MAYOR
Caroline Simmons

DIRECTOR OF OPERATIONS
Matthew Quiñones

Land Use Bureau Chief
Ralph Blessing

Principal Planner
Vineeta Mathur
(203) 977-4716
vmathur@stamfordct.gov

Associate Planner
Lindsey Cohen
(203) 977-4388
lcohen@stamfordct.gov

CITY OF STAMFORD
ZONING BOARD
LAND USE BUREAU
888 WASHINGTON BOULEVARD
STAMFORD, CT 06904 -2152

June 21, 2023

Ms. Theresa Dell, Chair, Planning Board
Land Use Bureau, City of Stamford
888 Washington Blvd.
Stamford, CT 06904

RE: **Application 223-29 – Horn & Hoof Properties LLC, c/o Joseph J. Capalbo, II, 961 Long Ridge Rd and 16 Wire Mill Road, Stamford, CT - Map Change:** Applicant is proposing to rezone 961 Long Ridge Road and 16 Wire Mill Road from the present R-10 (Single Family, Low Density) to proposed RM-1 (Multiple Family, Low Density Design District).

Dear Ms. Dell:

In accordance with Section C6-40-10 of the Charter of the City of Stamford, the above captioned Application for a Map Change is hereby referred to the Planning Board of the City of Stamford for its advisory report.

A public hearing has not yet been scheduled. Referral comments should be filed with the Zoning Board Office by ***July 26, 2023.***

If you have any questions, please feel free to contact me at (203) 977-4716.

Sincerely,

Vineeta Mathur
Principal Planner

City of Stamford
Zoning Board · Land Use Bureau
Government Center · 888 Washington Boulevard · Stamford, CT 06904-2152
Phone: 203.977.4719 · Fax: 203.977.4100

APPLICATION FOR CHANGE IN THE ZONING MAP OF STAMFORD, CONNECTICUT

Complete, notarize, and forward **thirteen (13) hard copies and (1) electronic copy in PDF format** to Clerk of the Zoning Board with a **$1,000.00 Public Hearing Fee** and the required application filing fee **(see Fee Schedule below),** payable to the City of Stamford.

NOTE: Cost of required Public Hearing advertisements are payable by the Applicant and performance of mailing of required property owners is the sole responsibility of the applicant. **LAND RECORDS RECORDING FEE**: $60.00 for First page - $5.00 for each additional page)

Fee Schedule

Map Change **(Affected Area of 1 Acre or Less)**	**$1,060.00**
Map Change **(Affected Area of greater than 1 Acre)**	**$1,060.00 + $2,000 per acre or portion thereof in excess of 1 acre**

APPLICANT NAME (S): HORN & HOOF PROPERTIES LLC

APPLICANT ADDRESS: c/o Joseph Capalbo 1100 Summer Street Stamford, CT 06905

APPLICANT PHONE #: (203) 324-8882

IS APPLICANT AN OWNER OF PROPERTY IN THE CITY OF STAMFORD? YES

PRESENT ZONING DISTRICT: R-10 PROPOSED ZONING DISTRICT: RM-1

LOCATION OF PROPOSED CHANGE: (Give boundaries of each parcel in proposed change and indicate dimensions from nearest intersecting street. Also include Assessor's Card number and Town Clerk's Block number, and square footage of land. Attach twelve (12) copies of map showing area proposed for change.) Legal description attached; property on the corner of Long Ridge Road and Wire Mill Road; Block 377; 001-8189 and 001-8187; total square footage in proposed change ±2.63 acres.

LIST NAME AND ADDRESS OF THE OWNERS OF ALL LAND INCLUDED WITHIN THE PROPOSED CHANGE:

NAME & ADDRESS	LOCATION
Horn & Hoof Properties LLC 76 New Canaan Avenue #7 Norwalk, CT 06850-2646	16 Wire Mill Road 961 Long Ridge Road

ARE THERE DEED RESTRICTIONS THAT CONFLICT WITH THE PROPOSED ZONE DISTRICT FOR THIS PROPERTY?

No.

IF YES, LIST REFERENCE TO TOWN CLERK BOOK & PAGE #: N/A

DOES ANY PORTION OF THE PREMISES AFFECTED BY THIS APPLICATION LIE WITHIN 500 FEET OF THE BORDER LINE WITH GREENWICH, DARIEN OR NEW CANAAN? No. *(If yes, notification must be sent to Town Clerk of neighboring community by registered mail within 7 days of receipt of application – PA 87-307).*

City of Stamford
Zoning Board · Land Use Bureau
Government Center · 888 Washington Boulevard · Stamford, CT 06904-2152
Phone: 203.977.4719 · Fax: 203.977.4100

DATED AT STAMFORD, CONNECTICUT, THIS 6th DAY OF June, 2023

SIGNED: _____

Joseph Capalbo, II Duly Authorized

NOTE: The application cannot be scheduled for public hearing until 35 days have elapsed from the date of referral to the Stamford Planning Board. If applicant wishes to withdraw the application, this must be done in writing, and be received by the Zoning Board at least three (3) working days prior to public hearing in order to provide sufficient time to publicize the withdrawal. Applications withdrawn less than three (3) days prior to a schedule hearing date will not be rescheduled within 90 days.

STATE OF CONNECTICUT

ss STAMFORD June 6, 2023

COUNTY OF FAIRFIELD

Personally appeared JOSEPH J. CAPALBO II, signer of the foregoing application, who made oath to the truth of the contents thereof, before me.

_____

~~Notary Public~~ Commissioner of the Superior Court

FOR OFFICE USE ONLY

APPL. #: _____ Received in the office of the Zoning Board: *Date:* _____

By: _____

Revised 04/30/20

June 6, 2023

City of Stamford
Planning Board
Zoning Board
888 Washington Blvd.
Stamford, CT 06901

ATTENTION: Lindsey Cohen

RE: APPLICATION FOR CHANGE TO MASTER PLAN AND ZONING MAPS
961 LONG RIDGE ROAD and 16 WIRE MILL ROAD, STAMFORD, CT

Dear Ms. Cohen;

The undersigned, owner of the properties commonly known as 961 Long Ridge Road and 16 Wire Mill Road, Stamford, Connecticut does hereby authorize Attorney Joseph J. Capalbo, II, or his designee(s) and employee(s), to act as our agent in connection with all matters before the Stamford Land Use Boards, agencies or departments in order to effectuate a change in the land use designation to permit town house type, residential development on the above referenced parcels.

Horn & Hoof Properties LLC:

By: Brenda Case
Duly Authorized

LEGAL DESCRIPTION

961 Long Ridge Road

ALL THAT CERTAIN piece, parcel or tract of land, together with the buildings and improvements thereon, situated in the City of Stamford, County of Fairfield, and State of Connecticut shown and delineated on a certain map entitled, "Property Surveyed for Alexandra R. Crandall, Stamford, Conn., "Certified `Substantially correct', L. Bromfield, Jr., Engineer & Surveyor, Stamford, Conn., October 25, 1946", which map is now on file in the office of the City and Town Clerk of Stamford and numbered 3362, reference thereto being had. Said premises are bounded and described as follows:

NORTHERLY: 83.74 feet, more or less, and EASTERLY: 153.06 feet, more or less, by second tract hereinafter described: SOUTHERLY: 84.54 feet by Wire Mill Road: SOUTHWESTERLY: 39.37 feet by the curved intersection of Wire Mill Road and Long Ridge Road; and WESTERLY: 131.33 feet by Long Ridge Road.

16 Wire Mill Road

ALL THAT CERTAIN piece, parcel or tract of land, together with the buildings and improvements thereon, situated in said City of Stamford and shown and delineated on a certain map entitled, "Property Surveyed for Arthur I. Crandall and Alexandra R. Crandall, Stamford, Conn., "certified "Substantially Correct' by L. Bromfield, Jr., Engineer & Surveyor, Stamford, Conn., Aug. 7, 1950, which map is now on file in the office of the city and Town Clerk of said Stamford and numbered 4064, reference thereto being had. Said premises are bounded and described as follows:

COMMENCING at a point on the northerly side of Wire Mill Road, which point marks the division line between the first tract hereinabove described and land herein described, thence running north along said first tract N. 18 degrees 18 minutes West 153.06 feet; thence continuing along said first tract South 61 degrees 36 minutes West 83.74 feet to Long Ridge Road; thence along Long Ridge Road on a curve to the left on the arc of a circle the radius of which is 1677.28 feet, a distance of 225.45 feet; thence continuing along Long Ridge Road North 17 degrees 36 minutes 40 seconds West 35.83 feet to land of the State of Connecticut known as the Merritt Parkway; thence along the Merritt Parkway North 67 degrees 15 minutes 10 seconds East 288.25 feet to land of Dorothy F. Spiers; thence along said land of Dorothy F. Spiers South 16 degrees 51 minutes 50 seconds East 284.84 feet to the northerly side of Wire Mill Road; thence along the northerly side of Wire Mill Road South 29 degrees 10 minutes West 130.01 feet; then continuing along the northerly side of Wire Mill Road on a curve to the right on the arc of a circle the radius of which is 171.91 feet, a distance of 97.31 feet and South 61 degrees 36 minutes West 34.0 feet to the point or place of beginning.

ZONING COMPARISON CHART

961 LONG RIDGE ROAD

16 WIRE MILL ROAD

DISTRICT		R-10		RM-1
AREA (sf)		10000		5000
FRONTAGE (ft)		75		50
S.F. PER FAMILY		10000		3750
MAX FAMILIES PER LOT		1		-
STORIES / FEET		2.5 / 30		2.5 / 30*
% OF LOT COVERAGE		20		25*
DISTANCE TO STREET LINE		40		25
DISTANCE TO STREET CENTER		65		50
ONE SIDE YARD SETBACK		10		10*
BOTH SIDE YARD SETBACKS		20		20*
REAR YARD		30		30*

* Subject to Note 18 to the Footnotes of Appendix B

in the Stamford Zoning Regulations

.

AMENDED
NARRATIVE

MASTER PLAN
MAP CHANGE APPLICATION
OF
HORN & HOOF PROPERTIES LLC
FOR
961 LONG RIDGE ROAD
AND
16 WIRE MILL ROAD

The properties subject to this proposed Master Plan Map Change application are commonly known as 961 Long Ridge Road (001-8187) and 16 Wire Mill Road (001-8189) and are owned by the applicant, Horn & Hoof Properties LLC (hereinafter both properties being collectively referred to as the "Premises"). The Premises is generally bounded to the west by Long Ridge Road, to the south by Wire Mill Road, to the east by a single-family residence, and to the north by the Merritt Parkway. The Premises is ± 2.58 acres in area. The Premises is currently zoned R-10. Areas immediately east and south are also zone R-10. Immediately across the street on Long Ridge Road the zoning designation is C-D. The area adjacent and immediately north is the Merritt Parkway. There is currently existing a commercial structure, two stories, approximately 3,173 square feet in area constructed in or around 1920. There also exists an accessory structure ± 520 square feet, also of significant age. A majority of the Premises is presently used as an equipment and material storage and staging area for the utility companies and the State of Connecticut. The two commercial structures are occupied by assorted commercial tenants.

Presently, the Premises is located in Master Plan Category 2, Residential-Low Density Single Family. Areas immediately to the south and east are also located in Master Plan Category 2. The areas to the north and northwest along the Merritt Parkway are in Master Plan Category 14, Open Space-Public Parks. The area directly west is in Master Plan Category 8, Mixed Use-Campus, currently used and occupied as a corporate campus.

Wire Mill Road, east of the Premises is developed with single family homes in accordance with the R-10 designation. The area south of the Premises along the east side of Long Ridge Road consists of a mix of single-family dwellings and legal non-conforming commercial uses. The west side of Long Ridge Road is entirely commercial consisting of corporate campus type development.

The applicant is proposing to amend the Master Plan Map for the Premises from Master Plan Category 2 to Master Plan Category 3, Residential-Low Density Multi-Family. The objective is to consolidate the two parcels into one and propose a change of zone to allow the existing commercial buildings to remain and provide for the remainder of the Premises to be developed into a residential townhouse style community. Should the applicant be successful in obtaining a change to the Master Plan Map, the Zoning Board will be asked to consider an Application to Amend the Zoning Map from R-10 to RM-1 along with an Application for Site Plan Review to consider the proposed townhouse style of development.

