

MVI Tool Quick “How-To” Guide 2024

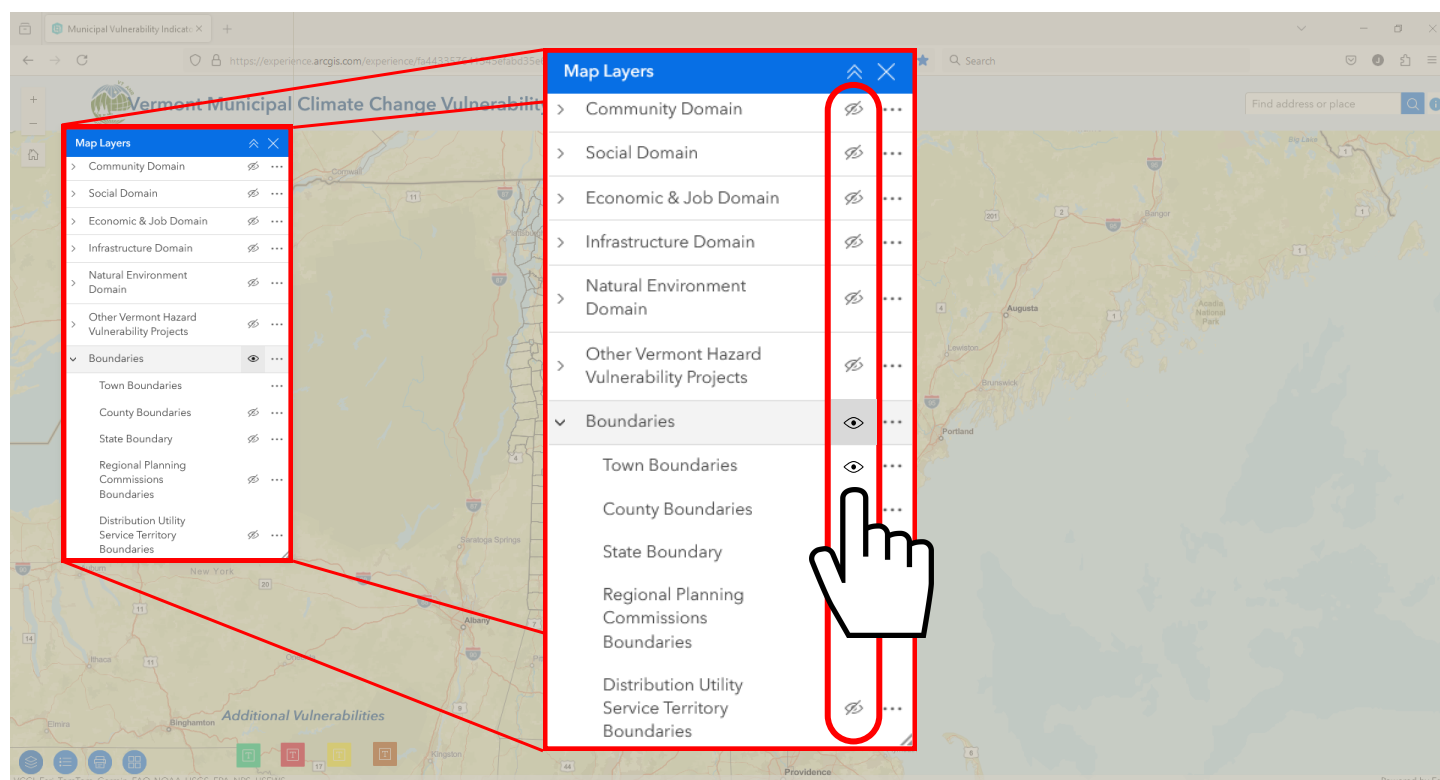
<https://climatechange.vermont.gov/mvi>

- The Municipal Vulnerability Indicators (MVI) Tool is an online mapping tool that can provide a high-level, data-rich, visual overview of climate vulnerabilities across Vermont. Use the MVI tool as an important conversation starter with local decision makers and key stakeholders to inform climate-smart planning and enhance community resilience.
- The MVI tool can help identify where climate change is placing pressure on social, economic, and environmental assets in the community. It can also help inform local hazard mitigation plans, emergency management plans, town plans, energy planning, and other climate and resiliency efforts.
- Regional Planning Commissions (RPC) are here to help municipalities in using the MVI tool and taking related next steps. Find your RPC contact and request support here:

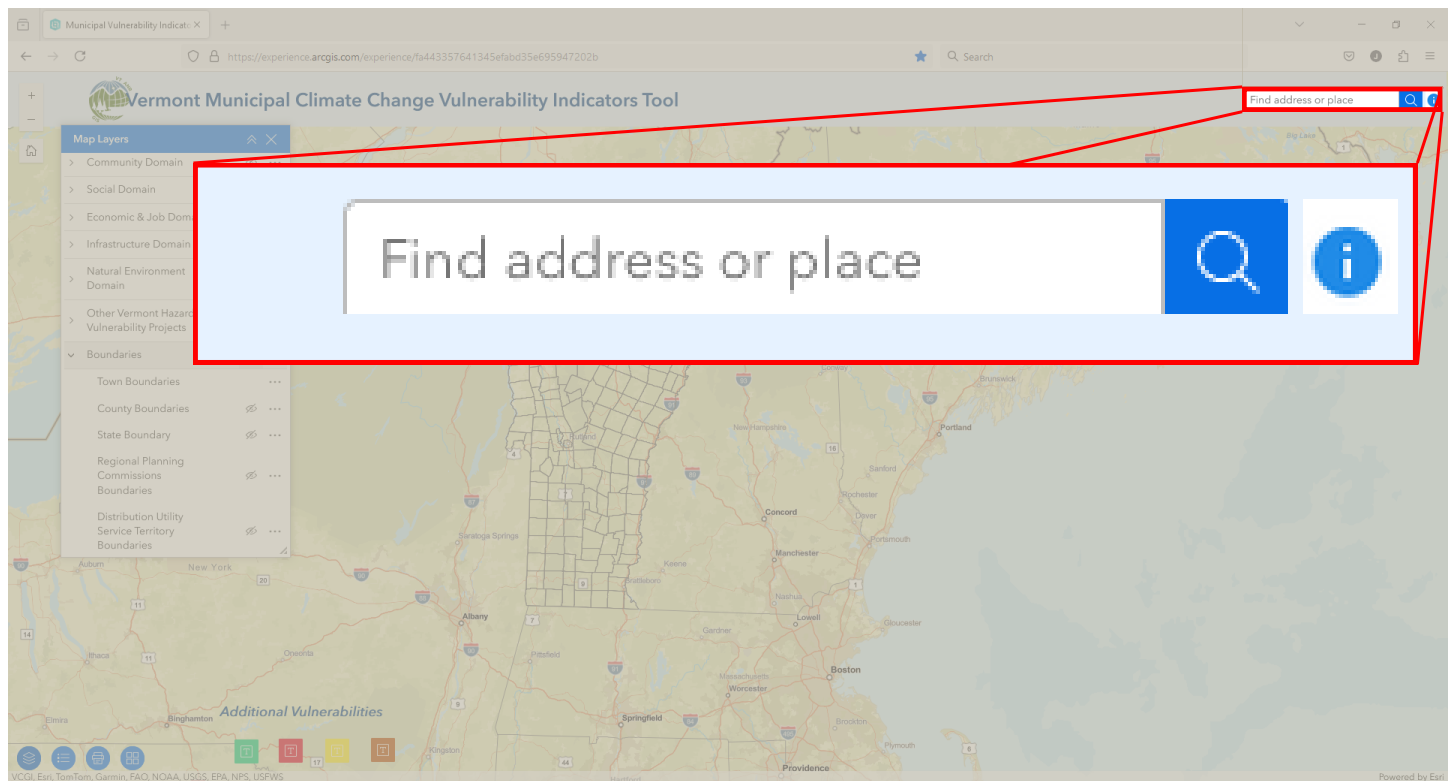
<https://www.vapda.org/regions.html>

Before you begin to explore the MVI tool at the local level...

Turn off all “Map Layers,” except “Town Boundaries,” by clicking on the visibility (eye) icons, as shown below.



