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# *Design Ideas for Belmont Community Path Routes Adjacent to MBTA Fitchburg Line*



**Belmont Community Path Advisory Committee (CPAC)**

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**20 February 2014**



# Overview

- **Belmont Community Path Advisory Committee seeking MBTA feedback on potential recreational trail segments**
- **Routes are currently notional, and do not include engineering designs**
- **Potential trail routes shown in green or yellow lines**
- **Labels (e.g., "1-E") used to specify routes**
- **Motivation is to connect Belmont into Mass Central Rail-Trail corridors to east and west**
- **Former Mass Central Railroad (MCRR) right-of-way paralleled Fitchburg Line exclusively in Belmont (on north side of tracks)**
- **MCRR corridor being considered for some potential trail segments**
- **More route details can be found on CPAC website:**  
[http://www.belmont-ma.gov/Public\\_Documents/BelmontMA\\_BComm/CPAC/CPAC](http://www.belmont-ma.gov/Public_Documents/BelmontMA_BComm/CPAC/CPAC)



# Safety Fencing

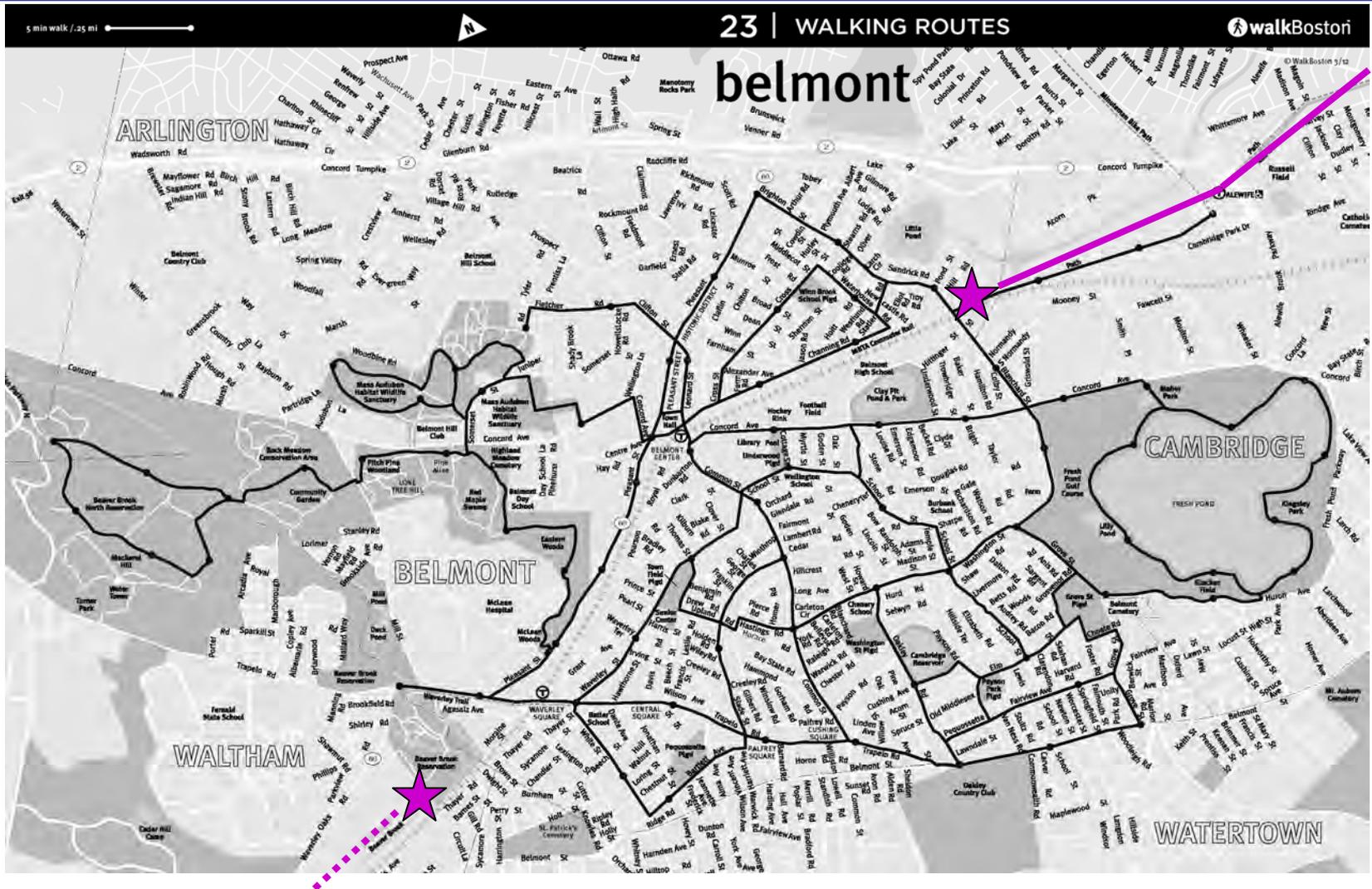
- All potential routes adjacent to Fitchburg Line would include rigid fencing to keep Path users off tracks

- Fencing examples:





# Belmont Mass-Central Rail-Trail Gap





# Brief Descriptions of Potential Belmont Path Routes Near Fitchburg Line

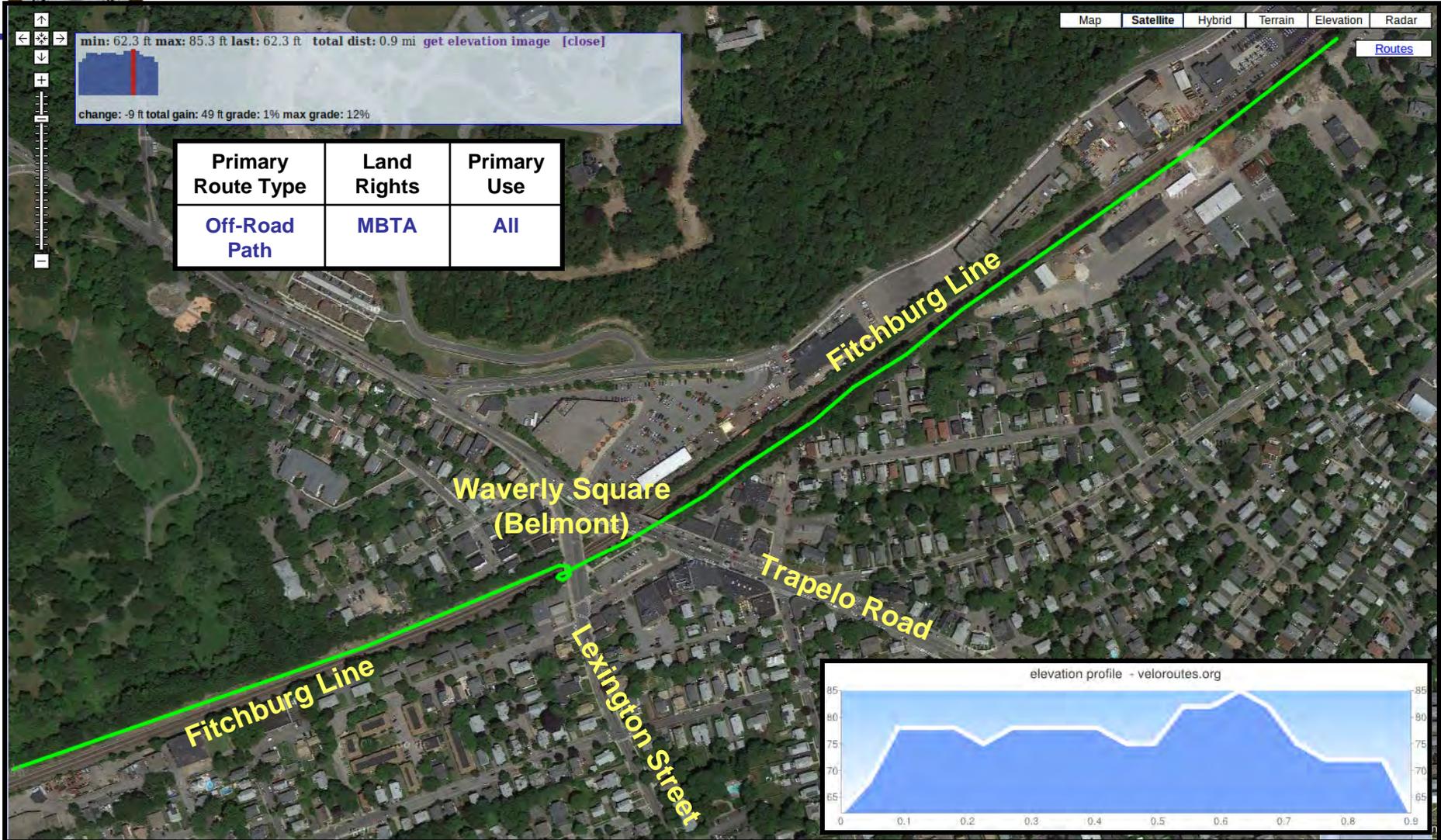
<b>Label</b>	<b>Name</b>	<b>Area</b>
<b>1-E</b>	<b>Beneath Lexington St./Trapelo Rd.</b>	<b>Waverley</b>
<b>2-B</b>	<b>Flatlander Route Behind DPW/Belmont Housing Authority</b>	<b>Between Waverley and Belmont Center</b>
<b>2-C</b>	<b>Beneath Clark Street Footbridge</b>	<b>Between Waverley and Belmont Center</b>
<b>3-A</b>	<b>MCRR Alignment Behind Police/BMLD</b>	<b>Belmont Center</b>
<b>3-C</b>	<b>Royal Road Woods</b>	<b>Belmont Center</b>
<b>---</b>	<b>Historical Railroad Bridge Crossing</b>	<b>Belmont Center</b>
<b>4-CD</b>	<b>MCRR Alignment near Channing Road</b>	<b>East Belmont</b>
<b>4-FI</b>	<b>At-Grade Crossing of Tracks at Brighton Street (Concord Ave. Route)</b>	<b>East Belmont</b>



# Potential West Belmont Routes



# Beneath Lexington/Trapelo (Route 1-E)





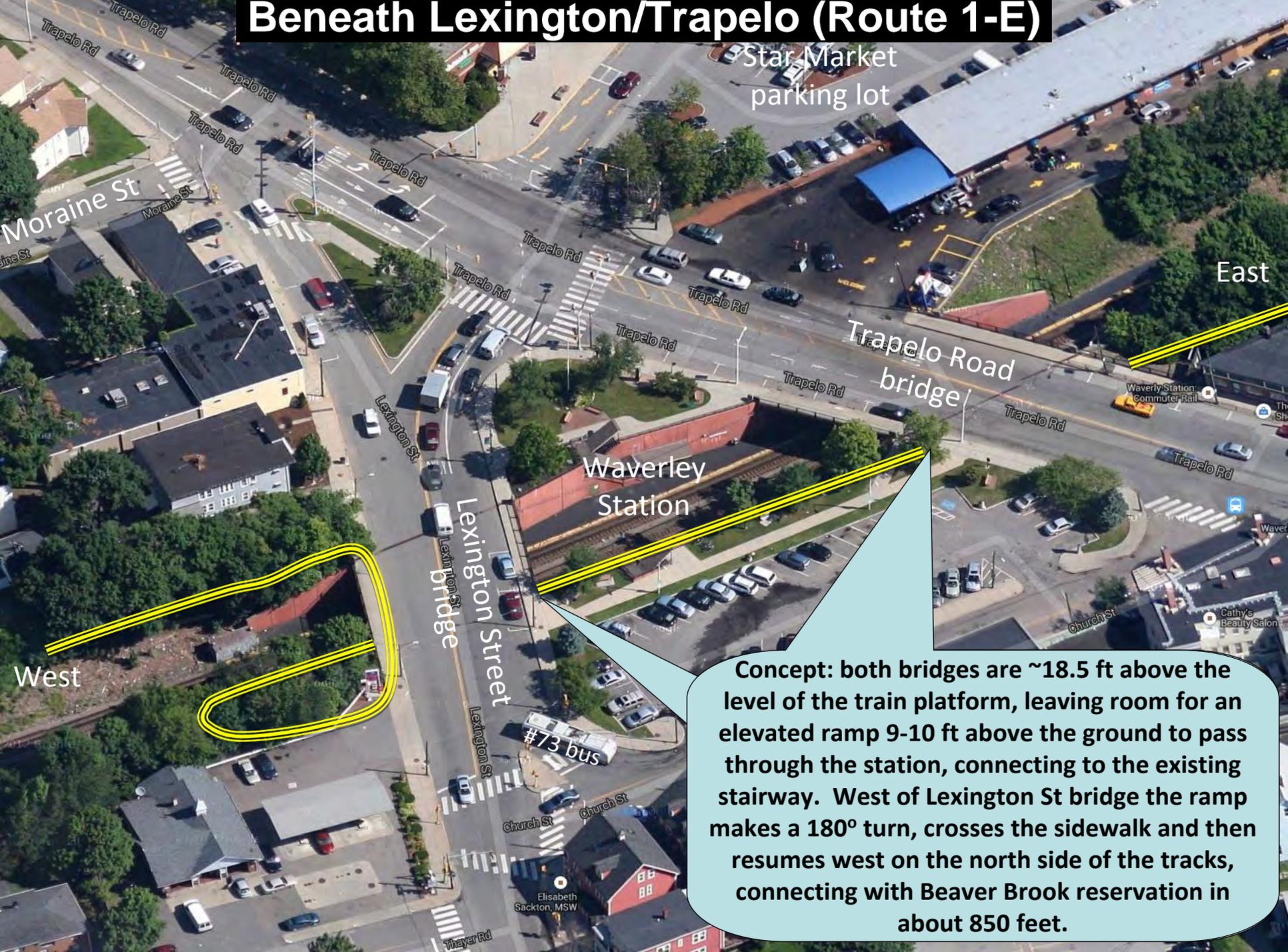
# Beneath Lexington/Trapelo (Route 1-E)

Primary Route Type	Land Rights	Primary Use
Off-Road Path	MBTA	All



Close-up view of Lexington Street

# Beneath Lexington/Trapelo (Route 1-E)



Star Market parking lot

East

Trapelo Road bridge

Waverley Station

Lexington Street bridge

West

**Concept: both bridges are ~18.5 ft above the level of the train platform, leaving room for an elevated ramp 9-10 ft above the ground to pass through the station, connecting to the existing stairway. West of Lexington St bridge the ramp makes a 180° turn, crosses the sidewalk and then resumes west on the north side of the tracks, connecting with Beaver Brook reservation in about 850 feet.**