Master Plan Category 3, Residential - Low Density, Multifamily is defined in the Stamford Master Plan as, "intended to allow the amenities of multifamily living in a single-family neighborhood setting. The category is intended to provide for and protect single family dwellings and the least intensive of multifamily development…"

Master Plan Category 3 is the most appropriate vehicle to fulfill the general policies and objectives of the Master Plan as they relate to these two parcels. This Premises abuts Long Ridge Road and the Merritt Parkway on two sides, is directly across the street from a corporate office park and maintains a single-family neighborhood to its east. An amendment to the Master Plan Map to Category 3 will promote and enhance the Master Plan policies by:

- Providing a buffer to help maintain the residential neighborhood character of Wire Mill Road (Policy 6A)
- Supporting residential development while maintaining and preserving existing residential communities. (Policy 6A.1)
- Providing increased density along the transit corridors. (Policy 6C.5)
- Reinforcing the policy of preserving historic buildings. (Policy 6D)
- Encouraging appropriate multifamily density standards. (Policy 7G.2)
- Encouraging Infill development. (Policy 7H)

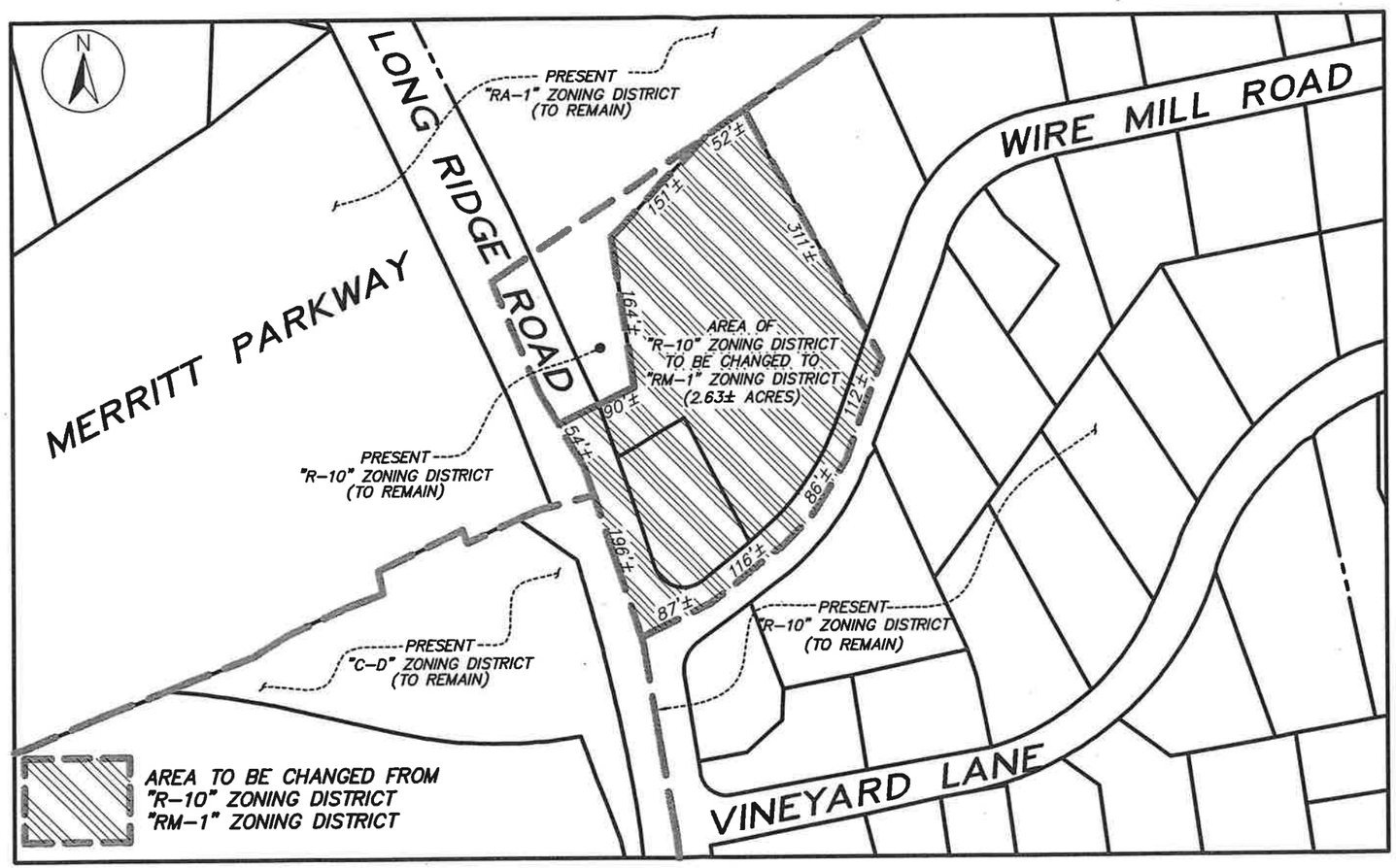
- In addition, a change to Category 3 will result in aesthetic improvements to the landscape and streetscape, a policy encouraged by the Long Ridge / High Ridge Corridors Study.

Approval from the Planning Board for a change in the Master Plan Map to Category 3 will trigger the aforesaid applications for an RM-1 development of the Premises. The RM-1 zone permits one family for each 3750 square feet of area. It limits the lot coverage to 25% and building height, in most instances, to 2 ½ stories, but never more than 3.

Considering the location of this Premises, its nature and use, as well as the surrounding area, the proposed concept of development will provide an appropriate transition between the commercial nature of Long Ridge Road, the vehicular activity and noise from the Merritt Parkway, and the single-family residences along Wire Mill Road. The applicant has submitted for illustration purposes a proposed site plan. Intended is a townhouse style of development with garage parking and adequate screening and buffer zones. Although development is only conceptual at this time, there is anticipated to be a total of approximately eighteen (18) residential units proposed while permitting the historically significant commercial structures to remain. The present activities, including the use of the

Premises as staging areas for State of Connecticut and utility company equipment and materials will cease.

The applicant's proposed development for a mixed use of predominantly residential housing directly addresses and fulfills the policies of the city's Master Plan. It will cause to eliminate an existing use of the site as a staging area, obnoxious to the residents to the east, and provide an adequate buffer zone for the nearby single family residences. For all of the foregoing reasons a change to the Master Plan Map to Category 3 is most appropriate for these two parcels of land.



JANUARY 30, 2023

D'ANDREA SURVEYING & ENGINEERING, PC

- LAND PLANNERS
- ENGINEERS
- SURVEYORS

P.O. BOX 549
RIVERSIDE, CT 06878

6 NEIL LANE
TEL. 637-1779

1 INCH = 150 FEET
SCALE
0 150
IN FEET

PROPOSED REVISION OF ZONING DISTRICTS AT 961 LONG RIDGE 16 WIRE MILL ROAD STAMFORD, CONNECTICUT

21VS_ZONECHANGE_11x17_0.DWG (DTD)

BLOCK No. 377

PARKING SUMMARY – REQUIRED		
RESIDENTIAL PARKING:		
REQUIRED (2 BEDROOM UNIT): 1.75/UNIT	17 X 1.75	= 29.75
REQUIRED (2 BEDROOM AFFORDABLE): 1.5/UNIT	2 X 1.5	= 3
REQUIRED COMMERCIAL: 3 SPACES/1,000 SF GFA	(10,250/1,000)*3	= 30.75
	TOTAL	= 63.5
	TOTAL REQUIRED	= 64

BICYCLE PARKING SUMMARY		
CLASS A		
RESIDENTIAL = 1 PER 5 DWELLING UNITS	19/5	= 4
COMMERCIAL = 1 PER 5,000 SF	10,250/5,000	= 3
CLASS B		
RESIDENTIAL = 1 PER 10 DWELLING UNITS	19/10	= 2
COMMERCIAL = 1 PER 2,000 SF	10,250/2,000	= 6
	TOTAL REQUIRED	= 15
	TOTAL PROVIDED	15

PARKING SUMMARY – PROVIDED		
GARAGE	= 19	SPACES
UNCOVERED PARKING	= 33	SPACES
UNCOVERED TANDEM PARKING	= 9	SPACES
HANDICAPPED	= 3	SPACES
ELECTRIC VEHICLE PARKING	= 5	SPACES
(5 REQUIRED X 0.5 = 2.5)	= -(2.5	SPACES)
TOTAL	= 66.5	SPACES
TOTAL PROVIDED	= 66	SPACES

LEGEND:

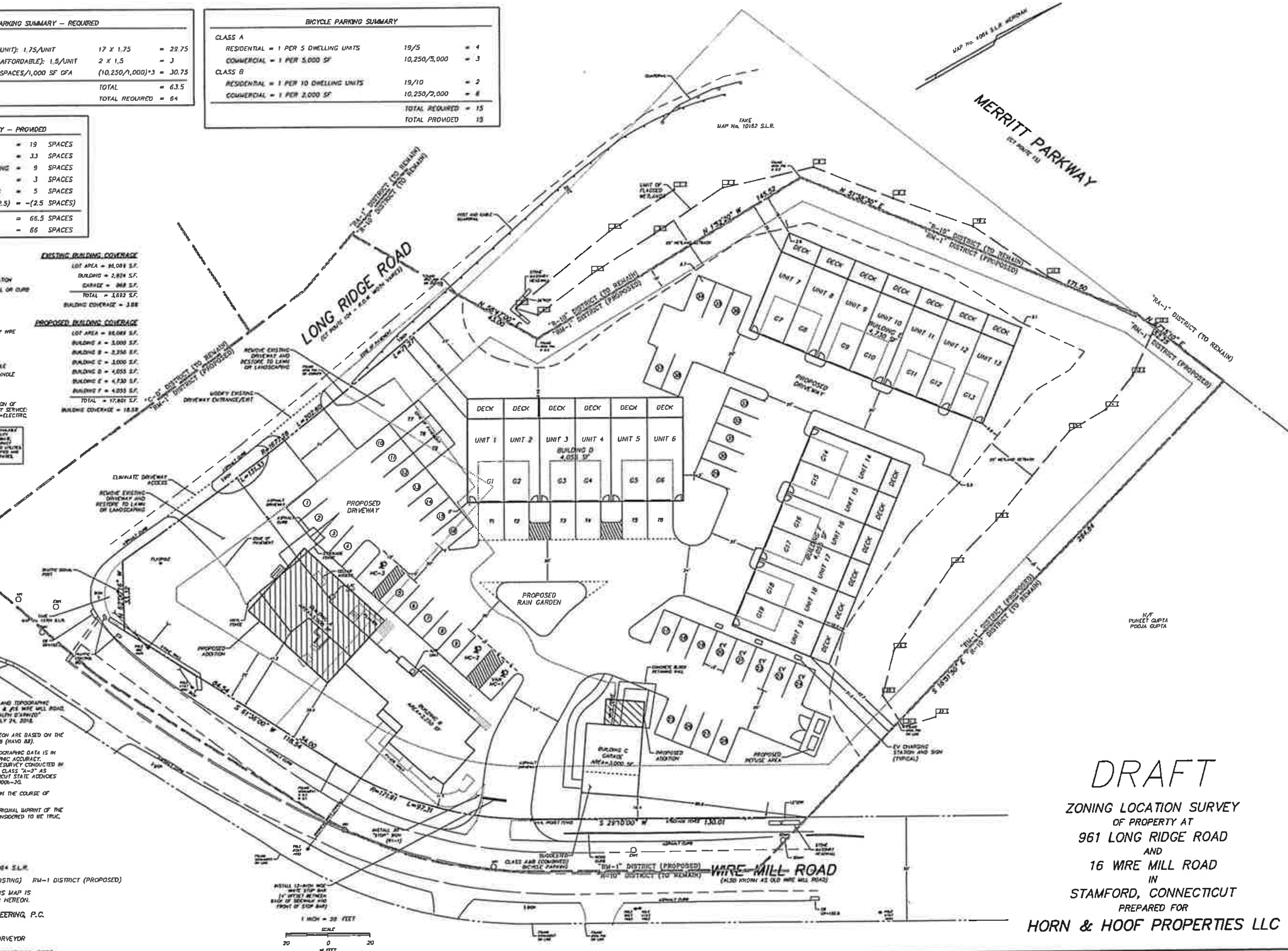
	EXISTING CONTOURS
	EXISTING SPOT ELEVATION
	TOP/BOTTOM OF WALL OR CURB
	DECIDUOUS TREE
	CONIFEROUS TREE
	UTILITY POLE W/ GUY WIRE
	SIGN
MH	MANHOLE
EMH	ELECTRIC MANHOLE
SDMH	STORM DRAIN MANHOLE
SSMH	SANITARY SEWER MANHOLE
CB	CATCH BASIN
	WETLANDS FLAG
	APPROXIMATE LOCATION OF UNDERGROUND UTILITY SERVICE: W=WATER, G=GAS, E=ELECTRIC, C=COMMUNICATIONS

EXISTING BUILDING COVERAGE

LOT AREA = 96,089 S.F.
BUILDING = 2,824 S.F.
GARAGE = 868 S.F.
TOTAL = 3,692 S.F.
BUILDING COVERAGE = 3.8%

PROPOSED BUILDING COVERAGE

LOT AREA = 96,089 S.F.
BUILDING A = 3,000 S.F.
BUILDING B = 2,250 S.F.
BUILDING C = 3,000 S.F.
BUILDING D = 4,055 S.F.
BUILDING E = 4,730 S.F.
BUILDING F = 4,055 S.F.
TOTAL = 17,801 S.F.
BUILDING COVERAGE = 18.5%



REFER TO A SURVEY ENTITLED "PROPERTY AND TOPOGRAPHIC SURVEY DEPICTING #961 LONG RIDGE ROAD & #16 WIRE MILL ROAD, STAMFORD, CONNECTICUT, PREPARED BY RALPH D'ARPINO" PREPARED BY REDNISS & MEAD, DATED JULY 24, 2018.

