INTRODUCTION

A *Neighborhood Resilience and Adaptation Study* was performed as part of the Old Saybrook Coastal Community Resilience Study. The neighborhood study focused on developing an understanding of the specific risks, challenges and resilience and adaptation opportunities at the neighborhood scale within Old Saybrook. Two "neighborhoods" were selected: 1) the Chalker Beach Community, which is representative of the Low Beach Communities; and 2) the Rt. 154 "Resilience Corridor", which is representative of Saybrook Point and Town Center.

Each of these neighborhoods were impacted by Superstorm Sandy. For each neighborhood, the resilience team:

performed a detailed evaluation of flood vulnerability and risk;

coordinated with neighborhood representatives;

conducted stakeholder workshops; and

developed concepts for neighborhood-specific adaptation and resilience strategies.

This attachment summarizes the results of these efforts.

The frequency and intensity of coastal floods will increase in the future, primarily as a result of sea level rise. Over the last 100 years the, sea level within Long Island Sound has risen about 0.8 foot. Over the next 100 years sea levels are projected to rise, with a reasonable probability, another 4 to 6 feet and may increase as much as 15 feet. During the next 100 years, regardless of the actual amount of sea level rise, the rate of sea level rise will steadily increase. The on-going, incremental effects of rising sea levels will require that neighborhoods adapt.

Neighborhood resilience and adaptation strategies should consider the stakeholder perspectives, issues, opportunities, geography and history that are unique to that neighborhood. They also need to consider the functional, spatial and symbolic roles played by the neighborhood in relation to the Town and the State. In this sense, each neighborhood should be understood within a larger set of geographic relationships and in relation to very local conditions.

LOW BEACH COMMUNITIES - CHALKER BEACH

The Low Beach Communities represent a fundamental part of the history and character of Old Saybrook. With frontage on Long Island Sound and surrounded by tidal marsh, however, the Low Beach Communities (including Chalker Beach; Indiantown; Saybrook Manor; Great Hammock Beach and Plum Bank) are highly vulnerable to coastal flooding. These communities are located almost entirely within the current FEMA AE zone (representing the 100-year and 500-year recurrence interval floods). The beaches, which are developed with residences, front the Sound and are exposed to high waves and located within a FEMA VE zone. Upland areas of these communities are also surrounded by tidal marsh.

These communities are also vulnerable to frequent flooding, and the frequency of flooding will consistently increase with sea level rise. Portions of these neighborhoods will be chronically flooded (i.e., flooding on average 26 times per year) by the years 2040 to 2050.

The flood risks that are specific to, or amplified by, the coastal setting of these neighborhoods include the following:

- The neighborhoods are vulnerable to flooding from both Long Island Sound (overtopping the beaches) and the tidal marsh – basically, flood inundation advances from all sides.
- The beaches, which form the frontage of these communities, are dynamic systems and subject to erosion and short-term and long term shoreline change. Active measures (such as beach nourishment) can be expected to be required to maintain the shoreline location.
- The location of structures within VE zones are particularly vulnerable to flood-related damage as most structural damage is a result of wave action. Elevating these structures, by itself, does not eliminate coastal flood hazards.
- Structures located within these neighborhoods, due to their high flood vulnerability, have the potential to become repetitive insurance loss properties impacting the overall cost of insurance within Old Saybrook.
- The ground surface elevation throughout most of the land area of these communities is quite low relative to sea level. This has implications to: a) frequency of flooding; b) performance of on-site, subsurface wastewater disposal systems; and c) stormwater run-off, with ponding and flooding due solely to heavy rainfall.
- Street flooding will become frequent events.

These neighborhoods also have other coastal flood challenges that are somewhat specific. These include:

- The beaches are generally private, with access and use limited to the community residents. This may, increasingly, become an issue if the cost of maintaining the beaches (even if only for flood and shoreline protection purposes) are borne by all the Town residents (many of whom do not have rights to use the beach).
- The very high flood vulnerability of these communities results in a situation where these communities represent a disproportionately high coastal flood risk (and subsequent costs for public safety, public works, wastewater management, etc.) relative to the Town as a whole.
- The high value of waterfront properties results in a situation where major contributors to real estate tax revenue are also properties that are the most vulnerable to coastal flooding.
- The cost to provide necessary public infrastructure improvement (e.g., elevating roads) within these communities may not be sustainable.
- Resistance to retreating from these areas is both understandable and is to be expected. However, as flooding becomes more frequent, the perspective of residents about retreat (e.g., voluntary buybacks) will likely change.

Chalker Beach Overview

Relative to coastal flood vulnerability, the Chalker Beach Community is characterized by three separate areas:

