



Highland Innovation Center
557 Highland Ave, Needham, MA
Transportation Summary Focus

Planning Board Meeting #2 – July 7, 2022

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Highland Innovation Center (557 Highland Avenue) Transportation Summary

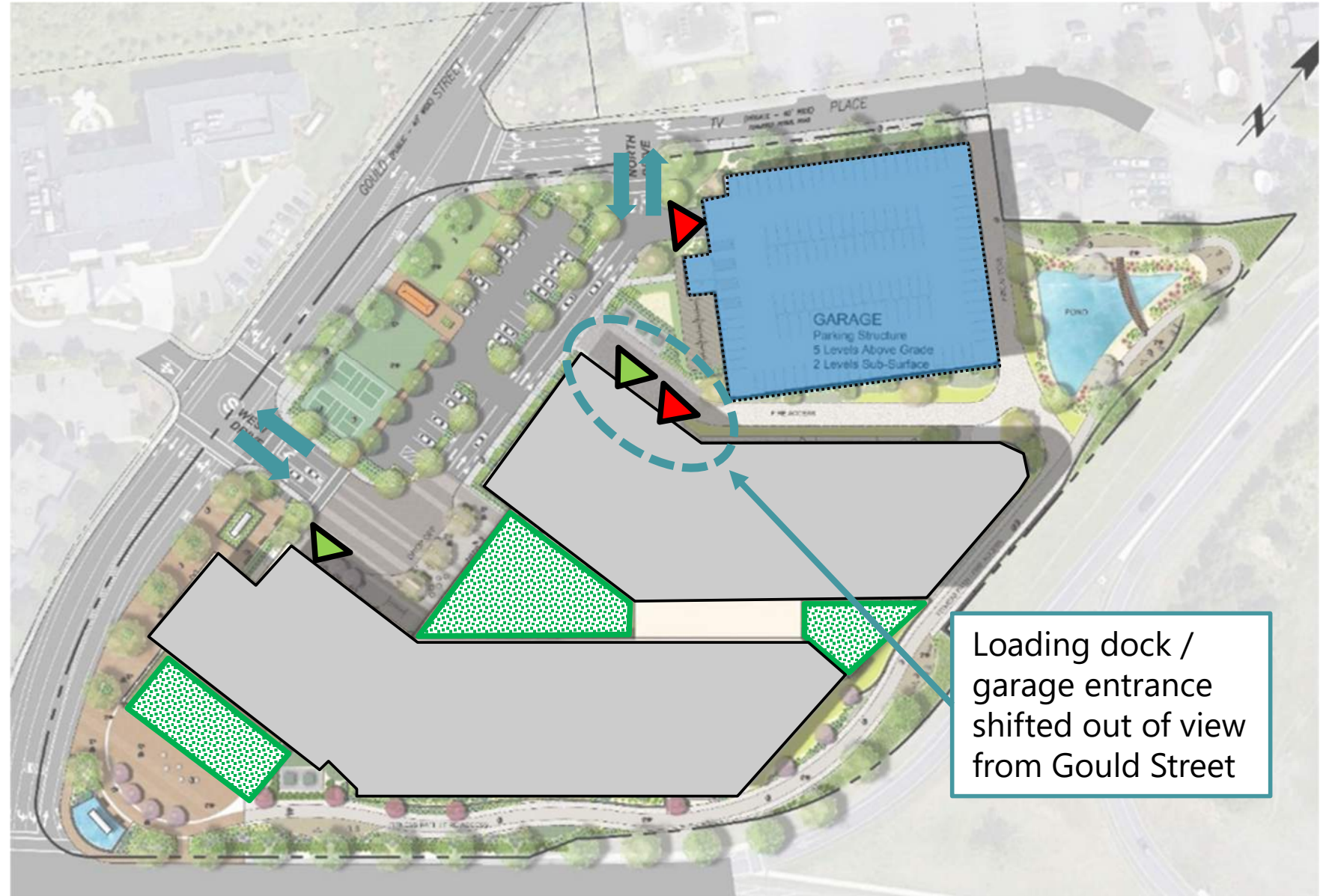
Agenda



- Project Summary
- Traffic Study Methodology
- Project Trip Generation
- Transportation Mitigation

Project Site Plan

Building Program

Use	Size (SF)
Office	248,347
R&D	248,347
Retail	10,000
Total	506,694



-  Garage Access
-  Loadings Access

Transportation Study Process

Comprehensive Transportation Impact and Access Study conducted by VHB supporting both Special Permit (town) and MEPA (state) application processes

Prior to study:

- Transportation Scoping Letter submitted to MassDOT.
- Coordination with Town of Needham and Greenman-Pederson, Inc. (GPI) (the Town's transportation consultant).
- Careful review of the 2020 GPI Transportation Study and related outcomes commissioned by the Town in connection with the recent rezoning effort for this site.

Local Submittal Timeline:

- Special Permit Submission with Traffic Study: April 8, 2022
- Neighborhood community meetings and coordination with Town departments: April-June 2022
- GPI Peer Review report: May 27, 2022
- First Planning Board Meeting: June 7, 2022

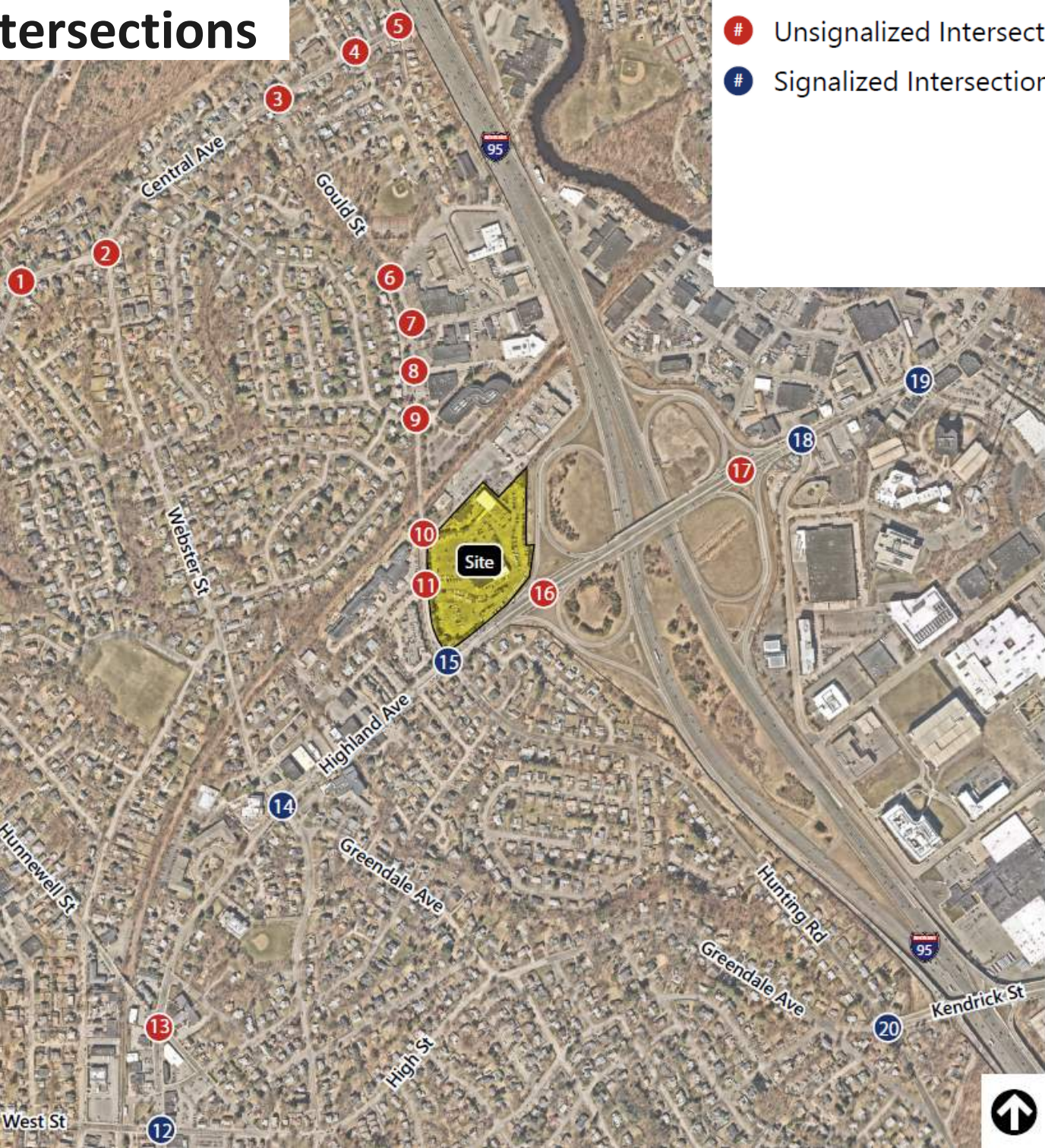
State Submittal Timeline:

- State MEPA ENF Submission with Traffic Study: April 1, 2022
- Certificate / Comment Letters Received: May 9, 2022
- Draft Environmental Impact Report to be submitted July 15, 2022

Traffic Study Overview

- Review of Existing (2022) Conditions
- Assessment of Future (2029) Conditions without the proposed Project
 - › Includes completion of MassDOT reconstruction of Highland Avenue
 - › Includes other nearby developments (100 West Street, Boston Children’s Hospital at Founders Park, Newton Northland Development)
- Assessment of Future (2029) Conditions with the proposed Project
 - › Impacts with and without mitigation
 - › Summary of Transportation mitigation and TDM

Study Area Intersections



- 1 Central Avenue at Cedar Street
- 2 Central Avenue at Webster Street
- 3 Central Avenue at Gould Street
- 4 Central Avenue at Hampton Avenue
- 5 Central Avenue at River Park Street
- 6 Gould Street at Ellis Street
- 7 Gould Street at Kearney Road
- 8 Gould Street at Station Road
- 9 Gould Street at Noanett Street
- 10 Gould Street at TV Place
- 11 Gould Street at Muzi Ford/Wingate Res.
- 12 Highland Avenue at West Street
- 13 Highland Avenue at Hunnewell Street
- 14 Highland Avenue at Webster Street
- 15 Highland Avenue at Gould Street
- 16 Highland Avenue at I-95 SB Ramps
- 17 Highland Avenue at I-95 NB Ramps
- 18 Highland Avenue at 1st Avenue
- 19 Highland Avenue at 2nd Avenue
- 20 Kendrick Street at Hunting Road

Trip Generation | Existing Site Trips

Existing Site Vehicle Trips	
Weekday Daily	
Total	887
Weekday Morning Peak Hour	
Enter	37
<u>Exit</u>	<u>24</u>
Total	61
Weekday Evening Peak Hour	
Enter	29
<u>Exit</u>	<u>57</u>
Total	87

- Car wash alone was known to service **up to 1,300 cars/day at peak times** with daily averages between October and May approximately 600 cars/day as reported by Felix Taranto of Wash World, the car wash operator since the 1990s
- Car wash was **busiest in late Winter/Spring**, less busy in Summer
- Existing daily trips for Muzi site included Chevrolet dealership, Ford dealership, body shop, service center, new car sales, used car sales, outsourced sales, and parts pick-up (new and used) including gas, fuel, hazardous waste, and other removals constituting commercial trucks
- Existing trips quantified during COVID (July 2021) and **pre-COVID volumes were likely measurably higher** than what is quantified in the Transportation Study (conservative assumption)

Note: based on empirical counts conducted by VHB in July 2021, during COVID-19, and during the "slow" portion of the season

Trip Generation | Estimated Proposed Site Trips

Adjusted Vehicle Trips

	Office	R&D	Retail	Total Driveway Trips	Pass-by	Existing Site Trips	Total Net-New Vehicle Trips
Weekday Daily							
Total	2,658	2,763	629	6,050	(-158)	(-887)	5,005 *
Weekday Morning Peak Hour							
Enter	334	209	11	554	(-2)	(-37)	515 *
Exit	<u>42</u>	<u>44</u>	<u>9</u>	94	<u>(-2)</u>	<u>(-24)</u>	68 *
Total	376	253	20	649	(-4)	(-61)	584 *
Weekday Evening Peak Hour							
Enter	62	39	36	136	(-15)	(-29)	92 *
Exit	<u>303</u>	<u>204</u>	<u>38</u>	545	<u>(-15)</u>	<u>(-57)</u>	473 *
Total	365	242	74	681	(-30)	(-87)	565 *

* Trip Generation Likely Over-Estimated, Does Not Account For:

1. Local Trip Rates
2. Transit Use or Walk / Bike Trips
3. Work from Home / Hybrid Work Environment

Trip Generation | “Actual” Site Trips - Local Trip Rates

Estimated vs “Actual” Trip Rates

- Estimated trip rates based on national data from the Institute of Transportation Engineers (ITE) between the 1980s and 2010s
- Data provided based on three different land use codes: Office, R&D, and Retail
- Local trip rate data for office and R&D sites was reviewed from actual developments in the City of Cambridge from 2017/2018 to determine a more accurate representation of Project-generated trips

Office Trip Rate per 1,000 SF

	ITE National Data	Local Cambridge Data	Percent Difference
Weekday Daily			
Total	10.25	8.29	-19%
Weekday Morning Peak Hour			
Total	1.46	1.15	-21%
Weekday Evening Peak Hour			
Total	1.41	1.25	-11%

R&D Trip Rate per 1,000 SF

	ITE National Data	Local Cambridge Data	Percent Difference
Weekday Daily			
Total	10.65	5.95	-44%
Weekday Morning Peak Hour			
Total	0.98	0.72	-27%
Weekday Evening Peak Hour			
Total	0.94	0.72	-23%

Trip rates include all commuters (drivers, transit riders, walkers, and bikers)

Trip Generation | “Actual” Site Trips – Mode Share

Estimated vs “Actual” Mode Share / Work from Home

- Estimated Site-generated trips assume 100% of commuters will drive to work
- Estimated Site-generated trips do not include the impact of work from home / hybrid work schedules
- Analyses are highly conservative as some commuters will take transit (with shuttle connection), walk, bike, and/or work from home
- US Census data for City of Newton reviewed to determine potential transit/walk/bike/work from home mode share for Site
 - Newton data reviewed as Site is expected to operate more similarly to workplaces in Newton with connections to transit and direct interstate access
- Pre-COVID work from home share assume to double in future (at a minimum) to account for new hybrid work environment

Site Mode Share

	Vehicle	Transit, Walk, Bike	Work From Home
Estimated in Traffic Study	100%	0%	0%
City of Newton pre-COVID data ^a	77%	16%	7%
Potential Site “Actual” Mode Share ^b	72%	14%	14%

a – Mode shares determined from US Census Journey to Work Data (2012-2016) for workplaces located within the City of Newton, MA.

b – The estimated work from home mode share was doubled to account for the impacts of COVID-19 on the remote working environment.

Trip Generation | “Actual” Site Trips

“Actual” Site-Generated Trips estimated based on

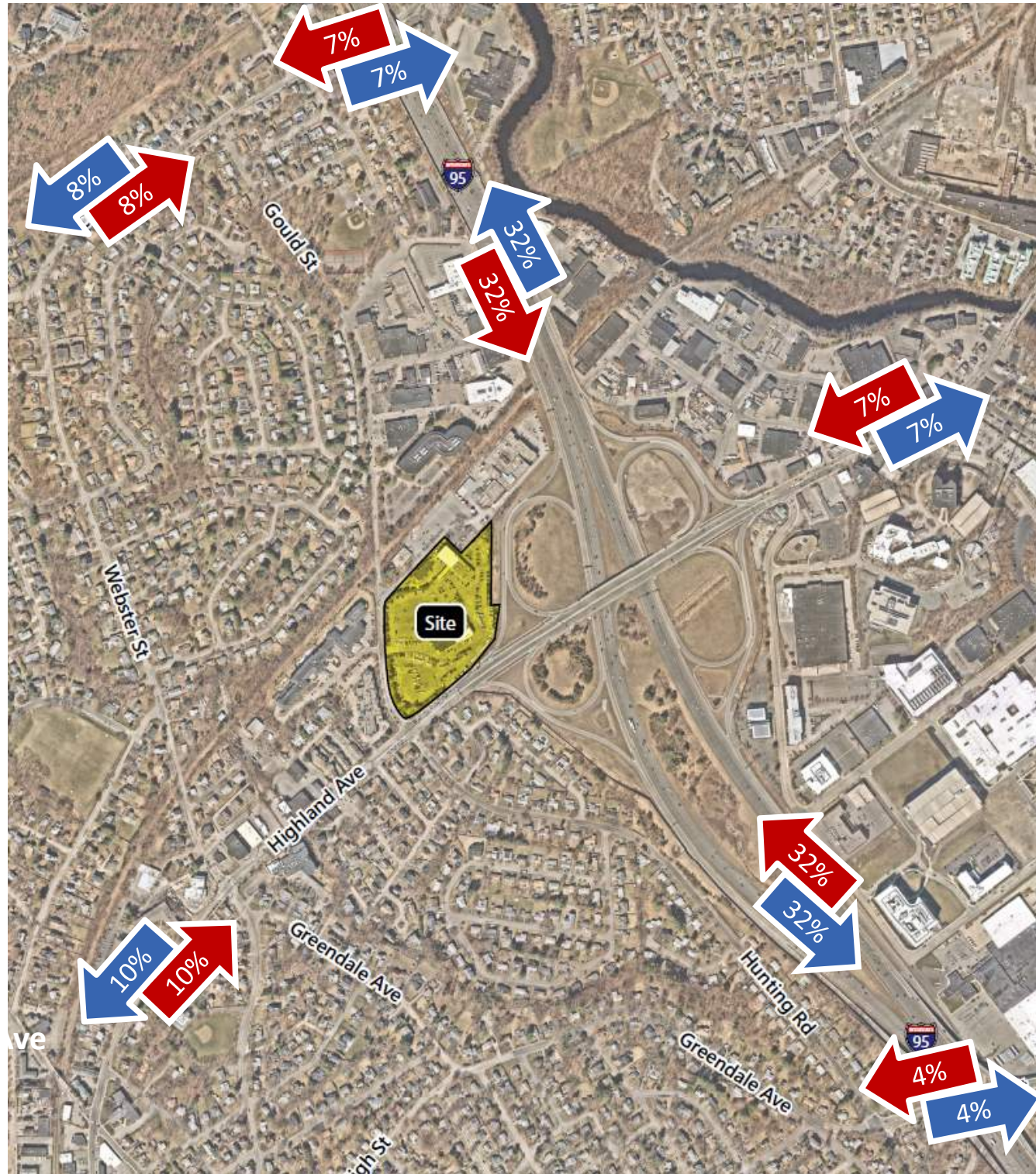
1. Local Trip Rates
2. Transit Use and Walk / Bike Trips
3. Work from Home / Hybrid Work Environment

