

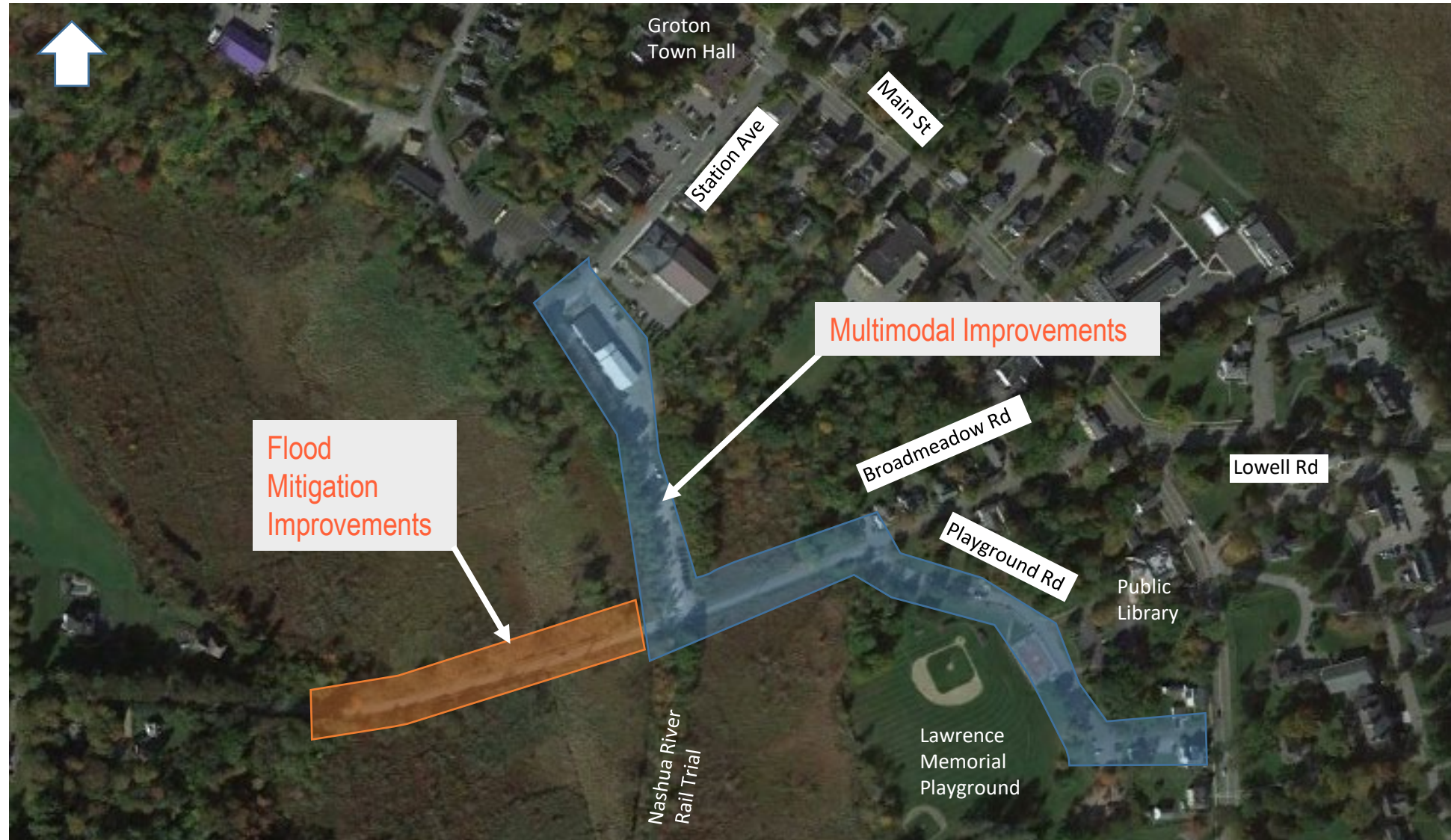


# Broadmeadow Road, Playground Road, and Station Avenue Revitalization

Town of Groton



# Project Location

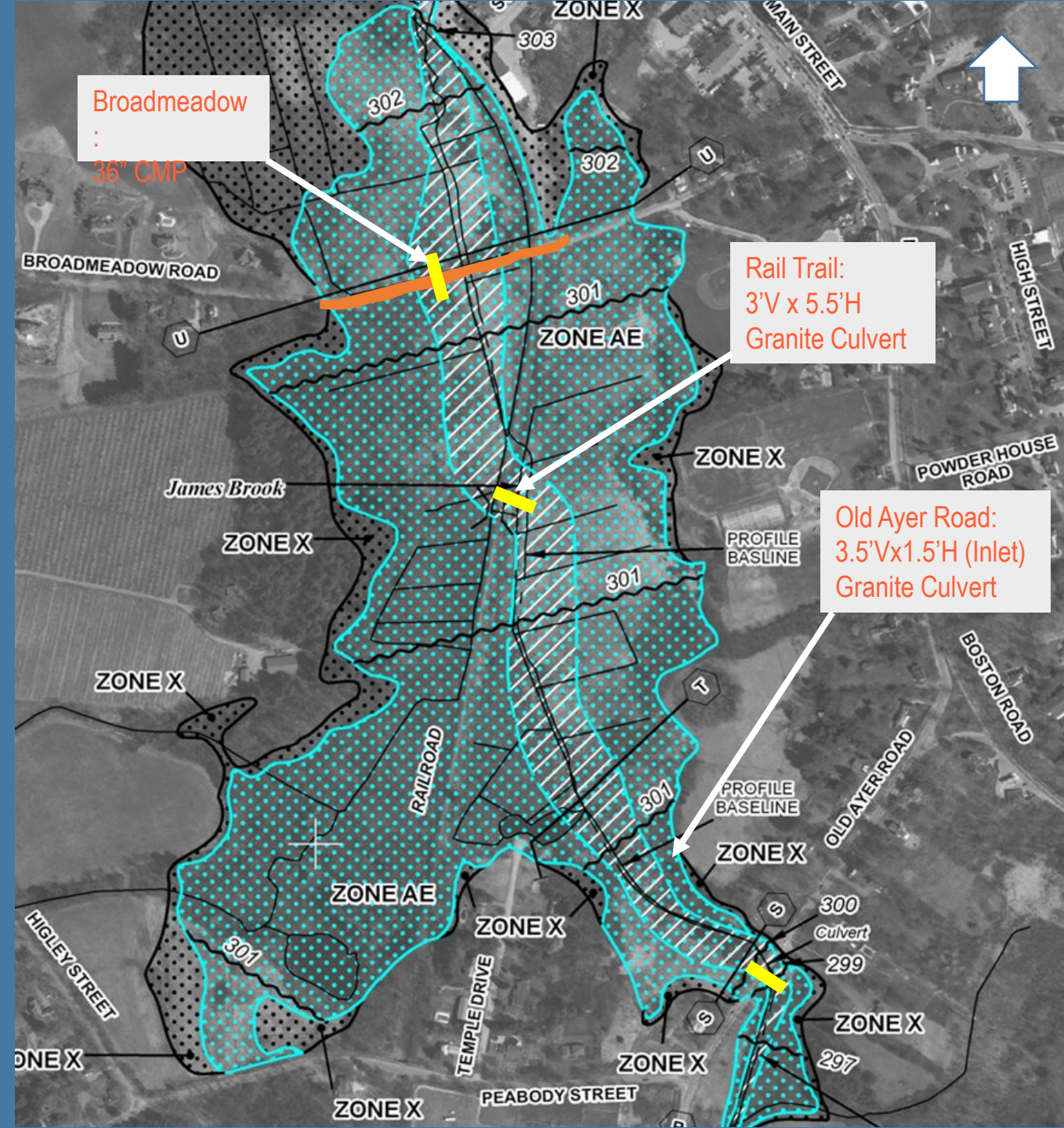


# Broadmeadow Road Flood Mitigation Improvements



# EXISTING CONDITIONS

- Broadmeadow Road in Floodplain (Orange)
- Culverts (Yellow)
  - Broadmeadow
  - Rail Trail, and
  - Old Ayer Road
- Flooding 1.28' Above Broadmeadow Road
- Flooding Contributors:
  - Low road elevations through natural low swamp/wetlands.
  - Undersized Culverts at Broadmeadow, Rail Trail, and Old Ayer Road.

