



Emergency Management in Community Spaces on St. Croix Island, USVI

In September 2017, two major hurricanes hit the U.S. Virgin Islands, causing billions of dollars in damage. In response, the Federal Emergency Management Agency provided more than \$1.9 billion in grant funding to help repair damaged infrastructure, among other efforts.^[1]

As noted throughout this Studio's research and work, natural disasters and storms are a great threat to St. Croix. Additionally, with climate change, these natural threats, such as hurricanes and flooding, are expected to increase in intensity.^[2]

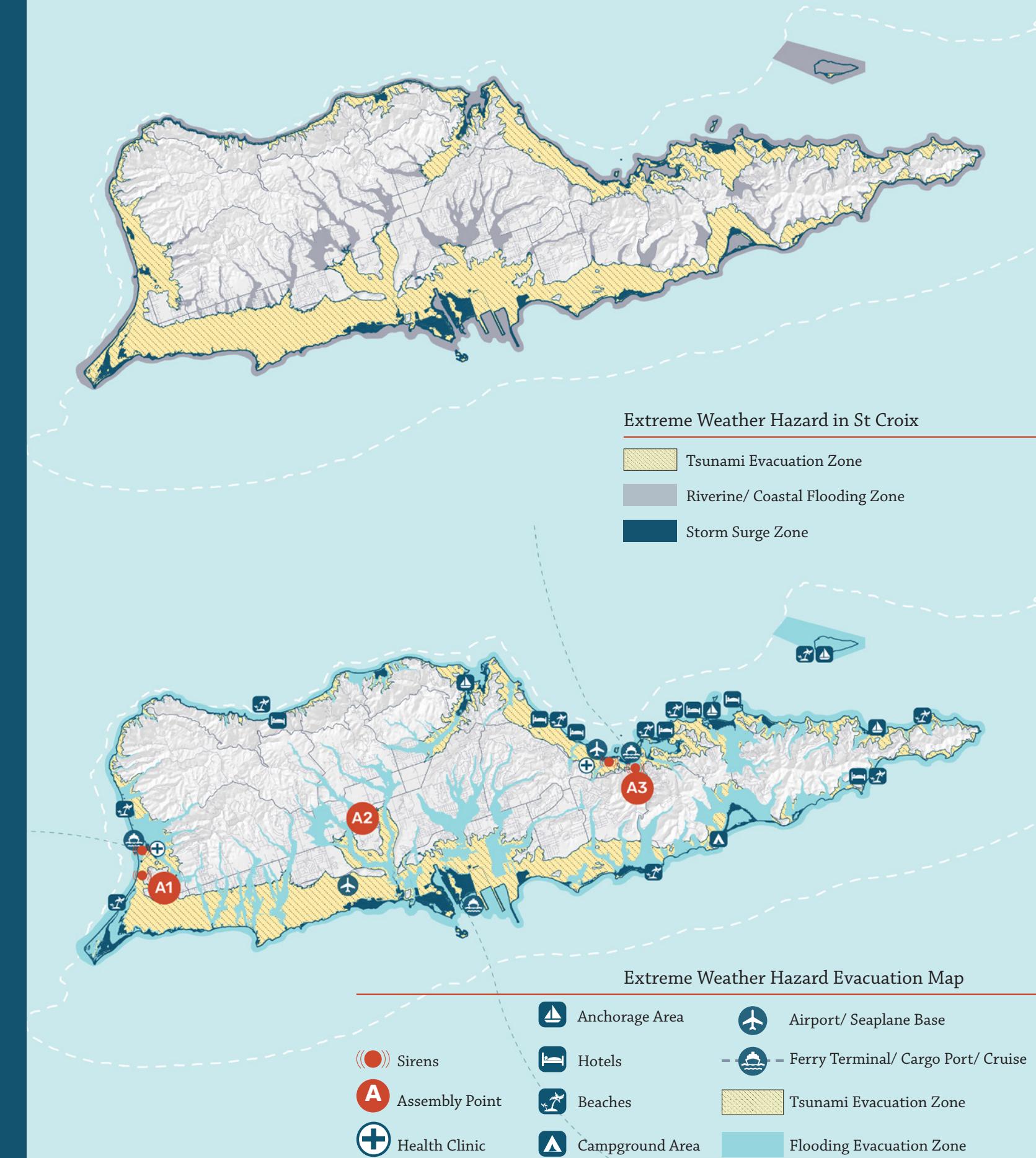
Citizens vulnerable to these threats may seek shelter or assistance in community safe rooms. Community safe rooms are classified as any safe room not defined as a residential safe room, such as those intended for use by the general public.^[3] Thus, it is important that not only do community safe rooms exist, but also that citizens are familiar with the locations of these sites, feel safe and welcomed, and are

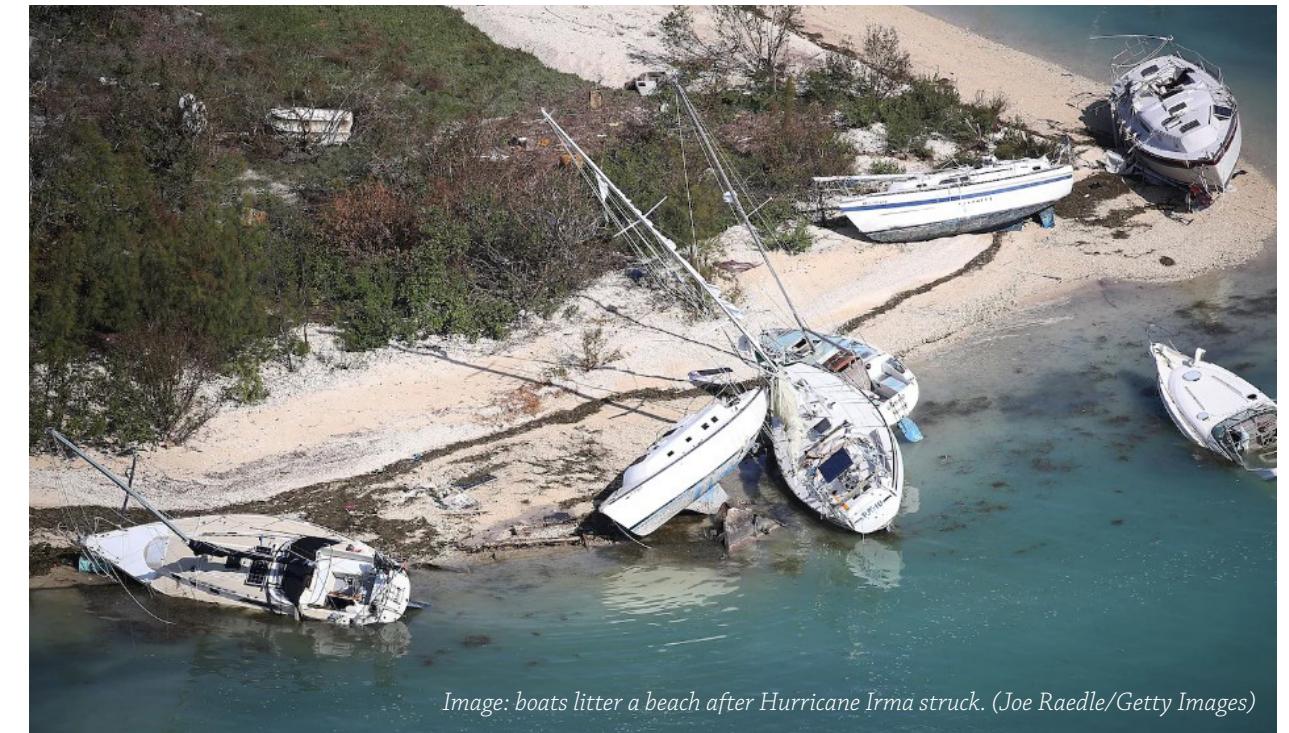
protected and accommodated in these spaces.

Modern community safe rooms aim to be functional, inviting areas for assembly in the everyday life of citizens. Spaces of majority gathering and workforce development, such as places of worship and club meeting spaces, that are especially familiar to the ecologically vulnerable, elderly, and socioeconomically disadvantaged populations were preferred locations in our analysis.

The Emergency Management in Community Spaces Project is inspired by the St. Croix Foundation's work with the Alexander Theater.

The Emergency Management in Community Spaces Project was created by Joann Zhao, Lexi Lee-Ittah, Olivia Marcus, and Wynter Adams. The Project focuses on the Williams Delight Basketball Court as a proposed safe room location.





About 19,900 people are living in the extreme weather hazard zone.

Summary & Our Process

Our analysis began by researching information about FEMA Safe Rooms, including requirements, codes, regulations, and funding. This led us to question what best practices exist around emergency management and creating safe rooms- regarding general location and site-specific characteristics, population capacity, target demographic, and potential funding sources. With this, we concluded that an effective, modern-day safe room should be located close to a densely populated area and serve as a multifunctional facility that

benefits the local community in both times of disaster and blue-sky days. Additionally, a safe room located in a high poverty area would best serve the needs of vulnerable populations.