- To be conservative, traffic analyses conducted without these estimated credits applied
- All roadway improvements designed to accommodate “worse-case” scenario

Total New Project Vehicle Trips

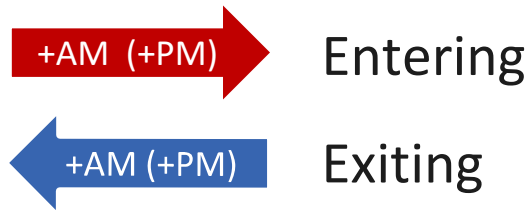
	Estimated New Vehicle Trips	“Actual” New Vehicle Trips	Percent Difference
Weekday Daily			
Total	5,005	2,072	-59%
Weekday Morning Peak Hour			
Enter	515	291	
<u>Exit</u>	<u>68</u>	<u>-12</u>	
Total	584	279	-52%
Weekday Evening Peak Hour			
Enter	92	29	
<u>Exit</u>	<u>473</u>	<u>273</u>	
Total	565	302	-47%

Trip Distribution



Source: Trip Distribution based on US Census Journey to Work Data (2012-2016) for workplaces located within the Town of Needham, MA.

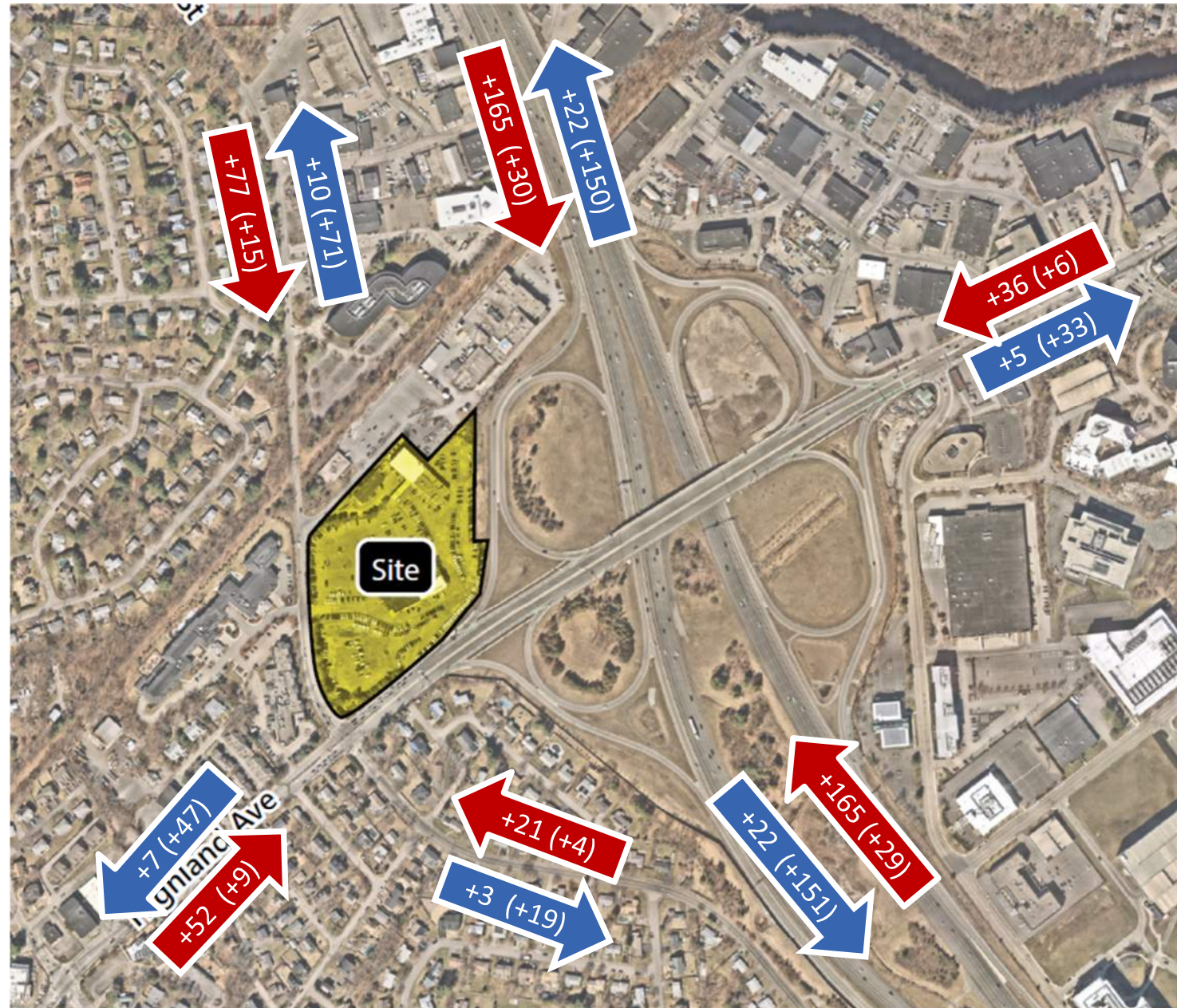
New Project-Generated Trips



*** Trip Generation Likely Over-Estimated, Does Not Account For:**

1. Transit Use or Walk / Bike Trips
2. Work from Home / Hybrid Work Environment

Based on higher Trip Generation to determine proposed mitigation



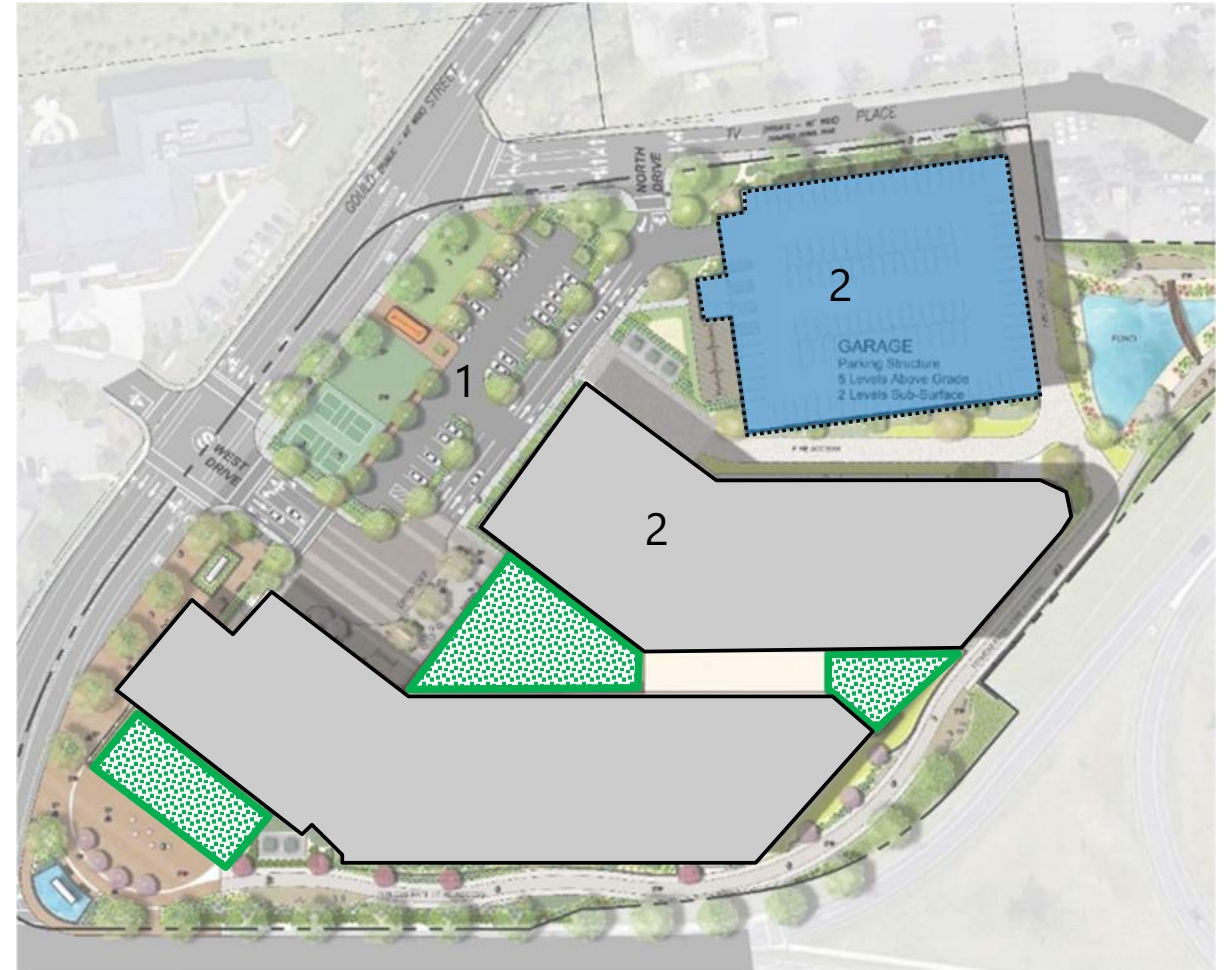
Parking Supply

Type	Spaces
Vehicle	1,408 spaces
Bike	154 spaces

1. Small surface parking lot for patrons and visitors
2. Stand-alone garage and underground parking for employees



25% of all parking spaces will include **EV charging stations**



Parking Demand

Conservative Analysis based on 100% Auto Use