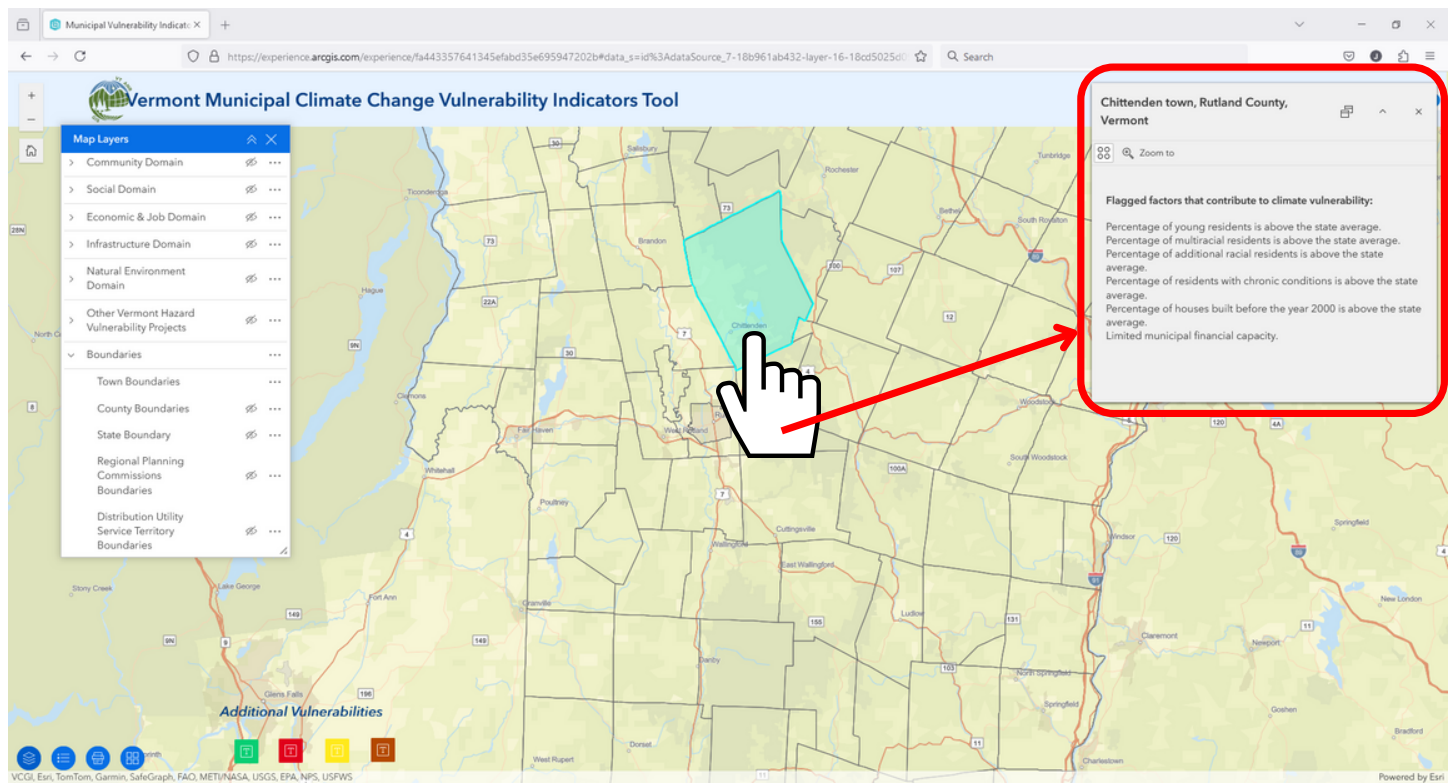
Then, click on the desired location on the map, or use the “Find address or place” search bar in the top right corner.



Step 1 - Identify Vulnerable Social Populations

Identify groups of people who are at a higher risk to climate change impacts, due to social, economic, or environmental disadvantages. The Vermont Climate Action Plan further defines these populations as those highly exposed to climate risks, such as health impacts, flooding, and extreme temperatures; those who experience oppression and racism, are excluded from opportunities, or have fewer resources to adapt to climate and economic change; those who bear the brunt of pollution and negative effects from today's fossil fuel and extractive economies; and those more likely to experience a job transition as Vermont addresses climate change.

- To identify the “Flagged factors that contribute to climate vulnerability” in a specific community, click the municipality directly on the map to bring up a pop-up box that lists all the flagged vulnerability factors that are above/below state average. Keep these “flagged factors” in mind to be more aware of who is most vulnerable in your community and to help inform who should be included in planning conversations and decision-making.



FYI: “Flagged Factors” in the MVI are those data layers that are not geospatially represented (meaning they are not specific points on a map), but are flagged if they are above or below particular thresholds set (such as VT State averages) to indicate increased vulnerability to climate change hazards.

Step 2 - Identify Critical Assets

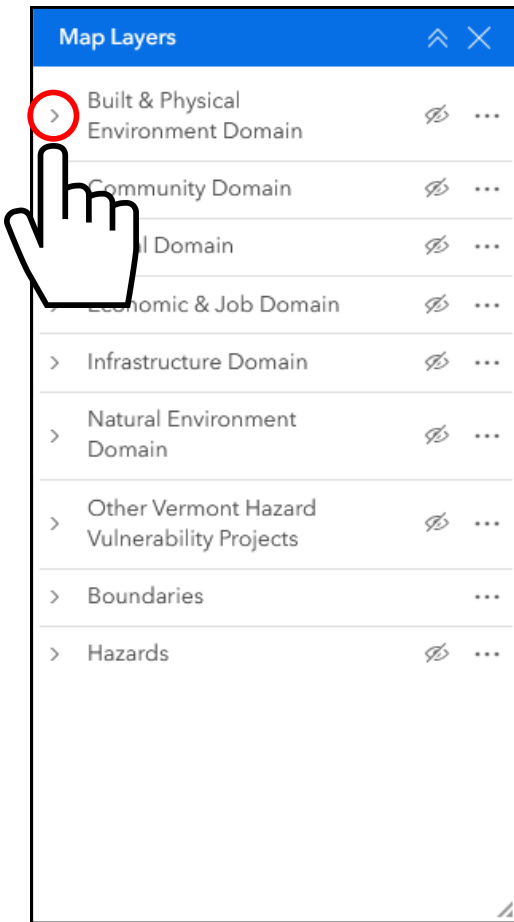
Identify critical assets that are vulnerable to climate change risks in your community, such as buildings or structures that provide essential services and functions before, during, and after a disaster.

Example #1 - Where are critical assets and emergency services located?

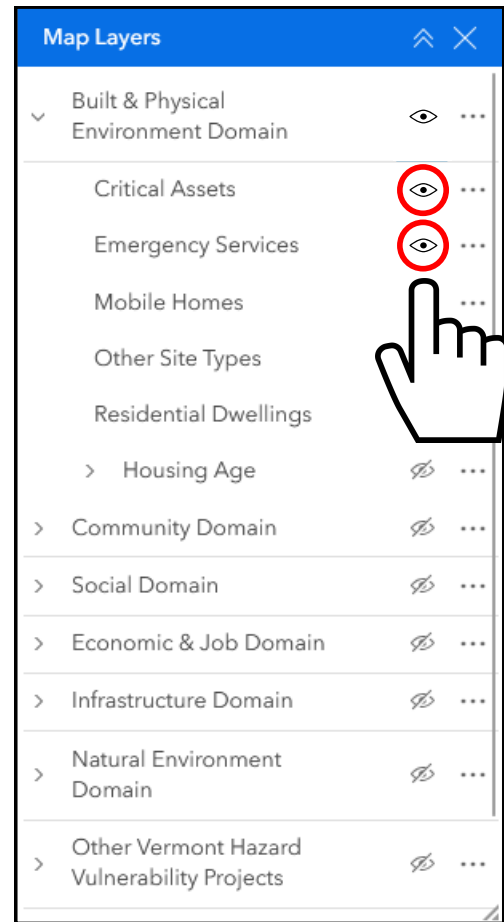
MVI Activated “Open” Layers:

1) Built & Physical Environment Domain > Critical Assets, Emergency Services

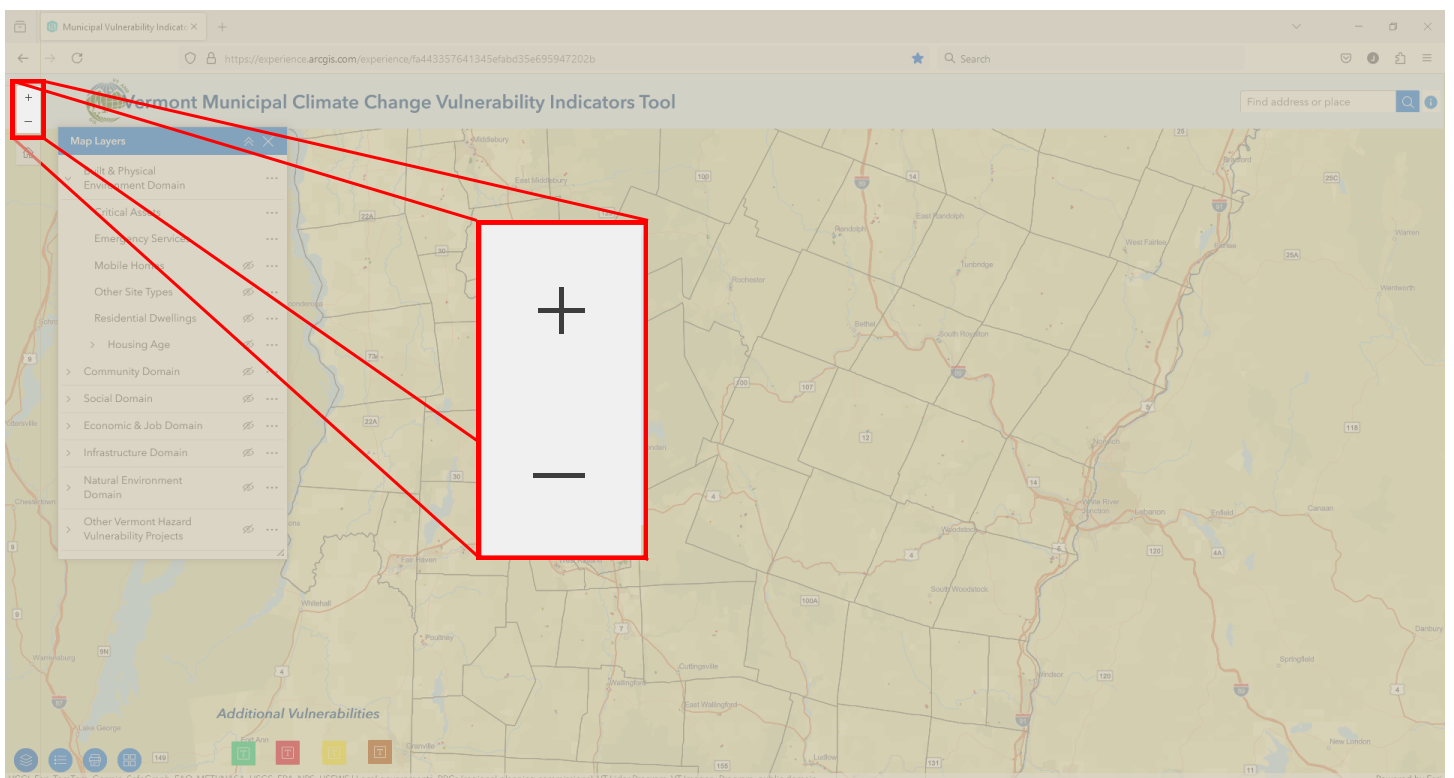
1. Click: Built & Physical Environment Domain



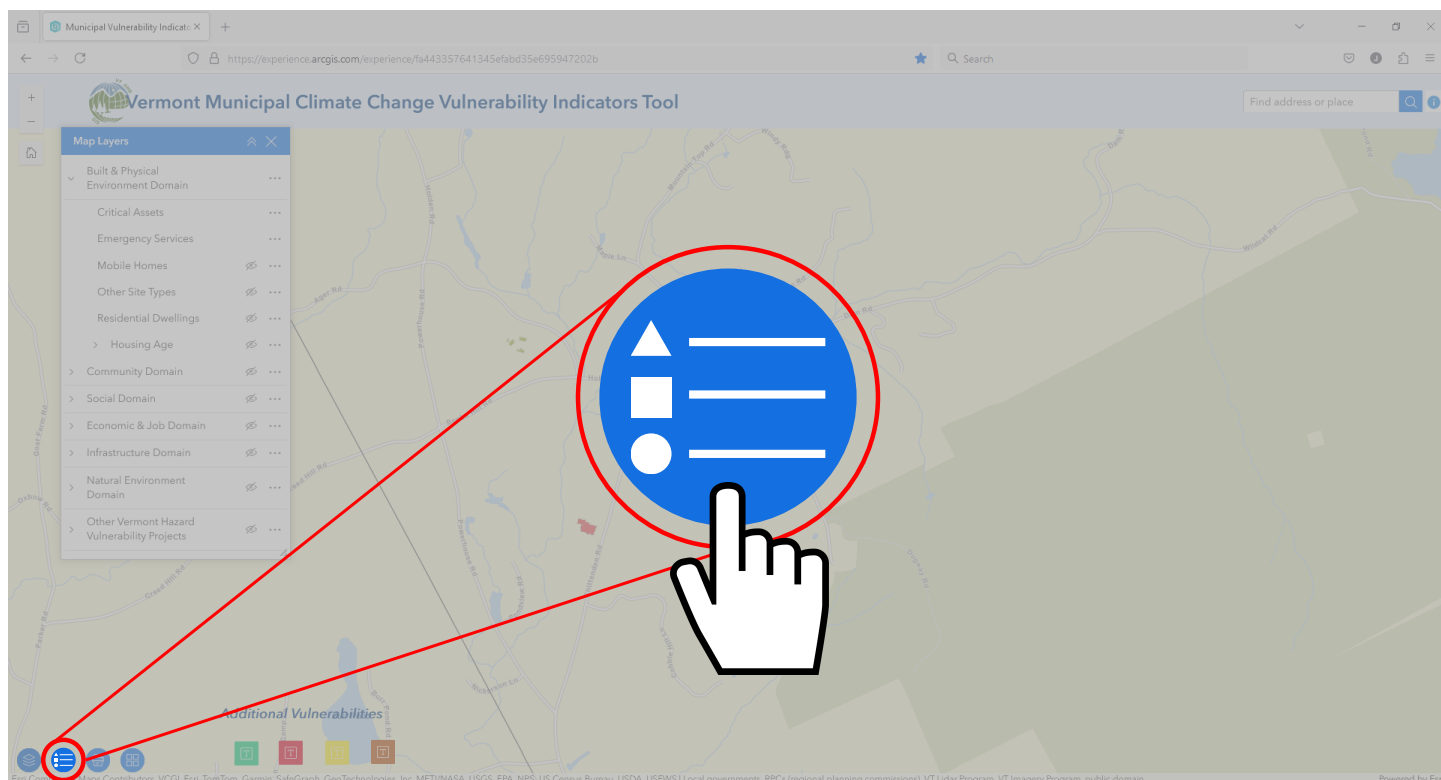
2. Click: Critical Assets
3. Click: Emergency Services



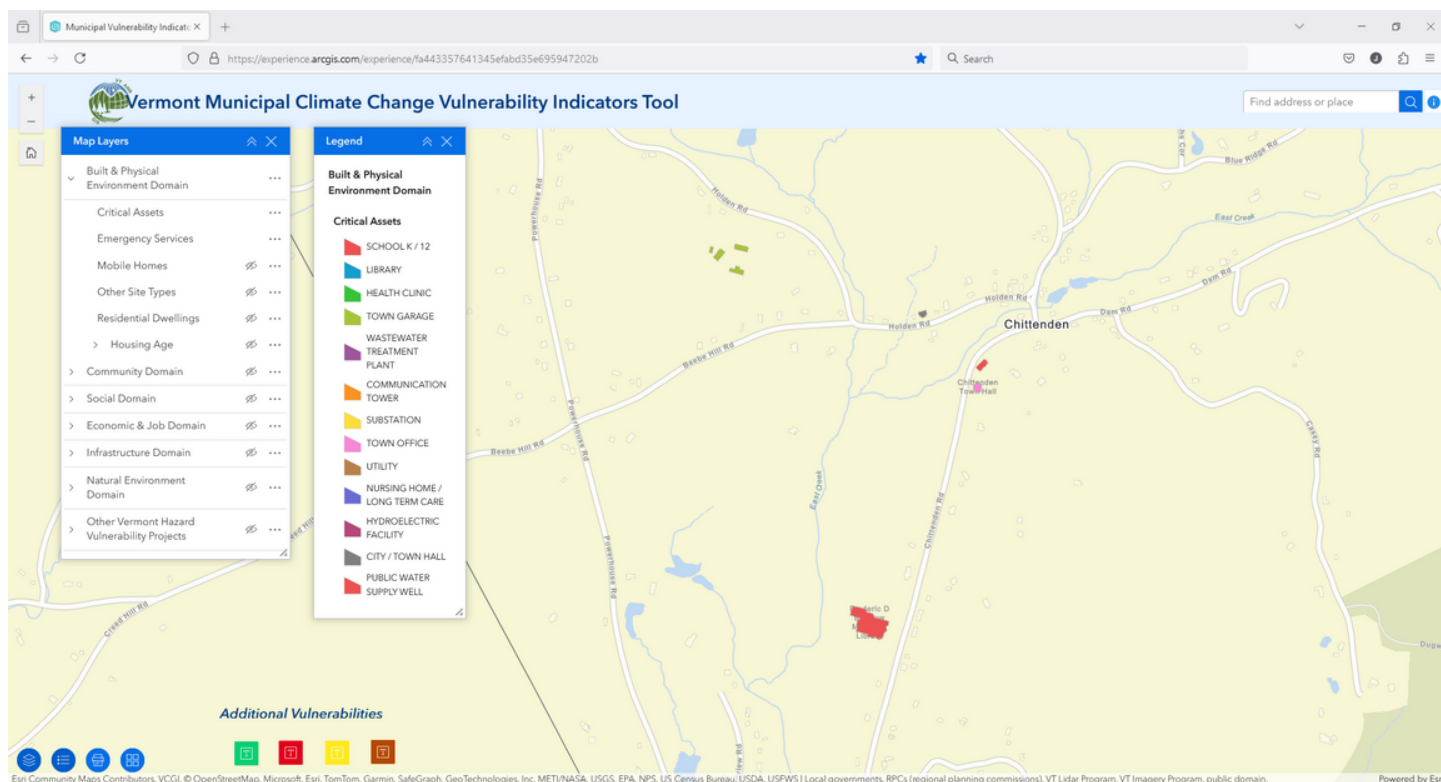
4 Click: Magnify button to zoom in (You may be able to use your mouse scroll wheel)



5 Click: Legend Button



6 Reposition: You may need to reposition the map to see the assets. Hold the LEFT mouse button down while the pointer is on the map to drag the map around.



