

Attachment D: All Groups – Completed Risk Matrices

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Community Resilience Building Risk Matrix				Group 1		www.CommunityResilienceBuilding.org						
Location = Mark on the map, note on matrix Multiple, Specific or Town-Wide <u>V</u> = Vulnerability <u>S</u> = Strength Type of Feature = <u>I</u> nfrastructural, <u>S</u> ocietal, or <u>E</u> nvironmental <u>H</u> igh, <u>M</u> edium, or <u>L</u> ow priority for action over the <u>S</u> hort or <u>L</u> ong term (and <u>O</u> ngoing)				Top Priority Hazards (floods, wildfire, hurricanes, drought, sea level rise, heat wave, etc.)								
				Hurricane/Nor' Easter		Intense Rain/Storm Surge		Coastal Flooding		Sea Level Rise		Priority <u>H</u> - <u>M</u> - <u>L</u>
Features		Location	Owner	<u>V</u> or <u>S</u>								
Infrastructurel												
Beach Road flooding		Beach Road	State	V	Install breakwater		Elevate road/buildings		Seawall			
Water Street		Water Street	Town	V	Capture runoff from uphill		Increase drainage pipes		Seawall		Divert runoff/groundwater recharge	
Lagoon Pond Rd		Lagoon Avenue	Town	V	Increase culvert at Lagoon Pond bridge		Increase drainage					
Union Street (Detour)		Union Street	Town	S								
Police Station		Water Street	Town	V	Relocate		COOP - update					
Sewer pump station			Town	V	Waterproof							
Above-ground power distribution			Private	V	Tree trimming		Private road access					
Fuels			Private	V	Storage capacity		Renewable energy					
Packer barge mooring		Tashmoo	Private	S								
Eversource Response				S								
VTA				S								
Trees				V	Tree trimming							
Docks - Owen Park				V	Elevating dock		Seawall					
Private roads				V	Town regulations							
Streamship Authority				S/V			Seawall					
Communications/hard lines				V	Tree trimming							

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Features		Location	Owner	V or S	Hurricane/Nor' Easter	Intense Rain/Storm Surge	Coastal Flooding	Sea Level Rise	Priority H - M - L	Time Short Long Ongoing
Societal										
Grinder Pump Station Ind.			V	Education						
Vulnerable population list			S	Update on a regular basis	Education					
Elderly housing	Various areas		V	Back-up generators				Comprehensive stormwater study		
Private road impassable			V	Tree trimming	Road maintenance for emergency access	Regulations				
Public awareness			V	Education/trifolds						
Aging population			V							
Affordable housing			V							
Community and faith-based organizations			S							
Elderly housing ERP			S							
Environmental										
Coastal development			V	Breakwater	Hazard Mitigation Plan			Seawall		
Veteran's Park, flooding with water drainage			S							
Extending Eastville Jetty			S	Breakwater						
State road regulation			V	Hazard Mitigation Plan						
North shore wetlands			S							
Sewage overflow			V	Study						
Inner harbor			V	Study						

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Features	Location	Owner	V or S	Intense Rain/Flooding	Hurricanes/Nor' Easters	Coastal Flooding/Storm Surge	Sea Level Rise	Priority	Time
								H - M - L	Short Long Ongoing
Infrastructural									
Steamship Authority Terminal	Terminal	State/Town	V/S	Raise Water Street from Five Corners to Union Street				H	*
Waterfront Commercial District		Private	V/S	Raise Water Street from Five Corners to Union Street				H	
Vineyard Haven Harbor		Public/private	V/S	Extending breakwater (Eastville) Hardening Beach Road (Tisbury Wharf to Shell Station)				H	*
Wastewater pump station	SSA	Public/private	V	Project in progress					
Stormwater drainage system (collectively)	All	State/Town	V	Controlling runoff, porous pavement, reduce state road runoff, upstream retention areas				H	*
Electrical system (communication, power)	West Chop, Lagoon Pond Rd, Northern Pines	Town/private	V	Bury main lines in most vulnerable areas					
Navigational channels (Tashmoo, harbor and lagoon)		Town/state/federal	V	Tashmoo - extending jetties to mitigate the need for dredging, naturalizing it					
Beach Road		State	V	Raise existing seawall between bridge to RM Packer's property				H	
Lagoon Pond Road		Town	V	Needs to be raised					
Water Street*		Town	V					H	
Post office	5 Corners	Federal	V	Relocate post office					
Police station	Water Street	Town	V	Relocate station					
Harbor Master's Office	Owen Park	Town	V	Redesign to make it resilient					
RM Packer's Terminal	Beach Road	Private	V	Raising seawall and extending jetty (Eastville)					
Societal									
Disruptions to post office, RM Packer (fuel)...supply chain, SSA	5 Corners, Water Street	Federal/State	V	Warehousing at airport (regional), i.e., energy, fuel, propane, batteries				H	*
Disruption - power cable from mainland to island	Harbor	Private (Eversource)	V						
Police station - response	Water Street	Town	V	Relocate facility				H	
Propane and fuel delivery	SSA	Private	V					H	
Public transportation - VTA	All roads	Public	V	Backup hub at alternative sites					
Gas stations	Beach Road	Private	V					H	
Emergency shelter	Oak Bluffs	Public	V/S	Currently at Oak Bluffs Elementary School, regional agreement, better communication between emergency management directors and public, communication, community outreach, alternative routes				H	*
Access to hospital	Multiple roads	State	V	creating additional points of access to hospital (identify alternative routes to critical facilities), address improvements to Beach Road				H	
Recreational facilities	Veteran's Park	Town	V	Access, stormwater retention, relocating what would be displaced					
Solar array alternative energy sources and storage (energy)	Landfill	Town/private	S	Redirecting energy to batteries at various locations (storage), increase generator capacity (Eversource)				H	*

