

**The *New Mix*:  
Project Advisory Committee (PAC) Meeting #3B  
April 29, 2022**



**HNTB**

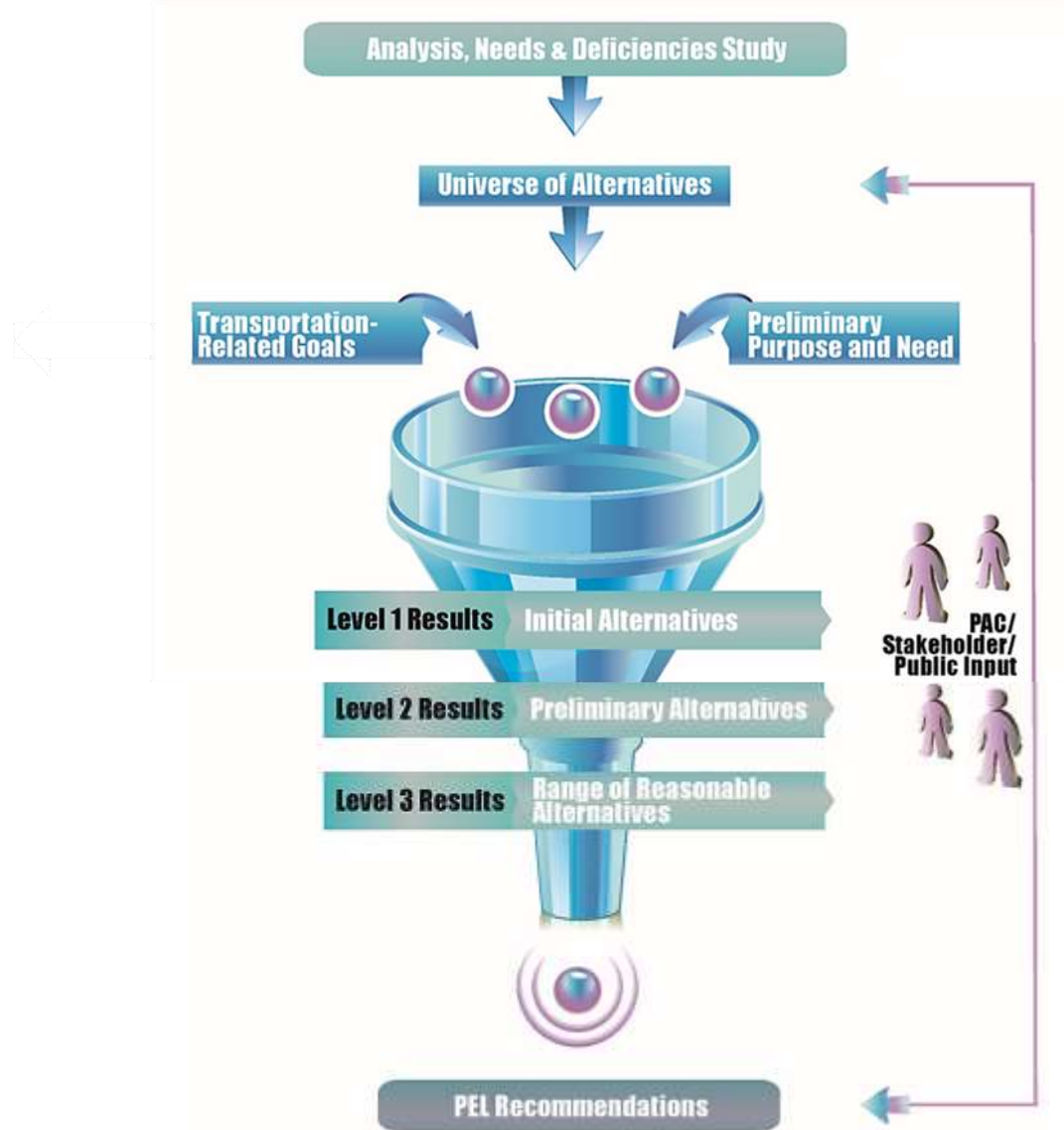


# Agenda

- **Welcome Back!**
- **PEL Process and Existing Conditions Review**
- **Urban Design Preliminary Approach**
- **The Universe of Alternatives**
  - **Introduction to the features of the Replacement Alternatives**



# New Mix PEL Process Preview: Screening of Alternatives





**Analysis, Needs & Deficiencies Study**



**Universe of Alternatives**



**Transportation-Related Goals**



**Preliminary Purpose and Need**



**Level 1 Results** **Initial Alternatives**



**PAC/  
Stakeholder/  
Public Input**





# Existing Conditions Review



# Preliminary Approach

## Places and Spaces



Parks, Greenways, and  
Open Space



Smart Development

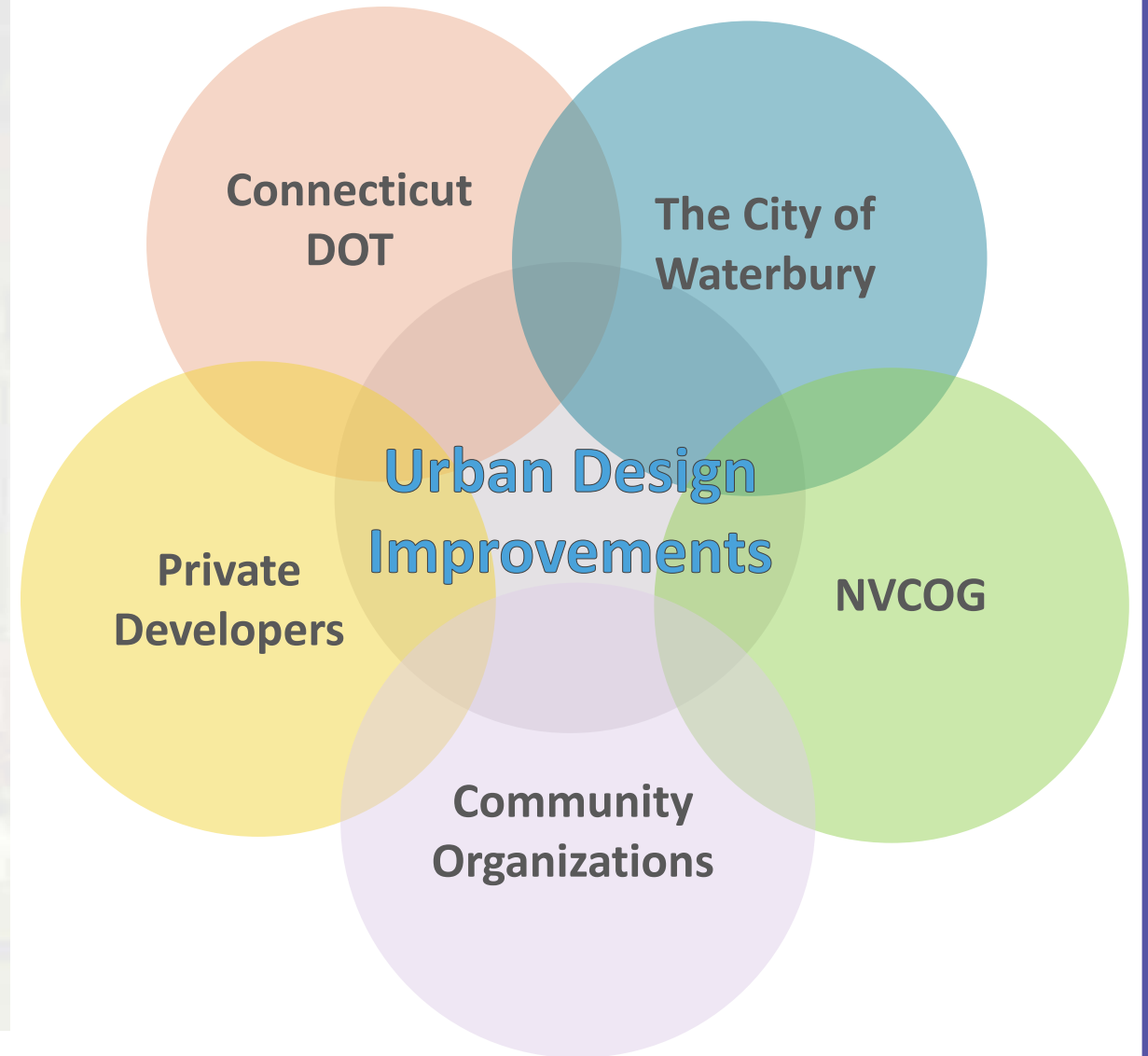
## Connecting Corridors



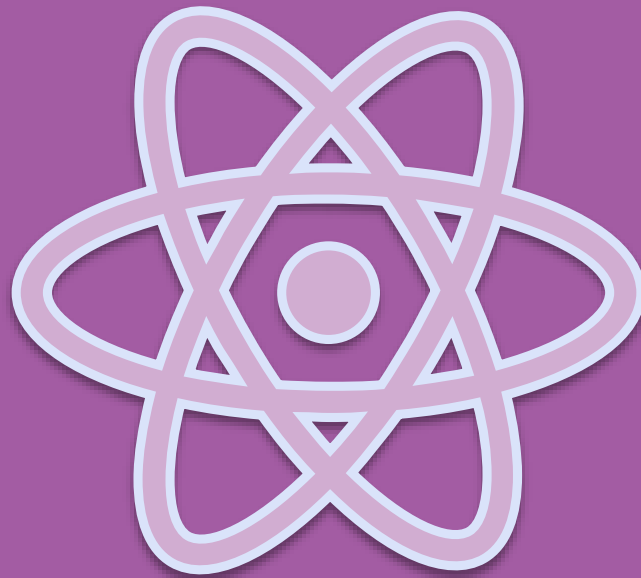
Safe Active Routes



Enlivened Underpasses and  
Overpasses



***New Mix* PEL Study**  
**Universe of Alternatives**  
**Replacement Alternatives**



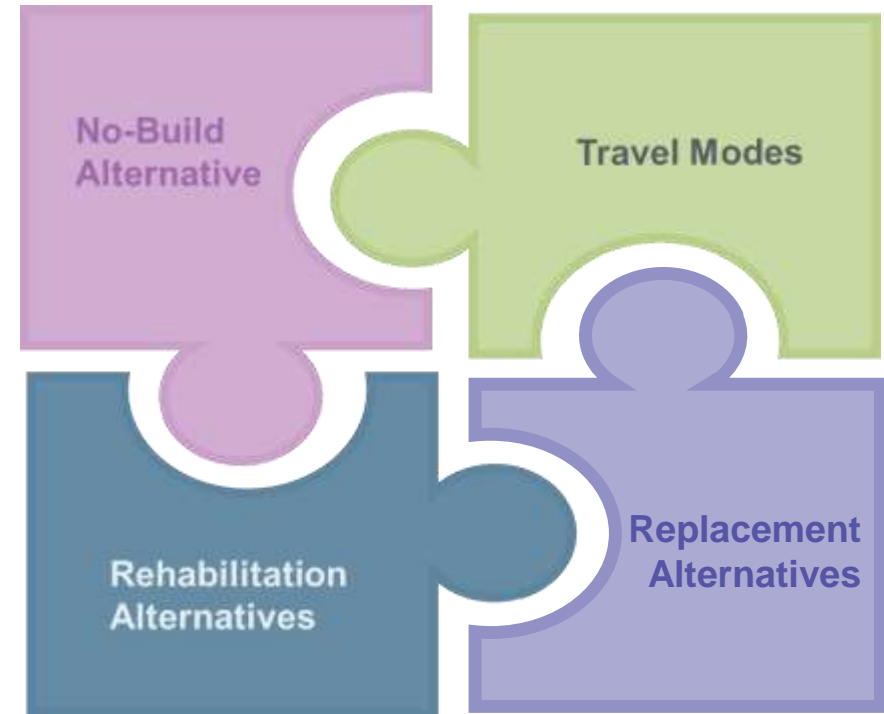


# Universe of Alternatives



The Study Team summarized and consolidated similar conceptual alternatives

**The final Universe defined the following groups of alternatives:**





# Key Factors for Identifying New Mix Replacement Alternatives



NEEDS	PURPOSE
Structural Deficiencies	Improve bridge conditions.
Geometric Deficiencies	Improve roadway conditions.
Operational Deficiencies	Improve operational conditions.

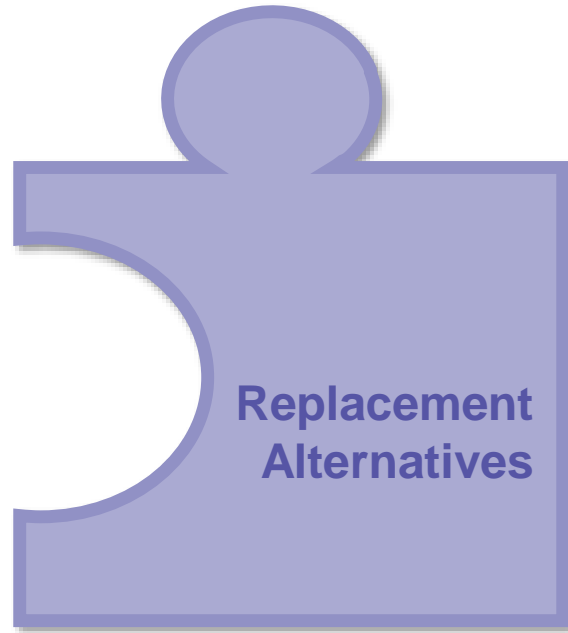
**Improve bridge conditions**, extending the serviceable life of the I-84 and Route 8 Structures:  
new structures or reuse of existing structure(s)

**Improve roadway geometry:**  
e.g., fewer sharp curves, maintain travel speeds, and improve stopping sight distance, and shoulder widths.

**Improve operations:**  
e.g., fewer left-hand entrances/exits, improve merging distance, improve interchange spacing, and improve deficient intersections with local roadways.

