

Appendix F

Zones of Shared Risk Narratives

Appendix F1

Methodology

APPENDIX

Zone of Shared Risk Methodology

INTRODUCTION

According to CIRCA, the Resilient Connecticut Project aims to establish resilient coastal communities through smart planning that incorporates economic development framed around transit-oriented development, alongside conservation measures and infrastructure improvements. This approach provides a framework for regional, municipal, and site scale planning to tackle the challenges of future storms, sea-level rise, and riverine flooding. This planning approach connects **zones of shared risk** with **resilience corridors** to link critical facilities and provide greater continuity of service to the lower-lying communities.

According to CIRCA¹

- “**Zones of shared risk** are regions that face common challenges either in existence already or caused by climate change, and therefore risks are shared among or between groups of people that may have different perspectives and priorities for coastal resilience. A Zone of Shared Risk includes the houses, land, infrastructure, hydrological, ecological, social, and institutional elements that contribute to the functioning of a place.”
- “**Resilience corridor** utilizes the concept of urban redevelopment corridors as a mechanism to adapt coastal urban areas at risk. The resilience corridor supports transportation, utilities, stormwater and habitats, and economic development that connect the upland areas of Connecticut where resources exist (resilience zones) down to shorefront communities.”

The Scope of Services for Task 4, Develop a Regional Risk and Vulnerability Assessment and Identify Regional Zones of Shared Risk, is:

- CIRCA and the Resilient Connecticut Team seek to create a shared baseline understanding of climate risks informed by recent CIRCA and UConn-led scientific research, that can be utilized for planning going forward. The impacts of climate change to infrastructure, public health, ecology and other systems are felt at the watershed and cross jurisdictional scales, and therefore do not conform to business as usual municipal land use planning as an effective mechanism for adequately solving all challenges. While much previous planning has been done in Connecticut to understand risks and identify resilience projects town by town, the Resilient Connecticut Phase II planning process seeks to understand climate risks from a systems perspective, identify vulnerabilities to regional infrastructure, and create a process for shared investment and decision making at scales appropriate to address common problems among stakeholders.

The consultant will integrate the inventory from Task 3 along with CIRCA provided modeling tools, including CIRCA Coastal Vulnerability Index, and others as needed, to conduct a comprehensive

¹ <https://resilientconnecticut.uconn.edu/zones-of-shared-risk-dataset/#brief-description>

regional risk and vulnerability assessment across Fairfield and New Haven Counties, working in partnership with the CIRCA Research Team.

- Develop a limited set of indicators to identify regionally significant risk factors and vulnerabilities including those that result from cascading and regional impacts of climate hazards (e.g. sea-level rise, extreme precipitation, inland flooding, heat) upon public health, critical infrastructure systems, energy, transportation, housing, water (drinking water, wastewater, and stormwater), regional economic assets, and ecological systems.
- Develop social vulnerability maps for the two counties including socioeconomics, social capital (Kyne, D., & Aldrich, D. P. 2020. Capturing Bonding, Bridging, and Linking Social Capital through Publicly Available Data.) and health data.
- **Develop methodology for identifying regional zones of shared risk with focus on the 31 municipalities, building on CIRCA provided coastal/municipal zones of shared risk maps and methodology completed in Phase I; and indicators from [task 4.1.1]. Identify and delineate at least one zone of shared risk in each of the 31 municipalities or spanning their borders, unless the COG believes that some municipalities do not need such designation.**
- Building on the CIRCA Coastal Vulnerability Index model, develop a regional *Climate Vulnerability Index* to illustrate comparative impacts of coastal and inland flooding, along with heat. The process to develop the Climate Vulnerability Index should include weighting methodology options informed by stakeholder feedback. The scale of this analysis will not be more fine-grained than the scale of CIRCA’s work to date.

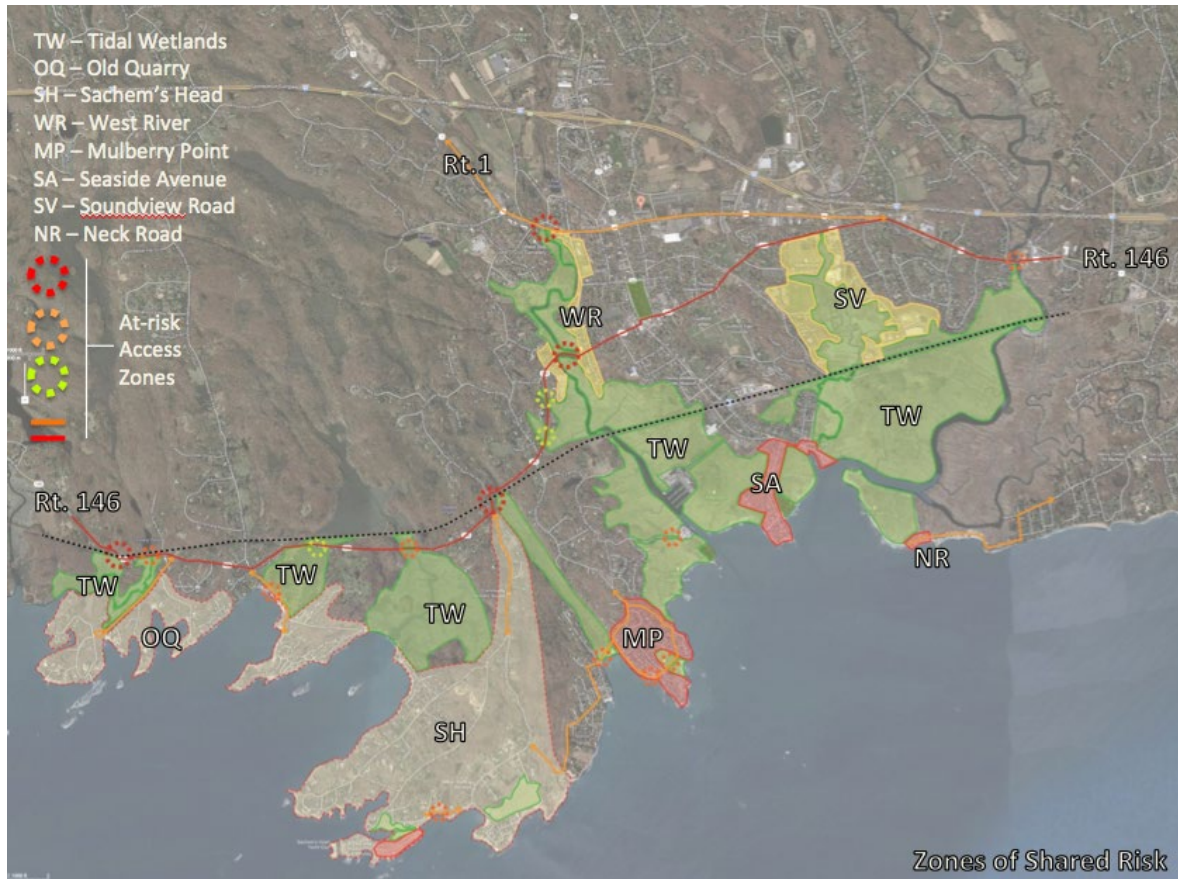
The scope states clearly that the ZSR methodology should build upon prior work; this implies that Peter Miniutti’s work for CIRCA along the shoreline towns should be directly considered; we concur. The scope also links the “indicators” to the ZSR methodology, but it does not state that the Climate Vulnerability Index (which is developed using indicators) must inform the ZSR. This is important because using the Climate Vulnerability Index to delineate ZSRs would then make the project somewhat circular if the Climate Vulnerability Index was *next* used to prioritize which ZSRs should be selected for pilot project development. In other words, keeping the development of the Climate Vulnerability Index separate from the development of ZSRs helps maintain the integrity of both. The scope of services above appears to recognize this, as the ZSR and Climate Vulnerability Index tasks are separate, and the Climate Vulnerability Index is sequenced after the ZSR task.

REVIEW OF PRIOR WORK – GUILFORD COMMUNITY RESILIENCE PLAN

The Town of Guilford’s Community Resilience Plan introduced the ZSR term and concept as follows:

“One way to evaluate, prioritize, and implement such a system of coastal adaptation strategies is to consider how they may be applied in “Zones of Shared Risk.” Zones of Shared Risk are regions that face common challenges either in existence already or caused by climate change, and therefore risks are shared among or between groups of people that may have different perspectives and priorities for coastal resilience. A Zone of Shared Risk includes the houses, land, infrastructure, hydrological, ecological, social, and institutional elements that contribute to the

Finally, the Guilford plan notes that *“In addition to these general types, Zones of Shared Risk are also applicable to regional elements including transportation infrastructure such as Route 146, which crosses three coastal municipalities. Within this regional Zone of Shared Risk, municipalities can target specific points of concern where Route 146 crosses under the Amtrak line, or low lying roadways adjacent to wetlands with modified hydrology that experience frequent flooding.”*



The four types of ZSRs presented in the Guilford Community Resilience Plan provide a reasonable reference framework for Phase II of Resilient Connecticut.

REVIEW OF NEW HAVEN ZSR MAPPING

Peter published a Zones or Shared Risk report focused on New Haven in May 2020². The report presents six “sets” of maps (six maps) for New Haven. The first five maps in the report are similar to the five maps posted by CIRCA on September 11, 2020:

- Topography
- Flood Projections
- Ecological Systems
- Structures and Roadways
- Land Use and Social Characteristics

² Revised mapping was issued in February 2021

However, the sixth map in the New Haven-focused report, which appears to be the zones of shared risk map, was not included in the bundles of maps posted by CIRCA on September 11, 2020. The zones of shared risk are therefore:

- Upper West River Riverine Area (Westville and Amity)
- Middle West River Riverine Area
- West River Riverine/Coastal Area
- Inland Industrial/Commercial Area (Long Wharf)
- Coastal Estuary Industrial/Commercial Area (Harbor District³, Fair Haven, and the Port)
- Southern East Shore (Morris Cove and Lighthouse Point)
- Mill River Riverine Area (Mill River including west side of Fair Haven)
- Quinnipiac River Riverine Area

These ZSRs are generally coterminous with coastal and riverine flood zones, although a couple of them span separate areas of flood risk that are near one another. Given their shared presence in the delineated zones of flood risk, one can conclude that direct impacts of inundation are a fundamental commonality among all eight ZSRs in New Haven. However, given the geography of the city, none of these ZSRs are uniquely at risk of isolation in the way that some ZSRs are in other communities like Guilford. In other words, the eight ZSRs in New Haven resemble the Proximity ZSRs and Location ZSRs in Guilford.

Practitioners working in the field of resiliency are likely aware of – and concerned with – direct and indirect impacts of hazards as well as primary and secondary risks that can affect zones of shared risk. We can define these as follows:

- Primary Risks – most important or earliest occurring
- Secondary Risks – resulting from something primary
- Direct Risks – occurs without intervening factors
- Indirect Risks – occurs through implied or circuitous means, or by passing through

If we assemble these into a matrix, we can think of potential examples for different sectors found throughout the Resilient Connecticut planning region such as critical facilities⁴ and businesses⁵:

<i>Risk for a Fire Station</i>	Primary	Secondary
Direct	Fire station is flooded	Fire station cannot function because electrical system fails
Indirect	Road to fire station is flooded, and employees cannot access the building	Fire trucks cannot get from the fire station to residents if a fire is detected during a flood

³ Harbor District is a more recent term for the area formerly known as Canal/Belle Dock

⁴ Risks characterized in Critical Facility Assessment for Southeastern Connecticut, MMI

⁵ Risks characterized in Small Business Assessment and Risk Reduction Guides for Rhode Island, MMI sub to RPS

<i>Risk for a Small Business</i>	Primary	Secondary
Direct	Small business is flooded	Small business cannot function because credit card system fails
Indirect	Road to small business is flooded and employees cannot access the business	Small business cannot function because supply chain is cut off

Carrying this forward to ZSR theory, a zone of shared risk can face a combination of risks but should be dominated by one type that gives it an overall character or defining challenge. For the New Haven example above, the “Inland Industrial/Commercial Area” (Long Wharf) is a ZSR with a direct/primary risk profile (i.e. flooding can impact buildings and roads) and a lesser direct/secondary risk profile (i.e. flooding will harm the functions of businesses in the area). While one could argue that indirect risks also occur (i.e. roads that lead to businesses can be cut off from flooding, stranding employees or cutting off supply chains), the geographic area itself is already flooding when roads flood. Therefore, the direct effects are more significant than the indirect effects.

This approach suggests that some of the potential zones of shared risk for New Haven could be shifted. For example, Fair Haven is bounded by three delineated zones of shared risk and small slivers of Fair Haven lie within each:

- Mill River Riverine Area
- Quinnipiac River Riverine Area
- Coastal Estuary Industrial/Commercial Area (Harbor District, Fair Haven, and the Port)

Fair Haven was a community within New Haven for many years and is currently an economic opportunity zone with a significant SVI. During a severe flood, Fair Haven residents can reach New Haven’s other neighborhoods via eight separate bridges over the Mill River and Quinnipiac River, or by driving directly north on State Street (Route 5) toward Hamden. However, only the edges of Fair Haven are at significant risk of direct flooding. Therefore, Fair Haven may be a good example of an indirect/primary or indirect/secondary zone of shared risk. The risk profile is notable in that it parallels the ongoing socioeconomic challenges associated with Fair Haven’s geography and position within the city.

Taking this analysis further, one can conclude that the Coastal Estuary Industrial/Commercial Area (Harbor District, Fair Haven, and the Port) could be divided into three zones of shared risk:

- Fair Haven
- Port area
- Long Wharf and Harbor District

These three areas share the coastal flood risks associated with New Haven Harbor but have vastly different types of resources and capacities. Therefore, they will have different sets of challenges and different sets of solutions to reduce risk. Strengthening Fair Haven’s ties to the rest of the city will reduce its risk of isolation during a severe flood and make it more resilient. In the context of promoting

resilience corridors, the long-term solution to address a Fair Haven zone of shared risk is to enhance its connectivity to other parts of New Haven and, potentially, State Street to the north.

On the other hand, occupants of the port will have their own business interests in becoming more resilient and strengthening their ties to Interstate 95, whereas occupants of Harbor District consider themselves part of “Long Wharf” and associate themselves with ongoing development patterns extending into Long Wharf proper along Sargent Drive⁶. Private investment into the Long Wharf area will address risks to some degree, likely with the City’s participation.

Applying this approach to Guilford would result in fewer changes than it would in New Haven. This is because the concepts of direct, indirect, primary, and secondary are similar to “access,” “location,” and “proximity” risks. Sachems Head would be an area of indirect risks whereas Soundview would be an area of mostly direct risks.

REVIEW OF MILFORD ZSR MAPPING

Peter published a Zones or Shared Risk report focused on Milford in August 2020⁷. Like the New Haven report, the Milford report presents six sets of maps (six maps) for Milford. The zones of shared risk depicted on the sixth map are hereby given the following names, based on our familiarity with Milford through development of the Milford Coastal Resilience Plan in 2015-2016:

- Milford Point to Laurel Beach
- Laurel Beach and Wildemere Beach
- Walnut Beach
- Silver Sands
- Bayview Beach and Point Beach
- Morningside and Burwells Beach
- Head of Gulf Pond

Most of these areas were addressed in the Milford coastal resilience plan, and Peter’s team identified the same risks and similar potential solutions. Moving away from terms such as primary and secondary for the moment, most of the ZSRs in Milford have some risk of inundation from coastal waters during a coastal flood event. However, they do not all face risk of isolation, erosion, or wave damage. The following table summarizes some of the shared challenges.

Delineated ZSR	Inundation	Potential for Isolation	Erosion	Wave Damage
Milford Point	Yes	Yes	Uncertain	Yes
Laurel Beach and Wildemere Beach	Yes	No	Yes	Yes
Walnut Beach	Yes	No	Uncertain	No
Silver Sands	Yes	Yes	Uncertain	Yes
Bayview Beach and Point Beach	Yes	No	Uncertain	Yes
Morningside and Burwells Beach	No and Yes	No	No	Yes
Head of Gulf Pond	Yes	No*	No	No

⁶ Refer to the Long Wharf Responsible Growth Plan, 2019

⁷ Revised mapping was issued in February 2021

*The inundation in this area could cause significant loss of access, but not isolation

As noted above in the New Haven discussion, a ZSR can face a combination of risks but should be dominated by one type that gives it an overall character or defining challenge. Most of the ZSRs delineated in Milford meet this test. A community may decide that some ZSRs can be addressed simultaneously. For example, the City of Milford hired GEI and MMI to design a somewhat continuous dune ridge project along Wildemere Beach and Walnut Beach, addressing two ZSRs. On the other hand, a community may decide to address risks in only small portions of ZSR; for example, Fuss & O'Neill is designing drainage improvements in part of Bayview Beach, whereas numerous homes were elevated in Point Beach using public funds available in the 1990s. Milford is therefore a good example of a community where the division between ZSRs is not critical for the odds of any one area being addressed.

The Milford ZSR report of 2020 did not attempt to delineate a ZSR in areas of riverine flood risk; these were depicted instead on the revised mapping for Milford that Peter's team published in February 2021.

REVIEW OF NOTABLE RESILIENCY PROJECTS AT ZONES OF SHARED RISK

The Meriden Green project in downtown Meriden is one of the State's most notable flood mitigation projects in recent history. Meriden Green incorporates elements of natural resources restoration with the daylighting of Harbor Brook, setting aside of open park space to accommodate flooding, and construction of new resilient buildings that are elevated or floodproofed. The Meriden railroad station is in very close proximity, placing Meriden Green within the area of reasonable expectations for Transit-Oriented Development (TOD).

