

BELMONT COMMUNITY PATH FEASIBILITY STUDY

Public Meeting #5 –
Hot Topics/Matrix

December 7, 2016



AGENDA

- | | |
|--------------------------------|-----------------|
| 1. Introduction | Russell Leino |
| 2. Purpose and Level of Design | Amy Archer |
| 3. Public Engagement Goals | Kathleen Fasser |
| 4. Alternatives Summary | Amy Archer |
| 5. Hot Topics Identified | Amy Archer |
| 6. Advanced Matrix | Kathleen Fasser |
| 7. Public Engagement | Open Discussion |
| 8. Next Steps | Amy Archer |

PURPOSE

To recommend a **preferred alternative** for a non-motorized, **multi-use path** through Belmont that will **serve** the Town's **residents as well as** “fill the gap” along **the Mass Central Rail Trail** (MCRT) between Waltham and Cambridge using the alignments from the CPAC as a base, **and to develop an evaluation process that ensures the selected alternative is justified.**

LEVEL OF ANALYSIS/DESIGN

- Feasibility study intended to advance to conceptual design and planning cost estimate
 - Define path options – alignments and typical sections
 - Quantify impacts to property and resources
 - Quantify costs based on path definition
 - Weight and rank pros and cons of alternatives

PUBLIC ENGAGEMENT GOALS



Describe and outline public engagement efforts that will inform the Study

ENGAGEMENT GOAL

Level of Engagement: Collaborate (See page 6, Stakeholder Roles and Responsibilities)

	Inform	Consult	Collaborate	Partner
Engagement Goal:	To provide stakeholders with factual, balanced, and timely information to help them understand the project.	To obtain stakeholder feedback on project analysis, alternatives, or decisions.	To work directly with the public throughout the process to ensure that perspectives are consistently understood, considered, and reflected in project decisions.	To partner with stakeholders in each aspect of decision making in order to develop and implement collaborative project solutions.

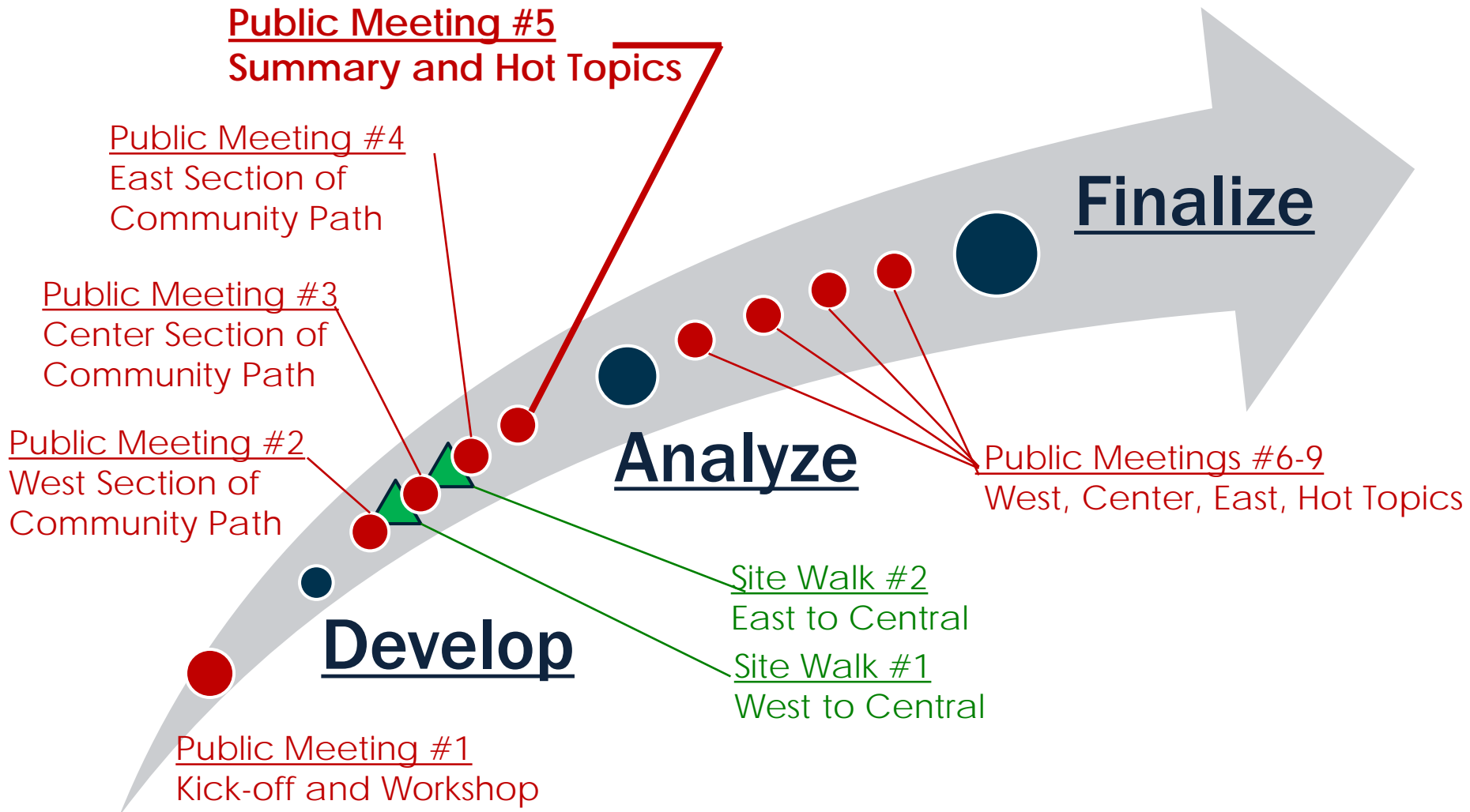
PUBLIC ENGAGEMENT GOALS



ROLES & RESPONSIBILITIES

engage in the process in a manner that promotes **respectful civil discourse** and enhances mutual understanding of all stakeholder viewpoints.