1. The area to the south of Beach Road West, Beach Road East and Bel Air Manor Road, including the beach (a barrier spit) and the houses constructed on the beach. The ground surface elevation is low, ranging from about 0 (mean sea level) to about 7 feet NAVD88, with the elevation around the houses generally ranging from 5 to 7 feet NAVD88. The beach is about 80 to 120 feet in width and 2,200 feet in length and the shoreline includes 8 groins that were constructed for the purpose of trapping sediment. The groins were repaired during the 1980s. Since that time, the beach has experience net accretion. The eastern portion of the beach, across from Bel Aire Manor Road, is eroding. No groins are present along this section of beach. This area is very vulnerable to both flood inundation due to storm surge and wave effects and is completely within the current FEMA VE zone, with a Base Flood Elevation of 14 feet NAVD88. The predicted 100-year recurrence interval currently located south of Beach Road, on the beach and within the FEMA VE zone. wave heights at the building faces are about 3 to 4 feet. About 50 houses are
2. The area immediately to the north of Beach Road West, Beach Road East and Bel Air Manor Road, including the roads and land area between the roads and the tidal marsh. This east-west trending area consists of artificially-filled marsh. This area is flat and low-lying, with ground surface elevations ranging from about 4 to 5 feet NAVD88. This area is very vulnerable to flood inundation due to storm surge and, to a lesser degree, wave effects. It is located completely within the current FEMA AE zone, with a Base Flood Elevation of 12 feet NAVD88. In the absence of the existing structures along the beach, 100-year recurrence interval wave heights within this area would be around 2 to 3 feet in height. Due to its poor drainage (the ground typically slopes less than 1%), the area is also flood during periods of heavy precipitation.
3. The third area includes Chalker Beach Road, which runs north-south, and the houses on either side of the road between the road and the tidal marsh. This area consists of natural glacial meltwater deposits, and the ground surface is higher than along the beach. Ground surface elevations range from about 6 feet NAVD88 along the south end of Chalker Beach Road to about Elevation 10 to 12 feet NAVD88 at the north end near Route 1 Boston Post Road. This area, except for the very north end near Boston Post Road, is located completely within the current FEMA Coastal AE zone, with a Base Flood Elevation of 12 feet NAVD88. This area initially floods due to floodwaters encroaching from the tidal marsh; however, for floods greater than the 2-year recurrence interval flood (with a stillwater elevation of about 5 feet NAVD88), floodwaters encroach directly from both Long Island Sound and the tidal marshes, and the entire area of the Chalker Beach Community is under water.

Economic aspects of the Chalker Beach Community are summarized in **Table 5-1**, below.

Table 5-1: Chalker Beach Economic Relationship to Town

$169,840,286	Estimated market value of property off Chalker Beach Road and Indian Town
$118,888,200	Estimated total assessed value
$0.01966	Town mill rate
$2,337,342	Estimated property tax revenue
$40,543,368	Town-wide property tax revenue
5.8%	Percent from study area
$5,300,000	Hazus estimated Average Annualized Loss (AAL)

The Chalker Beach Community is managed by the Chalker Beach Improvement Association (CBIA). The CBIA was formed in 1931, and is recognized by the State of Connecticut as a special taxing district. This status authorizes the CBIA to levy property taxes in addition to those levied by the Town to pay for services including but not limited to:

- maintain and regulate the beaches, swimming areas, and recreational facilities;
- construct and maintain roads;
- provide fire, police, or security protection; and
- maintain flood or erosion control systems (e.g., dams, ditches, retaining walls, and waterfronts).

One of CBIA's goals is to proactively preserve the shoreline. The CBIA has independently executed several adaptation projects as a special taxing district including replenishment and nourishment of beaches, construction eight groins and recent repair of two groins, and installation and maintenance of a tide gate at the west end of the beach.

Community Workshop/Stakeholder Outreach

The resilience and adaptation planning team, led by GZA, held a workshop on August 19, 2017 to present the coastal flood risk and discuss some of the issues presented above.

Over seventy participants attended the workshop. During the workshop, the team reviewed the near to long-term risks and engaged with residents and members of this area in an interactive dialogue to review and discuss adaptation options.

Through the workshop process, the team assessed stakeholder goals and the willingness of the residents and community leaders (Chalker Beach Improvement Association [CBIA]) to contribute resources, and make compromises, to achieve coastal resilience and adapt to rising sea levels. Top priorities identified from group discussions and polling included:

1. Investment in protective infrastructure such as perimeter berms and beach nourishment.
2. Prioritize investment into low-lying areas.
3. Make infrastructure investment to make community ingress and egress roads for chronic flooding and high probability (e.g., 2-year recurrence interval floods).
4. Prepare for evacuation during larger, less frequent flood events.
5. Perimeter flood protection berms of up to six feet in height would be acceptable (from an aesthetics, water access perspective).
6. Unwillingness to entertain buyouts and relocation.
7. Willingness to contribute to an adaptation fund of an amount no more than $10,000 per household for "one-time" measures and $1,000 per household on a recurring 10-year basis.

Topics without a clear consensus from the discussions and polling were:

- How to deploy perimeter berms (easements, design guidelines, voluntarily or otherwise).
- If perimeter flood protection berms, located on private property, should also be used as recreational, public access greenways.
- Whether property should be dedicated to allow for lateral advancement of tidal marsh (or whether marsh advancement is important to the residents).
- Whether zoning regulations should dictate the visual and aesthetic requirements for elevating houses.

Resilience and Adaptation Strategies

The resilience and adaptation team operationalized the workshop's outcomes into the following resilience and adaptation priorities:

1. Ensure evacuation during flood levels greater than the 10-year recurrence interval flood, including access to the Town's public shelter.
2. Ensure that the Town's Essential and Lifeline facilities are protected to the 500-year recurrence interval floods.
3. Use alternative emergency response capabilities, such as amphibious vehicles during floods when roads are flooded.
4. Conditionally support the community residents' goal of staying in the community (i.e., not retreating) and using a strategy of flood protection at the property scale (i.e., elevated structures, consistent with building codes) in the near and medium term, while considering each project's long-term survivability and potential for repetitive loss.
5. Use an integrated approach to adapt to flood protection and adaptation, using a variety of strategies and measures.

A number of alternative strategies were presented and discussed during the workshop. These are presented on **Figures 5-2** through **5-4** and summarized in **Table 5-2**.