Focusing on St. Croix, we researched, analyzed, and mapped existing safe room sites, as well as future safe room sites planned. Our finding indicated that there are not enough safe room sites or capacity to serve the island's population, and that safe room sites are not adequately or evenly distributed thorough the island.

VISIONS

Enhance
the existing
safe rooms

Convey
the new
contingency
plan

Embrace
local culture and
community life

Our team also did a deep dive into community spaces and resources on the island. While there are several notable organizations, resources, and spaces that serve various communities on the island, we found that there is potential to increase as well as improve or renovate the condition of these spaces.

Taking all this information into account, we narrowed down areas and specific sites on the island that would benefit from the presence of community safe rooms. We developed a methodology and criteria for our project's proposed safe room to be an existing community space, outside of natural disaster hazard zones, in densely populated areas with high socioeconomic vulnerability, located close to a main roadway, and in an area absent of safe rooms. Further

information on this can be found in Safe Room Location Selection Filters.

Throughout our process, meetings with local organizations on the island and subsequent virtual meetings with VITEMA and the St. Croix Foundation heavily influenced this process and project proposal.

**How can we plan
community spaces to
serve as safe rooms during
emergencies to adapt
to increasing intensity
of extreme weather
events and fortify the
neighborhood identity?**



Image: Community Safe Room (FEMA)



Image: FEMA

*“A **safe room** is a hardened structure specifically designed to meet the Federal Emergency Management Agency (FEMA) criteria and provide near-absolute protection in extreme wind events, including tornadoes and hurricanes.”*

Meetings with Local Organizations

As part of our research process, our team met with local organizations (such as VITEMA and the St. Croix Foundation) virtually after our studio's trip to St. Croix. Below are some of the main takeaways from our discussions:

- *Lack of multifunctional community safe rooms on the island (with the exception of the Alexander Theater)*

- **Preference for existing community assets**

There tends to be a preference, from both FEMA and the community, for transforming and fortifying existing community assets as safe room sites. There is an opportunity to work with the many underutilized spaces on the island rather than to build new construction.

- *Importance of outreach, accessibility, and visibility as part of emergency management*

- **Disadvantages of schools as community safe rooms**

As safe rooms may serve as long term shelter, this affects the ability for students and children to return to school.

- *Frederiksted and Williams Delight neighborhood*

Densely populated and high poverty.



Image: Alexander Theater (St Croix Foundation)



Image: Vision of Alexander Theater Community Safe Room (St Croix Foundation)

During our studio's trip to Stx, we were heavily inspired by Stx Foundations work on the Alexander Theater.

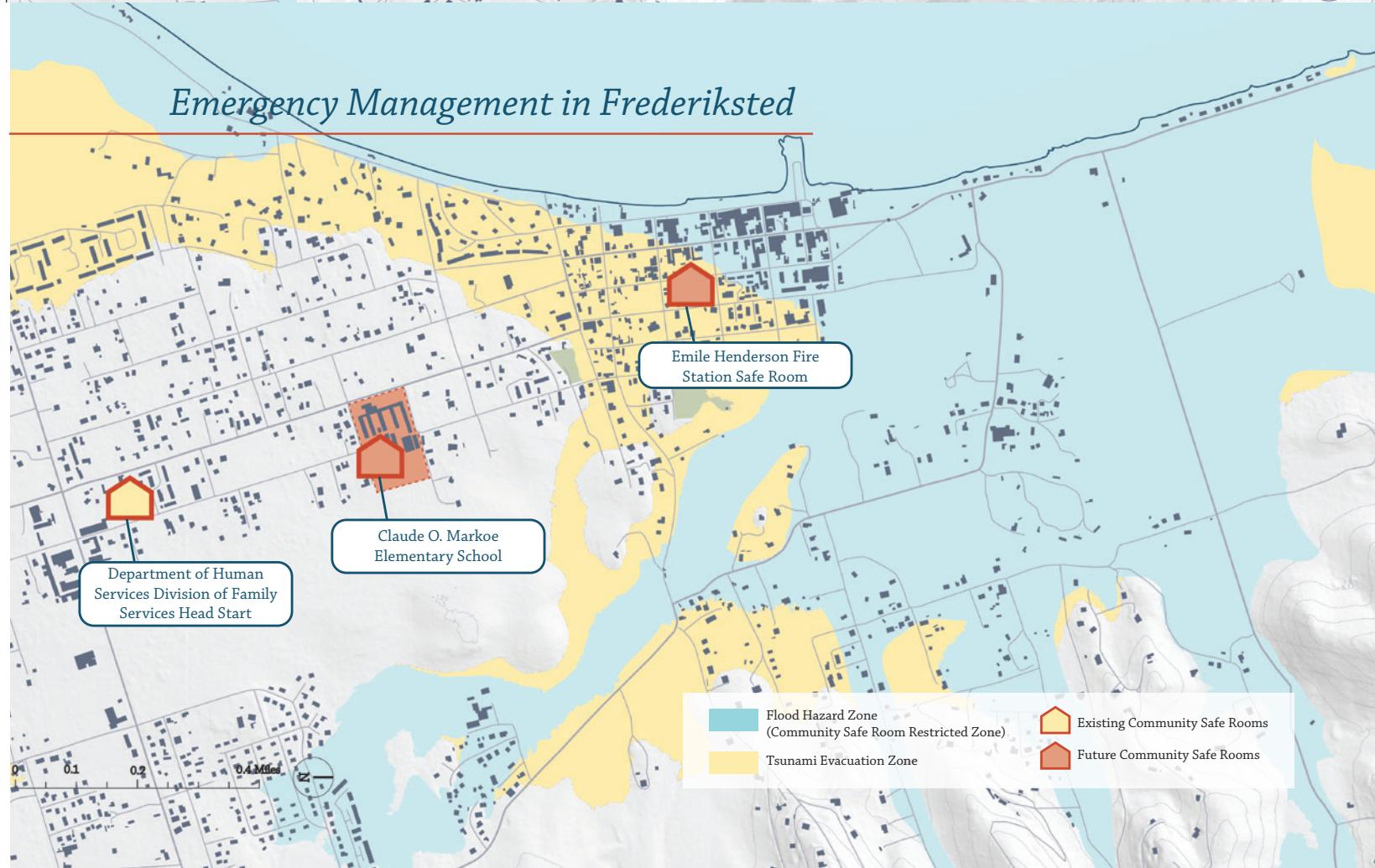
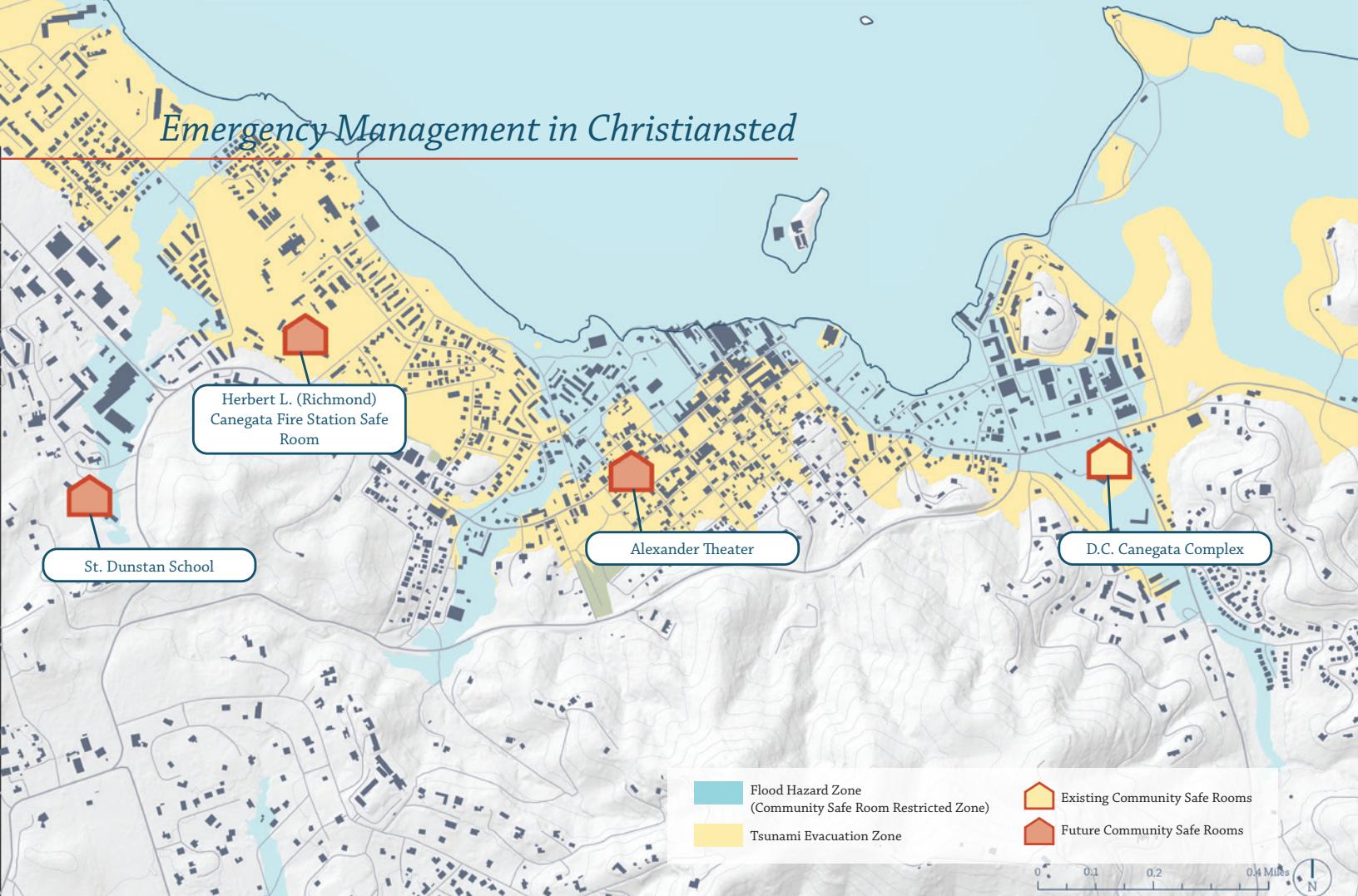
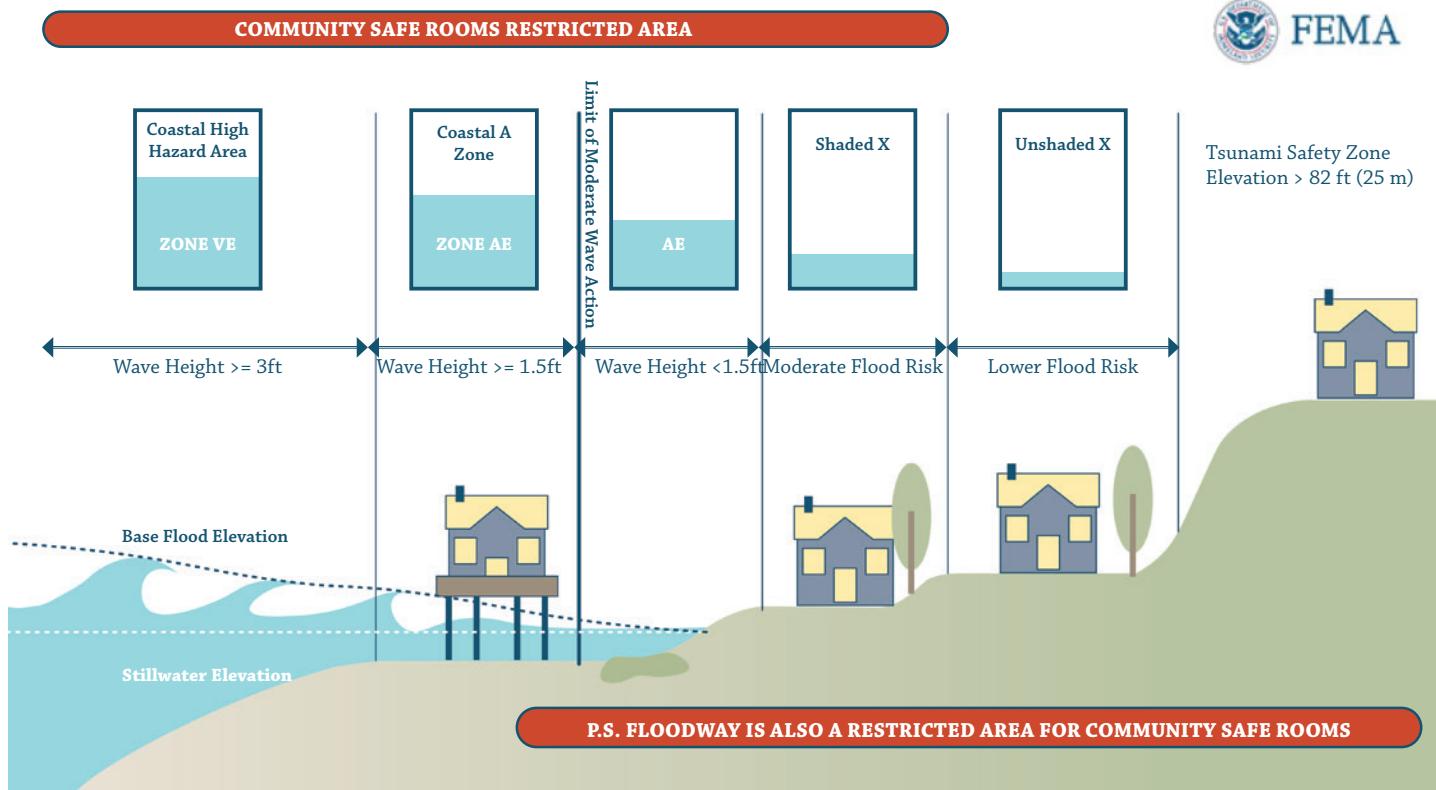
In 2019, the STX Foundation was awarded a FEMA Hazard Mitigation Grant to partially fund the renovation

