City of Santa Cruz

REVISED

Sea Leve Rise Adaptation Policy Guidance

December 2020

Primary Authors

Ross Clark, Sarah Stoner-Duncan, Charles Lester

Rachel Pausch, David Revell, Andre Joseph-Witzig

CCWG
central coast wetlands group

integral consulting inc.

Table of Contents

1. Introduction

An LCP update or Public Works Plan (PWP)[1] are two different mechanisms for implementing the City's preferred shoreline adaptation strategies, including land use plans, zoning, regulations and programs, while addressing the requirements of the California Coastal Act. An LCP update will set policy to guide future decisions, and the soon to be drafted PWP will identify short term (<10 year) projects to increase West Cliff resilience. The Coastal Act, and by extension the LCP or a PWP, direct new development in the coastal zone, including City infrastructure, private development or other actions affecting the intensity and density of the use of land in the coastal zone, including public access to and along the shoreline. Because of this, it is important that other City policy documents, including the General Plan and Local Hazard Mitigation Plan work in harmony with the LCP and PWP policies, ordinances and programs. These other plans should be considered when updating the LCP, but any policy or regulatory conflicts would need to be resolved in favor of the LCP and Coastal Act. Related, effective implementation of the City's shoreline adaptation strategy may require updates to these other documents (and should where conflicts are identified), to minimize the potential for misunderstanding and conflict in the planning and regulation of development, as well as in future program planning, budgeting and project implementation decisions.[2] Hence, an LCP update is an opportunity to better integrate all of the City's planning and regulatory programs that address coastal resilience along the shoreline.

2. Structural and Other City-wide Planning Considerations

Existing LCP

The certified LCP consists of multiple components that will need to be updated to varying degrees, depending on the structural approach taken with the update by the City. These components are:

a. General Plan/LCP Coastal Policies and Maps
b. Area and Specific Plan Policies and Maps
c. Public Access Plan
d. LCP Implementation Regulations
e. Beach/South of Laurel Design Guidelines
f. City-wide Creeks and Wetlands Management Plan

Ideally the entire LCP will be reviewed and updated to address identified shoreline vulnerabilities and adaptation strategies. Such an update would surely involve amendments

[1] The City and Coastal Commission have discussed the use of the Coastal Act's Public Works Plan (PRC 30605) mechanism to implement the recommendations of the West Cliff Drive adaptation planning project.
[2] See, generally, California Adaptation Clearing Housing, Coastal Hazard Resilience Planning in California: It Takes a Comprehensive Approach, https://resilientca.org/topics/plan-alignment/compass/.

to the policies, implementing zoning ordinances and aspects of specific plans, such as the public access plan or Beach/South of Laurel guidelines. However, other parts of the LCP may not require updating, such as the Creeks and Wetlands Management Plan, if no shoreline planning issues are implicated. At the very least, though, it will be important to assure that there are no internal conflicts between any updated components of the LCP and those plans that may not be considered for update.

Addressing Uncertainty through Mandates for Future Planning

Whether the LCP update is comprehensive or more targeted, another consideration is the extent to which certain aspects of the City's adaptation strategy will be addressed through policies that trigger additional planning in the future. The most important factor to consider when deciding how much planning to defer to a later date may be the extent to which the City's proposed LCP update allows the Coastal Commission to evaluate and find consistency of the LCP with the Coastal Act. Important questions about how the updated LCP will protect coastal resources in the future should not be left so unaddressed that no conclusions can be made about future resource protection. Nor should private property owners assume the City is prepared to take actions it is not. Such clarity can be addressed through the details of the City's preferred adaptation pathways that describe how the community intends to address future hazards.

When the City will transition from one adaptation strategy to another also needs to be described. For instance, if additional sand management planning is needed in order to figure out how to best maintain beaches over the medium and long term, the LCP could include specific beach width performance standards that if unmet will trigger other requirements or actions, such as initiating managed retreat measures or removing shoreline revetments. Such policies will provide an incentive for the City to implement the necessary sand management planning and give the Coastal Commission assurance that the protection of beach resources will be addressed as described. Each specific adaptation strategy, including additional planning, triggers and pathways will be important topics of discussion with the Coastal Commission in order to assure a favorable review of the LCP update.

Another related reason for potentially rolling forward some planning would be to allow further consideration of how the City's adaptation strategy will work as a whole, especially considering the mandates of the Coastal Act. Specifically, if the City is contemplating a strategy that relies on shoreline armoring for some shoreline areas that may result in the loss of beach areas and resources, such as along West Cliff Drive, then the City may want to consider strategies elsewhere that protect and enhance beach access and recreation, such as surfing opportunities, to offset this loss of beach. If not addressed directly in the current LCP update effort, this type of "balancing" within the directives of the LCP could be accomplished by a Coastal Resilience Implementation Plan, to be drafted and adopted at a later date. This Plan will help to implement the policies described within this LCP update and ensure they are consistent with the Coastal Act and provide a clear path to evaluate CDPs in the context of a larger City Coastal Resilience Plan.

Other Planning Processes

The question of how an LCP and a City General Plan are related is a common concern, and often local jurisdictions are interested in integrating the two documents. This can work, as with the original City of Santa Cruz LCP/General Plan that distinguished policies that were both General Plan and LCP policies with the "wave" symbol. However, it can also be challenging (as Santa Cruz has found), in part because policies within LCPs must be much more specific than the typical general plan in order to address the specific requirements of the Coastal Act.[3]

Of course, the Coastal Act, and by extension the LCP, is the controlling land use authority for development in the coastal zone. Ideally, the LCP's policies, ordinances and programs would be implemented through specific direction identified within a future Implementation Plan (IP) update and work in harmony with other City policy documents, including the General Plan and Local Hazard Mitigation Plan. These other authorities can be considered when updating the LCP, but any policy or regulatory conflicts would need to be resolved in favor of the LCP and Coastal Act. Hence, effective implementation of the City's shoreline adaptation strategy may require updates to these other documents as well, to minimize the potential for misunderstanding and conflict in the planning and regulation of development.

General Plan

For Santa Cruz, the General Plan was updated in 2012. However, this was before any focused consideration of climate change adaptation (there is no mention of climate "adaptation" in the plan). General Plan Policy NRC 4.5 does state the City's intent to "[m]inimize impacts of future sea level rise." And policy NRC 4.5.1 directs the completion of a city vulnerability study and climate change risk assessment. But it would be beneficial to consider amending the General Plan to reflect any shoreline adaptation strategies that may be adopted through the LCP update process and identify a frequency of updating of the vulnerability study and climate change risk assessment

Related, although most of the General Plan's policies are general enough to accommodate the requirements of the Coastal Act, the City should review the specific goals and policies of the General Plan and amend them as required to be consistent with the LCP update. For example, General Plan policy ED 1.8.13 directs the City to "[p]romote Seabright area beaches and the harbor to play a more significant role as Santa Cruz visitor attractions." Policy ED

[3] Coastal Act Section 30523 states:

> *It is the intent of the Legislature that local coastal programs certified by the commission should be sufficiently specific to meet the requirements of Section 30108.5, but not so detailed as to require amendment and commission review for minor changes, or to discourage the assumption by local governments of post-certification authority which ensures and implements effective protection of coastal resources. . . .*

Section 30108.5 address the land use plan component of an LCP, defined as "the relevant portion of a local government's general plan, or local coastal element which are sufficiently detailed to indicate the kinds, location, and intensity of land uses, the applicable resource protection and development policies and, where necessary, a listing of implementing actions."

5.4.2 directs the development of "a parking strategy and parking solutions for the Beach Area." Both of these may be consistent or potentially conflict with specific direction of preferred adaptation pathways that may be referenced within the LCP update, and therefore should be potentially updated.

