

Traffic Impact Study
4600 N. Marine Drive Residential Development
Chicago, Illinois



Prepared For:

LINCOLN
PROPERTY
COMPANY

KLOA
Kenig, Lindgren, O'Hara, Aboona, Inc.

May 28, 2021

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I. Executive Summary

This report summarizes the results of a traffic impact study conducted by Kenig, Lindgren, O'Hara, Aboona, Inc. (KLOA, Inc.) for the proposed residential development to be located at 4600 Marine Drive in Chicago, Illinois. The objectives of the traffic study are as follows:

- Determine the existing vehicular, pedestrian, bicycle, and public transportation conditions in the study area to establish a base condition.
- Assess the impact that the proposed development will have on transportation conditions in the area.
- Determine any street, access, bicycle, and pedestrian modifications and/or improvements that will be necessary to effectively accommodate and mitigate future conditions.

Vehicle, pedestrian, and bicycle counts were conducted during the weekday morning and weekday evening peak periods at the intersections of Wilson Avenue with the Lake Shore Drive ramps, Wilson Avenue with Marine Drive, Wilson Avenue with Clarendon Avenue, Wilson Avenue with Sheridan Road, Clarendon Avenue with Eastwood Avenue, Clarendon Avenue with Lawrence Avenue, and Clarendon Avenue with Montrose Avenue.

As proposed, the site (which is currently occupied by a surface parking lot) will be redeveloped with a twelve-story residential building providing approximately 314 residential units and 136 parking spaces. Access to the parking garage will be provided via a proposed access drive off Clarendon Avenue while access to the loading area will be provided off the Weiss Memorial Service Drive.

Based on the preceding analyses and recommendations, the following conclusions have been made:

- Given the location of the site within an urban area and its proximity to alternative modes of transportation, the number of generated trips will be reduced.
- The volume of traffic estimated to be generated by the proposed development will consist of approximately two percent of the total traffic traversing the intersection of Wilson Avenue with Clarendon Avenue.
- As part of the proposed development, a full access drive will be provided on Clarendon Avenue.
- Truck loading for the development will occur on-site via two loading bays located on the north side of the building. Access to the loading bays will be provided via the east-west service drive connecting Clarendon Avenue to Marine Drive which serves Weiss Memorial Hospital.

- While within the loading dock, trucks will not be within the influence of the service drive and will not block or impede its operations.
- Consideration should be given to providing a CTA transit information kiosk within the lobby in order to further encourage public transit use.

DRAFT

1. Introduction

This report summarizes the results of a traffic impact study conducted by Kenig, Lindgren, O'Hara, Aboona, Inc. (KLOA, Inc.) for the proposed residential development located at 4600 Marine Drive in Chicago, Illinois.

As proposed, the site (which is occupied by a surface parking lot) will be redeveloped with a 12-story residential building providing 314 units and a parking garage with 136 parking spaces. Access to the parking garage will be provided via a single access drive off Clarendon Avenue.

The purpose of this study was to examine existing traffic conditions, assess the impact that the proposed development will have on traffic conditions in the area, and determine recommendations to mitigate any impacts and enhance the area's streets and alternative modes of transportation.

Figure 1 shows the location of the site in relation to the area street system. **Figure 2** shows an aerial view of the site.

The sections of this report present the following:

- Existing street conditions
- A description of the proposed development
- Directional distribution of the development traffic
- Vehicle trip generation for the development
- Future traffic conditions including access to the development
- Traffic analyses for the weekday morning and weekday evening peak hours
- Evaluation and recommendations with respect to adequacy of the site access, on-site circulation, and adjacent street system.

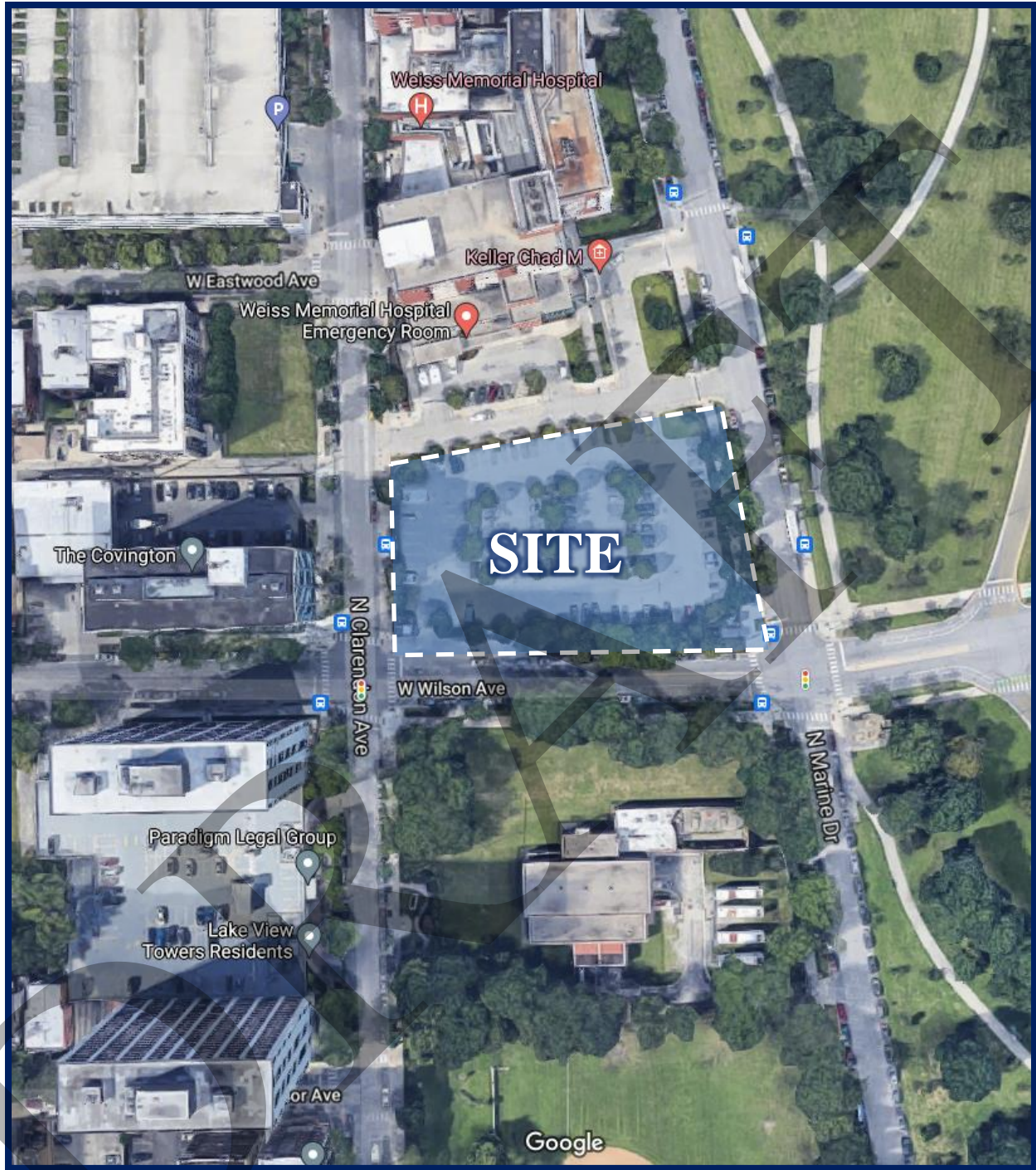
Traffic capacity analyses were conducted for the weekday morning and weekday evening peak hours for the following conditions:

1. Existing Conditions - Analyze the capacity of the existing street system using existing peak hour traffic volumes in the surrounding area.
2. Projected Conditions – Analyze the capacity of the future street system using the projected traffic volumes that include the existing traffic volumes, background development traffic growth, and the traffic estimated to be generated by the proposed development.



Site Location

Figure 1



Aerial View of Site

Figure 2

2. Existing Conditions

Existing transportation conditions in the vicinity of the site were documented based on field visits conducted by KLOA, Inc. in order to obtain a database for projecting future conditions. The following provides a description of the geographical location of the site, physical characteristics of the area street system including lane usage and traffic control devices, and existing peak hour traffic volumes.