However, this part of downtown Meriden (formerly known as the "HUB") was never delineated as a ZSR because it pre-dated the term. It had many of the same characteristics. In Guilford terminology, the ZSR was clearly one of location and proximity. Using the modified New Haven approach, risks were mainly direct (primary and secondary) because flooding frequently damaged numerous properties. Specific areas of the city were not isolated, although east-west access was often impeded.

Meriden HUB/Meriden Green is a good test of ZSR theory. If CIRCA were delineating ZSRs in Meriden ten years ago, would the area be selected and mapped as a ZSR? We can confidently say that Meriden HUB would have been mapped as a ZSR for the following reasons:

- "Location" risks (risks primarily derived from a prevalence of low-lying lands within an area; these lands are vulnerable to flooding) and "Proximity" risks (primarily derived from adjacency to low-lying, vulnerable lands) are significant.
- Commonalities would be found among the five sets of indicators used by Peter's team (Topography, Flood Projections, Ecological Systems, Structures and Roadways, Land Use and Social Characteristics)
- Direct primary and secondary risks to businesses, critical facilities, and people are shared in the HUB area.

In the case of Meriden, the ZSR became a pilot project priority area and then subsequently executed to become a successful resilience project adjacent to TOD.

PROPOSED APPROACH

Our approach for delineating ZSRs:

- Must be consistent with the work already completed and summarized in this narrative.
- Must be effective in areas of coastal flood risk as well as areas of riverine flood risk.
- Must be repeatable across the 33 target municipalities of the two counties.
- Should result in delineating ZSRs in a manner that is somewhat blind to the SVIs mapped in the underlying census blocks or tracts (in other words, areas with low or high SVI may have ZSRs).

Review of automated or semi-automated GIS methods for delineating ZSRs has underscored the challenges of this mapping. Although sophisticated tools for evaluating transportation networks are available such as Network Analyst, these programs cannot take into account some of the nuances associated with Connecticut’s geography and municipal characteristics. The ZSR approach must be guided through user knowledge and aided by stakeholder engagement at appropriate times. We recommend a checklist method with a set of baseline criteria such as:

- A ZSR must include one of the following within or adjacent to an area of current or future flood risk:
 - Several buildings
 - A critical facility
 - A segment of collector/arterial roadway
 - Natural systems that could protect buildings and infrastructure
- A ZSR may include community capacity commonalities such as:
 - Shared shelter
 - Shared heating/cooling center
 - Shared medical facilities or hospitals
- A ZSR may include other infrastructure commonalities such as:
 - Shared water utility
 - Use of private wells
 - Shared sewer utility
 - Use of septic systems



The starting point for analysis is identification of coastal and riverine FEMA-delineated flood zones (both the 1% and 0.2% annual chance risk areas) and areas of sea level rise. These areas are easily identified using GIS methods. The criteria listed above are then applied to determine which should be subject to delineation of ZSRs. Human interpretation is needed to further refine ZSRs into the various types (either access, location, proximity, and natural protection; or direct, indirect, primary, and secondary).

Additional sources of information to inform the ZSR mapping are described below.

SOURCES OF PREVIOUSLY DELINEATED AREAS OF RISK FOR CONSIDERATION AS ZONES OF SHARED RISK

Hazard Mitigation Plans

Because Single-Jurisdiction Hazard Mitigation Plans typically contain detailed narrative descriptions about areas of flood risks along with detailed focused mapping, the Single-Jurisdiction Hazard Mitigation Plans for the following municipalities were reviewed to identify areas of flood risk that translate into ZSRs:

- Meriden, 2018
- Former HVCEO – Bethel, Brookfield, Danbury, Redding, Ridgefield, 2014-2015
- Former COGCNV – Beacon Falls, Naugatuck, Waterbury, 2014-2015
- New Haven, 2011
- Guilford, 2010
- East Haven, 2010

While some Multi-Jurisdiction Hazard Mitigation Plans typically lack detailed narrative descriptions about areas of flood risk and detailed focused mapping, one contained this type of information and was utilized:

- Former VCOG – Shelton, Derby, Ansonia, and Seymour, 2012

The following Multi-Jurisdiction Hazard Mitigation Plans were reviewed to capture “problem statements” and other narratives:

- MetroCOG, 2019
- SCRCOG, 2018

Finally, the draft Multi-Jurisdiction Hazard Mitigation Plans for WestCOG and NVCOG (both due to be completed in 2021) were reviewed for information collected in the planning process data collection meetings during 2020.

Hazard mitigation plans were helpful for determining whether, and where, ZSRs should coincide with mapped flood zones. For example, only specific segments of the Mad River corridor in Waterbury were designated as ZSRs; and numerous river corridors in very rural towns were not designated as ZSRs.

In many cases, hazard mitigation plans were critical for identifying ZSRs. For example, ZSRs in Derby, Shelton, Waterbury, and Naugatuck (pictured below) are located along streams that are partly conveyed in culverts and lack mapped FEMA flood zones. Without the hazard mitigation plans, some other potentially time-consuming method would have been necessary to identify these ZSRs.



Municipal Flood Mitigation and Resilience Plans

ZSRs were directly mapped in the Guilford Coastal Resilience Plan. Furthermore, the narrative vulnerability assessments, maps, and neighborhood focus areas in the following coastal resilience plans (and the two plans in Fairfield that function as limited coastal resilience plans) were used to delineate ZSRs:

- Branford Coastal Resilience Plan (2016)
- Fairfield Flood Mitigation Plan (2012)
- Fairfield Ash Creek/Riverside Side Flood Mitigation Plan (2017)
- Guilford Coastal Resilience Plan (2014)
- Madison Coastal Resilience Plan (2016)
- Milford Coastal Resilience Plan (2016)
- Stratford Coastal Resilience Plan (2016)
- West Haven Coastal Resilience Plan (2017)

Regional Framework for Coastal Resilience

In specific instances, segments of the data collection for the *Regional Framework for Coastal Resilience* were helpful for delineating ZSRs. Examples include Russian Beach in Stratford, the area adjacent to the Egan Center (former Lennox Avenue School) in Milford (pictured below), and parts of the shoreline in East Haven.



The Opportunity Assessment memos completed for each of the ten municipalities as part of the *Regional Framework for Coastal Resilience* were also helpful for identifying risks that may not have been identified in hazard mitigation plans.

EDITS TO ZONES OF SHARED RISK BASED ON FEEDBACK FROM JANUARY/FEBRUARY 2021 WORKSHOPS

The workshops were helpful in the evolution of ZSR theory because, as one participant noted, they are rooted somewhat in recognition of typologies. While the four original types of ZSRs (access, location, proximity, and natural protection) are aligned with typologies, other typologies were recognized. One example is railroad underpasses, as they all have significant flood risk whether the area is mapping by FEMA or not mapped by FEMA.

Comments about ZSRs were divided into short-term and long-term needs. The short-term needs included:

- Specific ZSRs need to be added per feedback.
- Specific ZSRs need to be edited per feedback.
- ZSR shapes should be “tightened up” based on topography where appropriate, to capture elevation changes and remove lower risk areas.
- Incorporate natural protection areas and relevant elements of watershed management plans into ZSR mapping.
- Railroad underpasses in all the towns should be identified as a new type of ZSR.
- Determine how to map ZSR associated with regionally significant facilities such as sewer collection and treatment facilities that serve multiple towns, and power substations that serve multiple pumping stations or utilities.
- Determine how to map ZSR associated with regionally important facilities located *outside* of the project area and therefore not mapped.

These comments were therefore used for editing the ZSRs.

Long-term needs identified from the workshops included:

- Typologies: ZSR typologies should eventually lead to predictable types of projects. For example, consider developing ZSR typologies that would automatically lead to building acquisitions vs. building elevations in areas of riverine flood risk and areas of coastal flood risk.

- Future ZSR Development: Future phases should identify areas where actions in one location can affect a broader area. Additionally, future ZSR development could allow ZSRs to quantify the number of people, number of jobs, percent of the tax base, and metrics associated with highly vulnerable populations.
- Time Horizons for ZSR Development: Risk mitigation strategies for areas with high flood exposure over the next decade might be different than those areas with high flood exposure over a longer timeframe. A time element could be added to ZSR mapping.

These long-term suggestions were not used to edit the ZSRs.

VERIFICATION THROUGH COMPARISON TO UCONN-PRODUCED ZONES OF SHARED RISK MAPS

Peter Miniutti's full set of coastal ZSR mapping was published in February 2021. The map for New Haven was similar to the previous map, whereas the map for Milford was significantly revised relative to the previous map. Maps for the other municipalities spanning from Greenwich through Madison were new.

The maps were reviewed and compared to the draft ZSR mapping that had already been discussed during the January/February 2021 workshops and edited as a result of the workshops. For most municipalities, the new maps from Peter's team favored a simplified approach with larger, more extensive ZSRs delineated instead of numerous smaller ZSRs. Peter's team tended to include most of the FEMA flood zones, whereas the draft ZSR maps for the workshops excluded the most undeveloped flood zones where roads and other infrastructure were absent; and where floodplains were not being used to function as natural protection. The maps from Peter's work were used to edit and in many cases increase the ZSRs mapped for Resilient Connecticut.

Appendix F2

WestCOG Documentation

Zones of Shared Risk in the WestCOG Planning Region Supporting Documentation

Brookfield Hazard Mitigation Plan, 2014: Still River – The most frequently flooded areas in town are adjacent to the Still River. The existing economic hub of Brookfield located on Federal Road (Route 202) where the Town Center is located in the area of most concern. Because the Still River cuts through the center of town, possible flooding could impair east-west accessibility. Bridges in Brookfield could be compromised. The town does have a few north-south routes but these are minor arterial roads that do not have a large carrying capacity for the town’s traffic volume. Three areas of the Still River corridor experience the worst flooding: Lower Federal Road, Sand Cut Road, and Dean Road. The Dean Road area includes commercial and residential buildings that are subject to flooding.

6600-00-233-0

Brookfield Hazard Mitigation Plan, 2014: Lime Kiln Brook – Meadowbrook Manor is a key area of flood concern in Brookfield. A substantial number of homeowners have suffered flood damage in this neighborhood. A review of historic topographic maps shows that portions of Lime Kiln Brook were likely re-routed long ago to construct the streets and homes in the neighborhood. During this process, drainage systems were also installed. At the present time, drainage systems and watercourse conveyances are believed undersized. The town would like to implement a conveyance and drainage improvement project¹ to increase capacities and reduce flooding.

6600-10-234-0

Brookfield Annex of WestCOG Hazard Mitigation Plan, 2021: Hollow Oak Lane – Flooding along this road is believed associated with an unnamed stream that originates from an impoundment north of Huckleberry Hill School. The Town has proposed a hazard mitigation action to address this road.

6600-07-537-0

Other areas in Brookfield that are not described in the hazard mitigation plan: This area has the potential to be cut off during flood events affecting Candlewood Lake.

6400-00-538-0, Candlewood Lake

Danbury Hazard Mitigation Plan, 2014: Still River – Fire Engine Company 24 is a Danbury Fire Department building located on Eagle Road. The property is completely within the 0.2-percent-annual-chance floodplain of the Still River with portions of the building within the mapped 1-percent-annual-chance floodplain (with elevations defined) and the floodway (green area) of the Still River. While this building has not experienced flooding damage in the past, the potential exists that this facility would be flooded by a severe flood event in the future.

¹ This project was completed using a FEMA HMA grant

... The city's transportation network is at risk of flooding. As shown in the historic record, the Metro North railroad running from Norwalk to Danbury has been damaged by flooding (or simply flooded) during several storm events, forcing service shutdowns. Severe storms such as Tropical Storm Floyd have the potential to close many city roads, resulting in Interstate 84 being the only means to cross the city. This is particularly a concern given that Danbury's emergency personnel are regional responders, and flooding can make it difficult for ambulances to access Danbury Hospital due to a variety of detours from road closures.

6600-00-223-0

6600-00-221-37

Danbury Hazard Mitigation Plan, 2014: Upper Still River – According to City personnel, Kenosia swamp floods often although limited damages result due to the undeveloped nature of the area.

... Jensen's Mobile Home Park on Lake Kenosia continues to be a repeated flooding area. The mobile homes nearest the lake are only 1 to 2 feet above the normal water elevation of the lake. This park is historically flooded several times each year, with larger events resulting in necessary evacuations although few significant storms or flood events have occurred since adoption of the initial HMP. Past utility improvements at the park have included electrical facilities being raised to mitigate flooding damage. There is an effort underway to tie the park into the municipal sewage system, which will remove the problem of septic overflow due to high groundwater. As an age-restricted (55+) park, this area also has a high concentration of elderly persons who need additional assistance during an emergency.

6600-01-229-115

... Restrictions in the Still River channel near Segar Street cause it to back up through Mill Plain Swamp behind the Danbury Fair Mall and then into Lake Kenosia. The problems are exacerbated by inflow from Miry Brook and Kissen Brook and by the small, antiquated bridge on Kenosia Avenue that overtops during the 10-year flood event. When enough rainfall backs up, Jensen's Mobile Home Park floods, with floodwaters closing down Kenosia Avenue.

... Residents at Kenosia Commons Mobile Home Park at 46 Kenosia Avenue now have a need for flood insurance because of the recent FIRM update. More than half of the park is mapped within the 1-percent-annual-chance floodplain.

6601-00-229-116

... One of the most frequently flooded areas in the city is in the vicinity of the airport. Miry Brook, an unnamed stream, and Kissen Brook all drain through the airport to their eventual confluences with the Still River. The airport and the on-site Fire Department (Engine Company 26) are in the combined 1-percent-annual-chance floodplain of Miry Brook and Kissen Brook along with a large commercial area that includes restaurants, stores, and the parking lot of the Danbury Fair Mall. During Tropical Storm Floyd, the majority of the airport and its runways were inundated as was the entire mall parking lot and many of the surrounding stores.

... The airport is built primarily on fill material, which has reduced overall floodplain storage capacity, and in the past, improvements have been performed to allow the drainage system to pass the 5-year, 2-

hour rainfall event without overtopping. These improvements also serve to retain some water at the site in order to reduce peak flows downstream (particularly at West Street). As noted in Section 2.4, the TP-40 rainfall values have been superseded with more recent rainfall data that suggest that storm sizes are increasing. Thus, even with the improvements in the early 1990s, it is likely that the airport and the surrounding area will be flooded more frequently in the future than they were in the past.

... Additional improvements have been constructed at the mall to provide additional flood storage capacity. A series of retention ponds line the access roads leading into the mall adjacent to both Miry Brook and Kissen Brook. Flap gates allow each pond to fill with water but close to prevent drainage during a flood event. These improvements buffer the natural capacity of Mill Plain Swamp to store floodwaters.

... Exacerbating the problem at the airport and the mall is the fact that outflow from Lake Waubeeka in southern Danbury was diverted north into the city after the floods of 1955. This diversion was performed because Lake Waubeeka is used for contact recreation, and the upper Saugatuck River drains to reservoirs used for public water supply; in-water recreation is contrary to the Public Health Code. As such, more water is directed into the airport now than when it was first built in the late 1920s. The outflow from Lake Waubeeka manifests along Route 7 as Kissen Brook and drains the eastern side of the airport through a system of open channels and closed culverts.

... The Danbury Municipal Airport and its fire station, Fire Engine Company 26, were constructed in the 1-percent-annual-chance floodplain of Miry Brook. The airport is expected to partially flood during minor events (greater than 5-year return frequency) and completely flood during serious flood events. Various improvements have been performed at the airport to reduce the vulnerability of the facility to flooding. While the Danbury Fair Mall is located within the 1-percent-annual-chance floodplain of the Still River and Miry Brook, the mall structure was designed such that the doors are above the 1-percent-annual-chance flood elevation. As such, the parking lot and a portion of the lowest level of the parking garage will be flooded, but the interior of the mall will not be flooded during a 1-percent annual-chance flood event. The mall parking lot will be inaccessible from Backus Road due to the flooding, thus requiring a mall closure similar to that which occurred during Tropical Storm Floyd in 1999. The mall is considered a critical facility because after natural disasters it is utilized as an important regional commodity distribution site.

6601-00-229-0

Danbury Hazard Mitigation Plan, 2014: Middle Still River Area – Downstream of Segar Street, a sand and gravel processing site and a few houses on Belmont Lane are the only buildings in the 1-percent-annual-chance floodplain until the vicinity of Oil Mill Road. The River Woods Condominium complex has units within the 1-percent annual-chance floodplain; however, the access bridge over the Still River is designed to pass the 1-percent-annual-chance flood event with 2 feet of freeboard. As such, this complex should not get isolated from the rest of the city during a 1-percent-annual-chance flood although parts of the complex may flood. Beyond this bridge, the Still River channel is incised and does not have a delineated floodplain until it nears West Street.

6600-00-228-0

... The intersection of West Street and Benedict Avenue is where the railroad bridge passes over West Street. A combination of factors at this location results in frequent flooding. First, West Street drops in

elevation to pass under the railroad bridge, creating a road surface that is near the water elevation of the Still River and a depression that collects rainwater. When the Still River is high, the storm drains beneath the railroad bridge cannot discharge water to the river, and a pool forms. The sharp "S-curve" in the Still River provides tangential velocity to aid the river in running overbank. The City sets up barricades in this area to close the road several times per year during heavy rain events. Flooding in the railroad underpass area is exacerbated by sedimentation, which is caused by the pooling described above. Danbury has plans to dredge at this site, is working on securing permits, and hopes to complete the project by the end of the 2016-2017 fiscal year. Downstream of West Street, a pair of factories (with multiple employers) is located within the 1-percent-annual-chance floodplain. The Still River then proceeds to enter the three major flood control projects erected after the floods of 1955. The 1-percent-annual-chance flood is completely contained within these protection projects although the 0.2-percent-annual-chance flood will inundate a significant area near the railroad yard. These culvert systems continue to need attention and maintenance.