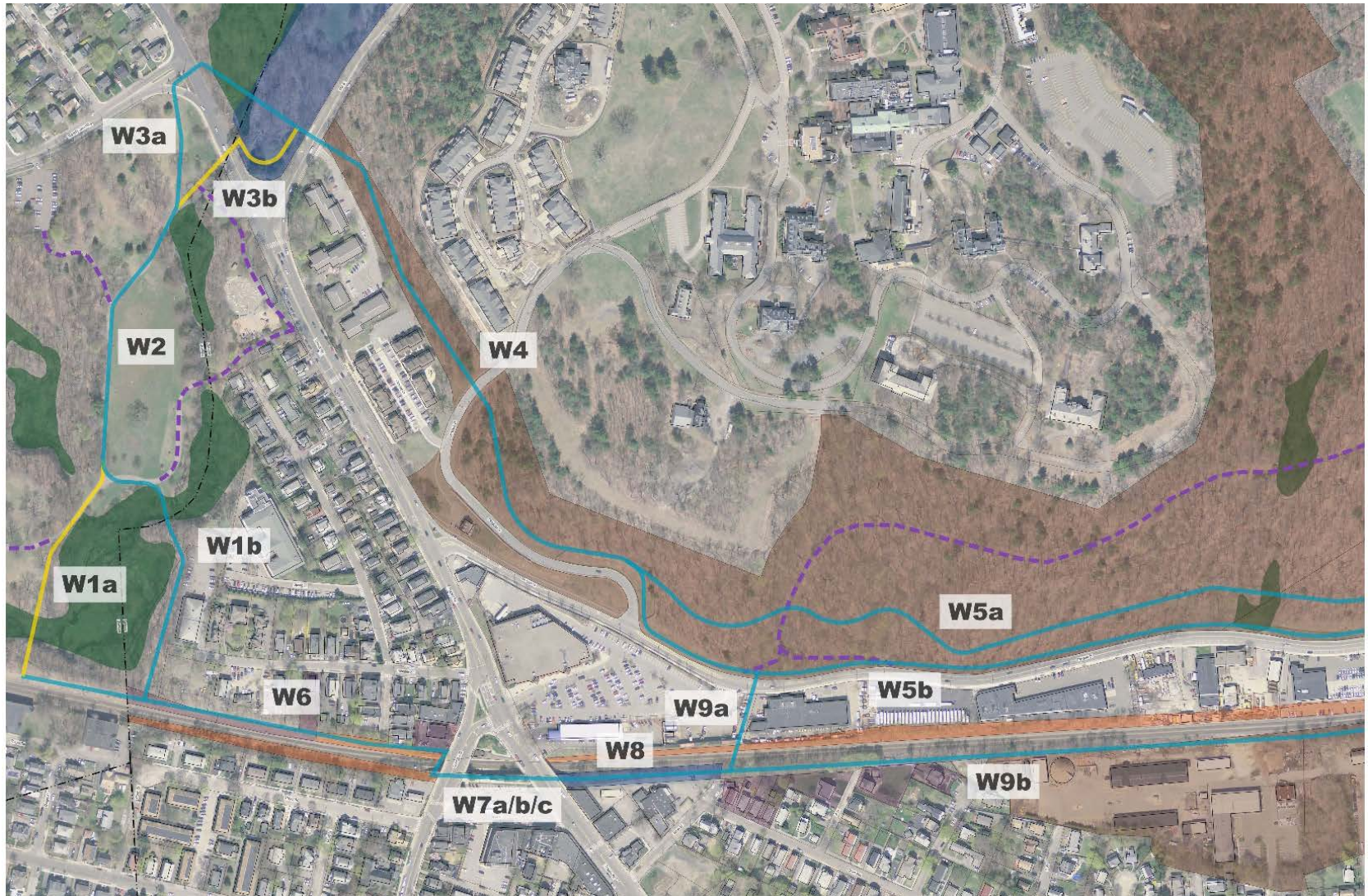
PROCESS



CPAC ALIGNMENTS

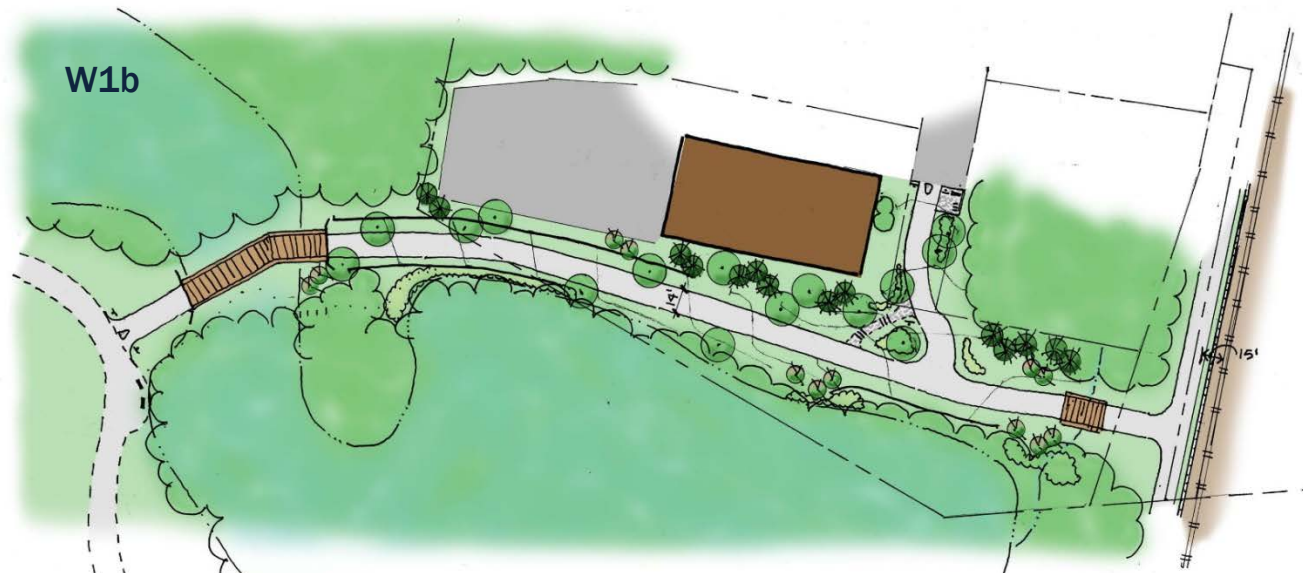
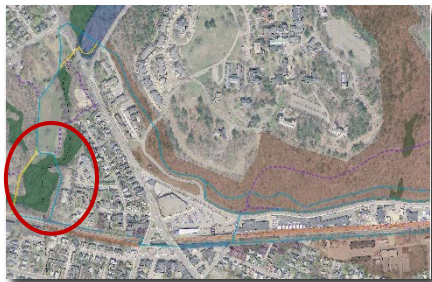
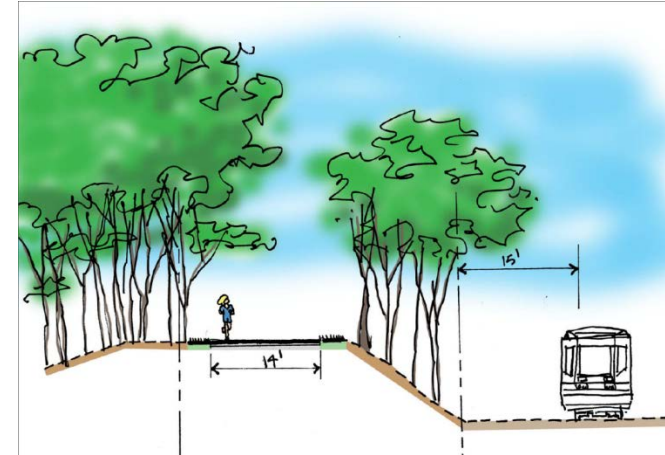


FEASIBILITY ALIGNMENTS – WEST END



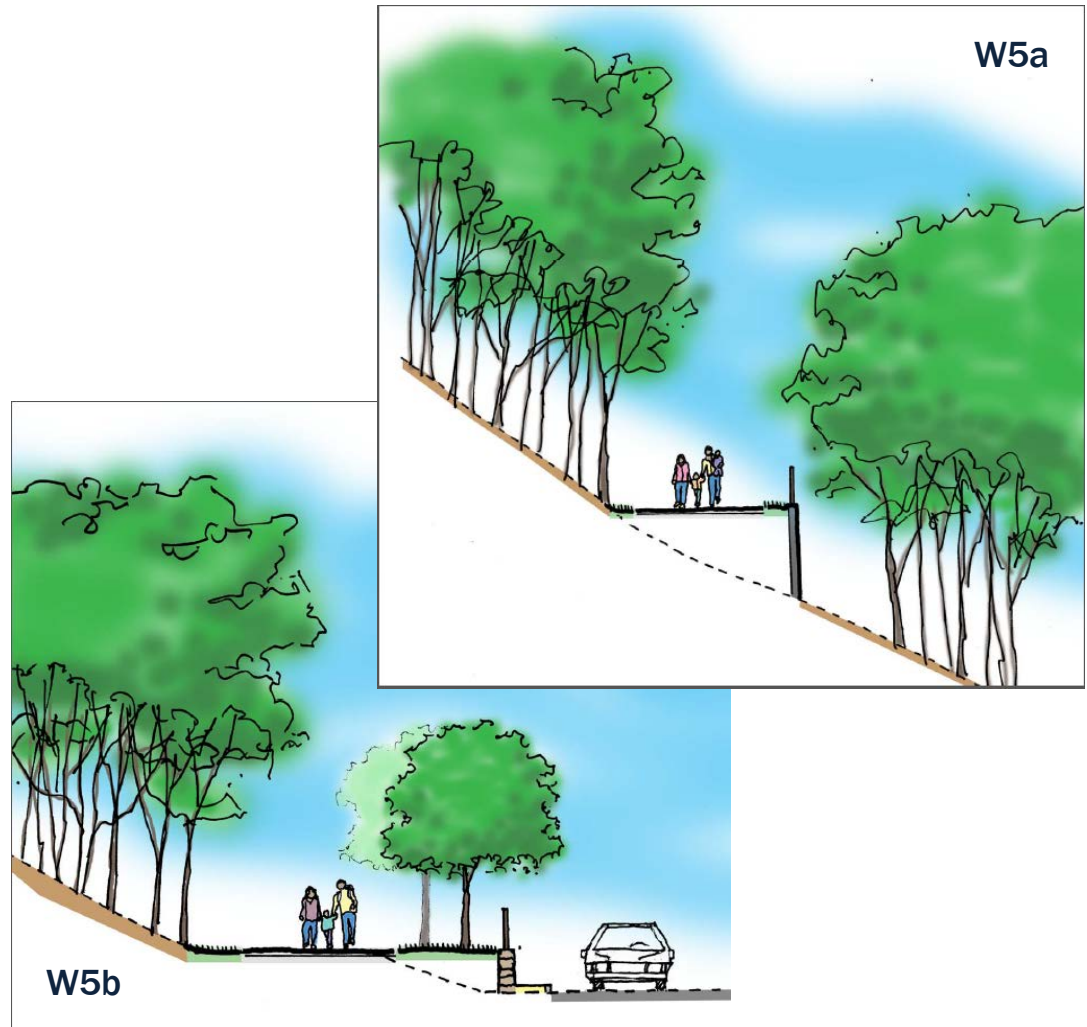
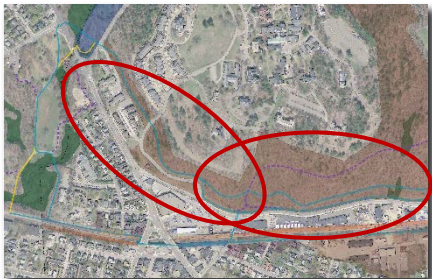
BEAVER BROOK (W1, W2 & W3)

- W1b: Shift east of CPAC Alignment
 - Trail Head and Boardwalk
 - Connection to Moraine
- W2 Traverse Beaver Brook Reservation
- W3a: Cross Trapelo Road at Waverley Oaks
Road vs. midblock



LONE TREE HILL (W4 & W5)

- W4 and W5a: Wooded Area
 - Has extreme cross slope
 - Requires 12' wall, 30' swath, 3.25 acre
- W5b: Pleasant Alternative
 - Use existing wall, ½ mile less impact to mature woodland
 - Increased access and visibility

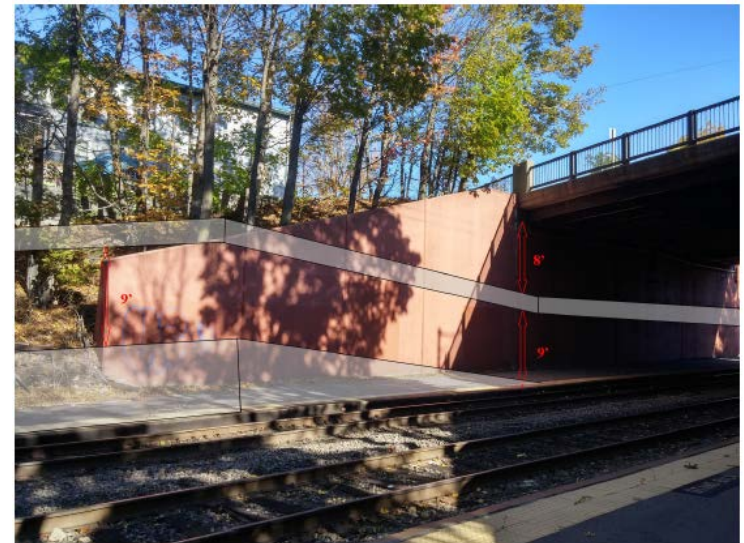
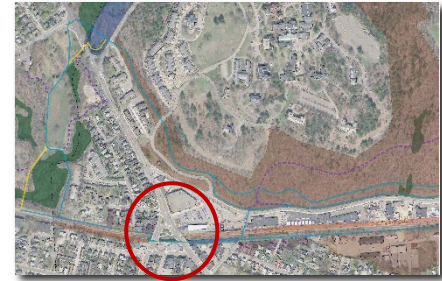


WALTHAM CONNECTION (W6)



WAVERLEY STATION (W7)

- W7a: Elevated over Platform
 - 10' maximum width, 9' clearance for covered platform
 - MBTA to determine separation requirement
 - May become infeasible if MBTA elects full-high platforms



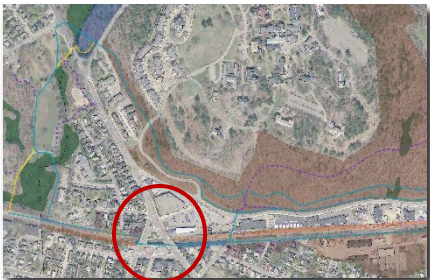
WAVERLEY STATION (W7)

■ W7b: “Box Over” Station

- Convert Church Street to one-way WB
- Create large park connecting to businesses

