The *New Mix:*
Project Advisory Committee (PAC) Meeting No. 2
December 13, 2021

Agenda

- **Welcome Back!**
- **PAC Meeting #1 Review**
- **Analysis, Needs & Deficiencies Summary**
- **Next Steps**

The *New Mix* Leadership Team

Connecticut Department of Transportation

- Nilesh Patel, PE, Principal Engineer
- Scott Roberts, PE, Project Manager
- Jonathan Dean, PE, Project Engineer

HNTB Corporation

- Jacob Argiro, PE, Project Manager
- David Schweitzer, PE, Deputy Project Manager
- Chris Fagan, PE, Project Engineer

New Mix PAC Members

All Saints/Todos los Santos Parish

Bender Plumbing

City of Waterbury:

- Bureau of Engineering
- City Planning & Inland Wetlands
- Department of Economic Development
- Department of Public Works
- Fire Department
- Office of the Mayor
- Police Department
- Public Schools

Connecticut Association for Community Transportation (CACT)

Connecticut Coalition for Environmental Justice (CCEJ)

CT transit

Federal Highway Administration (FHWA)

Greater Waterbury Transit District

Hispanic Coalition of Greater Waterbury/ Waterbury Working Cities Challenge

Holy Trinity Greek Orthodox Church

Housatonic Valley Association

Jarjura's Farm

Main Street Waterbury

Metro-North Railroad

Motor Transport Association of Connecticut (MTAC)

National Association for the Advancement of Colored People (NAACP) of Greater Waterbury

Naugatuck Valley Community College

Naugatuck Valley Council of Governments (NVCOG)

Palace Theater

Police Activity League (PAL) River Brigade

Riverside Cemetery

Saint Mary's Hospital

University of Connecticut (UCONN) Waterbury Branch

Waterbury Bridge to Success

Waterbury Development Corporation

Waterbury Hospital

Waterbury Neighborhood Associations: Brooklyn, Bunker Hill, Gilmartin, Waterbury, & Waterville

Waterbury Regional Chamber

PAC Roles and Responsibilities Review

Your role as PAC members is to be a contributory entity, providing public input/insight in what will ultimately become the New Mix program by:

Participating
and attending PAC meetings

Reviewing
PAC meeting material

Educating
oneself, sharing community issues, and staying informed

Sharing
perspectives and collaborating in the development and assessment of concepts

Serving
as the community link between the Study Team and the Waterbury community

Providing
input so CTDOT can make informed decisions on program transportation related issues, while respecting differences in opinion and perspective

Accepting
of agency determinations, understanding that complete agreement on all issues is likely not possible

Since Our Last Meeting…

You have been:

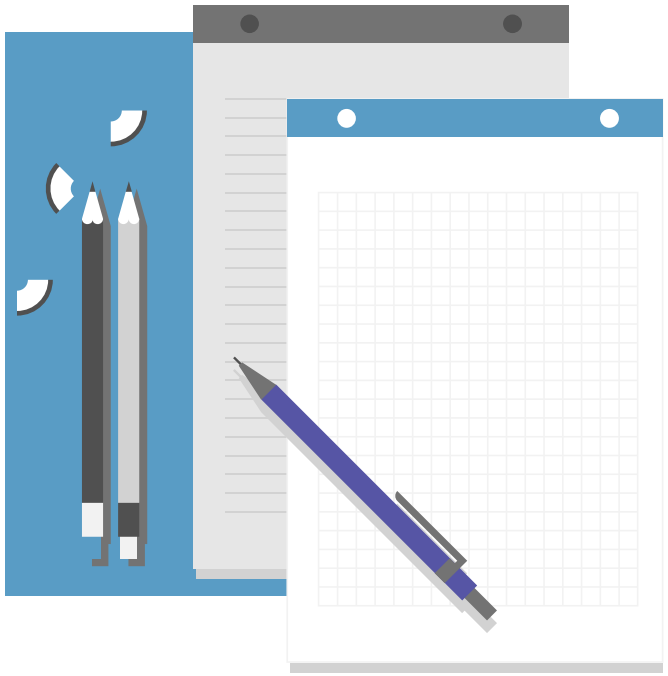
Identifying Transportation-Related Goals & Objectives on input map.

Checking email for information about the New Mix Program.

We have been:

Obtaining Input from PAC members, stakeholders, and the public.

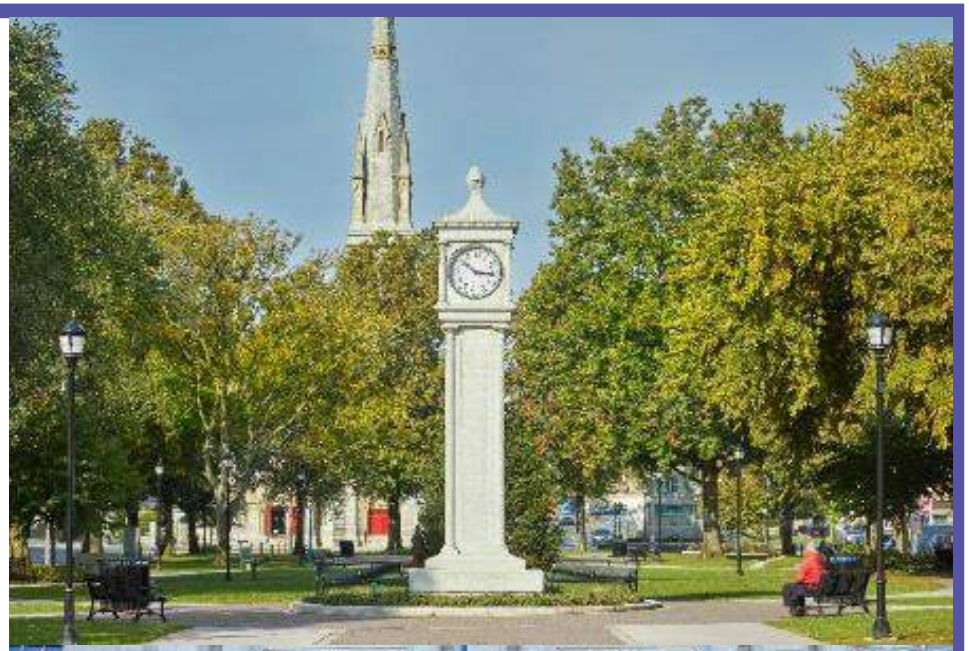
Refining the Preliminary Purpose & Need Statement and other Transportation-Related Goals & Objectives



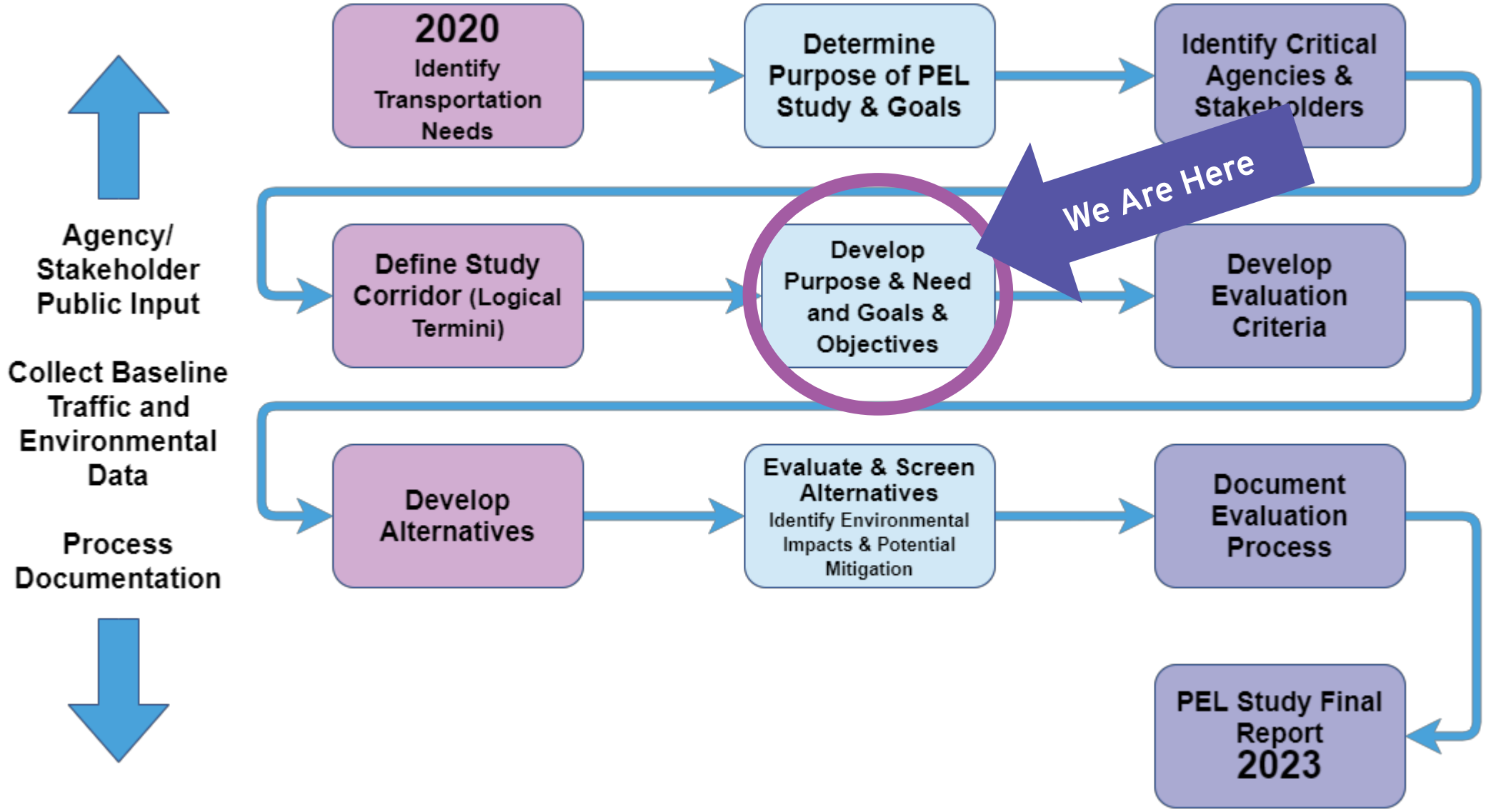
PAC Meeting #1 Review

The *New Mix* Program

- Long-term plan for the future of the Mixmaster
- Program projects will occur over time
- Analyze rehabilitation and replacement options that:
  - Modernize
  - Improve safety & functionality
  - Improve function of local road network & the interchange
  - Reduce congestion
  - Align with economic development & community plans
- CTDOT is using the federally recognized Planning and Environmental Linkages (PEL) approach for the study which will be used to inform the subsequent NEPA process



New Mix PEL Study Overview/Schedule



Analysis, Needs & Deficiencies Summary

Analysis, Needs and Deficiencies Report

(AN&D)

(a.k.a. the existing conditions report)

Commonly Used Terms

Interchange *is a system of interconnecting roadways that allows for traffic to travel uninterruptedly.*

System ramp *a roadway that connects a "limited access" highway to another (e.g., I-84 EB to Route 8 NB).*

Service ramp *a roadway that connects the local roadway network to a limited access highway (i.e., on/off ramps).*

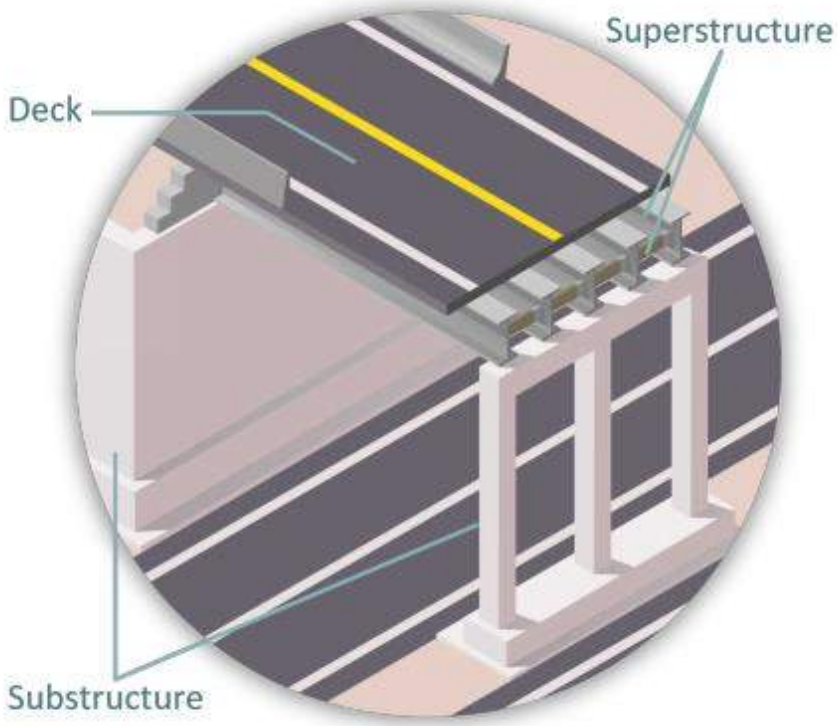
Congestion *is defined as the travel time or delay in excess of that which normally occurs under light or free-flow travel conditions.*

Deficiency *refers to a physical condition that falls below industry standards.*

Future *refers to the "No-Build" scenario which includes previously programmed projects/improvements.*