Elisabeth Sackton, MSW

#73 bus

Waverly Station Commuter Rail

Cathy's Beauty Salon

Church St

Church St

Church St

Thayer Rd

Moraine St

Trapelo Rd

Waverly

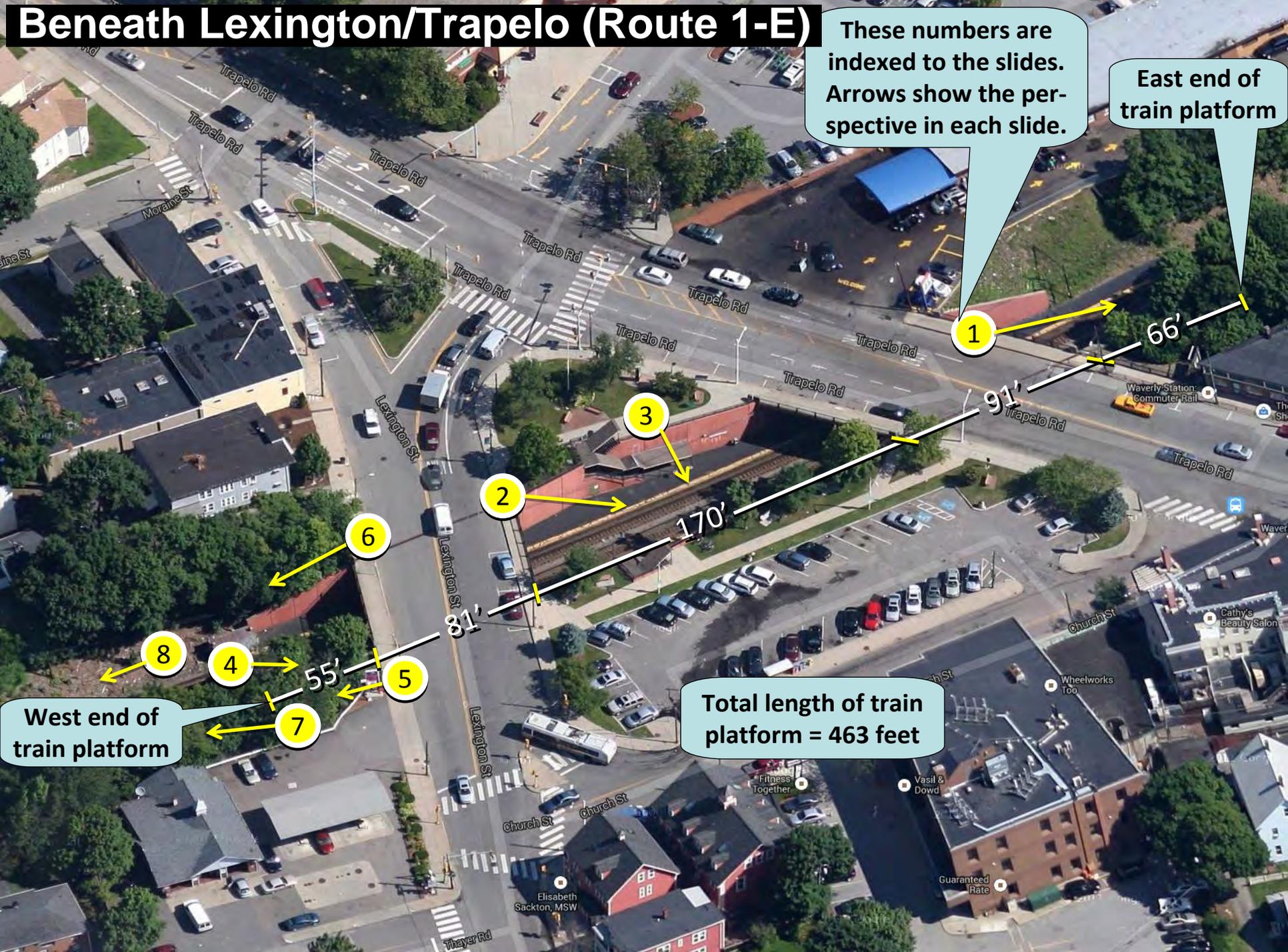
# Beneath Lexington/Trapelo (Route 1-E)

These numbers are indexed to the slides. Arrows show the perspective in each slide.

East end of train platform

West end of train platform

Total length of train platform = 463 feet



1

3

2

6

8

4

7

5

1

3

2

6

8

4

7

5

81'

170'

55'

91'

66'

Trapelo Rd

Moraine St

Lexington St

Lexington St

Church St

Church St

Church St

Thayer Rd

Waverly Station  
Commuter Rail

Cathy's  
Beauty Salon

Wheelworks  
Too

Fitness  
Together

Vasil &  
Dowd

Guaranteed  
Rate

Elisabeth  
Sackton, MSW

# Beneath Lexington/Trapelo (Route 1-E)

1

This land is privately owned (next slide)

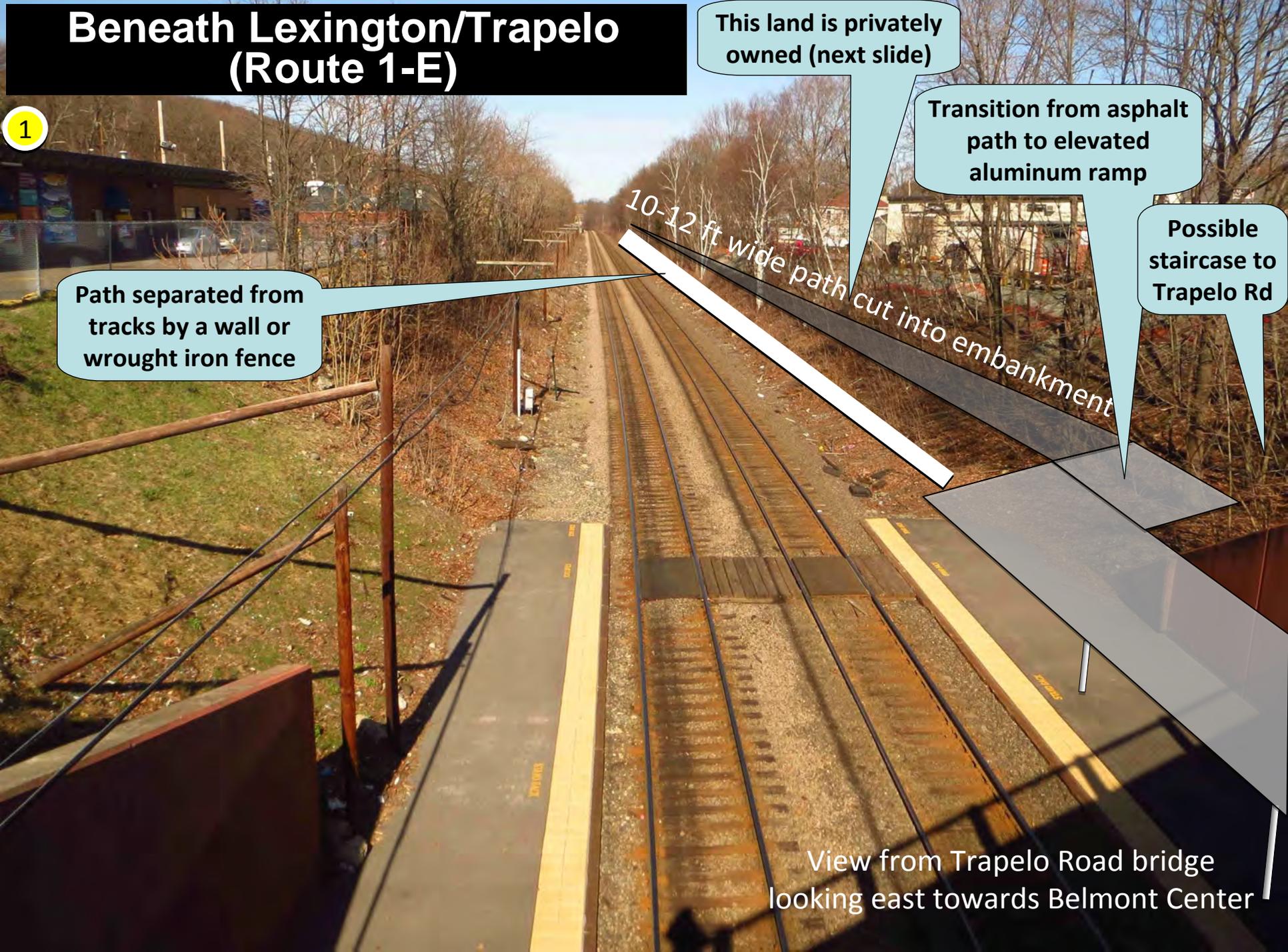
Transition from asphalt path to elevated aluminum ramp

Possible staircase to Trapelo Rd

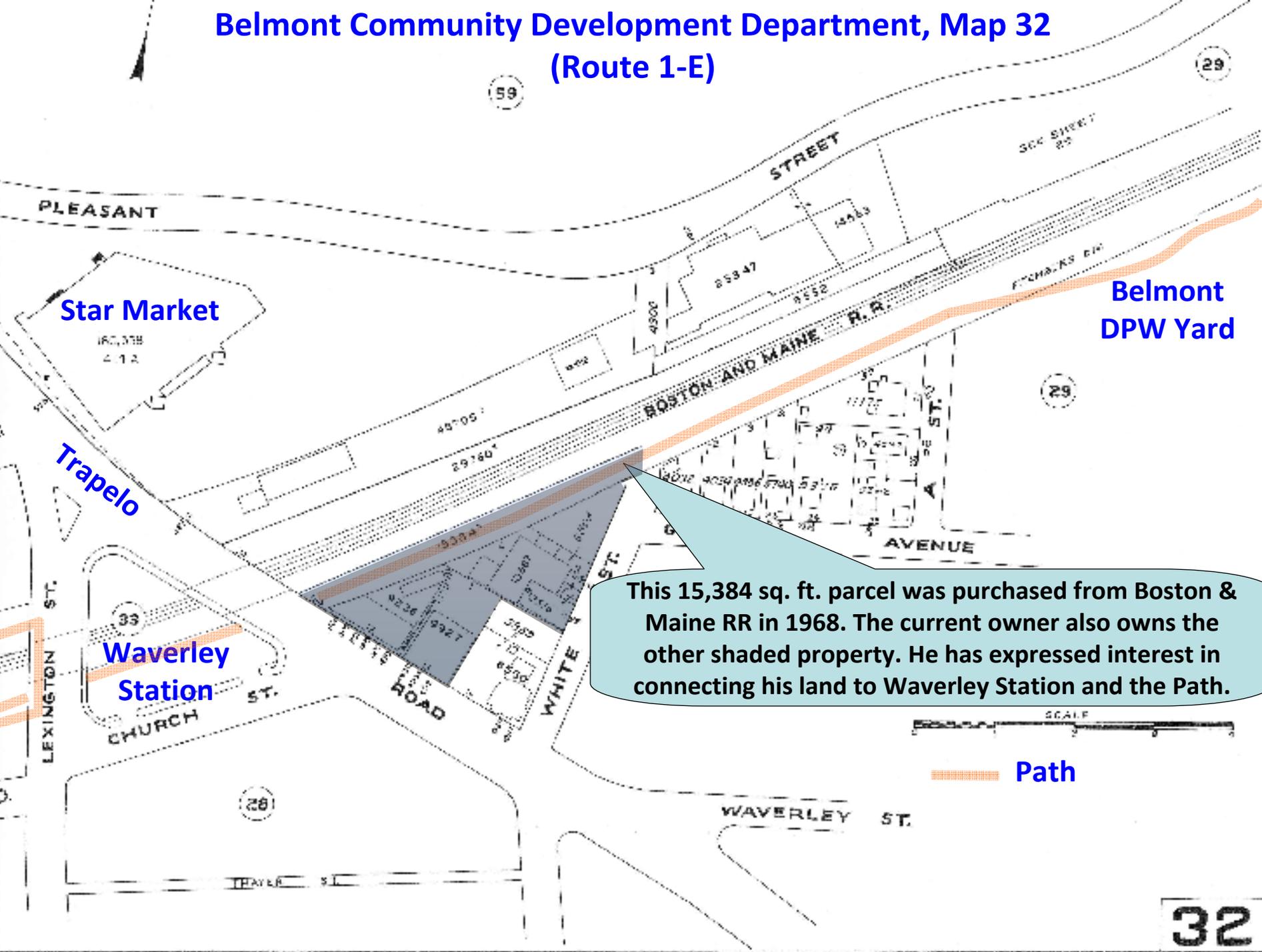
Path separated from tracks by a wall or wrought iron fence

10-12 ft wide path cut into embankment

View from Trapelo Road bridge looking east towards Belmont Center



# Belmont Community Development Department, Map 32 (Route 1-E)



This 15,384 sq. ft. parcel was purchased from Boston & Maine RR in 1968. The current owner also owns the other shaded property. He has expressed interest in connecting his land to Waverley Station and the Path.

# Beneath Lexington/Trapelo (Route 1-E)

The ramp could connect to the platform level here for handicapped access

~15'4" from wall to rail.

The aluminum ramp gently climbs (~5% slope) from platform level at the east end of the station to 9' off the ground 28' west of the Trapelo Road underpass (195' dotted line; includes 3 landings, 5' each, at 30" intervals). The ramp is flat all through the station, leaving 9' of head room below the Lexington Street bridge. The ramp has a high railing, and possibly a roof (next slide).

From the wall to the yellow boarding strip is ~17 ft; from the wall to the rail is ~22.5 ft. Thus a 9-foot wide elevated ramp would be ~13.5 ft. from the track.

The ramp can double as a roof for eastbound train passengers

195-ft 8 or 9 ft. wide elevated aluminum ramp

17 ft

View from Lexington St bridge looking east toward Trapelo Road bridge and (beyond) Belmont Center



# Aluminum Ramp Examples (Route 1-E)

Maadi Group (Montreal) is a major fabricator of aluminum bike/walking paths



Aluminum bridges are used for trails in a wide variety of settings.



A covered bridge would completely separate trail users from trains and eliminate snow & ice



Aluminum structures integrated with existing roads and bridges.



On site assembly of this bridge took 45 minutes.