■ W7c: Existing Station At-Grade

- Bumpouts and sidewalk widening
- Signalization



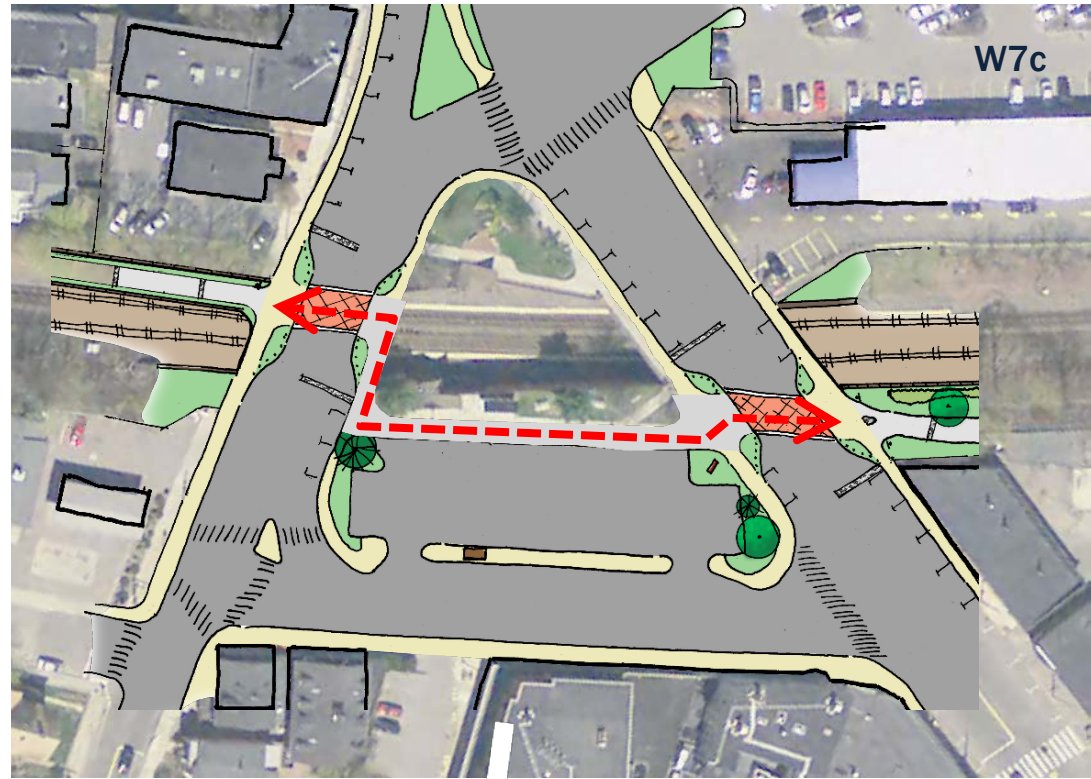
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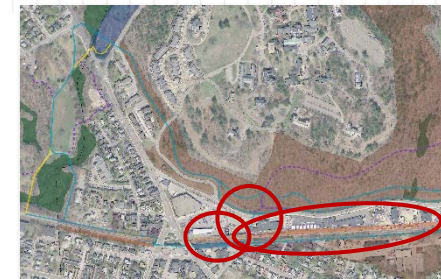
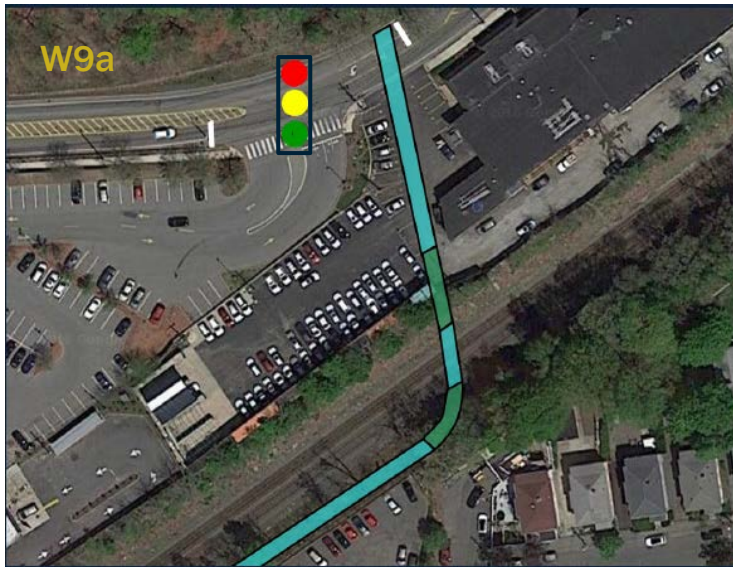
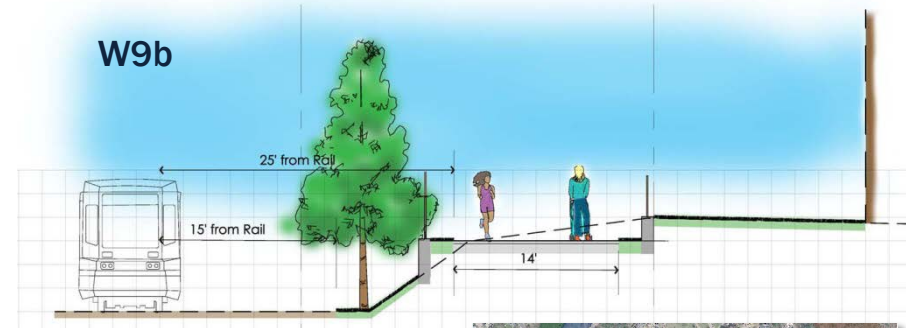
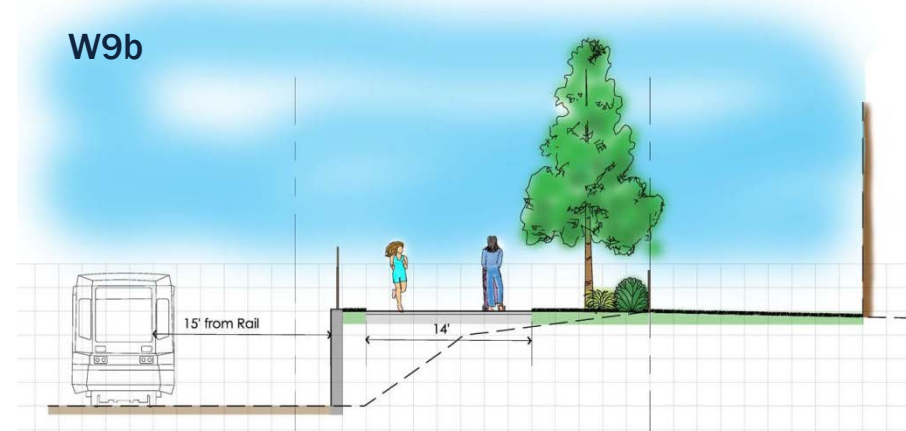
■ W7c: Existing Station At-Grade

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EAST OF TRAPELO ROAD (W8 & W9)

- W8 and 9b: Remain on south side of rail through DPW
 - Varying ROW, varying distance to tracks
- W9a: Cross to north side of rail
 - Connect to 5b
 - Paper Street owned by Town, Reduces need for walls, furthers redevelopment



FEASIBILITY ALIGNMENTS – CENTRAL

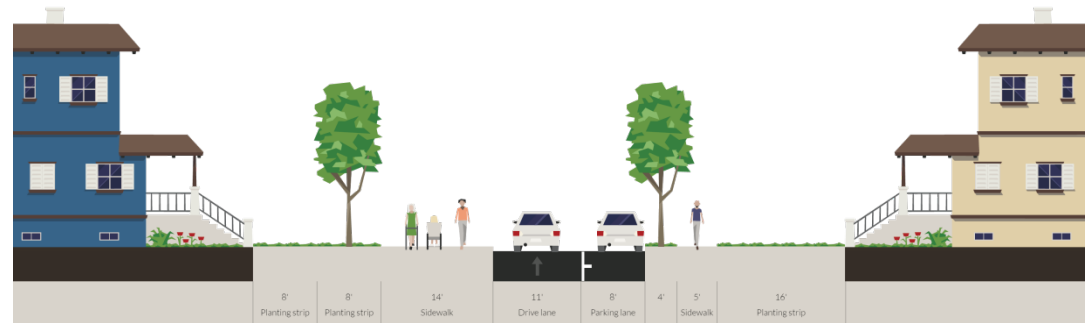


CONTINUE TO CLARK STREET (C1)

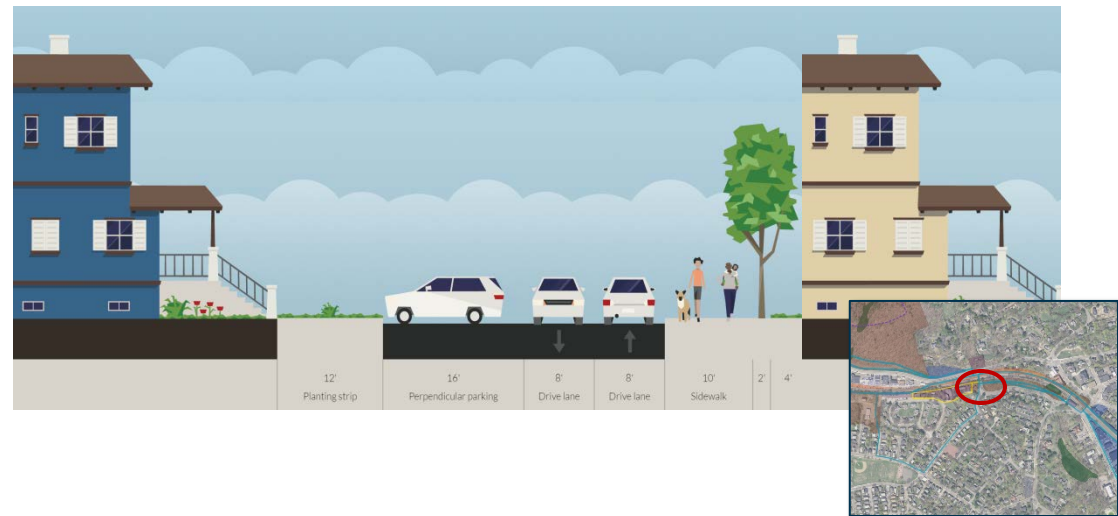
- C1a same as W5b
- C1b has impact to residential structures at 15' min. offset
- C1c: CPAC Alignment - Continue east from DPW through BHA development and Clark Lane
 - Clark Lane has 12% grade at east end, must go behind 104 Clark Street



