

## WHAT IS “RESILIENT DANBURY”?

### STRATEGY

The Mayor is leading an initiative with the Departments of Emergency Management, Engineering, Public Works, health organizations, and the community to develop strategy and actions.

### PILOT PROJECT

- Current project in the East Ditch Watershed to reduce flooding and heat risk.
- Implemented by the City, UCONN CIRCA, and the consultant team.

**This pilot project is one of many projects being developed by the City as they prepare for future conditions.**

Thu Sep 15 2022

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# RESILIENT DANBURY

Public Workshop #1



## MEETING AGENDA

### Welcome and Introduction

15 mins

### Background

25 mins

- How did we get here
- Path toward resilience

### PATH TOWARD RESILIENCE – breakout stations

60 mins

- Green Main Street – What are GI Solutions?
- Flooding – We can fight back!
- What about Heat?
- Going for a Walk
- Survey

### Sum It Up

35 mins

- Summary of feedback from Stations
- Question and Answer

## INTRODUCTIONS

### Project Team



- CIRCA
  - David Murphy – Director of Resilience Engineering
  - John Truscinski – Director of Resilience Planning



- City of Danbury
  - Matt Cassavechia – Director of Emergency Management and Emergency Medical Services
  - Antonio Iadarola – Director of Public Works / City Engineer



- Consultant Team
  - Fuss & O'Neill
  - Dewberry



- Citizen and Technical Advisory Committee (CTAC)
- The Community



# FUSS & O'NEILL AND DEWBERRY TEAM

# RESILIENT DANBURY



Erik Mas, PE  
Project Director



Elsa Loehmann, PE, WEDG  
Project Manager



Ian Law, RLA  
Community Engagement



Sara Morrison, MLA, WEDG  
Climate Adaptation Design



Akta Patel, PE  
Assistant Project Manager



Sage Hardesty  
Project Engineer



Scott Choquette  
Heat Analysis

## Citizen and Technic AC MEMBERS

- Cpt Thomas Corbett      Community Emergency Response Team, Team Coordinator
- Sharon B. Calitro, AICP      City of Danbury Planning and Zoning, Director
- Susan M. Tomanio      City of Danbury Elderly Services, Director
- Kara Prunty, MPA, MPH      City of Danbury Health and Human Services , Director
- Jeff Rieck      City of Danbury Housing Authority, Executive Director
- Tim Nolan      City of Danbury Highway Services, Superintendent
- Warren Levy      City of Danbury City Council - At Large, Council Member
- Joseph Cavo      City of Danbury City Council - At Large, Council Member
- Vinny DiGilio      City of Danbury City Council - 2nd Ward, City Council President, Council Member
- Duane E. Perkins      City of Danbury City Council - 5th Ward, Council Member
- Fred Visconti      City of Danbury City Council - 5th Ward, Council Member
- Paul T. Rotello      City of Danbury City Council - 6th Ward, Council Member
- Dr. Derek DeLeon      Nuvance Health , Chief Academic Officer
- Joseph DaSilva      Affordable Housing Development, Developer
- Marlene Moranino      CT Institute for Communities Greater Danbury Community Health Center, Board Chair
- Bill Diamond      Danbury Ice Arena
- Jenny Guerra      Danbury War Memorial
- Mike Seelig      Danbury School District, Superintendent

## RESILIENT DANBURY

*The mission of Resilient Danbury is to develop a climate resilience strategy and **implement this pilot project** focused on protecting people, homes, businesses, and infrastructure in the downtown gateway neighborhoods from flooding and extreme heat, to foster long-term prosperity in Danbury.*

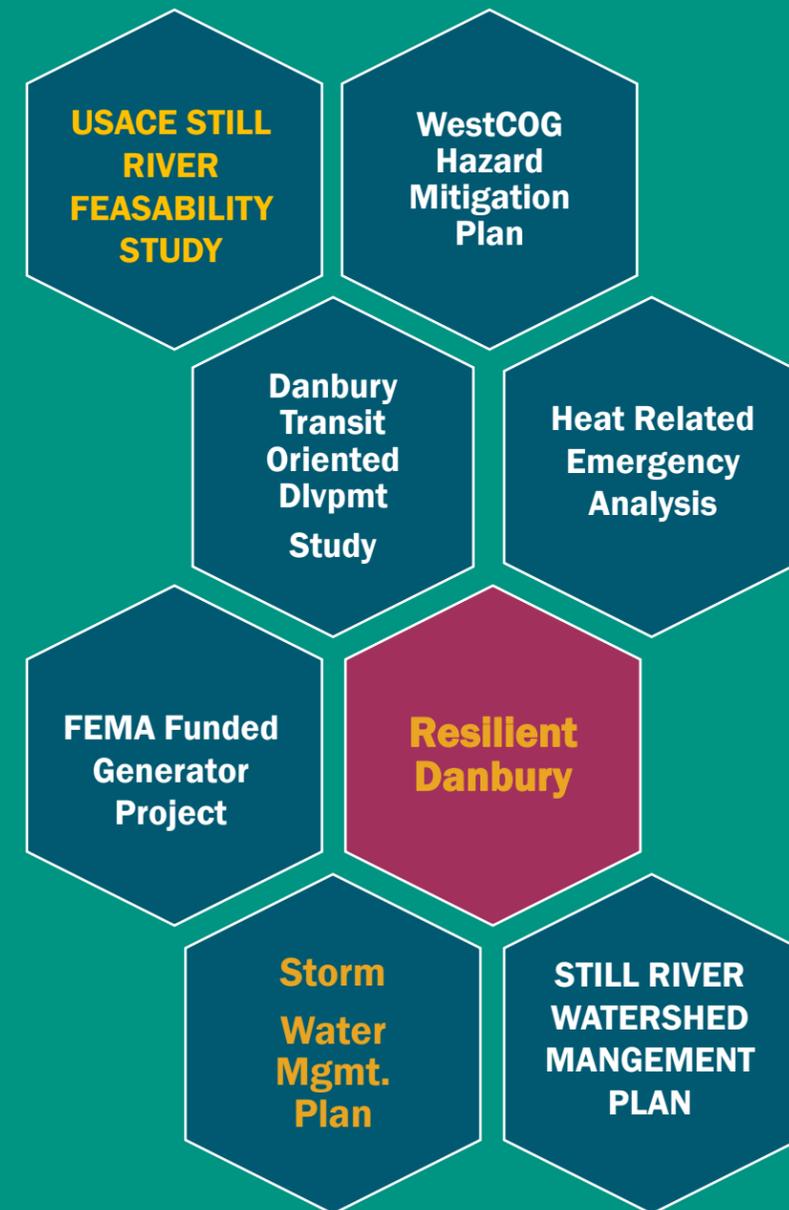
Thu Sep 15 2022

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# RESILIENT DANBURY— IN CONTEXT WITH THE BIGGER PICTURE

# RESILIENT DANBURY

- **City-wide focus** on flood reduction and heat mitigation.
- **Strategy:**
  - Analysis of flood-prone areas
  - Analysis of heat related injuries
  - Securing grants and funding for solutions
- **Departments working together:** Emergency Management, Engineering, Public Works, and others
- **Coordinated** efforts across sectors



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60 mins

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- Flooding – We can fight back!
- What about Heat?
- Going for a Walk

\*Survey

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35 mins

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# RESILIENT CONNECTICUT PHASE II

# RESILIENT DANBURY

## Resilient Connecticut Phase II

### Regional Adaptation/Resilience Opportunity Areas

Name: Downtown Danbury

Location: Danbury

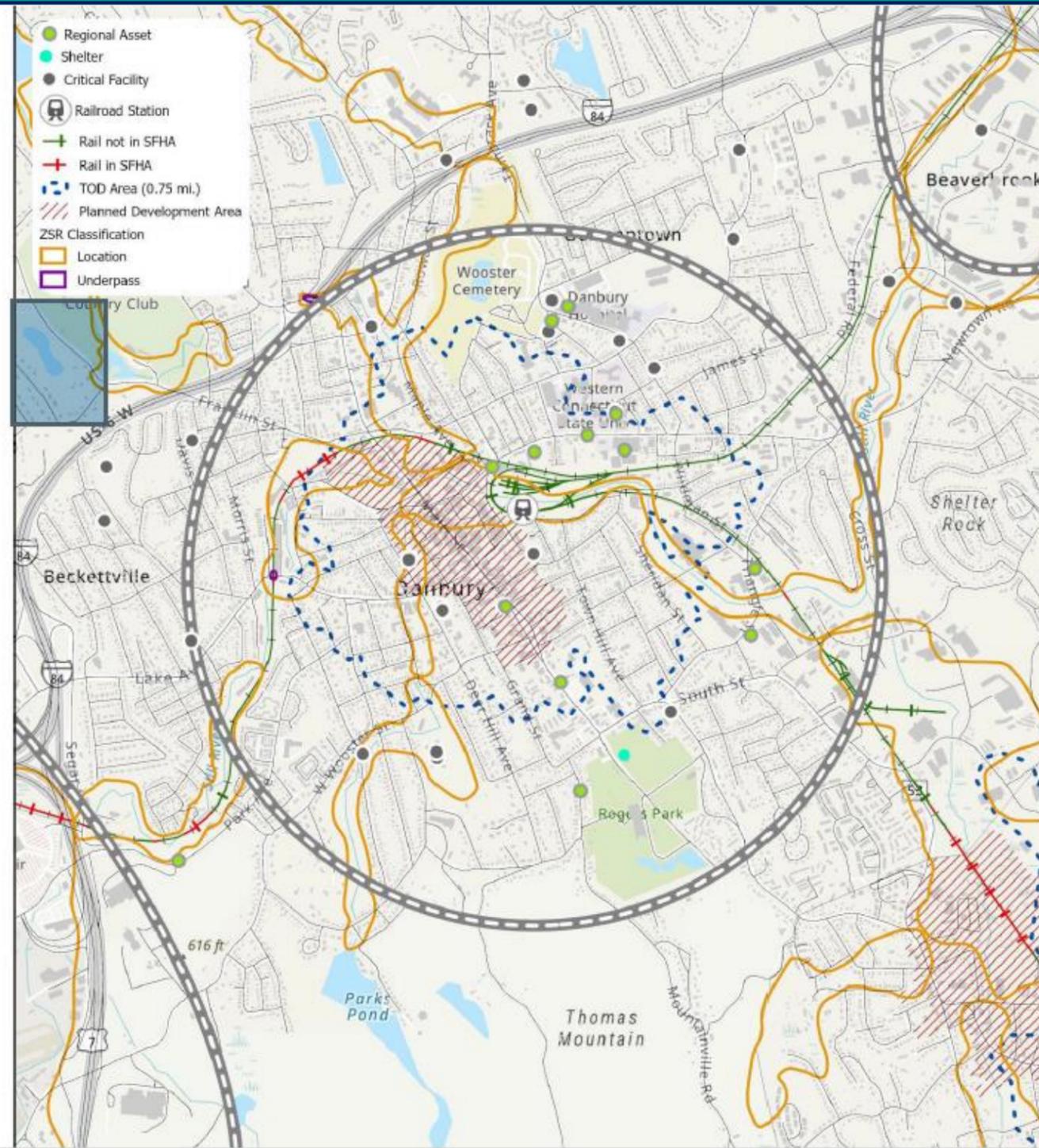
Considerations	Characteristics of Area
Flood Vulnerability	● ● ● ● ●
Heat Vulnerability	● ● ● ● ○
Social Vulnerability	● ● ● ● ●

The center of Danbury is characterized by zones of shared risk associated with the confluence of Padanarum Brook, Kohanza Brook, and the Still River. Despite many flood risk reduction projects undertaken over decades, TOD and planned development areas are located in close proximity to – or within – these zones of shared risk. Numerous critical facilities, historic resources, and the terminus of the MetroNorth Danbury line are also located in the area. Downtown Danbury is a regional center for northern WestCOG.