The General Plan policy most directly applicable to potential LCP updates is perhaps PR 3.3 and its subparts:

> ***PR3.3*** *Protect, maintain, and enhance publicly accessible coastal and open space areas. . . .*
>
> > ***PR3.3.1*** *Protect coastal bluffs and beaches from intrusion by non-recreational structures and incompatible uses.*
> >
> > ***PR3.3.2*** *Ensure that development does not interfere with the public's right to access the ocean (where acquired through use or other legislative authorization).*
> >
> > ***PR3.3.3*** *Require new development and public works projects to provide public access from the nearest public roadway to the shoreline and along the coast, except where it is inconsistent with public safety or protection of fragile coastal resources, or where adequate access exists nearby.*
> >
> > ***PR3.3.4*** *Maximize public access and enjoyment of recreation areas along the coastline.*

PR policy 3.3.3. concerning public works in particular highlights the need to update the General Plan consistent with policy and specific adaptation pathway projects that may be adopted in the LCP.

The City can also work with the Coastal Commission to identify when and where certain public access amenities (i.e. parking) may need to be sacrificed as part of an adaptation strategy for the retention of other coastal resources and amenities. For instance, it may be determined that PR policy 3.3 take precedence over similar policies to preserve coastal parking when coastal adaptation needs put these two policies at odds.

Local Hazard Mitigation Plan

Similarly, there is a need to review and update the Local Hazard Mitigation Plan (LHMP) consistent with any adopted adaptation strategies in the LCP and PWP. In particular, the LHMP contains two mitigation measures allocated to the Public Works Department that could work at cross-purposes both to an eventual LCP update and the General Plan policy 3.3.3. These measures are B-2, "protect and preserve coastline infrastructure through permit review"; and B-3, "protect and preserve coastline and infrastructure through coastal restoration efforts – West Cliff Drive." Measure B-3 also indicates that its implementation is "dependent on funds and as emergencies happen." These measures reflect in part LHMP Coastal Erosion Goal 3 to "protect and preserve current infrastructure." B-3 should identify maintenance of existing armoring while seeking medium and longer term sand management and recreational prioritized adaptation strategies.

Update of LHMP occurs in 2022. The City would benefit from coordinating the public process of drafting a *Coastal Resilience Implementation Plan* as recommended within this policy document and the next LHMP update.

The Local Hazard Mitigation Plan currently has a number primary goals for reducing disaster risk in Santa Cruz: 1. Avoid or reduce the potential for loss of life, injury and economic damage to Santa Cruz residents from earthquakes, wildfires, floods, drought, tsunami, coastal erosion, landslide and dam failure. 2. Increase the ability of the city government to serve the community during and after hazard events. 3. Protect Santa Cruz' unique character, scenic beauty and values from being compromised by hazard events. 4. Encourage mitigation activities to increase the disaster resilience of institutions, private companies and systems essential to a functioning Santa Cruz. 5. Continue to monitor effects of climate change as outlined in the City of Santa Cruz Climate Adaptation Plan.

Of course, one the objectives of the current adaptation pathway planning process is to move the City away from emergency responses designed to protect development, and rather move towards planned adaptation, including redesign of existing infrastructure and/or relocation of development. Projects described within the existing LHMP that are intended to preserve existing coastline and infrastructure may or may not be consistent with future adaptation pathways adopted by the City and described within the LCP update or Coastal Resilience Implementation Plan, particularly if these pathways select the removal or relocation of infrastructure.

More generally, the next update of the LHMP should take into account the updated LCP and draft Coastal Resilience Implementation Plan, and be updated accordingly to assure integration of these planning tools. This includes objectives and measures related to coastal flooding, tsunami and coastal erosion. The current LHMP makes no mention of the LCP, which could lead to misunderstandings in future invocation of mitigation measures that may not be consistent with the LCP[4], risking obtainment of federal funding. Nor is it clear that the hazard mapping of the LHMP and the LCP update work are consistent with each other (or the General Plan). Most broadly, the LHMP should reflect the most recent focus of the City on resilience and adaptation, including the adaptation pathways, triggers and preferred projects that could be considered "pre-mitigation" of hazards identified in the LHMP (i.e. upgrade of failing armor to soil nail walls or implementation of a sand management program).

Capital Improvement Plan

The Capital Improvement Plan is an iterative internal City plan that describes a revolving list of necessary infrastructure improvement projects and prioritizes those projects for funding. Projects in the CIP are "relatively large-dollar amount, nonrecurring outlays and are for the purpose of constructing, purchasing, improving, replacing or restoring assets with multi-year useful life. In addition, certain special projects and activities are included"[5]. The CIP includes proposed projects for the next three fiscal years and describes projects that will be carried

[4] The LHMP does acknowledge the Coastal Commission as an interested party in the area of coastal erosion.
[5] 2019-2020 City of Santa Cruz Adopted Capital Investment Program Budget

over from the current fiscal year. Usually, projects selected for funding during the next year of the CIP are incorporated into and adopted with the annual budget. This annual planning process provides City Council and other decision makers with an excellent time to reevaluate current adaptation actions and consider if a transition towards an alternate strategy is appropriate (as described within the preferred pathways and triggers). All coastal repair, protective upgrades and other adaptation projects can be reviewed through the preferred future adaptation pathway lens to determine if alternative approaches are warranted.

> ***Policy:*** *Incorporate resiliency measures and adaptation strategies into capital improvement planning and other investment decisions.*

Beach Management Plan

It should be noted that the City actively manages Cowell and Main beaches pursuant to a Beach Management Plan (BMP) permitted by the Coastal Commission. This plan is not part of the LCP but rather a plan that outlines a variety of maintenance, management, and recreational activities approved by the Coastal Commission in a coastal development permit with a term of five years. It may be necessary to amend this plan and associated permit to reflect any adopted LCP updates and adaptation strategies such as a living shoreline projects or sand management. The BMP was recently renewed (March, 2020), however, and the current plan doesn't anticipate any amendments related to sea level rise planning in the next five years. It states:

> *E. Sea Level Rise Coordination*
>
> *The City will continue to study and develop policies and actions to respond to climate change and adapt to sea level rise. The City plans to undertake a project to more comprehensively identify and coordinate coastline specific adaptation strategies. Future LCP updates may include recommendations for programs, policies, and actions that can achieve resilient coastal access, use, and beach management. Staff does not anticipate that any of the future study's recommendations will affect the activities covered within the Beach Management Plan's five-year timeframe.*

Neighboring Jurisdictions and Authorities

In addition to integrating existing City plans, attention should also be paid to the plans and policies of adjacent jurisdictions and authorities. Specifically Santa Cruz County and City of Capitola should be consulted and where possible partnered with to implement beach management planning and retain public access. For example, long-term public beach access planning may benefit from a county-wide assessment of the supply and demand for beach access, including beaches in the County and the City of Capitola. Sand management and dredge practices should be a collaborative effort that ensures equitable preservation of county wide beaches.

State Parks Coordination

State Parks is the manager for Natural Bridges and Seabright beaches in the City, as well as State Park beaches in the County. There are beach specific management plans for both

Seabright and Natural Bridges state beaches. LCP policies that provide coastal resource management guidance for these areas should be developed in partnership with the Santa Cruz State Parks District and reflect the priorities within these management plans. To note, State Parks district staff were consulted routinely during this resilient coast planning process. Partnership opportunities can be investigated to reduce adaptation costs for both Parks and the City and cooperative programs (living shoreline and coastal access enhancements) may reduce operational costs.

3. Hybrid Strategy to LCP Coastal Policy Updates

The City's intentions to take a hybrid approach to their LCP update that updates policies throughout the document while also drafting new policies for key coastal needs (specifically sea level rise). The LCP's broad coastal policies will need to be updated to (1) address the Coastal Commission's general guidance on how to address sea level rise in development planning and review; and (2) provide the foundation for the City's preferred adaptation strategies and pathways. The Coastal Commission will likely request updated general policies to implement Coastal Act sections 30235 and 30253 in keeping with their SLR guidance. Additionally, the City is considering the addition of a *Beaches and Bluff Hazards* Chapter that will provide policies that direct the City's preferred pathway. We provide example policies for each beach to support implementation-level adaptation strategies and projects that best meet the recently identified beach specific resource management goals.