Pearson Road

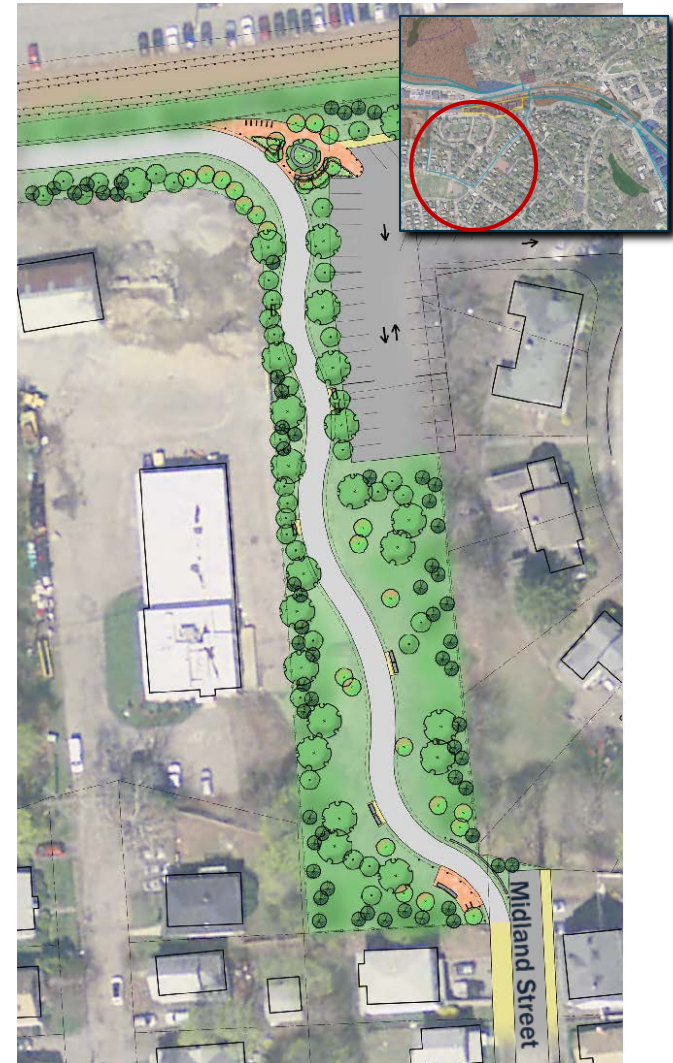


Clark Lane



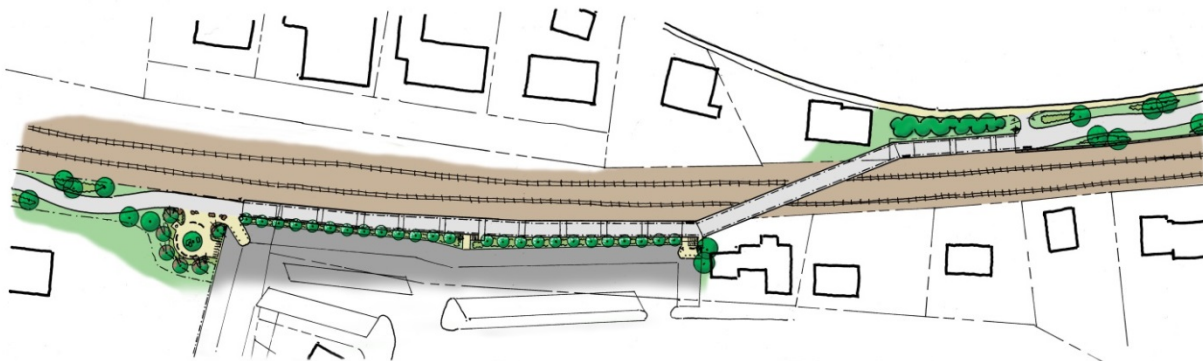
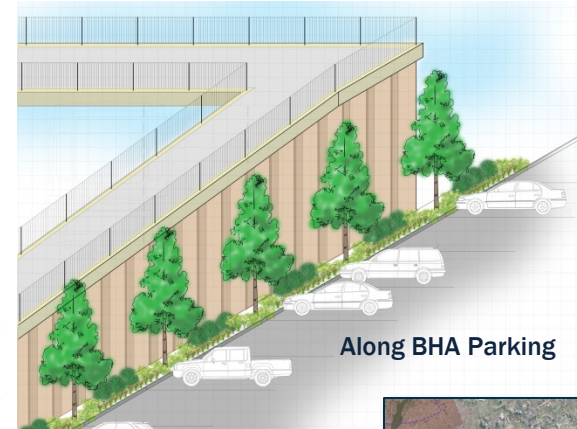
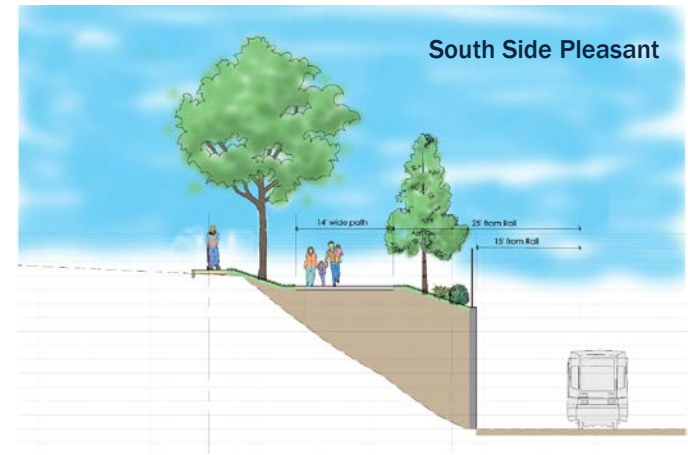
CONTINUE TO CLARK STREET (C1)

- C1d: Go around BHA/Clark Lane to the South
 - Continue along Waverley, Thomas and Clark Streets
 - Could convert Waverley/ Beech Streets to one-way pair
 - Connect to Town Field and Beech Street Center



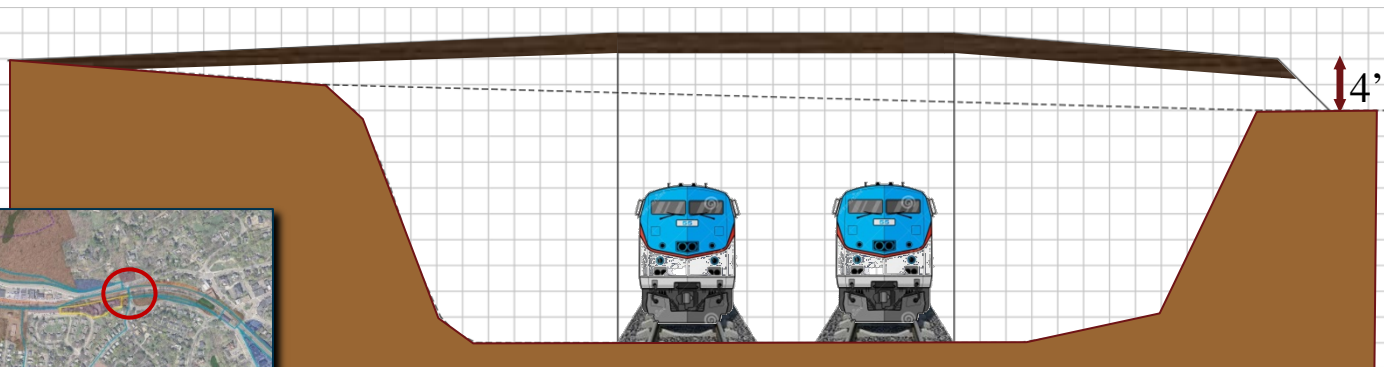
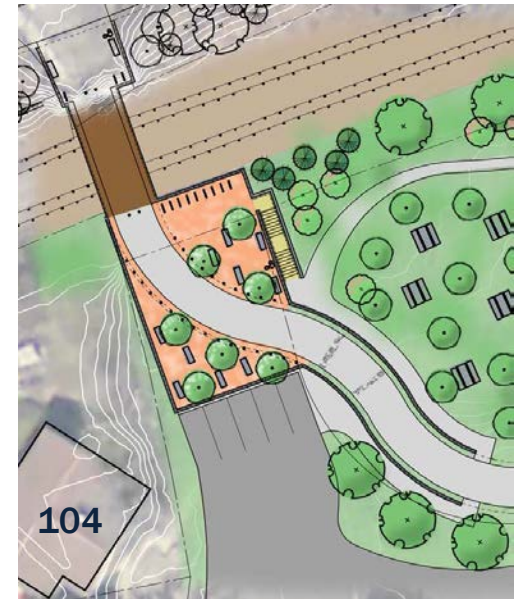
CONTINUE TO CLARK STREET (C1)

- C1e: Go around BHA/Clark Lane to the North
 - Make connection from BHA parking lot to south side of Pleasant Street
 - Connect to Pleasant Street businesses/redevelopment
 - Requires structure along BHA lot and bridge
 - Requires retaining wall (approx. 18' tall) for 600' along Pleasant Street
 - Can replicate existing parking with minor lot adjustments



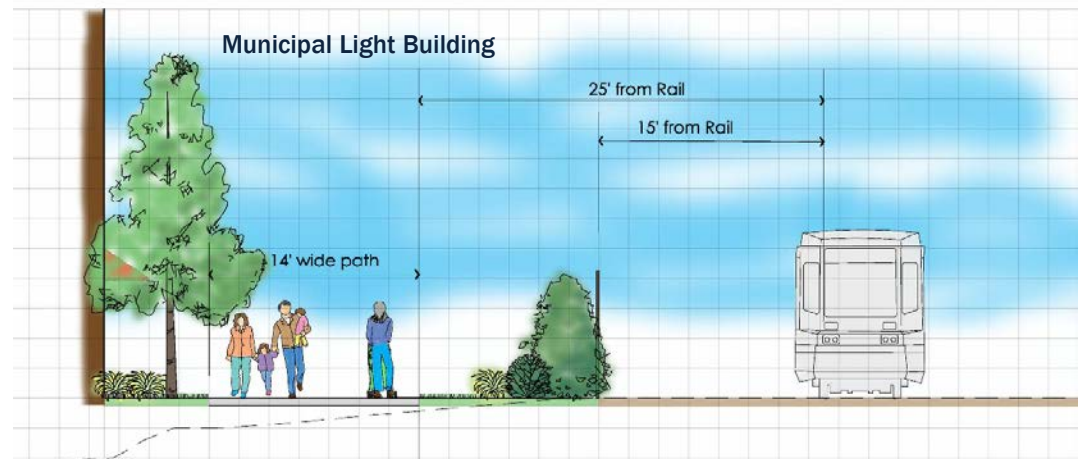
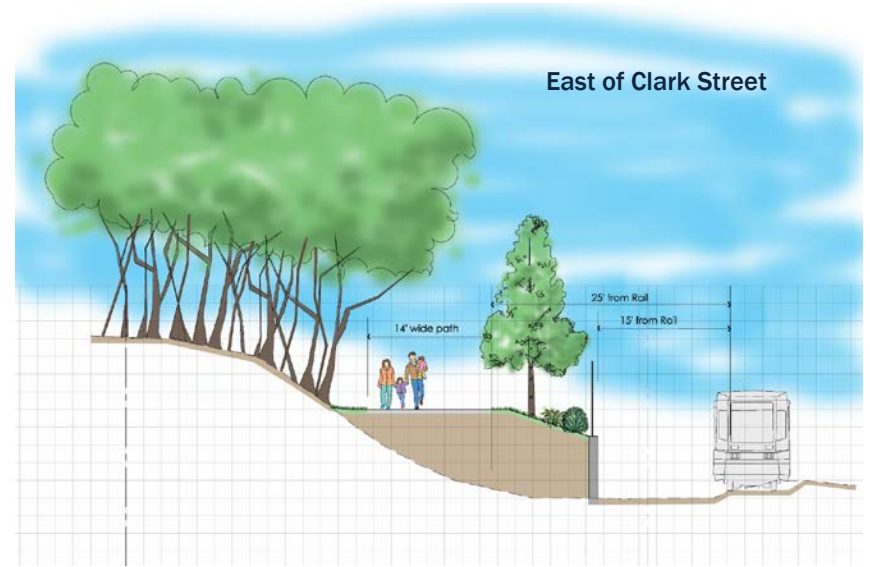
CLARK STREET CONNECTIONS (C2)

