



Belmont Community Path Phase 2: Clark Street Bridge to Waltham Line

Town of Belmont, MA

*Technical Expertise With a
Personal Approach!*

**Community Forum #1
May 18, 2023**



1. Introduction Russell Leino and Holly Muson, CPPC
2. Project History Amy Archer, Pare
3. Scope & Schedule Amy Archer, Pare
4. Public Engagement Kathleen Fasser, Toole
5. Data Collection Amy Archer, Pare
6. Evaluation Criteria Kathleen Fasser, Toole
7. Draft Recommendation Amy Archer, Pare
8. Questions and Feedback In-person and Virtual Attendees
9. Next Steps Amy Archer, Pare

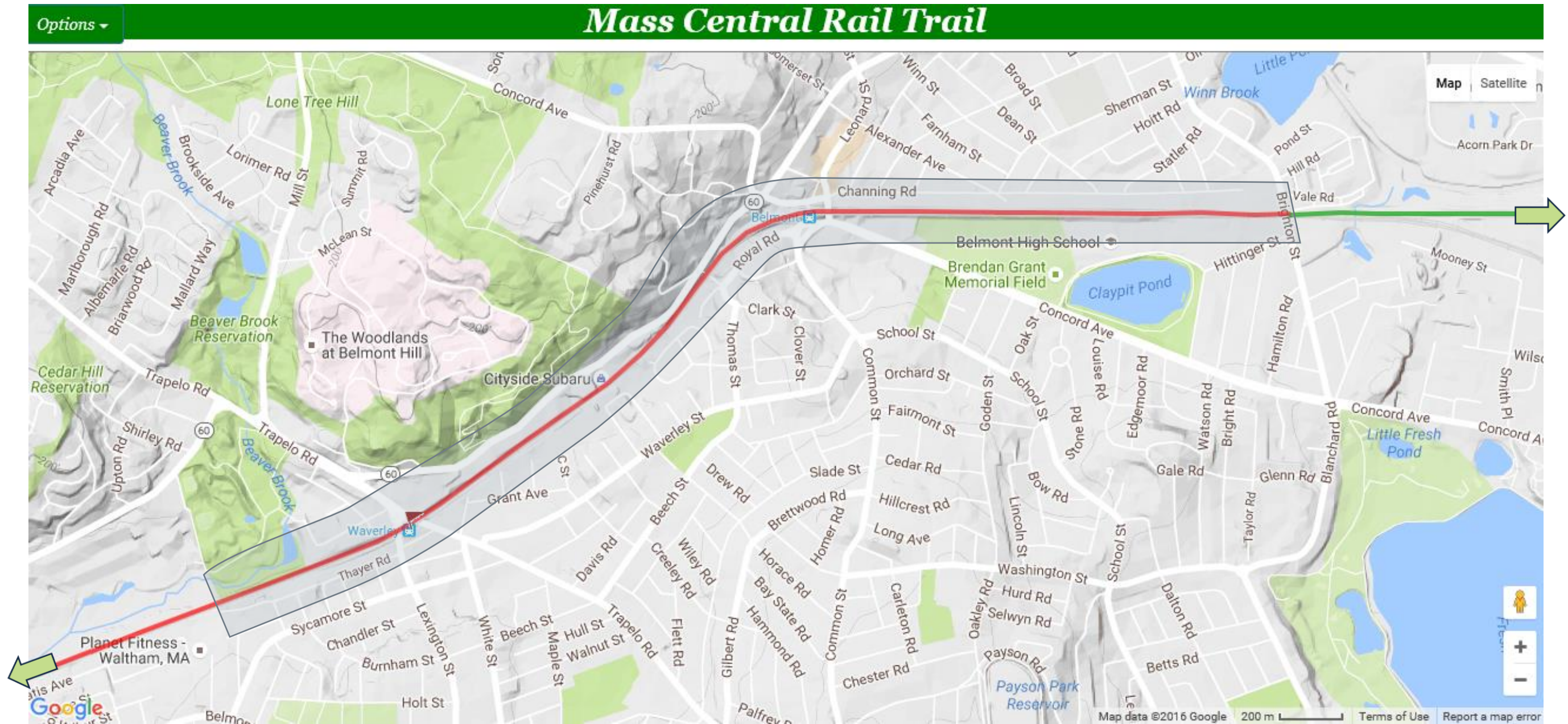
- Please provide feedback after the presentation.
 - You will find information on how to give feedback at the end of the presentation.
- Q&A function is open for comments during the presentation and will be addressed at the end of the presentation
- Cameras + microphones
 - Your camera is on
 - We will enable your microphone only when you are speaking after the presentation

Please note that this public meeting will be recorded and the recording will be posted online shortly after.

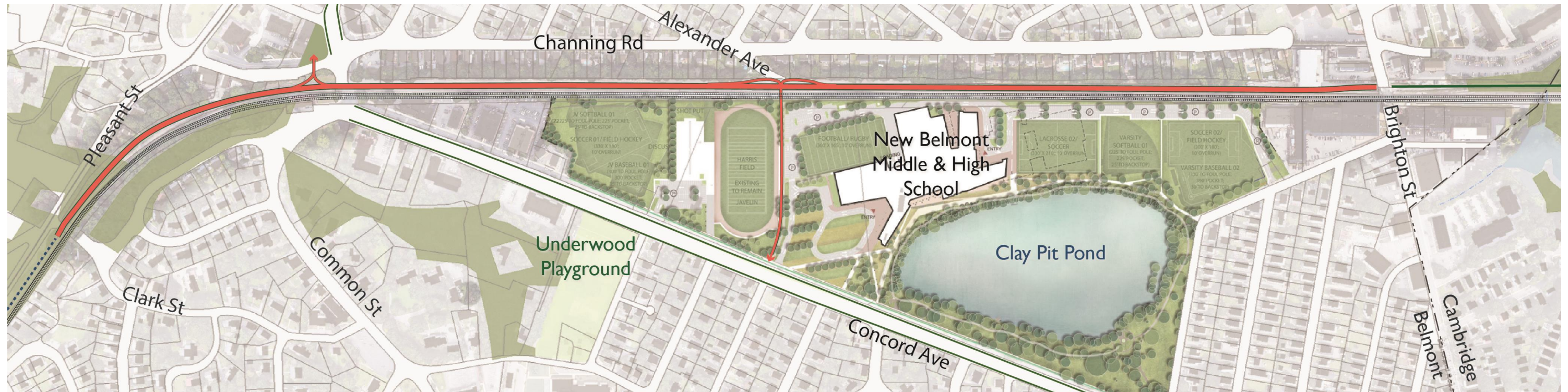


- › 1994: With potential for funding, the BOS formed the Bikeway Planning Committee
- › 1997: Proposal for a multi-use path through Belmont started to advance as part of the Mass Central Rail Trail (MCRT)
- › 1997: Wallace Floyd Group prepared the Belmont Bikeway Preliminary Feasibility Analysis
- › 1998: MCRT was stalled due to lack of funding and lack of participation from communities along route; some communities including Cambridge proceeded independently
- › 2010: Construction began on Fitchburg Cutoff Path; DCR signed 99-year lease for abandoned CMRR corridor (Waltham to Berlin)
- › 2012: Belmont Bikeway Trail Alignment Study conducted by Metropolitan Area Planning Council (MAPC)
- › 2012: BOS elected CPAC to review previous efforts, obtain public input and recommend alternatives for path
- › 2014: CPAC delivered final report and recommendations
- › 2016: BOS elected CPIAC to enlist and facilitate the use of the Pare consultant team to evaluate the proposed recommendations
- › 2017: BOS endorsed the recommended route from the Feasibility Study prepared by the Pare consultant team
- › 2019: Design of Phase 1 began by Nitsch

Path History – MCRT Route



104 miles → connecting 24 communities → Boston to Northampton



- › Extends from the Fitchburg Cutoff Path to the Clark Street Bridge
- › Runs along the north side of the rail
- › Makes connections to Belmont Center, the Middle/High School and through the campus to Concord Avenue
- › Completed 25% Design Submission (2021)
- › Programmed on FFY2026 TIP for \$21M with Boston Region MPO support (2022)

Goal Focused Design

- Practicability/constructability review
 - Changes to Existing Conditions since Feasibility
 - Borings/Geotechnical Analysis
- Surveying
 - Determined Route
 - MassDOT Standards
- Trail, Landscape and Structural Design
 - Cohesive product
 - Accessibility to all users
- Funding, Agency Coordination and Construction Administration
 - Assisting all elements of project through completion

A. Recommendation of Final Alignment

B. Preparation and Submittal of Project
Initiation Form

C. Public Engagement

D. Existing Conditions, Survey, and Information
Gathering

E. Preliminary Design and Design Development

F. Final Design and Construction Bid
Documents



G. Construction Oversight

Project Schedule

Town of Belmont - Belmont Community Path Phase 2



Task	2023												2024												2025					
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Spring	
Project Coordination with Town/CPPC		C			X						C			X			C		X				C		C		X			
Task A - Recommendation of Final Alignment																														
Task B - Submit for Mass DOT Funding																														
Task C - Public Engagement																														
Kick-off/Scoping Meeting	X																													
Finalize Public Engagement Plan (PEP)																														
Public Engagement During Task A - Alts Analysis		X			X																									
Public Engagement During Task E - Prelim Design									X						X															
Public Engagement During Task F - Final Design																	X					X					X			
Task D - Land Survey and Existing Conditions																														
Existing Conditions Survey (incl. ROW)																														
Field Verification (critical areas)																														
Document Review																														
Detailed Field Work (3 field visits)																														
Task E - Preliminary Design																														
Preliminary Design Plans (approx 9 sheets)																														
Early Environmental Coordination (EEC/CE)																														
Preliminary Cost Estimate																														
Task F - Construction Plans, Specs and Estimate																														
75% Design Plans (approx 9 sheets)																														
75% Cost Estimate																														
75% Specifications (job specific)																														
100% Design Plans (approx 9 sheets)																														
100% Cost Estimate																														
100% Specifications (job specific)																														
Regulatory Permits and Approvals																														
Bid Procedure (incl. mtg)																														
Task G - Construction Oversight																														

LEGEND
 X = Meeting
 C = Conference Call
 = Pare Progress
 = Town/Agency Review



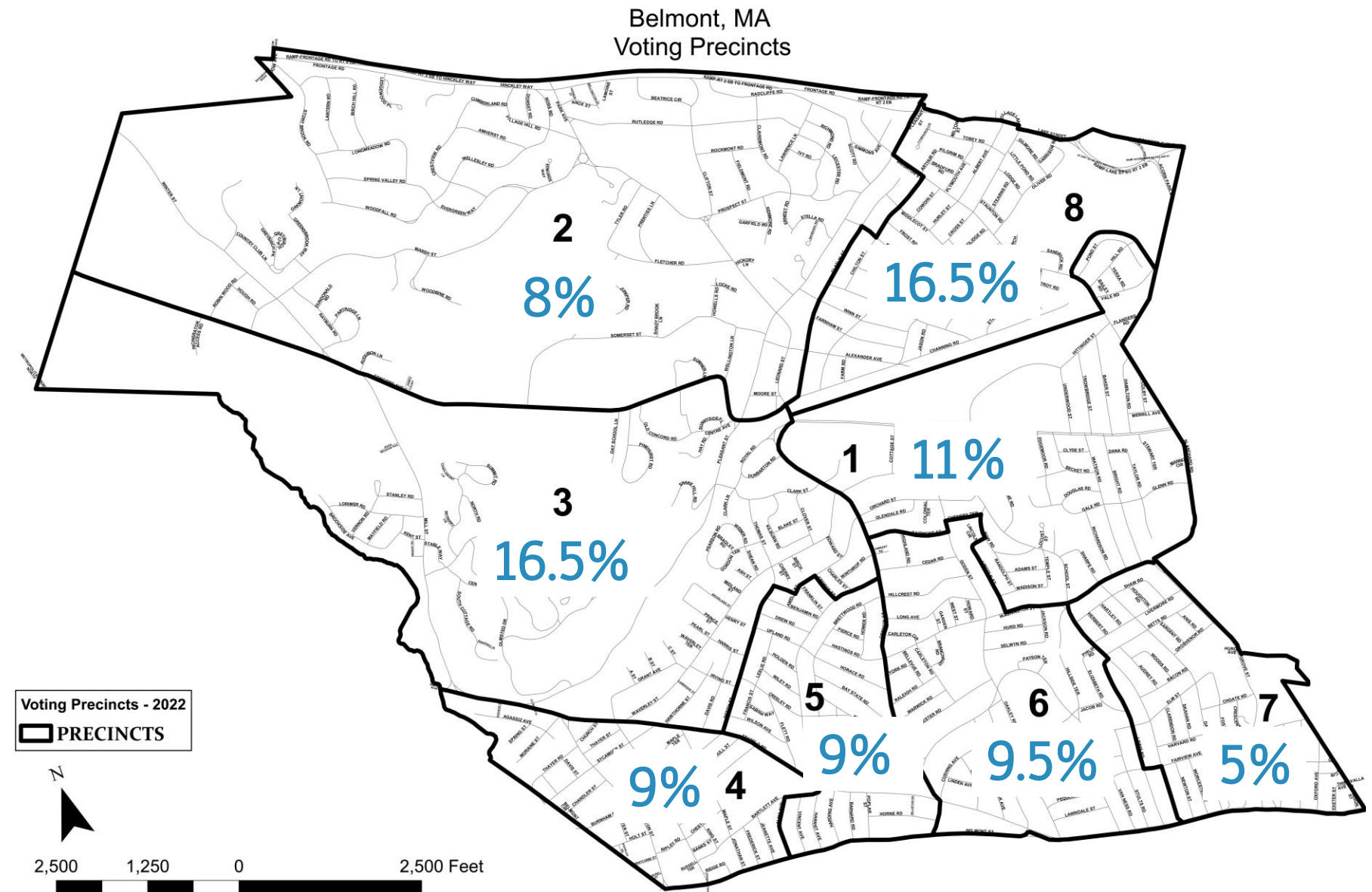
PARE
CORPORATION

TOOLE
DESIGN

Who Responded?