Replacement Alternatives allow more opportunities to incorporate improvements

# Key Factors for Identifying New Mix Replacement Alternatives



NEEDS	PURPOSE
Structural Deficiencies	Improve bridge conditions.
Geometric Deficiencies	Improve roadway conditions.
Operational Deficiencies	Improve operational conditions.

## Replacement

### I-84 and Route 8 Alignments

north, south, east, west, and in-kind bypass, shift the Naugatuck River

### Unique Solutions

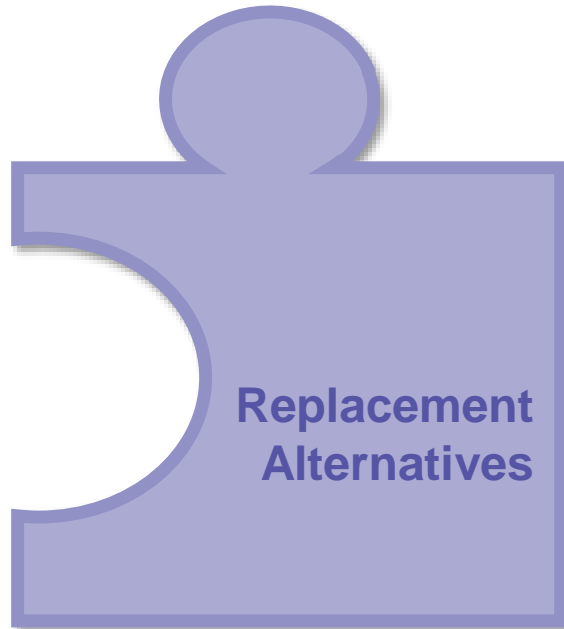
tunnel portions of the mainlines

### System Connections: Full or Partial

Local Connectivity (service interchanges, frontage road systems, collector/distributor roads, etc.)

# The Universe of Alternatives: Replacement Alternatives

Includes the complete replacement of the stacked Route 8 and I-84 structures.



1. I-84 Reconstruction In-Place
2. Interchange Shifted East
3. Modern Crossover Interchange
4. Modern Crossover Interchange with Route 8 Split to the South
5. Naugatuck River Shift
6. Keeping Route 8 Stacked
7. Washington Street Bypass
8. South City Bypass
9. Tunnel
10. Combined System Connections
11. Interchange Shifted East with Inner Loop Ramp
12. Modified Diverging Diamond
13. Half Diverging Diamond
14. Partial System Crossover Interchange
15. Partial System Interchange with Freight Street Interchange
16. At Grade System Connections
17. Route 8 Boulevard



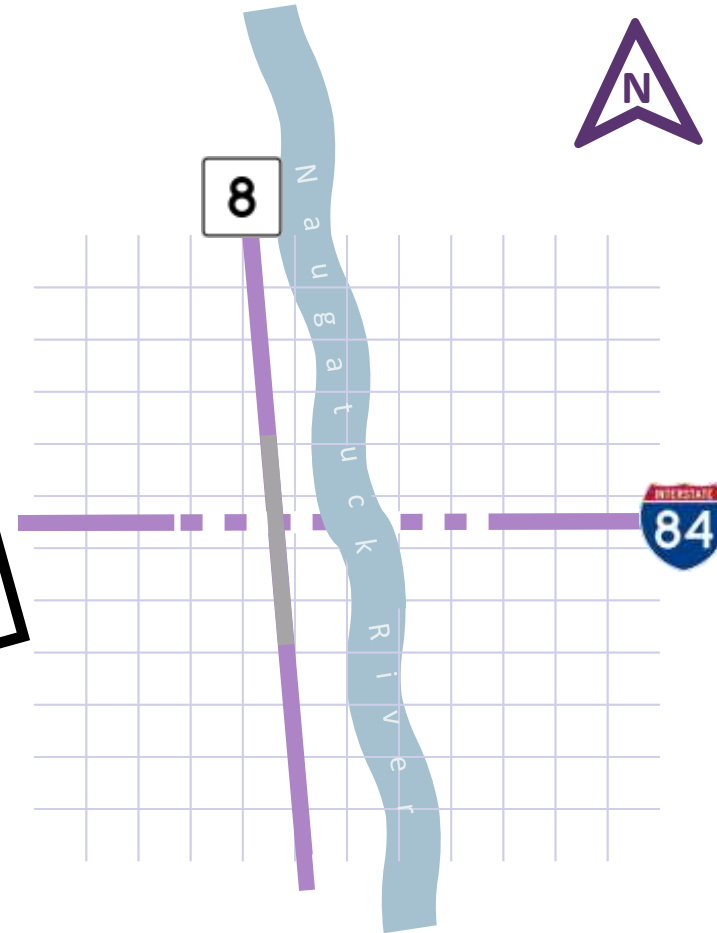
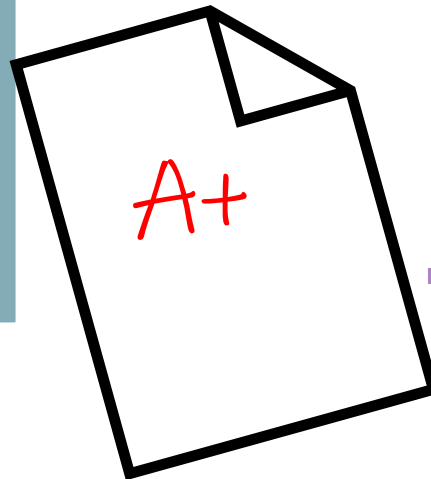
# New Mix Program: Highway Design 101