The proposed Project parking supply of up to **1,408 off-street parking spaces** exceeds the expected demand.

Use	Size (SF)	Employee/Patron Density ^a	VOR ^b	Parking Demand
Office	248,347	3.33/ksf	1.15	719 spaces
R&D	248,347	2.46/ksf	1.15	531 spaces
Retail	10,000	3.33/ksf	1.15	29 spaces
Total				1,279 spaces ^c

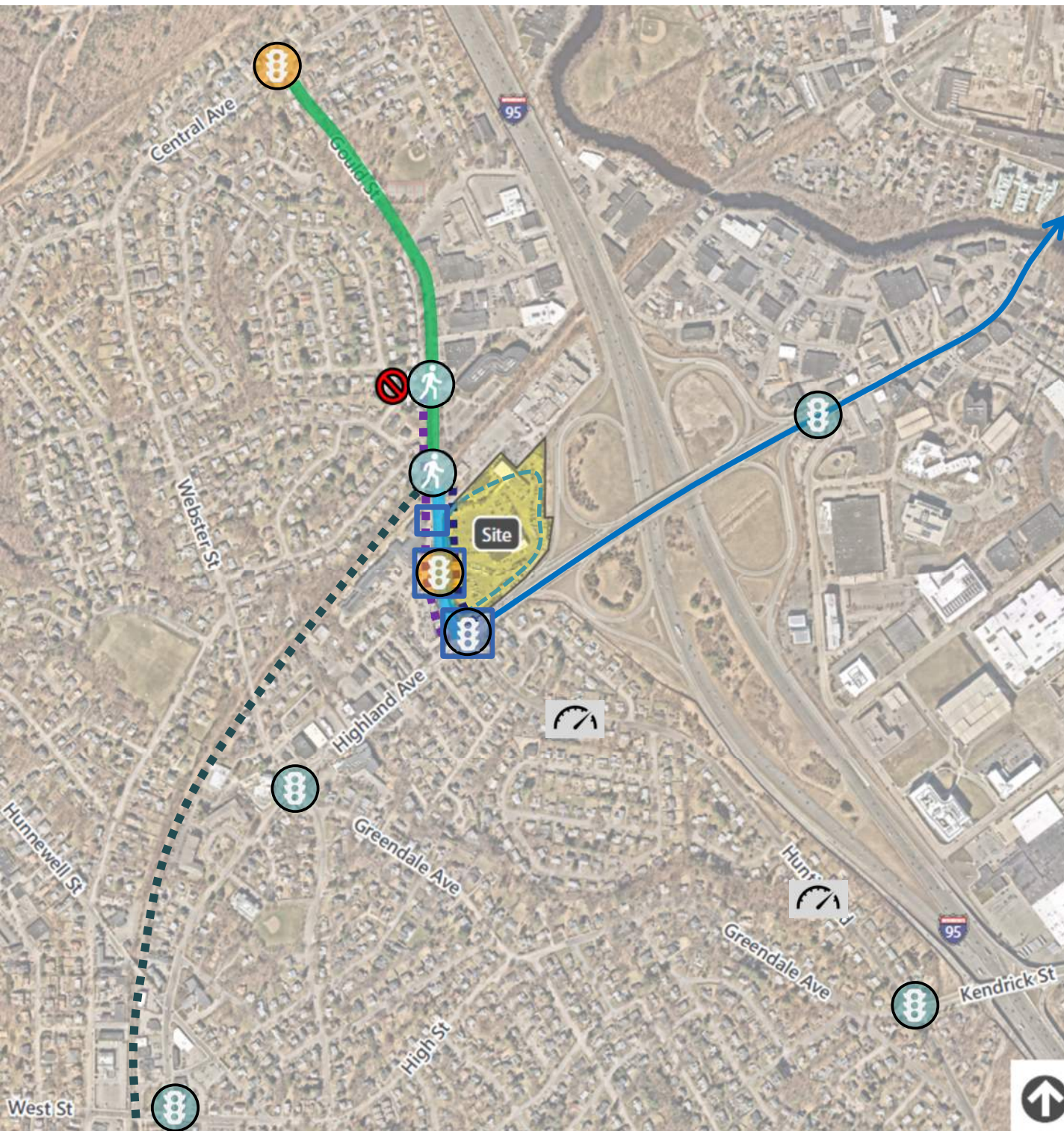
a – Based on Town of Needham zoning requirements for office and retail and employee density data from existing sites in Cambridge for R&D

b – Vehicle Occupancy Rates (VOR) based on Existing data for workplaces within Needham















c – Would result in parking rate of 2.52 spaces per kSF

Parking demand likely to be lower than 1,279 spaces due to transit/walk/bike commuters and hybrid work environment

*25% of all parking spaces to include **EV charging stations***



Mitigation Measures

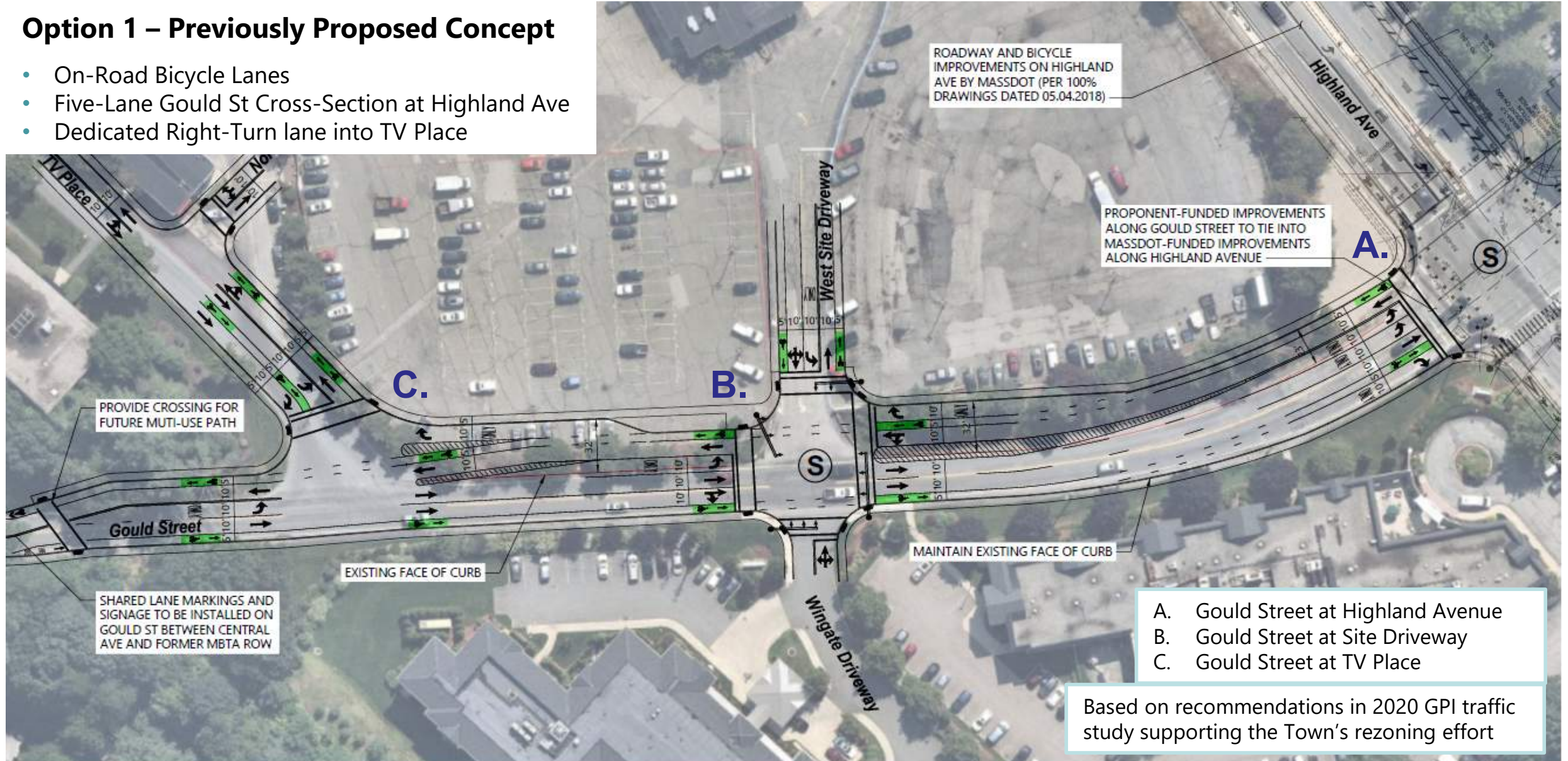
-  New traffic signal
-  Signal Timing and Equipment Improvement
-  Signal Timing Modifications
-  Geometric Improvements
-  Sidewalk Level Separated Bicycle Facilities
-  Shared Bicycle Lane Markings and Signage
-  Reconstruction of Sidewalk
-  New Pedestrian Facility
-  Pedestrian Infrastructure Improvements
-  Signage to deter cut-through traffic during peak hours
-  Installation of radar-embedded speed limit signs
-  On-Site Walking/Fitness Path
-  Shared Use Path Feasibility Study
-  Shuttle Service (Connection to Transit Station)

