

Appendix A
Stakeholder Workshop Reports



Resilient Connecticut

Phase II Report of Workshop Series #1

February 15, 2021
SLR Consulting
Formerly Milone & MacBroom, Inc.



Connecticut Institute for Resilience
and Climate Adaptation



This publication does not express the views of the Department of Housing or the State of Connecticut. The views and opinions expressed are those of the authors. Funding for this project was provided by the United States Department of Housing and Urban Development through the Community Development Block Grant National Disaster Recovery Program, as administered by the State of Connecticut, Department of Housing. More information can be found at:
<https://resilientconnecticut.uconn.edu/>

Workshop Report

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Contents

1. Goals and Objectives for the Workshops of January/February 2021.....	1
2. Description of Outreach Conducted and Meeting Attendance.....	2
2.1 CIRCA Web Site and Social Media.....	2
2.2 Resilience Roundup.....	2
2.3 COG Direct Email Distribution.....	2
2.4 COG Social Media.....	3
2.5 COG Board and Committee Meetings.....	3
2.6 Inclusion of Traditionally Under-Represented Communities and EJ Communities.....	4
2.7 Pre-Workshop Engagement.....	4
3. Workshop Logistics and Attendance.....	4
3.1 Description of Attendance.....	5
4. Results of Workshops.....	6
4.1 Feedback on CCVI.....	6
As Planning Tool.....	6
As Component of Resilient Connecticut Project.....	9
Location-Specific Feedback.....	10
General Feedback, Viewer Tool Feedback, and Advice to Improve User Experience.....	11
4.2 Feedback on ZSR.....	13
As Planning Tool.....	13
As Component of Resilient Connecticut Project.....	15
Location-Specific Feedback.....	18
General Feedback, Viewer Tool Feedback, and Advice to Improve User Experience.....	19
5. Next Steps.....	20
5.1 Short-Term Outcomes (February-April 2021).....	20
For CCVI.....	20
For Zones of Shared Risk.....	21
5.2 Long-Term Outcomes (Resilient Connecticut Phase III and Beyond).....	21

For Climate Change Vulnerability Index.....	21
For Zones of Shared Risk	22

Appendices

Appendix A: Pre-Workshop Materials

Appendix B: Attendance List

Appendix C: Workshop Meeting Notes

1. Goals and Objectives for the Workshops of January/February 2021

Task 2 of the Resilient Connecticut Phase II consultant services is entitled "Organize and Run a Community and Stakeholder Engagement Process." One of the primary sub-tasks of Task 2 is to "oversee the organization and management of two regional stakeholder meetings in each Council of Government (COG) region, to provide input and review the outcomes of the regional vulnerability analysis, regional zones of shared risk, adaptation scenarios, and target projects." These were scoped as "charrette style meetings with maps and visualizations in order to co-generate a shared understanding of risks and opportunities as well as regional project strategies with stakeholders. Online participation options should be included due to ongoing public health concerns."

Two such workshop series were defined in May 2020 prior to the commencement of consultant services:

- Workshop Series #1 was initially scoped for "reviewing regional adaptation areas/resilience opportunities, developing potential adaptation scenarios, refining decision support criteria with more specific measurements, and reviewing potential target projects."
- Workshop Series #2 was initially scoped for "presenting pilot project recommendations and results from Final Report."

Given the elevated status of the COGs in the Resilient Connecticut engagement process, their involvement in the timing of the project was of significant importance. Phase II engagement with the Councils of Governments began through sustained correspondence with COG staff from August through October 2020. Engagement with the COG boards (consisting of chief elected officials) began in earnest during the COG meetings of November 13 (NVCOG), November 18 (SCRCOG), and November 19 (WestCOG and MetroCOG); as well as during CIRCA's annual summit on November 20, 2020. During these opportunities in November 2020, CIRCA and the Phase II consultant team explained the intent to convene virtual workshops during the winter of 2020-2021.

Given the overall timing of COG engagement, CIRCA and the consultant team ultimately determined that the initial workshop series should be scheduled for January 2021. This would allow for additional scope execution in December 2020 followed by runup and publicity for the workshops. With reference to the initial content intended for the workshops, which was set in May 2020 prior to the execution of consultant services, CIRCA and the consultant team determined that the workshops should ultimately attempt a somewhat less broad reach, with focus on the draft progress of the Climate Change Vulnerability Assessment (CCVA) and delineations of Zones of Shared Risk (ZSR). The topics of developing potential adaptation scenarios, refining decision support criteria with more specific measurements, and reviewing potential target projects would therefore be deferred to the second workshop series.

Overall, the goals for workshop series #1 were:

- Ground truth the Climate Change Vulnerability Index (CCVI);
- Discuss which pieces of the CCVI (which “contributors”) make the most sense for influencing the outcomes;
- Discuss which pieces of the CCVI (which “contributors”) make the most sense for influencing the tool’s utility for future planning;
- Understand the concept of ZSRs;
- Review preliminary ZSRs; and
- Get positioned for the next steps.

2. Description of Outreach Conducted and Meeting Attendance

Dates for workshop series #1 were set on subsequent Mondays and Friday to avoid COG meetings and subcommittee meetings, which are largely held on Tuesdays, Wednesdays, and Thursdays; as well as the general prevalence of longstanding project and team meetings that tend to be aggregated mid-week for the average workshop participant. The selected dates were January 22, 25, and 29; and February 1¹, 2021. Flyers and registration materials were prepared by the consultant team and provided to CIRCA and the four COGs.

A thorough outreach process, described below, was undertaken to advertise the dates.

2.1 CIRCA Web Site and Social Media

The CIRCA and Resilient Connecticut web pages announced the workshops on January 7, 2021. The CIRCA Facebook page posted the workshop announcements, and CIRCA distributed the translated flyer on this Facebook page and on the workshop website.

2.2 Resilience Roundup

The January 11, 2021 edition of the Resilience Roundup provided a description of the workshop series and links to the registrations. The Roundup reaches an estimated 1,115 email addresses representing a diverse array of stakeholders in Connecticut and beyond.

2.3 COG Direct Email Distribution

The four COGs provided thorough email distribution of the workshop announcements and registration materials. These emails reached the chief elected officials and their staff; municipal planners, engineers, and public works personnel; and municipal boards and commissions that typically interact with the COGs (such as planning and zoning commissions).

¹ Due to inclement weather that would have significantly reduced participation, the fourth date was changed from February 1 to February 8, 2021

2.4 COG Social Media

The four COGs provided workshop announcements and registration materials through their social media. This included the following:

Facebook:

- WestCOG – Posted on January 12, 2021
- MetroCOG – None
- SCRCOG – None
- NVCOG – Posted on January 11, 13, 14, 15, 16, 17, 18, 19, 20, and 21, 2021

Twitter:

- WestCOG – Posted January 12, 2021
- MetroCOG – None
- SCRCOG – None
- NVCOG – Posted on January 11, 13, 14, 15, 16, 17, 18, 19, 20, and 21, 2021; and live post during the workshop on January 22, 2021

COG Web Sites:

- WestCOG – Twitter feed copied to main page (see above; posted January 12, 2021)
- MetroCOG – None
- SCRCOG – Posted under “Announcements” in January 2021
- NVCOG – Posted under “Events” in January 2021

2.5 COG Board and Committee Meetings

During the COG Board and Committee meetings in December 2020, the consultant team and CIRCA mentioned that workshops were being scheduled for January 2021. However, dates were not available during these discussions. Dates were announced and registration links were provided during the following January COG meetings:

- WestCOG
 - Board 1/21/21
 - TAG 1/12/21
- MetroCOG
 - TTAC 1/20/21
- SCRCOG
 - Board 1/21/21

Unfortunately, the NVCOG Board (COG) meeting of January 8, 2021 and the MetroCOG Board meeting of January 28, 2021 were canceled, and therefore final in-person announcements were not possible prior to the workshops focused on NVCOG and MetroCOG, respectively.

2.6 Inclusion of Traditionally Under-Represented Communities and EJ Communities

The workshop flyer and registration materials were translated to Spanish by CIRCA. CIRCA distributed the translated flyer on this Facebook page and on the workshop website. NVCOG posted the Spanish edition of the flyer to its social media (Facebook and Twitter) on January 20, 2021.

2.7 Pre-Workshop Engagement

The consultant team emailed pre-workshop materials to workshop registrants several days before the scheduled workshops. These materials included two fact sheets (one for the CCVI and one for the ZSR), a brief dialog embedded in a survey format, a link to the CCVI viewer (through ArcGIS Online), and a link to the ZSR viewer (also through ArcGIS Online). Copies of these materials are included in Appendix A.

3. Workshop Logistics and Attendance

Due to the ongoing COVID-19 pandemic, all four workshops were held virtually via Zoom. This platform features polling and breakout room capabilities. To better reach the target goals for this workshop, the two- and half-hour event was divided into two sections. The first half of the event included a brief introduction, followed by a presentation on the CCVI flood tool. The presentation focused on the development of the tool, some of key CCVI terms, and how this tool is relative to the Resilient Connecticut project, as well as their roles. During the CCVI presentation attendees were polled on their initial reaction to the contributors used in the tool; this polling was to gauge perceived importance on the data used. At the conclusion of the presentation attendees were broken up into groups which were based on their geographic representation.

During the small group break outs the interactive tool was explored, and attendees were asked to provide their feedback on the representation of the mapping, the relevance it might play in their role, and whether the representation of vulnerability seemed accurate. The results of these sessions can be found in the subsequent section.

The large group then reconvened, general breakout points were discussed, and a brief presentation of ZSR was then given. Similar to the CCVI presentation, a basic understand of the ZSR tool was presented along with key terms and relevance. Attendees were then broken out into the same geographically designated groups and facilitators proceeded to run through a similar exercise. The interactive ZSR tool was explored, and attendees were solicited for feedback, relevance, and accuracy.

At the conclusion of the breakout period the large group again convened, breakout highlights were review and attendees were given insight to the next steps of Phase II. Attendees were

reminded to provide feedback via the links sent in the pre-workshop email, and to also monitor the Resilient Connecticut webpage for workshop resources and other feedback methods.

3.1 Description of Attendance

The number of registrations for each workshop varied:

- WestCOG – 32 registrants plus five from consultant team and four from CIRCA
- MetroCOG – 37 registrants plus five from consultant team and four from CIRCA
- SCRCOG – 44 registrants plus five from consultant team and four from CIRCA
- NVCOG – 18 registrants plus five from consultant team and four from CIRCA

Attendance was typically close to the total number of registrations in each case. Attendance lists are included in Appendix B.

Attendees consisted mainly of COG staff, municipal staff, and municipal board and commission members. Non-municipal attendees included several consultants and the following:

- NYMTC
- Sikorsky Airport
- The Kennedy Center
- GAF Roofing
- Connecticut Association for Community Transportation
- The Trust for Public Land
- FHWA
- NJTPA
- Pomperaug River Watershed Coalition
- Save the Sound
- Mill River Watershed Association
- Neighborhood Housing Services of Waterbury
- CT DPH Drinking Water
- Desegregate Connecticut
- REX Development
- Greater New Haven Water Pollution Control Authority
- Stamford Downtown
- Norwalk River Watershed Association
- Connecticut Roundtable on Climate and Jobs
- DEMHS
- Connecticut Energy Network / Clean Water Fund
- Baralmar Advisors LLC
- Wilton Go Green
- Bethel Water Department

Traditionally under-represented communities were represented by the municipalities hosting such communities and by the Connecticut Association for Community Transportation, Neighborhood Housing Services of Waterbury, Desegregate Connecticut, and Connecticut Energy Network / Clean Water Fund.

4. Results of Workshops

Notes from the four workshops are included in Appendix C. Narrative descriptions of highlights and salient points are provided below.

4.1 Feedback on CCVI

Feedback about the CCVI was divided into four buckets:

- ✓ As a planning tool – this type of feedback characterizes the ability of the CCVI or its components to be used for planning, project development, and grant-writing outside the context of Resilient Connecticut. Some feedback in this category is also found in the other buckets.
- ✓ As a component of Resilient Connecticut – this type of feedback is helpful for identifying challenges and opportunities in the context of the Resilient Connecticut project goals.
- ✓ Location-specific feedback – this feedback is geared toward a specific part of the geography; the comments will tend to suggest that a modification to the CCVI may be needed, and the comments are often found in other buckets.
- ✓ General feedback, viewer tool feedback, and advice to improve the user experience – this feedback is not tied to specific geography, but strongly suggests changes to be considered to improve the CCVI tool.

As Planning Tool

WestCOG

- The viewer tool appears to mostly represent flood zones well with regard to the shading.
- The CCVI could potentially be useful as a tool to identify areas for “intervention” but may currently be too broad and all-encompassing in its current form.
 - To effectively inform actions, the user should be able to drill down and unpack the data.
 - Classifying the leading drivers and types of vulnerabilities can improve usefulness in decision making (e.g., where high vulnerability is driven by demographic factors vs environmental factors, coastal flooding vs inland flooding sources, etc.).
 - Different applications/end users would have different weighting priorities.

- Framing the presentation of vulnerability summary results by type or end-user group will make it more useful for agencies prioritizing and implementing projects within their jurisdictions.
- CIRCA should move beyond a tool for data to identify agency-specific actions.
 - Planning decisions are “siloed” and this tool crosses sectors; someone needs to identify partners, or nobody will take ownership of using the tool.
 - Project priorities and strategic recommendations should be aimed towards specific statewide agencies (DEEP, DOT, etc.) for implementation.
 - If actions are not assigned to specific stakeholders, no one will take ownership.
- The versatility of CCVI definitions, weighting, and prioritization may be beneficial for local planning purposes, but for the State, CIRCA needs to define a clear and consistent prioritization criterion.
- The CCVI should intersect with statewide vulnerability assessment work coming out of the GC3.
- There may be a “cause and effect” aspect of the CCVI. An example was made regarding vulnerable areas that are associated with certain socioeconomic populations. This could be viewed in two ways: social vulnerabilities are causing the overall vulnerability and challenge, or this is an area for investment and improvement.
- It is important to frame this tool as not negatively highlighting an area. The example used was that an area that is vulnerable and heavily developed is not necessarily “bad” but may be a good candidate for certain types of redevelopment, such as green infrastructure or pervious surfaces.
- Danbury is becoming a StormReady community; ideally, the CCVI could be used to support participation.
- Overall, the tool may try to do too much for most people to turn it into something useful. The CCVI needs to be simplified for public to understand.

MetroCOG

- Pros and cons are apparent for using the CCVI for larger scale planning purposes vs. regulatory purposes. Developers are more focused on regulations and may not welcome the CCVI vulnerability analysis as part of site consideration/design/development.
- The method of prioritizing data is important so this tool can be used for funding; some areas may be “less vulnerable” according to the CCVI, but do have a degree of risk, and may be discounted for funding. A potential solution is that the next phase of the CCVI could include weighted scenarios that may address this concern. For example, infrastructure (built contributors) can be weighted more heavily than other in certain scenarios.
- The Camden Street/Rutland Avenue/Royal Avenue area located between the Rooster River and I-95 has long been challenging due to the flood risk and limited egress. The Town is generally supportive of acquisitions in this neighborhood. High vulnerabilities in the CCVI could be supportive of acquisitions. However, the color schemes in the neighborhood do

not appear to be aligned with the vulnerabilities and risks. The floodway cells are not ranked highest, but likely should be ranked highest.

- The high variation in colors (scores) in the broad coastal floodplain of Fairfield is a concern. The Town views this area as having a relatively uniform flood risk and pointed out that the flooding was Sandy was uniform in this area. The perception of variable risk is problematic for planning purposes. Weighting is a process that could help provide some uniformity across this floodplain. Depending on the coefficients (weights) used, and to which layers they are applied, the CCVI could appear differently in this area. For example, weighting the FEMA flood zones more heavily would give that layer more significance in the scoring.

SCRCOG

- The Town of Madison is developing a master plan for Surf Club Beach, and it would be helpful if the CCVI could be used to develop spatial recommendations in the master plan.
- The CCVI could be valuable at informing the update to the Milford POCD.
- The CCVI tool may be too complicated, and therefore getting the average person to understand the tool will be difficult.
- Given that the most desirable areas (for real estate) are along the shoreline where vulnerability is highest, the tool could present political challenges.
- The tool would be valuable from the regional planning perspective and useful from a wider scale range, such as the multi-jurisdictional HMPs.
- Future resilience projects may change the CCVI.

NVCOG

- Working with census data can sometimes be challenging, so a tool that aggregates and depicts census data can potentially be helpful.
- Exposure may be the most apparent and commonly understood (by users) part of the equation. For a planner, the flood exposure data might be the most directly useful, while sensitivity and adaptive capacity might be less useful.
- Public Works departments could potentially use the tool to prioritize projects that address flooding. However, in the context of larger public works projects that may be impactful, users would need to explore the data more fully in order to fully understand the CCVI and allow it to help determine what is driving the specific issues (i.e., impervious surfaces, over-development, or undersized culverts).
- Regarding whether the CCVI could be used outside flood zones to make planning or project decisions, such as siting of rain gardens in urban settings, the challenge is that other factors may be more important such as which parcels are owned by a municipality.
- With reference to overall flood vulnerability scores, hillside shades tell a large part of the story. There may be implications for using the CCVI in connection with hillside and slope land conservation planning.
- As in the other workshops, discussion occurred about whether CCVI scores would be helpful for pursuing funds or grants. The consensus was that they probably would not be directly

useable, as the vulnerability scores are relative. However, the CCVI would be useful to assist in screening and ranking applicants for funding sources. For example, this tool might be useful with an overlay of potential project areas. In addition to the traditional "yes/no" questions, the CCVI can provide a little more insight into the project location and help with scoring. Overall, NVCOG attendees noted that the CCVI could be a useful screening tool for projects, to help score projects, and for grant applications.

As Component of Resilient Connecticut Project WestCOG

- As noted above, the CCVI could potentially be useful as a tool to identify areas for "intervention" but may currently be too broad and all-encompassing in its current form.
 - To effectively inform actions, the user should be able to drill down and unpack the data.
 - Classifying the leading drivers and types of vulnerabilities can improve usefulness in decision making (e.g., where high vulnerability is driven by demographic factors vs environmental factors, coastal flooding vs inland flooding sources, etc.).
 - Different applications/end users would have different weighting priorities.
 - Framing the presentation of vulnerability summary results by type or end-user group will make it more useful for agencies prioritizing and implementing projects within their jurisdictions.
- CIRCA should move beyond a tool for data to identify agency-specific actions.
 - Planning decisions are "siloe" and this tool crosses sectors; someone needs to identify partners, or nobody will take ownership of using the tool.
 - Project priorities and strategic recommendations should be aimed towards specific statewide agencies (DEEP, DOT, etc.) for implementation.
 - If actions are not assigned to specific stakeholders, no one will take ownership.
- Objective prioritization may be challenging. Weighting can effectively make rankings anything the user desires. Important questions are:
 - Who does the weighting/prioritization?
 - How adaptive is it?
 - How do we prevent weighting from becoming unwieldy?
 - Can weighting be user or stakeholder specific?

These questions are essential to take this beyond a thought exercise and drive actual project development and priority setting.

- The connection between CCVI and TOD efforts could be more prominent.
 - TOD potential would be a useful contextual layer to show.
 - Need to account for range of regulatory efforts at the municipal level in place (to assess true TOD potential, not just the theoretical potential).

MetroCOG

- Considering multiple hazards might change outcomes. An example was provided involving sheltering in place for the pandemic as opposed to traveling to shelters, where the distance to shelters is then a contributor, and how that might change the vulnerability.
- As noted above, the Camden Street/Rutland Avenue/Royal Avenue area located between the Rooster River and I-95 has long been challenging due to the flood risk and limited egress, and Fairfield is generally supportive of acquisitions in this neighborhood.
- Downtown Fairfield flood risks are being addressed in accordance with the green infrastructure plan. Porous pavement (36,000 sf) has been installed in the train station parking lot.
- Jennifer Fogliano of the Northern NJ Transportation Planning Authority discussed the Passaic River Watershed Resilience Study, specific to transportation as having some parallels that may inform Resilient Connecticut.
- Sikorsky Airport has developed a Master Plan which included plans to address questions surrounding sea level rise and coastal flooding concerns. Some parts of the plan may factor into the project, such as:
 - A marsh restoration project
 - Address the flooding along Main Street.
 - A nearby elevation project
 - The town is currently pursuing a BRIC grant for a repetitive loss area analysis.
 - The WPCF is building a dike with FEMA funding.
 - There are significant risks to environmental justice communities.

SCRCOG

Specific comments were not offered from workshop participants regarding how to use the CCVI for Resilient Connecticut.

NVCOG

Specific comments were not offered from workshop participants regarding how to use the CCVI for Resilient Connecticut.

Location-Specific Feedback

WestCOG

Specific location-based comments were not offered from workshop participants regarding the CCVI.

MetroCOG

- The Camden Street/Rutland Avenue/Royal Avenue area located between the Rooster River and I-95 and the Brooklawn Parkway need to be checked relative to how floodways are handled in the CCVI.
- As noted above, the high variation in colors (scores) in the broad coastal floodplain of Fairfield is a concern. The Town views this area as having a relatively uniform flood risk and pointed out that the flooding was Sandy was uniform in this area. The perception of variable risk is problematic for planning purposes. Weighting is a process that could help provide some uniformity across this floodplain. Depending on the coefficients (weights) used, and to which layers they are applied, the CCVI could appear differently in this area. For example, weighting the FEMA flood zones more heavily would give that layer more significance in the scoring.
- The rankings for presence of septic systems in coastal Fairfield do not make sense, and this should be checked, as this area is entirely sewered. A cell in question is very close to the sewage treatment plant, in fact.
- Sikorsky Airport has developed a Master Plan which included plans to address questions surrounding sea level rise and coastal flooding concerns. The town provided comments on the Plan, many of which would have aligned the master plan with hazard mitigation plan and coastal resilience plan goals. Some parts of the plan may factor into the CCVI.

SCRCOG

- Based on the CCVI along Whitfield Street in Guilford, TOD will be challenging.

NVCOG

- Riverine flood protection structures on the Naugatuck River should be factored into Adaptive Capacity. This may have been incorporated into adaptive capacity and distributed to several cells surrounding the systems in place.

General Feedback, Viewer Tool Feedback, and Advice to Improve User Experience

WestCOG

- FEMA flood zones should appear darker in the CCVI.
- Ground-truthing the CCVI results should be considered.
- Using the most current census data in the CCVI is recommended.
- Clipping data to coastline is recommended, as well as ensuring information in the final tool is available regarding what rankings mean.
- The CCVI viewer could improve method for classification/rankings.
 - Highest vulnerability areas seem to be in the water.
 - Checker pattern across lower-risk areas is confusing and makes it hard to identify actual hot-spots within the landscape.
 - Consider broadening the range so that vulnerability classifications are more refined.

- Attempt visioning exercises with different extreme weights to see the impacts to CCVI.
- It was noted that use of SVI in the CCVI could be politically portrayed negatively (e.g., vulnerable people are artificially driving up overall vulnerability).

MetroCOG

- Darked-shaded cells offshore should be clipped.
- Floodway cells should be ranked as highly as VE zone cells, given the highest flood risks associated with floodways and VE zones.
- The figure for flood policies in force in Fairfield should be checked, as changes could have occurred recently.
- Building densities should be determined from building footprints and not from land use or zoning layers.
- The rankings for presence of septic systems in coastal Fairfield do not make sense, and this should be checked, as this area is entirely sewerred. A cell in question is very close to the sewage treatment plant, in fact.
- The impacts of debris on flooding, particularly at the shoreline, should be added as a contributor.
- Related to the ecologic indicators, there was discussion of including wildlife connectivity corridors, specifically the Trumbull & Monroe wildlife corridor along the Pequannock River.
- A more user-friendly naming convention for the menu of contributing factors would be beneficial.
- For each layer (E, S and AC), the contributors in the explanation pane should be click-linked to areas that would provide an example.
- The CCVI should include “washover” flood scenarios, especially since flooding can approach from multiple sides, and a large physical barrier for flooding from one direction is not a complete solution.
- Weighting is a process that could help provide some uniformity across the coastal floodplain of Fairfield. Depending on the weights used, and to which layers they are applied, the CCVI could appear differently in this area. For example, weighting the FEMA flood zones more heavily would give that layer more significance in the scoring.