CONTOURS AND ELEVATIONS DEPICTED HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

THIS MAP IS A TOPOGRAPHIC SURVEY. TOPOGRAPHIC DATA IS IN ACCORDANCE WITH CLASS "T-2" TOPOGRAPHIC ACCURACY. BOUNDARY INFORMATION IS BASED ON A RESURVEY CONDUCTED IN ACCORDANCE WITH HORIZONTAL ACCURACY CLASS "A-2" AS DEFINED IN THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH SEC. 20-300b-20.

NEW MONUMENTATION HAS NOT BEEN SET IN THE COURSE OF MAKING THIS SURVEY.

ONLY COPIES OF THIS MAP, BEARING AN ORIGINAL IMPRINT OF THE SURVEYOR'S EMBOSSED SEAL SHALL BE CONSIDERED TO BE TRUE, VALID COPIES.

AREA = 14,339 S.F. (FIRST TRACT)
AREA = 81,750 S.F. (SECOND TRACT)
AREA = 96,089 S.F. (TOTAL)

REFER TO MAPS No. 3362 AND 4064 S.L.R.

LAND LIES IN "R-10" DISTRICT (EXISTING) RM-1 DISTRICT (PROPOSED)

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

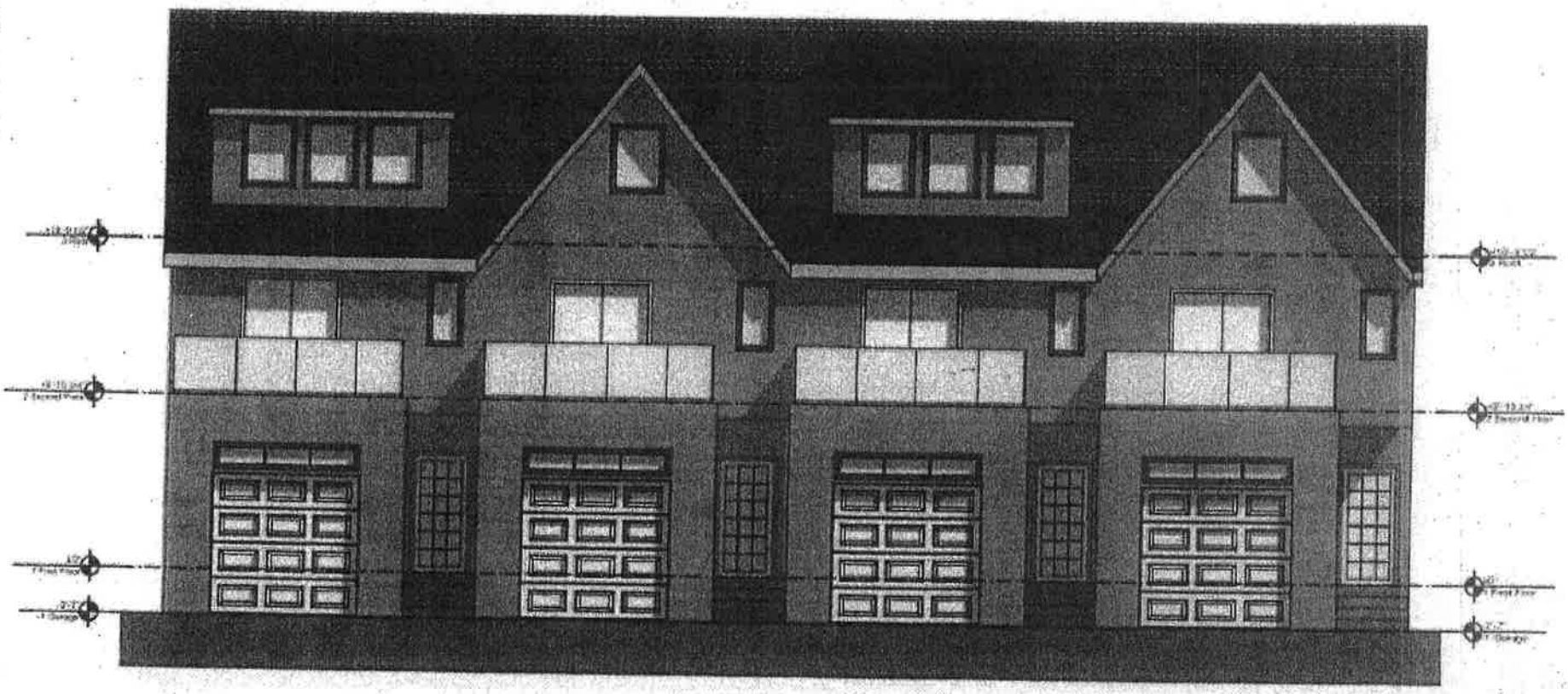
D'ANDREA SURVEYING & ENGINEERING, P.C.

PROGRESS, SURVEYOR
ROBERT L. LIDDEL JR., CT LS No. 19773
RIVERSIDE, CONNECTICUT JANUARY 11, 2023

1 INCH = 20 FEET

DRAFT

ZONING LOCATION SURVEY
OF PROPERTY AT
961 LONG RIDGE ROAD
AND
16 WIRE MILL ROAD
IN
STAMFORD, CONNECTICUT
PREPARED FOR
HORN & HOOF PROPERTIES LLC



Project Name
D Modular

Drawing Scale
3/16" = 1'-0"

Layout ID
SD7

Revis


From Wire Mill Road


FAIRFIELD CONTRACTORS
DESIGN BUILD
ModSquad
MODULAR HOMES
From Long Ridge Road


HARD HAT
AREA
Rear from Lamp Ridge Road


Looking toward building from rear


VOLVO
Looking Inbound Pkwy from rear

April 28, 2023

Mr. Ralph D'Arienzo
Ms. Brenda L. Case
Horn & Hoof Properties

Re: Traffic Study
Proposed Residential and Office Development
16 Wire Mill Road/Long Ridge Road
Stamford, Connecticut
SLR #141.21518.00001

Dear Ms. Case and Mr. D'Arienzo,

At your request, SLR International Corporation (SLR) has prepared this study to assess the traffic aspects of your proposed development to add 19 residential units and approximately 7,000 square feet (SF) of net increase of office space to 16 Wire Mill Road in Stamford, Connecticut. The site location and area roadways are shown in **Figure 1.**

The study involved field reconnaissance and inventory of current roadway and traffic conditions; collection and review of traffic volume data, crash data, and other pertinent information; review of the sight lines at the site access driveways; estimation of amounts of new site traffic that may be generated by the proposed development; estimation of future roadway traffic volumes with and without the proposed development; and analysis of anticipated future traffic flow operations adjacent to the site at the signalized intersection of Long Ridge Road at Wire Mill Road and the Merritt Parkway northbound off-ramp exit 34, and at the site driveway intersections with Long Ridge Road and Wire Mill Road. Additionally, a field meeting with City of Stamford Department of Transportation, Traffic & Parking (TTP) staff was held at the site on March 21, 2023, to confirm the scope of this traffic study.

Study Area Roadway and Site Environs

Long Ridge Road (Route 104) is a north-south principal arterial roadway that runs between North Stamford and the New York state line to the north, and the Bulls Head area of Stamford to the south. Long Ridge Road near the site has four vehicle travel lanes plus dedicated turn lanes at key intersections and has a posted speed limit of 40 miles per hour (mph). Directly adjacent to the site, Long Ridge Road is noted to have a raised median. The Merritt Parkway (Route 15), which provides regional east-west access, is located just north of the site, and has on- and off-ramps nearby including a northbound off-ramp (exit 34) that connects with Long Ridge Road at a signalized intersection opposite Wire Mill Road at the southwest corner of the site.

Wire Mill Road is a local road that runs generally east-west and, along with Cedar Heights Road to the east, connects Long Ridge Road with High Ridge Road. Wire Mill Road has one lane in each direction and a posted speed limit of 25 mph. The surrounding area is mostly residential with commercial uses along Long Ridge Road.

Area Traffic Volume Data

Review was made of available traffic data from the Connecticut Department of Transportation (CTDOT). The state maintains a traffic monitoring location on Long Ridge Road south of Wire Mill Road nearby. The latest available state data at this location indicates that Long Ridge Road had a two-way Annualized Average Daily Traffic (AADT) of 18,400 vehicles in 2020. Pre-pandemic, Long Ridge Road near the site had an AADT volume of 26,200 vehicles in 2017, according to the CTDOT traffic monitoring data. The most recent vehicle travel speed data recorded at this location by CTDOT found that the average travel speeds and 85th percentile travel speeds on Long Ridge Road are approximately 35 mph and 41.5 mph in the northbound direction, respectively, and 35 mph and 42.5 mph in the southbound direction, respectively.

To supplement the state data, new manual turning movement counts were collected at the intersection of Long Ridge Road at Wire Mill Road and the Merritt Parkway northbound off-ramp (exit 34), as well as the site driveway at Wire Mill Road, on Tuesday, March 28, 2023, during the morning and afternoon commuter peak periods. **Figure 2** shows the peak-hour traffic volumes for the weekday morning (7:45 a.m. to 8:45 a.m.) and afternoon (4:45 p.m. to 5:45 p.m.).

Area Crash History

Information on crash data along the site frontage, and at the intersection of Long Ridge Road at Wire Mill Road and the Merritt Parkway northbound off-ramp, was obtained from the Connecticut Crash Data Repository for the 5-year period of March 26, 2018, to March 27, 2023. The data collected for this period is shown in **Table 1**, summarized by location, collision type, and crash severity.

In the direct vicinity of the site's driveways, only two crashes were reported to have occurred over this 5-year period, both of which resulted in reported property damage only. At the signalized intersection of Long Ridge Road at Wire Mill Road and the Merritt Parkway northbound off-ramp, there was a reported total of thirteen crashes over this 5-year period; nine that resulted in property damage only and four that involved possible or suspected injuries. No fatalities were reported. The crash that resulted in suspected serious injury was a collision between a car and a motorcycle. Of the thirteen intersection crashes, six were rear-end collisions, four were collisions at an angle, two were sideswipes, and one was a collision with a fixed object. There do not appear to be any unusual crash patterns adjacent to the site, as rear-ends, angle and sideswipe collisions at these rates are unfortunately common at/adjacent to large, signalized intersections.

SLR

Table 1 Crash Summary

Location	Type Of Collision						Crash Severity				
	Angle	Fixed Object	Rear-End	Sideswipe – Opposite Direction	Sideswipe – Same Direction	Total	Possible Injury	Property Damage Only	Suspected Minor Injury	Suspected Serious Injury	Total
Along the Site Frontage on Long Ridge Road	0	0	0	0	1	**1**	0	1	0	0	**1**
Along the Site Frontage on Wire Mill Road	1	0	0	0	0	**1**	0	1	0	0	**1**
Long Ridge Road at Wire Mill Road/Merritt Parkway Northbound Off-ramp Exit 34	4	1	6	1	1	**13**	2	9	1	1	**13**
Total	**5**	**1**	**6**	**1**	**2**	**15**	**2**	**11**	**1**	**1**	**15**

Source: Connecticut Crash Data Repository from March 26, 2018, to March 27, 2023

Proposed Development

Proposed for 16 Wire Mill Road is the addition of 19 housing units within three new multi-family townhouse buildings, as well as additional office space to be added to the existing buildings on site. The site currently has approximately 3,200 SF of office space that will be expanded with a net increase of around 7,000 SF of new added office space. Vehicle access to/from the development will remain as currently exists, with right-in/right-out driveway access at Long Ridge Road (left turns restricted by the median on Long Ridge Road) and a full-access driveway at Wire Mill Road. Note that the site currently has two curb cuts at Long Ridge Road that will be consolidated to one with this proposed development. Site egress will remain stop-controlled to both Long Ridge Road and Wire Mill Road.