- 622 total responses
- 48% female, 46% male, 1% gender nonconforming or nonbinary
- 80% live in Belmont, 28% commute through Belmont
- Approximately 30% responded that they have a disability that makes it challenging to get around
- 56% responded that they identify as a race other than white

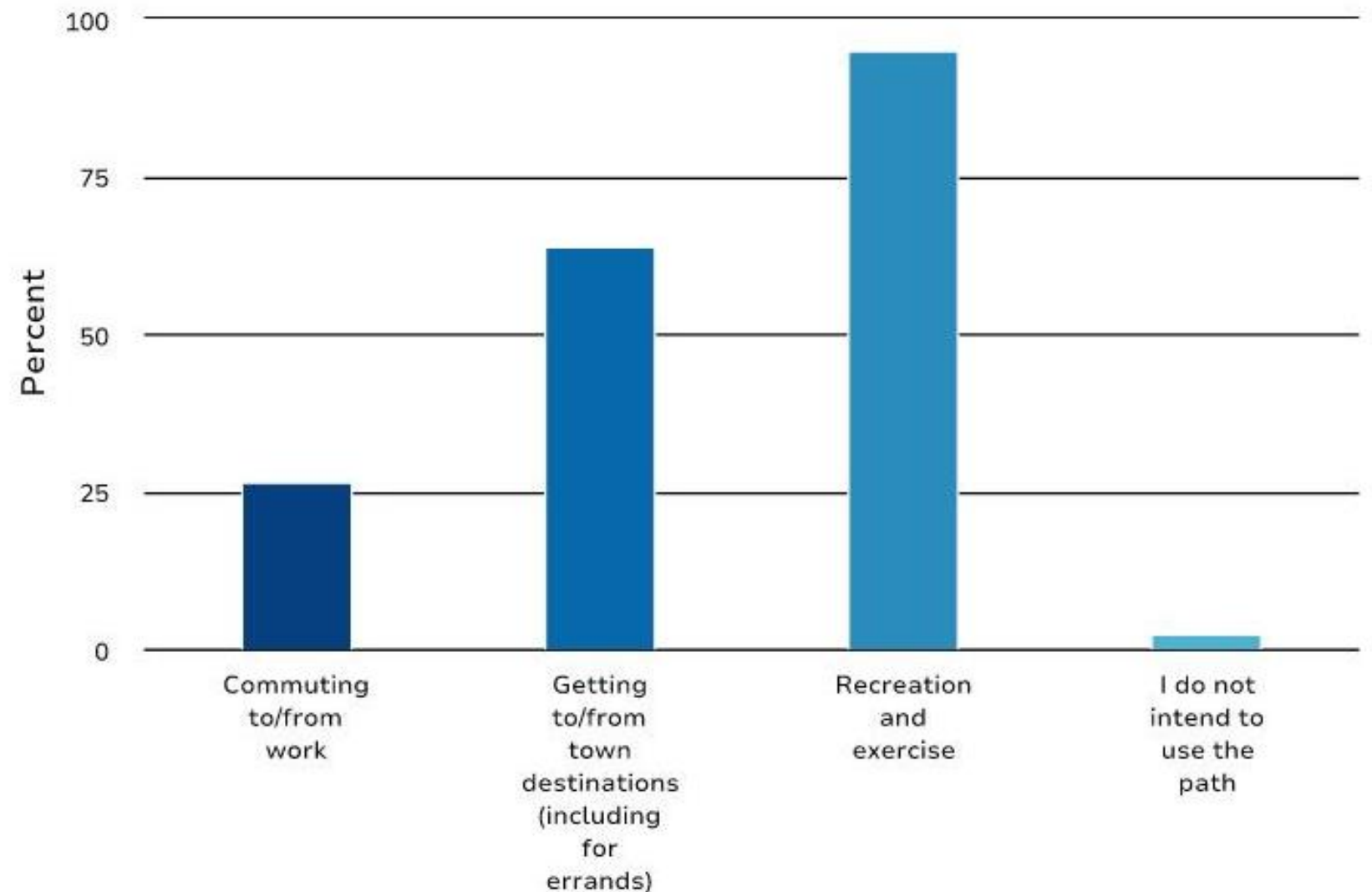
GREAT RESPONSE!



Path Use

- Parking
 - 71% Never
 - 25% Sometimes/occasionally
 - 4% Always need parking
- Shoulders
 - 71% Don't have a preference
 - 23% 3' should on both sides
 - 7% 4' one side/2' other side
- Buffer from railroad tracks
 - 43% Will use it regardless
 - 30% Glad it will be separated
 - 24% Planted buffer

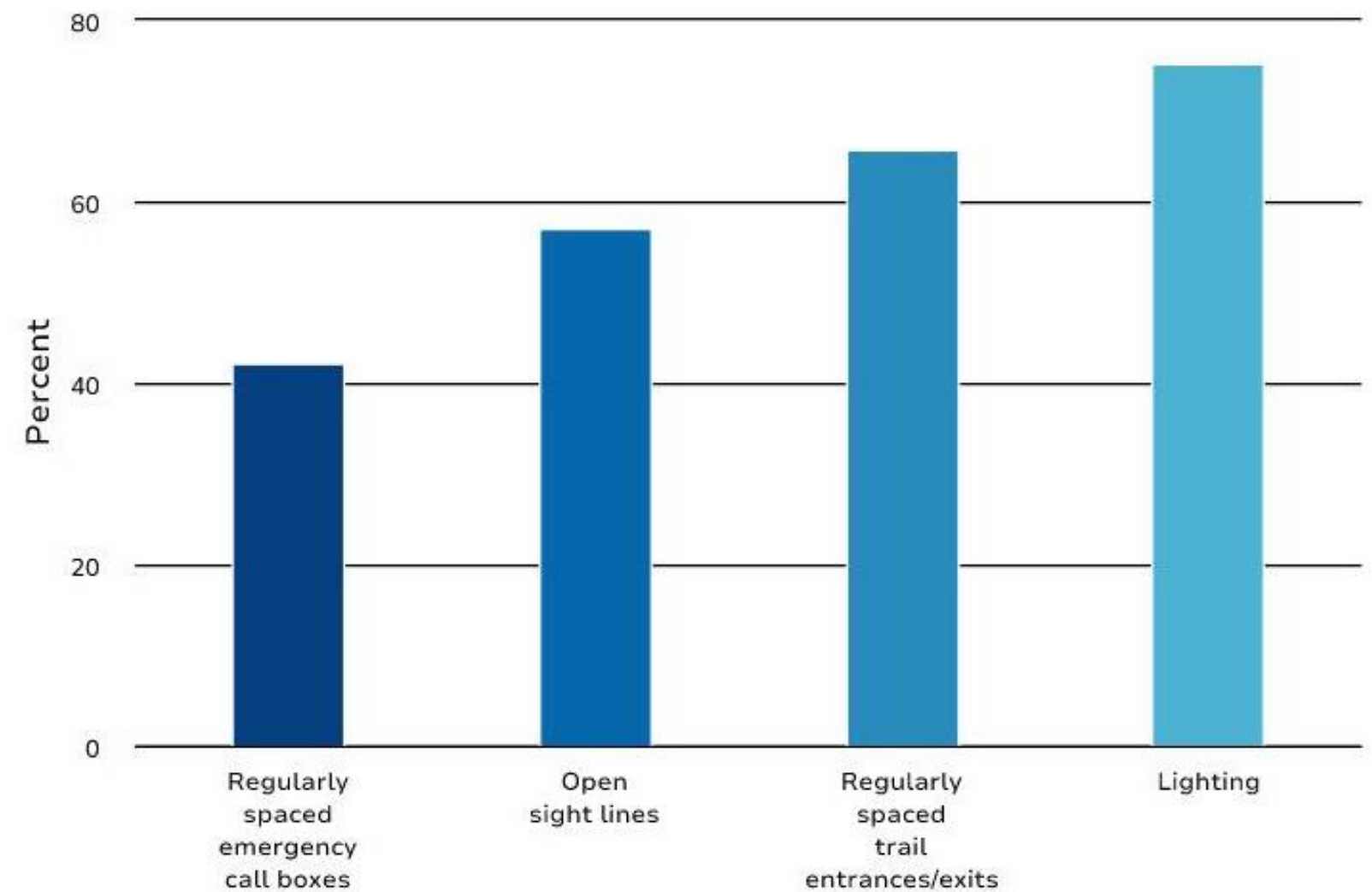
I intend to use the path for:



Path Use

- 25% concerned with sun exposure
- Wayfinding
 - 78% To community destinations
 - 76% Cross streets
 - 48% Mile markers
 - 65% Maps
 - 41% Interpretive signage
 - 29% Trail identity/branding

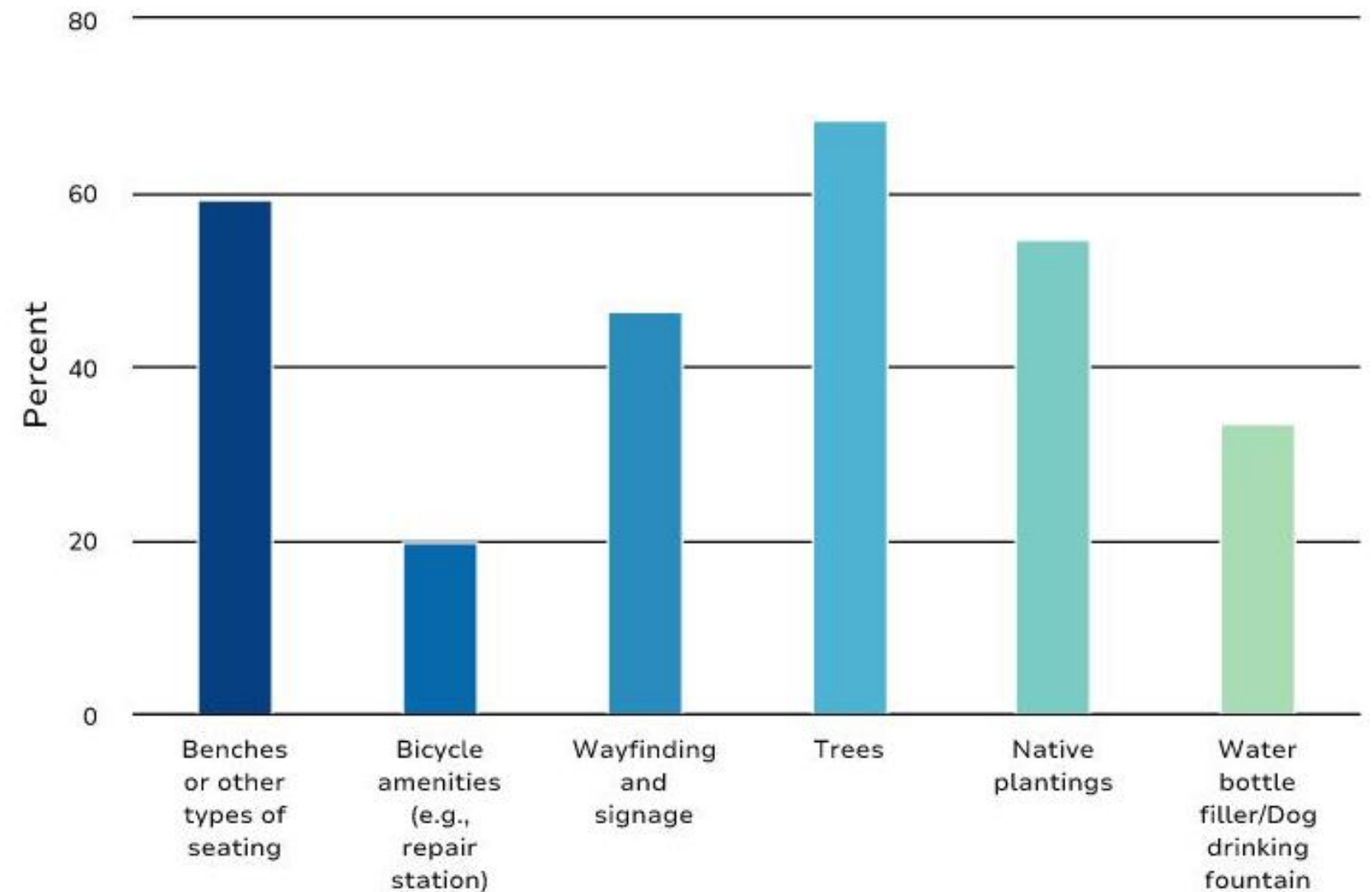
Elements that would increase sense of security:



Amenities

- 75% regularly spaced benches
- Bicycle amenities
 - 71% Bicycle racks
 - 50% Repair stations
 - 22% Covered bicycle parking
 - 12% Should not be any