Transportation Mitigation | Gould Street

DRAFT – FOR PRELIMINARY DISCUSSION ONLY

Option 1 – Previously Proposed Concept

- On-Road Bicycle Lanes
- Five-Lane Gould St Cross-Section at Highland Ave
- Dedicated Right-Turn lane into TV Place



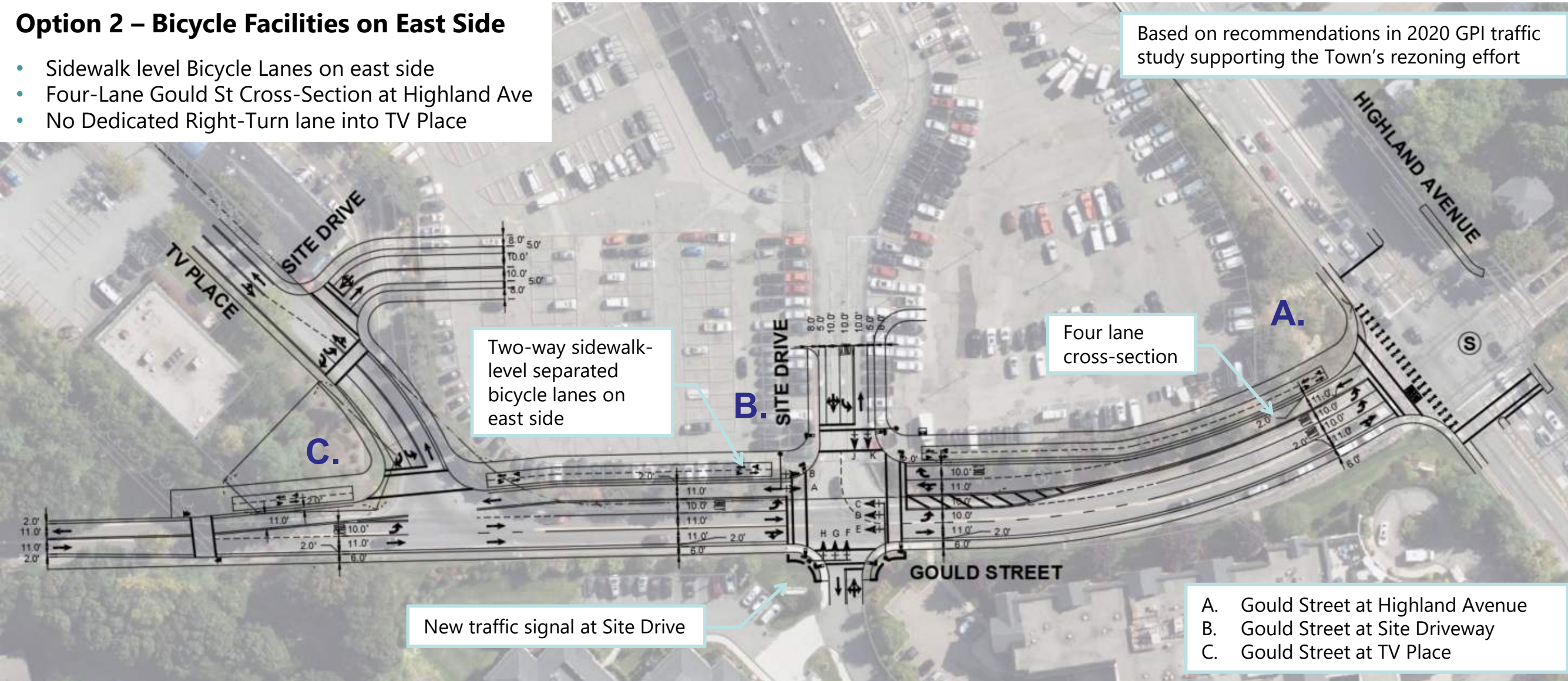
Transportation Mitigation | Gould Street

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Option 2 – Bicycle Facilities on East Side

- Sidewalk level Bicycle Lanes on east side
- Four-Lane Gould St Cross-Section at Highland Ave
- No Dedicated Right-Turn lane into TV Place

Based on recommendations in 2020 GPI traffic study supporting the Town's rezoning effort



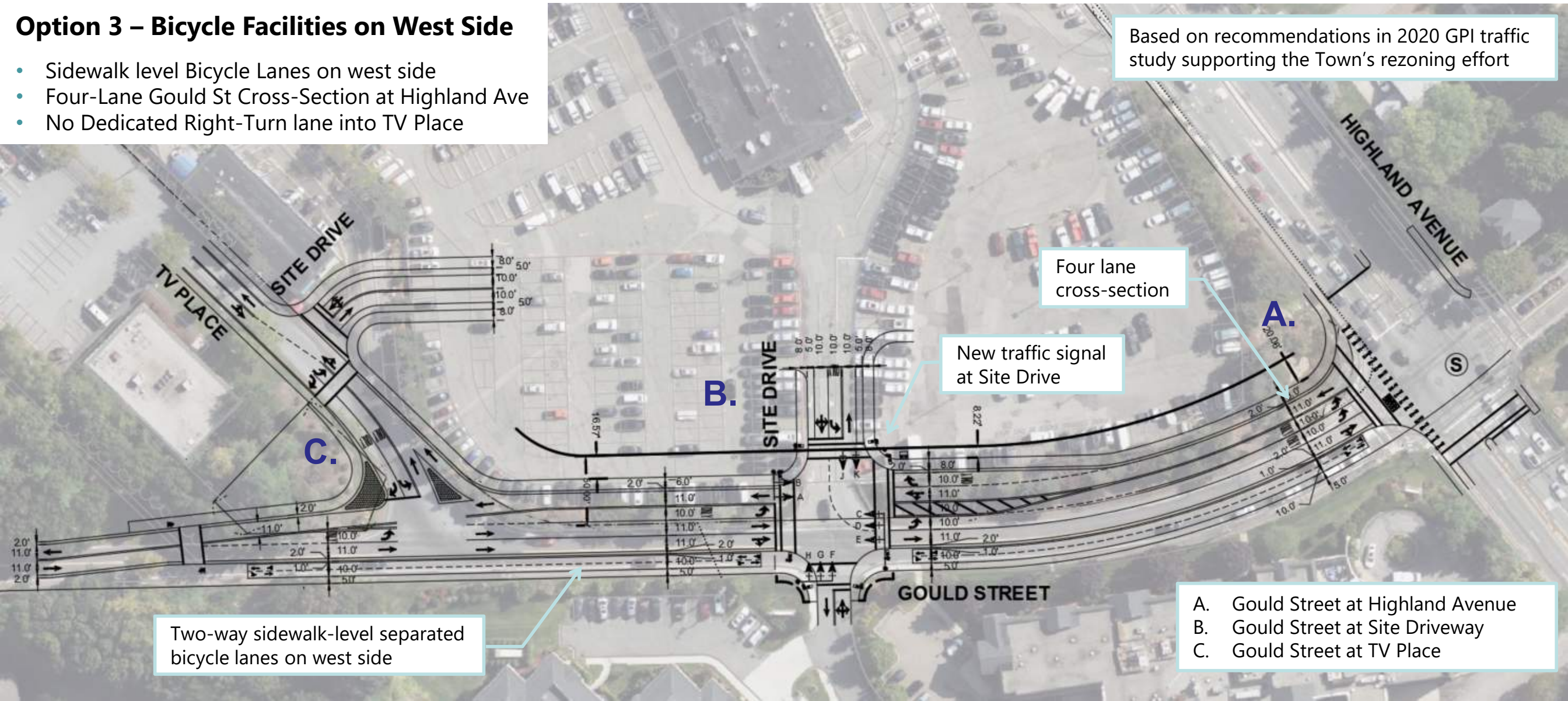
Transportation Mitigation | Gould Street