Table 5-2: Chalker Beach Resilience and Adaption Strategies

Strategy	Benefits/Limitations
Strategic Realignment: • Voluntary, managed retreat from VE Zones and other high flood vulnerability areas. • Create natural barrier spit beach and dune. • Allow natural beach migration and marsh advancement. • Publically-owned beaches and greenways.	**Benefits:** • Will reduce future Town costs associated with repetitive loss, public safety, public works and wastewater management. • Provides a valuable, public, natural and recreational resource. • Improves ecology and habitat. **Limitations:** • Loss of tax revenue (unless property owners relocate somewhere else in Town). • Retreat is not desirable to community residents.
Adaptive Environments: • Elevate structures • Floodable roads (or elevated roads) • Elevated pedestrian boardwalks • Off-site wastewater treatment • Beaches remain private • Beach nourishment • Engineered dunes, beach berms • Improved stormwater management, including green infrastructure	**Benefits:** • Residents remain and the community continues. • Cost of building flood protection borne by the property owner – not the Town taxpayers. • Cost of beach nourishment, maintenance of coastal structures, etc. borne by the community – not the Town taxpayers. **Limitations:** • Future increased Town costs associated with repetitive loss, public safety, public works and wastewater management. • Future increased Town costs associated with repetitive loss, public safety, public works and wastewater management. • Cost of elevating roads will be high and likely require municipal bonds. • No public (Town residents) access to beach and shore.
Perimeter Protection: • Construct flood protection landscaped earthen berms along perimeter of tidal marshes • Elevate structures • Beaches remain private • Possibly use berms as public greenways • Engineered dunes, beach berms • Beach nourishment • Improved stormwater management, including green infrastructure	**Benefits:** • Residents remain and the community continues. • Cost of beach nourishment, maintenance of coastal structures, etc. borne by the community – not the Town taxpayers. • Perimeter protection provides flood protection to both private property and public infrastructure. • Berms used as greenways provides valuable, public recreational resource. **Limitations:** • While the berms will reduce flood risk, it will not likely be feasible to construct berms that qualify as FEMA-certified levees; therefore, nor reduction in flood insurance or regulatory flood requirements will result. • Cost of perimeter flood protection berms is high; responsibility for cost is undetermined. • Construction of berms is technically and legally challenging because all property along the berm alignment is divided by parcel and privately owned. • No public (Town residents) access to beach and shore.