<http://www.youtube.com/watch?v=JxDGZ1-fQdo>  
<http://www.youtube.com/watch?v=cnPHiv7lBms>

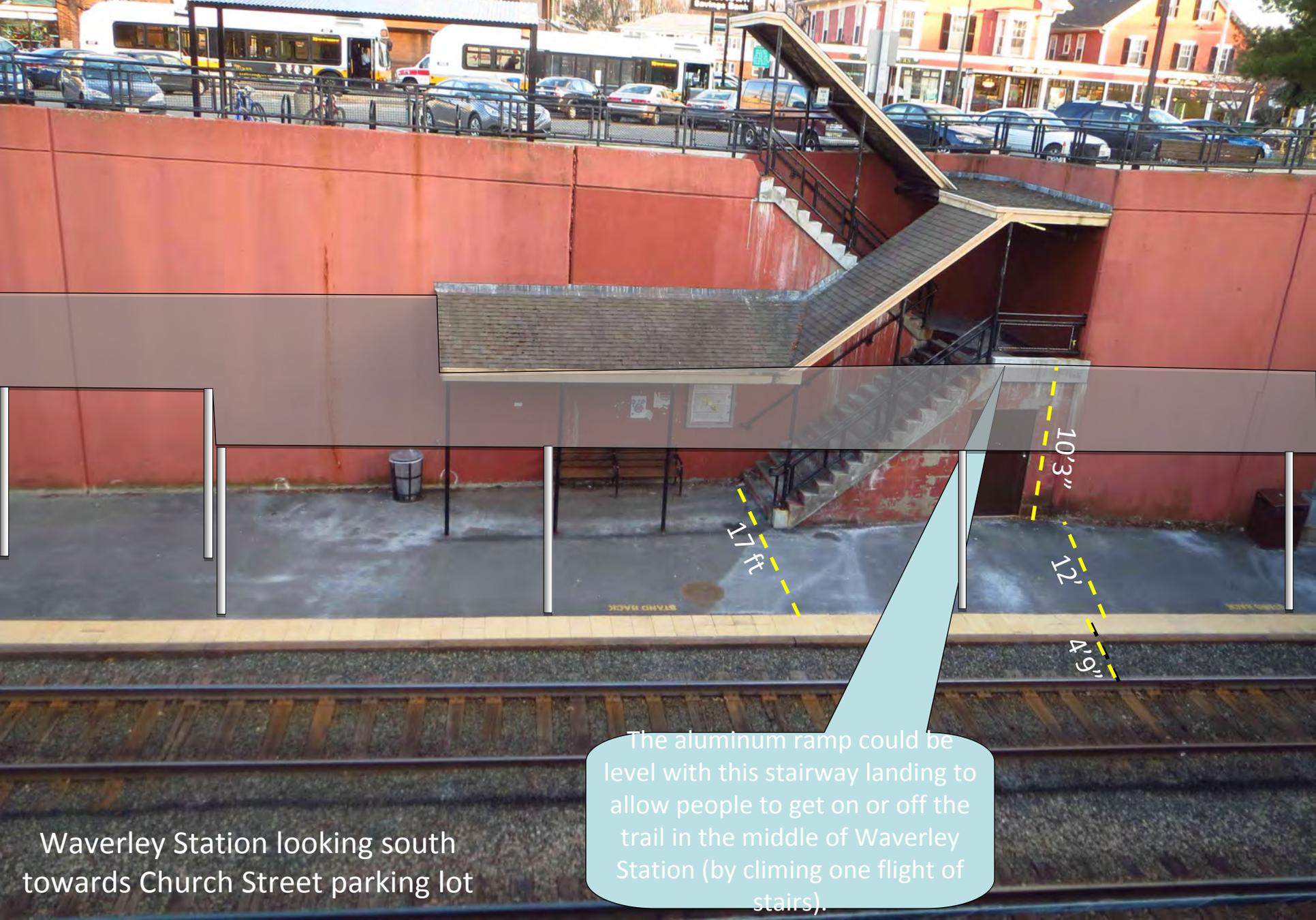
Aluminum bridges are compatible with harsh winter conditions.



See:

Community Path Advisory Committee

# 3 Beneath Lexington/Trapelo (Route 1-E)



Waverley Station looking south towards Church Street parking lot

The aluminum ramp could be level with this stairway landing to allow people to get on or off the trail in the middle of Waverley Station (by climbing one flight of stairs).

# Beneath Lexington/Trapelo (Route 1-E)

Connect to Lexington Street sidewalk

Large landing for turns

Lexington Street bridge

sidewalk

440

5' Landing

15' Landing

5' Landing

9' 4"

21' 4"

10' 8"

55'

The ramp ascends at a 2% slope under the bridge (81 ft x 1/50 = 1'7" rise) and emerges 10' 8" above the platform

The ramp must climb 10' 8" from where it exits the bridge to reach the sidewalk at 21'4" above the platform. At a 6.67% slope (1:15) it takes 160 ft to climb 10' 8". This can be accomplished with two parallel 80 ft ramps as shown (not to scale). To make the structure ADA compliant there must be a landing for every 30" rise, which would increase the length of the ramp by 25' (5' + 10' + 5').

Ramp ascends ~10'8" to sidewalk, so ~5' 4" ascent to landing and ~5' 4" ascent to sidewalk. 5% slope requires platform 110 ft from bridge.

West of Waverley Station looking east at the inbound track, the Lexington St bridge and the Gulf gas station on Lexington St.

5

# Beneath Lexington/Trapelo (Route 1-E)



24' 1"

10 feet

Ramp descends to platform, then turns and goes under bridge

Path continues over bridge

Lexington Street bridge, south side, looking west

6

# Beneath Lexington/Trapelo (Route 1-E)

Path extends 850 ft to Beaver Brook Reservation

Path continues on north side of tracks

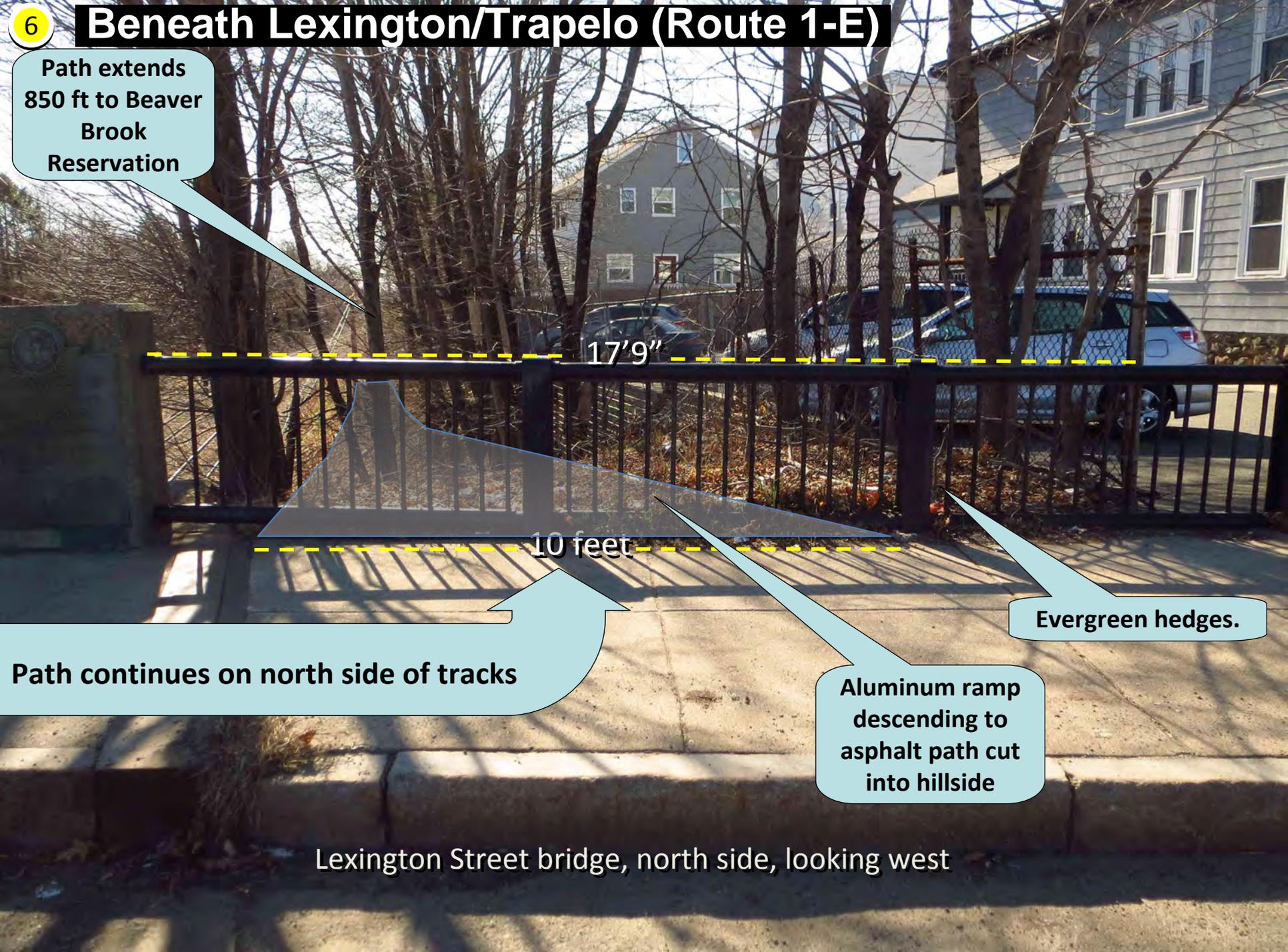
17'9"

10 feet

Evergreen hedges.

Aluminum ramp descending to asphalt path cut into hillside

Lexington Street bridge, north side, looking west



7

# Beneath Lexington/Trapelo (Route 1-E)

850 feet to Beaver Brook reservation (where Path diverges from Fitchburg Line)

It may be necessary to move the power line either up or down hill to provide space for a Path, cut into the hill

8 foot high security fence or wall



Waverley Station platform, south side, looking west

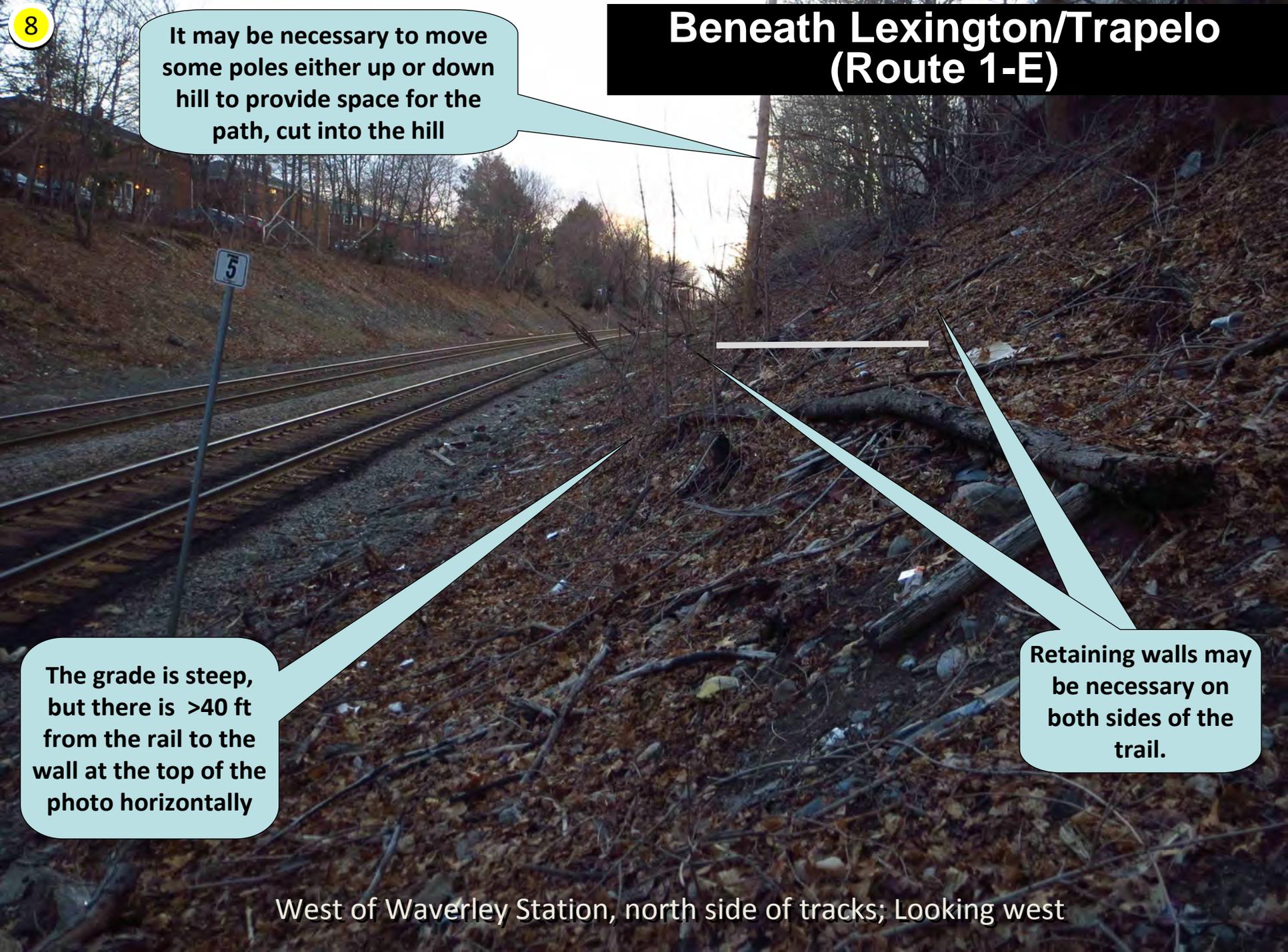
# Beneath Lexington/Trapelo (Route 1-E)

It may be necessary to move some poles either up or down hill to provide space for the path, cut into the hill

The grade is steep, but there is >40 ft from the rail to the wall at the top of the photo horizontally

Retaining walls may be necessary on both sides of the trail.