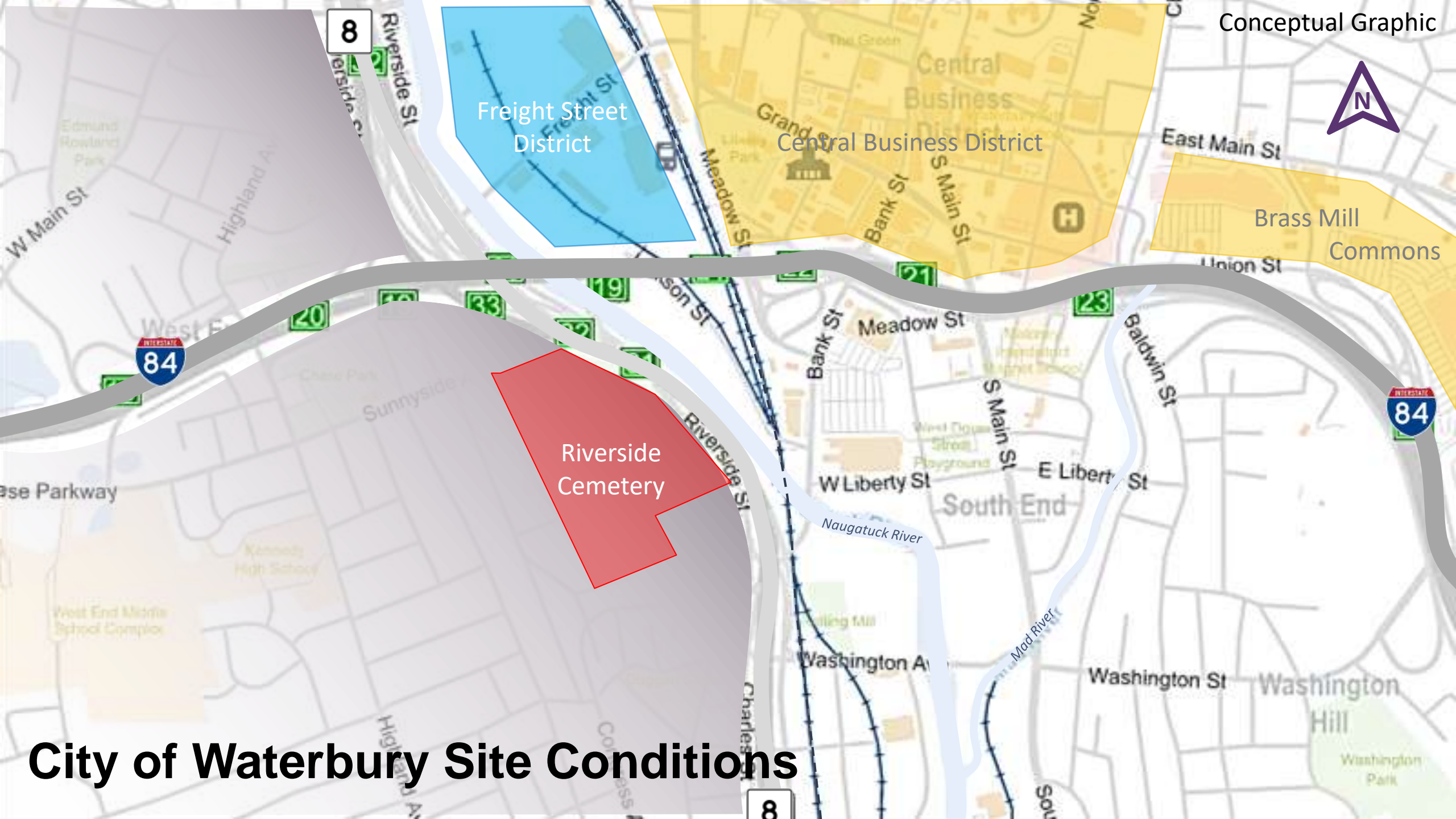
## I-84 and Route 8 Alignments

I-84: north or south

Route 8: east or west

Unique: tunneling portions of the mainline





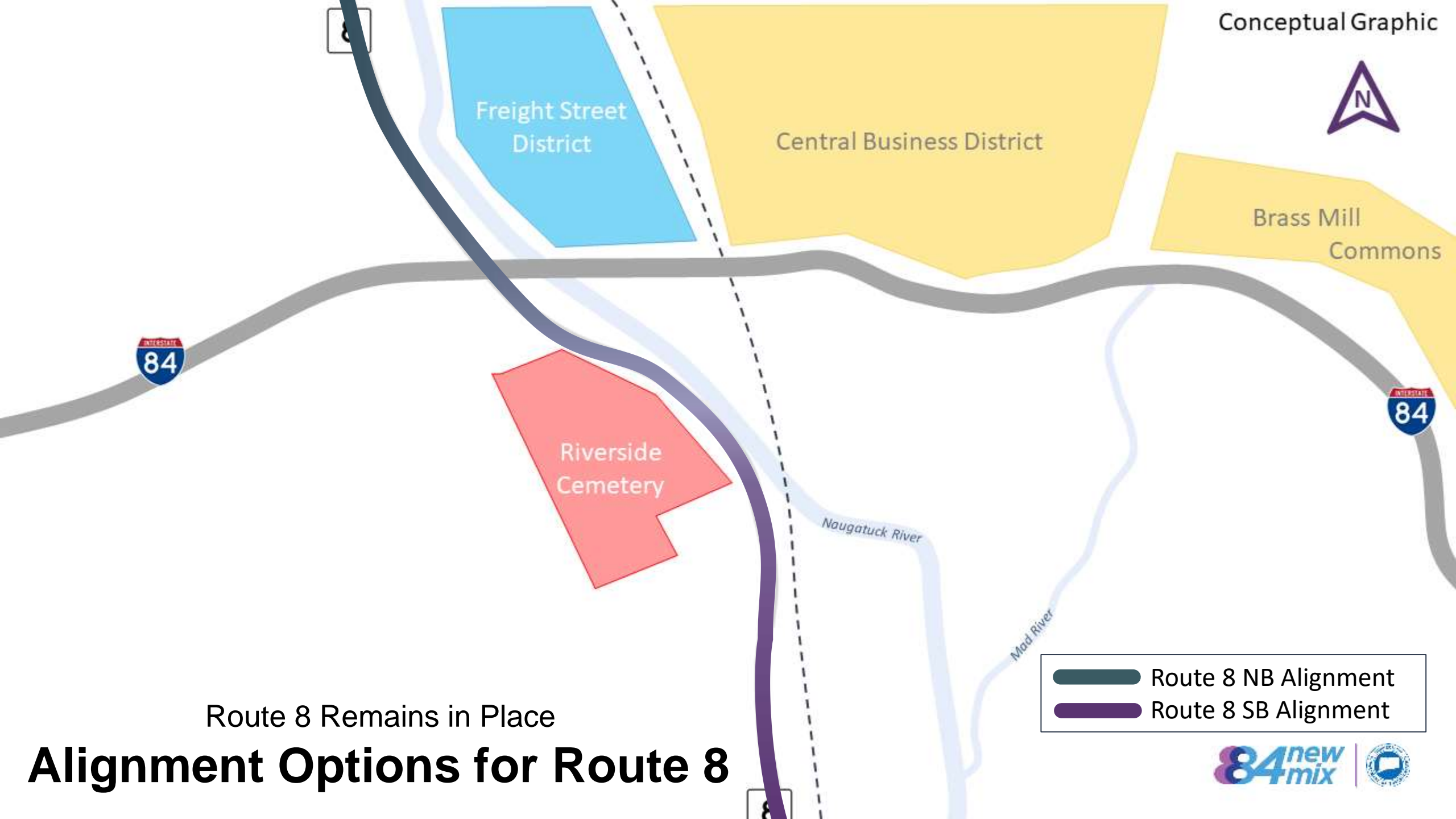
Freight Street District

Central Business District

Brass Mill Commons

Riverside Cemetery

# City of Waterbury Site Conditions

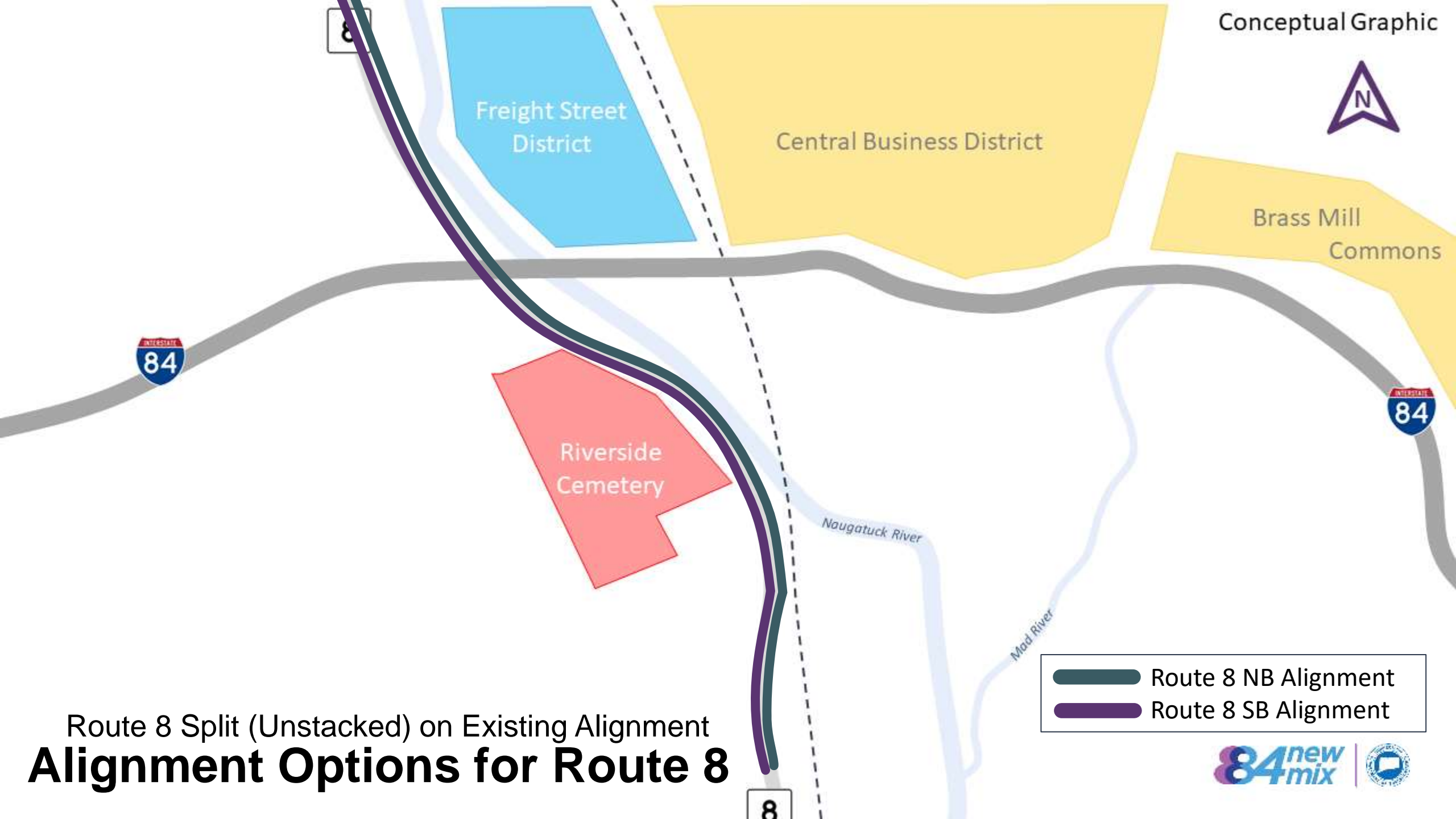


Route 8 Remains in Place

# Alignment Options for Route 8

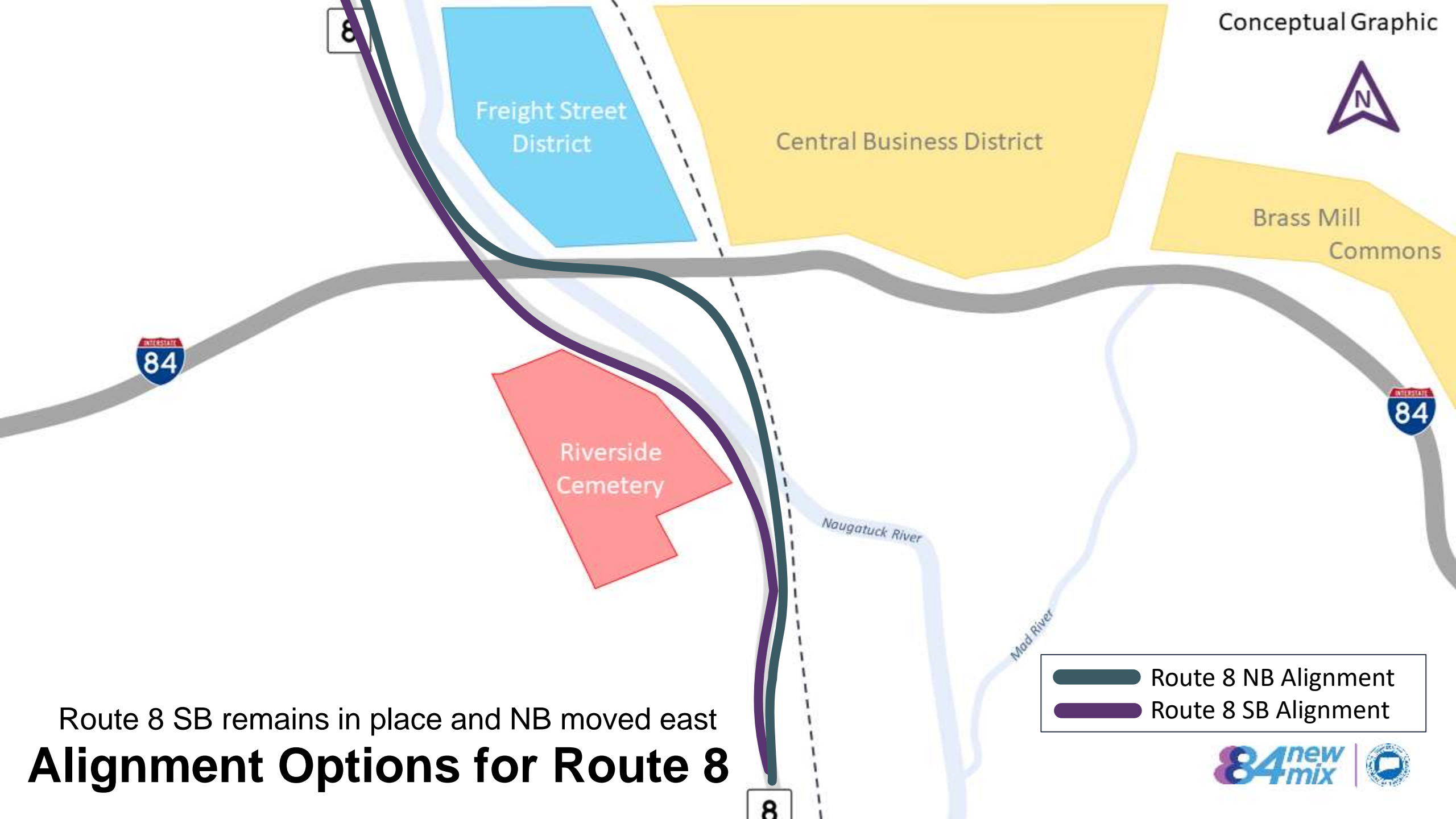
- Route 8 NB Alignment
- Route 8 SB Alignment





Route 8 Split (Unstacked) on Existing Alignment  
**Alignment Options for Route 8**

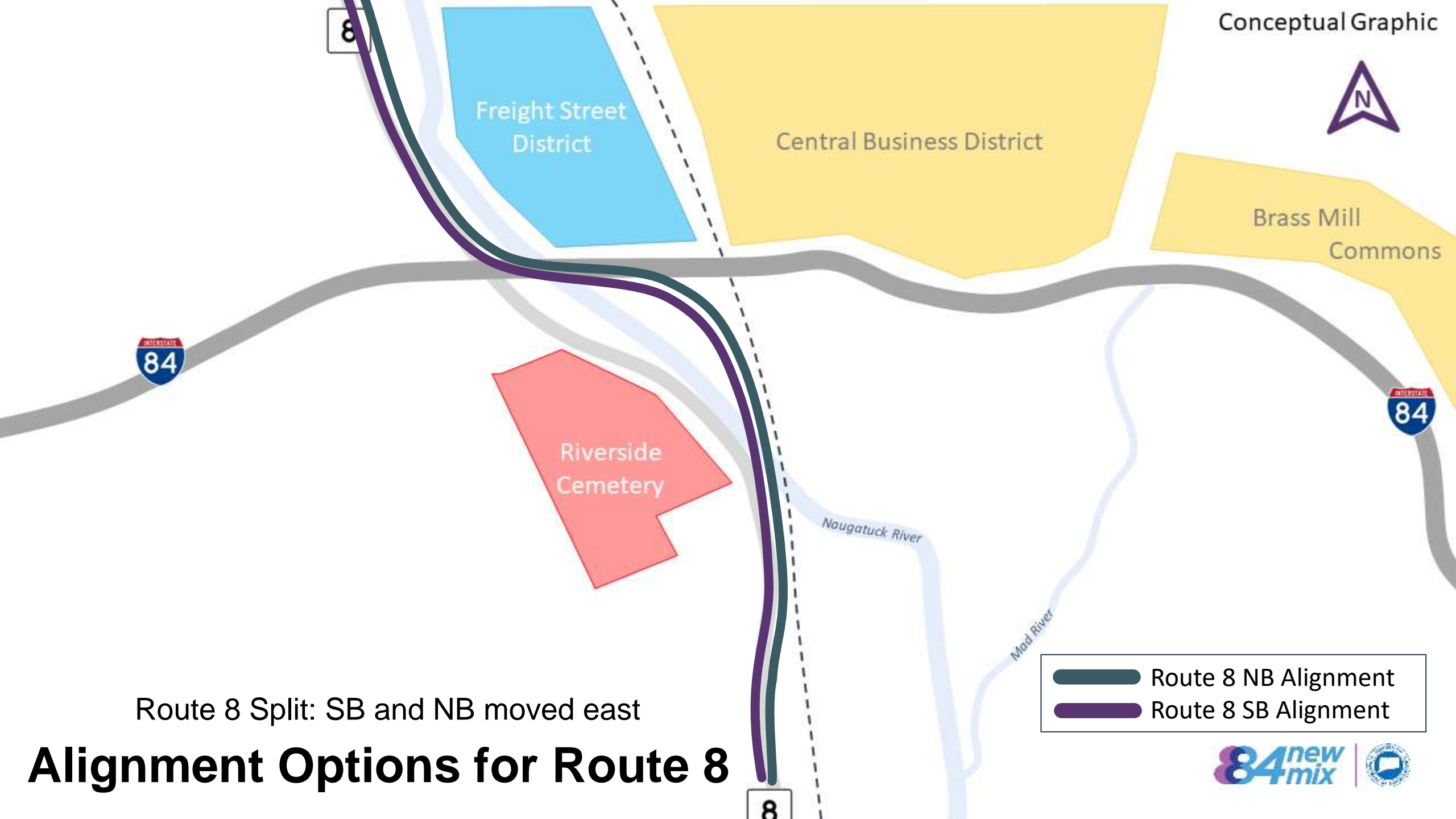
- Route 8 NB Alignment
- Route 8 SB Alignment