Step 3 - Explore Hazards & Risks

Identify local hazards and risks, such as flooding, extreme precipitation, ice/wind-storms, drought, extreme temperatures, etc. that the community has dealt with in the past, currently faces, and/or anticipates experiencing in the future. A hazard is something that has the potential to cause widespread harm, while risk is the likelihood of that hazard causing harm to people, services, facilities, and infrastructure in a community.

The MVI tool is designed to allow the user to assess vulnerability to each included climate hazard by selecting ONE hazard at a time in combination with the factors that shape climate vulnerability. Note that some of the hazard layers, like Extreme Precipitation, include more than one layer due to different projected climate scenarios. In these cases, users must expand the hazard layer and select among the climate scenarios. To learn more about the individual hazard layers, and projected climate hazard data included in the MVI tool, see Section 3 of the in-depth MVI user guide available online at <https://climatechange.vermont.gov/mvi>.

Example #1 - Which buildings are located near river corridors that might be at risk?

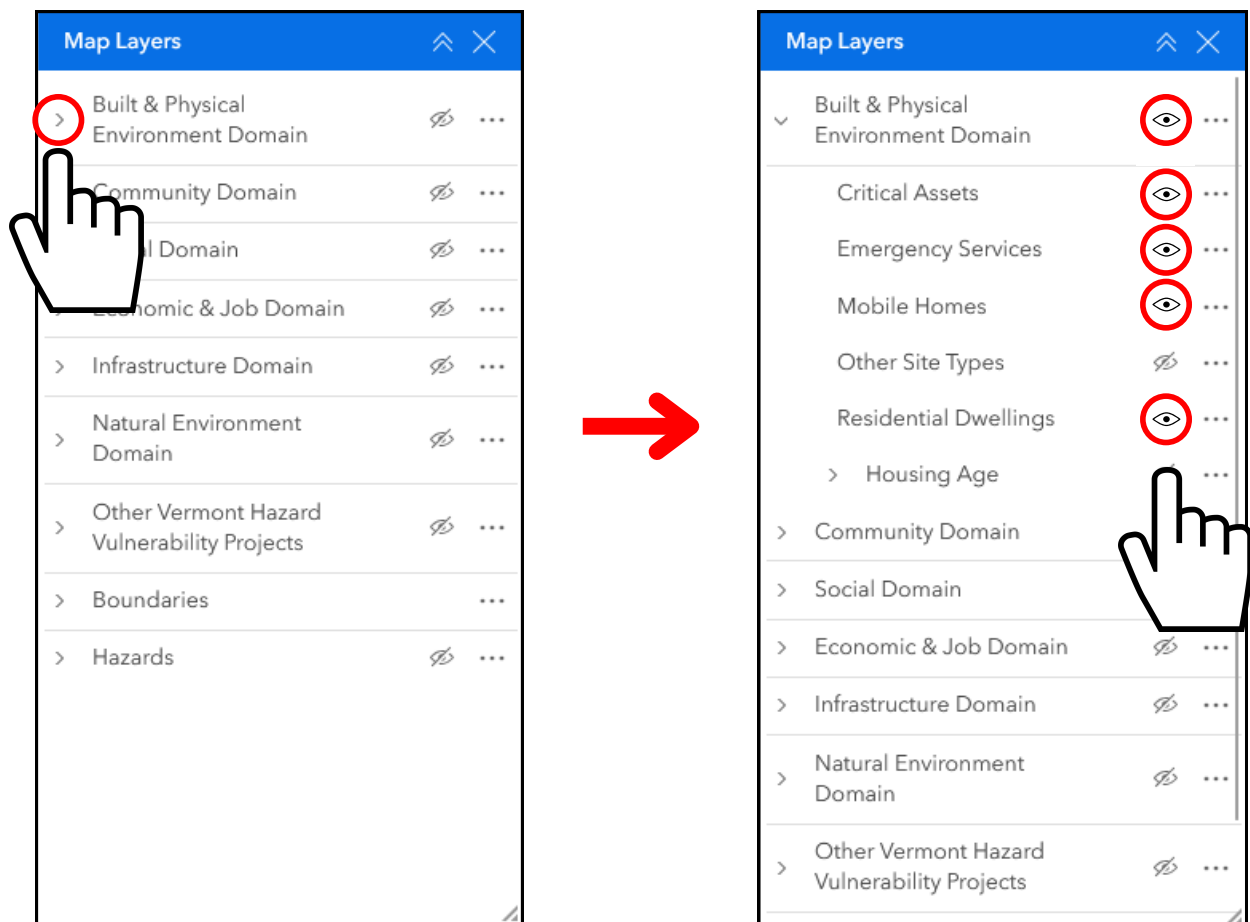
MVI Activated “Open” Layers:

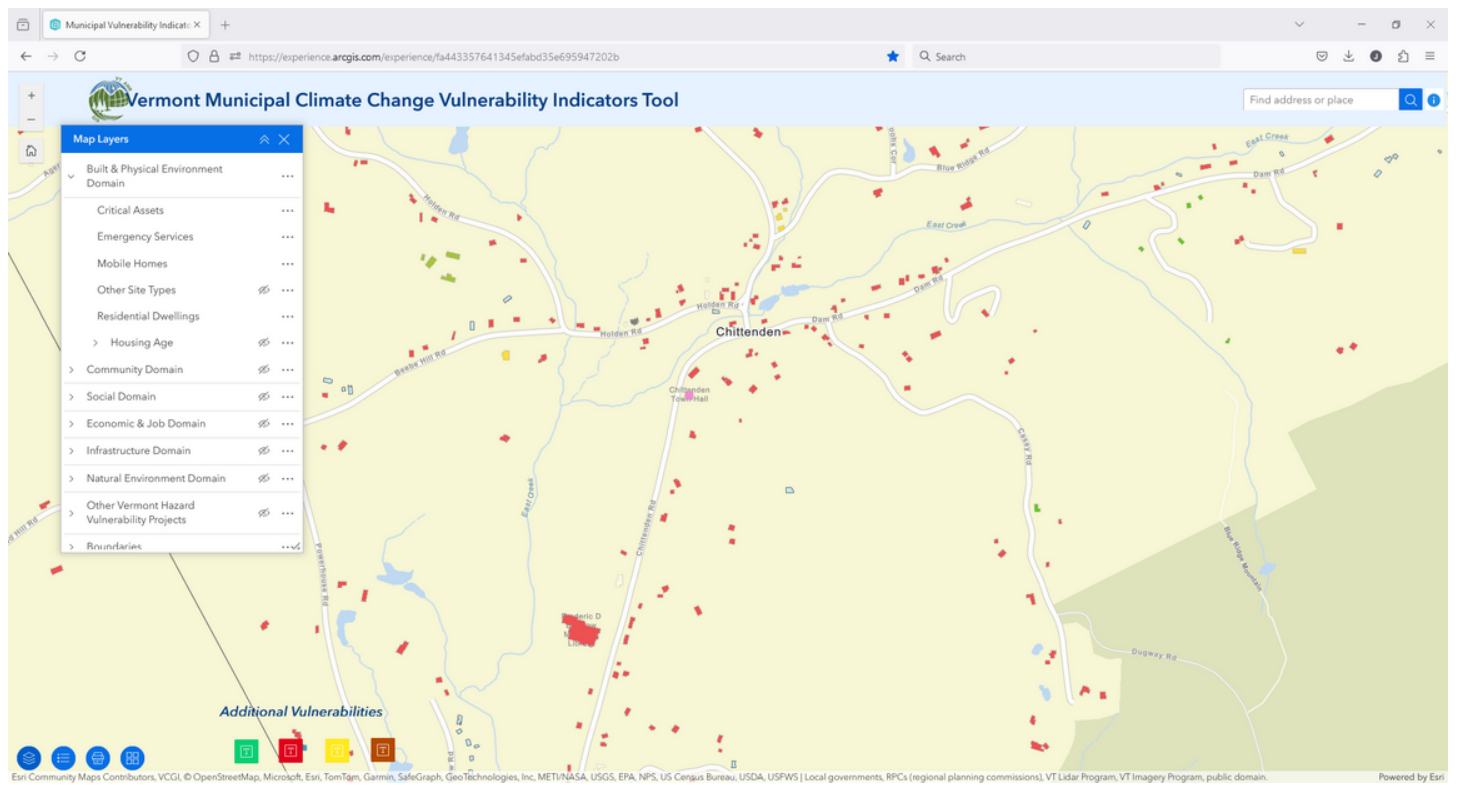
1) Built & Physical Environment Domain > all sublayers, except “Other Site Types”

