213-217 Washington Street
Weymouth, MA 02184

Owner: Jennifer Nguyen

Attorney: Greg Galvin
775 Pleasant Street – Unit 16
Weymouth, MA 02189

Architect: 686 Architects
1156 Dorchester Ave.
Dorchester MA, 02125

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Project Summary

To raze the existing commercial building, and prepare the 29,118 SF site for a new 3-story, mixed use building consisting of 25 residential units, 4,467 SF of retail space at grade, 44 interior (below grade parking spaces) includes 2 handicap accessible spaces and 3 exterior (at grade parking spaces) includes 2 handicap accessible spaces, and 10 bicycle locking stations.

Building Summary

(25) 2 Bed, 2 Bath Units
– ranging in size from 983 S.F. to 1,101 S.F.

(2) Ground Level Retail Spaces
– ranging in size from 1,753 S.F. to 2,714 S.F.

47 Parking Spaces on Site

NUMBER OF UNITS	25
RETAIL AREA	4,467 s.f.
LOT AREA	29,118 s.f.
TOTAL GROSS LIVING AREA	32,106 s.f.
FAR	1.10

FLOOR AREA RATIO (FAR)
The fixed relation between the lot area and the floor area of all multiple-family residential buildings, excluding the floor area of garages, carports, breezeways, stairways, hallways and balconies and excluding the area of any floor more than four feet below average grade where no part of such basement is used for sleeping rooms or other living quarters, and expressed as a fraction of floor area/lot areA.

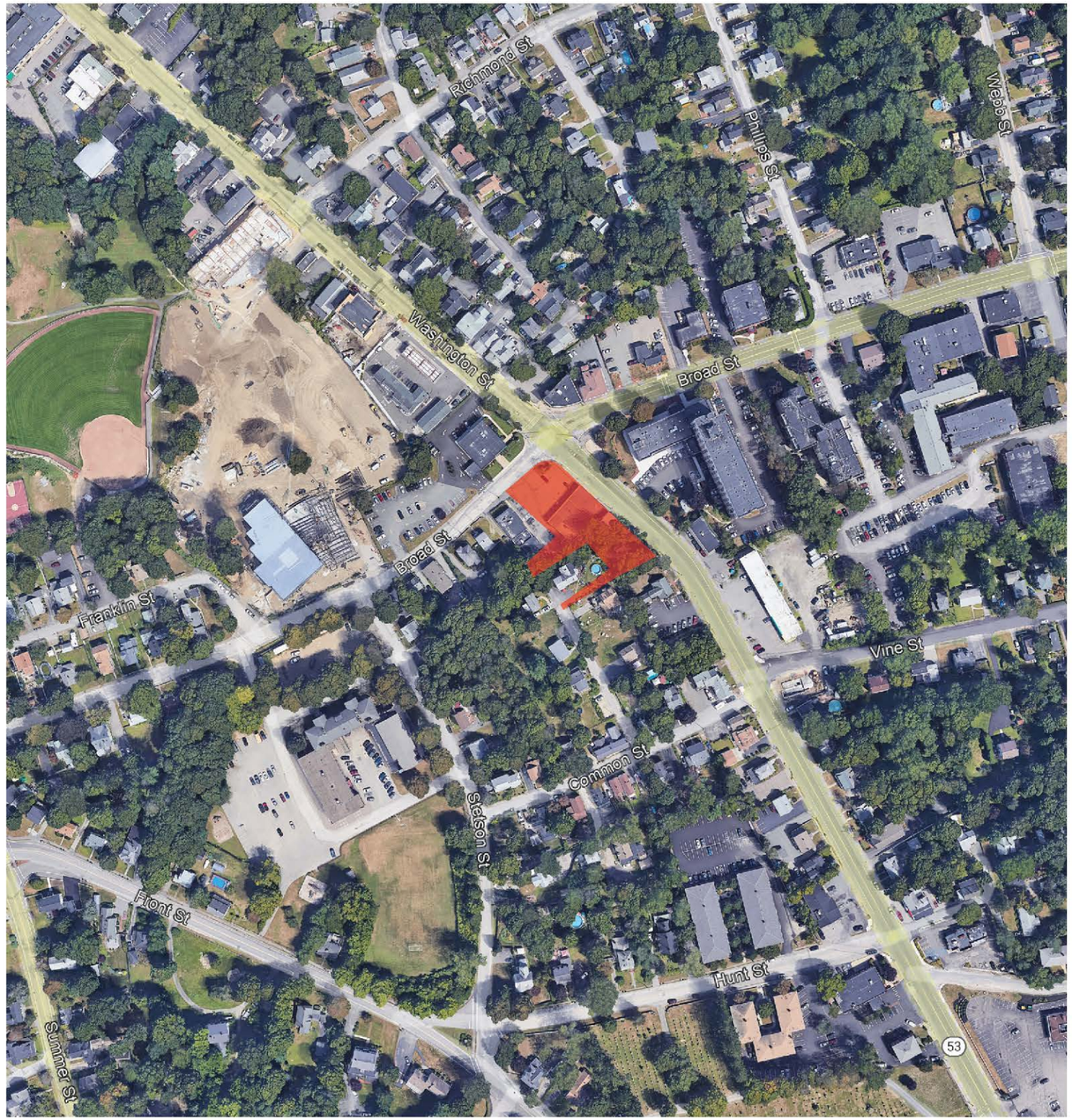
ZONING	B-2 (Limited Business District)
	R-1 (Resident District)
	VC (Village Center Overlay District

VC (Village Center Overlay District	
Maximum Height	4 stories, not to exceed 50 feet by special permit
Front, Side and Rear Setbacks	shall be calculated as follows: the maximum front and street side building setback may not exceed the average front yard depth of the nearest two lots on both sides of the subject lot or 10 feet, whichever is less.
A portion of the building may be set back from the maximum setback line in order to provide an articulated facade or accommodate a building entrance feature, provided that the total area of the space created must not exceed one square foot for every linear foot of building frontage.	

PARKING REQUIREMENTS	
Dwelling Units	1.5 per unit
Retail	1 per 250 s.f. (min.) of gross area on the 1st floor of a building

PROVIDED PARKING SPACES - 47 TOTAL (55 req'd.)	
25 Units	37 spaces (1.5 per Unit = 37.5 req'd.)
Retail	10 spaces for 4,467 s.f. (4,467 / 250 s.f. = 18 spaces req'd.)
Bike	1 Bike per 20 Parking Spaces. (61/20 = 3 Bike spaces req'd.)

Aerial View



Site Map

213-217 Washington Street

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Existing Condition and Site Map

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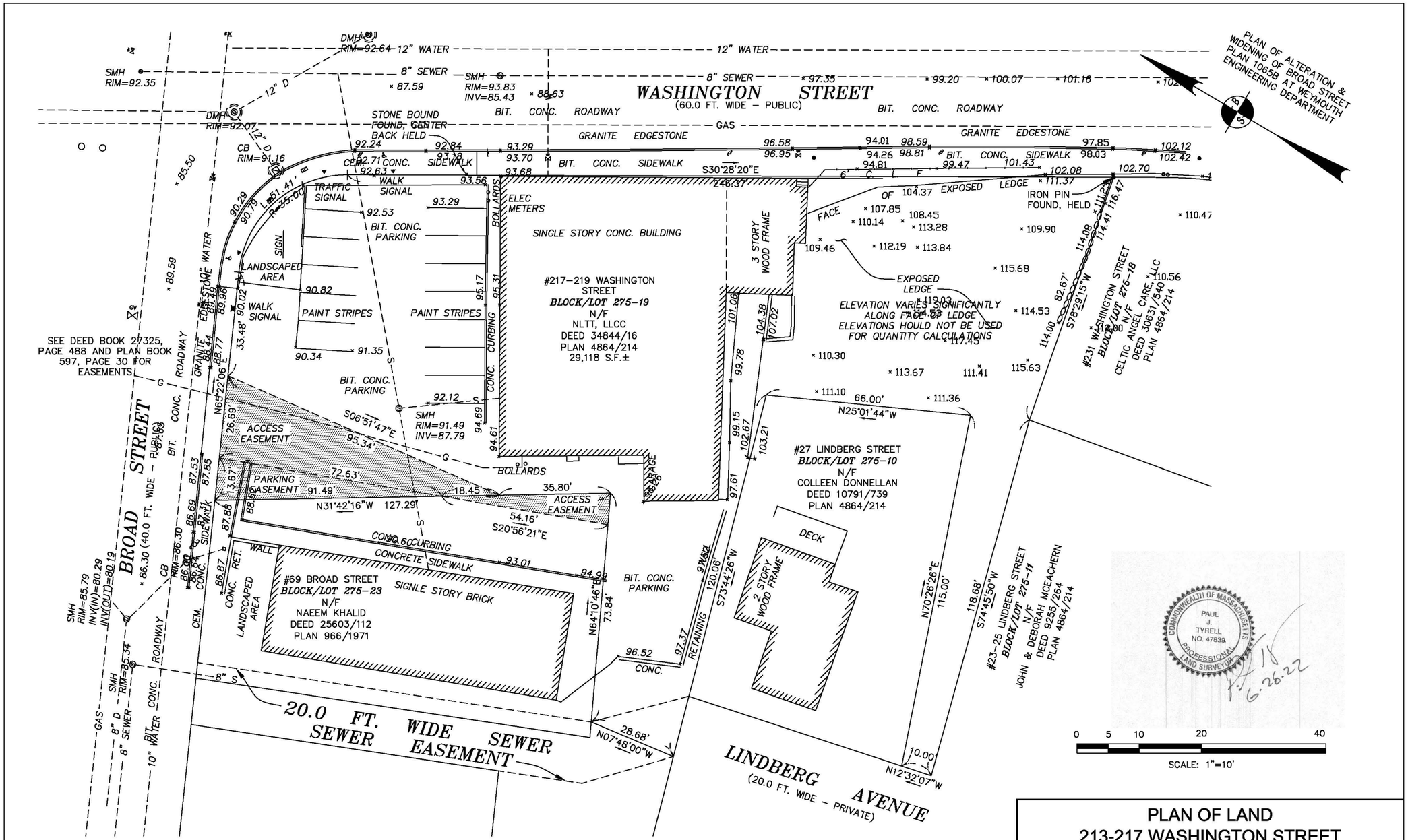
View from Corner Of Washington Street & Broad Avenue

View from Washington Street Toward The Landing

View from Broad Avenue Toward Washington Street



PLAN OF LAND
213-217 WASHINGTON STREET
WEYMOUTH, MASSACHUSETTS
(NORFOLK COUNTY REGISTRY OF DEEDS)

PREPARED FOR
JAMES CHRISTOPHER

GREATER BOSTON SURVEYING AND ENGINEERING
19 FREDITH ROAD
WEYMOUTH, MA 02189
(781) 331-6128

CALC BY: PJT	DATE: JUNE 27, 2023	SCALE: 1"=10'

213-217 Washington Street

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Existing Site Plan

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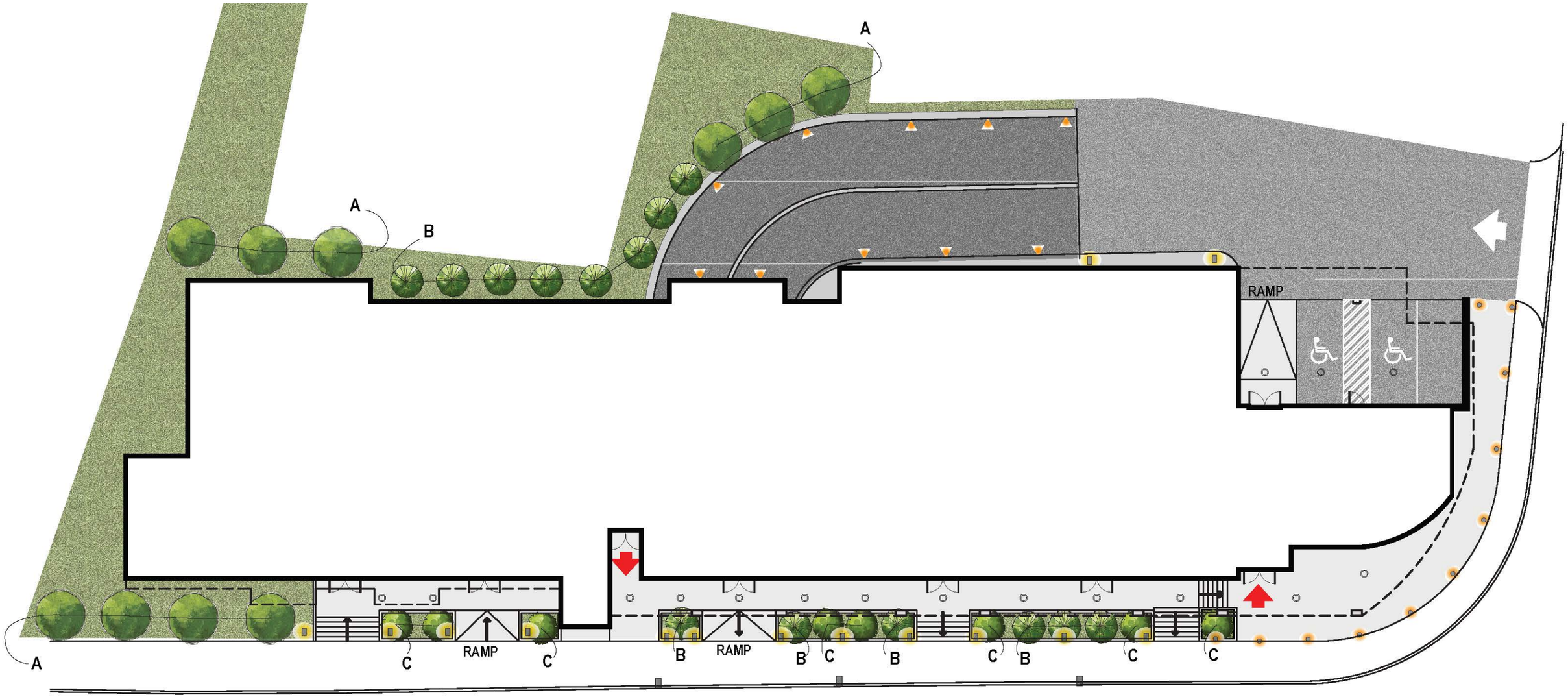


Oak Tree Size 8'-0"

Dogwood Tree Size 4'-0"

Ilex Glabra Shrubs

Shoebox Lights - Dimmable

Bollard LED Lights

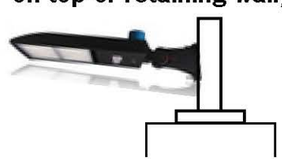
Shoebox Lights - Dimmable (This would be mounted on top of retaining wall)

