

INCREASE RESILIENCE

DRAFT Adaptation Strategies that provide assets the capacity to withstand and recover quickly from hazards

Adaptation Strategy	Description	Time Horizon: Short Term (ST) or Long Term (LT)	Asset Category						Benefits	Constraints	Community Comments	
			Infrastructure	Property	Cultural	Civic	Coastal Amenities	Ecological				
1	Emergency Planning	Update emergency response plans and procedures to consider how emergency response activities will continue if roads are flooded and utilities are disrupted	ST	X	X	X	X	X		<ul style="list-style-type: none"> Community specific protocols to respond to disruptions in advance of significant SLR and flooding hazards in a coordinated manner Leverages existing plans that are already in place Provide continuity of public services 		
2	Upgrade Existing Public Infrastructure	Flood-proof, retrofit, relocate and elevate, add redundancy (e.g., back-up power), etc. to accommodate impacts. Examples: a) Kinney Circle/Windward LFD/SW Pump Station b) Venice Pumping Plant c) Tide gate systems d) Cleaning outfalls (county)	ST	X	X	X	X	X	X	<ul style="list-style-type: none"> Can be integrated into capital improvement planning Can be implemented as part of a phased approach (buys time for long-term action) Less expensive than replacing a facility Requires continual interagency coordination that is crucial for emergency planning Can be added to Municipal Green Bond package for the City 	<ul style="list-style-type: none"> May prolong and maintain life of infrastructure and public services in hazard areas 	
3	Beach Nourishment	“Soft/nature-based” strategy involving artificial placement of sand on a beach to replace eroded sand or to protect against erosion and storm flooding in order to enhance the existing protection provided by the beach.	ST, ongoing	X	X	X	X	X	X	<ul style="list-style-type: none"> Venice’s wide beach which currently serves as a major form of coastal protection and can accommodate additional beach nourishment Maintains public access Beneficial reuse of sediment from upland sources, wetlands and harbors, and offshore deposits A California Coastal Commission preferred strategy to encourage the use of soft shoreline protection methods and other “green” infrastructure as alternatives to hard shoreline protective devices 	<ul style="list-style-type: none"> Temporary solution; nourishment may need to occur more often depending on storm events and as sea level rises Sand sources may be unavailable or limited and requires agency permitting time 	
4	Dune Creation	“Soft/nature-based” strategy involving native plant revegetation, non-native plant removal, organic dune thatching, and dune fencing to create dunes to protect against erosion and storm flooding.	ST, Ongoing	X	X	X	X	X	X	<ul style="list-style-type: none"> Venice has a wide beach to accommodate dune creation Enhances the natural landscape, provides wildlife habitat, and water purification Provides recreation and beach access and engagement opportunities Helps the beach maintain its natural equilibrium and preserve the ability of the beach to respond naturally to storm events A California Coastal Commission preferred soft strategy 	<ul style="list-style-type: none"> Can take years to establish a functioning and protective dune system Relies on natural processes and a steady supply of accumulated sand 	
5	Green Infrastructure	Uses vegetation, soils, and other elements and practices to restore natural processes required to manage water. E.g. Green stormwater infrastructure employs natural, on-site drainage strategies, such as low impact development, green roofs, permeable pavements, bioretention (e.g. vegetated swales, rain gardens) and cisterns.	ST, Ongoing	X	X	X	X	X	X	<ul style="list-style-type: none"> Restores natural processes without hard structures Reduces the amount of stormwater that flows into the drainage system 	<ul style="list-style-type: none"> Does not address large scale storm events 	

DEVELOPMENT & PERMIT STANDARDS

DRAFT Adaptation Strategies that avoid siting new development or perpetuating redevelopment in hazard areas