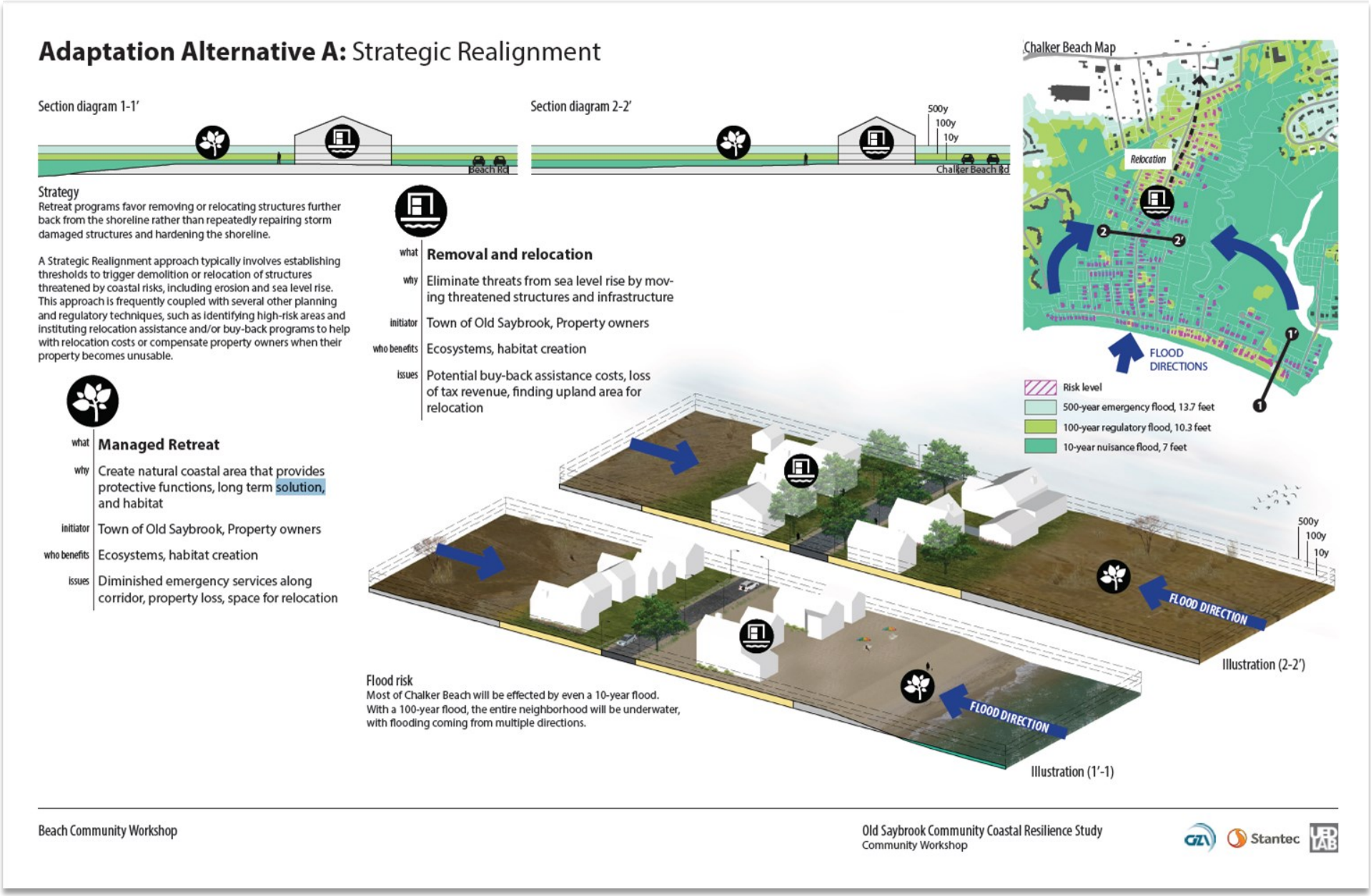

Figure 5-2: Adaptation Strategy A - Strategic Realignment

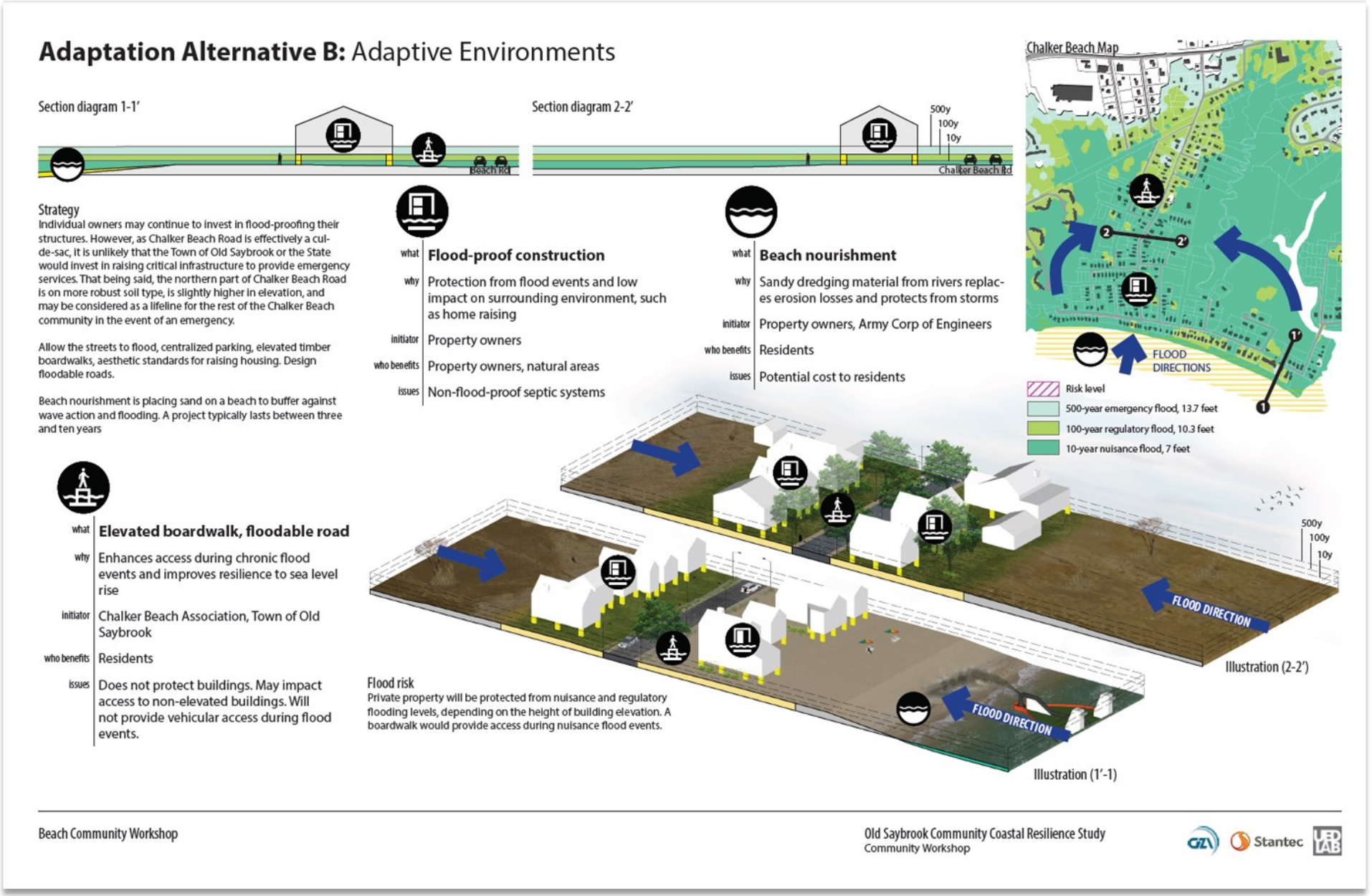

Figure 5-3: Adaptation Strategy B – Adaptive Environments

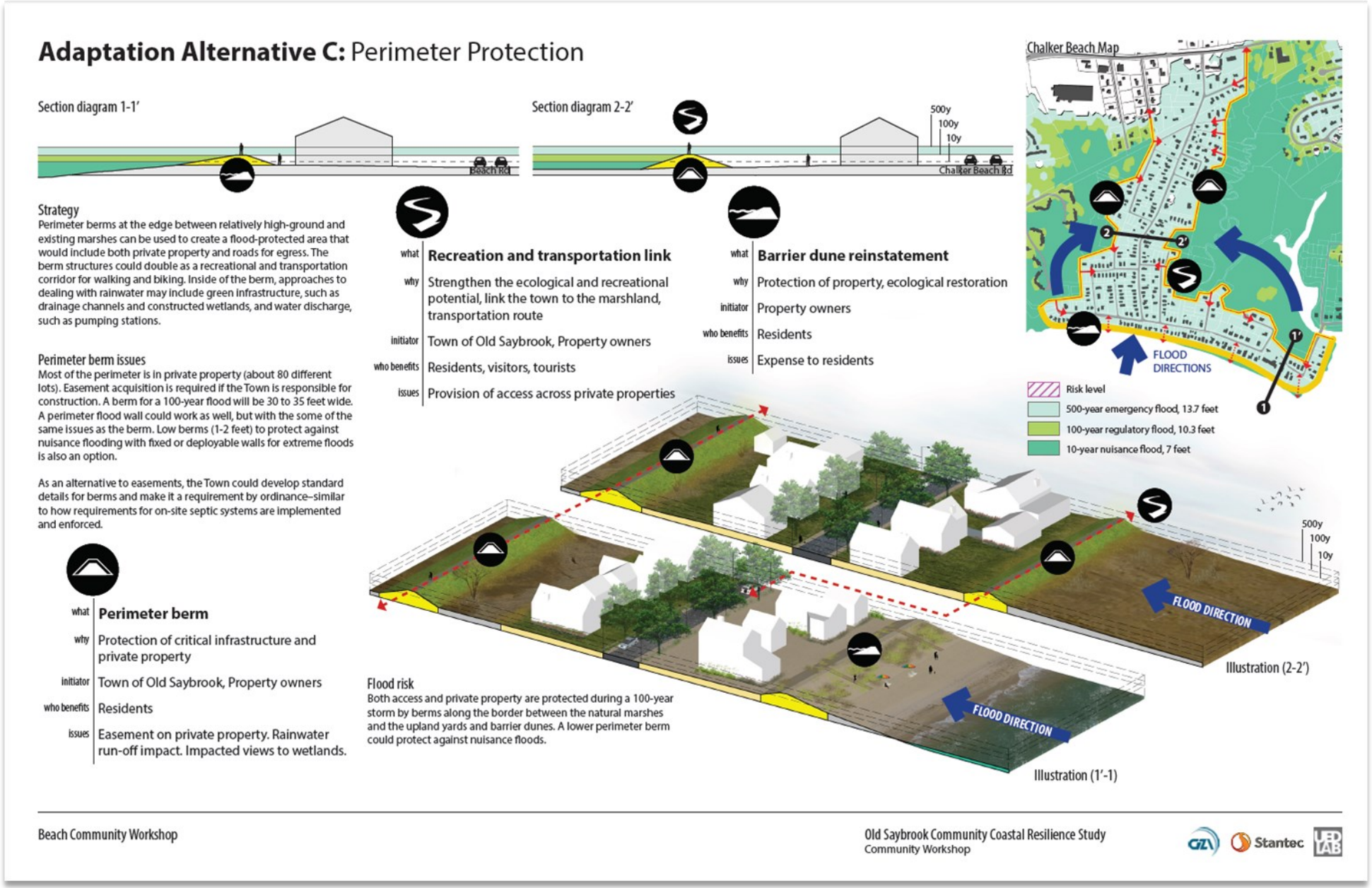

Figure 5-4: Adaptation Strategy C – Perimeter Protection

Rt 154 RESILIENCE CORRIDOR

Route 154 is a major Town arterial. Running approximately east-west, it connects Saybrook Point to the Town Center as well the Cornfield Point to Fenwood neighborhoods located to the south via Maple Avenue. It provides access to homeowners in the area, abuts several historic properties, and serves commercial and recreational facilities at Saybrook Point. It is also highly vulnerable to coastal flooding, resulting in roadway flooding, disruption to services and customers to local area businesses, and limited capacity for ingress and egress of residents.

This area was selected for a Neighborhood Study since it is representative of a common coastal flood condition that occurs throughout the portion of Old Saybrook located south of Interstate 95 - during coastal floods the roads flood and higher elevation areas effectively become "islands" with no access in or out during the flood.

The flood risks that are specific to the flooding of major arterials in Old Saybrook are:

- Flooding of the roods during major storms impacts the Town's capability to provide emergency response services;
- Flood-related damage of roadways will result in increased public works costs;
- Frequent roadway flooding disrupts access to homes and businesses;
- Roadway flood mitigation improvements, such as elevating roads, are both technically challenging and very expensive. For example, elevating roads affects adjacent driveways and homes (many of which are historical properties) and existing mature landscaping; and
- Elevating roadways could also change the character of Old Saybrook.

Rt 154 Resilience Corridor Overview