Exterior Recessed Down Lighting

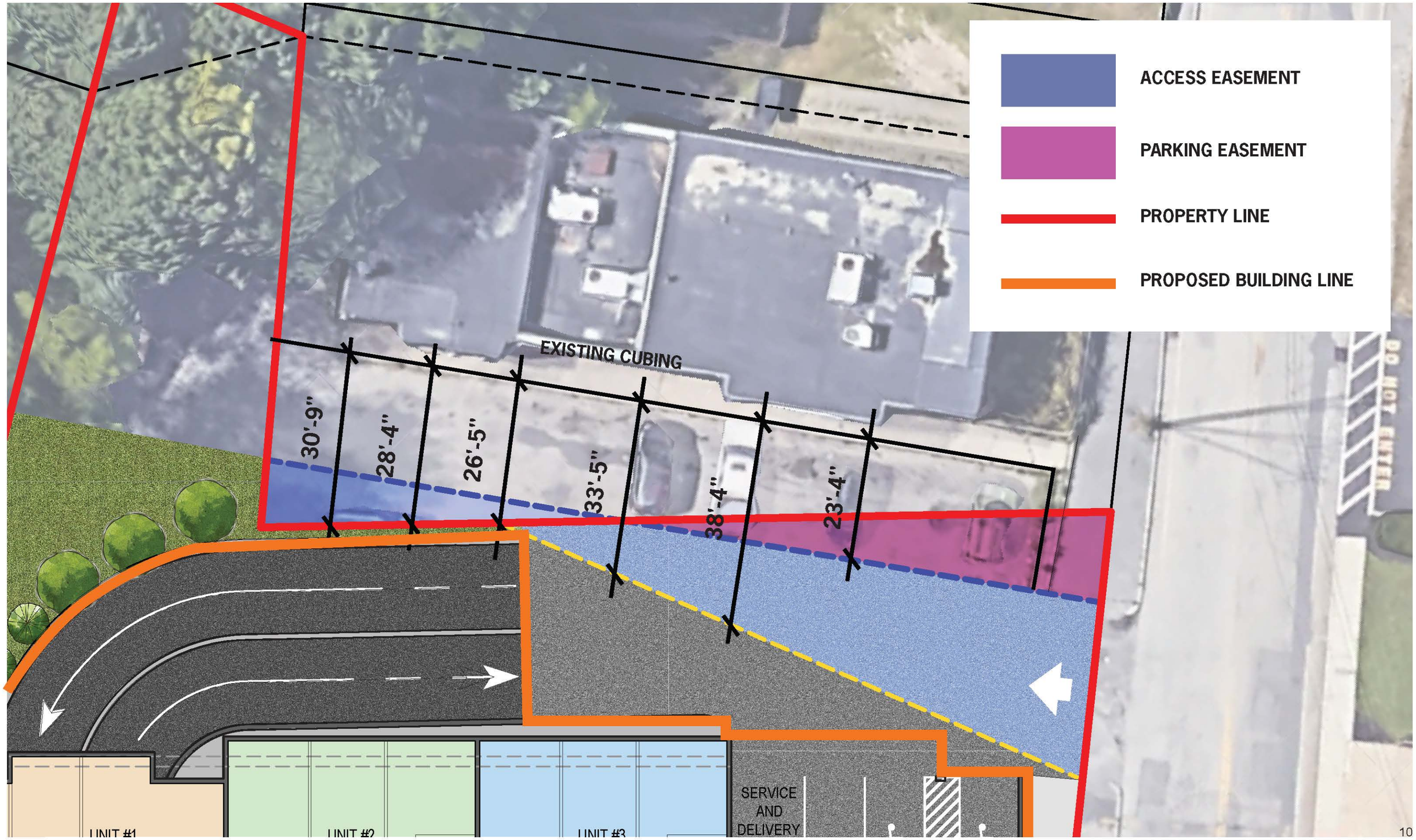
A

B

C



Proposed Landscape and Lighting Plan



Easement Diagram

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Proposed Site Plan

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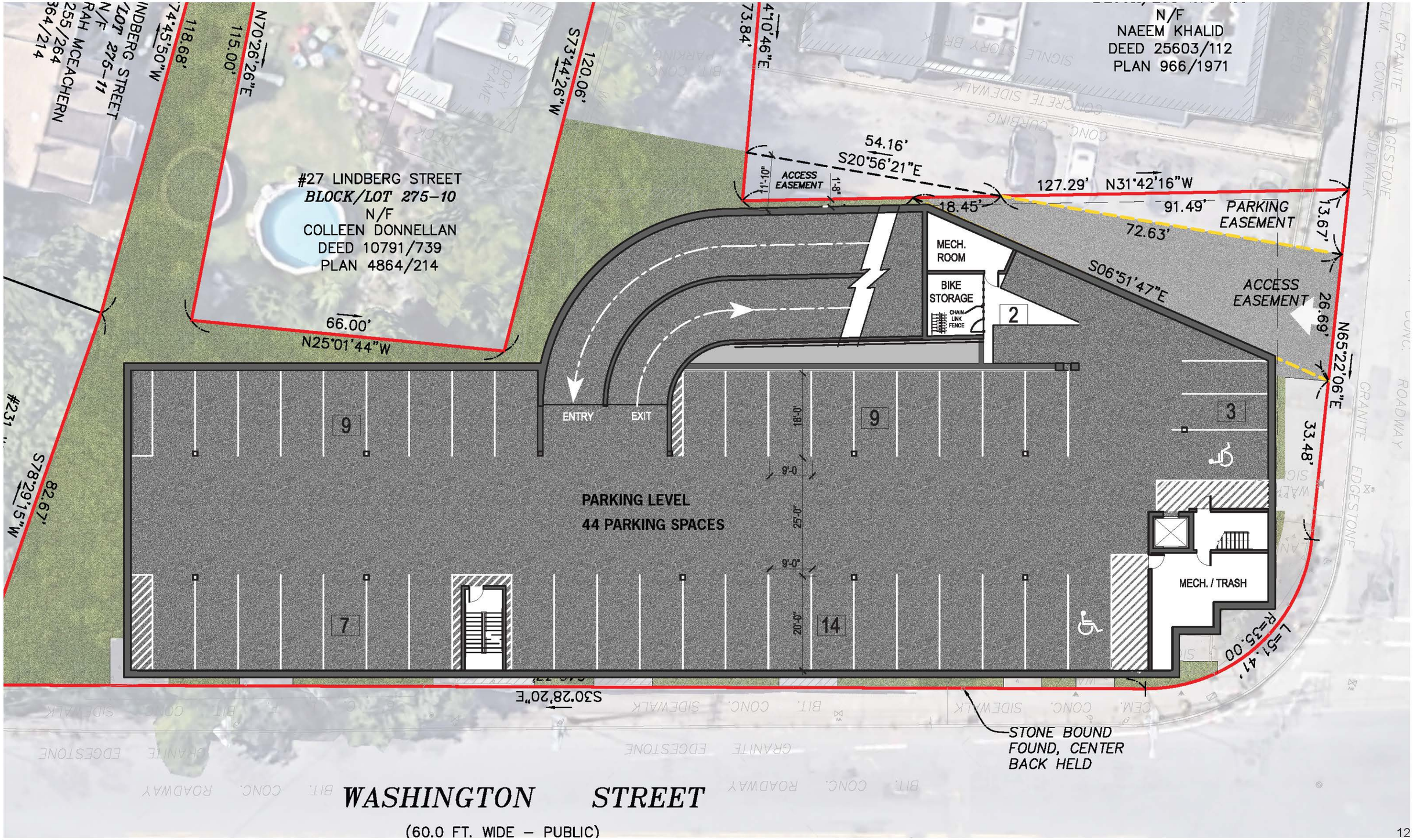
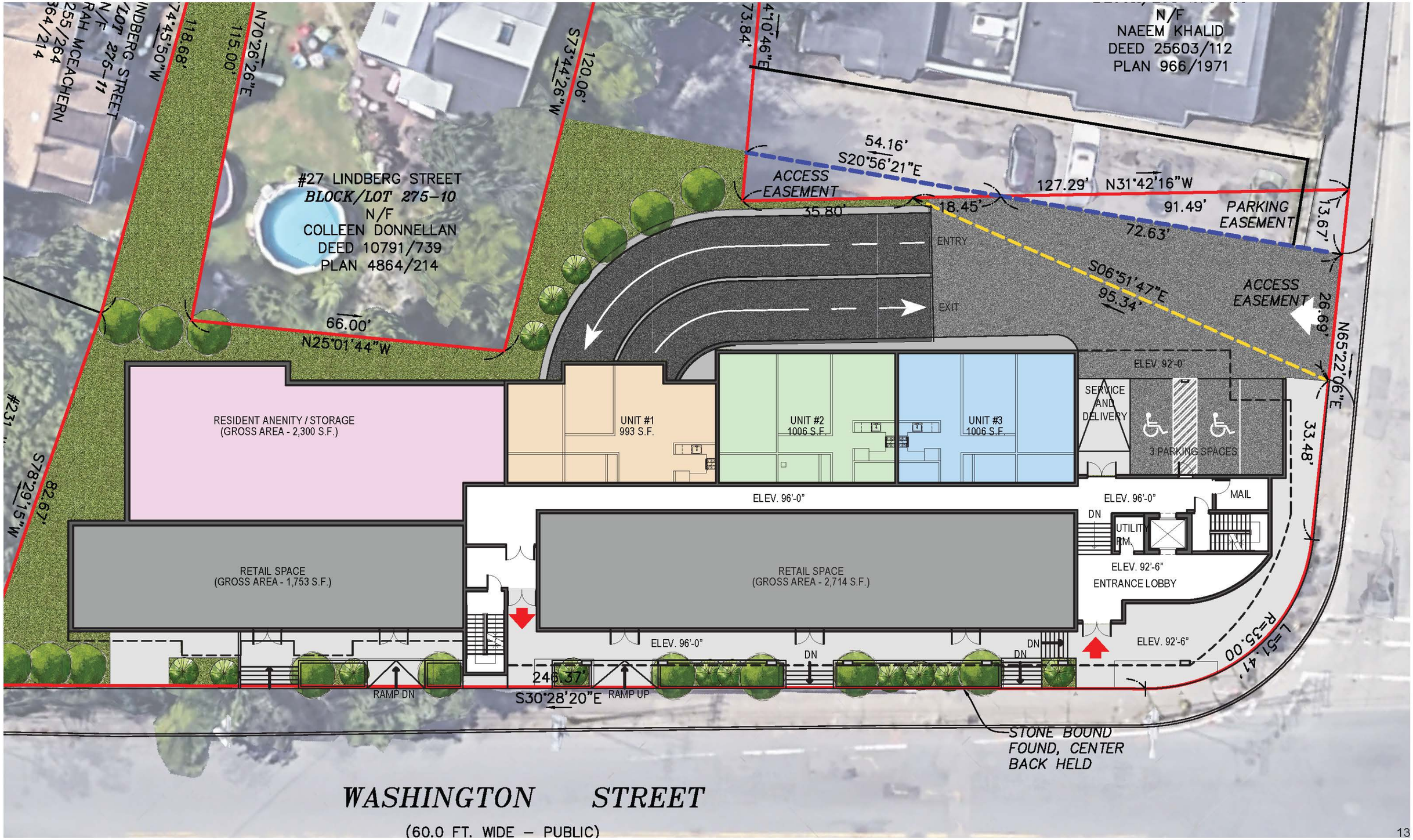
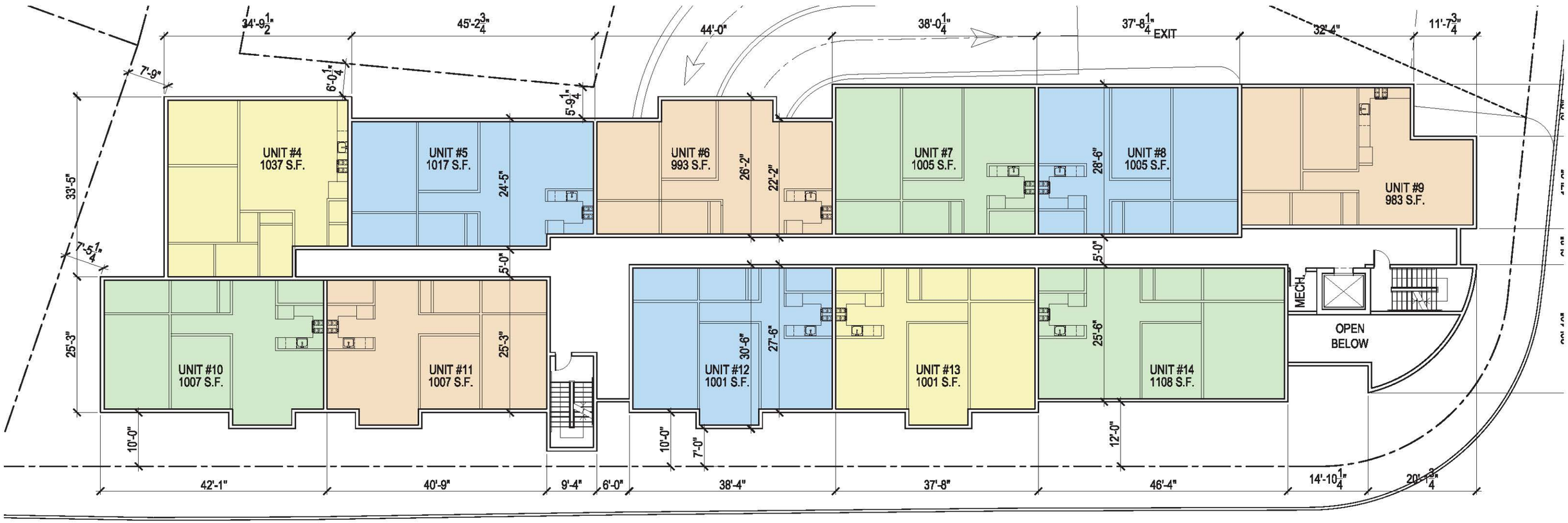


Proposed Garage Parking Plan



Proposed First Floor Plan



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Proposed Second Floor Plan

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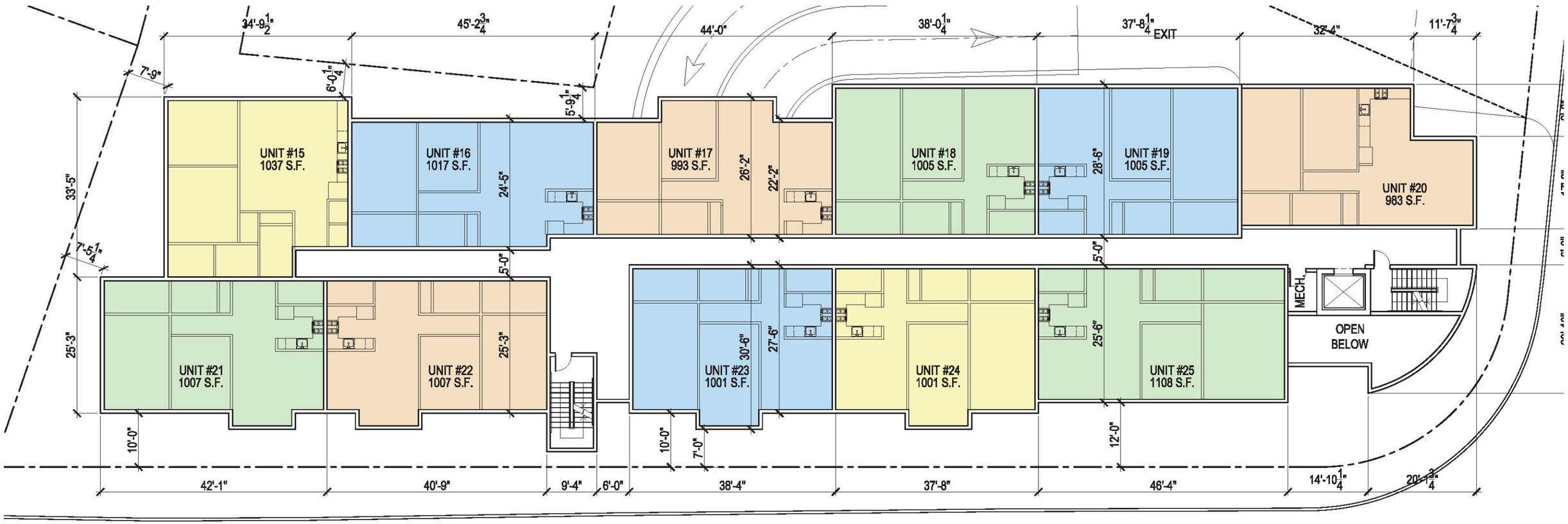

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Proposed Third Floor Plan

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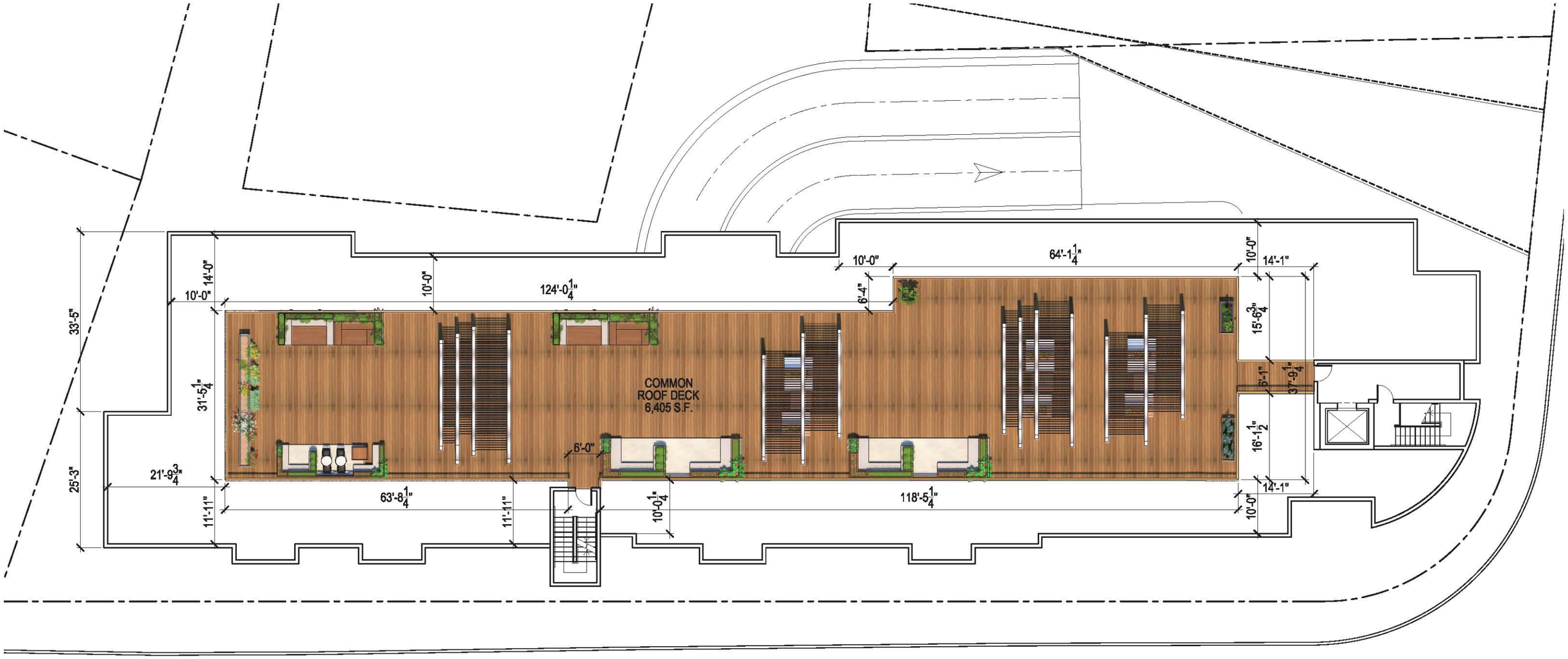

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Proposed Roof Deck Plan

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Front Elevation

Rear Elevation

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Proposed Elevations

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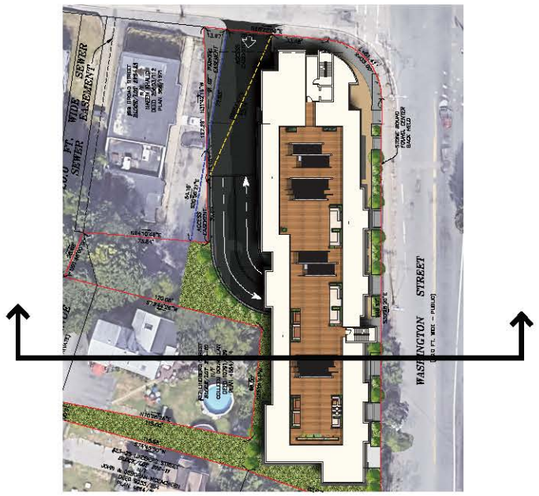
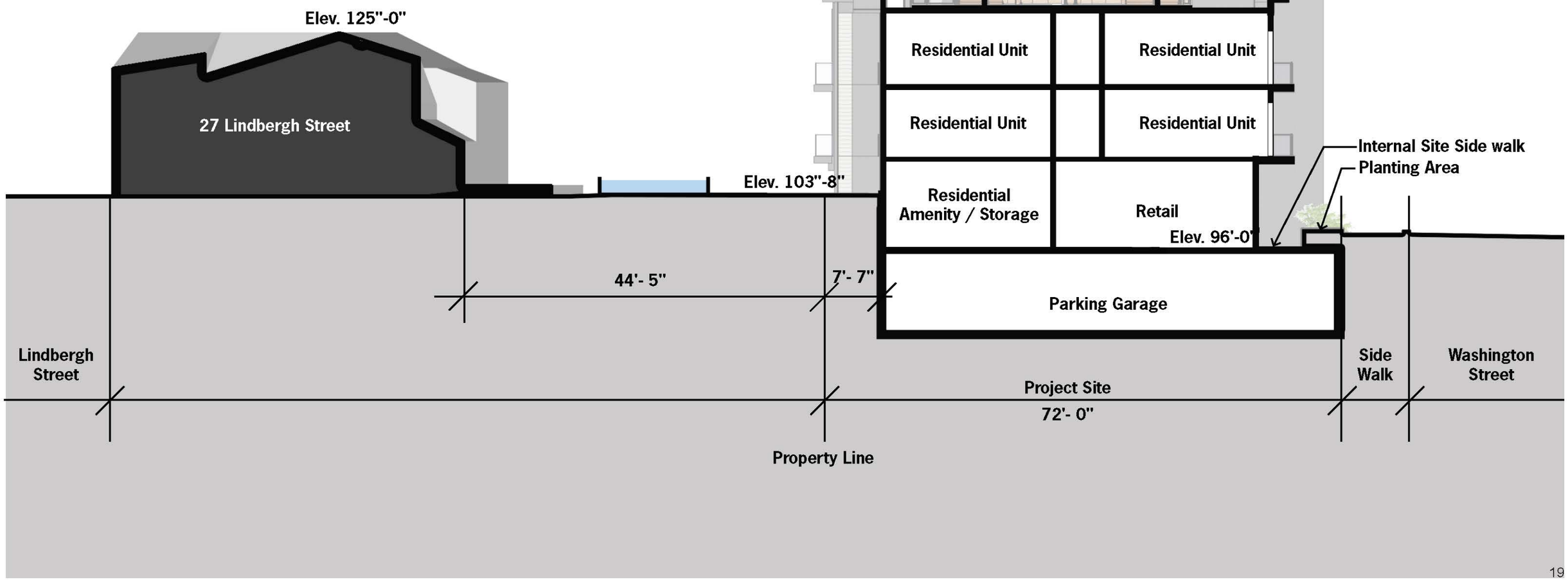
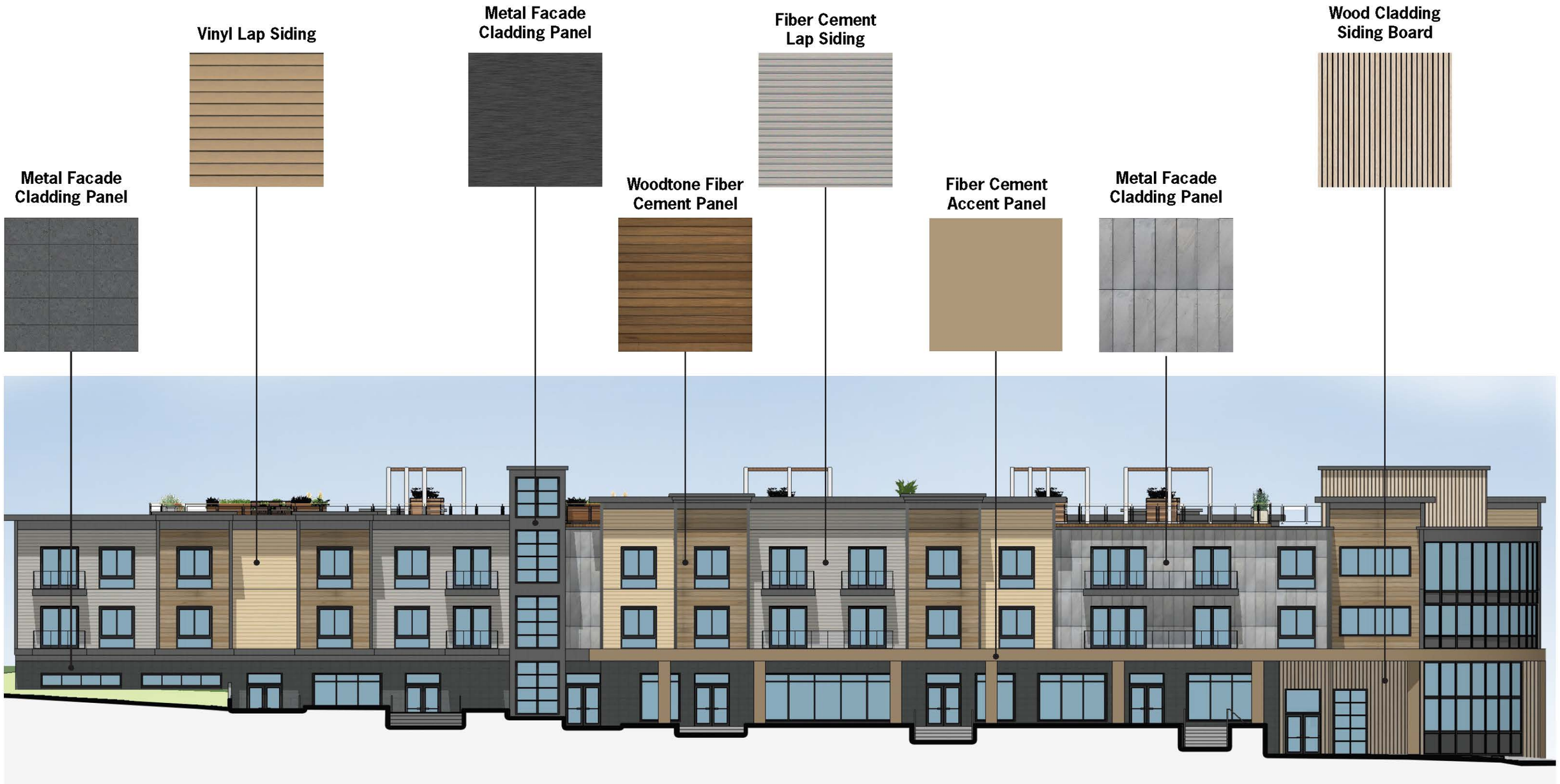
Left Elevation