Route 8 SB remains in place and NB moved east



# Alignment Options for Route 8

- Route 8 NB Alignment
- Route 8 SB Alignment

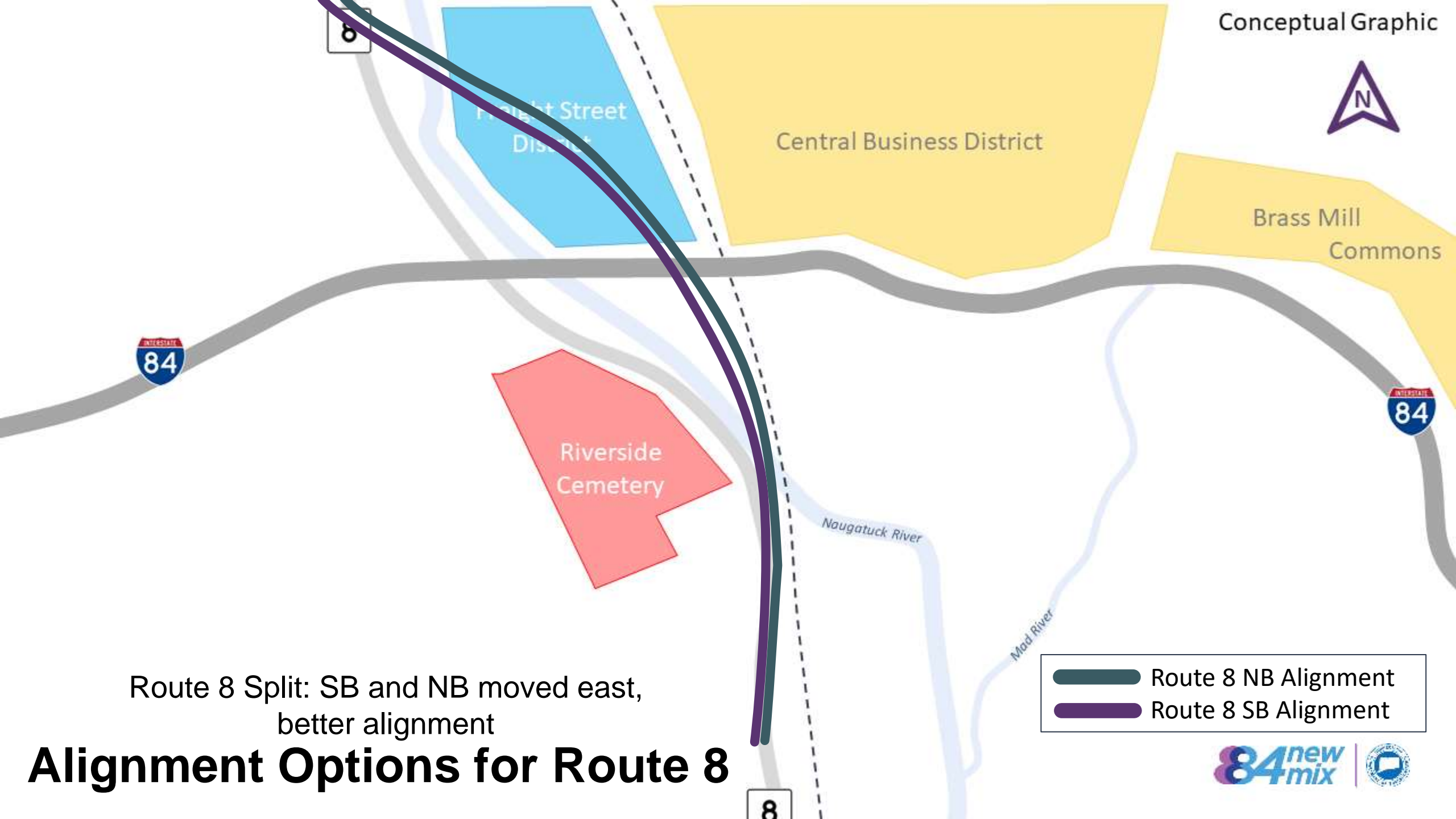


Route 8 Split: SB and NB moved east

# Alignment Options for Route 8

-  Route 8 NB Alignment
-  Route 8 SB Alignment

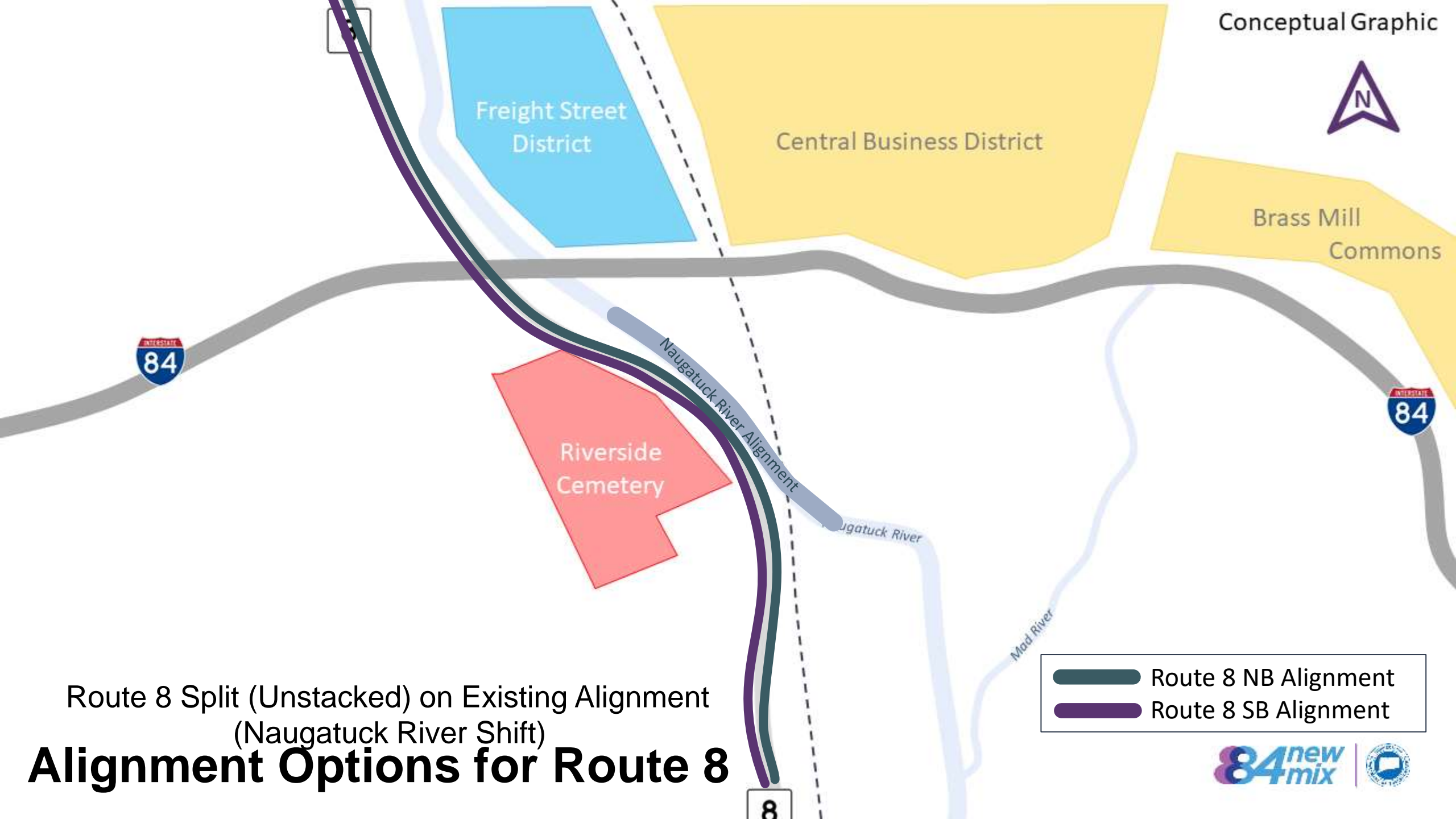




Route 8 Split: SB and NB moved east,  
better alignment

# Alignment Options for Route 8

- Route 8 NB Alignment
- Route 8 SB Alignment



Freight Street District

Central Business District

Brass Mill Commons

Riverside Cemetery

Naugatuck River Alignment



Naugatuck River

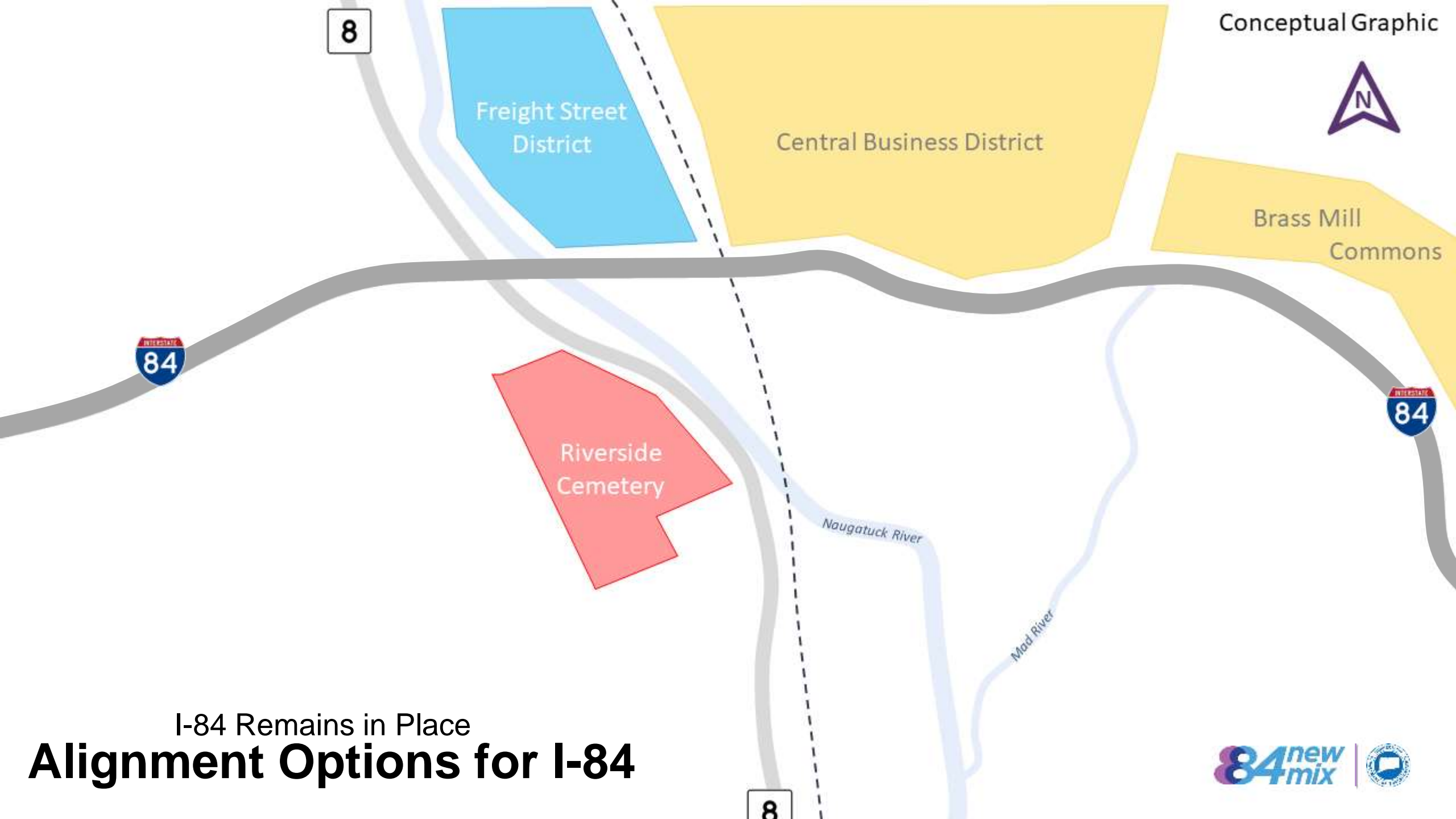
Mad River



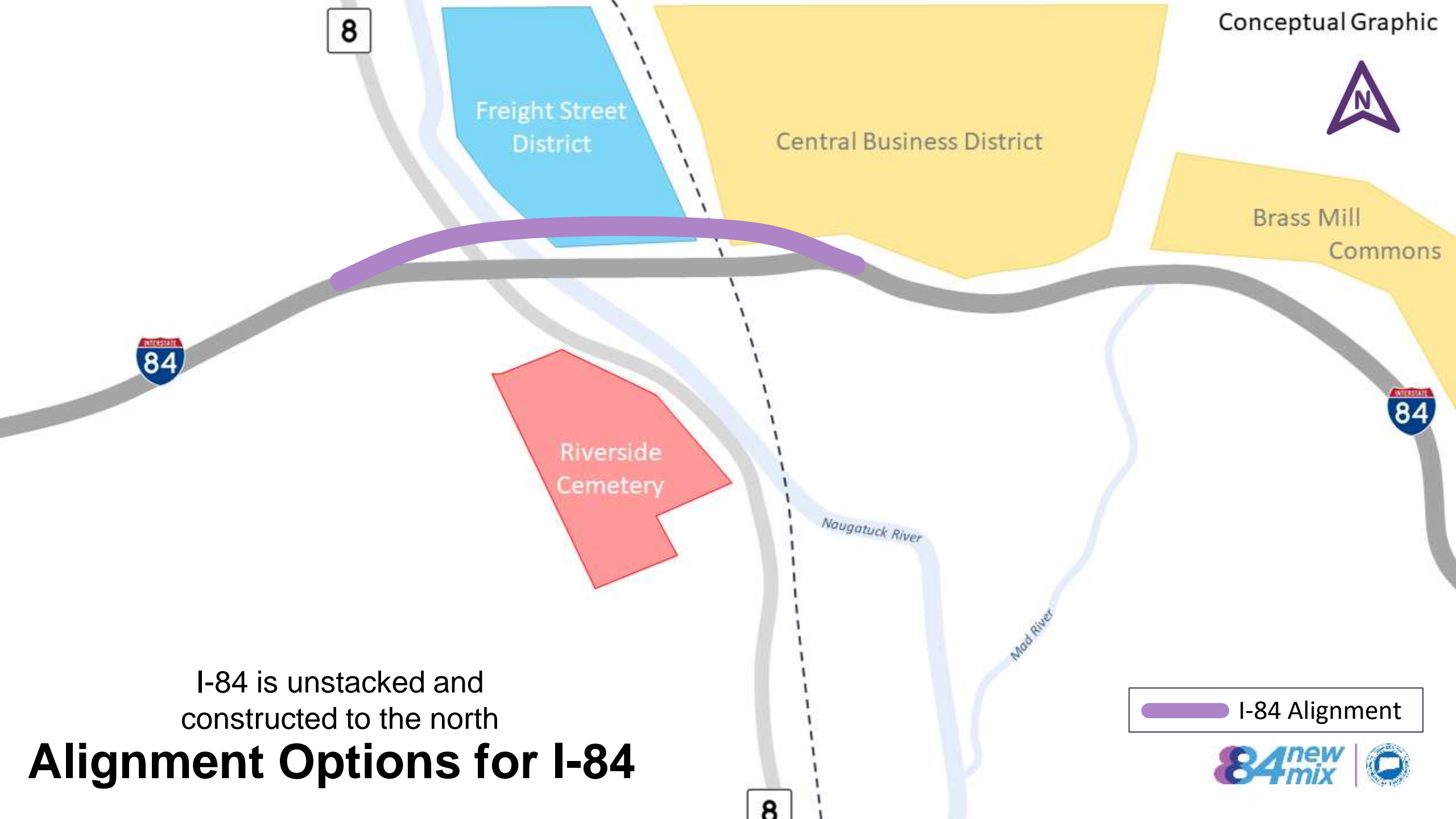
Route 8 Split (Unstacked) on Existing Alignment  
(Naugatuck River Shift)