General Coastal Policy Updates

The LCP should be reviewed to identify necessary additions and deletions to assure consistency with the preferred adaptation strategies and the Coastal Commission's guidance. At a minimum, subsections B (Geologic Hazards) and D (Flooding Hazards) of the current LCP's Safety Element should be updated with an array of policies to address, for example, such issues as the use of best available science, redevelopment of existing structures, authorization of shoreline structures and hazard identification and noticing. There are several LCP updates either in development locally or approved by the Coastal Commission that provide examples of the kinds of policies and standards to consider in an updated Land Use Plan. These include Pacifica[6], the City of Santa Barbara[7], San Clemente[8], Pacific Grove[9] and Half Moon Bay[10]. Corresponding sections of the City's LCP implementation plan should also be updated accordingly. Here are two examples of such policies that would apply to all new development in the coastal zone:

> ***Best Available Science***. *Planning and development reviews shall use, as applicable, the best available science about projected sea level rise and other*

[6] https://www.cityofpacifica.org/civicax/filebank/blobdload.aspx?t=65377.05&BlobID=15842.
[7] https://www.santabarbaraca.gov/services/planning/mpe/lcp/clup/dclup.asp.
[8] https://www.san-clemente.org/home/showdocument?id=51862.
[9] https://www.cityofpacificgrove.org/living/community-development/planning/local-coastal-program.
[10] https://planhmb.org/.

climate-change related environmental changes when addressing coastal erosion, bluff failure, flooding and other coastal hazards.

***New Development in Hazard Zones**. New development in shoreline coastal hazard zones, including substantial improvements of existing structures, shall be sited and designed to be safe from erosion, bluff failure, wave runup, flooding and other coastal hazards for at least 100 years without existing or new shoreline protection, considering projected sea level rise and other climate change effects. Permit approvals shall prohibit shoreline protection for the authorized development, require the property owner to record an acknowledgement that the development does not qualify as a structure entitled to shoreline protection under Coastal Act Section 30235 and a waiver of any rights to such protection, and where necessary require a removal and restoration plan, including bonding for large projects, to avoid future shoreline protection or project failure.*

Other general coastal policy sections (and corresponding IP sections) of the LCP that should be updated to reflect the adaptation planning of the City include, but may not be limited to, the following:

- Environmental Quality Element
    - Water Quality (pgs. 28-29) [Stormwater Infrastructure Issues]
    - Soils (pgs. 29-31) [potentially, concerning erosion control and site stability]
    - Biotic Diversity and Stability (pgs. 31-34) [beach and shoreline ecology; living shorelines]
- Community Design Element (pgs. 38-42) [urban form/setting, adaptation pathways]
- Land Use Element (pgs. 44-59) [adaptation pathways, land use, circulation, public works, coastal access, etc.]
- Circulation (pgs. 60-62)
- Housing (pg. 64) [housing density; parking]
- Economic Development (pg. 66-69) [shoreline recreation and tourism]
- Community Facilities and Services Element (pgs. 70-72) [wastewater/water infrastructure]
- Parks and Recreation (pgs. 74-79) [Shoreline recreation, access and design; parks]
- Cultural (tribal – spiritual practice and surfing – historic precedent (surfing first came to the Mainland in Santa Cruz and surfed at the San Lorenzo river mouth, community identity – World Surfing reserve). Cultural Resources Element (pgs. 81-83) (archaeological, paleontological, historic, cultural, sacred sites) (add cultural resource updates, including surfing-related).

Beaches and Bluffs Hazards Chapter

In some cases, new policies may need to be added to support the goals and objectives of the Resilient Coast planning process. Some or all of the coastal resource and management goals

identified by the City, community and the Coastal Commission[11] could form the basis for these policies and be added in as overarching policies within a *Beaches and Bluffs Hazards Chapter*, or be inserted into other relevant corresponding sections of the LCP:

Coastal Resource Goals

1. Maintain/protect beach width where feasible. [Env. Quality]
2. Ensure beaches along the length of the city coastline remain accessible and preserve public and private visitor serving facilities in order to minimize increases in visitor densities on specific beaches and in collaboration with other agencies holding jurisdiction (e.g., Port District, State Parks). [Parks and Recreation]
3. Maintain a distribution of beach access points by encouraging a variety of transportation options along the entire city coastline. [Parks and Recreation]
4. Minimize coastal habitat loss and maintain ecological connectivity. [Env. Quality]
5. Address needs of underserved people of the community, both local residents and visitors with respect to housing, little to no cost access and recreation, day use parking, transportation, cultural and spiritual uses, and jobs. [Community Design; Housing, Cultural]
6. Maintain public safety on beaches and when accessing beaches; work with marine safety staff to upgrade priority marine rescue egress locations (i.e. Zone 2). [Safety]
7. Accommodate a diversity of recreational activities for a range of users. [Parks and Recreation]
8. Maintain and enhance water quality to the extent feasible. [Env. Quality]
9. Encourage, enhance and maintain regional sediment supply to the coast including sand management programs that enhance beach and coastal recreation while partially mitigating some impacts from coastal armoring. [Safety, Env. Quality, and Parks and Recreation]

Coastal Management Goals

1. Minimize coastal armoring. [Safety, Park and Rec, Env Quality, Econ Development]
2. Reduce beach area loss from placement footprint of shoreline protection structures. [Safety, Parks and Recreation]
3. Prioritize living shoreline adaptations. [Safety, Park and Rec, Env. Quality]
4. Monitor coastal access infrastructure and beach width long-term and in response to extreme storm events; monitor how coastal change is impacting coastal use. [Safety]

[11] Coastal resource and management goals were developed by the project team in partnership with the City of Santa Cruz and Coastal Commission in December 2019 as part of the Resilient Coast Santa Cruz adaptation planning effort.

Incorporating Adaptation Planning and Pathways into the LCP

In addition to a general update of land use plan policy, the LCP may be updated to incorporate the general guidance regarding the city's adaptation strategy to address sea level rise and specific aspects of adopted adaptation pathways. This guidance should identify a preference for adaptation strategies that prioritize preservation of coastal dependent recreation. This can be done through LCP policy, with corresponding ordinance updates or included in a new *Beaches and Bluffs Hazards Chapter*. Depending on the state of specific planning on different components of the adaptation strategy, additional planning (*Coastal Resilience Implementation Plan*) can be signaled through policy direction.

As discussed earlier, the extent to which future adaptation actions are not specified in the current LCP update and are instead addressed in future planning efforts is an important policy consideration that should be coordinated with the Coastal Commission. The Coastal Commission has approved LCP policies that roll adaptation decisions forward to future plans.

For example, the 2019 City of Santa Barbara LCP update includes a general requirement for the city to "develop a comprehensive Sea Level Rise (SLR) Adaptation Plan that identifies the City's vulnerability to SLR and analyzes the feasibility, economic impacts, costs, and environmental consequences of a range of adaptation strategies." Similarly, the approved San Clemente LCP requires the future completion of a "Citywide Sea Level Rise Vulnerability Study." Importantly, both of these required plans must be incorporated into the LCP through future amendments. The City of Santa Cruz has surpassed these municipalities in that they have completed the Vulnerability evaluation and identified a range of adaptation strategies. Now the city is challenged to select appropriately specific policies where agreement on a pathway exists and describe a specific planning process that will lead to agreed pathways and needed policy updates.

In terms of specific policies to implement the adaptation strategy of the City, the LCP should include policies that require implementation of an adopted strategy or strategies, including through the completion of the two necessary Coastal Resilience adaptation plans (West Cliff Public Works Plan and Coastal Resilience Implementation Plan). Policy should describe how the City will implement the drafted adaptation plans and meet requirements to monitor shoreline change, including specific triggers identified in the plan, and to periodically update the plans, including through future LCP amendments.