Right Elevation

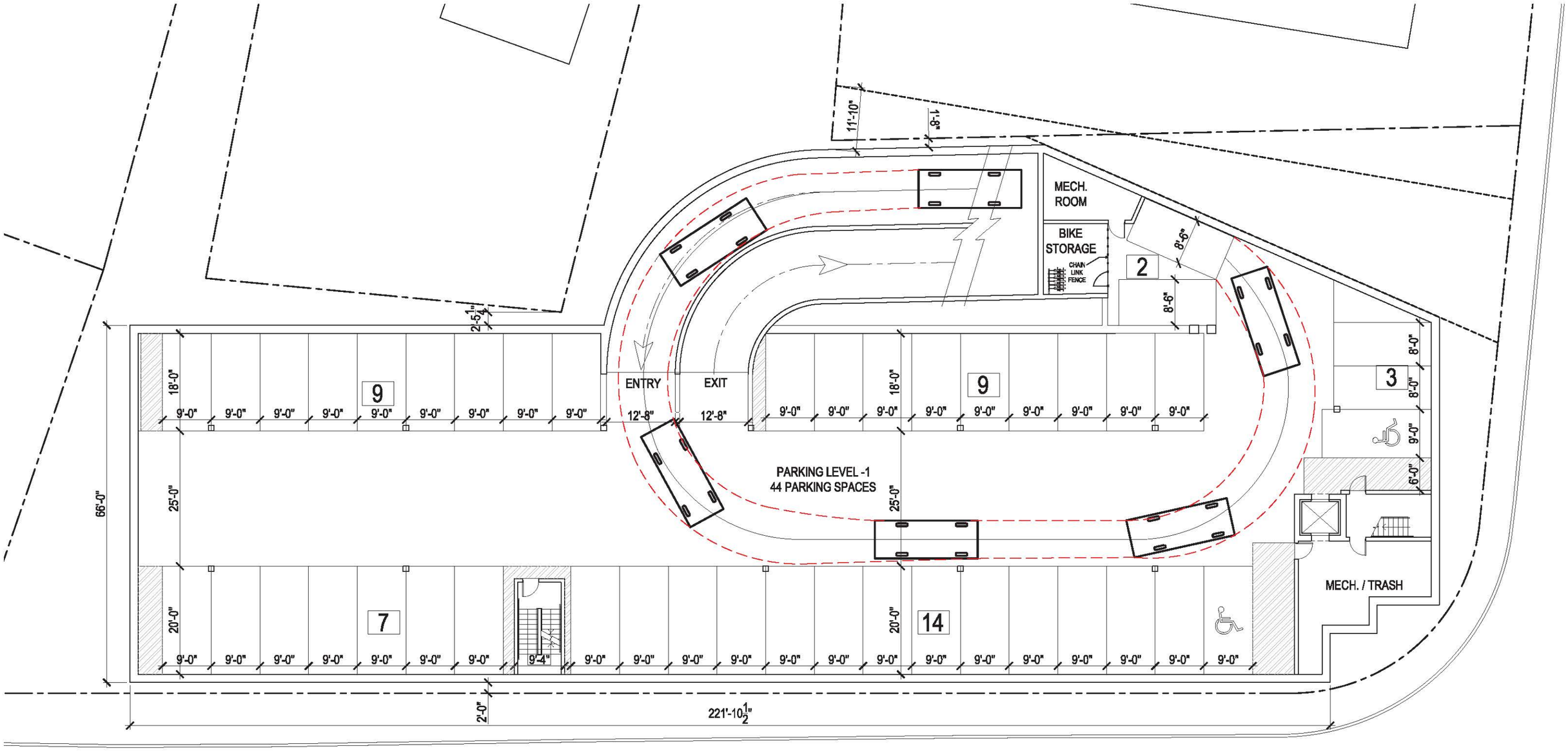




Site Section Diagram



Exterior Material Palette



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Paking Level Turning Radius Plan

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Proposed Perspective View

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Proposed Perspective View

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Proposed Perspective View

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Proposed Perspective View of Building Rear

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Proposed Perspective View

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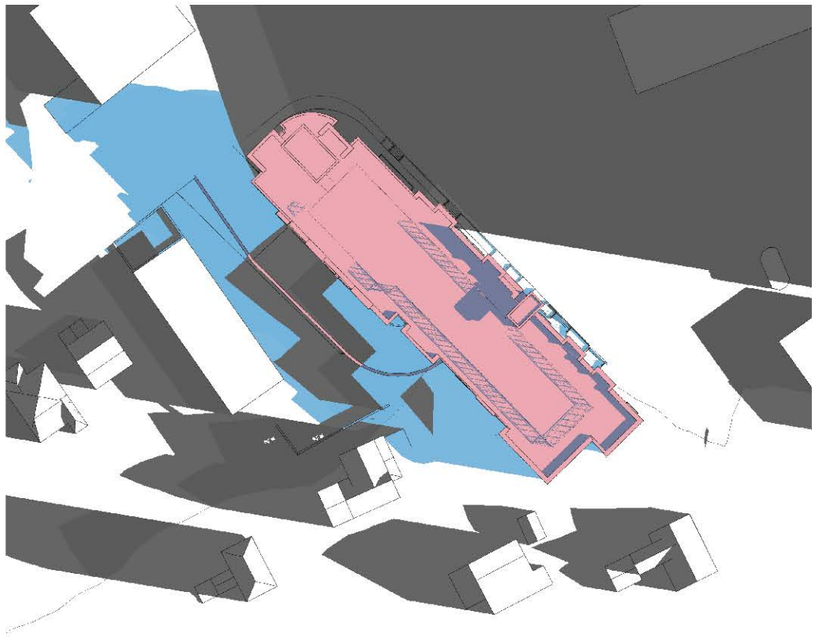
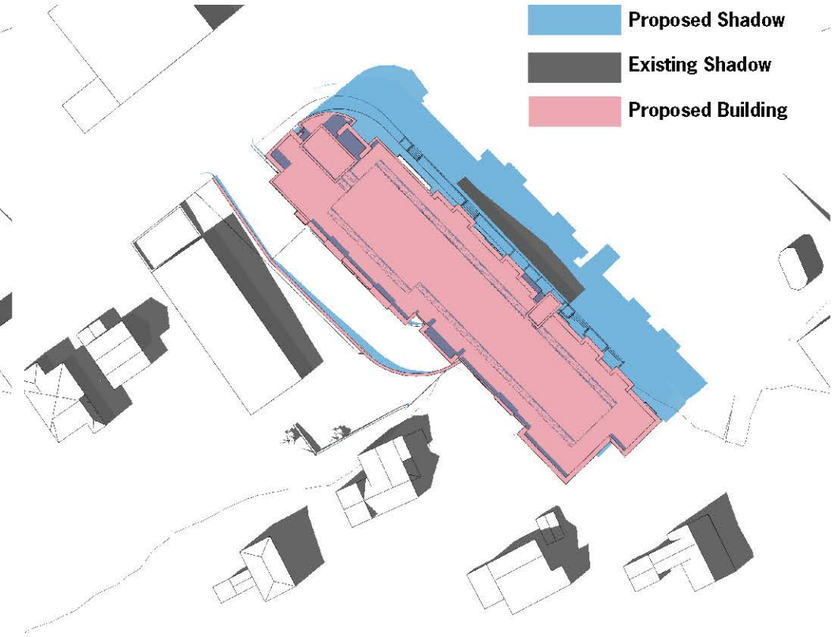
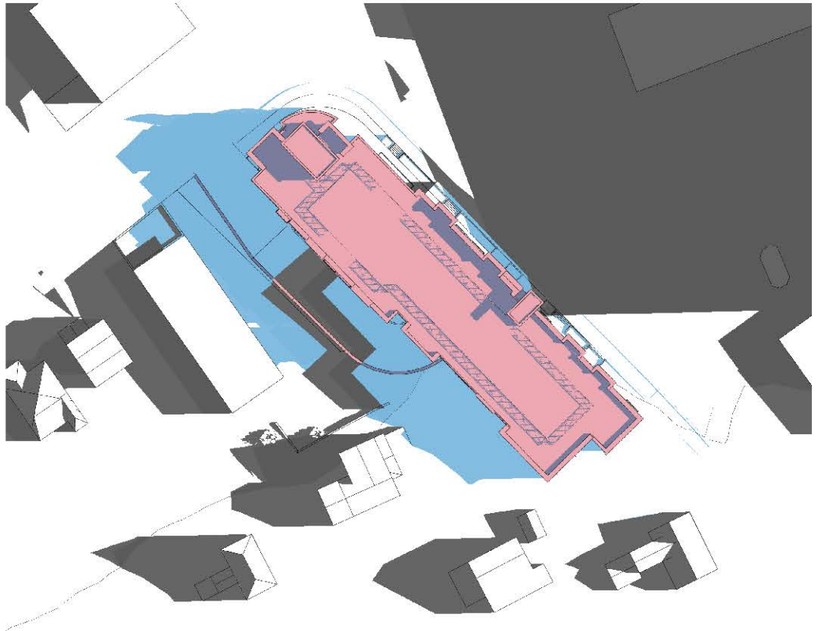


Spring Morning

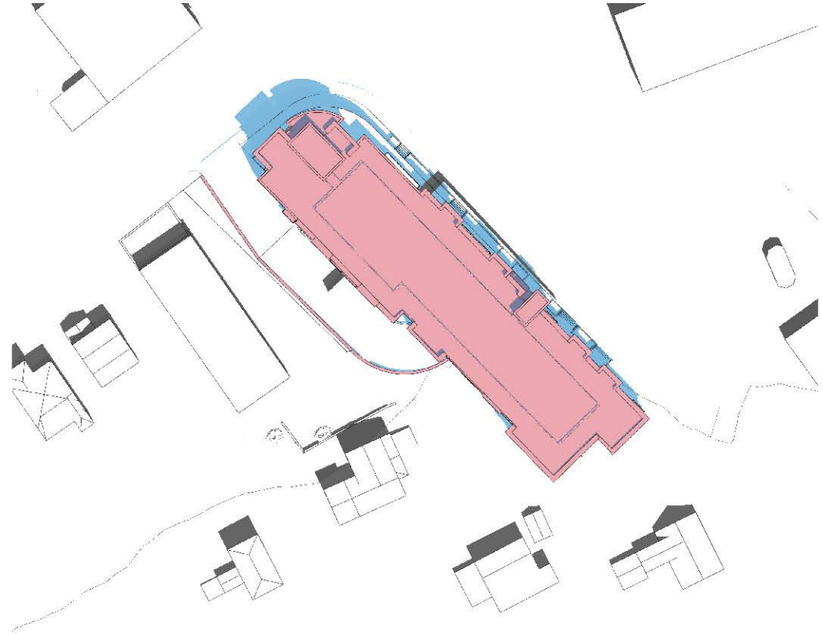
Spring Noon



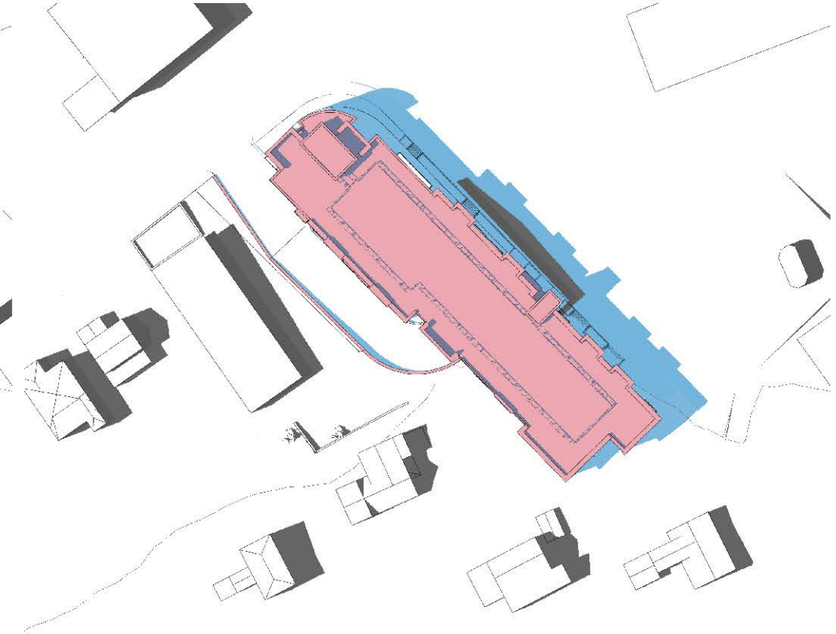
Spring Evening



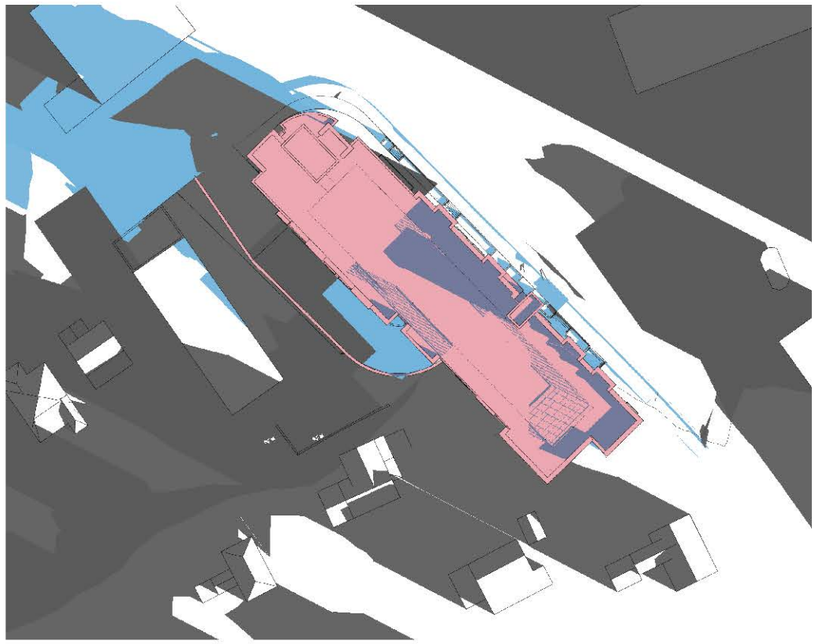
Summer Morning



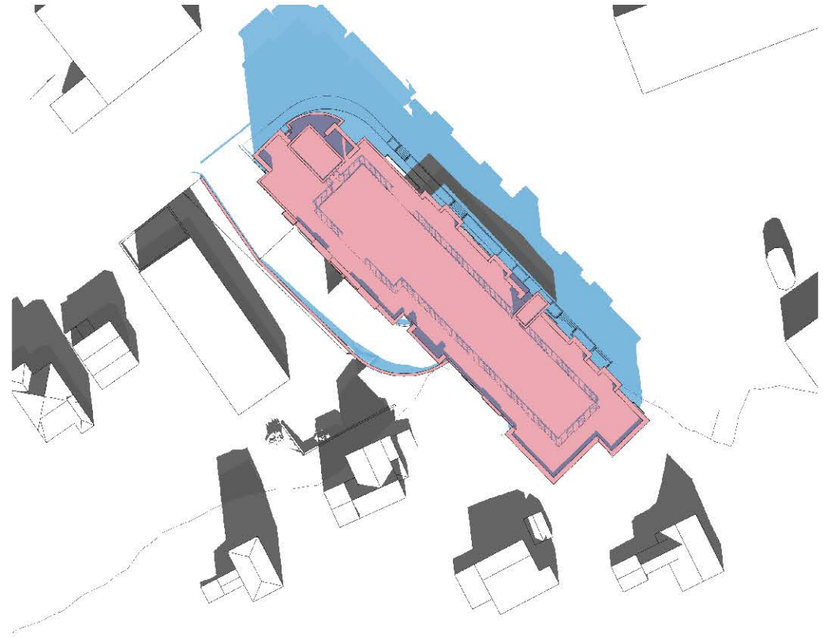
Summer Noon



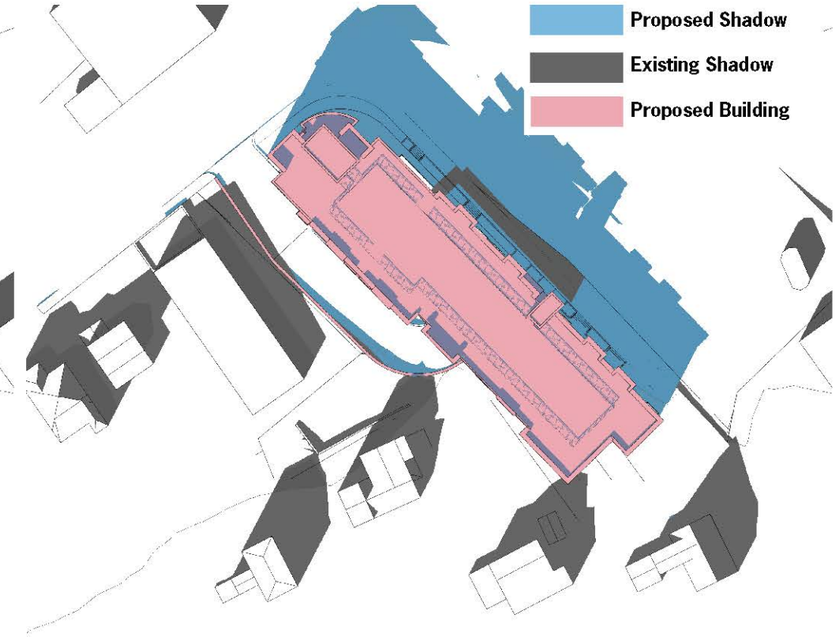
Summer Evening



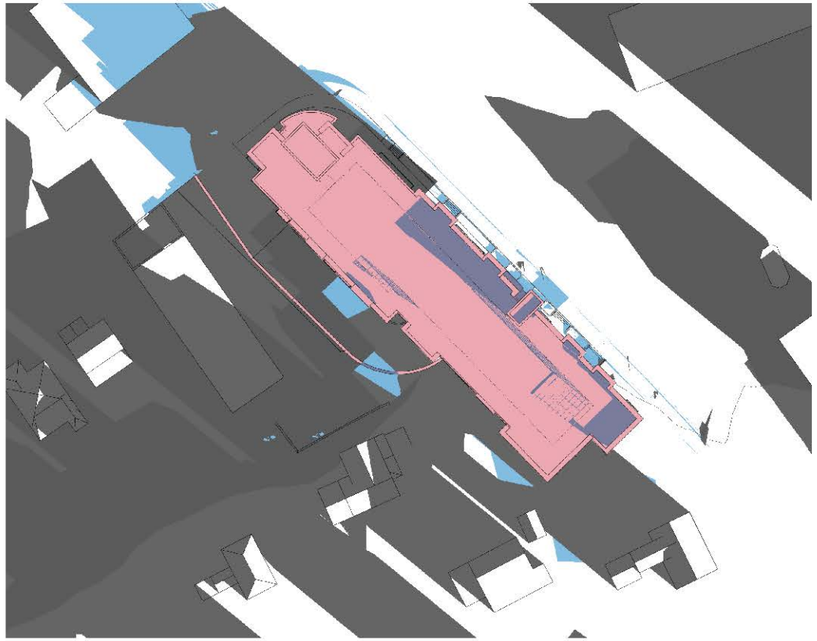
Fall Morning



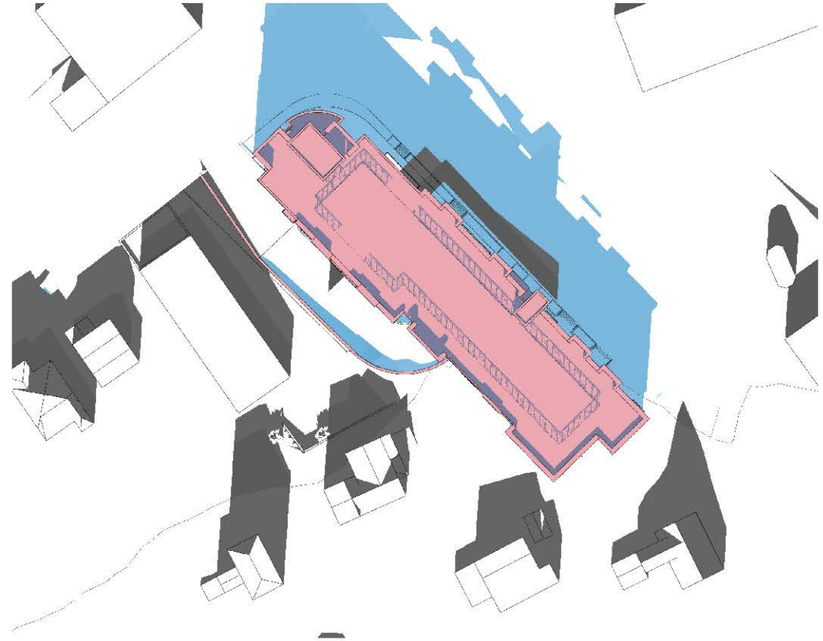
Fall Noon



Fall Evening



Winter Morning



Winter Noon

Winter Evening

213-217 Washington Street

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Shadow Study

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Questions?