of the Alexander Theater, built in nineteen fifty four, transforming it into a performing arts center, convening space, and the only downtown Christiansted Community Disaster Safe Room.^[4]

FEMA Code for Community Safe Rooms

FEMA divides different flood hazard zones according to wave actions and elevations in different areas. The location restrictions for safe rooms are mainly based on these flood zones.

The community safe room restricted zones are zone VE, AE, and Shaded X. Besides, floodway is also a restricted zone. Based on this code, we can draw our own safe room restricted area map of St Croix island.

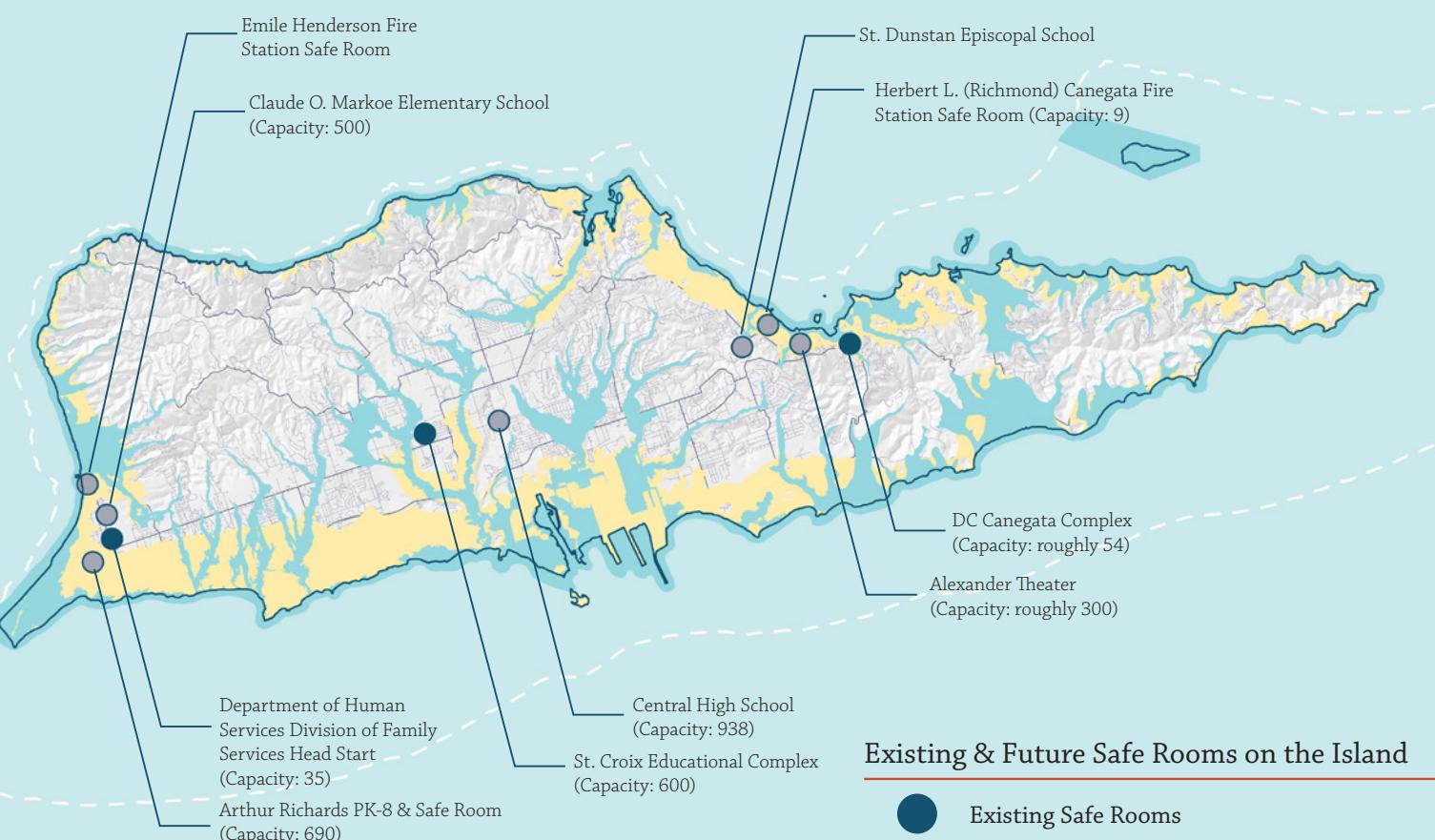


St. Croix Existing & Future Safe Rooms

The planned capacity for safe rooms is meant to be 10% of the population, which is roughly **5,060** for St. Croix as of 2021.^[10] However, as of 2022, the St. Croix shelters can take **792** people.^[11]