- 4 Alternatives – C2a stays north, C2c/d stays south
- C2b: North to South or South to North
 - Reconstruct Clark Street Bridge
 - Needs to be raised approx. 5' to meet 22'-6" clearance required by MBTA
 - Requires regrading on south side



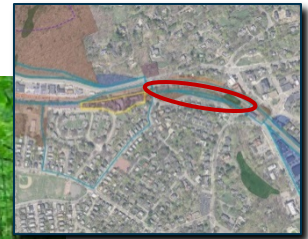
CLARK STREET TO BELMONT CENTER (C3)

- C3a: Continue along north side of rail
 - Short wall needed east of Clark Street
 - Connect to redevelopment of Municipal Light building
 - Enters Belmont Center at track level – westbound platform



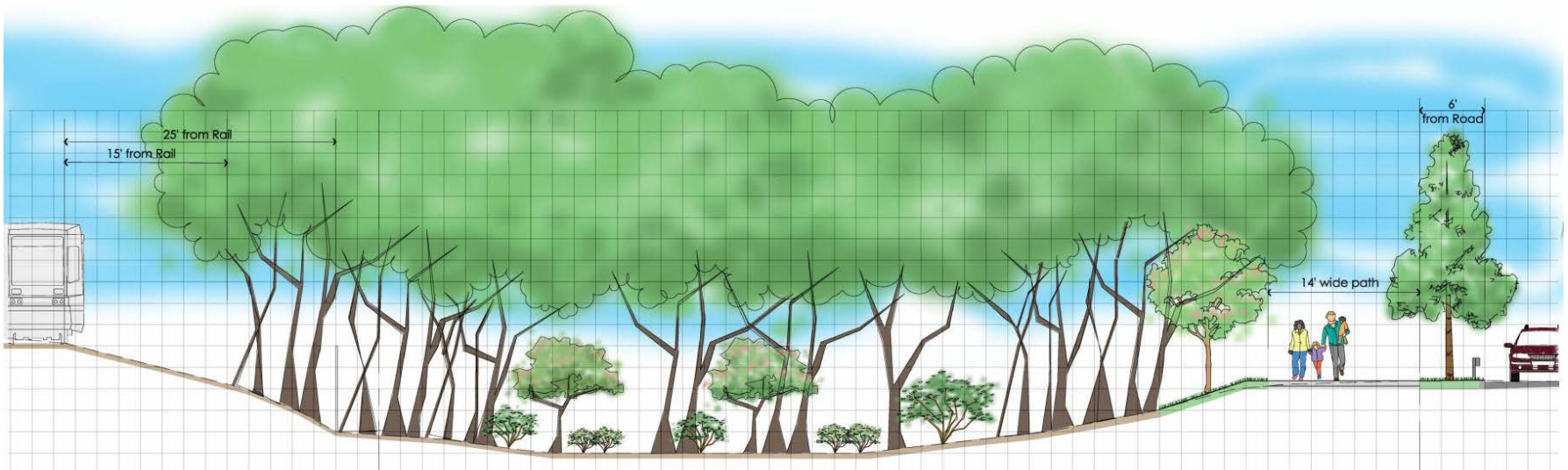
CLARK STREET TO BELMONT CENTER (C3)

- C3b/c: Continue along south side of rail
 - Run through/along Royal Road Woods
 - Connects to Belmont Center Station
 - C3b Allows for separate running path
 - 3Cb Wetland impacts not fully defined, may require extensive boardwalk



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BELMONT CENTER CONNECTIONS (C4)

- C4a/d: Continue North Side of Rail
 - C4a - Create park and enhance downtown connection
 - C4d - Widen/Shorten existing station access tunnel



BELMONT CENTER CONNECTIONS (C4)

- C4b: Concord Avenue Underpass
 - Descend or ascend to/from street via park
- C4c: Cross Concord Avenue
 - Signalized street crossing/Roundabout
- C4e: Switchback to south side of rail

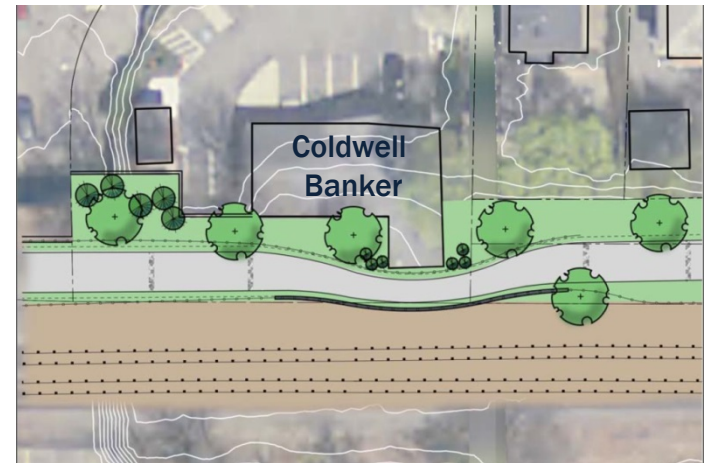
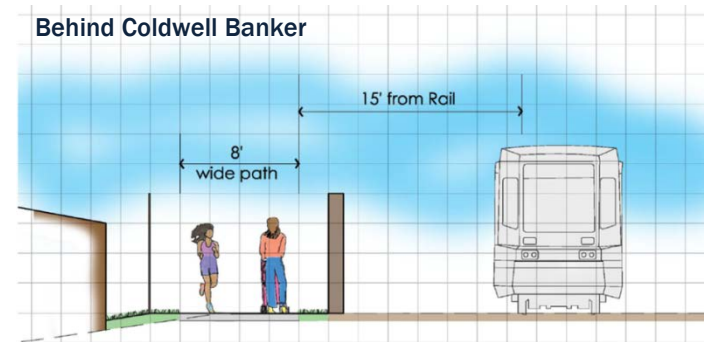
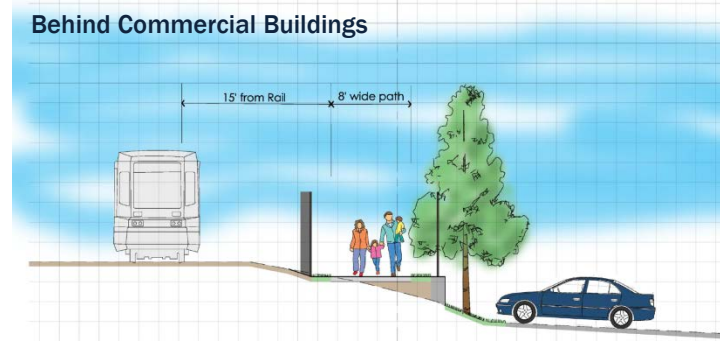
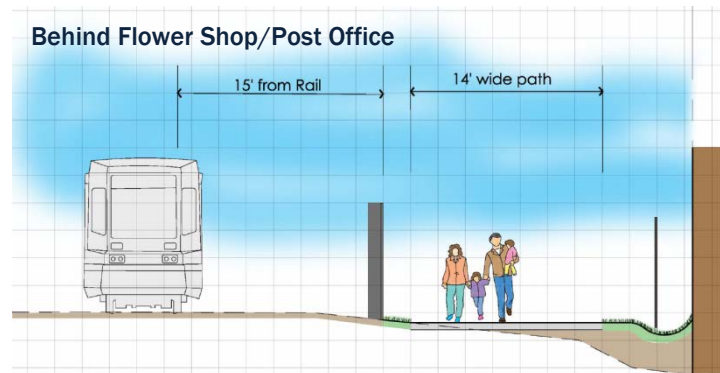


FEASIBILITY ALIGNMENTS – EAST END



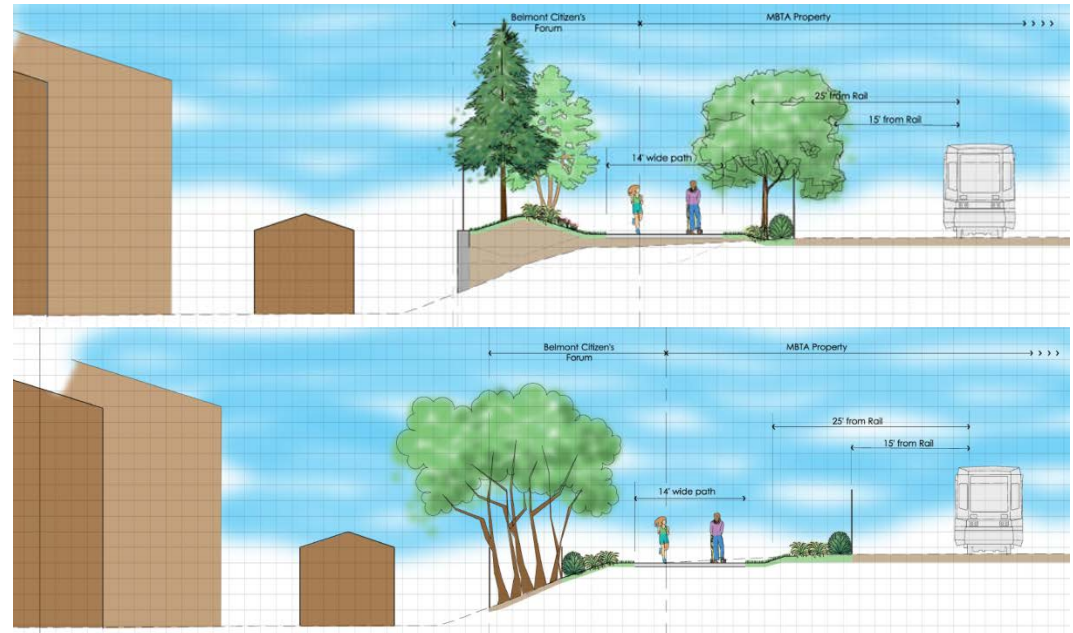
DOWNTOWN TO ALEXANDER AVENUE (E1)