Almost all of the downtown area is moderately vulnerable to heat, with the highest vulnerable area concentrate along route 53 commercial properties. Presenting few opportunities for shade or street trees, the area has high heat emittance. In addition, there is high social sensitivity throughout the area.

City Hall  
Fire headquarters  
Hose Co. 5, 6, 7, and 9  
Danbury Hospital  
Danbury Health and Housing Dept.  
Western CT State College Police

Assisted living facilities  
War Memorial  
Substation  
Power plant  
Museums



## RESILIENT CONNECTICUT PHASE III PROJECT GOALS



### IDENTIFY RESILIENCY MEASURES

- Improve flood and heat resilience
- Leverage Nature-Based Solutions

### COMMUNITY CO-BENEFITS

**Collaborate** with stakeholders in downtown Danbury to select strategies and projects

**Develop** conceptual Designs

**Position** projects for funding

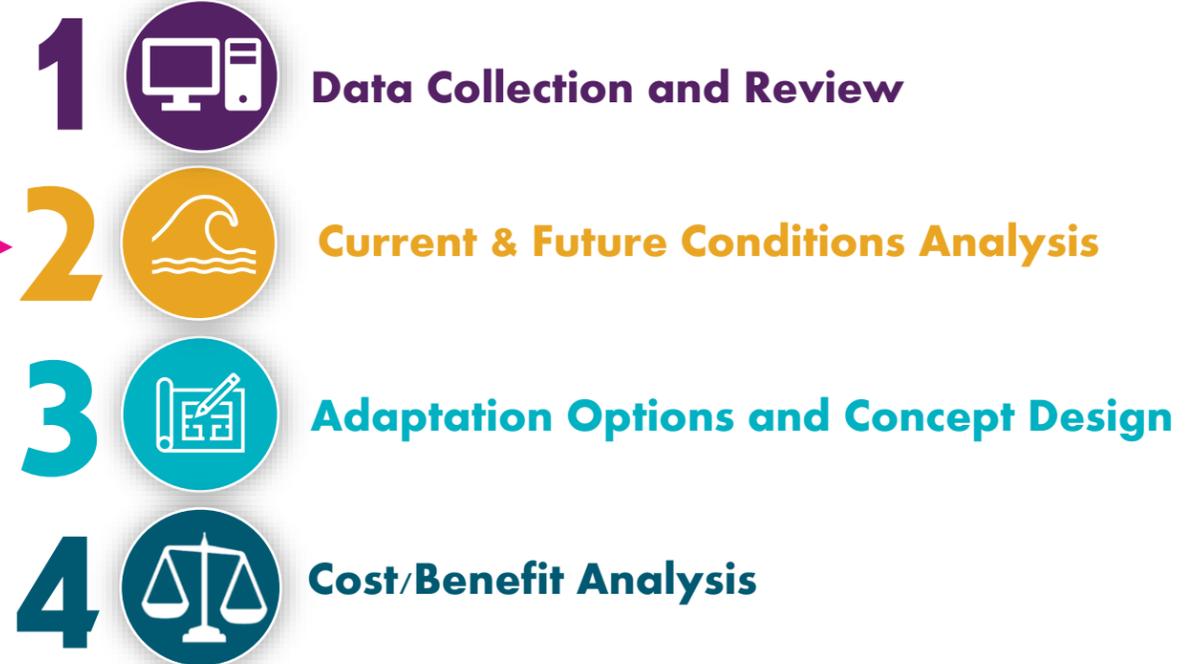


# RESILIENT CONNECTICUT PHASE III

# RESILIENT DANBURY

- Understand and Communicate Relative Risks
- Engage the City and Community to Create the Vision
- Develop Alternatives Based on Risk and Cost
- Create a Plan that Prioritizes Implementable Actions & Positions Projects for State/Federal Funding

WE ARE HERE



# RESILIENT DANBURY PROJECT OVERVIEW

## PROJECT EXTENT

Deer Hill Ave. to Town Hill Ave.  
Park Place to Pahquioque Ave.

1.25 square miles

Over 40 Community Buildings within project area

### Library/ Post Office/City Hall

- 1 UNITED STATES POST OFFICE
- 2 PUBLIC LIBRARY
- 3 CITY HALL

### Religious Center

- 1 UNIVERSAL CHURCH
- 2 ALL NATION BAPTIST CHURCH
- 3 ST. JAMES EPISCOPAL CHURCH
- 4 TEMPLE BETHEL
- 5 STRONG GOD CHURCH
- 6 EMANUEL ASSEMBLY-GOD CHURCH
- 7 GREATER MERCY TEMPLE CHURCH
- 8 SACRED HEART CHURCH
- 9 SEVENTH DAY ADVENTIST CHURCH

### Community Center

- 1 LEBANON-AMERICAN CLUB
- 2 ECUADORIAN CIVIC CENTER
- 3 DANBURY COMMUNITY CENTER
- 4 OUR LADY OF APARECIDA PARISH - BRAZILIAN COMMUNITY CENTER

### Affordable Housing

- 1 AFFORDABLE HOUSING
- 2 PROPOSED AFFORDABLE HOUSING

### Healthcare Facility & Senior Center

- 1 COMMUNITY HEALTH CENTER OF DANBURY
- 2 PALACE VIEW SENIOR HOUSING
- 3 GREATER DANBURY COMMUNITY HEALTH CENTER
- 4 PHARMACY (WALGREENS)
- 5 PLANNED PARENTHOOD
- 6 GREATER DANBURY COMMUNITY HEALTH CENTER
- 7 ELMWOOD HALL SENIOR CENTER
- 8 DANBURY REGIONAL WIC NUTRITION PROGRAM / OLD JAIL

### School/ Educational Centers

- 1 CENTER FOR EMPOWERMENT & EDUCATION
- 2 ST. PETER'S SCHOOL
- 3 SOUTH STREET SCHOOLS
- 4 SACRED HEART SCHOOL
- 5 HEAD START CENTER

### Public Open Space

- 1 DANBURY CITY CENTER GREEN
- 2 DANBURY SKATE PARK
- 3 ELMWOOD PLACE

### State of Connecticut

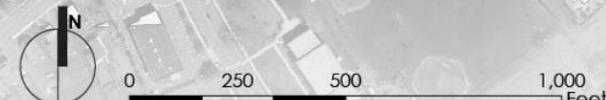
- 1 FAIRFIELD COUNTY COURTHOUSE
- 2 TRAIN STATION

### Other

- 1 ICE RINK
- 2 MUSEUM AND HISTORICAL SOCIETY
- 3 GROCERY STORE (PRICE RITE)
- 4 CONNECTICUT LIGHT & POWER CO
- 5 BECKERIE & CO. FIRE ENGINE 9

## LEGEND

-  Ex. Outfalls
-  Ex. Conduits
-  City of Danbury Parcels
-  Watershed Boundary
-  Roadways



# RESILIENT DANBURY WATERSHED MAP

## Downtown Danbury Main Street

- Low lying area next to Still River
- Highly impervious surrounding areas
- Located in valley over 600 feet elevation change from nearby peaks.

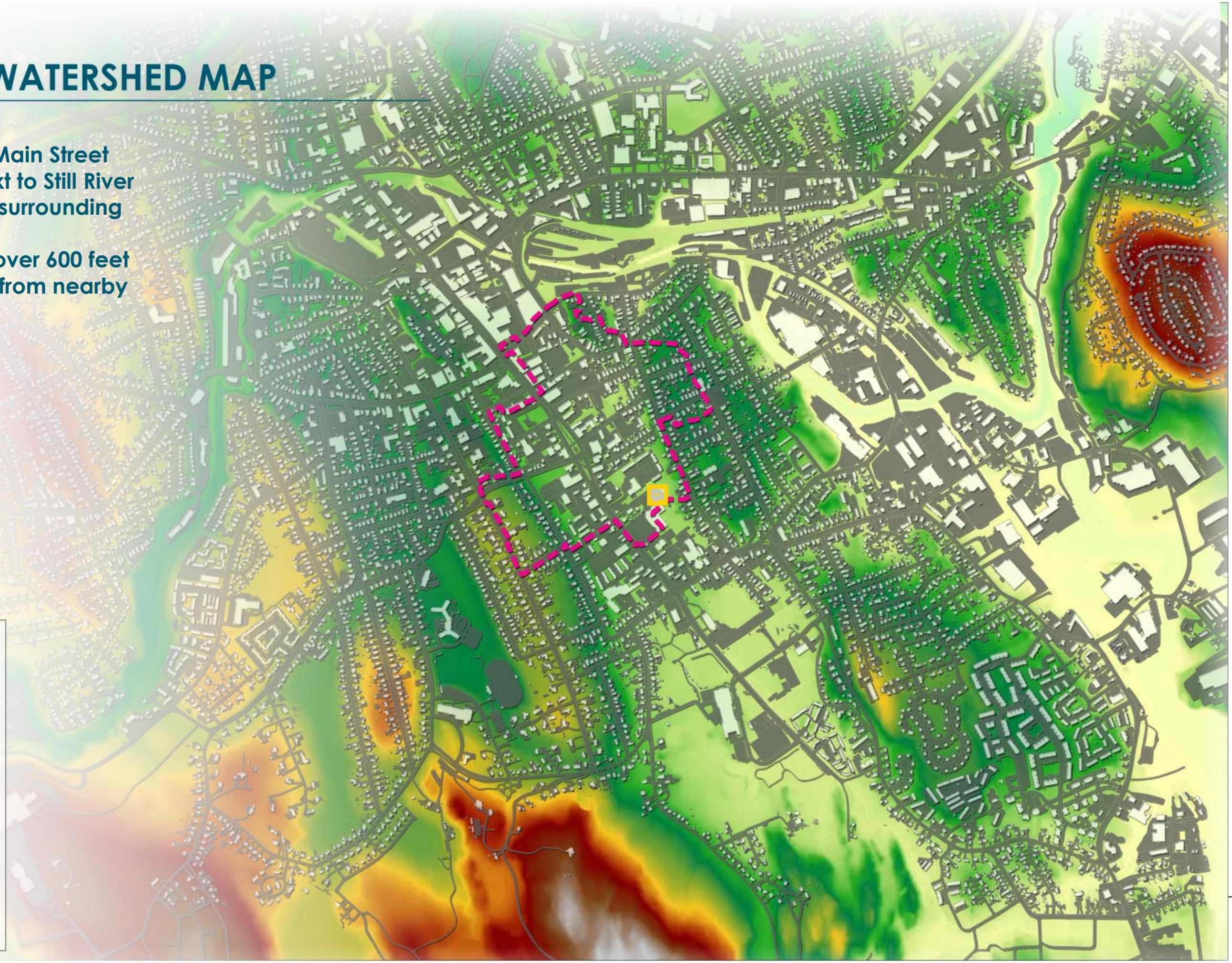
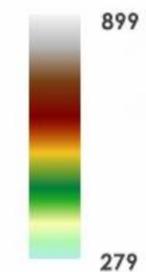
### LEGEND