West of Waverley Station, north side of tracks; Looking west





# Aluminum Structures: Benefits and How They Compare to Steel

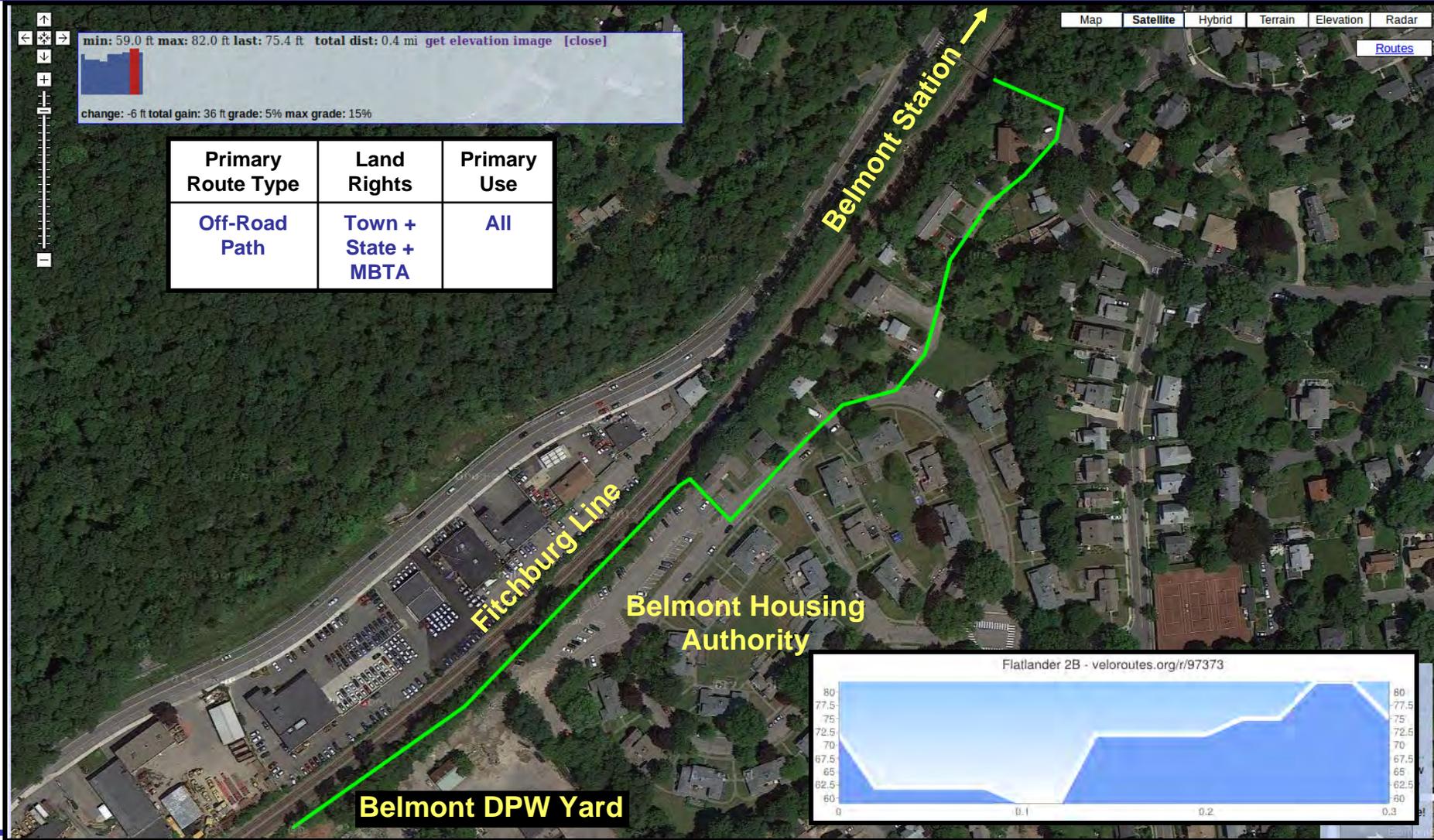
The benefits of Aluminum include:

- **Lightweight:** Aluminum is about one-third the weight of steel, iron, copper, or brass. Aluminum's lighter weight reduces transportation and manipulation costs, and by replacing steel, extends the life and maximizes the load-bearing capacity of bridges.
- **Strong:** Aluminum profiles can be made as structurally strong as needed for most applications. Cold-weather applications are particularly well-served by aluminum because, as temperatures fall, aluminum actually becomes stronger.
- **Non-corrosive:** Aluminum naturally generates a protective oxide coating and is highly corrosion resistant, greatly reducing maintenance costs and retaining an aesthetically pleasing, rust-free appearance.
- **Resilient:** Aluminum combines strength with flexibility, and can flex under loads or spring back from the shock of an impact.
- **Recyclable—**Aluminum retains a high scrap value, and can be recycled and reused indefinitely without losing any of its superior characteristics, making its disposition a revenue-generating possibility. The re-melting of aluminum requires little energy: only five percent of the energy required to produce the primary metal initially is needed in the recycling process.
- **Accepts finishes:** Aluminum can be permanently finished using a variety of common techniques, including liquid paint, powder coatings, anodizing, or electroplating.
- **Seamless:** Complex aluminum shapes can be produced in one-piece extrusions without using mechanical joining methods. Such parts are made stronger and less likely to leak or loosen over time, potentially increasing the structure's lifespan and reducing costs.



# Flatlander (Route 2-B)

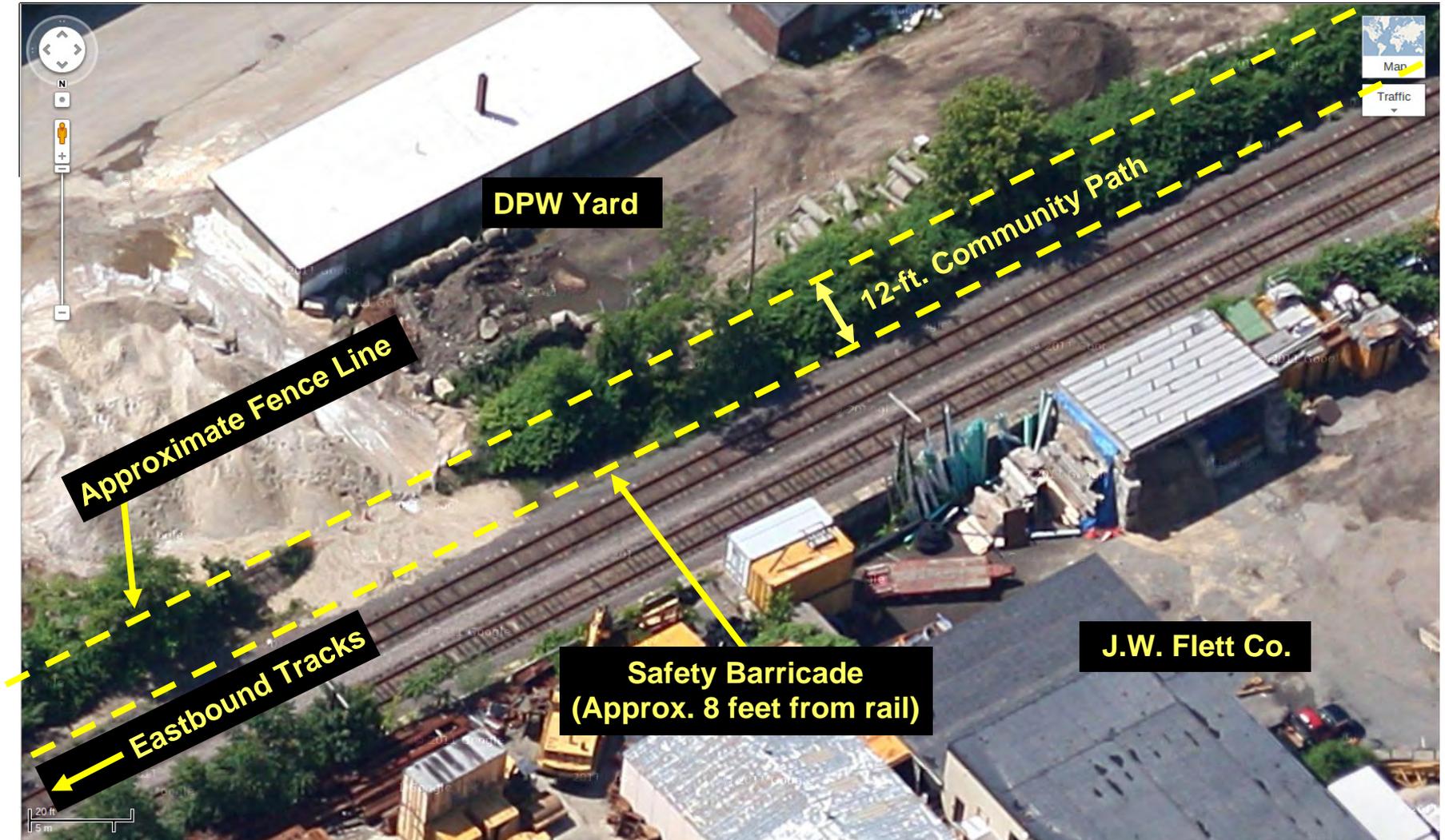
Portion of trail adjacent to Belmont Housing Authority parking lot would be off-road and could be placed between parking lot and rail-line





# Flatlander Potential Route (2-B)

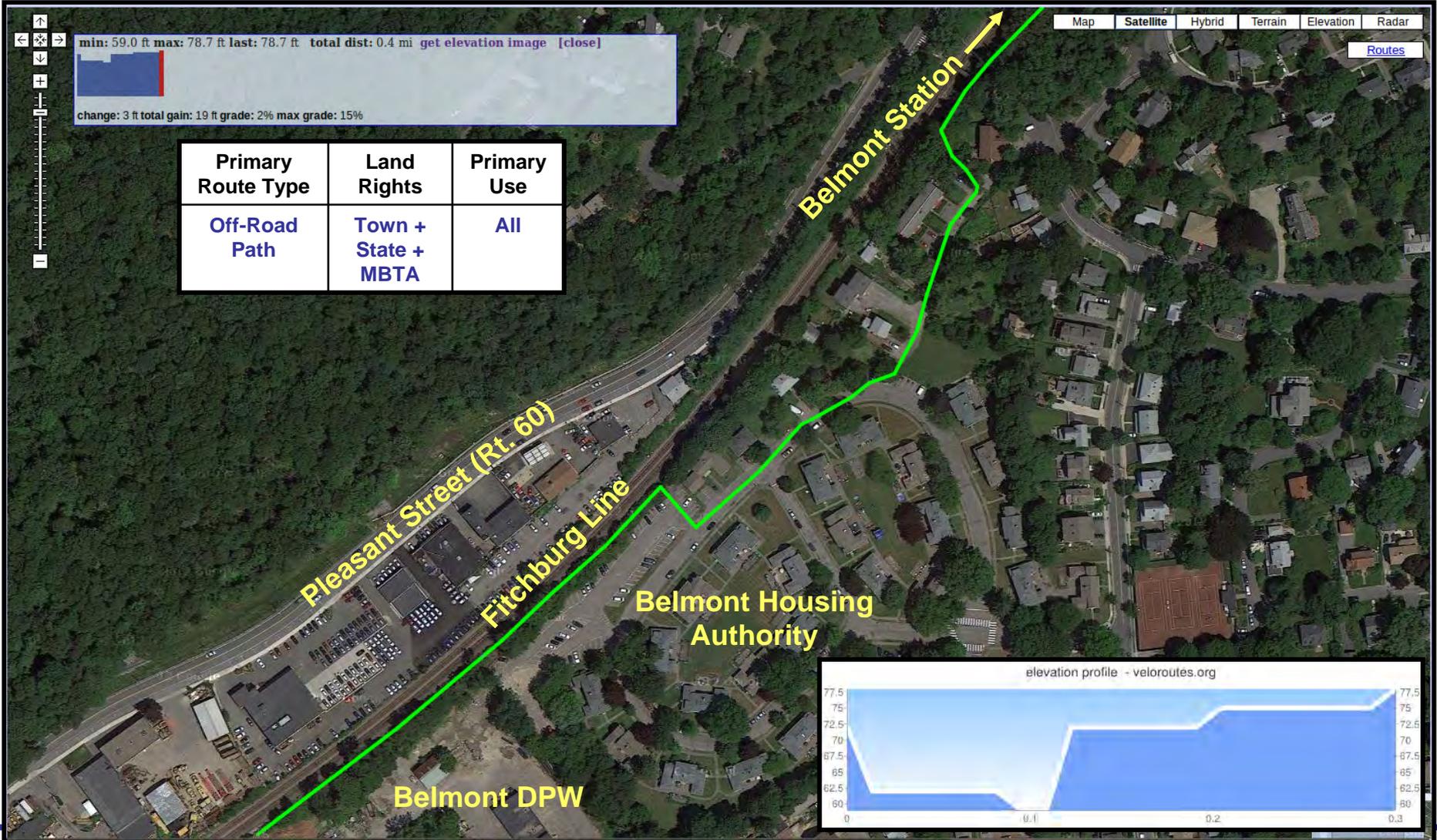
## Vicinity of Belmont DPW Yard





# Beneath Clark Street Footbridge (Route 2-C)

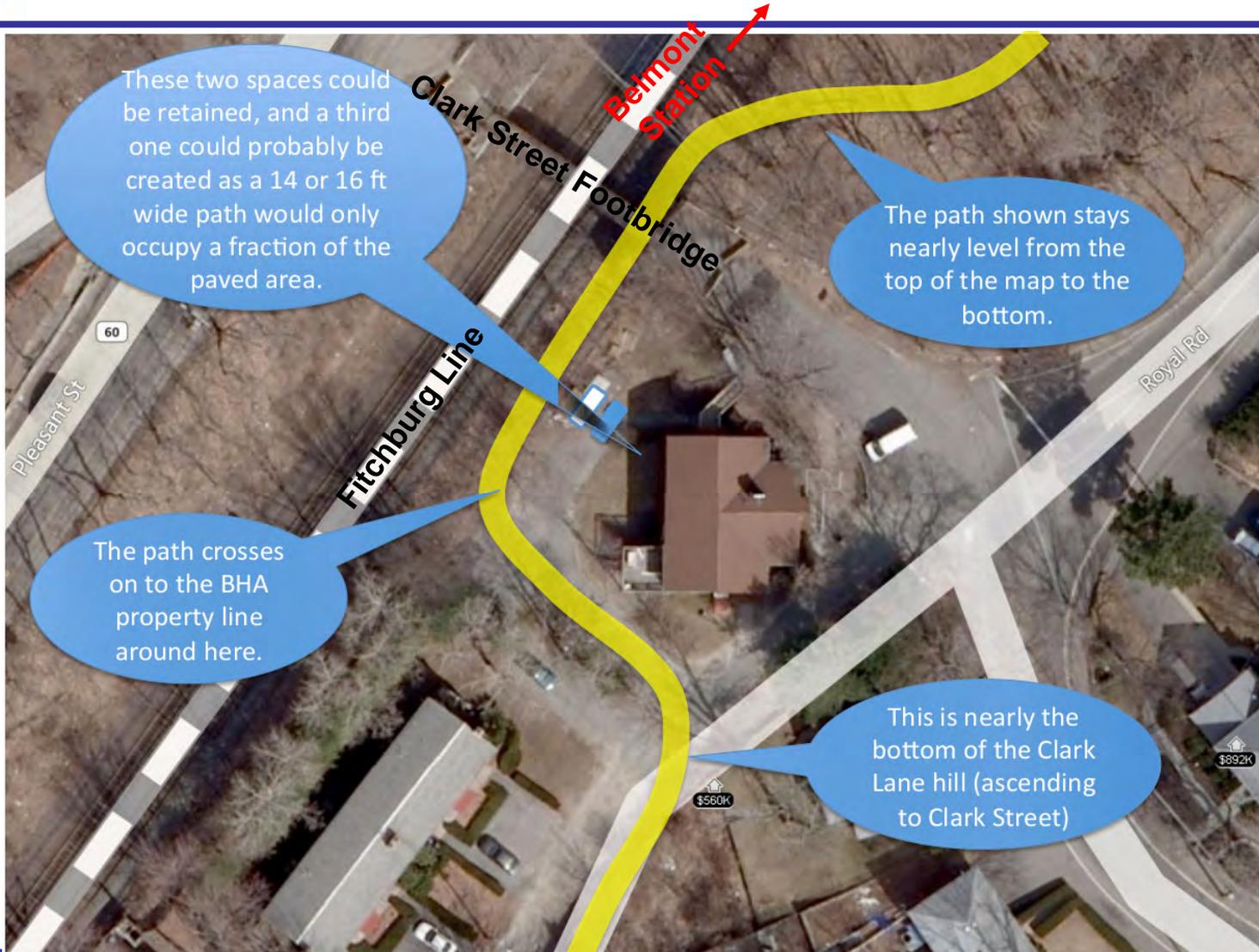
Share driveway of Belmont Housing Authority #104 Clark Street to provide access between Clark Lane and trail beneath Clark Street Footbridge





# Beneath Clark Street Footbridge (Route 2-C)

## Further ideas and details



# Beneath Clark Street Footbridge (Route 2-C)

Royal Road  
woods

steep  
20' hill

Snake Hill Road

Peasant Street (Rt. 60)

footbridge

Clark Street

Royal Road

Clark Lane

Steep  
road

Little space  
behind these  
houses for path

Royal Road climbs from Belmont Center (at the Belmont Lions Club) to the intersection with Clark Street, then immediately descends Clark Street. The hill could be avoided by routing the path to the back of the Royal Road woods, around the Clark Street bridge abutment, then through the parking lot and driveway of the Belmont Housing Authority at 104 Clark Street to Clark Lane.