Structural Conditions

Commonly Used Terms



State

Of

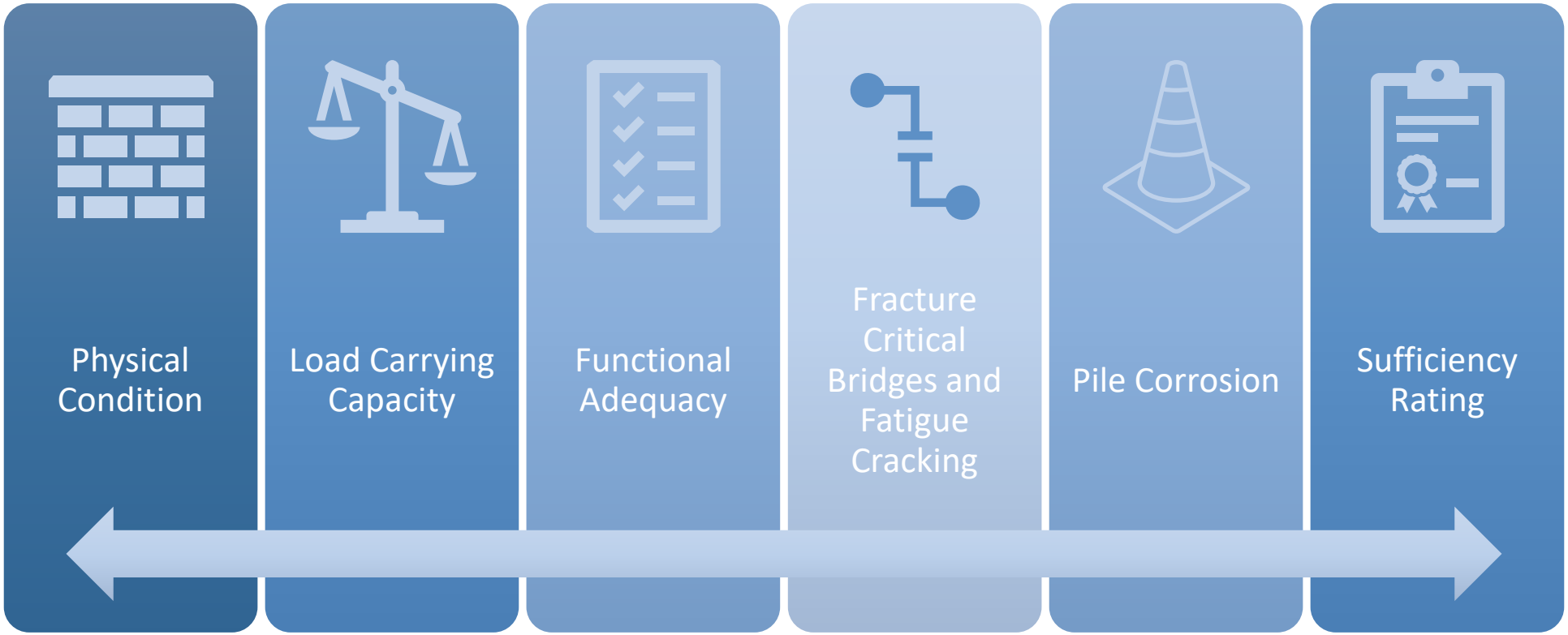
Good

Repair

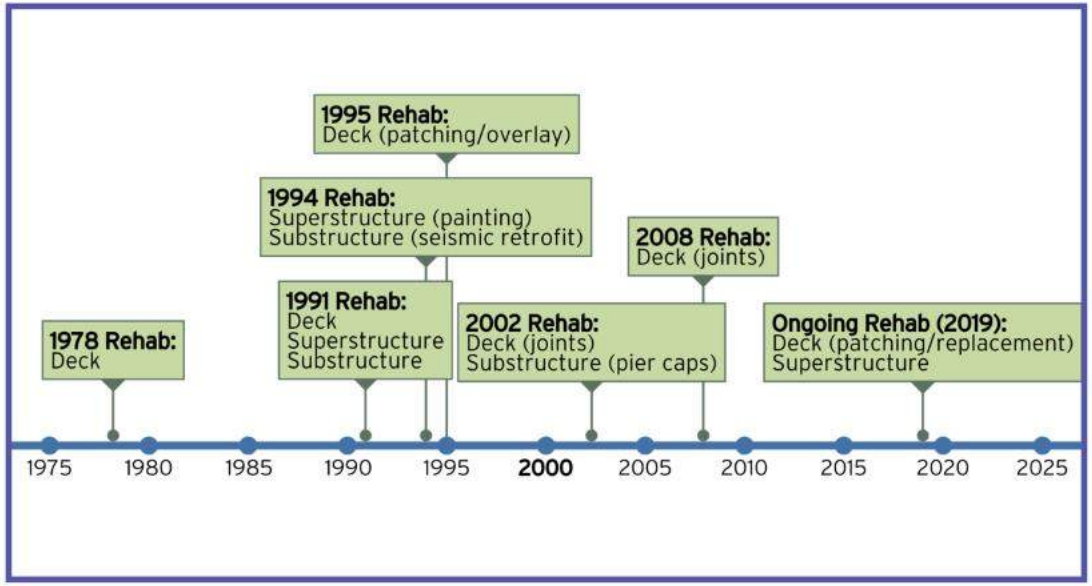
Bridge Condition: NBI Ratings and State of Good Repair		
9	Excellent	SOGR
8	Very Good	
7	Good	
6	Satisfactory	
5	Fair	
4	Poor	
3	Serious	
2	Critical	
1	Imminent Failure	
0	Failed	

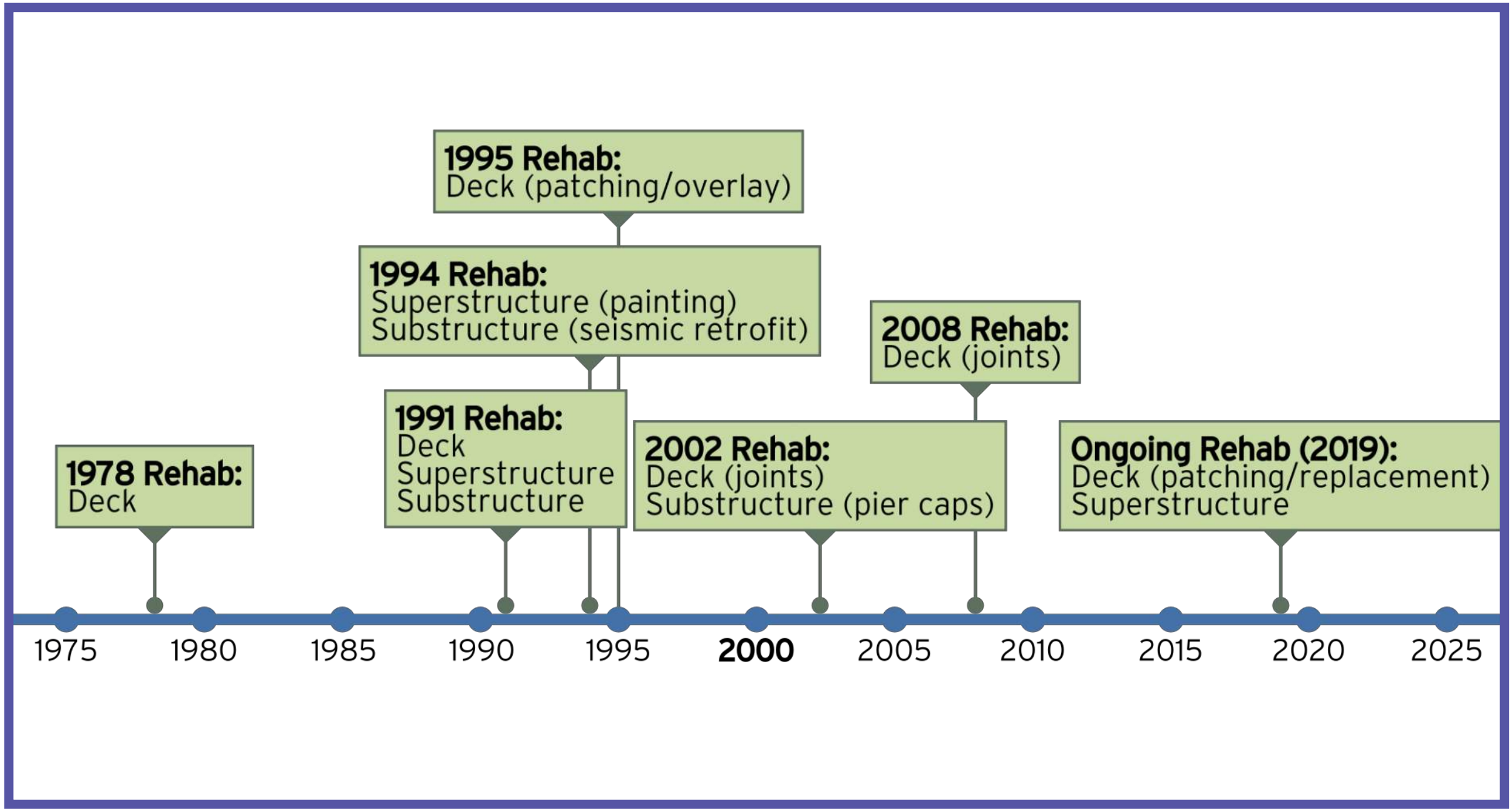
Structural redundancy *means that the bridge's structural system can carry loads after localized damage or the failure of one or more of its members.*

Structural Conditions & Methodology



Structural Conditions




1995 Rehab:
Deck (patching/overlay)
1994 Rehab:
Superstructure (painting)
Substructure (seismic retrofit)
2008 Rehab:
Deck (joints)
1991 Rehab:
Deck
Superstructure
Substructure
2002 Rehab:
Deck (joints)
Substructure (pier caps)
Ongoing Rehab (2019):
Deck (patching/replacement)
Superstructure
1978 Rehab:
Deck
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

Structural Conditions

62 studied bridges
Over 1,000,000 square feet of deck

Pre-2019 Rehab Statistics
Measured by deck area

60% were structurally deficient

Over 40% were functionally obsolete

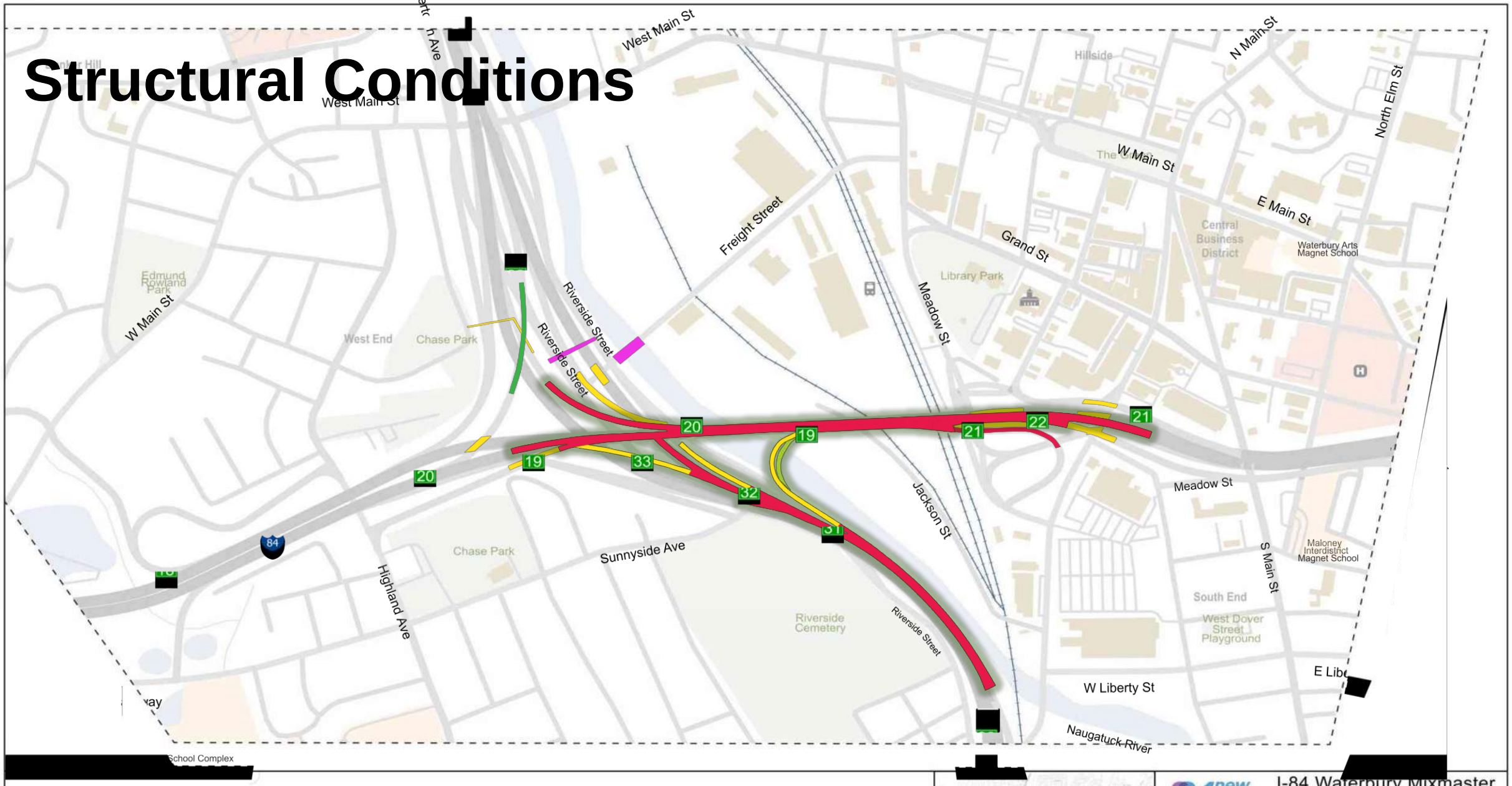
19% are fracture critical

Classifying a bridge as structurally deficient does not mean the bridge is unsafe, but that deficiencies require maintenance, rehabilitation, or replacement

Functionally obsolete bridges have inadequate lane widths, shoulder widths, vertical clearances, etc.

Fracture Critical Bridges have critical structural members that require hands-on inspections

Structural Conditions



Overall Condition Rating*

- Condition Rating Is 7 Or Above (Good)
- Condition Rating Is 5 Or 6 (Fair)
- Condition Rating Is 4 Or Below (Poor)

0 275 550 1,100 Feet

84new mix

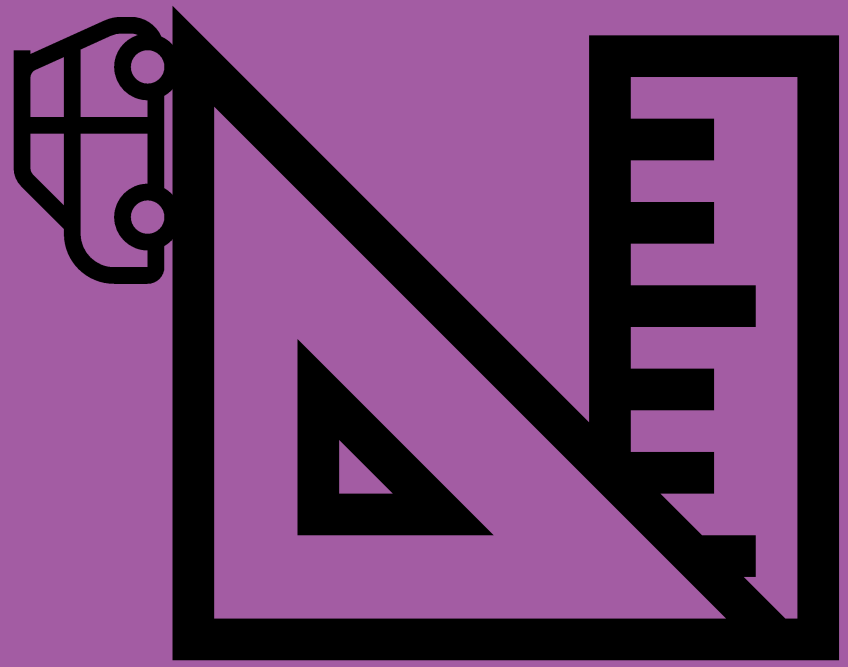
I-84 Waterbury Mixmaster Reconstruction Project

HNTB

Existing Physical Conditions Map (Overall Bridge) | Core Interchange Bridges

Date: | Figure No.