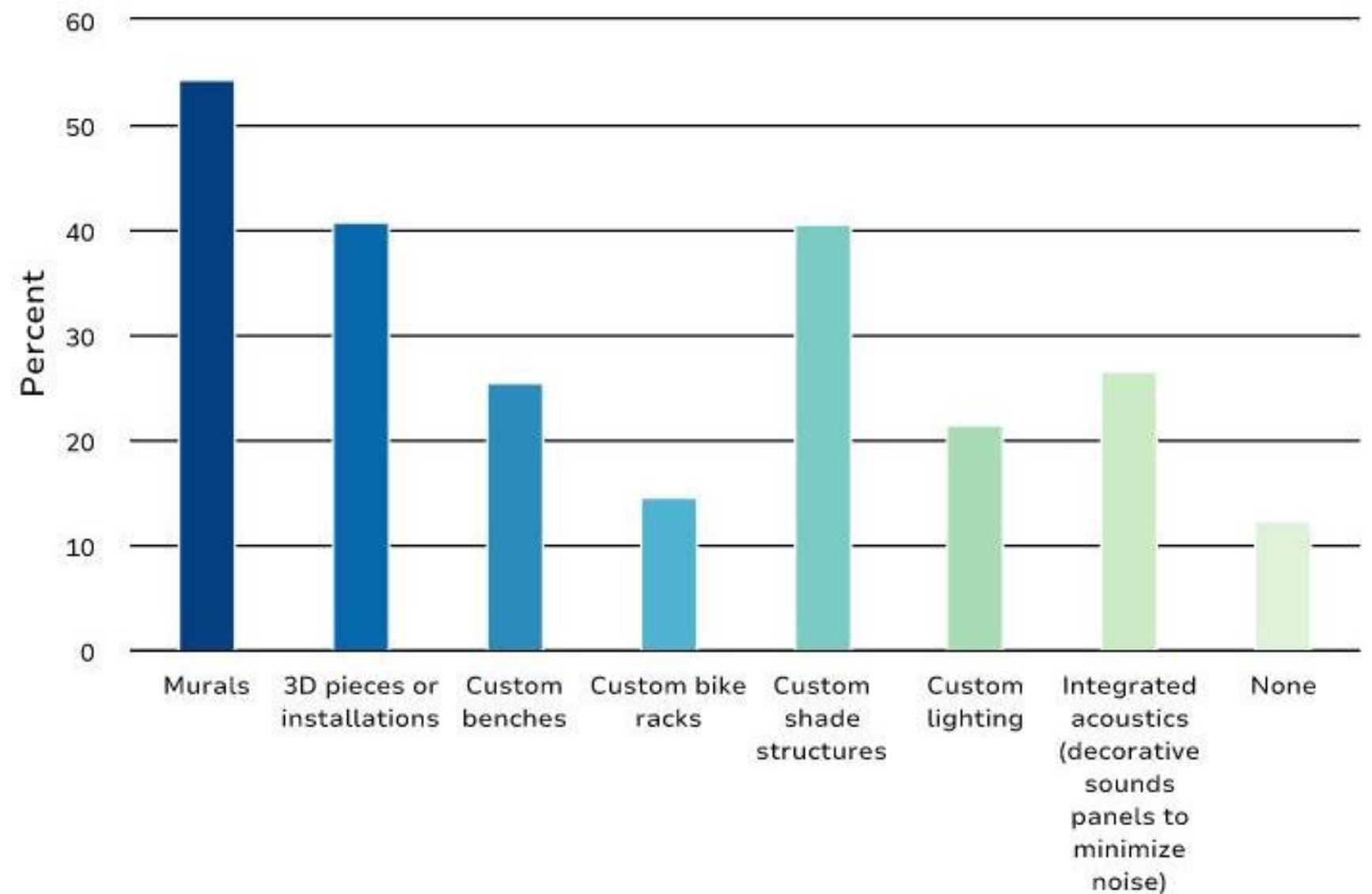
What amenities would you like along the path?



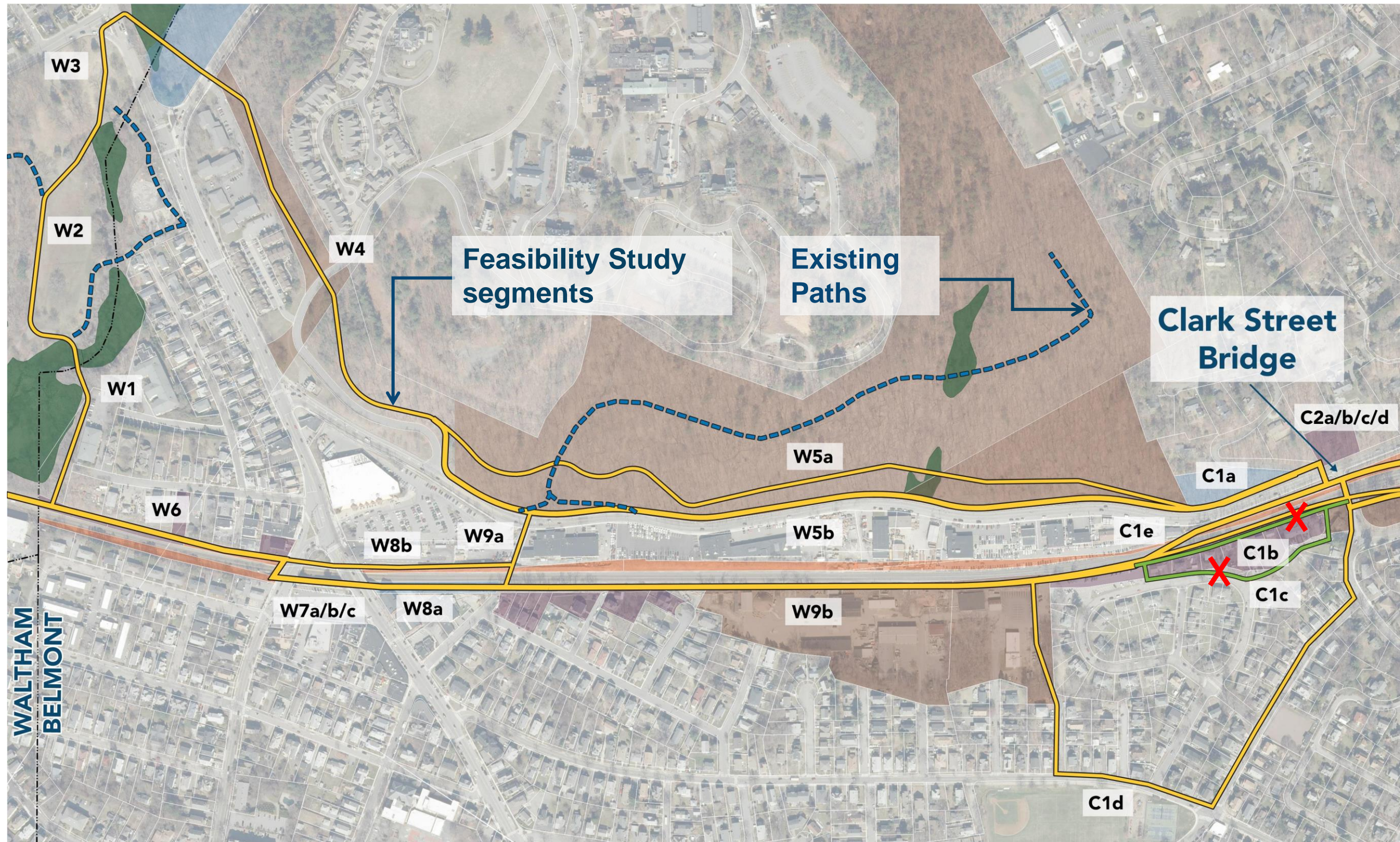
Character

- Style – amenities
 - 25% Don't have a preference
 - 23% Naturalistic
 - 22% Industrial
 - 16% Traditional
 - 11% Depends
- Style – bridge (if required)
 - 58% Naturalistic
 - 27% Contemporary
 - 8% Traditional
 - 7% Industrial

What types of public art (where space permits)?



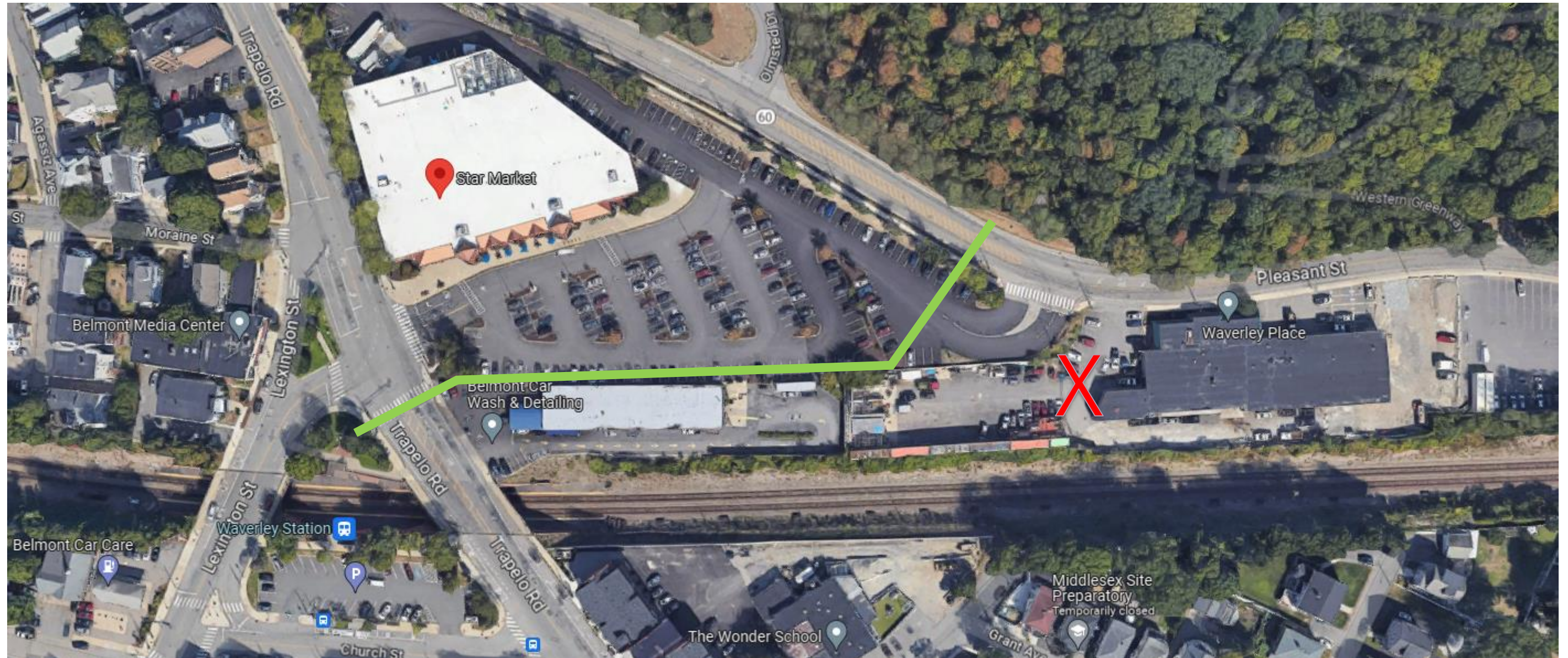
Alternatives



Operations

- Conflicts along paper street
 - Commercial property access
 - Heavy vehicles
 - Sun glare at crossing location
- Shift through Star Market lot

Data Collection – Constructability Review



Subsurface Investigation – Boring Location Plan

- 8 borings performed along the MBTA Fitchburg Line by New England Boring Contractors.
- B23-7 and B23-8 are located at the proposed bridge abutments
- B23-2 and B23-9 were not drilled due to utility conflicts
- Borings were completed to depths between 25.5 and 65.5 feet below the existing ground surface



Subsurface Investigation – Subsurface Conditions

Typical Subsurface Profile

Approx 1-7 inches of either PAVEMENT or
TOPSOIL

Approx 3.5 to 27.5 feet of loose to dense FILL

Approx. 3.0 to 34.0 feet of medium dense to
very dense COARSE DEPOSITS

Approx. 14.0 to 52.5 feet of loose to dense
FINE DEPOSITS

Approx. 3.0 to 12.0 feet of medium dense to
very dense WEATHERED BEDROCK

BEDROCK at approx. 19.1 feet at B23-8

- › Groundwater was observed at 2.0 to 10.0 feet below existing ground surface
- › Based on the observed subsurface conditions, it appears that the in-situ soils are not susceptible to liquefaction.
- › If COARSE DEPOSITS are encountered throughout the bridge footprint at the proposed footing elevation, the structure should be supported on a foundation using a factored bearing capacity of 3,500 pounds per square foot.