Site Location

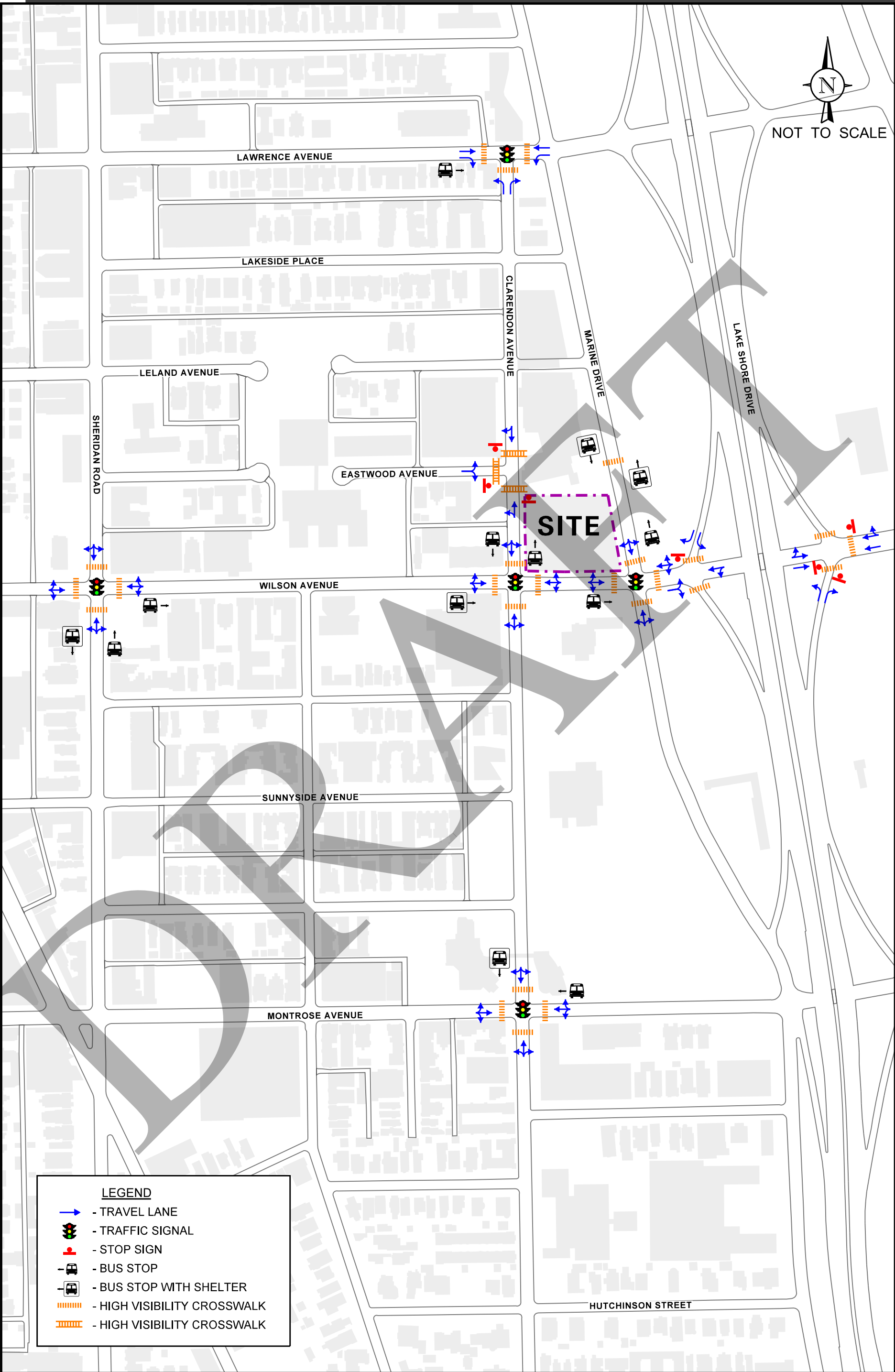
The site located on the north side of Wilson Avenue between Marine Drive and Clarendon Avenue and is boarded by an east-west service drive on the north. The site currently contains a surface parking lot that formally provided permit parking for Weiss Memorial Hospital. Land uses in the vicinity of the site are primarily recreational open space to the east and south, residential/institutional to the west and includes the Weiss Memorial Hospital to the north.

Existing Street System Characteristics

The characteristics of the existing streets near the development are described below and illustrated in **Figure 3**. All streets are under the jurisdiction of the Chicago Department of Transportation (CDOT) unless otherwise noted.

Wilson Avenue is an east-west major collector street that provides one travel lane in each direction. At its signalized intersections with Clarendon Avenue, Marine Drive, and Sheridan Road, Wilson Avenue provides a shared left/through/right-turn lane. At its unsignalized intersection with the Lake Shore Drive southbound ramps, Wilson Avenue provides a shared through/right-turn lane on the eastbound approach and a shared left-turn/through and an exclusive through lane on the westbound approach. At its all-way stop sign controlled intersection with the Lake Shore Drive northbound ramps, Wilson Avenue provides a shared left-turn/through and an exclusive through lane on the eastbound approach and an exclusive through lane and a shared through/right-turn lane on the westbound approach. Parking is prohibited within the vicinity of the Lake Shore Drive Ramps, is permitted on the south side of the street between Marine Drive and Clarendon Avenue and is permitted on both sides of the street west of Clarendon Avenue. Wilson Avenue carries an AADT volume of 10,400 vehicles (IDOT AADT 2018).

Clarendon Avenue is a north-south minor collector street that provides one lane in each direction. At its signalized intersection with Wilson Avenue, Clarendon Avenue provides a shared left/through/right-turn lane on the northbound and southbound approaches. At its signalized intersection with Lawrence Avenue, Clarendon Avenue provides an exclusive left-turn lane and an exclusive right-turn lane on the northbound approach. At its signalized intersection with Montrose Avenue, Clarendon Avenue provides a shared left/through/right-turn lane on the northbound and southbound approaches. At its all-way stop sign controlled intersection with Eastwood Avenue, Clarendon Avenue provides a shared left-turn/through lane on the northbound approach and a shared through/right-turn lane on the southbound approach.



At its unsignalized intersection with the Weiss Memorial Hospital service drive, Clarendon Avenue provides a shared through/right-turn lane on the northbound approach and a shared left-turn/through lane on the southbound approach. Parking is generally permitted on both sides of the street. Clarendon Avenue carries an AADT volume of 3,400 vehicles (IDOT AADT 2018).

Marine Drive is a north-south major collector street that provides one lane in each direction. At its signalized intersection with Wilson Avenue, Marine Drive provides a shared left/through/right-turn lane on the northbound and southbound approaches. At its unsignalized intersection with the Weiss Memorial Hospital service drive, Marine Drive provides a shared left-turn/through lane on the northbound approach and a shared through/right-turn lane on the southbound approach. Parking is generally permitted on both sides of the street. Marine Drive carries an Average Annual Daily Traffic (AADT) volume of 2,400 vehicles (IDOT AADT 2018).

Lake Shore Drive is a north-south other principal arterial street that operates as a freeway in the vicinity of the site and provides four travel lanes in each direction. As previously discussed, the southbound off-ramp is under stop-sign control at its intersection with Wilson Avenue and the northbound off ramp has an all-way stop sign controlled intersection with Wilson Avenue. Lake Shore Drive is under the jurisdiction of the Illinois Department of Transportation (IDOT) and carries an AADT volume of 113,800 vehicles (IDOT AADT 2019).

Montrose Avenue is an east-west major collector street that in the vicinity of site provides one travel lane in each direction. At its signalized intersection with Clarendon Avenue, Montrose Avenue provides a shared left/through/right-turn lane on the eastbound and westbound approaches. Parking is generally permitted on both sides of the street. Montrose Avenue carries an AADT volume of 13,400 vehicles (IDOT AADT 2018).

Lawrence Avenue is an east-west arterial street that in the vicinity of the site provides one travel lane in each direction. At its signalized intersection with Clarendon Avenue, Lawrence Avenue provides a shared through/right-turn lane on the eastbound approach, and a shared left-turn/through lane and an exclusive through lane on the westbound approach. Parking is generally permitted on both sides of the street, west of Clarendon Avenue. Lawrence Avenue is under the jurisdiction of IDOT and carries an AADT volume of 12,100 vehicles (IDOT AADT 2018).

Sheridan Road is a north-south major collector street that in the vicinity of the site provides one travel lane in each direction. At its signalized intersection with Wilson Avenue, Sheridan Road provides a shared left/through/right-turn lane on the northbound and southbound approaches. Parking is generally permitted on both sides of the street. Sheridan Road carries an AADT volume of 7,700 vehicles (IDOT AADT 2018).

Eastwood Avenue is an east-west local road that provides one travel lane in each direction. Within the vicinity of the site, Eastwood Avenue extends from Clarendon Avenue west to its terminus 525 to the west at Uplift Community High School. At its all-way stop sign controlled intersection with Clarendon Avenue, Eastwood Avenue provides a shared left/right-turn lane. Parking is generally permitted on both sides of the street.

Lake Shore Drive Improvement Study

It should be noted that Lake Shore Drive within the vicinity of the site is part of the North Lake Shore Drive Improvement Study being conducted by IDOT and CDOT. As part of this study, the existing ramps at Wilson Avenue and Montrose Avenue will be modified as follows:

- The southbound entrance and exit ramps at Wilson Avenue and Montrose Avenue will be consolidated to provide a single signalized intersection located on Marine Drive, midblock between Wilson Avenue and Montrose Avenue.
- The northbound exit ramp at Wilson Avenue will remain, however, the exit ramp will be combined with the Montrose Avenue exit ramp and will be a frontage road along Lake Shore Drive connecting Montrose Avenue to Wilson Avenue.
- The northbound entrance ramp at Wilson Avenue will be eliminated. Vehicles traveling north on Lake Shore Drive will be able to do so at Lawrence Avenue or Montrose Avenue.

The Lake Shore Drive Improvement Study is still in the Phase I engineering phase. Additional information pertaining to the study can be found on the northlakeshoredrive.org website.