- 1. Open:** Built & Physical Environment Domain
- 2. Click:** Built & Physical Environment

- 3. Click:** Critical Assets
- 4. Click:** Emergency Services

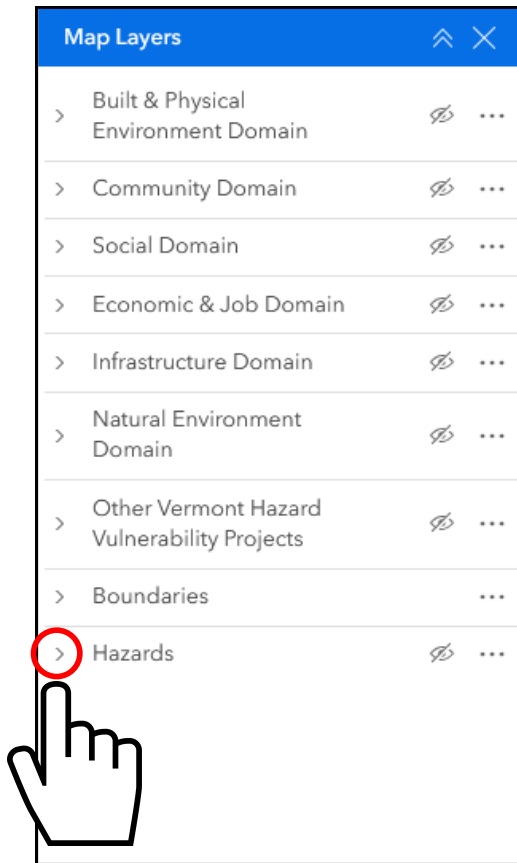
- 5. Click:** Mobile Homes
- 6. Click:** Residential Dwellings





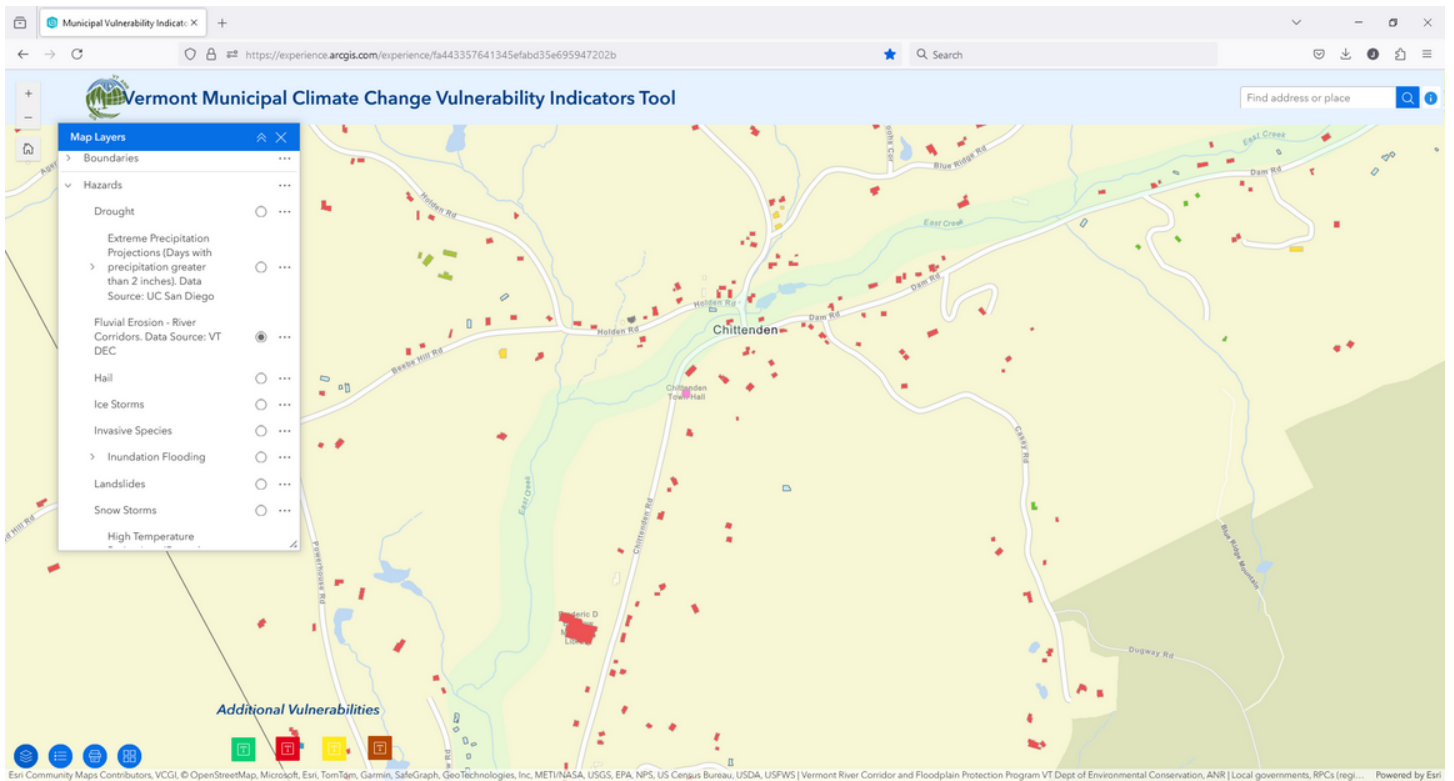
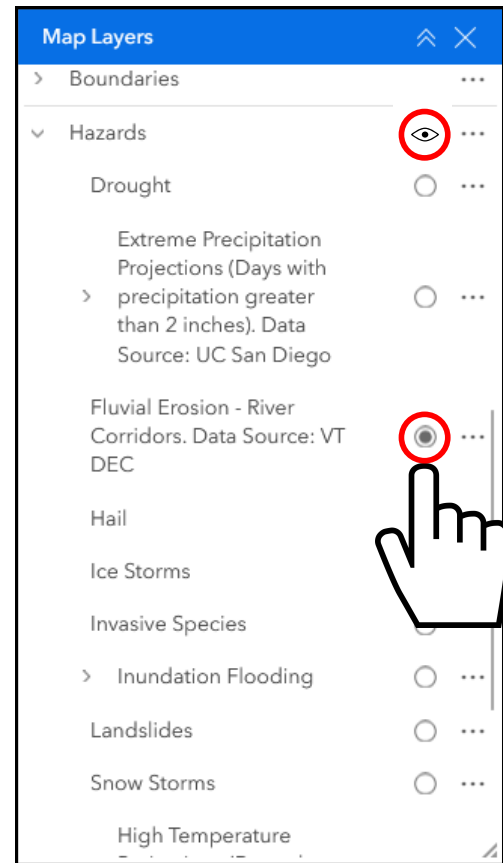
2) Hazards > Fluvial Erosion – River Corridors, Data Source VT DEC

1. Open: Hazards Domain



2. Click: Hazards

3. Click: Fluvial Erosion



Example #2 - What areas might be at risk to water run-off and/or heat island effect?

MVI Activated “Open” Layers:

- 1) Infrastructure Domain > Impervious Surfaces
- 2) Hazard 1 > Extreme Precipitation
- 3) Hazard 2 > High Temperature Projections > Fossil-fueled Development

Example #3 - What infrastructure, such as culverts, might be at risk due to landslides? What hazardous or toxic sites might be at risk?

MVI Activated “Open” Layers:

- 1) Infrastructure Domain > Culverts; Toxic and Hazardous Sites
- 2) Hazard 1 > Landslides

Example #4 - Which bridges and roads are most at risk to flooding?

MVI Activated “Open” Layers:

- 1) Other Vermont Hazard Vulnerability Projects > Transportation Resilience Planning > Bridges, Culverts, Roads
- 2) Hazards > Inundation Flooding > FEMA National Flood Hazard Data

Step 4 - Identify Strategies for Building Resilience

What can your community do to help mitigate risk and increase adaptive capacity? What nature-based solutions can help build resilience in this location? What planning should happen to better protect vulnerable populations facing increased risk and exposure to climate change impacts? Consider the natural environment surroundings, and the regional impact of conserved lands as a strategy to reduce vulnerability to climate hazards like flooding.

