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 nonmotorized, 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



Level of Engagement: <u>Collaborate</u> (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.



ROLES & RESPONSIBILITIES

engage in the process in a manner that promotes respectful civil discourse and enhances mutual understanding of <u>all</u> 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









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, ¹/₂ 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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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





C4b/c

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







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







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







- 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









• E3d: Linear Park



- 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
 E4b
- E4c has impact to Crate Escape building







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

Matrix

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Hot Topics from Public Engagement



 Operation and Maintenance – Hours, Lighting, Permit Parking

Hot Topics from Public Engagement



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



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











Pratt Truss





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



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



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



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

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

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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			

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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

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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
Environmental and Cultural Impacts
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
Cast
COSI
Range of Construction Costs
Operations and Maintenance Costs
Qualify for Funding
Value Added

USER EXPERIENCE

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

	Criteria
1	<u>User Experience</u>
	Ease of Access
	Aesthetics
	Comfort
	Environmental and Contral Impacts
	Wetlands
	Historic resources
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	Cost
	COSI
	Operations and Maintenance Costs
	Quality for Funding
	Value Added

ENVIRONMENTAL/CULTURAL IMPACTS

- Wetlands
- Historic Resources
- Mature Woodlands

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

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<u>Cost</u>
Range of Construction Costs
Operations and Maintenance Costs
Qualify for Funding
Value Added

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>
	Ease of Access
	Aesthetics
	Comfort
	Environmental and Cultural Impacts
	Wetlands
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	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
	-
	Cost
	Range of Construction Costs
	Operations and Maintenance Costs
	Qualify for Funding
	Value Added

TRANSPORTATION

- Vehicular Conflicts cars and trains, offroad 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
	<u>User Experience</u>
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	Range of Construction Costs
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	Qualify for Funding
	Value Added

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

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

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
<u>User Experience</u>
Ease of Access
Aesthetics
Comfort
Environmental and Cultural Impacts
Wetlands
Historic resources
Mature Woodland
<u>Design Attributes</u>
Encroachments necessary/MOU
Fire and Safety
Potential Partnerships
Distance to residential structures
T
Vehicular conflicts
Amenities and Transit)
Ease of universal public accessibility
Consistency with regional plans
(MCRT/Wayside Trail)
Impeer on existing traffic/transportation
<u>Cost</u>
Range of Construction Costs
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 **O** and are <u>not</u> 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>	<u>Transportation</u>
Ease of Access	Vehicular conflicts
Aesthetics	Connectivity to Destinations (Resources,
Comfort	Ease of universal public accessibility
Environmental and Cultural Impacts	Consistency with regional plans (MCRT/Wayside Trail)
Wetlands	Impact on existing traffic/transportation
Historic resources	
Mature Woodland	<u>Cost</u>
	Range of Construction Costs
<u>Design Attributes</u>	Operations and Maintenance Costs
Encroachments necessary/MOU	Qualify for Funding
Fire and Safety	Value Added
Potential Partnerships	Potential higher weight
Distance to residential structures	Potential lower weight

ROUTE EVALUATIONS

What is a **<u>ROUTE</u>**??

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 = \pm 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

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

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