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Features	Location	Owner	V or S	Intense Rain/Flooding	Hurricanes/Nor' Easters	Coastal Flooding/Storm Surge	Sea Level Rise	Priority	Time
								H - M - L	Short Long Ongoing
Communications (landline, cell), infrastructure support		Town/private	V						
Reverse 911 system	Island-wide	Public/private	V	Unified mass system notification that is consistent					
Emergency services volunteers		State/Town	V/S	Promote community outreach for younger generation					
Neighbor-to-neighbor (cultural)	Island-wide	Town	S						
Demographic changes		Town	V	Unified mass system notification that is consistent					
Economy and tourism		Town	S	Coordinate with Chamber of Commerce - packet for new comers					
Environmental									
Wetlands, marsh lands	Coastal area	Town	V	Detailed (enhanced) mapping, artificially building up marsh					
Shellfish, fin fish nurseries	Lagoon Pond, Lake Tashmoo, Outer Harbor	Town	V	Identify potential industry adaptations				H	
Development in flood zones	West Chop to Tashmoo	Private	V	Addressing stormwater and access issues					
Beach erosion	Northeast facing West Chop	Private	V	Identifying beach erosion on public properties					
Vegetation (land and water)	Coast		V	Land: planting trees (climate adaptive), shade trees in downtown area, Sea: aquaculture (seaweed)					
Ocean acidification	Island-wide		V						
Island food production, agricultural changes	West Tisbury, Chilmark, Edgartown	Private	S						
Natural resources of food, hunting: deer/fishing	Island-wide	Public/private	V/S	Proactive and adaptation re: natural resources					
Evacuation	Island-wide	Town/State	V						
Waste removal	Town-wide	Town	V	More on island - composting (industrial level) to reduce what goes off island, recycling, repurposing				H	
Water supply				Protecting zones of contribution (1,2,3)					
Sole source aquifer		Town	S	Protecting zones of contribution (1,2,3)					
Power Company - Eversource	Island-wide	Private	V	Burying main power line					
Workforce (off island), XXXXX, tradesmen	Island-wide	Private	V	Become less dependent, increase educational opportunities, increase housing					

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				Coastal Flooding/Storm Surge	Sea Level Rise	Hurricanes/Nor' Easters	Intense Rain/Flooding	H · M · L	Short · Long · Ongoing
Features	Location	Owner	V or S						
Infrastructural									
Beach Road at 5 Corners, Water Street		Public		Elevate Roads and buildings 10 ft, relocate or raise					
Steamship Terminal - wind		Private	V	Relocate Steamship - Eastville Beach					
Lagoon Pond Road	Hines Pt.	Public	V	Multiple layers - top is functional level of usable space					
Packer Wharf - gas and oil	Beach Road	Private	V	Protect or raise					
Electrical service		Public	V	Explore and map bury or harden wires - buried wires after winds up					
Herring Creek Road	West Chop, Minic Meadow	Public/private	V						
Septic and sewer	Flood zones	Public	V	Use similar system as Edgartown - elevate/vault/protect using grant money					
Major pump station	Stop and Shop	Public	V	Protect or raise					
Food - Stop and Shop	5 Corners	Private	V	Elevate or relocate					
VTA Terminal - Node	5 Corners	Public	V	Public support to improve infrastructure - invest to preserve					
Secondary route to hospital	Barnes Road	Public	V	Public/private partnership to incentivize move to high ground for essential services					
Drawbridge requires power		Public	V	Replace - habitat restoration and raised infrastructure, drainage and new waterfront					
Police Department in flood zone		Public	V						
Town Hall and emergency services high			S						
Landfill high			S						
Evacuation centers on hill			S						
Above ground electrical		Public	V						
NSTAR advances teams to help		Public	S						
Steamship Generator		Public	S						
Electrical cable to West Chop		Public	S						
New lines on VH and EDG Rd		Public	S						
Hospital generator		Private	S						
Generators for sewer and municipal buildings		Public	S						
No shelters in V.H.	School	Public	V	More Red Cross volunteers to staff, educate about other spaces and staffing options					
Dependency on mainland for food and resources			V	Revegetation also cleans water					
Airport		Public/County	S						
Evacuation route and mode			V						
Storm drains run downhill empty into 5 corners and problem harbor areas				Recycle or redistribute runoff and water - power source?, Veteran's Park as water retention area, divert or redirect away from flood zone towards bioretention for environmental benefit					