Adaptation Strategy	Description	Time Horizon: Short Term (ST) or Long Term (LT)	Asset Category						Benefits	Constraints	Community Comments	
			Infrastructure	Property	Cultural	Civic	Coastal Amenities	Ecological				
1	Real Estate Disclosure	Requirement to document site-specific hazard information in real estate transactions or recorded documents that run with the land, such as location on hazard map and any applicable Coastal Development Permit conditions.	ST, Ongoing		X					<ul style="list-style-type: none"> Helps ensure that property owners will plan with SLR and associated hazards in mind Can set reasonable economic expectations Can facilitate limited and cautious redevelopment 	<ul style="list-style-type: none"> May cause a decrease in property value 	
2	Assumption of Risk	Requirement for property owners to assume the risks of developing in hazardous locations (new or re-development); implemented through Coastal Development Permit conditions of approval.	ST, Ongoing		X				<ul style="list-style-type: none"> Can facilitate limited and cautious redevelopment 	<ul style="list-style-type: none"> May cause a decrease in property value 		
3	Site-Specific Hazard Report	Requirement for proposed development in a hazard area to be analyzed based on hazards from a range of sea level rise scenarios for the lifetime of the development. The goal of the report is to demonstrate that the proposed development will avoid or minimize impacts from coastal hazards and to provide an evaluation of the foreseeable effects that the development will have on coastal resources over time; implemented through Coastal Development Permit process.	ST, Ongoing		X				<ul style="list-style-type: none"> Identifies the current and future hazards so that they can be avoided during site redevelopment 			
4	Improvements to non-conforming structures	Policy requirement that would prohibit improvements to non-conforming structures that increase the degree of non-conformity; improvements that qualify as "redevelopment" must conform to current development standards and policies.	ST, Ongoing		X				<ul style="list-style-type: none"> Improves resiliency of an existing structure in a hazard area 	<ul style="list-style-type: none"> May limit how a property can be improved or redeveloped 		
5	Adaptive Design	Building design standards to minimize risk from potential hazards by constructing smaller structures, increasing finished floor elevations, using movable foundations, and installing wall flood vents for new development where relocation and/or structure is in a high-risk location.	ST, Ongoing		X				<ul style="list-style-type: none"> Extends the time that the building can avoid or minimize damage due to SLR Allows a phased approach to responding to SLR 	<ul style="list-style-type: none"> Potential change in current development pattern, such as building heights Can keep a house safe but utilities including roads, water, sewer services may be compromised unless also designed or upgraded to avoid or withstand hazards 		
6	Redevelopment and siting new development	Siting standards which rely on SLR predictions (based on a site-specific hazard report) over the anticipated life of the property so that hazards are avoided or minimized and development will not need future protection from shoreline hazards; implemented through detailed policy and implementation plan measures where feasible	ST, Ongoing		X				<ul style="list-style-type: none"> Useful where redevelopment is currently in flood zones or predicted to be impacted by future SLR Can be implemented in areas looking to accommodate SLR in the short term and can prompt planned retreat from a coastal region by incrementally restricting new and modified structures in a current or future hazardous area Disincentive for staying in hazardous areas Requires property owners to internalize the costs associated with rebuilding in areas that will be at risk due to SLR Limits a property owner's ability to rebuild structures destroyed by natural hazards such as flooding 	<ul style="list-style-type: none"> May limit how a property can be improved or redeveloped 		
7	Removal Plans for New Development	Permit processing requirement for preparation and execution of a "Removal and Restoration" plan for development in highly hazardous areas to be used at a future time if the following: (1) any government agency with relevant authority and jurisdiction has ordered that the structures are not to be occupied due to hazards, or be removed; (2) essential services to the site can no longer feasibly be maintained (e.g., utilities, roads); (3) removal is required pursuant to LCP policies for sea level rise adaptation planning; or (4) the development requires new and/or augmented shoreline protective devices that conflict with LCP or relevant Coastal Act policies.	LT, Ongoing		X				<ul style="list-style-type: none"> Provides use of property in hazardous areas for as long as structure is safe for occupancy Provides transparent process for how to modify, relocate, and/or remove development that becomes threatened in the future by sea level rise and/or when triggers are met Provides flexibility given the uncertain timing of the impact 	<ul style="list-style-type: none"> May cause a decrease in property value 		
8	Define Redevelopment	Mechanism to require that redevelopment meets safety and structural stability standards, protects life, property, and coastal resources under expected future conditions by defining the threshold of improvements that constitute "redevelopment", and is implemented through policy definitions and development requirements.	ST, Ongoing		X		X		<ul style="list-style-type: none"> Brings an entire structure up to current Local Coastal Program policy and implementation plan standards by limiting the way a structure can be rebuilt or renovated in a hazard area Avoids perpetuation of development in a hazard area Ensures that new development is designed to appropriately and built in safer locations 	<ul style="list-style-type: none"> Redevelopment can include improvements, alterations, and additions and can happen piecemeal over time, which can make it challenging to determine when a threshold has been met or distinguish from repair and maintenance 		