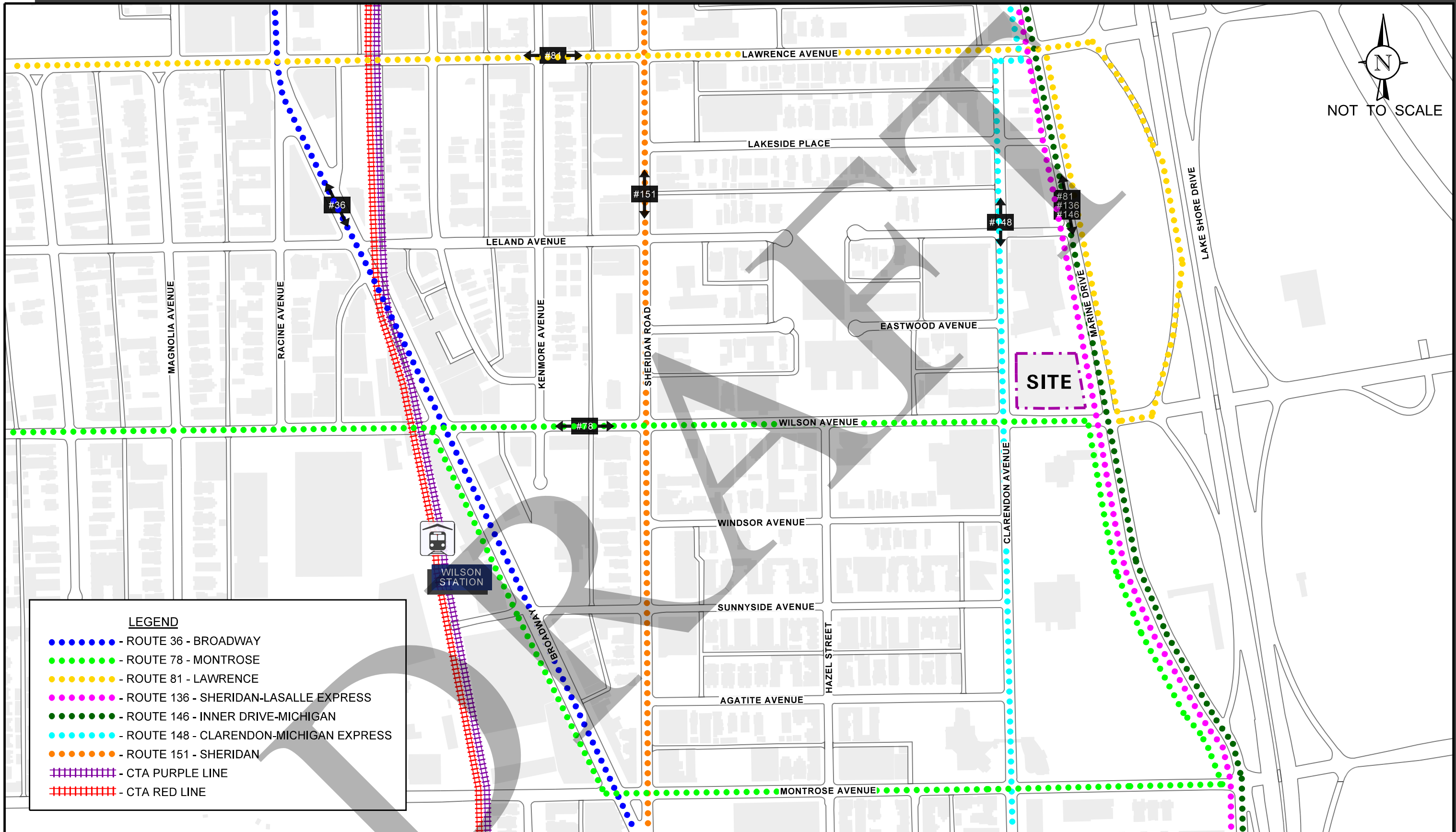
Public Transportation

The public transportation serving the area is summarized below and illustrated in **Figure 4**.

CTA Rapid Transit. The area is served by the Chicago Transit Authority (CTA) rapid transit via the Wilson Purple/Red Line station located 2,150 feet (less than one-half of a mile) to the west of the site. The following is a description of each rapid transit line:

- The CTA Red Line operates 24 hours a day, seven days a week between Howard Street and the 95th/Dan Ryan station located along the Dan Ryan Expressway at 95th Street. Additional service is provided via the Green Line tracks between the Cermak-McCormick Place station and the Ashland/63rd station during rush periods only.
- The CTA Purple Line operates between Linden Avenue (in Wilmette) and Howard Street (in Chicago) via Evanston. Additionally, the Purple Express Line, which serves the stop at Chicago Avenue, runs during weekday rush-periods between the Howard Station and the downtown Loop.

It should be noted that according to the Transit Friendly Development Guide produced in part by CDOT and the CTA, the area surrounding the Wilson Purple/Red Line Station is considered a Major Activity Center (MC). This classification describes station areas which are intended to be developed at a significant density that supports and provides services for the region and nearby neighborhoods. These areas often provide a balance of residential, retail, and employment uses.



LEGEND

- - ROUTE 36 - BROADWAY
- - ROUTE 78 - MONTROSE
- - ROUTE 81 - LAWRENCE
- - ROUTE 136 - SHERIDAN-LASALLE EXPRESS
- - ROUTE 146 - INNER DRIVE-MICHIGAN
- - ROUTE 148 - CLARENDON-MICHIGAN EXPRESS
- - ROUTE 151 - SHERIDAN
- ||||| - CTA PURPLE LINE
- ||||| - CTA RED LINE

PROPOSED XXX
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CHICAGO, ILLINOIS

EXISTING TRAFFIC VOLUMES

CTA Bus Routes. The area is also served by the following bus routes, all of which have bus stops within a few blocks of the site:

Route 36 (Broadway) generally operates along State Street, North Broadway, and Clark Street from Loyola University to Congress Parkway. Notable stops include Lincoln Park Zoo, the Chicago History Museum, and the Main Post Office. Service is provided seven days a week, including holidays.

Route 78 (Montrose) operates along Montrose Avenue from Harlem Avenue to just before Lake Shore Drive. Summer service includes an additional stop at Montrose Beach. Notable stops include Truman College, the Montrose Blue Line Station, Wright College, and Chicago Read Hospital. Service is provided seven days a week, including holidays.

Route 81 (Lawrence) generally operates along Lawrence Avenue from Milwaukee Avenue to Marine Drive. It provides service at all times seven days a week with notable stops at Blue, Brown, and Red Line stations and the Ravenswood Metra Station.

Route 136 (Sheridan/LaSalle Express) generally provides service along LaSalle Street and Sheridan Road from Devon Avenue to Jackson Boulevard. No stops are provided between its stops at the intersections of Columbus Drive with Wacker Drive and Marine Drive with Bittersweet Place. Service is only provided on the weekdays, with southbound service only provided in the morning (approximately 5:45 A.M. to 9:50 A.M.) and only northbound service provided in the evening (approximately 3:35 P.M. to 7:30 P.M.).

Route 146 (Inner Drive/Michigan Express) generally runs between Berwyn Avenue and the Museum Campus along Lake Shore Drive, Michigan Avenue, and State Street. No stops are provided between the intersections of Michigan Avenue with Delaware Place and Lake Shore Drive with Belmont Avenue. Service is provided on the weekdays from approximately 6:00 A.M. to 11:30 P.M. Earlier weekend service starting at 5:15 A.M. is also provided.

Route 148 (Clarendon/Michigan Express) provides north-south service from Foster Avenue to Harrison Street primarily along Michigan Avenue, Lake Shore Drive, Clarendon Avenue, and Marine Drive. Service is provided from approximately 6:00 A.M. to 11:00 P.M.

Route 151 (Sheridan) generally operates in a north-south orientation providing service to Loyola University, Howard Terminal (Red-Purple-Yellow lines), Sheridan Station Red Line, Lincoln Park Zoo, Millennium Park, and Union Station. Service is provided seven days a week, including holidays.

Alternative Modes of Transportation

The alternate modes of transportation serving the area are summarized below:

Pedestrian Accommodations. Sidewalks are located on both sides of all streets except for along the east side of Marine Drive. However, the east side of Marine Drive is open space that provides pedestrian paths and bicycle paths throughout. Furthermore, high-visibility crosswalks are provided at all of the study intersections and pedestrian countdown signals are provided at all of the study area signalized intersections.

Bike Facilities. Within the vicinity of the study area, exclusive bike lanes/buffer protected bike lanes are provided on Wilson Avenue west of Lake Shore drive and “Sharrows” are provided on Clarendon Avenue, Lawrence Avenue and Marine Drive. According to the City of Chicago’s *Streets for Cycling Plan 2020*, the following streets in the area are designated as future bike routes:

- Spoke Route
 - Clark Street
- Crosstown Bike Route
 - Lawrence Avenue
 - North Broadway
- Neighborhood Bike Route
 - Wilson Avenue
 - Clarendon Avenue (south of Wilson Avenue)
 - Leland Avenue
 - Marine Drive (between Leland Avenue and Lawrence Avenue)
 - Kenmore Avenue (north of Leland Avenue)
 - Winthrop Avenue (north of Leland Avenue)

Furthermore, the Lakefront Trail is located less than 700 feet east of the site.

Mode-Sharing Transportation Availability. A number of Divvy bike sharing stations are located in the vicinity of the site with the closest station located on the east side of Clarendon Avenue, south of Lakeside Place which provides 15 docks. Additional stations are located on the south side of Wilson Avenue at the Lakefront Trail (13 docks), the southeast corner of the intersection of Clarendon Avenue with Junior Terrace (23 docks), and at the Wilson Purple/Red Line Station (23 docks).

Existing Traffic Volumes

In order to determine current vehicle, pedestrian, and bicycle conditions within the study area, KLOA, Inc. utilized peak period traffic, pedestrian, and bicycle counts conducted utilizing Miovision Scout Video Collection Units for the following intersections:

- Wilson Avenue with Clarendon Avenue
- Wilson Avenue with Marine Drive
- Wilson Avenue with Lake Shore Drive Northbound Ramps
- Wilson Avenue with Lake Shore Drive Southbound Ramps
- Wilson Avenue with Sheridan Road
- Clarendon Avenue with Lawrence Avenue
- Clarendon Avenue with Eastwood Avenue
- Clarendon Avenue with East-West Service Drive
- Marine Drive with East-West Service Drive