SCRCOG

- The CCVI tool should be available for review after the workshop.
- Trees and tree limbs on roads (blocking access) continue to be a prevalent hazard. The CCVI for wind risks is forthcoming.
- Ratcheting the weighting up and down depending on interest (e.g. ecological vs. infrastructure) would be useful.
- Access points to the shoreline should be considered in the CCVI layers.
- A wider range of colors to depict vulnerability would be useful.
- The latest North Atlantic Aquatic Connectivity Collaborative (NAACC) data could be incorporated into the tool.

- Although dams were not directly included in the CCVI due to the challenges of spatially representing the dams and dam failure in the grid style analysis, the dam location and classification could be incorporated into the analysis in some way.
- The CCVI does not capture certain types of infrastructure that pose debris challenges, such as culverts and bridges. Although it would be challenging to incorporate debris movement, incorporating infrastructure that is affected may be worth exploring.

NVCOG

- Changing the transparency of the layers in the CCVI viewer is helpful.
- Overlaying the FEMA SFHA would be helpful.
- Brownfields could be added as a CCVI contributor in sensitivity or exposure.

4.2 Feedback on ZSR

Feedback about the ZSR was divided into four buckets, as with the CCVI feedback:

- ✓ As a planning tool – this type of feedback characterizes the ability of the ZSR mapping to be used for planning, project development, and grant-writing outside the context of Resilient Connecticut. Some feedback in this category is also found in the other buckets.
- ✓ As a component of Resilient Connecticut – this type of feedback is helpful for identifying challenges and opportunities in the context of the Resilient Connecticut project goals.
- ✓ Location-specific feedback – this feedback is geared toward a specific part of the geography; the comments will tend to suggest that a modification to the ZSR may be needed, and the comments are often found in other buckets.
- ✓ General feedback, viewer tool feedback, and advice to improve the user experience – this feedback is not tied to specific geography, but strongly suggests changes to be considered to improve the ZSR maps.

As Planning Tool

WestCOG

- The versatility of ZSR definitions and prioritization may be beneficial for local planning purposes, but for the State, CIRCA needs to define a clear and consistent prioritization criterion.
- Zones of shared risk have potential value if they identify geographic areas with non-obvious values, relationships, and interdependencies.
 - Can they identify areas where actions in one place can affect a broader area?
 - Level of regional connectivity and importance should play into identification and prioritization of ZSR.
 - Can ZSRs quantify the number of people, number of jobs, percent of the tax base, and portion of highly vulnerable populations?

- Time horizon is an important component. Risk mitigation strategies for areas with high flood exposure over the next 10 years might be different than those areas with high flood exposure over the next 1,000 years.
- ZSR and related planning efforts should incorporate natural protection zones and relevant elements of watershed management plans.
- Danbury could use ZSR mapping to help with revisions to regulations.

MetroCOG

- ZSRs could be used for actions such as downzoning. Downzoning in New York City was considered to change zoning from multi-family to single-family, to eventually reduce the risk by reducing the potential for losses. This could be considered in ZSRs in Connecticut.
- Rooster River was discussed at length. DEMHS may be supportive of acquisitions to reduce risk at individual buildings, but also to the extent that groups of acquisitions can be used to set aside land for floodplain storage. A suitable ZSR typology should be developed that could help advance these types of projects and the necessary acquisitions.
- Residents understand how to elevate coastal homes but do not understand the implications of elevating homes with riverine flood risk, because the risk profile is so different. ZSR typologies could lead to predictable types of projects such as elevations vs. acquisitions.
- As portrayed, the heat-based ZSRs do not offer much.
- The question was posed how will we use the ZSR to identify actual projects with an emphasis on regional approaches? A discussion ensued about the need to drill down further into the problems creating risk and using the tool for screening and then moving to other studies.
- Getting ZSR information in front of elected officials and the public in ways that can be more widely understood would help to build political support and urgency to move things beyond a Town's coastal resilience plan and hazard mitigation plan.
- FEMA maps are widely understood and accepted; something like the ZSR should be pushed into "common knowledge" and be accepted as a planning/regulatory tool.
- ZSR products should be coordinated with regulatory or advisory updates such as the Emergency Operations Center at the state, into local NHMPs, the Community Rating System.
- The Massachusetts MVP program was raised as an example of a potential vehicle for incorporating some of these tools into a state-funded planning process.

SCRCOG

- Showing areas of isolation is very helpful.
- One value of ZSR concepts is for "neighborhood scale" planning. Identification of ZSRs can help neighborhood associations cobble together resources and clout for pursuing projects.
- The regional scale planning aligned with Resilient Connecticut should help address needs in towns outside the planning region
- Guilford may share risk-based maps with people who intend to buy property.
- Regarding the former "sawpit" property in Guilford, should this be a ZSR given its past development potential while being surrounded by tidal wetlands? Drawing that type of ZSR

could help with future grants. Additionally, delineating natural ZSRs can help with projects along the West River and East River. Some natural lands-based ZSRs could help identify lands to set aside.

- The question again was raised whether completed projects will be identified on the mapping.
- The tool was believed valuable from a visual perspective and for helping Aldermen and citizens visualize problem areas. A comment was made that ZSR will be a valuable planning tool for POCD, HMPs, TOD, etc.
- Being able to see that travel to shelters is impaired by certain events will inform evacuation planning.
- ZSRs show potential for being used during zoning decisions, such as how neighboring zoning types may be impacted by the presence of a certain ZSR. This might also be useful for POCD development in identifying areas where shovel-ready projects could be at the forefront of planning efforts.

NVCOG

- Potential of uses ZSR mapping are to help state agencies with planning, grant programs, and deciding about whether to recognize or invest in TOD areas (i.e., use ZSR as criteria for TOD). In terms of TOD, the ZSR could help inform type of development in certain areas or could direct development to nearby safer sites.
- ZSR may be useful in some cases for planning and prioritizing the acquisition of open space.
- A potential use of ZSR mapping is to help update hazard mitigation plans.
- There may be a nexus between ZSR mapping and eventually developing maps of private well locations, which is something desired by State agencies.
- The regional buildout analysis for NVCOG could hypothetically use the ZSR maps.
- Overall, ZSR could be helping for grants and planning, but probably not for development decisions.

As Component of Resilient Connecticut Project

WestCOG

- Zones of shared risk have potential value if they identify geographic areas with non-obvious values, relationships, and interdependencies. They should identify areas where actions in one place can affect a broader area, and the level of regional connectivity and importance should play into identification and prioritization of ZSR.
- For projects that transcend multiple municipalities, the tool would be useful to make connections.
- Considering multiple hazards might change the outcomes. An example was provided involving sheltering in place for the pandemic as opposed to traveling to shelters, where the distance to shelters is then a contributor, and how that might change the outlook.

- The relationship between ZSRs and critical facilities and infrastructure is important to consider. The Danbury wastewater treatment plant and fire stations were cited as examples. The wastewater treatment plant cannot be moved, but Danbury would look at siting of fire stations differently than siting a wastewater treatment plant. If the City wanted to move a fire station downtown, the City might look at something like the ZSR maps.
- The inclusion of Brookfield, which does not currently have TOD potential (but where rail extension is possible) highlights the regional nature of this effort. Brookfield residents use the hospital in Danbury. If people in Brookfield cannot access the hospital, then serious consequences can occur.
- Another regional example is the WPCA plant that serves both Darien and Stamford and how to differentiate between ZSR with larger regional impacts vs. those that are self-contained.
- Another regional example is the emergency boat situation, with current limitations at Candlewood Lake. The City of Danbury is forced to pre-plan lake response.
- Another regional example is that Westport shares some challenges with Fairfield, which they address on a case-by-case basis. For example, there is a road that runs along the Westport/Fairfield line and it is necessary to work out who plows, paves, etc.
- Transportation corridors are critical, and the rail might be extended to New Milford.
- Shelters are being reviewed in Danbury, and regional shelters are important considerations. If trees are down on roads, access is impeded.
- "Weighting" ZSRs could be considered to highlight areas that potentially have a larger share of the tax base, jobs, or equity.
- Norwalk has been working on TOD zoning for Norwalk, with a plan developed for East Norwalk station, and a plan underway for the Merritt Station. The City is also working on a Coastal Resilience Plan.

MetroCOG

- ZSRs appear to represent or imply a typology. Regarding ZSR typologies, all railroad underpasses in all the towns should be identified as a new type of ZSR. This will help advance them to a higher level of consideration.
- The Metro Center TOD area is an example of where people could be relocated from areas of higher risk. Approximately 500 units are proposed at the moment. Developers around the MetroCenter train station are actively looking for more property to develop, and the Town is viewing a lot of activity along Kings Highway. However, dry access to the Fairfield Metro railroad station could be improved. Laura mentioned nearby past flooding (depth three feet) on Chambers Street. Overall, the TOD area needs to be more resilient.
- Significant open space is located along the Mill River, but some risks may still be present. Most neighborhoods along the Mill River have adequate egress. Many dams are located upstream.
- DEMHS may be supportive of acquisitions along the Rooster River to reduce risk at individual buildings, but also to the extent that groups of acquisitions can be used to set aside land for floodplain storage.

- Stratford has approved approximately 500 units within the TOD area. With some already having been constructed, the town is working on “complete streets” implementation with 60% in design phase. Two greenways are being considered. A corridor study is being conducted for Barnum and Main Streets to include more mixed use and pedestrianized corridors.
- The elevation of Broad Street over Ferry Creek is a priority in Stratford. A ZSR concern was raised as to the lack of connection between the Town Center ZSR and the Ferry Creek ZSR. There are drainage concerns throughout this area that may want to be considered with a larger ZSR delineation. A pumping station on Broad Street serves the neighborhood.
- Flexibility in the Lordship evacuation plan allows the town to make prudent decisions but can also pose a challenge to residents when planning emergency response without specificity. The town would like to elevate greenways, especially along Access Road, with dikes as part of this implementation.
- Better coordination with surrounding towns on addressing risk is needed. For example, could the Resilient Bridgeport project be expanded to include Stratford?
- Bruce Brook along the Stratford/Bridgeport line is a regional issue; this brook often floods and impacts both municipalities.
- There is a need to drill down further into the problems creating risk, and to use the tool for screening.
- ZSRs could be renamed to emphasize “opportunities” [this is coming later].

SCRCOG

- The ZSR should be used in conjunction with the CCVI to unpack the social sensitivities in a certain zone. Care should be taken to avoid these tools shifting vulnerabilities to more vulnerable neighborhoods.
- TOD may not be feasible if railroad stations have flood risk. Resilient Connecticut is the type of project that may help address this challenge.
- Many risk factors are located near the Guilford railroad station. Access can be challenging, and the town lacks sewers, which means that properties rely on septic systems.
- The area around Tweed Airport includes sections of New Haven and East Haven. The area was noted as an example of a “regional” zone of shared risk that includes a major transportation facility along with surrounding local areas in each municipality that contain roads and homes at risk.

NVCOG

- NVCOG attendees noted that at first glance, the mapping appeared to capture most vulnerable areas. A “transportation corridor lens” is a helpful way to think about ZSR.
- Regionally significant facilities such as sewer collection and treatment facilities that serve multiple towns were discussed; how would someone depict the ZSR?

- Power substations that serve multiple pumping stations were given as another example of regional importance. How do you capture the extent of vulnerability or the ZSR for the impacts of a small site like that?
- Some regionally important facilities are *outside* of the project area and therefore not mapped, such as the Waterbury Bus Terminal in Watertown.

Location-Specific Feedback

WestCOG

- In Danbury, Kohanza Brook should likely be given a ZSR.
- An industrial area in Norwalk was discussed. This area, near Meadow Street, is outside of a ZSR (as currently depicted) as it is not directly in a flood zone, however, if there were an issue here during an event it could pose regional issues as it contains several employers and could potentially result in pollution concerns.

MetroCOG

- The ZSRs located near railroad tracks should be extended all the way to the railroad tracks.
- The downtown Fairfield ZSR should be separate from the broad coastal ZSR because it underscores that the challenges are unique in the downtown area.
- The Camden Street/Rutland Avenue/Royal Avenue neighborhood might be a good location for a nested ZSR, as it would highlight the enhanced risk in that neighborhood. Moving outward from this area, the Town recommended identifying the Nathan Hale Street area as separate than Camden Street/Rutland Avenue/Royal Avenue.
- The LOMR for the MetroCenter-owned parcels in Fairfield should be checked to see whether this should affect the ZSR delineation.
- All railroad underpasses in all towns should be identified as a new type of ZSR. This will help advance them to a higher level of consideration.
- Invasive species at Dogwood Lake will impact Stratford.
- Development around the Westville Mall (Trumbull Mall) increases vulnerability [flood risk] downstream in Fairfield. Additional ZSRs may be warranted for this reason.
- A ZSR concern was raised as to the lack of connection between the Town Center ZSR and the Ferry Creek ZSR in Stratford. There are drainage concerns throughout this area that may want to be considered with a larger ZSR delineation.

SCRCOG

- Drawing a ZSR around the former Sawpit property could help with future grants. Additionally, delineating natural ZSRs can help with projects along the West River and East River.

- Beach areas, the two WWTPs, and mall areas in Milford and Orange were thought to be generally accurate. A regional ZSR area may be considered where both Orange and Milford made improvements to bridges on Flax Mill Lane.
- With reference to TOD, three different bus systems service the CT Post Mall and serve more purposes than shuttling people to and from the mall. A recommendation was made to review and include more of the mall area in the existing ZSR at that location.

NVCOG

- Cherry Street² flooding in Naugatuck and other small areas could be added.

General Feedback, Viewer Tool Feedback, and Advice to Improve User Experience

WestCOG

- Pros and cons exist regarding whether ZSRs should be joined or whether larger ZSRs should be broken up. ZSRs might as well be drawn separately, but either approach could make sense.
- Using topography would help with delineating the ZSRs; highlighting historic districts may also be helpful.
- Tree and tree limb damage from wind events is a persistent concern. Challenges associated with drawing wind-based ZSR are apparent, such as the lack of spatial information from utilities. The National Weather Service, Eversource, and the airports should be contacted for information.

MetroCOG

- More one-on-one community engagement with towns on ZSR is important.
- ZSR mapping could be further developed by working with neighboring towns in the region.
- ZSR boundaries should be brought outward in some cases. For example, the ZSRs located near the railroad tracks should be extended all the way to the railroad tracks.
- Regarding critical facilities:
 - Landfills may be included as critical facilities.
 - Senior living facilities should be included.
 - A “ring of color” or some other method of highlighting should be used around critical facilities to call more attention to them.
 - Use of FEMA-recognized critical facilities should be used for consistency.

SCRCOG

²² This appears to have been mapped prior to the workshop

- A wind study by Cornell University, studying viability of wind power, was cited as a potential source of data for wind-based ZSRs. Correlating with direction from storm bearing may be useful for wind ZSRs.

NVCOG

- Brownfields could be added as a visible mapping element in the ZSR.
- ZSR shapes should be “tightened up” based on topography where appropriate, to truly capture elevation changes and remove lower risk areas.
- The municipalities would like to participate in ZSR mapping.

5. Next Steps

5.1 Short-Term Outcomes (February-April 2021)

For CCVI

- Users should be able to easily find and add the FEMA SFHA in the CCVI viewer and ZSR viewer.
- Further ground-truthing of the CCVI is needed.
- Brownfields should be considered as a CCVI contributor in sensitivity or exposure and added as a visible mapping element in the ZSR.
- Flood policies in force should be checked or verified.
- Incorporate historic buildings into the CCVI as a contributing factor for sensitivity.
- Remove cells that are mostly in Long Island Sound, from the CCVI.
- Ensure that riverine flood protection structures on the Naugatuck River are factored into Adaptive Capacity.
- Floodway cells should be ranked as highly as VE zone cells, given the highest flood risks associated with floodways and VE zones.
- Building density calculations should be checked. Ensure they are from building footprints and not from a zoning or land use layer.
- The presence of septic systems in coastal Fairfield (and possibly other towns) should be checked.
- Check wildlife connectivity corridors, specifically the Trumbull & Monroe wildlife corridor, for potential inclusion.
- Consider using North Atlantic Aquatic Connectivity Collaborative (NAACC) data.
- Determine whether dams and dam failure inundation areas can be included in the CCVI.
- Consider incorporating bridges and culverts that can be blocked by debris.
- Consider broadening the ranges in the CCVI layer scoring so that vulnerability classifications are more refined.

- Consider that for each aggregated layer (E, S and AC), the contributors in the explanation pane could be click-linked to areas that would provide an example.
- Regarding weighting:
 - Consider reducing checkerboard patterns in areas of very low risk *and* areas of very high risk, as the checkerboard patterns make hot spots as well as broad spatial trends hard to see. This could potentially be accomplished through weighting of layers (contributors) or through weighting of the individual terms (exposure, sensitivity, and adaptive capacity). A good example of this is coastal Fairfield, where it was discussed at length, but other workshop attendees noticed this in other towns as well.
 - Some areas may appear “less vulnerable” according to the CCVI but do have risk. Weighting could address this concern. For example, infrastructure (built contributors) can be weighted more heavily than others in certain scenarios. This is important because the CCVI may be used for pursuing project funds.

For Zones of Shared Risk

- Make critical facilities more visible in the viewer and ensure that they are consistent with those listed and mapped in hazard mitigation plans.
- Specific ZSRs need to be added as noted above.
- Specific ZSRs need to be edited as noted above.
- Incorporate natural protection areas and relevant elements of watershed management plans into ZSR mapping.
- ZSR shapes should be “tightened up” based on topography where appropriate, to capture elevation changes and remove lower risk areas.
- Railroad underpasses in all the towns should be identified as a new type of ZSR.
- Data from airports, utilities, and the NWS may be needed to help draw wind-based ZSRs.
- Heat-based ZSRs need additional sources.
- 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.
- Finally, the municipalities should be given an opportunity to review and comment on the ZSR mapping.

5.2 Long-Term Outcomes (Resilient Connecticut Phase III and Beyond)

For Climate Change Vulnerability Index

- Planning Tools: Numerous discussions were focused on whether the CCVI tool and/or the CCVI scores would be helpful for planning or plan development (POCD, buildouts, hazard mitigation plans, participation in the StormReady program, etc.). The level of interest may justify development of an FAQ or “how to” guide for using the CCVI for plan development.

- Project Development Tools: Numerous discussions were focused on whether the CCVI tool and/or the CCVI scores would be helpful for planning specific projects (drainage, public works, rain gardens, etc.). The level of interest may justify development of an FAQ or “how to” guide for using the CCVI for project development.
- Project Grant Development: Numerous discussions were focused on whether the CCVI tool and/or the CCVI scores would be helpful for pursuing funds or grants, either through screening and ranking applicants for funding sources or by using the CCVI as an overlay. The level of interest may justify development of an FAQ or “how to” guide for using the CCVI for grant development.
- Casual Vs. Sophisticated Users: Consider splitting CCVI viewer tool into public “casual user” and public “advanced user” editions.
- Investing in TOD Areas: Some discussions implied that the CCVI and ZSR should be used to determine *whether* to invest in TOD areas. However, the more appropriate way to cast this question may be: can CCVI and ZSR be used to determine *how* to invest in TOD areas?
- Updates: As census data is released, updates to the CCVI may be necessary.
- Coordination with GC3: The CCVI should intersect with statewide vulnerability assessment work coming out of the GC3.

For Zones of Shared Risk

- 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.

Appendix A

Pre-Workshop Materials

Pre-workshop Materials to NVCOG
Sent January 21, 2021

EMAIL:

Good morning,

Thank you for registering for the first Resilient Connecticut Workshop: Climate Change Vulnerability Assessment and Regional Zones of Shared Risk. The first workshop is focusing on the NVCOG region.

This workshop will focus on understanding and exploring the tools being developed as part of Phase II of Resilient Connecticut, while also discussing how these tools can be refined to better suit the municipalities and stakeholders that will ultimately be using these planning resources.

To help participants prepare for these workshops, the Resilient Connecticut team has developed a few resources for your review to gain a basic understanding of the tools, and to provide preliminary feedback on the products and for your workshop expectations.

Attached to this email are fact sheets to provide a general overview of the Climate Change Vulnerability Index (CCVI) and Zones of Shared Risk (ZSR); both of which will be reviewed during the workshop. The area of analysis for the CCVI is New Haven County and Fairfield County, whereas the ZSR delineation is focused on communities with potential for Transit-Oriented Development. However, all NVCOG municipalities may have an interest in the CCVI and ZSR given the regional issues and concerns related to climate change vulnerabilities and risk reduction.

In addition, please take a few minutes to answer a few preliminary questions [here](#). In this pre-workshop form you will find links to some Resilient Connecticut resources you may find useful, including links to interactive mapping tools for the CCVI and ZSR which we will also cover in the workshop.

These mapping tools can also be accessed using the following links:

[CCVI Maps](#)

[ZSR Maps](#)

Workshop registration is still open, so please feel free to pass along workshop information to any interested colleagues.

We look forward to seeing you Friday morning.

Resilient Connecticut



Thanks for taking the time to participate in the Resilient Connecticut NVCOG first regional workshop.

This form will help participants become familiar with some of the tools we will be discussing during the workshop, and provide us some info that we can use to better develop the specifics for the day.

Takes 7+ min

Start

press Enter ↵

1 → The Resilient Connecticut Team is developing a Climate Change Vulnerability Index (CCVI) - have you heard of it? If not, that's OK! Review the fact sheet sent, or if you'd like, take a look at some slides from the Nov. 2020 Resilient Connecticut Summit [Here](#), or watch a recording of the breakout session [Here](#). Let us know if there is anything specifically you would like to learn about the CCVI during the workshop below.

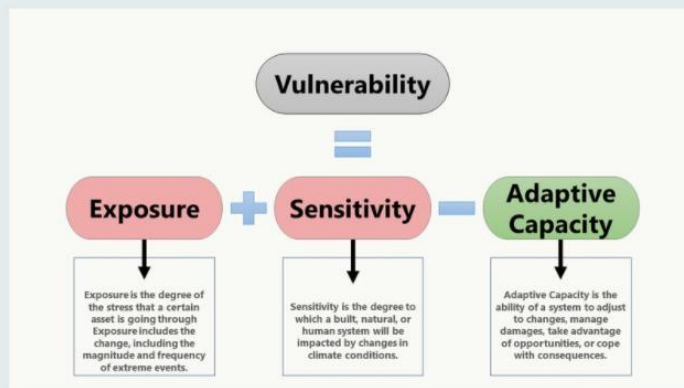
Type your answer here...

Shift ⌘ + Enter ↵ to make a line break

OK ✓

press Enter ↵

2 → The CCVI is being developed into a tool that municipalities can use to help identify different types of vulnerabilities in their communities and throughout the region for flooding, heat, and wind. The Team will be reviewing the preliminary version of this tool during the workshop; take a few minutes to explore some of that data [Here](#). The layers found in the tool represent the components to the equation below. Let us know below what information might help someone use this tool more efficiently, what is helpful, or anything else that can help the Team use the data.



0 of 9 answered

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3 → Based on your knowledge of the NVCOG communities, are any areas known to be more vulnerable to flooding, heat, or wind?

Type your answer here...

Shift ⌘ + Enter ↵ to make a line break

OK ✓

press Enter ↵

0 of 9 answered

Powered by **Typeform** ^ v

4 → If there are certain areas, are these well represented in the mapping tool, or were you surprised by the more (or less) vulnerable areas?

Type your answer here...

Shift ↑ + Enter ↵ to make a line break

OK ✓ press Enter ↵

0 of 9 answered

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5 → Think about the equation for vulnerability and the terms exposure, sensitivity, and adaptive capacity. None of the three terms, nor their contributors, are given more or less importance in the equation. Do you think any one of the terms is more important for quantifying vulnerability?

Type your answer here...

Shift ↑ + Enter ↵ to make a line break

OK ✓ press Enter ↵

0 of 9 answered

Powered by **Typeform** ^ v

6 → The Resilient Connecticut Team is developing Zones of Shared Risk (ZSR) - haven't heard of that either? That's OK! You can review the fact sheet sent along, or learn more at the Resilient Connecticut website [Here](#). Let us know if there is anything specifically you would like to learn about ZSR during the workshop below.