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				Coastal Flooding/Storm Surge	Sea Level Rise	Hurricanes/Nor' Easters	Intense Rain/Flooding	H - M - L	Short Long Ongoing
Features	Location	Owner	V or S						
Societal									
Agreement with Packer - Red Cross	Waterfront	Private	S						
Two thousand workers commute via ferry	Harbor		V	Housing contingency for short term housing of essential services					
Off-island workforce		Private	V						
Meals on Wheels comes from hospital			V	Alternative transportation, boats, specialized vehicles - duck boats, snowmobiles					
Access to shelters - senior housing			V	Improved communications - emergency network - dispatch system					
Medicine, food, staples		Public/private	V						
Airport - Red Cross supplies		Public	S						
Regional focus and planning	AG Hall etc		S						
Gateway for all workers, food, etc			V	Use airport and AG Hall as hub, fly in supplies (county, FAA etc may already have plan); organize town, county and empower emergency managers					
Red marker on homes for seniors			S						
Strong support and organizations			S						
Strong educational programs for community	Red Cross		S						
Population surge - 100K a day			V	Parking plan for vehicles stranded and shuttles, ping, 211, social media to communicate					
Shelter system			S						
Communications (without cell)			V						
Evacuation planning - what's been done? Routes, modes, plan(?)			V/S						
Real estate development, in flood zones especially			S						
Take advantage of high ground			S	Move essential services to high ground - High Pont Rd					
Animals and pets - DART Program			S						
Environmental									
Gas and oil leaks	Beach Road	Private	V	Require business to exceed federal standards to address local concerns					
Barrier beaches	Herring, Tashmoo		S						
Trial oyster reefs: lagoon, Eastville	No Shore, Eastville, Owen Lile		S	Climate change education, sustainability					
Erosion	Lagoon Pond	Private	V	Personal habits - electric cars, solar					
Geography conducive to "Dutch" mitigation	Tashmoo and harbor		S	Restoration of marshes, oyster reef balls					
Two safe harbors	Lagoon Pond, Lake Tashmoo		S						
Filled marsh - floods	Tisbury Marketplace		V						
Displacement area	Veteran's Park		S						
Water supply on high ground	High Point		S						
Shellfish stock - farming	W Spring St		V	Diverting water, runoff, no					

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Group 4

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Top Priority Hazards (floods, wildfire, hurricanes, drought, sea level rise, heat wave, etc.)

Features	Location	Owner	V or S	Intense Rain/Flooding	Hurricanes/Nor' Easterns	Coastal Flooding/Storm Surge	Sea Level Rise	Priority	Time
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Infrastructural									
Beach Road			V	Beach Road reconstruction/beach renourishment from dredging, local maintenance (on-going)				8	
Steamship Concrete Structure			V	Future plan? Rebuild plan? Time to return to operation. Identify timeframe - how to cover gap - vulnerability assessment, public knowledge				9	
Beach Road Sewer			V					4	
Fuel storage			S						
Building codes/zoning, flooding/wind damage, future			V	Strategic retreat - marine oriented recon. - transfer development rights				1	
Wind velocity/building codes									
Inner harbor structures on coast, vessels			V						
Breakwater porosity and height			V	Additional breakwater 400 - 500' at Eastville Beach. Extend existing breakwater. Recon. to increase height at back channel breakwater.				10, 3	
Eastville Jetty to protect harbor and coastal areas				Additional breakwater 400 - 500' at Eastville Beach.					
Pump station at Stop and Shop			V	Assess and floodplain compliant - retrofit safeguards and temp backup				7	
Societal									
Steamship			V						
Supply chain			V	Short and long rehabilitation goals/actions plan if the depot docks go down - what is the action plan to get supplies? What to do. How to do it. Back up generators.				10	
Hospital			V						
School shelter			S						
Fuel storage			S						
Water quality/shellfish, economy			V	BMPs to reduce nitrogen and phosphorus and fecal Coliform and bacteria				4	
Health - mold in homes, dampness			V						
Hospital, 7 days operation			S						
Assessment of emergency shelter program	Tisbury School		S						
Communication - on-island and off-island options, code red reverse 911			V/S	Oak Bluff Elementary shelter (regional) vs. Tisbury Elementary School (local), how to know where to go, emergency manager to announce each winter shelters and access, pets?				8	
Safety and awareness									
Accessible policy makers/politicians				language barrier, disabilities, elderly - limited mobility					
Streamline permitting process for navigation and coastal defense									

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								H - M - L	Short Long Ongoing		
Features	Location	Owner	V or S								
Environmental											
Coastal buffers			V								
Fuel storage			V								
Private septic systems			V								
Public water supply, surrounding green space			S	Capacity study to support future development						2	
Water quality/shellfish			V								
West Chop natural wetland to absorb flooding			S								
Drainage at Lagoon Pond Road and 5 Corners				Stormwater system maintenance - deferred - needs accountability - current O&M guide - improve drainage						6	
Shellfish harvesting				Raise awareness (signage and education) - create controlled access at Clam Shack Marsh - salt marsh restoration and debris removal						3	

Attachment E: All Groups - Annotated Tisbury Base Maps

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