Figure 5-5 shows the limits of flood inundation in the area of the Rt 154 Resilience Corridor based on the current FEMA special flood hazard area mapping, corresponding to the 100-year recurrence interval flood. **Figure 5-6** and **Figure 5-7** shows the limits of the 2-year and 10-year recurrence interval floods, respectively, in the area of the Rt 154 Resilience Corridor. These figures show both the extent and the frequency of flooding around this section of Rt 154. The current 2-year recurrence interval flood is consistent with the chronic flood inundation that will occur around the years 2040 to 2050; at that time, this degree of flooding is predicted to occur on average about 26 times per year. Flood inundation simultaneously encroaches on inland areas from the North, South Cove and the Connecticut River shoreline.

Figure 5-5: Limits of FEMA Special Flood Hazard Area around Route 154

Figure 5-6: Limits of 2-year Recurrence Interval Flood around Route 154

Figure 5-7: Limits of 10-year Recurrence Interval Flood around Route 154

Community Workshop/Stakeholder Outreach

Workshop 1:

The resilience and adaptation planning team, led by GZA, held workshops on June 20, 2017 and August 1, 2017 to present the coastal flood risk and discuss some of the issues presented above.

Seventeen participants attended the first workshop on June 20, 2017. During the workshop, the team reviewed the near to long-term risks and engaged with residents and members of this area in an interactive dialogue to review adaptation options for near, mid, and long-term future coastal flooding and sea level rise scenarios. Through the workshop, the team assessed the stakeholder goals and the willingness of decision makers to contribute resources and to make tradeoffs to achieve adaptation options. This workshop resulted in the identification of adaption options and the associated tradeoffs for further assessment.