# Beneath Clark Street Footbridge (Route 2-C)



60

Clark Street footbridge

Bridge abutment

Little used parking area

104 Clark St driveway

To make up for the loss of some parking spaces in the lower lot Belmont could formalize the existing parking patterns along this dead end section of Clark Street, perhaps even narrowing the road to give 104 Clark a bigger front yard.

path

104 Clark Street

Clark Lane

Clark St

\$560K

\$605K

\$892K

Pleasant St

60

Fitchburg Line

# Beneath Clark Street Footbridge (Route 2-C)



Connect to north side of tracks over footbridge

Numbers are indexed to slides showing numbered view

Connect to Royal, Clark and other neighboring streets via Clark Lane

3

2

1

4

104 Clark Street

Connecting routes

Pleasant St

Royal Rd

Clark St

Fitchburg Line

60

60

\$892K

1

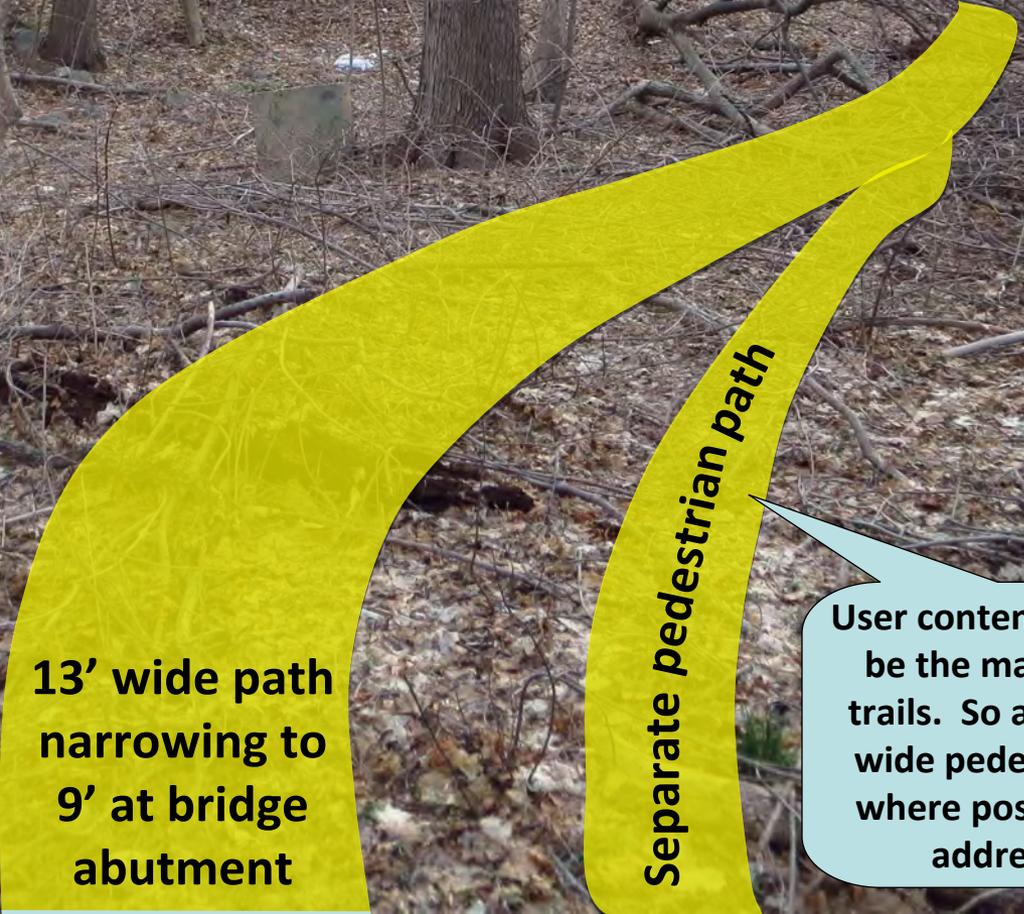
# Beneath Clark Street Footbridge (Route 2-C)

104 Clark  
Street

Clark Street  
footbridge

Bridge  
abutment

Steep  
20' hill



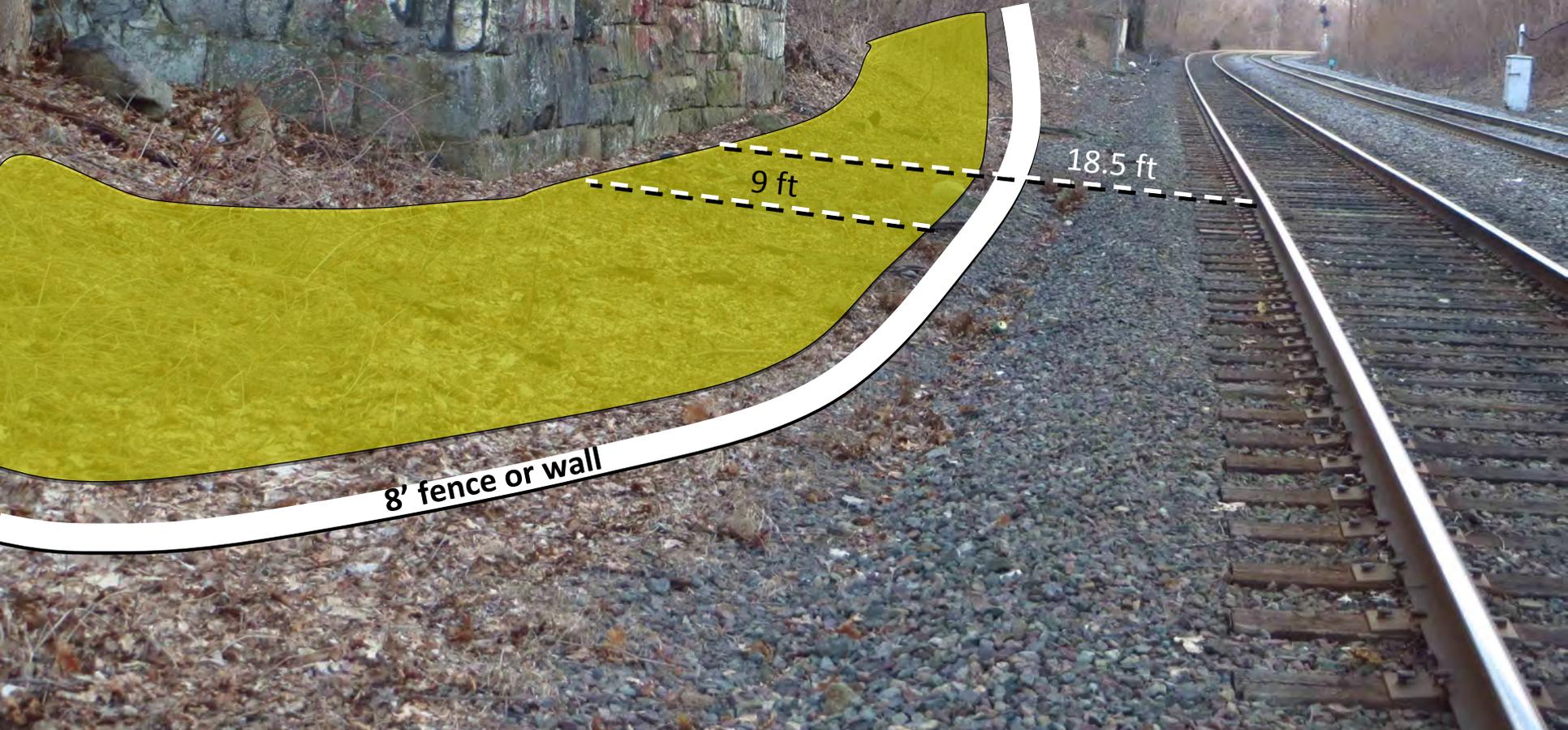
Royal Road woods,  
looking west

13' wide path  
narrowing to  
9' at bridge  
abutment

Separate pedestrian path

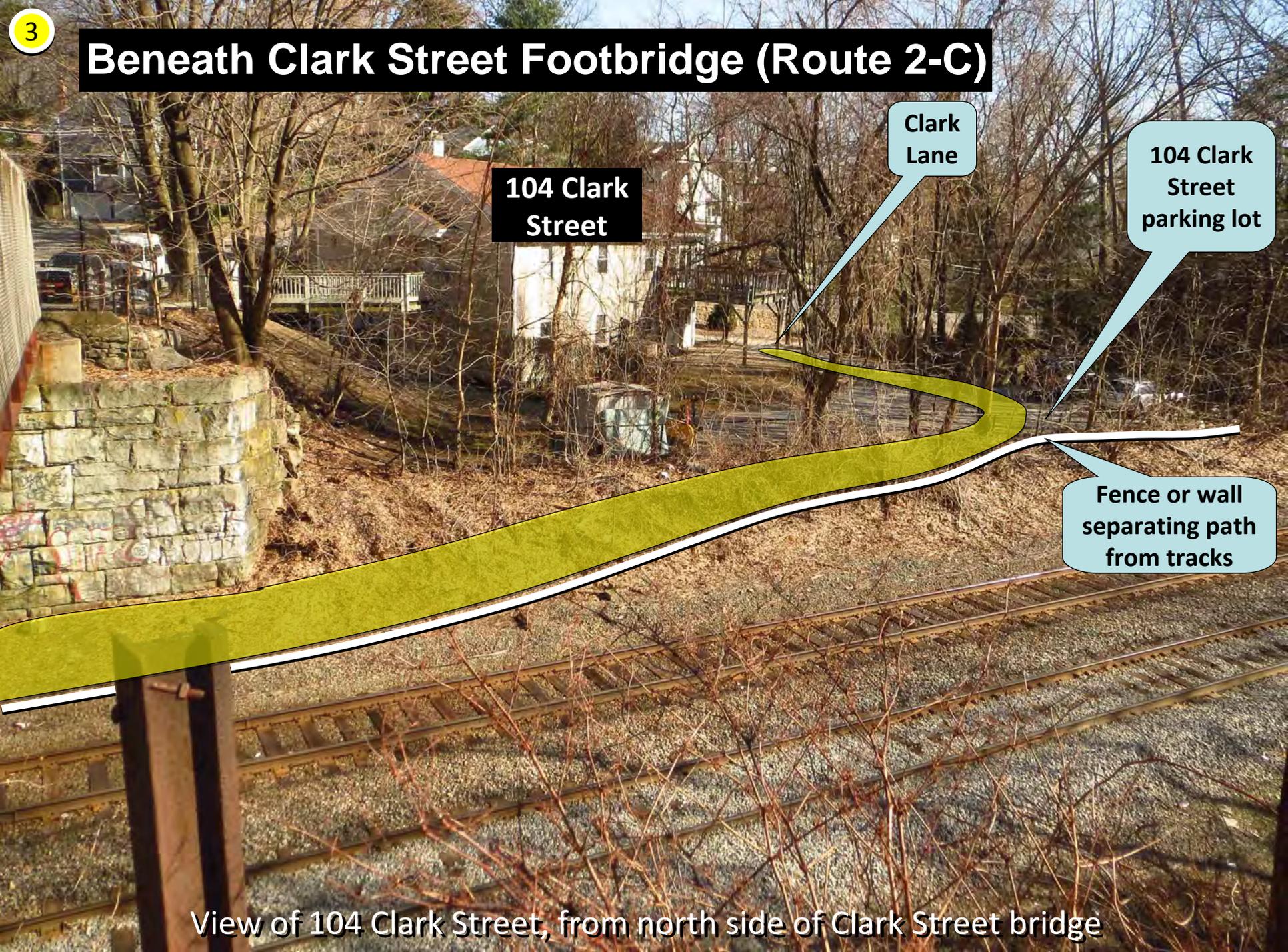
User contention seem to  
be the main issue on  
trails. So a separate 5'  
wide pedestrian path,  
where possible, could  
address this.