- E1a: Continue on north side of rail
 - Pinch behind Coldwell Banker building - 25' length, Minimum offset and path
- E1b: Continue on south side of rail
 - Pinch behind flower shop, post office and commercial properties - 400' min offset and 450' min offset and path



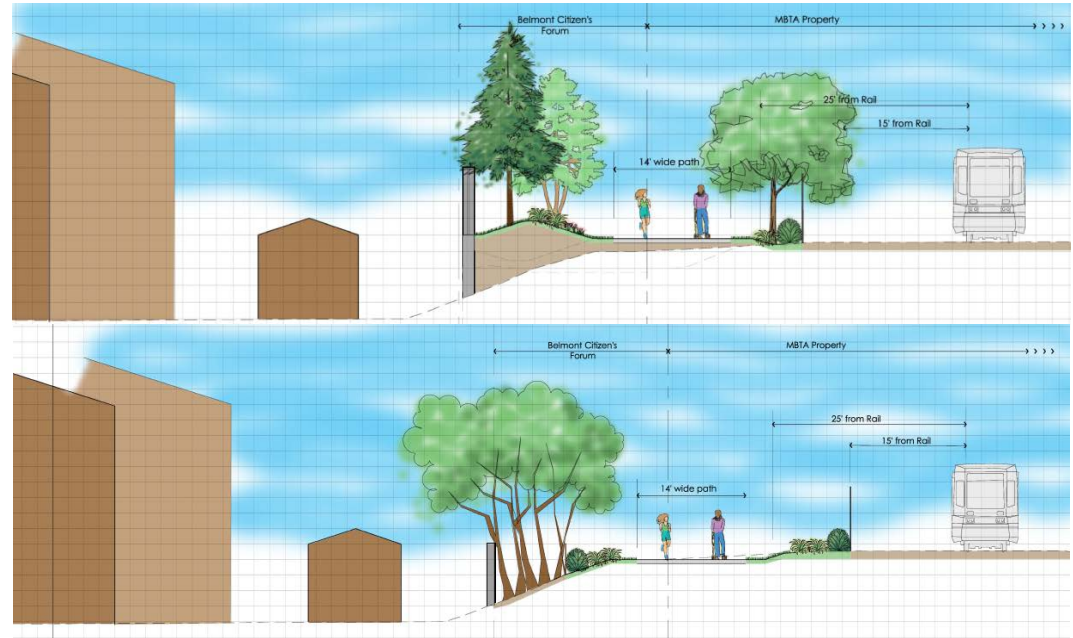
ALEXANDER AVE TO BRIGHTON ST (E3)

- E3a: Continue east on combination of MBTA and Belmont Citizen's Forum (BCF) property.
 - Many options for edge treatments – 2 shown



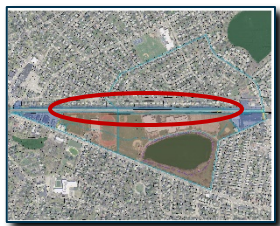
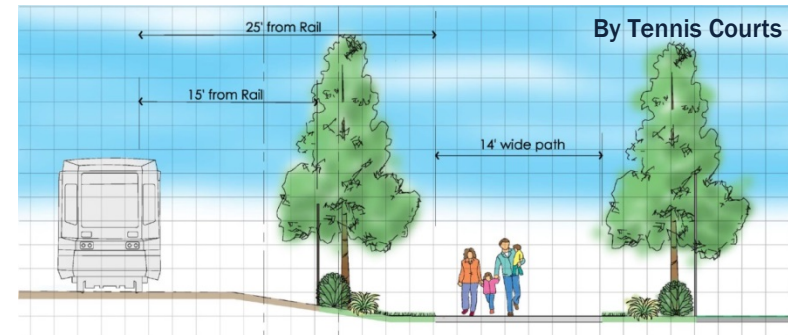
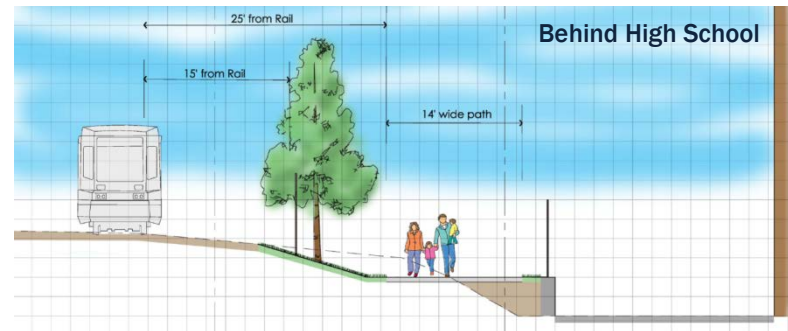
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ALEXANDER AVE TO BRIGHTON ST (E3)

- E3b: Along south side of rail
 - Path runs behind existing high school building
 - Minimum offset to rail
 - Retained to maintain drive aisle
 - Offset increases to recommended along tennis courts
- E3c: Incorporated within MSBA approved high school reconstruction



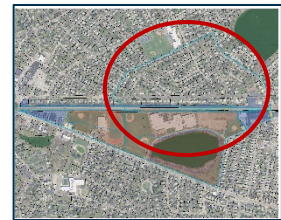
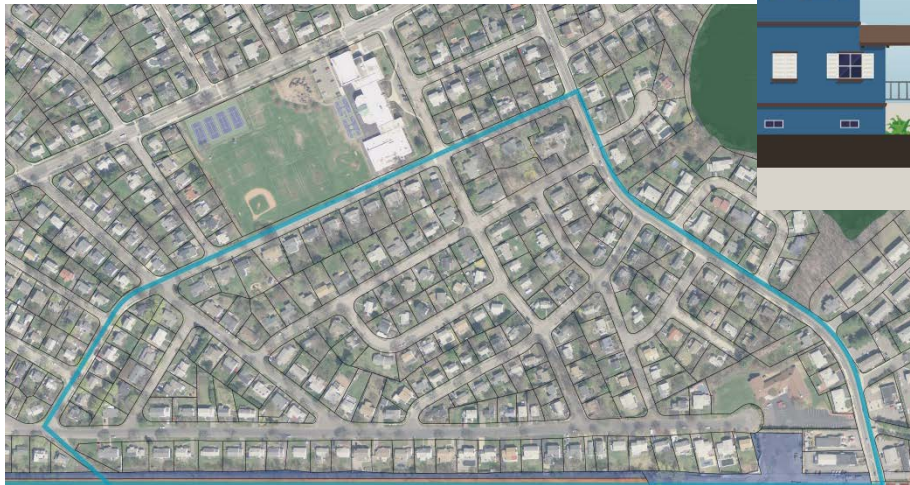
ALEXANDER AVE TO BRIGHTON ST (E3)

- E3d: Linear Park



ALEXANDER AVE TO BRIGHTON ST (E3)

- E3e: Alternative – Traverse Winn Brook Neighborhood
 - Makes connection to Winn Brook Elementary School
 - Avoids pinch point at F&M property



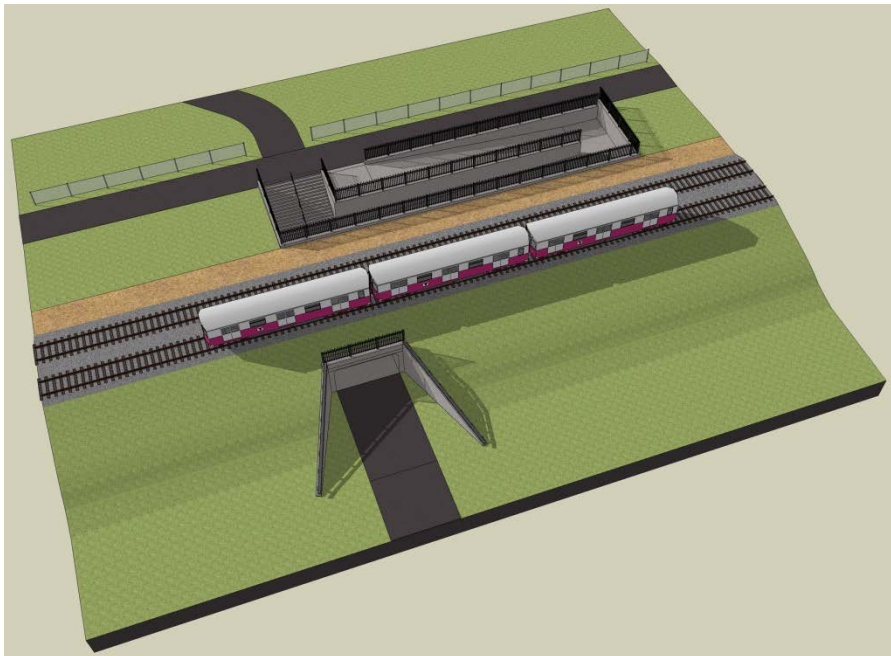
ALEXANDER AVENUE UNDERPASS (E2)

- E2a: Path Depresses to Underpass
 - Only works with path on north side of rail
 - Requires walls along property line and MBTA maintenance drive aisle
 - Provides ample space for path enjoyment



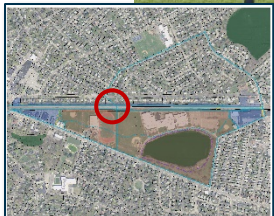
ALEXANDER AVENUE UNDERPASS (E2)

- E2b: Switchback
 - Works with any path location
 - Path running on north side of rail could bypass underpass
 - Less walls required than E2a