Explore the “Natural Environment Domain” layers in the MVI tool - Maintaining functioning natural environments can be one of the most effective climate mitigation measures. However, when natural environments are degraded, their ability to provide climate mitigation benefits for the surrounding area decreases, and as a result, the surrounding area can experience increased vulnerability. Communities might use the MVI tool to look at conserved lands along rivers, or look at major rivers up/downstream of their town boundaries, as well as the local benefits of conserved lands in neighboring communities. Explore the examples below in your community and consider what needs to be conserved, enhanced, and or protected in the natural environment.

● **Example #1 - MVI Activated “Open” Layers:** Natural Environment Domain > Conserved and Protected Lands

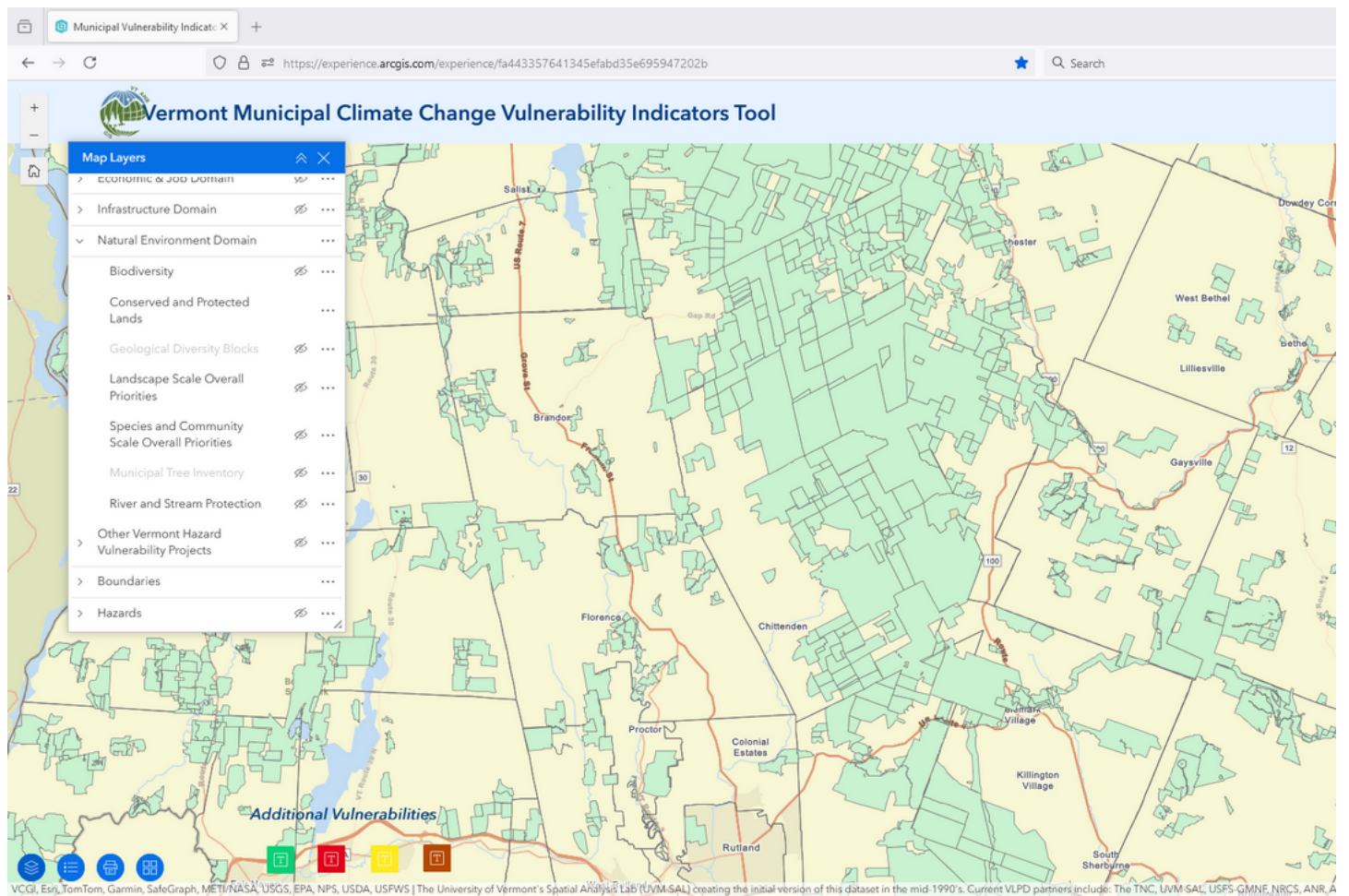
1. **Open:** Natural Environment Domain

Map Layers		
>	Built & Physical Environment Domain	...
>	Community Domain	...
>	Social Domain	...
>	Economic & Job Domain	...
>	Infrastructure Domain	...
>	Natural Environment Domain	...
	Other Vermont Hazard Vulnerability Projects	...
	Boundaries	...
>	Hazards	...



2. **Click:** Natural Environment
3. **Click:** Conserved and Protected Lands

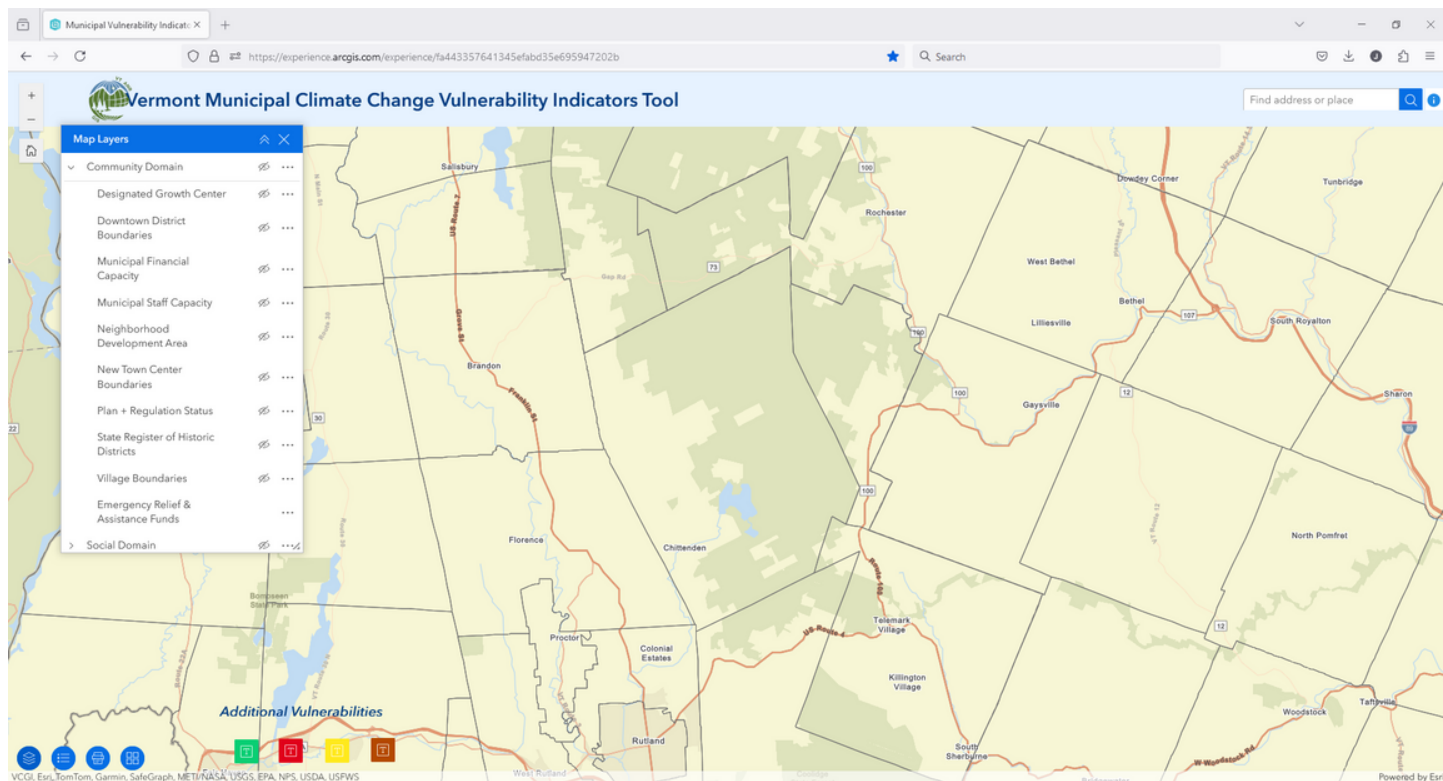
Map Layers		
>	Economic & Job Domain	...
>	Infrastructure Domain	...
✓	Natural Environment Domain	...
	Biodiversity	...
	Conserved and Protected Lands	...
	Geological Diversity Blocks	...
	Landscape Scale Overall Priorities	...
	Species and Community Scale Overall Priorities	...
	Municipal Tree Inventory	...
	River and Stream Protection	...
>	Other Vermont Hazard Vulnerability Projects	...
>	Boundaries	...
>	Hazards	...