WEYMOUTH, MASSACHUSETTS

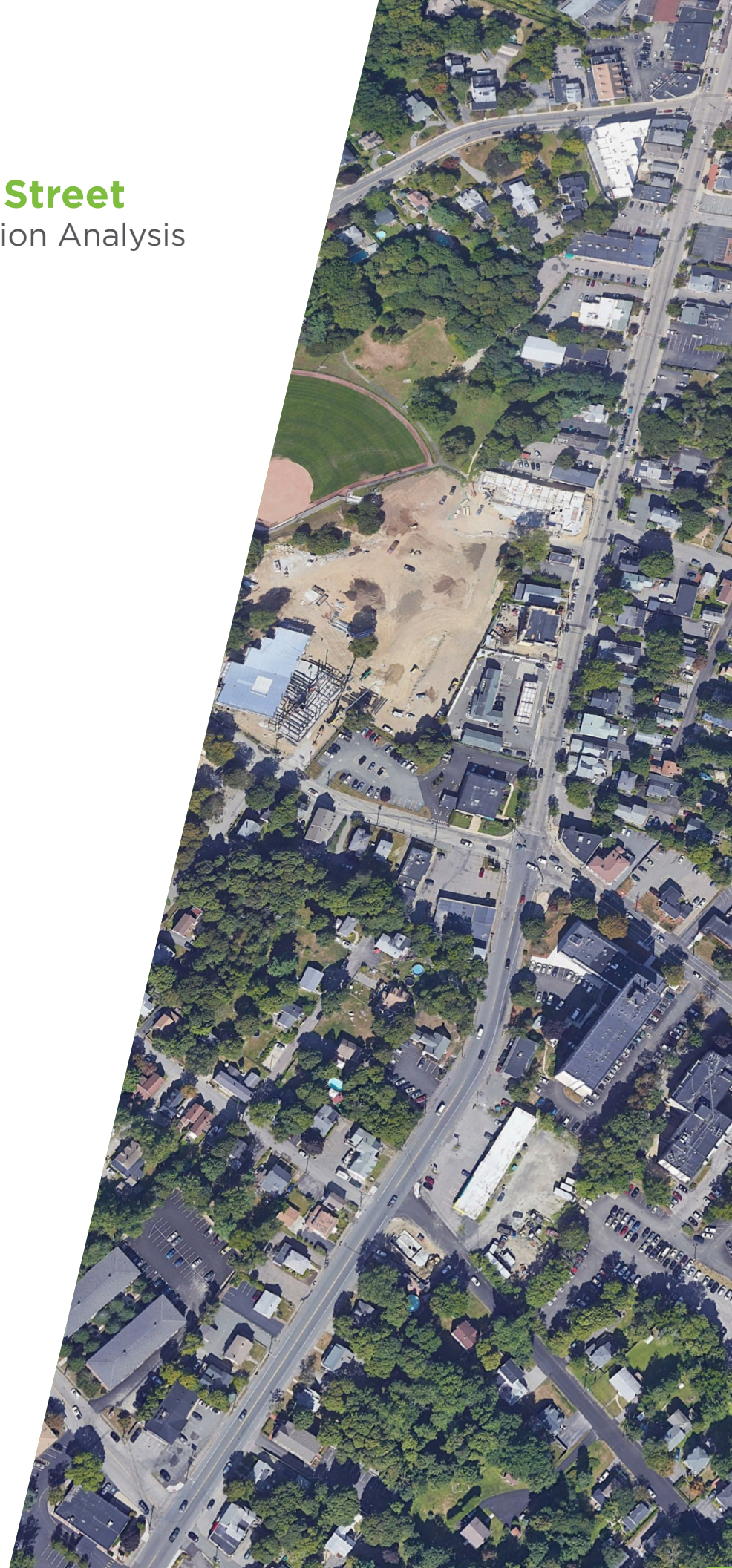
213-217 Washington Street

Supplemental Transportation Analysis

Prepared for
Town of Weymouth

Prepared by
Howard Stein Hudson

July 2023



HOWARD STEIN HUDSON

Engineers + Planners

TO:	Town of Weymouth Board of Zoning Appeals	DATE:	July 27, 2023
FROM:	Keri Pyke, P.E., PTOE Melissa Restrepo	HSH PROJECT NO.:	2022083.00
SUBJECT:	Supplemental Transportation Analysis 213-217 Washington Street, Weymouth		

Introduction

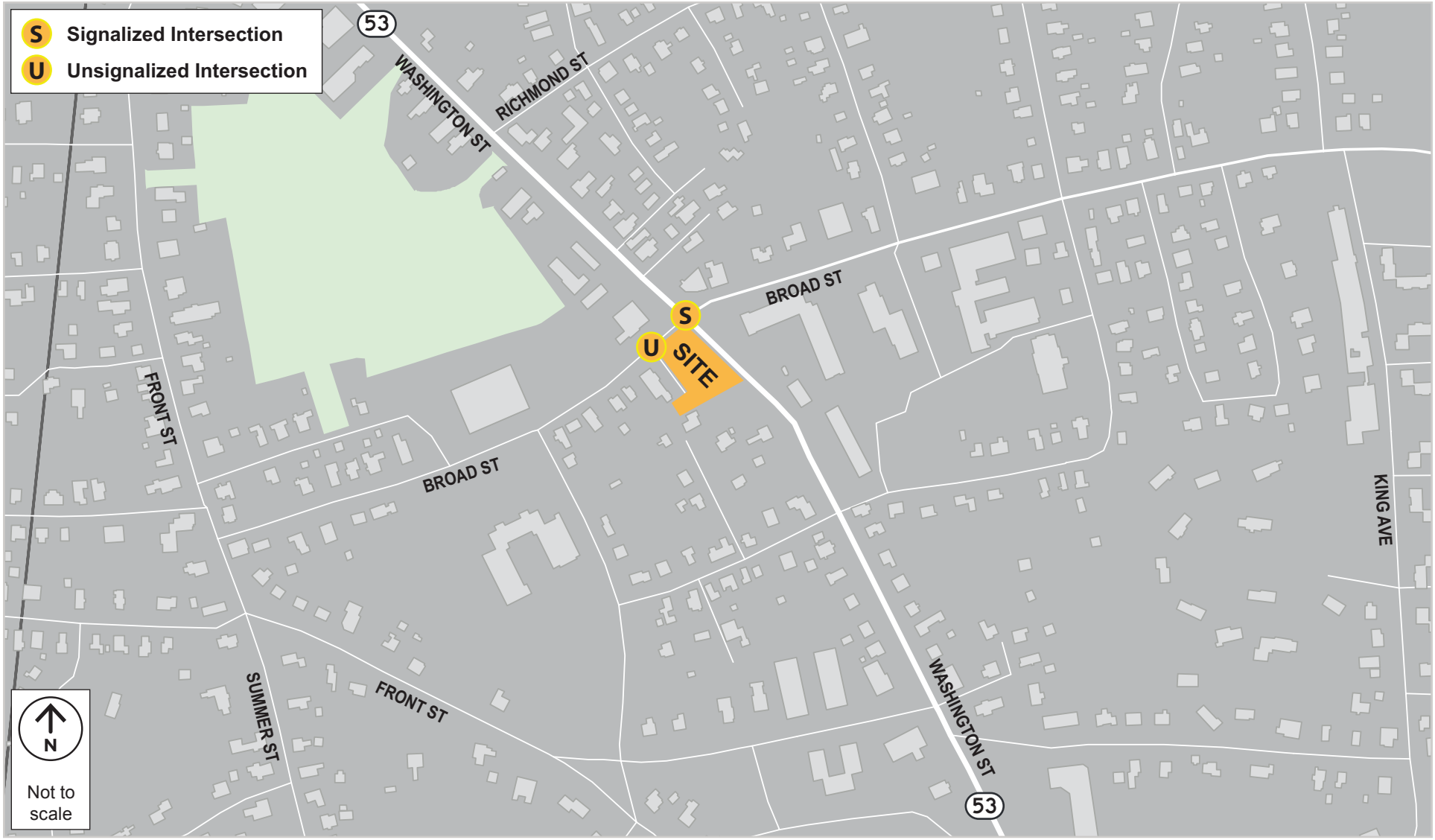
Howard Stein Hudson (HSH) originally conducted a Transportation Impact Assessment (TIA) dated June 23, 2022, of the proposed redevelopment of a vacant commercial building with surface parking, located at 213-217 Washington Street (the "Project"/the "Site") in Weymouth, Massachusetts. The proposed Project will consist of the construction of a new mixed-use building with approximately 25 residential units and approximately 4,147 square feet (sf) of ground floor commercial space. The Project will also provide a total of 47 parking spaces, which includes 10 parking spaces for the proposed retail space. Vehicular access to the Site will be provided on Broad Street.

As part of the Special Permit process, the Board of Zoning Appeals (BZA) requested further analysis be conducted, including the intersection of Broad Street and Site Driveway, to understand the current activity of the existing convenience store and laundromat, which are located behind the proposed Site and will share the Project driveway. Additionally, this memorandum includes revisions to the trip generation and trip distribution per input from the Town of Weymouth Traffic Engineer, Owen MacDonald.

Study Area

The original transportation study area consisted of the signalized intersection of Washington Street at Broad Street. Per the BZA request, the Broad Street at Site Driveway intersection was added to the study area, as shown in **Figure 1.**

Figure 1. *Study Area*



Existing Conditions

This section includes revised on-street parking regulations and peak-hour vehicular volumes at the intersection of Broad Street/Site Driveway.

Existing On-Street Parking Regulations and Public Parking Lots

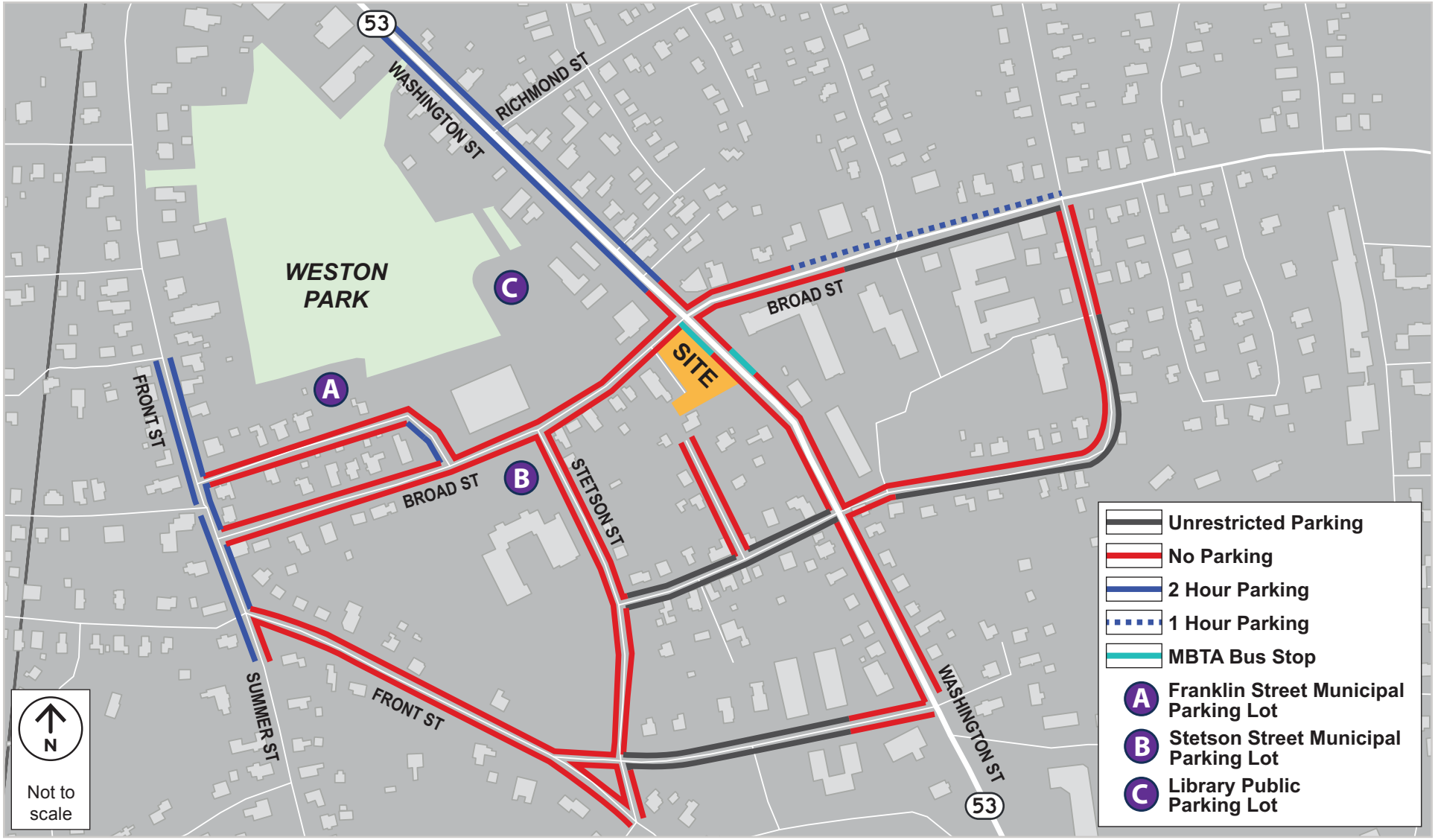
An inventory of the existing curb uses and on-street parking in the vicinity of the Site was revised. Along Washington Street, on-street parking consists of two-hour parking, unrestricted parking, or no parking. Additionally, nearby public parking lots were documented. The revised existing on-street parking regulations and nearby public parking lots are shown on **Figure 2**.

Existing Condition Traffic Volumes

Turning movement counts (TMCs) were conducted during the weekday a.m. and p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively) at the Washington Street at Broad Street intersection on Tuesday, May 24, 2022. Manual counts were collected during the weekday a.m. and p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively) at the Broad Street at Site Driveway intersection on Tuesday, July 11, 2023, to capture the general peak-hour traffic and the regular business activity. Traffic counts are provided in **Attachment A**.

Per field observations on Tuesday, July 11, 2023, during the morning peak period, very little queuing was observed on the Broad Street eastbound approach of the Washington Street/Broad Street intersection, with a maximum of five vehicles, which extended past the Site Driveway. The average queue on the Broad Street eastbound approach in the morning peak period was 2 – 3 vehicles. However, the activity in and out of the Driveway was relatively low during the observed peak periods, such that the eastbound queue was not an issue. No queuing was observed along Broad Street in the westbound direction in the vicinity of the Driveway during the morning peak period.

Figure 2. *On-street Parking Regulations and Public Parking Lots*



During the afternoon peak period, the Broad Street eastbound approach queues reached a maximum of 8 - 9 vehicles, with an average of about five vehicles. For vehicles on the Broad Street westbound approach waiting to turn left into the Driveway, no more than one vehicle was observed waiting; therefore, no queues spilled back into the Washington Street/Broad Street intersection. Similarly to the morning observations, when there was a queue along the Broad Street eastbound approach that would spill back and block the Driveway, drivers were generally courteous and left an opening to let the entering vehicle turn into the Driveway. The Existing Condition vehicle volumes for the weekday a.m. and p.m. peak hours are shown in **Figure 3**.

Build Condition

This section includes revised trip generation and trip distribution, which have been modified to better represent the future conditions of the Project.

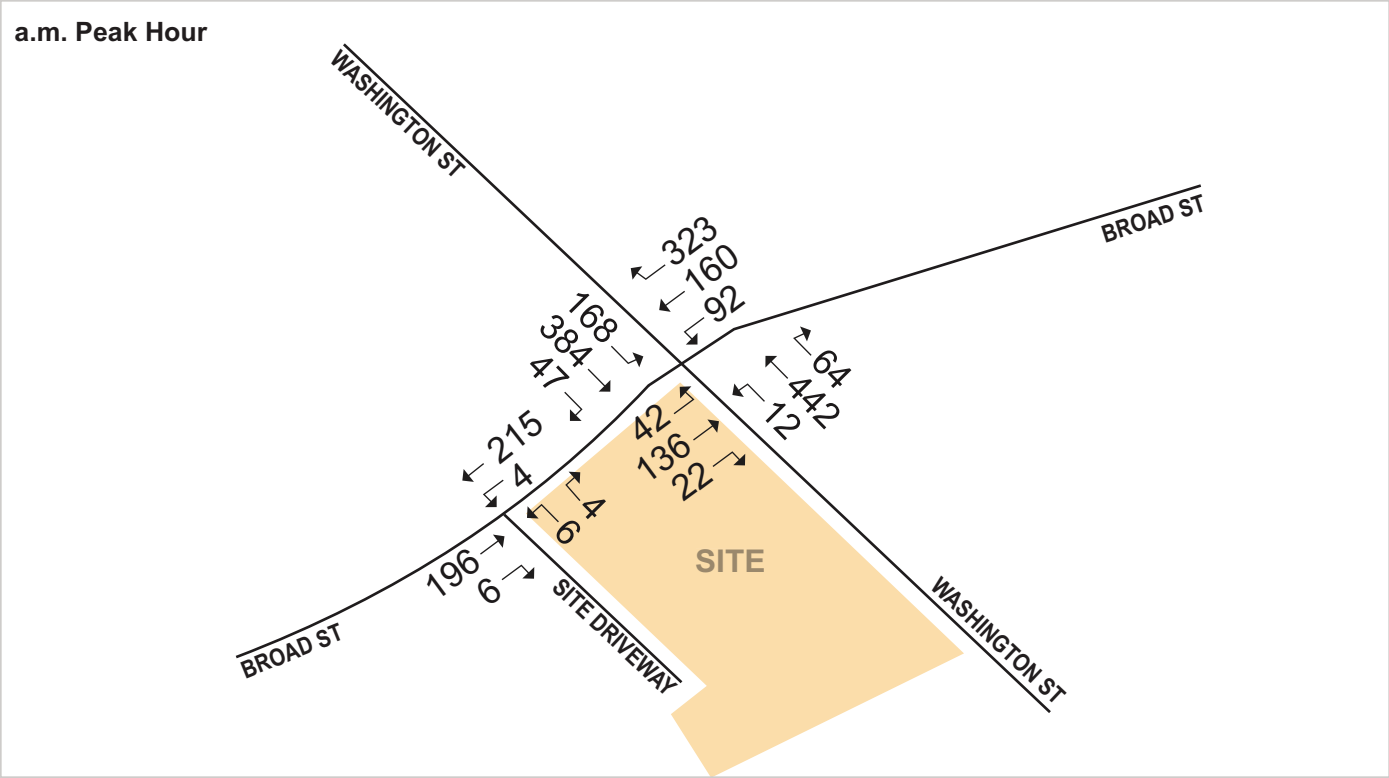
Project Trip Generation

To estimate the trip generation for the Project, the following land use codes were used:

- **Land Use Code 221 – Multifamily Housing Mid-Rise Residential**. Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and 10 levels (floors).
- **LUC 822 – Strip Retail Plaza (<40k) "Retail"**. A strip plaza is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. Each study site in this land use has less than 40,000 sf of gross leasable area (GLA).

Note that the original TIA dated June 2022, used LUC 820 – Shopping Center for the retail portion of the Project. After meeting with the Town's Traffic Engineer, LUC 822 was adopted as the more accurate representation of the proposed retail space. The revised trip generation of the Project by travel mode is shown in **Table 1** and the detailed trip generation information is provided in **Attachment B**.