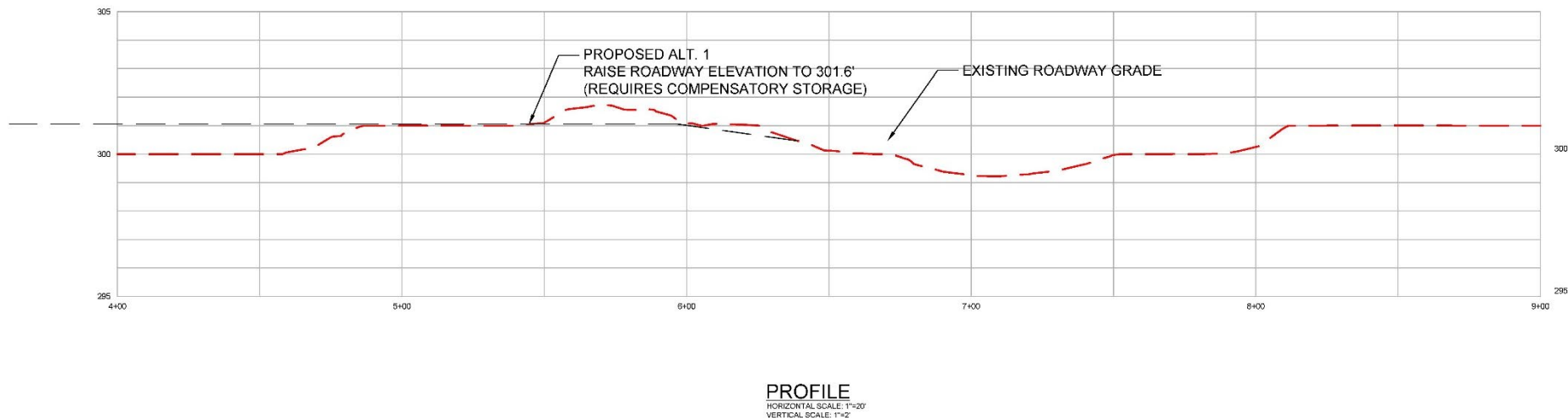


# Alternative 1: Elevate Roadway Above Floodplain

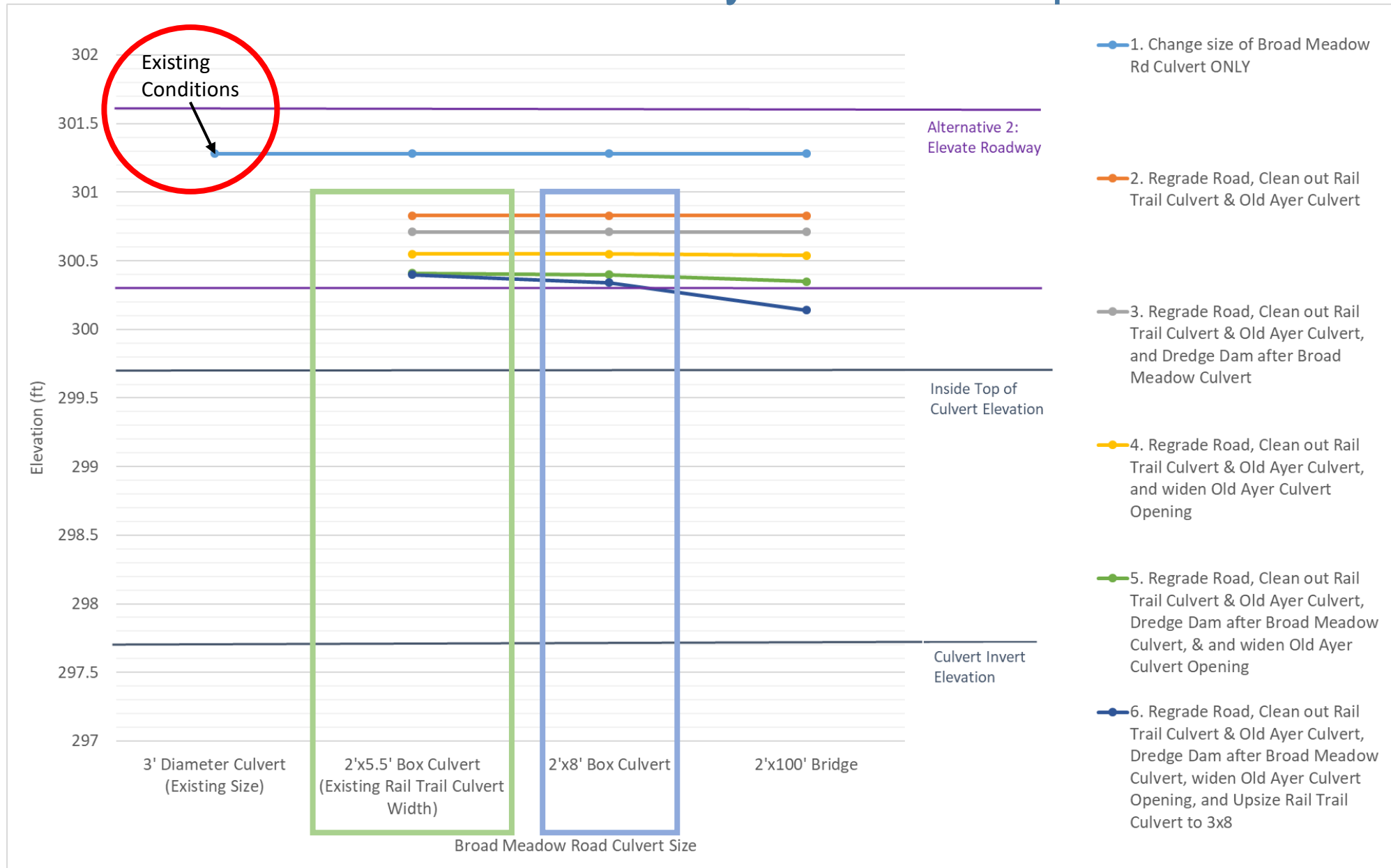




# Alternative 1: Elevate Roadway Above Floodplain

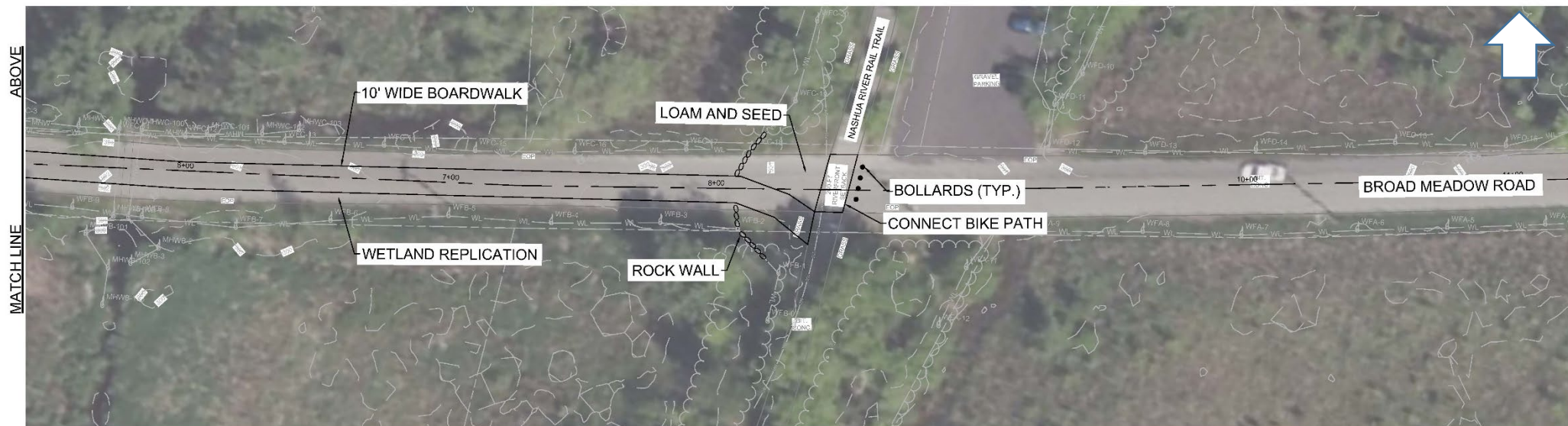
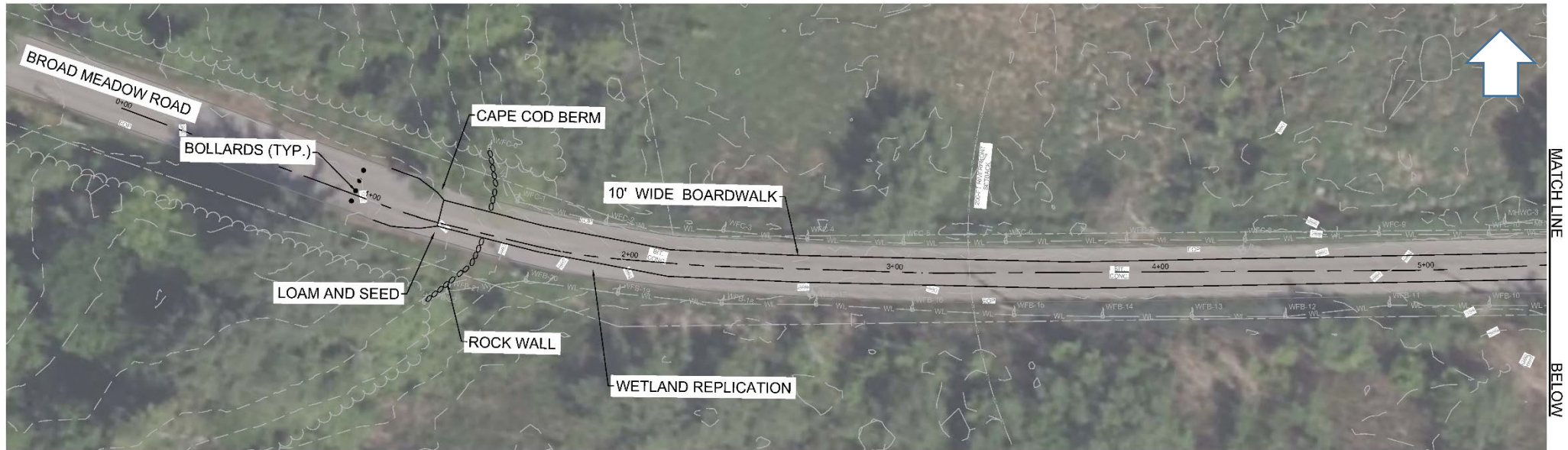


# Alternative 1: Elevate Roadway Above Floodplain





# Alternative 2: Road Removal and Boardwalk Installation





# Broadmeadow Road Flood Mitigation Order-of-Magnitude Opinion of Probable Construction Cost

<b>Elevate Roadway Above Floodplain</b>	<b>\$2.75M to \$4.12M</b>
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<b>Road Removal &amp; Boardwalk Installation</b>	<b>\$1.53M to \$2.3M</b>
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# Broadmeadow Road Flood Mitigation Alternatives Considerations

## Alternative 1:

### Elevate Roadway Above Floodplain

#### Advantages

- Road flood mitigation (up to 25-year Frequency)
- Sustainable Road