... The area of Lower Main Street, Elm Street, Kennedy Avenue, and New Street was described as continuing to be frequently flooded. There is concern that new development in the area, specifically the construction of a condominium complex, will exacerbate flooding. Few other areas within the middle section of the Still River are vulnerable to overbank flooding except the confluence with Sympaug Brook.

6600-00-225-0

6600-00-223-0

Danbury Hazard Mitigation Plan, 2014: Lower Still River Area – Downstream of Cross Street, the Still River enters a major industrial and commercial area of the city. Many properties in this area have experienced flood damage. When flooding occurs, it is exacerbated by the many meanders of the Still River in the area, particularly near the confluence of Limekiln Brook and Federal Road. Historically, floodwaters in this area have been deep and widespread; during Tropical Storm Floyd, several feet of flooding was reported in many buildings, and floods up to 3 feet deep have occurred several times on Finance Drive. The Still River Alliance believes that most of the flooding along the Still River will continue to be concentrated in the area near the confluence with Limekiln Brook as it acts as a floodplain bottleneck. Flooded properties are mainly commercial and industrial in this area although roads are flooded as well. The Eagle Road area used to be a farm prior to its development, and the Finance Drive area is constructed on fill. Both of these factors suggest that an overall loss in floodplain storage has occurred in this area. City personnel say they have observed increasing flooding in this area in past years.

6600-00-223-0

Danbury Hazard Mitigation Plan, 2014: Boggs Pond Brook and Kohanza Brook Area – Infrequent flooding occurs in the upper reaches of Boggs Pond Brook above the West Lake Reservoir. This area does not have any floodplains defined; these are first delineated on Kohanza Brook upstream of Kohanza Street at Ridgewood Country Club. The golf course does not have any structures (other than cart path bridges) that are in the floodplain. Downstream of Kohanza Street, the 1-percent-annual-chance floodplain is confined to the channel of the brook such that there are few flooding problems until after Kohanza Brook passes into a culvert beneath Interstate 84. When Kohanza Brook is high, the drainage systems on Main Street can back up and cause pooling near Interstate 84. During severe storms, this can essentially close one lane of traffic as observed during Tropical Storm Nicole in 2010. Downstream of Main Street, the brook daylight in a commercial area between Thorpe Street Extension and Patch

Street that experienced severe flooding damage during Tropical Storm Floyd. This area has occasional flooding problems, with two RLPs and Fire Engine Company #3 located within the 1-percent-annual-chance floodplain. Due to the nearby confluence of Kohanza Brook with Padanaram Brook, this area can be affected by flooding from either source.

... Fire Engine Company 3 is a Danbury Volunteer Fire Department building located on North Street. The property is completely within the 1-percent annual-chance floodplain (with elevations defined) of Kohanza Brook. While this building is known to have only experienced minor flooding damage, the potential exists that this facility could be damaged by a severe flood event.

6602-00-450-0

6603-00-224-0

Danbury Hazard Mitigation Plan, 2014: Padanaram Brook Area – The upper basin of Padanaram Brook is impounded by various reservoirs, which provide a measure of flood mitigation except during extreme events when the reservoirs are full. The major flooding issues along the corridor begin at the beginning of the mapped floodplain. The stream corridor is narrow and steep through the reach, culminating in a culvert beneath the Danbury Shopping Center. Flooding in this area is exacerbated by the influx of water from Penny & Ericson Brook into the underground culvert. Just southeast of this area, floodwaters back up near the terminus of Walnut Street due to the constriction in flow caused by the Interstate 84 culvert. Flooding damages are usually relatively minor along Rowan Street although there are several apartment complexes and homes within the 1-percent-annual-chance floodplain in this area. The confluence of Kohanza Brook (in the vicinity of North Street, Barnum Court, and Patch Street) is a repeated flooding area. Flooding during Tropical Storm Floyd was so severe that evacuations were necessary. Padanaram Brook continues southeast toward its confluence with the Still River. A new Police Department building was completed in 2009 near East Franklin Street; the back parking lot of this building is located within the 1-percent-annual-chance floodplain of the brook. This building currently contains the civilian-operated dispatch center for Police, Fire, and Emergency Medical Services, previously located in the Fire Engine Company 6 building within the 1-percent-annual-chance floodplain of Blind Brook. This represents a removal of that critical facility from a hazardous area although the parking lot of the current location is within the 1-percent-annual-chance floodplain of Padanaram Brook as noted above.

6603-00-230-0

6603-00-231-0

6603-00-224-0

Danbury Hazard Mitigation Plan, 2014: Blind Brook – Flood damage is generally limited immediately downstream of Tarrywile Lake although significant flood damage occurred during Tropical Storm Floyd. City employees point to Blind Brook Park, between East Pearl Street and West Worcester Street, as a location that experiences frequent flooding. Upstream of West Wooster Street, Fire Engine Company 6 and the Pope John Paul Health Center are located in the 1-percent-annual-chance floodplain associated with Blind Brook. Repeated flooding damages occur downstream of West Wooster Street. According to City personnel, flooding occurs within this part of the Blind Brook corridor three or four times per year. One of the most common areas for flooding is the East Pearl Street and William Street neighborhood. Flooding in this area is due primarily to channel encroachments reducing flow capacity. Downstream of George Street, Blind Brook is directed into an underground culvert that extends north past New Street to daylight at the Fire Headquarters. This underground culvert reportedly passes

beneath several houses. City personnel have noted in the past that the entire culvert system needs repairs and have described the section of culvert beneath New Street as "failing."

The culvert continues to be channelized by an open-topped concrete culvert down to the access road leading to the City homeless shelter. This section of channel continually narrows which has caused damage to the adjacent concrete. The Pentecostal Church in this area has reportedly experienced flooding damage. The brook then enters a short underground culvert that empties into the underground channel of the upstream Still River protection project. Several studies of the corridor have occurred to attempt to quantify the frequency and magnitude of flooding. The USACE (2000) has studied the stream and determined that its rate of flow is too low to qualify for federal funding through USACE grants. The USACE noted that outflow from the two upstream dams on Tarrywile Lake and Parks Pond peaks well after the lower watershed has its peak flows. As such, water from these ponds is not a major contributor to peak flows in the lower section of the brook, and the USACE recommended further study on a detention basin upstream of Jefferson Avenue and culvert improvements downstream of West Wooster Street.

A study was performed by Roald Haestad, Inc. for the City of Danbury in 2003 to investigate the improvements recommended by the USACE. The report noted that the current culverts within the Blind Brook study reach have the capacity to discharge a 2-year to 5-year return frequency flood while the Elm Street culvert can discharge an approximate 10-year flood. The report noted that the proposed detention above Jefferson Avenue would result in significant discharge reductions for all flood frequencies (1-percent-annual-chance was lowest frequency studied) at Jefferson Avenue and West Wooster Street but that discharge reductions were less noticeable at West Street (only for 25-year flood and above) and at Elm Street (only for 50-year storm and above). Thus, the upstream detention improvements would have limited impact on higher frequency floods but would mitigate peak flows for the lower frequency, higher discharge events.

... Fire Engine Company 6 is a Volunteer Fire Department station located on Jefferson Avenue. The property is completely within the 1-percent-annual-chance floodplain (without elevations defined) of Blind Brook. The mapped 1-percent-annual-chance floodplain is the area in teal. While this building is not known to have experienced serious flooding damage, the potential exists that this facility could be flooded by a severe flood event.

... The southeast wing of the Pope John Paul Healthcare Center is located within the 1-percent-annual-chance floodplain of Blind Brook (without elevations defined). This floodplain is due to backwater flooding caused by the constriction in flow at the West Wooster Street culvert. This facility has reportedly experienced minor flooding in the past. The proposed improvements to the lower reaches of Blind Brook (from West Wooster Street to New Street) that have been proposed in previous studies could reduce future flooding at this location.

... The Fire Department Headquarters is partially located within the 1-percent-annual-chance floodplain of Blind Brook. The mapped 1-percent-annual chance floodplain is the blue area. The brook is culverted beneath New Street and daylights near the southeast corner of the property. The culvert is reportedly in poor condition. When the flow in the brook is excessive, it overtops New Street and can flood the building. This occurred during Tropical Storm Floyd in 1999 when 5 inches of water was flowing through the main hallway of the building. The 9-1-1 call center in this building is being relocated in the near future to the new Police Station on Main Street (this new building does not lay within the 1-percent

annual-chance floodplain). The proposed Blind Brook improvements being planned should mitigate future flooding of this building.

6600-04-226-0

6600-04-227-0

Danbury Hazard Mitigation Plan, 2014: Sympaug Brook – While the Sympaug Brook Area has a defined floodway and 1-percent-annual-chance floodplain, there are relatively few areas prone to flood damage in this part of the city. A factory on Great Pasture Road and six industrial properties on Shelter Rock Road are the only structures within the 1-percent-annual-chance floodplain. Similar to Limekiln Brook, much of the flooding in this area occurs due to high flows on the Still River creating backwater conditions.

6604-00-248-0

Danbury Hazard Mitigation Plan, 2014: Limekiln Brook – Limekiln Brook enters Danbury just east of the former City landfill and receives inflow from the City's WPCF. While the Danbury WPCF performs tertiary treatment, it does rely on Limekiln Brook and the Still River for waste assimilation. The most common area for flooding along Limekiln Brook in Danbury is at Newtown Road (Route 6). According to the Still River Alliance, during severe rain events a minor constriction at the Interstate 84 culvert creates backwater flooding conditions along the Still River and along the lower section of Limekiln Brook.

... The Danbury Fire Training Facility is located on Plumtrees Road near the former City landfill. Portions of the area are within 1-percent-annual chance floodplains associated with Limekiln Brook. However, no significant infrastructure at this location is believed to be affected by flooding. If the Fire Department chooses to expand this facility to take on a more regional nature in the future² (as suggested by various planning documents), careful consideration should be given to nearby floodplains.

6605-00-221-0 – *Lime Kiln Brook*

Danbury Hazard Mitigation Plan, 2014: Saugatuck River Area – Route 7 South near the Redding town line experiences occasional flooding issues from the Saugatuck River.

7200-00-232-0 – *Saugatuck River*

Bethel Hazard Mitigation Plan, 2015: Although the Still River does not lie within Bethel, flood stages along this river are a significant concern for Bethel staff. Backwater conditions from the Still River can extend well upstream along very flat lower reaches of Limekiln Brook, East Swamp Brook, and Sympaug Brook, exacerbating local flooding conditions. It is the understanding of Bethel staff that the Still River and its tributaries are in need of maintenance to enhance capacity. Part of the problem is that many of the shallow, narrow tributary streams occasionally have erosion control issues, and when the sediment load reaches the flat tributaries (such as Limekiln Brook) the lack of velocity causes the sediment to settle out and further reducing channel capacity. Exacerbating the flooding problems along the lower reaches of Limekiln Brook, East Swamp Brook, and Sympaug Brook is the fact that many areas that are located in the floodplain also have undersized drainage infrastructure such that the drainage systems

² As of 2021, this fire training facility is not regional

are consistently backing up or becoming clogged. Town staff maintain a list of detention storage areas, primary basins, etc. that are in need of increased capacity.

6604-00-248-0
6605-00-221-0
6605-00-220-34
6605-00-220-35
6605-00-220-36

Bethel Hazard Mitigation Plan, 2015: Flooding in the downtown area is primarily the result of undersized culvert system conveying portions of Chestnut Brook underground from the vicinity of Chestnut Street to the vicinity of Keeler Street. In particular, the 36-inch diameter and 18-inch diameter culverts beneath Seeley Street are undersized. This causes repeated overflows of Seeley Street and subsequent flooding along Main Street and at P.T. Barnum Square as water runs along the surface to eventually drain into the drainage system in those areas. In particular, mud and debris collect at P.T. Barnum Square. The culvert system downstream of this location is also undersized, and overflows contribute to basement flooding in the area such as occurs at the municipal building. Town staff propose either bypassing the culvert presently located under the Larson Building, and/or installing a parallel culvert to the existing School Street culvert in order to increase capacity. The Town should pursue funding to institute one or both of these measures to mitigate flooding of the downtown area. In order to completely address conveyance issues in the downtown area, the drainage systems on School Street and along Durant Avenue from Greenwood Avenue to the Post Office would need to be replaced. Full replacement of these systems would be very expensive and are not being considered at this time.

6604-00-524-0

Bethel Hazard Mitigation Plan, 2015: Other areas that require projects that will increase conveyance include Maple Avenue Extension at a tributary to East Swamp Brook, Benson Road near Bethel Reservoir Brook, Reservoir Street at Terehaute Brook, Saxon Road near a tributary to Bethel Reservoir Brook (where a home at repeatedly flooded), Fleetwood Avenue at Bethel Reservoir Brook, and Plumtrees Road at East Swamp Brook. A combination of increased culvert sizes or improved drainage systems will mitigate flooding in these areas. The Town should study potential mitigation solutions and implement projects in these areas. In particular, the Plumtrees Road project could be very expensive as it may require widening the bridge to accommodate traffic turning onto Whittlesey Drive and Walnut Hill Road.

6605-00-221-0
6604-00-215-0
6604-02-216-0
6604-02-217-0
6605-00-220-34

Other areas identified in Bethel that are not described in the hazard mitigation plans:

6606-01-222-0 Upper Limekiln Brook
6605-00-219-0 Upper East Swamp Brook
6605-01-220-0 Wolf Pit Brook
6605-02-218-0 Wolf Pit Brook

Ridgefield Hazard Mitigation Plan, 2015: Miry Brook – George Washington Highway in the northern section of town experiences flooding from Miry Brook and its tributaries.

6601-00-205-0

Ridgefield Hazard Mitigation Plan, 2015: Titicus River – The Titicus River corridor is floodprone. An Army Corps project to conduct selected clearing in the river has long been delayed according to some town representatives. Private properties have been flooded along the river, with some damage over the years. The town has hired contractors over the years to clear out sections of the river to improve conveyance and reduce flood risk. A house on Wooster Street near the Titicus River would be a good candidate for elevation and the town could serve as the applicant for FEMA mitigation funds.

8104-00-204-0

8104-00-203-0

8104-00-204-33

8104-00-202-0

8104-00-204-32

Ridgefield Hazard Mitigation Plan, 2015: Norwalk River - Redevelopment in Branchville is the most significant area of future development for the town. This area includes flood risk zones and is subject to flooding from the Norwalk River. Route 7 has flooded in various sections from Route 35 into Wilton, including Branchville. Precision Brake on Route 7 (32 Ethan Allen Highway) is repeatedly flooded by the Norwalk River. Town officials also believe that replacement of North Bridge and the Florida Hill Road Bridge at the Norwalk River are potential mitigation projects that could alleviate flooding.

7300-00-201-0

7300-00-200-0

7300-00-246-0

Ridgefield Hazard Mitigation Plan, 2015: Ridgefield Brook – Town officials indicated that two small drainage basins reportedly merge on the Casagmo Condominiums property and the condominiums are flooded. Although damage has not yet occurred, town officials believe that it will happen one day as impervious surfaces continue to increase in the watershed upstream of the condominiums. This area is a tributary to Ridgefield Brook and thus a tributary to the Norwalk River. Town officials will need to ensure that new projects in the condominium complex do not increase flooding. The town also believes that a downtown drainage study is needed. This study could include the Casagmo Condominiums and other downtown properties. The results of the study could be used to demonstrate to the land use commissions when the tipping point for flood damage could occur. Funding for this study could be sought through the Small Town Economic Assistance Program.

7300-01-247-0 Ridgefield brook downtown

7300-02-206-0

7300-02-199-0

Redding Hazard Mitigation Plan, 2015: Saugatuck River – The Saugatuck River drainage basin poses flood risks in the vicinity of Route 53 near Umpawaug Road and John Read Middle School. Flooding in this area causes frequent road closures. In addition, according to a September 2, 2013 NBCconnecticut.com article, heavy rains and flash flooding caused Simpaug Turnpike and Long Ridge

Road to flood and cars were submerged up to their windows. The town plans to install additional stormwater infrastructure along the Saugatuck River in an effort to reduce flooding and ponding impacts.

... John Read Middle School is not known to have experienced serious flooding damage in recent years. While this facility is at risk for flooding during the 1% annual chance flood, it may also be susceptible to floods of lesser magnitude. Furthermore, flooding of Redding Road could isolate the school in cases when the building may not flood. Potential measures for mitigating future flooding damage at this critical facility is discussed in Section 3.6.2. Town officials have indicated that there are no plans to relocate the school outside the SFHA.

7200-00-207-0

7200-00-211-0

7200-00-210-0

7200-00-213-0

Redding Hazard Mitigation Plan, 2015: Little River – Route 58 in the vicinity of Putnam Park Road has been identified as an area of concern due to flooding that often requires road closures. The closure of this road may have negative impacts on the general public, school buses and emergency vehicles, which is of particular concern to the town since this is the main route to the hospital in Danbury.

7201-00-208-0

Redding Hazard Mitigation Plan, 2015: Norwalk River – The town’s primary focus for flood mitigation is the commercial area of Georgetown located along the Norwalk River. Installation of flood walls and floodproofing is a large part of the proposed redevelopment project and design.