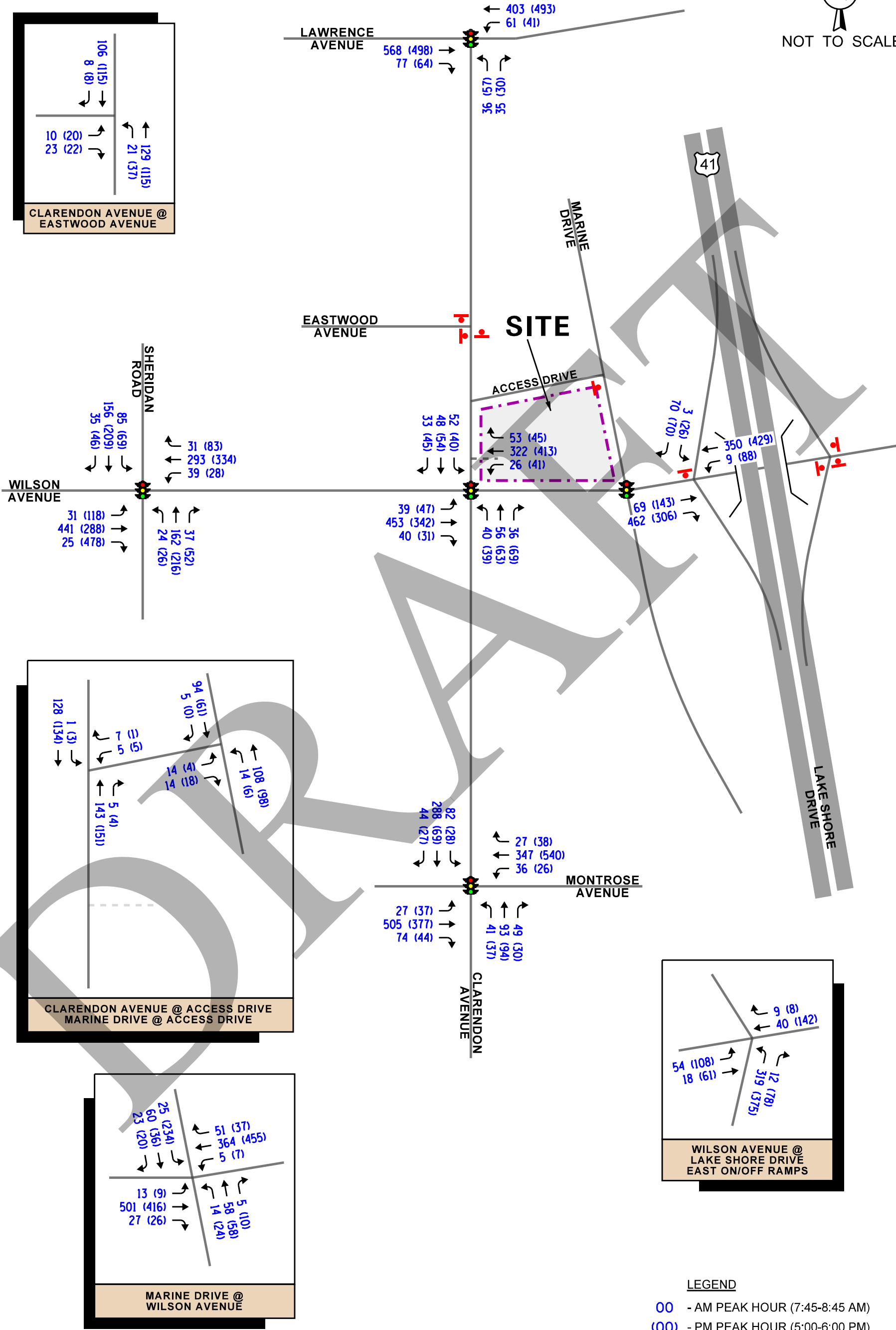
The counts were conducted in May 2021 during the weekday morning (7:00 A.M. to 9:00 A.M.) and weekday evening (4:00 P.M. to 6:00 P.M.). The results of the traffic counts show that the weekday morning peak hour generally occurs between 7:45 A.M. and 8:45 A.M., the weekday evening peak hour generally occurs between 5:00 P.M. to 6:00 P.M. These counts were supplemented with counts previously conducted by KLOA, Inc. at the intersections of Clarendon Avenue with Montrose Avenue and Wilson Avenue with Sheridan Road.

Due to the ongoing COVID-19 pandemic, it is anticipated that traffic volumes within the area are not reflective of typical conditions. As such, the Year 2021 traffic counts were increased by approximately 30 to 50 percent during the weekday morning peak hour and between 10 to 35 percent during the weekday evening peak hour. These adjustments were based on a comparison with traffic counts previously conducted by KLOA, Inc. in the area and based on IDOT's AADT volumes available for the street segments within the study area.

Figure 5 illustrates the Year 2021 base traffic volumes. **Figure 6** illustrates the existing pedestrian and bicycle volumes.

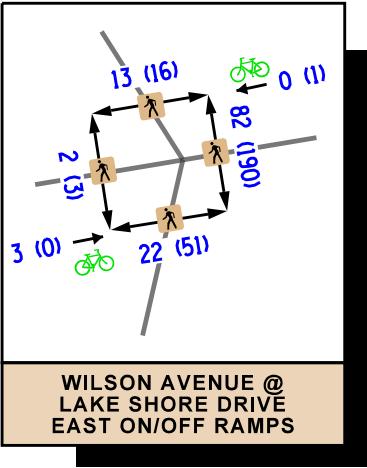
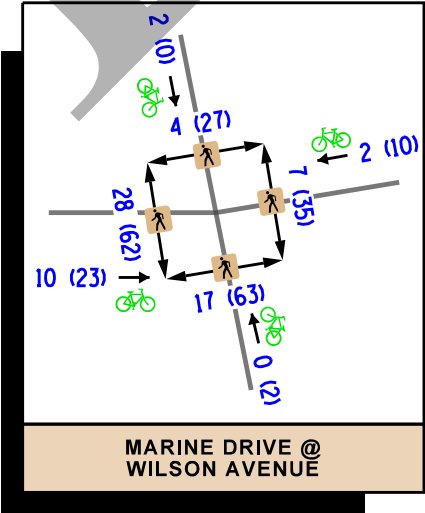
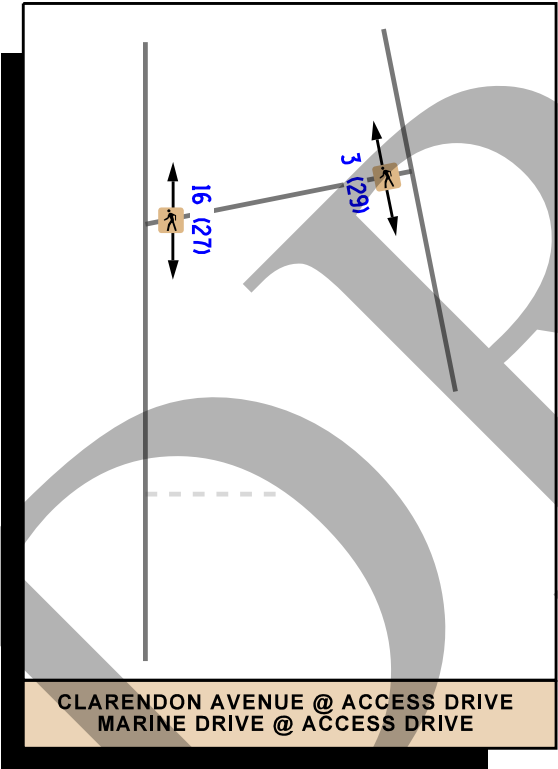
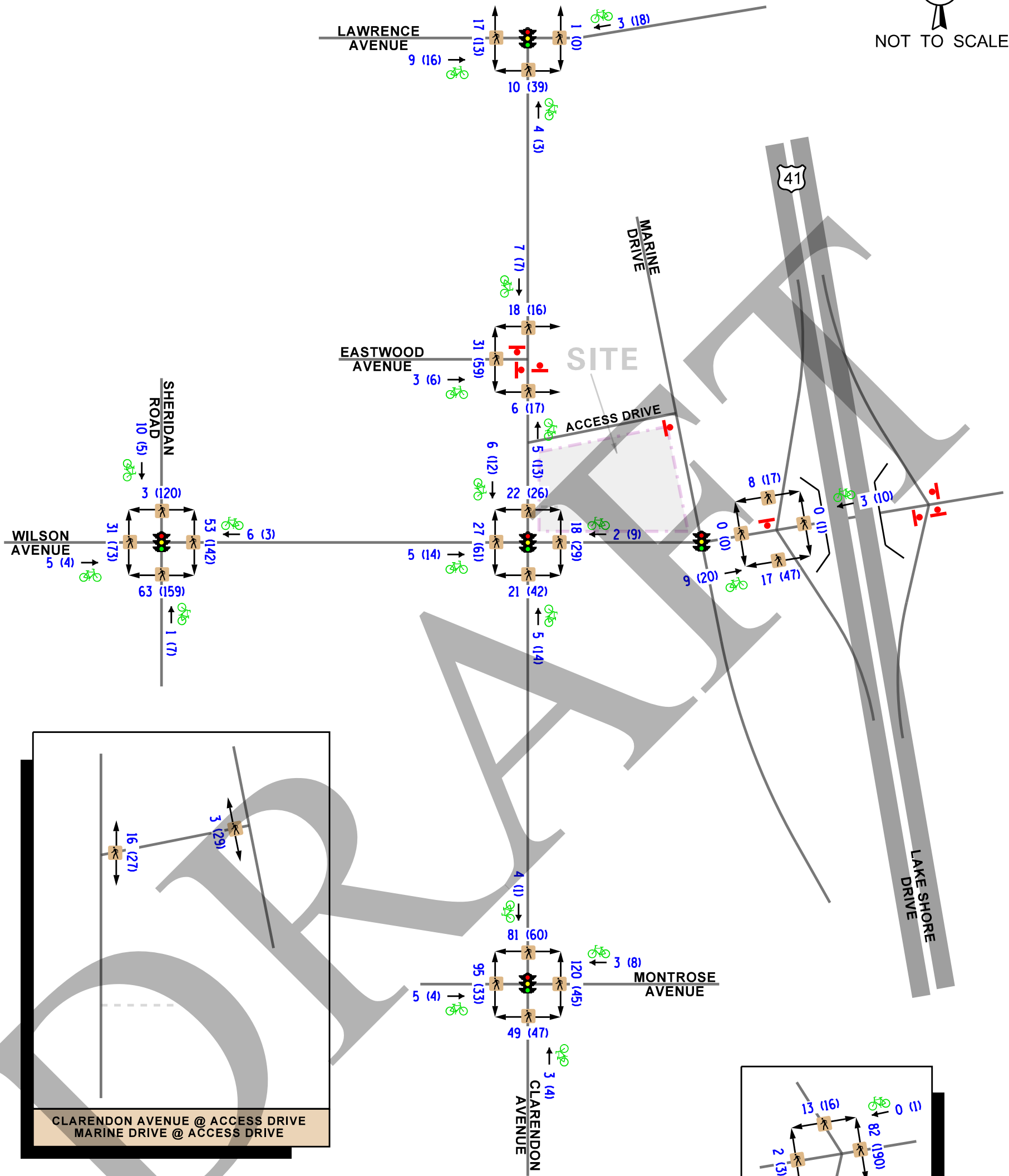


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NOT TO SCALE



LEGEND

- 00 - AM PEAK HOUR (8:00-9:00 AM)
- (00) - PM PEAK HOUR (5:00-6:00 PM)
- 00 (00) - PEDESTRIAN VOLUME
- 00 (00) - BICYCLE VOLUME

3. Traffic Characteristics of the Proposed Development

In order to properly evaluate future traffic conditions in the surrounding area, it was necessary to determine the traffic characteristics of the proposed development, including the directional distribution and volumes of traffic that it will generate.