Figure 5-8: A group reporting their results during the first Resilient Corridor workshop

Workshop takeaways

1. Issues raised at multiple tables:
    - Safe egress routes from isolated areas;
        - Preserve open space for marshes and marsh migration;
        - Voluntary buyout and relocation program to upland areas.
2. Values with selective support:
    - Elevate road at lowest portion, preferable with low bridge;
    - Strategically implement multi-use berms; and
    - Flood risk is the responsibility for property owners only.

Principles derived from the workshop

- Embrace a changing landscape due to sea level rise and storms while ensuring safe egress routes and protecting essential and lifeline facilities during major storm events.
- Preserve marshes, views of marshes, and open space for marsh migration.
- Provide options for voluntary buyout and relocation of at-risk property.

The workshop's participants broke into four tables to discuss adaption options and reach a shared vision. **Table 5-2** presents the approaches each of the four tables developed and presented at the conclusion of the workshop.

Table 1 **Minimal intervention**	**Table 2** **Adaptive engineering**	**Table 3** **Mixed strategy**	**Table 4** **"Barbell" solution**
Let the water in and preserve the marshes	Two new berms, one becomes new road	Use top of berm for a recreation trail	Berm where needed around Saybrook Point & downtown
Owners responsible for flood protection	Multi-use berms for recreation and septic	Voluntary program allowing home buy-out and relocation	Run berm into elevated road at the neck on Main Street
Protect only important buildings and infrastructure	Elevated bridge in place of existing road	Raised bridge	Relocate volunteer residences from the neck on Main Street
Relocate to upland and diversity of housing types	Elevate East Street and allow Maple Street to flood	Designate egress corridors, elevate one road per area	Create space for marsh to migrate where possible

Table 5-3: Approaches from Table Discussions

Workshop 2:

Fourteen participants attended the second workshop on August 1, 2017. The workshop gathered additional input from representatives of Old Saybrook, state of Connecticut's Department of Energy and Environmental Protection (DEEP), University of Connecticut's Center for Land Use Education and Research and CIRCA, and from residents in interactive discussions and exercises about the adaptation alternatives and trade-offs. A series of goals were developed in discussion with the workshop participants that contributed to the conceptual design development.

The participants established seven goals for a resilience approach:

1. Emergency response service during storm events
2. Accommodate frequent flooding
3. Support essential and lifeline facilities
4. Work with homeowners
5. Function as a public amenity with multiple benefits
6. Provide economic value/land development
7. Preserve the historic and natural character of Old Saybrook

Top priorities from the discussions and polling were as follows:

- Creating a program to raise roads to provide access to the largest number of homes.
- Egress routes as more important that protection of low-lying areas.
- Providing egress and mobility during frequent Sandy-sized storms, but not necessarily during the 1% annual-chance flood levels (aka 100-year return period flood).
- Having evacuation policies for Sandy-sized and larger storms.
- Providing sloped access to private driveways off of raised roads.
- Creating floodable (green) streets for non-critical routes.
- Creating recreational trails along the marshes, either with or without berms, and/or along rights-of-way.
- Building perimeter berms two to six feet tall.
- Leaving the responsibility of raising structures up to owners.

One topic without a clear consensus from the discussions and polling was how to deploy perimeter berms (easements, design guidelines, voluntarily, or otherwise).

Resilience and Adaptation Strategies

The concept of a state-wide Resilience Corridor was developed for the State of Connecticut's National Disaster Resilience Competition submission for the U.S. Department of Housing and Urban Development (HUD) (2016). The concept creates a Connecticut Resilience Corridor that couples critical transportation infrastructure, public safety objectives and smart economic investment to create long-term State and community viability in the face of sea level rise and coastal flood risk. Building upon the idea of transit-oriented developments, the Resilience Corridor connects the coastal areas of Connecticut through the major coastal East-West transportation corridors (Route 1, Interstate 95, the Merritt Parkway and Metro North rail), which in turn connect to other areas of the state.

The Resilience Corridor concept is supported by Connecticut's coastal geology which consists of elevated glacial ice-laid deposits (glacial till) and bedrock. Low-lying, glacial meltwater deposits (glacial drift) and post-glacial beach and marsh deposits are present to the south of the East-West transportation corridors, along the shoreline. The major East-West transportation corridors are, for the most part, located along the higher elevation glacial till and bedrock deposits and higher elevation areas of glacial meltwater deposits, at elevations typically higher (>15 feet NAVD88) than coastal flood elevations.

The state-wide Resilience Corridor connects the more vulnerable coastal communities, providing ingress and egress, evacuation routes and access for State and federal emergency response and recovery services. **Figure 5-10** conceptually illustrates the state-wide Resilience Corridor. The Route 154 Resilience Corridor, is conceptually, a part of the state-wide resilience corridor. It is also a major arterial that connects the areas of Saybrook Point, parts of the Town center and Cornfield Point to Fenwood to Route 1 and Interstate 95.

The resilience and adaptation team operationalized the workshop's outcomes into the following resilience and adaptation priorities:

1. Elevate the roadway (Main Street and intersection with Maple Avenue), including the use of low bridges, is desired. However, the technical feasibility and cost will prohibit significant grade increase (e.g., above the 100-year return period flood). Lower increase in grade, along smaller stretches of road, may be feasible.
2. Consider perimeter berms are an appropriate flood mitigation alternative to elevating roadways.
3. Ensure evacuation during flood levels greater than the 10-year recurrence interval flood, including access to the Town's public shelter.
4. Ensure that the Town's Essential and Lifeline facilities are protected to the 500-year recurrence interval floods and that emergency response service can be provided – even over flooded roads.