7300-00-246-0

Redding Annex of WestCOG Hazard Mitigation Plan, 2021: Umpawaug Pond Brook is a tributary of the Saugatuck, flowing north from Topstone Park to join the Saugatuck near the Redding train station at Simpaug Turnpike. Umpawaug Brook is reported to cause flooding on a section of Topstone Road, as well as Chestnut Woods Road.

7200-03-209-0

Other areas identified in Redding that are not described in the hazard mitigation plans:

7202-00-212-0 Aspetuck River

7202-00-214-0 Aspetuck River

Wilton Annex of WestCOG Hazard Mitigation Plan, 2021: There are 15 repetitive loss properties located in Wilton; 11 are residential and 4 are non-residential. The majority are on the Norwalk River.... Wilton has reported flooding to be a concern at the following locations: Norwalk River corridor, Merwin Meadows, and Arrowhead Road.

7300-11-197-0

7300-14-195-0

Other areas identified in Wilton that are not described in the hazard mitigation plans:

7302-04-198-0 Silvermine River
7301-00-196-0 Comstock Brook

New Canaan Annex of WestCOG Hazard Mitigation Plan, 2021: The primary area of risk related to delineated floodplains is the area long the Five Mile River.... There are 6 repetitive loss properties located in New Canaan; all are residential. The majority are on the Five Mile River. Town staff have reported that there is a Repetitive Loss Property that the Town has considered for acquisition and removal in the past; however other mitigation steps have been taken.

7401-00-192-0

Other areas identified in New Canaan that are not described in the hazard mitigation plans:

7302-11-241-0 Silvermine River
7403-00-191-0 Noroton River
7405-00-194-0 Rippowam River
7405-00-193-0 Rippowam River
7405-00-113-0 Rippowam River

Greenwich Annex of WestCOG Hazard Mitigation Plan, 2021: Flooding is a concern at the following locations:

... Sound Beach Avenue in Old Greenwich – Town staff have observed road flooding more frequently in recent years. Coastal flooding and poor drainage flooding both impact the area. Flooding impacts emergency access. Town has explored alternative routes for emergency access but flooding also floods those alternative routes.

7000-43-77-0

... Shore Road, near Greenwich Point – Town reports “nuisance” flooding.

7000-43-82-0
7000-42-83-0

... Byram River between Route 1 and Comly Avenue – Flooding is a problem in the Pemberwick Neighborhood. Town has been working on a study with CT DOT since 2012 for this area. A draft Feasibility Study for proposed improvements to the area is nearing completion. The study addresses replacing bridges on Route 1 at the state line, so New York DOT is also involved.

7411-00-65-0

... Greenwich Creek at East Putnam Avenue and Hillside Road, near Greenwich High School – Flooding has been a problem here in the past. CT DOT will be redoing the bridge at East Putnam Avenue and Hillside Rd in 2020.

7408-00-71-0

Greenwich Annex of WestCOG Hazard Mitigation Plan, 2021: Brothers Brook & Mianus River Pond – Southern reaches of these waterbodies have large delineated floodplains, and therefore may be considered to be the most at-risk areas along the river. Within this southern half there are 18 RLPs, indicating past flood challenges. There are road and rail crossings over this area, which may present challenges in regard to infrastructural capacity during a heavy event.

7407-15-73-0

Greenwich Annex of WestCOG Hazard Mitigation Plan, 2021: Long Island Sound Coastline – The shoreline of Greenwich is primarily residential, with pockets of commercial activity. The entire coastline, specifically Old Greenwich Point Park, Old Greenwich, and Cos Cob, are all identified to have low lying, coastal stretched which may be at risk of both nuisance and storm surge flooding.

7411-00-62-0

7000-54-61-0

7000-54-63-0

7000-52-64-0

7000-50-67-0

7000-48-68-0

7000-47-74-0

7000-46-75-0

7000-46-76-0

7000-43-77-0

7000-43-81-0

7000-43-82-0

7000-42-83-0

7000-42-84-0

7000-47-238-38

7000-46-238-39

7000-47-505-0

7407-00-506-0

Greenwich Underpasses: The following ZSRs were added to represent underpasses that were not already mentioned above in the hazard mitigation plan:

7411-00-430-0

7000-53-431-0

7409-00-432-0

7409-00-433-0

7409-00-434-0

7000-50-435-0

7000-48-436-0

7407-00-437-0

7000-43-438-0

7000-42-439-0

Greenwich Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

7000-54-61-0
7411-00-62-0
7000-54-63-0
7000-52-64-0
7411-00-65-0
7409-00-66-0
7000-50-67-0
7000-48-68-0
7409-00-69-0
7411-00-70-0
7408-00-71-0
7408-04-72-0
7407-15-73-0
7000-47-74-0
7000-46-75-0
7000-46-76-0
7000-43-77-0
7000-44-78-0
7000-45-79-0
7000-45-80-0
7000-43-81-0
7000-43-82-0
7000-42-83-0
7000-42-84-0
7410-02-85-0
7410-00-86-0
7411-00-87-0
7411-00-88-0
7410-01-89-0
7411-00-237-0
7409-00-238-0
7000-47-238-38
7000-46-238-39
7000-40-236-0
7411-00-237-0
7408-00-504-0
7000-47-505-0
7407-00-506-0

Stamford Annex of WestCOG Hazard Mitigation Plan, 2021: Long Island Sound Coastline – Stamford has reported flooding to be a concern along the entire Long Island Sound coastline.... The shoreline of Stamford is primarily residential, with pockets of commercial activity. The entire coastline, specifically

Shippan Point, Waterside, and the East Side (particularly Cummings Park), are all identified to have low lying, coastal stretches which may be at risk of both nuisance and storm surge flooding.

7000-39-98-0
7000-38-99-0
7000-38-100-0
7000-38-101-0
7000-38-102-0
7000-38-103-0
7000-38-104-0
7000-38-105-0
7000-42-239-0
7000-42-506-110
7000-39-507-0

Stamford Annex of WestCOG Hazard Mitigation Plan, 2021: Rippowam River – Southern reaches of the river have the largest delineated floodplains, and therefore may be considered to be the most at-risk areas along the river. Within this southern half there are 11 RLPs, indicating past flood challenges. There are several road crossings over the river, in the downtown area, which may present challenges in regard to infrastructural capacity during a heavy event. It is also important to note that a stretch of this river has been restored to promote increased flood storage, and properties have been acquired and conserved as open space.

7405-00-110-0
7405-00-96-0
7405-00-93-0
7405-00-91-0
7405-00-92-0

Stamford Annex of WestCOG Hazard Mitigation Plan, 2021: Riverine floodplains are present along many rivers and streams in the City. These include Mianus River, Mianus River East Branch, Rippowam River tributaries (Haviland Brook, Poorhouse Brook, Ayers Brook and Toilsome Brook), and Noroton River (Including Springdale Brook).

7407-00-95-0
7406-00-114-0
7405-00-94-0
7405-00-97-0
7405-00-110-0
7405-00-96-0
7403-03-106-0
7403-00-107-0
7403-00-108-0
7403-02-109-0
7403-00-240-0

Stamford Underpasses: The following ZSRs were added to represent underpasses that were not already mentioned above in the hazard mitigation plan:

7405-00-461-0

7000-40-462-0

Stamford Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

7000-42-239-0

7000-42-90-0

7405-00-91-0

7405-00-92-0

7405-00-93-0

7407-00-95-0

7405-00-96-0

7000-39-98-0

7000-38-99-0

7000-38-100-0

7000-38-101-0

7000-38-102-0

7000-38-103-0

7000-38-104-0

7000-38-105-0

7403-03-106-0

7403-00-107-0

7403-00-108-0

7403-02-109-0

7403-00-240-0

7405-00-110-0

7405-00-111-0

7405-00-112-0

7405-00-113-0

7406-00-114-0

Darien Annex of WestCOG Hazard Mitigation Plan, 2021: Darien has reported flooding to be a concern at the following locations:

- ... Neighborhood adjacent to Town Hall
- ... Boston Post Road and Hecker Avenue
- ... Various locations along Boston Post Road

7402-03-126-0

7402-01-464-0

7402-01-132-0

- ... Leroy Avenue, and Raymond Street at train underpasses

7402-01-463-0

7402-01-463-0

... Pear Tree Beach

7000-35-119-0

... Weed Beach

7000-36-118-0

... Coastal flooding at Holly Pond, Contentment Island Road, and through Tokeneke

7000-37-115-0

7000-37-116-0

7000-31-130-0

7000-32-130-28

7000-34-128-0

7000-33-129-0

7000-34-127-0

Darien Annex of WestCOG Hazard Mitigation Plan, 2021: Flooding at the intersection of state and town roads results in major traffic diversions and impedes emergency response capabilities, as the reroutes for emergency vehicles are very indirect. Boston Post Road and Leroy Avenue, which lie on either side of the Darien Train Station, flood during heavy rains; Town staff observe that drainage issues appear to be related to tides. The Town has begun to permanently station barricades along these roadways for deployment because flooding has become so frequent. Boston Post Road is the Town's primary emergency route. Mitigation of flooding in this area should be a focus for the Town moving forward; such mitigation would also align with the goals of the Resilient CT initiative, which supports the creation of resilient corridors centered around transportation hubs, such as train stations.

7402-01-463-0

7402-01-464-0

7401-00-465-0

Darien Annex of WestCOG Hazard Mitigation Plan, 2021: Two areas of flooding concern include the location of a new mixed-use development, and a residential neighborhood adjacent to town hall. It is anticipated that the drainage upgrades associated with the mixed-use projects will help alleviate these concerns.

7402-03-126-0

Darien Annex of WestCOG Hazard Mitigation Plan, 2021: There are sections of the Noroton River that have relatively wide floodplains in town, increasing the flood risk to development in these areas.

7403-03-106-0

7403-00-107-0

7403-00-108-0

7403-00-240-0

Darien Annex of WestCOG Hazard Mitigation Plan, 2021: There is a large floodway surrounding Gorhams Pond, which is located at the confluence of Stony Brook and the Goodwives River. While other streams in town also have flood zones, these may be the higher risk areas.

7402-00-125-0

7402-00-124-0

Darien Annex of WestCOG Hazard Mitigation Plan, 2021: The shoreline of Darien is primarily residential. The entire coastline, specifically the southern areas of Norton and the eastern neighborhoods of Tokeneke are identified to have low lying, coastal stretches which may be at risk of both nuisance and storm surge flooding.

7000-37-115-0

7000-37-116-0

7000-37-117-0

7000-36-118-0

7000-35-119-0

7000-34-120-0

7000-34-121-0

7000-34-122-0

7000-35-123-0

7402-00-124-0

7000-34-127-0

7000-34-128-0

7000-33-129-0

7000-31-130-0

7000-32-130-28

7000-33-242-0

7401-00-130-26

7401-00-130-27

Darien Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

7000-37-115-0

7000-37-116-0

7000-37-117-0

7000-36-118-0

7000-35-119-0

7000-34-120-0

7000-34-121-0

7000-34-122-0

7000-35-123-0

7402-00-124-0

7402-00-125-0
7402-03-126-0
7000-34-127-0
7000-34-128-0
7000-33-129-0
7000-31-130-0
7401-00-130-26
7401-00-130-27
7000-32-130-28
7401-00-131-0
7402-01-132-0
7402-01-133-0
7401-00-134-0
7402-03-135-0
7402-03-136-0
7000-33-242-0

Norwalk Annex of WestCOG Hazard Mitigation Plan, 2021: Norwalk River – Southern reaches of the river have the large delineated floodplains, in addition to a large floodway area delineated at the convergence point of the Norwalk and Silvermine Rivers. Therefore, these may be considered to be the most at-risk areas along the Norwalk river. While there are only 3 RL properties along the river, there is potential for flooding in some areas, The Norwalk River flows directly into Long island Sound; there are numerous repetitive loss properties located at the mouth of the river along the Norwalk Harbor

7300-00-147-0
7300-00-148-0
7300-00-151-0
7300-00-152-0
7300-00-158-0
7300-00-159-0
7300-00-161-0
7300-00-162-0
7300-17-163-0

Norwalk Annex of WestCOG Hazard Mitigation Plan, 2021: Long Island Sound Coastline – The shoreline of Norwalk is primarily residential, with commercial activity along the Norwalk Harbor. The entire coastline, specifically southern areas of Rowayton, Wilson Point, Manressa Island, and the southern areas of East Norwalk are particularly at risk of storm surge during an event under future sea level rise scenarios.

7000-27-138-0
7000-28-139-0
7000-25-140-0
7000-26-141-0
7000-25-142-0
7000-25-143-0
7000-26-144-0
7000-25-145-0

7000-26-145-29
7000-25-146-0
7000-24-153-0
7000-24-154-0
7000-24-155-0
7000-24-156-0
7000-23-157-0
7000-26-243-40
7000-23-244-0
7401-00-507-111
7000-29-507-112
7000-29-507-113
7000-29-507-114
7000-29-508-0
7000-24-509-0
7000-24-510-0
7401-06-149-0

Keeler Brook Flood Study, 2011: The study evaluated methods of reducing flood risk along Keeler Brook, with additional focus at Rowayton Avenue.

7401-07-243-0
7401-06-149-0

Norwalk Underpasses: The following ZSRs were added to represent underpasses that were not already mentioned above in the hazard mitigation plan:

7401-00-466-0
7000-25-467-0
7300-00-468-0
7300-00-469-0
7000-24-470-0
7300-00-471-0

Norwalk Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

7401-00-137-0
7000-27-138-0
7000-28-139-0
7000-25-140-0
7000-26-141-0
7000-25-142-0
7000-25-143-0
7000-26-144-0
7000-25-145-0

7000-26-145-29
7000-25-146-0
7300-00-147-0
7300-00-148-0
7401-06-149-0
7401-00-150-0
7300-00-151-0
7300-00-152-0
7000-24-153-0
7000-24-154-0
7000-24-155-0
7000-24-156-0
7000-23-157-0
7300-00-158-0
7300-00-159-0
7401-00-160-0
7300-00-161-0
7300-00-162-0
7300-17-163-0
7200-31-164-0
7200-31-165-0
7000-26-243-40
7000-23-244-0
7401-00-507-111
7000-29-507-112
7000-29-507-113
7000-29-507-114
7000-29-508-0
7000-24-509-0
7000-24-510-0

Westport Annex of WestCOG Hazard Mitigation Plan, 2021: While FEMA flood zones have similar risk levels, there are some areas in Westport that experience flooding more frequently and are at a greater risk of frequent flooding for various reasons. Riverine areas include Muddy Brook (several culverts are undersized and need to be upgraded) and Dead Man Brook (several culverts along the stream are undersized and need to be upgraded).

7200-29-169-0
7200-29-170-0
7000-16-171-0
7000-16-189-0

Westport Annex of WestCOG Hazard Mitigation Plan, 2021: Saugatuck River – The river has several delineated floodplains, and therefore may be considered to be the most at-risk areas along the river. Within Westport and along the river, there are 17 RLPs, indicating past flood challenges. There are several road crossings over the river, in the downtown area, which may present challenges in regard to infrastructural capacity during a heavy event.

7202-00-167-0
7202-00-168-0
7200-29-169-0
7200-29-170-0
7200-00-173-0
7200-00-174-0
7200-31-175-0
7200-00-177-31
7200-31-178-0
7200-00-179-0

Westport Annex of WestCOG Hazard Mitigation Plan, 2021: Long Island Sound Coastline – The shoreline of Westport is primarily residential, with pockets of commercial activity. The entire coastline is all identified to have low lying, coastal stretched which may be at risk of both nuisance and storm surge flooding. There are 178 repetitive loss properties.... Certain areas, such as Canal Road and Saugatuck Shores, frequently experience nuisance flooding. Low-lying coastal areas are at risk of coastal flooding or storm surge, while those that are coastal and in proximity to a river may see compounded flooding during extreme events.

7000-16-171-0
7000-22-176-0
7000-22-177-0
7000-22-177-30
7200-00-177-31
7000-21-181-0
7000-21-182-0
7000-21-183-0
7000-19-184-0
7000-15-185-0
7000-19-186-0
7000-19-187-0
7000-18-188-0
7000-16-189-0
7000-13-190-0
7000-12-511-0
7000-22-512-0

Westport Underpasses: The following ZSRs were added to represent underpasses that were not already mentioned above in the hazard mitigation plan:

7000-22-472-0
7000-21-473-0
7000-13-474-0
7000-13-475-0

Westport Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and

configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

7203-06-166-0
7202-00-167-0
7202-00-168-0
7200-29-169-0
7200-29-170-0
7000-16-171-0
7000-18-172-0
7200-00-173-0
7200-00-174-0
7200-31-175-0
7000-22-176-0
7000-22-177-0
7000-22-177-30
7200-00-177-31
7200-31-178-0
7200-00-179-0
7000-18-180-0
7000-21-181-0
7000-21-182-0
7000-21-183-0
7000-19-184-0
7000-15-185-0
7000-19-186-0
7000-19-187-0
7000-18-188-0
7000-16-189-0
7000-13-190-0
7109-00-245-0
7000-12-511-0
7000-22-512-0

Appendix F3

MetroCOG Documentation

Zones of Shared Risk in the MetroCOG Planning Region Supporting Documentation

Fairfield portions of MetroCOG Hazard Mitigation Plan, 2019: The Town of Fairfield contains four primary drainage basins that flow in a primarily north to south direction. The system most susceptible to inland flooding is along the Mill River, which flows from the Easton Reservoir through the center of the Town. Extensive flooding is caused by a 1% storm as well as from a more severe storm... Much of the property directly abutting the Mill River falls within the 1% flood contour, while a smaller portion falls within the 0.2% flood contour. These flooding concerns extend the length of river and remain a very real threat.