Type your answer here...

Shift ↑ + Enter ↵ to make a line break

OK ✓ press Enter ↵

0 of 9 answered

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7 → Review the ZSR maps for [here](#) - are you surprised that some ZSRs might not include mapped flood zones?

Type your answer here...

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OK ✓ press Enter ↵

0 of 9 answered

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8 → Are there any particular community assets, such as critical facilities, historic resources, infrastructure, or public places, that play a regional role and should be included in a Zone of Shared Risk?

Type your answer here...

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OK ✓ press Enter ↵

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9 → Is there anything in particular, for either the CCVI of ZSR, that you would like to learn more about or think the Team should cover in this workshop?

Type your answer here...

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OK ✓ press Enter ↵

0 of 9 answered

Powered by Typeform ^ v

Thank you!

We look forward to seeing you at the workshop!

Submit press Ctrl + Enter ↵

Never submit passwords! - [Report abuse](#)

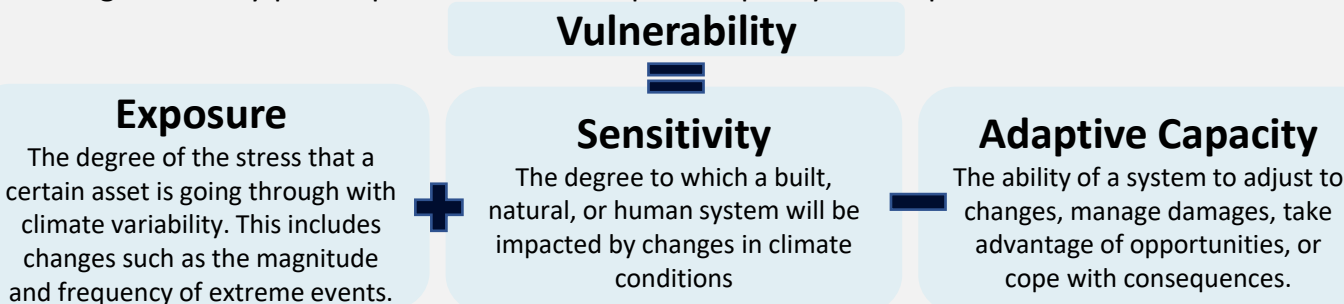
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Climate Change Vulnerability Index (CCVI)

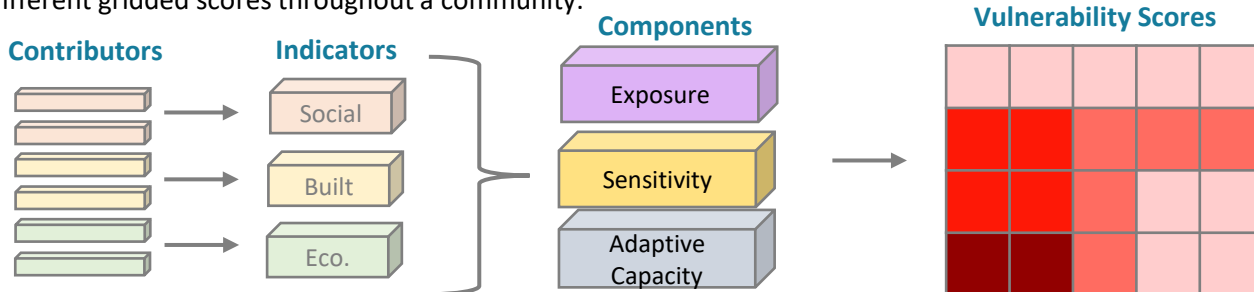
1 What is the CCVI?

An index-based spatial model that identifies community vulnerability to flood, wind, and heat-related impacts of climate change. The CCVI characterizes areas based on an equation using sensitivity plus exposure, minus adaptive capacity. The equation can be defined as:



2 How does it work?

The CCVI process is based on combinations of exposure, sensitivity, and adaptive capacity applied to thousands of grid cells. For example, the sensitivity component includes many different contributors that fall under three different indicators – social, built, and ecological. Each indicator has its own final “score” based on the average of the contributors. The average of the 3 indicators represents a score of sensitivity for one grid cell. This sensitivity score, along with final exposure and adaptive capacity scores, is used to calculate the vulnerability score, leading to many different gridded scores throughout a community.



3 What might these mean for municipalities?

In addition to other planning tools, the CCVI can be used to make educated decisions on future development and infrastructure investments. The tool will also help identify potential *Resilient Connecticut* pilot projects.

4 How can you play a role in developing the CCVI?

Stakeholders will be involved throughout the *Resilient Connecticut* process, and are encouraged to provide feedback to CIRCA on this and other tools that are a product of *Resilient Connecticut*. It is important to understand what works best for future users, so that these tools are tailored to the needs of Connecticut's communities.

Zones of Shared Risk (ZSR)

1 What are Zones of Shared Risk?

“Zones of Shared Risk” are regions that face common flood, wind, or heat-related challenges already, or caused by climate change. A Zone of Shared Risk (ZSR) includes land, buildings, and infrastructure as well as the hydrological, ecological, social, and institutional elements that contribute to the functioning of a place. Risks are shared among or between groups of people that may have different perspectives and priorities for resilience.

2 How does it work?

Each ZSR is identified by utilizing resources such as Natural Hazard Mitigation Plans, flood risk mapping, urban heat risk mapping, and **stakeholder input**. ZSRs can be large or small and may span municipal boundaries. ZSRs may be nested within one another. Therefore, a ZSR can be an indicator of local level concerns, but each ZSR can also be viewed from a larger perspective and the role it plays at a regional or watershed scale. How might the risks, and potential resilience strategies to address risks, cascade upstream and downstream of a particular ZSR?



3 What might these mean for municipalities?

In addition to other planning tools, the ZSR can serve as an overlay to help identify potential Resilient Connecticut pilot projects. This is also a useful tool when evaluating watershed level concerns, such as upstream or downstream actions and their impacts to other communities.

4 How can you play a role in developing the CCVI?

Stakeholders will be involved throughout the *Resilient Connecticut* process, and are encouraged to provide feedback to CIRCA on this and other tools that are a product of *Resilient Connecticut*. It is important to understand what works best for future users, so that these tools are tailored to the needs of Connecticut's communities.

Pre-workshop Materials to WestCOG
Sent January 21, 2021

EMAIL:

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This workshop will focus on understanding and exploring the tools being developed as part of Phase II of Resilient Connecticut, while also discussing how these tools can be refined to better suit the municipalities and stakeholders that will ultimately be using these planning resources.

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In addition, please take a few minutes to answer a few preliminary questions [here](#). In this pre-workshop form you will find links to some Resilient Connecticut resources you may find useful, including links to interactive mapping tools for the CCVI and ZSR which we will also cover in the workshop.

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[ZSR Maps](#)

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We look forward to seeing you Monday.

Resilient Connecticut



Thanks for taking the time to participate in the Resilient Connecticut WestCOG first regional workshop.

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Takes 7+ min

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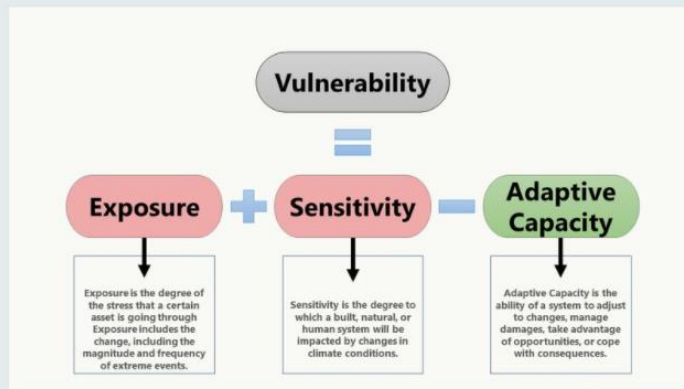
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OK ✓

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0 of 9 answered

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OK ✓

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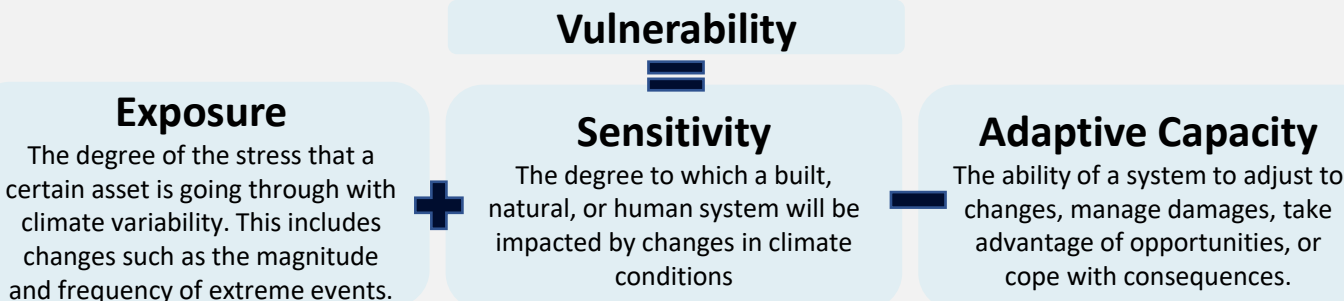
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Climate Change Vulnerability Index (CCVI)

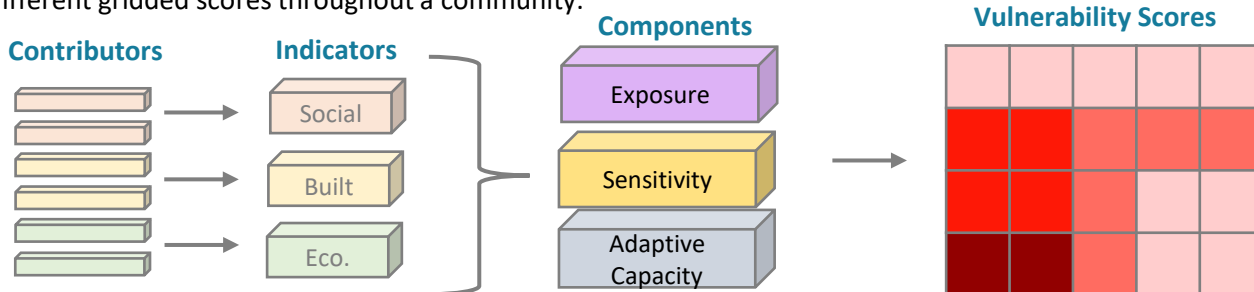
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3 What might these mean for municipalities?

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Zones of Shared Risk (ZSR)

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Pre-workshop Materials to SCRCOG
Sent January 27, 2021

EMAIL:

Good morning,

Thank you for registering for the first Resilient Connecticut Workshop: Climate Change Vulnerability Assessment and Regional Zones of Shared Risk. The first workshop is focusing on the SCRCOG region. You will find a link below where you can provide some feedback and workshop expectations.

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[CCVI Maps](#)

[ZSR Maps](#)

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We look forward to seeing you Friday morning.

Resilient Connecticut



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Takes 7+ min

Start

press Enter ↵

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Type your answer here...

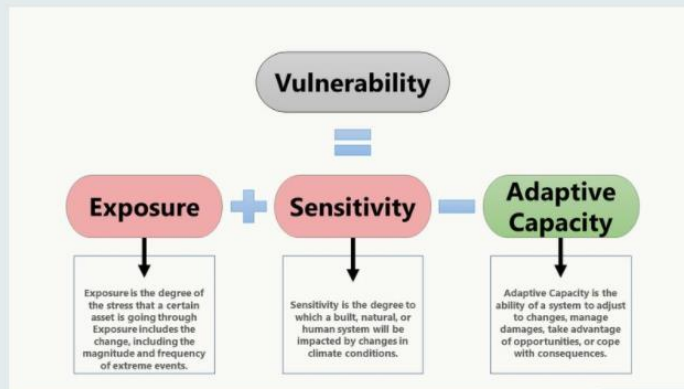
Shift ⌘ + Enter ↵ to make a line break

OK ✓

press Enter ↵



2 → The CCVI is being developed into a tool that municipalities can use to help identify different types of vulnerabilities in their communities and throughout the region for flooding, heat, and wind. The Team will be reviewing the preliminary version of this tool during the workshop; take a few minutes to explore some of that data [Here](#). The layers found in the tool represent the components to the equation below. Let us know below what information might help someone use this tool more efficiently, what is helpful, or anything else that can help the Team use the data.



0 of 9 answered

Powered by **Typeform** ^ v

3 → Based on your knowledge of the SCRCOG communities, are any areas known to be more vulnerable to flooding, heat, or wind? Provide some details if you can!

Type your answer here...

Shift ⌘ + Enter ↵ to make a line break

OK ✓

press Enter ↵

0 of 9 answered

Powered by **Typeform** ^ v

4 → If there are certain areas, are these well represented in the mapping tool, or were you surprised by the more (or less) vulnerable areas?

Type your answer here...

Shift ⌘ + Enter ↵ to make a line break

OK ✓ press Enter ↵

0 of 9 answered

Powered by **Typeform** ^ v

5 → Think about the equation for vulnerability and the terms exposure, sensitivity, and adaptive capacity. None of the three terms, nor their contributors, are given more or less importance in the equation. Do you think any one of the terms is more important for quantifying vulnerability?

Type your answer here...

Shift ⌘ + Enter ↵ to make a line break

OK ✓ press Enter ↵

0 of 9 answered

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6 → The Resilient Connecticut Team is developing Zones of Shared Risk (ZSR) - haven't heard of that either? That's OK! You can review the fact sheet sent along, or learn more at the Resilient Connecticut website [Here](#). Let us know if there is anything specifically you would like to learn about ZSR during the workshop below.

Type your answer here...

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OK ✓

press Enter ↵

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7 → Review the ZSR maps for [here](#) - are you surprised that some ZSRs might not include mapped flood zones?

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8 → Are there any particular community assets, such as critical facilities, historic resources, infrastructure, or public places, that play a regional role and should be included in a Zone of Shared Risk?

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Thank you!

We look forward to seeing you at the workshop!

Submit

press Ctrl + Enter ↵

Never submit passwords! - [Report abuse](#)

0 of 9 answered

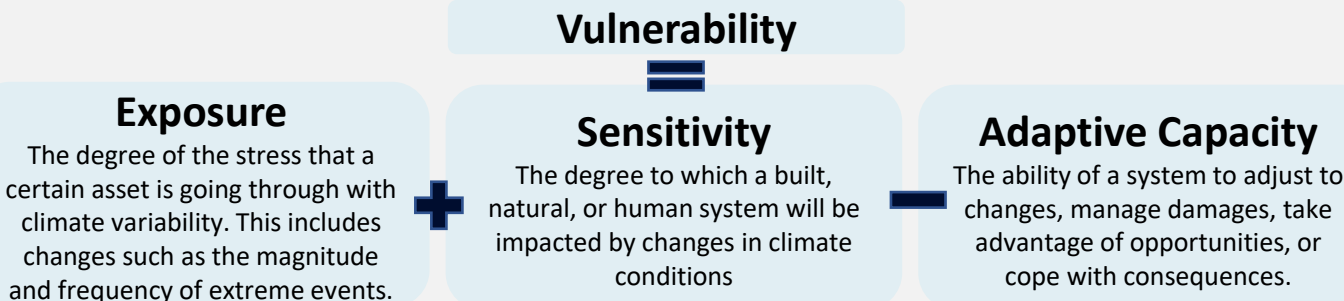
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Climate Change Vulnerability Index (CCVI)

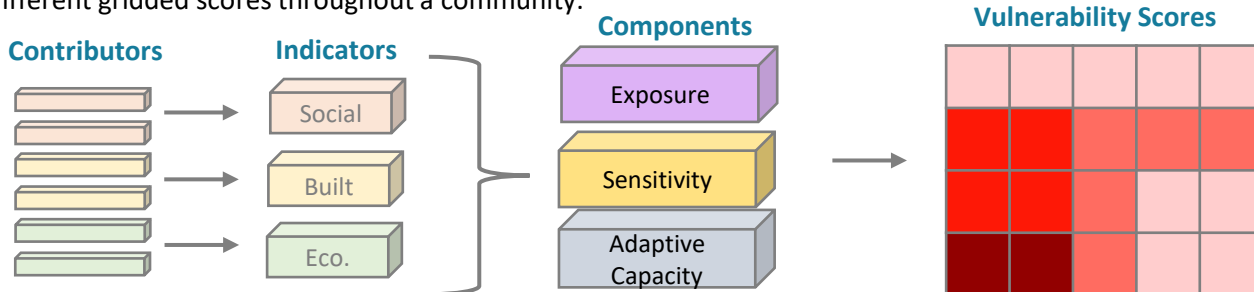
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Pre-workshop Materials to MetroCOG
Sent January 27, 2021

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We look forward to seeing you Monday morning.

MetroCOG Pre-workshop survey

Resilient Connecticut



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Takes 7+ min

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OK ✓

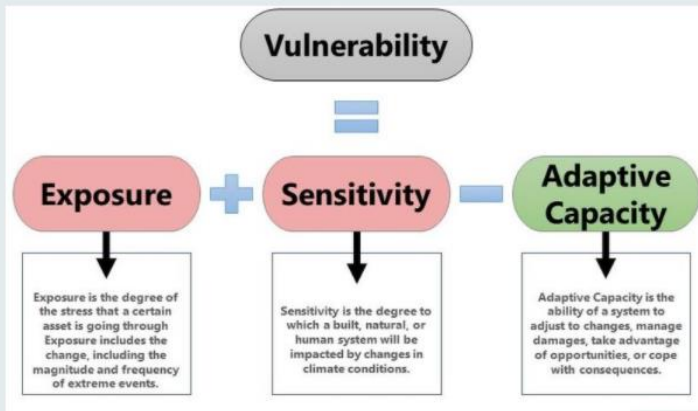
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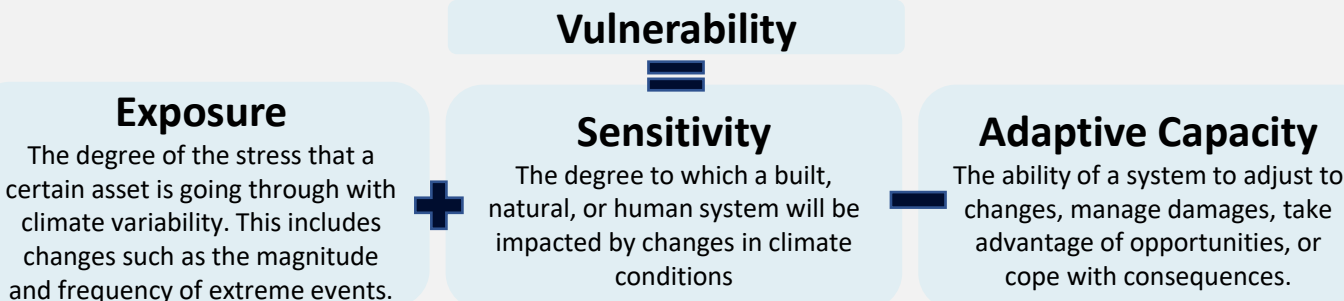
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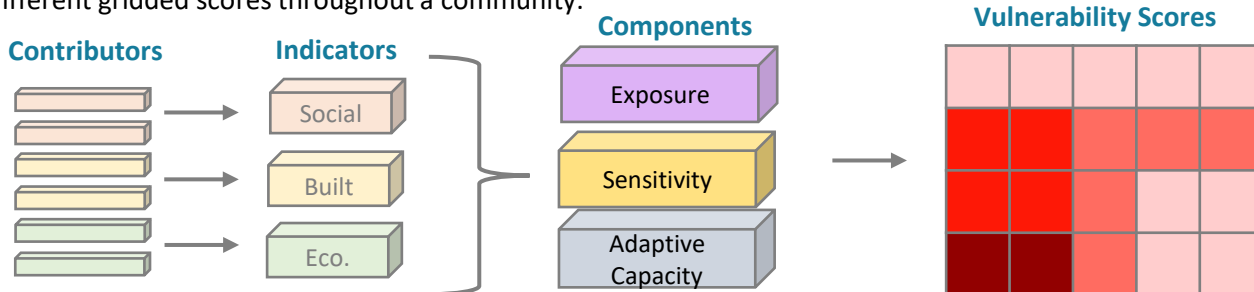
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Appendix B
Attendance Lists

Participants: NVCOG 1/22/21

12037207006
12037207042
Aaron Budris
Carol Haskims
David Murphy
David Simpson
deb denfeld
Elsa Loehmann
Glenda Prentiss
James Stewart
Joanna Wozniak-Brown
Johanna Greenspan-Johnston

John Truscinski
Katie Lund
Lori Rotella
Mary Barton
Noah Slovin
Richard Crowther
Roy Cavanaugh
Scott Choquette
Steven Wallett
Victoria Brudz
Yaprak Onat

Participants: WestCOG 1/25/21

12032570458
12038547956
19172704729
Alexis Cherichetti
Ali Mohseni
Amy Siebert
Benjamin Oko
Bryan Baker
Corey van Oostendorp
David Havens
David Kooris
David Murphy
Diane Mas
Francisco Gomes
Henry Paszczuk
Jackie Algon
James Michel
Joanna Wozniak-Brown
Johanna Greenspan-Johnston
John Truscinski

Kathryn Faraci
Katie Lund
Keith Wilberg
Manish Shah
Matthew Cassavechia
Michael Wrinn
Michelle Eckman
Michelle Perillie
Mike Conklin
Nicole Sullivan
Noah Slovin
Patrice Gillespie
Paul Hearn
Scott Choquette
Sharon Calitro
Steven Kleppin
Thomas Villa
victoria brudz
Yaprak Onat

Participants: SCRCOG 1/29/21

12038746321
Andrew Skolnick
Andy Cirioli
Anne Hartjen
Anthony Allen
Barbara Malmberg
Bonnie Potocki
Burton Guion
Carl Amento SCRCOG
Daria Larson
dave clark
David Anderson
David Murphy
David Sulkis
Eugene Livshits
Evan Breining
Henry Maguire
Indrani Ghosh
Isabella Schroeder
J. Andrew Bevilacqua
Jaime Stein
Janice Plaziak
Jeremy Grant

Joanna Wozniak-Brown
Johanna Greenspan-Johnston
john figurelli
JOHN HOEFFERLE
John Iennaco
John Truscinski
Joseph P Maco
Julia Carey-Ruiz
Katie Lund
Kevin Magee
MaryRose Palumbo
Peggy Lyons
Peter Alexander L.A.
Raju Vasamsetti
Rebecca Andreucci
Scott Choquette
Spencer Kinyon
Victoria Brudz
Walter Welsh
William Richards
Woodie Weiss
Yaprak Onat

Participants: MetroCOG 2/8/21

12032187745
12033854017
Annette Jacobson
Becky Bunnell
Bill Heiple
David Murphy
Dean Audet
Don Watson
Emmeline Harrigan
Hannah Reichle
Harold Watson
Jay Habansky
Jennifer Carrier
Jennifer Fogliano
Joanna Wozniak-Brown
Johanna Greenspan-Johnston

John Casey
John Truscinski
Katie Lund
Kelly Kerrigan
Laura Pulie
Louanne Cooley
Mary Hogue
MARY TOMOLONIUS
Meg Haffner
Meghan Sloan
Michelle Muoio
Noah Slovin
Rachel Hiskes
Richard Dmochowski
Sarah Cwikla
Scott Choquette

Shawn O'Sullivan
Susmitha Attota
Tatiana Solovey

Victoria Vetre
Yaprak Onat
Zach Giron

Appendix C
Workshop Meeting Notes

**NVCOG Workshop
Meeting Notes
January 22, 2021**

Breakout Room A

Attendance

CIRCA and Consultant Team:

- David Murphy, Milone & MacBroom, Inc./SLR Consulting
- Joanna Wozniak-Brown, CIRCA
- Johanna Greenspan-Johnston, Dewberry

Attendees:

- Carol Haskins, PRWC
- Deb Denfield, Fuss & O'Neill
- Lori Rotelli, Borough of Naugatuck
- Jim Stewart, Borough of Naugatuck
- Mary Barton, Town of Prospect
- Richard Crowther, NVCOG
- David Simpson, City of Waterbury
- Roy Cavanaugh, Town of Watertown

CCVI

- The group sequentially viewed sensitivity, exposure, and then adaptive capacity.
- Regarding sensitivity, David asked if there were any potential benefits to the availability of the CCVI. Carol responded that working with census data can sometimes be challenging, so **a tool that aggregates and depicts census data can potentially be helpful.**
- Regarding exposure, attendees compared and contrasted exposure scores with the underlying FEMA flood zone.
- David asked if the exposure could be used outside flood zones to make planning or project decisions. For example, could the tool be used to help site rain gardens in urban settings? Carol responded that other factors may be more important such as which parcels are owned by the City.
- Attendees noted the benefits of changing the transparency of the layers in the viewer.
- Attendees reviewed differences in adaptive capacity scores within Southbury.
- With reference to overall flood vulnerability scores, Carol noted that hillside shades tell a large part of the story. There may be **implications for using the CCVI in connection with hillside and slope land conservation planning.**
- Deb posed the question of whether scores will be helpful for pursuing funds or grants. The consensus was that they probably would not be directly useable, as the vulnerability scores are relative.