Existing Site and Proposed Development Plan

The site located on the north side of Wilson Avenue and is bordered by Marine Drive on the east, Clarendon Avenue on the west and an east-west service drive on the north. The site currently contains an approximately 107 space surface parking lot that formerly served as permit parking for Weiss Memorial Hospital.

As proposed, the site will be redeveloped with a 12-story residential tower providing 314 units and a parking garage with 136 spaces. Access to the parking garage will be provided via a single access drive off Clarendon Avenue, located approximately 140 feet north of Wilson Avenue. This access drive will provide one inbound lane and one outbound lane with outbound movements under stop-sign control. Two on-street parking spaces will need to be eliminated to accommodate the proposed access drive.

Proposed Pedestrian Access

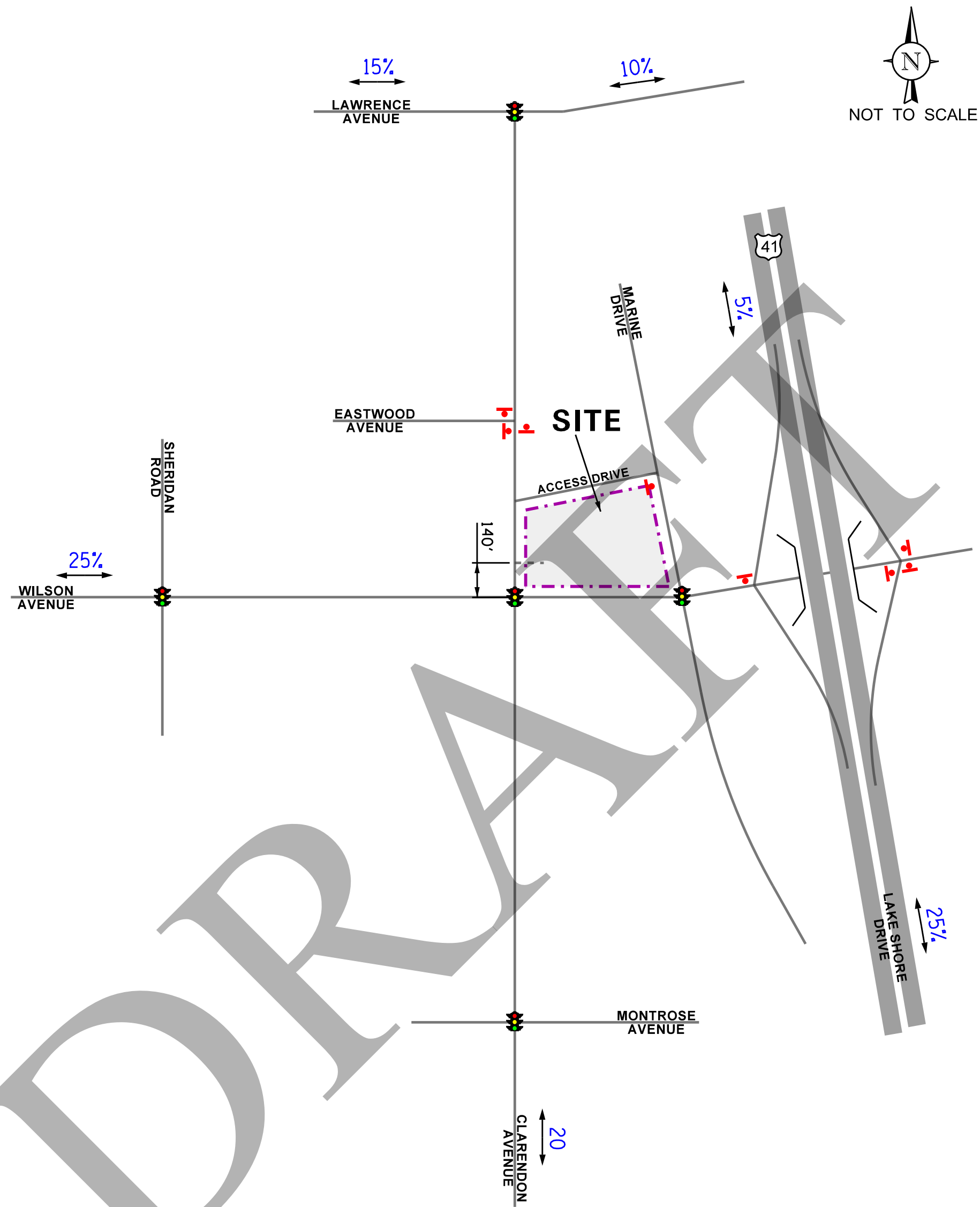
Pedestrian access to the residential units will be provided via a residential lobby that will have direct access to Marine Drive. Furthermore, bicycle parking for the development will also be provided on the ground level near the residential lobby and can be accessed via Wilson Avenue. The bicycle parking area can accommodate parking for approximately 157 bicycles.

Truck Loading

Truck loading for the development will occur on-site within two loading bays located on the north side of the building. Access to the loading bays will be provided via the east-west service drive connecting Clarendon Avenue to Marine Drive which serves Weiss Memorial Hospital. While within the loading dock, trucks will not be within the influence of the service drive and will not block or impede its operations. Turning exhibits for the truck loading bays are included in the Appendix.

Directional Distribution

The directions from which residents will approach and depart the site was estimated based on existing travel patterns, as determined from the traffic counts, one-way and turning restrictions, and the proposed access system of the development. **Figure 7** illustrates the directional distribution of traffic.



Peak Hour Traffic Volumes

The number of peak hour trips estimated to be generated by the proposed residential development was based on trip generation rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 10th Edition.

It is important to note that the surveys conducted by ITE are generally based on suburban areas where the primary mode of transportation is a personal automobile. Given the location of the development within an urban area and the availability of alternative modes of transportation, the estimated trips that will be generated by the proposed development will be reduced.

Based on Census Data available for Census Tracts 314, 315.01, and 315.02, approximately 55 percent of residents utilizes public transportation, bicycles, or walks to work. Furthermore, it is anticipated that approximately ten percent of the trips generated by the proposed development will be made by ride-sharing vehicles. As such, the volume of traffic estimated to be generated by the proposed development was reduced accordingly.

Table 1 summarizes the trips projected to be generated by the development.

Table 1
PROJECTED SITE-GENERATED TRAFFIC VOLUMES

ITE Land Use Code	Land-Use/Size	Weekday Morning Peak Hour			Weekday Evening Peak Hour			Daily Two- Way Traffic
		In	Out	Total	In	Out	Total	
222	High-Rise Apartments General Urban/Suburban (314 Units)	24	77	101	70	45	115	1,448
	55% Reduction for Public Transportation, Bicycle, and Walking	<u>-13</u>	<u>-43</u>	<u>-56</u>	<u>-39</u>	<u>-25</u>	<u>-64</u>	<u>-796</u>
	Total Passenger Vehicle Trips	11	34	45	31	20	51	652

4. Projected Traffic Conditions

The total projected traffic volumes include the existing traffic volumes, increase in background traffic due to growth, and the traffic estimated to be generated by the proposed subject development.

Development Traffic Assignment

The estimated weekday morning and weekday evening peak hour traffic volumes that will be generated by the proposed development were assigned to the street system in accordance with the previously described directional distribution (Figure 7). **Figure 8** illustrates the traffic assignment of the development.