For example, general policies may be included in the LCP update that reference programs and actions listed within the two implementation plans (see Section 5) to ensure the adaptation plan and monitoring programs are implemented:

> **Policy (Coastal Resilience Implementation Plan)**
> *The City shall draft and implement a Coastal Resilience Implementation Plan to ensure preferred long term sea level rise adaptation pathways are achieved. The City shall monitor implementation and update the Coastal Resilience Implementation Plan to strengthen public safety, prioritize coastal dependent recreation, preserve existing neighborhoods, assure local economic vitality, respond to climate change, promote environmental justice, implement the Coastal Act and protect the public trust.*

Policy (Monitoring Shoreline Change)
The City shall implement a monitoring program for sea-level rise, beach width, bluff offset, flooding and storm damage, traffic patterns, recreational uses, and other potential measures or triggers for guiding implementation of the LCP's sea-level rise adaptation policies. The monitoring program shall include post storm and yearly (minimum) shoreline and bluff edge surveys, document annual maintenance costs and also establish thresholds for reassessing the City's Coastal Resilience Implementation Plan. Annual monitoring results will be reported to City Council for review.

Policy (Sea-level Rise Adaptation Plan Update)
The City shall draft its Coastal Resilience Implementation Plan by 2023 and reassess its implementation as expressed in the LCP every five years or sooner as required by the shoreline monitoring program. The reassessment shall consider the following:

- *Efficacy of Adaptation Plan and implemented measures*
- *Updated sea level rise projections, coastal hazard projections, and risks.*
- *Potential need to revise adaptation measures or implement new measures, including review of emerging engineering, science, and technologies.*
- *Funding needs and potential funding sources.*

Policy (Adaptation Funding)[12]
The City will pursue feasible grant funding sources or new funding mechanisms, such as the formation of special districts including Geologic Hazard Abatement Districts (GHADs), or securing FEMA and other federal or state adaptation and hazard mitigation funds, to finance adaptation strategies for public infrastructure.

Policy (New Shoreline Structures)
Unless a waiver of rights to shoreline protection applies on the property, shoreline protection structures, including revetments, breakwaters, groins, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted consistent with the LCP's policies when required to serve coastal-dependent recreation uses or protect existing principal development structures or public beaches in danger from erosion, when designed to eliminate or mitigate adverse impacts on local shoreline sand supply, minimize the footprint of the structure on the beach and when there is no less environmentally damaging feasible alternative such as beach nourishment, non-structural drainage and native landscape improvements, or other similar non-structural options. New structures shall be required to pay in lieu fees into a fund to support coastal adaptation in the City. For purposes of this policy "existing principal structures" means shoreline structures that were legally authorized prior to January 1, 1977.

[12] **NOTE:** Appendix F of the Santa Cruz June 2020 Adaptation and Policy Strategy Report provides examples of funding mechanisms that could be explored to implement various adaptation strategies.

4. Recommended Supplemental Plan Development

Two plans have been identified as necessary to implement broad sea level rise adaptation policies to be included within a revised LCP including a Coastal Resilience Implementation Plan and a West Cliff Drive Public Works Plan (PWP).

Coastal Resilience Implementation Plan

One strategy to increase the City's ability to adapt to environmental changes and benefit from best available science and data regarding the success of existing projects within the City and in other jurisdictions is to select specific adaptation pathways and the programs and policies needed to implement them. The drafting of a Coastal Resilience Implementation Plan will enable the City to consider the unique adaptation challenges and selected strategies of each of the City's beaches and West Cliff Drive zones and how these beach specific adaptation strategies help meet city wide access and recreation goals, as well as shoreline habitat conservation priorities. Identifying unique pathways for each beach segment can facilitate the review of the Coastal Commission for consistency with the Coastal Act by providing a city coastwide mechanism to consider trade-offs between different beach areas allowing, for example, the maintenance of armoring and loss of beach area along West Cliff that could be offset by protection and enhancement beaches elsewhere in the City.

Previous discussions among City and Coastal Commission Staff determined that the proposed Coastal Resilience Implementation Plan will best be drafted as an appendix/attachment to LCP, that can be updated periodically to best reflect existing conditions, community priorities and best available data. Policy updates within the existing LCP therefore should support the adaptation strategy priorities described within the Coastal Resilience Implementation Plan and ensure that programs and actions needed to achieve these strategies (e.g. coastal monitoring program, trigger review) are implemented in a timely manner to initiate planning, engineering, permitting and financing of future strategies in time to reduce future impacts/risks.

A Coastal Resilience Implementation Plan can be used as the instrument to guide adaptation strategies referenced within the revised LCP.

> **Policy:** *The City will draft a Coastal Resilience Implementation Plan that defines beach specific adaptation actions, strategies and long term pathways that best meet the multiple resource management goals for those beach segments. The plan will identify short term actions and future environmental triggers that signal the need to consider alternate adaptation approaches. The plan will include monitoring program scope, needed access and infrastructure upgrades needed to maximize public use by all community members and a funding strategy for implementation. Such a plan may include:*
>
> 1. *Identify priority beaches for long term preservation in face of sea level rise.*
> 2. *Select beaches that are good candidates for nourishment that benefit downcoast beaches*
> 3. *Identify possible local sand sources (Harbor dredge, San Lorenzo River, etc.)*

4. *Beach Nourishment/Living Shoreline implementation and funding plan*
5. *Long term public access strategy to ensure access is provided for all user groups*
6. *Monitoring program and triggers for moving from one adaptation strategy to the next within a beach specific adaptation pathway*
7. *Link City Council approval of coastal infrastructure upgrade and repair funding with review of monitoring data and trigger exceedances*
8. *Identify need for a Private Property Acquisition Program*
9. *Define management plan implementation oversight and funding mechanism*
10. *Identify which areas are a priority for removal, maintenance, upgrades, redesign of armoring*
11. *Establish an equitable, dependable long term funding strategy*
12. *Define maintenance, catastrophic repair and removal strategies for armoring.*
13. *Managed retreat guidelines describing 1) implementation triggers, 2) monitoring protocol, 3) strategies to support incremental transition of public roads to pedestrian priority use, 4) strategy to address catastrophic cliff failure that threatens priority public and private uses.*
14. *Real Estate Disclosure to acknowledge existing and future coastal hazards and abdicate City responsibility for access to properties, advise that retreat of WCD may require acquisition of inland easements and or acquisition of property*
15. *Coastal Hazard overlay – require additional technical studies for development/redevelopment*
16. *Coastal Construction standards (low lying use FEMA V-zone construction standards if in Coastal Hazard overlay, construction standards for foundations that allow for relocation on cliff tops).*

A Coastal Resilience Implementation Plan can also be used to guide the preservation of vulnerable marine resources including surf breaks from coastal adaptation actions. The City of Santa Cruz was the site in 1885 of the first recorded surfing excursion outside of Hawaii. The City is often referred to as Surf City, USA. The Santa Cruz Surf Museum located at the Lighthouse documents the substantial innovations that Santa Cruz surf breaks have contributed to the global surf culture.

Under the existing LCP in 1992, Table LCP-5, the Coastal Recreation and Preservation Area and Map LCP-6 identify the City's existing coastal access routes and points. For the beach access at Lighthouse Point/Steamers Lane, the LCP identifies Lighthouse Point as a "prime surfing point (called Steamer Lane, located to the east of Lighthouse Point)…".

In 2012, Santa Cruz World Surfing Reserve was designated stretching approximately 7 miles from Natural Bridges State Park on the west end of the City of Santa Cruz eastward along the city and county coast to Opal Cliffs, just east of Pleasure Point. At least 23 consistent surf

breaks are sited along this coast, including the world-class breaks of Steamer Lane and Pleasure Point.

Specific policy recommendations would be to add a map of the surf breaks for all of the surf breaks in the City, and establish processes to protect them from impacts of coastal armoring and prioritizing their preservation.

Public Works Plan for West Cliff Drive Corridor

The City and the Coastal Commission have selected the use of the Coastal Act's Public Works Plan (PWP) mechanism for the West Cliff Drive area of the City. Although the planning involved to create a PWP is similar to the LCP planning process, and any PWP would need to be consistent with the LCP, there are some key differences. The reason to pursue a PWP is to allow for up-front consideration and conceptual approval of specific strategies or projects to implement an adaptation pathway. For example, the PWP will identify specific armoring repair, technical studies, or access enhancement projects to meet Coastal Act priorities as well as to begin to plan and implement a preferred adaptation pathway. Projects included in the PWP approved by the Coastal Commission are essentially "pre-authorized" if implemented consistent with other requirements of the PWP.