# Alignment Options for Route 8

-  Route 8 NB Alignment
-  Route 8 SB Alignment




I-84 Remains in Place  
**Alignment Options for I-84**

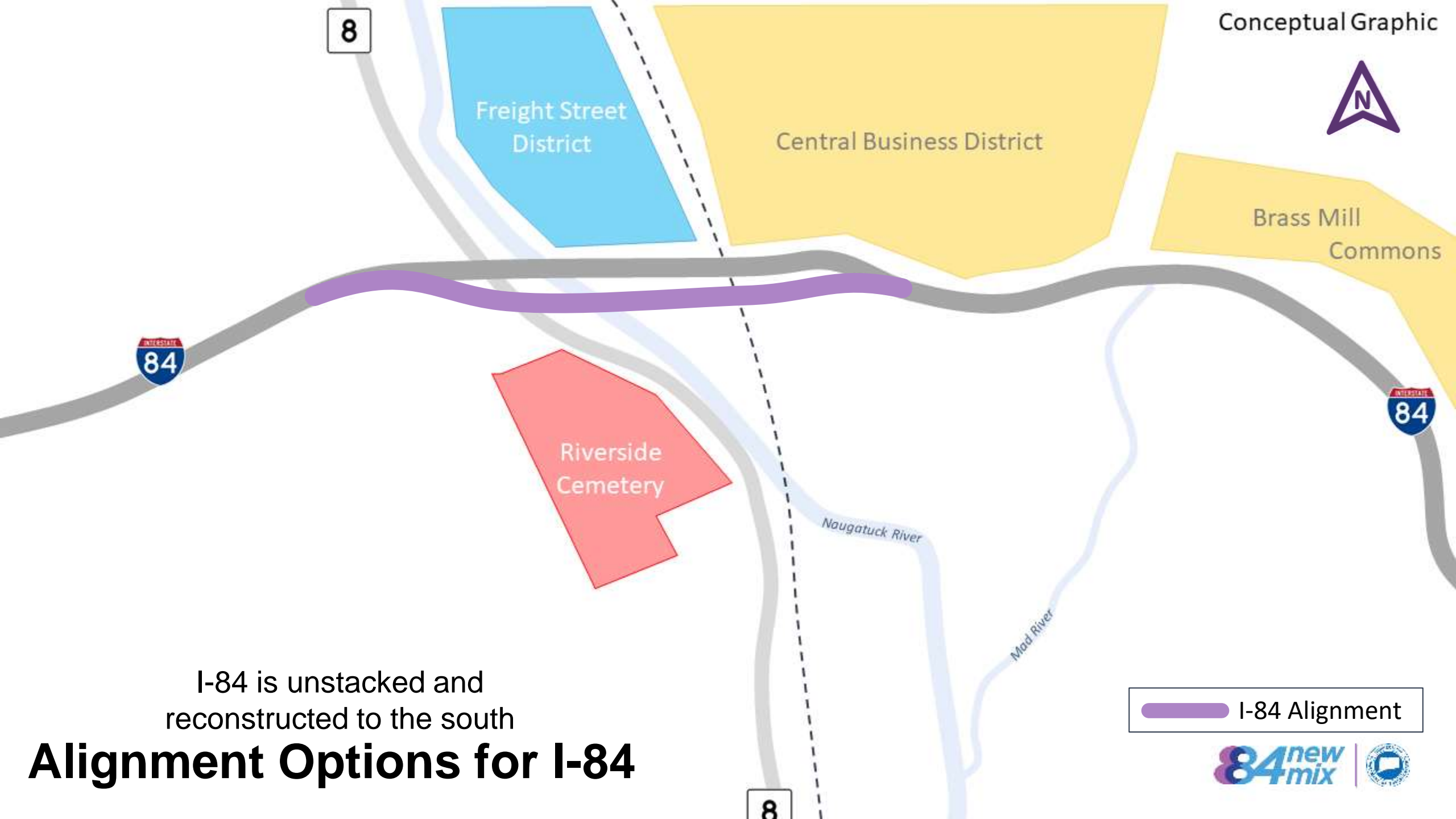


I-84 is unstacked and constructed to the north

# Alignment Options for I-84

 I-84 Alignment

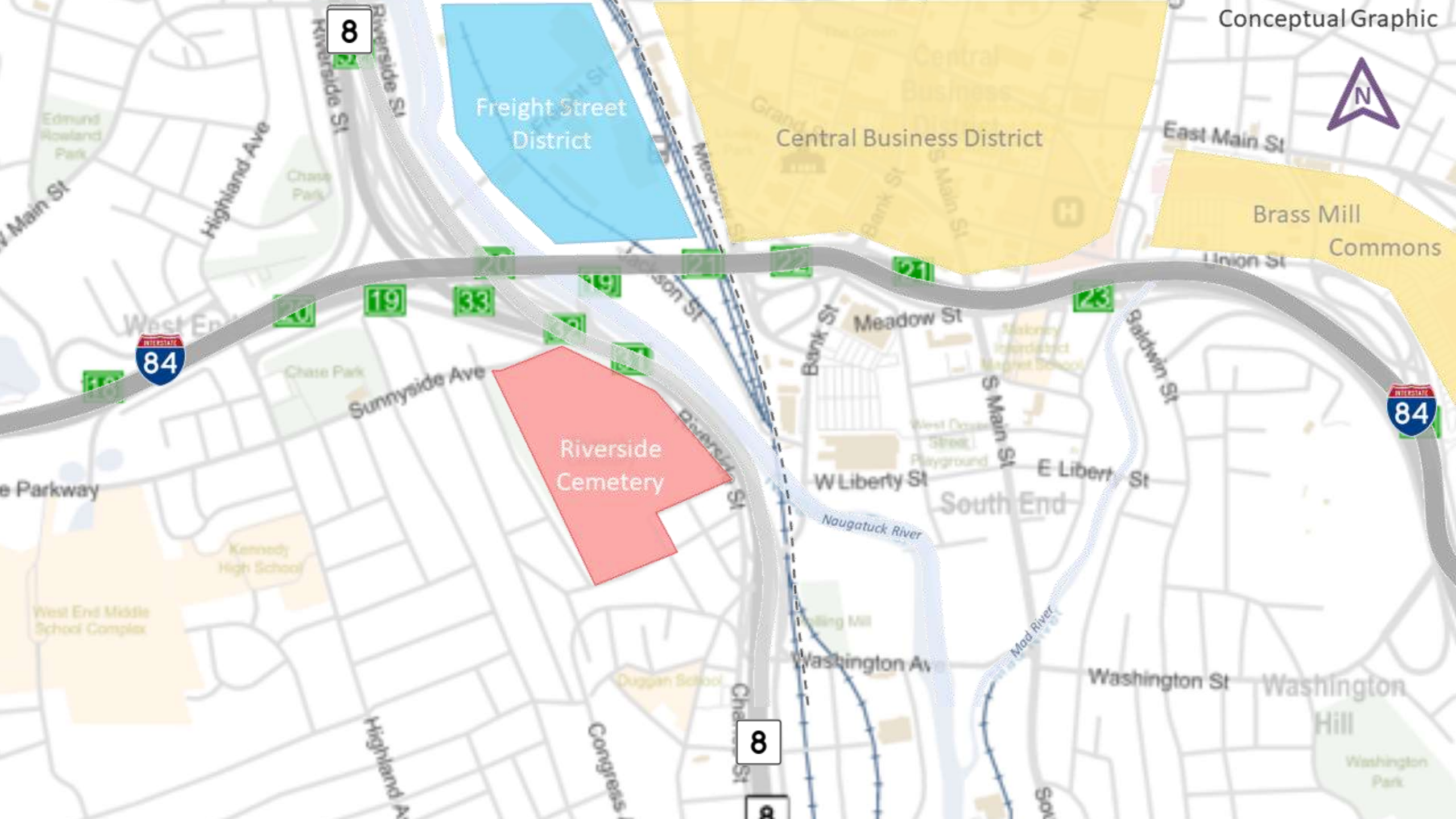




I-84 is unstacked and reconstructed to the south

# Alignment Options for I-84

I-84 Alignment



Freight Street District

Central Business District

Brass Mill Commons

Riverside Cemetery

84

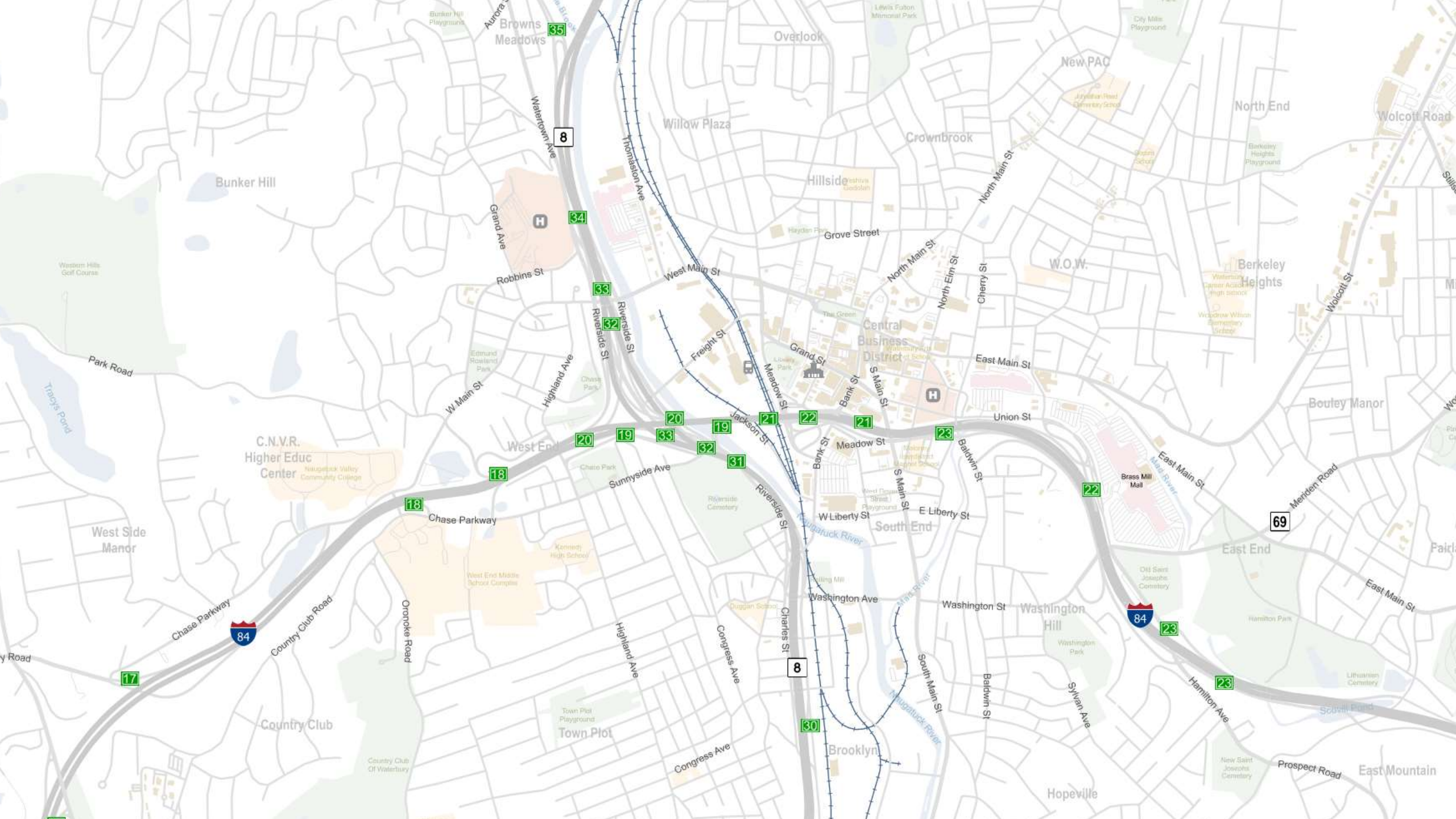
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Bunker Hill

C.N.V.R. Higher Educ Center

Country Club

Browns Meadows

Willow Plaza

Overlook

Crownbrook

Hillside

North End

Wolcott Road

Berkeley Heights

Bouley Manor

West Side Manor

South End

East End

Washington Hill

East Mountain

Chase Parkway

Country Club Road

Oronoke Road

West End

Sunnyside Ave

Congress Ave

Brooklyn

South Main St

Washington St

Sylvan Ave

Hamilton Ave

Prospect Road

Robbins St

Highland Ave

Chase Parkway

Town Plot

West Main St

Freight St

Washington Ave

Congress Ave

Grand St

W Liberty St

Washington St

Grove Street

North Main St

Bank St

Washington St

Congress Ave

North Main St

North Elm St

S Main St

Washington St

South Main St

Cherry St

East Main St

Baldwin St

Baldwin St

W.O.W.