# Beneath Clark Street Footbridge (Route 2-C)



View beneath the Clark Street bridge, south side of tracks, looking west

# Beneath Clark Street Footbridge (Route 2-C)



104 Clark Street

Clark Lane

104 Clark Street parking lot

Fence or wall separating path from tracks

View of 104 Clark Street, from north side of Clark Street bridge

# Beneath Clark Street Footbridge (Route 2-C)

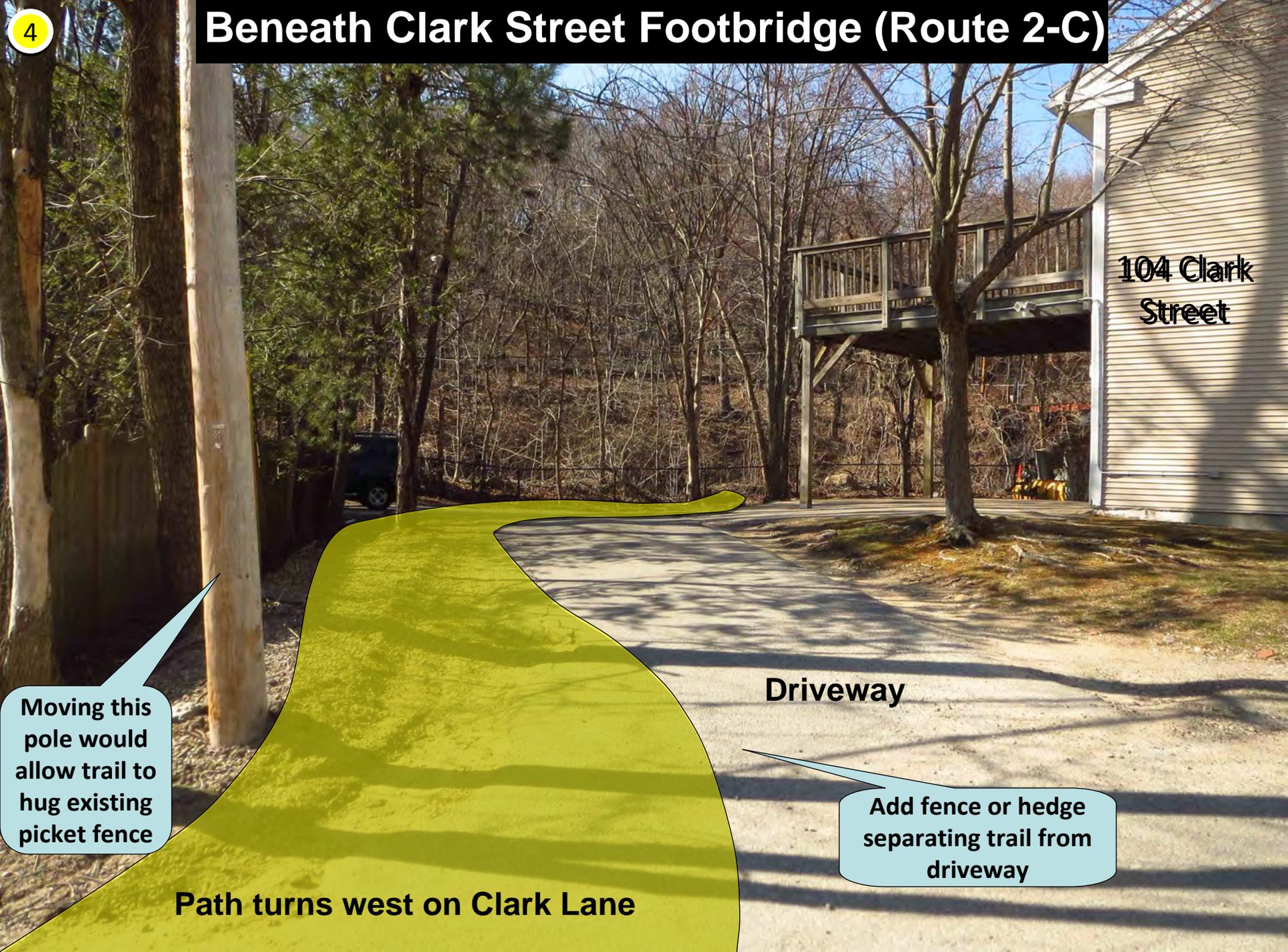
104 Clark Street

Driveway

Moving this pole would allow trail to hug existing picket fence

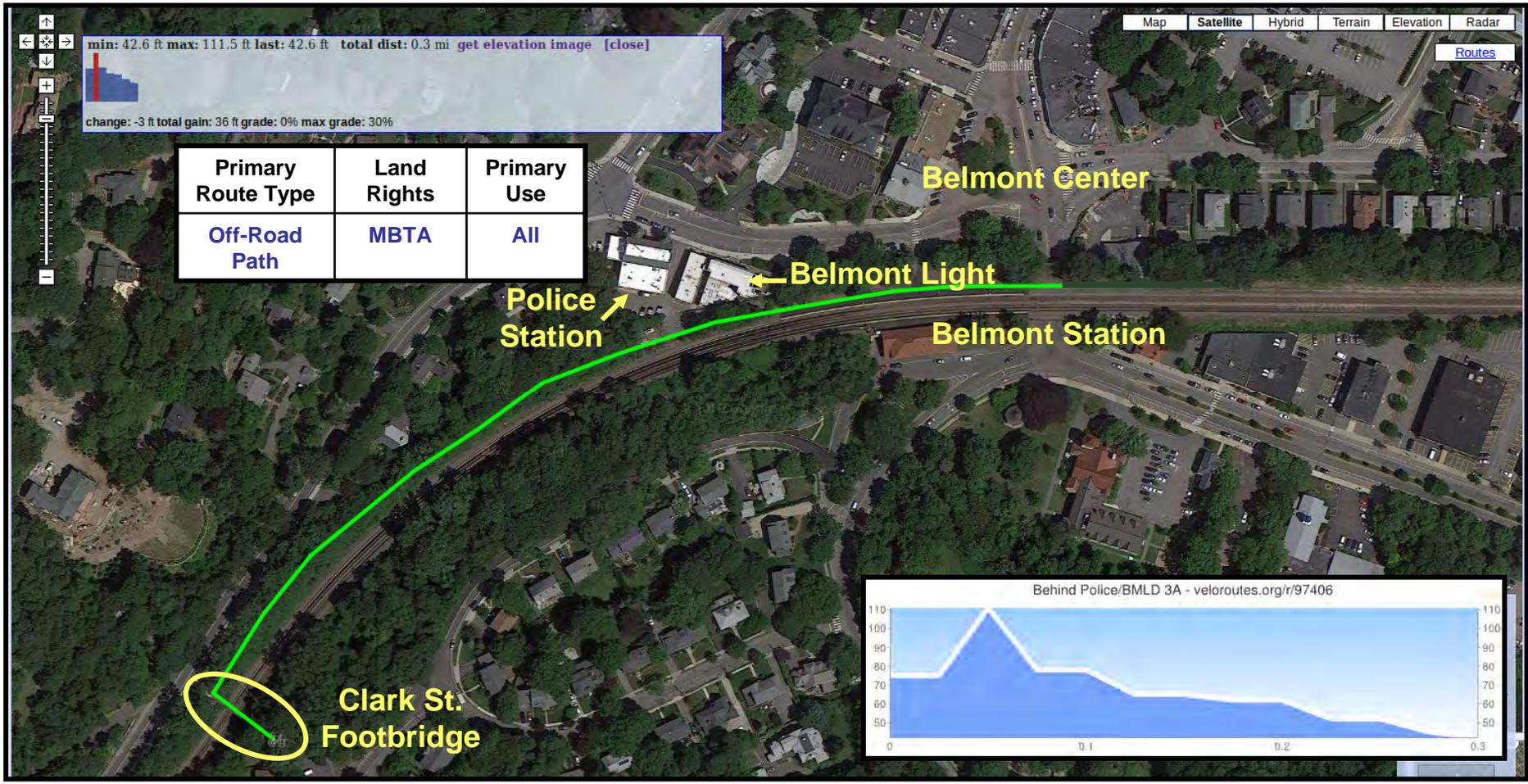
Add fence or hedge separating trail from driveway

Path turns west on Clark Lane





# MCRR Alignment Behind Police/BMLD (3-A)

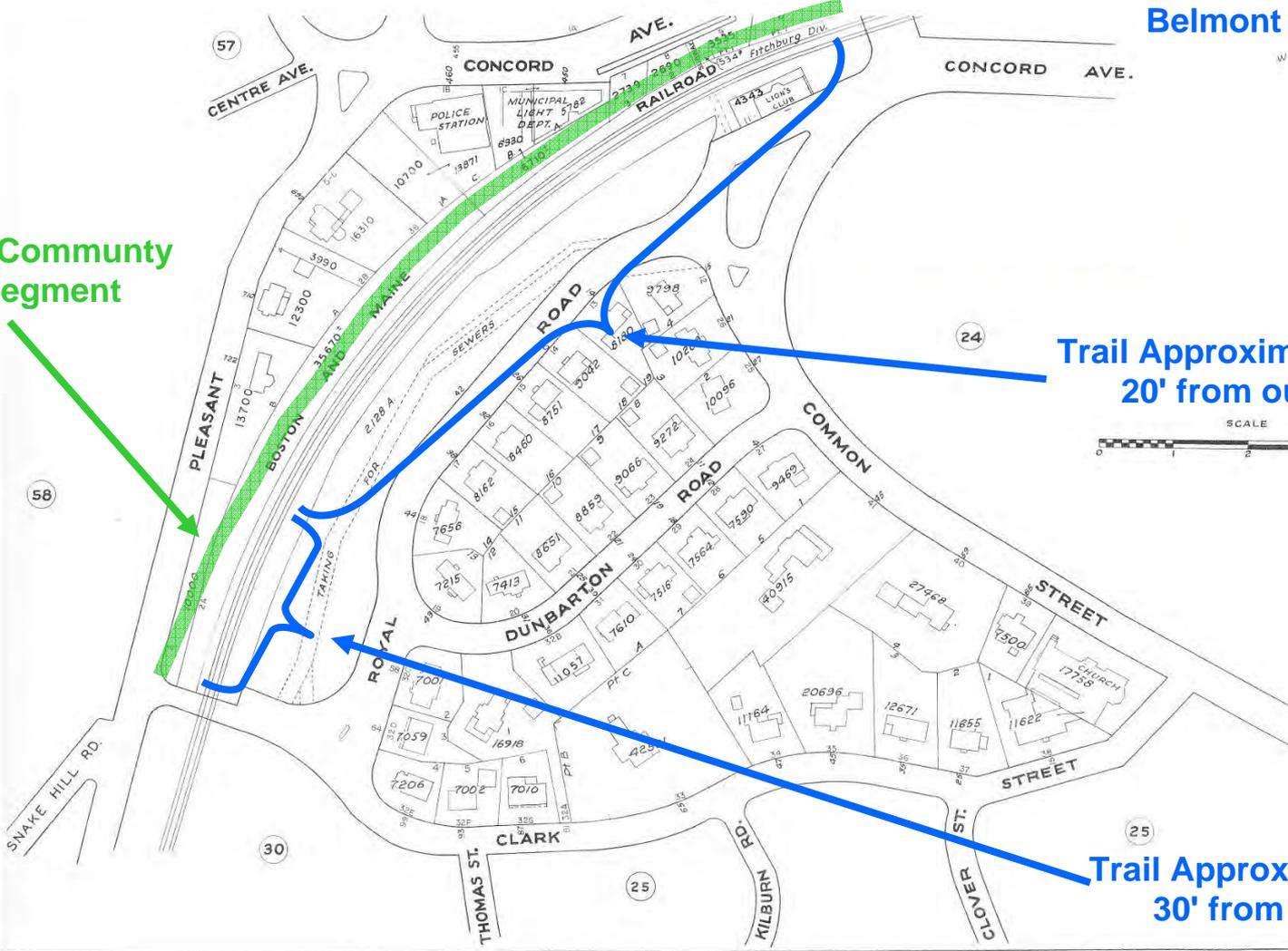




# MCRR Alignment Behind Police/BMLD (3-A)

Belmont Town Map 31

Potential Community Path Segment



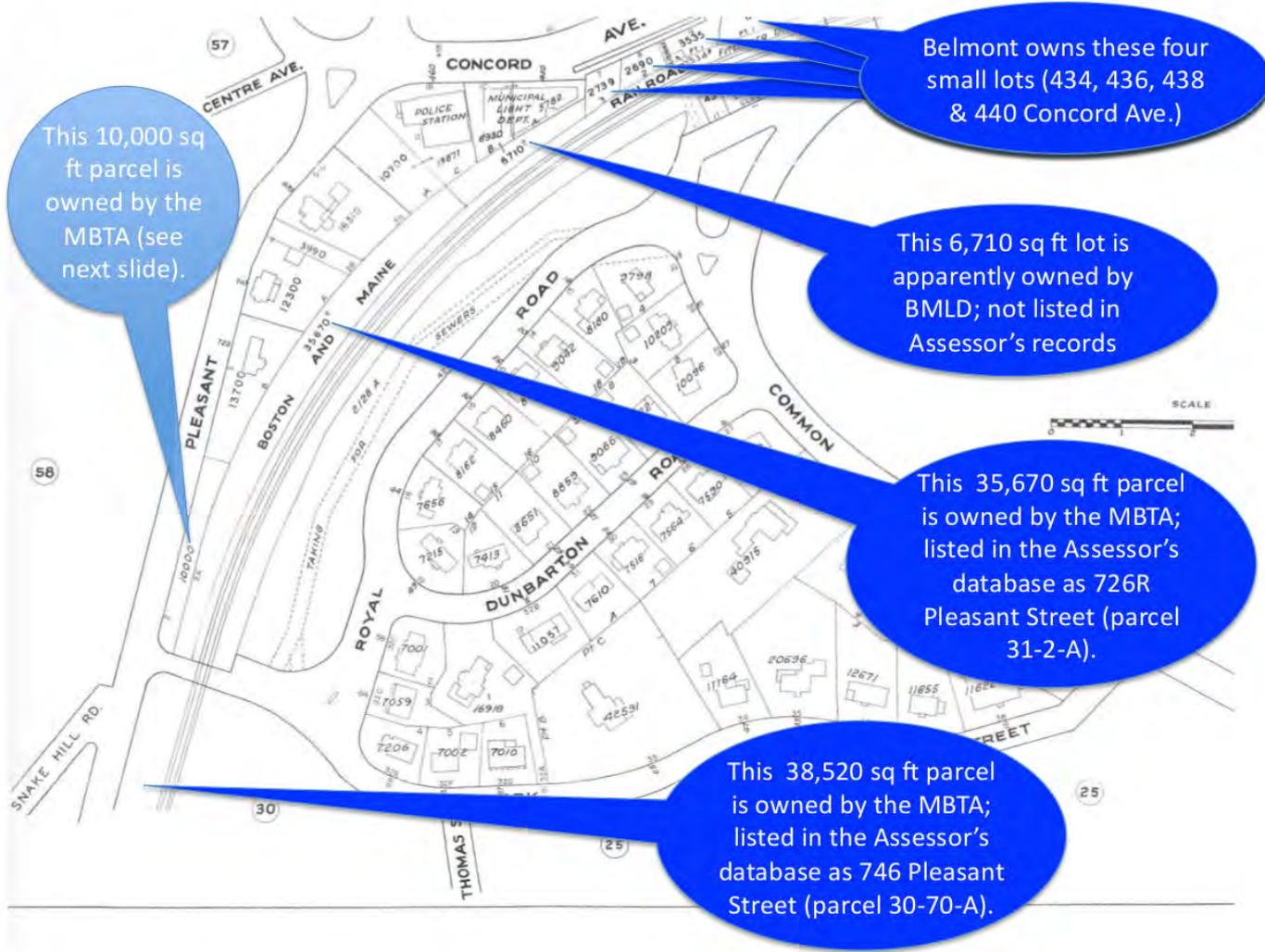
Trail Approximately 15' to 20' from outer rail