 Impervious Buildings

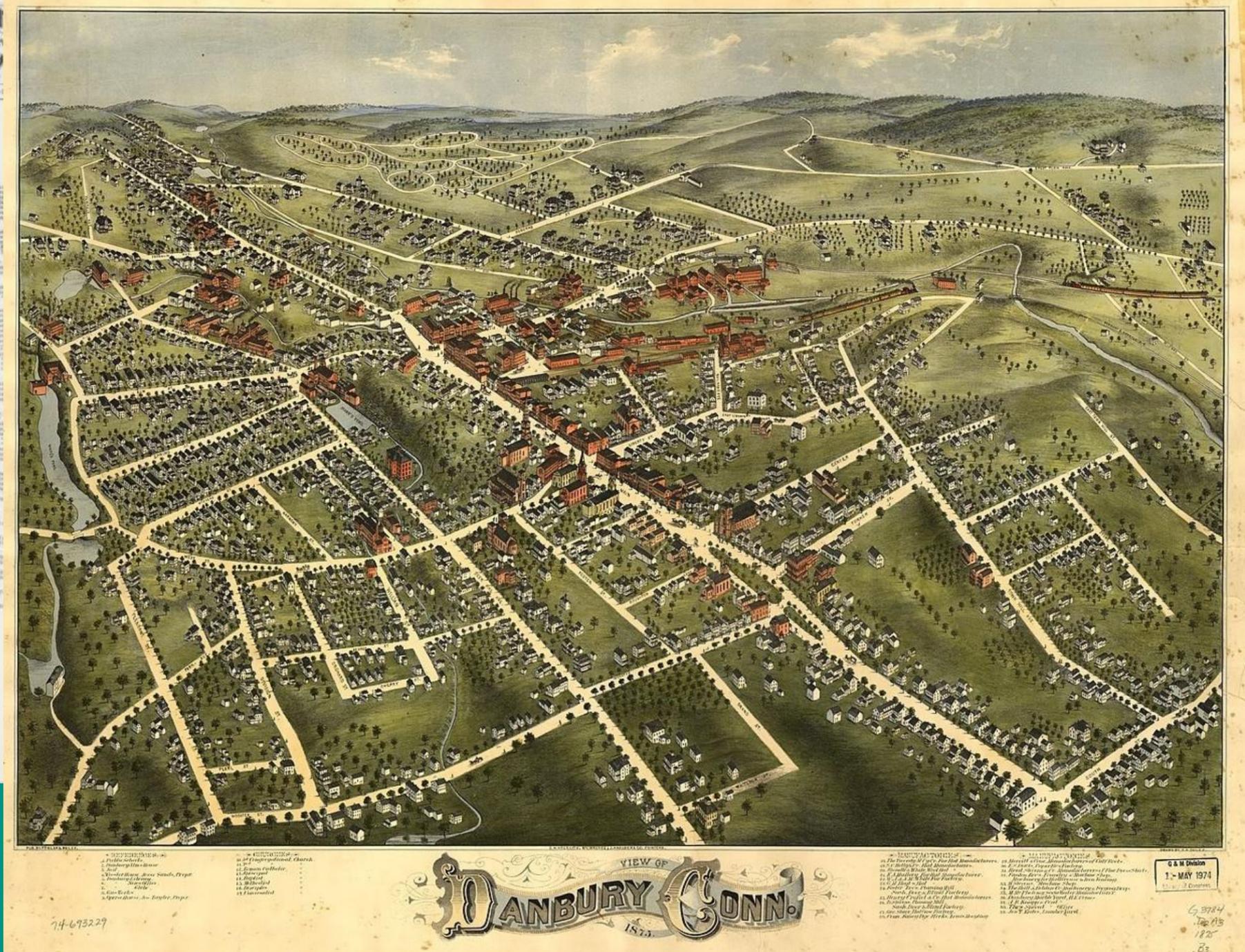
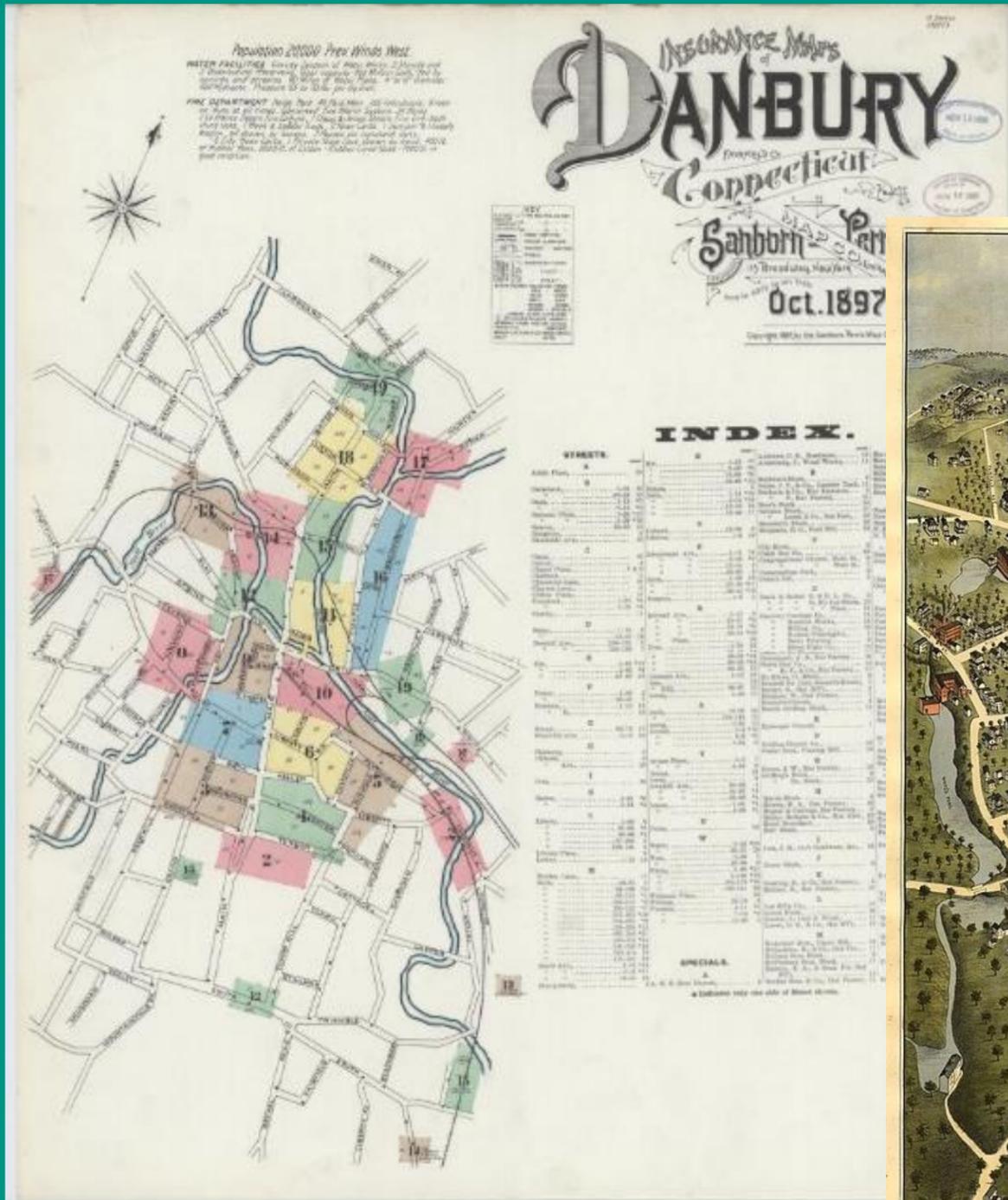
 Impervious Surfaces

 Watershed Boundary

Elevation (ft)



# RESILIENT DANBURY



# EAST DITCH FLOODING & EXTREME HEAT

# RESILIENT DANBURY



DANBURY, Conn.



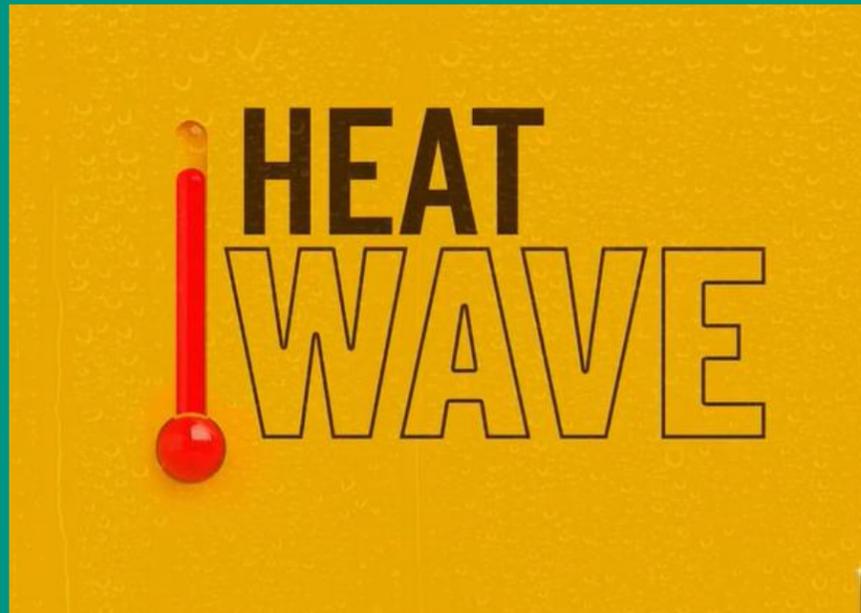
# RESILIENT DANBURY

## EAST DITCH FLOODING



# DANBURY EXTREME HEAT

# RESILIENT DANBURY



## As State Activates Extreme Heat Protocol, Danbury Cooling Centers Open

With temps forecasted to soar, lasting for days, cooling centers in Danbury are open.