Union St

Washington St

Hopeville

City Mills Playground

New PAC

Julian Road Elementary School

Wagon School

Waterbury Green Acres High School

Woodsboro Union Elementary School

Brass Mill Mall

Old Saint Josephs Cemetery

Hamilton Park

New Saint Josephs Cemetery

Barkley Heights Playground

Waterbury Green Acres High School

Woodsboro Union Elementary School

Hamilton Park

Hamilton Park

Hamilton Park

Lithuanian Cemetery

New Saint Josephs Cemetery

Wolcott Road

Wolcott St

Wolcott St

East Main St

East Main St

Prospect Road

East Mountain

Tracy's Pond

Country Club

Country Club

Country Club

Bunker Hill

Western Hills Golf Course

Park Road

Chase Parkway

Country Club Road

Oronoke Road

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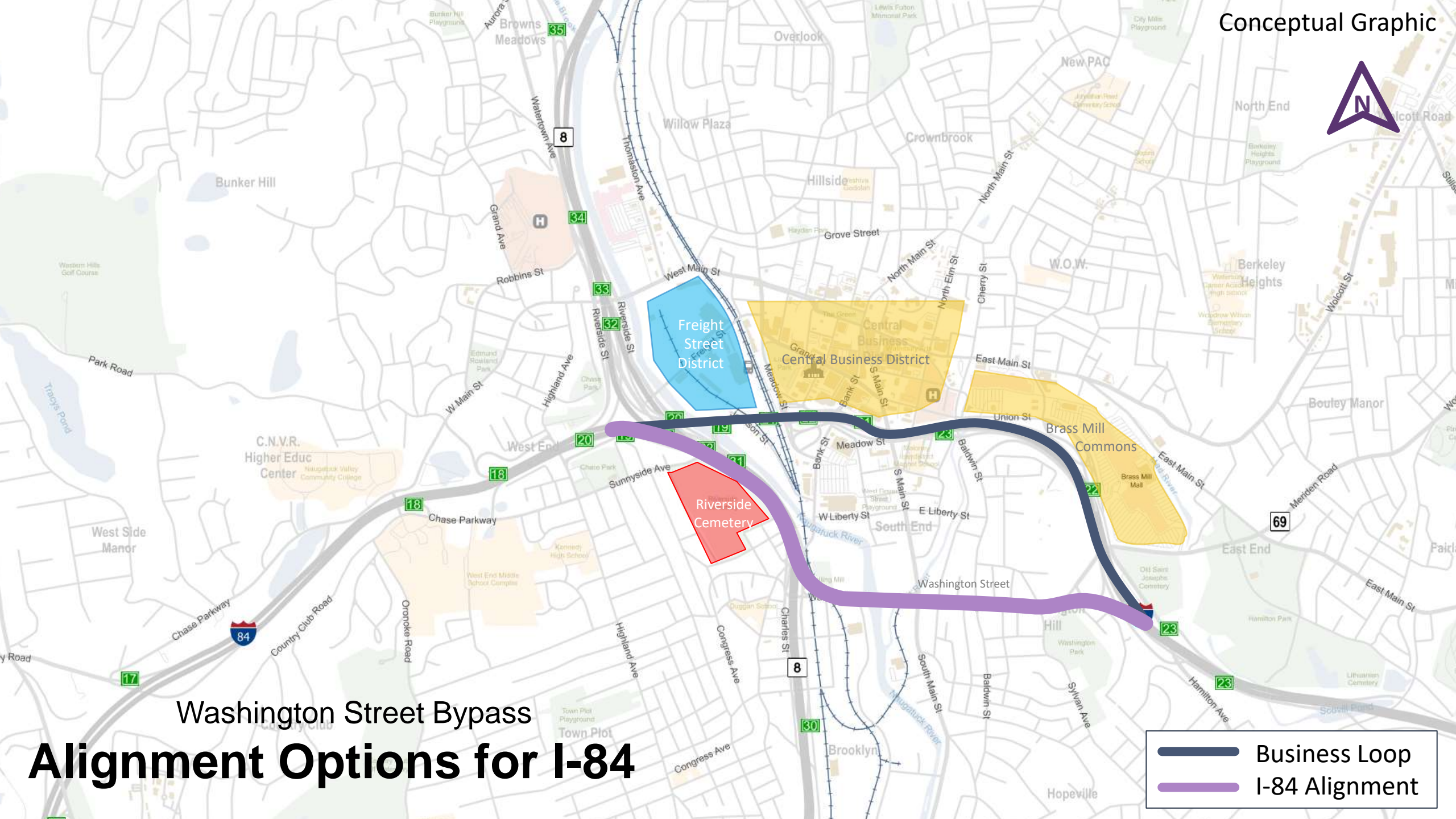
Bunker Hill

Western Hills Golf Course



Park Road

Chase Parkway

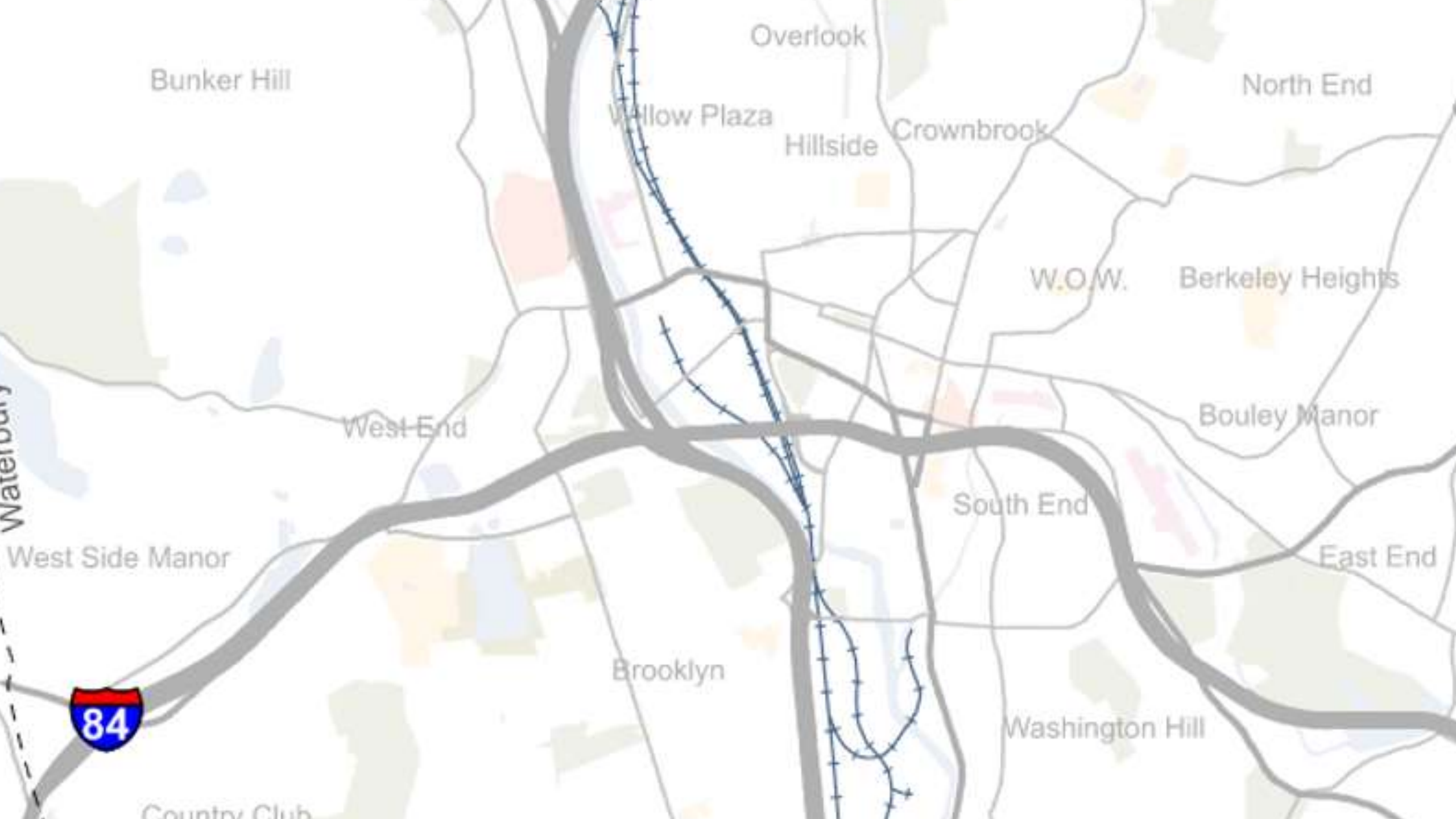
Country Club Road



# Washington Street Bypass Alignment Options for I-84

	Business Loop
	I-84 Alignment





Bunker Hill

Overlook

North End

Willow Plaza

Hillside

Crownbrook

W.O.W.

Berkeley Heights

West End

Bouley Manor

Waterbury

West Side Manor

South End

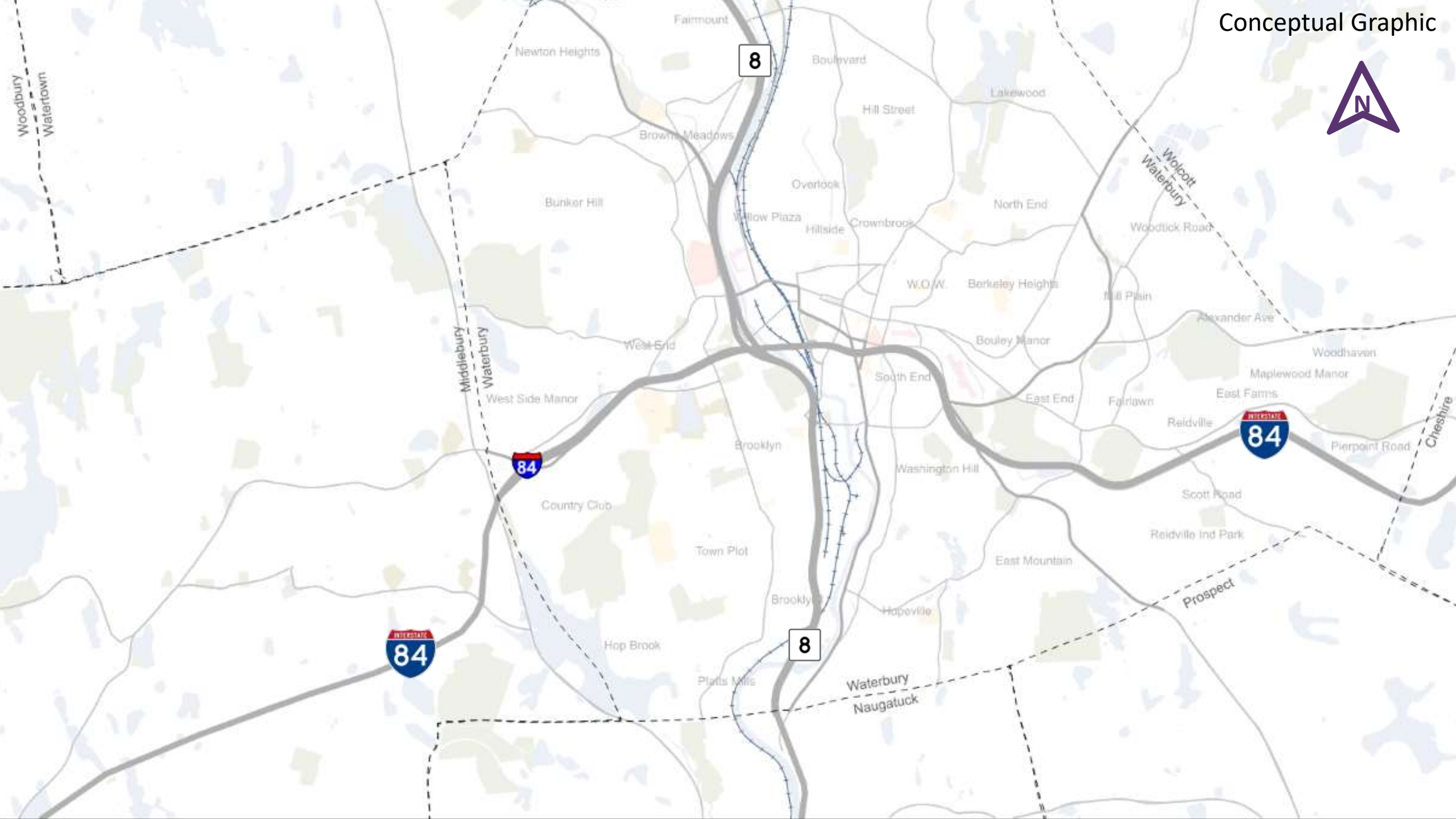
East End

Brooklyn

84




Washington Hill

Country Club





# South City Bypass Alignment Option for I-84

-  Business Loop
-  I-84 Alignment
-  Route 8



# Tunnel Alternative

No graphics produced



NEEDS	PURPOSE
Structural Deficiencies	Improve bridge conditions.
Geometric Deficiencies	Improve roadway conditions.
Operational Deficiencies	Improve operational conditions.





Tunnel Alternative

# Alignment Option for I-84

# New Mix Program: Highway Design 101

## System Connections

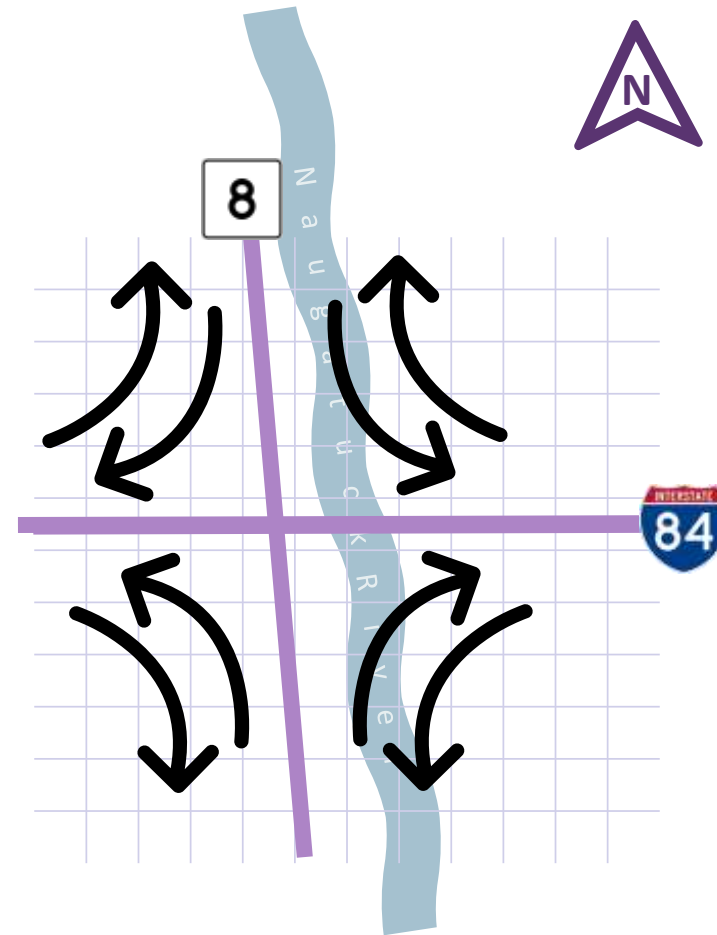
(getting to/from I-84 and Route 8)