Zones of Shared Risk

- The group discussed the concept of drawing ZSRs for area of heightened wind risk. David asked attendees for ideas about where to obtain better information.
- Carol pointed out the **nexus between ZSR mapping and eventually developing maps of private well locations.**
- Carol posed the idea **that a “transportation corridor lens” is a helpful way to think about ZSR.**
- David asked the group how ZSR mapping can be helpful for planning. One potential use is with the updates of hazard mitigation plans. Joanna noted that the ZSR maps can help state agencies with planning, grant programs, and deciding about whether to recognize or invest in TOD areas (i.e., use ZSR as criteria for TOD).
- Richard explained that he was conducting a regional buildout analysis for NVCOG and hypothesized that the ZSR maps could potentially be useful.
- Katie asked attendees to identify common threads and think regionally.

Breakout Room B

Attendance

CIRCA and Consultant Team:

- Victoria Brudz, Milone & MacBroom, Inc./SLR Consulting
- Scott Choquette, Dewberry
- Katie Lund, CIRCA
- John Trucinski, CIRCA

Attendees:

- Steven Walleth, DPH Drinking Water
- Aaron Budris, NVCOG
- Jim Stewart, Borough of Naugatuck
- Glenda Prentiss, NVCOG
- Elsa Loehmann, self

CCVI

- The group was asked to provide input on the relative importance of sensitivity, exposure, and adaptive capacity. Aaron noted that exposure is the most apparent and commonly understood by users. It was noted that for a planner, the flood exposure data is therefore most apparent, and might be the most useful, while sensitivity and adaptive capacity might be less useful.
- James Stewart raised a question about how riverine structures on the Naugatuck River factored into Adaptive Capacity, and time was spent on that layer investigating. It was explained that this was picked up in adaptive capacity and was distributed to several cells surrounding the systems in place. Victoria noted that this is a great example of identifying an area that is protected but may have other sensitivities or types of exposure.

- Aaron noted that the CCVI would be useful to assist in screening and ranking applicants for funding sources. For example, this tool might be useful with an overlay of potential project areas. In addition to the traditional "yes/no" questions, the CCVI can provide a little more insight into the project location and help with scoring.
- There was discussion about the utility of being able to overlay the SFHA.
- James Stewart suggested adding brownfields as a contributor. Victoria explained that this had not been done, and they were being looked at with ZSR, however, it would be worth exploring incorporating this data into sensitivity or exposure.
- John T asked how PW departments prioritize projects that address flooding.
 - It was noted that it is usually addressed in small components as funding is available.
 - James Stewart added that most areas are known and pretty obvious, for example drainage issues in the TOD area.
- Steven W. asked how critical facilities were identified.
- There was discussion about whether planned larger projects that may be impactful in terms of vulnerability were included, followed by discussion of whether they could be in the future. In order to fully understand the CCVI, participants would really need to explore the data more fully; however, it may be a useful tool to help determine what is driving the issues (i.e., impervious surfaces, over-development, or undersized culverts).
- There was discussion and an examination in the tool of shared flood risk between Waterbury and Shelton.
- Overall, attendees noted that the CCV would be a useful screening tool for projects, to help score projects, and for grant applications.

Zones of Shared Risk

- Attendees were asked if there were any general questions regarding the ZSR methodology; however, there were none. The preliminary ZSRs were then reviewed in the mapping tool. Attendees notes that at first glance, the mapping appeared to capture most vulnerable areas.
- Discussion continued with talk of regionally important facilities outside of the project area, such as the Waterbury Bus Terminal in Watertown¹.
- Similar regionally significant facilities such as wastewater facilities that service multiple towns were discussed; how do you depict the ZSR?
- It was noted that the ZSR may be useful in some cases for planning and prioritizing the acquisition of open space.
- In terms of TOD, the ZSR could help inform type of development in certain areas or could direct development to nearby safer sites.
- ZSR could be good for grants and planning, but probably not for development decisions.
- James suggested "tightening up" the ZSRs base on topography where appropriate, to truly capture elevation changes and remove lower risk areas.
- Katie asked if it would be useful to have more of a participatory process with the towns in developing the ZSR, and the consensus was yes, this would be helpful.
- Time was spent navigating the map tool. James suggested Cherry Street flooding and other small areas could be added.

¹ Watertown is located in Litchfield County

- The question was raised about the utility of combining ZSR with the CCVI. One response was that it would not add a lot of additional benefit.
- John suggested broadening the context and looking at what are the uses in the floodplain; who is there; what do they rely on, etc.? Regional significance was discussed based on John's comment.
- Power substations that serve multiple pumping stations were given as an example of regional importance. How do you capture the extent of vulnerability or the ZSR for the impacts of a small site like that?

**MetroCOG Workshop
Meeting Notes
February 8, 2021**

Fairfield Breakout Room

Attendance

CIRCA and Consultant Team:

- David Murphy, Milone & MacBroom, Inc./SLR Consulting
- Yaprak Onat, CIRCA

Attendees:

- Emmeline Harrigan, Town of Fairfield
- Laura Pulie, Town of Fairfield
- Becky Bunnell, Town of Fairfield FECB
- Dick Dmochowski, Town of Fairfield FECB
- Mary Hogue, Sustainable Fairfield Task Force
- Annette Jacobson, Town of Fairfield
- Meghan Sloan, MetroCOG
- Shawn O'Sullivan, Sustainable Fairfield Task Force

CCVI

- The Town requested focusing on the Camden Street/Rutland Avenue/Royal Avenue area located between the Rooster River and I-95. This area has long been challenging due to the flood risk and limited egress. The Town is generally supportive of acquisitions in this neighborhood. **High vulnerabilities in the CCVI could be supportive of acquisitions.** However, the color schemes in the neighborhood do not appear to be aligned with the vulnerabilities and risks. The floodway cells are not ranked highest, but likely should be ranked highest. **The Town would be supportive of floodway cells being ranked as highly as VE zone cells, given the highest flood risks associated with floodways and VE zones.**
- Brooklawn Parkway was checked next, given the presence of floodways. This area appears to have the same potential problem. **David noted that floodways will be checked in the CCVI.**
- Laura Pulie noted that downtown Fairfield risks are being addressed in accordance with the green infrastructure plan. Porous pavement (36,000 sf) has been installed in the train station parking lot.
- The shoreline was viewed. Marshes appear to have a lighter CCVI color due to the absence of buildings.
- Attendees asked how the grid cell size was determined. Yaprak explained that the goal was to have cells smaller than census tracts and blocks (where social data comes from) but not too small.
- Attendees asked why darker colors were located offshore. **David noted that it may be reasonable to clip the cells that are mostly water.**
- Overall, attendees were **concerned about the high variation in colors (scores) in the broad coastal floodplain of Fairfield.** The Town views this area as having a relatively uniform flood risk, and

pointed out that the flooding was Sandy was uniform in this area. David noted that adaptive capacity may be a factor that contributes to the high variability.

- **Emmeline recommended checking the figure for flood policies in force, as the Town believes it has recently changed to a lower number.** The Town has not determined why insurance policies in force are decreasing.
- Flood sensitivities in the broad coastal floodplain were viewed from cell to cell. The Town cautioned that **building densities should be determined from building footprints** and not from land use or zoning layers.
- The **rankings for presence of septic systems do not make sense, and this should be checked, as this area is entirely sewered.** The cell in question is very close to the sewage treatment plant, in fact.
- The Town again stated that the cells in the coastal floodplain should have similar vulnerability scores, even with the understanding of the contributing layers. **This led to a discussion about whether weighting was a process that could help provide some uniformity across this floodplain.** Depending on the coefficients (weights) used, and to which layers they are applied, the CCVI could appear differently in this area. For example, weighting the FEMA flood zones more heavily would give that layer more significance in the scoring.

Zones of Shared Risk

- David opened the session by explaining that a heat-based ZSR was not available for Fairfield, but additional work in this area could be helpful in determining whether this is appropriate. He noted that the TPL viewer tool had missed Fairfield.
- Becky asked whether ZSR mapping would be further developed by working with neighboring towns in the region.
- Attendees discussed how to draw boundaries. They recommended that boundaries be brought outward in some cases. For example, the ZSRs near the railroad tracks should be extended all the way to the railroad tracks.
- David asked attendees about smaller vs. larger ZSR sketching. He asked if attendees would keep the downtown Fairfield ZSR as a separate ZSR, or should it be merged with the broader/larger coastal floodplain ZSR. The Town favored **keeping it separate because it underscores that the challenges are unique in the downtown area.**
- The Rooster River corridor was viewed. **The Camden Street/Rutland Avenue/Royal Avenue neighborhood discussed earlier during the CCVI session might be a good location for a nested ZSR, as it would highlight the enhanced risk in that neighborhood. Moving outward from this area, the Town recommended identifying the Nathan Hale Street area as separate than Camden Street/Rutland Avenue/Royal Avenue.**
- **Emmeline asked if ZSRs were meant to imply a typology and David responded in the affirmative.**
- Emmeline recommended that **ZSRs could be used for actions such as downzoning.** Downzoning in New York City was considered to change zoning from multi-family to single-family, to eventually reduce the risk by reducing the potential for losses. This could be considered in ZSRs in Connecticut.
- Emmeline noted that the TOD plan for Fairfield Metro was adopted in 2019.
- Emmeline recommended checking for the LOMR for the MetroCenter-owned parcels. Becky inquired about whether **removing parcels from the FEMA flood zone would remove them from a ZSR. David indicated this was not necessarily the case.**

- David reminded the attendees of Meriden Green as a resilience opportunity that “could have” come from ZSR mapping, and asked if anything similar could be identified. Emmeline responded that the Metro Center TOD area is an example of where people could be relocated from areas of higher risk. Approximately 500 units are proposed at the moment. Developers around the MetroCenter train station are actively looking for more property to develop, and the Town is viewing a lot of activity along Kings Highway. However, **dry access to the Fairfield Metro railroad station could be improved.** Laura mentioned nearby past flooding (depth three feet) on Chambers Street. Overall, **the TOD area needs to be more resilient.**
- Regarding ZSR typologies, Emmeline recommended that **all railroad underpasses in all the towns should be identified as a new type of ZSR.** This will help advance them to a higher level of consideration. David noted that this had come up in Darien.
- The Mill River corridor was viewed. The Town noted that significant open space is located along the river, but some risks may still be present. Laura noted that most neighborhoods along the Mill River have adequate egress. Many dams are located upstream.
- Rooster River was discussed. The Town believes that DEMHS is supportive of acquisitions to reduce risk at individual buildings, but also to the extent that groups of acquisitions can be used to set aside land for floodplain storage. The Town asked if there was a **suitable ZSR typology that could help advance these types of projects and the necessary acquisitions.** The discussion continued, and the Town explained that residents understand how to elevate coastal homes but do not understand the implications of elevating homes with riverine flood risk, because the risk profile is so different. In summary, the **Town recommended that ZSR typologies should lead to predictable types of projects.**

Bridgeport Area Breakout Room

Attendance

CIRCA and Consultant Team:

- Scott Choquette, Dewberry
- Johanna Greenspan-Johnston, Dewberry
- Katie Lund, CIRCA

Attendees:

- Dean Audet, Fuss & O’Neill
- Don Watson, EarthRise Design
- Hannah Reichle, MetroCOG
- Jennifer Fogliano, NJTPA
- Mary Tomolonius, CT Association for Community Transportation
- Rachel Hiskes
- Tatiana Solovey, Town of Trumbull
- Zach Giron, MetroCOG

CCVI

- The only town directly represented was Trumbull.
- Don Watson noted that the CCVI will be great as a planning tool but potentially too complicated to communicate to the public and politicians.
- Rachael agreed that the tool would be good at the planning level, especially regionally.
- The impacts of debris on flooding, particularly at the shoreline, should be added as a contributor.
- Jennifer Fogliano (Northern NJ Transportation Planning Authority) discussed the Passaic River Watershed Resilience Study, specific to transportation as having some parallels that may inform Resilient Connecticut.
- Tatiana S. (Trumbull) thought developers are focused on regulation only and would not welcome the additional vulnerability analysis as part of site consideration/design/development.
- A discussion ensued about using the tool for larger scale planning purposes vs. regulatory purposes.
- Related to the ecologic indicators, there was discussion of including wildlife connectivity corridors, specifically the Trumbull & Monroe wildlife corridor along the Pequannock River. That area was explored with the viewer and contributors discussed further.
- It was noted that a more user-friendly naming convention for the menu of contributing factors would be beneficial.
- It was further noted that for each layer (E, S and AC) that the contributors in the explanation pane should be click-linked to areas that would provide an example.

Zones of Share Risk

- The group agreed that for projects that transcend multiple municipalities, the tool would be useful to make connections.
- There was discussion about how examining multiple hazards might change the equation (both ZSR and CCVI). An example was provided involving sheltering in place for the pandemic as opposed to distance to shelters as a contributor, and how that might change the vulnerability outlook.
- Invasive species at Dogwood Lake will impact Stratford.
- Development around the Westville Mall (Trumbull Mall) increases vulnerability [flood risk] in downstream Fairfield. The area was viewed, the discussion included some ZSR, and additional ZSRs were offered for consideration.
- Nested ZSR and adjacent ZSR were reviewed and discussed.
- There was a discussion about how to better delineate heat. As portrayed, the heat-based ZSRs do not offer much.
- The question was posed how will we use the ZSR to identify actual projects with an emphasis on regional approaches? A discussion ensued about the need to drill down further into the problems creating risk, and using the tool for screening and then moving to other studies.
- Regarding critical facilities:
 - It was noted that landfills should be included as critical facilities.
 - Senior living facilities should be included.
 - A “ring of color” or some other method of highlighting should be used around critical facilities to call more attention to them.
 - There was discussion about where critical facilities came from and an opinion that use of FEMA-recognized critical facilities should be used for consistency.
- Don was interested in how the ZSR mapping interacts with the State EOP.

- There was a suggestion that ZSR be renamed to emphasize “opportunities.” Scott explained how the transition from ZSR to opportunity zones was coming as a next step.
- The need for more one-on-one community engagement from towns on ZSR was identified as very important.

Stratford Breakout Room

Attendance

CIRCA and Consultant Team:

- Victoria Brudz, Milone & MacBroom, Inc./SLR Consulting
- John Trucinski, CIRCA
- Joanna Wozniak-Brown

Attendees:

- Harold Watson, EarthRise Design
- Michelle Muoio, City of Bridgeport - Sikorsky Airport
- Louanne Cooley, UConn
- John Casey, Town of Stratford
- Kelly Kerrigan, Town of Stratford
- Susmitha Attota, Town of Stratford
- Jay Habansky, Town of Stratford
- Bill Heiple, Stantec

CCVI

- Attendees were asked if there were any general questions regarding the CCVI or the presentation.
- There was a general comment that all infrastructure in coastal areas will be at risk.
- One attendee asked how we are prioritizing data so this can be used for funding. There was a concern that some areas that may be “less vulnerable” according to the CCVI, but that do have a degree of risk, may be discounted for funding.
 - Attendees discussed that the next phase of the CCVI could include weighted scenarios which may address this concern. For example, the question was raised regarding infrastructure (built contributors) can be weighted more heavily than other in certain scenarios.
- It was pointed out that weighting could be useful, especially in a town like Stratford which is very dynamic and has diverse and vulnerable populations, industrial use, etc.
- A question was posed regarding the collaboration between the Town and Sikorsky Airport by way of resilience projects. The airport has developed a Master Plan which included plans to address questions surrounding sea level rise and coastal flooding concerns. The town provided comments on the Plan, many of which would have aligned the master plan with hazard mitigation plan and coastal resilience plan goals. Some of the notable points or projects include:
 - A marsh restoration project
 - Address the flooding along Main Street.
 - A nearby elevation project

- The town is currently pursuing a BRIC grant for a repetitive loss area analysis.
- The WPCF is building a dike with FEMA funding.
- There are significant risks to environmental justice communities.
- The various flooding scenarios were discussed as to what they represent. An attendee asked whether the CCVI included washover flooding scenarios, especially since flooding approaches from multiple sides and a large physical barrier for flooding from one direction is not a complete solution.

Zones of Shared Risk

- Attendees were asked if there were any general questions regarding the ZSR or the presentation, and what is the current situation regarding TOD in Stratford.
- It was noted that the town has approved approximately 500 units within the TOD area. With some already having been constructed, the town is working on “complete streets” implementation with 60% in design phase. Two greenways are being considered. A corridor study is being conducted for Barnum and Main Streets to include more mixed use and pedestrianized corridors.
- Another project discussed was the elevation of Broad Street over Ferry Creek. In this same discussion, a ZSR concern was raised as to the lack of connection between the Town Center zone and the Ferry Creek zone. There are drainage concerns throughout this area that may want to be considered with a larger zone delineation. There is a pump station on Broad Street for the neighborhood.
- The attendees were asked if Stratford has a designated evacuation route for the Lordship area. The route was described as situational. While this flexibility allows the town to make prudent decisions, it can also pose a challenge to residents when planning emergency response without the specificity. The town would like to elevate greenways, especially along Access Road, with dikes as part of this implementation.
- An attendee noted that sequencing all of these planning activities and efforts is a challenge, and posed the question “Where does a municipality start? With policy changes or with specific projects?”
- What needs to happen to help establish a long-term vision for how projects and plans fit together and could be sequenced?
 - Getting ZSR information in front of elected officials and the public in ways that can be more widely understood would help to build political support and urgency to move things beyond the Town’s coastal resilience plan and hazard mitigation plan.
 - FEMA maps are widely understood and accepted; something like the ZSR should be pushed into “common knowledge”, especially for new people moving to the area, and be accepted as a planning/regulatory tool.
 - It was also noted there should be certain considerations for low-income areas that have a flood risk and have invested a lot into their homes for flood protection.
- The Massachusetts MVP program was raised as an example of a potential vehicle for incorporating some of these tools into a state-funded planning process.
- An attendee from Stratford Planning mentioned a general desire to better coordinate with surrounding towns on these issues, particularly wanting to know if the Resilient Bridgeport project could be expanded to include Stratford.

- Bruce Brook along the Stratford/Bridgeport line was noted as a regional issue; this brook often floods and impacts both municipalities. The town is pursuing a grant to conduct a Bruce Brook watershed scaled plan.
- These products should be coordinated with regulatory or advisory updates such as the Emergency Operations Center at the state, into local NHMPs, the Community Rating System. Rollouts and other information-sharing efforts should utilize existing tools and meetings.

**SCRCOG Workshop
Meeting Notes
January 29, 2021**

Branford/Guilford/Madison Breakout Room

Attendance

CIRCA and Consultant Team:

- David Murphy, Milone & MacBroom, Inc./SLR Consulting
- Yaprak Onat, CIRCA
- Katie Lund, CIRCA

Attendees:

- John Hoefflerle, Town of Branford
- Kevin Magee, Town of Guilford
- Janice Plaziak, Town of Guilford
- Peggy Lyons, Town of Madison First Selectman
- David Anderson, Town of Madison
- Hank Maguire, Town of Madison Coastal Resilience Commission
- John Iennaco, Town of Madison Coastal Resilience Commission
- Joseph Maco, Town of Madison Coastal Resilience Commission
- David Clark, Town of Madison Coastal Resilience Commission
- David Clout, Town of Madison Coastal Resilience Commission
- Walter Welsh, Town of Madison Coastal Resilience Commission
- Daria Larson, SCRCOG
- Evan Breining, Town of Branford
- Rebecca Andreucci, SCRCOG
- Woodie Weiss, Town of Madison Coastal Resilience Commission

CCVI

- The group started in Branford, moved to Madison, and then ended with Guilford. Specific comments were not offered by attendees during the Branford focus.
- The group focused on Surf Club. Peggy explained that the Town of Madison is developing a master plan for Surf Club Beach, and it would be helpful if the CCVI could be used to develop spatial recommendations in the master plan.
- Hank noted that one very light color cell is located at Surf Club. This appears to be due to the sensitivity score. The adjacent darker cell has a building, which is why it has a higher sensitivity.
- John asked to view Post Road.
- Moving onward to Guilford, David asked Kevin Magee to comment on how the CCVI could be used for TOD planning. Light and dark cells were individually explored along Whitfield Street, which extends southward from the railroad station. Attendees noted that TOD would be challenging in this area.

- **Katie reminded attendees that the CCVI scale is very small when viewed at this level, and it is important to step back and look at regional patterns.**
- Janice asked if the tool would be available for review after the workshop.
- Back in the main group during the report-out, Katie reminded attendees to provide feedback after the workshop.

Zones of Shared Risk

- Janice noted that **showing areas of isolation was** very helpful.
- David asked attendees to comment on sizes and shapes of the ZSRs while viewing them. Janice noted that they appeared to be reflecting risks to the built environment.
- Joseph noted the “elephant in the room” that **TOD is not feasible if railroad stations have flood risk**. David explained that Resilient Connecticut was the type of project that may help address this challenge. Yaprak noted that the regional perspective afforded by the project could also help address this challenge.
- Nested ZSRs were viewed in Madison and the group reviewed the four types of ZSRs (location, proximity, access, and natural).
- Attendees asked why Middle Beach Road was identified as a ZSR and David explained that this came partly from the risks identified in the Madison Coastal Resilience Plan. Wave energy and flooding are risks for Middle Beach Road.
- David Anderson noted that he recognized the **value of ZSR concepts for “neighborhood scale” planning**.
- David C explained that this type of planning and **identification of ZSRs can help Associations cobble together resources and clout for pursuing projects**. Joe M noted that Madison Property Owners Association may be defunct, but smaller associations are present.
- Walter asked how Clinton can be addressed, given the lack of ZSR mapping? David noted that this was indeed a limitation, but perhaps the regional scale planning aligned with Resilient Connecticut could help address needs in Clinton.
- Janice asked is any riverine-based ZSRs had been identified, and the group viewed them.
- David C explained that trees and tree limbs on roads, blocking access, is truly a prevalent hazard for these communities. He asked if there had been any progress in this area. David noted that CCVI for wind risks is forthcoming. Yaprak noted that utility companies may be able to provide some information.
- Janice noticed **many risk factors near the Guilford railroad station**. Access can be challenging, and the town lacks sewers, which means that properties rely on septic systems.
- Kevin explained the Guilford will share risk-based maps with people who intend to buy property.
- David asked about the former “sawpit” property in Guilford and posed the question, should this be a ZSR given its past development potential while being surrounded by tidal wetlands. Kevin responded that yes, **drawing that type of ZSR could help with future grants. Janice also said yes, that delineating natural ZSRs can help with projects along the West River and East River.**
- John H of Branford explained that some **natural lands-based ZSRs could help identify lands to set aside**.