Ambient Traffic Growth

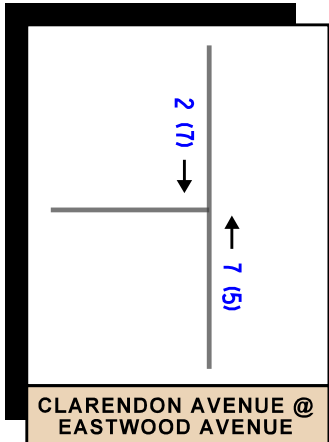
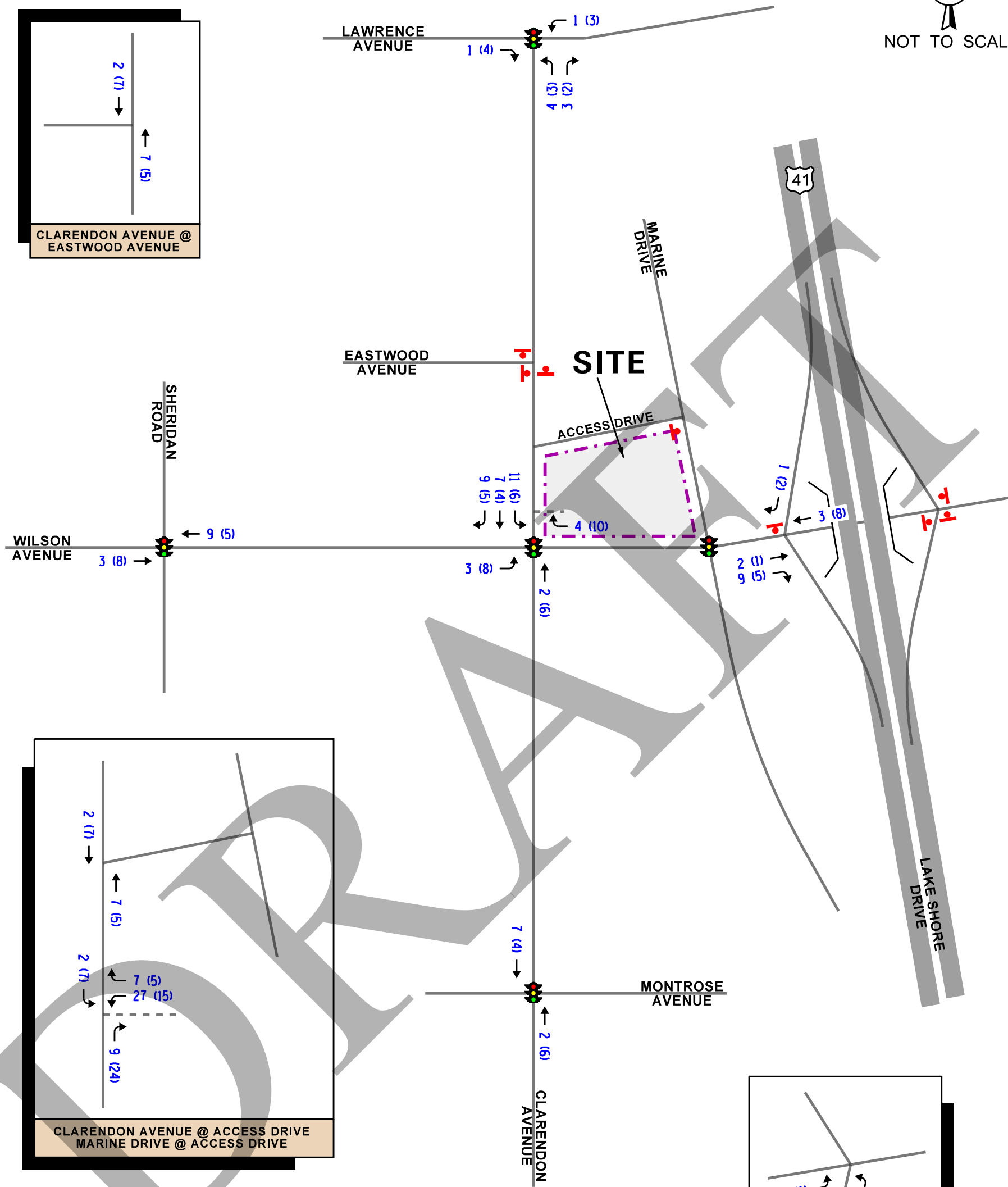
To account for any additional increase in traffic due to other factors or developments not previously discussed, an industry standard ambient growth factor of 0.5 percent per year was also applied to the study area over a six-year period to represent Year 2027. Furthermore, in order to account for the increase in population in the study area, bicycle and pedestrian volumes were increased by 10 percent at each intersection. In addition, the traffic that will be generated by the proposed Transit Oriented Development (TOD) located at 1050 West Wilson Avenue with 110 apartment units and approximately 3,300 square feet of retail was included.

Total Projected Traffic Volumes

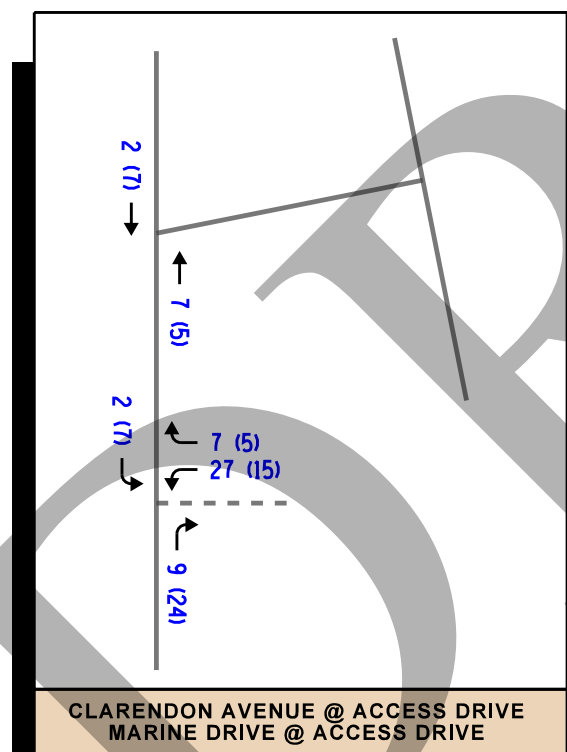
The existing traffic volumes were combined with the traffic from the other developments in the area, the ambient growth in the area, and the new peak hour traffic volumes generated by the subject development to determine the total projected traffic volumes, shown in **Figure 9**.



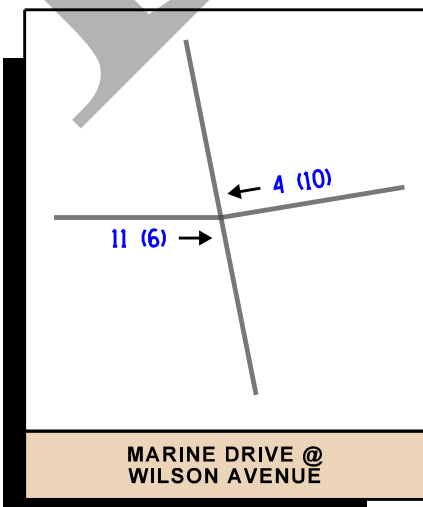
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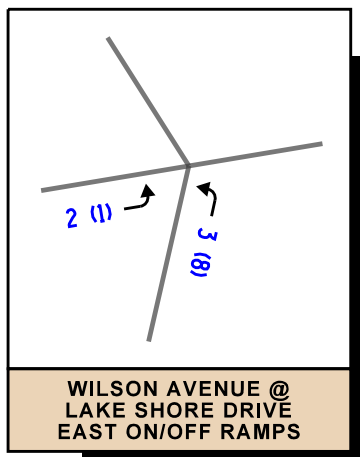
CLARENDON AVENUE @ EASTWOOD AVENUE