Trail Approximately 20' to 30' from outer rail

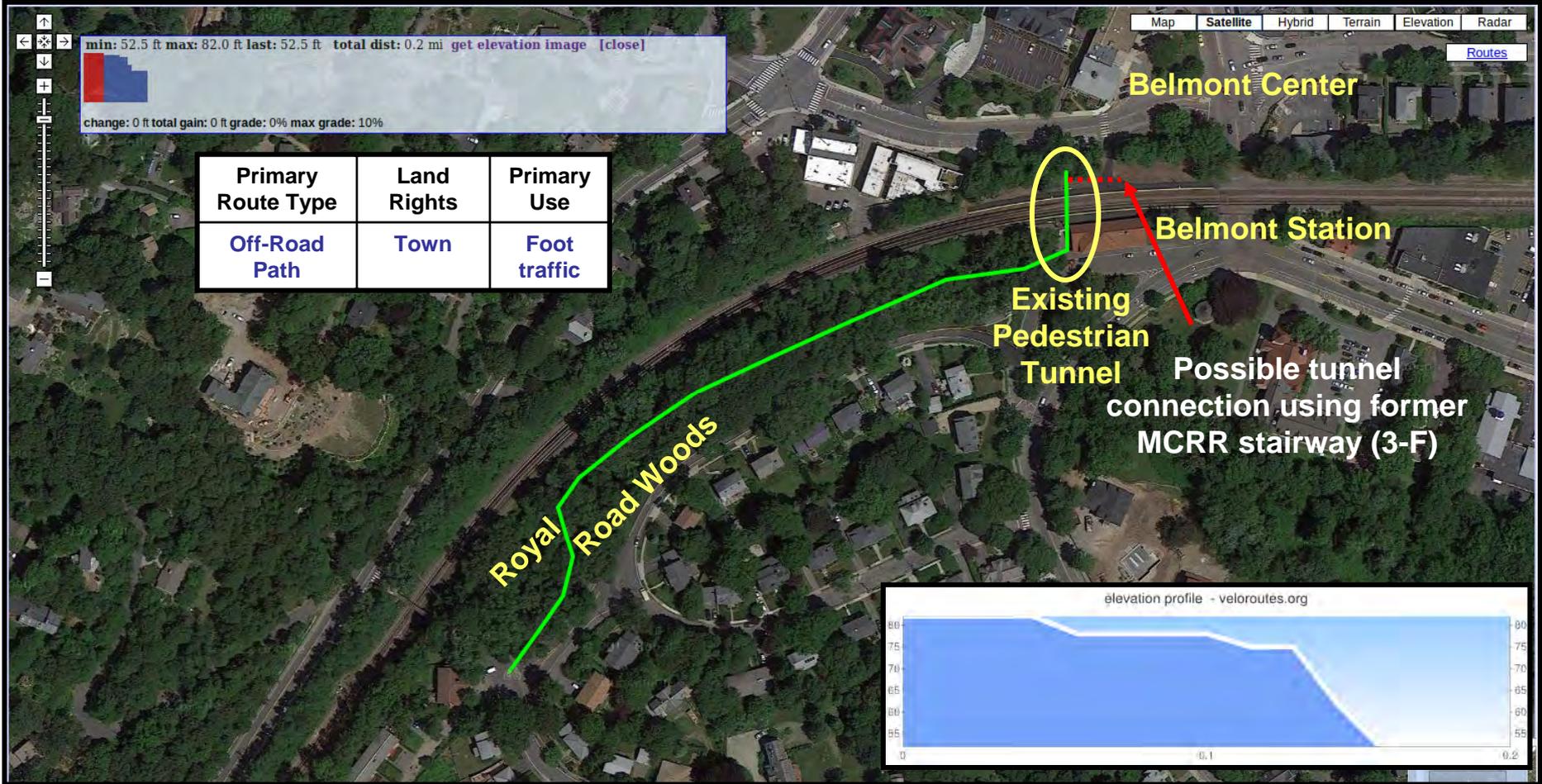


# MCRR Alignment Behind Police/BMLD (3-A) Lot Ownership





# Royal Road Woods (3-C)

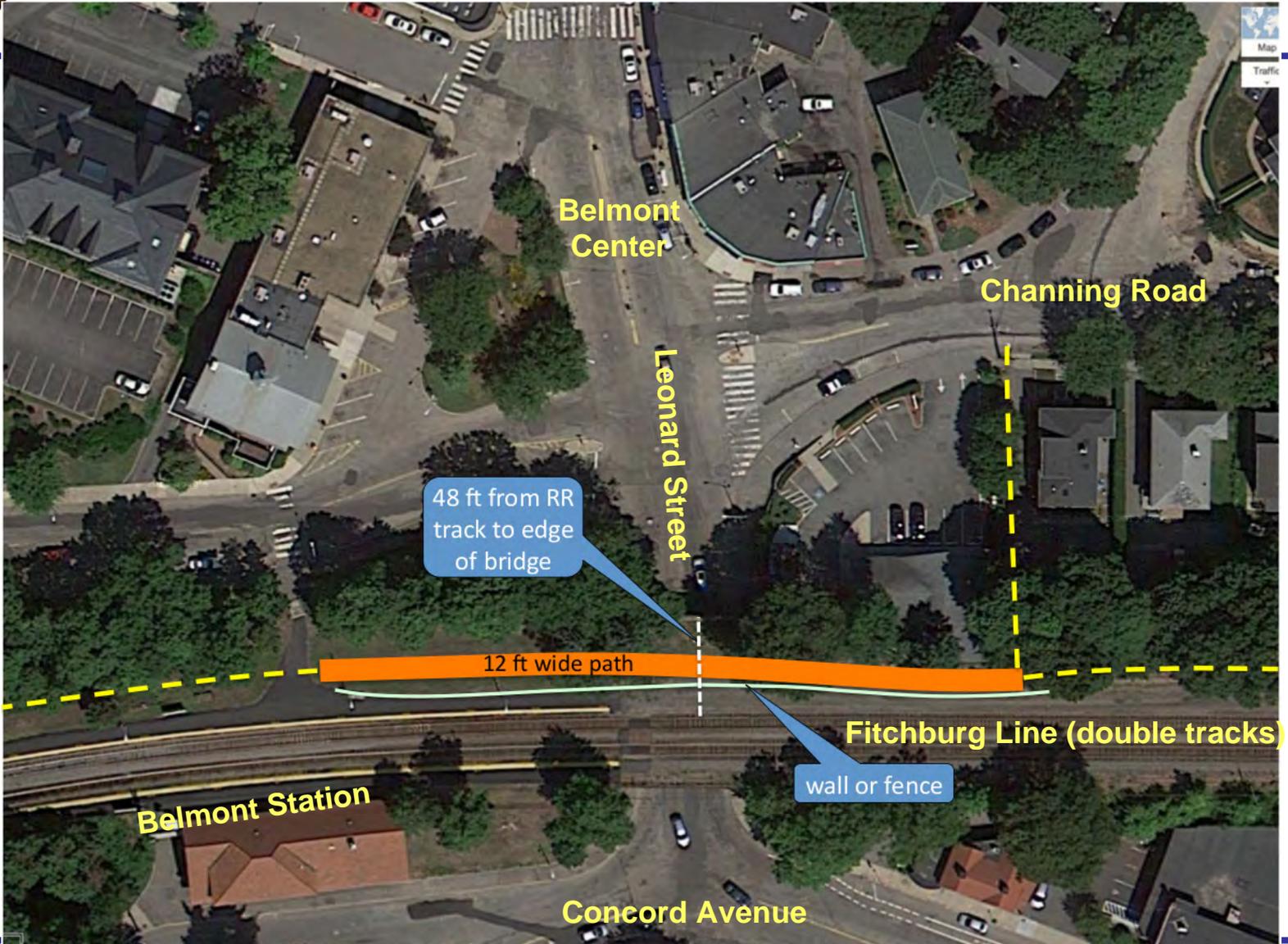




# Potential Belmont Center Crossing



# Belmont Center Crossing





# Potential East Belmont Routes



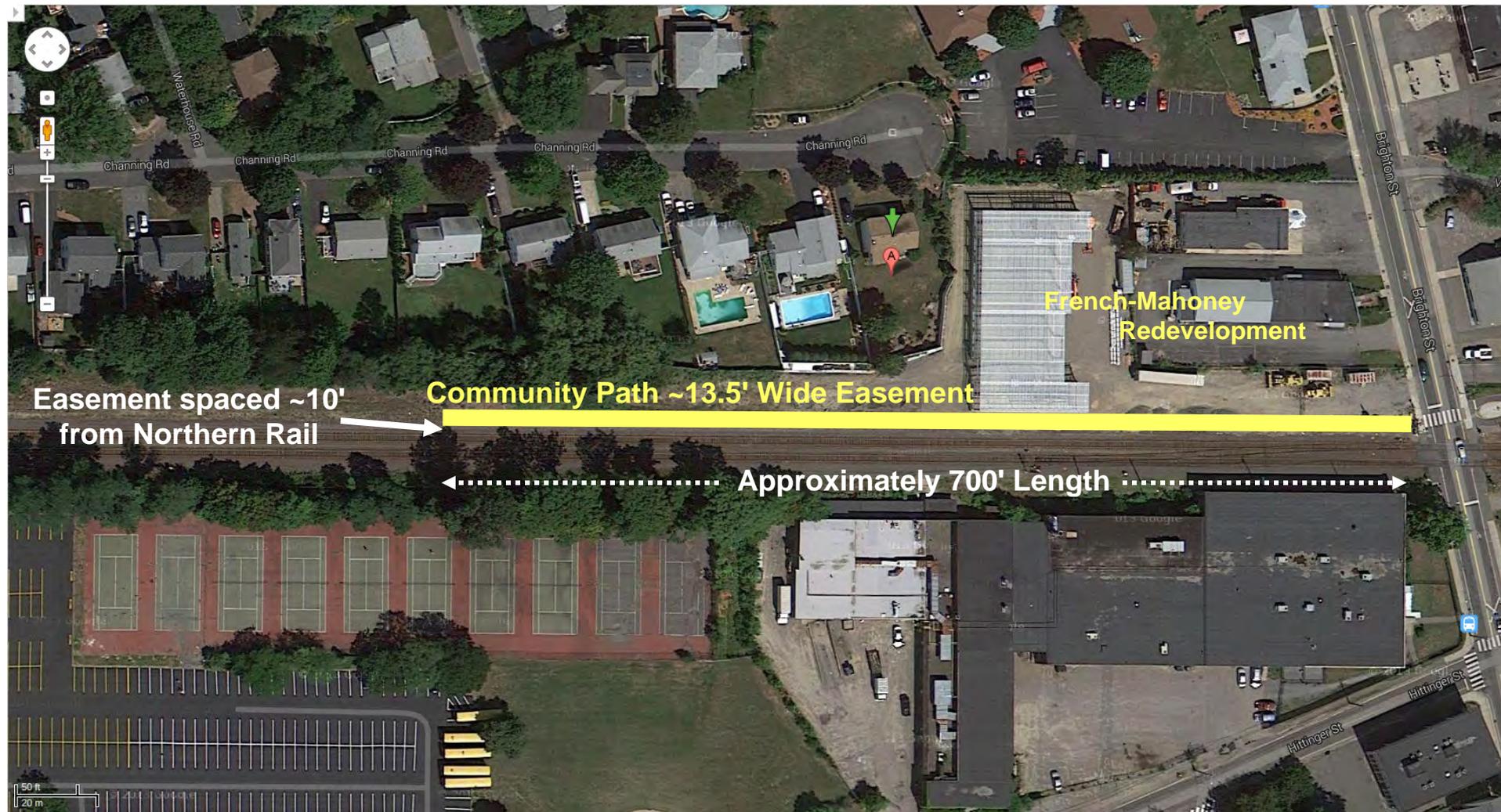
# MCRR Alignment (4-CD)



Primary Route Type	Land Rights	Primary Use
Off-Road Path	MBTA	All

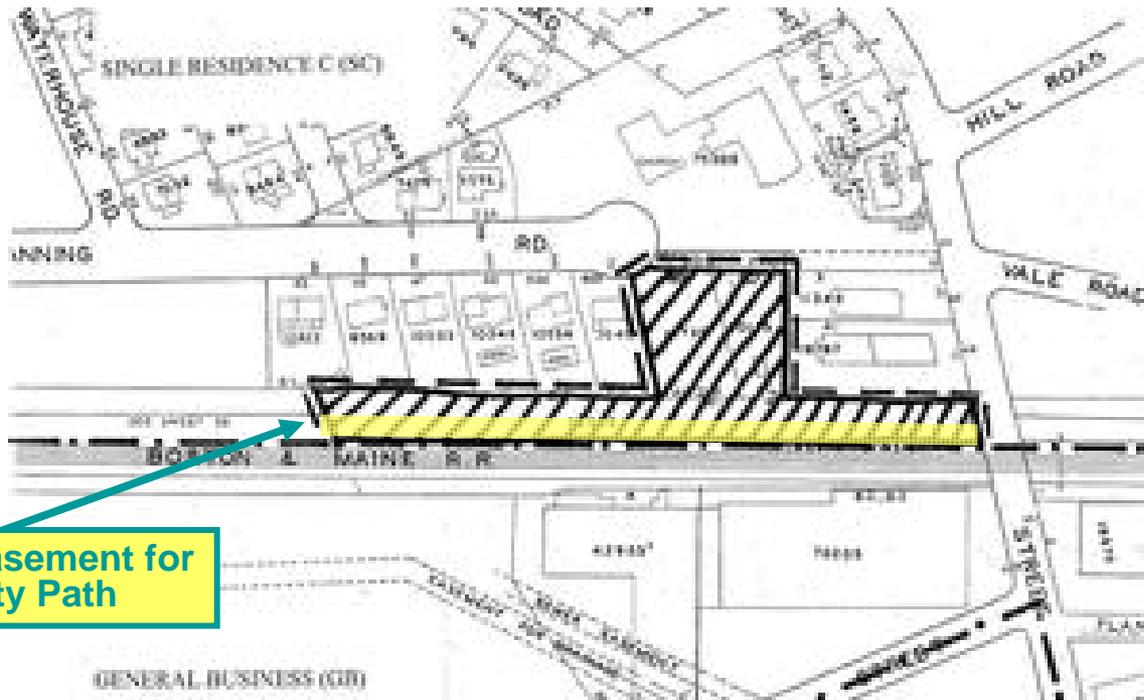


# MCRR Alignment (4-CD) Easement through French-Mahoney Redevelopment





# MCRR Alignment (4-CD) French-Mahoney Redevelopment Area



~13.5' Wide Easement for  
Community Path

# Possible Cross-Sectional View (Route 4-CD)

Typical house setback from rear property line is approx. 50 feet

Property line



The Belmont Citizens Forum owns the land north of the MBTA up to the property line of Channing Road houses, on average 30.6 feet.