COMMUNITY-SCALE ADAPTATION

DRAFT Adaptation Strategies that require a larger “community-wide” approach

Adaptation Strategy	Description	Time Horizon Short Term (ST) or Long Term (LT)	Asset Category						Benefits	Constraints	Community Comments	
			Infrastructure	Property	Cultural	Civic	Coastal Amenities	Ecological				
1	Prepare Adaptation Plan	Based on the Venice Vulnerability Assessment. Develop and implement an adaptation plan for existing development, public improvements, coastal access, recreational areas, and other coastal resources that examines priorities for adaptation, timelines, options, specific projects to be implemented, phasing and action triggers. The Adaptation Plan should evaluate the feasibility of hazard avoidance, managed retreat, restoration of the sand supply and beach nourishment in appropriate areas.	LT	X	X	X	X	X	X	<ul style="list-style-type: none"> Creates a specific planning phase to action phase roadmap Fosters cross-jurisdictional coordination to address asset vulnerabilities Opportunity to analyze trade-offs and cost/benefit analyses 	<ul style="list-style-type: none"> Can be a challenging to win stakeholder buy-in given diversity of interests 	
2	Financing Adaptation	Geologic Hazard Abatement Districts (GHAD) or other tax incentive program, grant program, or direct cost share assistance to incentivize soft protection (beach nourishment, land use changes) or hard protection solutions (pumps/walls) for private landowners	ST, ongoing -LT (to implement)	X	X	X	X	X	X	<ul style="list-style-type: none"> Potential means for funding sea level rise adaptation measures on a neighborhood scale 		
3	Align LCP with Local Hazard Mitigation Plan (LHMP)	Coordinate with other City departments to identify adaptation projects that meet the goals of both the Local Coastal Program and LHMP and leverage FEMA funding opportunities E.g. repetitive loss program	ST, ongoing	X	X	X	X	X	X	<ul style="list-style-type: none"> Potential funding source for adaptation strategies Streamlined City-wide response to hazards 		
4	Design Guidelines to reduce Greenhouse Gases (GHGs)	A strategy to encourage property owners to use weatherizing techniques, solar panels, and wind energy to reduce GHGs locally in order to contribute to regional, statewide, and global scale efforts of overall GHG emission reduction.	ST, ongoing	X	X	X	X	X	X	<ul style="list-style-type: none"> Facilitates community engagement in global issue Leverages new technology for utility cost savings Help reach City's goal of reducing GHGs (45% below 1990 levels by 2025) 		
5	Managed Retreat Program	Establishes program to remove, modify, or relocate development when certain triggers are met, e.g., beach width. Property owners of new development in hazardous areas must enroll in program as a condition of approval, while property owners with existing development in hazardous areas may voluntarily enroll in the program. The City would pursue funding to purchase easements or development rights from property owners who voluntarily enroll and to acquire non-conforming structures from willing sellers. Could rely on mechanisms such as transfer of development rights (TDRs) and downzoning.	LT	X	X	X	X	X	X	<ul style="list-style-type: none"> Avoids problems associated with hard protection (e.g. environmental impacts of seawalls) 	<ul style="list-style-type: none"> Requires long lead time and significant coordination Need to facilitate relocation for property owners to (upland locations) Willingness of community/local government 	

Build Knowledge

DRAFT Adaptation Strategies that increase the community's understanding about baseline conditions in order to plan more effectively for the future

	Adaptation Strategy	Description	Time Horizon: Short Term (ST) or Long Term (LT)	Asset Category						Benefits	Constraints	Community Comments
				Infrastructure	Property	Cultural	Civic	Coastal Amenities	Ecological			
1	Map Hazards Understand Sea Level Rise Hazards	Adopt and update hazard maps using multiple sea level rise scenarios as new science, modeling results, and state guidance becomes available to inform risk assessments, property owners and the public, and prepare for hazards.	ST, ongoing	X	X	X	X	X	X	<ul style="list-style-type: none"> Critical information for updating policy standards Educates the community May streamline permitting in some coastal areas because maps could be used in lieu of site-specific hazard reports in certain circumstances 	<ul style="list-style-type: none"> Requires ongoing time, cost, and effort to keep track of emerging best available science and revise maps, e.g., update maps at least every 10 years May reduce property values for high risk locations 	
2	Groundwater Analysis	Coordinate with LA County to understand the existing groundwater monitoring data and evaluate the variability in local groundwater levels and what factors influence them.	ST	X	X	X	X	X	X	<ul style="list-style-type: none"> Improve the region's understanding of how sea level rise will affect groundwater levels Understanding groundwater can be used to project how each sea level increment will affect existing and proposed development 	<ul style="list-style-type: none"> Data not readily available in many areas 	
3	Conduct Drainage/Capacity Study	Investigation of Venice's stormwater system capacity with various storm events and different SLR scenarios to inform various adaptation project potentials. <i>Study may facilitate planning efforts to:</i> <ul style="list-style-type: none"> - Modify tide gate operations - Add storm water pumps - Increase canal capacity -Acquire land to create flood storage facilities 	ST	X	X	X	X	X	X	<ul style="list-style-type: none"> Basis for potential engineered adaptation options and future projects to respond to inland flooding hazards and sea level rise Technical analysis to justify potential phased approach to future adaptation strategies 	<ul style="list-style-type: none"> Data verifying correct drainage basins is difficult to ascertain (reports/databases show conflicting information) 	
4	Cost-Benefit Analysis of Adaptation Strategies	Calculate the costs and benefits of adaptation strategies to comparatively evaluate which strategies have the highest return on investment.	ST	X	X	X	X	X	X	<ul style="list-style-type: none"> Can help the community prioritize adaptation strategies or specific infrastructure upgrade projects Economic information can provide an incentive for action 	<ul style="list-style-type: none"> Costs and benefits are estimates; actual design, construction and permitting costs may not be available at later planning stages Some issues such as sea level rise impacts to public health, environmental justice, ecosystems are difficult to monetize 	