Figure 3. ***Existing Condition Vehicle Volumes, Weekday a.m. and p.m. Peak Hours***



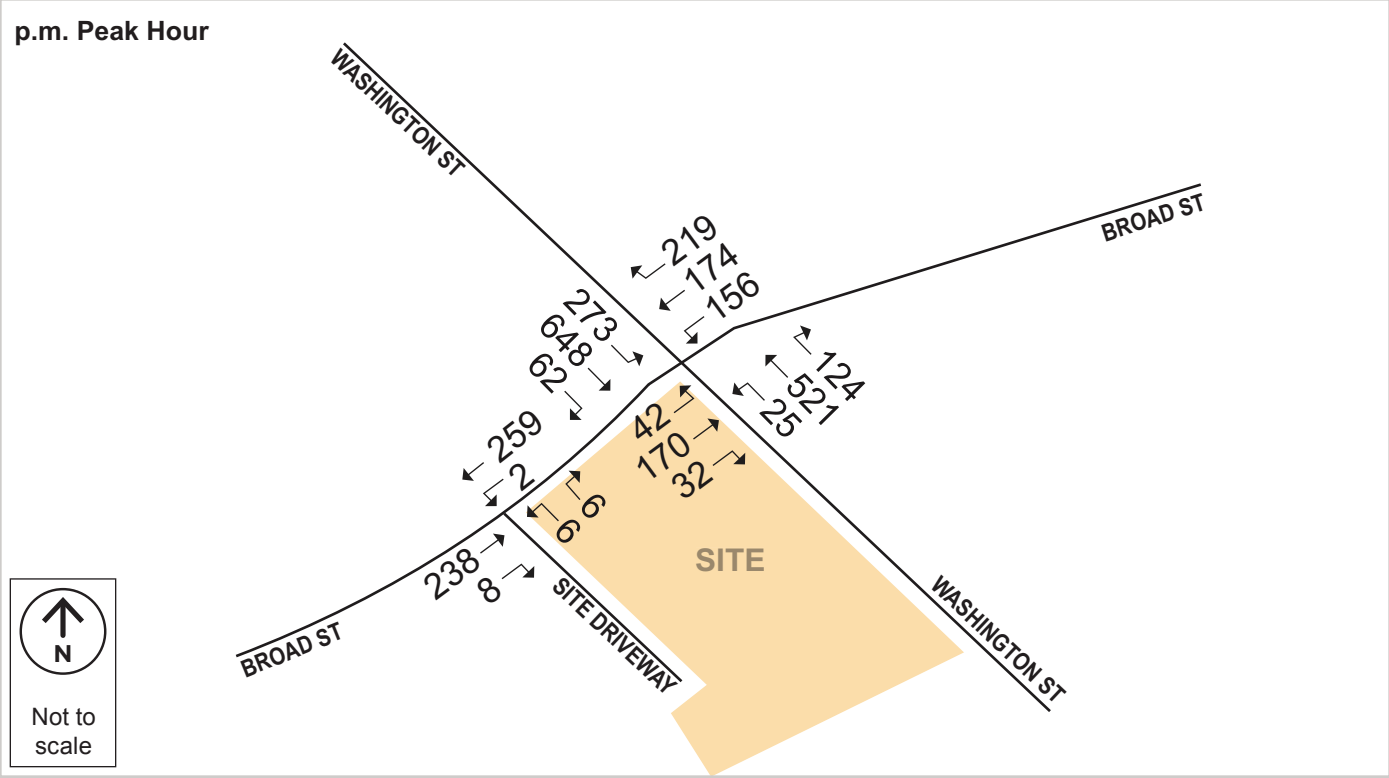


Table 1. Project Trip Generation

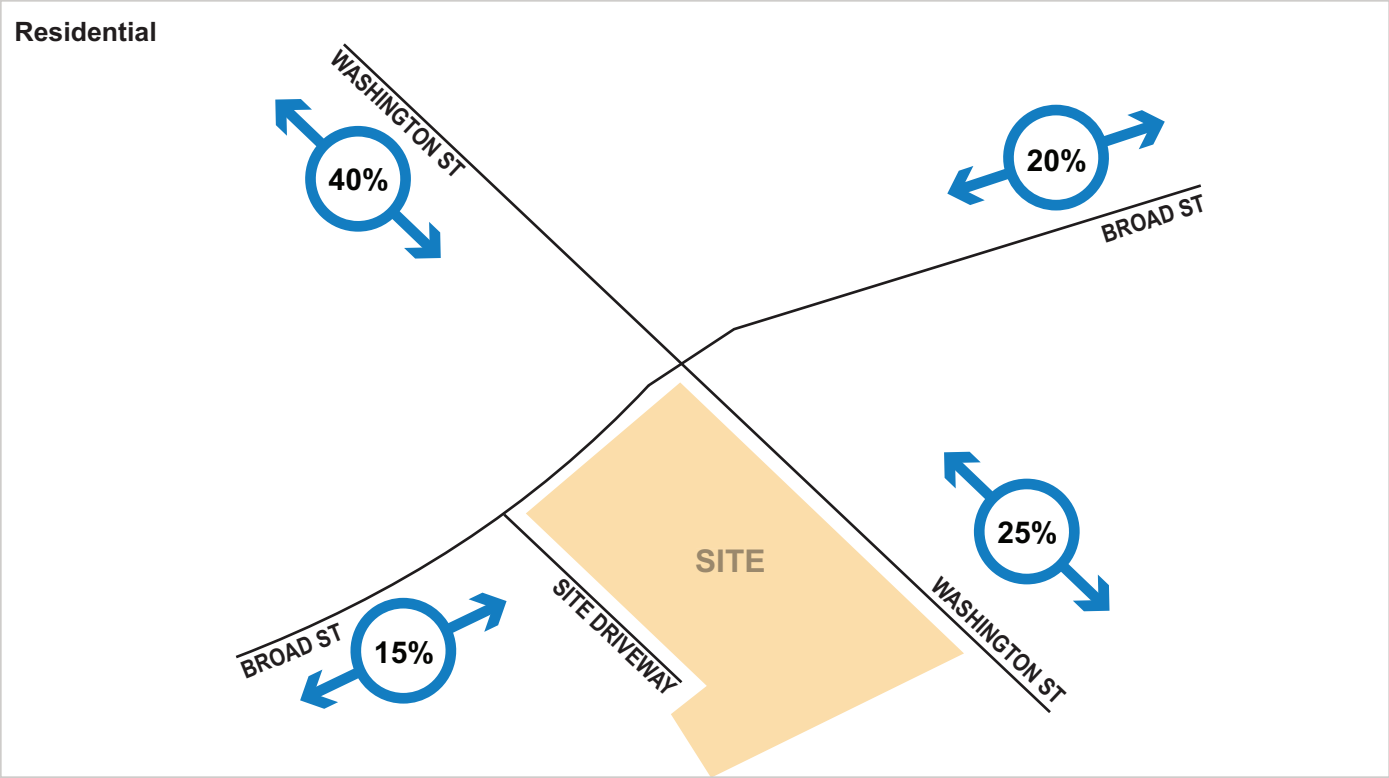
Land Use/Direction		Walk/Bike Trips	Transit Trips	Vehicle Trips
a.m. Peak Hour				
Residential 25 units	In	0	0	2
	Out	0	1	6
	Subtotal	**0**	**1**	**8**
Retail 4,147 sf	In	0	3	8
	Out	0	2	5
	Subtotal	**0**	**5**	**13**
	Total	**0**	**6**	**21**
p.m. Peak Hour				
Residential 25 units	In	0	1	5
	Out	0	1	3
	Subtotal	**0**	**2**	**8**
Retail 4,147 sf	In	1	6	17
	Out	1	6	17
	Subtotal	**2**	**12**	**34**
	Total	**2**	**14**	**42**

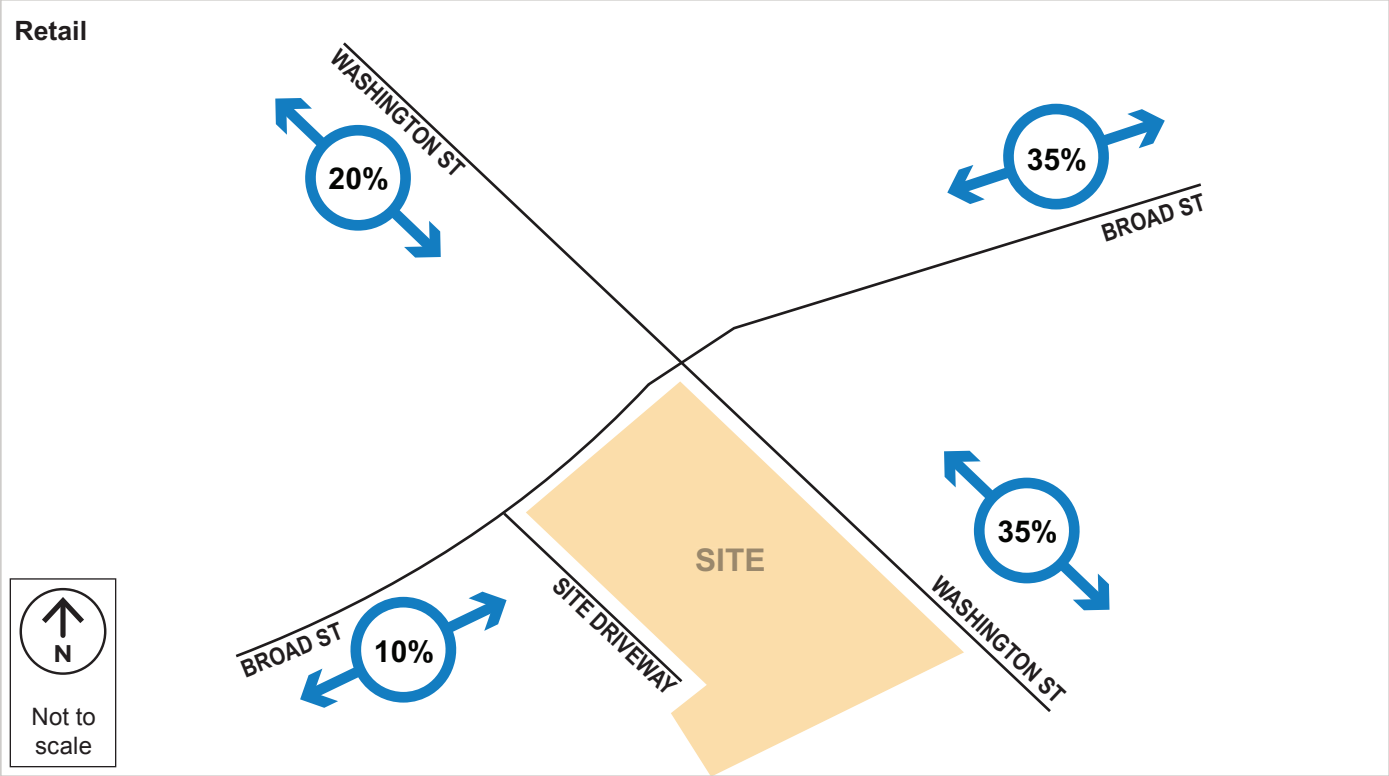
The Project Site is expected to generate approximately 21 vehicle trips during the weekday a.m. peak hour and 42 vehicle trips during the weekday p.m. peak hour. The Project Site is expected to generate approximately six transit person trips during the a.m. peak hour and approximately 14 transit person trips during the p.m. peak hour.

Vehicle Trip Distribution

The trip distribution for the new Project trips was revised after input from the Town's Traffic Engineer along with a review of previous studies done in the Town of Weymouth, existing counts patterns, and Journey-to-Work data obtained from the U.S. Census for persons residing in the Town of Weymouth. **Figure 4** shows the revised trip distribution pattern for Project trips entering and exiting the Site.

Figure 4. ***Vehicle Trip Distribution, Residential and Retail***

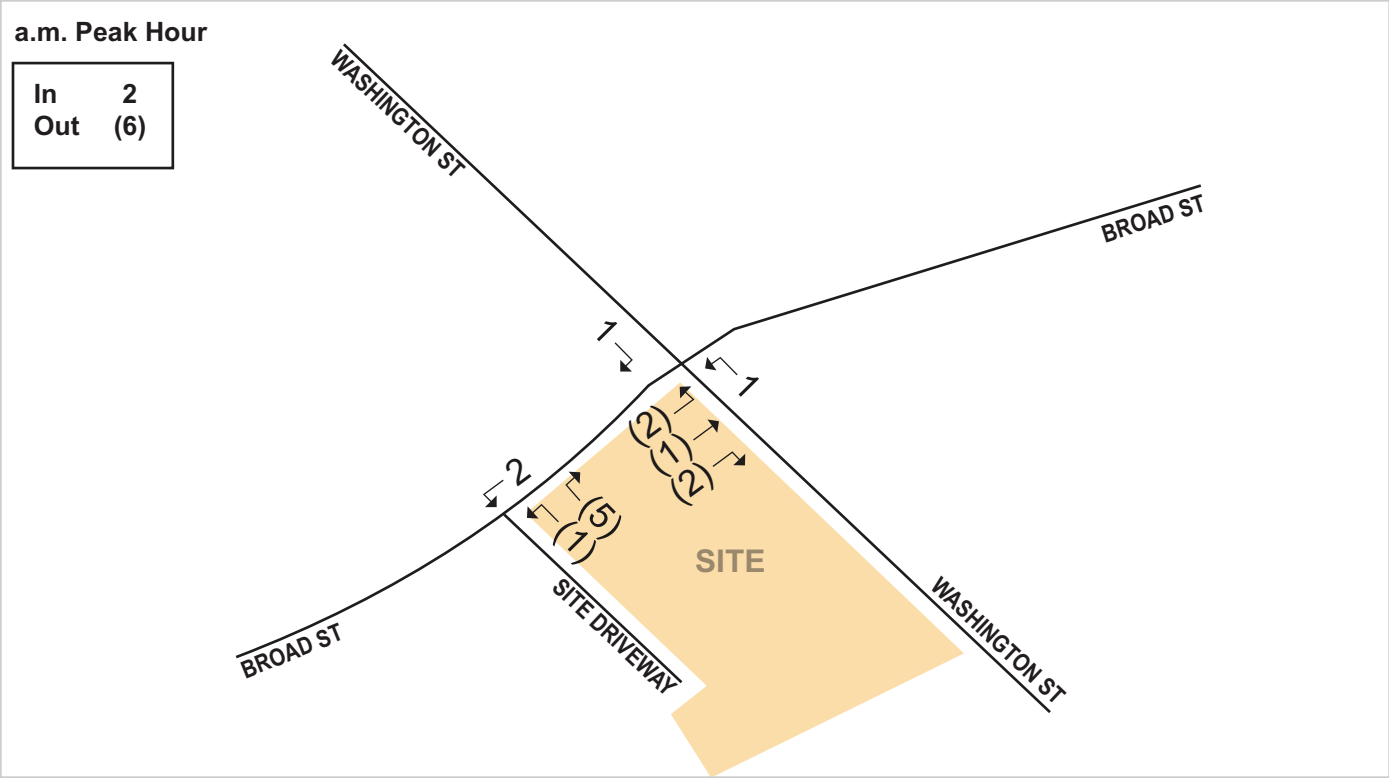




Build Condition Traffic Volumes

The trip distribution patterns were applied to the new Project trips to develop the Project-generated residential vehicle trips shown in **Figure 5** and the Project-generated retail vehicle trips shown in **Figure 6.** Then, the Project-generated trips were added to the No-build (2029) Condition traffic volumes to develop the Build (2029) Condition traffic volumes shown in **Figure 7** for the weekday a.m. and p.m. peak hours.

Figure 5. ***Project-generated Residential Vehicle Trips, Weekday a.m. and p.m Peak Hours***



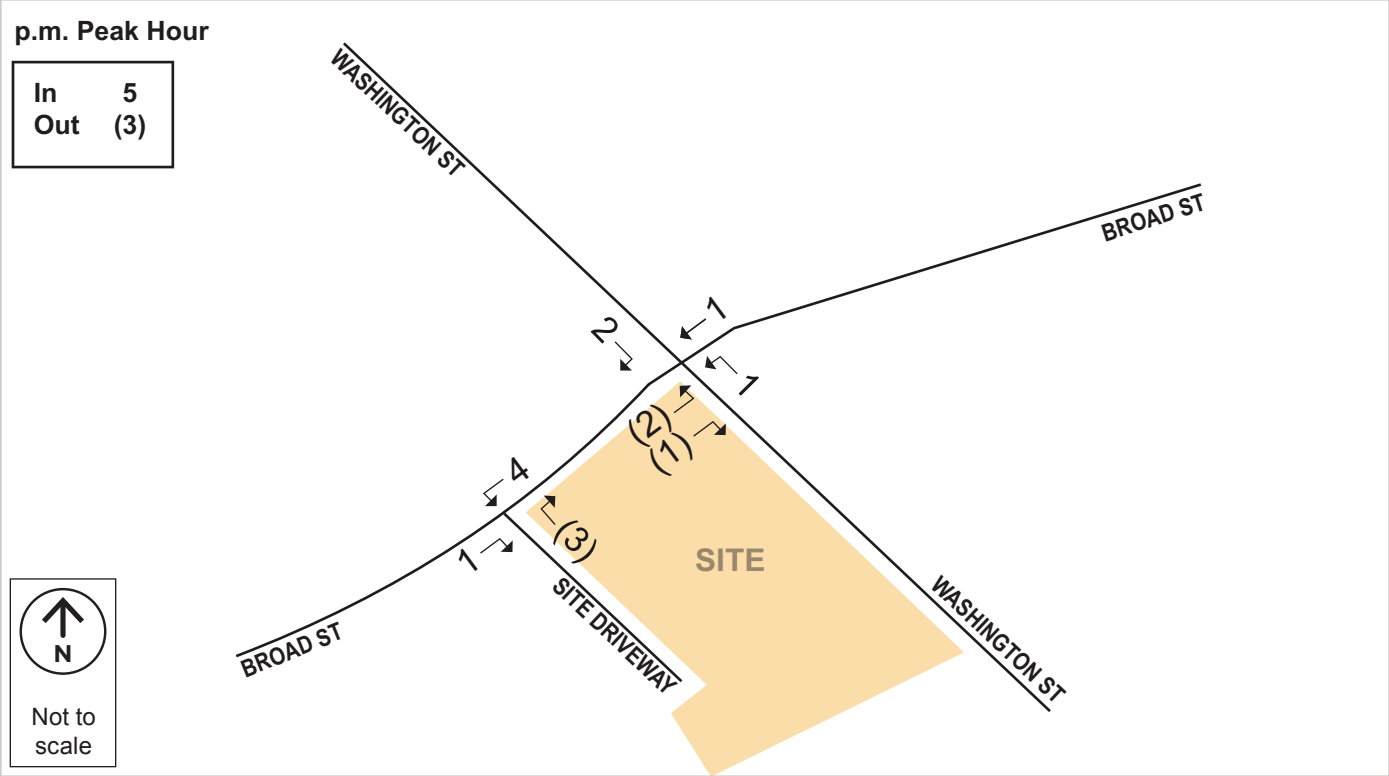
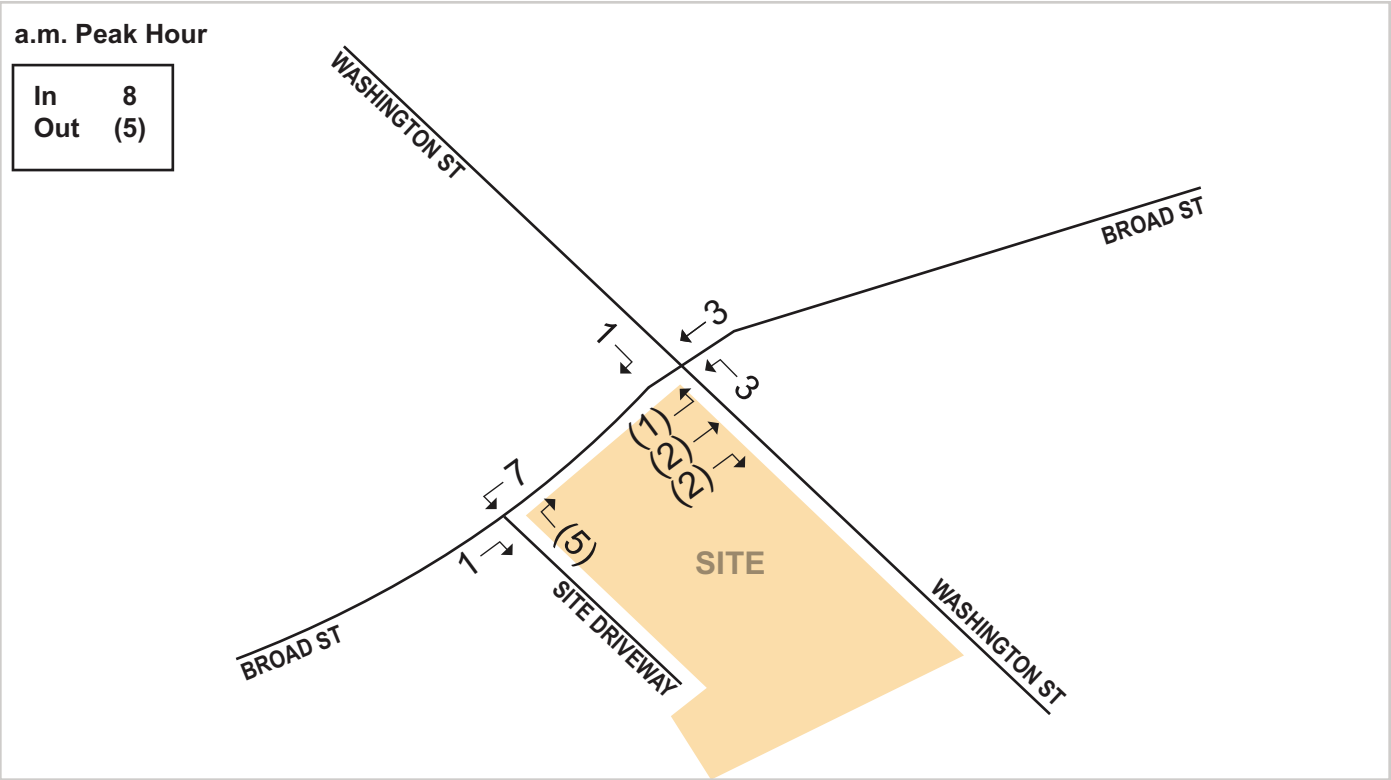