Geometric Analysis



Geometric Conditions Methodology and Criteria

Design Speed

Travel Lane and Shoulder Widths

Horizontal Alignment

Vertical Curvature

Stopping Sight Distance

Cross Slopes

Super Elevation

Vertical Clearances

Intersection Sight Distances

CTDOT's Highway Design Manual and AASHTO's policies were used to evaluate geometric deficiencies

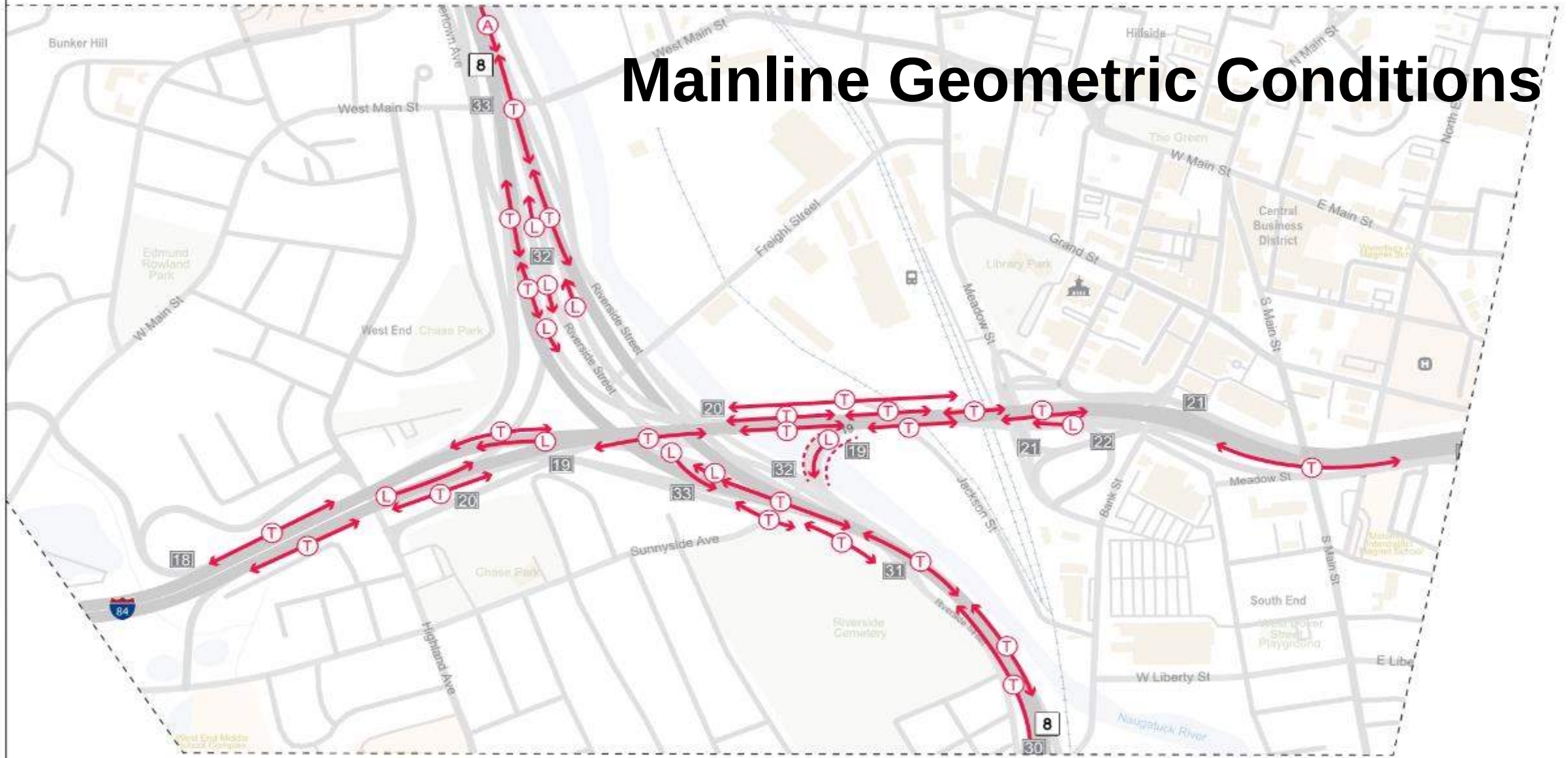
ded Impacting Interstate 84

cy Identified Impacting Route 8

Deficiency Identified Impacting System Ramp

EXIT Deficiency Identified Impacting Service Ramp

Mainline Geometric Conditions

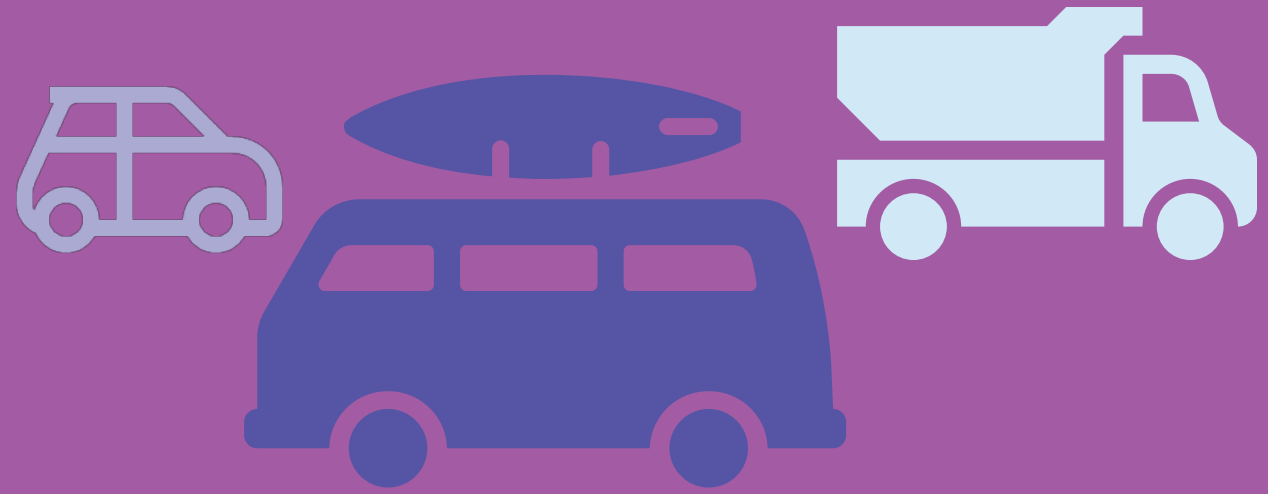


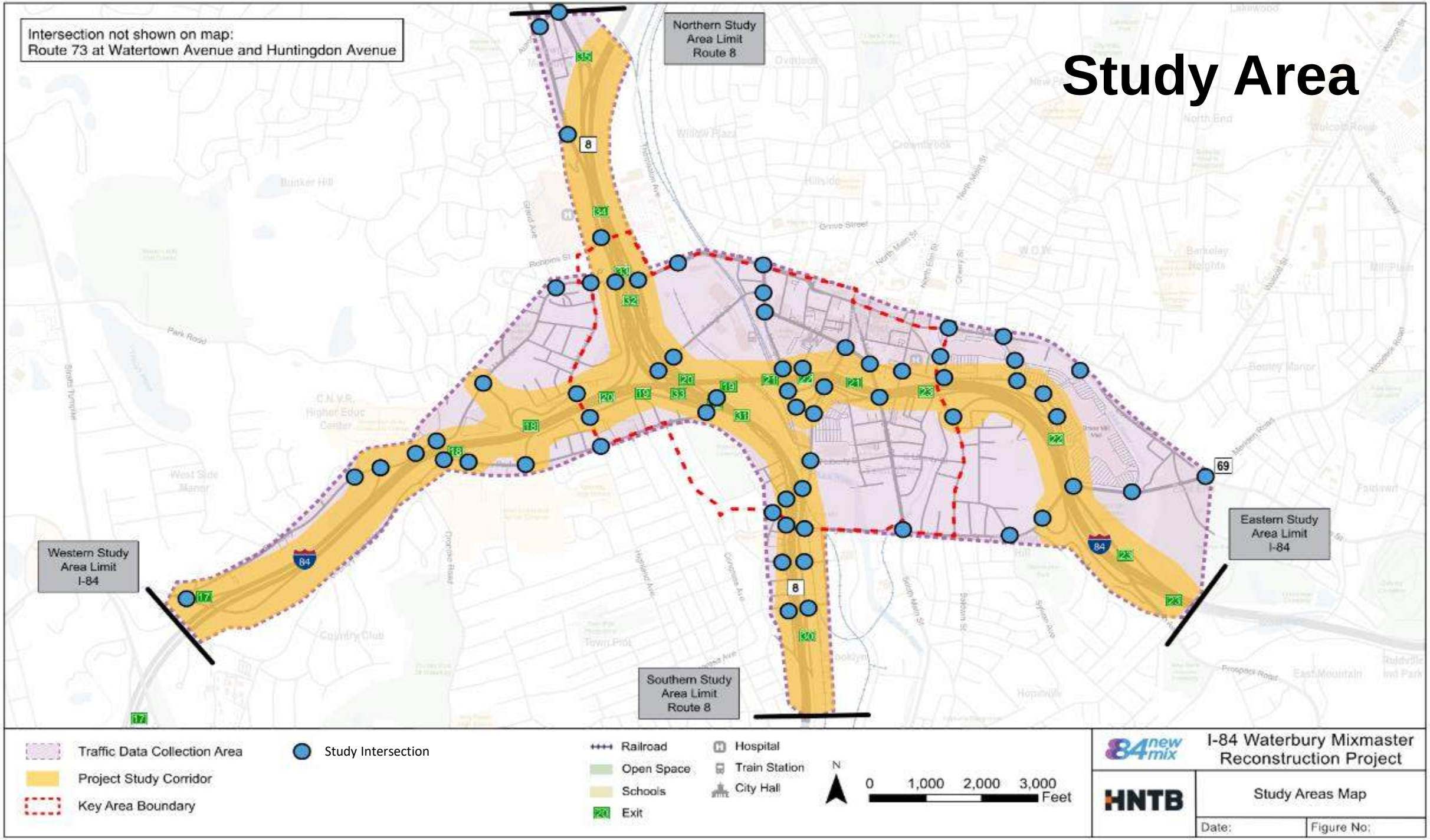
Left Hand Ramp
Deficient Terminal Spacing
Low Ramp Speed
Deficient Deceleration Lane
Deficient Acceleration Lane
Railroad
Open Space
Schools
20 Exit
Train Station
City Hall
N
0 275 550 1,100 Feet

84new mix
I-84 Waterbury Mixmaster Reconstruction Project
HNTB
Ramp Deficiencies Map 2 of 5
Date: 11/22/2019
Figure No: 2-47

Traffic Analysis

(operational conditions)





Study Area

I-84 Waterbury Mixmaster Reconstruction Project

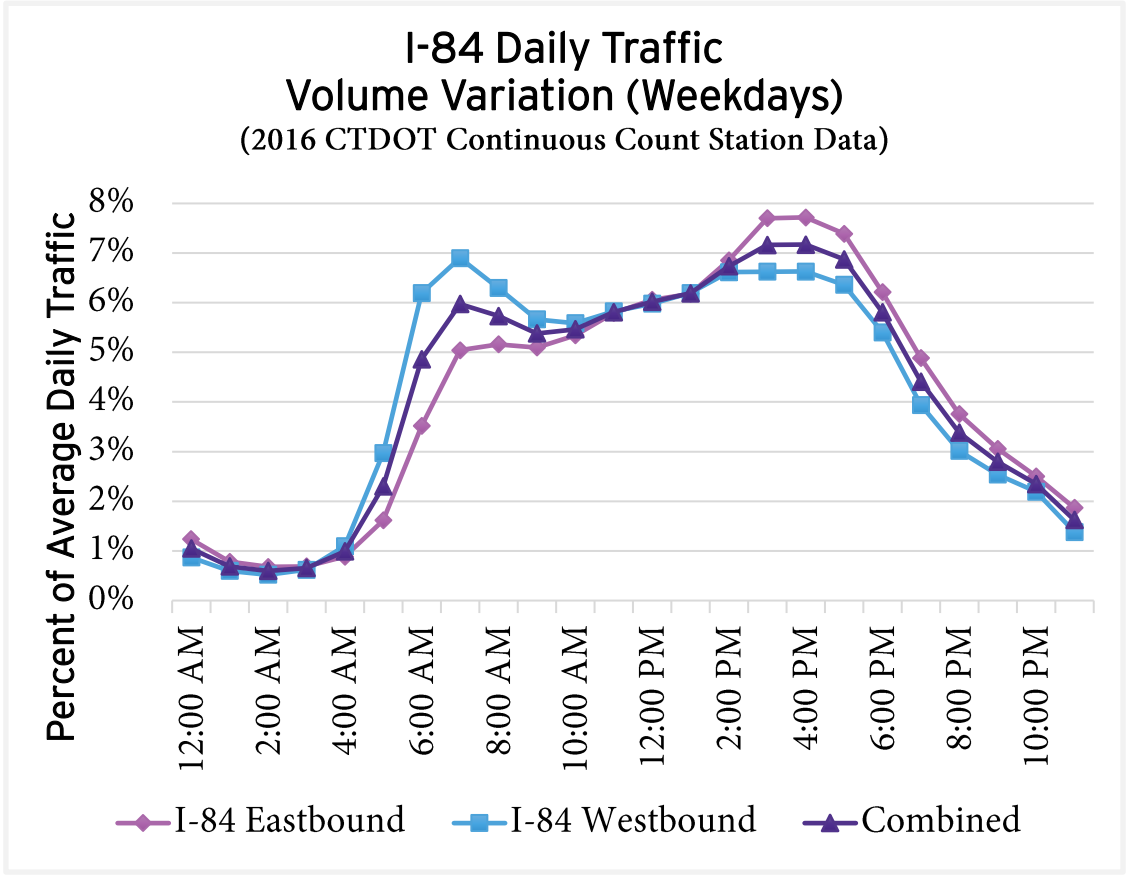
HNTB

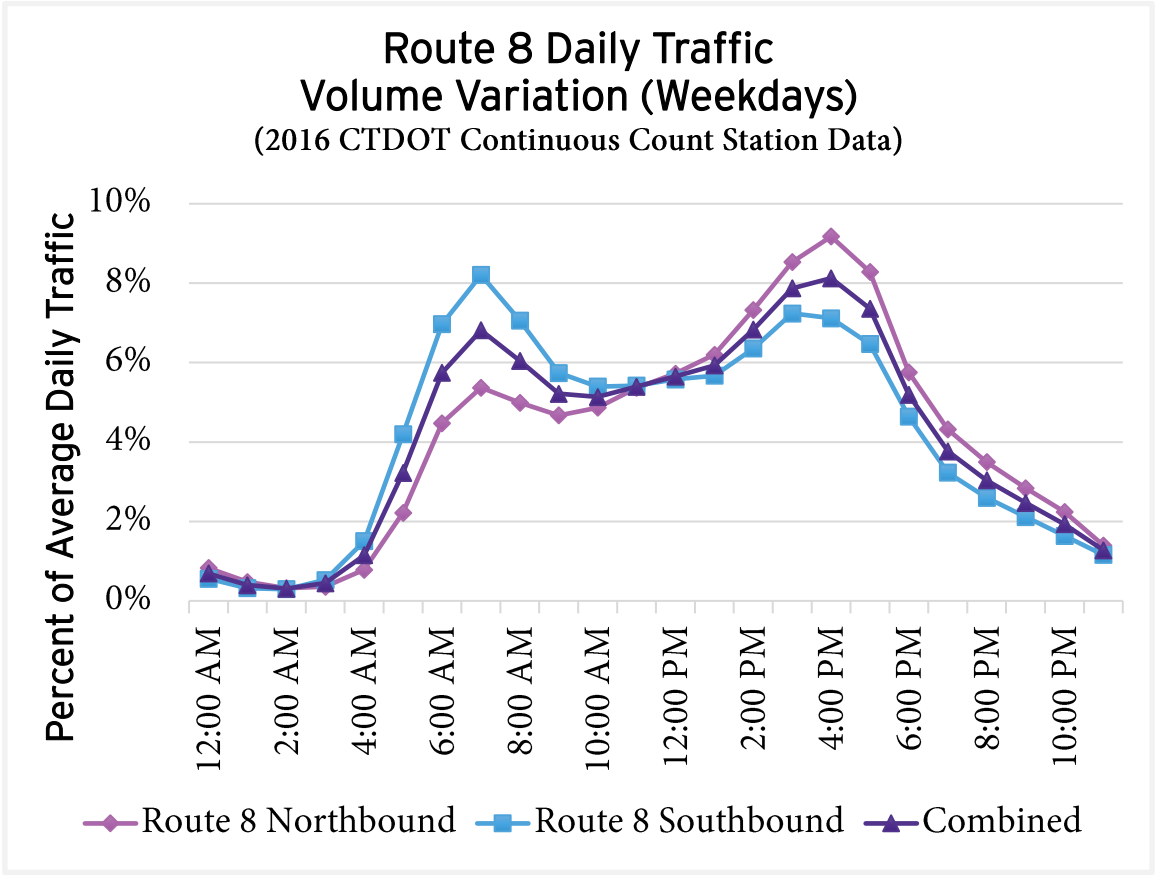
Study Areas Map

Date:

Figure No:

Interchange Traffic Volumes

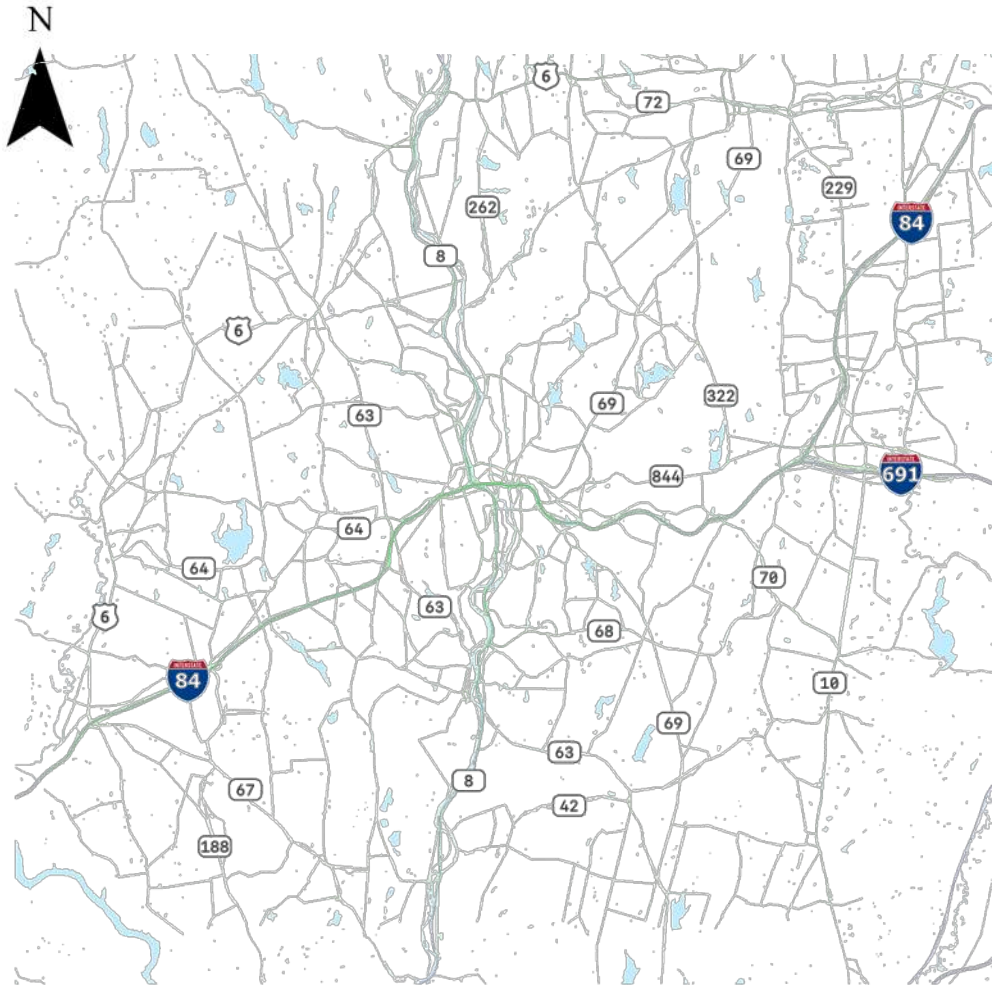




84new mix

CONNECTICUT DEPARTMENT OF TRANSPORTATION

Traffic Modeling and Future Forecasting

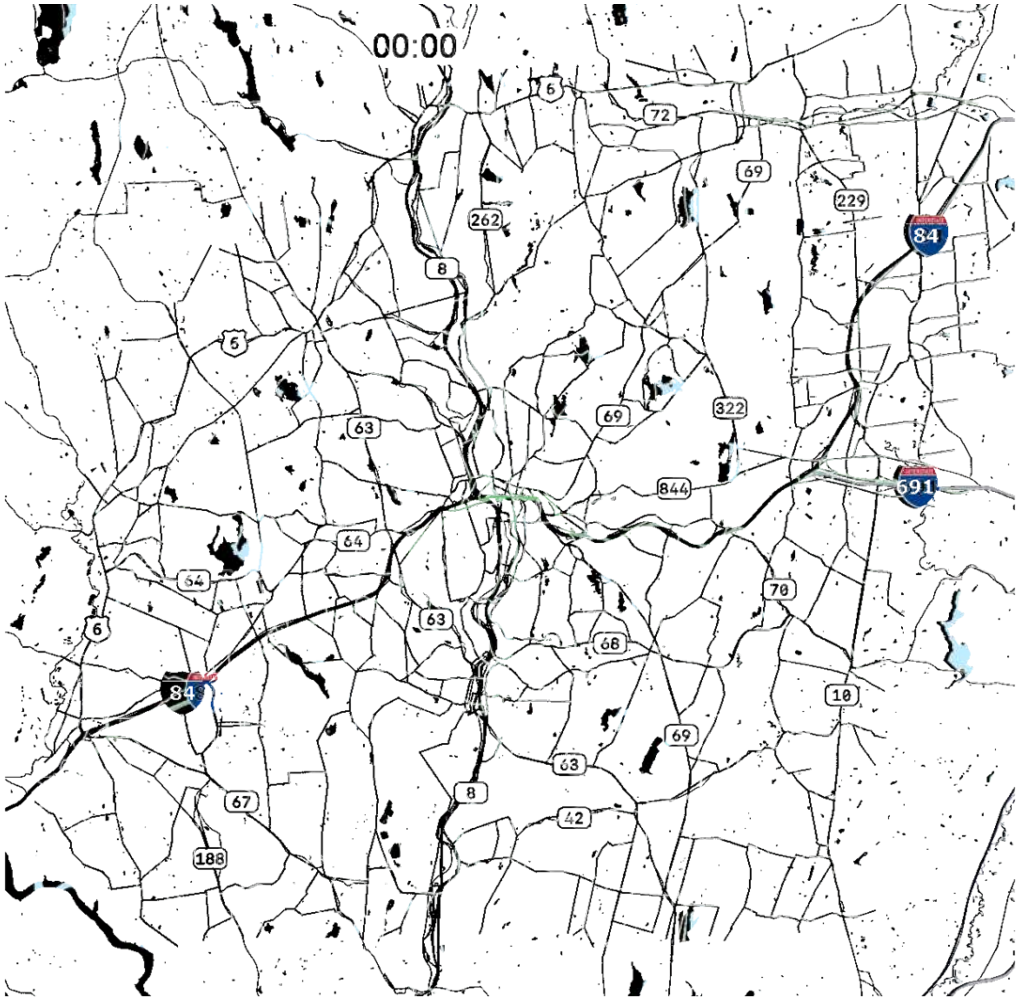


TRAVEL DEMAND MODEL

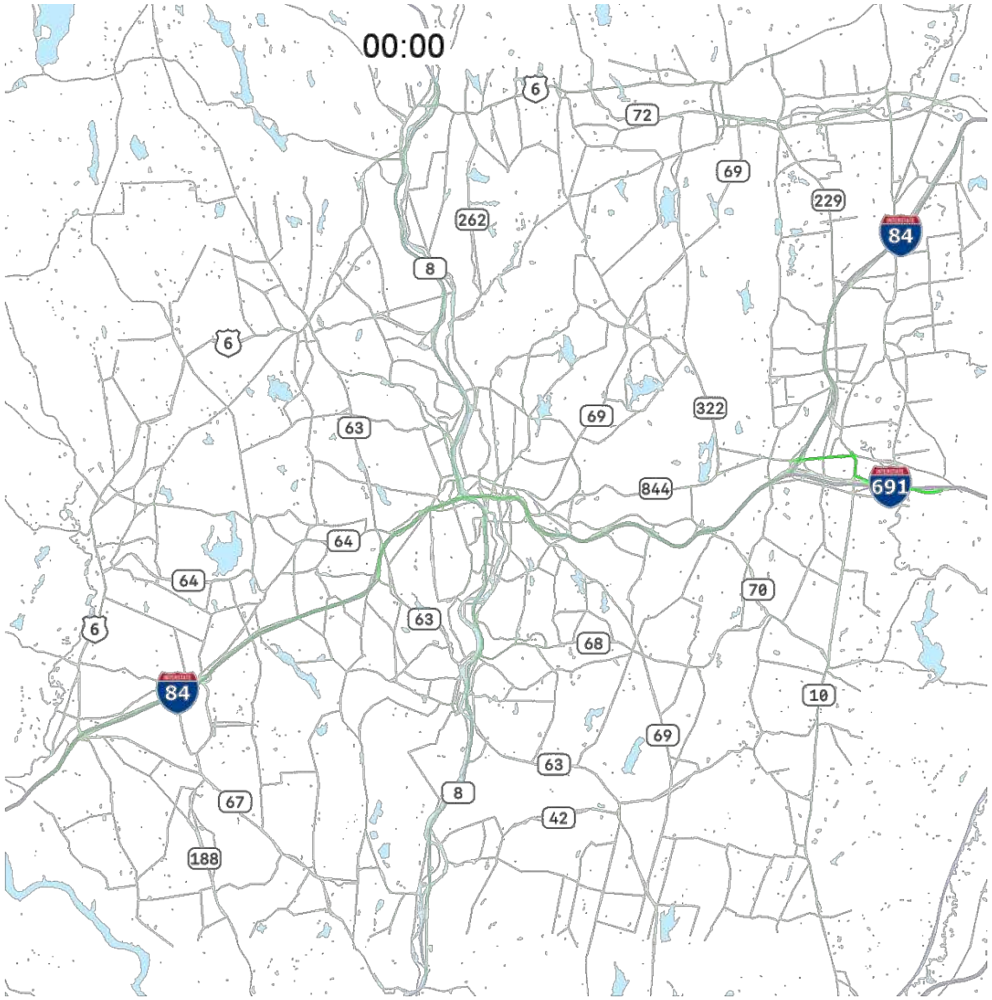
TRAFFIC SIMULATION MODEL

Traffic Modeling Congestion Levels

2017

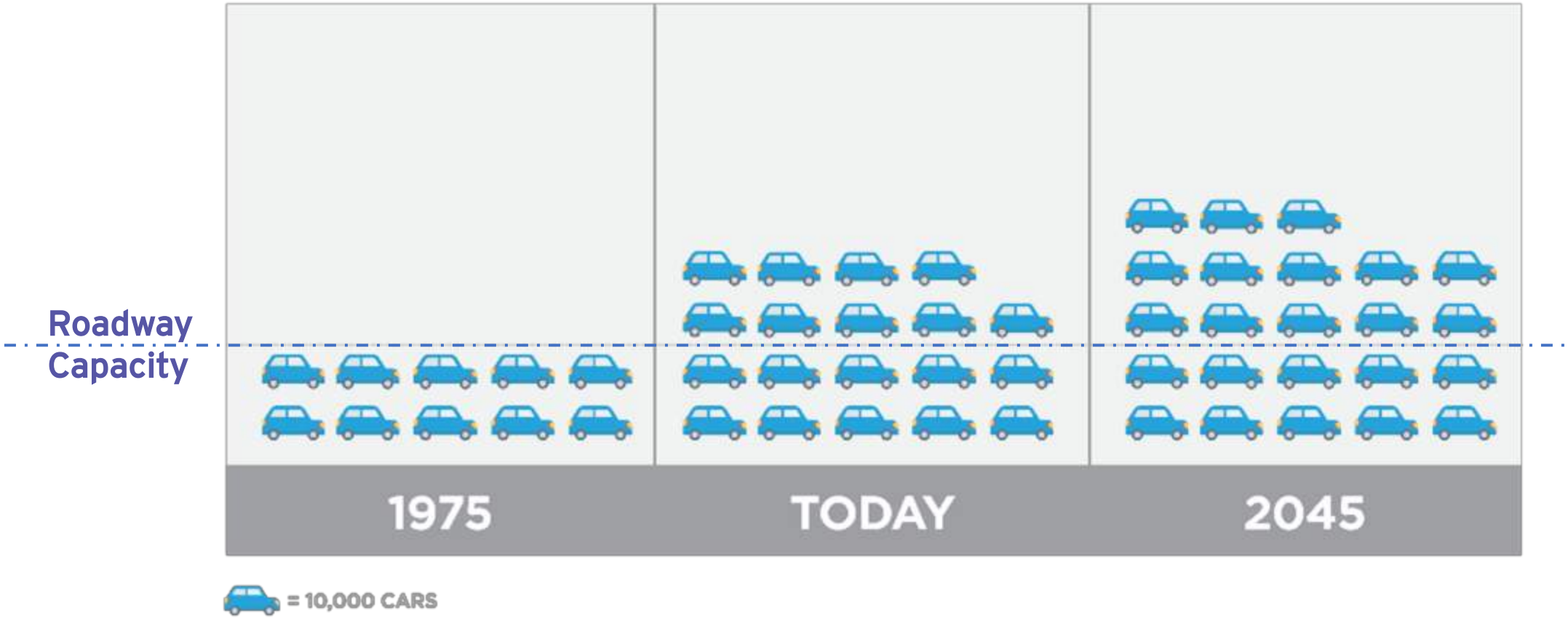


2045



N

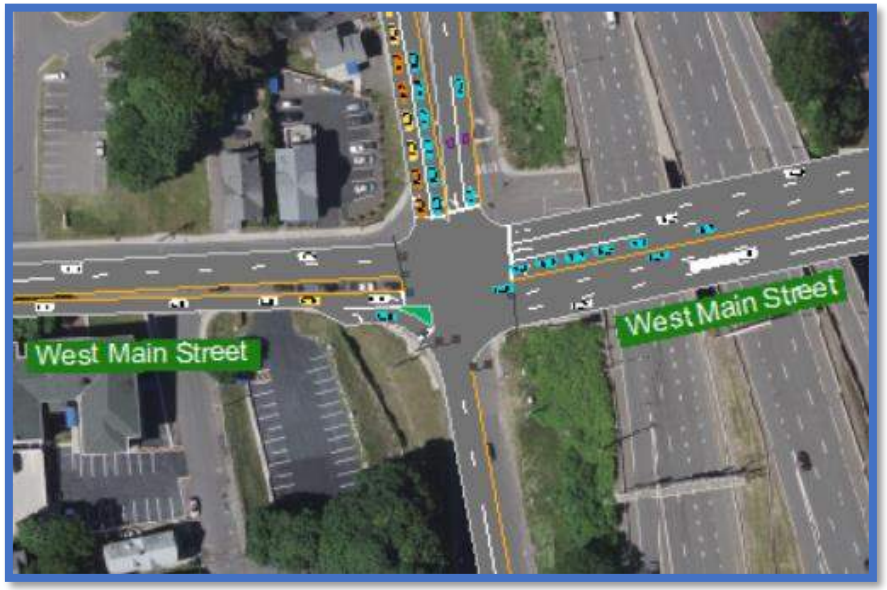
Mixmaster Traffic Volumes



Traffic Operational Analysis

TRAFFIC SIMULATION MODEL

TRAFFIC ANALYSIS TOOLS



Future Traffic Conditions Traffic Simulation Model Animation

This animation uses VISSIM software to simulate vehicular traffic flow

Traffic Conditions: Level of Service (LOS)