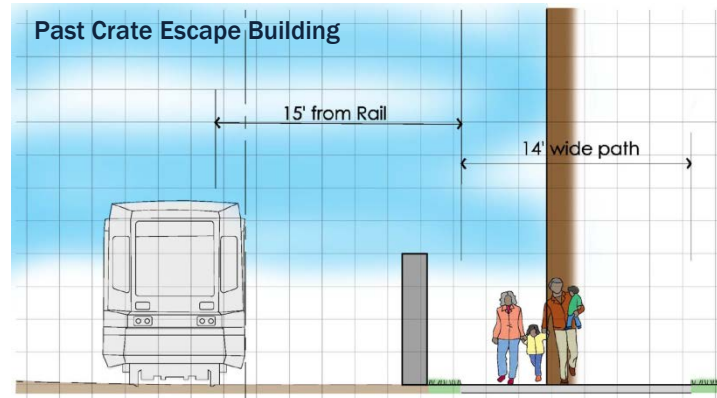
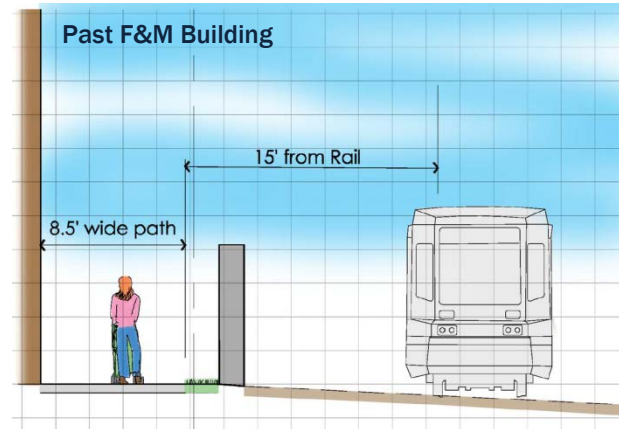
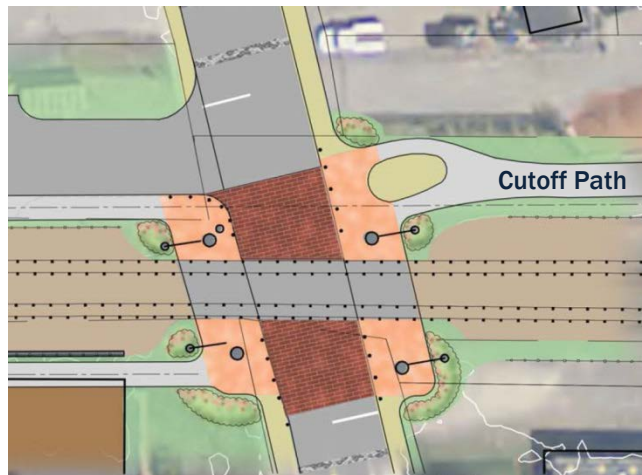
ALEXANDER AVENUE UNDERPASS (E2)

- E2c: Alexander Avenue Uses Underpass
 - Works with path on High School or Concord Avenue
 - Minimal wall construction
- E2 All: Connection to Concord Avenue
 - Must coordinate with redevelopment of high school campus
 - Includes links to pool, library, music school and more



BRIGHTON STREET (E4)

- E4a: Cross Brighton Street At Grade
 - Use highly visible pave treatment
 - Adjust stop bar locations
 - Widen sidewalks



BRIGHTON STREET (E4)

■ E4b/c: Cross over Brighton Street

- Existing cutoff must pass under structure to maintain connection to neighborhoods
- E4b must ascend to full height west of F&M building - Less than 15' offset to rail for short pinch
- E4c has impact to Crate Escape building



HOT TOPICS IDENTIFIED

■ Hot Topics from Public Engagement

- Path Access and Length – Directness of Connections
- Crossings – Roadways and Rail
- Proximity to Vehicles
- Proximity to Residences
- Dedicated Bike Space vs. Intermingled Use
- Edge Treatments
- Path Amenities – including Parking, Parks, Bike Racks, Signage, etc.
- Operation and Maintenance – Hours, Lighting, Permit Parking

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Matrix

Design

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■ Crossings – Roadways and Rail

■ Proximity to Vehicles

■ Proximity to Residences

■ Dedicated Bike Space vs. Intermingled Use

■ Edge Treatments

■ Path Amenities – including Parking, Parks, Bike Racks, Signage, etc.

■ Operation and Maintenance – Hours, Lighting, Permit Parking

Matrix

Design

**Beyond
Scope**

RECOMMENDED DESIGN DETAILS

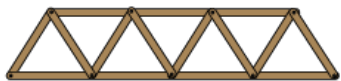
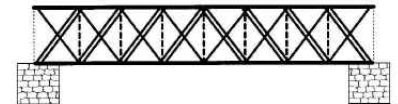
- Roadway Crossings/Vehicle Proximity
 - Desire to have distinct separation from traffic – no glorified sidewalks
 - Desire to minimize number of roadway and driveway crossings
 - All major roadway crossings will include signal and pedestrian improvements – Trapelo, Lexington, Pleasant, Concord, Brighton



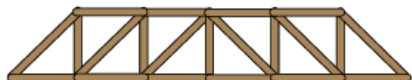
RECOMMENDED DESIGN DETAILS

■ Rail Crossings: Bridges

- Desire to be as open/visible as possible
- Long, steep grades undesirable - 5% max.
- Bridges with strength for emergency vehicle/plow
- Recommend simple howe/pratt or warren truss



Warren Truss



Howe Truss

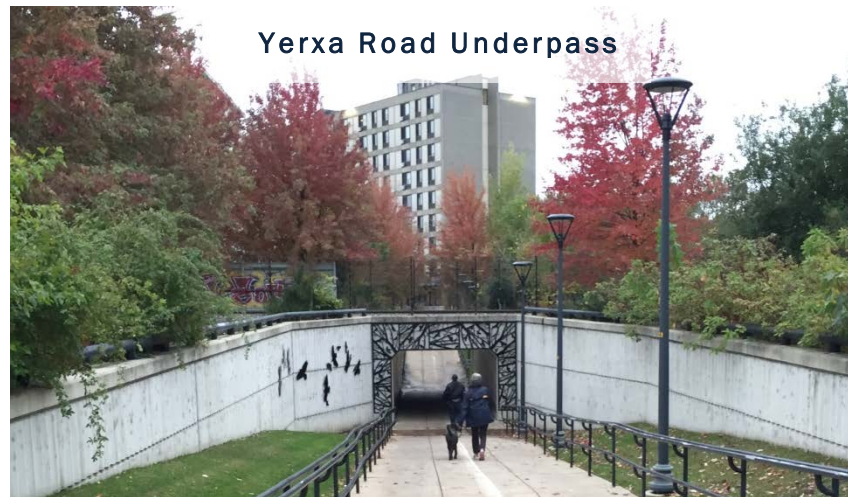


Pratt Truss



RECOMMENDED DESIGN DETAILS

- Rail Crossings: Underpasses
 - Desire to be as open/visible as possible
 - Underpasses width 20' to allow shy distance to walls
 - Up to 15% more cost than 16' width – approx. \$3 - 4 Mil expected
 - Yerxa is 11' wide and 54' long for comparison



RECOMMENDED DESIGN DETAILS

- Desire to be as open/visible as possible
 - Retaining Walls - Single structures where possible
 - Limit “Boxed In” Feeling
 - Reduce Cost



RECOMMENDED DESIGN DETAILS

■ Proximity to Residences

- Abutters want path users to continue moving and not linger
- Amenities including parks/parklets, benches, water fountains, etc. will not be proposed adjacent to residences



Replace bench
with low plantings

RECOMMENDED DESIGN DETAILS

- Dedicated Bike vs. Intermingled
 - Dedicated bike space preferred – increase paved path width to 16'
 - Increase pave and excavation costs approx. 15%
 - Minor change to structures costs
 - Desire for side/nature trails could be accommodated where possible with widened shoulder (6' vs. 2') - Marginal effect on cost



Intermingled



Dedicated Bike Space

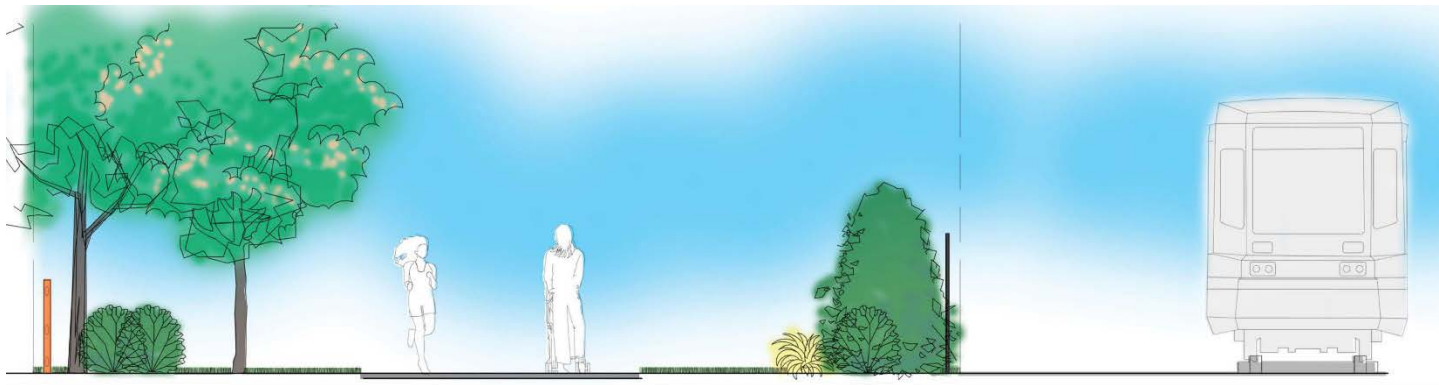


Additional Wide Shoulder

RECOMMENDED DESIGN DETAILS

■ Edge Treatments & Amenities

- Plantings along both sides of path
- Fences/barriers near property lines, not near path edge
- Fence vs. Planting vs. Solid Barrier = beyond feasibility scope
 - Carry cost for higher option throughout
- Placement of amenities = beyond feasibility scope
 - Assume average quantity per mile for cost based on past projects



MATRIX DEVELOPMENT: WORKSHOP STATIONS

■ What is Most Important?