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Option 3 – Bicycle Facilities on West Side

- Sidewalk level Bicycle Lanes on west side
- Four-Lane Gould St Cross-Section at Highland Ave
- No Dedicated Right-Turn lane into TV Place

Based on recommendations in 2020 GPI traffic study supporting the Town's rezoning effort



Four lane cross-section

New traffic signal at Site Drive

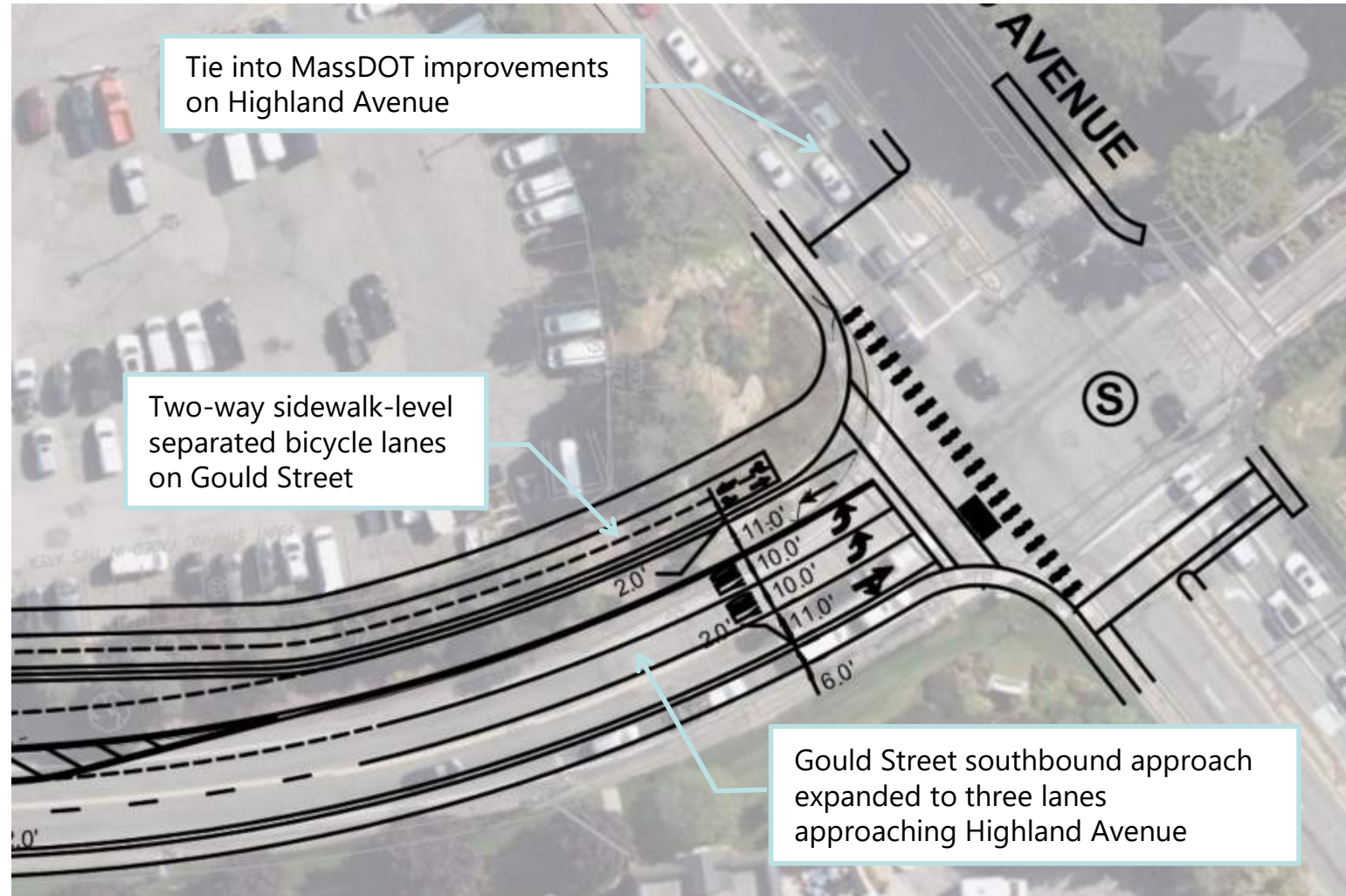
Two-way sidewalk-level separated bicycle lanes on west side

- A. Gould Street at Highland Avenue
- B. Gould Street at Site Driveway
- C. Gould Street at TV Place

Transportation Mitigation | Gould Street at Highland Avenue

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A.