7108-00-42-0
7108-00-46-9
7108-00-46-10
7108-00-46-11
7108-00-46-12
7108-00-46-13
7108-00-46-14
7108-00-47-0
7108-00-48-0
7108-00-49-0
7108-00-53-0
7108-00-513-0
7106-00-449-109

Fairfield portions of MetroCOG Hazard Mitigation Plan, 2019: Inland flooding is also a problem along the Rooster River and Ash Creek and their tributaries. With regards to the Rooster River and Ash Creek, flooding is more commonly caused by man-made constriction. A specific location is where the river passes under Interstate 95. The flow is controlled by a culvert system. During times of heavy precipitation, the culvert can be overwhelmed and flooding can occur in the neighborhood surrounding Royal Avenue and Camden Street. Homes in this neighborhood are in the floodplain, and a viaduct is the only way in and out.

7106-03-51-0
7106-02-55-0
7106-00-29-0
7106-00-29-5
7106-00-27-0
7106-00-449-109

Fairfield portions of MetroCOG Hazard Mitigation Plan, 2019: To a lesser extent, inland flooding poses a threat during extreme weather events along Great Brook and Saco Brook.

7109-07-46-0
7109-00-52-0

7109-00-54-0
7109-00-245-0

Fairfield portions of MetroCOG Hazard Mitigation Plan, 2019: Low-lying homes adjacent to London's Brook and downstream of the Fairchild Wheeler Golf Course are also prone to flooding.

7106-03-51-0

Fairfield portions of MetroCOG Hazard Mitigation Plan, 2019: Undersized culverts and low-lying rail underpasses create chokepoints that cause isolated flooding in several areas.... Install pump stations to address flooding in the underpasses of New Haven rail line bridges; determine the feasibility of installing pumping stations beneath the railroad underpasses to remove floodwaters.... Reconstruct New Haven rail line bridges over town streets to prevent flooding, including at North Pine Creek Road, Mill Plain Road, and Round Hill Road.

7000-11-476-0
7000-11-477-0
7000-09-478-0
7000-09-479-0
7000-09-480-0
7106-04-481-0

Fairfield Flood Mitigation Plan, 2013: The Flood and Erosion Control Board's Flood Mitigation Plan was prepared in response to T.S. Irene and SuperStorm Sandy, and it addresses numerous coastal flood risk areas.

7106-04-37-0
7000-09-36-0
7000-09-51-15
7000-09-51-16
7000-09-51-17
7000-09-51-18
7106-00-51-19
7000-09-51-20
7000-09-36-8

Downtown Green Infrastructure Plan, 2018: This plan evaluates methods of reducing stormwater runoff and associated flooding in the downtown area by incorporating green infrastructure into existing and new developments, roads, and parking areas.

7000-09-40-0

Riverside Drive/Ash Creek Flood Mitigation/Resilience Plan, 2017: This plan evaluates methods of flood protection along Riverside Drive and Ash Creek to reduce flooding of the coastal floodplain from the Ash Creek side.

7106-04-37-0

7000-09-36-0
7106-00-51-19

Rooster River Flood Study, 2019: The Rooster River study evaluates floodplain storage projects to reduce flood risks along the river.

7106-03-51-0
7106-02-55-0
7106-00-29-0
7106-00-29-5
7106-00-27-0
7106-00-449-109

Regional Framework for Coastal Resilience in Southern Connecticut, 2017: The following ZSRs are based on areas of focus in the Regional Framework for Coastal Resilience in Southern Connecticut.

7106-00-26-0
7106-04-37-0
7000-09-36-0
7000-09-51-15
7000-09-51-16
7000-09-51-17
7000-09-51-18
7106-00-51-19
7000-09-51-20
7000-09-36-8

Fairfield Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

7000-07-35-7
7000-09-36-0
7000-09-36-8
7106-04-37-0
7106-04-38-0
7106-04-39-0
7000-09-40-0
7000-09-41-0
7108-00-42-0
7000-11-43-0
7000-11-44-0
7109-00-45-0
7109-07-46-0
7108-00-46-9
7108-00-46-10
7108-00-46-11

7108-00-46-12
7108-00-46-13
7108-00-46-14
7108-00-47-0
7108-00-48-0
7108-00-49-0
7107-00-50-0
7106-03-51-0
7000-09-51-15
7000-09-51-16
7000-09-51-17
7000-09-51-18
7106-00-51-19
7000-09-51-20
7109-00-52-0
7108-00-53-0
7109-00-54-0
7106-02-55-0
7108-00-513-0
7106-00-449-109
7108-12-451-0
7109-00-245-0

Bridgeport portions of MetroCOG Hazard Mitigation Plan, 2019: Although Bridgeport is a heavily developed urban environment, waterways still exist within its limits and have the potential to pose inland flooding concerns. Furthermore, due to the urban nature of the City, much of the water courses have undergone large-scale channel modifications or have been buried. This has resulted in many unintentional constrictions that have the potential to create flooding issues during heavy precipitation events. Of particular concern are the channels of Island Brook and Ox Brook, along with several tributaries of the Yellow Mill River in the northeastern section of the City. In addition, smaller more localized areas experience flooding, such as the Rooster River, Ash Creek, and Bruce Brook. Flooding is also typical along the banks of the Pequonnock River downstream of Bunnells Pond.

7105-00-32-0
7106-00-30-0
7106-00-35-0
7105-10-56-0
7105-10-34-0
7103-02-58-0
7103-00-19-0
7106-02-55-0
7106-00-29-0
7106-00-29-5
7106-00-27-0
7102-00-5-0

Bridgeport portions of MetroCOG Hazard Mitigation Plan, 2019: Access to some parts of the City can be cut-off due to flooding, especially at underpasses of the Metro North New Haven Line and Interstate 95.... Reconstruct New Haven Rail Line bridges over city streets to prevent flooding.... Execute the design to address drainage and flooding at Seaview Avenue where it crosses the railroad line, potentially coinciding with the proposed Barnum RR Station.

7102-00-482-0
7000-07-525-0
7000-07-526-0
7000-07-527-0
7000-07-528-0
7000-07-529-0
7000-07-530-0
7000-07-531-0
7000-06-532-0
7000-06-533-0
7000-06-534-0
7000-06-535-0

Rebuild By Design and Resilient Bridgeport: The following ZSRs were added based on the evaluations conducted to date through Rebuild By Design and Resilient Bridgeport:

7000-07-21-0
7000-06-20-0

Lower West End Economic Development Resiliency Plan: The following ZSRs were added to represent the area evaluated through the Lower West End study and resiliency planning:

7000-07-22-0

Ox Brook Flood Control Study: The following ZSRs were added to represent the areas evaluated through the Ox Brook studies of the 1990s and 2000s:

7106-00-30-0
7106-00-35-0

Island Brook Flood Control Study: The following ZSRs were added to represent the areas evaluated through the Island Brook studies of the 1990s and 2000s:

7105-10-56-0

Northeast Bridgeport Flood Control Study: The following ZSRs were added to represent the area evaluated through the northeast Bridgeport flood studies:

7103-02-58-0

Regional Framework for Coastal Resilience in Southern Connecticut, 2017: The following ZSRs are based on areas of focus in the Regional Framework for Coastal Resilience in Southern Connecticut.

7000-04-16-0
7000-04-57-0
7103-00-18-0
7105-00-31-0
7000-07-21-0
7000-06-20-0
7000-07-22-0
7000-07-23-0
7000-08-24-0

Bridgeport Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

7000-04-16-0
7103-00-17-0
7103-00-18-0
7103-00-19-0
7000-06-20-0
7000-07-21-0
7000-07-22-0
7000-07-23-0
7000-08-24-0
7106-00-25-0
7106-00-26-0
7106-00-27-0
7106-00-28-0
7106-00-29-0
7106-00-29-5
7105-00-31-0
7105-00-32-0
7105-00-33-0
7105-10-34-0
7106-00-35-0
7000-07-35-6
7105-10-56-0
7000-04-57-0
7103-02-58-0
7106-00-449-109

Stratford portions of MetroCOG Hazard Mitigation Plan, 2019: Inland flooding in Stratford occurs with moderate to frequent regularity, with major events being seen on average once every five years. Areas that are most frequently reported flooded during rain events include Main Street at Stratford Center, Broadbridge Avenue, Terrill Road, Hamilton, Reed Street, Bunnell Avenue, and Parkwood Road. Flooding can also occur in localized areas from storm drains backing up. Areas affected from this variety of inland

flooding include the regions of Albert Avenue and Albright Avenue where several residents have reported repeated flooding, with one resident having to file multiple flood insurance claims.

6000-88-59-0

7101-00-2-0

7102-00-5-0

7102-00-6-0

7103-02-58-0

6000-88-60-0

6000-84-8-0

Stratford portions of MetroCOG Hazard Mitigation Plan, 2019: Properties along the Pumpkin Ground Brook also experience frequent flooding, especially in the area of Cutspring Road and Chapel Street.

6026-00-11-0

Stratford portions of MetroCOG Hazard Mitigation Plan, 2019: Flooding impacts the Oronoque Village condominium complex, an over-55 community consisting of 929 homes spread across about 300 acres. The property is crossed by the Freeman Brook and a small unnamed brook. Both have buried sections through the Village. During more severe rain events these streams tend to overflow and cause flooding, primarily in the FEMA designated flood zones. Property damage from these events has exceeded \$300,000 with loss of vehicles, furnaces, hot water heaters and damage to basements/lower levels and garages.

6000-82-14-0

Stratford portions of MetroCOG Hazard Mitigation Plan, 2019: Flooding is a concern at underpasses for the New Haven rail line especially at Bruce Avenue, King Street, West Broad Street, Main Street and East Main Street.... On July 17, 2018 a vehicle was trapped in floodwaters under the railroad overpass on West Broad Street between Knowlton Street and Linden Avenue in Stratford.... Complete the West Broad railroad viaduct renovation project. Assess feasibility of other locations in need (Bruce Avenue, King Street, East Main). New Action: Execute the West Broad Street project to reduce drainage related flooding associated with Tanners Brook.

7102-00-483-0

6000-88-485-0

6000-88-486-0

6000-00-487-0

6000-88-542-0

Stratford portions of MetroCOG Hazard Mitigation Plan, 2019: During thunderstorms and heavy rain events over a short period of time, inland flooding occurs in the south end, under railroad viaducts and along several smaller brooks and streams, especially in the Stratford Center area, Oronoque Village and along Bruce Brook and Raven Brook.

7101-00-2-0

6000-88-59-0

6000-88-60-0

6000-84-8-0
7102-00-4-0
7102-00-5-0
7102-00-6-0
6000-82-14-0

Stratford Underpasses: The following ZSRs were added to represent underpasses that were not already mentioned above in the hazard mitigation plan:

7101-00-484-0

Stratford Coastal Resilience Plan: The following ZSRs were added to represent areas of focus in the Stratford Coastal Resilience Plan:

7101-00-2-0
7000-03-51-25
7101-00-51-24
6000-90-1-0
7000-02-1-1
7101-00-1-2
7000-01-1-4
6000-90-1-3
6000-90-51-21
6000-90-51-22
6000-90-51-23
6000-88-3-0

Regional Framework for Coastal Resilience in Southern Connecticut, 2017: The following ZSRs are based on areas of focus in the Regional Framework for Coastal Resilience in Southern Connecticut.

7101-00-2-0
6000-00-13-0
6000-84-8-0
6000-88-3-0
6000-90-51-22
6000-90-51-23
6000-90-1-0
7000-02-1-1

Stratford Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

6000-90-1-0
7000-02-1-1
7101-00-1-2
6000-90-1-3

7000-01-1-4
7101-00-2-0
6000-88-3-0
7102-00-4-0
7102-00-5-0
7102-00-6-0
6000-00-7-0
6000-84-8-0
6000-00-9-0
6026-00-10-0
6026-00-11-0
6026-00-12-0
6000-00-13-0
6000-00-15-0
6000-90-51-21
6000-90-51-22
6000-90-51-23
7101-00-51-24
7000-03-51-25
6000-88-59-0
6000-88-60-0
6026-00-514-0

Appendix F4

NVCOG Documentation

Zones of Shared Risk in the NVCOG Planning Region Supporting Documentation

Waterbury Hazard Mitigation Plan, 2014: Naugatuck River – The Army Corps flood control projects have confined all but the most extreme flood events to the primary channel of the Naugatuck River. Only one location has a repeated history of flooding. Specifically, overbank flooding occurs infrequently and temporarily near the Wastewater Treatment Plant on South Main Street. This is a minor issue that causes little damage in the surrounding area.

6911-00-402-0
6900-00-404-0
6900-00-405-0
6900-00-406-0
6900-00-440-0

Waterbury Hazard Mitigation Plan, 2014: Mad River – Condominiums and apartments are clustered in the floodplain of the Mad River upstream and downstream of Sharon Road. This area has a history of repeated flooding. The condominiums at the northwest corner of the river and the road lie several feet above the river elevation. The River's Edge apartment complex, located at the southeast corner of the river and the road, has expansive common areas that were partly underwater following the June 2, 2006 storm, and some of the paved areas were close to the water elevation. Most recently, a powerful spring nor'easter of April 15-16, 2007 caused severe flooding of the Mad River corridor, affecting residents of Woodtick Road (including evacuation of 45 condominium units) and Sharon Road.

6914-00-408-0

Waterbury Hazard Mitigation Plan, 2014: Mad River – Flooding along the Mad River occurs elsewhere, as well. In spring 2006, flooding occurred in the area of Maybury Circle off Southmayd Road. Near the downstream end of the river, the Industrial Arts School on Mill Street may experience limited flooding since it is much lower than adjacent properties.

6900-00-406-0

Waterbury Hazard Mitigation Plan, 2014: Little Brook – Little Brook is a tributary to Great Brook which drains the Fulton Park ponds. The City is upgrading Fulton Park which experiences drainage problems. The upstream drainage system is very limited and excessive sediment has filled in downstream ponds and the drainage channel. The park experiences shallow flooding that causes sediment to deposit, but houses are not affected. Little Brook flows underground into a culvert at Hopkins Street and intersects with the Great Brook culvert underneath Brook Street near the Palace Theatre. The culvert at the corner of Bishop Street and Grove Street backed up due to a debris clog during the September 17, 2005 storm, so proper maintenance of this culvert system is important.

6900-22-409-0

Waterbury Hazard Mitigation Plan, 2014: Great Brook – There are concerns about the structural integrity and capacity of this below-grade culvert throughout its reach in Waterbury. In particular, the reach of the culvert near Brown Street and Water Street reportedly needs maintenance and a structural integrity study. The reconstruction of the Great Brook culvert at two locations (Water and Brown Streets, and under Cherry Street) is current under design. However, the City does not possess drainage easements where the brook crosses through private properties, and will not be able to upgrade these sections.

6900-22-409-0

Waterbury Hazard Mitigation Plan, 2014: Hopeville Pond Brook and Tributaries – Several areas in the Hopeville Pond Brook watershed were revealed to be insufficient in regards to conveying heavy stormwater discharges. Edgewood Avenue and Edgewater Street are very flat and near the level of Pritchards Pond, contributing to poor drainage in that area. There is an area of repeated flooding in the vicinity of Pritchard’s Pond, and the city believes that home acquisitions may be an option in this area. Beaver dams along Hopeville Pond Brook have caused flood damage to surrounding properties recently.

6900-23-407-0

Waterbury Hazard Mitigation Plan, 2014: Trumpet Brook (aka Clough Brook) – This corridor of this brook has experienced several problems with backyard flooding and poor drainage throughout its reach. A study of the stream corridor was completed subsequent to the adoption of the last HMP, but mitigation projects will need to be conducted to result in improved conditions.

6912-00-403-0

Other areas of flood risk in Waterbury: These areas are not identified in a hazard mitigation plan, but numerous buildings appear to have flood risk. The 2021 HMP notes that: “Few flooding problems were reported along Steele Brook or Hancock Brook. However, beaver dams along Steele Brook have caused flood damage to surrounding properties recently.”

Steele Brook, 6912-00-401-0

Hancock Brook, 6911-00-402-0

Naugatuck Hazard Mitigation Plan, 2015: Spencer Street Corridor/Cherry Street/Pleasant Avenue – This area was cited as a significant flood-prone area during the data collection meeting for the initial plan, although severe damage does not occur and nuisance flooding appears to be the problem. A review of historical topographic mapping reveals that an unnamed stream was formerly located in this area in 1947, flowing from west to east, but it has been located in a culvert underground since at least 1954. Currently, there is a detention pond near this area with an adjacent swale from a hillside; and a stream daylight to the west of Lewis Street. Streets and homes can flood within the development during periods of heavy rainfall. Stormwater systems tied to this watercourse are also affected. It has been reported that water levels can rise so rapidly that a "geyser" forms in the storm drainage system when water gets backed up following periods of high rainfall. In fact, the historic Grant House on Cherry Street Extension was damaged due to pressures within the stormwater system.... It should be noted that in response to chronic downtown and neighborhood flooding problems, the Mayor's Office in association with the Department of Public Works, the Fire Department and the Engineering Department met with State officials to determine the appropriate course of action. Steps were taken to determine the areas of

critical need and subsequently an HMGP application was submitted to secure funding for drainage improvements on Nettleton Avenue and within the vicinity of Cherry Street. At this time, it does not appear that this project was selected for funding.