- Improved stream hydraulics (flow)
- Capable for emergency vehicle use
- Vehicular and pedestrian

#### Disadvantages

- Costs (Potentially \$1.8M more than Alternative 2)
- Impacts to wetland resource areas
- Compared to Alt. 2, less wetland and wildlife connection

## Alternative 2:

### Road Removal and Boardwalk Installation

#### Advantages

- Additional Recreational Connected Area
- Wetland resource improvements and restoration
- Additional flood storage
- Costs (\$1.8M less than Alt. 1)
- Reduced vehicle use (no longer a cut-thru roadway)
- Low Maintenance (No culvert or pavement)

#### Disadvantages

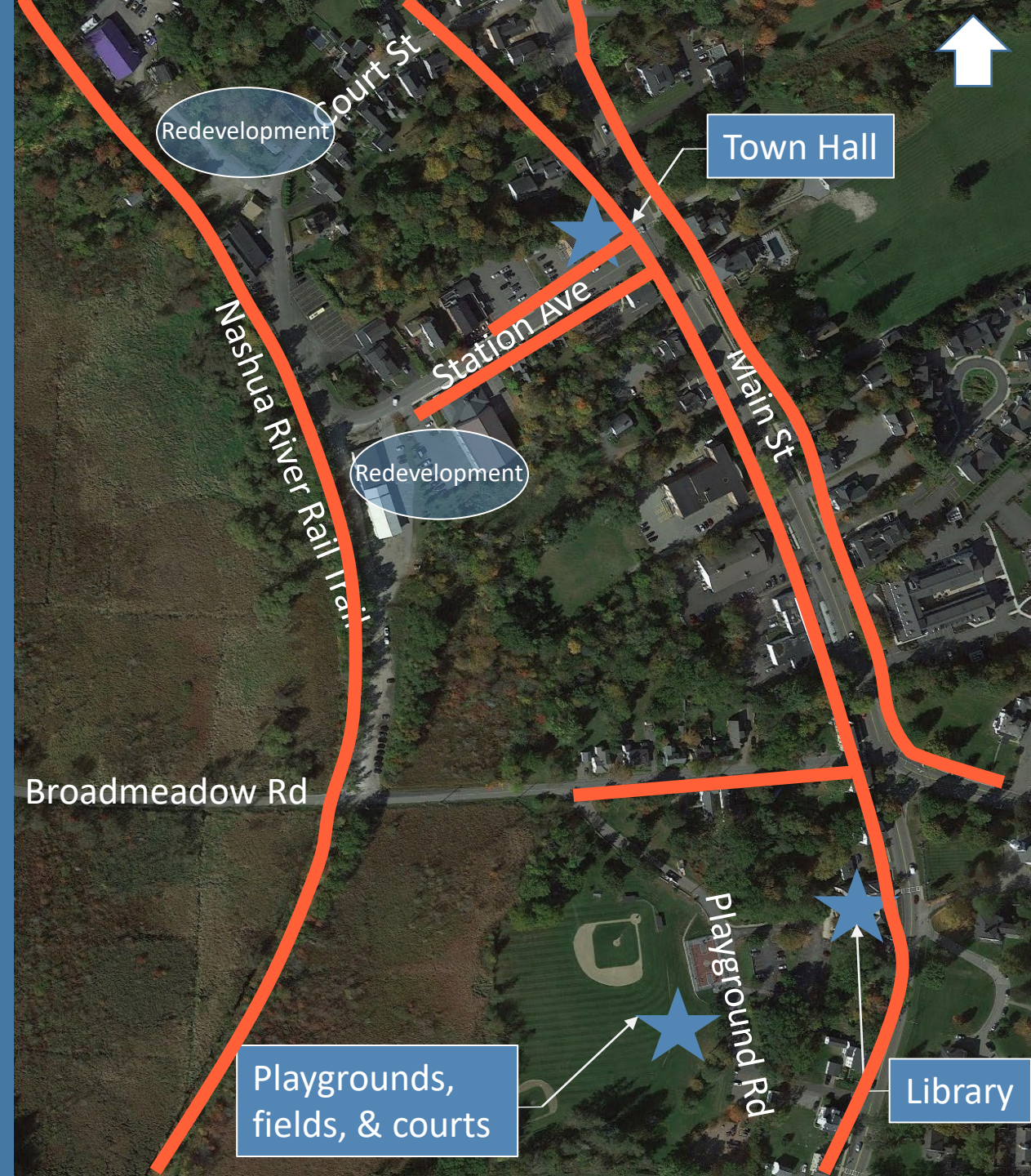
- Not available for emergency vehicle use
- Loss of connectivity to Main Street from Route 111
- Potential loss to utility pole access
- Requires development of a turnaround between Main St. and the Rail Trail
- Reduced vehicle use (no longer a cut-thru roadway)