With only three existing locations and nine future expected locations^{[5]-[9]}, our findings indicated that there is an insufficient number of safe rooms in St. Croix. Moreover, there are not

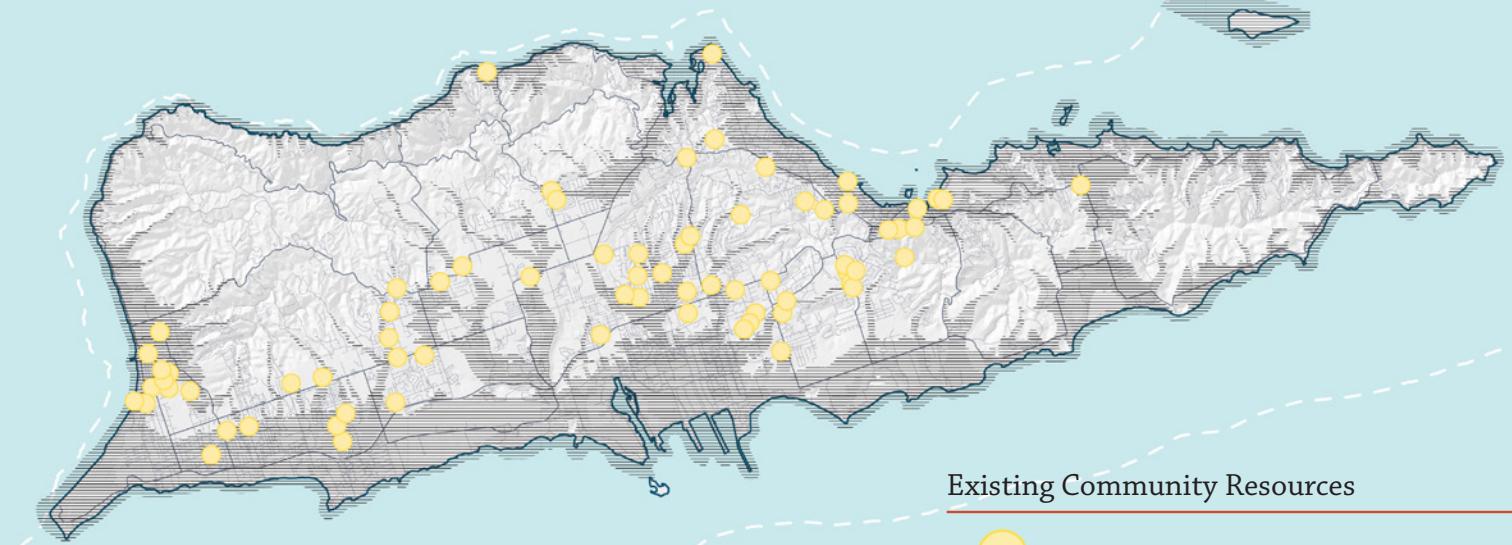
enough safe room sites, there is not enough capacity to serve St. Croix's population, and safe rooms are not adequately or evenly distributed throughout the island.



Existing & Future Safe Rooms on the Island

- Existing Safe Rooms
- Future Safe Rooms
- Tsunami Evacuation Zone
- Hurricane/ Flooding Evacuation Zone

Community Spaces & Resources



Before we developed our site plan, researched and mapped island-wide community resources, including youth centers, recreational spaces, churches and other religious institutions, art and cultural centers, and more.

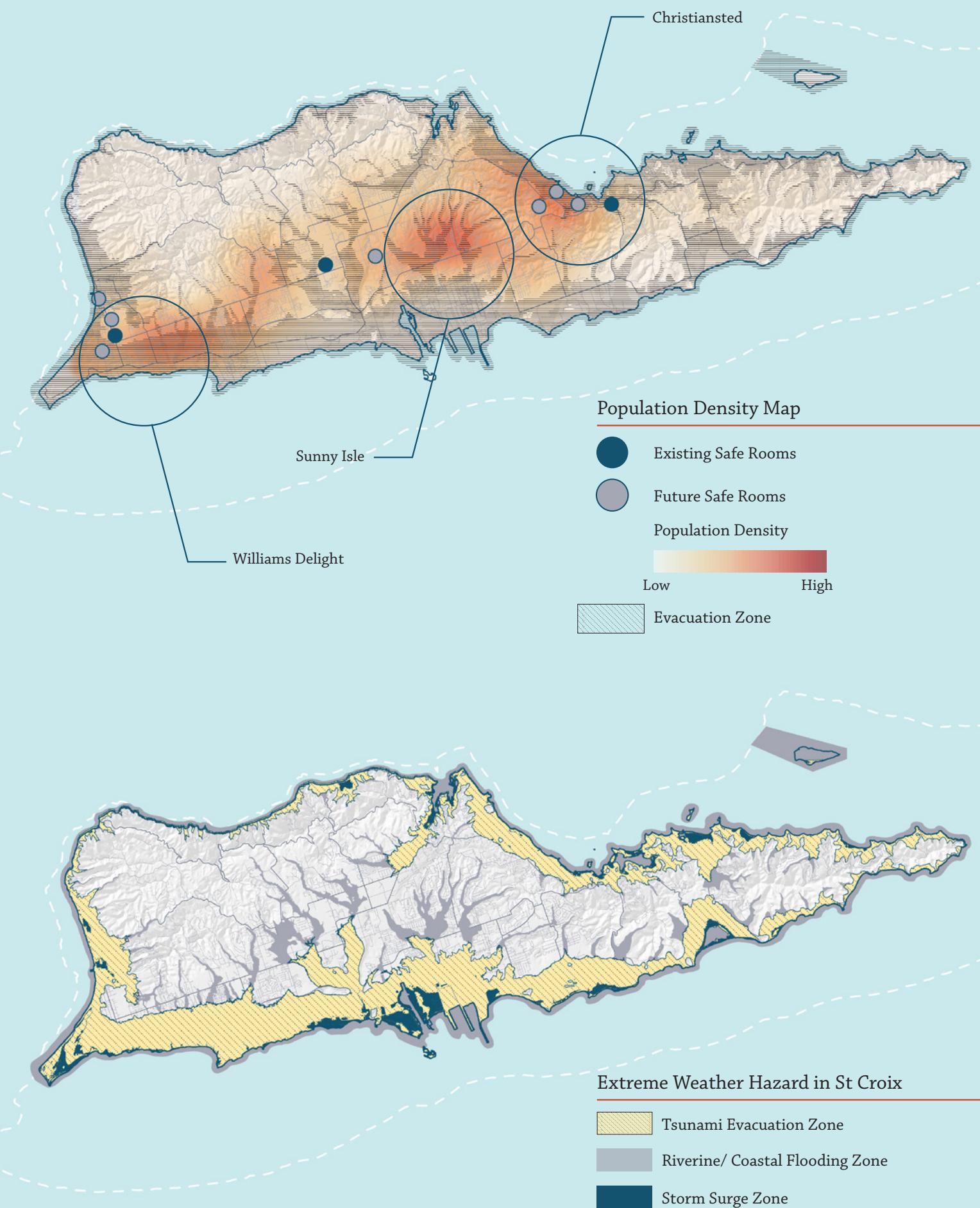
While there are several notable organizations, resources, and spaces