A	**Free Flow Traffic** No Delays
B	**Light/Moderate Traffic** No Delays
C	**Steady Traffic** Minimal Delays
D	**Speeds Begin to Decline** Minimal Delays
E	**Traffic at Capacity** Significant Delays
F	**Heaviest Congestion** Forced Flow

84new mix

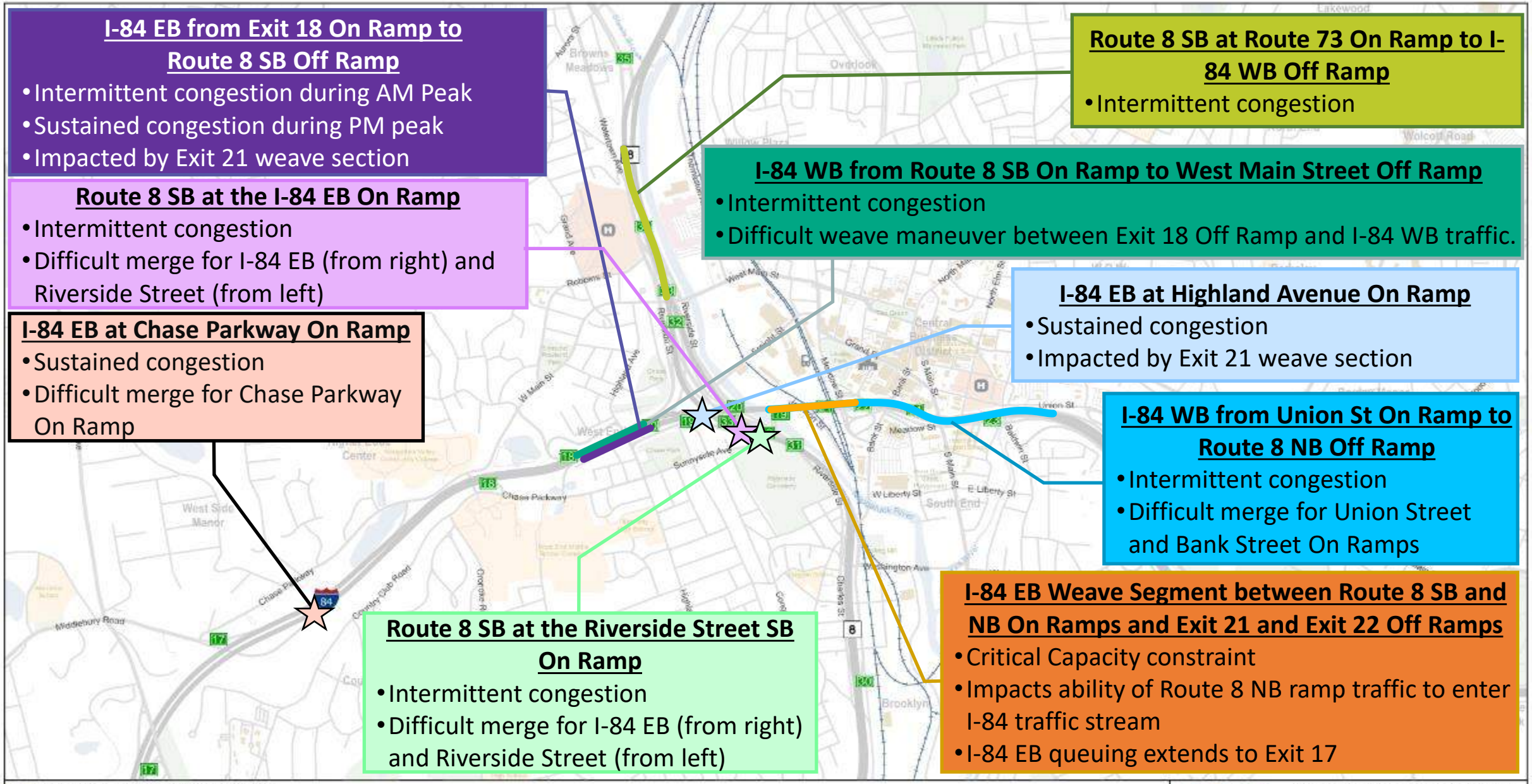
CONNECTICUT DEPARTMENT OF TRANSPORTATION

Intersection Traffic Operations

65 Intersections Analyzed

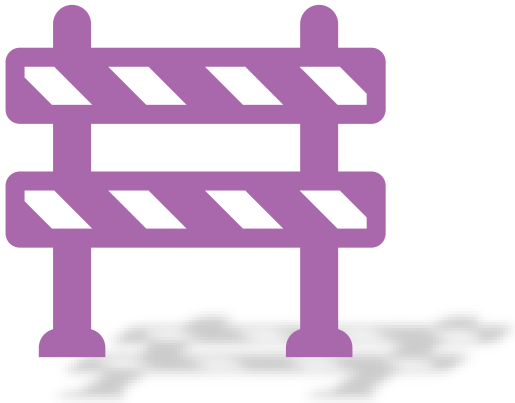
2017 Conditions
8 Operationally Deficient Locations

2045 Conditions
17 Operationally Deficient Locations


I-84 EB from Exit 18 On Ramp to Route 8 SB Off Ramp
•Intermittent congestion during AM Peak
•Sustained congestion during PM peak
•Impacted by Exit 21 weave section
Route 8 SB at Route 73 On Ramp to I-84 WB Off Ramp
•Intermittent congestion
I-84 WB from Route 8 SB On Ramp to West Main Street Off Ramp
•Intermittent congestion
•Difficult weave maneuver between Exit 18 Off Ramp and I-84 WB traffic.
Route 8 SB at the I-84 EB On Ramp
•Intermittent congestion
•Difficult merge for I-84 EB (from right) and Riverside Street (from left)
I-84 EB at Highland Avenue On Ramp
•Sustained congestion
•Impacted by Exit 21 weave section
I-84 EB at Chase Parkway On Ramp
•Sustained congestion
•Difficult merge for Chase Parkway On Ramp
I-84 WB from Union St On Ramp to Route 8 NB Off Ramp
•Intermittent congestion
•Difficult merge for Union Street and Bank Street On Ramps
I-84 EB Weave Segment between Route 8 SB and NB On Ramps and Exit 21 and Exit 22 Off Ramps
•Critical Capacity constraint
•Impacts ability of Route 8 NB ramp traffic to enter I-84 traffic stream
•I-84 EB queuing extends to Exit 17
Route 8 SB at the Riverside Street SB On Ramp
•Intermittent congestion
•Difficult merge for I-84 EB (from right) and Riverside Street (from left)
I-84 EB from Chase Parkway/Country Club Rd to Rte 8 SB off Ramp On Ramp
I-84 EB from Rte 8 SB and NB On Ramps and Meadows St and Main St Off Ramps
I-84 WB from Rte 8 SB On Ramps to West Main St Off Ramp
I-84 WB from Union St On Ramp to Rte 8 NB Off Ramp
Rte 8 SB at Rte 73 On Ramp to I-84 WB Off Ramp
I-84 EB at Chase Parkway On Ramp
I-84 EB at Highland Ave On Ramp
Rte 8 SB at I-84 EB On Ramp
Rte 8 SB at Riverside St SB On Ramp
Railroad
Open Space
Schools
Exit
Hospital
Train Station
City Hall
N
0 1,000 2,000 3,000 Feet
I-84 Waterbury Mixmaster Reconstruction Project
HNTB
Model Performance and Observations
Date: 11/22/2019
Figure No:

Safety Conditions

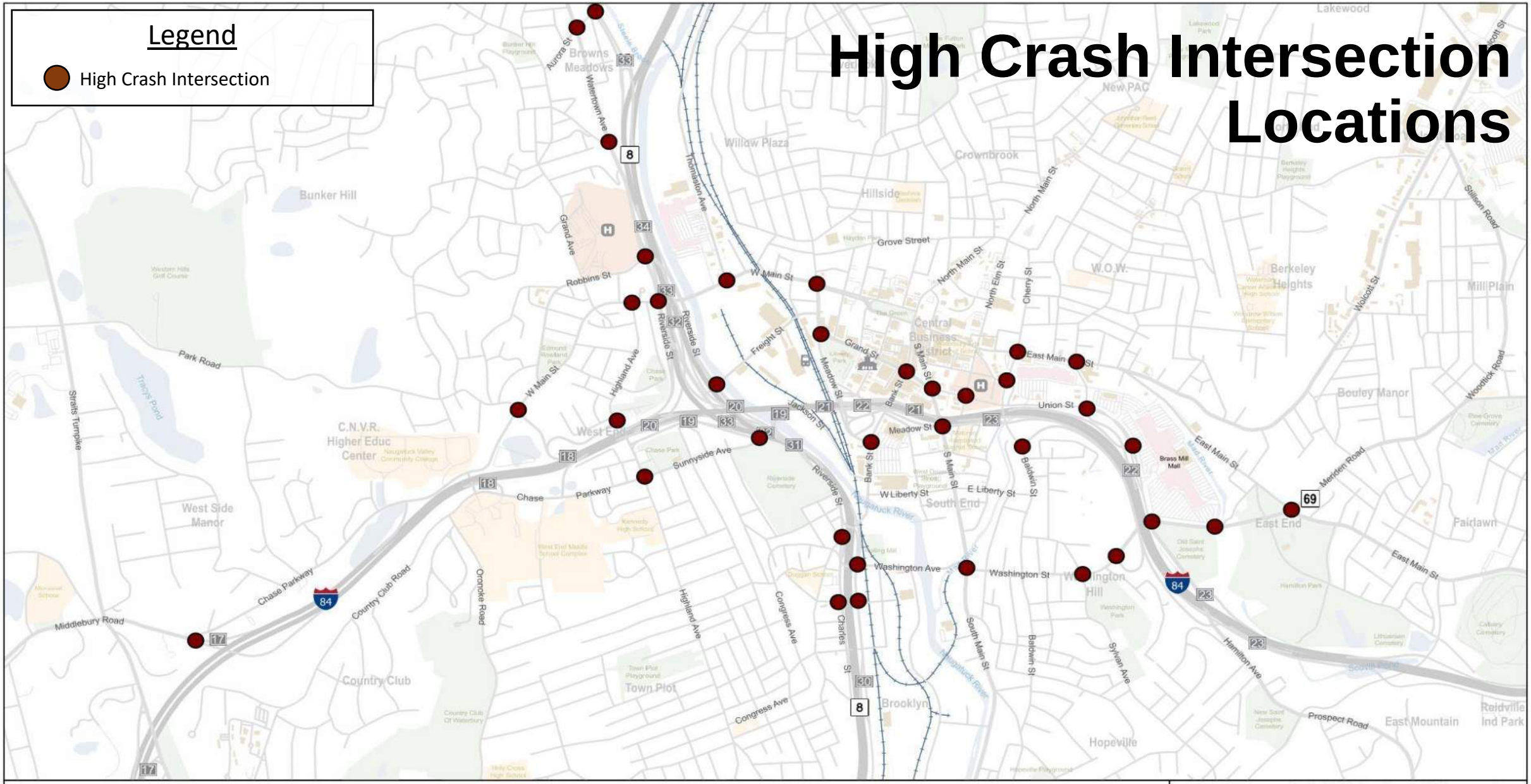
Safety Conditions Methodology



Crash data for the I-84 and Route 8 interchange system and for 65 local road intersections within the study area was obtained for a three-year period:

January 1, 2015 to December 31, 2017

High Crash Intersection Locations



LEGEND

High Crash Corridor Intersection

2015-2017 Study Period
High Crash Intersection Criteria

Crashes Observed > 15
Actual Crash Rate > Critical Crash Rate

Hospital
Train Station
City Hall
Exit

N

0 1,000 2,000 3,000 Feet

84new mix

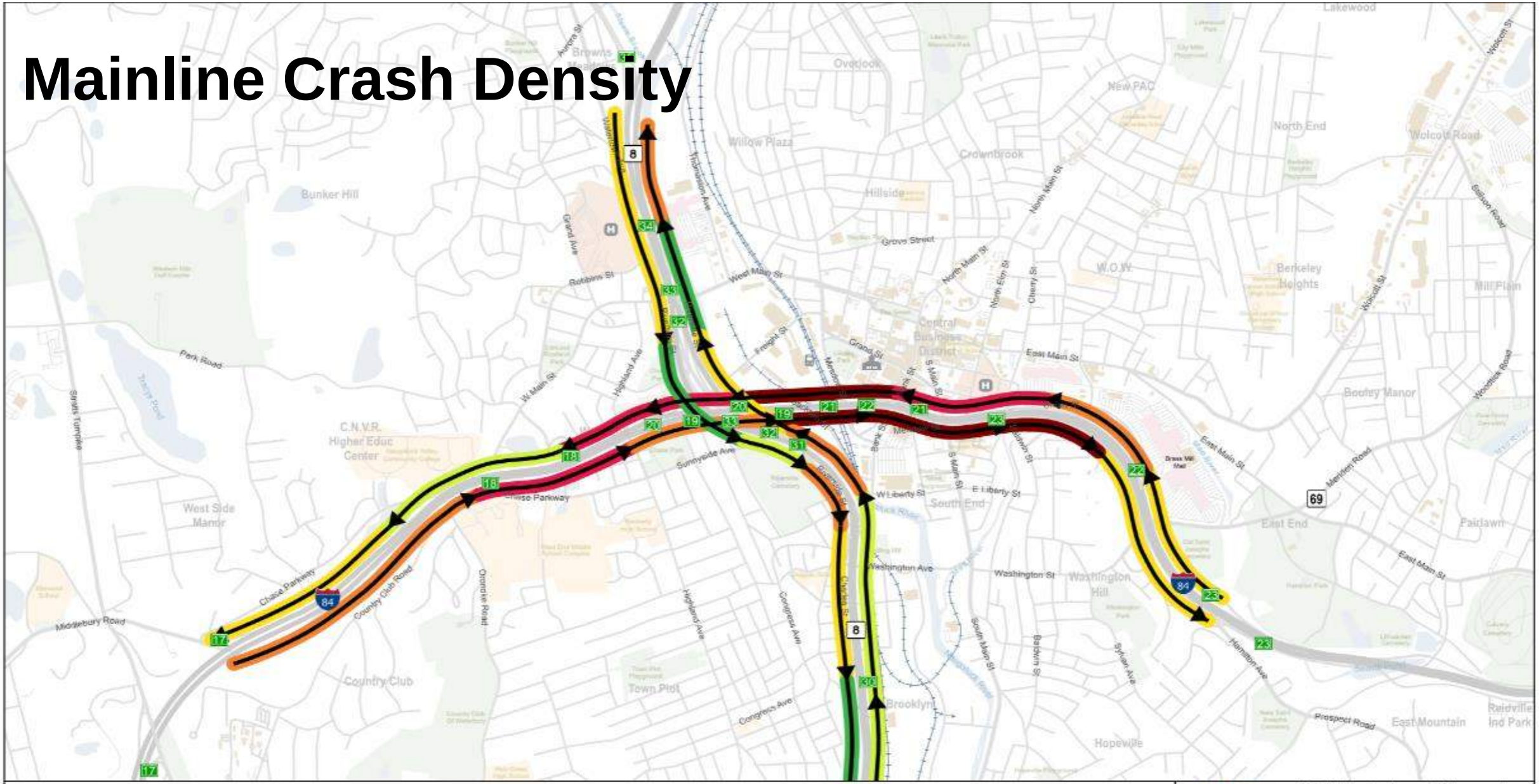
I-84 Waterbury Mixmaster Reconstruction Project