Milford Breakout Group

Attendance

CIRCA and Consultant Team:

- Scott Choquette, Dewberry
- Johanna Greenspan-Johnston, Dewberry
- Joanna Wozniak-Brown, CIRCA

Attendees:

- Andrew Skolnick, Harlow, Adams & Friedman
- Andy Cirioli, SCRCOG
- David Sulkis, City of Milford
- Eugene Livshits, SCRCOG
- Jeremy Grant, City of Milford
- MaryRose Palumbo, City of Milford
- Spencer Kinyon, Save the Sound

CCVI

- Ratcheting the weighting up and down depending on interest (e.g. ecological vs. infrastructure) would be useful
- David indicated that CCVI could be valuable at informing the update to the Milford POCD.
- A comment was made that the tool is too complicated, and therefore getting the average person to understand the tool will be difficult.
- Milford attendees noted that since its most desirable areas are along the shoreline where vulnerability is highest, the tool could present political challenges.
- Spencer (Save the Sound) appreciated the social vulnerability components and indicated the layer is consistent with work they are engaged with. He further suggested that in addition to environmental justice, access points to the shoreline should be considered.
- Spencer asked if the public or non-profits would be able access the data; the answer was generally yes, after some additional review.
- John Figurelli suggested using a wider range of colors to depict vulnerability would be useful.
- Eugene indicated that the tool would be valuable from the regional planning perspective and useful from a wider scale range, and he mentioned the multi-jurisdictional HMPs.
- Consistent with other COG sessions, the question came up about maintenance and how future resilience projects will change the CCVI.

Zones of Share Risk

- A demo of the tool proceeded, looking at areas around the Beaver Brook WWTP and transit-oriented development areas. Specific areas were requested by attendees. Beach areas, the two WWTPs, and mall areas were reviewed by the group and thought to be generally accurate.

- There was discussion about a regional ZSR area where both Orange and Milford made improvements to bridges on Flax Mill Lane.
- John F. gave an example (in reference to one of the nested ZSR) of a WWTP on Cape Cod that was safe when looked at in isolation but had access/egress issues during storms, presenting maintenance and operation challenges and causing the loss of service to a large area.
- The group appreciated that hazard mitigation projects from the HMP were shown on the mapping, with attributes.
- The question again was raised dealing with whether completed projects will be identified on the mapping.
- The tool was believed valuable from a visual perspective and for helping Aldermen and citizens visualize problem areas. A comment was made that ZSR will be a valuable planning tool for POCD, HMPs, TOD, etc.
- A wind study by Cornell University, studying viability of wind power, was cited as a potential source of data for wind-based ZSRs. Correlating with direction from storm bearing may be useful for wind ZSRs.
- Being able to see that travel to shelters is impaired by certain events will inform evacuation planning.
- With reference to TOD, three different bus systems service the CT Post Mall and serve more purposes than just shuttling people to and from the mall. A recommendation was made to review and include more of the mall area in the existing ZSR at that location.

New Haven/I-91 Corridor Breakout Group

Attendance

CIRCA and Consultant Team:

- Victoria Brudz, Milone & MacBroom, Inc./SLR Consulting
- John Truscinski, CIRCA

Attendees:

- Jaime Stein, City of New Haven
- Anthony Allen, Save the Sound
- Julia Carey-Ruiz, Desegregate CT
- Bonnie Potocki, Consultant
- Indrani Ghosh, Weston & Sampson
- Anne Hartjen, City of New Haven
- J. Andrew Bevilacqua, Town of North Haven
- Burton Guion, SCRCOG
- Isabella Schroeder, GNHWPCHA

CCVI

- Attendees were asked if there were any general questions regarding the CCVI or the presentation.
- One attendee asked how we are prioritizing and ranking the data. It was explained that statistics are one of the primary drivers for the rankings. Social data rankings are derived based on census percentiles, along with other data types. One participant noted the value in having the latest updated census data in the tool and having the maps available.
- One participant raised the question as to whether the latest North Atlantic Aquatic Connectivity Collaborative (NAACC) data was incorporated into the tool. It was not included in this draft CCVI, however the Resilient Connecticut team agreed it was worth evaluating the potential incorporation.
- An attendee asked if dams were incorporated into the tool. It was noted that dams were not, due to the challenges of spatially representing the dams in the grid style analysis. Participants agreed that it might be useful to at least have the dam location and classification incorporated into the analysis in some way.
- A discussion was had on whether the CCVI was capturing certain types of infrastructure that pose debris challenges, such as culverts and bridges. It was noted that during SuperStorm Sandy that debris damage was a major issue. Because the CCVI is an index, and not a “what if” model, it would be challenging to incorporate debris movement. However, incorporating infrastructure that is affected, if data exists, would be worth exploring.
- A participant noted that if there is certain benchmark or baseline data on flood damages, then this might be worth exploring for incorporation.

Zones of Shared Risk

- Attendees were asked if there were any general questions regarding the ZSR or the presentation.
- It was asked why ZSR were sketched with a certain blindness to social vulnerabilities, and how easily can this be built back in. The team explained that ZSR are meant to identify the actual physical risk to an area, regardless of social vulnerabilities to avoid a biased identification. However, this is a primary example of when the ZSR may want to be used in conjunction with the CCVI – to unpack the social sensitivities in a certain zone. A participant shared concern of these tools shifting vulnerabilities to more vulnerable neighborhoods, and this is a good opportunity to “clump” areas across certain boundaries.
- Participants were asked how they might see using this tool. One attendee noted that ZSR shows potential for being used during zoning decisions, such as how neighboring zoning types may be impacted by the presence of a certain ZSR. This might also be useful for POCD development in identifying areas where shovel-ready projects could be at the forefront of planning efforts.
- One attendee noted the importance of specific population type zones. The example presented was that several elderly housing facilities were out of power post-Sandy, leaving the facility without elevator capabilities, essentially stranding residents in high rises.
- The group reviewed the area around Tweed Airport that includes sections of New Haven and East Haven. It was noted that having previous NHMP actions included on the map is helpful to see how different projects that surround the area might fit together or negatively impact each other. The area was noted as an example of a “regional” zone of shared risk that includes a major

transportation facility along with surrounding local areas in each municipality that contain roads and homes at risk.

**WestCOG Workshop
Meeting Notes
January 25, 2021**

Danbury Area Breakout Room

Attendance

CIRCA and Consultant Team:

- David Murphy, Milone & MacBroom, Inc./SLR Consulting
- Yaprak Onat, CIRCA
- Katie Lund, CIRCA

Attendees:

- Corey Van Oostendorp, City of Danbury
- Henry Paszczuk, DEMHS Region 5
- Kathryn Faraci, CT DOT
- Matt Cassavechia, City of Danbury
- Nicole Sullivan, WestCOG
- Sharon Calitro, City of Danbury
- Benjamin Oko, Ridgefield Energy Task Force
- Francisco Gomez, FHI

CCVI

- Benjamin asked if there had been any effort to ground-truth the CCVI results. David explained that ground-truthing was one of the reasons for the workshop, and that additional efforts will be made.
- Sharon asked if FEMA flood zones should appear darker. The group zoomed in to view several cells in the downtown Danbury area, and compared/contrasted different colors and scores for cells located in and adjacent to flood zones. The viewer tool appears to **mostly represent flood zones well, with regard to the shading.**
- Sharon asked about the date of the census data. David explained that the baseline date is 2010, but that census-published updates were used. David asked **if attendees would use this tool in lieu of directly accessing census data, and attendees indicated that they would use whatever was easiest to access and understand.**
- David asked attendees how the CCVI could be used, and posed the question of whether users would look for the darker colors (higher vulnerabilities) or look for patterns at a regional scale.
- Matt explained that Danbury is becoming a **StormReady community, and asked how the CCVI could be used for that?** David explained that the tool is best used for planning prior to storm events, so it was not clear that the CCVI could be directly useful for StormReady participation.

Zones of Shared Risk

- David explained the general premise of ZSR mapping and asked if watercourses like Kohanza Brook should be included. Sharon and Matt indicated that **Kohanza Brook should likely be given a ZSR.**

- David asked about whether small ZSRs should be joined or whether larger ZSRs should be broken up. What are the pros and cons of both approaches? Attendees said they might as well be drawn separately but generally noted that either approach could make sense.
- Matt asked how critical infrastructure is considered in ZSR mapping. **Attendees agreed that critical infrastructure is important to consider. Sharon said, for example, that the wastewater treatment plant cannot be moved, but the City would look at siting of fire stations differently than siting a wastewater treatment plant. If the City wanted to move a fire station downtown, the City might look at something like the ZSR maps.** The City could also use ZSR mapping to help with revisions to regulations.
- Attendees viewed and discussed the orange and brown points (hazard mitigation plan projects and historic resources, respectively).
- Attendees viewed and discussed ZSR maps in the Branchville area, where TOD is desired.
- David asked about Brookfield, which does not currently have TOD potential, but where rail extension is possible. **Matt explained that this highlights the regional nature of this effort. Brookfield residents use the hospital in Danbury. If people in Brookfield cannot access the hospital, then serious consequences can occur.** Another example is the emergency boat situation, with current limitations at Candlewood Lake. They are forced to pre-plan lake response.
- Sharon concurred. **Transportation corridors are critical,** and the rail might be extended to New Milford.
- Sharon explained that tree and tree limb damage from wind events is a constant concern. Ben asked what the team was using for wind-based ZSR. David explained the challenges associated with drawing these, such as the lack of spatial information from utilities.
- Matt explained that his team was **reviewing shelters in Danbury. He noted that regional shelters are important considerations.** If trees are down on roads, access is impeded.
- Sharon suggested that the **National Weather Service be contacted for information. Additionally, Eversource may be able to explain where outages have been the longest in duration.** Yaprak indicated that CIRCA received some wind data from Eversource.
- Sharon recommended **checking with the airports,** as well.

Stamford Area Breakout Room

Attendance

CIRCA and Consultant Team:

- Scott Choquette, Dewberry
- Johanna Greenspan-Johnston, Dewberry
- Joanna Wozniak-Brown, CIRCA

Attendees:

- Ali Mohseni, MHSTCC - NYMTC
- Amy Siebert, Town of Greenwich - DPW
- David Kooris, Stamford Downtown
- Diane Mas, Fuss & O'Neill

- James Michel, Town of Greenwich
- Paul Hearn, Baralmar Advisors LLC

CCVI

- David K. kicked off a discussion that the CCVI could potentially be useful as a tool to identify areas for intervention, but currently it is too broad and all-encompassing in its current form.
 - In order to effectively inform intervention actions, the user should be able to drill down and unpack the data.
 - Classifying the leading drivers and types of vulnerabilities can improve usefulness in decision making (e.g., where high vulnerability is driven by demographic factors vs environmental factors, coastal flooding vs inland flooding sources, etc.).
 - Different applications/end users would have different weighting priorities.
 - Framing the presentation of vulnerability summary results by type or end-user group will make it more useful for agencies prioritizing and implementing projects within their jurisdictions.
- Further comments indicated that CIRCA needs to go beyond a tool for data to identify agency-specific actions.
 - Planning decisions are “siloes” and this tool crosses sectors; someone needs to identify partners, or nobody will take ownership of using the tool.
 - Project priorities and strategic recommendations should be aimed towards specific statewide agencies (DEEP, DOT, etc.) for implementation.
 - If actions are not assigned to specific stakeholders, no one will take ownership.
- Diane M. – how does the CCVI intersect with statewide vulnerability assessment work coming out of the GC3? Attendees believe that EO 3 will likely build on this process.
- In its current form, the CCVI viewer could improve method for classification/rankings.
 - Highest vulnerability areas seem to be in the water.
 - Checker pattern across lower-risk areas is confusing and makes it hard to identify actual hot-spots within the landscape.
 - Would be hard to interpret for a general user?
 - Consider broadening the range so that vulnerability classifications are more refined.
- The connection to TOD efforts could be more prominent.
 - TOD potential would be a useful contextual layer to show.
 - Need to account for range of regulatory efforts at the municipal level in place (to assess actual TOD potential, not just theoretical potential).
 - CIRCA’s use of the PERSIST framework may eventually account for these feasibility factors.
- It was noted that use of SVI in the CCVI could be politically portrayed negatively (e.g., vulnerable people are artificially driving up overall vulnerability).

Zones of Share Risk

- Diane M. noted that the zones of shared risk and related planning efforts should incorporate natural protection zones and relevant elements of watershed management plans.
- David K stated that the zones of shared risk have potential value if they identify geographic areas with non-obvious values, relationships, and interdependencies.

- Can they identify areas where actions in one place can affect a broader area?
- Level of regional connectivity and importance should play into identification and prioritization of ZSR.
- What are we measuring within the ZSRs? Can quantify the number of people, number of jobs, percent of the tax base, portion of highly vulnerable populations?
- Time horizon is an important component. Risk mitigation strategies for areas with high flood exposure over the next 10 years might be different than those areas with high flood exposure over the next 1,000 years.
- “Objective” prioritization is not possible. Weighting can effectively make rankings anything you want it to be.
 - Who does the weighting/prioritization?
 - How adaptive is it?
 - How do we prevent it from becoming unwieldy?
 - Can it be user or stakeholder specific?
 - These questions are essential to take this beyond a thought exercise and drive actual project development and priority setting.
- It is important that this work is made relevant and understandable for local engagement and communication purposes.
- Discussion about adding percentage of tax base / # of Jobs into ZSR selection decisions.
- The versatility of CCVI/ZSR definitions, weighting, and prioritization may be beneficial for local planning purposes, but for the State, CIRCA needs to define a clear and consistent prioritization criterion.
- There was discussion about facilities such as the WPCA plant that serves both Darien and Stamford and how to differentiate between ZSR with larger regional impacts vs. those that are self-contained.
- Referring back to the CCVI, Diane M. noted that the tool may try to do too much for most people to turn it into something useful. Attendees agreed that the CCVI needs to be simplified for public to understand.
- Overall, these are good decision support aides and good for grant applications.
- Attendees recommended trying some visioning exercises with different extreme weights to see the impacts.

Norwalk/Wilton/Westport Breakout Room

Attendance

CIRCA and Consultant Team:

- Victoria Brudz, Milone & MacBroom, Inc./SLR Consulting
- John Trucinski, CIRCA

Attendees:

- Jackie Algon, Town of Wilton Conservation Commission
- Alexis Cherichetti, City of Norwalk
- Bryan Baker, City of Norwalk

- Mike Conklin, Town of Wilton
- Keith Wilberg, Town of Westport
- Alicia Mozian, Town of Westport
- Michael Wrinn, Town of Wilton
- Michelle Perillie, Town of Westport
- Patrice Gillespie, CT Energy Network / Clean Water Fund
- Scott Fisher, Town of Wilton Inland Wetland Commission
- Steven Kleppin, City of Norwalk Planning and Zoning Commission
- Tammy Thornton, Wilton Go Green

CCVI

- Attendees were asked if there were any general questions regarding the CCVI or the presentation. Clarification was asked about what a “TOD” was.
- Steve noted that Norwalk has been working on TOD zoning for Norwalk, with a plan developed for East Norwalk station, and a plan underway for the Merritt Station. The City is also working on a Coastal Resilience Plan.
- Attendees were then asked what they felt the pros and cons might be using this type of tool. A few aesthetic points were made such as clipping data to coastline and ensuring information in the final tool is more available such as what rankings mean.
- It was asked what the implications might be or are there any concerns regarding political pushback from highlighting wealthier areas as “vulnerable.”
- A point was raised regarding the “cause and effect” aspect of his tool, and how some data could be taken in either a negative or positive connotation. The example was made regarding vulnerable areas also being associated with certain socioeconomic populations. This could be viewed in two ways: they are the ones causing the issue, or this is an area for investment and improvement.
- An attendee also noted that it is important to frame this tool as not negatively highlighting an area. The example used was that an area that is vulnerable and heavily developed is not necessarily “bad” but may be a good candidate for certain types of redevelopment, such as green infrastructure or pervious surfaces.

Zones of Shared Risk

- Attendees were asked if there were any general questions regarding the ZSR or the presentation. There were none.
- Attendees were then asked if at first glance, and after exploring the map, did it appear any data or information may be missing. It was noted that using topography would help with delineating the zones, and that highlighting historic districts may also be helpful.
- It was then asked if there are any regional facilities/assets that cross boundaries, and specifically, if a town shares an asset how it is handled. Keith noted that seeing as Westport does share some “issues” with Fairfield, they address the issue on a case-by-case basis. For example, there is a road that runs along the Westport/Fairfield line and it is necessary to work out who plows, paves, etc.
- An industrial area in Norwalk was highlighted for discussion. This area, near Meadow Street, is outside of a ZSR as it is not directly in a flood zone, however, if there were an issue here during an

event it could pose regional issues as it contains several employers and could potentially result in pollution concerns.

- It was asked if there was a way to “weight” these zones to highlight areas that potentially have a larger share of the tax base, jobs, or equity.



Resilient Connecticut

Phase II Report of Workshop Series #2

May 28, 2021
SLR Consulting
Formerly Milone & MacBroom, Inc.



Connecticut Institute for Resilience
and Climate Adaptation

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This publication does not express the views of the Department of Housing or the State of Connecticut. The views and opinions expressed are those of the authors. Funding for this project was provided by the United States Department of Housing and Urban Development through the Community Development Block Grant National Disaster Recovery Program, as administered by the State of Connecticut, Department of Housing. More information can be found at:
<https://resilientconnecticut.uconn.edu/>

Workshop Report

May 28, 2021

Contents

1. Goals and Objectives for the Workshops of May 2021	1
2. Description of Outreach Conducted and Meeting Attendance	2
2.1 CIRCA Web Site and Social Media	2
2.2 Resilience Roundup	2
2.3 COG Direct Email Distribution	2
2.4 COG Social Media	2
2.5 COG Board and Committee Meetings	3
2.6 Inclusion of Traditionally Under-Represented Communities and EJ Communities	4
2.7 Pre-Workshop Engagement	4
3. Workshop Logistics and Attendance	4
3.1 Description of Attendance	5
4. Results of Workshops	6
4.1 Pre-workshop Survey Results	6
4.2 Workshop Feedback	9
Regional Asset and Infrastructure Recognition	10
Asset or Area Prioritization	11
Current and Future Planning or Development Efforts	13
Resilience Opportunity Area Characteristics	14
Potential Adaptation and Resilience Solutions	15
General Conversation Takeaways	17
4.3 Workshop Conclusions	19
5. Next Steps	20
5.1 Short-Term Outcomes (Resilient Connecticut Phase II)	20
5.2 Long-Term Outcomes (Resilient Connecticut Phase III and Beyond)	21

List of Figures

Figure 1: Pre-workshop survey question 1 responses.....	7
Figure 2 Pre-workshop survey question 2 responses.....	8
Figure 3 Pre-workshop survey question 4 responses.....	9

Appendices

- Appendix A: Pre-Workshop Materials
- Appendix B: Attendance List
- Appendix C: Workshop Meeting Notes

1. Goals and Objectives for the Workshops of May 2021

Task 2 of the Resilient Connecticut Phase II consultant services is entitled “Organize and Run a Community and Stakeholder Engagement Process.” One of the primary sub-tasks of Task 2 is to “oversee the organization and management of two regional stakeholder meetings in each Council of Government (COG) region, to provide input and review the outcomes of the regional vulnerability analysis, regional zones of shared risk, adaptation scenarios, and target projects.” These were scoped as “charrette style meetings with maps and visualizations in order to co-generate a shared understanding of risks and opportunities as well as regional project strategies with stakeholders. Online participation options should be included due to ongoing public health concerns.”

Two such workshop series were defined in May 2020 prior to the commencement of consultant services:

- Workshop Series #1 was initially scoped for “reviewing regional adaptation areas/resilience opportunities, developing potential adaptation scenarios, refining decision support criteria with more specific measurements, and reviewing potential target projects.”
- Workshop Series #2 was initially scoped for “presenting pilot project recommendations and results from Final Report.”

Given the elevated status of the COGs in the Resilient Connecticut engagement process, their involvement in the timing of the project was of significant importance. Phase II engagement with the Councils of Governments began through sustained correspondence with COG staff from August through October 2020. Engagement with the COG boards (consisting of chief elected officials) began in earnest during the COG meetings of November 13 (NVCOG), November 18 (SCRCOG), and November 19 (WestCOG and MetroCOG); as well as during CIRCA’s annual summit on November 20, 2020. During these opportunities in November 2020, CIRCA and the Phase II consultant team explained the intent to convene virtual workshops during the winter of 2020-2021.

Given the overall timing of COG engagement, CIRCA and the consultant team ultimately determined that the initial workshop series should be scheduled for January 2021. This would allow for additional scope execution in December 2020 followed by runup and publicity for the workshops. With reference to the initial content intended for the workshops, which was set in May 2020 prior to the execution of consultant services, CIRCA and the consultant team determined that the first set of workshops should ultimately attempt a somewhat less broad reach, with focus on the draft progress of the Climate Change Vulnerability Assessment (CCVA) and delineations of Zones of Shared Risk (ZSR). The topics of developing potential adaptation scenarios, refining decision support criteria with more specific measurements, and reviewing potential target projects would therefore be deferred to the second workshop series. As the

project progressed through early 2021 into spring, the consultant team and CIRCA further narrowed the scope of the second workshop series to focus on achieving buy-in from stakeholders about the identified areas of adaptation and resilience opportunities in the 33 communities with TOD potential.

Overall, the goals for workshop series #2 were:

- Review the draft adaptation/resilience opportunity areas and the methodology used to identify these areas.
- Identify any regional assets or infrastructure that may have been absent from the analysis.
- Recognize criteria for asset and opportunity area prioritization.

2. Description of Outreach Conducted and Meeting Attendance

Dates for workshop series #2 were set for four consecutive days in the afternoon in an effort to boost attendance while minimizing morning COG meeting conflicts. The selected dates were May 24, 25, 26 and 27, 2021. Flyers and registration materials were prepared by the consultant team and provided to CIRCA and the four COGs.

A thorough outreach process, described below, was undertaken to advertise the dates.

2.1 CIRCA Web Site and Social Media

The CIRCA and Resilient Connecticut web pages announced the workshops on April 29, 2021. The CIRCA Facebook page posted the workshop announcements, and CIRCA distributed the translated flyer on this Facebook page and on the workshop website.

2.2 Resilience Roundup

The May 6, 2021, edition of the Resilience Roundup provided a description of the workshop series and links to the registrations. The Roundup reaches an estimated 1,115 email addresses representing a diverse array of stakeholders in Connecticut and beyond.

2.3 COG Direct Email Distribution

The four COGs provided thorough email distribution of the workshop announcements and registration materials. These emails reached the chief elected officials and their staff; municipal planners, engineers, and public works personnel; and municipal boards and commissions that typically interact with the COGs (such as planning and zoning commissions).

2.4 COG Social Media

The four COGs provided workshop announcements and registration materials through their social media. This included the following:

Facebook:

- WestCOG – Posted May 13, 2021
- MetroCOG – None
- SCRCOG – None
- NVCOG – Posted on May 13 and 20, 2021

Twitter:

- WestCOG – Posted May 13, 2021
- MetroCOG – None
- SCRCOG – None
- NVCOG – Posted on May 20, 2021

COG Web Sites:

- WestCOG – Under “News an Updates” on May 13, 2021, and Twitter feed copied to main page (see above; posted May 13, 2021)
- MetroCOG – None
- SCRCOG – Posted under “Announcements” in May 2021
- NVCOG – Posted under “Events” in May 2021

2.5 COG Board and Committee Meetings

The consultant team and CIRCA mentioned the May workshops during several COG meetings in the months of April and May. A “Save the Date” message was conveyed during earlier meetings in April, with registration links provided later in the month and throughout May. The workshops were discussing during the following COG meetings:

- MetroCOG
 - April – update flyer was circulated to several committees.
 - TTAC 5/19/2021
- NVCOG
 - April – update flyer was circulated to several committees.
 - Board 4/9/2021 – flyer was circulated.
 - Board 5/14/2021
- SCRCOG
 - April – update flyer was circulated to several committees.
- WestCOG
 - April – update flyer was circulated to several committees.
 - Planners Lunch 5/11/2021
 - Board 5/20/2021

In depth presentations were given at both the WestCOG Planner’s Lunch and the WestCOG Board meetings of May 2021. At this board meeting the opportunity areas were presented to the members, who were encouraged to review these further and attend the workshop or provide feedback. The remaining three COG board meetings were scheduled for after the

workshops, when chief elected officials will be presented the opportunity areas and again encouraged to provide feedback. This in-depth presentation has been targeted for the board meetings as the members are typically municipal CEOs and do not normally attend workshops, however, at this stage of Phase II their feedback and participation are important.