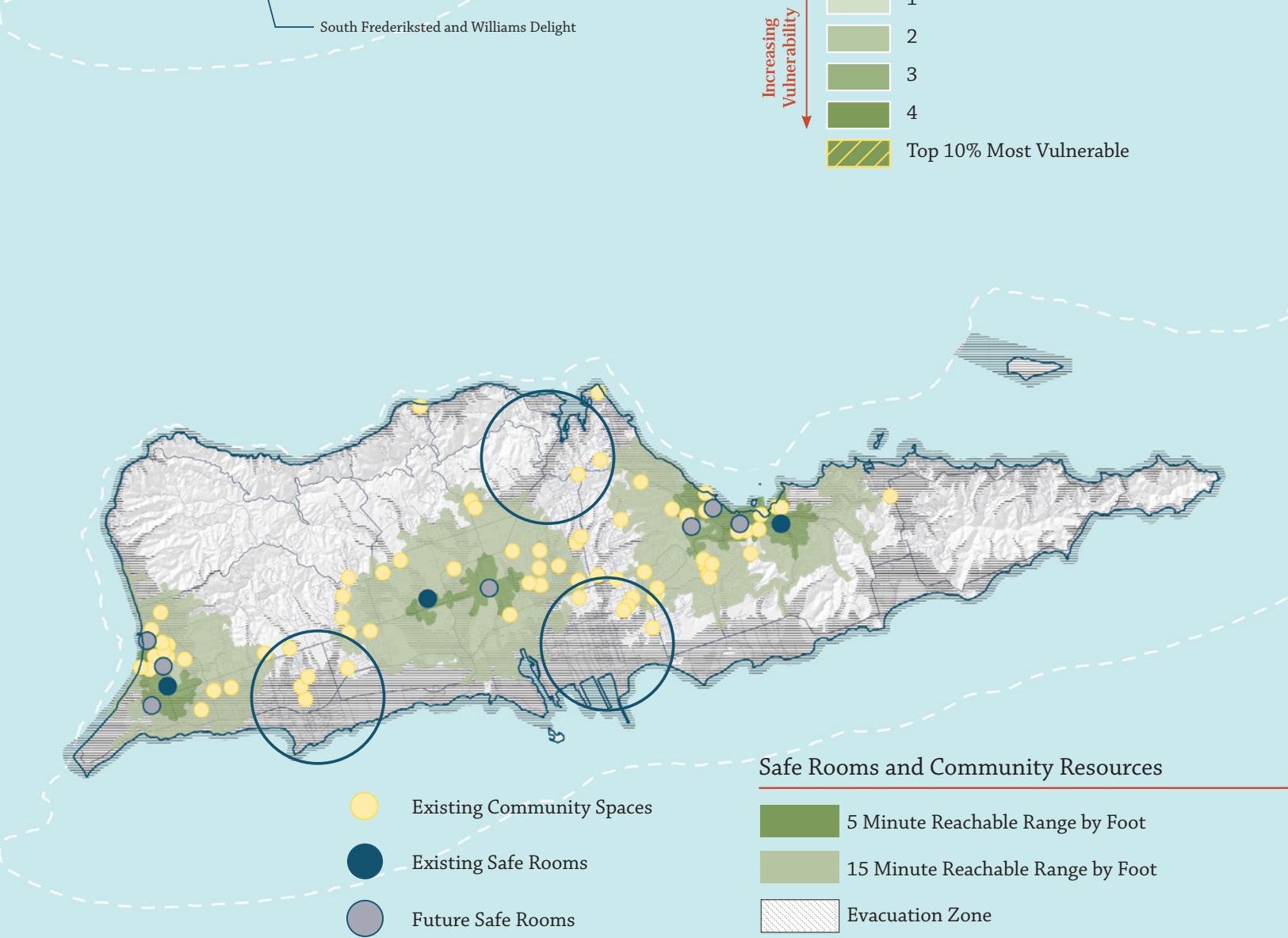
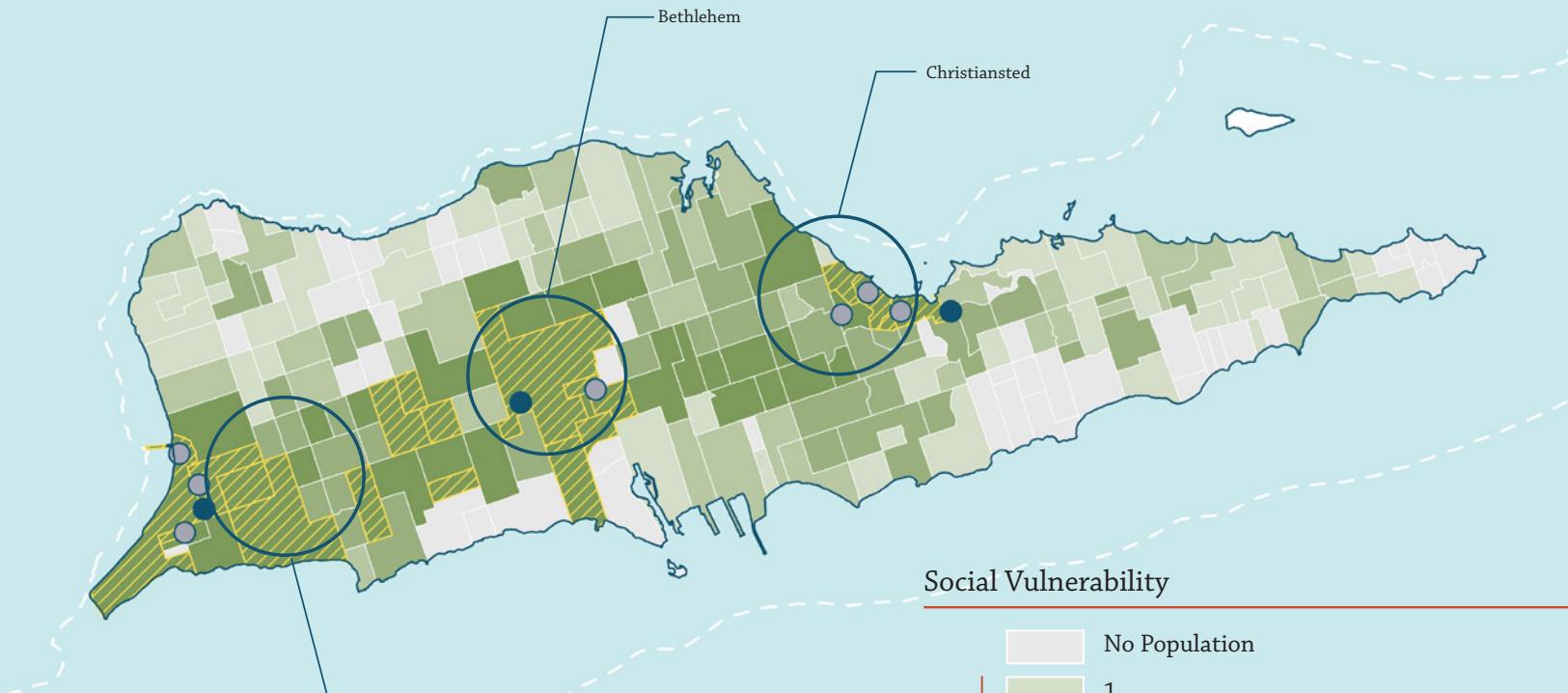


that serve various communities on the island, we found that additional and improved spaces may benefit local communities, especially those that are particularly vulnerable. Additionally, many of the spaces that do exist could be improved or renovated to maximize their potential and use.

Safe Room Location Selection Filters

- **Population**
 - High density
 - High social vulnerability
- **Outside of Natural Disaster Hazard Zones**
 - Outside of Floodway Boundary, Flooding Zones (X, AE, and VE), 2090 Sea Level Rise Zone, and Tsunami Hazard Zone
 - Preferred community safe room location in Zone X
- **Areas Lacking Safe Room Sites**
- **Accessibility**
 - In close proximity to a main roadway
- **Existing Community Asset**
- **Input from Local Organizations**
 - No schools- disadvantages of schools as community safe rooms because they transition into long term shelter which affects students returning to school
 - Frederiksted- densely populated and high socioeconomic vulnerability





With this, several sites stood out to us as potential new safe room locations- such as the Five Corners Office Building and Shopping Center, Cruz St Baseball Field, Williams Delight Basketball Court, Renholdt Jackson Sports Complex, and St. Joseph's Catholic Church. Based on our

research, analysis, and methodology we decided to develop a site plan for the Williams Delight Basketball Court especially as meetings with local organizations led us to focus on Frederiksted, and particularly the neighborhood of Williams Delight.





Safe Room Candidate Overview: Williams Delight Basketball Court

Our team conducted a market study to understand the currently present and missing resources in the Williams Delight neighborhood, where the William's Delight Basketball Court is located. Williams Delight has various grocers and restaurants, sports recreation spaces, retail presence, a historical place, and other community assets.

In our research, we found that William's Delight has struggled with violent crimes. Cultural hubs that allow expression through art can help individuals, especially teens and young adults, invest in healthy self-expression. The St Croix Walls Mural Chain is a collaborative effort from Sea Walls, Clean Sweep Frederiksted, and St. Croix Walls Project, Inc to utilize art to inspire healing and community, and shed light on local challenges, such as environmental health.^[12]

Demographics:

According to 2020 Census Data, Williams Delight has a total population of 2,202. Sixty-nine percent of the population is Black; twenty-seven percent is Hispanic or Latino; and two percent of the population is white. The population is relatively young as twenty-nine percent of the residents are under eighteen years old. On the other hand, fifteen percent of the population is sixty-five years old and over. In terms of educational attainment, forty-seven percent of the population over twenty-five years old have not graduated high school. The neighborhood is mostly comprised of families as seventy percent of total households are families.