Rich Kirby, Patch Staff  
Posted Tue, Jul 19, 2022 at 4:07 pm ET

Reply



### NEWS

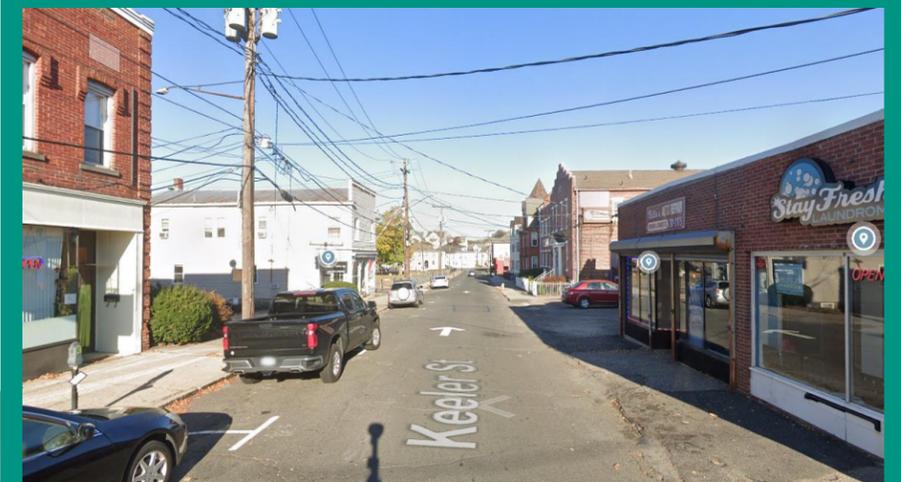
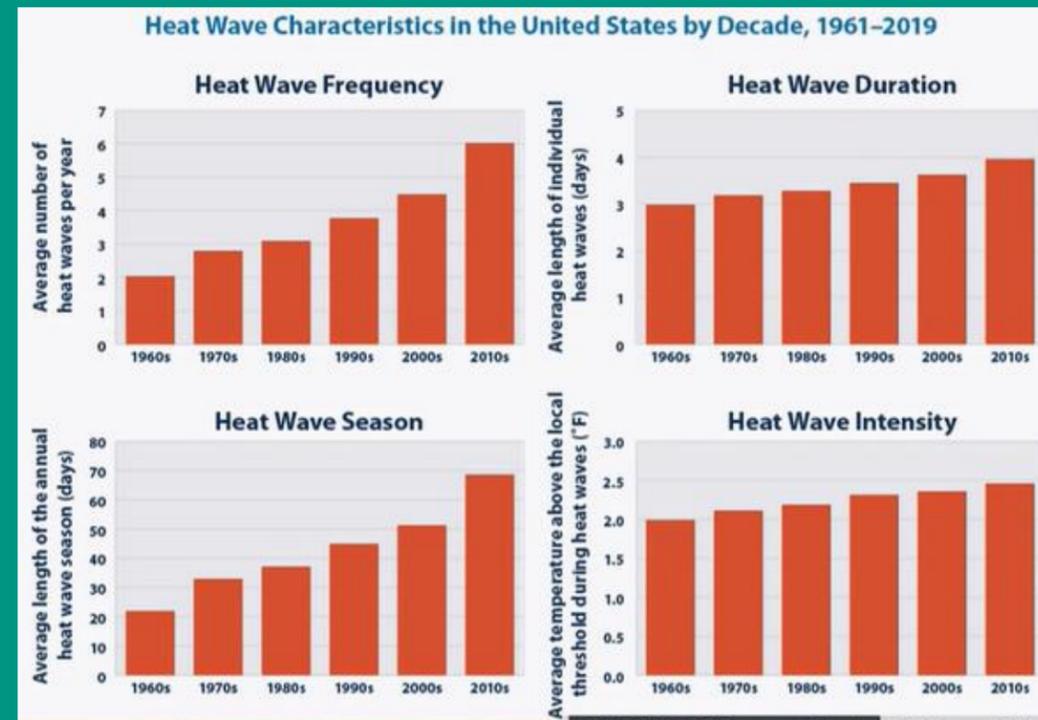
## Danbury is heating up: Here's what the city is doing to prepare and help residents cope.

Doug Girardot  
Aug. 7, 2022

HEAT WAVE

## Lamont Activates CT's Extreme Weather Protocol Ahead of Forecasted Heat

Published August 1, 2022 • Updated on August 1, 2022 at 10:59 pm



### What makes it worse?

- Widespread impervious surfaces
- Limited and disconnected green spaces/shade

### What is Danbury doing?

- Developing strategies to reduce the impacts of extreme heat Danbury while enhancing quality of life

# RESILIENT DANBURY HEAT CONTRIBUTORS

**LEGEND**

- ▲ Existing Cooling Centers
- ▲ Proposed Cooling Centers
- Tree Cover
- Public Green Space
- Impervious Ground Surface
- Impervious Building Surface
- Pervious Surface



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# RESILIENT DANBURY PROJECT OVERVIEW

**WE WILL NEVER ELIMINATE FLOODING!**

We can reduce depth, duration, and extent.

## PRIORITIES

1. Address Critical Transportation and Resilience Corridors
2. Reduce Flood Risk and Coordinate with Redevelopment Efforts
3. Reduce the Impacts of Extreme Heat
4. Integrate Nature-Based Solutions + Green Infrastructure with City Green and Resilience Initiatives.

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## LEGEND

-  Ex. Outfalls
-  Ex. Conduits
-  City of Danbury Parcels
-  Watershed Boundary
-  Roadways



# 100-year Flood or 1% Annual Chance???

**% Annual Chance:** the probability of a particular flood event happening in any given year

**Recurrence Interval:** The average number of years, over the long term, between subsequent Annual Chance Exceedance events

**% Annual Chance = 100/recurrence interval**

1 year storm	$100/1 = 100\%$	AC
2-year storm	$100/2 = 50\%$	AC
5-year storm	$100/5 = 20\%$	AC
100-year	$100/100 = 1\%$	AC

**% Annual Chance** means that it is possible for a given flood to occur twice in one year, in back-to-back years, or not at all for a period of years.



**1% chance = 100-year flood**

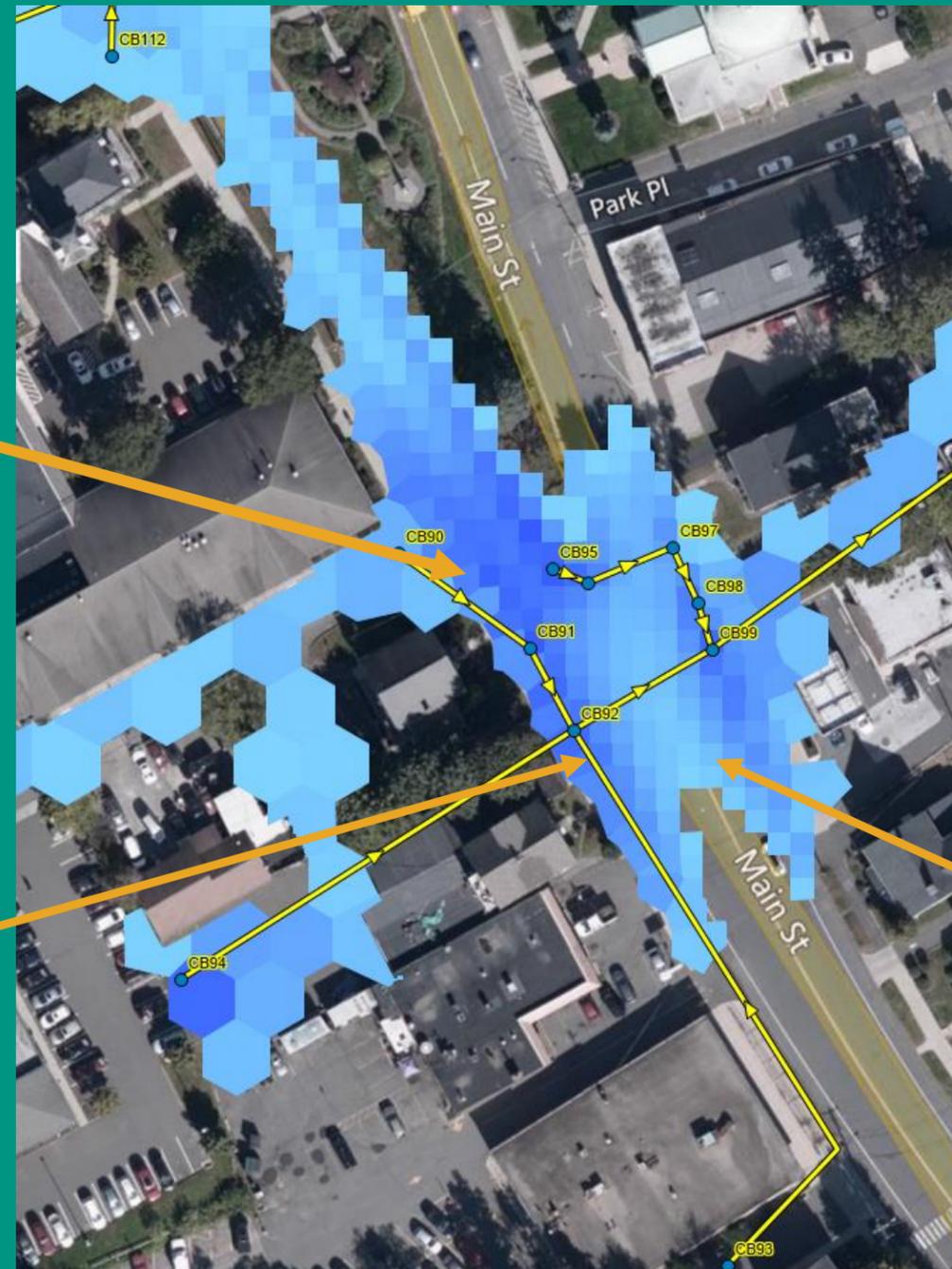
**50% chance = 2-year flood**

**100 Year Flood:** You have a jar with 100 marbles – 99 clear and one red. There is a 1 in 100 (or 1% chance) of you reaching into your jar and pulling out the red marble.