2.6 Inclusion of Traditionally Under-Represented Communities and EJ Communities

The workshop flyer and registration materials were translated to Spanish by CIRCA. CIRCA distributed the translated flyer on this Facebook page and on the workshop website. This flyer was also circulated to the COGs. NVCOG and WestCOG posted the translated materials to their social media.

2.7 Pre-Workshop Engagement

The consultant team emailed pre-workshop materials to workshop registrants several days before the scheduled workshops. These materials included links the Resilient Connecticut website, to the CCVI and ZSR map viewers, to map viewers that provided background information to the opportunity areas, and a short anonymous survey which polled users on regional assets and opportunity area prioritization. A copy of the survey can be found in Appendix A, with survey results in section 4.

3. Workshop Logistics and Attendance

Due to the ongoing COVID-19 pandemic, all four workshops were held virtually via Zoom. This platform features polling and breakout room capabilities. To better reach the target goals for this workshop, the two-hour event was divided into two sections. The first half of the event included a brief introduction including past Phase II engagement and progress, followed by a preview of the resilience opportunity area identification methodology and an introduction on the informational sheets that accompanies and characterizes each area. At the conclusion of the presentation attendees were broken up into groups which were based on their geographic representation.

During the small group break outs the informational sheets were used to introduce the resilience opportunity areas for the entire region represented by the COG, as well to allow a focus on the areas that are of heightened interest to each group. These sheets contain information such as vulnerability scores, assets, and infrastructure within the identified adaptation/resilience areas, and whether transit-oriented development, potential planning areas, and/or an opportunity zone are present in proximity. Once the sheets were presented the groups also had the ability to explore a viewer tool which depicted the opportunity areas throughout the region and included several other data layers that may be useful for

conversation. Attendees were generally asked to provide their feedback on the assets and infrastructure captured in the region, their thoughts on resilience opportunity area identification (in other words, presence or absence of an area in a community but not a prioritization), if there were projects in the works that may link to Resilience Connecticut efforts, and what potential types of adaptation/resilience projects could address climate-induced risks in some of the areas. The results of these sessions can be found in the subsequent section.

The large group then reconvened, a detailed report out was done for each group, and a short presentation on the next steps was then given. The next steps included those taken for the Resilient Connecticut planning process as a whole, and what attendees can expect as the identification of resilience opportunity areas and adaptation scenario development evolves. Attendees were reminded to provide feedback via the links sent in the pre-workshop email, and to also monitor the Resilient Connecticut webpage for workshop resources, other feedback methods, and for the public release of a report in late June 2021.

3.1 Description of Attendance

The number of registrations for each workshop varied:

- WestCOG – 28 registrants plus five from consultant team and six from CIRCA
- MetroCOG – 34 registrants plus four from consultant team and five from CIRCA
- SCRCOG – 43 registrants plus five from consultant team and five from CIRCA
- NVCOG – 24 registrants plus four from consultant team and five from CIRCA

Attendance was typically close to the total number of registrations in each case. Attendance lists are included in Appendix B.

Attendees consisted mainly of COG staff, municipal staff, and municipal board and commission members. Non-municipal attendees included several consultants and the following:

- A resident of the City of Ansonia
- Senator Chris Murphy's Office
- CT Division of Emergency Management and Homeland Security (DEMHS)
- Housatonic Valley Association
- Yale University
- CT Department of Public Health (DPH)
- Norwalk River Watershed Association
- Greater New Haven Water Pollution Control Authority (GNHWPCA)
- Southwest Conservation District
- The Nature Conservancy
- CT Department of Energy and Environmental Protection (DEEP) representing the Governor's Council for Climate Change (GC3)
- CT Department of Transportation (DOT) Sustainability and Resiliency Unit
- CT Green Bank

- Menunkatuck Audubon Society

Traditionally under-represented communities were represented by the municipalities hosting such communities and by the Connecticut Green Bank, DEEP/GC3, and DPH.

4. Results of Workshops

Notes from the four workshops are included in Appendix C. Narrative descriptions of highlights and salient points are provided below.

4.1 Pre-workshop Survey Results

In an effort to collect as much feedback as possible and to get registrants up to speed on Resilient Connecticut progress, a pre-workshop email was sent to all those registered containing several resources. Most of those included viewers and documentation to understand the results of Phase I, and the tools developed in the beginning of Phase II. In addition, a short survey was developed using Survey Monkey and included in the pre-workshop correspondence. This survey aimed to collect preliminary input on some of the topics that would be discussed during the workshop. Of the 129 registrants that received the survey, 16 responses were gathered.

While the survey was anonymous, respondents were asked which part of the region they associate with. If they did not associate with the State or a COG, they were able to provide a comment. This highest number of responses were received from the SCRCOG region with 37.5%.

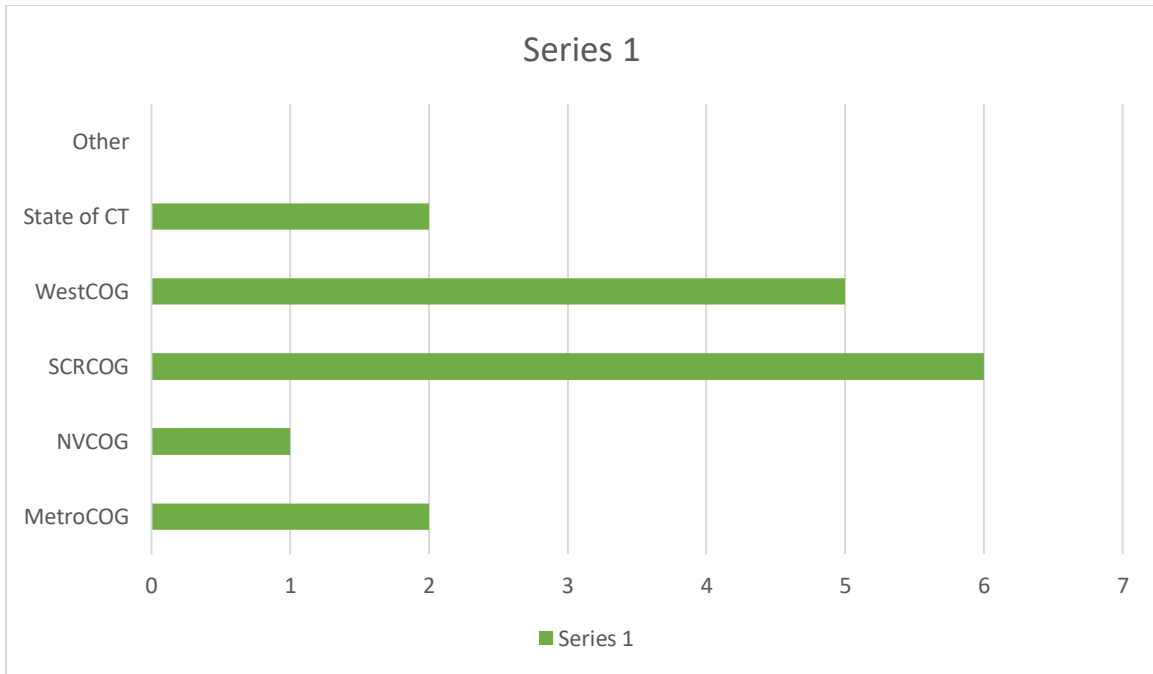


Figure 1: Pre-workshop survey question 1 responses

The second question polled respondents on their perception of regional assets. This included infrastructure that might cross municipal boundaries, a locational asset that is in one municipality but serves multiple, an economic asset, or an ecological asset. This open-ended question received 15 responses; the below word cloud conveys some of the commonly mentioned assets and infrastructure in the region.



Figure 2 Pre-workshop survey question 2 responses

Survey participants were then asked if any of these assets that they identified were vulnerable to climate change, especially flooding or extreme heat events. Of the 14 responses, all agreed that there was some level of vulnerability for these assets. Generally, some participants noted general asset types such as wastewater treatment infrastructure, roadways and railways, power systems, and an increase in fire hazard during extended droughts. A few participants noted specific assets including:

- Sikorsky Airport (flood)
- Ash Creek (flood)
- Remington Woods (heat)
- Regional Water Authority system

Question 4 then asked participants to rank certain considerations when thinking about delineating a resilience opportunity area. In total 15 responses were collected for this question. Respondents ranked nine variables based on how much they would take that factor into consideration and were also given the opportunity to provide a comment if there were variables not included in the list. The comments included:

- Food production/storage (cold)/distribution

- All housing types
- Power grid infrastructure
- Utilities
- Identifying areas that may need microgrids or emergency power

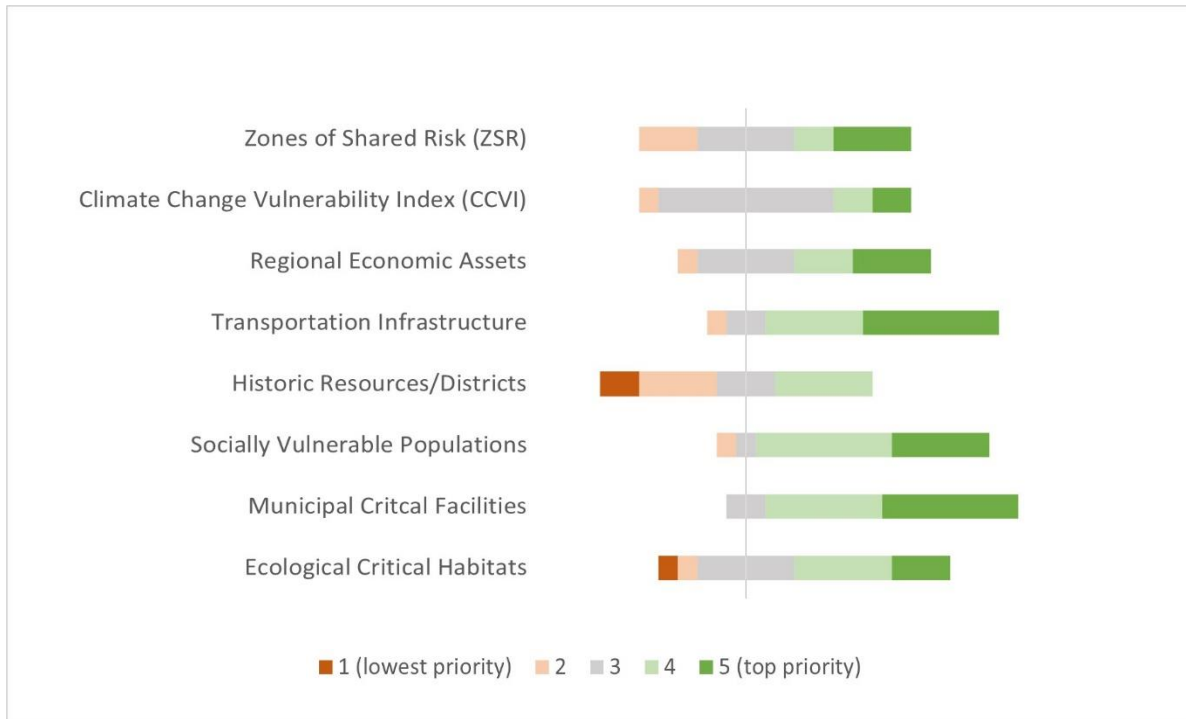


Figure 3 Pre-workshop survey question 4 responses

The final question polled respondents on whether there appeared to be an area missing from the current inventory of resilience opportunity areas. In general, most participants were unsure and were looking for more information or expressed a need for more time to review map viewers. The limited comments made, however, included the following:

- Major bridges over the Housatonic River including Routes 133 and 84.
- vulnerable electric and gas assets, coastal wetland resources, or areas with high heat island effect were not explicitly visible.
- Prioritize social vulnerability as a driver for making decisions, and “do not spread-out focus for what appears to be political reasons”.

4.2 Workshop Feedback

The breakout room facilitation was designed to identify and discuss a few key aspects of resilience opportunity area identification. These categories include:

- Regional asset and infrastructure recognition
- Asset or area prioritization based on regionality
- Current and future planning or development efforts
- Adaptation and resilience opportunity area identification
- Potential adaptation and resilience solutions
- General comments about Resilient Connecticut

In addition, conversation spanned several other topics outside of these categories, all of which will be taken into consideration for both resilience opportunity area development and Phase II next steps.

Regional Asset and Infrastructure Recognition

NVCOG

- Infrastructure resiliency is important, particularly during redevelopment.
- Municipalities in the NVCOG region are working to redevelop legacy industrial properties; this presents an opportunity to address heat vulnerabilities by adding green space, green roofs, and reducing impervious pavement area.
- While trains are a large focus in the TOD discussion, it was also noted that other types of transit might be considered.
- The Naugatuck River Greenway will pass through all of the opportunity areas that were presented. Because it will connect all of them, Resilient Connecticut should recognize the significance of the greenway.
- Traffic density was mentioned as a consideration when delineating the areas.
- The challenge of the railroad stations and transit being located in the floodplains was recognized.

MetroCOG

- The National Guard Armory in Stratford was suggested as a potential regional asset if it had not already been captured.
- Lordship area is vulnerable to flooding, and vulnerable populations, particularly in the opportunity zones, are vulnerable to heat events.
- Route 113 in Stratford is also vulnerable to flooding and is a main route for access and egress.
- In Fairfield, North Benson Road and Round Hill Road are most at risk of flooding; this was encompassed in discussion surrounding the challenges that exist with railroad underpasses. The proximity of Route 1 and the MetroNorth/Amtrak rail line to one another (often parallel) is a problem for roads that need to intersect with Route 1 but cross the rail line at right angles. The proximity makes it harder to pass over or under the rail line while remaining at grade with Route 1.
- Encouraged looking at the critical facilities that are known to be weak points in disaster recovery (including gas stations, pharmacies, and food distribution)

- Critical facilities and priorities can be measured by looking at the “weakest link” assets likely to cause harm during a flood or unable to be moved (such as lumber yards, storage facilities, or places that might lead to debris flow).
- Community shelters should be considered as well.

SCRCOG

- The Branford treatment plant, which is located just southeast of the opportunity area, Branford River marina, substation on East Main Street, and the community and senior centers.
- Guilford noted the historic structures in the downtown area, Guilford Fairgrounds, and public works area. Also, the town all and town center are in the opportunity area.
- Madison noted the Surf Club, Amtrak station and the Madison Beach hotel.
- Several places along Route 1 from Branford to Madison are low lying and prone to flooding.
- Affordable housing is indirectly incorporated through social vulnerabilities (and therefore, in the heat and flood CCVI) and also incorporated through mapping of affordable housing. More direct incorporation may be needed.

WestCOG

- Critical infrastructure such as water, wastewater, transportation, communications, and power were mentioned, particularly because this “critical infrastructure supports critical infrastructure” and the loss of one component may have cascading effects.
- Regional transmission lines run through the area (Redding and Ridgefield), and these do not necessarily deliver power to adjacent areas.
- The Wilton YMCA was identified as having a high flood risk during discussion.
- There is a new substation in Cos Cob that services roughly 95% of Greenwich.
- Affordable housing was discussed including how it has been, and will be, included in the process.
- The Stamford station often experiences stormwater flooding.
- Large substations in Bridgeport and Norwalk were discussed due to their regional significance.

Asset or Area Prioritization

NVCOG

- It was noted that Derby should remain a walkable city, and that there are certain challenges to the railroad station and other transit being located in the floodplains.
- In general, public transit is utilized when it is easy and accessible. For example, Shelton is experiencing a higher of degree of redevelopment in comparison to Ansonia. Route 8 is easier to access in Shelton; the ease of access may promote automobile transit versus other modes.

- There may be a preference for using the Stratford or Milford train stations from valley residents. The trains are more frequent along the main MetroNorth line, and there is ample parking at the Milford station. This underscores the fact that people will use infrastructure when it's easy, and that mobility is the key.
- Some transportation centers are more regional than others relative to how many communities are served. A transportation center that serves more communities should perhaps get more attention than one that serves fewer.

MetroCOG

- Public safety facilities or areas of public assembly should be prioritized.
- Prioritization could be thought of through the lens of what is most feasible given time and financial constraints.
- It was noted that focus should be placed on addressing public interests rather than private interests.
- A point was raised as to whether upstream resilience opportunity areas were being prioritization seeing as they may have downstream benefits.

SCRCOG

- Participants in the eastern part of the COG discussed the importance of treatment plants and rail stations.
- Other priority areas mentioned included State DOT in Guilford, hospitals in New Haven, Route 146 in Branford (evacuation route), Neck Road in Madison (evacuation route), Stony Creek are in Branford (potential isolation).
- Natural gas infrastructure, particularly since this tends to get shut off post disaster which may be a concern for socially vulnerable populations.
- One participant noted that utilities may have information as to which, if any, substations have been mitigated.
- Bulk storage/distribution of gasoline and home heating oil, as well as ports and harbors and their relation to distribution
- Regional food distribution centers
- Redundant power sources
- Mapping of buildings with air conditioning could be helpful; the Green Bank may have some information about housing constructed in the last ten years and noted that developers are scored according to a sustainability score card.
- Social vulnerabilities are important to consider, such as the impact of losing a week's worth of groceries for a family of low income vs. a wealthier family.

WestCOG

- There is state policy of focusing resilience and adaptation efforts on vulnerable efforts.
- Power outage prevention should be a high priority.

- Discussions also involved access/egress.
- As noted by Norwalk, the shell fishing industry and water related infrastructure are critical to the area. Also, Water Street is a perpetual flood challenge.
- Compo Beach and Saugatuck Shores, residential areas in Westport, have flood related challenges including possible evacuation challenges due to the one way in, one way out.

Current and Future Planning or Development Efforts

NVCOG

- The Naugatuck River Greenway is continuing development. NVCOG noted that a greenway is infrastructure; the costs range from \$2 million to \$3 million per mile. Aaron explained that NVCOG recently completed the prioritization of sections. Resilient Connecticut should become familiar with this.
- As noted above, Municipalities in the NVCOG region are working to redevelop legacy industrial properties. Ansonia, Derby, Naugatuck, and Waterbury all have redevelopment plans. Freight Street in Waterbury will have some type of mixed uses; and the Waterbury Industrial Area will be subdivided into various industrial and commercial uses. CIRCA would like to understand these better, to see where CIRCA can add value through Resilient Connecticut.
- Communities and the State typically think of brownfield cleanup and as needing a "return on investment," and think of new residential or commercial uses as a way to return on these investments. However, communities and the State do not have a good way to consider green space as a return on these investments.

MetroCOG

- Stratford has several efforts in the works including a new WPCF dike that will be constructed soon, Shakespeare property redevelopment, Great Meadows restoration by USFW, expanding oyster beds along western waterfront.
- The Town of Fairfield is seeking funding for green infrastructure applications in the downtown area in addition to asking developers to incorporate green methods when possible.
- Fairfield zoning promotes mixed-use development, and development pressures are high near the railroad stations in the TOD areas. However, residential redevelopment pressures remain along the shoreline and in flood zones where risks are high; the Town observes many duplexes being constructed for rental housing, often sought by students of Fairfield University.

SCRCOG

- Guilford is exploring the idea of relocating the public works facility and redeveloping the site into a TOD friendly area, including "floodable first floors".

- Branford is in the early stages of evaluating the wastewater treatment plant vulnerabilities in greater depth, and in the beginning stages of making the town center more resilient.
- Madison is in the early phase of exploring a wastewater management plan to address potential future septic failures – the main point raised was identifying *where* a treatment plant could do.
- Affordable housing, especially when poised for rebuilding and retrofitting.

WestCOG

- Greenwich is in the process of developing a Coastal Resilience Plan with a large ecological component.
- Discussions surrounded the presence of socially vulnerable populations in high flood vulnerable areas, which are often the same populations that do not have air conditioning.
- Norwalk will be developing a waterfront study, and there is an East Norwalk TOD plan in the works.
- Westport is developing residential units in the TOD area.
- There is some degree of consolidation with emergency dispatch/response in the region.
- The WestCOG region perhaps does not have many examples of comprehensive complex resilience projects like Resilient Bridgeport. The region enjoyed significant resilience efforts many decades ago when the Stamford hurricane barrier and Norwalk River flood control systems were constructed, though they were not called resilience projects.

Resilience Opportunity Area Characteristics

NVCOG

- Derby area is walkable, which is an important characteristic to the city.
- The Naugatuck River Greenway traverses the opportunity areas presented in the NVCOG region; this is significant as it will provide a connection between them all.

MetroCOG

- Relative to the broad coastal floodplain of Fairfield, individual vulnerability scores appear to vary considerably but overall, this zone of shared risk had a flood vulnerability score of 3.9 which is relatively high and indicative of flood risk. Commonalities should be recognized, and potential projects should be identified that address numerous cells rather than focusing on a small number of cells.
- Participants indicated that the Fairfield Metro and Bridgeport's lower west end should remain within the same resilience opportunity area as new pedestrian access will link Fairfield Metro and Black Rock; this is a good example of recognizing the importance of shared economic benefits.

- Identification of opportunity areas may need to look upstream of potential opportunity areas when trying to prioritize them. Rooster River is an example of an area that would need attention and should factor into consideration of the opportunity area downstream at Ash Creek.
- The idea of a Southport resilient opportunity area was discussed, however participants noted that this was not a good candidate as redevelopment could be challenging.
- Participants recognized the utility in addressing proximate zones of shared risk in the same larger opportunity area, given the economic linkages and connections.

SCRCOG

- The Fair Haven area was discussed. One note was made about residents being able to shelter in place (i.e., when access is compromised by flooding and storms) without heat-related stress.

WestCOG

- One participant noted the inclusion of Branchville/Georgetown, which was not included in the initial inventory presented to COG Board members a few days prior. It was noted that area has high flood vulnerability and low heat vulnerability. Even without the high heat vulnerability grid cells in the Georgetown/Branchville area, the area has two TOD locations and regional infrastructure, and future development must not increase the potential for higher heat vulnerabilities.
- With reference to situations where opportunity areas are close to one another like two of the three in Danbury, the group discussed whether risks should be addressed separately or together. Some prefer breaking areas into the smallest parts that make sense.
- The efforts should prioritize nature based and green infrastructure where it makes sense, and not lose sight of policy and planning projects that have long term benefits.
- The South Norwalk are captures vulnerable populations, and overall a high density of residents.
- Westport reiterated the presence of at least three critical facilities in the downtown Westport area.

Potential Adaptation and Resilience Solutions

NVCOG

- Projects that come to light during the planning process can be teed up in other ways; developing a “project pipeline” can be helpful for state planning as more funding and support of resilience projects becomes available.
- Some smaller-scale projects like bridge upgrades are also important; these smaller local projects should have a resiliency perspective.
- Resilient Connecticut could address damage to homes, trees, and power lines during severe storms.

- Some of the current housing stock is aging and will soon become eligible for being considered historic. We should look for ways to adapt this housing beforehand.
- The State recognizes the importance of reducing the reliance on automobiles as well as the parking and roadway needs that come along with using cars. Alternatives such as transit (trains or the Hartford busway) can reduce congestion and CO2 emissions. Densifying areas near public transportation can help achieve these goals. Economic development can be a co-benefit through this focus on transit and density.
- The State understands that flood risk needs to be addressed, but we can use this opportunity to ask what else can be accomplished. For example, can we reduce CO2 emissions? Can we reduce heat risks? The co-benefits should be recognized.

MetroCOG

- Resilient Connecticut may lead to common solutions for similar challenges among communities. Resilient Connecticut should focus on public interests rather than private interests along the shoreline. This was reflected in the positioning of the opportunity areas further from the shoreline, over the TOD areas rather than hugging the edge of the sound.
- As noted above, some work had been done in the downtown area of Fairfield with installing green infrastructure. The Town of Fairfield was trying to secure additional funds and grant for green infrastructure in the downtown area.
- Planting trees to address heat vulnerabilities can have co-benefits.
- The Fairfield Metro station parking is an example of significant paved areas that could be greener.
- Overall, participants emphasized the importance of identifying co-benefits of project elements, evaluating cost benefit, and address achievable project elements in early stages of more complex projects. Multiple benefits to the region should occur as a result.
- CIRCA could focus on the easier project elements in the early stages of more complex projects.
- Parks may already be considered in the CCVI since they have features that reduce heat and flooding, but they also may represent a good opportunity area for a resilience project—where parks can be retrofitted to include stormwater retention, flood levees, more shade trees, etc.
- Look at areas of active and anticipated redevelopment to identify where projects can fit into existing design and construction cycles, capitalizing on time-relevant opportunities.
- Emphasized the value of green infrastructure and natural and nature-based features to tackle both heat and flood risks.