There are 978 housing units in the area, with eighty-four percent of them being occupied, and only two percent used for seasonal use. Owners comprise fifty-four percent of occupied units, while renters make up forty-six percent of occupied units. Furthermore, thirty-nine percent of renters, and twenty percent of owners, are cost burdened renters and owners, respectively. High proportions of cost burdened renters and owners may be, in part, explained by high poverty and low incomes, as the neighborhood has a median household income of \$25,492. In fact, nearly half of households (49%) have a household income of less than \$25,000.
[13]

The demographics of the neighborhood indicate that Williams Delight is largely home to a historically marginalized and underserved population that may still bear the effects and challenges linked to cycles of systemic poverty. Low levels of income and education highlight the need, as well as opportunity, for youth and educational programming, especially given the large proportion of residents under eighteen years old.



Community Basketball Court:

The area could increase its walkability; few sidewalks connect major areas of assembly or have walkable destinations. Establishing more paths and walkways can increase the accessibility and health of the community. Moreover, roads often flood in this area which can lead to run-off pollution, increase habitat for vector-borne diseases, and cause infrastructural damage; road drainage systems and green spaces are two potential solutions

to decrease flooding. Additionally, William's Delight is no exception to the occasional power outages. Perhaps, green spaces allocated for flooding, such as rain gardens, can double as solar parks.

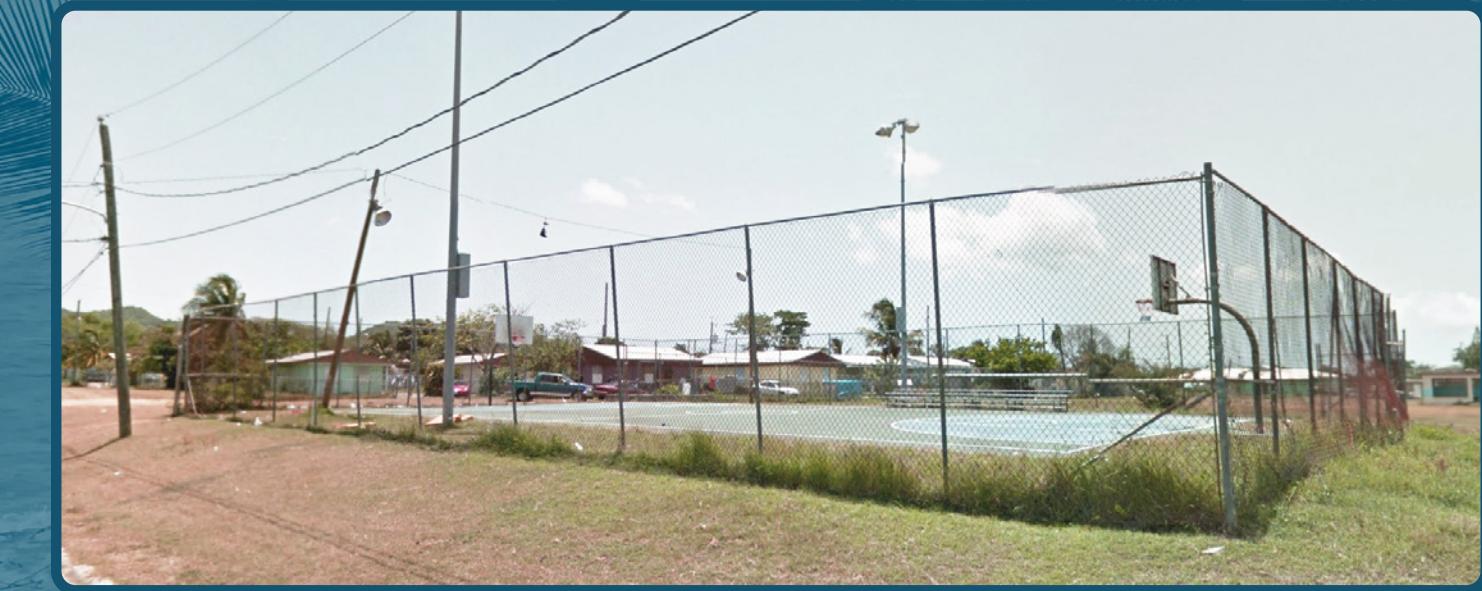
The William's Delight Basketball Court was ultimately selected as the site for our Project as it met the criteria set forth above. William's Delight Basketball Court is located at 784 Estate, Frederiksted, St Croix 00840 and has a capacity of 20 sq ft per person during non-covid conditions.

Community uses for the site may include recreation, nature-based recreation, entrepreneurship, climate mitigation, energy and water generation, crop production, general public services, as well as after-disaster uses.



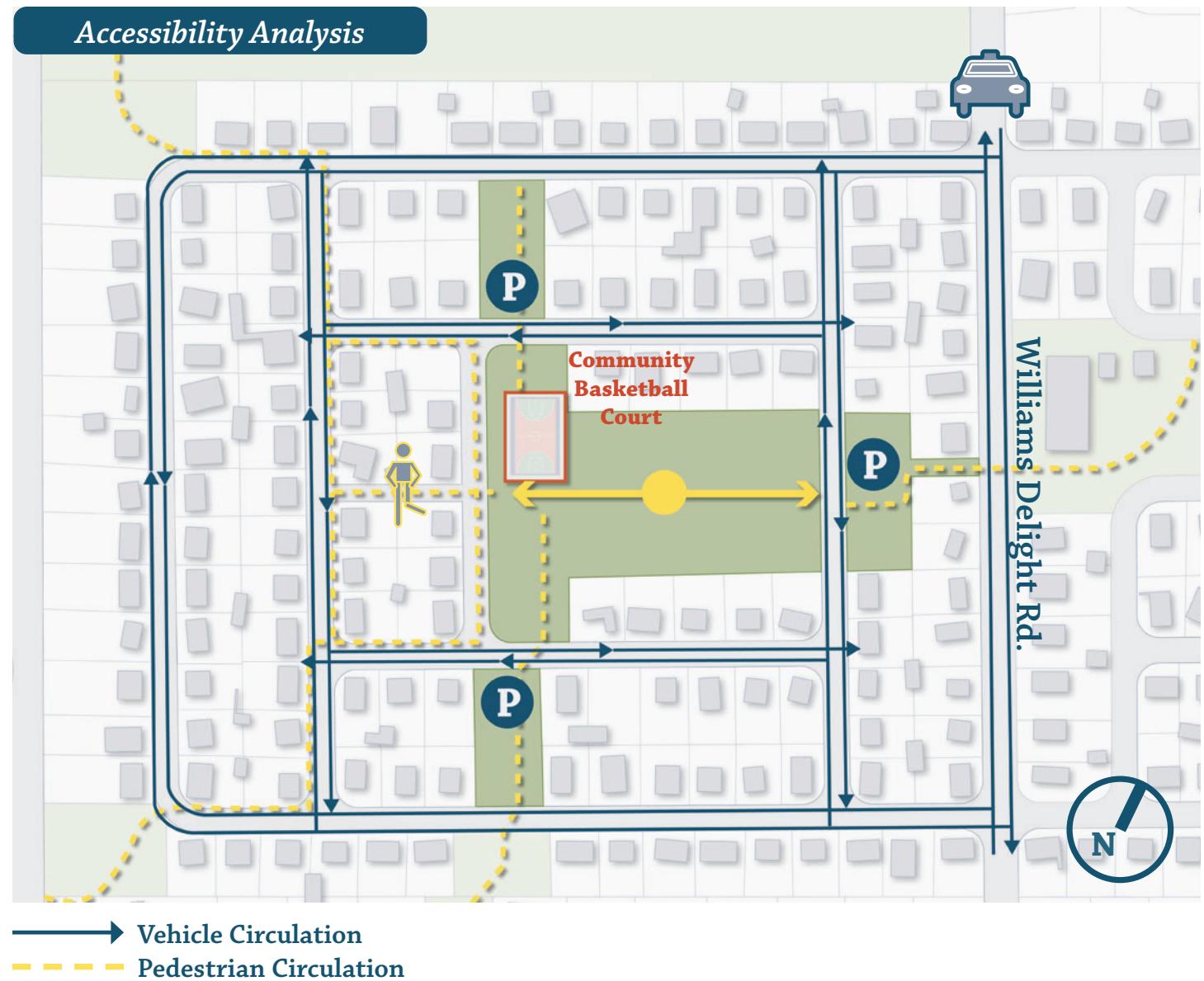
The current condition of the basketball court shows that there is an opportunity to maximize the recreational potential of the space while enhancing emergency management preparedness by creating a safe room aspect. Community