### Full System Interchange

Direct connections: stay on the mainline, typical from I-84/Rt 8

### Partial System Interchange

Indirect Connections: must leave the mainline, on the local road network



**84**new  
mix



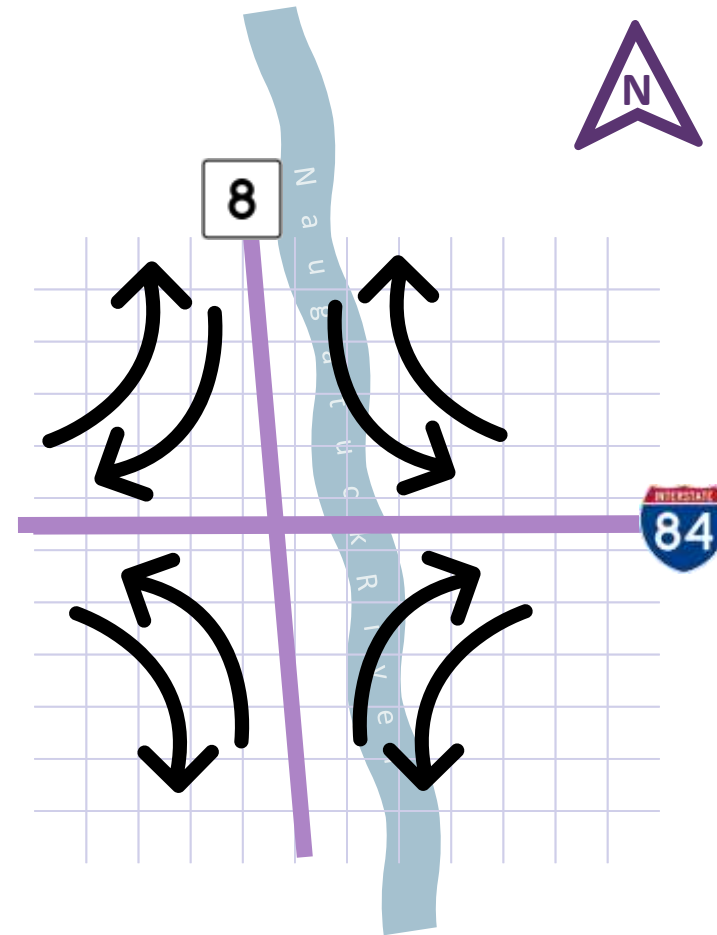
# Full System Interchange Features

Direct connections: stay on the mainline to get to/from I-84/Route 8 (how these roadways currently connect)

Crossover Interchange

Combined System Movement

Diverging Diamond Interchange



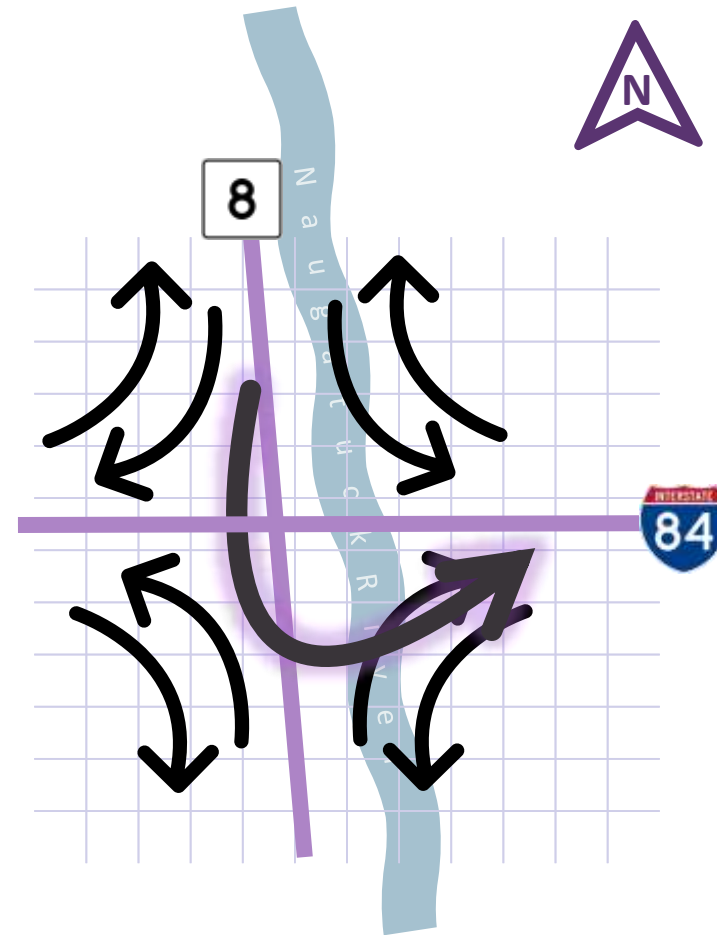
**84**new  
mix



# Full System Interchange Features

## Crossover Interchange

Instead of left-hand entrances and exits, the system connection would cross over or under the mainlines for a typical/safer right-hand entrance and exit.

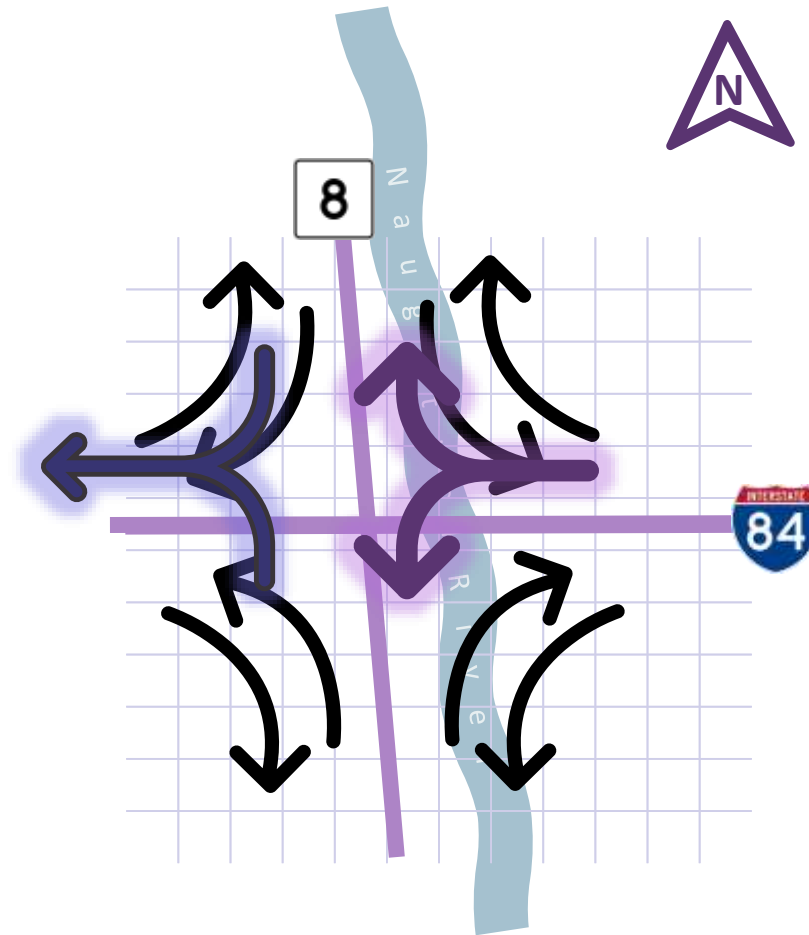




# Full System Interchange Features

## Combined System Movement:

Vehicles traveling on a mainline together, leave or join a mainline together. This movement has increased traffic flow and requires more vehicular maneuvers.



**84**new  
mix



# Full System Interchange Features

## Diverging Diamond Interchange:

Relatively new interchange type in the United States. DDI designs confer many benefits when compared to traditional crossover interchanges, including reduced delays, increased turning movement capacity, and compact layouts.



Source: [Utah Department of Transportation YouTube Channel](#)

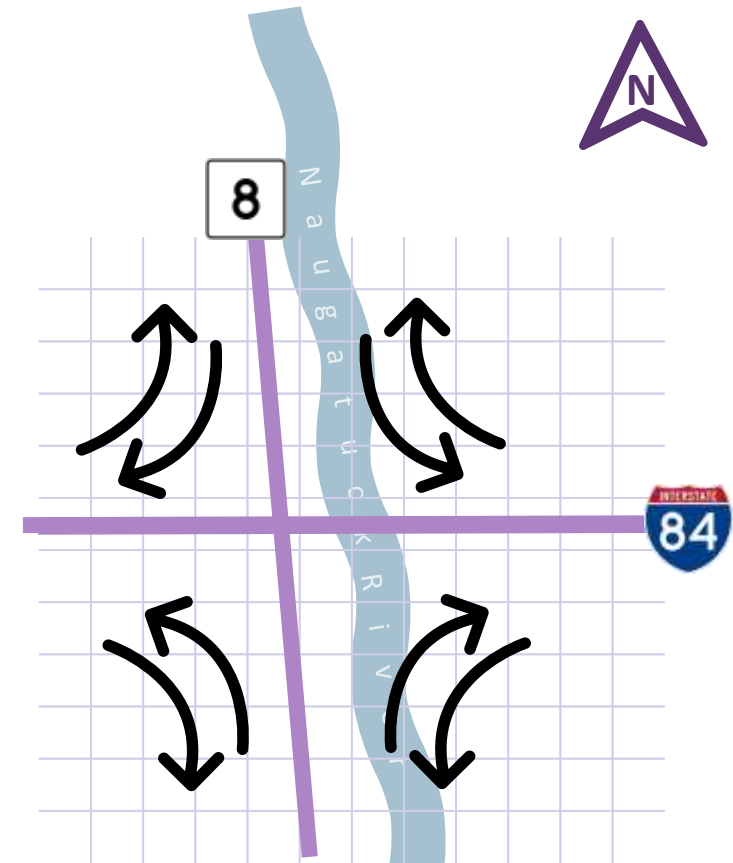
# Partial System Interchange Features

Indirect Connections: must leave the mainline.  
Connections are made on the local road network.

No Conceptual Alternative has all indirect connections for mainline movements

Indirect Connections include:

- I-84 EB to Route 8 NB
- I-84 EB to Route 8 SB
- Route 8 NB to I-84 WB



**84**new  
mix





# Local Connectivity Features

**Local Connectivity:** service interchanges, frontage road systems, and more:

Connecting the city to the mainlines and enhancing local roadway network

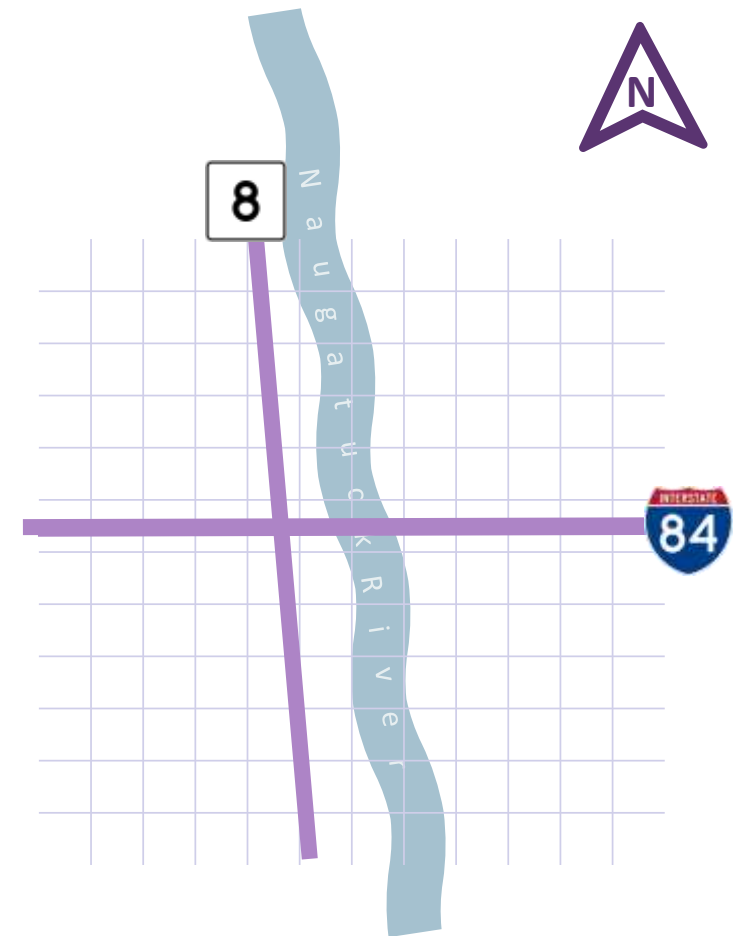
Arterial Improvements

Intersection Improvements

Increased Interchange Spacing

Collector/Distributor(C/D) Roads

Frontage Roads



# Local Connectivity Features

**Local Connectivity:** service interchanges, frontage road systems, and more:

**Collector/Distributor(C/D) Roads:** lower speed limited access highways that are separated from the mainline.

(e.g. McMahon St. to I-84 EB)





# Local Connectivity Features

**Local Connectivity:** service interchanges, frontage road systems, and more:

**Collector/Distributor(C/D) Roads:** lower speed limited access highways that are separated from the mainline.

(e.g. McMahon St. to I-84 EB)

**Frontage Roads:** often parallel the mainline and improve the traffic operations on local road networks while providing access to commercial properties.

(e.g. Reidville Dr.)





# Local Connectivity Features

**Local Connectivity:** service interchanges, frontage road systems, and more:

**Frontage Roads:** often parallel the mainline and improve the traffic operations on local road networks while providing access to commercial properties.

(e.g. Reidville Dr.)