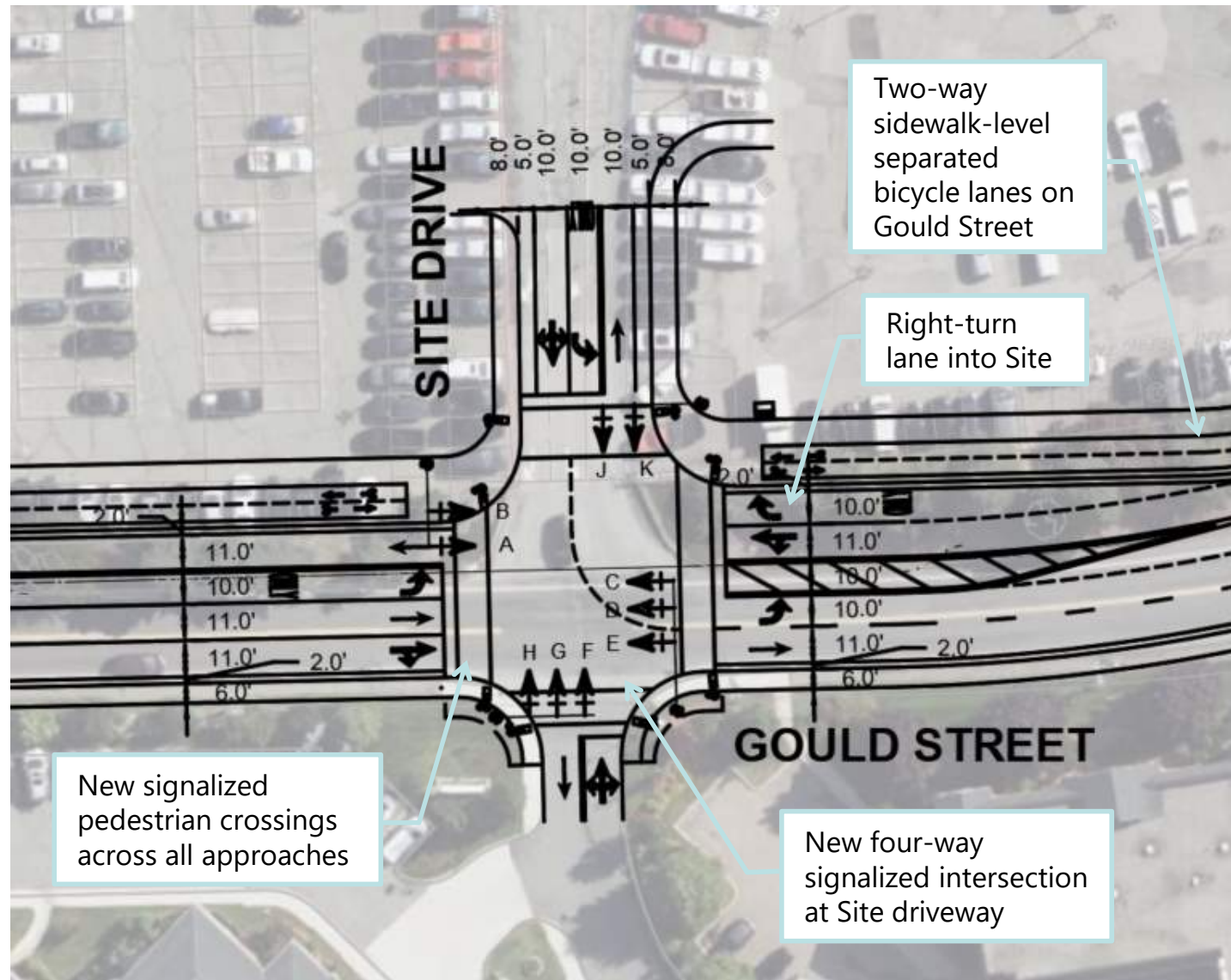


Option 2 (Separated bike facility on east side) shown for reference

Transportation Mitigation | Gould Street at Site Driveway

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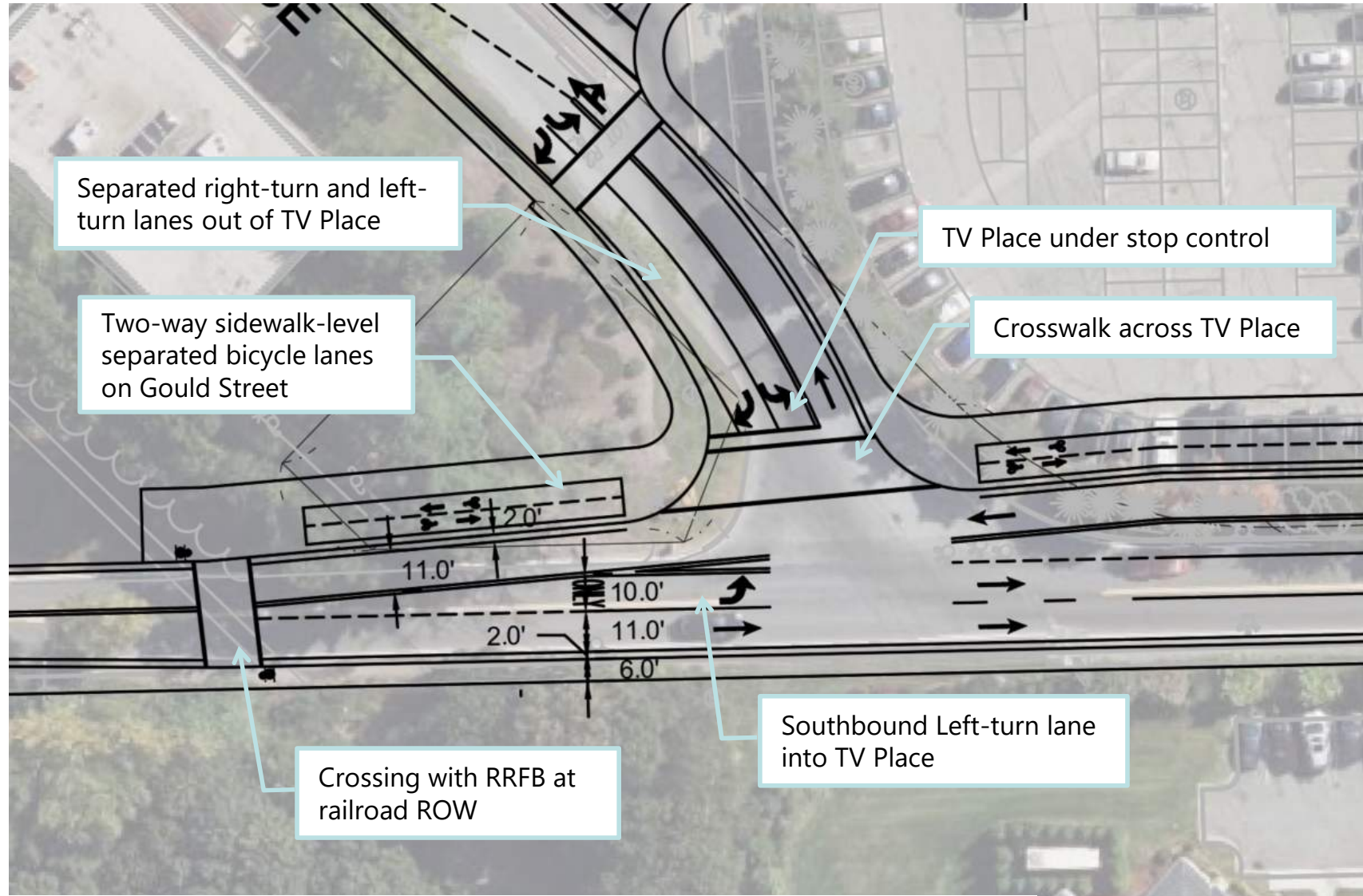


Option 2 (Separated bike facility on east side) shown for reference

Transportation Mitigation | Gould Street at TV Place

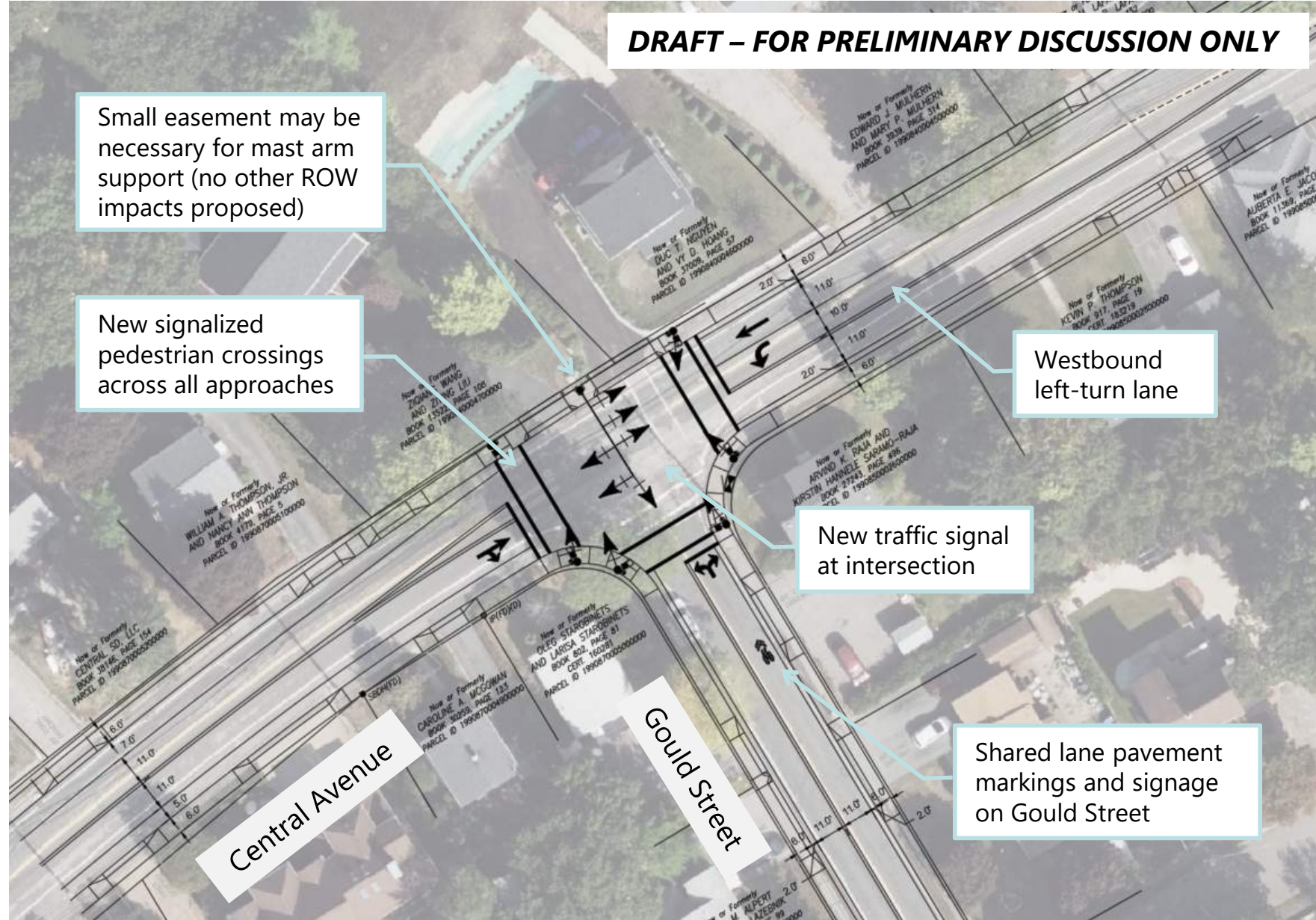
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C.