6900-00-414-0

Naugatuck Hazard Mitigation Plan, 2015: Long Meadow Pond Brook – The corridor of this stream and its tributary were noted by Borough personnel as experiencing flooding during heavy rainfall. The specific area of concern is located adjacent to the Long Meadow Pond Brook and its tributary near Rubber Avenue and Harlow Court, near Mountview Plaza and north of the Baummer Dam. The flooding at this site is partly associated with water entering from the vicinity of Webb Road. There have been approximately four residential or commercial sites that have been flooded in this location, though repetitive loss properties are not located in this area. All of the Long Meadow Pond Brook culverts flooded during the August 1, 2012, localized heavy rainfall which dropped 6" of rain in the Greater Naugatuck area in one hour.... The lower portion of Arch Street at Long Meadow Pond Brook receives three feet of standing water during large rainfall events. A storm drain near a vacant building is sometimes clogged, causing storm water to back up and build in the street during these storms. On one account, the standing water caused a dumpster to float.

6917-00-411-0

6900-00-412-0

Naugatuck Hazard Mitigation Plan, 2015: Beacon Valley Road – Flooding has been reported along Beacon Valley Road near Beacon Falls. This neighborhood becomes inundated with water from Beacon Hill Brook after heavy rains.

6918-00-413-0

Naugatuck Hazard Mitigation Plan, 2015: Fulling Mill Brook along Route 68 – Flooding of Route 68 has been known to occur during periods of heavy rain. The channel is near street level in some areas, and when water is overbank, it causes minor flooding.... The portion of East Waterbury Road below the Union Ice Company Dam now becomes flooded after heavy rains. As a result of the pond losing storage due to sedimentation, this problem may be worsening. During substantial rain events, the dam overtops and water spills onto East Waterbury Road. The water runs down the road and eventually re-enters the tributary to Fulling Mill Brook. Under certain conditions, water can enter homes.

6915-00-410-0

Other areas of flood risk in Naugatuck: These areas are not identified in a hazard mitigation plan, but buildings appear to have flood risk.

Naugatuck River, 6900-00-441-0

Naugatuck River, 6900-00-412-0

Beacon Falls Hazard Mitigation Plan, 2015: Beacon Valley Road – Beacon Hill Brook runs along Beacon Valley Road. The road and numerous homes are located in the floodplain, but homes are reportedly impacted by flooding more often than the road itself. One or two homes routinely experience water in their basements, but not at the first floor level. The problems here are primarily yard flooding.

One of the public survey respondents stated that "We are lucky that we sit a little higher and only had a minimal amount of water in the basement. However, our neighbors on both sides have flooding issues with any major rain accumulation." There are several bridges on Beacon Valley Road in varying states of repair. If a large flood knocked out several bridges, these residents would be trapped and isolated from Town emergency services, as residents must travel through Naugatuck and Bethany to reach the center of Beacon Falls. The Borgnis Road and Cotton Hollow Road bridges over Beacon Hill Brook are reportedly undersized. If the Borgnis Road bridge fails, there is no other way out of Andrasko Road. If the Cotton Hollow Road bridge fails, then residents will have a long detour to the east along Beacon Valley Road to reach Route 8 in Naugatuck.

6918-00-413-0

6918-00-413-94

6918-00-413-93

Beacon Falls Hazard Mitigation Plan, 2015: Hockanum Brook Corridor – Many of the flooding problems in Town occur along this stream corridor. Route 42 at Blackberry Hill Road flooded twice in 2007. This intersection is low relative to the stream, and Town personnel note that the problem is exacerbated by a dam upstream in Bethany (likely Simpson Lake Dam) that is not properly controlled. Nearby homes are generally less affected, but the road is often closed due to the flooding. Route 42 is a primary evacuation route, and the road closure creates a long detour down several side streets. See Figure 3-2 for an area map.... The most regularly impacted transportation artery is Route 42, which is periodically closed due to flooding. Such flooding slows emergency response times due to detours around this area.

6900-28-415-0

Beacon Falls Hazard Mitigation Plan, 2015: North Main Street and South Main Street – Utilities along Main Street are affected by a variety of hazards, particularly flooding, wind damage, and damage from falling tree limbs. There is an old canal under Main Street that fills when the Naugatuck River is high, reportedly contributing to flooding in the area by impeding proper operation of drainage systems. Much of this area is also within the 500-year floodplain. The Town wishes to upgrade electrical and communication utilities and drainage from the Police Station to Exit 23 off Route 8, with the electrical and communication utilities optimally relocated below ground.... Noe Place at Route 42 – This intersection is the low point of Main Street in the floodplain. While not impacted by overbank flooding from the Naugatuck River, it is flooded due to poor drainage as drain pipes get backed up with the river is high.

6900-00-416-0

Beacon Falls Hazard Mitigation Plan, 2015: Old Turnpike Road, Shasta Terrace, Hubbell Avenue, and Nancy Avenue – Many of the homes are located in the Naugatuck River floodplain, but have not had flooding problems since the ACOE flood control dams were installed upstream on the Naugatuck River. While acquisitions of occupied buildings are not being considered at this time, the town has agreed to pay the back taxes on two properties located on Nancy Avenue that have been abandoned. The town will acquire the properties and demolish the existing structures. Since the properties are located in a floodplain they will remain as open space areas.

6900-00-417-0

Beacon Falls Hazard Mitigation Plan, 2015: Critical Facilities – Critical facilities are not regularly impacted by flooding in Beacon Falls, despite several critical facilities being located in the 500-year floodplain of the Naugatuck River. However, town officials have indicated that the pump station on Railroad Avenue has flooded in the past and that sand bags have been brought in to reduce damages. In addition, flooding also occurred at the Wastewater Treatment Plant on Lopus Road during Hurricane Irene. In order to address flooding at these critical facilities, the town may consider constructing a flood wall or berm around the side of the facilities that are near the Naugatuck River.

6900-00-416-0

6900-00-417-0

Beacon Falls Hazard Mitigation Plan, 2015: South Main Street near Seymour – Two mobile home parks, Valley Mobile Home Park and Beacon Falls Trailer Court, are located in the 100-year and 500-year floodplains of the Naugatuck River near the Seymour boundary. Evacuations have been necessary in recent years during floods. New trailers are required to be elevated. Despite the floodplain location and high population density, the Town of Beacon Falls is not considering buying out or relocating the mobile home parks at this time, and instead wishes to improve emergency communications and evacuation procedures for these residents.

6900-00-418-0

VCOG Hazard Mitigation Plan, 2012: Bank Street/Little River, Seymour – Properties along Bank Street in the area of Wire Company Dam #3 and Wire Company Dam #2 are reportedly subject to flooding as a result of high flows along Little River and poor drainage along Route 67. One RLP is listed at the end of the Little River, but this building has been demolished, and the site is unoccupied.

6920-00-420-0

VCOG Hazard Mitigation Plan, 2012: Beach Street/Bladens River, Seymour – Two ponds at and upstream of the Kerite Dam are reportedly nearly full of silt and fine sediments and have little to no storage capacity. During large-scale rain events, when the water level rises above the Bladens River Dam upstream of the Kerite Dam, the water flows down Beach Street, sometimes flowing down Pearl and Day Streets. This water overtops the roads and some properties in the area.

6919-00-419-0

VCOG Hazard Mitigation Plan, 2012: Housatonic River – Seymour's section of riverbank is at risk of flooding, but water levels must typically be very high for structures and roads to experience flooding... During Tropical Storm Irene, the river overflowed its banks in Seymour, leading to evacuations. Unnamed Drainage Along Roosevelt Drive (Route 34), Seymour – Multiple homes are subject to flooding from hillside drainage during large-scale rain events in this area of town.

6000-00-421-0

6000-00-422-103

6000-00-422-102

Other areas of flood risk in Seymour: These areas are not identified in a hazard mitigation plan, but the Seymour DPW and WPCF buildings appear to have flood risk.

Naugatuck River, 6900-00-442-0

VCOG Hazard Mitigation Plan, 2012: Naugatuck River – The Naugatuck River is largely controlled by upstream flood control dams and the flood control system of levees and floodwalls in Ansonia and Derby. Areas behind the levees are designated as "Zone X Protected by Levee," but they can be flooded. During Tropical Storm Irene, the floodgates on the Naugatuck River were reportedly closed for the first time in 47 years. The Housatonic River experienced backwater conditions in this area as a result of the incoming storm surge, which led to water moving northward up the Naugatuck River. The Olsen Drive area in Ansonia was nearly flooded, which would have forced the city to evacuate the many apartments on this road.

6900-00-422-0

6900-00-422-96

6900-00-422-97

6900-00-422-98 [this one is Olsen Drive in Ansonia]

6900-00-422-99

6900-00-422-100

VCOG Hazard Mitigation Plan, 2012: Housatonic River – Riverine flooding occurs downstream of the Stevenson Dam along the Housatonic River in Shelton, Seymour, and Derby. The floodprone section is from the Stevenson Dam (upstream of Shelton) to the Derby Dam, which spans the river at downtown Shelton and Derby. Severe flooding of the Maples area of Shelton is well documented. Flooding in March 2011 caused extreme damage, and coverage in the press was thorough. All 41 homes were evacuated as extremely high flows passed over the Stevenson Dam. The website www.sheltonemergency.com includes a survey for Maples residents and an example of a recent emergency warning statement. Some of the homes in the neighborhood have been elevated, but many have not. Many homes remain on the list of repetitive loss properties. Like Shelton, residential properties along the Housatonic River in Derby are floodprone. Approximately 25 homes in the McConney Grove neighborhood off Roosevelt Drive are at risk for flooding, and several residents were evacuated during the March 2011 flood event described above. The McConney Grove neighborhood has one RLP.

6000-00-422-101

6000-00-445-0

VCOG Hazard Mitigation Plan, 2012: Riverdale Avenue in downtown Shelton also experiences flooding when water levels in the Housatonic River are very high.

6000-75-427-0

VCOG Hazard Mitigation Plan, 2012: O'Sullivan's Island in downtown Derby was completely submerged during the March 2011 flood. A web page was developed on the electronic valley website to describe the flooding in Derby and demonstrate that local officials were evaluating the related issues (www.electronicvalley.org/derby/2011/flooding.htm). One RLP was located on the island, but the structure has been removed.

6900-00-422-95

VCOG Hazard Mitigation Plan, 2012: Unnamed Tributary to Beaver Brook, Ansonia – An unnamed tributary to Beaver Brook flows northward through culverts of insufficient capacity and sections of open air in the Prindle Avenue area of Ansonia. The watercourse extends from Fairview Street to the east of Upland Terrace to just north of Shortell Drive. The watercourse flows through Nelligen Park in this area of the city. The yards and basements of some homes along Prindle Avenue become inundated following a significant rainfall event or a succession of rainfall events, which exhausts the drainage network in this area.

6900-40-423-0

VCOG Hazard Mitigation Plan, 2012: Unnamed Drainage Course at Kielys Lane, Ansonia – An unnamed drainage course originating near Prindle Avenue flows to the northwest and past the north end of Kielys Lane. Four residential properties are flooded by this watercourse.

6900-40-423-104

VCOG Hazard Mitigation Plan, 2012: Unnamed Drainage Course Along Ells Street, Ansonia – An unnamed drainage course along Ells Street runs under two to three homes and through back yards in this area. A home has experienced significant flooding along the headwall.

6900-00-424-0

VCOG Hazard Mitigation Plan, 2012: Unnamed Watercourse Along Wakelee Avenue (Route 334), Ansonia – An unnamed watercourse along Wakelee Avenue inundates the roadway during large-scale rain events. This occurs just to the north of the Wakelee Avenue (Route 334)-Franklin Street intersection and in conjunction with potential Connecticut Department of Transportation (CT DOT) drainage issues along this stretch of the roadway.

6900-00-426-0

VCOG Hazard Mitigation Plan, 2012: Twomile Brook Near Sodom Lane, Derby – Minor flooding occurs downstream of O'Sullivan Road near Sodom Lane in Derby. The detention ponds in this area require routine maintenance, which is not occurring as needed. As a result, flooding is exacerbated downstream. Commercial buildings and parking lots on the south side of Sodom Lane experience flooding. Twomile Brook flows beneath some of the buildings and parking lots in culverts.

6000-77-425-0

VCOG Hazard Mitigation Plan, 2012: Unnamed Watercourse Along Wooster Street, Shelton – An Oak Avenue stone masonry culvert conveys a small watercourse that parallels Wooster Street from the area of Jefferson Street under Oak Avenue and through private properties to the Wooster Street-Brook Street intersection. The culvert is approaching 100 years of age and requires relocation to the public right-of-way as well as an increased conveyance capacity to eliminate flooding conditions. There are sections of the watercourse upstream of Jefferson Street that have been placed in conduits on private property that are in need of being upgraded and relocated to the public right-of-way for proper maintenance. Nearby, the Congress Avenue/Oak Avenue storm sewer conduit conveys a significant

drainage area of approximately 125 acres through private properties and under Oak Avenue. The various conduits consist of 30" reinforced concrete pipe (RCP), 42" RCP, and both 40" x 41" and 36" x 42" stone masonry structures. Various sections of this conduit have been repaired since 1983 as they fail.

6000-73-429-108

VCOG Hazard Mitigation Plan, 2012: Burying Ground Brook, Shelton – FEMA has mapped an area of shallow flooding (zone AO) in downtown Shelton along the historical channel of Burying Ground Brook, which is one of the only areas in the state mapped with the AO designation. It is indicative of potential sheet-flow flood damage with a depth of three feet. A stone masonry arch structure near Long Hill Avenue is eight feet in height and partially collapsed in 2011 after a moderate rainfall event, requiring emergency repairs. Flooding occurs in this area following significant rainfall events that lead to road closures.

6000-75-428-0

6000-75-429-107

Other areas of flood risk in Shelton: This area is not identified in a hazard mitigation plan, but numerous buildings appear to have flood risk.

6000-73-429-0, Curtiss Brook

Appendix F5

SCRCOG Documentation

Zones of Shared Risk in the SCRCOG Planning Region Supporting Documentation

Milford portions of SCRCOG Hazard Mitigation Plan, 2018: Residential structures that are subject to flooding during significant flood events are primarily in the southern section of the City and are impacted by coastal flooding. There is a mix of the types of homes in the hazard areas, but those at risk are primarily single-family dwellings. Most homes are year-round not seasonal.... Beach areas subject to coastal flooding include the following:

- Cedar Beach - Milford Point to the intersection of Milford Point Road and Seaview Avenue
- Laurel Beach - Milford Point Road / Seaview Avenue to Wildermere Avenue
- Wildermere Beach - Wildermere Avenue to Stowe Avenue
- Walnut Beach - Stowe Avenue to Nettleton Avenue extended
- Silver Beach - Silver Sands Parkway to Surf Avenue
- Fort Trumbull Beach - Surf Avenue to Rogers Avenue
- Gulf Beach - Milford Harbor to Point Lookout
- Bayview Beach - Point Lookout to Calf Pen Meadow Creek
- Pond Point Beach - Calf Pen Meadow Creek to Buckingham Avenue
- Point Beach - Buckingham Avenue to Hilldale Court
- Morningside Beach - Hilldale Court to South Street
- Hillside Area - South Street to Seabreeze / Merwin Avenue, Benjamin Street
- Anchor Beach - Benjamin Street to Beach Avenue
- Woodmont - Beach Avenue to West Haven Line

6000-89-386-0

6000-89-387-0

6000-89-388-0

5307-00-374-0

5000-60-375-0

5000-58-365-0

5000-58-367-0

5306-00-370-0

5000-57-363-0

5000-57-364-0

5000-57-389-0

5000-57-362-0

5000-57-515-0

Milford portions of SCRCOG Hazard Mitigation Plan, 2018: Flooding along the Wepawaug River which bisects the city is also a concern.

5307-00-372-0

5307-00-373-0

5307-00-374-0

5307-00-381-0

5307-00-382-87
5307-00-382-88
5307-00-383-0
5307-07-384-0
5307-00-385-0

Milford portions of SCRCOG Hazard Mitigation Plan, 2018: Areas that experience recurring tidal flooding include Laurel Beach by Milford Point Road, along Field Court, areas along Calf Pen Meadow Creek – particularly Melba St and Beachland Avenue, and the finger streets off East Broadway. The Silver Sands Area at East Broadway into Great Creak Area floods on the back sides of homes. The Coastal Resilience Plan addresses the dead-end finger streets. Most often the homes toward the end of the street have implemented mitigation measures and the homes in the middle have not.

6000-89-386-0
5000-60-375-0
5000-58-365-0
5000-58-366-0

Milford portions of SCRCOG Hazard Mitigation Plan, 2018: Platt Street/Point Beach – experiences flooding.

5000-57-363-0

Milford portions of SCRCOG Hazard Mitigation Plan, 2018: Areas of commercial properties at risk to flooding:

- Downtown/Milford Harbor Area
- Wepawaug River (North of I-95 south to Route 1)
- North side of Bridgeport Ave (between School House Road & Silver Sands Parkway)
- New Haven Avenue businesses adjacent to Gulf Pond outlet/Old Gate Lane
- 750 & 772 Bridgeport Avenue
- Intersection of Boston Post Road and Woodruff Road

5307-00-372-0
5307-00-373-0
5307-00-374-0
5307-00-381-0
5307-00-382-87
5307-00-382-88
5307-00-383-0
5307-07-384-0
5307-00-385-0
6000-87-378-0
5306-00-368-0
5306-00-391-0

Milford portions of SCRCOG Hazard Mitigation Plan, 2018: Nearly \$1 billion in city infrastructure is at risk to hurricane storm surge (up to Category 4) including an animal shelter, two wastewater treatment plants, an elementary school, and a middle school.... Animal Shelter is vulnerable to flooding and may become an island; pets are evacuated prior to flooding to Orange.