Once the PWP is adopted, the Coastal Commission can only approve or conditions projects included in the PWP. On the other hand, any projects considered through the PWP process would not be subject to the policies and procedures of the LCP. For example, a revetment approved under the PWP would not be subject to the CDP appeal process, but would automatically be heard by the Commission, and could only be approved or approved with conditions. If the same project was considered under the LCP, it may not need Commission review (if above the mean high tide), but could be appealed, and possibly denied by the Commission. There are internal City of Santa Cruz procedural considerations to take into account when assessing whether to use the PWP mechanism. Either way, the LCP and potentially the PWP would need to function as an integrated planning framework to be effective. A PWP, would likely identify priority projects for the next 10 years before having to be revisited and reauthorized by the Commission.

> **Policy:** *The City will implement a West Cliff Public Works Plan focused on short term maintenance, planning and engineering studies, and upgrades to West cliff Drive infrastructure. Projects included within the PWP may include: revetment repairs and upgrades, repairs, upgrades and rerouting of bike and pedestrian path, relocation of parking out of hazard areas, emergency repairs to failing armoring and caves, sand management program feasibility studies, etc.*

5. Beach Specific Adaptation Strategies

In addition to general policy and adaptation planning updates, the LCP could be updated to reflect the beach specific priority adaptation strategies evaluated through this adaptation pathways effort. This is perhaps best done through reference within the *Coastal Resilience*

Implementation Plan to specific actions, strategies, programs and pathways that the City intends to implement over time.

Within the *Coastal Resilience Implementation Plan,* beach specific goals, objectives, performance standards, monitoring needs, triggers, and potential actions can be identified that will shape future adaptation. Information on adaptation options, utility of these options within other municipalities, monitoring needs and environmental triggers that direct a change in management actions can be developed and included within the Plan are available within the various Santa Cruz June 2020 Adaptation and Policy Strategy Report appendices. City preferences will determine what level of guidance and policy is included within the LCP update and what is included in referenced plans (*Coastal Resilience Implementation Plan, West Cliff Public Works Plan*).

Policies within the updated LCP should focus on broad adaptation goals and strategies that reflect a preferred pathway but do not provide specific strategies to achieve those preferred adaptation options. Beach specific short term adaptation policies as well as Mid- to long-term adaptation options can be identified within the *Coastal Resilience Implementation Plan.*

Where there is strong support now for a specific preferred adaptation pathway for a beach segment, more specific policies can be included within the *Coastal Resilience Implementation Plan* to guide future development and inform the community of intended future pathways for adaptation. Such specificity may aid future permitting of these strategies and increase public understanding and support for these actions.

General policies that inform the community of future actions can reduce future conflict and enable the municipality and the community to develop programs and partnerships needed to implement long term strategies at a later date. By codifying long term pathways now, the City will be able to reduce investments in short term actions that are counter to long term pathway implementation. Beach specific coastal resource goals identified through this planning process are listed below and could be referenced within the LCP update. General policies that define the future priorities for beach specific adaptations may help inform the community and the Coastal Commission of intended pathways that will be expanded within the *Coastal Resilience Implementation Plan* and within future updates to this LCP.

Where there is yet to be an agreed upon adaptation pathway, additional dialog among city leaders and the community will be needed. The LCP can identify such a need with a policy committing to complete additional planning exercises using compiled information provided by this Coastal Resilience planning process and the concurrent West Cliff Drive planning process to identify cost effective adaptation pathways that focus resources on beach specific goals.

> **Policy:** *Establish a planning process to consider cost effective, long term options for the Beach Flats area, Seabright Neighborhood and West Cliff Drive that best reflect coastal resource priorities and predicted future hazards.*

Natural Bridges Beach

The Natural Bridges area provides a relatively straight-forward approaches for the LCP update. Currently, the LCP includes 37 policies for the Natural Bridges area covering environmental quality, land use, circulation, parks and recreation, cultural resources and safety. Assuming the City keeps a structure that includes a subarea plan for Natural Bridges, each of these policies will need to reviewed and either retained, amended or deleted, consistent with the proposed adaptation policies in the LCP update.

Additional programs and policies will need to be added to help achieve identified Natural Bridges coastal resource goals and support a preferred adaptation pathway. The existing Natural Bridges State Park Master Plan identifies the relocation of the entrance to along Delaware and City policies should facilitate that transition. In addition, armoring would be restricted, in part to reflect current State Park policy.

This planning process focused on aligning with State Parks plans and guidelines to select an adaptation pathway that emphasized the use of a living shoreline program and managed retreat of park resources, particularly along the current West Cliff Drive entrance, including beach and wetland areas and park infrastructure. Strategies that could be included in a *Coastal Resilience Implementation Plan*:

- Support State Parks efforts to implement a managed retreat strategy that meets beach width goals, considers unique aquatic habitat (e.g., tidepools, lagoon etc.), relocates the park entrance, and supports habitat restoration objectives.
- Focus on living shoreline adaptations.
- Investigate alternative ways to access Natural Bridges State Beach to avoid need for new armoring while maintaining multimodal access.
- Collaborate on living shoreline adaptation efforts among beaches.
- Identify adaptation actions that can be implemented together by the City and State Parks, leading to a cost savings to both parties.
- Encourage multimodal access.

Key goals that could be codified through LCP policy:

- *Maintain or increase beach area for public recreation*
- *Work with State Parks on managed retreat plan that meets beach width goals, considers unique aquatic habitat (e.g., tidepools, lagoon etc.), and supports habitat restoration objectives.*
- *Investigate alternative access ways to Natural Bridges outside of erosion and flood hazard zones, so as to maintain multimodal access*
- *Focus on living shoreline adaptations.*

Policies that Support Pathway

To support these resource goals through LCP policy, a broad goal could be added to recognize this pathway, while including identified triggers for action and more specific actions within the Coastal Resilience Implementation Plan and work with state parks to align

city policies with management objectives within the Natural Bridges State Beach Management Plan.

In the case of all State Parks properties including Natural Bridges, Lighthouse Field and Seabright, there will need to be an overarching policy requiring coordination with State Parks as the land owner/manager. The policy language itself should be developed in coordination with State Parks, but a coordination and planning policy could take a general form such as:

> ***Policy:*** *Support State Parks efforts to implement living shoreline projects and managed retreat strategies (including rerouting of main entrance to Delaware) to retain natural resource benefits and sufficient beach area to meet visitor's needs.*

Policy considerations to address needs of underrepresented groups

By implementing the Managed Retreat Adaptation Pathway and by implementing measures to upgrade specific recreational park services, the overall level of service for unique user groups can be enhanced. Expanded partnerships between the City and State Parks should be considered to identify funding to make upgrades prioritized by underrepresented groups within the community. Measures to support community equity and access opportunities for all might include:

- Upgrade signage to include multilingual and gender neutral bathrooms
- Provide fire pits and evening access
- Upgrade/integrate coastal trail with park access
- Maintain ADA parking
- Measures to support community equity and access opportunities for all include: Provide fire pits and evening access, Upgrade/integrate coastal trail with park access, Maintain ADA parking.
- To ensure the loss of services (roadway and parking) will not disproportionally impact user groups who rely on ADA amenities, and cliff top infrastructure, adaptation efforts within Natural Bridges State Park should prioritize the retention of cliff top public infrastructure (walkways and bike paths) and minimize the loss of public access and viewing opportunities.
- If the West Cliff Drive parking lot is decommissioned, parking should be reconfigured on-site, or Swanton Blvd and Delaware Ave to ensure ADA accessibility.

West Cliff Drive

No single adaptation strategy will address the projected erosion hazards or support the priority management goals for West Cliff beaches. Results of a Benefit Cost Analysis for WCD show that the highest probability of successful adaptation along WCD would be a focus on recreational enhancing strategies. This adaptation approach includes a combination of sand management, reduction in coastal armoring footprints through upgraded armoring from revetments to vertical seawall/soil nail walls and sand retention structures along with structural adaptation such as bluff top seawalls and cave fills in high hazard areas. The below identified policies are intended to work in unison with the West Cliff Drive Adaptation and Management Plan/Public Works Plan.