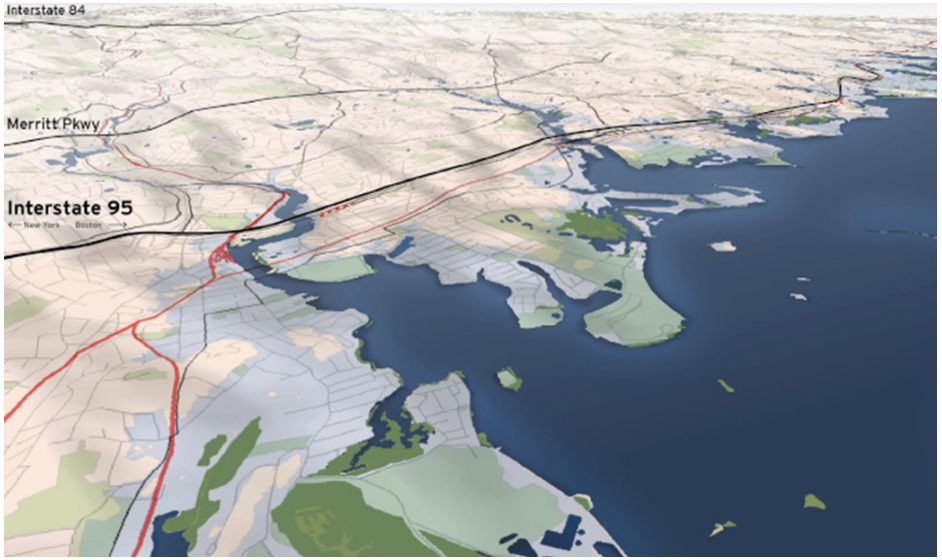

Figure 5-10: Illustration of State-Wide Resilient Corridor

5. Use an integrated approach to adapt to flood protection and adaptation, using a variety of strategies and measures.
6. Ensure that resilience investments result in **multi-functional public amenities**.
7. **Preserve the character** of Old Saybrook by maintaining view corridors, marshes, historic structures, and other characteristics.
8. Where reasonable, **accommodate frequent flooding** to maintain productive land uses.
9. Property owners are responsible for **protecting structures** during severe storms (up to the 1%-annual-chance flood level) as dictated in the building code.

Table 5-4: Resilient Corridor Design Solutions with Benefits and Limitations

Resilience alternative	Benefits	Limitations and risks
Elevated roads to the level of frequent flooding (e.g. 10-year recurrence interval flood)	Provides egress and emergency services during frequent storms Does not overly impact Old Saybrook's character by preserving views and access to historic structures Can be combined with public amenities such as bike lanes	Does not protect from severe floods Elevating homes is still required The landscape is not protected from floods May incentivize further investment into flood-prone areas
Perimeter berms selectively applied to the level of chronic and/or frequent floods	Protects landscape such that uses including parking and recreation are possible during chronic and frequent floods Can create redundant resilience when combined with elevated roads and elevated structures Can support public amenities such as recreation and open space Extends the life of landscape to retain property tax value	Does not protect from less frequent and catastrophic floods Does not provide FEMA-accredited risk reduction May build false sense of security Drainage of water from inside the berm, such as rainwater, needs to be managed Uncertainty around delivery mechanism (property taking, easements, design guideline, or voluntary buy-out) May incentivize further investment into flood-prone areas
Floodable areas	Long-term solution to sea level rise and flooding by allowing landscape to change Low cost approach Dis-incentivizes further investment into flood-prone areas Creates more room for flooding, open space, and natural systems	Uses such as parking and recreation are not possible with even chronic floods Flooded areas will eventually result in decreasing property tax revenue for the town over the long-term
Elevated structures to the level of regulatory floods	Reduces flood insurance Property tax revenue is retained Can be combined with floodable areas to allow landscape adaptation over time	Does not protect from catastrophic floods Expensive for property owners, and not mandatory unless major renovations resulting in a substantial improvement or new building construction, so non-conforming structures are likely Does not apply to historic structures
Amphibious emergency response during and after severe flood levels	Protect human life and property to some extent when roadways are flooded (in combination with early warning systems and evacuation) Less expensive than elevating roadways to higher flood levels throughout the town's low-lying areas	Emergency response during storms is unlikely, and would require waiting until storm conditions have passed Amphibious emergency response may be more limited than conventional response Potential risk to emergency responders operating in flood conditions

Figures 5-11 through **5-13** presents schematic representations of alternatives.