# Multimodal Improvements



# PROJECT GOAL

- Address lacking bicycle/  
pedestrian connectivity
  - Historic Town Center
  - Nashua River Rail Trail
  - Station Avenue Revitalization
  - Groton Town Hall
  - Groton Public Library
  - Lawrence Memorial & Hanson  
Playgrounds
  - Recreational fields and courts
  - Potential redevelopment



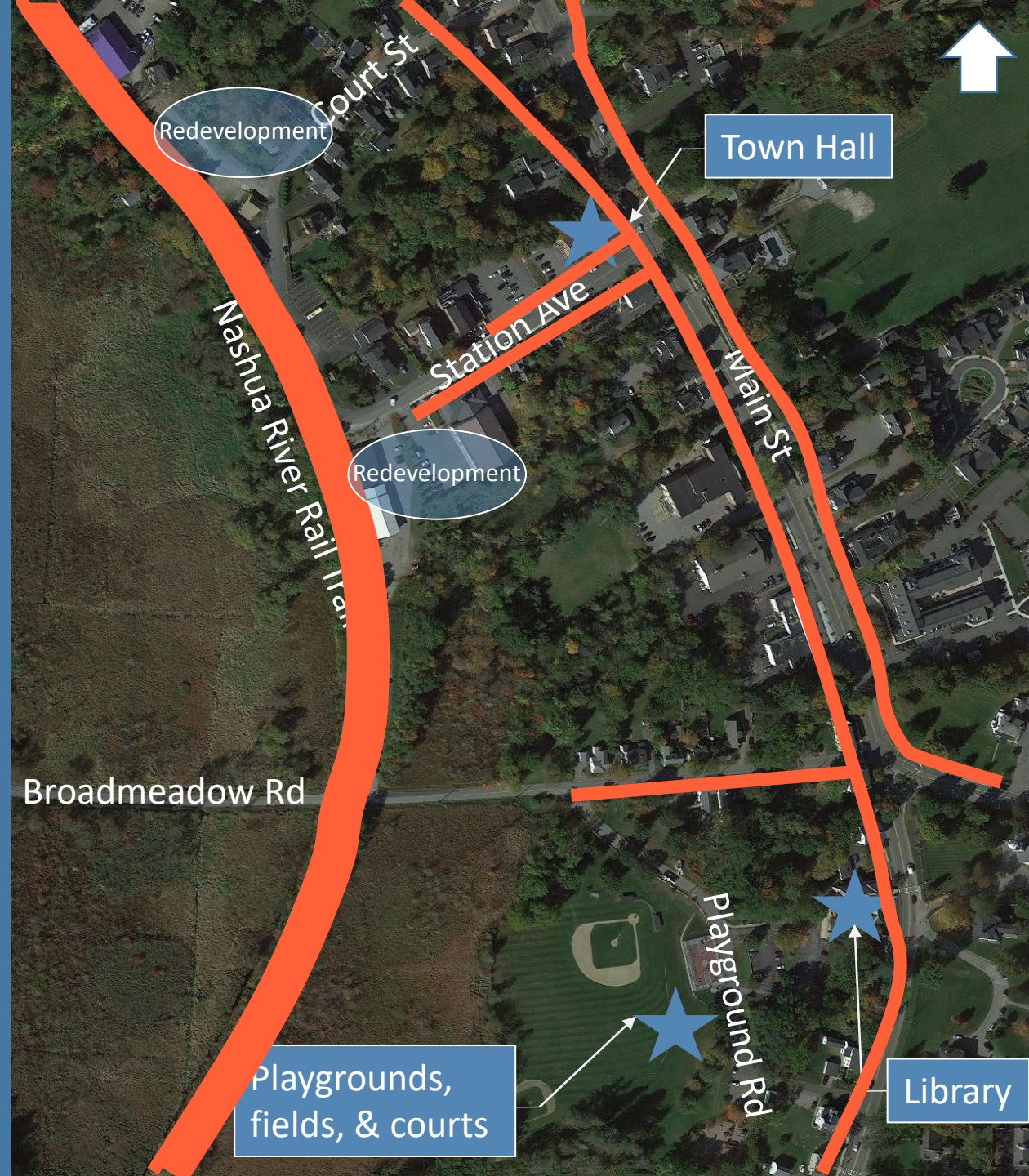


# OPPORTUNITIES

- Nashua River Rail Trail

