

1801 Grace Street Development Traffic Study Executive Summary

The following provides a summary of the development plan and the traffic study performed for the proposed 1801 Grace Street development.

- The development is to consist of a residential building with 62 apartment units and 66 parking spaces with access provided via a single access drive on Grace Street. The site of the development, which previously contained a Hines Lumber Yard, is zoned M1-2 and could contain a building with a maximum floor area of approximately 61,000 square feet.
- The volume of vehicle trips generated by the proposed development will be reduced due to dense, urban nature of the neighborhood and the alternative modes of transportation serving the area. Census data indicates that approximately 40 percent of residents in the area drive to work. The impact of the development traffic will be further reduced due to the excellent flexibility of the street system. Residents will have multiple ways to access the development which will distribute the traffic along the street system.
- The volume of traffic to be generated by the development is similar, if not, less than many manufacturing and commercial uses that could occupy the site under the current M1-2 zoning.
- Access to the 66 parking spaces and loading docks will be provided via a single access drive located on Grace Street that will be aligned opposite the Lofts at 1800 access drive. The design of the access drive will be sufficient to serve the traffic that will be generated by the proposed development.
- The development-generated traffic can be accommodated efficiently with limited impact to the external street system. This is evident in the fact that all of the intersections within the study limits are projected to operate at good levels of service with the addition of the development generated traffic.
- To further enhance the operation of Grace Street and its intersections with the access drives and to the development and the Trader Joe's store, parking should be prohibited on the south side of Grace Street between the two access drives and a minimum of twelve to fifteen feet east of the development access drive and west of the Trader Joe's access drive.
- While the Trader Joe's store can add to the queuing and delays within the area, particularly during the Saturday midday peak period, the proposed development will have a reduced impact on these existing conditions as (1) the development is projected to generate a low volume of total traffic and (2) given that excellent flexibility of the street system, the traffic will be distributed along the streets system.
- To further foster alternative modes of transportation other than the automobile the development is proposing to include bike racks as part of the development and reserve one to two spaces in the parking garage for car-sharing and electric vehicles.

MEMORANDUM TO: Tim Sledz
Capital 99 LLC

FROM: Michael Werthmann, PE, PTOE
Principal

DATE: April 8, 2014

SUBJECT: Addendum to the Traffic Impact Study
1801 West Grace Street
Chicago, Illinois

This memorandum is an addendum to the traffic study conducted for the proposed 1801 West Grace Street development to be located in Chicago, Illinois. The Grace Street development is proposed to consist of 62 apartment units and 66 parking spaces with access provided via a single access drive on Grace Street. As the traffic study has shown, the proposed 1801 West Grace Street development is projected to have a limited impact on the operation of the existing street system. In general, the street system has sufficient reserve capacity to accommodate the additional traffic estimated to be generated by the development.

While the street system generally operates at acceptable levels of service, field observations and the results of the capacity analyses show that additional localized queuing and delays occur on some approaches as well as certain individual movements during the peak periods, particularly during the Saturday peak period. This is primarily due to the traffic generated by the Trader Joe's store located in the southeast corner of the Lincoln Avenue/Grace Street/Wolcott Avenue intersection. Additional queuing and delays occur along Lincoln Avenue and Grace Street as vehicles wait to turn into the Trader Joe's parking lot or vehicles parallel park on these streets. Further, the Trader Joe's store can add to the circulation along the area streets as patrons search for a parking space.

The purpose of this addendum was to provide potential additional improvements and/or modifications other than those specified in the traffic study that would further enhance the flow of traffic in the area and the operation of the Trader Joe's store. While these potential improvements and/or modifications may resolve specific issues/concerns within the immediate area of the Trader Joe's store, it is important to note that they will have ramifications to other areas of the neighborhood and/or elements of the transportation system. As such, many of the potential improvements/modifications suggested below will need further study, input from the residents, businesses and stakeholders within the neighborhood as well as approval from the Alderman and the Chicago Department of Transportation (CDOT).

- In order to improve the sight lines for traffic entering and exiting the Trader Joe's store, restrict on-street parking a minimum of twelve to fifteen feet (1) on the south side of Grace Street both east and west of the access drive and (2) on the east side of Lincoln Avenue north of the access drive. The restrictions would result in a loss of two to three on-street parking spaces.

- In order to improve the operation of the Lincoln Avenue/Grace Street/Wolcott Avenue intersection, restrict parking on the following approaches of the intersection.
 - ❖ Restrict parking for an additional 25 feet (approximately one space) on the east side of Lincoln Avenue south of Grace Street.
 - ❖ Restrict parking for an additional 25 feet (approximately one space) on (1) the north side of Grace Street east of Lincoln Avenue and (2) on the south side of Grace Street west of Lincoln Avenue.
 - ❖ Restrict parking for an additional 25 feet (approximately one space) on the east side of Wolcott Avenue south of Grace Street.

Field observations and the results of the traffic counts show that this intersection is operating at an acceptable Level of Service. However, CDOT should examine the timing and offset at this intersection to ensure that it is optimally coordinated with the traffic signals located at the intersections of Lincoln Avenue/Addison Street/Ravenswood Avenue and Lincoln Avenue/Irving Park Road/Damen Avenue.