# Local Connectivity Features

**Local Connectivity:** service interchanges, frontage road systems, and more:

**Frontage Roads:** often parallel the mainline and improve the traffic operations on local road networks while providing access to commercial properties.

(e.g. Charles St. and South Leonard St. parallel to Route 8)





# Local Connectivity Features

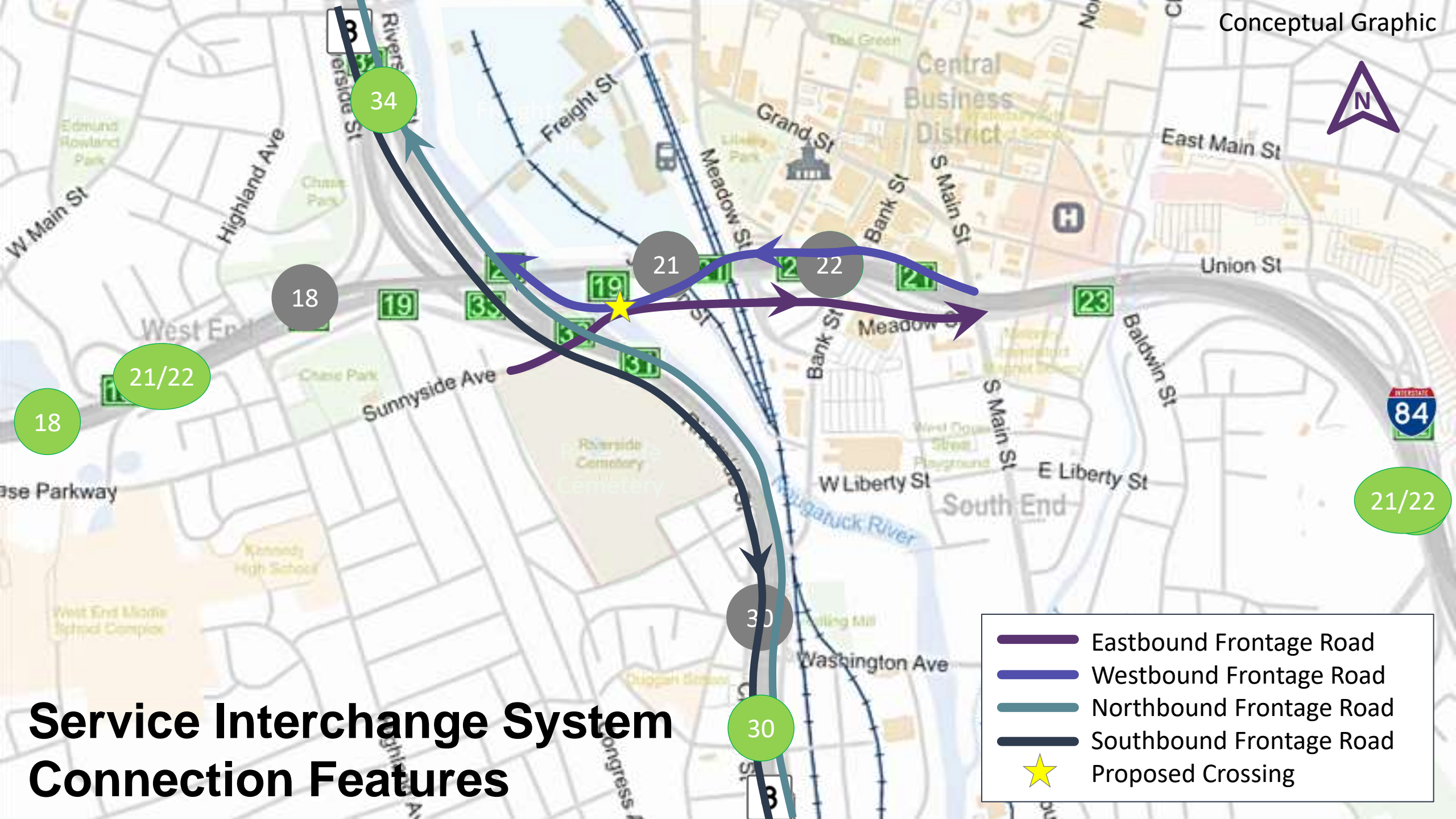
**Local Connectivity:** service interchanges, frontage road systems, and more:

**Frontage Roads:** often parallel the mainline and improve the traffic operations on local road networks while providing access to commercial properties.






(e.g. Charles St. and South Lenard St. parallel to Route 8)







# Service Interchange System Connection Features

-  Eastbound Frontage Road
-  Westbound Frontage Road
-  Northbound Frontage Road
-  Southbound Frontage Road
-  Proposed Crossing

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Sunnyside Ave

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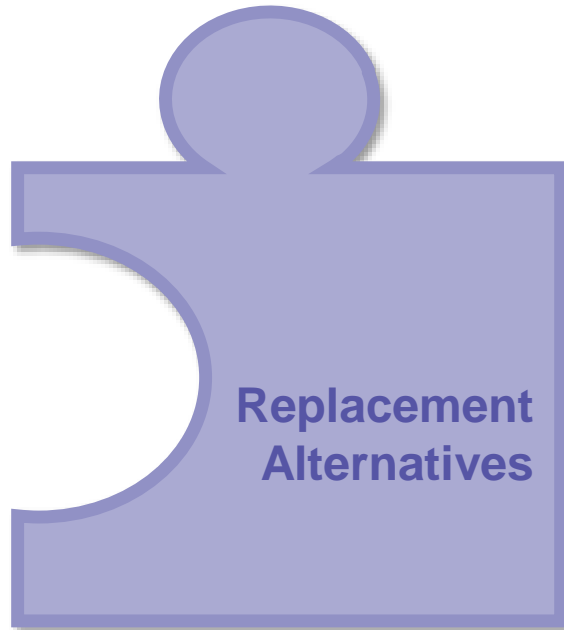
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# The Universe of Alternatives: Replacement Alternatives



- I-84 and Route 8 Alignments
- System Connections
- Local Connectivity

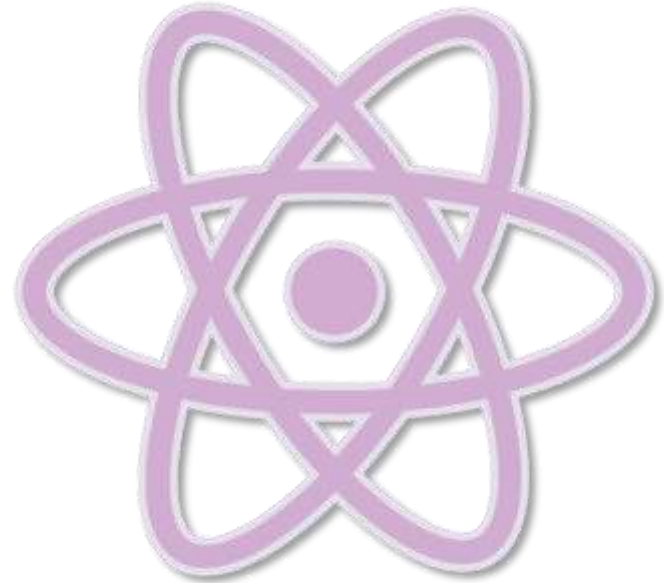


# The Universe of Alternatives

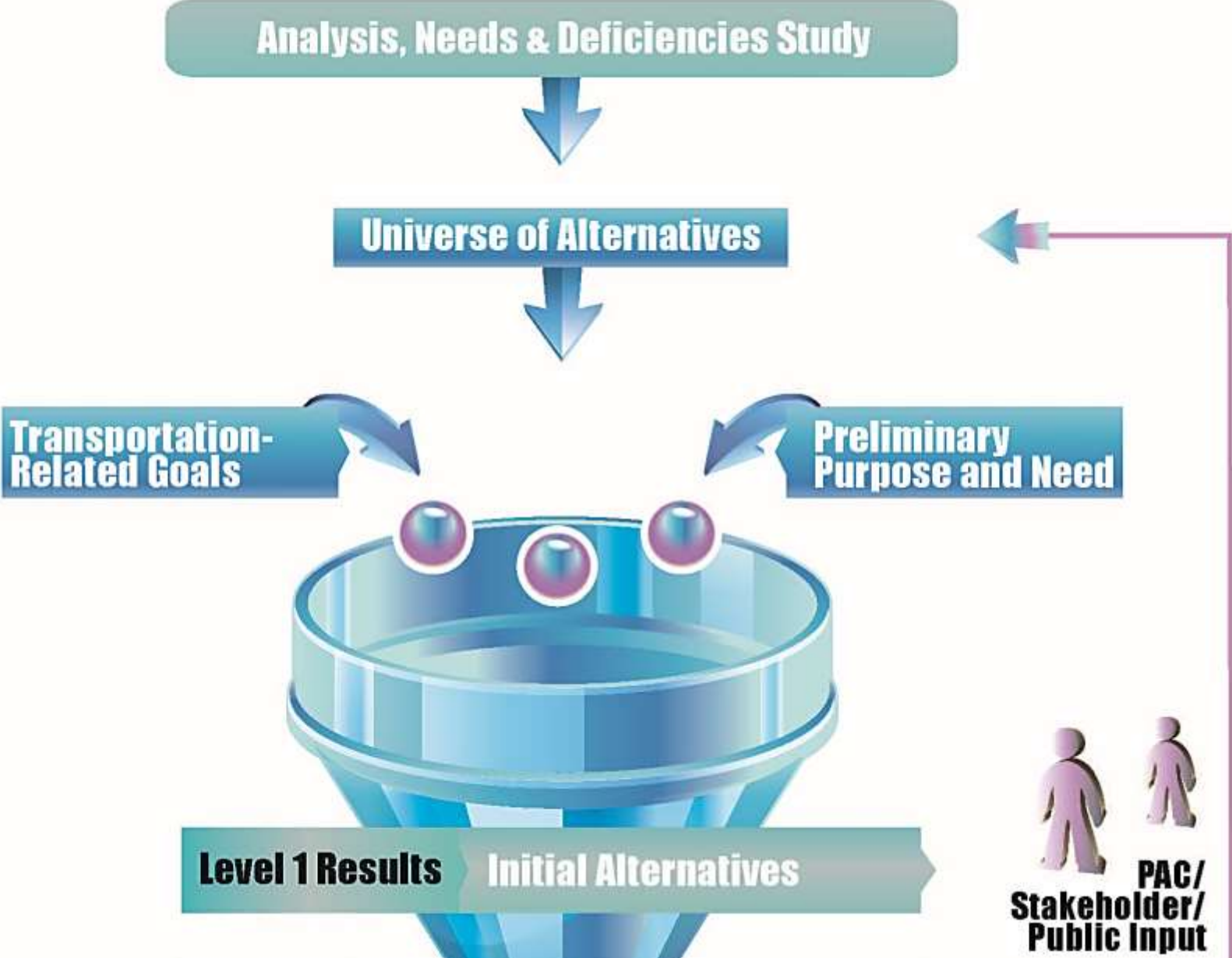
Conceptual level of engineering was performed to put ideas to paper. As the PEL Study progresses, these alternatives will become more defined.

Concepts are flexible! Favorable aspects could be added and unfavorable aspects could be subtracted.

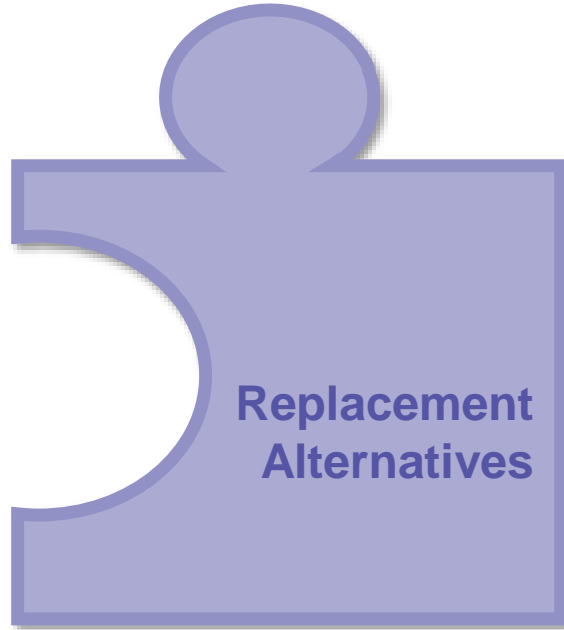
Developed during workshops and charettes based on: identification of constraints and challenges, State and Federal design standards, understanding program needs, input from a diverse team of experts, and determining evaluation criteria.







# The Universe of Alternatives: Replacement Alternatives



Any questions on the features of the Replacement Alternatives?

- I-84 and Route 8 Alignments
- System Connections
- Local Connectivity



# Reminder: PAC Input and Comments Due

On Draft PEL Documents:

Comments / Input Due: May 16, 2022

Email: Nhodges@hntb.com

May						
S	M	T	W	TH	F	S
24	25	26	27	28	29	30
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TODAY

COMMENTS DUE

PAC #3C

May 16, 2022

**Two week extension  
Comments Due:  
May 16th**

- The *Preliminary Purpose and Need Statement* report
- The *Analysis, Needs, and Deficiencies* Report



# Upcoming Meetings and Future PAC Agenda Items

## PAC Mtg #3A March 28, 2022

### Where:

Virtual via Zoom

### Topics:

- Present Universe of Alternatives and
- Obtain Input from PAC

## PAC Mtg #3B April 29, 2022

### Where:

Anticipated  
Virtual via Zoom

### Topics:

- Present Universe of Alternatives and
- Obtain Input from PAC

## PAC Mtg #3C Scheduled for May 23, 2022

### Where:

Anticipated  
Virtual via Zoom

### Topics:

- Review Universe of Alternatives and
- Level 1 screening Criteria
- Obtain Input from PAC



# Questions & Comments



# Thank you.