*Versus*

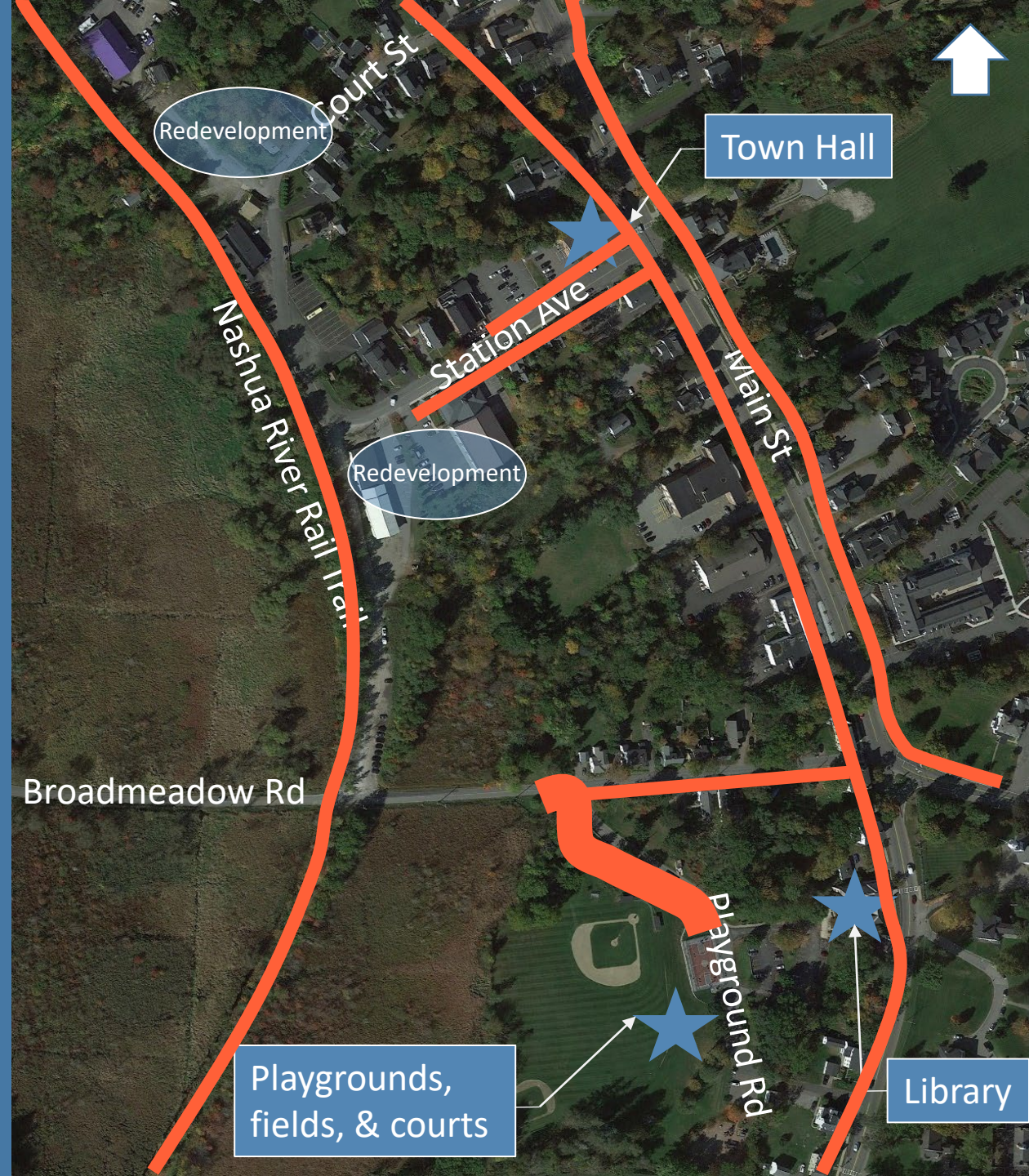
Main Street





# OPPORTUNITIES

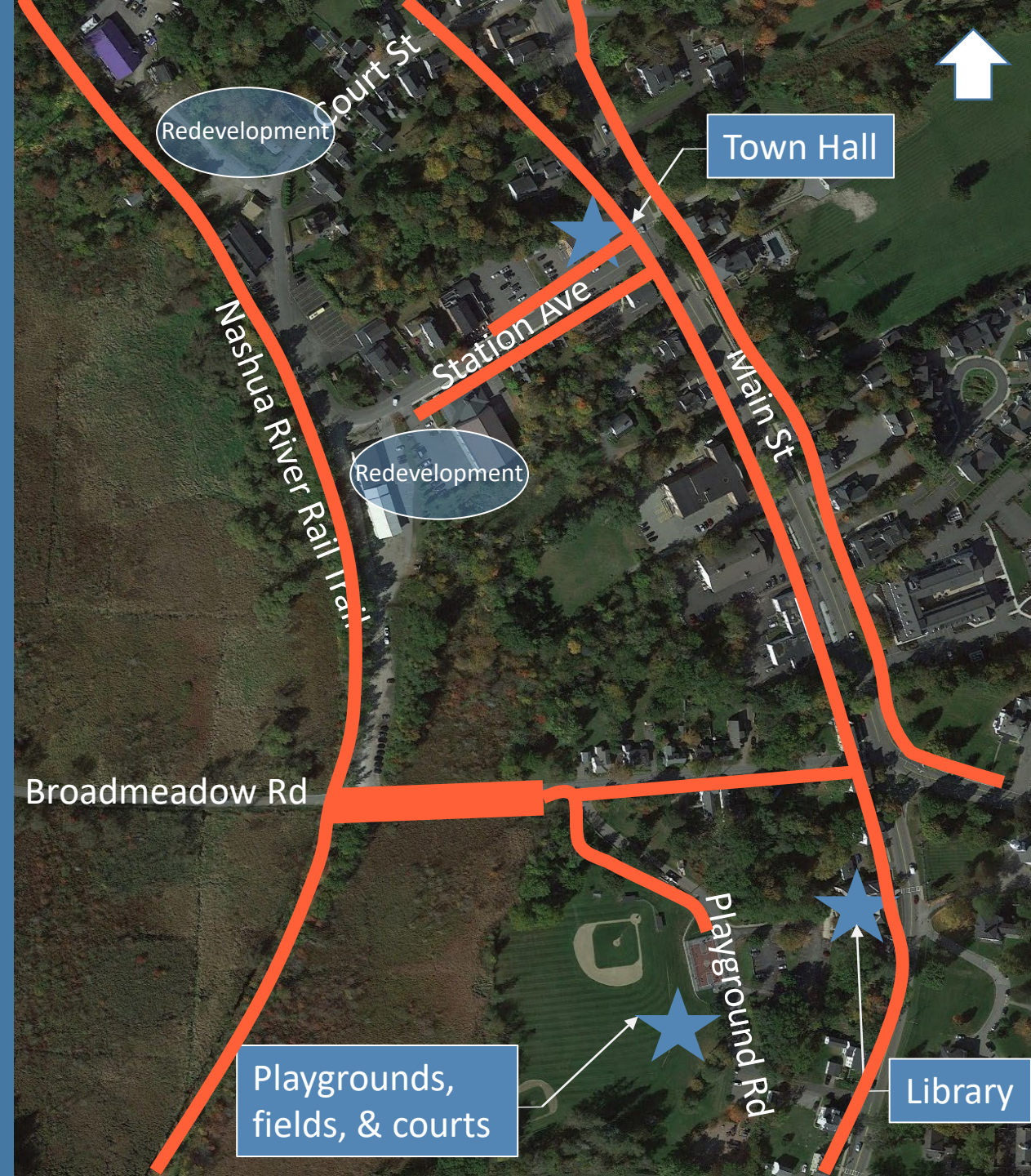
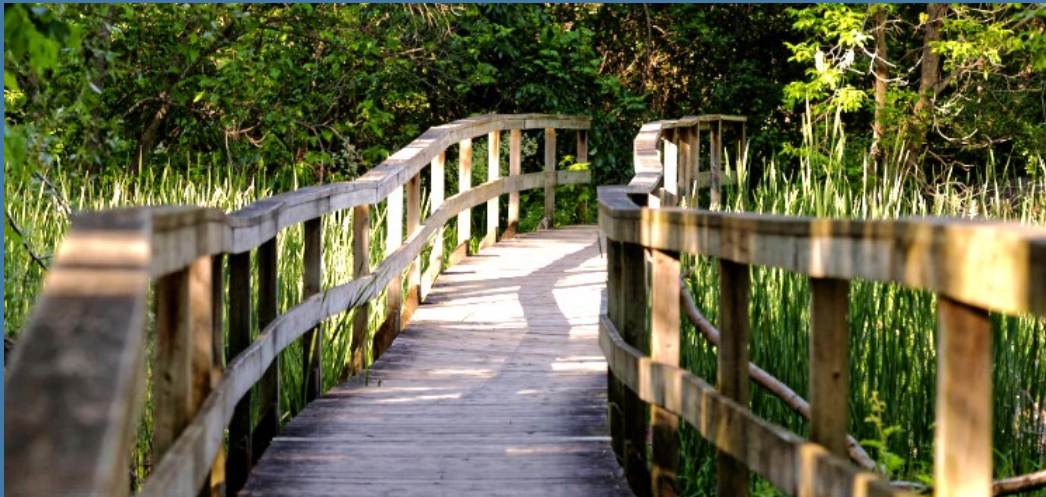
- Nashua River Rail Trail
- Connection along Playground Road





# OPPORTUNITIES

- Nashua River Rail Trail
- Connection along Playground Road
- Boardwalk along Broadmeadow Road to minimize impacts & connect to the Trail