Key goals that could be codified through LCP policy:

- Prioritize adaptation and erosion management approaches that support maximizing beach recreational uses and preserving surfing resources.
- Prioritize adaptation strategies that maintain or enhance existing surf breaks.
- To the extent possible, retain, maintain, and expand vertical access to pocket beaches with a high priority on Its Beach and Mitchells Cove through 2100.
- Support development of a sand management program that backpasses sand from the Santa Cruz Harbor to Pyramid Beach to improve coastal recreational uses as it drifts back to the Harbor.
- Manage public safety and education (on beach and bluff) with respect to erosion, sea cave and bluff failure and access ways.
- Retain and prioritize lateral multi modal recreation and beach access along the cliff top and bedrock platforms over the accommodation of vehicular traffic or parking.
- Reduce human influences on the rates of erosion through public access and storm water improvements
- Encourage usage by disadvantaged populations of WCD by upgrading signage on restrooms and interpretive installations
- Identify options for continued access along the coast even where beaches are
- Utilize native habitats to reduce erosion and manage informal access locations

Policies that Support Pathway

Reclamation of lost pocket beaches is unlikely but preservation of key pocket beaches including Pyramid Beach, Mitchell's Cove, and Its Beach may be feasible through the transition of rip-rap to vertical sea walls (to reduce the footprint of the coastal armoring structure and reclaim beach), a sand management program, and removal of rip-rap to support natural coastal erosion processes at Its beach. The integration of lateral access along terraces within seawall upgrades can improve coastal viewing, access, and recreational and fishing opportunities in places where pocket beach reclamation is unlikely. Allowing natural coastal erosion processes at Its beach and Lighthouse Point can benefit natural coastline processes and be integrated with other bluff top visitor serving upgrades.

Public input regarding Santa Cruz beach adaptation highlighted the values of using Living Shoreline strategies whenever possible. Replacement of non-native iceplant with native plants and integrating habitat enhancement actions with cliff stabilization can reduce the need for new armoring and enhance public use of the coastline.

> ***Policy:*** *New shoreline protective devices shall only be utilized if no other feasible, less environmentally damaging alternative is available, such as relocation, beach nourishment, non-structural drainage and native landscape improvements, or other similar nonstructural options. Such non-structural options shall be used and prioritized wherever possible to protect coastal resources, including coastal habitats, public recreational uses, and public access to the coast. If necessary, new shoreline protective structures shall be*

designed to occupy the smallest possible footprint and minimize reflective wave energy to the extent feasible.

Removal and repurposing of rip-rap placed on Its beach that is protecting the parking lot above is a high priority opportunity to allow cliff erosion and managed retreat of cliff top infrastructure. The removal of rock on Its Beach will help expand beach area and eliminate a lateral access obstruction. By establishing restrictions on new and removal of old armoring at Its beach, the City will have (though this planning effort) identified appropriate areas within the City to employ a managed retreat strategy that benefits beach resources and limits impacts to other coastal resources, access, infrastructure and private property. Example Policies include:

> ***Policy:*** *Where necessary, the City shall relocate parking inland of West Cliff Dr. to preferentially retain bike and pedestrian pathways and minimize the need for new armoring.*
>
> ***Policy:*** *New armoring along Its Beach is prohibited. The City shall remove existing shoreline revetment rock on Its Beach by 2025. Any repurposing of this material in the coastal zone shall be consistent with applicable LCP and Public Works Plan policies.*
>
> ***Policy:*** *Establish armoring restriction and moratorium zone along Its Beach to allow natural cliff erosion where feasible into public property to support resilient beach goals. The City will repurpose shoreline revetment rock on Its Beach for use to repair other existing structures or for use to fill sea caves.*
>
> ***Policy:*** *Draft a Managed Retreat Plan for Lighthouse Point to prioritize bike and pedestrian trail maintenance and realignment over retention of parking and two way traffic. Plan for and require the relocation of parking inland and the reduction of WCD traffic lanes to enable managed retreat policies and maintain space for the multi-modal Recreational Trail.*
>
> ***Policy:*** *Draft a surfing plan with a map of identified surf breaks in the City consistent with World Surf Reserve.*

The sea caves at Lighthouse Point pose a high risk of collapse, jeopardizing cliff top recreation, surf access, Lighthouse integrity, beach width at Its Beach, and surf conditions at Steamer Lane. Filling the Cave or placing armor riprap at the toe of the sea caves at Lighthouse Point may help reduce erosion and put off the predicted collapse of these sea caves.

> ***Policy:*** *Evaluate the potential of partially armoring or filling the Lighthouse Point sea cave to protect coastal resources, surf breaks and access opportunities.*

Where revetments have been built to protect cliff top infrastructure, those structures should be maintained as needed to provide their intended protection. Actions to monitor infrastructure integrity and prioritize repairs and upgrades will need to be included in the Public Works Plan and supported within the LCP update.

Policy: *Existing revetments shall be monitored frequently (as outlined in the West Cliff Public Works Plan) and necessary repairs and upgrades will be reported to City Council and the Coastal Commission.*

Policy: *Maintenance of existing revetments shall prioritize recreational benefits by removing fugitive rocks, enhancing vertical access opportunities and removing or repurposing unnecessary rip rap for use elsewhere along the West Cliff Drive corridor.*

Sand management and placement will help to mitigate secondary impacts to recreational resources from existing revetments including surf breaks, beach width and continued loss of narrow pocket beach access for all West Cliff beaches.

Policy: *The placement of sediments at appropriate points along the shoreline sourced from river and harbor maintenance efforts may be permitted for the purpose of beach nourishment, if the source material proposed for deposition contains the physical (e.g., grain size and type), chemical, color, particle shape, debris, and compatibility characteristics appropriate for beach replenishment and does not cause significant down coast sand limitations.*

Policy: *Sand Management. Expand beach nourishment and dredged sediment management to protect shorelines from erosion, lessen the need for shoreline protection devices (e.g. seawalls), and enhance beach and surf recreation, consistent with the policies of this Coastal and West Cliff Public Works Plan.*

To implement West Cliff preferred pathways through LCP policy, the broad goals of the approach could be added as proposed new policies or included through the drafting of the Public Works Plan. Longer term transitions from maintaining existing infrastructure to upgrading rip-rap to sea walls will required additional policy changes or site specific permitting. Monitoring of Mitchell's Cove beach width can be used to identify when triggers are met to transition to mid and long term actions.

Actions to monitor beach area and use to aid timing of future cliff upgrades will need to be included in the Public Works Plan and supported within the LCP update.

Policy: *The City shall implement a monitoring program for sea level rise, beach width, bluff offset, flooding and storm damage, and other potential measures or triggers for guiding implementation of the Coastal Resilience policies. The monitoring program shall include yearly (minimum) shoreline and bluff edge surveys and also establish thresholds for reassessing the City's Adaptation Plan.*

Policy: *Monitor the beach profile and recreational use of beaches to obtain baseline information for analyzing riprap proposals and their recreational impacts and establish criteria for a maximum permitted coverage of sandy beaches by seawalls.*

To ensure that storm drain related erosion problems are minimized along West Cliff, and thus reduce the need for new armoring, existing assessment of stormwater infrastructure in need of replacement will need to be included within the City Stormwater Management Program priority projects and a schedule for upgrades adopted. Possible LCP policies to support this action:

Policy: *Storm Water Policy: The City shall prioritize (I.e. include within related cliff top repair projects) the maintenance and improvement of West Cliff storm drain discharge infrastructure to ensure its function as a critical flood prevention device to limit discharge impacts (erosion) to coastal resources, coastal access, public infrastructure and facilities, and existing development.*

Policy considerations to address needs of underrepresented groups

- Signage improvements – multi lingual and gender neutral
- Upgraded seawalls should integrate user groups who value access to the water (fishing from beach and bedrock platforms), and ADA cliff top infrastructure that does not impair views. Ensure that new armoring does not impact those who prefer to fish from mid-level terraces along cliffs by including design elements that enhance public use of roadway, public bike and pedestrian pathways, and access points to the beach and terrace. Implementation of beach nourishment programs in conjunction with construction of hard armoring can help to mitigate the loss of beach area below these structures.
- The potential loss of services (roadway and parking) due to adopting a managed retreat strategy may impact user groups who rely on ADA amenities, and cliff top infrastructure. The City shall prioritize the retention of public recreational infrastructure (walkways and bike paths), minimize the loss of public vertical access over 2 lane vehicular access and parking.
- Measures to support community equity and access opportunities for all while adapting to sea level rise include: Install/maintain/ upgrade stairs, include cliff top fishing spots, expand ADA parking, remove rock impeding water access, upgrade stormwater and surface drainage infrastructure, replace lookouts as they fail, maintain coast trail, replace benches, gender neutral/late night bathroom, Integrate grassland/wetland restoration, riprap and enhance stairs, and Enhance overlooks

Site specific Santa Cruz LCP policy that may need to be amended

- PR 1.7.6 Develop and implement an integrated design, land use, recreation, cliff stabilization, and landscaping plan for West Cliff and East Cliff Drives to enhance public access, safety and recreational enjoyment in these areas.