SCRCOG

- After a brief discussion about whether current and future temperatures were incorporated into the heat vulnerability assessment, an attendee explained that planting trees was a reasonable tool for addressing heat, but the choice of tree is important, and the presence of trees can lead to cascading risks such as power outages during storms.
- Existing affordable housing needs to be efficient and cooling homes needs to be affordable.
- When affordable housing is poised for rebuilding or retrofitting, efficiencies need to be incorporated.
- As noted above, residents sheltering in place in Fair Haven (i.e., when access is compromised by flooding and storms) need to be able to shelter in place without heat-related stress.
- Solar power may be a part of resilience projects and therefore the panels' contribution to heat vulnerabilities was an important consideration.
- Redundant and backup power sources should be considered.
- Building social capacity is as important as building structural projects like flood walls. Havens Harvest (mentioned below) is an example cited in the breakout session.

WestCOG

- A question was raised if resilience projects need to be in rights-of-way or in related publicly owned areas; this was not required. Resilient Connecticut emphasizes projects with significant public benefits, and CIRCA recognizes that a higher fraction of private properties may be necessarily involved in more suburban and rural communities as compared to more urban communities.
- As noted above, the WestCOG region perhaps does not have many examples of comprehensive complex resilience projects like Resilient Bridgeport. The region enjoyed significant resilience efforts many decades ago when the Stamford hurricane barrier and Norwalk River flood control systems were constructed, though they were not called resilience projects.

General Conversation Takeaways

NVCOG

- Similar to the first set of Phase II workshops, participants were curious as to what these opportunity areas would mean by way of planning; how might they be used.
- There is concern in some municipalities with rapid turnover of housing, and how this may present a unique set of challenges, particularly when trying to make a community more resilient.
- There was great discussion on the redevelopment of industrial properties, what regional implications might be in redeveloping in the floodplain, and what "return on investment" might look like.

- Discussions were had surrounding the stakeholders involved in this process and it was suggested the team reach out to land trusts, conservation districts, and community or neighborhood groups.
- Environmental justice communities should be involved in the process, and also reap the benefits of this effort.
- Population patterns were not incorporated into any analysis but may be worth of exploring in the future.
- An NVCOG planner asked what the endgame of Resilient Connecticut will be. The team explained the need to gather a list of resilience projects. CIRCA acknowledged that Resilient Bridgeport is a good example but noted that his team would like to identify projects that have more regional significance than Resilient Bridgeport.
- Resilient Connecticut aims to bring people to new housing that is not developed in areas of risk. In some cases, we may need to develop outside of floodplains and then bring transit there.

MetroCOG

- A discussion occurred about heat as a driver for identifying opportunity areas, with the possibility raised that heat was over-emphasized in the analysis, which could therefore lead to identifying areas that overlapped with highly development urban heat islands. However, the analysis conducted does not support this. Additionally, many stakeholders have been in favor of emphasizing heat, so it was important to balance heat and flood.

SCRCOG

- A recommendation was made to coordinate with George Bradner and the Committee on Disaster Recovery. In addition, a pilot project to advance the use of more resilient roofing materials and roof construction may be developed. A pilot project could help lead to more resilient affordable housing, which could lead to lower insurance rates. The program would require contractors to participate in the training and become qualified. George reported outside the workshop that insurance company involvement is important.
- Suggestions were made to focus on smaller projects with regional impacts, and those that are centered around continuity of operations for essential services.
- Projects might not only include construction but also policy and planning.
- Significant discussion was had surrounding heat, its incorporation into analyses, other possible datasets, and affordable housing efficiency.
- The food recovery network may be able to help people bounce back from events that lead to a loss of power and food. Havens Harvest is an organization that retrieves food from places that otherwise would dispose of leftover food.
- Resilient Connecticut should aim to leverage state and local capabilities.
- Resilient Connecticut should lead to projects that maximize funding opportunities and BRIC is an example. Although recent legislation will allow towns to collect resilience

funds, it may take a while to build up these reserves. The Resilient Connecticut pilot projects could be aligned with the 6-7 “lifelines” emphasized by the BRIC program.

- The America Water Rescue Act is a potential funding source for water and sewer infrastructure projects.

WestCOG

- Food security was raised as a concern since cold storage can oftentimes be limited.
- Participants expressed concern about the challenges in both outreach and emergency messaging. Getting residents to understand the gravity of an event and flood evacuation is a challenge. And often during heat waves messaging on preparation is not consistent.
- Resilient Connecticut could help critical infrastructure become more resilient. Eventually the loss of critical infrastructure effects everyone, but it can have extreme impacts on vulnerable populations.
- Taking a holistic approach is important, considering future investments and ensuring that the State move to more resilient systems.
- Watershed planning and water quality have a connection to resilience planning. For example, flooding is one of the main sources of water quality impairment. The next iterations of watershed plans could potentially consider resilience concepts.

Open Discussions

- The federal government plans to double BRIC funding from \$500 million to \$1 billion in the next grant cycle.
- Important to recognize the value in linking adaptation projects to CO2 mitigation projects.
- CIRCA should identify numerous “easy” projects that represent the low-hanging fruit while more complex projects like Resilient Bridgeport were being conceptualized. He urged the team to consult with the Top 60 Projects in the C40¹ report, to help identify the least expensive types of actions that can be taken in the short term to address climate challenges.
- CIRCA explained to attendees why wind hazards were not directly included in the analysis and noted that its team would like to address this in the future.

4.3 Workshop Conclusions

Several key conclusions can be drawn from the workshop series:

- **Potential for additional opportunity areas** – Stakeholders are less concerned with potential opportunity areas that have already been identified, and more concerned with those which may be missing or otherwise not “yet” identified. Branchville/Georgetown is a good example of a specific addition that was suggested immediately prior to the workshop series during a COG meeting and was added for the workshop. In some cases, the

¹ <https://www.c40.org/>

suggestion that a portion of an area may be missing needs further analysis prior to revising the area; an example is the coastal floodplain of Fairfield. A second look at regional infrastructure and assets can help double-check for additional adaptation/resilience opportunity areas.

- **Critical infrastructure supports critical infrastructure** – Infrastructure needs to be made resilient in order to prevent cascading impacts over time as climate-induced stressors causes increasing risks to infrastructure.
- **Transit investments may not always be where they are desired** – Some of the discussions, especially in the NVCOG group, focused on the potential mismatch of where transit and TOD investments may occur vs. where the investments are most wanted due to transit being easier to use and/or more compatible with automobile usage. Because of how people make choices about where to use transit, some transportation centers are more regional than others relative to how many communities are served. While Resilient Connecticut cannot solve these types of challenges, opportunity area identification (and later, pilot project selection) should recognize the challenges. A transportation center that serves more communities should perhaps get more attention than one that serves fewer.
- **Emerging need for a small-scale resilience project pipeline** – Many discussions within and outside of the breakout groups centered around the idea that Resilient Connecticut could develop, compile, or prepare an inventory of many potential small-scale adaptation and resilience projects that are less expensive and more straightforward to implement, even if they are not part of more complex, comprehensive resilience solutions. These could lead into a small-scale project pipeline that is well-aligned with existing funding sources.

5. Next Steps

The feedback generated from the pre-workshop survey and during the workshops will be taken into consideration when evaluating the process of resilience opportunity area identification, and also as Phase II transitions into project development, design, and Phase III.

5.1 Short-Term Outcomes (Resilient Connecticut Phase II)

- With several discussions had surrounding specific examples or types of assets, the inventory used to capture the first draft of regional Zones of Shared Risk will be evaluated to ensure inclusion of these conversations.
- The team will work to develop a methodology to identify additional resilience opportunity areas that may have a significant vulnerability not captured in preliminary delineations. This may include a high flood or high heat area (not combined), or to identify areas that may have fewer number of assets, but those assets serve a significant purpose.

- Certain opportunity areas may require additional conversations with stakeholders and municipal representatives; therefore, the team will pursue more focused meetings to discuss some of the intricacies of these areas and the systems within them.

5.2 Long-Term Outcomes (Resilient Connecticut Phase III and Beyond)

- Specific nuances of the resilience opportunity areas will be taken into consideration during pilot project design and development as projects are selected.
- While the Resilient Connecticut projects aims to address larger regional challenges that municipalities may not be able to address alone, the endeavor will work to address stakeholders' comments for wanting smaller-scale projects and long-term planning benefits.
- The identification and potential redevelopment of identification process will ultimately raise long-term awareness surrounding these areas, the assets within them, and provide municipalities and stakeholders with the information necessary to address some of these vulnerabilities outside of the Resilient Connecticut conversation.

Appendix A

Pre-Workshop Materials

1. Which area in the region do you most associate with as a stakeholder?

MetroCOG

WestCOG

NVCOG

The State of Connecticut

SCRCOG

Other (please specify)

2. Can you identify any regional assets your municipality or organization relies on?

For example, this can be infrastructure that crosses municipal boundaries, a facility or location that serves multiple municipalities, a type of economic asset that is maybe a large employer or revenue generator, or an ecological asset.

3. If you identified any assets above, might they be vulnerable to climate change such as in a flood prone or high heat area?

Take a look at the **Climate Change Vulnerability Index (CCVI)** if you want to take a closer look at the asset location and it's vulnerability.

4. If you were to delineate a "resilience opportunity area" in the region, which of the following would you consider the most, the least, or not at all when drawing the boundaries. So, which should *really* be in an opportunity area, and which others may not be as necessary.

	Probably would not consider	1 (Not my top priority)	2	3	4	5 (Top priority)
Ecological critical habitats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Municipal critical facilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Socially vulnerable populations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Historic resources/districts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transportation infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regional economic assets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Affordable housing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Climate Change Vulnerability Index (CCVI) results	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zones of Shared Risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Something else you might consider?

5. If you have time, take a quick look at the preliminary **resilience opportunity areas**. Does it look like an area is missing? May not be necessary?

Appendix B
Attendance Lists

SCRCOG Participants: 5/24/2021

Aicha	Woods	Tracy	Everson
Brendan	Crowley	Victoria	Brudz
Carl R.	Harvey	Walter	Welsh
David	Murphy	Yaprak	Onat
Dawn	Henning	Alanis	Allen
Eugene	Livshits	Brian	Thompson
Giovanni	Zinn	Carl	Amento
Isabella	Schroeder	Christopher	Soto
John	Truscinski	Denise	Savageau
Kathleen	Schomaker	Jamie	Caplan
martin	mador	Jeremy	Grant
Wayne	Cobleigh	Joanna	Wozniak-Brown
Heather	Crawford	Johanna	Greenspan-Johnston
Jennifer	Acquino	Melissa	Mostowy
John	Hoefflerle	PAUL	HEARN
Katherine	Lund	Peter	Alexander L.A.
Kevin	Magee	Rebecca	Andreucci
Peter	Hentschel	Scott	

MetroCOG Participants: 5/25/2021

Amanda	Clark	Louise	Washer
dean	audet	Mary	Hogue
Emily	Slotnick	PAUL	HEARN
Jill	Pietropaolo	Peter	Alexander L.A.
Joanna	Wozniak-Brown	Richard	Dmochowski
John	Casey	Sara	Morrison
Josh	Lecar	Shawn	O'Sullivan
Patrick	Carleton	William	Hurley
Rich	Donovan	Adrienne	Houel
rick	Schultz	Alanis	Allen
Susmitha	Attota	Brian	Thompson
Tamara	Trojanowski	Don	Watson
Victoria	Vetre	Emily	Pysh
Becky	Bunnell	James	Bova
David	Murphy	Johanna	Greenspan-Johnston
Emmeline	Harrigan	John	Truscinski
Hannah	Reichle	Meghan	Sloan
Katherine	Lund	Michelle	Muoio
Larry	Kaley	Ricardo	Rodriguez

Scott	Burns	Yaprak	Onat
Tatiana	Solovey	Jim	O'Donnell

WestCOG Participants: 5/26/2021

Noah	Slovin	Michel	DeLuca
Amy	Siebert	Michelle	Perillie
Anita	Carpenter	Michelle	Andrzejewski
Ben	Spratford	Victoria	Brudz
Jayme	Stevenson	Amanda	Clark
Jill	Pietropaolo	David	Murphy
Johanna	Greenspan-Johnston	Debra	Franceschini
John	Truscinski	Henry	Paszczuk
Paul	Hearn	Julia	Pemberton
Peter	Alexander L.A.	Katherine	Lund
Rebecca	French	Maria	Evans
Sara	Morrison	Michael	Jastremski
Scott	Choquette	Pete	Bass
William	Cavers	Scott	DALE
Alicia	Mozian	Stephen	Woods
Brian	Weeks	Yaprak	Onat
Daniel	Stanton	Alex	Felson
Joanna	Wozniak-Brown	Trayvonn	Diaz
Keith	Wilberg	Jim	O'Donnell
Laura	Kenny	Nicole	Sullivan
Michael	Kiselak		

NVCOG Participants: 5/27/2021

Rebecca	French	Richard	Donovan
Aaron	Budris	Frederick	Bowes
Mark	Lewis	Amanda	Clark
John	Field	Emily	Slotnick
Christine	O'Neill	Peter	Ludwig
Sheila	OMalley	Emily	Pysh
Mary	Barton	Sara	Morrison
Nicole	Cignoli	Michael	West
Doris	Johnson	Peter	Alexander L.A.
Marissa	Wright	Jennifer	Reilly
Thomas	RisCassi	Paul	Grimmer
Melissa	Mostowy	PETER	ALEXANDER L.A.

Appendix C
Workshop Meeting Notes

SCRCOG Workshop #2
Meeting Notes
May 24, 2021

New Haven Area Group

David Murphy, Facilitator

John T, CIRCA

Dawn Henning, City of New Haven

Aicha Woods, City of New Haven

Wayne, GZA

Kathleen

Carl

David presented the information sheets for the zones of shared risk and potential opportunity areas from Wallingford to Guilford and West Haven. He then explained that the attendees could view of specific area or hold an open discussion.

- Wayne asked if current and future temperatures were incorporated into the heat vulnerability assessment. David explained that temperatures were not a significant factor, as the tool is organized around vulnerability contributors such as emissivity and reflectivity as well as adaptive capacity such as shade and cooling capabilities. Wayne explained that planting trees was a reasonable tool for addressing heat, but the choice of tree is important, and the presence of trees can lead to cascading risks such as power outages during storms. David concurred and noted that this was an important consideration of the overall project.
- Wayne inquired about the goals of the project, and he noted that he understood that Resilient Connecticut would aim to leverage state and local capabilities; David concurred.
- Aicha asked if heat and elevation had a correlation. David answered that in Connecticut, this was not a factor.
- Aicha asked if access to affordable housing was considered in the project. David responded that affordable housing is indirectly incorporated through social vulnerabilities (and therefore, in the heat and flood CCVI) and also incorporated through mapping of affordable housing in the GIS (courtesy of the State and SCRCOG).
- Wayne asked if the team had received mapping of buildings with air conditioning, and David responded that this was an item that had been discussed but not located. Wayne believes that the Green Bank may have some information about housing constructed in the last ten years and noted that developers are scored according to a sustainability score card.
- Kathleen explained that existing affordable housing needs to be efficient and that cooling homes needs to be affordable.
- Wayne noted that when affordable housing is poised for rebuilding or retrofitting, efficiencies need to be incorporated.
- John and David described some of the conceptual ideas for addressing heat in Fair Haven, and David noted that residents sheltering in place in Fair Haven (i.e., when access is

compromised by flooding and storms) need to be able to shelter in place without heat-related stress.

- Carl asked about whether solar panels contribute to heat. David noted that the team did not have an answer, but he noted that solar power may be a part of resilience projects and therefore this was an important consideration.
- Wayne emphasized the importance of Resilient Connecticut leading to projects that maximize funding opportunities and mentioned BRIC. He noted that recent legislation will allow towns to collect resilience funds, but it may take a while to build up these reserves. David mentioned the 6-7 "lifelines" emphasized by the BRIC program and noted that the Resilient Connecticut pilot projects could be aligned with these.
- Wayne noted that redundant and backup power sources should be considered and reminded the attendees that T.S. Isaias from 2020 was another wake-up call. This led to a discussion about HMGP and Public Assistance (PA) reimbursements. Aicha noted that New Haven may receive reimbursement for damage along River Street.
- Aicha explained that the social vulnerabilities are important to consider and used the example of the impact of losing a week's worth of groceries for a family of low income vs. a wealthier family. She asked if there was any way to account for that situation. David said that there was not a direct way to incorporate this situation but noted that the social vulnerability factors in the heat CCVI, flood CCVI, and SVI mapping rely on factors that are similar.
- Kathleen noted that the discussion was very focused on personal capacities but that different sectors have varying adaptive capacities. For example, the food recovery network may be able to help people bounce back from events that lead to a loss of power and food. Havens Harvest (located in Hamden) is an organization that retrieves food from places that otherwise would dispose of leftover food. She characterized this as an "emerging capacity."
- John noted that this was a key consideration for Resilient Connecticut. In some cases, building social capacity was as important, or more important, than building structural projects like flood walls.
- David reminded attendees to provide ideas (either now, or later) about other kinds of infrastructure such as roads, water systems, and sewer systems. Wayne noted that the America Water Rescue Act provides funding for water and sewer infrastructure projects.

Branford, Guilford, Madison Area Group

Victoria Vetre, Facilitator

Katie Lund, CIRCA

Yaprak Onat, CIRCA

Heather Crawford, Madison

Kevin Magee, Guilford

Jennifer Acquino, Branford

Walter Welsh, Madison

Peter Hentschel, Branford

Tracy Everson, Branford

John Hoefflerle, Branford

Victoria briefly reviewed some of the general types of assets used in opportunity area identification, and participants were then asked if there were any assets or general asset types that may have been overlooked, or if there were specific assets they felt were regional and should be included in an opportunity area.

- Branford noted that the treatment plant is located just southeast of the opportunity area, so it may be worth extending this area as the plant does serve some of North Branford also. It was also noted the marina on the Branford River is a large asset.
- There is a substation on East Main Street that is low lying and prone to flooding.
- Also, the community center and senior center are in a flood zone and in proximity to the opportunity zone.
- Guilford noted the historic resources in the opportunity area, also the Guilford Fairgrounds and the public works area.
- The Guilford town center and town hall are also in the area.
- Guilford noted they too have a busy marina, as well as Jacob's Beach and recreational fields in proximity to the opportunity area that are at risk of flooding.
- Madison does not have a specific opportunity area however several assets were pointed out such as the Madison Surf Club, Amtrak station, and the Madison Beach Hotel.
- It was also noted that several locations along Route 1 in Madison are low lying and present flood issues.

After the asset discussion, Victoria then asked participants based on this asset information how might opportunity areas be prioritized? Are there asset types or specific assets that really need to be addressed sooner than others, and are there assets outside of these three municipalities that the towns rely on?

- Discussion primarily revolved around the rail stations in the three towns and the treatment plants being the priority assets in each town.
- The question was raised as to how climate change impacts are being addressed in the data seeing as this is not a static situation. It was noted that some projects may seem adequate now but may need to be redeveloped in the near future as the climate changes.
- Other priority areas discussed included:

- Route 1 at the Guilford/Madison line
- State DOT facility in Guilford.
- St. Raphael's and Yale Hospital in New Haven
- Route 146 in Branford outside of the Hoadley Road area – this is an evacuation route for several small neighborhoods.
- Neck Road in Madison which leads to Our Lady Mercy and the state boat launch - also an evacuation route.
- Stony Creek in Branford.
- After noting these areas, discussion was had around connecting some of these vulnerable areas to a more resilient "opportunity area" – ultimately identifying some resilient corridors.
 - Branford noted that this sounded like a possible scenario as many of the small areas at risk of flooding could lead to the train station area.

Victoria then asked if there were any resilience related projects occurring in the towns that might link well with Resilient Connecticut.

Guilford: exploring the idea of relocating the public works facility and redeveloping the site into a TOD friendly area, including "floodable first floors".

Branford: in the early stages of evaluating the wastewater treatment plant vulnerabilities in greater depth, and in the beginning stages of making the town center more resilient.

Madison: early phase of exploring a wastewater management plan to address potential future septic failures – the main point raised was identifying *where* a treatment plant could do.

Before the end of the breakout participants were asked for any final thoughts or questions.

- It was noted that Regional Water Authority does have multiple water sources in this area including Lake Gaillard, Lake Saltonstall, and Lake Hammonasset.

Milford & West Haven Area Group

Johanna Greenspan-Johnston, Dewberry
Facilitator
Scott Choquette, Dewberry, Facilitator
Rebecca Andreucci, SCRCOG
Carl Amento, SCRCOG
Brian Thompson, CT DEEP
Melissa Mostowy, SWCD
Steven Wallett, CT DPH, Drinking Water

Alanis Allen, CT DEEP
Christopher Soto, West Haven
Jim O'Donnell, CIRCA
Denise Savageau, CCSWC
Joanna Wozniak-Brown, CIRCA
Jaime Caplan, Caplan Consulting
Kristie Sullivan, Woodbridge

The session started with reviewing the regional assets included in selecting opportunity areas. There was general agreement that the list was comprehensive.

- Natural gas distribution was cited as a major regional infrastructure.
- It was noted that gas gets shut off as a precaution frequently before a natural disaster which is especially problematic for socially vulnerable populations.
- Suggestion was to map who is serviced by the natural gas grid in the study area. Where are distribution centers? Are they protected? Etc.
- Electric substations were mentioned as being among the most important assets
- Rebecca French asked if all substations are vulnerable or if we did any research to determine which among them may have mitigation/adaptation. She suggested that data may be available from the utilities to determine what assets are already protected.
- It was noted that bulk storage and distribution of gasoline and home heating oil should also be a consideration.
- Regional food distribution centers were also noted as a regional asset for consideration

There was a brief discussion around areas zoned for quick adaptive uses. COVID testing and vaccination centers were cited as an example.

Coordination with George Bradner and the Committee on Disaster Recovery was recommended.

It was suggested that stations should be considered regional assets. Although they are typically associated with an individual community there are mutual aid agreements, and some departments share equipment and have specialized equipment to loan to neighbors.

It was suggested that we should focus on smaller projects with regional impact.

- Brian Thompson suggested projects centered around continuity of operations for essential services

Jim O'Donnell discussed ports and harbors and their connection to fuel distribution and other critical activities. Jim suggested that they be included as regional assets.

Jim discussed the important role the project will play in putting projects in the pipeline – not just the limited number Resilient Connecticut will fund.

The discussion ended with mention that projects should not be limited to those we construct, but also focused on policy and planning.

MetroCOG Workshop #2
Meeting Notes
May 25, 2021

Fairfield Area Group

David Murphy, Facilitator
Katie Lund, CIRCA
Dick D.
Emmeline Harrigan
Mary Hogue

Becky Bunnell
Bill Hurley
Hannah Reichle, MetroCOG
Paul Hearn
Peter A

David presented the information sheets and then opened the floor to discussion.

- Dick asked about whether coastal erosion was included in the analysis or selection of opportunity areas. David explained that it was a contributing layer or factor in the flood CCVI, but erosion was not directly used to select areas. Dick explained that some people on the FECB and in the Town would like to armor the shoreline to reduce erosion of land. Emmeline noted that hard structures can sometimes make erosion worse and stated that Fairfield has relatively wide beaches. Dick clarified that he was speaking about approaches that were more subtle than large walls.
- Becky inquired about grid cells patterns and noted that some lighter blues were located amongst darker blues in the broad coastal floodplain. David explained some of the factors that contribute to the scores under the categories of exposure, sensitivity, and adaptive capacity, and noted that some of these factors will vary from cell to cell such as land cover and distance to shelters whereas others such as FEMA flood zone may not. He pointed out that overall, this zone of shared risk had a flood vulnerability score of 3.9 which is relatively high and indicative of flood risk. David emphasized that it's important to look for and think about commonalities; and try to think of potential projects that address numerous cells rather than focusing on a small number of cells. He used Resilient Bridgeport as an example of a project that could have come from an examination of many grill cells if it had been conceptualized after development of the CCVI.
- Emmeline noted that Resilient Connecticut appears to be looking for typologies insofar that these may lead to common solutions for similar challenges among communities. She further explained that Resilient Connecticut should focus on public interests rather than private interests along the shoreline. David noted that this was reflected in the positioning of the opportunity areas further from the shoreline, over the TOD areas rather than hugging the

edge of the sound. Katie thanked Emmeline for this explanation of the goals and noted the importance of identifying areas that can be addressed with multiple benefits to the region occurring as a result.