5000-60-375-0
6000-89-376-0
6000-00-380-0

Milford portions of SCRCOG Hazard Mitigation Plan, 2018: The City's Beaverbrook Wastewater Treatment facility is at risk to flooding. Beaverbrook serves as a secondary treatment facility that augments the main Housatonic Wastewater Treatment facility, serving approximately 15,000 of Milford's 52,000 residents. The City is considering a FEMA grant to construct a berm around the plant with a 25% match from the City. There are grant approval requirements and funding obligations that the City is exploring to see if this is a viable project to be implemented.

6000-89-376-0

Milford portions of SCRCOG Hazard Mitigation Plan, 2018: Connecticut Post Mall experiences flooding.

5306-00-391-0

Milford portions of SCRCOG Hazard Mitigation Plan, 2018: Tri Beach and the Margret Egan Recreation Centers are vulnerable to flooding.

5000-57-362-0
6000-87-377-0

Milford Coastal Resilience Plan, 2016: The following ZSRs were added to represent areas of focus in the Coastal Resilience Plan:

5000-57-362-0
5000-57-362-85
5000-57-363-0
5000-57-364-0
5000-58-365-0
5000-58-366-0
5000-58-366-86
5000-58-367-0
5306-00-370-0
5306-00-371-0
5307-00-372-0
5307-00-373-0
5307-00-374-0
5000-60-375-0
6000-89-376-0
6000-87-377-0

6000-89-386-0
6000-89-387-0
6000-89-388-0
5000-57-389-0
5000-57-515-0

Milford Underpasses: The following ZSRs were added to represent underpasses that were not already mentioned above in the context of the hazard mitigation plan:

5307-00-488-0
5307-00-489-0
5307-00-490-0
5306-04-491-0
5306-00-492-0

Regional Framework for Coastal Resilience in Southern Connecticut, 2017: The following ZSRs are based on areas of focus in the Regional Framework for Coastal Resilience in Southern Connecticut.

6000-87-377-0
6000-89-387-0
6000-89-388-0
5306-00-370-0
5000-58-365-0
5000-57-364-0

Milford Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

5000-57-362-0
5000-57-362-85
5000-57-363-0
5000-57-364-0
5000-58-365-0
5000-58-366-0
5000-58-366-86
5000-58-367-0
5306-00-368-0
5306-00-369-0
5306-00-370-0
5306-00-371-0
5307-00-372-0
5307-00-373-0
5307-00-374-0
5000-60-375-0
6000-89-376-0
6000-87-377-0

6000-87-378-0
6000-87-379-0
6000-00-380-0
5307-00-381-0
5306-04-382-0
5307-00-382-87
5307-00-382-88
5307-00-383-0
5307-07-384-0
5307-00-385-0
6000-89-386-0
6000-89-387-0
6000-89-388-0
5000-57-389-0
5306-04-390-0
5306-00-391-0
5000-53-392-0
6000-00-443-0
5000-57-515-0
5306-00-516-0
6000-87-517-0
6000-87-518-0
6000-87-519-0

Orange portions of SCRCOG Hazard Mitigation Plan, 2018: South Greenbrier Drive – flooding concerns from Wepawaug River, just south of Lake Wepawaug Dam/ pump house. Attributed to accumulation of sediment, brush, and other debris at the dam.

... Grassy Hill Road @ Derby Milford Road – flooding concerns believed to be caused by the buildup of sediment, brush, and debris at Clarktown Pond Dam, which is in place for irrigation purposes.

5307-00-360-0
5307-00-360-84

Orange portions of SCRCOG Hazard Mitigation Plan, 2018: Mallard Drive – recurring street flooding along Indian Lake, causing access/isolation issues for up to 30 residential properties in the area. Indian River Dam is located downstream in Milford (privately owned) but noted for cause of flooding along upstream lake areas.

5306-00-391-0
5306-01-356-0

Orange portions of SCRCOG Hazard Mitigation Plan, 2018: Lambert Road@ Sunset Drive – flooding concerns from Indian River, likely caused by undersized culvert under Lambert Road (old masonry tunnel).

5306-00-359-0

Orange portions of SCRCOG Hazard Mitigation Plan, 2018: Surrey Drive – flooding concerns for low-density residential area along Race Brook.

5307-04-361-0

Areas of flood risk in Orange: These areas are not identified in a hazard mitigation plan, but buildings appear to have flood or isolation risk.

5306-01-357-0

5306-00-358-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Morgan Lane @ Railroad Underpass (between Heffernan Drive and Island Lane, near Yale West) – frequent and severe flash flooding concern with one recorded fatality.

5000-54-493-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Campbell Avenue and Washington Avenue at Railroad Underpasses; Elm Street – area subject to roadway and intersection flooding.

5000-50-494-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Allington area (Route 1 @ Campbell Avenue, near University of New Haven) – very frequent urban flooding problems across area (2-3 times per year) caused by inadequate drainage, and backflow from existing stormwater system. Has resulted in flooding to dormitories, vehicles, etc.

5305-00-353-0

5305-00-354-0

5305-00-355-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: West Main Street @ Painter Drive – urban flooding problems, even with minimal rainfall amounts (much of water comes down from Allington area). Some basement flooding reported in area.

5000-50-343-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: West Spring Street (near VA hospital campus) – area experiences velocity flooding caused by runoff from Veterans Affairs (VA) Hospital site, with impacts to public housing. Problems could get worse with potential paving of adjacent park (major concern for City). Cove River runs between West Spring Street and Coleman Street.

5000-50-346-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Water Street Bulkhead – ongoing project to extend the bulkhead, but not long enough to protect areas currently planned for future commercial development (brownfield site).

5000-49-351-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Ocean Avenue (areas south of South Street) – significant concerns regarding coastal erosion (south of existing shoreline protection structures).

5000-51-340-0

5000-51-341-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Area around 3rd Avenue Extension – this area includes Court Street, Peck Avenue, and the Old Field Creek floodplain and experiences repetitive residential flooding.

5000-49-348-0

5000-49-349-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Sewage Treatment Plant on Beach Street - located in floodplain, with history of frequent flooding issues at plant and flash flooding of access road. Area can become isolated after even 2-3” of rainfall.

5000-49-350-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: High school grounds are in floodplain of Cove River, but building is not. Facility does not serve as shelter but does serve as a public health dispensing site and does house the City’s mainframe computer systems.

5000-50-343-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Surfside Senior Housing (200 Oak Street) – located along coast and has required mandatory evacuation during past storms.

5000-49-348-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Morrissey Manor Senior Housing (Bayshore Drive) – located along coast and has required mandatory evacuation during past storms.

5000-52-338-0

West Haven portions of SCRCOG Hazard Mitigation Plan, 2018: University of New Haven has big problems with stormwater. Their system can handle the water that is generated on their campus, however the water that flows downhill onto the campus overloads the system and causes flooding. A detention basin at the top of the hill would slow the flow of water onto the campus so it could handle the flow and Campbell Avenue would not flood.

5305-00-353-0

West Haven Coastal Resilience Plan, 2016: The following ZSRs represent areas of focus in the Coastal Resilience Plan:

5000-51-340-0
5000-51-341-0
5000-50-342-0
5000-50-343-0
5000-49-348-0
5000-49-349-0
5000-49-350-0
5000-49-351-0
5305-00-278
5305-00-353-0

Regional Framework for Coastal Resilience in Southern Connecticut, 2017: The following ZSRs are based on areas of focus in the Regional Framework for Coastal Resilience in Southern Connecticut.

5000-51-340-0
5000-51-341-0
5000-50-342-0
5000-50-343-0
5000-49-348-0
5000-49-349-0
5000-49-350-0
5000-49-351-0

West Haven Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

5000-52-338-0
5000-52-339-0
5000-52-339-80
5000-51-340-0
5000-51-341-0
5000-50-342-0
5000-50-343-0
5000-54-344-0
5000-53-344-81
5000-53-344-82
5000-50-345-0
5000-50-346-0
5000-50-347-0
5000-50-347-83
5000-49-348-0

5000-49-349-0
5000-49-350-0
5000-49-351-0
5305-00-352-0
5305-00-353-0
5305-00-354-0

New Haven portions of SCRCOG Hazard Mitigation Plan, 2018: East Shore (Morris Cove), Fair Haven, Downtown & Wooster Square/Mill River, Long Wharf – The areas that are primarily prone to coastal flooding include the East Shore (Morris Cove) neighborhood, Fair Haven neighborhood, Downtown & Wooster Square/Mill River neighborhood, and the Long Wharf area. The Long Wharf area has large concentrations of commercial/industrial properties and the neighborhood boundary does not include any residential properties.

5000-45-279-0
5000-47-282-45
5200-00-392-89
5200-00-267-0
5200-00-268-0
5200-00-269-0
5200-00-270-0
5302-00-271-0
5000-48-272-0
5000-48-273-0
5000-47-274-0
5000-47-275-0
5302-00-520-0
5000-48-536-0

New Haven portions of SCRCOG Hazard Mitigation Plan, 2018: West, Mill, and Quinnipiac Rivers – The areas that are primarily prone to inland flooding include residential properties located adjacent to the West, Mill, and Quinnipiac Rivers. General areas of concern include the following:

- Upper Middletown Avenue
- Lower Middletown Avenue
- Hemingway Creek
- Quinnipiac Avenue
- Downtown and Union Station
- Fair Haven
- Stiles Street and Port of New Haven
- Fort Hale Park and Adjacent Areas

5200-00-392-89
5304-00-392-90
5302-00-495-0

5200-23-444-0
5200-00-267-0
5200-00-268-0
5200-00-269-0
5200-00-270-0
5302-00-271-0
5000-48-272-0
5000-48-273-0
5000-47-274-0
5000-47-275-0
5302-00-520-0

New Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Downtown & other Urban Flooding Areas – Frequent flooding events also occur in areas of the city with insufficient drainage; where conditions may cause localized flash floods, and where tidal influences may exacerbate drainage problems.... The Downtown area is particularly prone to inland flooding due to excess paved surfaces.

5000-48-536-0

New Haven portions of SCRCOG Hazard Mitigation Plan, 2018: East Haven Town Line, South End Road, Airport – Other flood problems areas include the area at the East Haven Town Line and South End Road (mainly during high tides and coastal storms), and the airport area was listed as the area experiencing flash floods by FEMA (area is primarily residential).

5000-45-279-0
5000-47-282-45

New Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Transportation Infrastructure – Transportation infrastructure in New Haven at risk to adverse effects from sea-level rise includes the railroad station and track yards, the Tweed-New Haven Airport and parts of Interstate-95. Port facilities on the water's edge are also particularly susceptible to sea level rise. There is an electric grid station next to the train station.

5000-45-279-0
5000-47-274-0
5000-48-273-0
5000-48-536-0

New Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Regional Water Authority – The Regional Water Authority's Operations and Administration Building (90 Sargent Drive) is in an identified SFHA. Flood mitigation measures recommended under Mitigation Action 6.

5000-48-273-0

New Haven portions of SCRCOG Hazard Mitigation Plan, 2018: United Illuminating – The United Illuminating Grand Avenue sub-station is within a FEMA flood zone and within surge zones, and has been observed to be vulnerable to flooding. United Illuminating has installed flood barriers, but loss of

this station during a flood would mean loss of power to a huge part of the east side of New Haven as well as other parts of the downtown.

5302-00-271-0
5200-00-392-89

New Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Coastal Protective Infrastructure – Many seawalls, bulkheads, and other protective infrastructure assets have been identified for improvement and maintenance for the city, particularly to address flooding and shoreline deterioration in the following areas: Morris Cove; Fort Hale Park and Adjacent Areas; East Shore Park; Port and Terminal Area; Fair Haven and Quinnipiac River Park; Belle Dock Terminal and Long Wharf.

5000-45-279-0
5000-47-282-45
5200-00-392-89
5200-00-267-0
5200-00-268-0
5200-00-269-0
5200-00-270-0
5302-00-271-0
5000-48-272-0
5000-48-273-0
5000-47-274-0
5000-47-275-0
5302-00-520-0
5000-48-536-0

Prior edition of New Haven Hazard Mitigation Plan, 2006: Areas of public housing can become isolated by flooding in West River tributaries such as Wintergreen Brook.

5304-02-393-0
5304-00-394-0
5304-01-395-0

Regional Framework for Coastal Resilience in Southern Connecticut, 2017: The following ZSRs are based on areas of focus in the Regional Framework for Coastal Resilience in Southern Connecticut.

5305-00-277-0
5302-00-271-0
5000-48-272-0
5000-48-273-0

New Haven Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

5200-00-267-0

5200-00-268-0
5200-00-269-0
5200-00-270-0
5302-00-271-0
5000-48-272-0
5000-48-273-0
5000-47-274-0
5000-47-275-0
5000-48-276-0
5305-00-277-0
5305-00-278-0
5000-45-279-0
5304-00-280-0
5305-00-281-0
5305-00-282-0
5000-47-282-45

East Haven portions of SCRCOG Hazard Mitigation Plan, 2018: North of Interstate 95, chronic flooding occurs in residential neighborhoods between the Saltonstall Ridge and North High Street. There has been periodic flooding of many residential areas along the Farm River, particularly along Hellstrom Road and Raymond Court.

5112-00-288-0
5112-00-288-56
5112-00-396-0
5112-00-397-0
5112-11-289-0

East Haven portions of SCRCOG Hazard Mitigation Plan, 2018: A broad area south of Interstate 95 is below the elevation of the 100-year coastal flood event. Chronic flooding occurs along Route 42 and in areas adjacent to the large tidal marsh to east of Route 42.... Hemingway Avenue repaving will raise the intersection 4-5 years.... Shore Beach Road/Route 42 is a flooding concern.

5112-00-284-0

East Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Several homes on Pardee Place Extension and businesses on Main Street and Frontage Road experience flooding from Tuttle Brook. Tuttle Brook at the intersection of Main Street frequently floods during significant rain events. The Frontage Road plaza parking lots flood frequently, leaving automobiles in the parking lot under water.

5000-45-286-0

East Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Cosey Beach was devastated by the storm surge from Tropical Storm Irene and remains at high risk to future storms, erosion, and sea level rise. The existing roadway (Cosey Beach Avenue) is frequently flooded due to spring tides and coastal storms.

5000-44-283-49

5000-44-283-50

East Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Other coastal areas include Meadow Street along Farm River Estuary, Old Town Highway in the Shell Beach/Morgan Point Area, Minor Road along Long Island Sound; and Coe Avenue, Hemingway Avenue, and Short Beach Road near the Farm River Estuary.

5112-00-283-52

5000-44-283-0

5112-00-284-0

5112-00-283-55

5000-46-283-47

5000-46-283-46

East Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Brazos Road and Fairview are the only roads in and out of a coastal community. The Regional Framework includes two designs for fixing this problem, one that elevates Brazos and abandons Fairview; and one that elevates Fairview and abandons Brazos. The logical mitigation action is to advance the design and permitting, since construction within five years is not likely.

5000-44-283-48

East Haven portions of SCRCOG Hazard Mitigation Plan, 2018: The Town's police station (417 North High Street) and public works facility (461 North High Street) are in Special Flood Hazards Areas (SFHAs) associated with the Farm River. The East Haven Middle School/Carbone School (67 Hudson Street) is located adjacent to the SFHA. While these facilities are not believed to have significantly flooded in recent years, the potential exists for severe flooding.

5112-00-288-0

East Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Tweed-New Haven Regional Airport is in a coastal SFHA and Category 1 Hurricane Storm Surge Inundation Area.

5000-46-285-0

Regional Framework for Coastal Resilience in Southern Connecticut, 2017: The following ZSRs are based on areas of focus in the Regional Framework for Coastal Resilience in Southern Connecticut.

5000-44-283-48

5000-44-283-50

5000-44-283-49

East Haven Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

5000-44-283-0
5000-46-283-46
5000-46-283-47
5000-44-283-48
5000-44-283-49
5000-44-283-50
5000-43-283-51
5112-00-283-52
5000-44-283-53
5000-46-283-54
5112-00-283-55
5112-00-284-0
5000-46-285-0
5000-45-286-0
5112-00-287-0
5112-00-288-0
5112-00-396-0
5112-00-397-0

Branford portions of SCRCOG Hazard Mitigation Plan, 2018: The Town of Branford noted that drainage in some low-lying areas is deemed very inadequate, resulting in some frequent but temporary roadway flooding. Access to these low-lying areas which become isolated following flood events remains a significant concern for the Town. Potential solutions/mitigation actions include elevating roadways, stormwater drainage improvements (upgrades underway for Hickory Road), and flood gates (i.e. Beckett Avenue). Areas of concern include Hickory Road, Burbank Drive, Tabor Drive, Beckett Avenue, Meadow Street, Sunset Beach, Riverside Drive, Summer Island Road, Waverly Park Area, Thimble Island Road, Shore Drive (Route 142), Limewood Avenue (Route 146), Island View Avenue, Club Parkway, and School Ground Road.

5000-42-292-0
5000-38-295-0
5000-35-306-0
5111-00-298-0
5000-38-299-0
5111-00-457-0
5000-37-294-57
5111-00-300-0
5000-39-303-0
5000-33-308-0
5000-42-291-0
5111-00-455-0

Branford portions of SCRCOG Hazard Mitigation Plan, 2018: The Town of Branford noted that coastal flooding, erosion, and sea level rise may cause saltwater intrusion into wells; and septic systems may become flooded, especially on Stony Creek.