Motorist visibility was reviewed from the points of site egress. At the site driveway exit to Wire Mill Road, the Intersection Sight Distance (ISD) looking to the left/east extends for a maximum distance of approximately 400 feet to a curve in the road east of the site. This ISD meets CTDOT guidelines to see approaching vehicles traveling 36 mph or less. Note again that the posted speed limit is 25 mph, and there is an advisory 15 mph speed sign for westbound traffic at the approach of the bend in Wire Mill Road northeast of the site. Looking to the right/west from the site driveway exit at Wire Mill Road, upon minor regrading of the site frontage and/or a minor regrading of the site driveway apron on-site to slightly elevate its approach to Wire Mill Road, the ISD will extend a maximum of approximately 280 feet to Long Ridge

Road. A 280-foot ISD corresponds with the CTDOT guideline for the 25-mph speed limit. Note, as well, that traffic turning onto Wire Mill Road at this point will be slowed by either turning left or right from Long Ridge Road, or by egressing the Merritt Parkway off-ramp. At the site driveway right-only exit to Long Ridge Road, the ISD looking to the left/south extends for several hundred feet to exceed CTDOT guidelines to see for approaching vehicles traveling well over the 40-mph speed limit.

Site Traffic and Distribution

The amount of site traffic to be generated by the proposed 19 residential units and net increase of 7,000 SF of office space was estimated based on review of statistical data published by the Institute of Transportation Engineers (ITE) in their *Trip Generation Manual* (Land Use Codes #220, Multifamily Housing (Low-Rise) and #710, General Office Building). **Table 2** below summarizes the peak hour traffic that is estimated to be generated by this development.

Table 2 New Site Traffic Estimates

Land Use	Number Of Vehicle Trips					
	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	In	Out	Total	In	Out	Total
Proposed Multifamily Housing (Low-Rise), 19 Units	2	6	8	6	4	10
Proposed Net Increase in Office Space 7,000 SF approximately	10	1	11	2	8	10
Total Trips	***12***	***7***	***19***	***8***	***12***	***20***

Trip Generation Manual, 11th Edition. Institute of Transportation Engineers, 2021 (ITE land uses #220 and #710)

The geographic distribution of the site-generated traffic was estimated based on review of Census Journey-to-Work data and our understanding of the surrounding roadway system. It is estimated that approximately 40 percent of the new site traffic will access the site via Long Ridge Road to/from the South, 30 percent will be oriented to/from the north of the intersection of Long Ridge Road at Wire Mill Road including to/from the east via the Merritt Parkway, 25 percent will be oriented to/from the west via the Parkway, and 5 percent to/from the east on Wire Mill Road.

Figure 3 and **Figure 4** illustrate the site generated traffic's geographic distribution and site generated trip estimates for the proposed development during the weekday morning and afternoon peak hours, respectively.

SLR

Future Traffic

For the purpose of this study, a future horizon build-year of 2025 was used for analysis. The 2025 intersection traffic volumes within our study area at/adjacent to the site were estimated and evaluated both without (background/no-build conditions) and with (combined/build conditions) the proposed development to determine possible traffic impacts specifically associated with this subject development.

To estimate the future background traffic volumes, the existing peak hour traffic volumes were projected to year 2025 using an annual growth rate of 0.5 percent that was suggested by CTDOT's Bureau of Policy and Planning. Discussions with CTDOT and the City of Stamford indicated that there are no approved developments of significant size nearby to also include in the 2025 background traffic volumes. The future background (no-build) volumes for the weekday morning and afternoon peak periods, which again do not include site-generated traffic, are shown in **Figure 5**.

The estimated new site traffic volumes generated by the proposed development were then added to the 2025 background traffic volumes to derive the future combined (build) traffic volumes. The combined traffic volumes reflect future roadway traffic volumes with the proposed development in place and are used in analyses to determine roadway adequacy. **Figure 6** depicts the 2025 combined traffic volumes for the weekday morning and weekday afternoon peak hours at/adjacent to the site.

Capacity Analysis

The study intersections were evaluated by means of capacity analysis techniques. Levels of Service (LOS) were then determined, which are qualitative measures of the efficiency of traffic flow operations in terms of delay and inconvenience to motorists. A description of the various LOS designations, A through F, is given in the Appendix. LOS A indicates very low average control delay per vehicle while LOS F describes operations with long average delays. Peak-hour LOS D or better is considered acceptable in most communities. However, in some areas, typically more urbanized areas, LOS E during peak hours may be deemed acceptable and can indicate an efficient tradeoff between traffic flow and the amount of land devoted to the movement of motor vehicles. The analysis worksheets are enclosed in the Appendix. **Table 3** summarizes the findings of future LOS at the study intersections without (Background Conditions) and with (Combined Conditions) the estimated new traffic from the proposed development.

No changes to LOS are anticipated at the signalized intersection of Long Ridge Road at Wire Mill Road and the Merritt Parkway northbound off-ramp during peak hours as a result of this proposed development's estimated new future traffic. This indicates that the subject proposed development will not have a traffic impact. Note that this intersection does have some peak-hour delays that occur today/will occur in the future regardless of this development. Review of potential traffic signal timing adjustments that the city could make finds that minor timing adjustments to this intersection could somewhat improve traffic flow operations, particularly for the southbound left turn movement's poor background LOS during the afternoon peak hour. It is important to note, again, that signal timing adjustments are not triggered as a

result of this proposed development. Nonetheless, the City of Stamford TTP Department could consider such timing adjustments, which are detailed in the Appendix, as part of routine signal traffic operations maintenance.

At the unsignalized site driveway intersections, motorist LOS are expected to be good in the future, with LOS A for motorists passing by and turning directly into the site driveways, and LOS C or better for motorists exiting the site during peak hours. At the Wire Mill Road site driveway, it is noted that vehicle queueing on Wire Mill Road from the Long Ridge Road signal does sometimes extend back to the driveway today. To manage this such that occasionally queuing would be less likely to block this driveway in the future, we recommend that a sign be installed on Wire Mill Road just east of the site driveway for westbound traffic that states 'Do Not Block Driveway'.

Table 3 Capacity Analysis Summary

Intersection	Level Of Service			
	Weekday Morning Peak Hour		Weekday Afternoon Peak Hour	
	Background	Combined	Background	Combined
Signalized				
Long Ridge Road at Wire Mill Road and Merritt Parkway Northbound Off-Ramp Exit 34				
Eastbound Left/Through	D	D	E	E
Eastbound Right	D	D	C	C
Westbound Left	E	E	E	E
Westbound Right	A	A	A	A
Northbound Through/Right	C	C	D	D
Southbound Left	D	D	F *	F *
Southbound Through	B	B	B	B
Overall LOS	**C**	**C**	**D**	**D**
Unsignalized				
Site Driveway at Wire Mill Road				
Southbound Left/Right	B	B	A	B
Eastbound Left/Through	A	A	A	A
Site Driveway at Long Ridge Road				
Westbound Right	C	C	C	C

*Could be improved by minor signal timing adjustment by the city.

Summary

A study was conducted to assess the traffic aspects of the proposed addition of 19 multi-family housing units and approximately 7,000 SF of net increase of office space to 16 Wire Mill Road in Stamford, Connecticut. A study of existing traffic conditions was undertaken through a detailed field reconnaissance

SLR

and data assembly effort. Traffic generated by the proposed development was estimated based on review of industry standard data. Future roadway traffic volumes were estimated with and without the development in place, and capacity analyses of Future Conditions were performed. It was found that no impacts to traffic LOS are expected to be caused by the proposed development. The proposed development is thus not expected to have a traffic impact.

We do make the following minor recommendations to best accommodate the proposed development from a traffic standpoint:

- Any vegetation along the site frontage and within the Long Ridge Road and Wire Mill Road rights-of-way adjacent to the site driveways should be kept trimmed to maintain good sight lines.

- For the site driveway at Wire Mill Road, a minor regrading of the driveway apron on-site should be done to elevate its approach to the road, and/or a minor regrading of the site frontage along Wire Mill Road between this driveway and Long Ridge Road should be done, to maximize sightlines from this driveway.

- A 'Do Not Block Driveway' sign should be installed on Wire Mill Road just east of the site driveway facing westbound traffic to lessen the likelihood of occasional signal queueing blocking this driveway.

Lastly, while not triggered as a result of this development's traffic, the city should consider making a minor signal timing adjustment to the intersection of Long Ridge Road at Wire Mill Road and the Merritt Parkway northbound off-ramp for the afternoon commuter period timing pattern to optimize signal operations.

We hope this traffic study is useful to you and the City of Stamford in assessing the traffic aspects of this proposed development. If you have any questions or need any further information, please do not hesitate to contact us.

Sincerely,

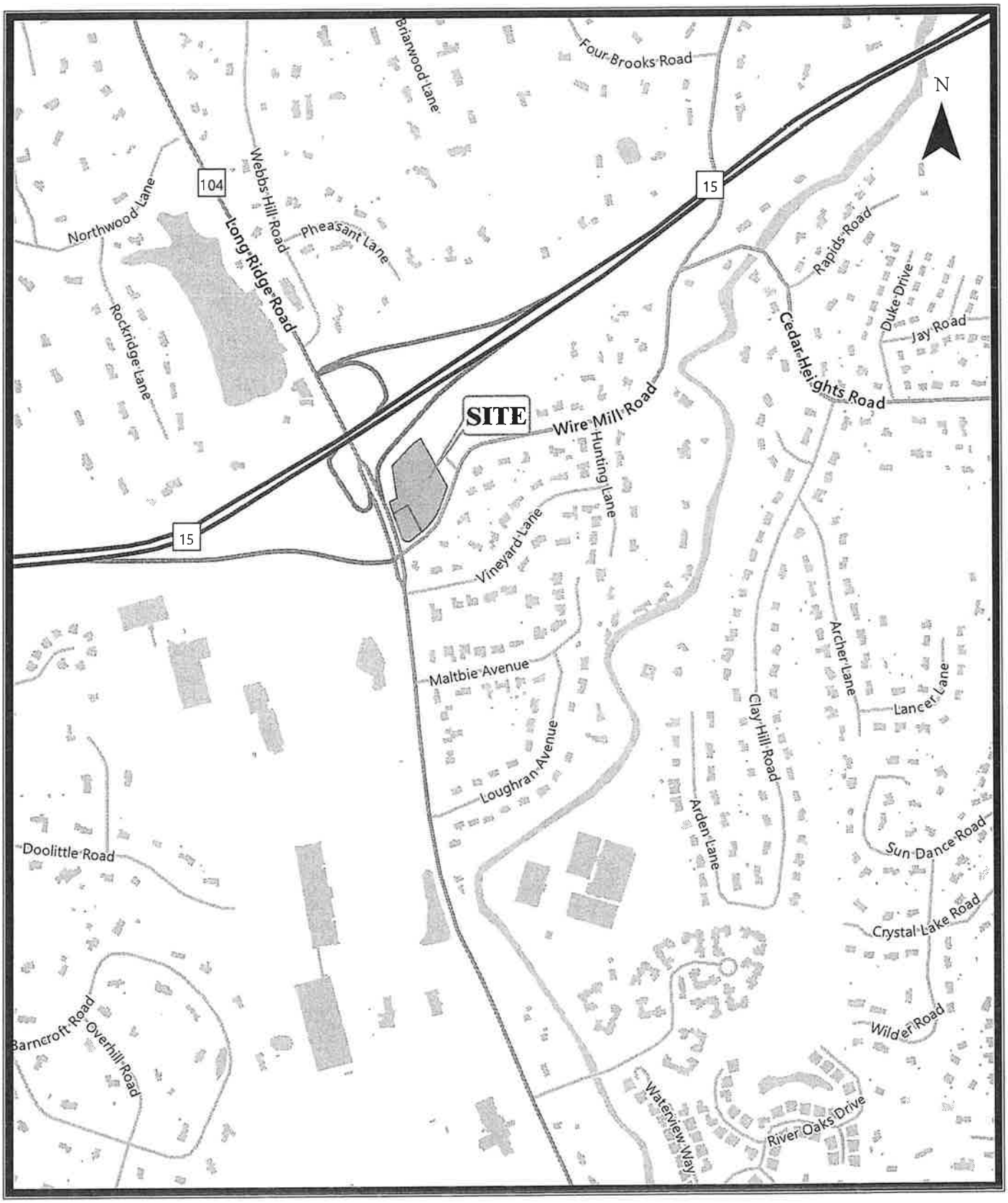
SLR International Corporation

David G. Sullivan, PE
U.S. Manager of Traffic & Transportation Planning

Neil C. Olinski, MS, PTP
Principal Transportation Planner

Enclosures

21518.00001.a2823.ltr.docx



SITE LOCATION MAP

0 500 1,000 Feet

SLR

Proposed Residential and Office Space Expansion
16 Wire Mill Road
Stamford, Connecticut