● **Example #2 - MVI Activated “Open” Layers:** Natural Environment Domain > Landscape Scale Overall Priorities; Species and Community Scale Overall Priorities

Explore the “Community Domain” layers in the MVI tool - What municipal planning efforts can help build resilience or increase capacity at the local level? What changes to planning or zoning can increase resilience to climate impacts? Are local plans up to date, like the Local Hazard Mitigation Plan?

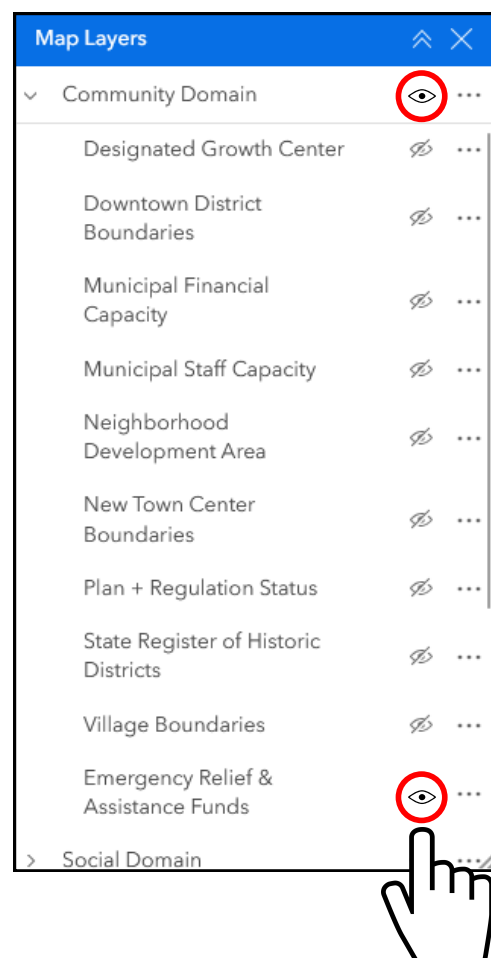
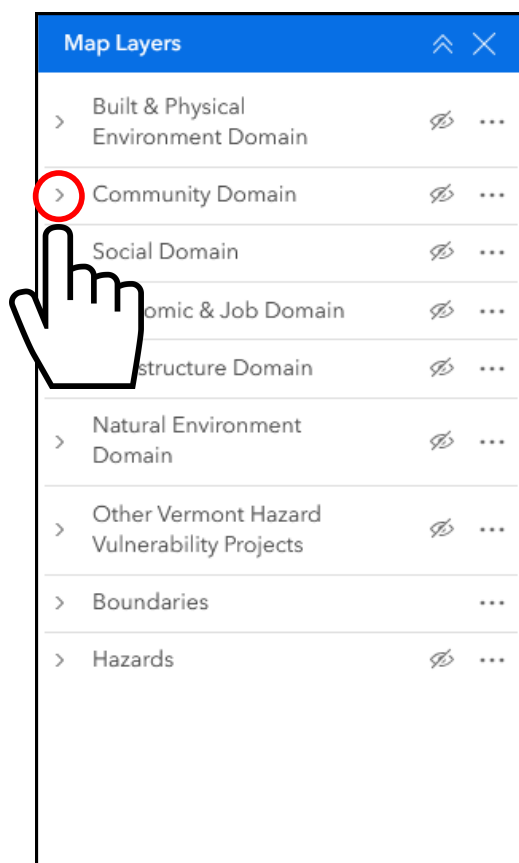
● **Example #1 - MVI Activated “Open” Layers:** Community Domain > Plan + Regulation Status; Emergency Relief & Assistance Funds (ERAF rates); Municipal Staff Capacity