# VALIDATION OF FLOOD MODELING

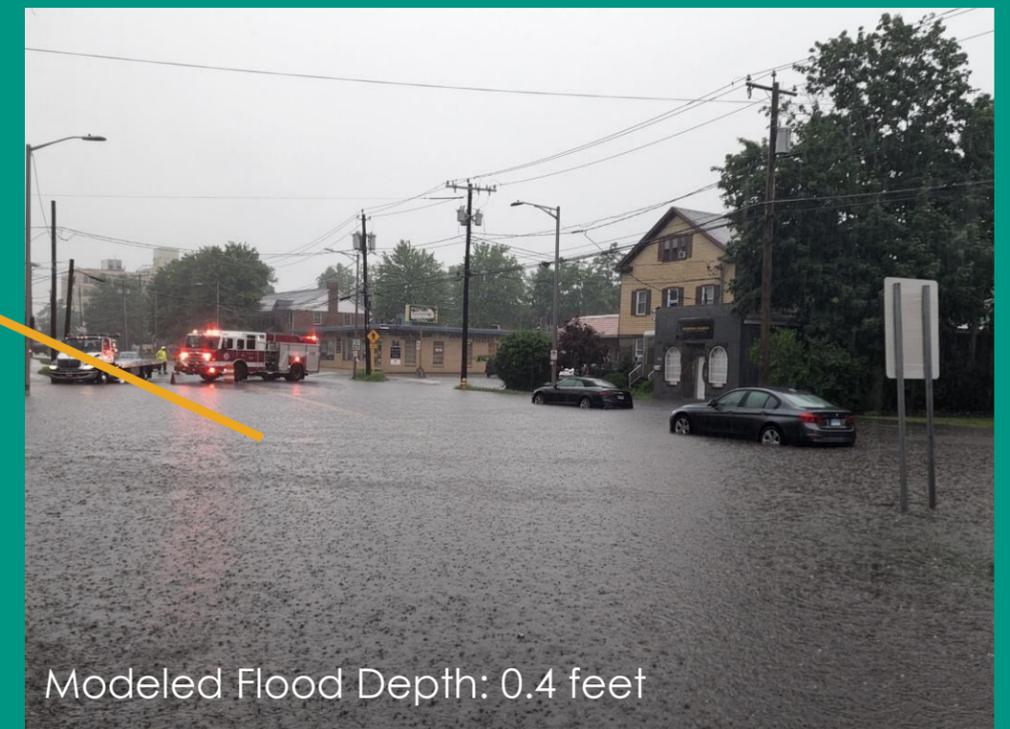
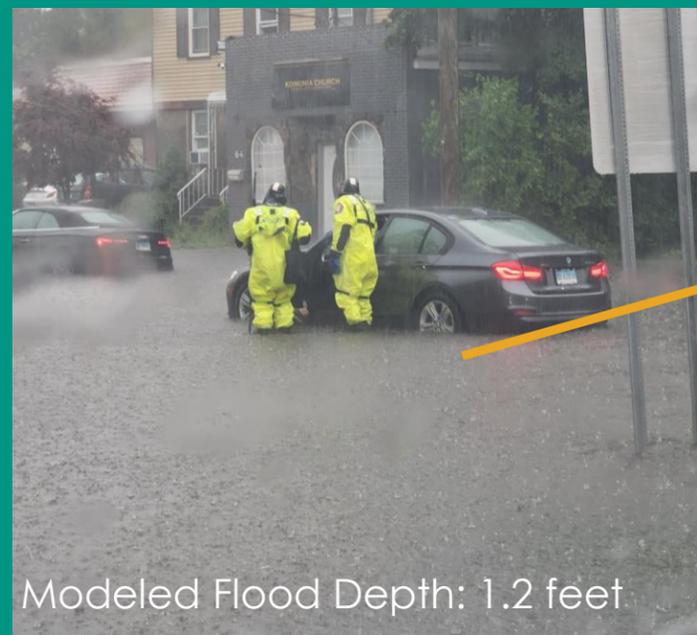
# RESILIENT DANBURY

5-Year Storm (20% Chance)  
Modeled Flood Extents



o Flood Date: June 2<sup>nd</sup>, 2022

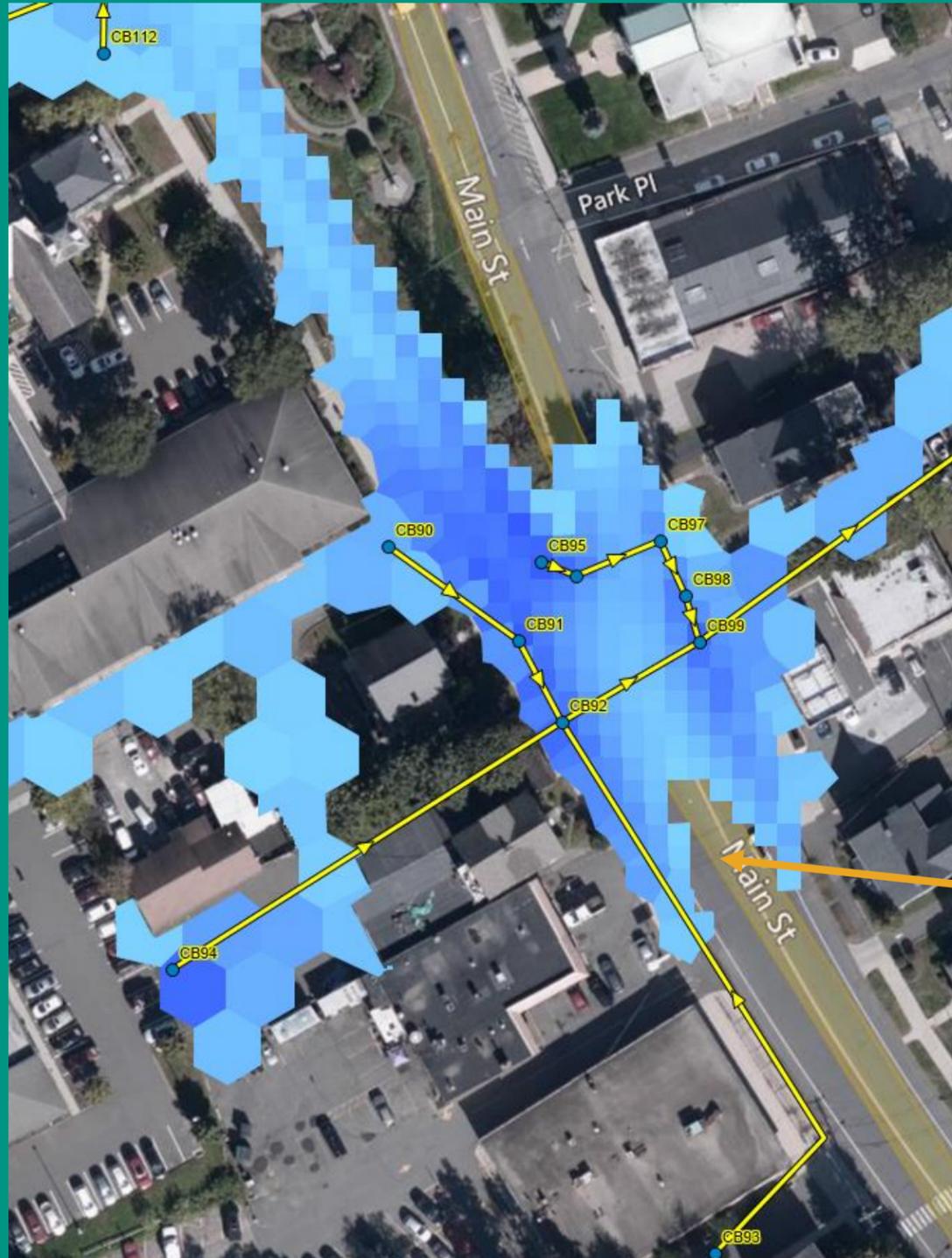
2.12 inches / 2 hours  
**5-Year Storm**  
**(20% chance)**  
2 Hour Storm Duration



# VALIDATION OF FLOOD MODELING

# RESILIENT DANBURY

5-Year Storm (20% Chance)  
Modeled Flood Extents



June 2<sup>nd</sup>, 2022, 5-Year Storm (20% Chance), Observed Flood Extents



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- 29 SOUTH STREET SCHOOLS
- 30 SACRED HEART SCHOOL
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## Public Open Space

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- 33 DANBURY SKATE PARK
- 34 ELMWOOD PLACE

## State of Connecticut

- 35 FAIRFIELD COUNTY COURTHOUSE
- 36 TRAIN STATION

## Other

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- 38 MUSEUM AND HISTORICAL SOCIETY
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- 40 CONNECTICUT LIGHT & POWER CO

## LEGEND

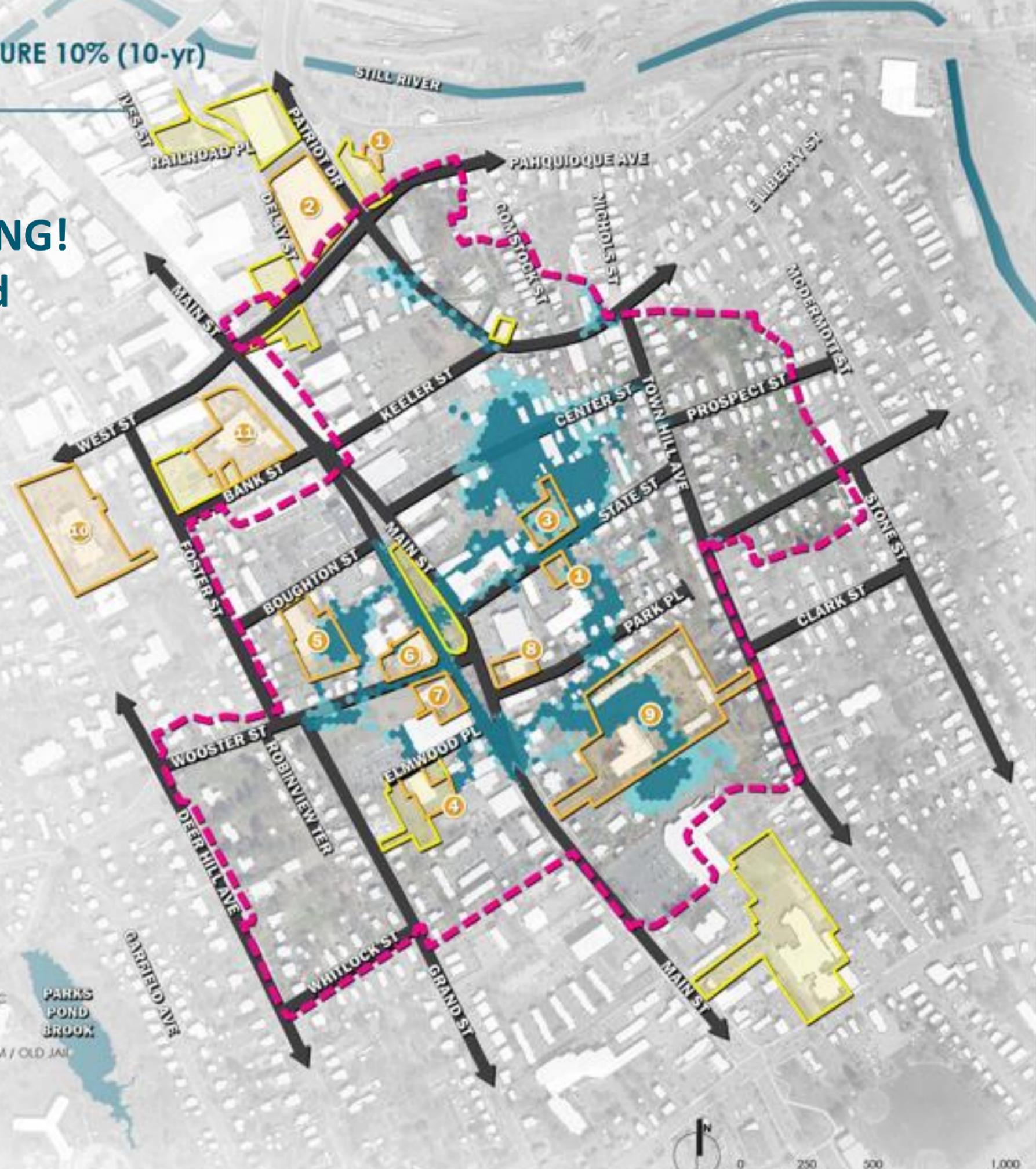
-  Ex. Outfalls
-  Ex. Conduits
-  City of Danbury Parcels
-  Watershed Boundary
-  Roadways