Figure 6. ***Project-generated Retail Vehicle Trips, Weekday a.m. and p.m Peak Hours***



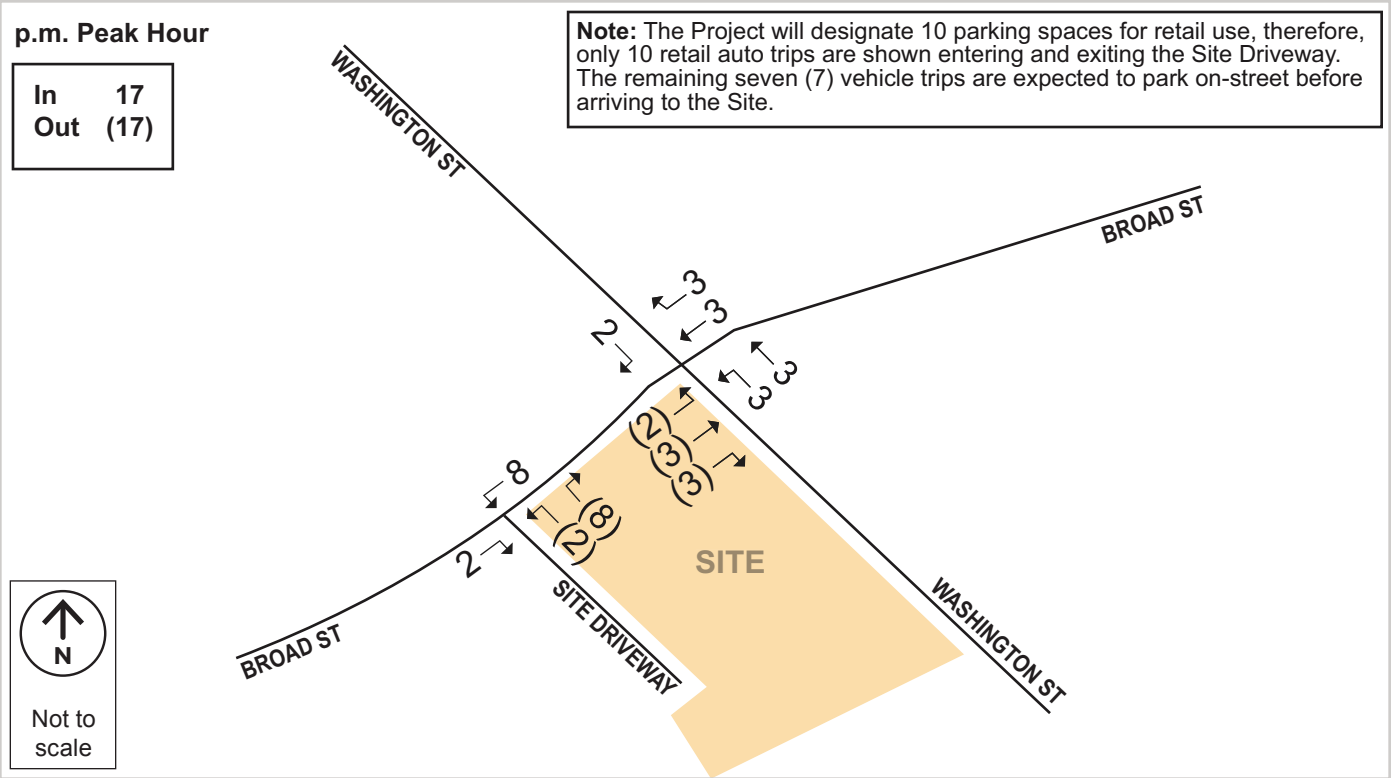
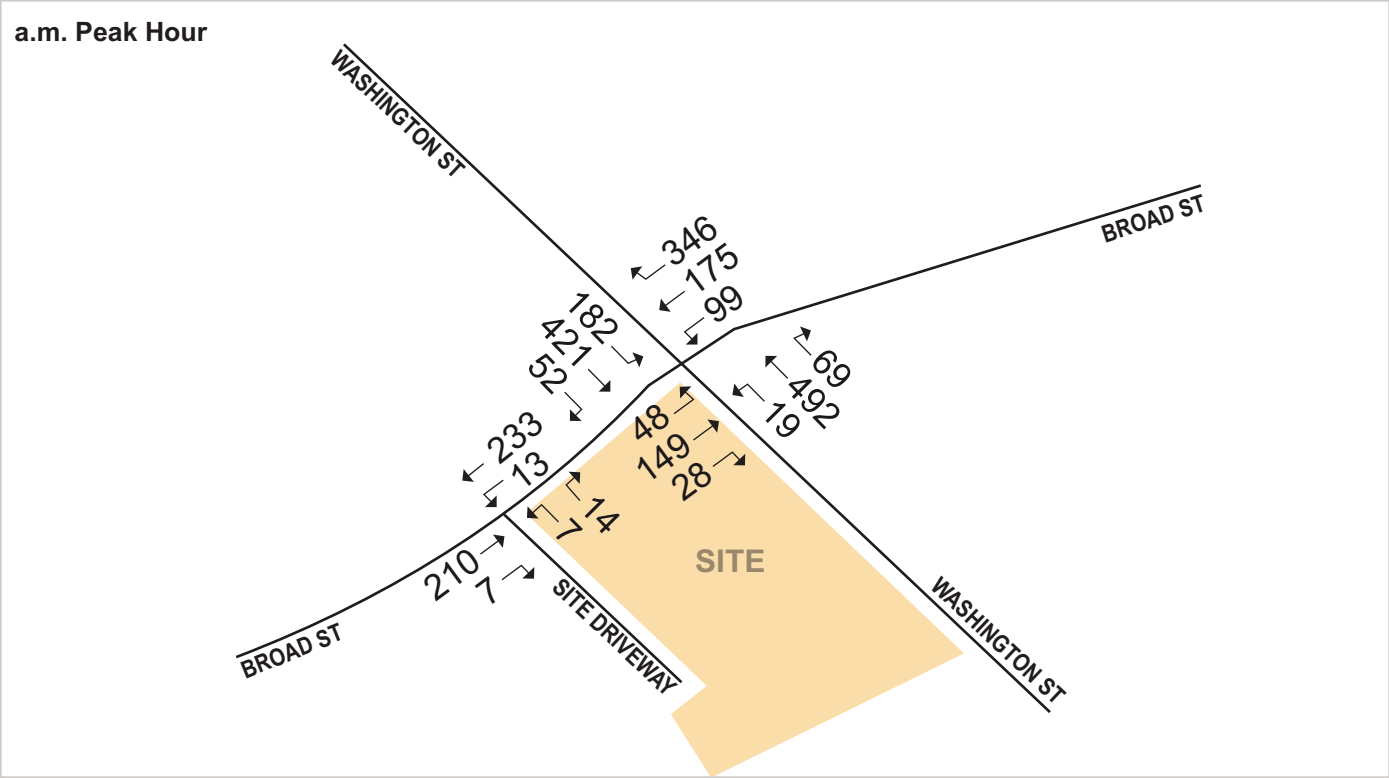
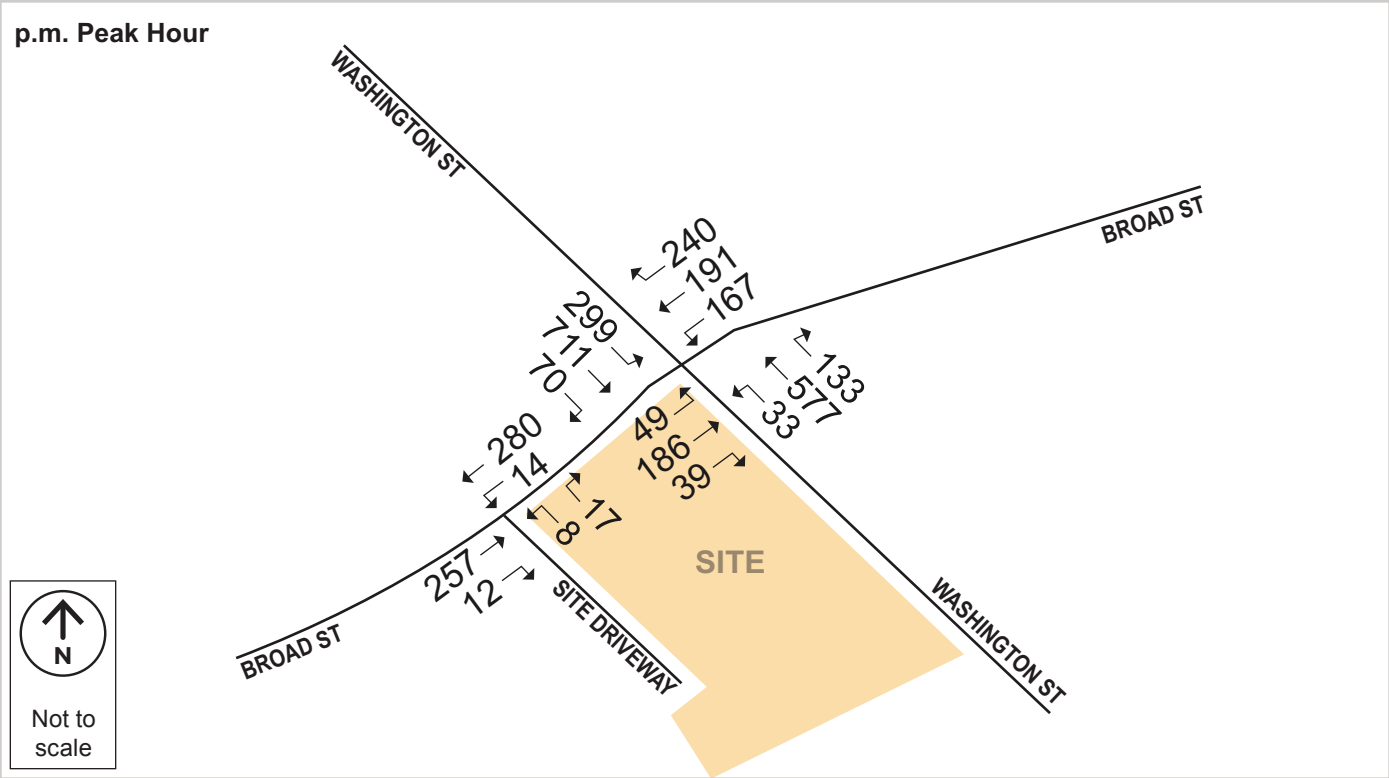


Figure 7. ***Build (2029) Condition Vehicle Volumes, Weekday a.m. and p.m. Peak Hours***





Traffic Operations Analysis

Table 2 summarizes the Existing Condition, No-build (2029) Condition, and the Build (2029) Condition capacity analysis for the study area intersections during the weekday a.m. and p.m. peak hours.

The signalized intersection of **Washington Street/Broad Street** currently operates at an acceptable Level of Service (LOS) during the a.m. peak hour and at a LOS E during the p.m. peak hour. During the a.m. peak hour, all approaches operate at an acceptable LOS. During the p.m. peak hour, the Broad Street eastbound and westbound approaches currently operate at LOS E and LOS F, respectively. The Washington Street southbound left-turn approach currently operates at LOS F during the p.m. peak hour. All approaches at the unsignalized intersection of **Broad Street/Site Driveway** currently operate at LOS B or better during both the peak hours.

Under the No-build condition, the signalized intersection of **Washington Street/Broad Street** overall decreases from LOS E to LOS F during the p.m. peak hour only. The Broad Street eastbound approach decreases from LOS E to LOS F during the p.m. peak hour and the Broad Street westbound approach decreases from LOS D to LOS E during the a.m. peak hour. The Washington Street northbound through approach decreases from LOS C to LOS F during the p.m. peak hour and the Washington Street southbound left-turn approach decreases from LOS C to LOS E during the a.m. peak hour. All approaches at the unsignalized intersection of **Broad Street/Site Driveway** continue to operate at the same LOS as the Existing Condition.

Under the Build Condition, all approaches continue to operate at the same LOS as the No-build condition, indicating that the Project will not significantly affect traffic operations in the area. The detailed Synchro results are provided in **Attachment C**.

Table 2. Capacity Analysis Summary, Weekday a.m. and p.m. Peak Hours

Intersection/Movement	Existing Condition					No-build (2029) Condition					Build (2029) Condition				
	LOS	Delay(s)	V/C ratio	50th % Queue Length	95th % Queue Length	LOS	Delay(s)	V/C ratio	50th % Queue Length	95th % Queue Length	LOS	Delay(s)	V/C ratio	50th % Queue Length	95th % Queue Length
Weekday a.m. Peak Hour															
Washington Street/Broad Street	**C**	**27.3**	**-**	**-**	**-**	**D**	**39.7**	**-**	**-**	**-**	**D**	**40.3**	**-**	**-**	**-**
Broad Street EB left/thru/right	C	30.3	0.51	77	#240	D	51.5	0.74	136	#334	D	54.6	0.78	145	#360
Broad Street WB left/thru	D	38.1	0.70	96	#373	E	57.7	0.88	153	#463	E	59.0	0.89	156	#470
Broad Street WB right	C	22.0	0.55	93	#349	C	24.4	0.57	143	#369	C	24.3	0.57	143	#369
Washington Street NB left	B	18.2	0.04	3	20	C	23.9	0.06	6	27	C	23.9	0.08	7	33
Washington Street NB thru	C	34.4	0.81	162	#477	D	41.7	0.84	266	#676	D	41.9	0.84	266	#676
Washington Street NB right	B	18.1	0.14	17	66	C	23.1	0.14	27	84	C	23.1	0.14	27	84
Washington Street SB left	C	26.9	0.66	33	#177	E	64.8	0.92	59	#285	E	65.0	0.92	59	#285
Washington Street SB thru/right	B	17.6	0.58	110	360	C	25.6	0.65	198	511	C	25..8	0.66	200	#516
Broad Street/Site Driveway	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Broad Street EB thru/right	A	0.0	0.14	-	0	A	0.0	0.14	-	0	A	0.0	0.14	-	0
Broad Street WB left/thru	A	0.2	0.00	-	0	A	0.1	0.00	-	0	A	0.5	0.01	-	1
Site Driveway NB left/right	B	10.8	0.02	-	1	B	10.8	0.02	-	1	B	10.4	0.03	-	3
Weekday p.m. Peak Hour															
Washington Street/Broad Street	**E**	**63.1**	**-**	**-**	**-**	**F**	**130.5**	**-**	**-**	**-**	**F**	**136.2**	**-**	**-**	**-**
Broad Street EB left/thru/right	E	77.8	0.95	120	#412	F	>80.0	>1.00	~229	#539	F	>80.0	>1.00	~257	#574
Broad Street WB left/thru	F	>80.0	>1.00	~210	#569	F	>80.0	>1.00	~400	#769	F	>80.0	>1.00	~401	#771
Broad Street WB right	C	22.1	0.42	74	173	B	15.1	0.33	91	135	B	15.5	0.34	93	138
Washington Street NB left	B	19.4	0.14	8	34	D	45.8	0.38	18	60	D	51.8	0.45	21	#69
Washington Street NB thru	C	34.3	0.85	247	#595	F	>80.0	>1.00	~578	#952	F	>80.0	>1.00	~589	#961
Washington Street NB right	B	17.6	0.23	41	115	C	31.1	0.31	81	165	C	31.5	0.31	81	166
Washington Street SB left	F	>80.0	>1.00	~60	#375	F	>80.0	>1.00	~190	#515	F	>80.0	>1.00	~195	#520
Washington Street SB thru/right	C	22.6	0.76	213	#746	D	44.9	0.93	466	#1088	D	47.3	0.94	476	#1101
Broad Street/Site Driveway	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Broad Street EB thru/right	A	0.0	0.16	-	0	A	0.0	0.17	-	0	A	0.0	0.17	-	0
Broad Street WB left/thru	A	0.1	0.00	-	0	A	0.1	0.00	-	0	A	0.5	0.01	-	1
Site Driveway NB left/right	B	11.1	0.03	-	2	B	11.4	0.02	-	2	B	11.1	0.04	-	3

Grey Shading indicates LOS E or F in the Existing Condition or a decrease to LOS E or LOS F in the No-build (2029) Condition and Build (2029) Condition.
~ 50th Percentile volume exceeds capacity, queue shown after two cycles
 # 95th Percentile volume exceeds capacity, queue shown after two cycles

Conclusion

As presented in this memorandum, the study team manually collected traffic counts at the Site Driveway/ Broad Street intersection during the morning and afternoon peak periods to capture the general peak-hour traffic and the regular business activity related to the existing convenience store and laundromat. Based on these data, it can be concluded that the existing traffic volumes using the Site Driveway are relatively low with an average of one vehicle during the morning period and 2-3 vehicles during the afternoon period.

With the proposed Project, the number of new vehicles trips utilizing the same driveway is expected to be minimal, approximately one new vehicle every three minutes during the morning peak hour and approximately one new vehicle every minute and a half during the afternoon peak hour. Based on field observations and Synchro analysis, the Project's new trips are not expected to create longer queues that would affect the operations at the signalized intersection of Washington Street/Broad Street.

HOWARD STEIN HUDSON

Engineers + Planners

Attachment A

Traffic Counts

Client:	Emma Parisi
Project #:	946_001_HSH
BTD #:	Location 1
Location:	Weymouth, MA
Street 1:	Washington Street
Street 2:	Broad Street
Count Date:	5/24/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 60°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	2	98	10	0	23	66	13	0	12	18	1	0	25	12	64
7:15 AM	0	2	121	9	0	24	60	16	0	13	20	2	0	19	26	64
7:30 AM	0	2	105	11	0	35	85	16	0	17	26	7	0	11	38	86
7:45 AM	0	4	102	10	0	42	79	6	0	11	26	4	0	21	37	62
8:00 AM	0	2	82	15	0	31	77	7	0	3	36	4	0	17	21	59
8:15 AM	0	2	79	17	0	32	79	10	0	4	25	3	0	28	37	62
8:30 AM	0	3	105	20	0	31	112	7	0	14	24	5	0	20	23	37
8:45 AM	0	1	94	23	0	49	106	17	0	10	26	4	0	31	25	44

	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	8	123	28	0	49	127	14	0	9	33	9	0	29	40	41
4:15 PM	0	4	97	15	0	52	125	13	0	4	30	4	0	34	32	46
4:30 PM	0	3	90	25	0	62	114	14	0	13	29	6	0	20	36	36
4:45 PM	0	4	85	26	0	44	125	6	0	6	37	5	0	35	24	43
5:00 PM	0	7	95	34	0	53	148	6	0	4	40	7	0	22	31	40
5:15 PM	0	4	96	32	0	45	121	10	0	2	34	4	0	37	19	51
5:30 PM	0	7	99	34	0	43	113	9	0	6	31	1	0	26	23	42
5:45 PM	0	5	110	23	0	58	105	8	0	7	23	5	0	30	20	24

AM PEAK HOUR 7:30 AM to 8:30 AM	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**10**	**368**	**53**	**0**	**140**	**320**	**39**	**0**	**35**	**113**	**18**	**0**	**77**	**133**	**269**
PHF	**0.91**				**0.92**				**0.83**				**0.89**			
HV %	**0.0%**	**0.0%**	**7.1%**	**5.7%**	**0.0%**	**9.3%**	**8.1%**	**5.1%**	**0.0%**	**5.7%**	**1.8%**	**5.6%**	**0.0%**	**1.3%**	**0.0%**	**3.0%**

PM PEAK HOUR 4:00 PM to 5:00 PM	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**19**	**395**	**94**	**0**	**207**	**491**	**47**	**0**	**32**	**129**	**24**	**0**	**118**	**132**	**166**
PHF	**0.80**				**0.98**				**0.91**				**0.93**			
HV %	**0.0%**	**0.0%**	**3.5%**	**0.0%**	**0.0%**	**1.0%**	**4.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.7%**	**2.3%**	**3.0%**

Client:	Emma Parisi
Project #:	946_001_HSH
BTD #:	Location 1
Location:	Weymouth, MA
Street 1:	Washington Street
Street 2:	Broad Street
Count Date:	5/24/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 60°F