FIGURE 1

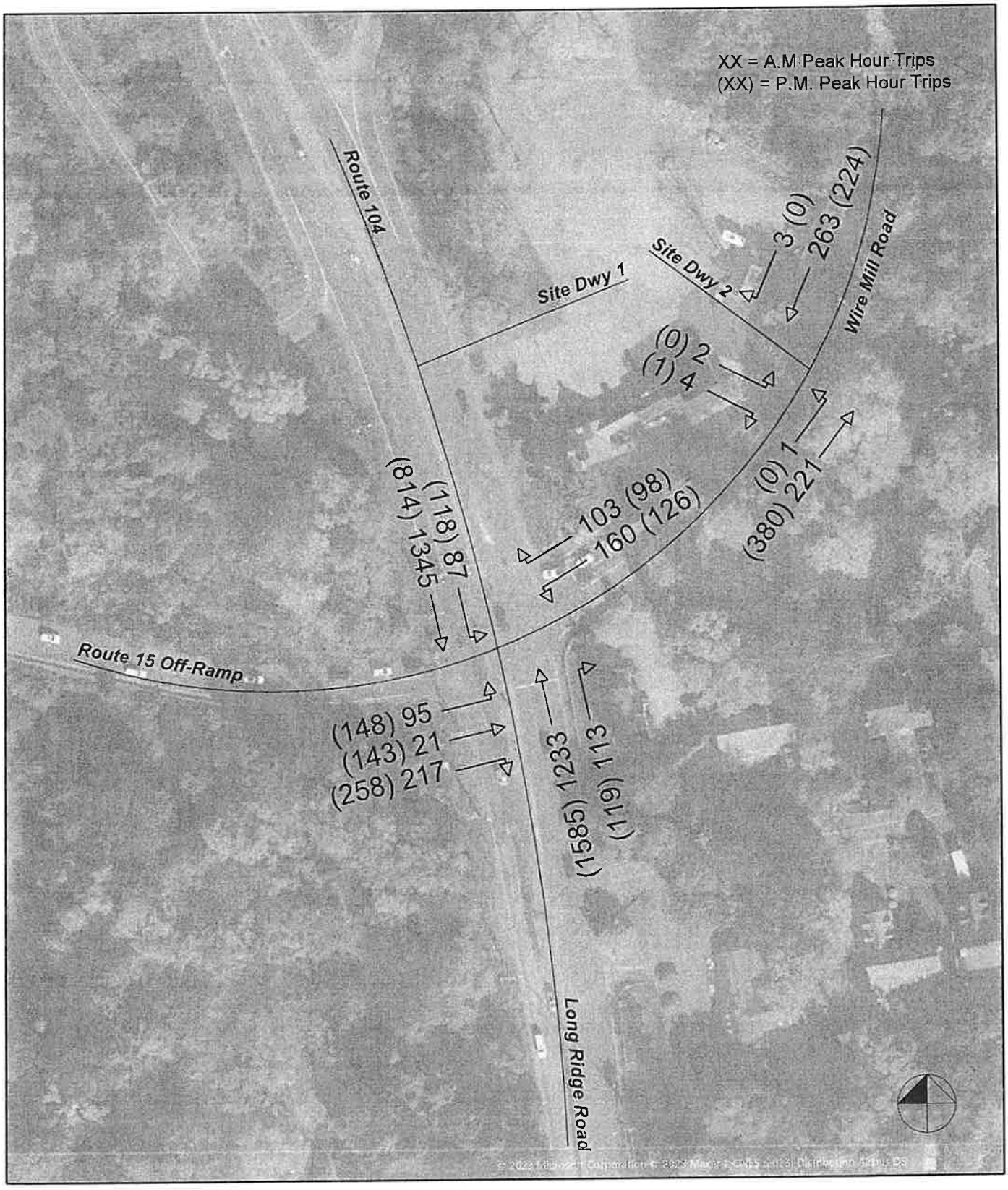


Figure 2
Existing Weekday Peak Hour Vehicular Traffic Volumes (2023)