Main and Cowell Beaches

Storm flooding is projected to impact low lying areas including the Beach Flats community as higher waves overtop the coastal infrastructure on Beach Street. Wave impacts to adjacent buildings and flooding of low lying areas is anticipated to increase over time as sea level rises and storm intensity increases. The entire 3,700 feet of Main Beach from the Dream Inn to the San Lorenzo River mouth, along the Boardwalk, has been protected for decades with a low concrete support wall and sheet pile wall. While the beach itself will gradually narrow as sea level rises in the decades ahead, erosion risk is lessened because of the presence of the concrete support wall and the elevation of the property and infrastructure located behind it. A significant change in the storm wave climate and the rate of sea level rise could lead to the overtopping of these walls leading to wave and flood impacts.

During the summer, seasonal closure of the San Lorenzo River Lagoon, often causes flooding to the Boardwalk, Downtown, Lower Ocean, and Beach Flat communities. The San Lorenzo Culvert project is currently being engineered with construction anticipated in 2021-22.

Key goals that could be codified through LCP policy:

- To the extent possible, work to maintain existing beach width but at a minimum, retain pre-harbor beach width (~220 ft) through 2100
- Ensure risks to residents and visitor serving businesses are considered when developing adaptation alternatives.
- Maintain diverse recreational opportunities (swimming, picnics, beach volleyball, surfing, kayaks, etc.) at Main and Cowells beaches for visitors of all socioeconomic levels.
- Retain easy access via multimodal transportation to the coast for use by residents and visitors of all socioeconomic levels to beaches, wharf and boardwalk.
- Maintain and, where feasible, improve flood protection infrastructure, e.g., pumps, levee and river mouth culvert, within Beach Flats and lower Ocean Street to safeguard residents, visitors, and assets.
- Retain safe access to the extent possible to the wharf and beaches through upgrades to access infrastructure by increasing their resiliency to winter storm events.
- Maintain structure of Santa Cruz Wharf as an important means of coastal access.
- Ensure river and beach management are coordinated.
- Maintain the San Lorenzo culvert
- Support Lagoon management to balance multi-objectives: endangered species, marine safety, beach recreation, water quality, and community flooding

Policies that Support Pathway

Short term actions to reduce impacts from winter wave damage include adoption of a living shoreline program, similar to the State Parks efforts at Seabright and Natural Bridges, implemented as a partnership between the City, Boardwalk and other vested businesses. Improvements to these projects could include the reuse of driftwood, rather than off hauling or permitting of harvesting. Cost savings could be realized by partnering with existing living shoreline enhancement program at Seabright Beach.

Implementation of a living shoreline solution will take adaptive management and a change in the use of driftwood and woody debris discharged from the San Lorenzo River. The use of this wood into living shore/dune solutions should be a City priority to develop dunes and enhance protection along Main, Cowell, and Seabright Beach.

> ***Policy:*** *Prepare a Coastal Resilience Implementation Plan that includes a Beach Nourishment/Living Shoreline implementation strategy to support increased wave resiliency of Main and Cowell Beach back shore habitat. Integrate natural wood, or*

hard structures within the dunes to increase protective capacity of living dune habitats.

For other portions of Main and Cowells beach, hip walls or other coastal upgrades can help reduce winter storm damage while retaining or enhancing public access and views.

> ***Policy:*** *Prepare a Coastal Resilience Implementation Plan that includes short and medium-term armoring upgrade and replacement strategies to protect public and private visitor-serving buildings and infrastructure along Beach Street. Included policies and programs should describe how to design upgraded structures to protect and enhance lateral public access and coastal viewing opportunities needed to retain or enhance existing 2020 amenities. The plan should establish indicators to determine when these upgraded structures no longer provide intended functions and thus, trigger long term alternative actions.*
>
> ***Policy:*** *Within the parameters of adopted adaptation parameters, any repairs or new armoring structures should overbuild the foundation to accommodate an additional 3 feet of elevation on the curb/hip walls.*

New visitor serving development along Beach Street should be designed and constructed to be resilient to predicted wave and flood impacts. This should consider applying FEMA V zone construction standards and adding 3.5 feet of sea level rise to the base flood elevation while also increasing the building heights to accommodate the sea level rise.

> ***Policy:*** *Incorporate resiliency measures and adaptation strategies into capital improvement planning and other investment decisions. Resiliency measures can include but are not limited to: raising of infrastructure and structures, establishment of permanent or temporary alternative routes for public transit and bikeways, green infrastructure that reduces flooding, and upgrades to stormwater and wastewater systems.*
>
> ***Policy:*** *Using best available science, new development, including substantial redevelopment of existing structures, shall be sited and designed to accommodate projected flood elevations and other coastal storm hazards for a 100-year storm for the life of the development. Development authorizations shall be conditioned to provide for potential relocation or removal as may be required by triggers and longer-term adaptation pathways.*

Once hazards are too great to maintain infrastructure in the current location or when beach width loss has become significant, relocation of vulnerable infrastructure may be necessary. By encouraging the relocation of infrastructure inland through zoning and or tax incentives, businesses can plan for long term relocation of infrastructure with some certainty of success.

> ***Policy:*** *To minimize the loss of other beach resources, encourage the relocation of existing vulnerable infrastructure to adjacent locations (i.e. parking lots) with streamlined redevelopment to prioritize the resiliency of visitor serving businesses and Main and Cowell beaches.*
>
> ***Policy:*** *To minimize the loss of other beach resources, prohibit revetments or other structures with large base footprints. Require new armoring to be small-footprint recurved sea walls.*

Policy considerations to address needs of underrepresented groups

- Upgrade signage to multi lingual and encourage gender neutral bathrooms
- Lateral access along the beach could be reduced through transition of some recreational areas to habitat. Lateral trails through the living shoreline (if implemented) can enhance access, however trails should be angled to the east to reduce winter wave run up "funneling".

Seabright Beach

Seabright State Beach is the widest beach within the City of Santa Cruz because sand accumulates behind the Santa Cruz Harbor Jetty. Winter waves are predicted to impact the cliff face leading to cliff erosion and potential loss of adjacent habitat, sidewalks, roadway, homes and the remaining portions of East Cliff Dr. and sidewalk. Management decisions regarding how to retain certain levels of access will need to consider the protection of private property and coastal access (auto, bike, pedestrian and parking). New cliff protective structures may be needed to protect private property along East Cliff (Seabright) where no structures currently exist or alternative adaptations strategies that prioritize beach resources may require revisions to inland infrastructure alignment.