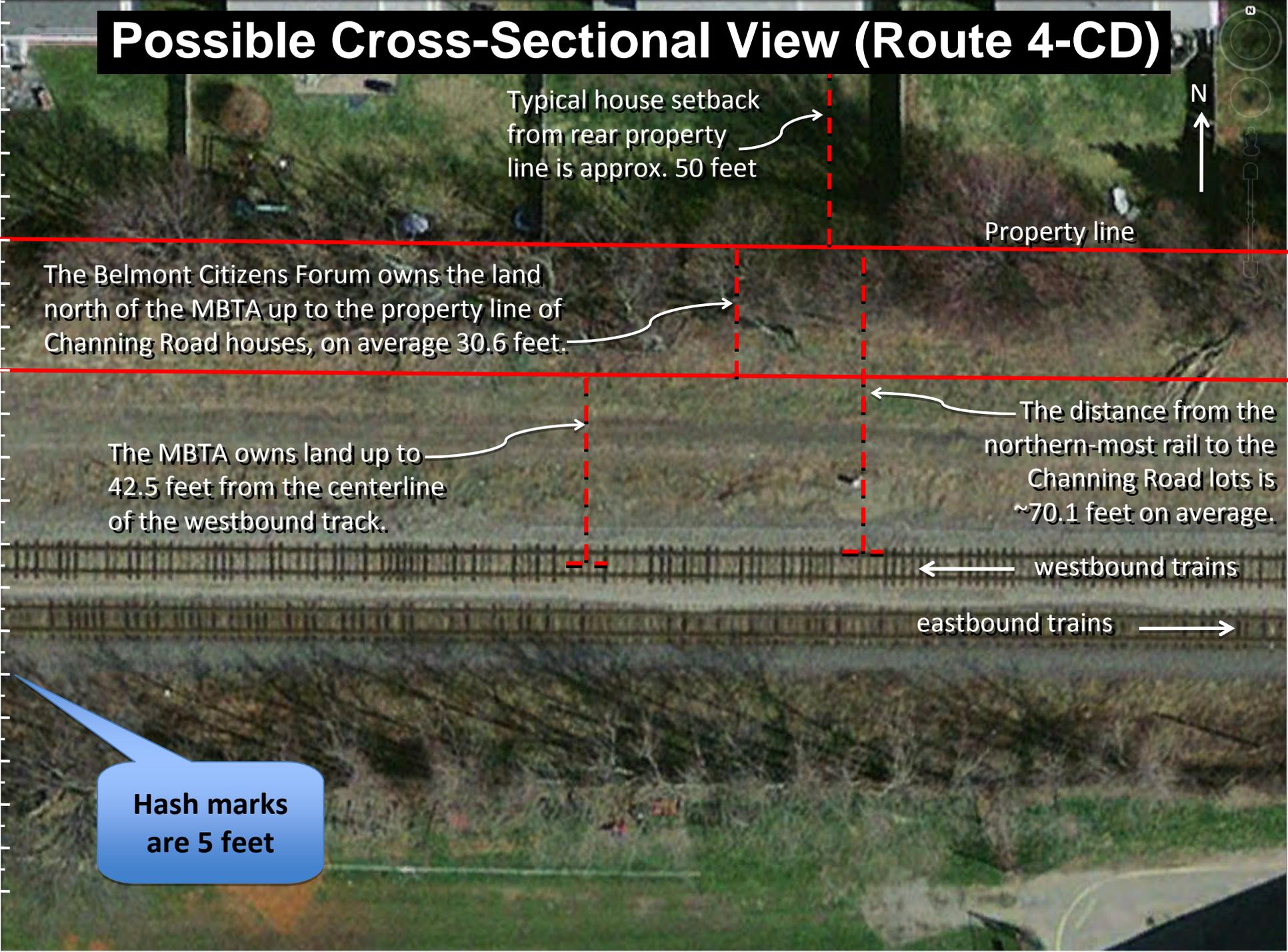
The MBTA owns land up to 42.5 feet from the centerline of the westbound track.

The distance from the northern-most rail to the Channing Road lots is ~70.1 feet on average.

← westbound trains

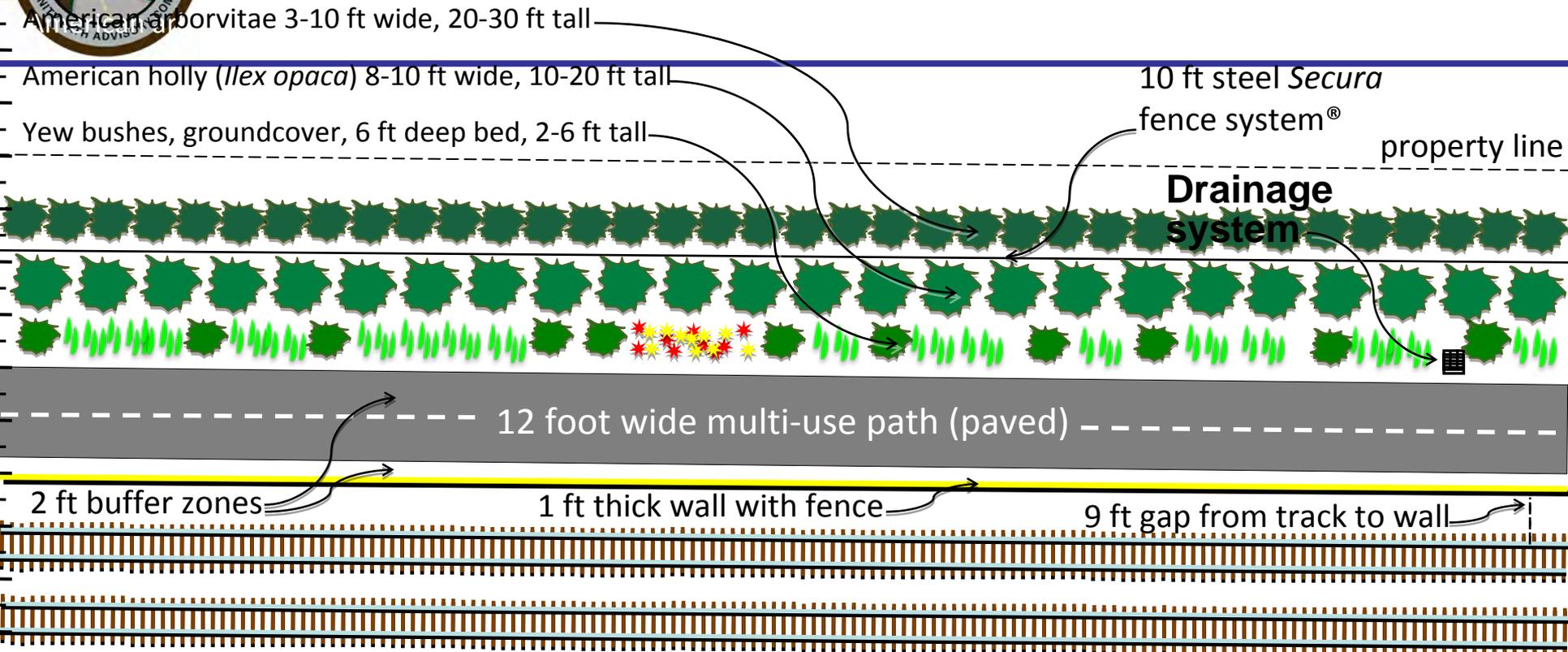
eastbound trains →

Hash marks are 5 feet





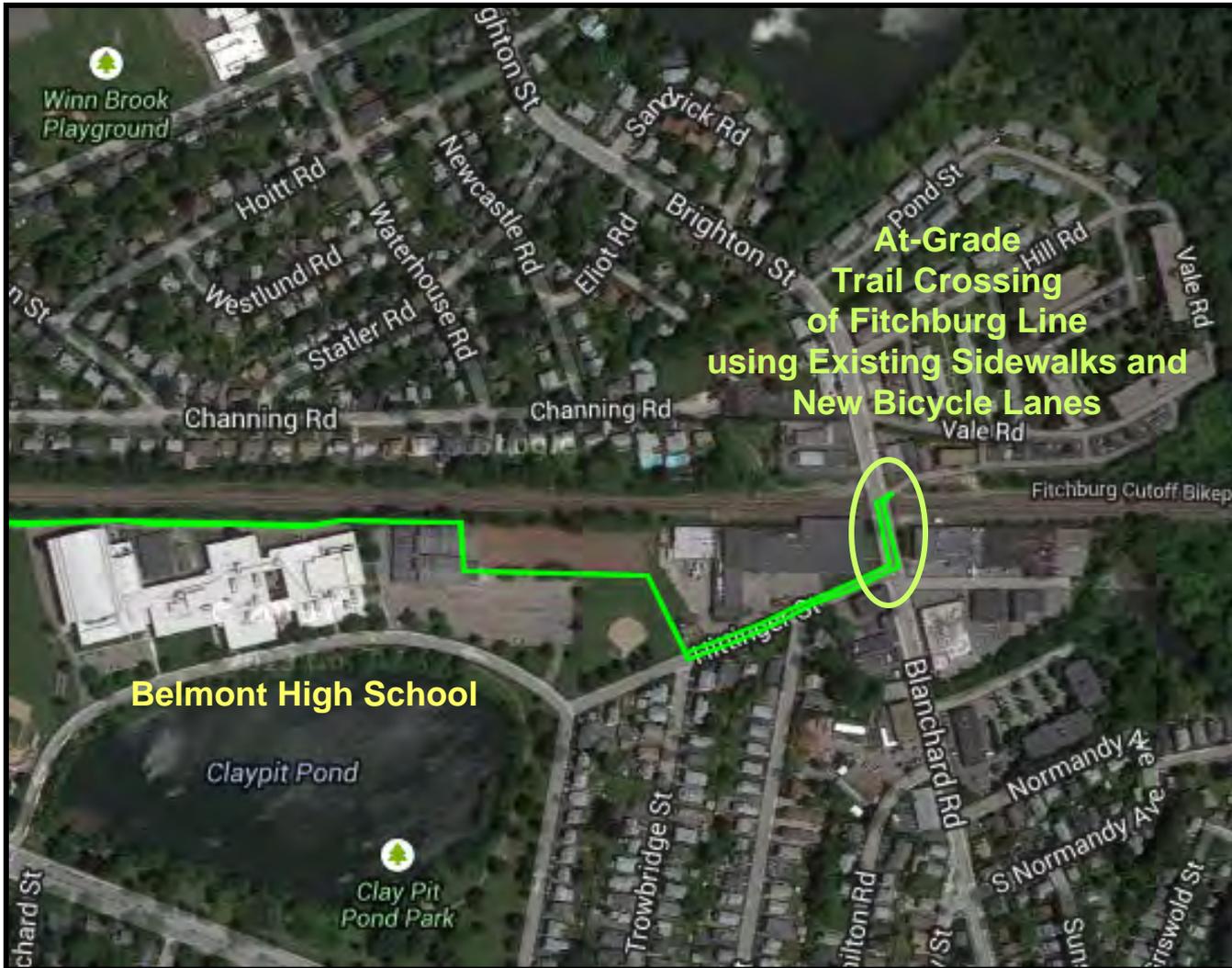
# Possible Cross-Sectional View (4-CD)



**Shared-Use Path Concept for pedestrians and cyclists; at grade; with railroad security fence**

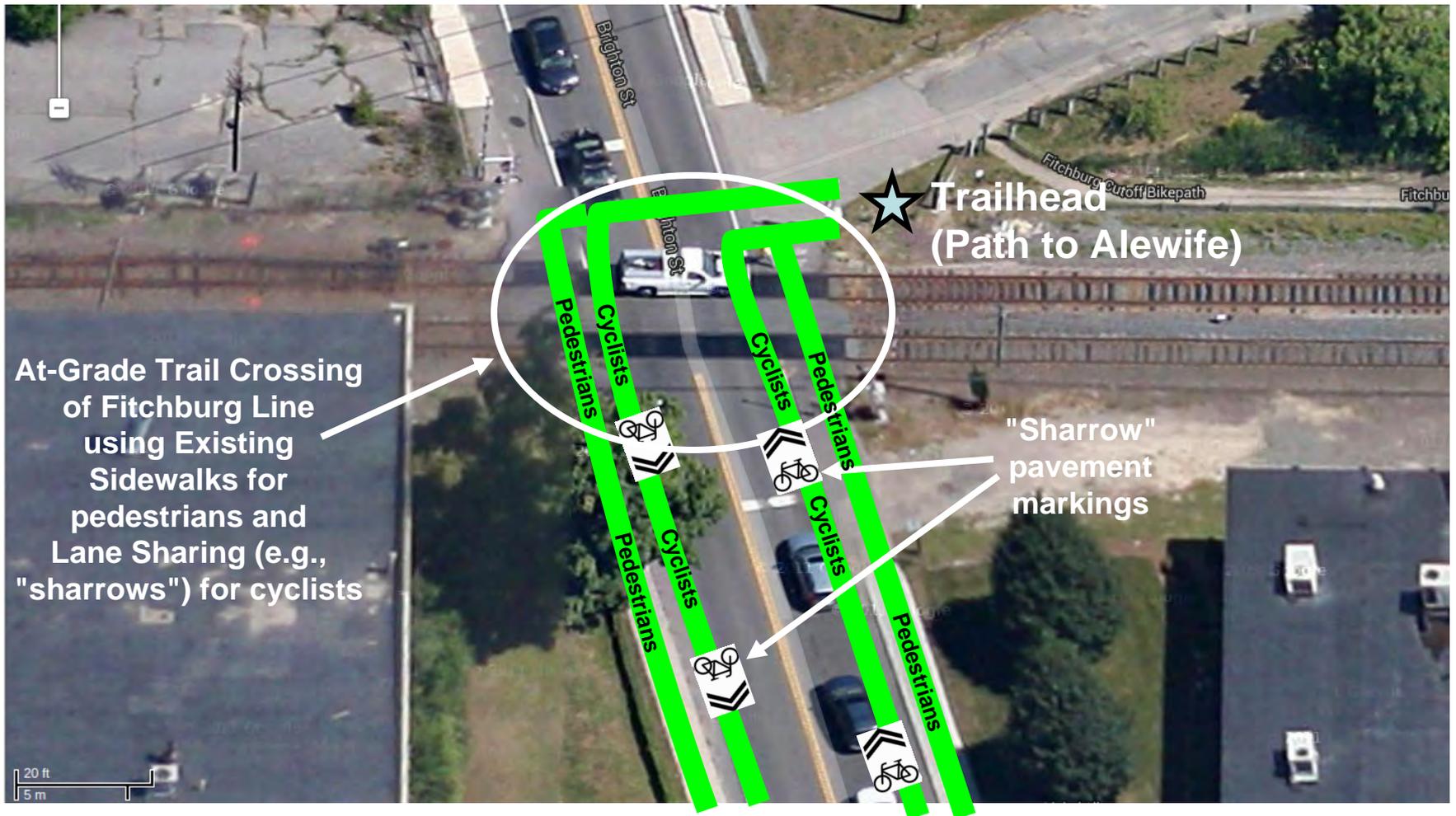


# At-Grade Crossing of Tracks at Brighton Street (Route 4-FI)





# At-Grade Crossing of Tracks at Brighton Street (Route 4-FI)



At-Grade Trail Crossing of Fitchburg Line using Existing Sidewalks for pedestrians and Lane Sharing (e.g., "sharrows") for cyclists

★ Trailhead  
(Path to Alewife)

"Sharrow"  
pavement  
markings



# At-Grade Crossing of Tracks at Brighton Street (Route 4-FI)



Trailhead  
(Path to  
Alewife)

"Sharrow"  
pavement  
marking

Brighton Street



# Request for Feedback

- **Looking for preliminary feedback on feasibility of these potential routes**
- **CPAC seeking this feedback by Mar. 25th if possible**
- **More information and details can be provided to MBTA if needed**