**WE WILL NEVER ELIMINATE FLOODING!**  
We can reduce duration, extent, and depth of flooding.

### Flooding

- Will occur more frequently and with greater depths if nothing is changed
- Impacts critical facilities and critical roadways
- Frequent storms have significant negative impacts



**LEGEND**

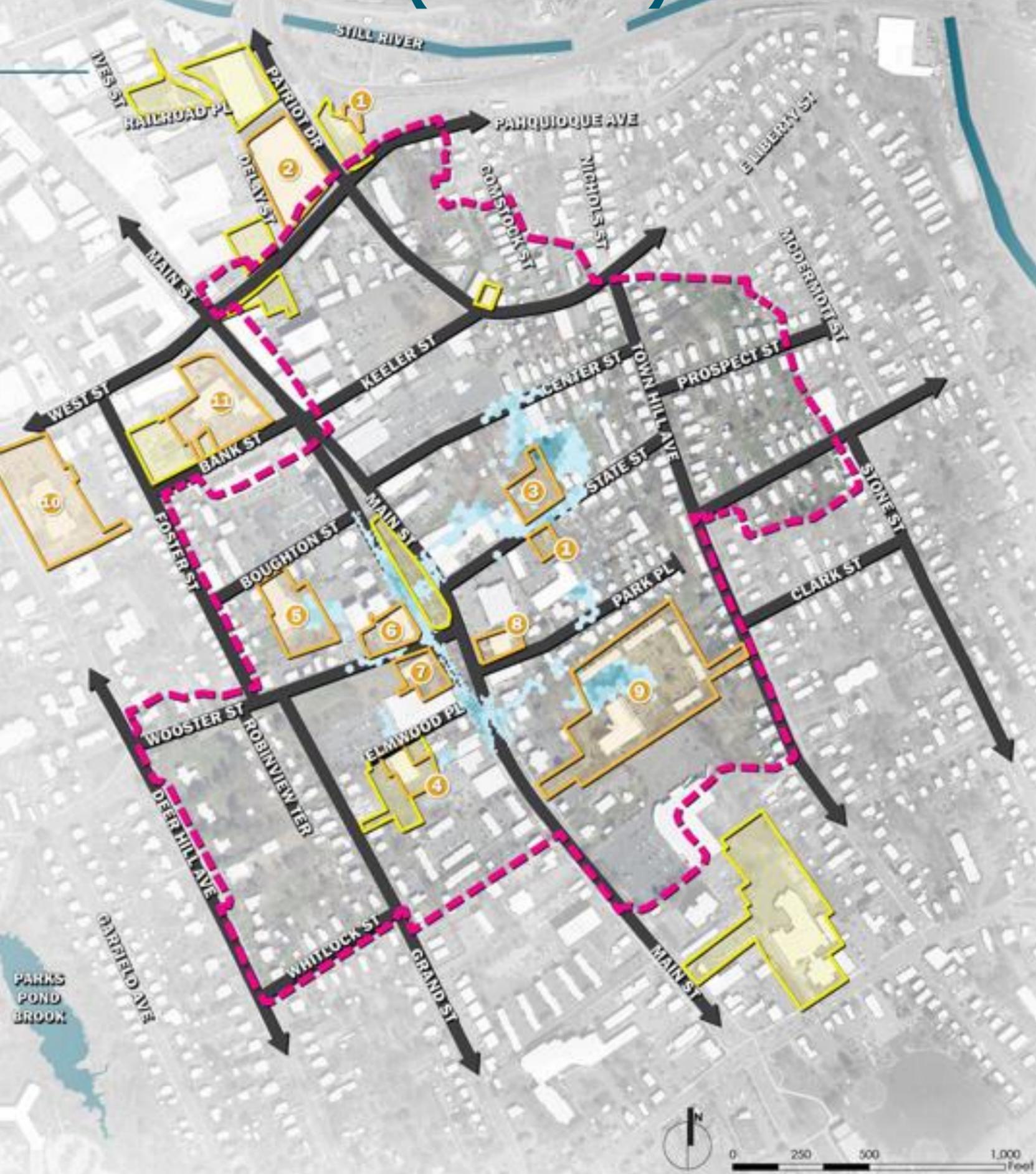
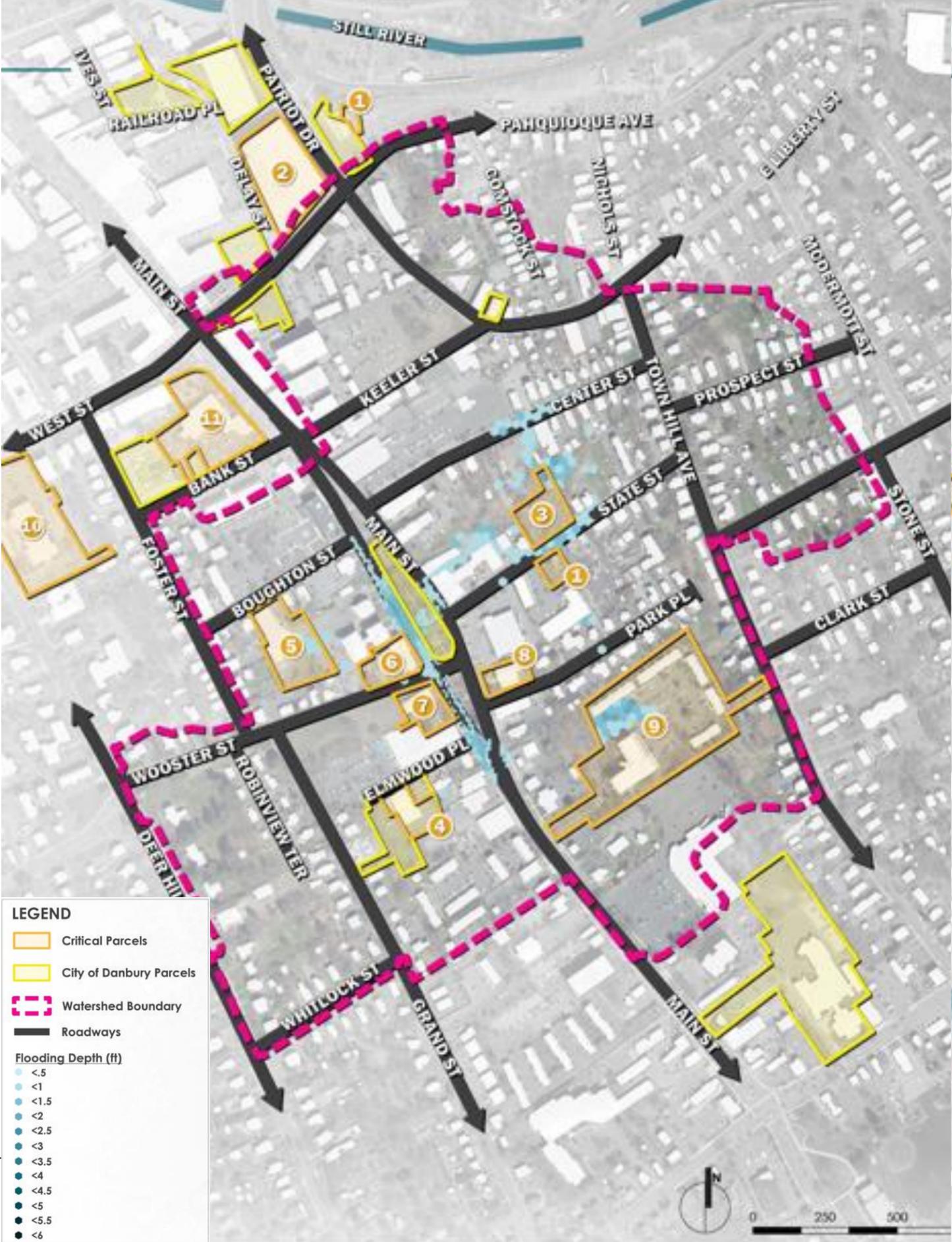
- Current 10% Annual Chance Flood
- Future 10% Annual Chance Flood
- Critical Parcels
- City of Danbury Parcels
- Watershed Boundary
- Roadways