- Emmeline asked how other communities are dealing with underpasses and David responded that this had not yet been addressed in the context of Resilient Connecticut. Bill noted later in the discussion that North Benson Road and Round Hill Road are the most at risk for flooding. Dick explained that the proximity of Route 1 and the MetroNorth/Amtrak rail line to one another (often parallel) is a problem for roads that need to intersect with Route 1 but cross the rail line at right angles. The proximity makes it harder to pass over or under the rail line while remaining at grade with Route 1.
- Emmeline asked how Resilient Bridgeport addressed driveways that need to meet elevated roads. David responded that he was not certain, but his impression from the public meetings was that these challenges had been minimized through project design elements.
- Katie called attention to Peter's comment in the chat and asked attendees for thoughts about where tidal marshes could help buffer areas. Dick described a situation where a bulkheads/walls are adjacent to marshes, and the potential problems.
- David asked attendees to think about green infrastructure and noted that some work had been done in the downtown area. Bill stated that the Town was trying to secure additional funds and grant for green infrastructure in the downtown area. He noted that the Town will ask developers to incorporate green infrastructure when possible. The Sherman Green upgrade included construction of a stormwater infiltration system.
- Emmeline explained that the Town's zoning promotes mixed-use development, and that development pressures are high near the railroad stations in the TOD areas. However, residential redevelopment pressures remain along the shoreline and in flood zones where risks are high. David asked what types of development pressures were occurring in these high-risk areas, and Emmeline explained that the Town observes many duplexes being constructed for rental housing, often sought by students at Fairfield University.
- Turning back to the configurations of opportunity areas, David posed a question about including Bridgeport's lower west end with the area that is centered on the Fairfield Metro Station. He asked the group to comment on whether this is appropriate, or whether they should be considered separate opportunity areas. Emmeline strongly favors keeping them together despite the physical separation, as new pedestrian access will link Fairfield Metro with Black Rock. Katie added that this is a good example of recognizing the importance of shared economic benefits.

- Katie asked attendees if any areas had been missed. David mentioned Southport, which is centered on a railroad station. Attendees said that this area did not need to be identified as a potential adaptation/resilience opportunity area, as the residents of Southport are resistant to development of any kind.
- Attendees discussed heat as a driver of identifying opportunity areas. Becky asked if it were possible that heat was over-emphasized in the analysis, which could therefore lead to identifying areas that overlapped with highly development urban heat islands. David described the process used to overlap high and moderate flood vulnerabilities with high and moderate heat vulnerabilities. He also noted that many stakeholders have been in favor of emphasizing heat, so it was important to balance heat and flood. He remarked that the discussion in the New Haven breakout room on the previous day was largely about heat, and flooding was barely mentioned.
- Mary made two points; first, planting trees to address heat vulnerabilities can have co-benefits; and second, she asked if the planning process was looking upstream of potential opportunity areas when trying to prioritize them. She mentioned Rooster River as an example of an area that would need attention and should factor into consideration of the opportunity area downstream at Ash Creek.
- Emmeline urged the CIRCA team to identify the co-benefits of project elements, as this will help them be competitive for funding. She used the Fairfield Metro station parking as an example of significant paved areas that could be greener. Becky added to this point by stating that the team should look at the damage from flooding vs. the cost of remediation for flooding, and that CIRCA could focus on the easier project elements in the early stages of more complex projects.

Stratford Area Group

Victoria Vetre, Facilitator
Joanna Wozniak-Brown, CIRCA
Jim O'Donnell, CIRCA
Jill Pietropaolo, RACE
Rich Donovan, NVCOG

Dean Audet, Fuss & O'Neill
Josh Lecar, NVCOG
Susmitha Attota, Town of Stratford
John Casey, Town of Stratford

Victoria briefly reviewed some of the general types of assets used in opportunity area identification, and participants were then asked if there were any assets or general asset types that may have been overlooked, or if there were specific assets, they felt were regional and should be included in an opportunity area.

- Hurricane Katrina was used as a comparison to note that public safety facilities and areas of public assembly should be included and prioritized.
- This might include stadiums, school auditoriums, or anywhere that accommodate more people during an event.
- The National Guard armory was also noted as a potential asset that should be considered.

Participants were then asked if there are any particular areas of flood or heat concern.

- The Lordship area is vulnerable to flooding.
- While heat is a concern, there is no area aside from those with vulnerable populations such as in the opportunity zones.

It was then asked what else can we take into consideration when prioritizing opportunity areas – social vulnerability, evacuation routes, projects happening or planned?

- Discussion was had about the importance of all of these, but what is the most feasible given time and financial constraints. One way to look at this is “envision what needs to be accomplished in an area, then develop how it can be accomplished.”
- An example was made using South End – will this opportunity area have on large project? Or will it be broken into several projects; this might help decide what is taken into consideration.
- Jim (CIRCA) then pointed out that this is precisely what Resilient Connecticut is looking to do – identify projects that have co-benefits on a regional scale. And to identify projects that municipalities cannot address themselves which may also have longer planning horizons.

Victoria then asked if there are any projects related either directly or indirectly to resilience.

Susmitha noted several projects:

- WPCF dike will soon be in construction phase.
- Residential property elevations
- Currently working with FEMA on a repetitive loss area analysis
- The Town has also applied for BRIC funding for flood protection.
- There are development discussions to include TOD and mixed-use development in Town Center.
- The Shakespeare property has an interested developer and may be promoted as a regional destination.
- Complete streets program
- The army engine plant project
- Great Meadows restoration by USFW.
- Plan to expand oyster beds along western waterfront.

Victoria then asked if shelters or cooling centers needed development, or if evacuation routes were at risk of flooding and may be candidates for resilient corridors.

- Susmitha noted that cooling centers are identified in the hazard mitigation plan and that most evacuation routes are not identified ahead of events seeing as they may change depending on the severity.
- John noted that route 113, both the northern and western reach, are vulnerable to flooding with the northern reach (Main Street) being lower elevation and slightly more vulnerable. This is a main route that would allow egress from the Lordship area.

WestCOG Workshop #2

Meeting Notes

May 26, 2021

Northern Community Breakout

David Murphy, SLR Consulting
Yaprak Onat, CIRCA
Katie Lund, CIRCA
Julia Pemberton, First Selectman,
Redding

Nicole Sullivan, WestCOG
Henry P, DEMHS Region 5
Alex Felson, for CIRCA
Scott Dale, Brookfield Planning
Commission

David presented the information sheets for the zones of shared risk and potential opportunity areas. He then explained that the attendees could view of specific area or hold an open discussion.

- Julia remarked that she was happy to see Georgetown/Branchville as a potential opportunity area. She asked what had changed, and why was it added subsequent to the COG meeting of May 20? David responded that her comments, and other similar comments, has demonstrated that the presence of high flood vulnerability without high heat vulnerability is nevertheless deserving of close consideration. He explained that even without the high heat vulnerability grid cells in the Georgetown/Branchville area, the area has two TOD locations and regional infrastructure, and future development must not increase the potential for higher heat vulnerabilities.
- Nicole asked if resilience projects need to be in rights-of-way or in related publicly owned areas. David responded that this was not required. Katie explained that Resilient Connecticut emphasizes projects with significant public benefits and recognized that a higher fraction of private properties may be necessarily involved in more suburban and rural communities as compared to more urban communities.
- Alex emphasized the importance of taking a holistic approach, considering future investments, and ensuring that we move to more resilient systems. David noted that the WestCOG region perhaps does not have many examples of comprehensive complex resilience projects like Resilient Bridgeport. He hypothesized that the region enjoyed significant resilience efforts many decades ago when the Stamford hurricane barrier and Norwalk River flood control systems were constructed, though they were not called resilience projects.
- Henry is interested in critical infrastructure such as water, wastewater, transportation, communications, and power. He mentioned the lifelines approach being embraced by FEMA.

He noted that “critical infrastructure supports critical infrastructure” and explained that the loss of one piece of infrastructure can have cascading effects on others. In response, Katie posed the question whether the opportunity areas that we identified could address lifelines and critical infrastructure; and Henry noted that Resilient Connecticut could help critical infrastructure become more resilient. He noted that eventually the loss of critical infrastructure affects everyone but can have extreme impacts on vulnerable populations.

- Julia noted that trees are often a local issue, and they understand that extended outages can occur after a storm. However, regional transmission lines run through the area (Redding and Ridgefield), and these do not necessarily deliver power to adjacent areas.
- Scott said that he was concerned with food security. He explained that cold storage is already oftentimes limited, and extended outages make the situation worse.
- David asked participants to comment on situations where opportunity areas are close to one another like two of the three in Danbury. He posed the question about whether risks should be addressed separately or together. Alex registered his preference for breaking areas into the smallest parts that make sense. Katie noted that yesterday during the Fairfield breakout session, participants recognized the utility in addressing proximate zones of shared risk in the same larger opportunity area, given the economic linkages and connections.
- Alex posed the question to participants if watershed planning and water quality had a connection to resilience planning. David responded that they are very closely connected, as flooding is one of the main sources of water quality impairment. He added that he looks forward to a time that the next iterations of watershed plans take resilience concepts into consideration.
- Katie asked participants to describe any resilience planning undertaken in the region. She asked if there had been any impediments. David noted that the towns have hazard mitigation plans, at a minimum.
- At the end of the session, Julia used the opportunity to ask a question about floodplain management and FEMA map updates. David answered her questions. Through the course of this discussion, the group learned that the Wilton YMCA has considerable flood risk.

Norwalk/Westport Community Breakout

Participants:

Victoria Vetre, Facilitator

Joanna Wozniak-Brown, CIRCA

Michelle Perillie, Westport Planning

Keith Wilber, Westport Engineering

Michael Kiselak, Westport Planning

Daniel Stanton

Alicia Mozian, Westport

Laura Kenny, Norwalk Planning

Michel DeLuca, Norwalk

Michelle Andrzejewski, Norwalk

Victoria briefly reviewed some of the general types of assets used in opportunity area identification, and participants were then asked if there were any assets or general asset types that may have been overlooked, or if there were specific assets, they felt were regional and should be included in an opportunity area.

- Norwalk noted that the SoNo opportunity area seemed to make sense capturing the vulnerabilities.
- Also, in the SoNo area are several public housing sites, new mixed use development sites – just overall a high density of residents.
- Westport noted that there are at least 3 critical facilities in the downtown opportunity area including the treatment plant and a shelter.

After the asset discussion, Victoria then asked participants based on this asset information how might opportunity areas be prioritized? Are there asset types or specific assets that really need to be addressed sooner than others, and are there assets outside of these three municipalities that the towns rely on? In general, what should be taken into consideration?

- There was a discussion regarding the considerations for the SoNo area. With high resident density and a high rental area, many do not have AC, overall socially vulnerable and a relatively high flood vulnerability.
- It was also asked how, if at all, the shell fishing industry is being taken into consideration. Victoria noted this was a good point and that more water related assets/industries need to be worked into the process.
- Westport noted that both Compo Bach and Saugatuck Shores, while primarily residential and not in an opportunity area, have their flood related challenges. Evacuation is a concern, while it is not impossible, there is typically only one way in, one way out.
- Victoria indicated that this was an important point as one component of this work is to identify resilient corridors.
- Norwalk then also noted that Water St., in the SoNo area, is also a perpetual flood related challenge.

Discussion was then had regarding education, outreach, and emergency messaging. Norwalk participants expressed frustration with making the connection between evacuations and getting residents to understand what a warning means, and that they should not wait until the last minute. A similar concern was raised about heat. When neighboring communities send conflicting messages

regarding heat wave precautions and safety, residents become skeptical. It might be useful to have more consistency with this type of messaging.

Victoria then asked if there were any resilience related projects, or TOD projects, occurring in the towns that might link well with Resilient Connecticut.

- Norwalk noted a waterfront study that will be kicking off very soon. This will look specifically at industrial properties, while considering community goals and the best use of the land.
- There is an East Norwalk TOD plan in the works.
- Westport is developing a 150 unit on Hiawatha Lane, which is in the TOD area.
- Alicia noted that Westport and possibly other municipalities may be relocating their EOC to an old GE location. There was confusion as to whether it was EOC or dispatch, however, this may be useful for shared resources.
- Westport has a downtown implementation plan that includes opening up more green space and other projects along the river.
- Norwalk has the Water Street coastal resilience plan as well.

Greenwich/Stamford/Darien Breakout Group

Participants:

Johanna Greenspan-Johnston, Dewberry
Facilitator
Scott Choquette, Dewberry, Facilitator
Jill Pietropaolo, Race Coastal Engineering
Anita Carpenter, Stamford
Paul Hearn, Baralmar Advisors

James Michel, Greenwich
Jim O'Donnell, CIRCA
Rebecca French, CT DEEP
John Truscinski, CIRCA
William Cavers, Darien
Peter Alexander, CReV

The session started with reviewing the regional assets included in selecting opportunity areas. There was general agreement that the list was comprehensive.

- Electric substations were mentioned as being among the most important assets
- Rebecca French asked if all substations are vulnerable or if we did any research to determine which among them may have mitigation/adaptation. She suggested that data may be available from the utilities to determine what assets are already protected.
- Scott indicated that at minimum that determination would be made early in project development.
- James indicated that there is a brand-new substation in the Cos Cob section of Greenwich that has a wide-ranging impact area (services ~95% of Greenwich).

There was a discussion about the inclusion of affordable housing.

- Scott and Johanna reviewed how it was included in the CCVI and the sources of the data.
- Affordable housing will weigh in heavily during the next phase as well.

During a discussion about prioritization of the opportunity areas Scott suggested project already identified in resilience plans would be a good starting point. He inquired about the Status of Greenwich's Resilience Plan.

- James indicated that the plan is not complete and that the project is stalled some, looking for additional funding.
- James was unaware with overlap between the plan and Resilient Connecticut. He is new to Greenwich and none of the planning team members for the local plan were able to be on the meeting.
- Patricia Sesto, Director of Environmental Affairs is leading the planning effort. James suggested reaching out to her.
- Scott noted that the Greenwich plan was to have a large ecological component, whereas some other plans are more infrastructure centric and how that was an example of equally important but different priorities.

John asked about TOD areas in Greenwich. James again suggested reaching out to Patricia Sesto.

Anita Carpenter from Stamford indicated that she has been with the city for only one month and was participating as an educational opportunity.

There was discussion about chronic stormwater flooding at Stamford Station which is a TOD area.

Rebecca pointed out that there is an overall state policy of focusing resilience and adaptation efforts on vulnerable populations and how that needs to be considered in our prioritization.

Rebecca further iterated that power outage prevention should be a priority.

- There was brief discussion about looking at egress/access issues around flooding.
- If a substation is floodproofed, is it accessible during an event.
- Scott and Johanna pointed out that some ZSR are selected based on the status of the area as an "island" in the flood.
- Large substations in Bridgeport and Norwalk were also discussed for their regional significance.

Jim O'Donnell mentioned the need to include analysis of natural gas, gasoline, and heating oil regional distribution facilities.

- John suggested that DEMHS and its REPT teams should be more involved.

There was a brief discussion at the end around prioritizing nature based and green infrastructure where it makes sense and on not losing site of policy and planning oriented projects that can have long term benefits.

NVCOG Workshop #2

Meeting Notes

May 27, 2021

State Agencies Breakout Group

Participants:

Victoria Vetre, SLR, Facilitator

Scott Choquette, Dewberry, Facilitator

John Truscinski, CIRCA

Joanna Wozniak-Brown, CIRCA

Marissa Wright, USACE

Thomas Riscassi, DEEP

Emily Pysh, CT DOT

Jennifer Reilly, CT DOT

Doris Johnson, DEEP

Pete Alexander, CREV

Several questions were raised regarding what groups have been contacted during the process so far, who has been consulted, and who the team was planning on reaching out to.

- This included land trusts – there is a state rep on the Resilient Connecticut Collaborative (RCC).
- It was suggested the team reach out to conservation districts regarding development and for feedback.
- It was asked if community groups, and neighborhood groups would be engaged – the team noted that these groups will be targeted a little later in the phase.
- The importance of being aligned with GC3 was discussed.

A question was raised about whether the team included an analysis of population growth/change as part of the CCVI.

- John T. noted that there haven't been significant changes in population in Connecticut that would meaningfully impact the analysis
- There was discussion about changes in population patterns during the COVID pandemic that would not yet show in the demographic data but might be worthy of analysis in the future.

A question was then raised regarding whether traffic density was incorporated into any of the process of analysis.

- Yaprak and Victoria agreed it was not.
- Jennifer Reilly noted that DOT could provide some of this data if it would be useful in some analysis.
- It was clarified that the data include local roads in addition to state highways

One participant asked how vulnerability is being characterized, as in how we know what is driving the flood or heat vulnerability.

- Victoria explored the CCVI viewer briefly to explain that there are several different scores for the vulnerability equation and that to further understand the drivers we can identify the higher scoring component in an area.

Doris Johnson noted the importance of keeping EJ communities involved in the process, and ensuring these communities ultimately reap some of the benefits of this analysis.

John asked the DOT representatives how Resilient Connecticut can incorporate DOT into these local planning efforts.

- It was noted that while the participants are just getting up to speed on this project, it is important to see which areas have been identified, and how they may relate and intersect with DOT planning and objectives.

There was a discussion about the use of solar for energy security (and redundancy) vs. the need to preserve undeveloped land

- The question of whether large solar arrays were included as an adaptive capacity. Although the answer is no, energy redundancy be it solar, microgrids or otherwise, could be part of a potential project.

Municipal Breakout Group

Municipal Group

David Murphy, SLR Consulting
Jim O'Donnell, CIRCA
Katie Lund, CIRCA
Alex Felson, for CIRCA
Christine O'Neill, NVCOG
Aaron Budris, NVCOG

Frederick Bowes, Beacon Falls Inland Wetland
and Watercourse Commission (IWWC)
Michael West, resident of Ansonia
Nicole Cignoli, Derby Library and designated
liaison for hazard mitigation

David presented the information sheets for the zones of shared risk and potential opportunity areas. He then explained that the attendees could view of specific area or hold an open discussion. He asked the municipal representatives to speak first. Katie asked participants to provide any local insight into specific areas or planning that is underway.

- Frederick stated that he had reviewed the background information prior to the workshop and understood the material. He expressed some uncertainty about how the Resilient Connecticut products could be used for planning, whether by his IWWC (which reviews proposals prior to the Planning and Zoning Commission) or by the Planning and Zoning Commission. David used the opportunity to switch screens to the Story Map and demonstrated some of the information available in the flood and heat CCVI viewers. Frederick explained that his IWWC is involved with careful planning about new developments.
- Michael stated that infrastructure resiliency is important. He is a resident of Ansonia and is interested in how the community redeveloped and prepares for the types of challenges being discussed.
- Nicole appreciated the explanation about the heat vulnerability mapping, as she initially thought that heat was about wildfires. She would like Derby to remain a walkable city, which is a reasonable goal given its small size. She noted the challenge of the railroad station and transit being in the floodplains. David asked her opinion of the frequent news about the influx of people to the valley, looking for relatively affordable housing, with many coming from the New York City area. Nicole noted that this seems beneficial, but one concern is that people will move to Derby and then leave for Oxford within a few years; this presents a set of challenges related to rapid turnover of housing while trying to make a community more resilient.
- David turned Nicole's concern into a question posed to Jim; how should the State deal with this kind of concern? Jim noted that part of the solution is to reduce the reliance on automobiles as well as the parking and roadway needs that come along with using cars.

Alternatives such as transit can reduce congestion and CO2 emissions. Densifying areas near public transportation can help achieve these goals. Economic development can be a co-benefit through this focus on transit and density.

- Aaron noted that heat would be challenging against the backdrop of the need to redevelopment legacy industrial properties. The towns are trying to use resources to redevelopment these areas. There is an opportunity to add green space such as green roofs and a lower proportion of asphalt.
- Alex noted that the redevelopment that Aaron speaks of is often with flood zones. These areas require long term investment, and he posed the question about what the regional scale implications might be.
 - Aaron responded that these industrial areas were once our job centers but will likely not be job centers going forward in most cases. He cited two examples: Freight Street in Waterbury will have some type of mixed uses; and the Waterbury Industrial Area will be subdivided into various industrial and commercial uses.
 - Jim acknowledged the many industrial sites and asked how our capacity to address them could be changed; should some of these sites be redeveloped or removed?
 - Christine pointed out that we typically think of brownfield cleanup and as needing a “return on investment,” and we think of new residential or commercial uses to return on these investments. However, we don’t have a good way to consider green space as a return on these investments.
- Christine urged Resilient Connecticut to address damage to homes, trees, and power lines during severe storms.
- Christine noted that TOD traditionally is about trains and asked why other types of transportation could not be considered in the project.
 - Jim reiterated his earlier states about reducing reliance on automobiles. He noted that trains were a priority for commuting but acknowledged the success with other types of transit such as the busway in the Hartford area.
 - Jim also noted that the Resilient Connecticut approach was developed five years ago when TOD was more visionary and prior to the working-from-home lessons provided by the pandemic.
 - Christine added that TOD is “aspirational” in the sense that it describes what we want.
 - Jim noted that the State understands that flood risk needs to be addressed, but we can use this opportunity to ask what else can be accomplished. For example, can we reduce CO2 emissions? Can we reduce heat risks? The co-benefits should be recognized.

- Alex mentioned the implications of housing stock in areas of risk. Some of the current housing stock is aging and will soon become eligible for being considered historic. We should look for ways to adapt this housing beforehand.
- Having listened to the discussions about transit and TOD, Michael related his experiences with using transit. When he wants to travel to New York City, he drives from Ansonia to the Milford train station. The trains are more frequent along the main MetroNorth line, and there is ample parking at the Milford station. He explained that people will use infrastructure when it's easy, and that mobility is the key. He noted that Shelton is experiencing more development than Ansonia and posed the explanation that Route 8 is much easier to access in Shelton; with this easy access to Route 8, people can drive quickly to places they need to go including railroad stations to the south.
- Responding to the many points, Jim explained that Resilient Connecticut wants to get people to new housing that is not developed in areas of risk. In some cases, we may need to develop outside of floodplains and then bring transit there.
- Katie noted that some transportation centers are more regional than others relative to how many communities are served. A transportation center that serves more communities should perhaps get more attention than one that serves fewer.
- Aaron explained that the Naugatuck River Greenway will pass through all the opportunity areas that were presented. Because it will connect all of them, Resilient Connecticut should recognize the significance of the greenway.
- Christine asked CIRCA what the endgame of Resilient Connecticut will be. Jim explained the need to gather a list of resilience projects. He acknowledged that Resilient Bridgeport is a good example but noted that his team would like to identify projects that have more regional significance than Resilient Bridgeport.
- Katie noted that projects that come to light during the planning process can be teed up in other ways; developing a "project pipeline" can be helpful for state planning as more funding and support of resilience projects becomes available. Alex added that some smaller-scale projects like bridge upgrades are also important; these smaller local projects should have a resiliency perspective.

Open Discussion

After the breakout session report-outs and final part of the presentation, Jim asked attendees if any notable large projects in the NVCOG region are moving forward. Aaron responded that Ansonia, Derby, Naugatuck, and Waterbury all have redevelopment plans. Jim would like to understand these better, to see where CIRCA can add value through Resilient Connecticut.

- Alex noted that the Naugatuck River Greenway perspective (from the breakout session) was interesting and asked if any infrastructure investments were included in the greenway project. Aaron responded that a greenway is infrastructure; the costs range from \$2 million to \$3 million per mile. Aaron explained that NVCOG recently completed the prioritization of sections. Resilient Connecticut should become familiar with this.
- Frederick asked if any of the resiliency planning could lead to a loss of local control, and Jim explained that this is not intended. Alex used this opportunity to note that Resilient Connecticut would like to include these local perspectives.
- Marissa explained that a list of partners should be developed, and they should remain informed.