CLARENDON AVENUE @ ACCESS DRIVE
MARINE DRIVE @ ACCESS DRIVE



MARINE DRIVE @ WILSON AVENUE



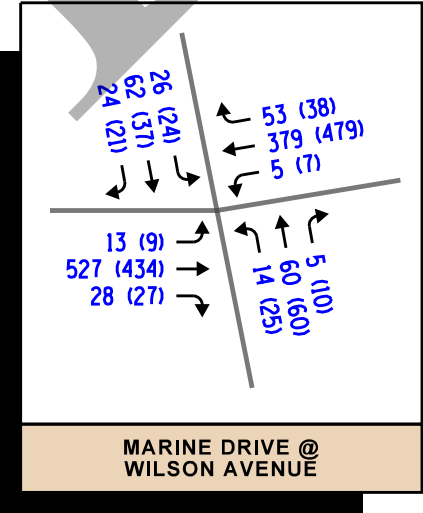
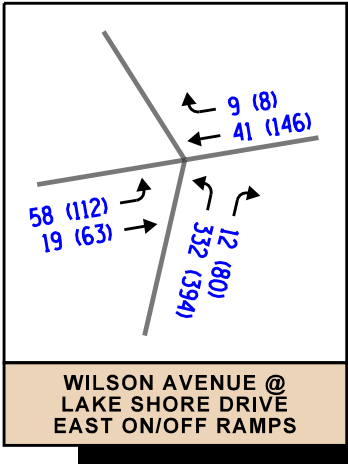
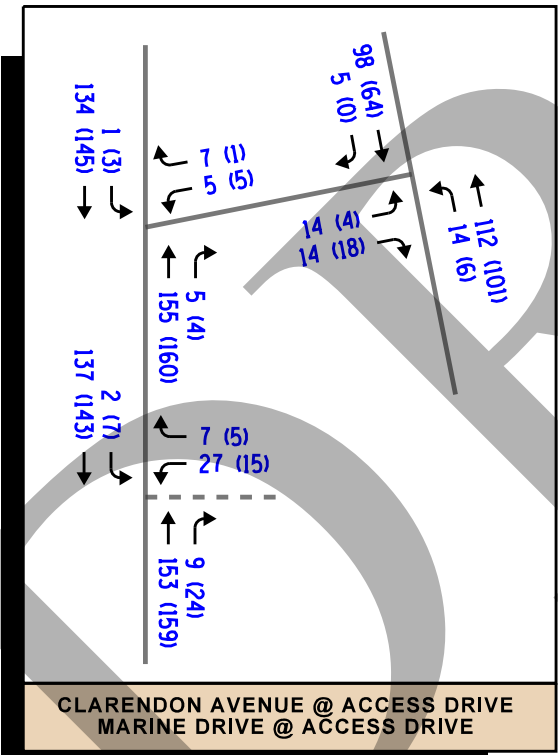
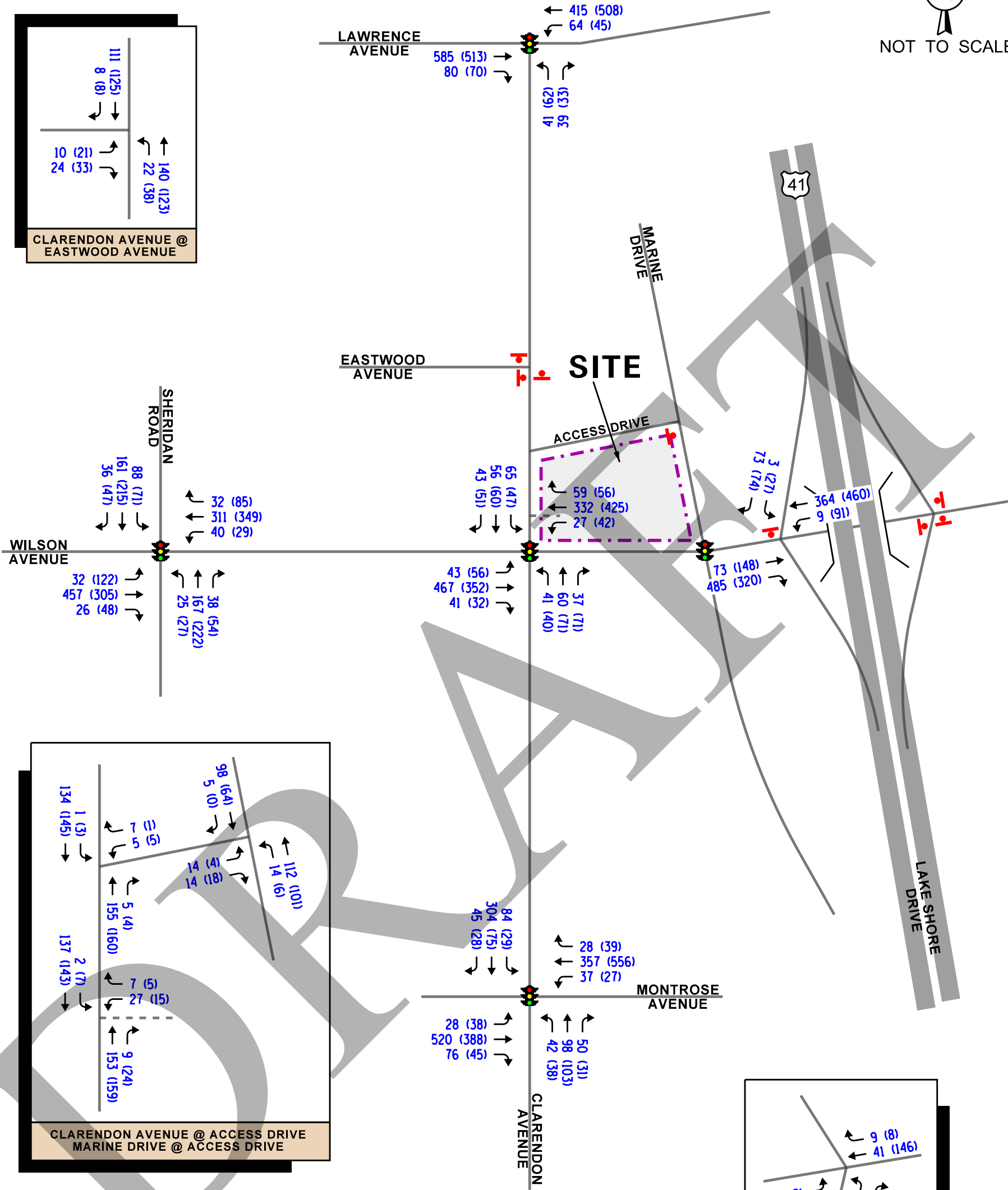
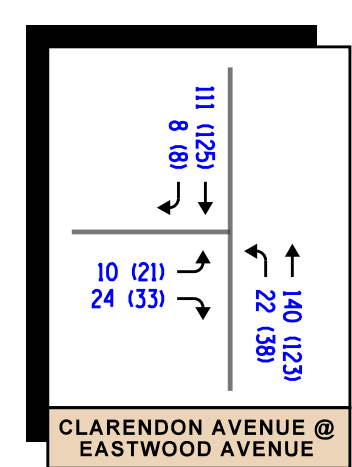
WILSON AVENUE @ LAKE SHORE DRIVE
EAST ON/OFF RAMP

LEGEND

- 00 - AM PEAK HOUR (7:45-8:45 AM)
- (00) - PM PEAK HOUR (5:00-6:00 PM)



NOT TO SCALE



LEGEND

- 00 - AM PEAK HOUR (7:45-8:45 AM)
- (00) - PM PEAK HOUR (5:00-6:00 PM)

5. Traffic Analysis and Recommendations

The following provides an evaluation conducted for the weekday morning and weekday evening peak hours. The analysis includes conducting capacity analyses to determine how well the street system and access drives are projected to operate and whether any street improvements or modifications are required.

Traffic Analyses

Intersection analyses were performed for the weekday morning and weekday evening peak hours for the existing (Year 2021) and future projected (Year 2027) traffic volumes.

The traffic analyses were performed using the methodologies outlined in the Transportation Research Board's *Highway Capacity Manual (HCM)*, 6th Edition and analyzed using Synchro/SimTraffic 11 software. The traffic analyses for the signalized intersections of Wilson Avenue with Clarendon Avenue, Wilson Avenue with Marine Drive, Wilson Avenue with Sheridan Road, Clarendon Avenue with Lawrence Avenue, and Clarendon Avenue with Montrose Avenue were accomplished utilizing actual cycle lengths, phasings, and offsets.

The analyses for the unsignalized intersections determine the average control delay to vehicles at an intersection. Control delay is the elapsed time from a vehicle joining the queue at a stop sign (includes the time required to decelerate to a stop) until its departure from the stop sign and resumption of free flow speed. The methodology analyzes each intersection approach controlled by a stop sign and considers traffic volumes on all approaches and lane characteristics.

The ability of an intersection to accommodate traffic flow is expressed in terms of level of service, which is assigned a letter from A to F based on the average control delay experienced by vehicles passing through the intersection. The *Highway Capacity Manual* definitions for levels of service and the corresponding control delay for signalized intersections and unsignalized intersections are included in the Appendix of this report.

Summaries of the traffic analysis results showing the level of service and overall intersection delay (measured in seconds) for the existing and Year 2027 total projected conditions are presented in **Tables 2** and **3**. A discussion of the intersections follows. Summary sheets for the capacity analyses are included in the Appendix.

Table 2

CAPACITY ANALYSIS RESULTS – EXISTING CONDITIONS – SIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Wilson Avenue with Marine Drive				
• Overall	B	12.1	B	12.0
• Eastbound Approach	B	10.8	A	9.3
• Westbound Approach	B	12.4	B	13.6
• Northbound Approach	B	15.5	B	15.6
• Southbound Approach	B	14.6	B	13.3
Wilson Avenue with Clarendon Avenue				
• Overall	A	9.2	A	9.6
• Eastbound Approach	A	8.7	A	8.7
• Westbound Approach	A	6.3	A	7.8
• Northbound Approach	B	14.2	B	13.6
• Southbound Approach	B	15.3	B	13.7
Wilson Avenue with Sheridan Road				
• Overall	C	21.2	C	30.4
• Eastbound Approach	C	30.3	E	59.8
• Westbound Approach	B	14.5	B	17.8
• Northbound Approach	B	15.1	B	16.4
• Southbound Approach	B	18.8	B	19.5
Lawrence Avenue with Clarendon Avenue				
• Overall	B	18.3	B	16.2
• Eastbound Approach	C	29.4	C	27.9
• Westbound Approach	A	2.3	A	2.4
• Northbound Approach	C	21.5	C	25.2
Montrose Avenue with Clarendon Avenue				
• Overall	C	32.6	B	19.3
• Eastbound Approach	C	22.6	B	10.9
• Westbound Approach	C	23.9	C	20.8
• Northbound Approach	C	26.4	C	31.3
• Southbound Approach	E	58.6	C	27.7
LOS = Level of Service Delay is measured in seconds.				

Table 3

CAPACITY ANALYSIS RESULTS – EXISTING CONDITIONS – UNSIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Wilson Avenue with Lake Shore Drive Northbound Ramps¹				
• Overall	B	12.3	C	16.7
• Eastbound Approach	A	9.4	B	11.5
• Westbound Approach	A	8.8	B	10.3
• Northbound Approach	B	13.7	C	23.4
Clarendon Avenue with Eastwood Avenue¹				
• Overall	A	8.1	A	8.1
• Eastbound Approach	A	7.4	A	7.6
• Northbound Approach	A	8.2	A	8.3
• Southbound Approach	A	8.1	A	8.0
Wilson Avenue with Lake Shore Drive Southbound Ramp²				
• Southbound Approach	B	10.2	B	13.2
• Westbound Left Turn	A	8.6	A	8.7
Clarendon Avenue with Weiss Memorial Hospital Service Drive²				
• Westbound Approach	A	9.8	B	10.9
• Southbound Left Turn	A	7.6	A	8.0
Marine Drive with Weiss Memorial Hospital Service Drive²				
• Eastbound Approach	A	9.6	A	9.2
• Northbound Left Turn	A	7.6	A	7.8
1 – All-Way Stop Sign Control	LOS = Level of Service			
2 – Two-Way Stop Sign Control	Delay is measured in seconds.			