HNTB

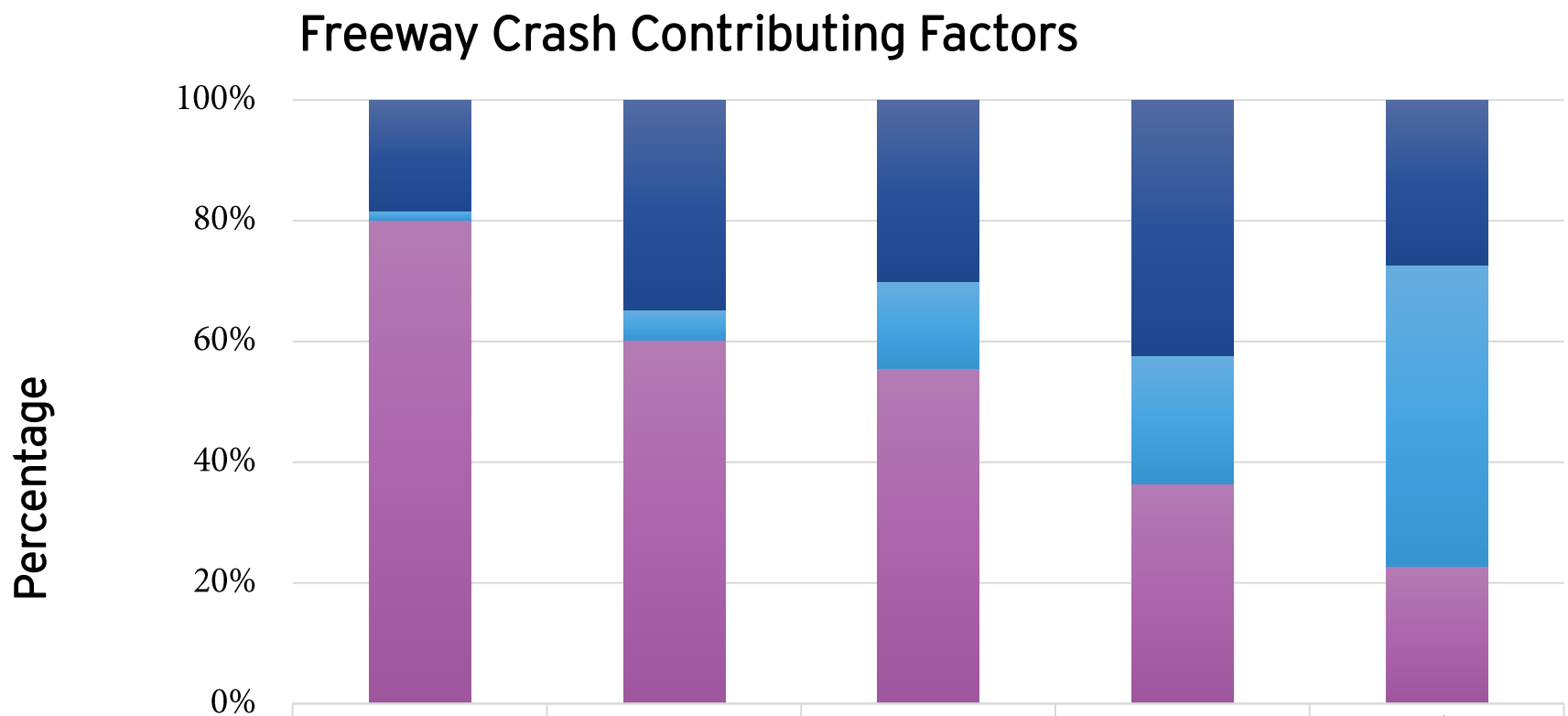
Existing (2017) High Crash Intersection Locations

Date: 11/22/2019 | Figure No: 2-56

Mainline Crash Density



Safety Conditions



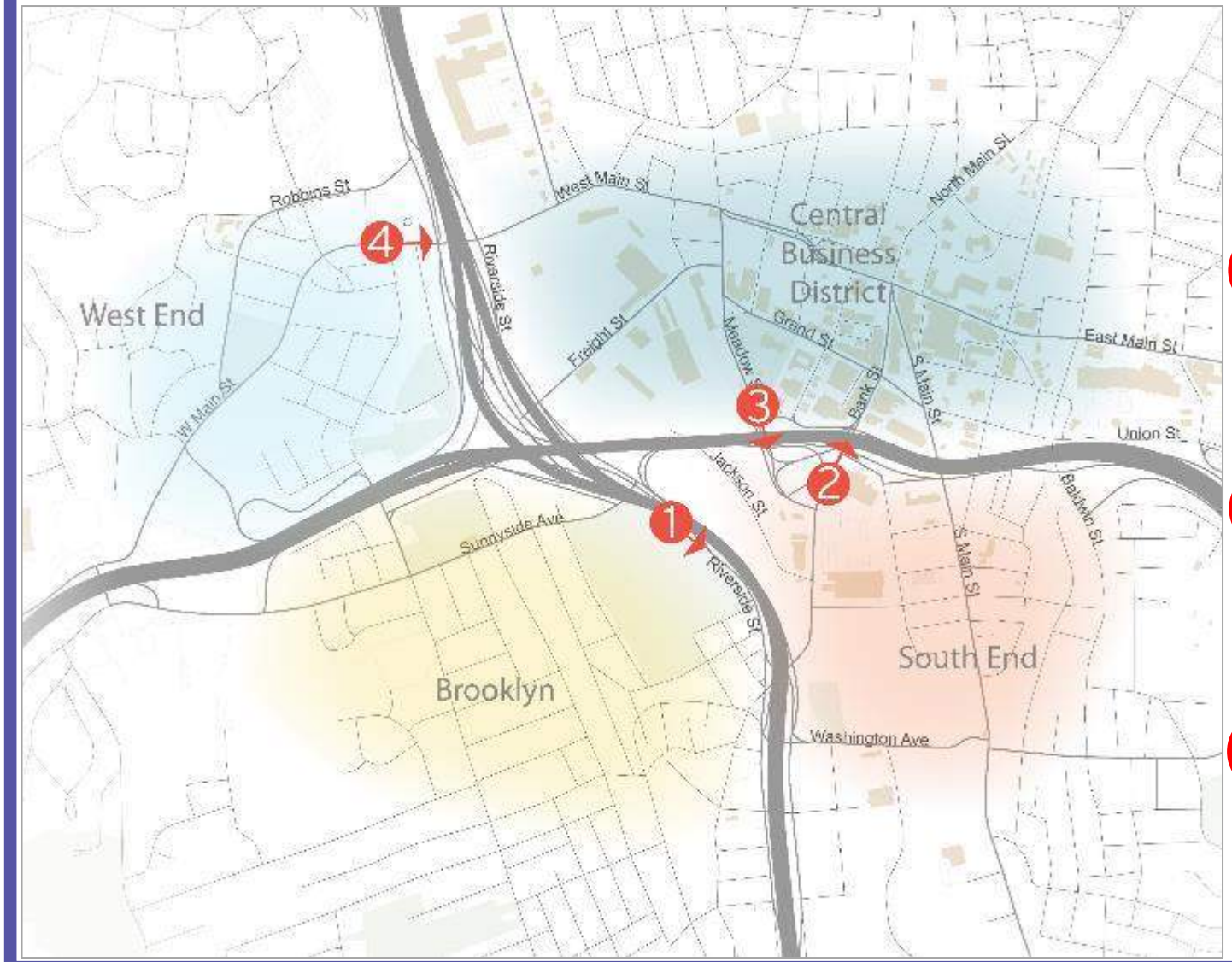
	I-84 EB	I-84 WB	Route 8 NB	Route 8 SB	Interchange Ramps
Driver Behavior/Other	18%	35%	30%	42%	27%
Geometry	2%	5%	14%	21%	50%
Traffic Congestion	80%	60%	56%	36%	23%

How do the structural, geometric, traffic, and safety analyses compare with your lived experience?

Multimodal Conditions

Bicycle,
Pedestrian,
Rail &
Transit

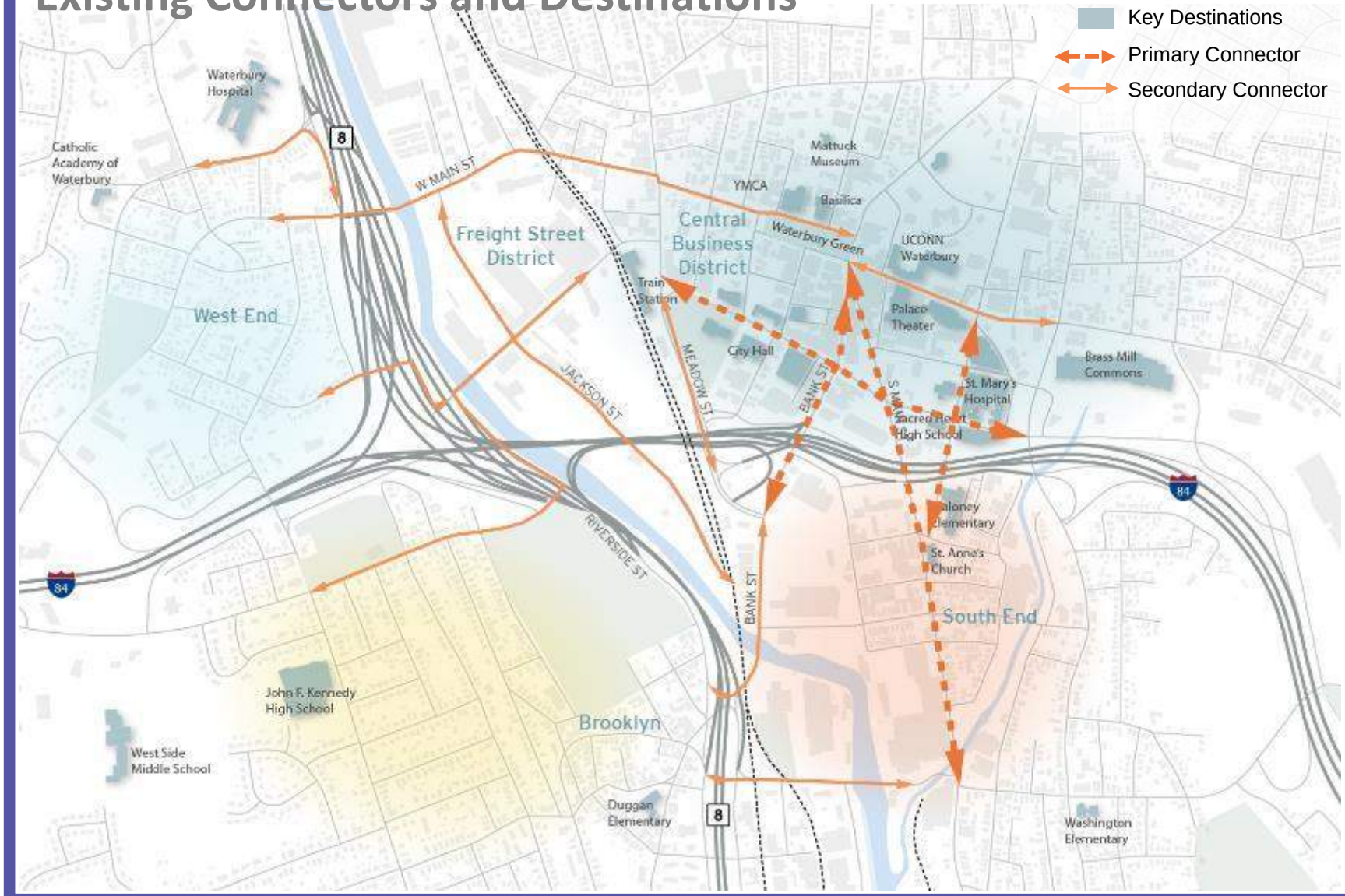
Bicycle and Pedestrian Conditions



- I-84 and Route 8 divide Waterbury into quadrants
- Connections between quadrants discourage pedestrians and bicyclists
  - Not ADA compliant
  - Dark
  - Narrow
  - Lack visual cues

Methodology

Existing Connectors and Destinations



- Identifying existing routes and key destinations allows us to:
  - Understand how people move around the interchange
  - Identify opportunities to enhance existing connections and create new ones where appropriate