**Critical Parcels**

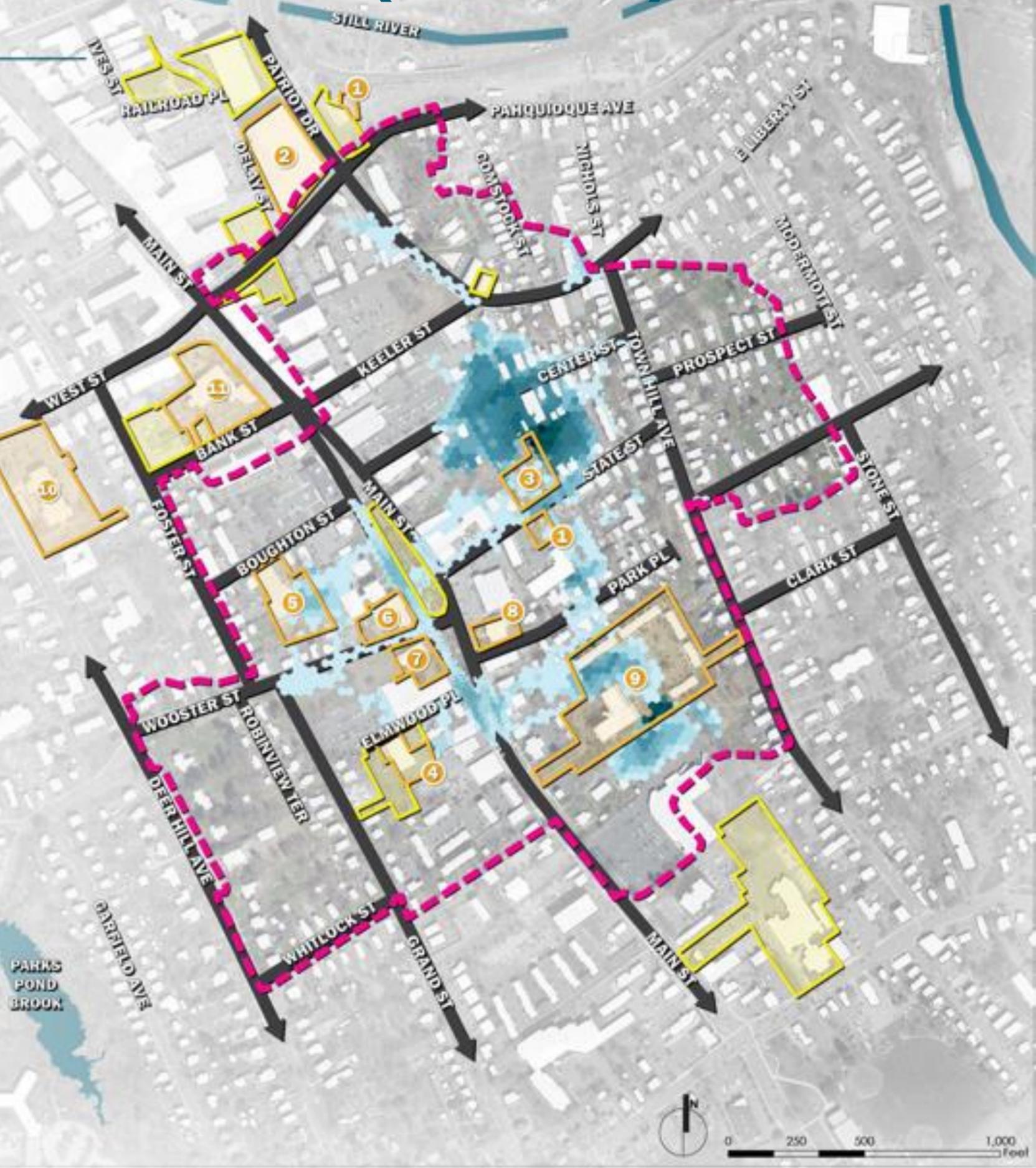
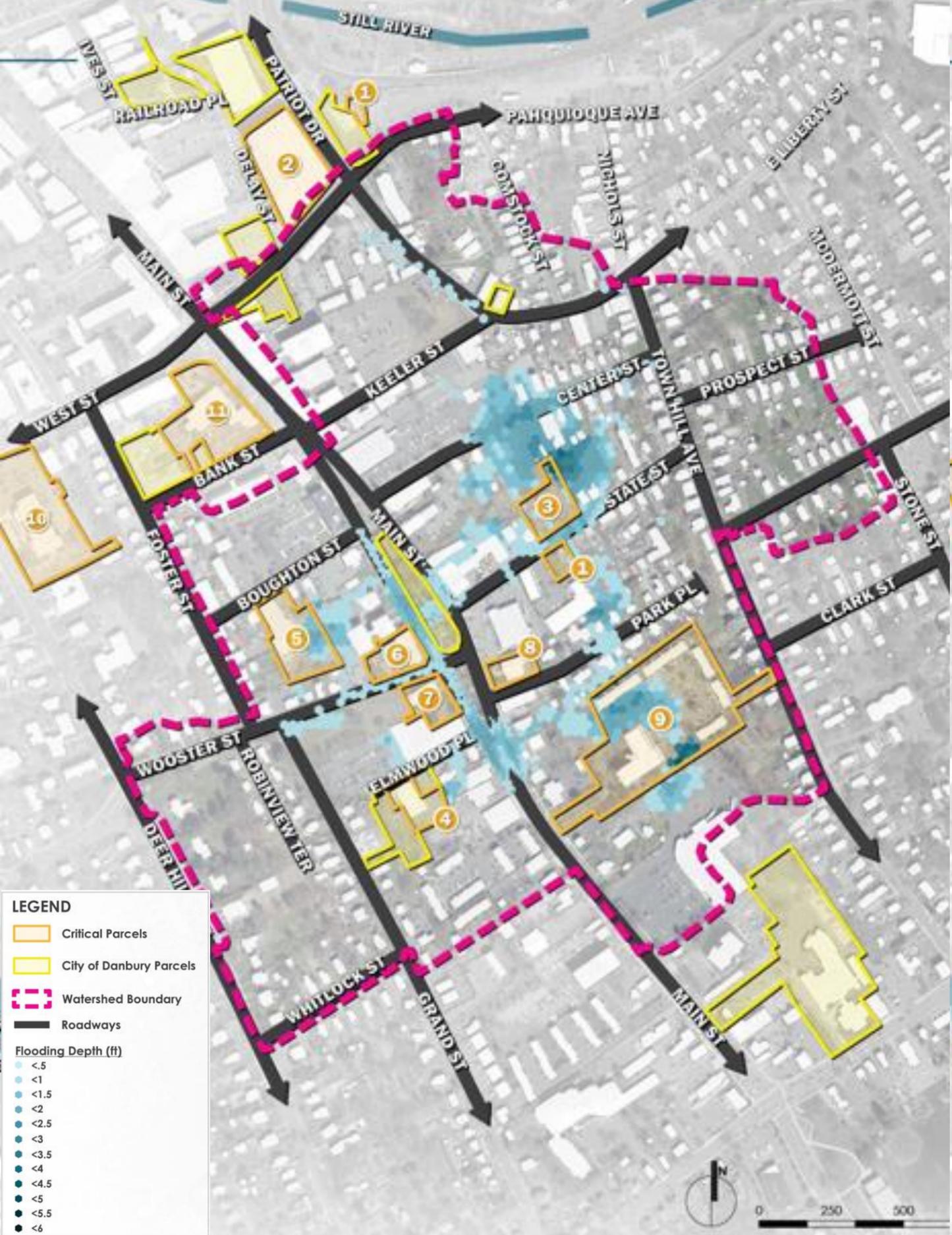
- 1 CONNECTICUT LIGHT & POWER CO
- 2 ICE RINK
- 3 PROPOSED AFFORDABLE HOUSING
- 4 ELMWOOD HALL SENIOR CENTER
- 5 CONNECTICUT INSTITUTE FOR COMMUNITIES INC
- 6 AFFORDABLE HOUSING
- 7 DANBURY REGIONAL WIC NUTRITION PROGRAM / OLD JAIL
- 8 STATE OF CONNECTICUT
- 9 AFFORDABLE HOUSING
- 10 CITY HALL
- 11 PUBLIC LIBRARY



# EXISTING VS. FUTURE 100% CHANCE EVENT (1-YEAR)



# EXISTING VS. FUTURE 10% CHANCE EVENT (10-YEAR)



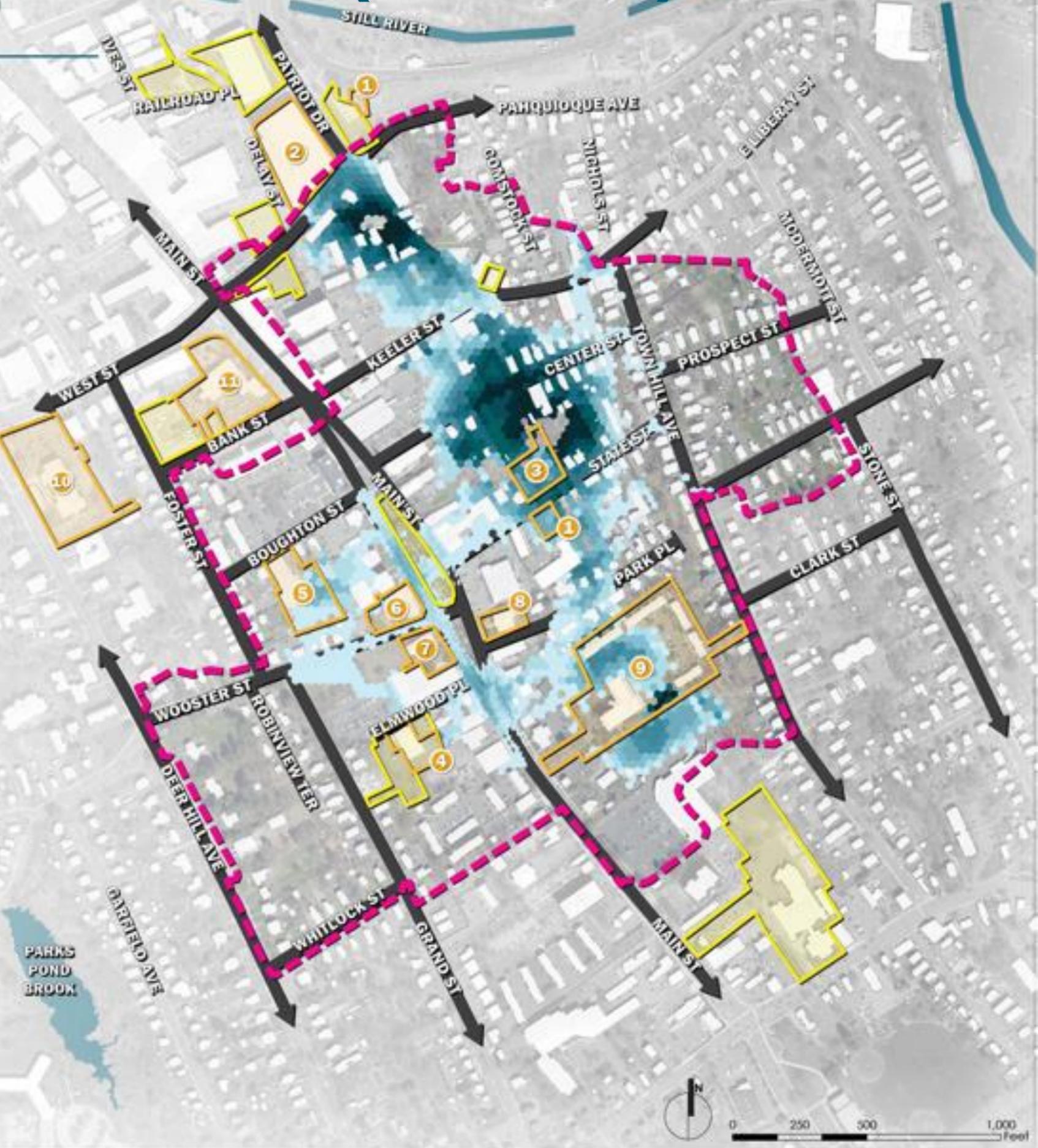
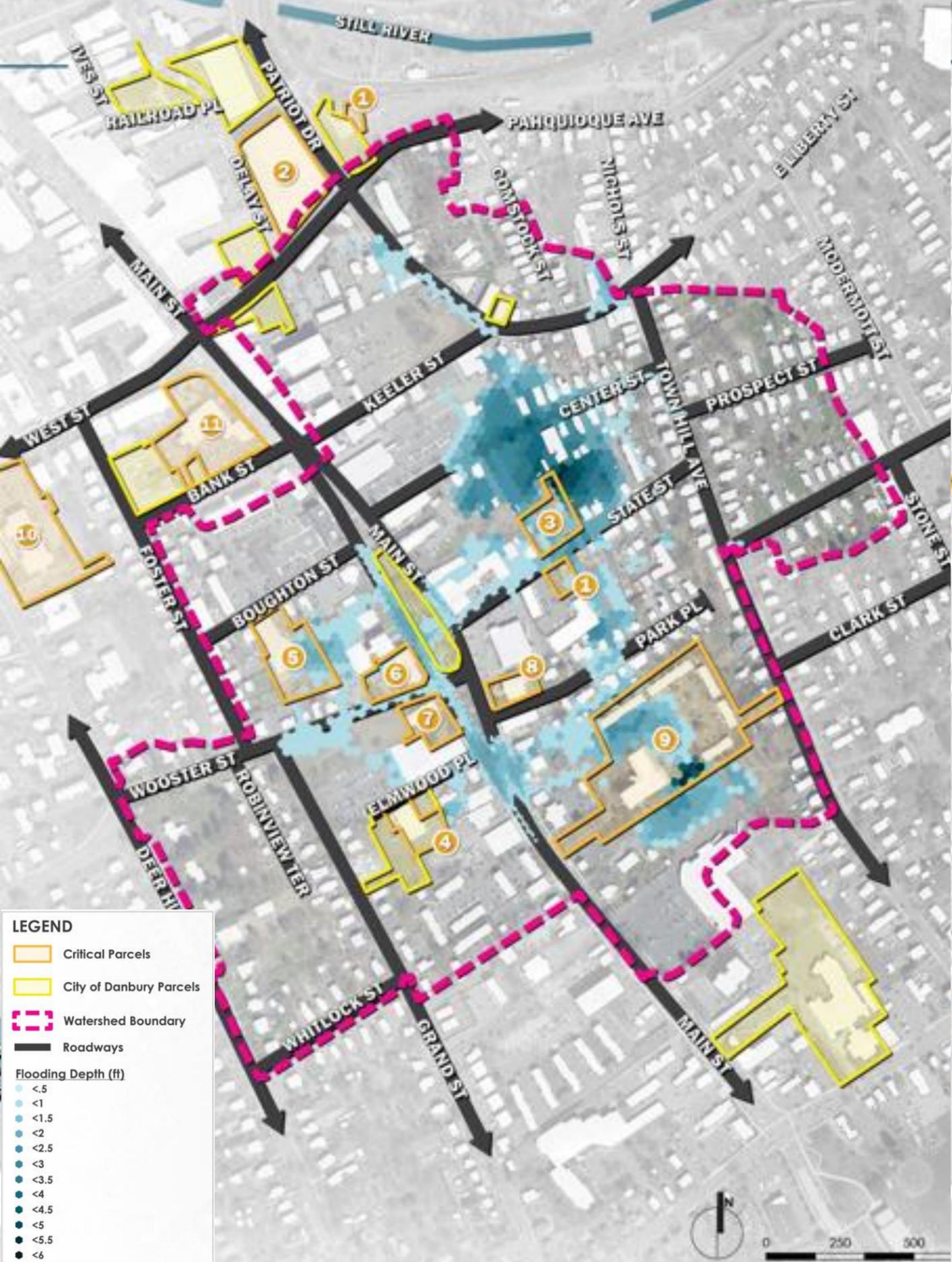
**LEGEND**