# BROADMEADOW RD. & PLAYGROUND RD.

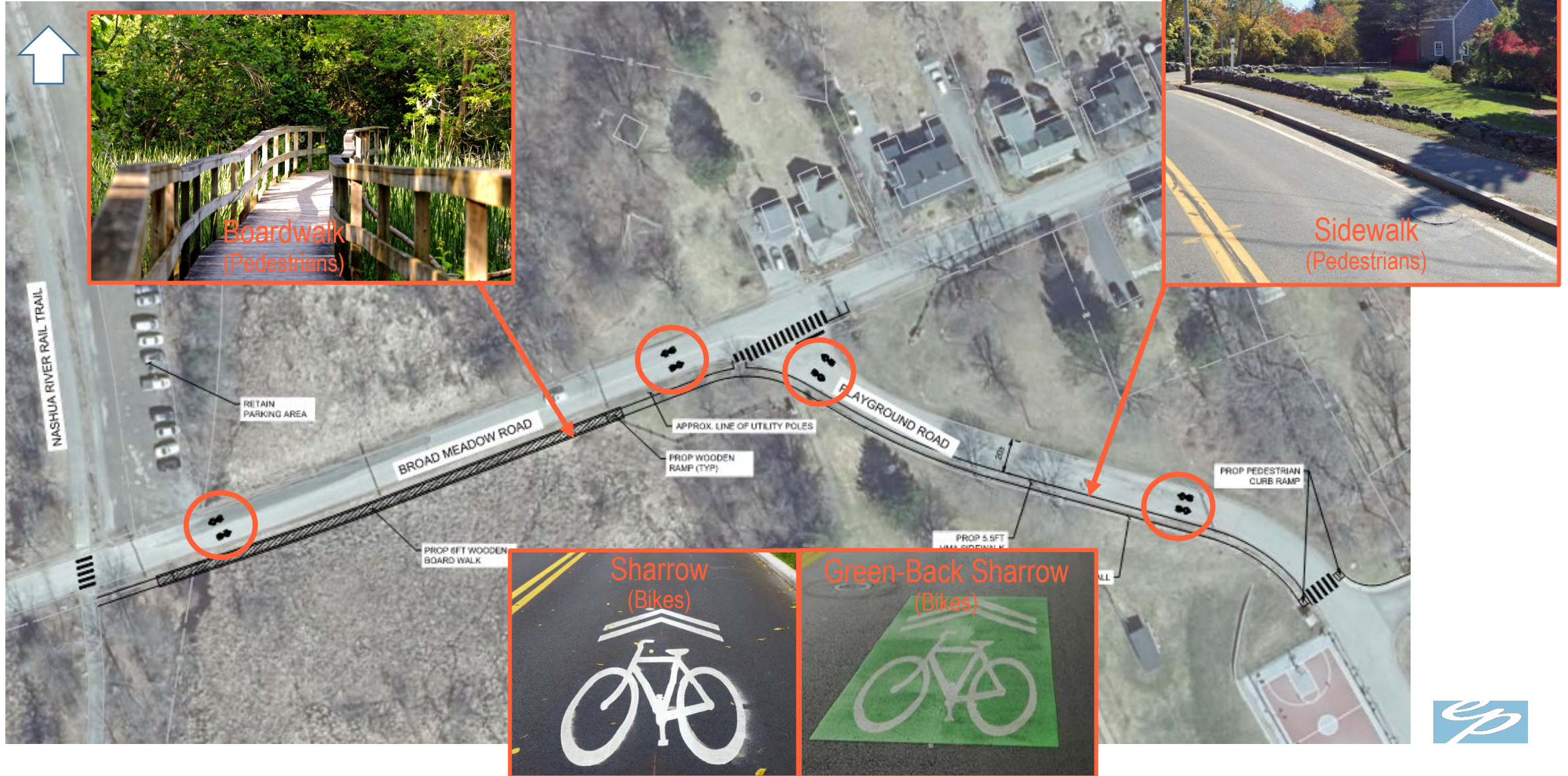
## Alternative 1 – Shared Use Path





# BROADMEADOW RD. & PLAYGROUND RD.

## Alternative 2 - Sidewalk with Sharrow Markings





# BROADMEADOW RD. & PLAYGROUND RD.

## Summary

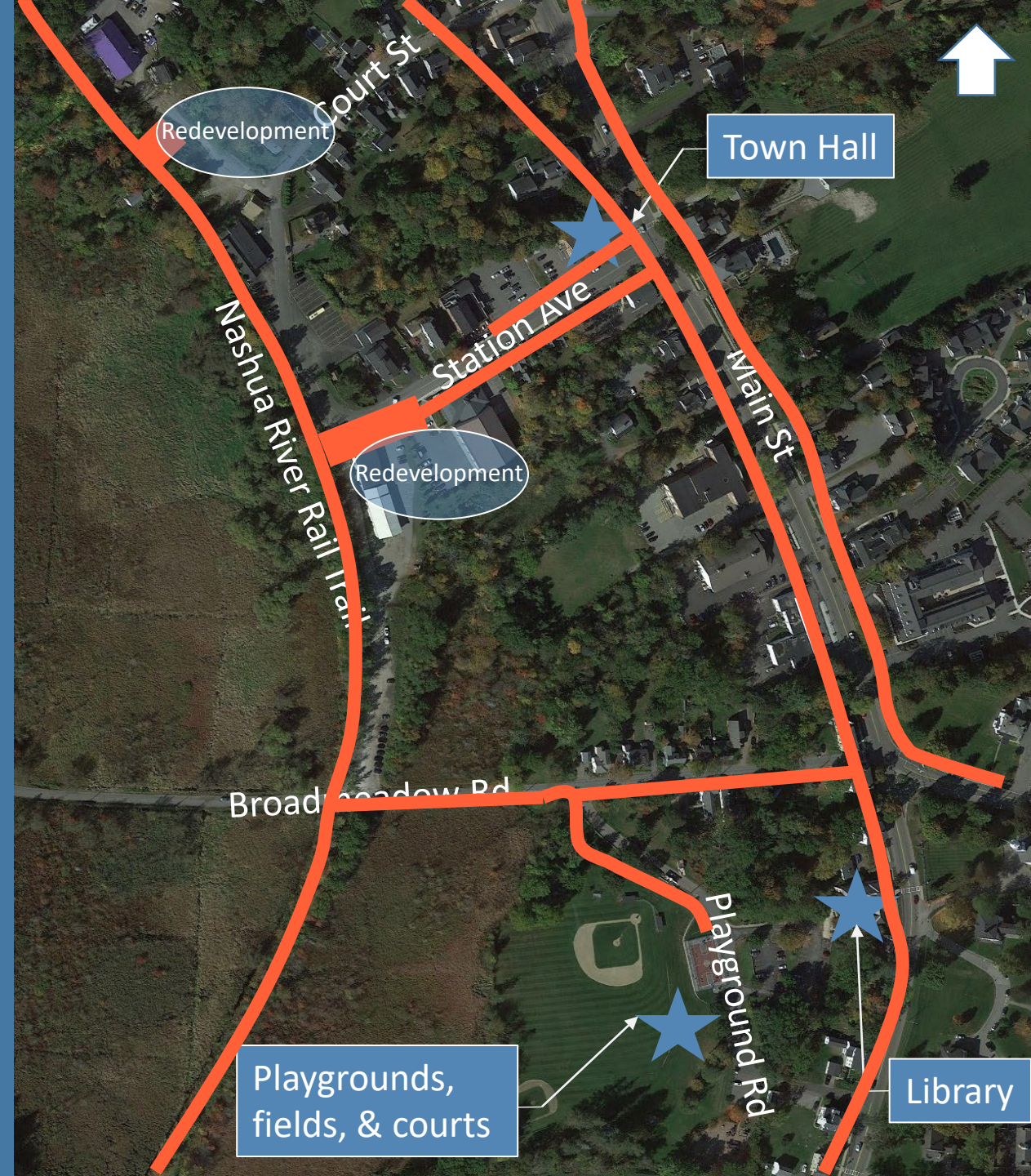


	Alternative 1 – Share Used Path	Alternative 2 –Sidewalk & Sharrow Markings
Separation between motorists and pedestrians for comfort/safety	✓ YES	✓ YES
Separation between motorists and bikes for comfort/safety	✓ YES	X NO
Defined multimodal hub at Rail Trail	✓ YES	X NO
Approx. Construction Cost	\$570,000	\$440,000