Transit & Rail Service Conditions

CT transit

Peter Pan

Greyhound

GWTD

MTA

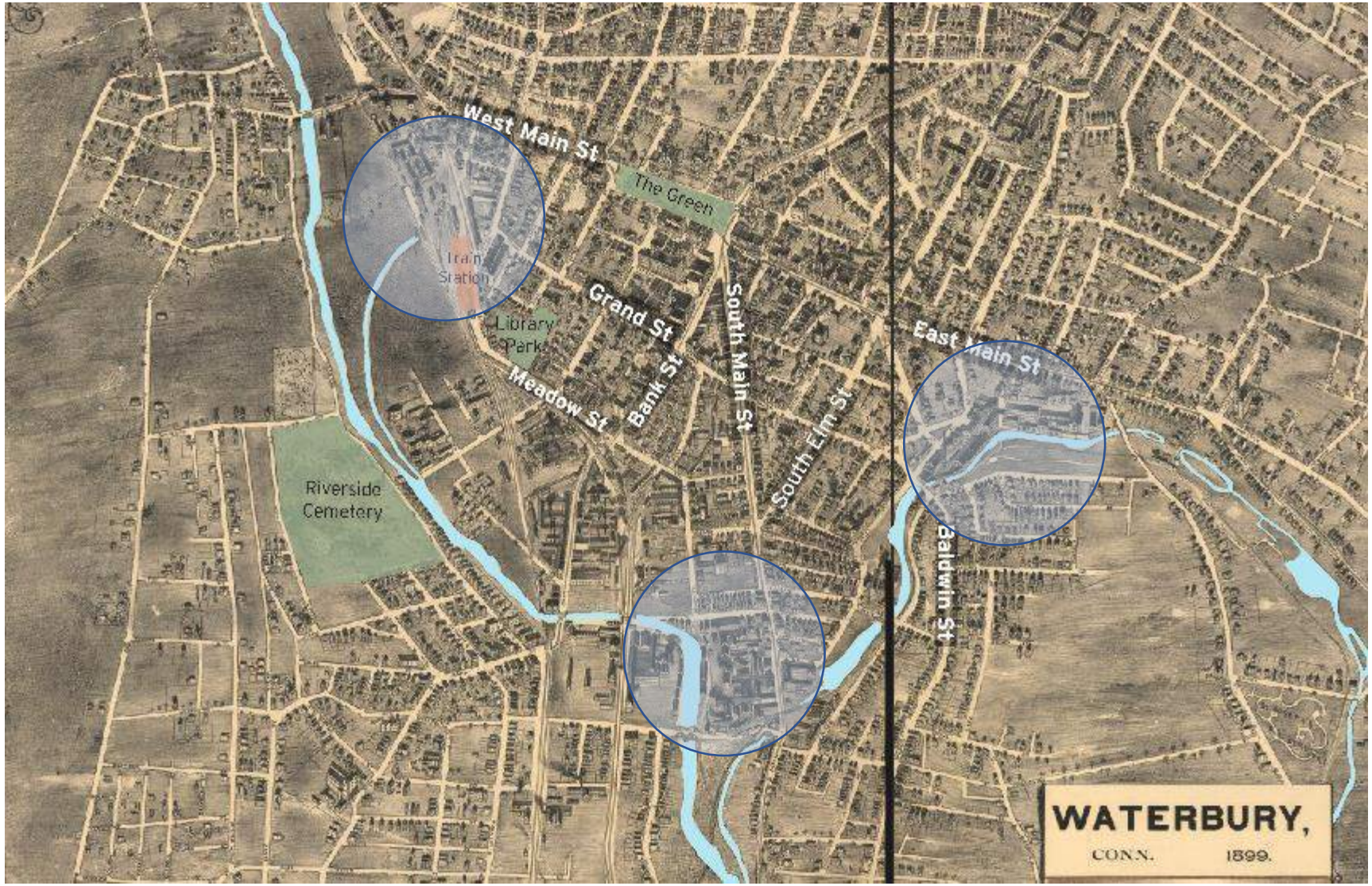
84new mix

CONNECTICUT DEPARTMENT OF TRANSPORTATION

Environmental & Community Overview

Community Context

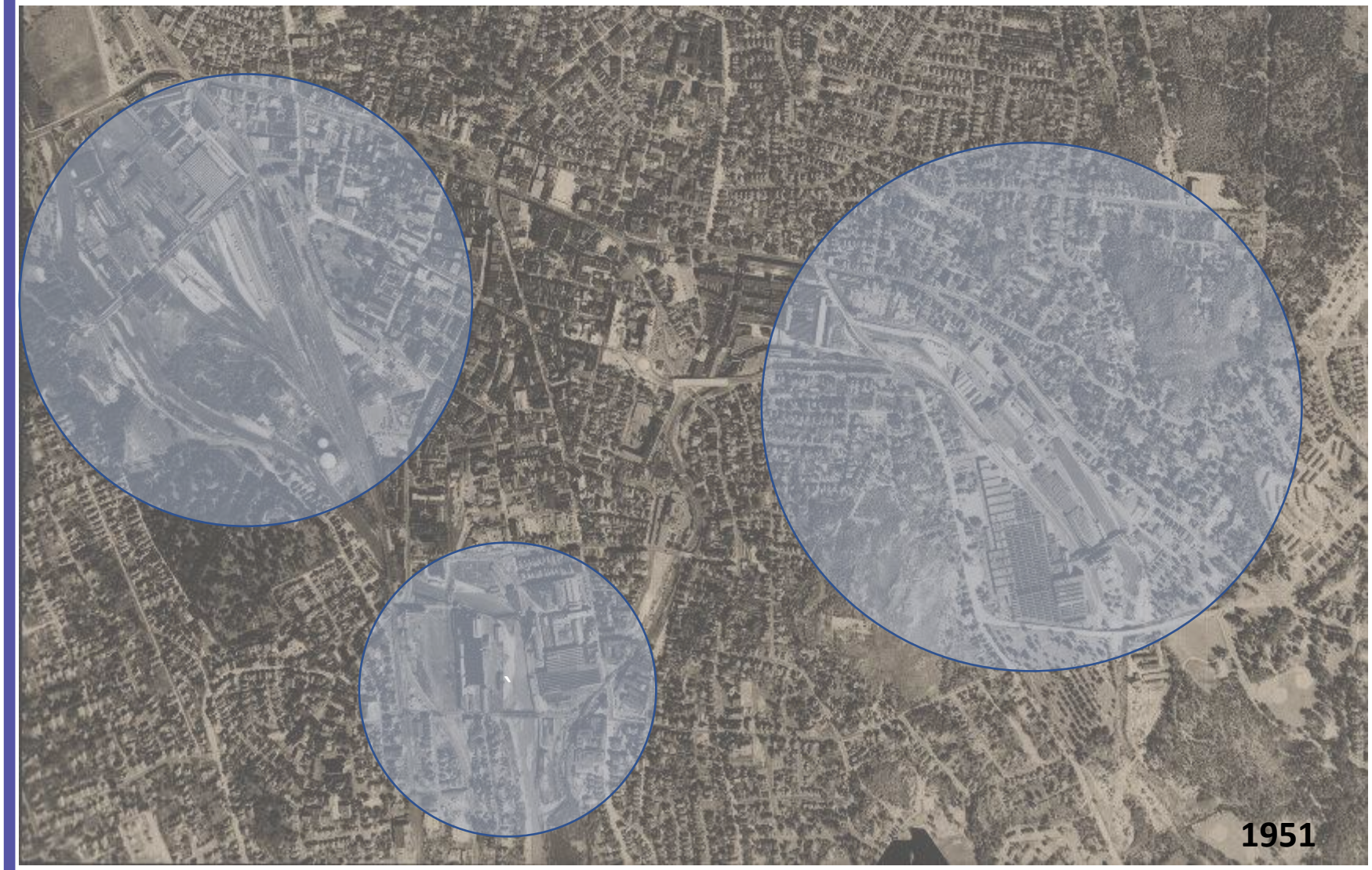
Historic Development Patterns: 1890s



- "One City"
- Development centered around the rivers
- Brass manufacturing
- Small blocks
- Walkable neighborhoods
- Extensive connectivity

Community Context

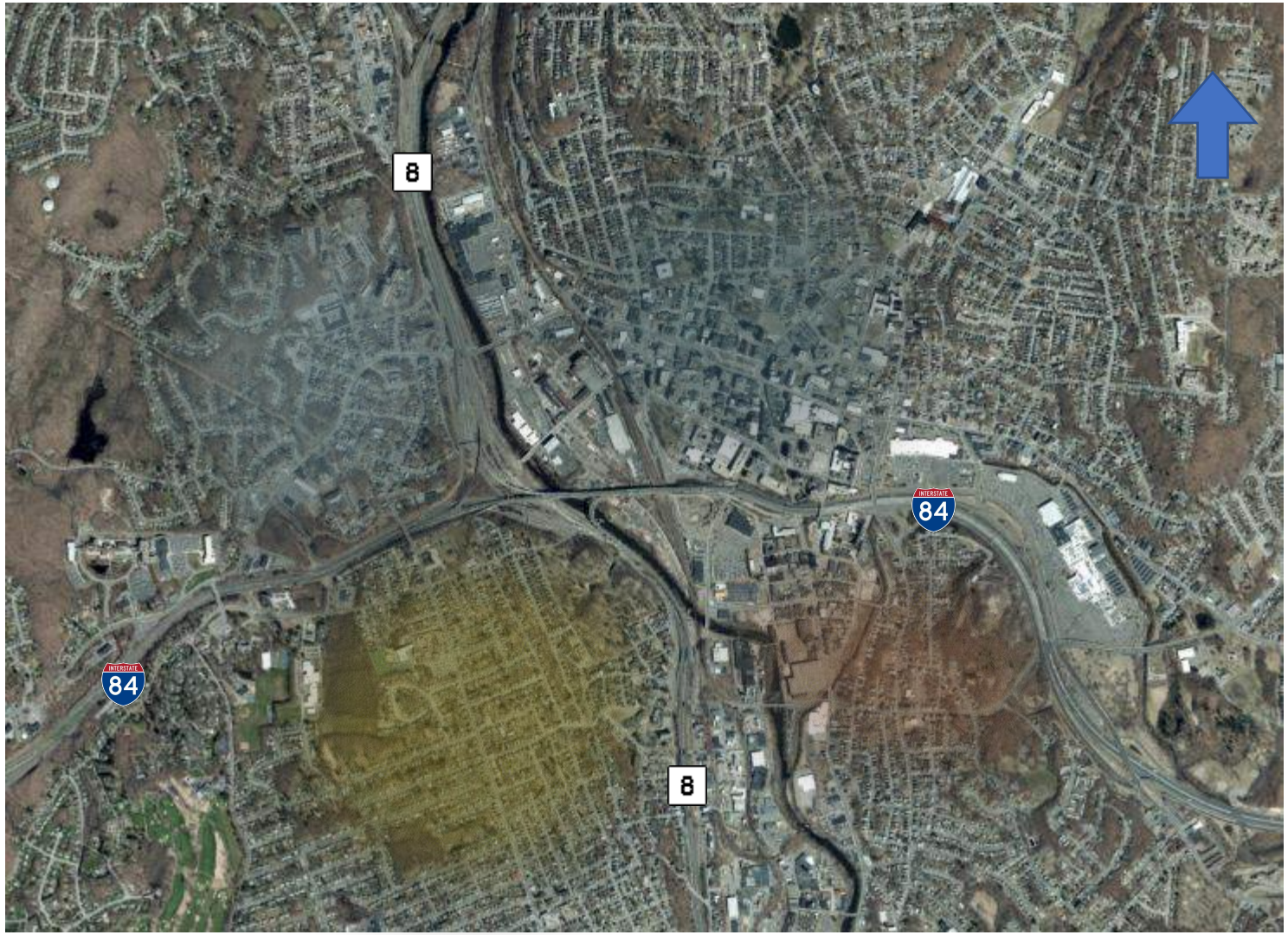
Historic Development Patterns – 1940s-1950s



- Industry peak during WWII
- Rail and freight expansion
- Larger areas of N/S and E/W barriers and segmentation emerge
- Manufacturing declines in 1950s

Community Context

Historic Development Patterns: 1960- Today



The Interchange Today

I-84 and Route 8 divide Waterbury into quadrants

- Highway development = “progress”
  - I-84 and Route 8 construction created permanent and continuous barriers
  - Loss of connectivity
  - Reliance on personal automobiles
  - Recurring congestion

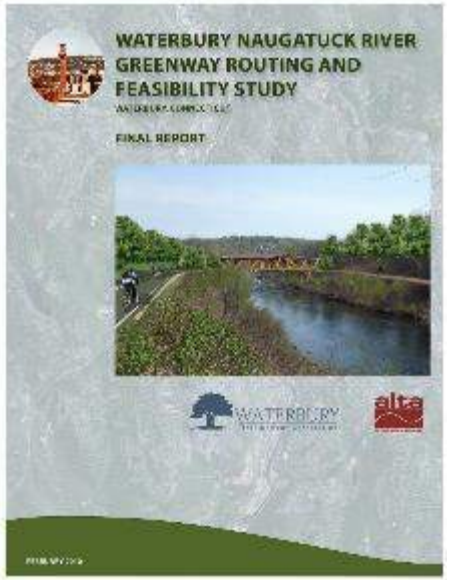
Environmental & Community Conditions Methodology

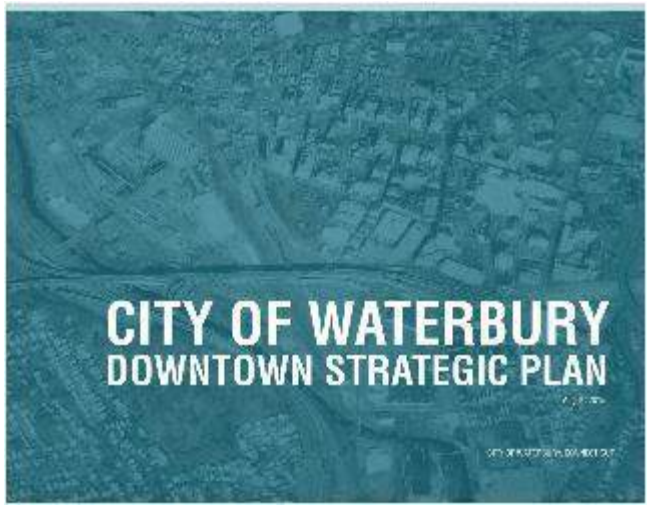
Our work is informed by:

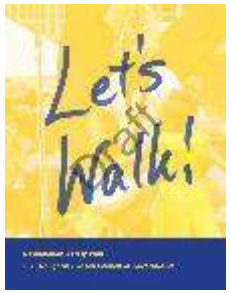
- GIS data-based research using Federal and State database tools
- State and Regional Engineering Evaluations

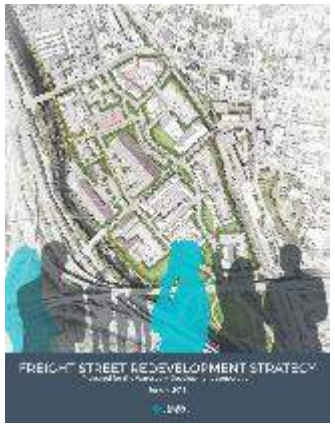
  e.g., I-84/Route 8 Waterbury Interchange Needs Study, etc.,
- State, Regional, and Local Planning Initiatives

  e.g., Regional Naugatuck River Greenway Routing Study, Long Range Regional Transportation Plan 2011-2040, The W.A.T.E.R. Project, etc.