- Critical Parcels
- City of Danbury Parcels
- Watershed Boundary
- Roadways

**Flooding Depth (ft)**

- <math>< .5</math>
- <math>< 1</math>
- <math>< 1.5</math>
- <math>< 2</math>
- <math>< 2.5</math>
- <math>< 3</math>
- <math>< 3.5</math>
- <math>< 4</math>
- <math>< 4.5</math>
- <math>< 5</math>
- <math>< 5.5</math>
- <math>< 6</math>

# EXISTING VS. FUTURE 1% CHANCE EVENT (100-YEAR)



# HISTORY OF PROPOSED SOLUTIONS

2002

Initial drainage system upgrade design

2011

Upgrade at Still River

2012-2021

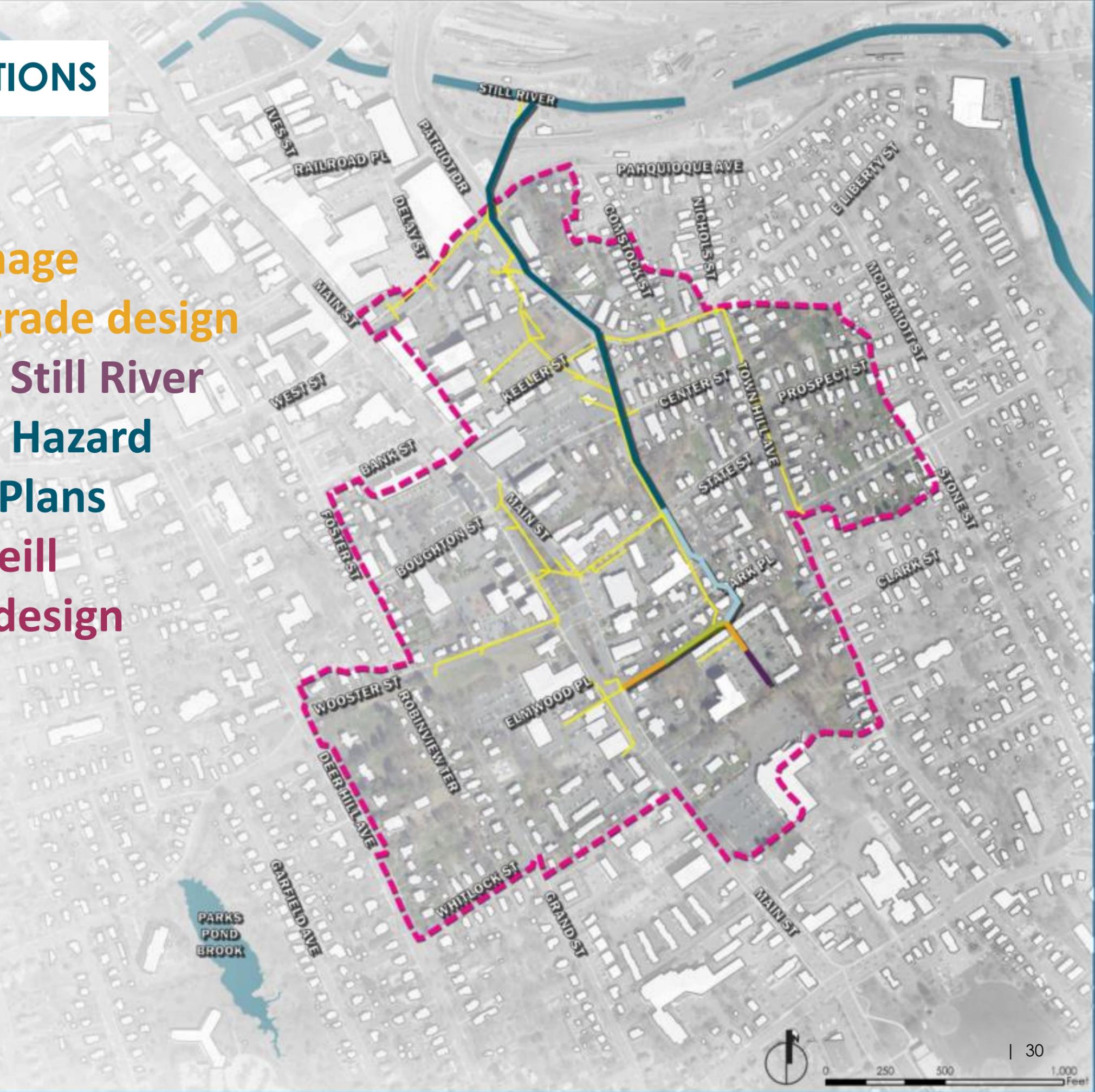
Included in Hazard Mitigation Plans

2023

Fuss & O'Neill advancing design

**LEGEND**

- Pr. 5x10 Box Culvert
- Pr. 4x10 Box Culvert
- Pr. 48" Pipe
- Pr. 42" Pipe
- Pr. 36" Pipe
- Ex. Conduits
- Watershed Boundary



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15 mins

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25 mins

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60 mins

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- Flooding – We can fight back! blue ●
- What about Heat? red ●
- Going for a Walk yellow ●

\*Survey

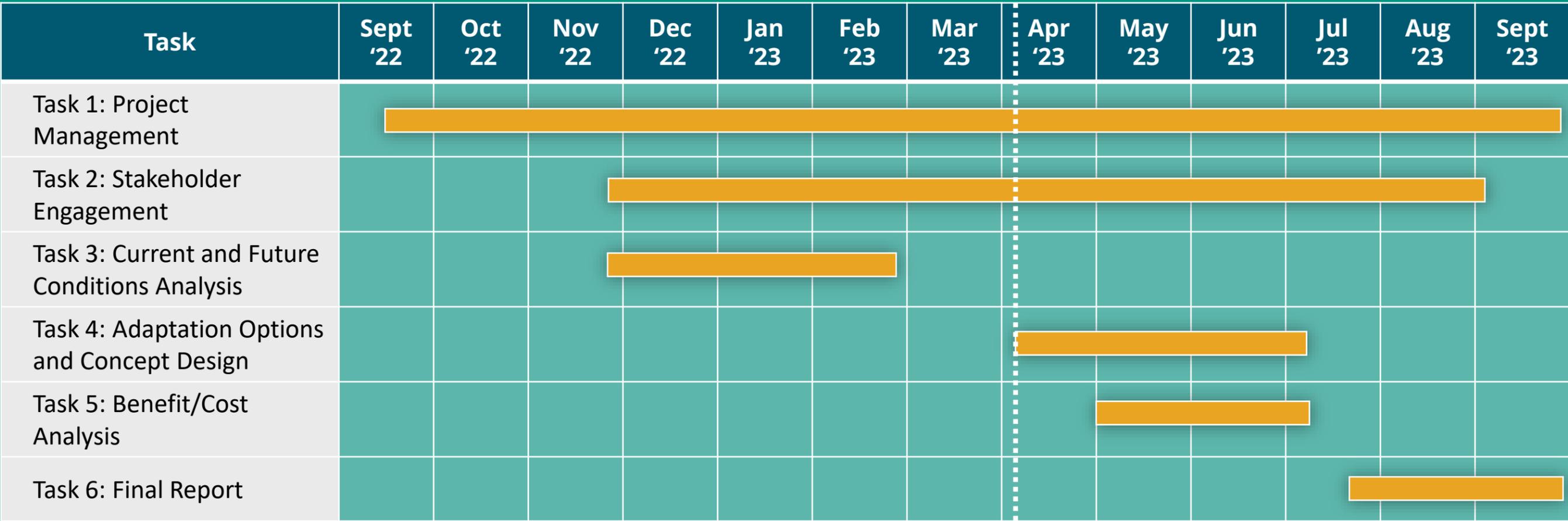
Sum It Up

35 mins

- Summary of feedback from Stations
- Question and Answer

## DISCUSSION

## OVERALL PROJECT SCHEDULE



## STAKEHOLDER ENGAGEMENT SCHEDULE

Public Workshops	Tentative Meeting Schedule
Public Workshop #1	April 2023
Public Workshop #2	July 2023
Public Workshop #3	September 2023

**PUBLIC Workshop #1 – EXISTING and FUTURE CONDITIONS**

**April 2023**

**PUBLIC Workshop #2 – Visioning**

**July 2023**

**PUBLIC Workshop #3 - Analysis**

**September 2023**

# RESILIENT DANBURY

## STAY IN TOUCH

Akta Patel, PE  
[apatel@fando.com](mailto:apatel@fando.com)

Elsa Loehmann, PE  
[eloehmann@fando.com](mailto:eloehmann@fando.com)

## WEBSITE

<https://resilientconnecticut.uconn.edu/resilient-danbury/>

Thu Sep 15 2022

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# RESILIENT DANBURY

# QUESTIONS?



FUSS & O'NEILL



**Dewberry**

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