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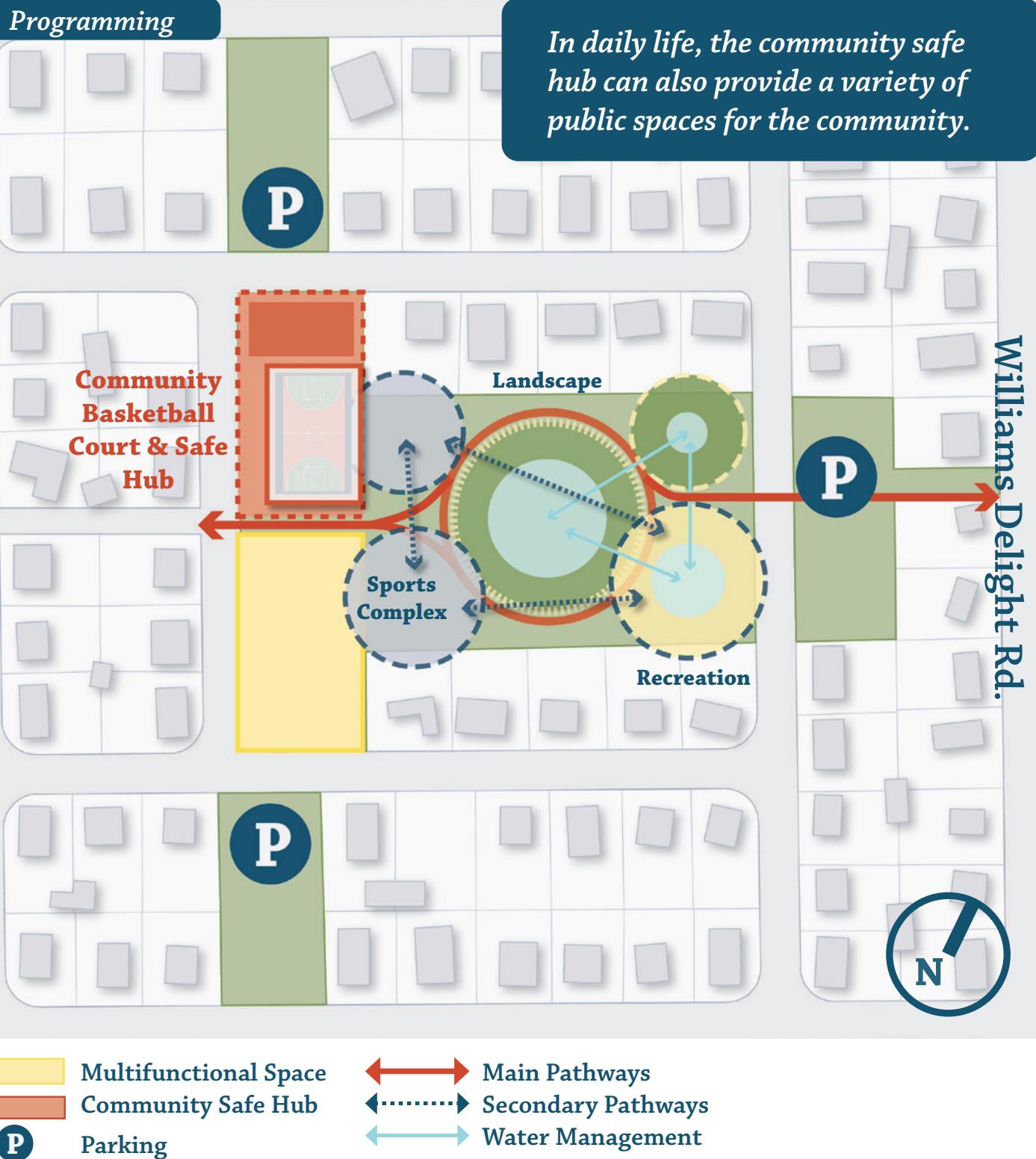
Design Concept: Accessibility & Community Life

Accessibility Analysis



By integrating the road system around the community basketball court parcel, the accessibility of the community safe hub can improve a lot. Three publicly owned parcels around the community safe hub were transferred into three emergency parking lots and pathways to the community safe rooms.

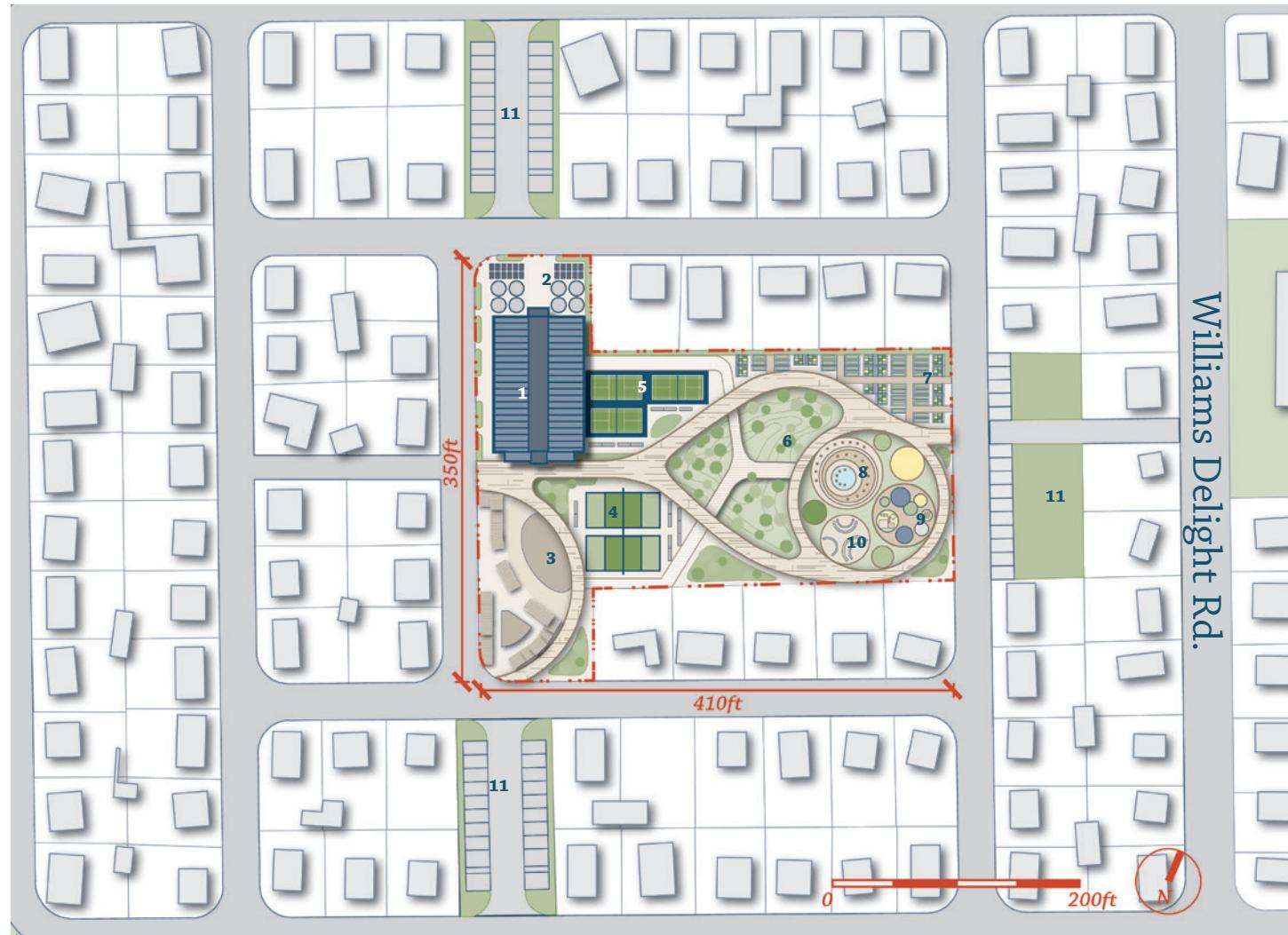
Within a five-minute pedestrian traffic range, this community safe hub can serve 74.7% of Williams Delight's community area. About half of the people who live in the area this community safe hub can serve to live in the extreme weather hazard evacuation area.



For programming, we create different types of interactive spaces and landscape to help enrich the function of a community center.

Besides the main pathways that serve as a quick access to the safe hub, there are also a secondary pathways which connect the vibrant community spaces.