Pre-Engineered Bridge Superstructures



Contech Continental Keystone® Truss



Contech Continental Keystone® Truss



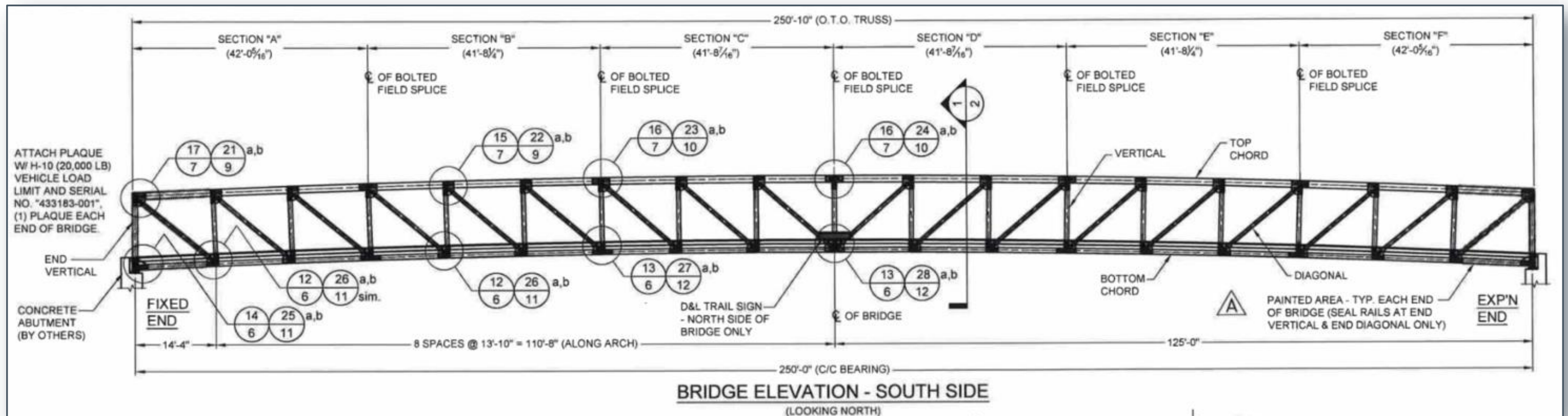
Contech Continental Gateway® Truss



U.S. Bridge Seneca Bow-String Truss

Bridge Superstructure Types

Example Bridge Superstructure – Contech Continental Gateway® Truss

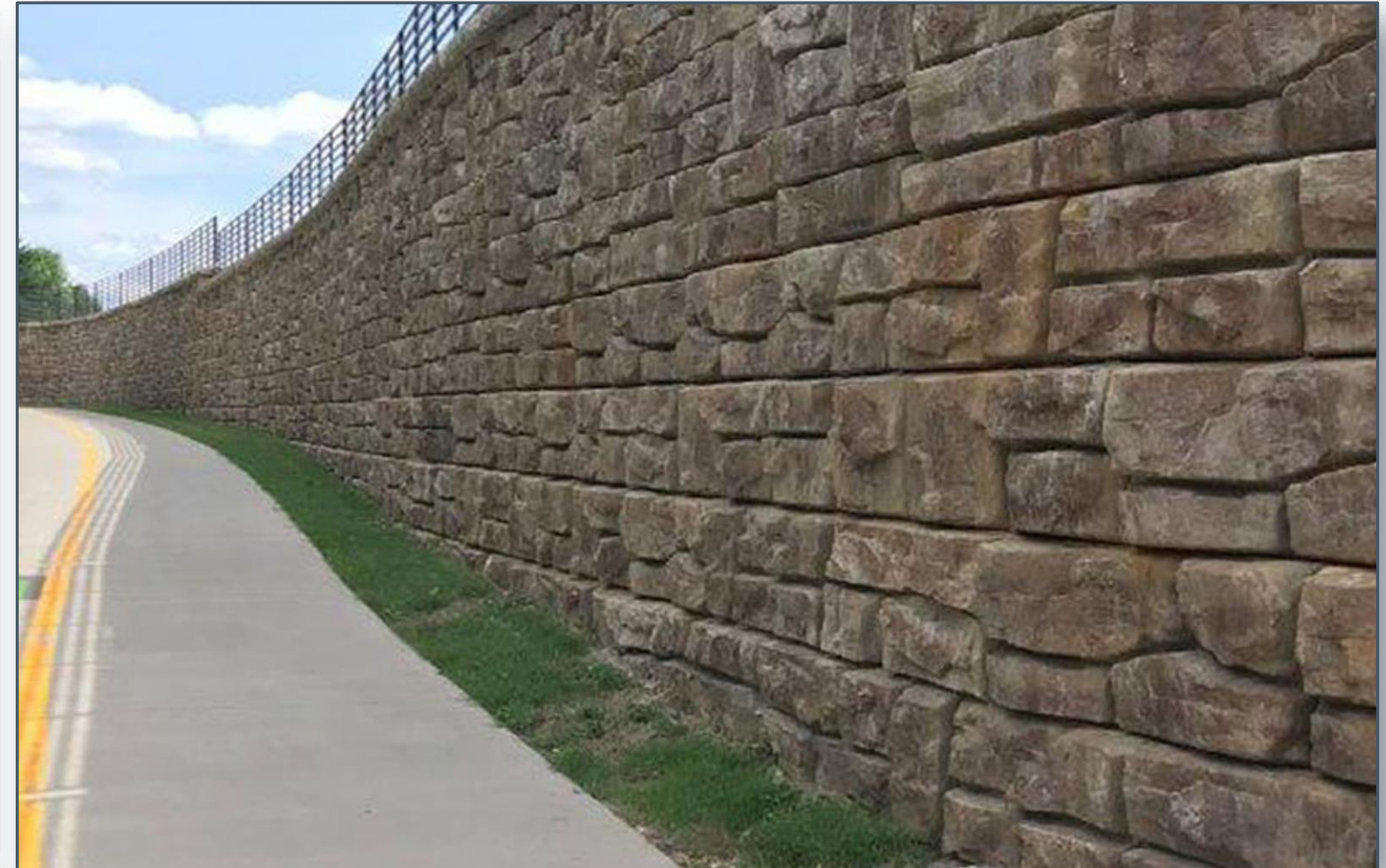


250-0" x 10'-2"
D&L Trail Over Lehigh River
Pedestrian Bridge
Jim Thorpe, PA

Prefabricated Modular Block (PMB) Walls



Stone Strong Systems® Retaining Wall

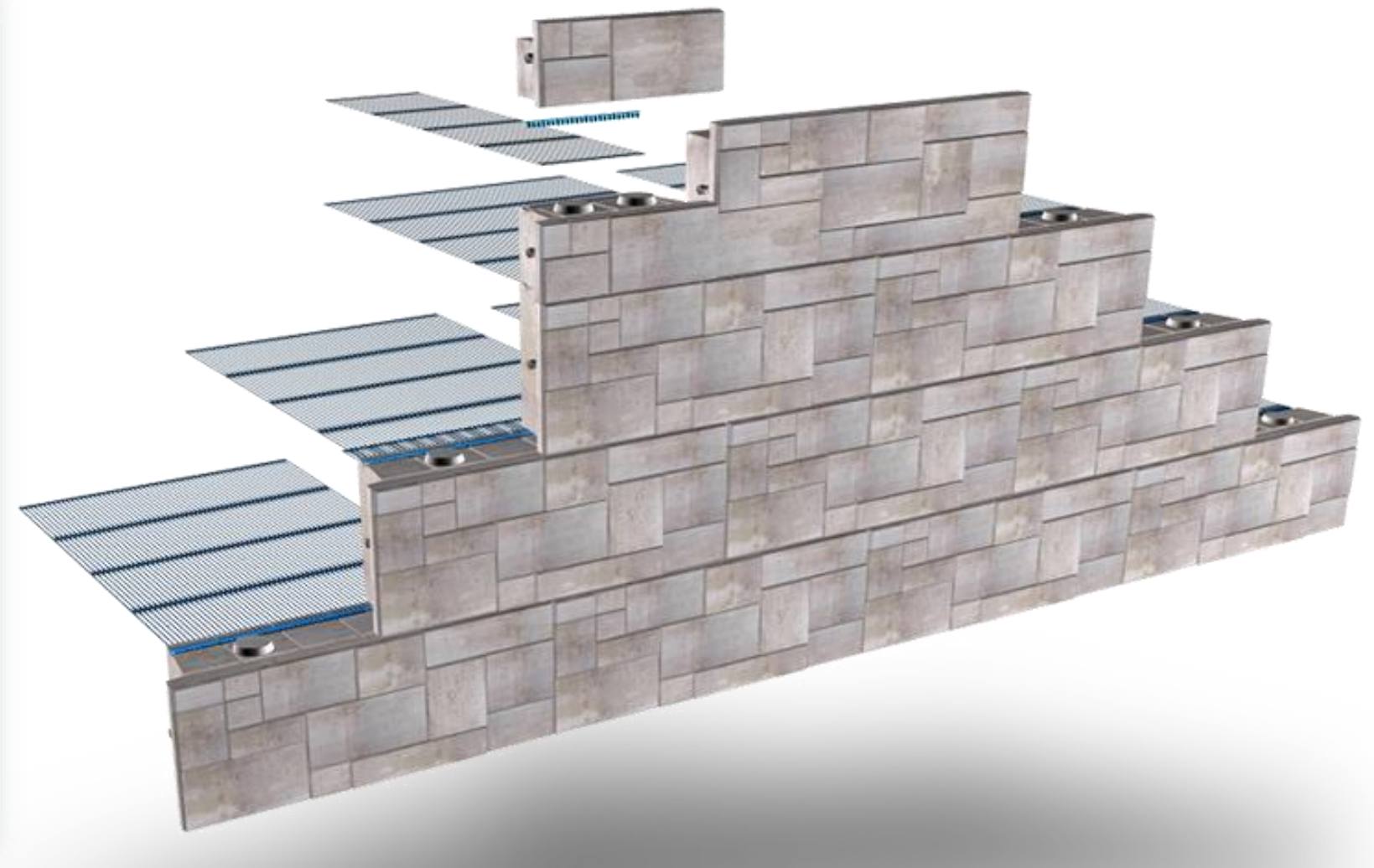


Redi-Rock Retaining Wall

Mechanically Stabilized Earth (MSE) Walls



Tensar ARES® MSE Retaining Wall System



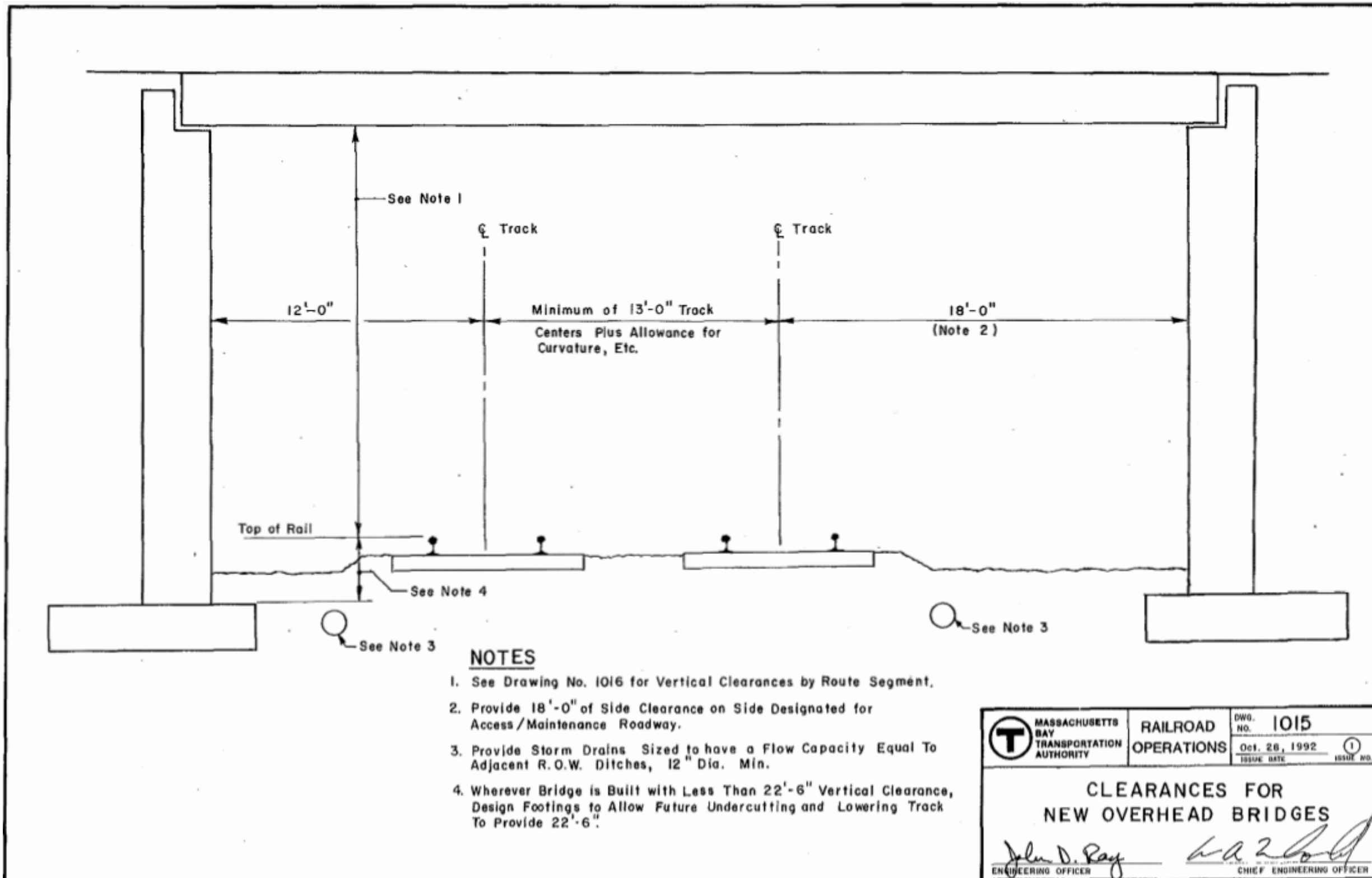
Oldcastle MegaWall™ MSE Retaining Wall System

Meetings Conducted with Each Entity

- MBTA
- BHA – Belmont Village
- DPW
- Fire Department
- Police Department
- MPO and MassDOT