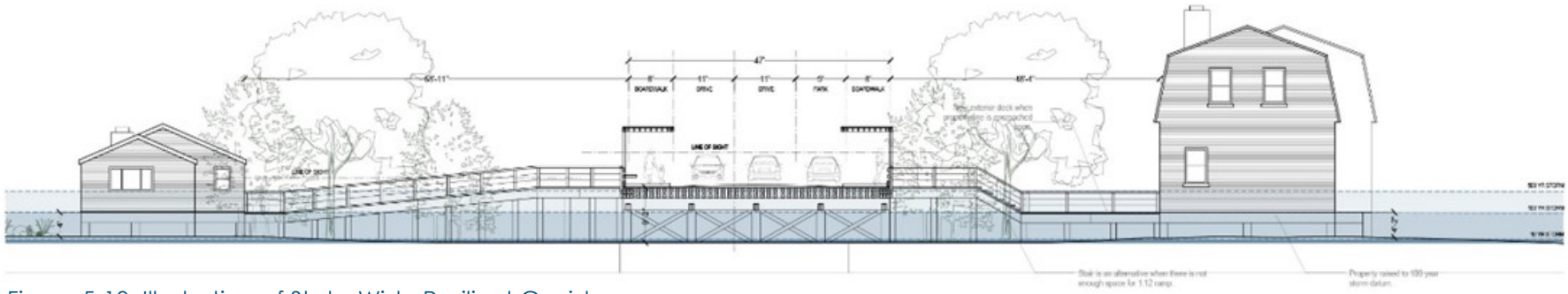

Figure 5-10: Illustration of State-Wide Resilient Corridor

Elevated roadways with either embankments or low bridges, depending on underlying ecology and abutting land uses, will improve accessibility and egress along major roads during chronic and frequent flood events. The new elevation of roads will balance increased operability during higher flood levels and negative visual impacts; access challenges; horizontal space for embankments; and the costs associated with elevation roadway grades. As elevating roads to the 100-year recurrence interval flood would require road raising by at least 5 to 6 feet in some locations (which is technically challenging, impactful to the existing character of Old Saybrook and cost prohibitive), the recommended solution is to elevate the road to accommodate frequent flooding. Elevated roads could be accompanied by a public amenity, such as sidewalks, multiuse trails, and/or bike lanes**.**

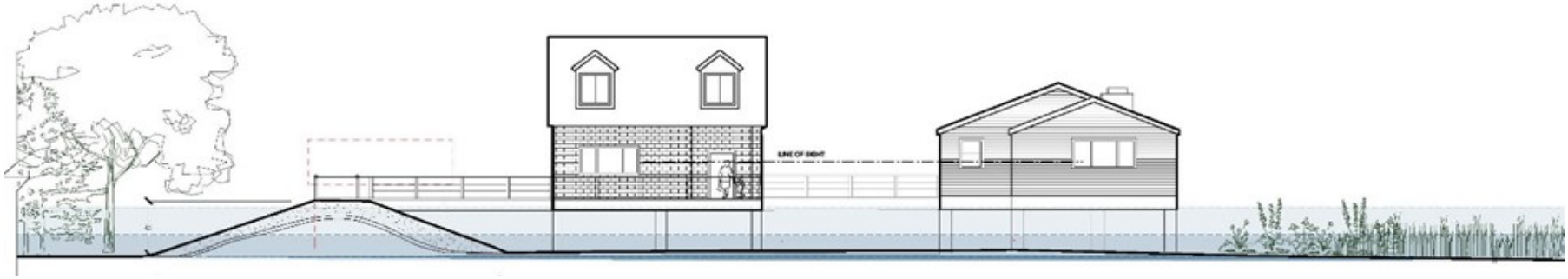

Figure 5-11: IPerimeter Berm Concept

The "upland" functionality of the landscape, for example parking and recreation, can be extended with low **perimeter berms** to protect private property and roadways from chronic and/or frequent floods. Like elevated roads, the height of perimeter berms is a compromise between increased protection from higher flood levels and preserving the character of Old Saybrook by maintaining a visual connection to the marshes; expenses associated with higher berms and wider footprint; and horizontal space required for embanked slopes. A perimeter berm strategy could be accompanied by a public amenity, such as a multiuse trail along the top or waterside toe of the berm.

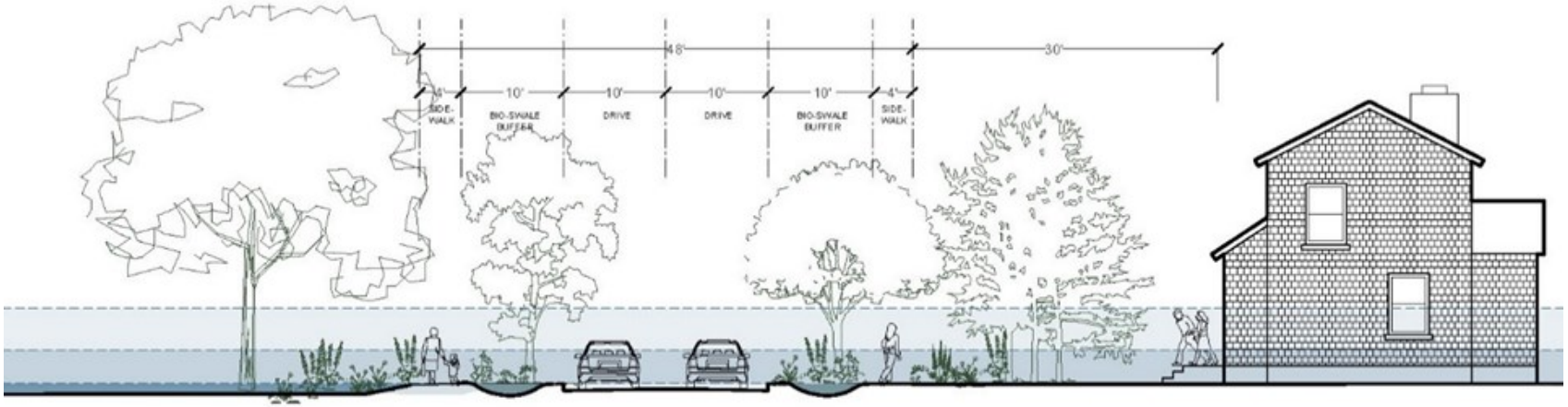

Figure 5-12: Floodable Streets

As sea level rise exacerbates accessibility challenges in Old Saybrook, **amphibious emergency response** may be more effective than raising all major access routes to low probability flood levels. Residents would evacuate for severe flood events and amphibious response capacity would continue delivering emergency services before and after the major storm events. Providing emergency response assistance during a major storm event may not be possible for local public safety officials. Such support is not recommended if the conditions may result in jeopardizing emergency responders' life-safety and for emergency responders without the appropriate training and equipment.