Community Safe Hub Site Plan

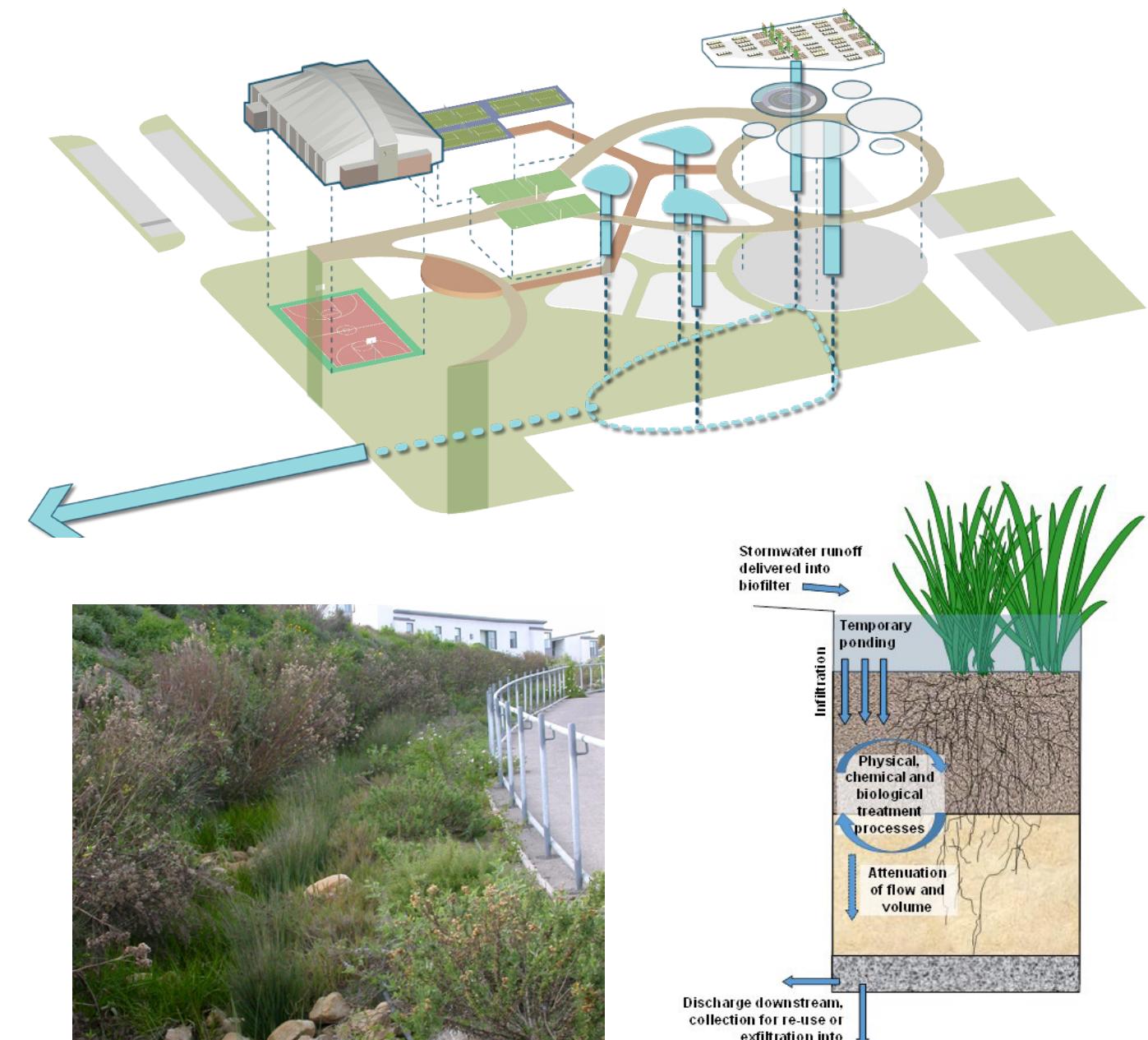


Site Plan

1. Indoor Basketball Court
2. Safe Room Auxiliary Space
3. Multifunctional Space
4. Volleyball Courts
5. Badminton Courts
6. Biofiltration Marshland
7. Community Farm Garden
8. Cooling Center/ Splash Pads
9. Kids Playground
10. Interactive Spaces
11. Parking

In different scene, the multifunctional spaces and the indoor basketball court can provide different community functions.

Stormwater Management: Biofiltration Marshland



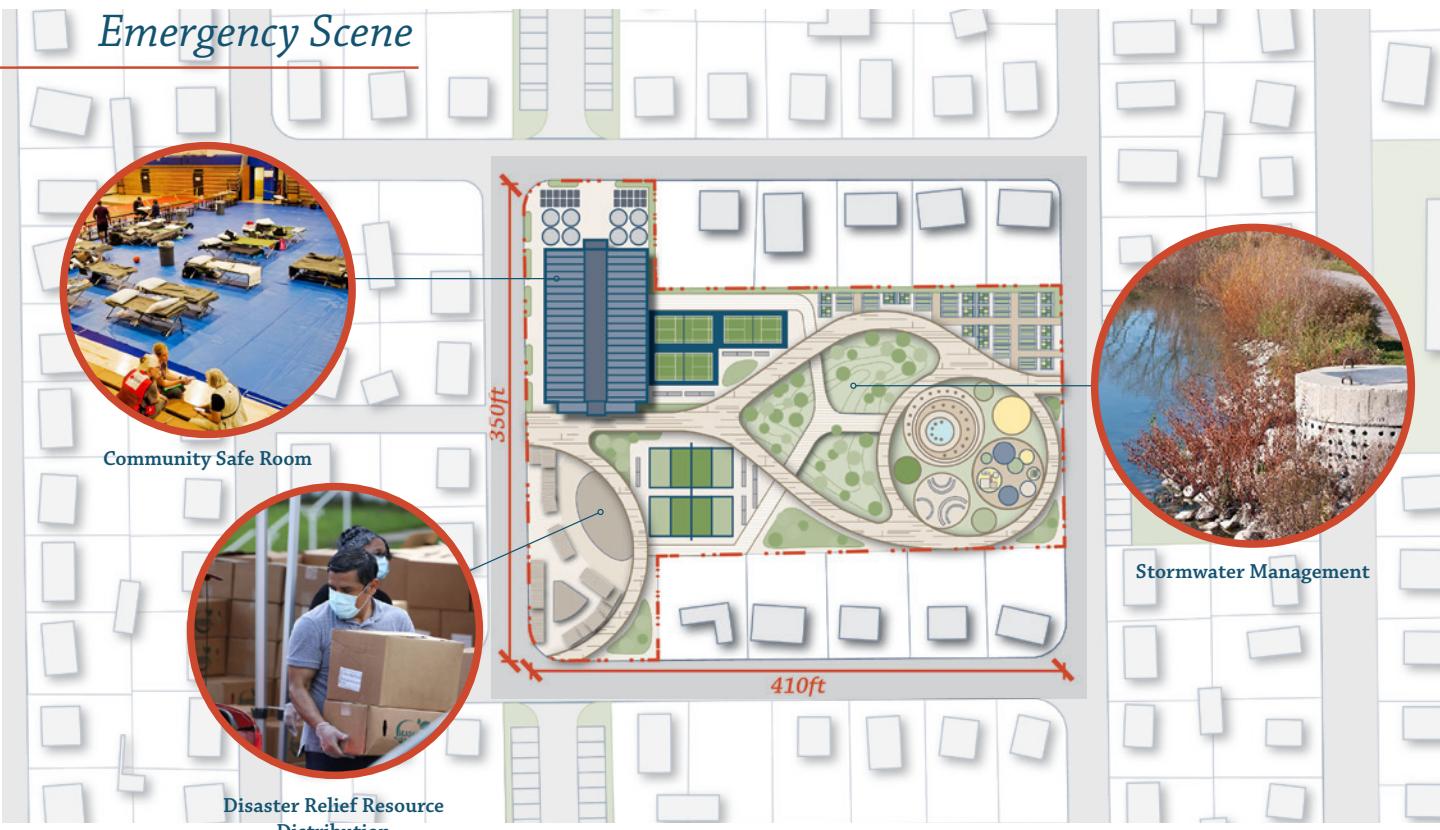
We also use biofiltration as one of our main landscape strategies to help create a beautiful landscape area for the community. Meanwhile, it can gather and purify the water from the garden and cooling center/ splash pads.

During an emergency such as riverine flooding, the biofiltration marshland can help manage the stormwater and reduce the impact of extreme weather hazards.

Daily Scene



Emergency Scene



Funding

A crucial component to our proposal is the funding portion. FEMA has a variety of grants available designated for safe rooms.

Within the Hazard Mitigation Grant Program, the Hazard Mitigation Assistance Program and the Building Resilient Infrastructure and Communities grants are applicable to St. Croix.^[14] These specific grants fund the fortification and construction of community safe rooms.^[15]

Also, Pre-Disaster Mitigation Funds are available to fund this proposal.^[16] In addition, The US Department of Housing and

Urban Development offers the Community Development Block Grant. This grant is designed to “support community development activities to build stronger and more resilient communities.”^[17]

Although these grants are available, they are extremely competitive to win. We propose creating a partnership with students enrolled in the “Winning Non-Profit & Faith Based Grants! Essential 21st Century Proposal Writing Techniques Class” at the University of the Virgin Islands. This partnership would include an internship for students to use their skills learned in the classroom in a real-world scenario.

In the future, the community safe hub can also serve as a natural disaster knowledge dissemination center.



A photograph capturing a heavy downpour. In the foreground, a person wearing a red poncho walks away from the camera, moving towards a large, modern building with a dark, angular roofline. The building is surrounded by lush greenery, including several palm trees. The sky is filled with dark, heavy clouds, and the rain is depicted as a dense, diagonal pattern of white lines against a dark background. The overall atmosphere is one of a severe storm.

In an emergency, this community safe hub can help provide a shelter and manage the stormwater.