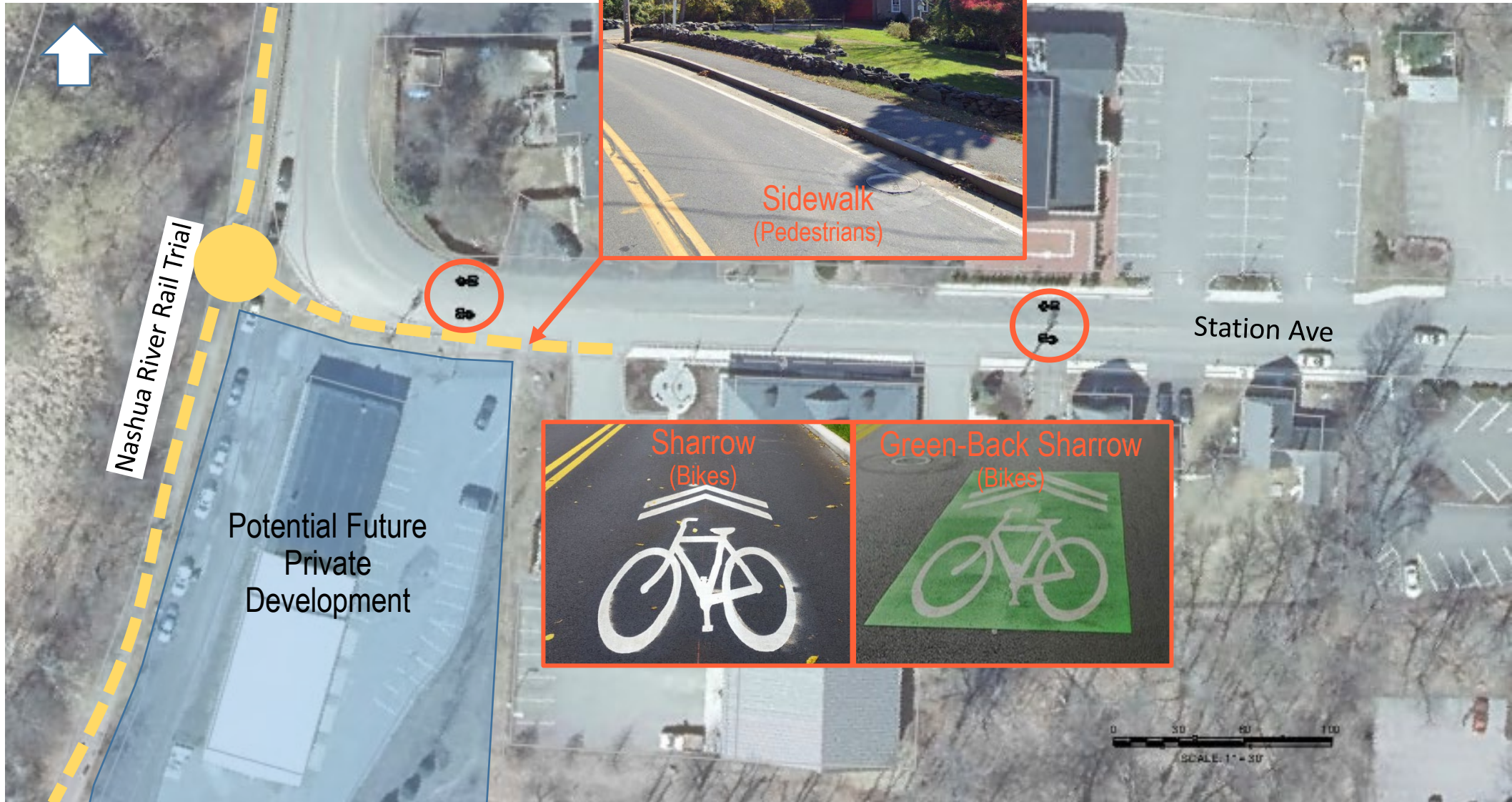
# OPPORTUNITIES

- Additional connections to Rail Trail for future development





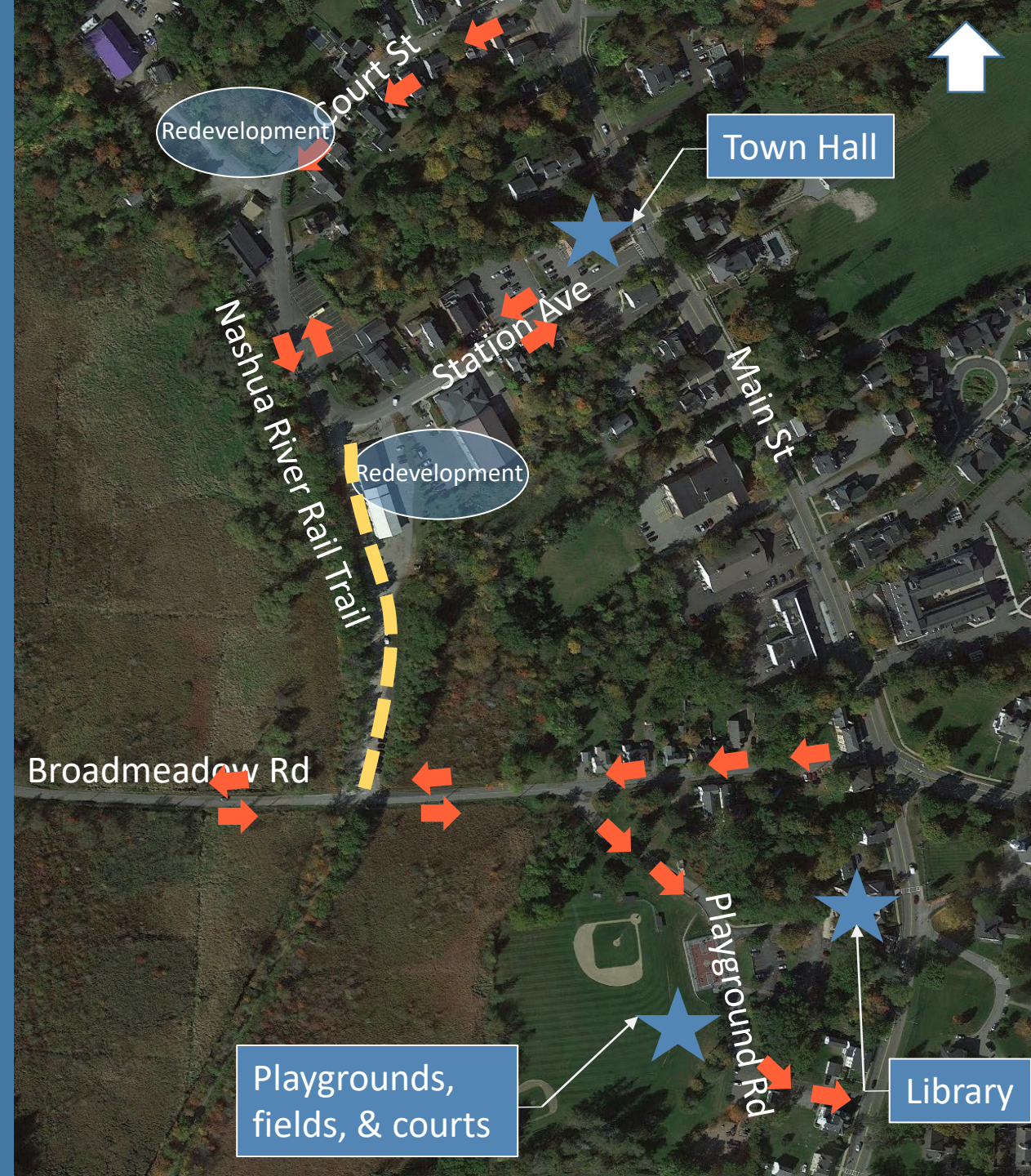
# Station Avenue





# PROJECT GOAL

- Improve vehicular circulation & safety (Broad Meadow Rd. to Station Ave.)





# BROADMEADOW RD. TO STATION AVE.



ALTERNATIVE 1: CUT-THROUGH



ALTERNATIVE 2: CUL-DE-SAC



ALTERNATIVE 3: HAMMERHEAD





# BROADMEADOW RD. TO STATION AVE.

## Summary



	Alternative 1 – Cut Through	Alternative 2 – Cul-de-Sac	Alternative 3 – Hammerhead
Vehicular connectivity (avoiding Main St.)	✓ YES	X NO	X NO
Access Permit req'd	✓ YES	X NO	X NO
Wetland impacts	X NO	✓ YES	X NO
Smoother flow for multiple vehicles	✓ YES	✓ YES	X NO
Approx. Construction Cost	\$180,000*	\$240,000	\$202,000