Meetings Conducted with Each Entity

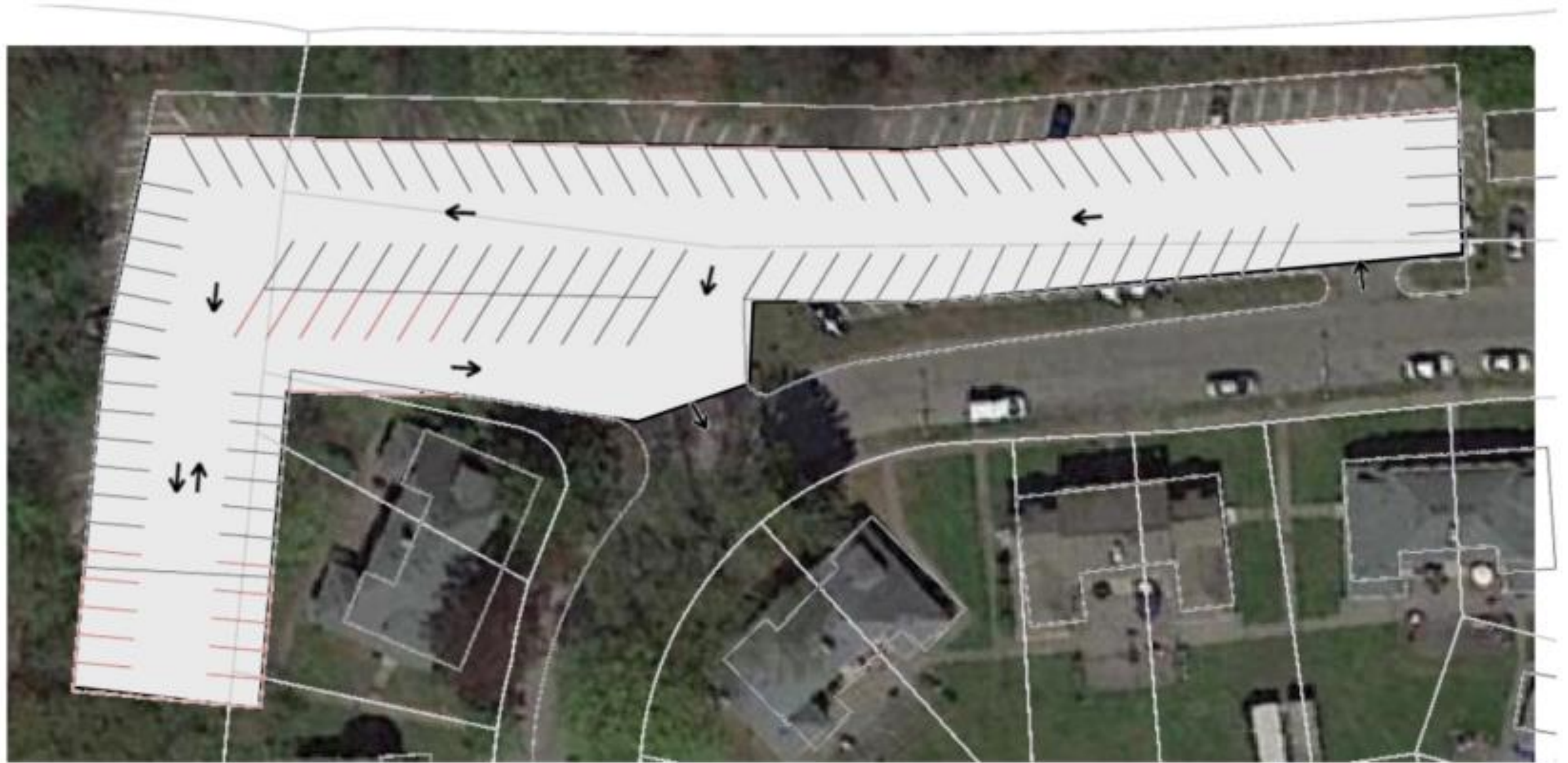
- **MBTA** →
 - BHA – Belmont Village
 - DPW
 - Fire Department
 - Police Department
 - MPO and MassDOT
- Horizontal offset – match detail
 - Vertical clearance – 22’ – 6” standard
 - Waverley Station – not currently identified as top tier priority, timeline uncertain
 - Single-tracking for construction – may be possible




Meetings Conducted with Each Entity

- MBTA
 - **BHA – Belmont Village** →
 - DPW
 - Fire Department
 - Police Department
 - MPO and MassDOT
- Second priority behind Sherman Gardens
 - 25% Design may follow BCP Phase 2
 - Conservatively assume existing conditions
 - Identified BHA office is beyond useful life


Stakeholder Engagement



Meetings Conducted with Each Entity

- MBTA
 - BHA – Belmont Village
 - **DPW** 
 - Fire Department
 - Police Department
 - MPO and MassDOT
- Site walk conducted with CPPC and Town DPW
 - DPW Staff confirmed that Path can be accommodated at the rear of the lot along the rail

Meetings Conducted with Each Entity

- MBTA
 - BHA – Belmont Village
 - DPW
 - **Fire Department** 
 - Police Department
 - MPO and MassDOT
- Provided access vehicle and associated turning movement information
 - A path adjacent to an existing roadway provides continual access
 - A route along the south side of the rail will need appropriate design, increases access to railbed
 - A path in the wooded hills would be difficult to access

Meetings Conducted with Each Entity

- MBTA
 - BHA – Belmont Village
 - DPW
 - Fire Department
 - **Police Department** →
 - MPO and MassDOT
- A path in the woods would be less desirable
 - Police take no exception to a path along the north or south side of the rail
 - In agreement with difficulties of crossing Pleasant Street in areas with poor visibility

FHWA Crossing Guidance

- STEP Analysis and Countermeasures

Pedestrian Crash Countermeasure for Uncontrolled Crossings	Safety Issue Addressed				
	Conflicts at crossing locations	Excessive vehicle speed	Inadequate conspicuity/visibility	Drivers not yielding to pedestrians in crosswalks	Insufficient separation from traffic
Crosswalk visibility enhancement					
High-visibility crosswalk markings*					
Parking restriction on crosswalk approach*					
Improved nighttime lighting*					
Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line*					
In-Street Pedestrian Crossing sign*					
Curb extension*					
Raised crosswalk					
Pedestrian refuge island					
Pedestrian Hybrid Beacon					
Road Diet					
Rectangular Rapid-Flashing Beacon					

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	① 2 4 5 6	① 5 6 7 9	① 5 6 7 9	① 4 5 6 7 9	① 5 6 7 9	① 5 6 7 9	① 4 5 6 7 9	① 5 6 7 9	① 5 6 7 9
3 lanes with raised median (1 lane in each direction)	① 2 3 4 5	① ③ 5	① ③ 5	① 3 4 5	① ③ 5	① ③ 5	① ③ 4 5	① ③ 5	① ③ 5
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	① 2 3 4 5 6	① ③ 5 6	① ③ 5 6	① 3 4 5 6	① ③ 5 6	① ③ 5 6	① ③ 4 5 6	① ③ 5 6	① ③ 5 6
4+ lanes with raised median (2 or more lanes in each direction)	① ③ 5	① ③ 5	① ③ 5	① ③ 5	① ③ 5	① ③ 5	① ③ 5	① ③ 5	① ③ 5
4+ lanes w/o raised median (2 or more lanes in each direction)	① ③ 5 6	① ③ 5 6	① ③ 5 6	① ③ 5 6	① ③ 5 6	① ③ 5 6	① ③ 5 6	① ③ 5 6	① ③ 5 6

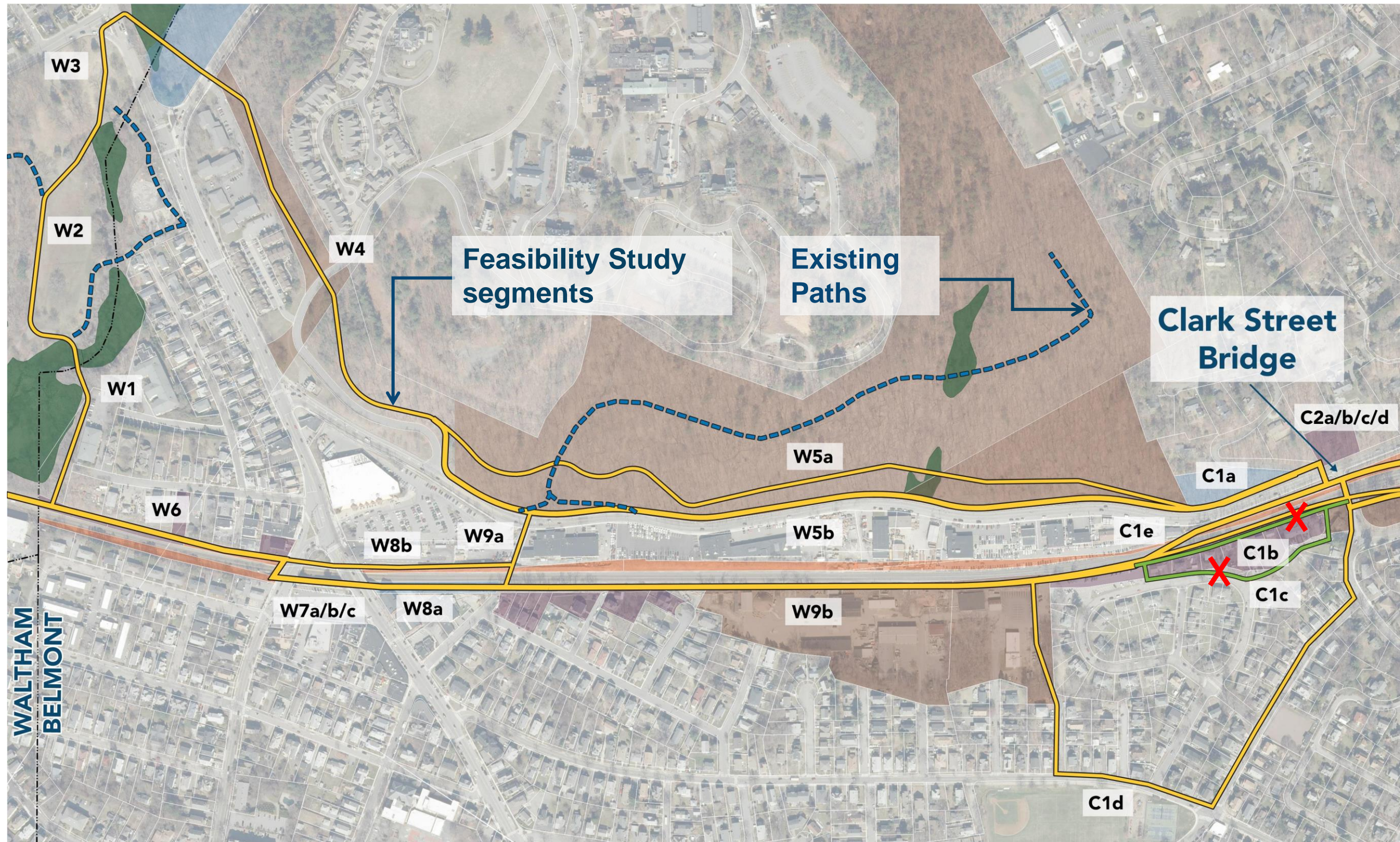
Given the set of conditions in a cell,
 # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
 ● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
 ○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*
 The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
 2 Raised crosswalk
 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
 4 In-Street Pedestrian Crossing sign
 5 Curb extension
 6 Pedestrian refuge island
 7 Rectangular Rapid-Flashing Beacon (RRFB)**
 8 Road Diet
 9 Pedestrian Hybrid Beacon (PHB)**