5000-33-308-0

Branford portions of SCRCOG Hazard Mitigation Plan, 2018: Linden Avenue is an area of significant concern for coastal flooding and coastal erosion. The existing revetment has been damaged and repaired multiple times. A separate taxing district was created to assist with erosion control.

5000-38-294-0

Branford portions of SCRCOG Hazard Mitigation Plan, 2018: The eastern portion of Route 146 floods. A study is underway with Guilford and SCRCOG to determine solutions for flooding in this area.

5000-31-309-0

Branford portions of SCRCOG Hazard Mitigation Plan, 2018: Waverly Park is residential area that is prone to flooding. The town may consider acquiring some homes in this area in the future.

5000-37-294-57

Branford portions of SCRCOG Hazard Mitigation Plan, 2018: The water treatment plant is in an area that becomes isolated following flood events (the facility is protected to a base flood elevation (BFE) for a 1 percent annual chance event).

5000-38-297-0

Branford portions of SCRCOG Hazard Mitigation Plan, 2018: Branford High School is a shelter that is in a potential storm surge inundation area.

5111-00-302-0

Branford portions of SCRCOG Hazard Mitigation Plan, 2018: The Connecticut Hospice (100 Double Beach Road) is in a coastal flood hazard area. The facility has large windows with no storm shutters. This facility now has a generator and a remote hookup for a mobile generator.

5000-41-398-0

Branford portions of SCRCOG Hazard Mitigation Plan, 2018: 1 fire station is in the 1-percent-annual-chance floodplain.

5000-38-294-0

Branford portions of SCRCOG Hazard Mitigation Plan, 2018: A large concentration of businesses is located along Commercial Street and Route 139 on the north side of town. This area is deemed potentially vulnerable to flooding of the nearby Branford River. Updated FEMA maps have removed some buildings from Commercial Street from the flood zone.

5111-00-455-0

Branford Underpasses: The following ZSRs were added to represent underpasses that were not already mentioned above in the context of the hazard mitigation plan:

5000-36-496-0
5000-33-497-0

Branford Coastal Resilience Plan, 2016: The following ZSRs were added to represent areas of focus in the Coastal Resilience Plan:

5000-42-290-0
5000-42-291-0
5000-42-292-0
5000-38-294-0
5000-37-294-57
5000-38-294-58
5000-38-295-0
5000-38-296-0
5000-38-297-0
5111-00-298-0
5000-38-299-0
5111-00-300-0
5000-39-303-0
5000-40-304-0
5000-41-305-0
5000-35-306-0
5000-35-307-0
5000-33-308-0
5000-31-309-0
5000-41-398-0
5000-39-523-0
5000-34-456-0
5111-00-457-0

Regional Framework for Coastal Resilience in Southern Connecticut, 2017: The following ZSRs are based on areas of focus in the Regional Framework for Coastal Resilience in Southern Connecticut.

5000-42-291-0
5000-38-294-0
5000-38-295-0
5000-35-306-0
5000-33-308-0

Branford Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

5000-42-290-0
5000-42-291-0
5000-42-292-0

5000-42-293-0
5000-38-294-0
5000-37-294-57
5000-38-294-58
5000-38-295-0
5000-38-296-0
5000-38-297-0
5111-00-298-0
5000-38-299-0
5111-00-300-0
5111-09-301-0
5111-00-302-0
5000-39-303-0
5000-40-304-0
5000-41-304-59
5000-41-305-0
5000-35-306-0
5000-35-307-0
5000-33-308-0
5000-31-309-0
5000-41-398-0
5112-14-452-0
5111-09-453-0
5111-09-454-0
5111-00-455-0
5000-34-456-0
5111-00-457-0
5000-42-458-0

Guilford portions of SCRCOG Hazard Mitigation Plan, 2018: The West River corridor is the primary area of vulnerability from inland flooding, with many of the problems occurring along Route 77.... Nuisance flooding occurs along the Route 77/West River corridor south of Lake Quonnipaug and the Spinning Mill Brook Crossing of Long Hill Road above Route 1.

5110-00-319-0
5110-00-321-0
5110-01-324-0
5110-09-399-0

Guilford portions of SCRCOG Hazard Mitigation Plan, 2018: Several coastal areas of Guilford may become isolated from the mainland during coastal storms such as nor'easters and hurricanes. These areas include Sachems Head, Vineyard Point, Leetes Island, Tuttlés Point, Indian Cove, and Mulberry Point as well as smaller unnamed areas adjacent to these.

5000-26-312-0
5000-24-313-0
5000-24-313-63

5000-24-313-64
5000-24-313-65
5000-24-314-0
5000-24-314-66
5000-23-314-67
5110-00-314-68
5000-22-314-69
5109-00-314-70

Guilford portions of SCRCOG Hazard Mitigation Plan, 2018: Three fire stations, the EOC, the Public Works building, and some senior living facilities are located within floodplains and/or hurricane storm surge inundation areas. The Public Works facility, proposed for relocation, is in a coastal flood zone and Category 1 hurricane surge zone associated with the Sluice Creek estuary.

5110-00-315-0
5109-00-315-71
5110-00-319-0

Guilford portions of SCRCOG Hazard Mitigation Plan, 2018: Route 1 just north of the West Side Cemetery has flooded during significantly high-volume precipitation events.

5110-00-319-0

Guilford portions of SCRCOG Hazard Mitigation Plan, 2018: The following locations have been identified by Guilford residents and Town officials as sites of chronic coastal flooding, where inundation occurs at least once every year and sometimes more frequently:

- Several sections of Route 146
- Sachems Head Road at Route 146
- End of Whitfield Street near marina
- Chimney Corner
- Shell Beach Road
- Vineyard Point Road
- Daniel Avenue
- Soundview Road
- Seaside Avenue
- River Street

5110-00-315-0
5109-01-317-0
5110-00-319-0
5000-28-498-0
5000-28-499-0
5000-24-500-0
5000-24-313-63
5000-24-313-65
5000-27-311-62

5000-24-314-66
5000-22-314-69
5109-01-317-0

Guilford Coastal Resilience Plan, 2014: The following ZSRs were added to represent areas of focus in the Coastal Resilience Plan:

5000-27-310-0
5000-27-310-60
5000-27-310-61
5000-27-311-0
5000-27-311-62
5000-26-312-0
5000-24-313-0
5000-24-313-63
5000-24-313-64
5000-24-313-65
5000-24-314-0
5000-24-314-66
5000-23-314-67
5000-22-314-69
5000-29-446-0
5000-21-449-0
5110-00-315-0
5110-00-319-0
5110-00-460-0
5109-00-314-70
5109-00-315-71
5109-00-316-0
5109-01-317-0
5109-01-459-0
5000-21-449-0
5000-16-325-72
5000-16-325-0
5108-00-336-0

Regional Framework for Coastal Resilience in Southern Connecticut, 2017: The following ZSRs are based on areas of focus in the Regional Framework for Coastal Resilience in Southern Connecticut.

5110-00-315-0
5110-00-460-0

Guilford Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

5000-27-310-0

5000-27-310-60
5000-27-310-61
5000-27-311-0
5000-27-311-62
5000-26-312-0
5000-24-313-0
5000-24-313-63
5000-24-313-64
5000-24-313-65
5000-24-314-0
5000-24-314-66
5000-23-314-67
5110-00-314-68
5000-22-314-69
5109-00-314-70
5110-00-315-0
5109-00-315-71
5109-00-316-0
5109-01-317-0
5109-01-318-0
5110-00-319-0
5108-00-320-0
5110-00-321-0
5108-10-322-0
5111-04-323-0
5110-01-324-0
5108-00-336-0
5110-09-399-0
5108-00-400-0
5000-29-446-0
5110-00-447-0
5108-00-448-0
5000-21-449-0
5109-01-459-0
5110-00-460-0

Madison portions of SCRCOG Hazard Mitigation Plan, 2018: Circle Beach Road – numerous homes at risk to regular coastal/tidal flooding and storm surge. Many have been damaged or destroyed in past storms, and most of those remaining or that were rebuilt are elevated with breakaway walls in accordance with FEMA standards.

5000-16-325-0
5000-16-325-72

Madison portions of SCRCOG Hazard Mitigation Plan, 2018: Middle Beach Road – area susceptible to coastal flooding and storm surge. Protected by 800-foot armored stone wall that was heavily damaged

following Hurricane Irene in 2011. Town is applying for repair/redesign and reconstruction of revetment through FEMA grants (Public Assistance).

5000-16-326-0
5000-16-400-92

Madison portions of SCRCOG Hazard Mitigation Plan, 2018: Hammonasset State Park – can double the Town’s population on a summer weekend day, creating life/safety concerns about severe thunderstorms and tornadoes.

5000-13-330-0

Madison portions of SCRCOG Hazard Mitigation Plan, 2018: Hartford Avenue – significant erosion concern for bluffs along the Sound

5000-16-325-0

Madison portions of SCRCOG Hazard Mitigation Plan, 2018: Low-lying neighborhoods that frequently become isolated by tidal/coastal flooding occurrences include areas along Neck Road, the west end of Green Hill Road, Harbor Avenue, and Circle Beach Road.

5000-16-325-0
5000-16-325-74
5108-00-336-0
5000-16-325-0
5000-16-325-72

Madison portions of SCRCOG Hazard Mitigation Plan, 2018: Fence Creek at Seaview Avenue floods.

5000-16-326-0

Madison portions of SCRCOG Hazard Mitigation Plan, 2018: Intersection at Garnet Park floods.

5000-19-333-0

Madison portions of SCRCOG Hazard Mitigation Plan, 2018: Railway underpass near Nathan’s Lane on Rt. 1 floods.

5000-19-333-0

Madison portions of SCRCOG Hazard Mitigation Plan, 2018: Surf Club (Town-owned beach and recreation area) – 45-acre park is vulnerable to coastal flooding and storm surge. Failure of seawall and loss of primary frontal dunes during Irene.

5000-16-400-91

Madison portions of SCRCOG Hazard Mitigation Plan, 2018: Town Campus (Town Hall, Police, EOC, community shelter (gym), etc.) is a critical lifeline for the continuity of government for the Town. Area is

in proximity to special flood hazard area for Hammonasset River and is downstream from Lake Hammonasset Dam (high hazard dam, owned by RWA). Should be considered for possible mitigation actions. Town's school bus parking facility is in special flood hazard area.

5106-00-332-0

Madison portions of SCRCOG Hazard Mitigation Plan, 2018: East Wharf and West Wharf are Town Beaches/Assets that have been damaged in the past.

5000-16-400-91

5000-16-400-91

Madison Underpasses: The following ZSRs were added to represent underpasses that were not already mentioned above in the context of the hazard mitigation plan:

5107-00-501-0

5000-15-502-0

5106-00-503-0

Madison Coastal Resilience Plan, 2016: The following ZSRs were added to represent areas of focus in the Coastal Resilience Plan:

5000-16-325-0

5000-16-325-72

5000-17-325-73

5000-16-325-74

5000-16-326-0

5000-19-333-0

5000-18-333-79

5108-00-336-0

5000-16-400-91

5000-16-400-92

Regional Framework for Coastal Resilience in Southern Connecticut, 2017: The following ZSRs are based on areas of focus in the Regional Framework for Coastal Resilience in Southern Connecticut.

5000-16-326-0

Madison Zone of Shared Risk Maps, CIRCA, 2021: The zones of shared risk delineated by Peter Miniutti and his colleagues were incorporated into the ZSR mapping by informing the locations and configurations. In many cases, additional breakdown was performed to delineate additional ZSRs and/or nested ZSRs. These include the following.

5000-16-325-0

5000-16-325-72

5000-17-325-73

5000-16-325-74

5000-16-326-0

5000-16-326-75
5000-16-326-76
5000-16-326-77
5000-15-327-0
5000-14-328-0
5000-15-329-0
5000-13-330-0
5000-13-330-78
5106-00-331-0
5106-00-332-0
5000-19-333-0
5000-18-333-79
5107-00-334-0
5107-01-335-0
5108-00-336-0
5000-19-337-0
5000-16-400-91
5000-16-400-92
5106-13-521-0
5106-14-522-0

Meriden Hazard Mitigation Plan, 2018: Harbor Brook – The most frequently flooded areas in the city are adjacent to Harbor Brook, in the densely developed downtown extending from Columbus Avenue upstream to Camp Street. The Harbor Brook tributaries of Spoon Shop Brook, Willow Brook, and North Branch of Harbor Brook are susceptible to flooding. Willow Brook is the cause of some flooding on Research Parkway and Pomeroy Avenue, including at the MidState Medical facility. Homes on Orchid Drive are susceptible to flooding from the confluence of all three tributaries, and some discussions during development of the Harbor Brook mitigation plan revolved around procuring some of these properties. East Main Street has some flood susceptibility at the Spoon Shop Brook crossing near Thorpe Avenue. Two smaller tributaries, Jordan Brook and Clark Brook, enter Harbor Brook at the Meriden Green. Jordan Brook is contained in culvert through much of its length. The watercourse does cause flooding of some individual structures, particularly along Twiss Street, and a lack of inlets into the culvert exacerbates street flooding along its length.

5206-00-249-0
5206-00-250-0
5206-01-251-0
5206-01-252-0

... Clark Brook enters Harbor Brook from the west and has been the subject of independent flood studies dating as far back as the 1970s. The Frary Avenue and Hill Street area is particularly vulnerable in part due to the presence of a historic elevated railroad downstream of Frary Avenue that has blocked the natural floodplain. This railroad is part of an abandoned spur line, portions of which are owned by Suzio. Downstream of Frary Avenue, Clark Brook is contained in culverts for much of its length and contributes to flooding along Brittainia Street, Center Street, Camp Street, and State Street.

5206-00-253-0

5206-00-249-0

Meriden Hazard Mitigation Plan, 2018: Sodom Brook – Homes along Peacock Drive and Bradley Avenue are flooded from Sodom Brook as is a portion of the Lincoln Middle School property. The Lewis Avenue and Kensington Road intersection floods near Sodom Brook, impacting access to the MidState Medical facility.

5205-00-254-0

5205-03-255-0

5205-00-256-0

5205-00-256-41

Other areas of flood risk in Meriden: These areas are not identified in a hazard mitigation plan, but buildings appear to have flood or isolation risk.

5200-10-257-0

Wallingford portions of SCRCOG Hazard Mitigation Plan, 2018: Riverine flooding is a major concern, especially along the Quinnipiac River and its tributaries which does result in flooding of homes (not just roadways). The Quinnipiac River is inundated with trees and silt that causes flooding at Warehouse Point.

5200-00-258-0

5200-00-258-42

Wallingford portions of SCRCOG Hazard Mitigation Plan, 2018: Main Street Homes Trailer Park (approx. 210-220 block of Main Street) – recurring severe/velocity flooding of mobile homes immediately adjacent to Quinnipiac River, located behind non-engineered earthen berm. Many residents are elderly and have had to be evacuated on multiple occasions. History of major damages and still deemed high risk area.

5200-00-258-42

Wallingford portions of SCRCOG Hazard Mitigation Plan, 2018: S. Colony Road @ S. Elm Street – periodic flooding of intersection.

5207-00-259-0

Wallingford portions of SCRCOG Hazard Mitigation Plan, 2018: Hampton Trail @ Grieb Trail (area north of Spring Lake) – concerns with periodic flooding of Muddy River. Larger pipe has been installed but flooding may still occur if catch basins fill with debris.

5208-01-260-0

North Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Inland/riverine flooding is greatest concern, especially along Muddy River and along tidal influenced Quinnipiac River.

5200-00-261-0
5208-00-263-0
5208-00-264-0
5208-00-264-43
5208-00-264-44
5208-11-266-0

North Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Muddy River – many areas/roads along river are impacted by flooding following heavy rain events, mostly attributed to sediment build up in channel, along with downed trees, beaver dams, etc. (unable to remove due to CT DEEP permitting process). Specific areas of concern are:

- Route 103 (Quinnipiac Avenue) @ Muddy River (near intersection with railroad)
- Old Maple Avenue – very frequent flooding occurrences for commercial properties along Muddy River. On average this area floods twice per year, with as much as 2 feet of water (threatens mechanical equipment). Have used Duck Bills as back flow preventers.
- Pine River Road – frequent flooding concerns for residential properties south of the Muddy River (floods homes and in-ground pools). Town receives many calls from residents for even 2-3” rain/snow events.
- Potter Road / Ansonia Drive – residential area south of Muddy River. Historical flooding issues, though much has been abated through recent upstream dredging and sediment control in Wallingford.
- Sheffield Drive – residences on east side of street are prone to flooding from the Muddy River.
- Patten Road – roadway flooding from Muddy River. Possible threat to approx. 5 new lots/homes in the area, especially if upstream reservoir is full combined with heavy rains.
- Spring Road @ Potter Road – flooding concerns from Muddy River (roadway and several residential properties).

5208-00-263-0
5208-00-264-0
5208-00-264-43
5208-00-264-44

North Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Bishop Drive @ State Street – flooding concerns from Quinnipiac River (4 feet of flood water on roadway during 1992 event).

... Elm Road/Stoddard Road – flooding issue.

5200-00-261-0

North Haven portions of SCRCOG Hazard Mitigation Plan, 2018: Spring Road @ Fitch Street – flooding concerns from Five Mile Brook (tributary to Muddy River).

5208-11-266-0

Other areas of flood risk in North Haven: These areas are not identified in a hazard mitigation plan, but buildings appear to have flood or isolation risk.

5200-19-262-0

5200-00-265-0