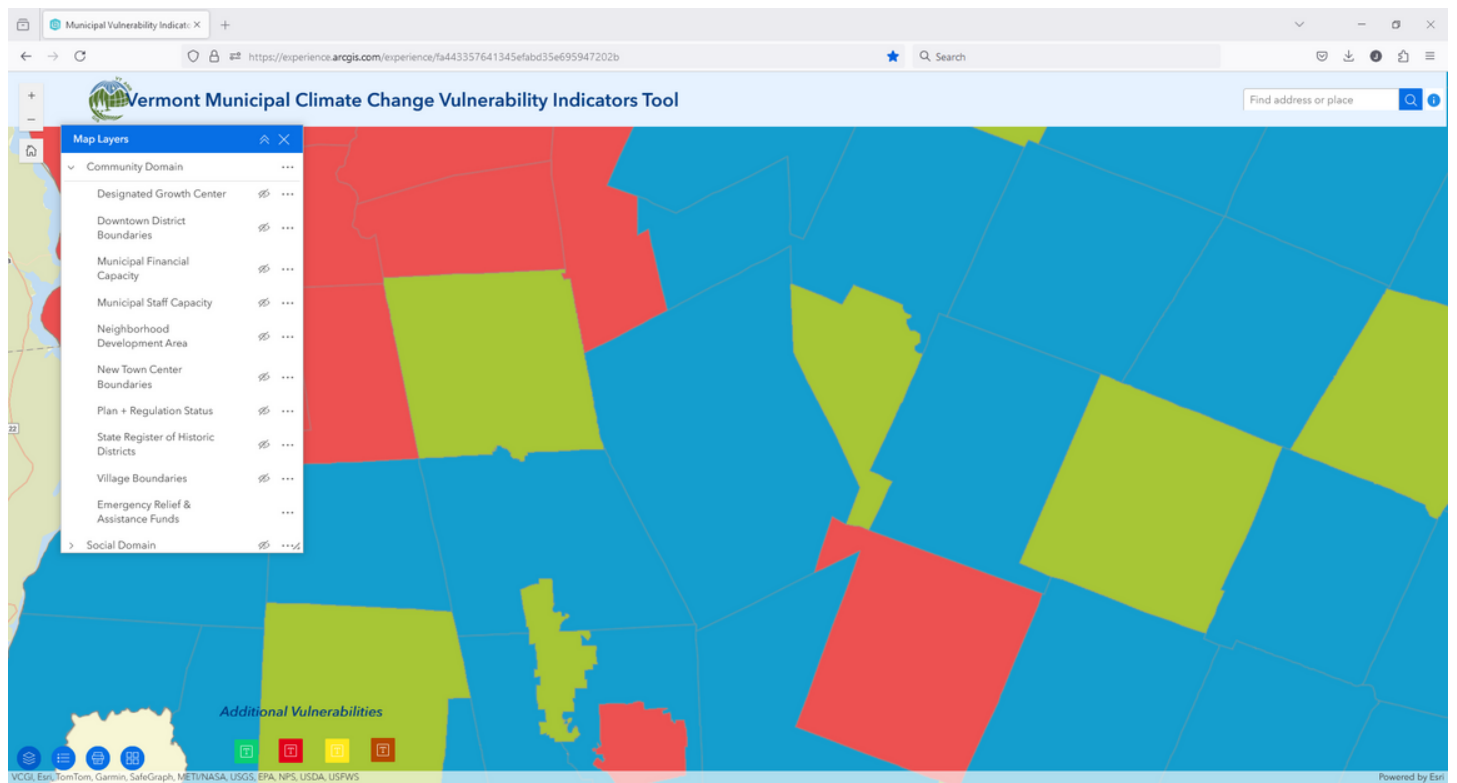


1. Open: Community Domain

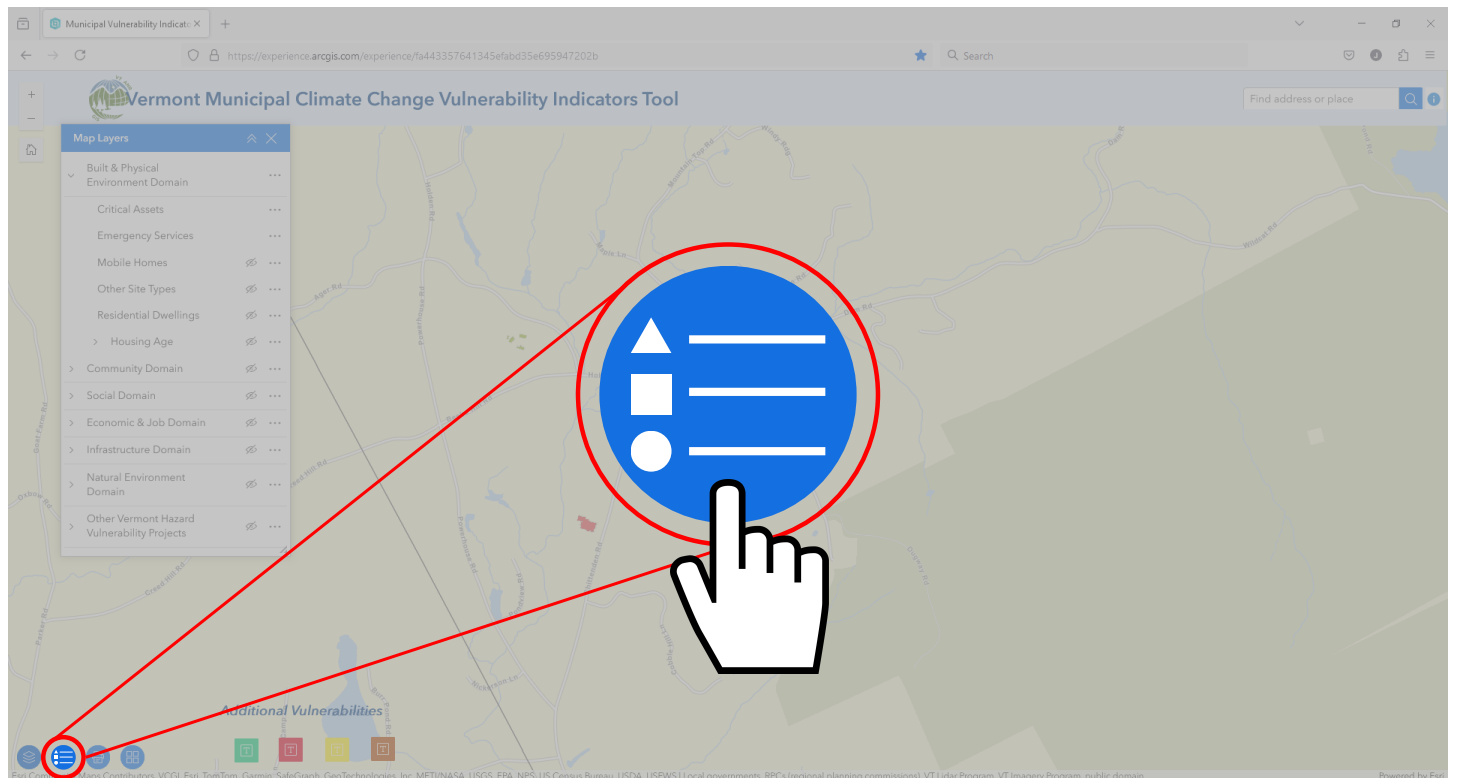
2. Click: Community Domain

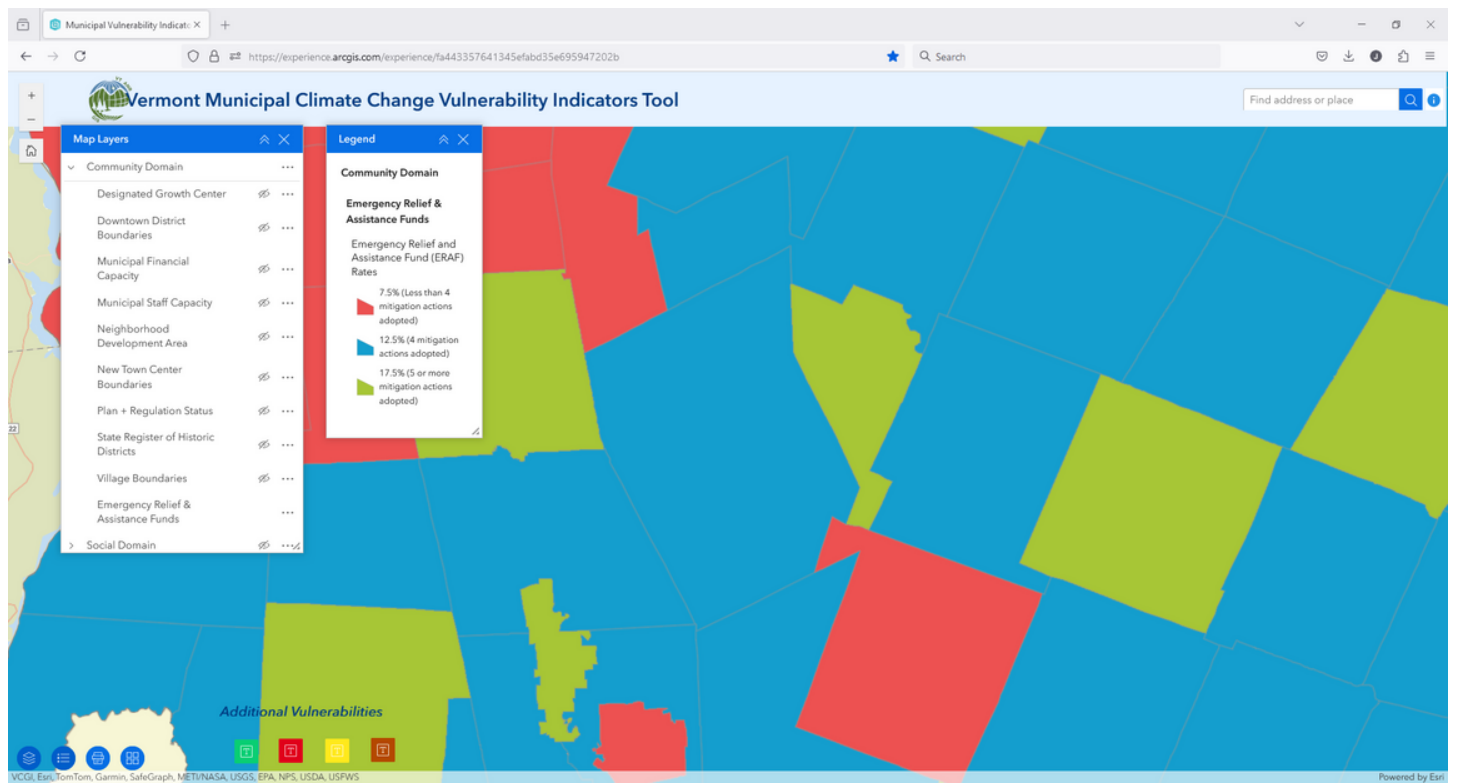
3. Click: Emergency Relief & Assistance Funds





4 Click: Legend Button





Step 5 - Next Steps:

Contact your Regional Planning Commission (RPC) to continue the MVI conversation and get answers to questions on how to build resilience and confront climate hazards and vulnerabilities in your community. Find your RPC contact here: <https://www.vapda.org/regions.html>

How can the MVI Tool be used to help municipalities tackle specific plans?

Local Hazard Mitigation Plan (LHMP):

- The MVI tool can help you get ready for meeting the FEMA [LHMP standards](#), by providing a high-level climate vulnerability assessment of a community.
- For example, requirement A2 speaks to including underserved and socially vulnerable groups in the planning process. The Social Domain in the MVI could help start to identify those groups most at risk and most vulnerable to climate hazards.
- Requirement B1 is the risk assessment, and the MVI can help identify the hazards of risk and extent of risk to the community. Requirement B2 is the impact on the community from the identified hazards and vulnerability. Using layers in the MVI (like critical facilities, mobile home communities, etc.) can help identify those impacts.

Local Emergency Management Plan (LEMP):

- MVI can help ID the most vulnerable populations that will need to be reached in times of emergency. It can also ID municipal/community centers that could serve as communications hubs or offer emergency shelter, supplies, backup power, etc.)
- The long-form LEMP can expand on how the vulnerable/underserved populations can be served in the event of an emergency.
- Some of the MVI layers might be helpful for Hot Weather Emergency Planning (annex), as new data sources are integrated like warming/cooling centers.

Town Planning:

- The MVI can help provide info for writing a brief community vulnerability assessment and update existing narrative sections of a Town Plan.
- The MVI can help ID where your critical facilities are and highlight who are the most vulnerable populations in your community.
- MVI can provide context for the Flood Resilience planning section, and help inform specific strategies for an implementation plan.

Enhanced Energy Planning:

- The MVI can help ID the most vulnerable populations in a community subject to specific climate change and energy burden risks.
- MVI allows communities to zoom in on visuals like the location of manufactured/mobile homes, utility distribution lines, or more closely consider average housing age and energy burden.

Capital Planning:

- The MVI tool can inform well-targeted capital improvements that promote development in safer locations and not placed in such a way as to spur development in hazard areas.
- MVI can help ID critical assets/infrastructure like municipal buildings, utilities, roads, bridges, culverts, etc. in need of resilience upgrades; ID lack of cooling/heating centers.
- [Flood Ready VT](#) provides additional guidance on capital planning priorities for more flood resilient communities.