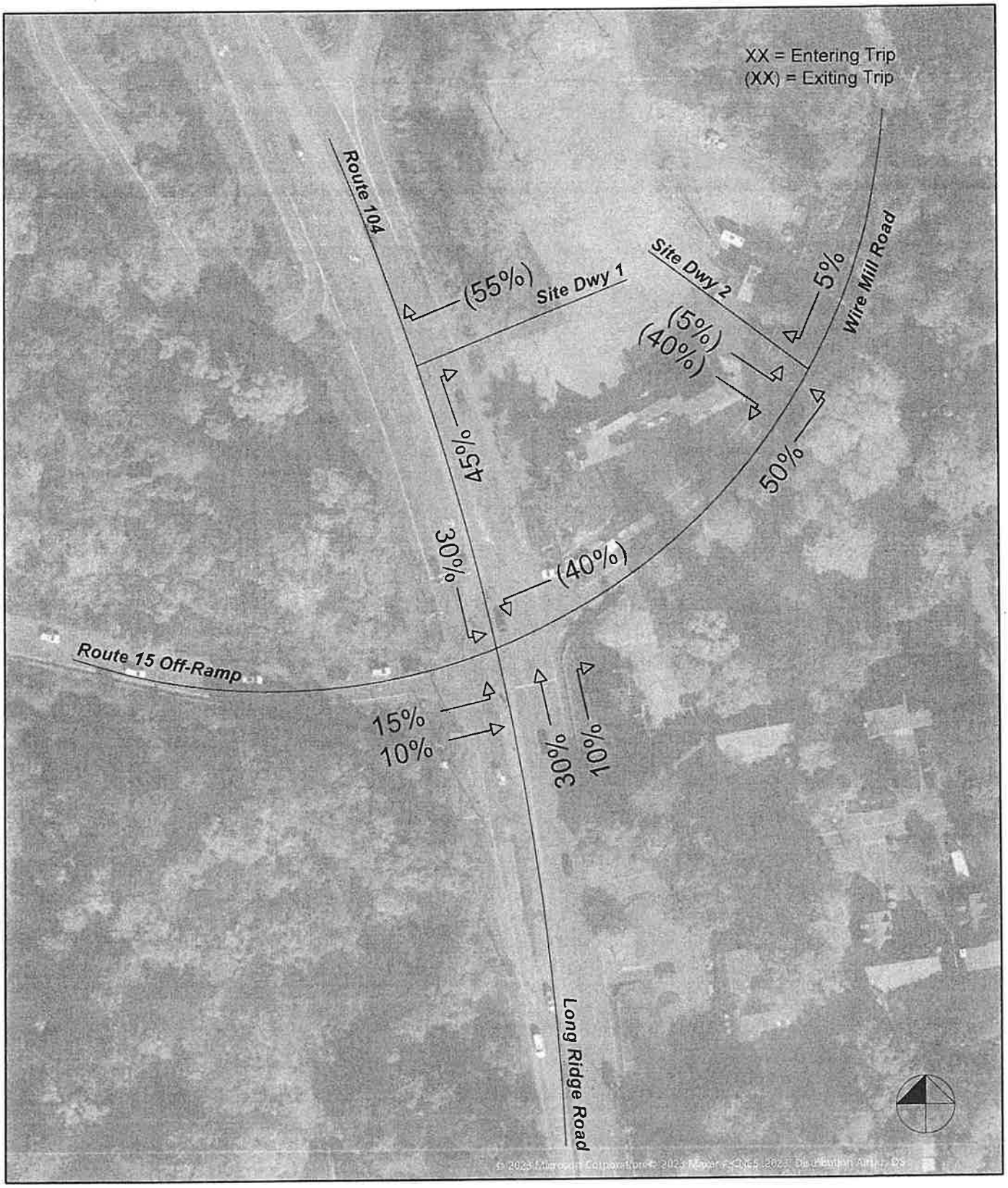


Figure 3
Site Traffic Distribution

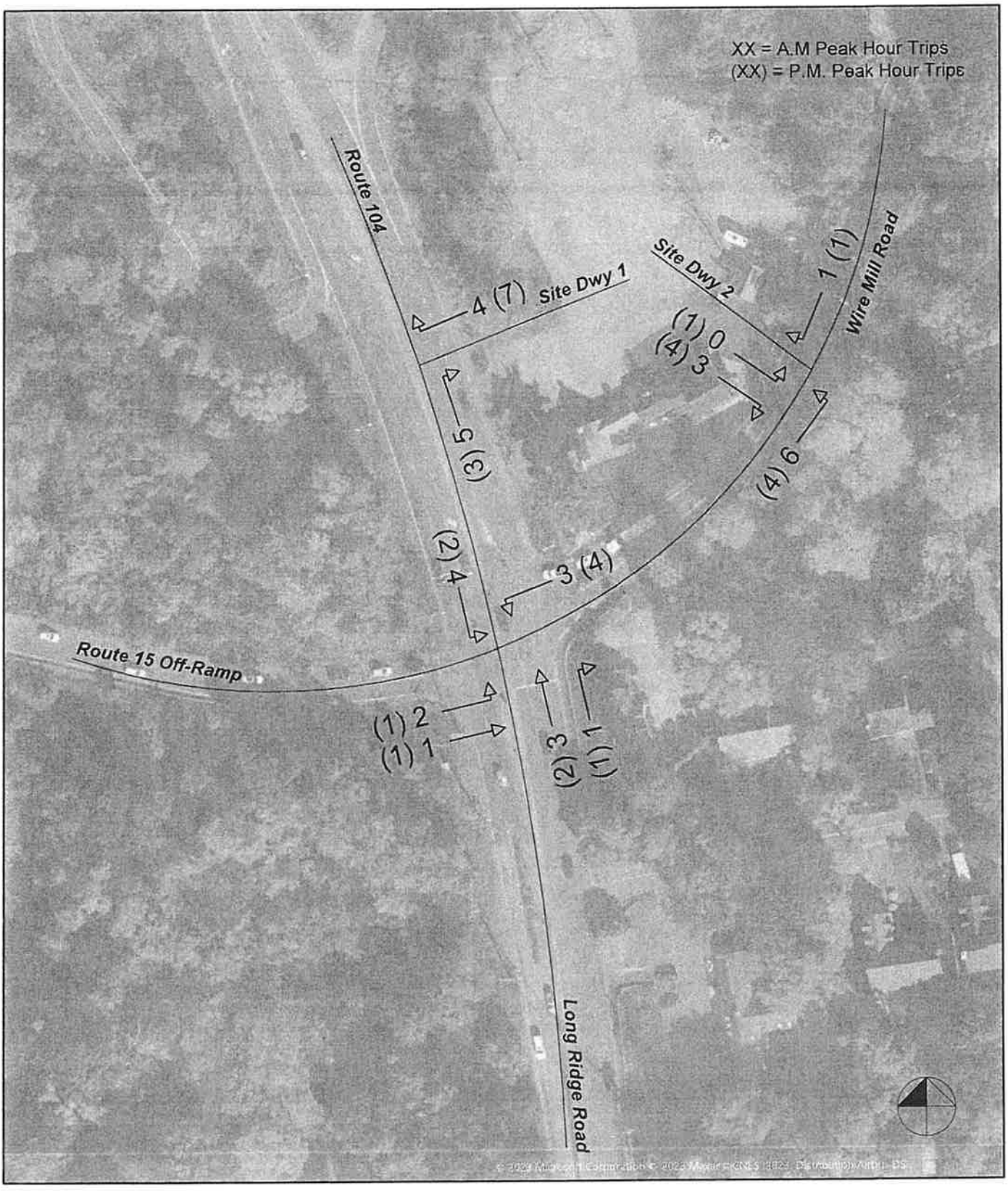


Figure 4
Site-Generated Weekday Peak Hour Traffic Volumes

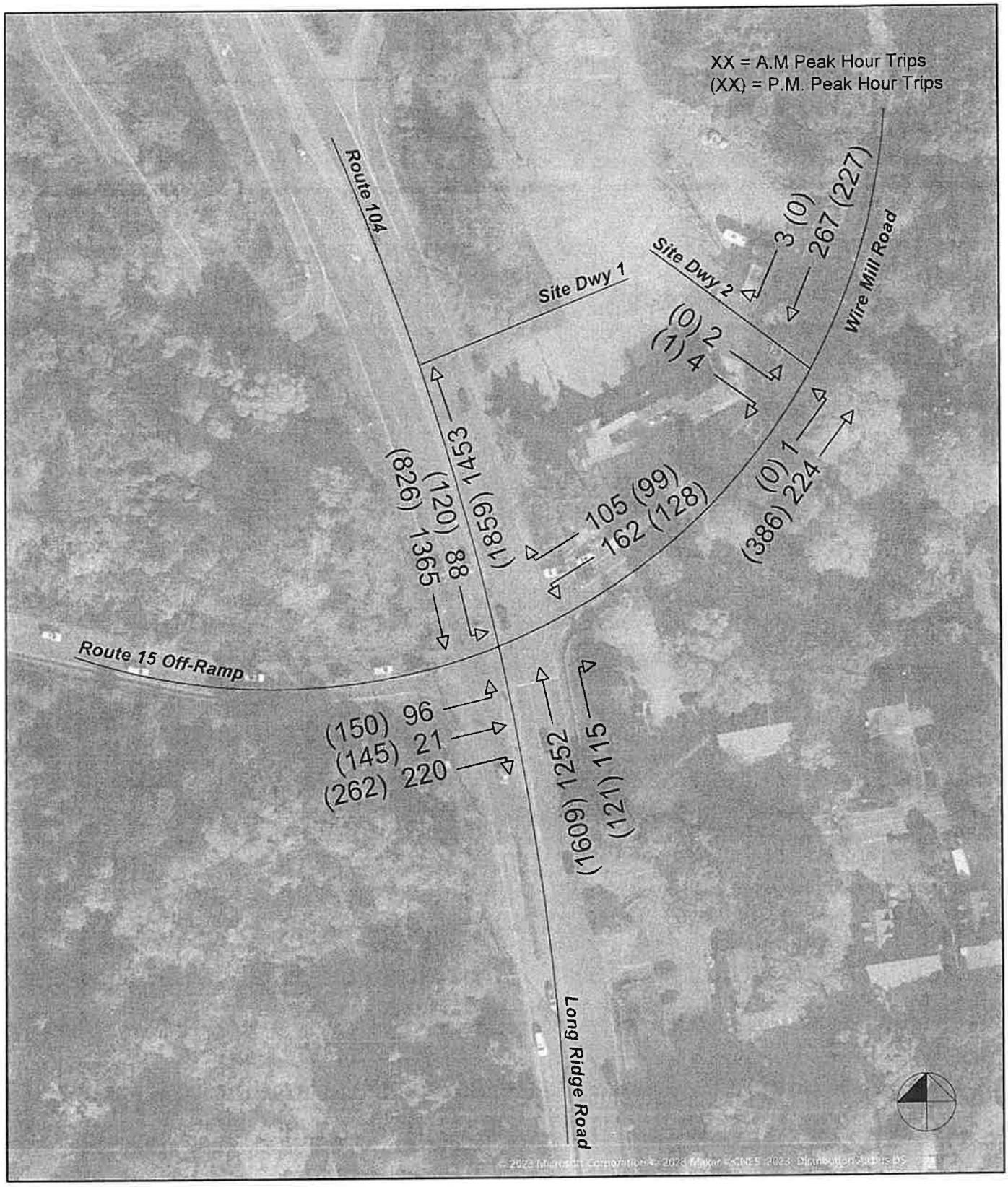


Figure 5
Future Background Weekday Peak Hour Traffic Volumes (2025)

SLR

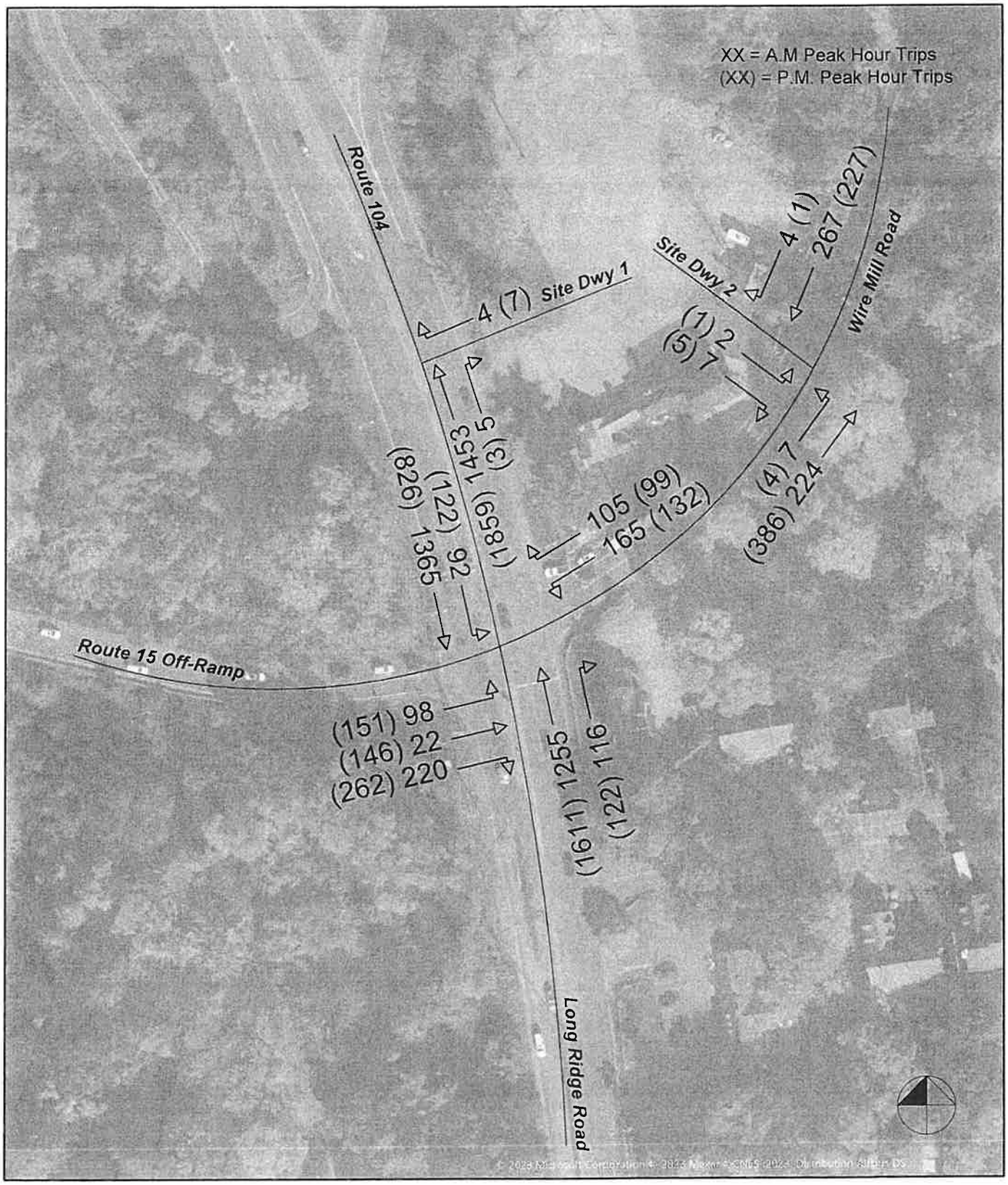


Figure 6
Future Combined Weekday Peak Hour Traffic Volumes (2025)

APPENDIX

LEVEL OF SERVICE
FOR
SIGNALIZED INTERSECTIONS
(MOTORIZED VEHICLE MODE)

Level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions: in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle, typically for a 15-min analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group. The criteria are given below.

LEVEL-OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS
MOTORIZED VEHICLE MODE

LOS By Volume-to-Capacity Ratio[1]		CONTROL DELAY (s/veh)
v/c ≤ 1.0	v/c > 1.0	
A	F	≤ 10
B	F	> 10 AND ≤ 20
C	F	> 20 AND ≤ 35
D	F	> 35 AND ≤ 55
E	F	> 55 AND ≤ 80
F	F	> 80

[1] For approach-based and intersection-wide assessments, LOS is defined solely by control delay.

Specific descriptions of each LOS for signalized intersections are provided below:

Level of Service A describes operations with a control delay of 10 s/veh and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If LOS A is the result of favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

Level of Service B describes operations with control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

Level of Service C describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

Level of Service D describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

Level of Service E describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

Level of Service F describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Reference: Highway Capacity Manual 6, Transportation Research Board, 2016.

LEVEL OF SERVICE
FOR TWO-WAY
STOP SIGN CONTROLLED INTERSECTIONS

The level of service for a TWSC (two-way stop controlled) intersection is determined by the computed or measured control delay and is defined for each minor movement. Level of service is not defined for the intersection as a whole. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. LOS criteria are given in the Table. LOS criteria are given below:

LEVEL-OF SERVICE CRITERIA FOR AWSC INTERSECTIONS	
LOS[1]	**CONTROL DELAY (s/veh)**
A	**≤ 10**
B	**> 10 AND ≤ 15**
C	**> 15 AND ≤ 25**
D	**> 25 AND ≤ 35**
E	**> 35 AND ≤ 50**
F	**> 50**

Note: LOS criteria apply to each lane on a given approach and to each approach on the minor street.
LOS is not calculated for major-street approaches or for the intersection as a whole.
LOS F is assigned to a movement if the volume-to-capacity ratio exceeds 1.0, regardless of the control delay

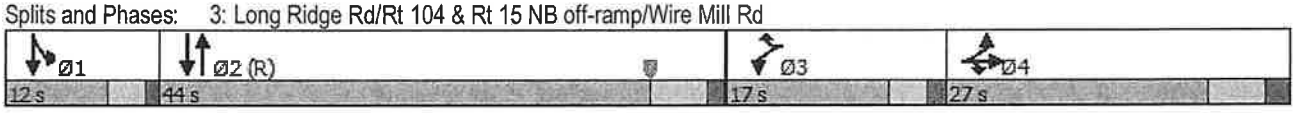
Reference: Highway Capacity Manual Version 6.0, Transportation Research Board, 2016.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	21	220	162	0	105	0	1252	115	88	1365	0
Future Volume (vph)	96	21	220	162	0	105	0	1252	115	88	1365	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		1	1		1	0		0	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	0.91	0.91	1.00	0.95	1.00
Frt			0.850			0.850		0.987				
Flt Protected		0.961		0.950						0.950		
Satd. Flow (prot)	0	1790	1583	1770	0	1583	0	5019	0	1770	3539	0
Flt Permitted		0.961		0.950						0.950		
Satd. Flow (perm)	0	1790	1583	1770	0	1583	0	5019	0	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124			147		17				
Link Speed (mph)		40			25			35			35	
Link Distance (ft)		391			302			586			164	
Travel Time (s)		6.7			8.2			11.4			3.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	23	239	176	0	114	0	1361	125	96	1484	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	127	239	176	0	114	0	1486	0	96	1484	0
Turn Type	Split	NA	Prot	Prot		Prot		NA		Prot	NA	
Protected Phases	4	4	4	3		3		2		1	1 2	
Permitted Phases												
Detector Phase	4	4	4	3		3		2		1	1 2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0		7.0		25.0		3.0		
Minimum Split (s)	13.5	13.5	13.5	17.0		17.0		31.0		7.0		
Total Split (s)	27.0	27.0	27.0	17.0		17.0		44.0		12.0		
Total Split (%)	27.0%	27.0%	27.0%	17.0%		17.0%		44.0%		12.0%		
Yellow Time (s)	4.4	4.4	4.4	3.0		3.0		4.4		3.0		
All-Red Time (s)	2.1	2.1	2.1	1.4		1.4		1.6		1.0		
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0		
Total Lost Time (s)		6.5	6.5	4.4		4.4		6.0		4.0		
Lead/Lag	Lag	Lag	Lag	Lead		Lead		Lag		Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes		Yes		Yes		
Recall Mode	None	None	None	None		None		C-Min		None		
Act Effct Green (s)		12.9	12.9	12.0		12.0		38.7		15.6	60.2	
Actuated g/C Ratio		0.13	0.13	0.12		0.12		0.39		0.16	0.60	
v/c Ratio		0.55	0.77	0.83		0.36		0.76		0.35	0.70	
Control Delay		48.7	35.8	73.8		6.6		29.7		44.7	17.0	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		48.7	35.8	73.8		6.6		29.7		44.7	17.0	
LOS		D	D	E		A		C		D	B	
Approach Delay		40.2			47.4			29.7			18.7	
Approach LOS		D			D			C			B	
Stops (vph)		105	105	145		8		1139		74	919	
Fuel Used(gal)		3	3	3		0		23		1	13	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
CO Emissions (g/hr)		175	225	238		31		1580		102	927	
NOx Emissions (g/hr)		34	44	46		6		307		20	180	
VOC Emissions (g/hr)		41	52	55		7		366		24	215	
Dilemma Vehicles (#)		4	0	0		0		68		0	68	
Queue Length 50th (ft)		78	71	110		0		297		55	314	
Queue Length 95th (ft)		125	144	#219		29		355		#134	486	
Internal Link Dist (ft)		311			222			506			84	
Turn Bay Length (ft)				150								
Base Capacity (vph)		366	423	223		327		1950		275	2131	
Starvation Cap Reductn		0	0	0		0		0		0	0	
Spillback Cap Reductn		0	0	0		0		0		0	0	
Storage Cap Reductn		0	0	0		0		0		0	0	
Reduced v/c Ratio		0.35	0.57	0.79		0.35		0.76		0.35	0.70	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 27.4		Intersection LOS: C	
Intersection Capacity Utilization 72.4%		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: Long Ridge Rd/Rt 104 & Rt 15 NB off-ramp/Wire Mill Rd