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HEAVY VEHICLES

	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	8	0	0	3	6	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	7	0	0	2	2	0	0	0	0	0	0	0	0	2
7:30 AM	0	0	4	0	0	3	5	1	0	0	1	0	0	0	0	0
7:45 AM	0	0	7	2	0	5	8	0	0	0	0	0	0	1	0	4
8:00 AM	0	0	6	1	0	1	9	0	0	0	0	1	0	0	0	3
8:15 AM	0	0	9	0	0	4	4	1	0	2	1	0	0	0	0	1
8:30 AM	0	1	6	2	0	2	3	0	0	0	1	0	0	1	0	1
8:45 AM	0	0	8	0	0	5	7	2	0	1	0	0	0	2	1	2

	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	5	0	0	1	4	0	0	0	0	0	0	1	1	3
4:15 PM	0	0	6	0	0	0	5	0	0	0	0	0	0	0	1	1
4:30 PM	0	0	1	0	0	1	5	0	0	0	0	0	0	0	1	1
4:45 PM	0	0	2	0	0	0	7	0	0	0	0	0	0	1	0	0
5:00 PM	0	0	3	0	0	1	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	3	0	0	0	5	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	1	1
5:45 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	1	0	1

AM PEAK HOUR 8:00 AM to 9:00 AM	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**29**	**3**	**0**	**12**	**23**	**3**	**0**	**3**	**2**	**1**	**0**	**3**	**1**	**7**
PHF	**0.92**				**0.68**				**0.50**				**0.55**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**14**	**0**	**0**	**2**	**21**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**3**	**5**
PHF	**0.58**				**0.82**				**0.00**				**0.50**			

Client:	Emma Parisi
Project #:	946_001_HSH
BTD #:	Location 1
Location:	Weymouth, MA
Street 1:	Washington Street
Street 2:	Broad Street
Count Date:	5/24/2022
Day of Week:	Tuesday
Weather:	Clouds & Sun, 60°F

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PEDESTRIANS & BICYCLES

	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
8:30 AM	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0

	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3
4:45 PM	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	2	0	0	0	1	0	0	0	0	0	0	1	1
5:15 PM	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	2	1	0	0	0	0	0	0	0	0	0	1	0
5:45 PM	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	1

AM PEAK HOUR[1] 7:30 AM to 8:30 AM	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	4	0	0	0	4	0	0	0	0	0	0	0	1

PM PEAK HOUR[1] 4:00 PM to 5:00 PM	Washington Street Northbound				Washington Street Southbound				Broad Street Eastbound				Broad Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	7	0	1	0	0	0	1	0	0	0	0	0	3

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

213-217 Washington Street, Weymouth
Broad Street at Site Driveway
Manual Vehicular Counts
July 11, 2023

	Broad Street Eastbound		Broad Street Westbound		Site Driveway Northbound	
Start Time	Thru	Right	Left	Thru	Left	Right
7:00 AM	22	0	1	13	0	0
7:15 AM	23	0	0	31	0	1
7:30 AM	19	1	2	25	1	0
7:45 AM	22	1	0	35	0	1
8:00 AM	**28**	**0**	**1**	**38**	**1**	**1**
8:15 AM	**25**	**2**	**1**	**53**	**2**	**0**
8:30 AM	**17**	**2**	**0**	**53**	**1**	**1**
8:45 AM	**37**	**2**	**2**	**42**	**2**	**2**

	Broad Street Eastbound		Broad Street Westbound		Site Driveway Northbound	
Start Time	Thru	Right	Left	Thru	Left	Right
4:00 PM	**44**	**2**	**0**	**49**	**1**	**0**
4:15 PM	**42**	**1**	**1**	**40**	**1**	**2**
4:30 PM	**39**	**4**	**1**	**35**	**3**	**2**
4:45 PM	**33**	**1**	**0**	**49**	**1**	**2**
5:00 PM	52	4	2	32	0	4
5:15 PM	35	0	1	36	3	0
5:30 PM	42	5	1	38	4	1
5:45 PM	27	3	5	42	4	4

HOWARD STEIN HUDSON

Engineers + Planners

Attachment B

Revised Trip Generation

213-217 Washington Street

Proposed Trip Generation Assessment

HOWARD STEIN HUDSON

20-Jul-2023

Land Use	Size	Category	Directional Split	Trip Rate	Unadjusted Vehicle Trips	Assumed National Vehicle Occupancy Rate[1]	Unadjusted Person-Trips	Primary Person Trips	Transit Share[2]	Transit Person-Trips	Walk/Bike/ Other Share[2]	Walk/ Bike/ Other Trips	Auto Share[2]	Auto Person-Trips	Primary Auto-Person Trips	Assumed Local Auto Occupancy Rate[3]	Total AutoTrips
Daily Peak Hour																	
Multifamily Housing (Mid Rise)[4]	25	Total		4.540	114	1.18	**134**	**134**	16%	**22**	2%	**2**	82%	**110**	110	1.18	**94**
	units	In	50%	2.270	57	1.18	**67**	**67**	16%	**11**	2%	**1**	82%	**55**	55	1.18	**47**
		Out	50%	2.270	57	1.18	**67**	**67**	16%	**11**	2%	**1**	82%	**55**	55	1.18	**47**
Strip Plaza[5]	4.147	Total		T = 42.20 (X) + 229.68	404	1.82	**736**	**736**	16%	**118**	2%	**14**	82%	**604**	604	1.82	**332**
	KSF	In	50%		202	1.82	**368**	**368**	16%	**59**	2%	**7**	82%	**302**	302	1.82	**166**
		Out	50%		202	1.82	**368**	**368**	16%	**59**	2%	**7**	82%	**302**	302	1.82	**166**
Total		Total			**518**		**870**	**870**		**140**		**16**		**714**			**426**
		In			**259**		**435**	**435**		**70**		**8**		**357**			**213**
		Out			**259**		**435**	**435**		**70**		**8**		**357**			**213**
AM Peak Hour																	
Multifamily Housing (Mid Rise)[4]	25	Total		0.360	9	1.18	**10**	**10**		**1**		**0**		**9**	9	1.18	**8**
	units	In	26%	0.094	2	1.18	**2**	**2**	16%	**0**	2%	**0**	82%	**2**	2	1.18	**2**
		Out	74%	0.266	7	1.18	**8**	**8**	16%	**1**	2%	**0**	82%	**7**	7	1.18	**6**
Strip Plaza[5]	4.147	Total		Ln(T) = 0.66 Ln(X) + 1.84	16	1.82	**29**	**29**		**5**		**0**		**24**	24	1.82	**13**
	KSF	In	60%		10	1.82	**18**	**18**	16%	**3**	2%	**0**	82%	**15**	15	1.82	**8**
		Out	40%		6	1.82	**11**	**11**	16%	**2**	2%	**0**	82%	**9**	9	1.82	**5**
Total		Total			**25**		**39**	**39**		**6**		**0**		**33**			**21**
		In			**12**		**20**	**20**		**3**		**0**		**17**			**10**
		Out			**13**		**19**	**19**		**3**		**0**		**16**			**11**
PM Peak Hour																	
Multifamily Housing (Mid Rise)[4]	25	Total		0.390	10	1.18	**12**	**12**		**2**		**0**		**10**	10	1.18	**8**
	units	In	61%	0.238	6	1.18	**7**	**7**	16%	**1**	2%	**0**	82%	**6**	6	1.18	**5**
		Out	39%	0.152	4	1.18	**5**	**5**	16%	**1**	2%	**0**	82%	**4**	4	1.18	**3**
Strip Plaza[5]	4.147	Total		Ln(T) = 0.71 Ln(X) + 2.72	42	1.82	**76**	**76**		**12**		**2**		**62**	62	1.82	**34**
	KSF	In	50%		21	1.82	**38**	**38**	16%	**6**	2%	**1**	82%	**31**	31	1.82	**17**
		Out	50%		21	1.82	**38**	**38**	16%	**6**	2%	**1**	82%	**31**	31	1.82	**17**
Total		Total			**52**		**88**	**88**		**14**		**2**		**72**			**42**
		In			**27**		**45**	**45**		**7**		**1**		**37**			**22**
		Out			**25**		**43**	**43**		**7**		**1**		**35**			**20**

1. 2017 National vehicle occupancy rates - 1.18:home to work; 1.82: family/personal business; 1.82: shopping; 2.1 social/recreational
2. Mode shares based on U.S Census Journey to Work, Tract 4224.02
3. Local vehicle occupancy rates based on 2017 National vehicle occupancy rates
4. ITE Trip Generation Manual, 11th Edition, LUC 221 (Multifamily Housing Mid-Rise (3-10 floors)), average rate
5. ITE Trip Generation Manual, 11th Edition, LUC 822 (Strip Plaza <40k), fitted curved

HOWARD STEIN HUDSON

Engineers + Planners

Attachment C

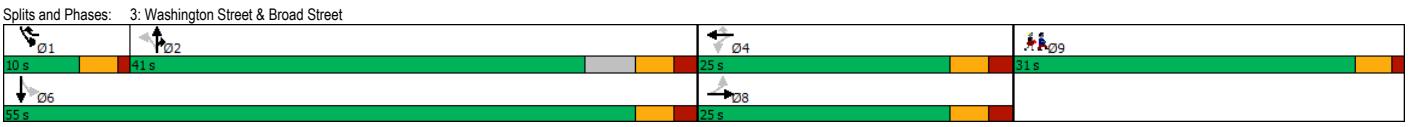
Revised Synchro Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	42	136	22	92	160	323	12	442	64	168	384	47	
Future Volume (vph)	42	136	22	92	160	323	12	442	64	168	384	47	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	15	12	12	11	10	10	10	10	10	10	12	
Grade (%)		3%			-2%			-3%			2%		
Storage Length (ft)	0		0	0		100	75		120	100		0	
Storage Lanes	0		0	0		1	1		1	1		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.985				0.850			0.850		0.984		
Flt Protected		0.990			0.982		0.950			0.950			
Satd. Flow (prot)	0	1944	0	0	1815	1478	1710	1682	1443	1530	1609	0	
Flt Permitted		0.823			0.739		0.495			0.206			
Satd. Flow (perm)	0	1616	0	0	1366	1478	891	1682	1443	332	1609	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		147			689			227			460		
Travel Time (s)		3.3			15.7			5.2			10.5		
Peak Hour Factor	0.83	0.83	0.83	0.89	0.89	0.89	0.91	0.91	0.91	0.92	0.92	0.92	
Heavy Vehicles (%)	6%	2%	6%	1%	0%	3%	0%	7%	6%	9%	8%	2%	
Adj. Flow (vph)	51	164	27	103	180	363	13	486	70	183	417	51	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	242	0	0	283	363	13	486	70	183	468	0	
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA	Prot	pm+pt	NA		
Protected Phases		8			4	1		2	2	1	6		9
Permitted Phases	8			4		4	2			6			
Detector Phase	8	8		4	4	1	2	2	2	1	6		
Switch Phase													
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	10.0	10.0	10.0	6.0	6.0		1.0
Minimum Split (s)	11.0	11.0		11.0	11.0	10.0	15.0	15.0	15.0	10.0	11.0		31.0
Total Split (s)	25.0	25.0		25.0	25.0	10.0	41.0	41.0	41.0	10.0	55.0		31.0
Total Split (%)	22.5%	22.5%		22.5%	22.5%	9.0%	36.9%	36.9%	36.9%	9.0%	49.5%		28%
Maximum Green (s)	20.0	20.0		20.0	20.0	6.0	36.0	36.0	36.0	6.0	50.0		27.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	2.0	2.0	2.0	1.0	2.0		1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)		5.0			5.0	4.0	5.0	5.0	5.0	4.0	5.0		
Lead/Lag						Lead	Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	None		None	None	None	Min	Min	Min	None	Min		None
Walk Time (s)													5.0
Flash Dont Walk (s)													20.0
Pedestrian Calls (#/hr)													9
Act Effct Green (s)		21.0			21.0	32.0	25.3	25.3	25.3	36.8	35.8		
Actuated g/C Ratio		0.29			0.29	0.45	0.36	0.36	0.36	0.52	0.50		
v/c Ratio		0.51			0.70	0.55	0.04	0.81	0.14	0.66	0.58		
Control Delay		30.3			38.1	22.0	18.2	34.4	18.1	26.9	17.6		
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay		30.3			38.1	22.0	18.2	34.4	18.1	26.9	17.6		
LOS		C			D	C	B	C	B	C	B		
Approach Delay		30.3			29.0			32.0			20.2		
Approach LOS		C			C			C			C		
Queue Length 50th (ft)		77			96	93	3	162	17	33	110		
Queue Length 95th (ft)		#240			#373	#349	20	#477	66	#177	360		
Internal Link Dist (ft)		67			609			147			380		
Turn Bay Length (ft)						100	75		120	100			
Base Capacity (vph)		476			402	663	525	991	850	277	1185		
Starvation Cap Reductn		0			0	0	0	0	0	0	0		
Spillback Cap Reductn		0			0	0	0	0	0	0	0		
Storage Cap Reductn		0			0	0	0	0	0	0	0		
Reduced v/c Ratio		0.51			0.70	0.55	0.02	0.49	0.08	0.66	0.39		

Intersection Summary

Area Type: Other
Cycle Length: 111
Actuated Cycle Length: 71.2
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 27.3 — Intersection LOS: C
Intersection Capacity Utilization 72.7% — ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Washington Street & Broad Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	196	6	4	215	6	4
Future Volume (Veh/h)	196	6	4	215	6	4
Sign Control	Free			Free	Stop	
Grade	3%			0%	0%	
Peak Hour Factor	0.83	0.83	0.89	0.89	0.91	0.91
Hourly flow rate (vph)	236	7	4	242	7	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				147		
pX, platoon unblocked					0.90	
vC, conflicting volume			243		490	240
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			243		380	240
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1323		560	799

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	243	246	11
Volume Left	0	4	7
Volume Right	7	0	4
cSH	1700	1323	628
Volume to Capacity	0.14	0.00	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.2	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	10.8
Approach LOS			B

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		24.5%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	42	170	32	156	174	219	25	521	124	273	648	62	
Future Volume (vph)	42	170	32	156	174	219	25	521	124	273	648	62	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	15	12	12	11	10	10	10	10	10	10	12	
Grade (%)		3%			-2%			-3%			2%		
Storage Length (ft)	0		0	0		100	75		120	100		0	
Storage Lanes	0		0	0		1	1		1	1		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.982				0.850			0.850		0.987		
Flt Protected		0.991			0.977		0.950			0.950			
Satd. Flow (prot)	0	2003	0	0	1777	1478	1710	1731	1530	1651	1672	0	
Flt Permitted		0.558			0.587		0.276			0.146			
Satd. Flow (perm)	0	1128	0	0	1068	1478	497	1731	1530	254	1672	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		147			689			227			460		
Travel Time (s)		3.3			15.7			5.2			10.5		
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.80	0.80	0.80	0.98	0.98	0.98	
Heavy Vehicles (%)	0%	0%	0%	2%	2%	3%	0%	4%	0%	1%	4%	0%	
Adj. Flow (vph)	46	187	35	168	187	235	31	651	155	279	661	63	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	268	0	0	355	235	31	651	155	279	724	0	
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA	Prot	pm+pt	NA		
Protected Phases		8			4	1		2	2	1	6		9
Permitted Phases	8			4		4	2			6			
Detector Phase	8	8		4	4	1	2	2	2	1	6		
Switch Phase													
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	10.0	10.0	10.0	6.0	10.0		1.0
Minimum Split (s)	11.0	11.0		11.0	11.0	10.0	15.0	15.0	15.0	10.0	15.0		31.0
Total Split (s)	25.0	25.0		25.0	25.0	10.0	40.0	40.0	40.0	10.0	55.0		31.0
Total Split (%)	22.5%	22.5%		22.5%	22.5%	9.0%	36.0%	36.0%	36.0%	9.0%	49.5%		28%
Maximum Green (s)	20.0	20.0		20.0	20.0	6.0	35.0	35.0	35.0	6.0	50.0		27.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	1.0	2.0	2.0	2.0	1.0	2.0		1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)		5.0			5.0	4.0	5.0	5.0	5.0	4.0	5.0		
Lead/Lag						Lead	Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	None		None	None	None	Min	Min	Min	None	Min		None
Walk Time (s)													7.0
Flash Dont Walk (s)													20.0
Pedestrian Calls (#/hr)													10
Act Effct Green (s)		20.5			20.5	31.2	36.6	36.6	36.6	47.9	46.9		
Actuated g/C Ratio		0.25			0.25	0.38	0.45	0.45	0.45	0.58	0.57		
v/c Ratio		0.95			1.33	0.42	0.14	0.85	0.23	1.11	0.76		
Control Delay		77.8			203.7	22.1	19.4	34.3	17.6	107.1	22.6		
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay		77.8			203.7	22.1	19.4	34.3	17.6	107.1	22.6		
LOS		E			F	C	B	C	B	F	C		
Approach Delay		77.8			131.4			30.6			46.1		
Approach LOS		E			F			C			D		
Queue Length 50th (ft)		120			~210	74	8	247	41	~60	213		
Queue Length 95th (ft)		#412			#569	173	34	#595	115	#375	#746		
Internal Link Dist (ft)		67			609			147			380		
Turn Bay Length (ft)						100	75		120	100			
Base Capacity (vph)		281			266	560	248	863	763	252	1042		
Starvation Cap Reductn		0			0	0	0	0	0	0	0		
Spillback Cap Reductn		0			0	0	0	0	0	0	0		
Storage Cap Reductn		0			0	0	0	0	0	0	0		
Reduced v/c Ratio		0.95			1.33	0.42	0.13	0.75	0.20	1.11	0.69		

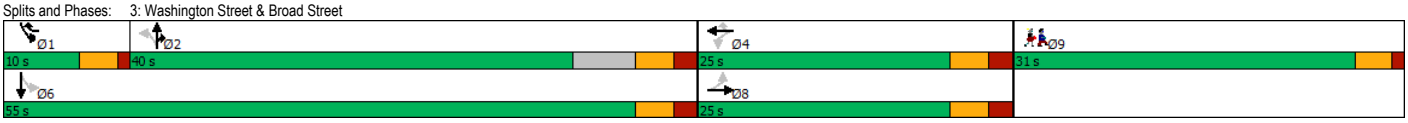
Intersection Summary

Area Type: Other
Cycle Length: 111
Actuated Cycle Length: 82.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.33
Intersection Signal Delay: 63.1 — Intersection LOS: E
Intersection Capacity Utilization 93.9% — ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Washington Street & Broad Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	238	8	2	259	6	6
Future Volume (Veh/h)	238	8	2	259	6	6
Sign Control	Free			Free	Stop	
Grade	3%			0%	0%	
Peak Hour Factor	0.91	0.91	0.93	0.93	0.80	0.80
Hourly flow rate (vph)	262	9	2	278	8	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				147		
pX, platoon unblocked						
vC, conflicting volume			271		548	266
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			271		548	266
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1292		496	772

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	271	280	16
Volume Left	0	2	8
Volume Right	9	0	8
cSH	1700	1292	604
Volume to Capacity	0.16	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.1	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	11.1
Approach LOS			B