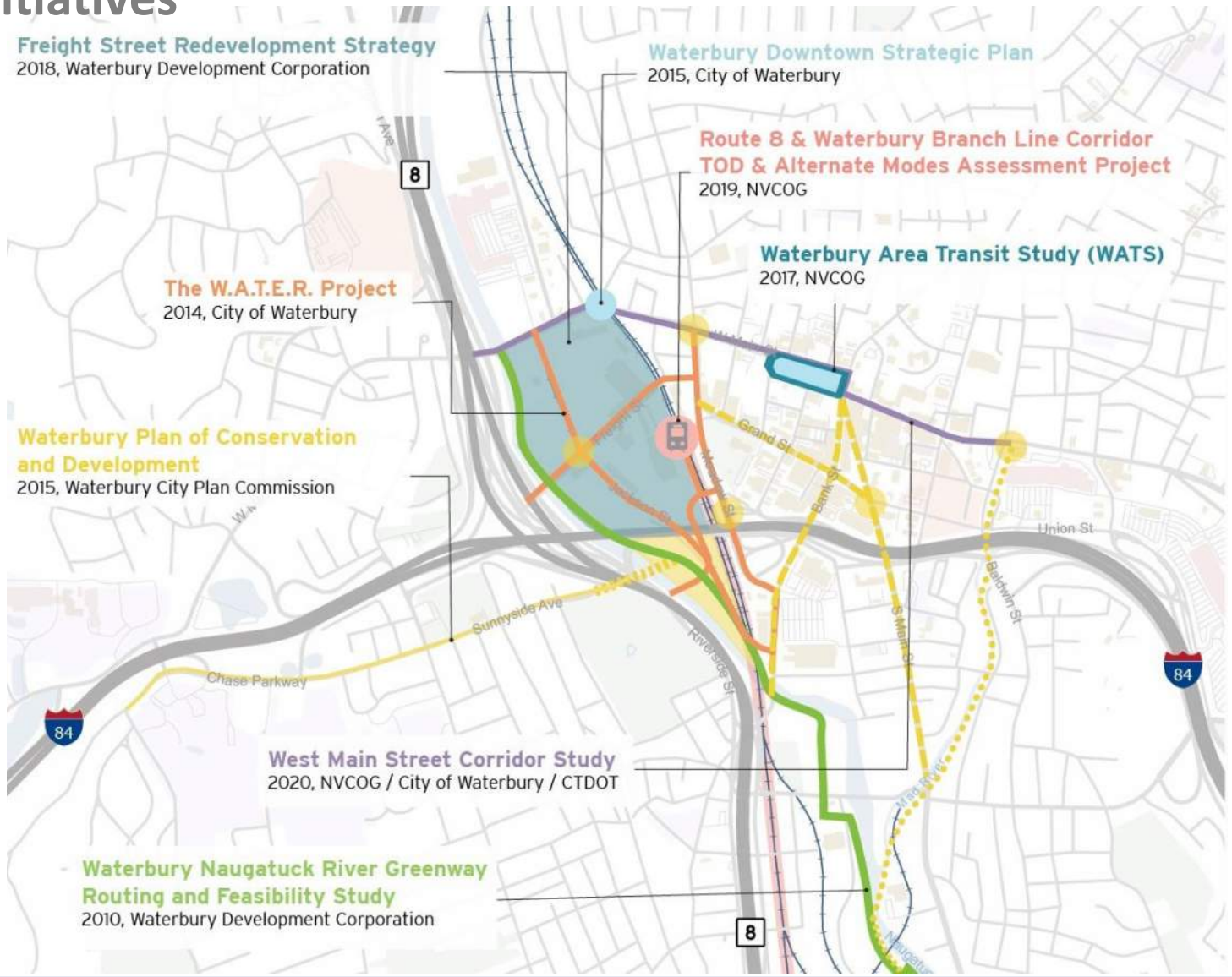






Environmental & Community Conditions Methodology

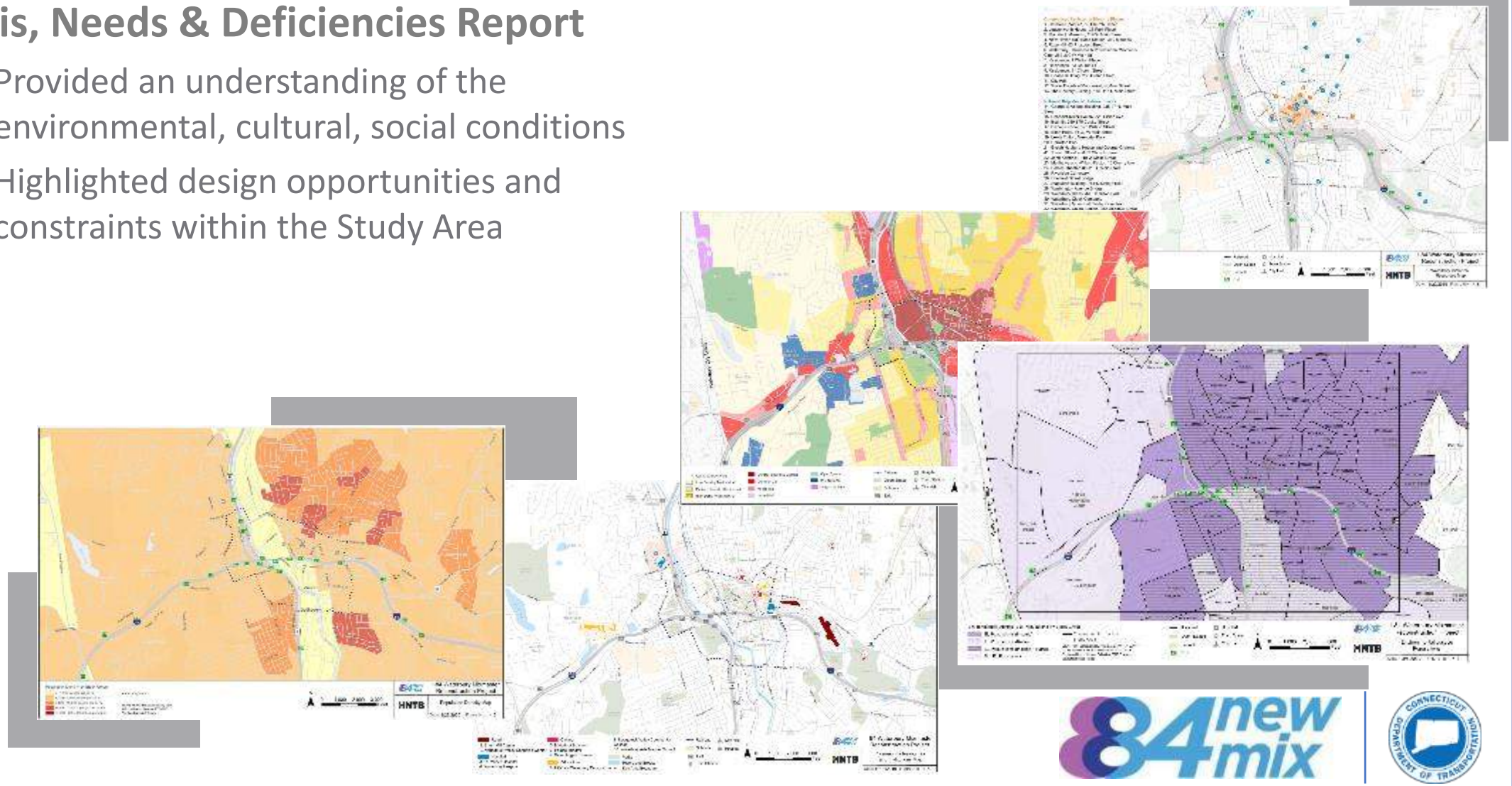
Local Planning Initiatives



Environmental & Community Conditions Methodology

Analysis, Needs & Deficiencies Report

- Provided an understanding of the environmental, cultural, social conditions
- Highlighted design opportunities and constraints within the Study Area

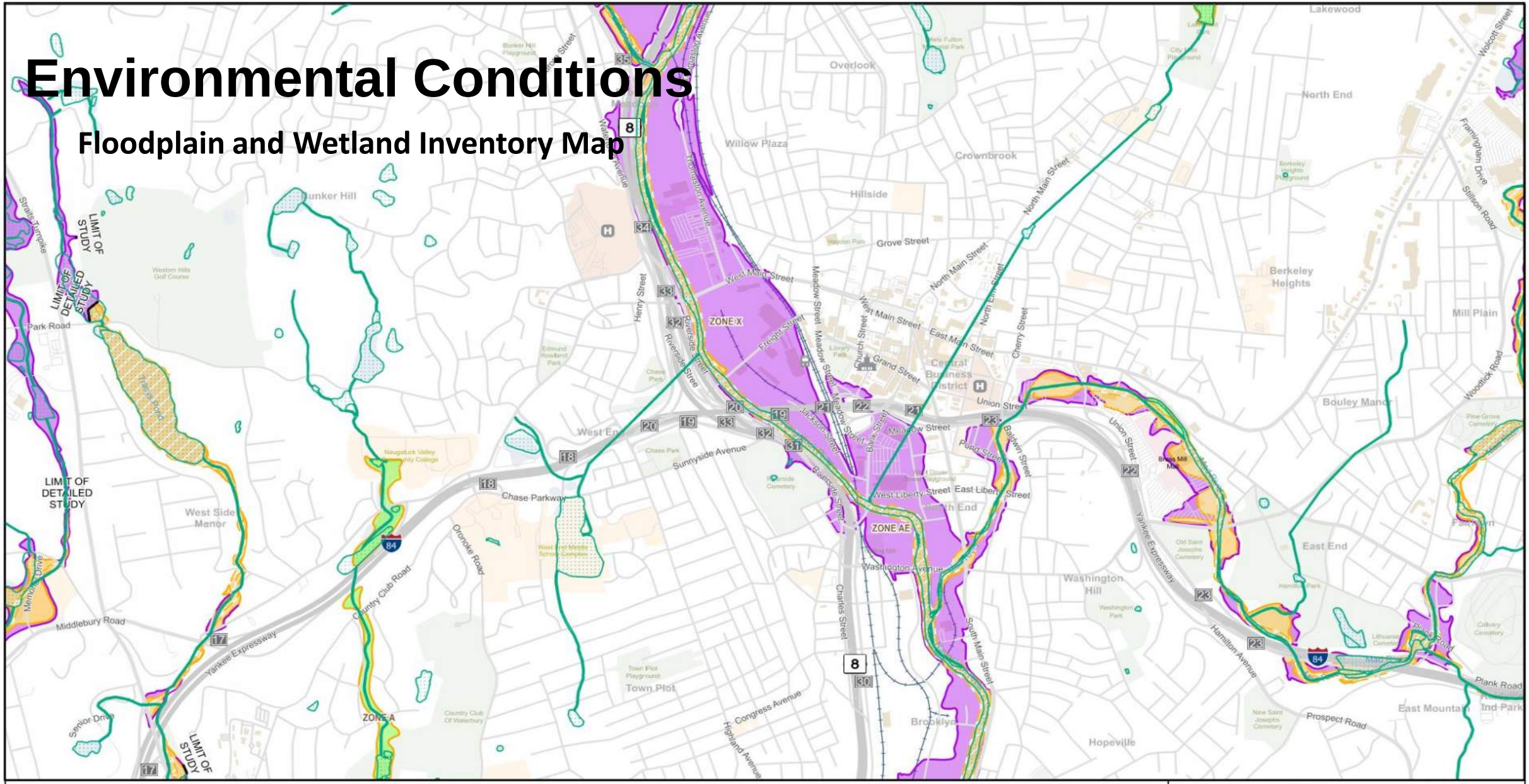


84new mix

CONNECTICUT DEPARTMENT OF TRANSPORTATION

Environmental Conditions

Floodplain and Wetland Inventory Map



84new mix

I-84 Waterbury Mixmaster Reconstruction Project

HNTB

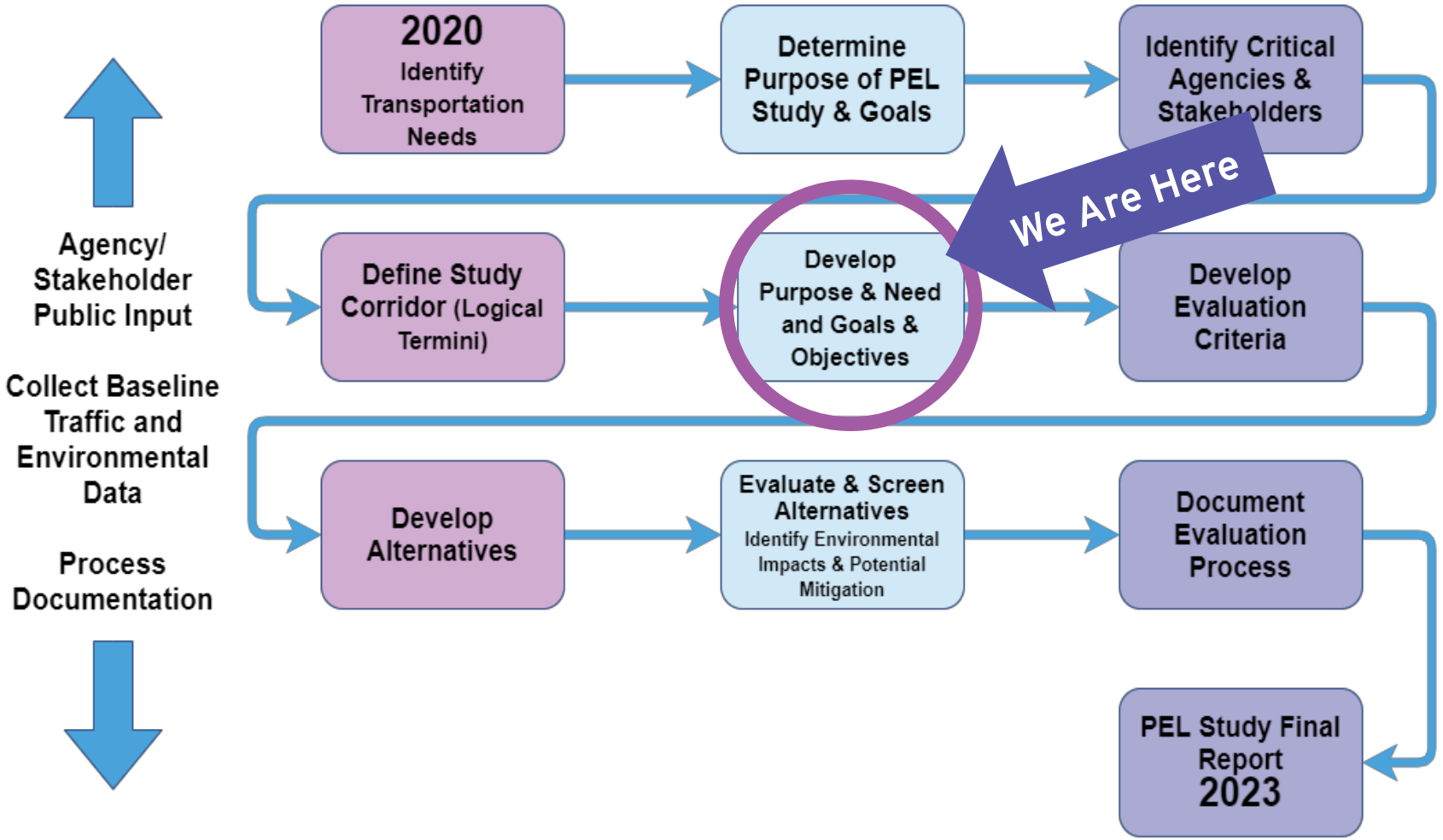
Floodplains and National Wetlands Inventory Map

Date: 11/22/2019 | Figure No: 4-35

How do the Multimodal, Community, and Environmental analyses compare with your lived experience?

Next Steps

New Mix PEL Study Next Steps



Purpose & Need Statement

Upcoming Meetings and Future PAC Agenda Items

Preliminary Purpose & Need Statement Workshop
January 2022

Where:
Anticipated Virtual via Zoom

Topics:

- Obtain Input from PAC
- Finalize Preliminary Purpose & Need Statement and other Transportation-Related Goals & Objectives

PAC Mtg #3 Anticipating
February 2022

Where:
Anticipated Hybrid: Virtual via Zoom/In-person
Location TBD

Topics:

- Present Conceptual Alternatives and Level 1 Evaluation Criteria, and
- Obtain Input from PAC

PAC Mtg #4 Anticipating
May 2022

Where:
Anticipated Hybrid: Virtual via Zoom/In-person
Location TBD

Topics:

- Present Level 1 Screening Results, Level 2 Evaluation Criteria, and
- Obtain Input from PAC

Before the Next Meeting Continue to…

- **Review** the Preliminary Purpose and Need Statement.
- **Identify** Other-Transportation-Related Goals & Objectives.
- **Explore** the Program Website.
- **Check email** for information about the next PAC meeting and scheduling.
- **Remain excited** to participate in our next meeting.

Questions & Comments

Thank you.