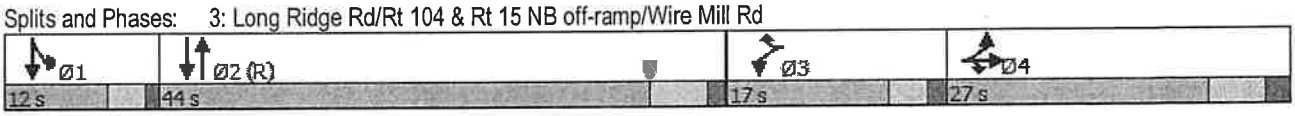


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	22	220	165	0	105	0	1255	116	92	1365	0
Future Volume (vph)	98	22	220	165	0	105	0	1255	116	92	1365	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		1	1		1	0		0	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	0.91	0.91	1.00	0.95	1.00
Frt			0.850			0.850		0.987				
Flt Protected		0.961		0.950						0.950		
Satd. Flow (prot)	0	1790	1583	1770	0	1583	0	5019	0	1770	3539	0
Flt Permitted		0.961		0.950						0.950		
Satd. Flow (perm)	0	1790	1583	1770	0	1583	0	5019	0	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124			147		17				
Link Speed (mph)		40			25			35			35	
Link Distance (ft)		391			302			607			164	
Travel Time (s)		6.7			8.2			11.8			3.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	107	24	239	179	0	114	0	1364	126	100	1484	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	131	239	179	0	114	0	1490	0	100	1484	0
Turn Type	Split	NA	Prot	Prot		Prot		NA		Prot	NA	
Protected Phases	4	4	4	3		3		2		1	1 2	
Permitted Phases												
Detector Phase	4	4	4	3		3		2		1	1 2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0		7.0		25.0		3.0		
Minimum Split (s)	13.5	13.5	13.5	17.0		17.0		31.0		7.0		
Total Split (s)	27.0	27.0	27.0	17.0		17.0		44.0		12.0		
Total Split (%)	27.0%	27.0%	27.0%	17.0%		17.0%		44.0%		12.0%		
Yellow Time (s)	4.4	4.4	4.4	3.0		3.0		4.4		3.0		
All-Red Time (s)	2.1	2.1	2.1	1.4		1.4		1.6		1.0		
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0		
Total Lost Time (s)		6.5	6.5	4.4		4.4		6.0		4.0		
Lead/Lag	Lag	Lag	Lag	Lead		Lead		Lag		Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes		Yes		Yes		
Recall Mode	None	None	None	None		None		C-Min		None		
Act Effct Green (s)		12.9	12.9	12.0		12.0		38.6		15.5	60.1	
Actuated g/C Ratio		0.13	0.13	0.12		0.12		0.39		0.16	0.60	
v/c Ratio		0.57	0.77	0.84		0.36		0.77		0.36	0.70	
Control Delay		49.3	35.6	75.4		6.6		29.8		45.1	17.1	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		49.3	35.6	75.4		6.6		29.8		45.1	17.1	
LOS		D	D	E		A		C		D	B	
Approach Delay		40.5			48.6			29.8			18.8	
Approach LOS		D			D			C			B	
Stops (vph)		110	105	149		8		1145		77	921	
Fuel Used(gal)		3	3	4		0		23		2	13	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
CO Emissions (g/hr)		183	224	247		31		1603		107	929	
NOx Emissions (g/hr)		36	44	48		6		312		21	181	
VOC Emissions (g/hr)		42	52	57		7		372		25	215	
Dilemma Vehicles (#)		5	0	0		0		68		0	68	
Queue Length 50th (ft)		80	71	113		0		298		57	314	
Queue Length 95th (ft)		129	144	#225		29		356		#141	486	
Internal Link Dist (ft)		311			222			527			84	
Turn Bay Length (ft)				150								
Base Capacity (vph)		366	423	223		327		1947		274	2128	
Starvation Cap Reductn		0	0	0		0		0		0	0	
Spillback Cap Reductn		0	0	0		0		0		0	0	
Storage Cap Reductn		0	0	0		0		0		0	0	
Reduced v/c Ratio		0.36	0.57	0.80		0.35		0.77		0.36	0.70	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 27.7		Intersection LOS: C	
Intersection Capacity Utilization 72.6%		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: Long Ridge Rd/Rt 104 & Rt 15 NB off-ramp/Wire Mill Rd



Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Traffic Vol, veh/h	1	224	267	3	2	4
Future Vol, veh/h	1	224	267	3	2	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	243	290	3	2	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	293	0	-	0	537	292
Stage 1	-	-	-	-	292	-
Stage 2	-	-	-	-	245	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1269	-	-	-	505	747
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	796	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1269	-	-	-	504	747
Mov Cap-2 Maneuver	-	-	-	-	504	-
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	796	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1269	-	-	-	644
HCM Lane V/C Ratio	0.001	-	-	-	0.01
HCM Control Delay (s)	7.8	0	-	-	10.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Traffic Vol, veh/h	7	224	267	4	2	7
Future Vol, veh/h	7	224	267	4	2	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	243	290	4	2	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	294	0	-	0	551	292
Stage 1	-	-	-	-	292	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1268	-	-	-	495	747
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	784	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1268	-	-	-	492	747
Mov Cap-2 Maneuver	-	-	-	-	492	-
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	784	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1268	-	-	-	670
HCM Lane V/C Ratio	0.006	-	-	-	0.015
HCM Control Delay (s)	7.9	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	1453	3	0	0
Future Vol, veh/h	0	4	1453	3	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	1579	3	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	791	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	285	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	285	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	285	-
HCM Lane V/C Ratio	-	-	0.015	-
HCM Control Delay (s)	-	-	17.8	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0	-

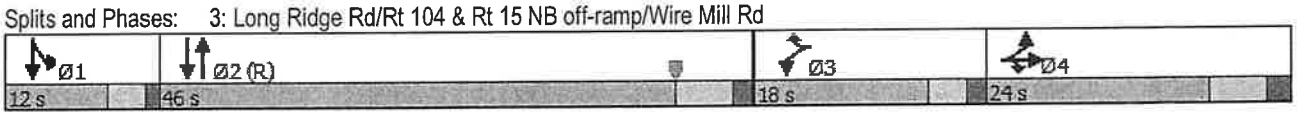
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	145	262	128	0	99	0	1609	121	120	826	0
Future Volume (vph)	150	145	262	128	0	99	0	1609	121	120	826	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		1	1		1	0		0	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	0.91	0.91	1.00	0.95	1.00
Frt			0.850			0.850		0.989				
Flt Protected		0.975		0.950						0.950		
Satd. Flow (prot)	0	1816	1583	1770	0	1583	0	5029	0	1770	3539	0
Flt Permitted		0.975		0.950						0.950		
Satd. Flow (perm)	0	1816	1583	1770	0	1583	0	5029	0	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			158			147		14				
Link Speed (mph)		40			25			35			35	
Link Distance (ft)		391			302			586			164	
Travel Time (s)		6.7			8.2			11.4			3.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	158	285	139	0	108	0	1749	132	130	898	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	321	285	139	0	108	0	1881	0	130	898	0
Turn Type	Split	NA	Prot	Prot		Prot		NA		Prot	NA	
Protected Phases	4	4	4	3		3		2		1	1 2	
Permitted Phases												
Detector Phase	4	4	4	3		3		2		1	1 2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0		7.0		25.0		3.0		
Minimum Split (s)	13.5	13.5	13.5	17.0		17.0		31.0		7.0		
Total Split (s)	24.0	24.0	24.0	18.0		18.0		46.0		12.0		
Total Split (%)	24.0%	24.0%	24.0%	18.0%		18.0%		46.0%		12.0%		
Yellow Time (s)	4.4	4.4	4.4	3.0		3.0		4.4		3.0		
All-Red Time (s)	2.1	2.1	2.1	1.4		1.4		1.6		1.0		
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0		
Total Lost Time (s)		6.5	6.5	4.4		4.4		6.0		4.0		
Lead/Lag	Lag	Lag	Lag	Lead		Lead		Lag		Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes		Yes		Yes		
Recall Mode	None	None	None	None		None		C-Min		None		
Act Effct Green (s)		19.5	19.5	11.3		11.3		40.0		8.3	54.3	
Actuated g/C Ratio		0.20	0.20	0.11		0.11		0.40		0.08	0.54	
v/c Ratio		0.91	0.65	0.69		0.35		0.93		0.89	0.47	
Control Delay		70.8	24.8	60.6		6.0		38.3		98.0	15.1	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		70.8	24.8	60.6		6.0		38.3		98.0	15.1	
LOS		E	C	E		A		D		F	B	
Approach Delay		49.2			36.8			38.3			25.6	
Approach LOS		D			D			D			C	
Stops (vph)		243	113	122		6		1535		100	483	
Fuel Used(gal)		7	3	2		0		32		3	7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
CO Emissions (g/hr)		519	219	166		28		2262		230	500	
NOx Emissions (g/hr)		101	43	32		5		440		45	97	
VOC Emissions (g/hr)		120	51	39		6		524		53	116	
Dilemma Vehicles (#)		12	0	0		0		85		0	41	
Queue Length 50th (ft)		203	73	86		0		409		84	176	
Queue Length 95th (ft)		#386	169	148		25		#520		#198	225	
Internal Link Dist (ft)		311			222			506			84	
Turn Bay Length (ft)				150								
Base Capacity (vph)		354	436	240		342		2020		146	1920	
Starvation Cap Reductn		0	0	0		0		0		0	0	
Spillback Cap Reductn		0	0	0		0		0		0	0	
Storage Cap Reductn		0	0	0		0		0		0	0	
Reduced v/c Ratio		0.91	0.65	0.58		0.32		0.93		0.89	0.47	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 36.5 Intersection LOS: D
Intersection Capacity Utilization 80.5% 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: Long Ridge Rd/Rt 104 & Rt 15 NB off-ramp/Wire Mill Rd