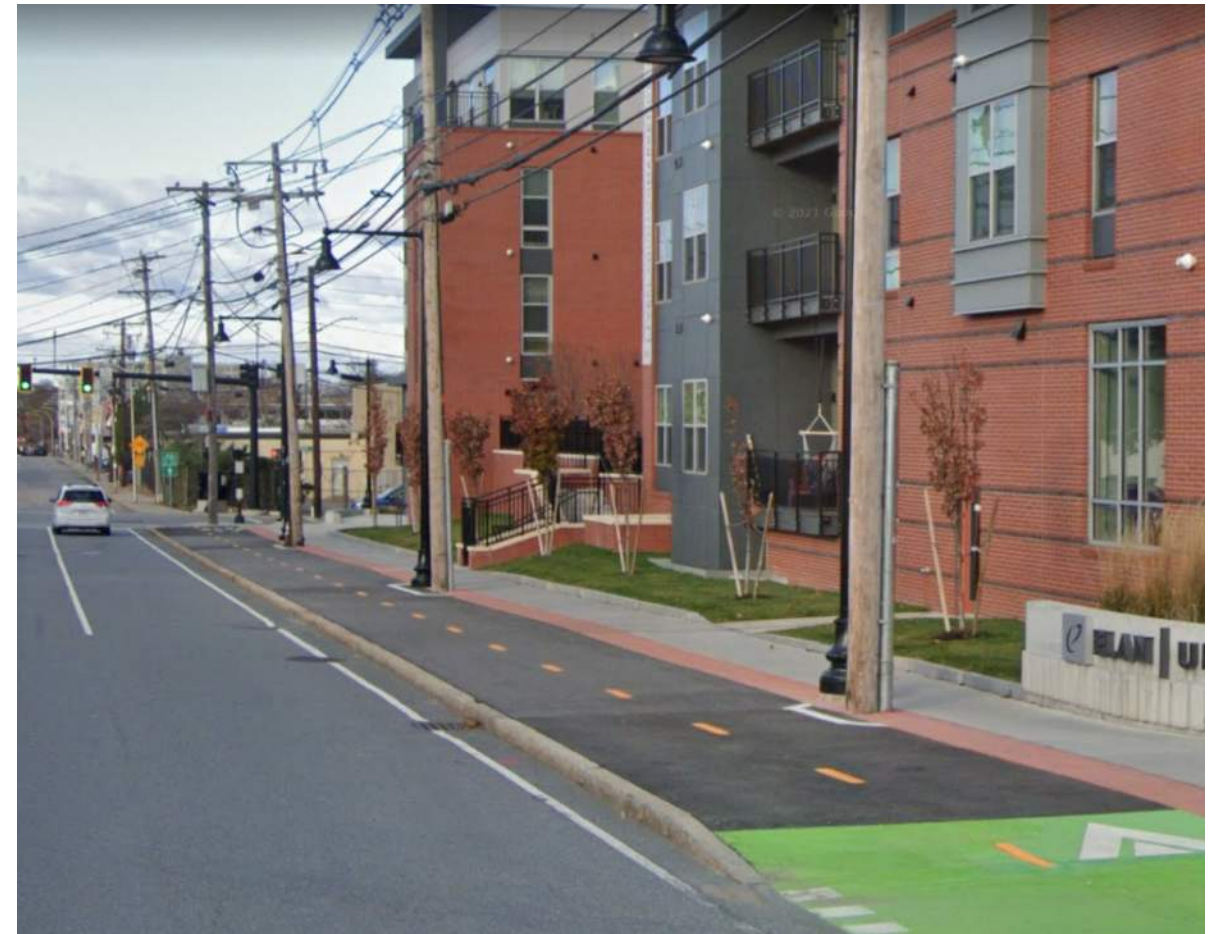
Option 2 (Separated bike facility on east side) shown for reference

Transportation Mitigation | Gould Street at Central Avenue



Transportation Mitigation | Pedestrian and Bicycle Accommodations

1. Up to **154 bicycle parking spaces** on-site
 - 104 secure spaces for employees in bike room
 - 50 spaces for visitors in outdoor public bike racks
2. Walking/fitness path on-site (0.5 miles) open to public
3. Construction of **two-way sidewalk-level separated bike lanes** on Gould Street between Highland Avenue and former MBTA ROW to provide a family-friendly facility
4. Full **Reconstruction of sidewalk** on west side of Gould Street between Highland Avenue and Noanett Road



Arsenal Street in Watertown, Massachusetts



Transportation Mitigation | Pedestrian and Bicycle Accommodations (cont.)

5. Support Town of Needham with additional funding for feasibility study of converting the former MBTA railroad ROW north of the Project Site into a **shared use path**
6. Construction of crosswalk across Gould Street at former MBTA ROW with **Rapid Rectangular Flashing Beacon (RRFB)** or **LED Warning signs**



Rapid Rectangular Flashing Beacon (RRFB)

LED lights flash only when the pedestrian push button is activated to warn drivers that a pedestrian is present in the crosswalk and lights flash only for the time needed to safely cross the roadway



LED Pedestrian Warning Sign

Illuminates 24/7 the pedestrian warning sign for added awareness

Transportation Mitigation | Transit Connection

- Direct connection to nearby public transit stations via an **electric shuttle**
- Potential connections to **Green Line D Branch** (at Newton Highlands) and/or **Commuter Rail** (at Needham Heights)
- Provides access to Site for employees who live closer to Boston



Transportation Mitigation | Noanett Road

Mitigation proposed based on feedback from neighborhood residents:

1. Reconfiguring the sidewalk ramps on the northwest and southwest corners of the intersection with Gould Street to be ADA accessible and striping of a crosswalk across the Noanett Road approach to Gould Street
2. Installing “Do Not Enter” signs between 7:00-10:00 AM and 3:00-6:00 PM such that the road will be limited to residents only – no through traffic.
3. Commissioning a police detail stationed in an unmarked cruiser, who will issue citations to violators upon opening of the project for the first three months and at such other intervals from time-to-time, as required (as done by the Proponent in Cambridge, MA on Acorn Park Drive)
4. Installing a traffic light at Gould Street and Central Avenue to facilitate traffic and encourage users to utilize the Gould/Central light in both directions.
5. Installing “Blind Driveway” signs and “Slow Children” signs as needed.



Example of peak period “Do Not Enter” sign in Cambridge, MA

Transportation Mitigation | Hunting Road



1. Speed limit signs with embedded radar
 - Alerts drivers to current speed in comparison to posted speed limit to try to slow speeds and increase driver awareness
 - Can be permanent or temporary installments
2. Intermittent police speed detail to enforce speed limit
3. Traffic monitoring to understand if cut-through traffic activity occurs and when
4. Installing directional signage to deter through traffic on Hunting Road

Transportation Mitigation | Sachem Road



Transportation Demand Management (TDM)

Proposed Measures

1. Shuttle Service to nearby transit stations
2. Transportation Employee Advisor
3. Secure/Indoor bicycle parking (104 spaces)
4. 50-percent transit pass subsidy
5. Emergency ride home
6. Carpool assistance and incentives
7. Bicycling/walking incentives and amenities
8. On-site locker rooms and showers
9. On-site amenities for employees to reduce midday trips
10. Telecommuting and compressed workweeks
11. Display real-time transportation-related information
12. Promotional efforts
13. EV charging stations (25-percent of all spaces)

Transportation Management Association (TMA):

The Proponent will join and become an active member of the 128 Business Council.

Transportation Monitoring:

Annual traffic collection program for five year, including:

- Parking garage counts
- Intersection counts at four off-site locations
- Intersection capacity analyses
- Travel survey of employees and patrons

Proponent will work with Town of Needham on monitoring commitment to not exceed projected trip generation

Project Mitigation Summary



Sustainable Transportation Modes:

- Gould St sidewalk level separated bicycle facilities between Highland Ave and former MBTA ROW
- Gould St shared lane markings and signage between former MBTA ROW and Central Ave
- Reconstruction of the sidewalk on the west side of Gould St between Highland Ave and Noanett Road
- Construction of a new pedestrian facility on the east side of Gould St along Site frontage
- New crossing of Gould St at former MBTA ROW with rectangular rapid flashing beacons
- Reconfiguring the sidewalk ramps on the corners of Noanett Rd and Gould St
- Support Town of Needham with Shared use path feasibility study for former MBTA ROW
- Transit connector shuttle service (with electric shuttle)



Targeted Intersection/Signal/Roadway Improvements:

- Highland Ave at Gould St/Hunting Rd: Geometric improvements, signal timing and equipment improvements, expansion of Gould St SB approach, and pedestrian infrastructure improvements
- Central Ave at Gould St: Traffic signal installation and pedestrian infrastructure improvements
- Gould St at Site Driveway/Wingate Driveway: Traffic signal installation, expansion of Gould St cross-section, and pedestrian infrastructure improvements
- Gould St at TV Place: Geometric improvements
- Signal timing modifications at Highland Ave at West St, at Webster St, at 1st Ave, and Hunting Rd at Kendrick St



Speed and Traffic Calming:

- Installation of signage to deter cut-through traffic during the peak hours at Noanett Rd
- Installation of two radar-embedded speed limit signs on Hunting Rd to encourage lower vehicle speeds

**FOR ANY QUESTIONS, PLEASE E-MAIL
TRANSPORTATION CONSULTANTS.**

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