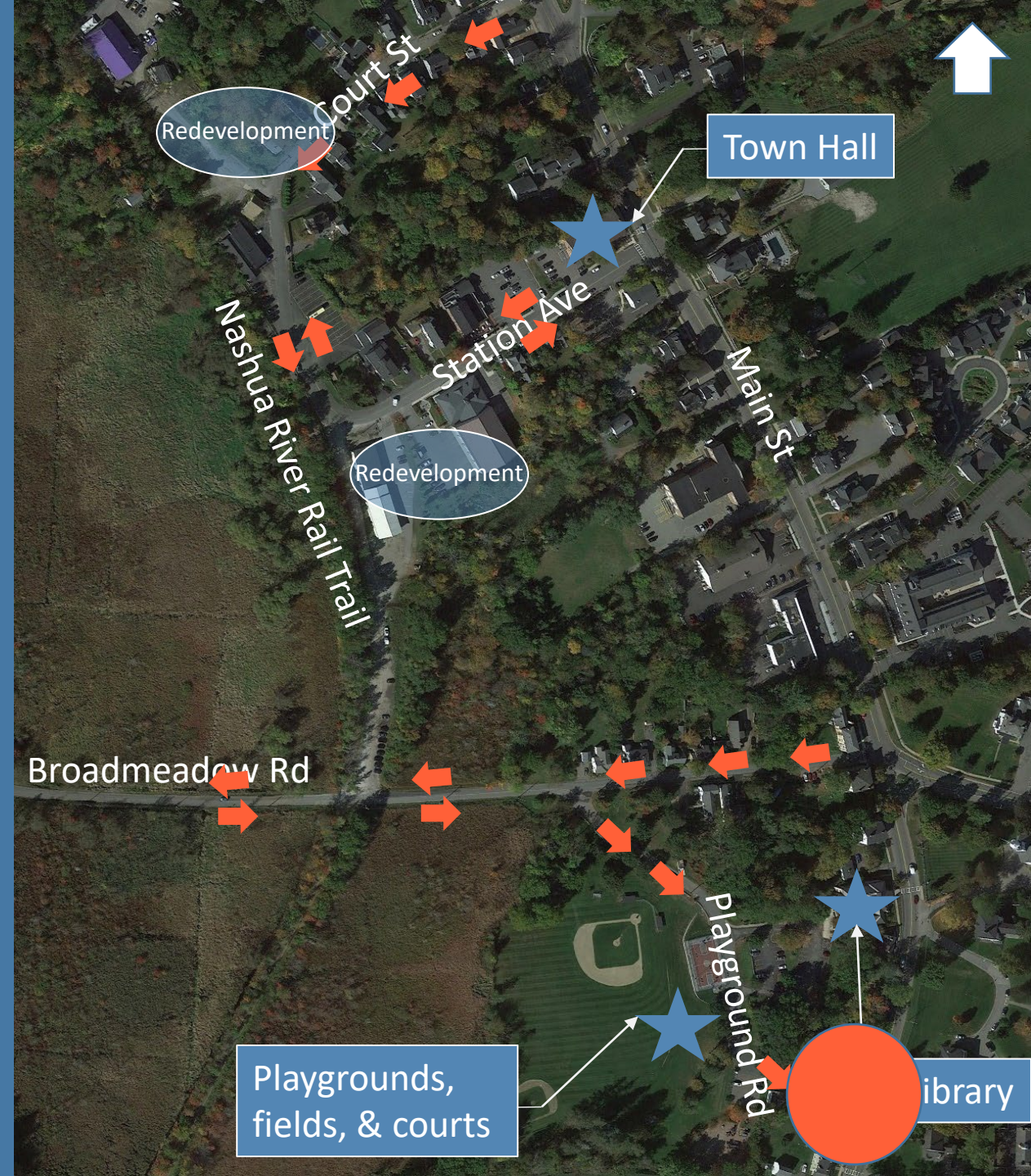
\*does not included construction within private property





# PROJECT GOAL

- Improve vehicular circulation & safety (Main St. at Playground Rd.)





# MAIN ST. AT PLAYGROUND RD.

## Existing Sight Distance



Playground Road Approach – Looking North



Main Street Approach – Looking South



# MAIN ST. AT PLAYGROUND RD.

## Existing Sight Distance





# MAIN ST. AT PLAYGROUND RD.

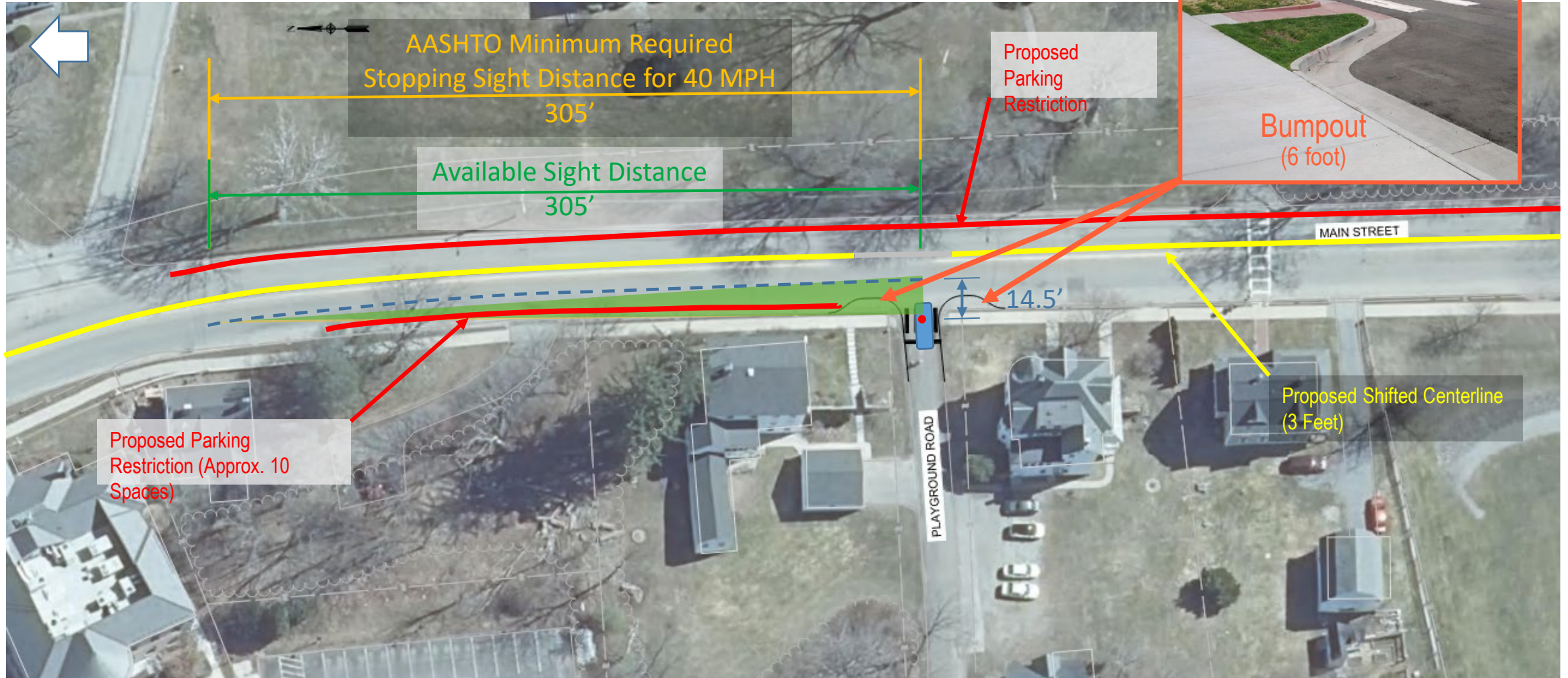
## Alternative 1- Small Bumpout





# MAIN ST. AT PLAYGROUND RD.

## Alternative 2- Larger Bumpout with Centerline Shift





# MAIN ST. AT PLAYGROUND RD.

## Summary



	Alternative 1 – Small Bump Out	Alternative 2 – Larger Bump Out
Adequate Sight Distance provided	<b>X</b> NO	<b>✓</b> YES
Additional parking restrictions	<b>X</b> NO	<b>✓</b> YES
Approx. Construction Cost	\$30,000	\$50,000



Transportation Improvements  
Order-of-Magnitude Opinion of Probable Construction Cost  
**Broad Meadow Road and Playground Road**

Alternative 1 - (Boardwalk and Shared Use Path) \$570,000

Alternative 2 - (Boardwalk and Sidewalk with Sharrow Markings) \$440,000

**Between Broad Meadow Road and Station Avenue**

Alternative 1 – Cut-Through and Parking Area \$180,000

Alternative 2 – Cul-de-sac Turnaround and Parking Area \$240,000

Alternative 3 – Hammerhead Turnaround and Parking Area \$202,000

**Main Street at Playground Road Intersection**

Alternative 1 – 3-Foot Bumpout \$30,000

Alternative 2 – 6-Foot Bumpout with Centerline Shift \$50,000





# THANK YOU

ENVIRONMENTAL  
 PARTNERS  
— An Apex Company —



# Transportation Improvements Pros and Cons

**X NO**

**✓ YES**

	Alternative 1 – Boardwalk/ Share Used Path	Alternative 2 –Boardwalk/ Sidewalk & Sharrow Markings
Separation between motorists and pedestrians	<b>YES</b>	<b>YES</b>
Separation between motorists and bikes	<b>YES</b>	<b>NO</b>
Greater level of comfort for vehicular and pedestrian	<b>HIGH</b>	<b>HIGH</b>
Greater level of comfort for vehicular and bikes	<b>HIGH</b>	<b>LOW</b>
Construction Cost & Impacts	<b>HIGHER</b>	<b>LOWER</b>