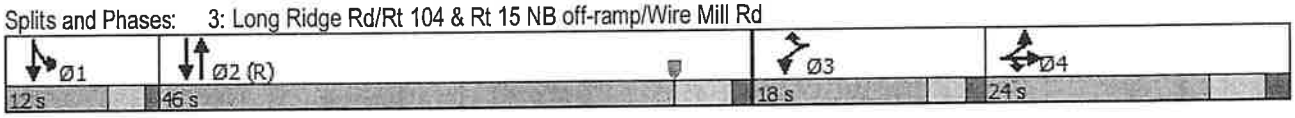


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	146	262	132	0	99	0	1611	122	122	826	0
Future Volume (vph)	151	146	262	132	0	99	0	1611	122	122	826	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		1	1		1	0		0	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	0.91	0.91	1.00	0.95	1.00
Frt			0.850			0.850		0.989				
Flt Protected		0.975		0.950						0.950		
Satd. Flow (prot)	0	1816	1583	1770	0	1583	0	5029	0	1770	3539	0
Flt Permitted		0.975		0.950						0.950		
Satd. Flow (perm)	0	1816	1583	1770	0	1583	0	5029	0	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			156			147		14				
Link Speed (mph)		40			25			35			35	
Link Distance (ft)		391			302			607			164	
Travel Time (s)		6.7			8.2			11.8			3.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	159	285	143	0	108	0	1751	133	133	898	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	323	285	143	0	108	0	1884	0	133	898	0
Turn Type	Split	NA	Prot	Prot		Prot		NA		Prot	NA	
Protected Phases	4	4	4	3		3		2		1	1 2	
Permitted Phases												
Detector Phase	4	4	4	3		3		2		1	1 2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0		7.0		25.0		3.0		
Minimum Split (s)	13.5	13.5	13.5	17.0		17.0		31.0		7.0		
Total Split (s)	24.0	24.0	24.0	18.0		18.0		46.0		12.0		
Total Split (%)	24.0%	24.0%	24.0%	18.0%		18.0%		46.0%		12.0%		
Yellow Time (s)	4.4	4.4	4.4	3.0		3.0		4.4		3.0		
All-Red Time (s)	2.1	2.1	2.1	1.4		1.4		1.6		1.0		
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0		
Total Lost Time (s)		6.5	6.5	4.4		4.4		6.0		4.0		
Lead/Lag	Lag	Lag	Lag	Lead		Lead		Lag		Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes		Yes		Yes		
Recall Mode	None	None	None	None		None		C-Min		None		
Act Effct Green (s)		19.6	19.6	11.4		11.4		40.0		8.1	54.1	
Actuated g/C Ratio		0.20	0.20	0.11		0.11		0.40		0.08	0.54	
v/c Ratio		0.91	0.66	0.71		0.35		0.93		0.93	0.47	
Control Delay		71.5	25.2	61.3		6.0		38.4		106.7	15.2	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		71.5	25.2	61.3		6.0		38.4		106.7	15.2	
LOS		E	C	E		A		D		F	B	
Approach Delay		49.8			37.5			38.4			27.0	
Approach LOS		D			D			D			C	
Stops (vph)		245	116	124		6		1537		101	484	
Fuel Used(gal)		8	3	2		0		33		4	7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
CO Emissions (g/hr)		525	222	172		28		2287		248	501	
NOx Emissions (g/hr)		102	43	34		5		445		48	97	
VOC Emissions (g/hr)		122	51	40		6		530		58	116	
Dilemma Vehicles (#)		13	0	0		0		85		0	41	
Queue Length 50th (ft)		205	74	88		0		410		86	176	
Queue Length 95th (ft)		#388	#172	151		25		#521		#202	225	
Internal Link Dist (ft)		311			222			527			84	
Turn Bay Length (ft)				150								
Base Capacity (vph)		355	434	240		342		2020		143	1914	
Starvation Cap Reductn		0	0	0		0		0		0	0	
Spillback Cap Reductn		0	0	0		0		0		0	0	
Storage Cap Reductn		0	0	0		0		0		0	0	
Reduced v/c Ratio		0.91	0.66	0.60		0.32		0.93		0.93	0.47	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 37.1		Intersection LOS: D	
Intersection Capacity Utilization 81.0%		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: Long Ridge Rd/Rt 104 & Rt 15 NB off-ramp/Wire Mill Rd



Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	386	227	0	0	1
Future Vol, veh/h	1	386	227	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	420	247	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	247	0	-	0	669	247
Stage 1	-	-	-	-	247	-
Stage 2	-	-	-	-	422	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1319	-	-	-	423	792
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1319	-	-	-	423	792
Mov Cap-2 Maneuver	-	-	-	-	423	-
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	662	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1319	-	-	-	792
HCM Lane V/C Ratio	0.001	-	-	-	0.001
HCM Control Delay (s)	7.7	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	
Traffic Vol, veh/h	4	386	227	1	1	5
Future Vol, veh/h	4	386	227	1	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	420	247	1	1	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	248	0	-	0	676	248
Stage 1	-	-	-	-	248	-
Stage 2	-	-	-	-	428	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1318	-	-	-	419	791
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	657	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1318	-	-	-	417	791
Mov Cap-2 Maneuver	-	-	-	-	417	-
Stage 1	-	-	-	-	790	-
Stage 2	-	-	-	-	657	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1318	-	-	-	688
HCM Lane V/C Ratio	0.003	-	-	-	0.009
HCM Control Delay (s)	7.7	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	7	1859	2	0	0
Future Vol, veh/h	0	7	1859	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	8	2021	2	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1012	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	204	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	204	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	204	-
HCM Lane V/C Ratio	-	-	0.037	-
HCM Control Delay (s)	-	-	23.3	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.1	-

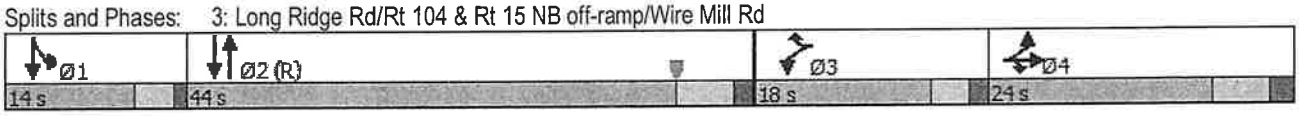
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	145	262	128	0	99	0	1609	121	120	826	0
Future Volume (vph)	150	145	262	128	0	99	0	1609	121	120	826	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		1	1		1	0		0	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	0.91	0.91	1.00	0.95	1.00
Frt			0.850			0.850		0.989				
Flt Protected		0.975		0.950						0.950		
Satd. Flow (prot)	0	1816	1583	1770	0	1583	0	5029	0	1770	3539	0
Flt Permitted		0.975		0.950						0.950		
Satd. Flow (perm)	0	1816	1583	1770	0	1583	0	5029	0	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			158			147		14				
Link Speed (mph)		40			25			35			35	
Link Distance (ft)		391			302			586			164	
Travel Time (s)		6.7			8.2			11.4			3.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	158	285	139	0	108	0	1749	132	130	898	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	321	285	139	0	108	0	1881	0	130	898	0
Turn Type	Split	NA	Prot	Prot		Prot		NA		Prot	NA	
Protected Phases	4	4	4	3		3		2		1	1 2	
Permitted Phases												
Detector Phase	4	4	4	3		3		2		1	1 2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0		7.0		25.0		3.0		
Minimum Split (s)	13.5	13.5	13.5	17.0		17.0		31.0		7.0		
Total Split (s)	24.0	24.0	24.0	18.0		18.0		44.0		14.0		
Total Split (%)	24.0%	24.0%	24.0%	18.0%		18.0%		44.0%		14.0%		
Yellow Time (s)	4.4	4.4	4.4	3.0		3.0		4.4		3.0		
All-Red Time (s)	2.1	2.1	2.1	1.4		1.4		1.6		1.0		
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0		
Total Lost Time (s)		6.5	6.5	4.4		4.4		6.0		4.0		
Lead/Lag	Lag	Lag	Lag	Lead		Lead		Lag		Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes		Yes		Yes		
Recall Mode	None	None	None	None		None		C-Min		None		
Act Effct Green (s)		19.5	19.5	11.3		11.3		38.0		10.3	54.3	
Actuated g/C Ratio		0.20	0.20	0.11		0.11		0.38		0.10	0.54	
v/c Ratio		0.91	0.65	0.69		0.35		0.98		0.71	0.47	
Control Delay		70.8	24.8	60.6		6.0		47.4		66.4	15.1	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		70.8	24.8	60.6		6.0		47.4		66.4	15.1	
LOS		E	C	E		A		D		E	B	
Approach Delay		49.2			36.8			47.4			21.6	
Approach LOS		D			D			D			C	
Stops (vph)		243	113	122		6		1535		106	483	
Fuel Used(gal)		7	3	2		0		36		3	7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
CO Emissions (g/hr)		519	219	166		28		2487		179	500	
NOx Emissions (g/hr)		101	43	32		5		484		35	97	
VOC Emissions (g/hr)		120	51	39		6		576		41	116	
Dilemma Vehicles (#)		12	0	0		0		83		0	41	
Queue Length 50th (ft)		203	73	86		0		424		82	176	
Queue Length 95th (ft)		#386	169	148		25		#545		#174	225	
Internal Link Dist (ft)		311			222			506			84	
Turn Bay Length (ft)				150								
Base Capacity (vph)		354	436	240		342		1919		182	1920	
Starvation Cap Reductn		0	0	0		0		0		0	0	
Spillback Cap Reductn		0	0	0		0		0		0	0	
Storage Cap Reductn		0	0	0		0		0		0	0	
Reduced v/c Ratio		0.91	0.65	0.58		0.32		0.98		0.71	0.47	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 39.9		Intersection LOS: D	
Intersection Capacity Utilization 80.5%		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: Long Ridge Rd/Rt 104 & Rt 15 NB off-ramp/Wire Mill Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	146	262	132	0	99	0	1611	122	122	826	0
Future Volume (vph)	151	146	262	132	0	99	0	1611	122	122	826	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		1	1		1	0		0	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	0.91	0.91	1.00	0.95	1.00
Frt			0.850			0.850		0.989				
Flt Protected		0.975		0.950						0.950		
Satd. Flow (prot)	0	1816	1583	1770	0	1583	0	5029	0	1770	3539	0
Flt Permitted		0.975		0.950						0.950		
Satd. Flow (perm)	0	1816	1583	1770	0	1583	0	5029	0	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			156			147		14				
Link Speed (mph)		40			25			35			35	
Link Distance (ft)		391			302			607			164	
Travel Time (s)		6.7			8.2			11.8			3.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	159	285	143	0	108	0	1751	133	133	898	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	323	285	143	0	108	0	1884	0	133	898	0
Turn Type	Split	NA	Prot	Prot		Prot		NA		Prot	NA	
Protected Phases	4	4	4	3		3		2		1	1 2	
Permitted Phases												
Detector Phase	4	4	4	3		3		2		1	1 2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0		7.0		25.0		3.0		
Minimum Split (s)	13.5	13.5	13.5	17.0		17.0		31.0		7.0		
Total Split (s)	24.0	24.0	24.0	18.0		18.0		44.0		14.0		
Total Split (%)	24.0%	24.0%	24.0%	18.0%		18.0%		44.0%		14.0%		
Yellow Time (s)	4.4	4.4	4.4	3.0		3.0		4.4		3.0		
All-Red Time (s)	2.1	2.1	2.1	1.4		1.4		1.6		1.0		
Lost Time Adjust (s)		0.0	0.0	0.0		0.0		0.0		0.0		
Total Lost Time (s)		6.5	6.5	4.4		4.4		6.0		4.0		
Lead/Lag	Lag	Lag	Lag	Lead		Lead		Lag		Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes		Yes		Yes		
Recall Mode	None	None	None	None		None		C-Min		None		
Act Effct Green (s)		19.6	19.6	11.4		11.4		38.0		10.1	54.1	
Actuated g/C Ratio		0.20	0.20	0.11		0.11		0.38		0.10	0.54	
v/c Ratio		0.91	0.66	0.71		0.35		0.98		0.74	0.47	
Control Delay		71.5	25.2	61.3		6.0		47.7		69.4	15.2	
Queue Delay		0.0	0.0	0.0		0.0		0.0		0.0	0.0	
Total Delay		71.5	25.2	61.3		6.0		47.7		69.4	15.2	
LOS		E	C	E		A		D		E	B	
Approach Delay		49.8			37.5			47.7			22.2	
Approach LOS		D			D			D			C	
Stops (vph)		245	116	124		6		1537		109	484	
Fuel Used(gal)		8	3	2		0		36		3	7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
CO Emissions (g/hr)		525	222	172		28		2516		188	501	
NOx Emissions (g/hr)		102	43	34		5		490		37	97	
VOC Emissions (g/hr)		122	51	40		6		583		44	116	
Dilemma Vehicles (#)		13	0	0		0		83		0	41	
Queue Length 50th (ft)		205	74	88		0		426		84	176	
Queue Length 95th (ft)		#388	#172	151		25		#547		#178	225	
Internal Link Dist (ft)		311			222			527			84	
Turn Bay Length (ft)				150								
Base Capacity (vph)		355	434	240		342		1919		179	1914	
Starvation Cap Reductn		0	0	0		0		0		0	0	
Spillback Cap Reductn		0	0	0		0		0		0	0	
Storage Cap Reductn		0	0	0		0		0		0	0	
Reduced v/c Ratio		0.91	0.66	0.60		0.32		0.98		0.74	0.47	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 40.4		Intersection LOS: D	
Intersection Capacity Utilization 81.0%		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: Long Ridge Rd/Rt 104 & Rt 15 NB off-ramp/Wire Mill Rd