- Guide development of potential evaluation criteria
- Provide input on what you think is most important for the path





WHAT IS MOST IMPORTANT? Environmental/Regulatory Traits

Belmont Community Path
Feasibility Study



Place ONE DOT in ONE BOX to the RIGHT of each TRAIT

WHAT SHOULD BE THE IMPORTANCE OF THE FOLLOWING PATH TRAITS WHEN RANKING THE ALTERNATIVE PATH ALIGNMENTS?	Least important	Important	Most important
Avoid or protect cultural resources and fragile environmental areas			
Minimize need for environmental permits			
Use existing open spaces when feasible			
Take advantage of the natural topography			

WHAT IS MOST IMPORTANT? Environmental/Regulatory Traits	Least important	Important	Most important
Avoid or protect cultural resources and fragile environmental areas			
Minimize need for environmental permits			
Use existing open spaces when feasible			
Take advantage of the natural topography			

WHAT IS MOST IMPORTANT? Local Community/Local Jobs	Least important	Important	Most important
Provide for local jobs			
Provide for local services			
Provide for local recreation			
Provide for local housing			

WHAT IS MOST IMPORTANT? Transportation	Least important	Important	Most important
Provide for local jobs			
Provide for local services			
Provide for local recreation			
Provide for local housing			

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Provide for local recreation			
Provide for local housing			

WHAT IS MOST IMPORTANT? Transportation	Least important	Important	Most important
Provide for local jobs			
Provide for local services			
Provide for local recreation			
Provide for local housing			

MATRIX DEVELOPMENT: WORKSHOP OPTIONS RESULTS

- Environmental, Land Use, Design, Social, and Fiscal: **ALL Important**
- Least Important: Pocket parks and dog runs
- Most Important:
 - **Community connections**
 - **High quality recreation**

MATRIX DEVELOPMENT: INITIAL COMPARISON

West Segment Stretch/Link	Access and Connectivity	Environmental Impacts	Property Impacts	Sense of Security/Comfort	Relative Cost	Total
W, C, E	3	1	3	2	2	11

MOST IMPORTANT

- Community Connections
- High Quality Recreation
- Safety

LEAST IMPORTANT

- Cost

MATRIX DEVELOPMENT: INITIAL COMPARISON

CRITERIA

- Based on community input – PAST AND PRESENT
- Includes Hot Topics

Access and Connectivity	Environmental Impacts	Property Impacts	Sense of Security/ Comfort	Relative Cost
3	1	3	2	2

GENERALLY

0 points for FATAL FLAWS

1 point for low or negative assessments

3 points for medium or neutral assessments

5 points for high or maximum positive assessments

2 or 4 points for an assessment that falls between the higher and lower number

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

MATRIX DEVELOPMENT

USER EXPERIENCE

- Ease of Access - ramps, directness
- Aesthetics - views, landscaping, amenities
- Comfort - noise, pollution, personal space

Criteria
<u>User Experience</u>
Ease of Access
Aesthetics
Comfort
<u>Environmental and Cultural Impacts</u>
Wetlands
Historic resources
Mature Woodland
<u>Design Attributes</u>
Encroachments necessary/MOU
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<u>Cost</u>
Range of Construction Costs
Operations and Maintenance Costs
Qualify for Funding
Value Added

MATRIX DEVELOPMENT

ENVIRONMENTAL/CULTURAL IMPACTS

- Wetlands
- Historic Resources
- Mature Woodlands

Criteria
<u>User Experience</u>
Ease of Access
Aesthetics
Comfort
<u>Environmental and Cultural Impacts</u>
Wetlands
Historic resources
Mature Woodland
<u>Design Attributes</u>
Encroachments necessary/MOU
Fire and Safety
Potential Partnerships
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Ease of universal public accessibility
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Operations and Maintenance Costs
Qualify for Funding
Value Added

MATRIX DEVELOPMENT

DESIGN ATTRIBUTES - beyond attributes designed into every alternative alignment

- Encroachments necessary/MOU
 - residential structure = 0
 - other structure=1
 - private residential property=2
 - other private property=3
 - construction easement/not permanent=4
 - no encroachment=5

- Fire and Safety - views, remoteness

- Potential Partnerships - land acquisition, funding, and/or maintenance

Criteria
<u>User Experience</u>
Ease of Access
Aesthetics
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<u>Environmental and Cultural Impacts</u>
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Qualify for Funding
Value Added

MATRIX DEVELOPMENT

DESIGN ATTRIBUTES - continued

- Distance to residential structures - Most every alignment passes adjacent to residential property. Concerns for potential negative impacts – THEREFORE:

- 0'-10' to residential structure =1
- 11'-20' to residential structure =2
- 21'-30' to residential structure =3
- 31'-40' to residential structure =4
- 41'-50' and over to residential structure=5

Criteria
<u>User Experience</u>
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Qualify for Funding
Value Added

MATRIX DEVELOPMENT

TRANSPORTATION

- Vehicular Conflicts - **cars and trains, off-road community preference**
 - Over 5 driveway crossing within 500 linear feet = 0
 - on-street = 1
 - mid-block crossing/at-grade rail crossing = 2
 - signalized intersection with heavy traffic/ Path immediately adjacent to road/at 15' to rail = 3
 - signalized crossing at low-traffic intersection/at 25' to rail = 4
 - No/few conflicts/Not immediately along rail = 5

Criteria
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Ease of universal public accessibility
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<u>Cost</u>
Range of Construction Costs
Operations and Maintenance Costs
Qualify for Funding
Value Added

MATRIX DEVELOPMENT

TRANSPORTATION - continued

- Connectivity to Destinations - resources, businesses, amenities and transit
- Ease of Universal Access - directness of accessible routes; quantity and challenge of accessible routes/ramps
- Consistency with Regional Plans - MCRT/Wayside Trail to Fitchburg Cut-off Path (connection to Alewife Station), relative directness
- Impact on existing traffic/transportation

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

MATRIX DEVELOPMENT

COST

- Range of Construction Costs
- Relative Operations and Maintenance Costs
- Qualify for various Funding sources
- Value Added
 - High scores in this category indicate that there is a high community value added by the path alignment
 - Low scores in this category indicate there is a negative overall community impact by the alignment
 - a score of 3 indicates a neutral rating

Criteria
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Operations and Maintenance Costs
Qualify for Funding
Value Added

MATRIX DEVELOPMENT: FATAL FLAWS

FATAL FLAW: proposed alignment is incompatible with the site or defined guideline/plan for a specific reason; and typically contains design characteristics that violate a community goal, code, initiative or requirement

They receive a score of **0** and are not considered for a Recommended Route (combination of high-ranking alternative Alignments for the full length of the Study Area).

MATRIX DEVELOPMENT: FATAL FLAWS

FATAL FLAWS:

- Direct impact to existing residential structure
- Significant impacts to high-quality wetlands
- Maintenance is physically infeasible due to access and/or alignment
- Excessive number of required roadway or driveway crossings, i.e. average of over 5 driveways/crossings within 500 linear feet

MATRIX DEVELOPMENT

WEIGHT THE CRITERIA

Public Input (Past and Present) indicate some relative importance: High quality recreational experience, community connectivity, off-road and safety

<u>User Experience</u> ★
Ease of Access
Aesthetics
Comfort
<u>Environmental and Cultural Impacts</u>
Wetlands
Historic resources
Mature Woodland
<u>Design Attributes</u>
Encroachments necessary/MOU
Fire and Safety
Potential Partnerships
Distance to residential structures

<u>Transportation</u>
Vehicular conflicts ★
Connectivity to Destinations (Resources, Amenities and Transit) ★
Ease of universal public accessibility
Consistency with regional plans (MCRT/Wayside Trail)
Impact on existing traffic/transportation
<u>Cost</u>
Range of Construction Costs ■
Operations and Maintenance Costs
Qualify for Funding
Value Added

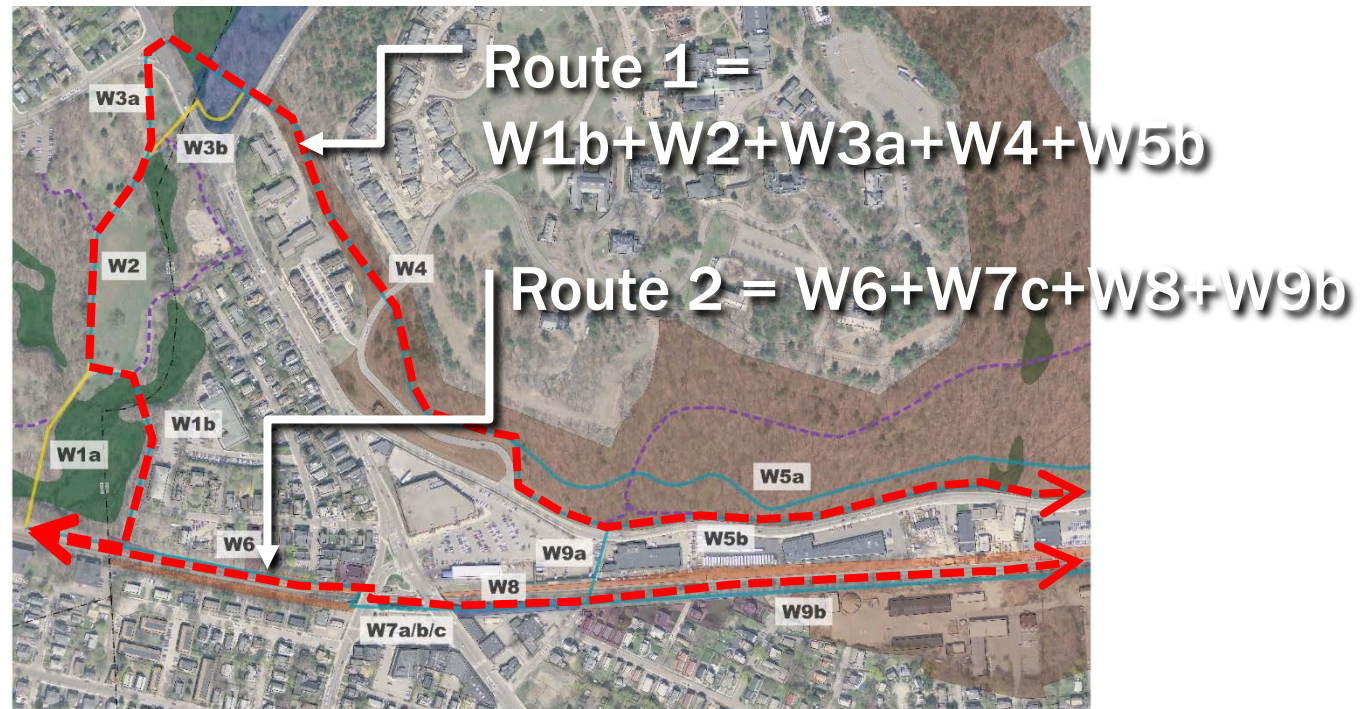
★ Potential higher weight
 ■ Potential lower weight

ROUTE EVALUATIONS

What is a ROUTE??

- combination of high-ranking alternative alignments for the full length of the Study Area

EXAMPLES



ROUTE EVALUATION

COMPARISON

- What makes a Route “HIGH RANKING”?
 - Fatal Flaws – are NOT considered for a Route
 - Total possible score = ± 95 (TBD based on weighting)
 - “High Ranking” to be determined based on final scores
- How to evaluate Routes?
 - Does a high ranking alternative raise the score of an adjacent low ranking alternative?
 - Does a low ranking alternative decrease the score of an adjacent high ranking alternative?
 - Do links and lengths count the same?

WHAT'S NEXT?

- Consultant Team cost alternatives, complete expanded matrix and begin assessment of overall routes
- Cost/Matrix presentations and discussion:
 - Meeting 6: Western End (Waltham to DPW) – TBD January
 - Meeting 7: Central Area (BHA to Downtown) – TBD January
 - Meeting 8: Eastern End (Downtown – Brighton) – TBD February
 - Meeting 9: Cost Summary/Full Matrix – TBD March

<http://www.belmont-ma.gov/community-path-implementation-advisory-committee-cpiac/pages/community-path-feasibility-study>

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