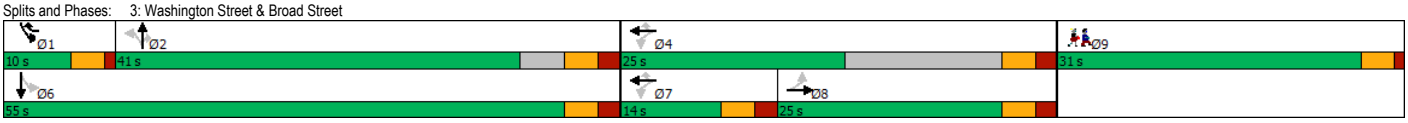
Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		25.2%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø4	Ø7	Ø9
Lane Configurations															
Traffic Volume (vph)	45	146	24	99	172	346	15	492	69	182	421	50			
Future Volume (vph)	45	146	24	99	172	346	15	492	69	182	421	50			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Width (ft)	12	15	12	12	11	10	10	10	10	10	10	12			
Grade (%)		3%			-2%			-3%			2%				
Storage Length (ft)	0		0	0		100	75		120	100		0			
Storage Lanes	0		0	0		1	1		1	1		0			
Taper Length (ft)	25			25			25			25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Frt		0.985				0.850			0.850		0.984				
Flt Protected		0.990			0.982		0.950			0.950					
Satd. Flow (prot)	0	1944	0	0	1815	1478	1710	1682	1443	1530	1609	0			
Flt Permitted		0.857			0.528		0.400			0.171					
Satd. Flow (perm)	0	1683	0	0	976	1478	720	1682	1443	275	1609	0			
Right Turn on Red			No			No			No			No			
Satd. Flow (RTOR)															
Link Speed (mph)		30			30			30			30				
Link Distance (ft)		147			689			227			460				
Travel Time (s)		3.3			15.7			5.2			10.5				
Peak Hour Factor	0.83	0.83	0.83	0.89	0.89	0.89	0.91	0.91	0.91	0.92	0.92	0.92			
Heavy Vehicles (%)	6%	2%	6%	1%	0%	3%	0%	7%	6%	9%	8%	2%			
Adj. Flow (vph)	54	176	29	111	193	389	16	541	76	198	458	54			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	259	0	0	304	389	16	541	76	198	512	0			
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA	Perm	pm+pt	NA				
Protected Phases		8			4 7	1		2		1	6		4	7	9
Permitted Phases	8			4 7		4 7	2		2	6					
Detector Phase	8	8		4 7	4 7	1	2	2	2	1	6				
Switch Phase															
Minimum Initial (s)	6.0	6.0				6.0	10.0	10.0	10.0	6.0	10.0		6.0	5.0	1.0
Minimum Split (s)	11.0	11.0				10.0	15.0	15.0	15.0	10.0	15.0		11.0	10.0	31.0
Total Split (s)	25.0	25.0				10.0	41.0	41.0	41.0	10.0	55.0		25.0	14.0	31.0
Total Split (%)	20.0%	20.0%				8.0%	32.8%	32.8%	32.8%	8.0%	44.0%		20%	11%	25%
Maximum Green (s)	20.0	20.0				6.0	36.0	36.0	36.0	6.0	50.0		20.0	9.0	27.0
Yellow Time (s)	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0				1.0	2.0	2.0	2.0	1.0	2.0		2.0	2.0	1.0
Lost Time Adjust (s)		0.0				0.0	0.0	0.0	0.0	0.0	0.0				
Total Lost Time (s)		5.0				4.0	5.0	5.0	5.0	4.0	5.0				
Lead/Lag	Lag	Lag				Lead	Lag	Lag	Lag	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes	Yes	Yes				Yes	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None				None	Min	Min	Min	None	Min		None	None	None
Walk Time (s)															7.0
Flash Dont Walk (s)															20.0
Pedestrian Calls (#/hr)															9
Act Effct Green (s)		20.2			34.5	45.1	37.3	37.3	37.3	48.5	47.4				
Actuated g/C Ratio		0.21			0.36	0.47	0.38	0.38	0.38	0.50	0.49				
v/c Ratio		0.74			0.88	0.57	0.06	0.84	0.14	0.92	0.65				
Control Delay		51.5			57.7	24.4	23.9	41.7	23.1	64.8	25.6				
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay		51.5			57.7	24.4	23.9	41.7	23.1	64.8	25.6				
LOS		D			E	C	C	D	C	E	C				
Approach Delay		51.5			39.0			39.0			36.5				
Approach LOS		D			D			D			D				
Queue Length 50th (ft)		136			153	143	6	266	27	59	198				
Queue Length 95th (ft)		#334			#463	#369	27	#676	84	#285	511				
Internal Link Dist (ft)		67			609			147			380				
Turn Bay Length (ft)						100	75		120	100					
Base Capacity (vph)		353			348	687	302	706	606	216	844				
Starvation Cap Reductn		0			0	0	0	0	0	0	0				
Spillback Cap Reductn		0			0	0	0	0	0	0	0				
Storage Cap Reductn		0			0	0	0	0	0	0	0				
Reduced v/c Ratio		0.73			0.87	0.57	0.05	0.77	0.13	0.92	0.61				

Intersection Summary	
Area Type:	Other
Cycle Length: 125	
Actuated Cycle Length: 96.9	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 39.7	Intersection LOS: D
Intersection Capacity Utilization 78.0%	ICU Level of Service D
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Washington Street & Broad Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	210	6	4	233	6	4
Future Volume (Veh/h)	210	6	4	233	6	4
Sign Control	Free			Free	Stop	
Grade	3%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	228	7	4	253	7	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				147		
pX, platoon unblocked					0.90	
vC, conflicting volume			235		492	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			235		376	232
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1332		559	808

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	235	257	11
Volume Left	0	4	7
Volume Right	7	0	4
cSH	1700	1332	629
Volume to Capacity	0.14	0.00	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.1	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	10.8
Approach LOS			B

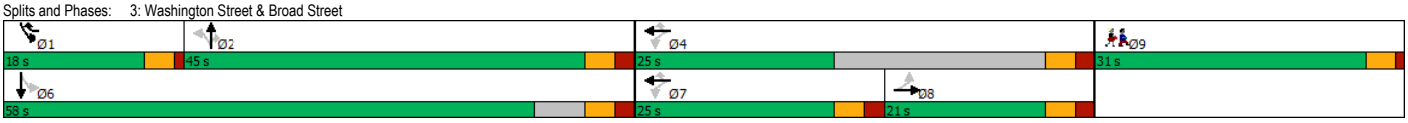
Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		25.5%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø4	Ø7	Ø9
Lane Configurations															
Traffic Volume (vph)	45	183	35	167	187	237	29	574	133	299	711	66			
Future Volume (vph)	45	183	35	167	187	237	29	574	133	299	711	66			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Width (ft)	12	15	12	12	11	10	10	10	10	10	10	12			
Grade (%)		3%			-2%			-3%			2%				
Storage Length (ft)	0		0	0		100	75		120	100		0			
Storage Lanes	0		0	0		1	1		1	1		0			
Taper Length (ft)	25			25			25			25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Frt		0.982				0.850			0.850		0.987				
Flt Protected		0.992			0.977		0.950			0.950					
Satd. Flow (prot)	0	2005	0	0	1777	1478	1710	1731	1530	1651	1672	0			
Flt Permitted		0.855			0.308		0.151			0.090					
Satd. Flow (perm)	0	1728	0	0	560	1478	272	1731	1530	156	1672	0			
Right Turn on Red			No			No			No			No			
Satd. Flow (RTOR)															
Link Speed (mph)		30			30			30			30				
Link Distance (ft)		147			689			227			460				
Travel Time (s)		3.3			15.7			5.2			10.5				
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.80	0.80	0.80	0.98	0.98	0.98			
Heavy Vehicles (%)	0%	0%	0%	2%	2%	3%	0%	4%	0%	1%	4%	0%			
Adj. Flow (vph)	49	201	38	180	201	255	36	718	166	305	726	67			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	288	0	0	381	255	36	718	166	305	793	0			
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA	Perm	pm+pt	NA				
Protected Phases		8			4 7	1		2		1	6		4	7	9
Permitted Phases	8			4 7		4 7	2		2	6					
Detector Phase	8	8		4 7	4 7	1	2	2	2	1	6				
Switch Phase															
Minimum Initial (s)	6.0	6.0				6.0	10.0	10.0	10.0	6.0	10.0		6.0	6.0	1.0
Minimum Split (s)	11.0	11.0				10.0	15.0	15.0	15.0	10.0	15.0		11.0	11.0	31.0
Total Split (s)	21.0	21.0				18.0	45.0	45.0	45.0	18.0	58.0		25.0	25.0	31.0
Total Split (%)	15.0%	15.0%				12.9%	32.1%	32.1%	32.1%	12.9%	41.4%		18%	18%	22%
Maximum Green (s)	16.0	16.0				14.0	40.0	40.0	40.0	14.0	53.0		20.0	20.0	27.0
Yellow Time (s)	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0				1.0	2.0	2.0	2.0	1.0	2.0		2.0	2.0	1.0
Lost Time Adjust (s)		-0.5				-0.5	-0.5	-0.5	-0.5	-0.5	-0.5				
Total Lost Time (s)		4.5				3.5	4.5	4.5	4.5	3.5	4.5				
Lead/Lag	Lag	Lag				Lead	Lag	Lag	Lag	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes	Yes	Yes				Yes	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None				None	Min	Min	Min	None	Min		None	None	None
Walk Time (s)															7.0
Flash Dont Walk (s)															20.0
Pedestrian Calls (#/hr)															10
Act Effct Green (s)		16.7			41.9	60.5	40.9	40.9	40.9	60.1	59.1				
Actuated g/C Ratio		0.14			0.36	0.53	0.36	0.36	0.36	0.52	0.51				
v/c Ratio		1.16			1.87	0.33	0.38	1.17	0.31	1.13	0.93				
Control Delay		149.3			435.5	15.1	45.8	127.1	31.1	122.8	44.9				
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay		149.3			435.5	15.1	45.8	127.1	31.1	122.8	44.9				
LOS		F			F	B	D	F	C	F	D				
Approach Delay		149.3			266.9			106.6			66.5				
Approach LOS		F			F			F			E				
Queue Length 50th (ft)		~229			~400	91	18	~578	81	~190	466				
Queue Length 95th (ft)		#539			#769	135	60	#952	165	#515	#1088				
Internal Link Dist (ft)		67			609			147			380				
Turn Bay Length (ft)						100	75		120	100					
Base Capacity (vph)		249			204	776	96	614	543	271	857				
Starvation Cap Reductn		0			0	0	0	0	0	0	0				
Spillback Cap Reductn		0			0	0	0	0	0	0	0				
Storage Cap Reductn		0			0	0	0	0	0	0	0				
Reduced v/c Ratio		1.16			1.87	0.33	0.38	1.17	0.31	1.13	0.93				

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 115.2	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.87	
Intersection Signal Delay: 130.5	Intersection LOS: F
Intersection Capacity Utilization 98.1%	ICU Level of Service F
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Washington Street & Broad Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	257	9	2	280	6	6
Future Volume (Veh/h)	257	9	2	280	6	6
Sign Control	Free			Free	Stop	
Grade	3%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	279	10	2	304	7	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				147		
pX, platoon unblocked					0.99	
vC, conflicting volume			289		592	284
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			289		587	284
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1273		469	755

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	289	306	14
Volume Left	0	2	7
Volume Right	10	0	7
cSH	1700	1273	578
Volume to Capacity	0.17	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.1	11.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	11.4
Approach LOS			B

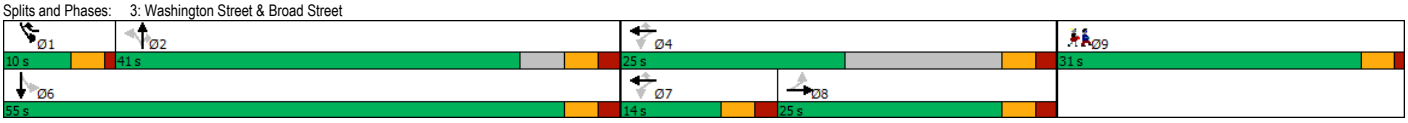
Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		26.3%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø4	Ø7	Ø9
Lane Configurations															
Traffic Volume (vph)	48	149	28	99	175	346	19	492	69	182	421	52			
Future Volume (vph)	48	149	28	99	175	346	19	492	69	182	421	52			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Width (ft)	12	15	12	12	11	10	10	10	10	10	10	12			
Grade (%)		3%			-2%			-3%			2%				
Storage Length (ft)	0		0	0		100	75		120	100		0			
Storage Lanes	0		0	0		1	1		1	1		0			
Taper Length (ft)	25			25			25			25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Frt		0.983				0.850			0.850		0.983				
Flt Protected		0.989			0.982		0.950			0.950					
Satd. Flow (prot)	0	1936	0	0	1815	1478	1710	1682	1443	1530	1608	0			
Flt Permitted		0.850			0.528		0.397			0.171					
Satd. Flow (perm)	0	1664	0	0	976	1478	715	1682	1443	275	1608	0			
Right Turn on Red			No			No			No			No			
Satd. Flow (RTOR)															
Link Speed (mph)		30			30			30			30				
Link Distance (ft)		147			689			227			460				
Travel Time (s)		3.3			15.7			5.2			10.5				
Peak Hour Factor	0.83	0.83	0.83	0.89	0.89	0.89	0.91	0.91	0.91	0.92	0.92	0.92			
Heavy Vehicles (%)	6%	2%	6%	1%	0%	3%	0%	7%	6%	9%	8%	2%			
Adj. Flow (vph)	58	180	34	111	197	389	21	541	76	198	458	57			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	272	0	0	308	389	21	541	76	198	515	0			
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA	Perm	pm+pt	NA				
Protected Phases		8			4 7	1		2		1	6		4	7	9
Permitted Phases	8			4 7		4 7	2		2	6					
Detector Phase	8	8		4 7	4 7	1	2	2	2	1	6				
Switch Phase															
Minimum Initial (s)	6.0	6.0				6.0	10.0	10.0	10.0	6.0	10.0		6.0	5.0	1.0
Minimum Split (s)	11.0	11.0				10.0	15.0	15.0	15.0	10.0	15.0		11.0	10.0	31.0
Total Split (s)	25.0	25.0				10.0	41.0	41.0	41.0	10.0	55.0		25.0	14.0	31.0
Total Split (%)	20.0%	20.0%				8.0%	32.8%	32.8%	32.8%	8.0%	44.0%		20%	11%	25%
Maximum Green (s)	20.0	20.0				6.0	36.0	36.0	36.0	6.0	50.0		20.0	9.0	27.0
Yellow Time (s)	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0				1.0	2.0	2.0	2.0	1.0	2.0		2.0	2.0	1.0
Lost Time Adjust (s)		0.0				0.0	0.0	0.0	0.0	0.0	0.0				
Total Lost Time (s)		5.0				4.0	5.0	5.0	5.0	4.0	5.0				
Lead/Lag	Lag	Lag				Lead	Lag	Lag	Lag	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes	Yes	Yes				Yes	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None				None	Min	Min	Min	None	Min		None	None	None
Walk Time (s)															7.0
Flash Dont Walk (s)															20.0
Pedestrian Calls (#/hr)															9
Act Effct Green (s)		20.3			34.6	45.2	37.2	37.2	37.2	48.4	47.4				
Actuated g/C Ratio		0.21			0.36	0.47	0.38	0.38	0.38	0.50	0.49				
v/c Ratio		0.78			0.89	0.57	0.08	0.84	0.14	0.92	0.66				
Control Delay		54.6			59.0	24.3	23.9	41.9	23.1	65.0	25.8				
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay		54.6			59.0	24.3	23.9	41.9	23.1	65.0	25.8				
LOS		D			E	C	C	D	C	E	C				
Approach Delay		54.6			39.7			39.0			36.7				
Approach LOS		D			D			D			D				
Queue Length 50th (ft)		145			156	143	7	266	27	59	200				
Queue Length 95th (ft)		#360			#470	#369	33	#676	84	#285	#516				
Internal Link Dist (ft)		67			609			147			380				
Turn Bay Length (ft)						100	75		120	100					
Base Capacity (vph)		348			347	688	299	705	605	216	843				
Starvation Cap Reductn		0			0	0	0	0	0	0	0				
Spillback Cap Reductn		0			0	0	0	0	0	0	0				
Storage Cap Reductn		0			0	0	0	0	0	0	0				
Reduced v/c Ratio		0.78			0.89	0.57	0.07	0.77	0.13	0.92	0.61				

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 97
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 40.3 — Intersection LOS: D
Intersection Capacity Utilization 78.7% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Washington Street & Broad Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	210	7	13	233	7	14
Future Volume (Veh/h)	210	7	13	233	7	14
Sign Control	Free			Free	Stop	
Grade	3%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	228	8	14	253	8	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				147		
pX, platoon unblocked					0.89	
vC, conflicting volume			236		513	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			236		396	232
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1331		539	807

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	236	267	23
Volume Left	0	14	8
Volume Right	8	0	15
cSH	1700	1331	688
Volume to Capacity	0.14	0.01	0.03
Queue Length 95th (ft)	0	1	3
Control Delay (s)	0.0	0.5	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.4
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		32.9%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø4	Ø7	Ø9
Lane Configurations															
Traffic Volume (vph)	49	186	39	167	191	240	33	577	133	299	711	70			
Future Volume (vph)	49	186	39	167	191	240	33	577	133	299	711	70			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Width (ft)	12	15	12	12	11	10	10	10	10	10	10	12			
Grade (%)		3%			-2%			-3%			2%				
Storage Length (ft)	0		0	0		100	75		120	100		0			
Storage Lanes	0		0	0		1	1		1	1		0			
Taper Length (ft)	25			25			25			25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Frt		0.981				0.850			0.850		0.987				
Flt Protected		0.991			0.977		0.950			0.950					
Satd. Flow (prot)	0	2001	0	0	1777	1478	1710	1731	1530	1651	1672	0			
Flt Permitted		0.841			0.323		0.145			0.090					
Satd. Flow (perm)	0	1698	0	0	587	1478	261	1731	1530	156	1672	0			
Right Turn on Red			No			No			No			No			
Satd. Flow (RTOR)															
Link Speed (mph)		30			30			30			30				
Link Distance (ft)		147			689			227			460				
Travel Time (s)		3.3			15.7			5.2			10.5				
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.80	0.80	0.80	0.98	0.98	0.98			
Heavy Vehicles (%)	0%	0%	0%	2%	2%	3%	0%	4%	0%	1%	4%	0%			
Adj. Flow (vph)	54	204	43	180	205	258	41	721	166	305	726	71			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	301	0	0	385	258	41	721	166	305	797	0			
Turn Type	Perm	NA		Perm	NA	pm+ov	Perm	NA	Perm	pm+pt	NA				
Protected Phases		8			4 7	1		2		1	6		4	7	9
Permitted Phases	8			4 7		4 7	2		2	6					
Detector Phase	8	8		4 7	4 7	1	2	2	2	1	6				
Switch Phase															
Minimum Initial (s)	6.0	6.0				6.0	10.0	10.0	10.0	6.0	10.0		6.0	6.0	1.0
Minimum Split (s)	11.0	11.0				10.0	15.0	15.0	15.0	10.0	15.0		11.0	11.0	31.0
Total Split (s)	21.0	21.0				18.0	45.0	45.0	45.0	18.0	58.0		25.0	25.0	31.0
Total Split (%)	15.0%	15.0%				12.9%	32.1%	32.1%	32.1%	12.9%	41.4%		18%	18%	22%
Maximum Green (s)	16.0	16.0				14.0	40.0	40.0	40.0	14.0	53.0		20.0	20.0	27.0
Yellow Time (s)	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0				1.0	2.0	2.0	2.0	1.0	2.0		2.0	2.0	1.0
Lost Time Adjust (s)		0.0				0.0	0.0	0.0	0.0	0.0	0.0				
Total Lost Time (s)		5.0				4.0	5.0	5.0	5.0	4.0	5.0				
Lead/Lag	Lag	Lag				Lead	Lag	Lag	Lag	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes	Yes	Yes				Yes	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None				None	Min	Min	Min	None	Min		None	None	None
Walk Time (s)															7.0
Flash Dont Walk (s)															20.0
Pedestrian Calls (#/hr)															10
Act Effct Green (s)		16.2			41.4	59.9	40.4	40.4	40.4	59.6	58.6				
Actuated g/C Ratio		0.14			0.36	0.52	0.35	0.35	0.35	0.52	0.51				
v/c Ratio		1.26			1.83	0.34	0.45	1.19	0.31	1.16	0.94				
Control Delay		189.0			417.9	15.5	51.8	134.8	31.5	134.4	47.3				
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay		189.0			417.9	15.5	51.8	134.8	31.5	134.4	47.3				
LOS		F			F	B	D	F	C	F	D				
Approach Delay		189.0			256.4			112.7			71.4				
Approach LOS		F			F			F			E				
Queue Length 50th (ft)		~257			~401	93	21	~589	81	~195	476				
Queue Length 95th (ft)		#574			#771	138	#69	#961	166	#520	#1101				
Internal Link Dist (ft)		67			609			147			380				
Turn Bay Length (ft)						100	75		120	100					
Base Capacity (vph)		238			210	769	91	607	536	264	850				
Starvation Cap Reductn		0			0	0	0	0	0	0	0				
Spillback Cap Reductn		0			0	0	0	0	0	0	0				
Storage Cap Reductn		0			0	0	0	0	0	0	0				
Reduced v/c Ratio		1.26			1.83	0.34	0.45	1.19	0.31	1.16	0.94				

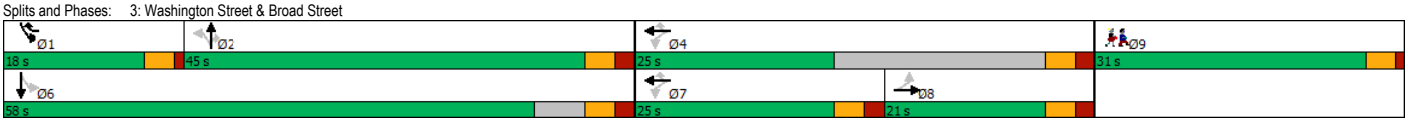
Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 115.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.83
Intersection Signal Delay: 136.2 — Intersection LOS: F
Intersection Capacity Utilization 100.8% — ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Washington Street & Broad Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	257	12	14	280	8	17
Future Volume (Veh/h)	257	12	14	280	8	17
Sign Control	Free			Free	Stop	
Grade	3%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	279	13	15	304	9	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				147		
pX, platoon unblocked					0.99	
vC, conflicting volume			292		620	286
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			292		612	286
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1270		447	754

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	292	319	27
Volume Left	0	15	9
Volume Right	13	0	18
cSH	1700	1270	614
Volume to Capacity	0.17	0.01	0.04
Queue Length 95th (ft)	0	1	3
Control Delay (s)	0.0	0.5	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	11.1
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		36.1%	ICU Level of Service A
Analysis Period (min)		15	

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