Table 4

CAPACITY ANALYSIS RESULTS – PROJECTED CONDITIONS – SIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Wilson Avenue with Marine Drive				
• Overall	B	12.9	B	12.5
• Eastbound Approach	B	12.3	A	10.0
• Westbound Approach	B	12.8	B	14.1
• Northbound Approach	B	15.6	B	15.9
• Southbound Approach	B	14.8	B	13.3
Wilson Avenue with Clarendon Avenue				
• Overall	A	9.9	B	10.1
• Eastbound Approach	A	9.3	A	8.7
• Westbound Approach	A	6.4	A	8.4
• Northbound Approach	B	14.5	B	14.5
• Southbound Approach	B	17.0	B	14.7
Wilson Avenue with Sheridan Road				
• Overall	C	22.9	D	37.3
• Eastbound Approach	C	33.3	E	79.5
• Westbound Approach	B	16.0	B	19.9
• Northbound Approach	B	15.3	B	16.8
• Southbound Approach	B	19.4	C	20.1
Lawrence Avenue with Clarendon Avenue				
• Overall	B	18.7	B	16.6
• Eastbound Approach	C	30.0	C	28.3
• Westbound Approach	A	2.5	A	2.7
• Northbound Approach	C	21.7	C	25.3
Montrose Avenue with Clarendon Avenue				
• Overall	D	36.2	C	20.1
• Eastbound Approach	C	23.8	B	11.2
• Westbound Approach	C	24.7	C	21.6
• Northbound Approach	C	27.3	C	32.4
• Southbound Approach	E	69.1	C	28.3
LOS = Level of Service Delay is measured in seconds.				

Table 5

CAPACITY ANALYSIS RESULTS – PROJECTED CONDITIONS – UNSIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Wilson Avenue with Lake Shore Drive Northbound Ramps¹				
• Overall	B	12.6	C	18.4
• Eastbound Approach	A	9.5	B	11.9
• Westbound Approach	A	8.9	B	10.6
• Northbound Approach			D	26.4
Clarendon Avenue with Eastwood Avenue¹				
• Overall	A	8.1	A	8.2
• Eastbound Approach	A	7.5	A	7.7
• Northbound Approach	A	8.3	A	8.4
• Southbound Approach	A	8.1	A	8.1
Wilson Avenue with Lake Shore Drive Southbound Ramp²				
• Southbound Approach	B	10.3	B	13.6
• Westbound Left Turn	A	8.7	A	8.8
Clarendon Avenue with Weiss Memorial Hospital Service Drive²				
• Westbound Approach	A	9.9	B	11.1
• Southbound Left Turn	A	7.6	A	8.1
Marine Drive with Weiss Memorial Hospital Service Drive²				
• Eastbound Approach	A	9.6	A	9.3
• Northbound Left Turn	A	7.6	A	7.8
Clarendon Avenue with Access Drive²				
• Westbound Approach	B	10.5	B	10.5
• Southbound Left Turn	A	7.6	A	7.7
1 – All-Way Stop Sign Control LOS = Level of Service				
2 – Two-Way Stop Sign Control Delay is measured in seconds.				

Discussion and Recommendations

The following summarizes how the intersections are projected to operate and identifies any street and traffic control improvements necessary to accommodate the development-generated traffic.

Wilson Avenue with Marine Drive

The results of the capacity analysis indicate that under existing conditions this intersection is operating at an overall LOS B during both peak hours. Under future conditions, the intersection is projected to continue to operate at an overall LOS B with increases in the overall delay of less than one second. Further inspection of the projected traffic volumes indicates that the proposed development traffic will consist of approximately one percent of the total traffic traversing the intersection. As such, the intersection has sufficient reserve capacity and no geometric or traffic control improvements will be necessary in conjunction with the proposed development.

Wilson Avenue with Clarendon Avenue

The results of the capacity analysis indicate that under existing conditions this intersection is operating at an overall LOS A during both peak hours. Under future conditions, the intersection is projected to continue to operate at an overall LOS A during the morning peak hour and at an overall LOS B during the evening peak hour with increases in the overall delay of less than one second. Further inspection of the capacity analyses and the simulation runs indicate that the southbound queues on Wilson Avenue will not extend to the proposed access drive or to the service drive. Lastly, the proposed development traffic will consist of approximately two percent of the total traffic traversing the intersection. As such, the intersection has sufficient reserve capacity and no geometric or traffic control improvements will be necessary in conjunction with the proposed development.

Wilson Avenue with Sheridan Road

Based on the results of the capacity analyses, the intersection is operating at an overall LOS C during the weekday morning and evening peak hours under existing conditions. Under future conditions, the intersection is projected to continue to operate at an overall LOS C during the morning peak hour and at an overall LOS D during the evening peak hour with increases in the overall delay of less than seven seconds. Further inspection of the capacity analyses indicate that the eastbound approach operates at a LOS E and will continue to do so in the future. However, based on our observations and a review of the traffic counts, the eastbound queues typically clear with every cycle length and therefore operates better than what the results of the analyses indicate. As such, the intersection has sufficient reserve capacity and no geometric or traffic control improvements will be necessary in conjunction with the proposed development.

Clarendon Avenue with Lawrence Avenue

The results of the capacity analysis indicate that under existing conditions this intersection is operating at an overall LOS B during both peak hours. Under future conditions, the intersection is projected to continue to operate at an overall LOS B with increases in the overall delay of less than one second. As such, the intersection has sufficient reserve capacity and no geometric or traffic control improvements will be necessary in conjunction with the proposed development.

Clarendon Avenue with Montrose Avenue

Based on the results of the capacity analyses, the intersection is operating at an overall LOS C during the weekday morning and at an overall LOS B during the evening peak hours under existing conditions. Under future conditions, the intersection is projected to operate at an overall LOS D during the morning peak hour and at an overall LOS C during the evening peak hour with increases in the overall delay of less than four seconds. Further inspection of the capacity analyses indicate that the southbound approach operates at a LOS E and will continue to do so in the future. However, based on our observations and the results of the simulation runs, the southbound queues typically clear with every cycle length and therefore operates better than what the results of the analyses indicate. As such, the intersection has sufficient reserve capacity and no geometric or traffic control improvements will be necessary in conjunction with the proposed development.

Wilson Avenue with Lake Shore Drive Ramps

The results of the capacity analysis indicate that all of the turning movements at both ramps are operating at acceptable LOS and will continue to do so under future conditions. As such, no geometric or traffic control improvement in conjunction with the proposed development.

As previously indicated, an improvement study is currently being conducted for Lake Shore Drive and as part of the study within the vicinity of the site is part of the North Lake Shore Drive Improvement Study being conducted by IDOT and CDOT. As part of this study, the existing ramps at Wilson Avenue and Montrose Avenue will be modified as follows:

- The southbound entrance and exit ramps at Wilson Avenue and Montrose Avenue will be consolidated to provide a single signalized intersection located on Marine Drive, midblock between Wilson Avenue and Montrose Avenue.
- The northbound exit ramp at Wilson Avenue will remain, however, the exit ramp will be combined with the Montrose Avenue exit ramp and will be a frontage road along Lake Shore Drive connecting Montrose Avenue to Wilson Avenue.
- The northbound entrance ramp at Wilson Avenue will be eliminated. Vehicles traveling north on Lake Shore Drive will be able to do so at Lawrence Avenue or Montrose Avenue.

Clarendon Avenue with Eastwood Avenue

The results of the capacity analysis indicate that under existing conditions this intersection is operating at an overall LOS A during both peak hours. Under future conditions, the intersection is projected to continue to operate at an overall LOS A with increases in the overall delay of less than one second. As such, the intersection has sufficient reserve capacity and no geometric or traffic control improvements will be necessary in conjunction with the proposed development.

Clarendon Avenue with East-West Service Drive

The results of the capacity analysis indicate that under existing conditions the westbound approach of this intersection is operating at a LOS A during the morning peak hour and LOS B during the evening peak hour. Under future conditions, the westbound approach is projected to continue to operate at the same LOS with increases in delay of less than one second. Inspection of the traffic counts indicates that during the morning peak hour no ambulances entered or exited the service drive and during the evening peak hour only one ambulance exited the service drive. As such and given the above, the intersection has sufficient reserve capacity and no geometric or traffic control improvements will be necessary in conjunction with the proposed development.

Marine Drive with East-West Service Drive

The results of the capacity analysis indicate that under existing conditions the eastbound approach of this intersection is operating at a LOS A during both peak hours. Under future conditions, the eastbound approach is projected to continue to operate at the same LOS with increases in delay of less than one second. Inspection of the traffic counts indicates that during the morning peak hour one ambulance entered the service drive and during the evening peak hour two ambulances entered the service drive. As such and given the above, the intersection has sufficient reserve capacity and no geometric or traffic control improvements will be necessary in conjunction with the proposed development.

Clarendon Avenue with Access Drive

The results of the capacity analyses indicate that westbound approach of the access drive will operate at a LOS B and the southbound left-turn movement will operate at a LOS A during both peak hours. It is important to note that the existing bus stop will not be impacted by the proposed access drive. However, given the existence of a bike lane, it is recommended that warning devices be provided at the access drive. Furthermore, it is important to note that providing direct access to Clarendon Avenue will not create additional traffic on the service drive, allowing traffic to disperse directly using the external street system and eliminating the potential for site traffic to create conflicts with the ambulances within the service drive. As such and given the above, the intersection has sufficient reserve capacity and no geometric or traffic control improvements will be necessary in conjunction with the proposed development.

6. Conclusion

Based on the preceding analyses and recommendations, the following conclusions have been made:

- Given the location of the site within an urban area and its proximity to alternative modes of transportation, the number of generated trips will be reduced.
- The volume of traffic estimated to be generated by the proposed development will consist of approximately two percent of the total traffic traversing the intersection of Wilson Avenue with Clarendon Avenue.
- As part of the proposed development, a full access drive will be provided on Clarendon Avenue.
- Truck loading for the development will occur on-site via two loading bays located on the north side of the building. Access to the loading bays will be provided via the east-west service drive connecting Clarendon Avenue to Marine Drive which serves Weiss Memorial Hospital.
- While within the loading dock, trucks will not be within the influence of the service drive and will not block or impede its operations.
- Consideration should be given to providing a CTA transit information kiosk within the lobby in order to further encourage public transit use.

Appendix

Traffic Count Summary Sheets

Site Plan

Truck Turning Diagrams

Level of Service Criteria

Capacity Analysis Summary Sheets