Key goals that could be codified through LCP policy:

- *To the extent possible, work to maintain existing beach width; but at a minimum, retain pre-harbor beach (150 ft) width through 2100.*
- *Maintain and enhance native back beach vegetation.*
- *Focus on living shoreline adaptations.*
- *Retain lateral coastal access along blufftop (California Coastal Trail segment) for multi modal transportation where beach sand can be considered as a secondary access.*
- *Retain or enhance beach amenities including restrooms and fire pits.*
- *Establish 2100 beach management goals and bluff erosion strategies.*
- *Work with the Port District on dredge management and jetty maintenance and ensure that coastal adaptation strategies and harbor adaptation strategies are integrated.*
- *Address storm drainage issues causing bluff erosion.*

Policies that Support Pathway

The preferred adaptation pathway focuses on retaining beach area and beach habitat through living shoreline restoration programs. Once lateral access and beach area are compromised and bluff erosion becomes a problem, bluff top retreat of public infrastructure can be implemented. Preservation of public lateral bluff top access is a priority. Some private property armoring may be allowed until coastal access and beach width triggers are met at which time managed retreat will be necessary.

The Santa Cruz community has provided input to adaptation selection and prioritized the enhancement of natural beach habitats and building of living shorelines that benefit coastal

environments and public enjoyment. Pilot efforts are underway to enhance backshore habitat and could be expanded and subsidized to increase bluff protective capacity.

> ***Policy:*** *The Coastal Resilience Implementation Plan will prioritize "soft" adaptation strategies such as managed retreat, beach nourishment, living shorelines, and dune restoration over "hard" adaptation strategies such as new seawalls. Implementation of soft strategies should be coordinated with key coastal stakeholders including State Parks, the Boardwalk, and the Harbor District to establish baseline funding to expand the existing dune enhancement effort to other priority areas of the City.*

This pathway prioritizes maintaining lateral public access right of way along the cliff top pedestrian pathway:

> ***Policy:*** *Draft Coastal Resilience Implementation Plan that outlines protection of public right of way (sidewalk) priorities over retention of parking or two way traffic. The plan should support the removal of infrastructure determined to be unsafe and redesign those areas to support lateral public access and coastal viewing opportunities.*

Because Seabright beach width is enhanced by the harbor jetty there may be a period in the future where the summer beach remains wide, but winter wave impacts threaten private property. Policies can be adopted that allow private armor to be constructed and maintained until beach width in front of structure is below established minimum widths.

> ***Policy:*** *Limit the use of protective devices to the minimum required to protect private properties. Protective devices shall be permitted when required to protect existing private structures in danger from erosion, and designed to avoid, or mitigate where unavoidable, impacts on public access and recreation, habitat, scenic views, beach width and other coastal resources. Structures will be allowed for an agreed upon duration and removed when there is a significant loss of beach width or the structure substantially impairs public trust resources or access to them, and as may be required by adopted adaptation pathways.*

The long term resiliency of Seabright Beach is dependent on the continued operation of the Harbor and the maintenance of the entrance jetty. The City and State Parks will need to work with the harbor district on any future jetty upgrades, ongoing dredging and sand placement activities and the future reuse of dredge spoils for a sand placement program that transports sand to West Cliff Drive beaches.

> ***Policy:*** *Draft Coastal Resilience Implementation Plan that acknowledges and requires City coordination with future efforts by the Harbor District to increase harbor resiliency. Identify opportunities and allow for upgraded jetty infrastructure (including increased elevation) as may be determined by analysis of Seabright Beach accretion and living shoreline expansion efforts and adaptation pathways.*

Site specific Santa Cruz LCP policy that may need to be amended

- 1.7.4.1 Maintain the existing level of public access to Seabright (Twin Lakes) Beach, including parking, while limiting or reducing impacts on residential areas and encouraging alternatives to the automobile. Any residential preferential parking

programs proposed in the Seabright subareas: Museum Area and Avenues Area (MAP ASP-18; Seabright Area) shall require an amendment to the Land Use Plan and Zoning, which amendment shall include the details of the program and the criteria used to determine that no negative impact on public access will occur.

6. References

California Coastal Commission. (2018). Residential Adaptation Policy Guidance https://documents.coastal.ca.gov/assets/climate/slr/vulnerability/residential/RevisedDraftResidentialAdaptationGuidance.pdf

City of Carlsbad. (2019). *Draft Local Coastal Program Land Use Plan*. https://cityadmin.carlsbadca.gov/civicax/filebank/blobdload.aspx?BlobID=39694

City of Half Moon Bay. (2020a). *City of Half Moon Bay Environmental Hazards LUP Draft*. https://www.half-moon-bay.ca.us/DocumentCenter/View/3149/7-Environmental-Hazards_HMB-LCLUP_2020-Final-CC-Draft_Sept-2020

City of Half Moon Bay. (2020b). *Coastal Access Half Moon Bay LUP Draft*. https://www.half-moon-bay.ca.us/DocumentCenter/View/3147/5-Coastal-Access-and-Rec_HMB-LCLUP_2020-Final-CC-Draft_Sept-2020

City of Imperial Beach. (2019). *General Plan-Local Coastal Program Land Use Plan Final Draft-Revised*. https://www.imperialbeachca.gov/vertical/sites/%7BF99967EB-BF87-4CB2-BCD5-42DA3F739CA1%7D/uploads/FinalRedlineGeneral_Plan_LCP_11182019_-_Comments_deleted__N-4.pdf

City of Malibu. (2015). *Malibu Local Coastal Program Land Use Plan Chapter 4 Hazards & Shoreline/Bluff Development.pdf*.

City of Newport Beach. (2017). *Newport Beach LCP Appendix A Sea Level Rise*. https://www.newportbeachca.gov/pln/LCP/LCP_Zoning/Appendix%20A%20-%20Sea%20Level%20Rise.pdf

City of Pacific Grove. (2020). *City of Pacific Grove Land Use Plan and Implementing Ordinances*. https://www.cityofpacificgrove.org/sites/default/files/general-documents/11152019-coastal-commission-approved-lcp-modifications/pg-lup-ccc-mods-clean-copy.pdf

City of Pacifica. (2020). *Local Coastal Land Use Plan Certification Draft*. https://cityofpacifica.egnyte.com/dl/EPskSdDwa4

City of San Clemente. (2018). *Local Coastal Program Land Use Plan*. https://www.san-clemente.org/home/showdocument?id=51862

City of Santa Barbara. (2019). *City of Santa Barbara LUP Coastal Hazards*. https://www.santabarbaraca.gov/civicax/filebank/blobdload.aspx?BlobID=202921

City of Santa Cruz. (1994). *Local Coastal Program and Coastal Land Use Policies and Maps*. http://www.cityofsantacruz.com/home/showdocument?id=51167

City of Santa Monica. (2018). *City of Santa Monica Local Coastal Monica Update LUP Final Draft*. https://www.smgov.net/uploadedFiles/Departments/PCD/Plans/Local-Coastal-Plan/LUP%20FINAL%20DRAFT%2011.19.18.pdf

City of Seaside. (2013a). *Coastal Implementation Plan*. https://www.ci.seaside.ca.us/DocumentCenter/View/378/Coastal-Implementation-Plan-PDF?bidId=

City of Seaside. (2013b). *Local Coastal Program Land Use Plan.pdf*. https://www.ci.seaside.ca.us/DocumentCenter/View/380/Land-Use-Plan-PDF?bidId=

City of Solana Beach. (2018). *City of Solana Beach Local Coastal Plan*. http://solana-beach.hdso.net/LCPLUP/LCPLUP-COMPLETE.pdf

County of San Mateo. (2013). *San Mateo County LCP*. https://planning.smcgov.org/sites/planning.smcgov.org/files/documents/files/SMC_Midcoast_LCP_2013.pdf

Georgetown Climate Center. (2020). *Equitable Adaptation Legal and Policy Toolkit, Resilient Affordable Housing, Anti-Displacement & gentrification.* https://www.georgetownclimate.org/adaptation/toolkits/equitable-adaptation-toolkit/resilient-affordable-housing-anti-displacement-gentrification.html

Peter Plastrik & John Cleveland (2018). *Life After Carbon: The Next Global Transformation of Cities, Island Press*, Dec 4, 2018 - Architecture - 304 pages

Sonoma County. (2019). *Sonoma County Local Coastal Plan Public Review Draft*. https://sonomacounty.ca.gov/PRMD/Long-Range-Plans/Local-Coastal-Program/Proposed/