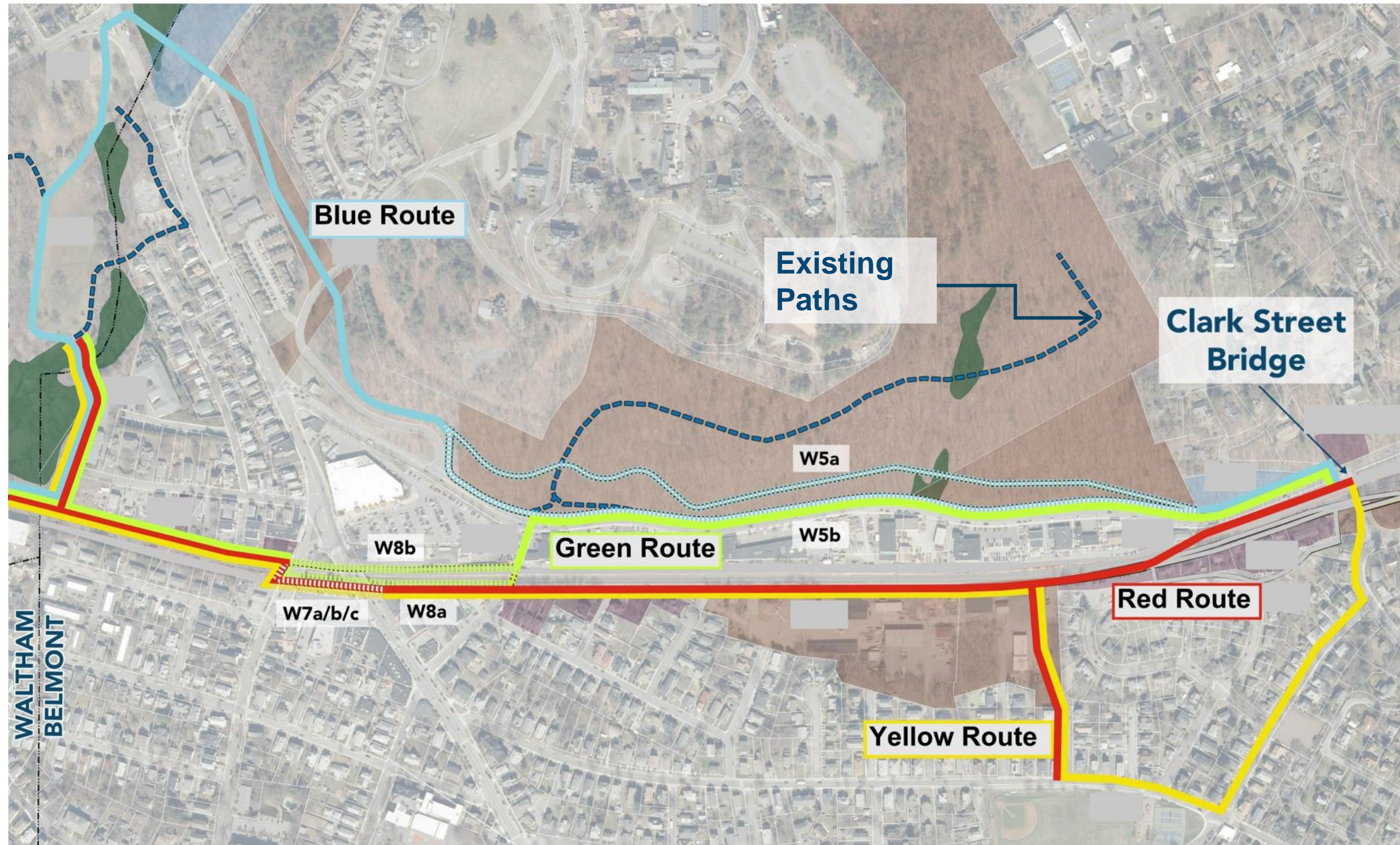
Meetings Conducted with Each Entity

- MBTA
 - BHA – Belmont Village
 - DPW
 - Fire Department
 - Police Department
 - **MPO and MassDOT** →
- Strong support for Phase 2 advancing to close gap in network
 - Discussed approach to evaluation criteria
 - In agreement with criteria
 - No expressed concerns with previously endorsed alignment

Alternatives



Routes consolidated for Phase 2



Routes consolidated for Phase 2

Blue - Lone Tree Hill / Beaver Brook

Between C1a and W1

Two options: W5a and W5b

Green - Lone Tree Hill to Waverley Sq.

Between C1a and W6 (via W9a)

Two Options: W8b and W8a/W7

Yellow - Clark Street to Waverley Sq.

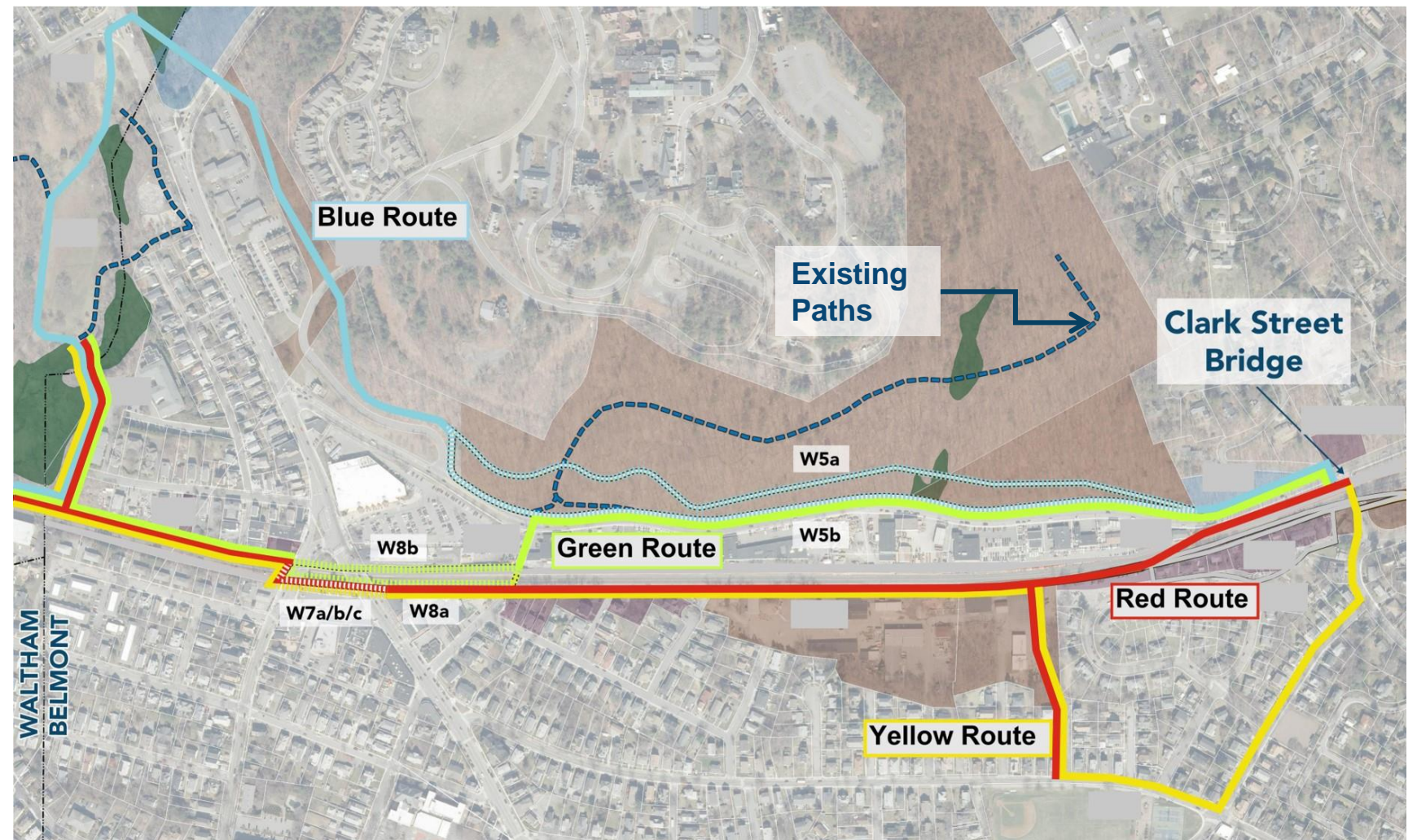
Between C1d and W6 (via Waverley Street)

Three Options: W7a, W7b, W7c
(all at Waverley Sq.)

Red - Clark/Pleasant to Waverley Sq.

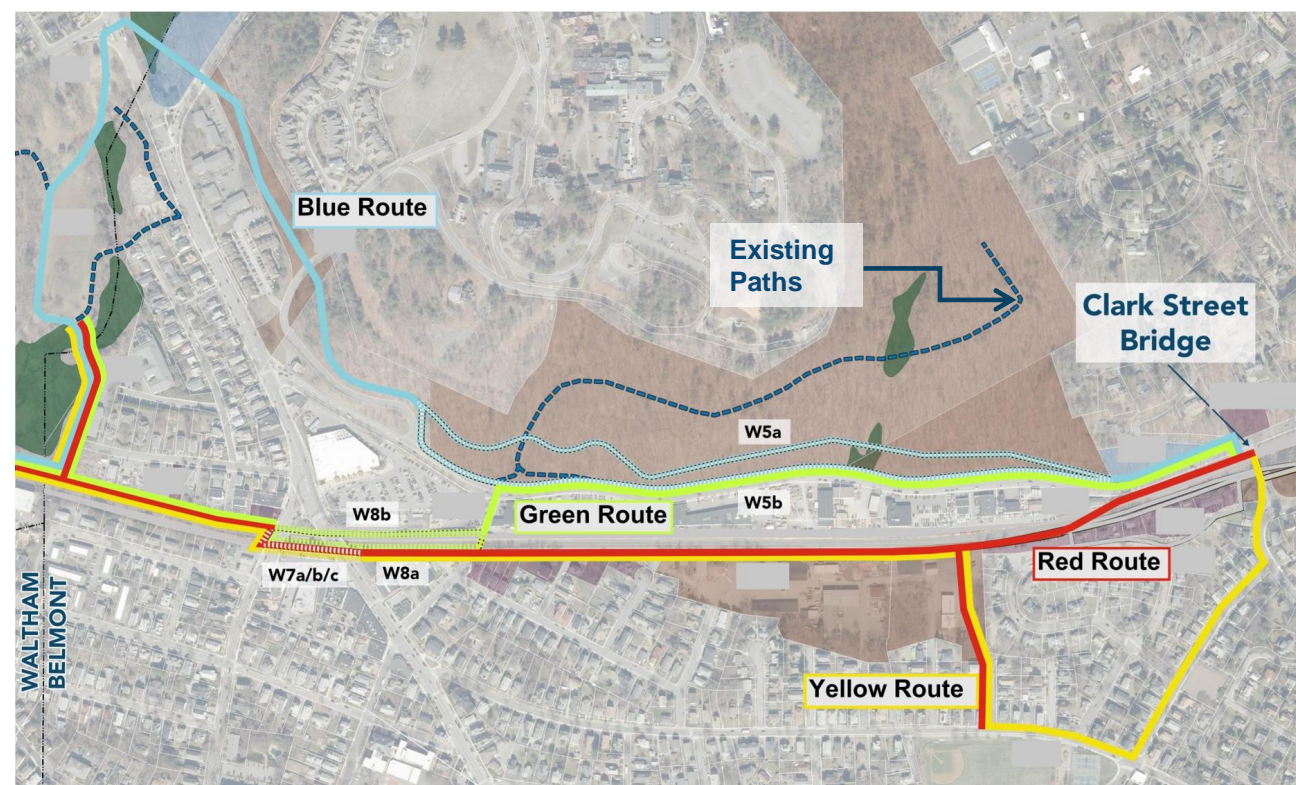
Between C1e and W6

Three Options: W7a, W7b, W7c
(all at Waverley Sq.)



Final recommended route will:

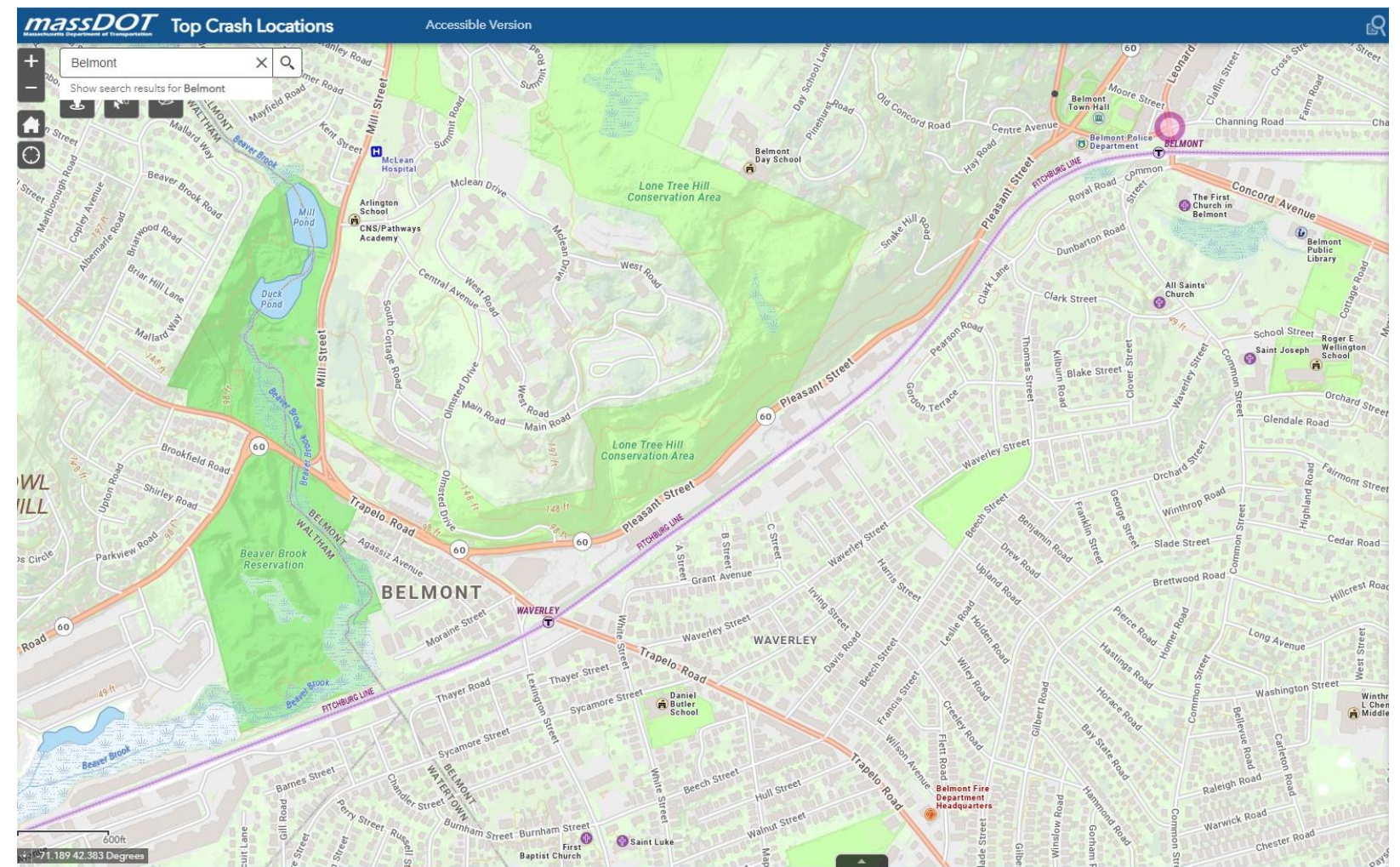
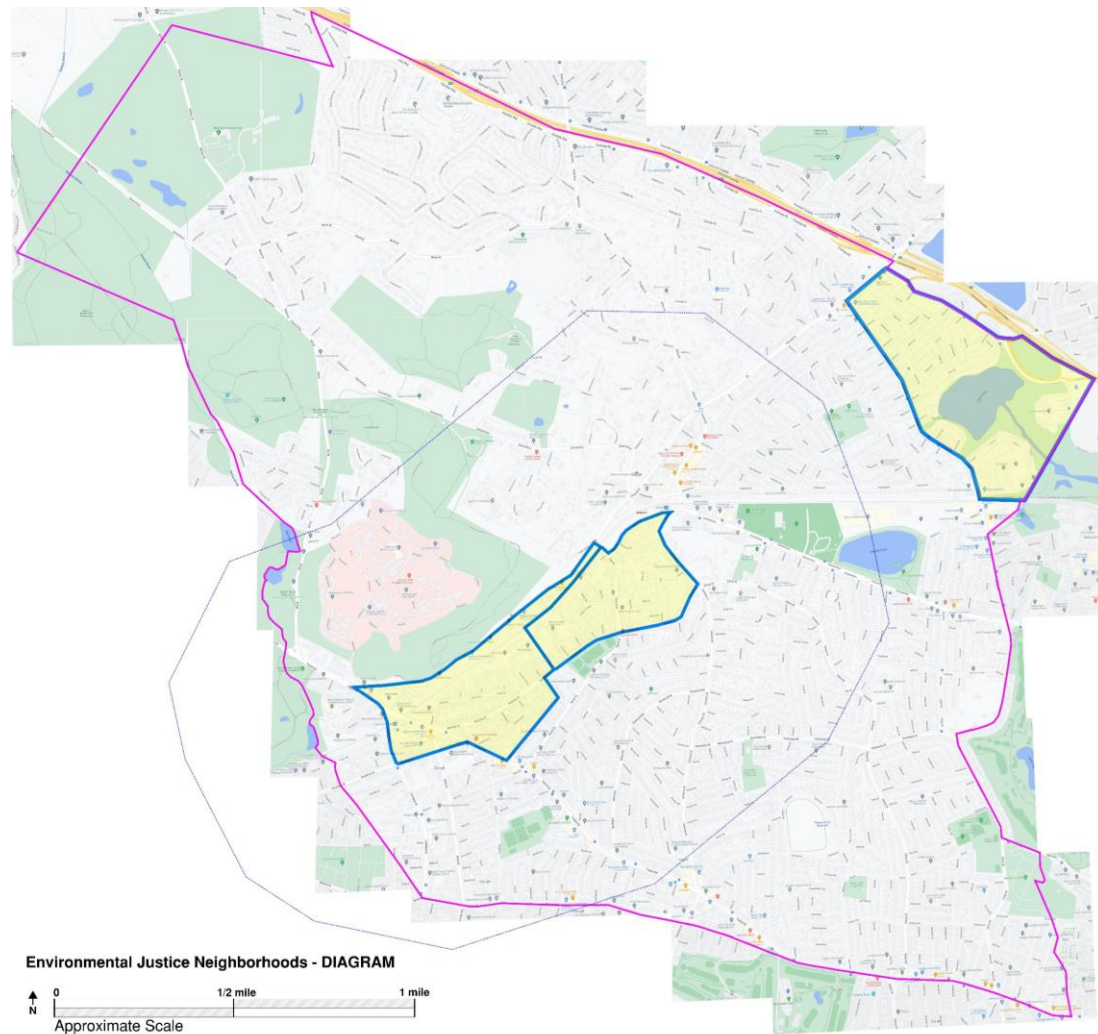
- Be constructable
- Reflect community's input from the Feasibility Study and this project
- Be fundable = align with MPO criteria used to select project for funding under the TIP



MPO	Boston Region Metropolitan Planning Organization
TIP	Transportation Improvement Program

Additional input considered:

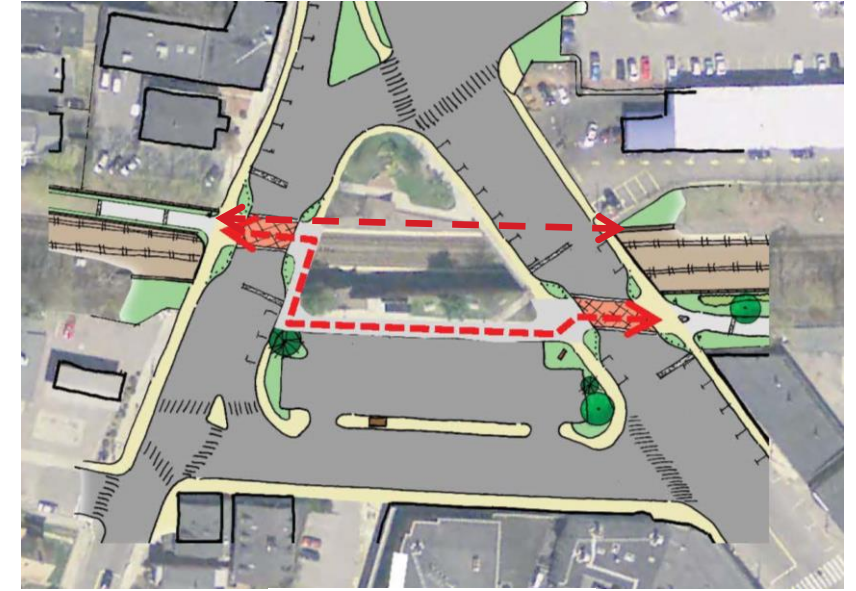
- Constructability review
- Environmental Justice neighborhoods
- Crash Clusters (Highway Safety Improvement Program)



Waverley Square Options (not being decided at this time)



W7a



W7c



W7bi



W7bii



W7biii

Feasibility Study Criteria

- Developed *with* the community
- User experience was most important
- Recommended and endorsed alignment by Select Board 2017

Feasibility Study Criteria

- Transportation system that supports sustainable, healthy, livable and economically vibrant region.
- Must be: safe, resilient, incorporate emerging technologies, provide equitable access, excellent mobility, varied transportation options.



The MPO has six investment programs.

[Read the Investment Programs Brochure to learn more!](#)

Complete Streets 	Community Connections 	Bicycle and Pedestrian Connections
Intersection Improvements 	Transit Modernization 	Major Infrastructure

Evaluation Criteria

Criteria to drop:

- Check List
 - all Routes must meet (accessibility)
- Understood
 - improves pedestrian connections
- Not applicable
 - impacts to historic resources
- Circular reference
 - qualifies for funding

Bicycle Network and Pedestrian Connections Project Scoring	
SAFETY: Transportation by all modes will be safe.	
Project improves bicycle safety (up to 7 points)	
Project improves pedestrian safety (up to 7 points)	
Project improves safety for all users (up to 6 points)	
SYSTEM PRESERVATION: Maintain and modernize the transportation system.	
Project improves bicycle safety (up to 5 points) ✓	
Improves connectivity to critical facilities (up to 2 points)	
Project improves pedestrian safety (up to 5 points)	
Project improves other existing assets (up to 2 points)	
CAPACITY MANAGEMENT/MOBILITY: Use existing facilities to the maximum extent possible.	
Project improves bicycle safety (up to 9 points) ✓	
Project improves bicycle safety (up to 9 points) ✓	
CLEAN AIR/SUSTAINABLE COMMUNITIES: Create an environment that is healthy and sustainable.	
Project reduces CO2 (up to 4 points)	
Project reduces other transportation-related emissions (up to 6 points)	
Project enhances natural environment (up to 4 points)	
ECONOMIC VITALITY: Ensure our transportation network promotes economic vitality.	
Project serves sites targeted for future development (up to 4 points)	
Project serves existing employment and population centers (up to 4 points)	
Project improves bicycle safety (up to 3 points)	
Project promotes access to affordable housing opportunities (up to 3 points)	

CRITERIA
<u>User Experience</u>
Ease of Access ←
Aesthetics
Comfort ←
Vehicular conflicts
Conflicts with pedestrian way
CRITERIA
<u>Environmental and Cultural Impacts</u>
Wetlands
Historic resources
Mature Woodland
CRITERIA
<u>Design Attributes</u>
Encroachments necessary/MOU
Fire and Safety
Public Safety ✓
Distance to residential structures ✓
CRITERIA
<u>Transportation</u>
Connectivity to Destinations (Resources, Amenities and Transit)
Ease of universal public accessibility ←
Consistency with regional plans (MCRT/Wayside Trail) ←
Impact on existing traffic/transportation
Rail conflicts/proximity ←
CRITERIA
<u>Cost</u>
Range of Construction Costs
Operations and Maintenance Costs
Qualify for Funding
Value Added

Categories:

- User Experience x2
- Safety
- Connectivity and Separation
- Resiliency
- Economic Vitality

<u>User Experience</u>
Increase barrier-free access
Advance positive aesthetics
Increase personal comfort
Increase distance from rail / heavy traffic
<u>Safety</u>
Reduce vehicular / pedestrian conflicts
Improve traffic / transportation
Include multi-modal safety improvements
<u>Connectivity and Separation</u>
Connect to community destinations
Connect to critical facilities
Connect to transit (rail and bus)
Ease access to EJ Neighborhoods
Close gap in MCRT
Maximize distance to residential structures

<u>Resiliency</u>
Enhance natural environment
Avoid impacts to Wetland Resource Areas
Protect mature woodlands
Limit additional pavement
Increase access to open space
Reduce vehicular trips
<u>Economic Vitality</u>
Cost relatively less to construct
Serve future development
Serve employment/population centers
Impact to Business Operations
Promote access to affordable housing

Draft Recommended Alignment

Blue - Lone Tree Hill /
Beaver Brook

Between C1a and W1
Two options: W5a and W5b

Green - Lone Tree Hill to
Waverley Sq.

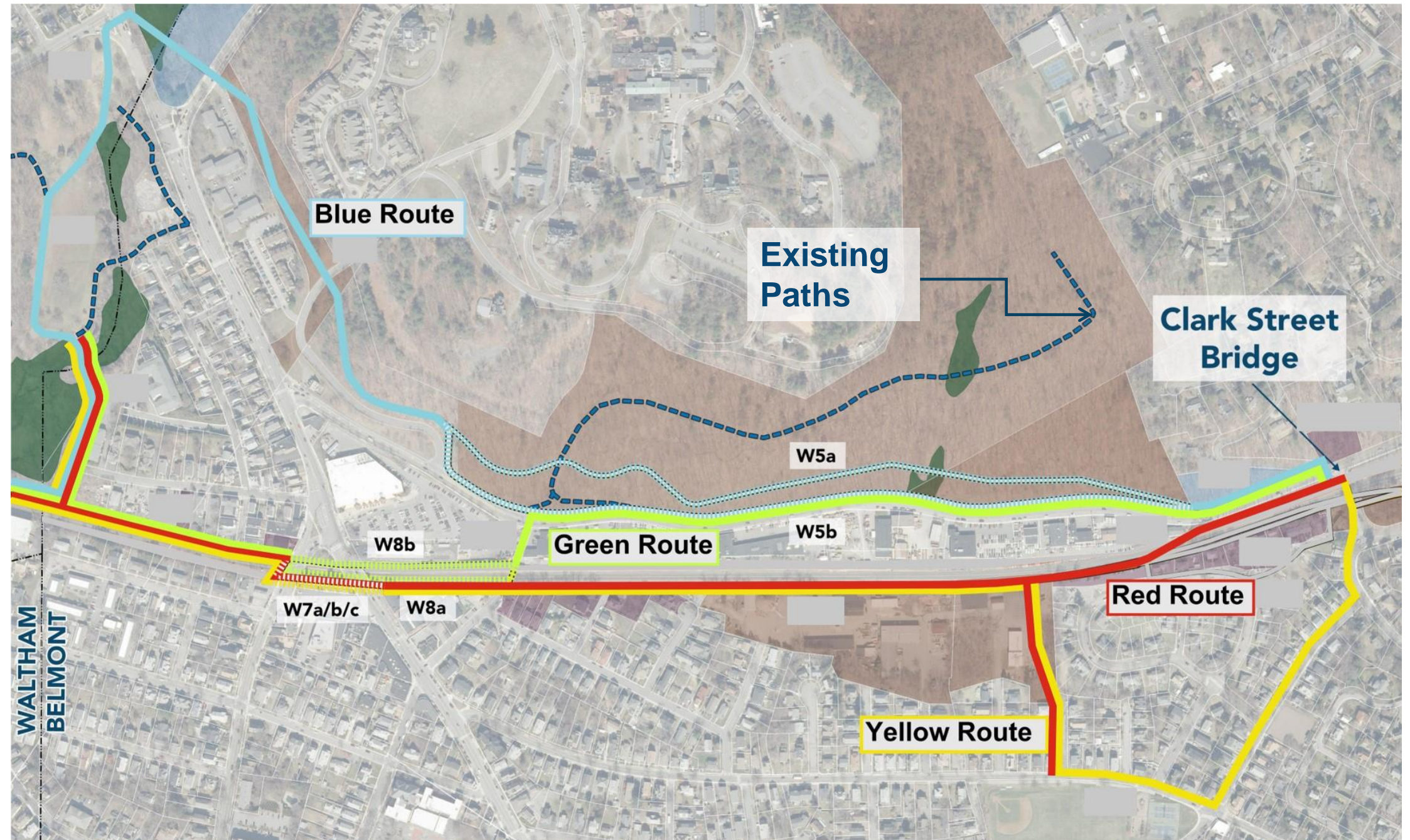
Between C1a and W6 (via
W9a)

Two Options: W8b and
W8a/W7

Yellow - Clark Street to
Waverley Sq.

Between C1d and W6 (via
Waverley Street)

Three Options: W7a, W7b,
W7c (all at Waverley Sq.)



Red - Clark/Pleasant to Waverley Sq.

Between C1e and W6 + 3 Options thru Waverley Sq.

- We will take comments from the live and virtual audience.
- Live Audience
 - Please step up the microphone and wait to be called on.
 - For those in the auditorium, you can come into the Select Board room or use the laptop in the auditorium.
- Virtual Audience
 - Please raise your hand.
 - Your mic will be turned on when called on.
 - If calling in, dial *9 to raise your hand and *6 to unmute.
 - Additional comments can be made using the Q+A function
 - Approximately every 15 minutes, we will answer questions from the Q+A.
- In order to allow everyone to speak, please try to limit your time to 1 minute.
- The meeting is scheduled to end at 9:00 PM.



Next Steps

- Review feedback and conduct follow-up coordination as necessary
- CPPC to present recommended route to Select Board mid-June
- Complete survey of selected route
- Begin design – 25% Submission early 2024 (pending funding)
- State review periods dependent on TIP FFY

Thank You for Participating!

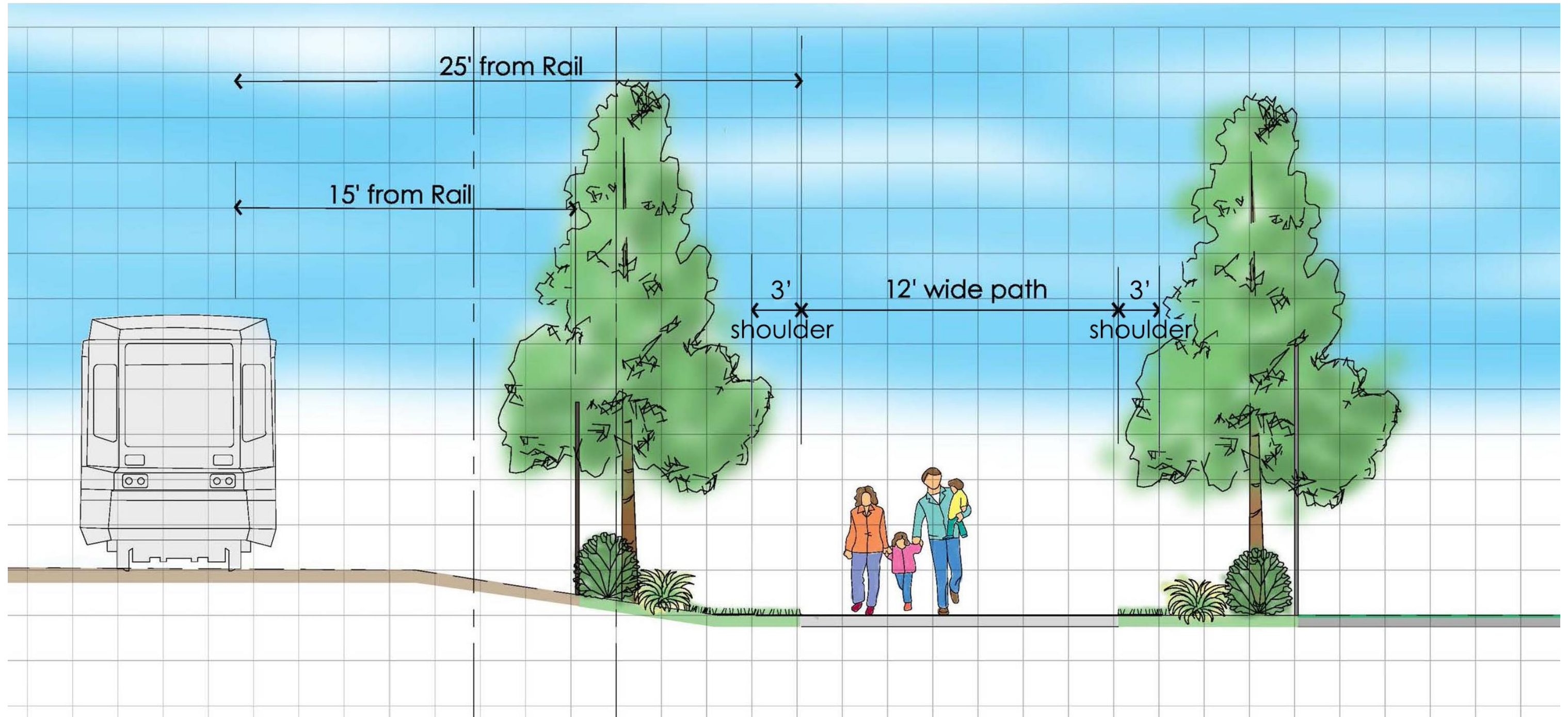
Town of Belmont
Community Path Phase 2 Design



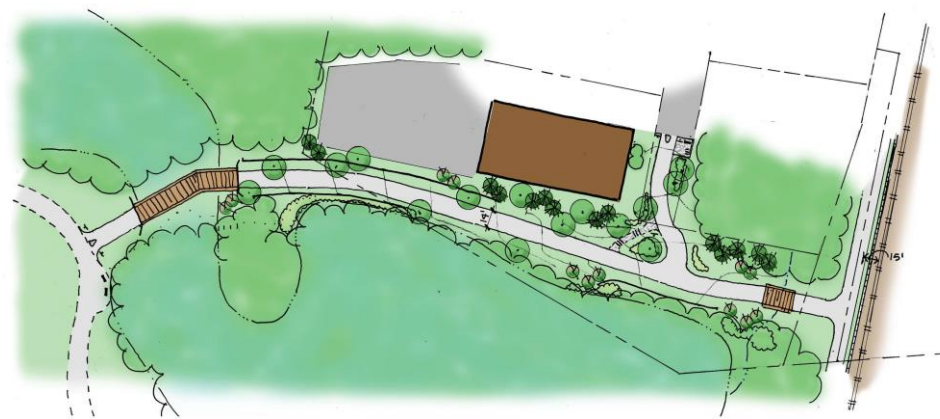
PARE
CORPORATION

TOOLE
DESIGN

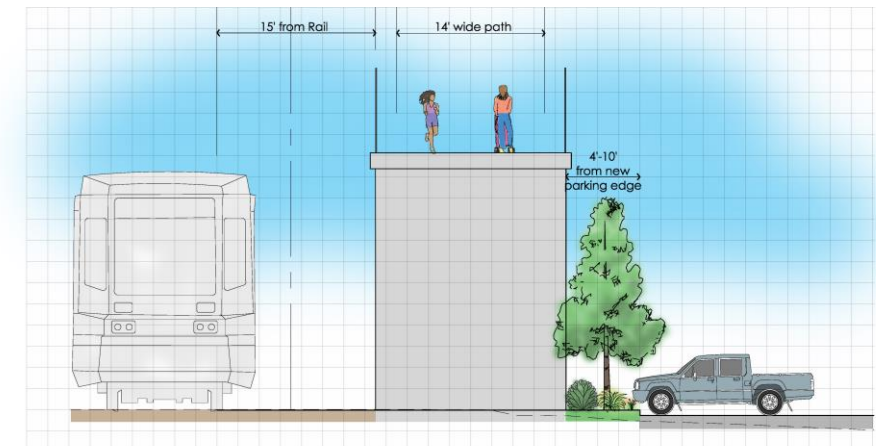
Typical Section



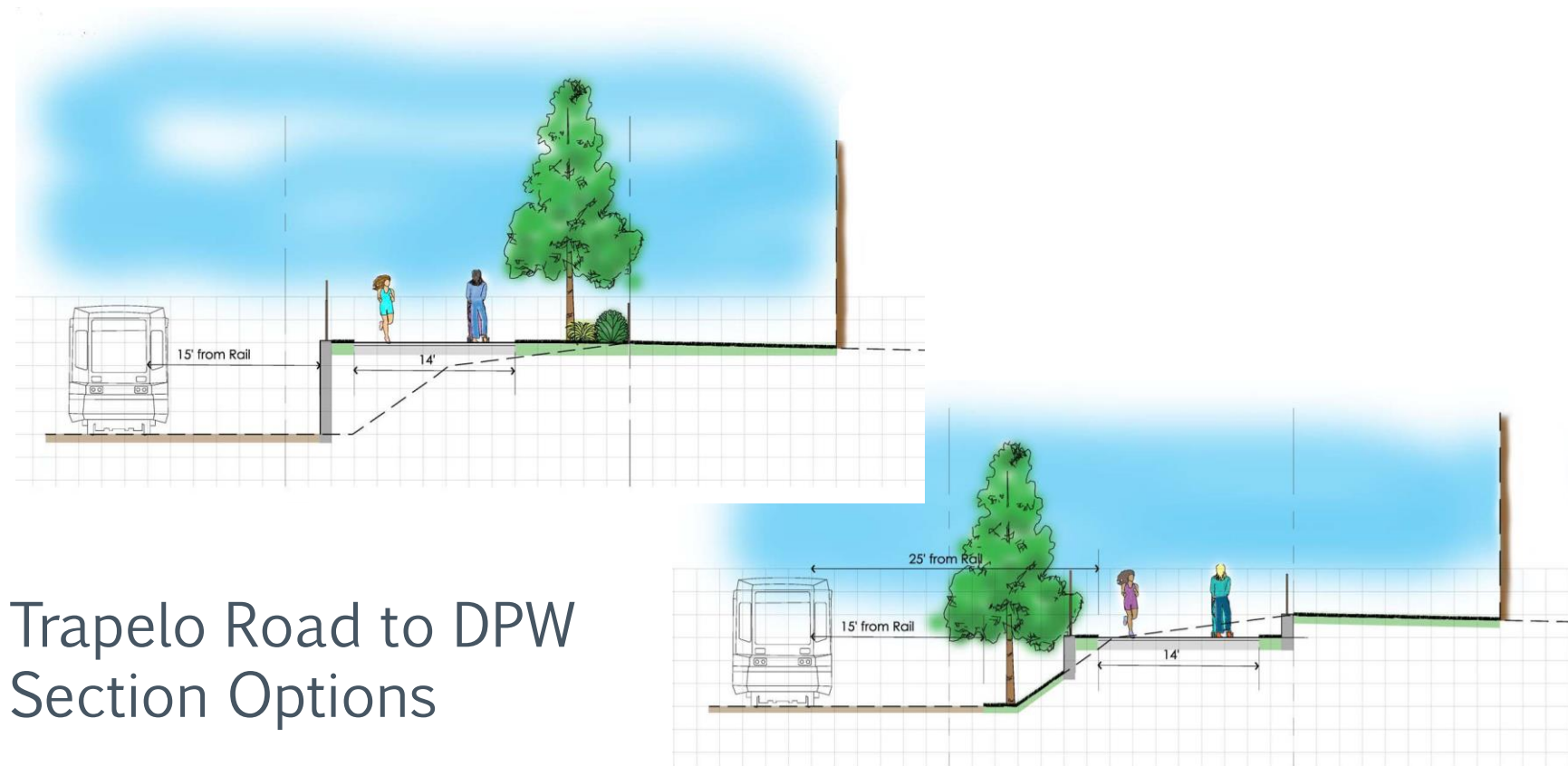
Draft Recommended Route Sketches (FS)



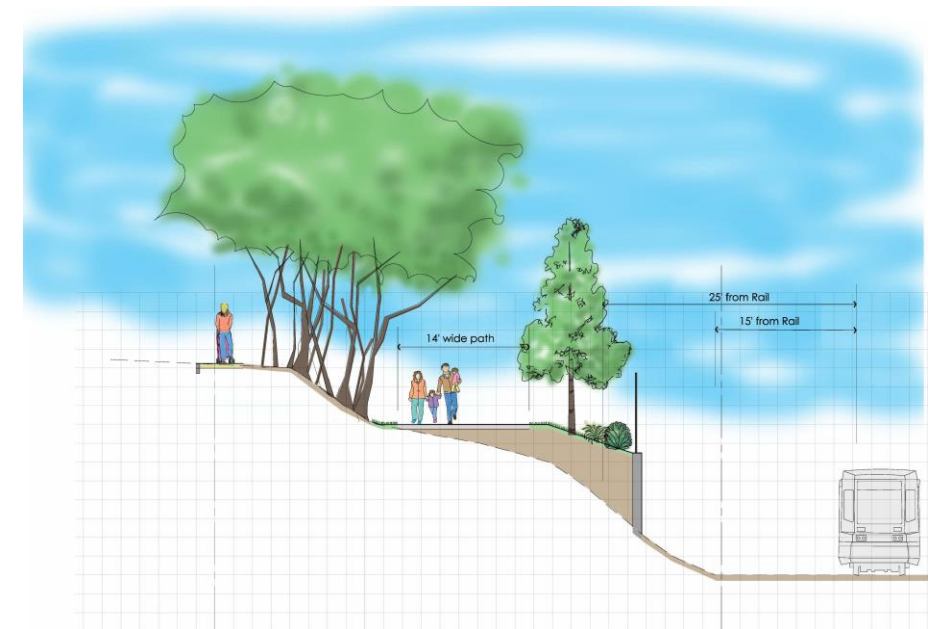
Beaver Brook Connection



BHA Section



Trapelo Road to DPW
Section Options



Pleasant Street Section