- To enhance the flow of traffic along Grace Street, eliminate parking or restrict parking during certain times of the day on one side of the street between (1) Lincoln Avenue and the Trader Joe's access drive or (2) Lincoln Avenue and Ravenswood Avenue (east section). The elimination/restriction of parking would provide wider through lanes and reduce the parallel parking activity all of which will provide for a more efficient flow of traffic along Grace Street. However, depending on what side of the street and how long the parking is eliminated or restricted, the available on-street parking would be reduced by approximately 10 to 20 spaces. Further, the improved flow of traffic may result in an increase in travel speeds and/or cut-through traffic on Grace Street.
- To reduce the volume of traffic as well as enhance the flow of traffic along Grace Street, convert Grace Street to one-way eastbound or westbound traffic flow. Given the existing street system, the likely conversion would need to extend from (1) Lincoln Avenue to Ravenswood Avenue (east section) or (2) Lincoln Avenue to Ashland Avenue. With the conversion of the street to one-way traffic flow, parking could continue to be provided on both sides of the street. However, it is important to note that Grace Street is the only street between Irving Park Road and Addison Street that extends between Lincoln Avenue and Ashland Avenue. As such, the conversion of Grace Street to a one-way street will reduce the access to and from and circulation through the neighborhood, particularly to or from the west. While the one-way conversion will reduce the traffic on Grace Street, it will result in an increase in traffic on the other neighborhood streets as traffic will have to seek alternative routes to access and circulate through the neighborhood. Further, the improved flow of traffic may result in an increase in travel speeds and/or cut-through traffic on Grace Street.

MEMORANDUM TO: Tim Sledz
Capital 99 LLC

FROM: Michael K. Scavo
Consultant

Michael Werthmann, PE, PTOE
Principal

DATE: April 8, 2014

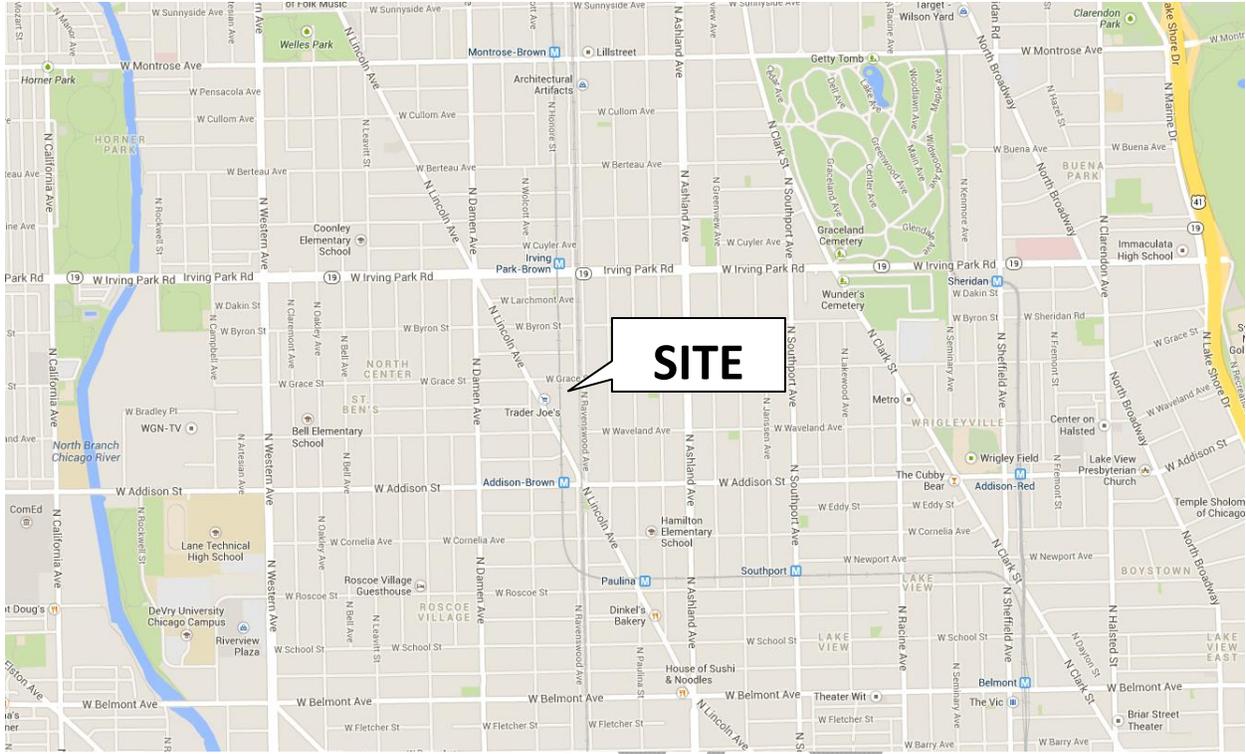
SUBJECT: Traffic Impact Study
1801 West Grace Street
Chicago, Illinois

This memorandum summarizes the methodologies, results and findings of a traffic impact study conducted by Kenig, Lindgren, O'Hara, Aboona, Inc. (KLOA, Inc.) for a proposed residential development to be located in Chicago, Illinois. The site, which previously contained a Hines Lumber Yard, is located on the south side of Grace Street bounded by the Chicago Transit Authority (CTA) Brown rapid transit line tracks on the west and the Union Pacific - North Line railroad tracks on the east. As proposed, the development is to consist of 62 apartment units and 66 parking spaces with access provided via a single access drive on Grace Street. **Figure 1** shows the location of the site in relation to the area street system. **Figure 2** shows an aerial view of the site area.

The purpose of this study was to examine background traffic conditions, assess the impact that the proposed development will have on traffic conditions in the area and determine if any street or access improvements are necessary to accommodate traffic generated by development.

The sections of this report present the following.

- Existing street conditions
- A description of the development
- Directional distribution of the development generated traffic
- Vehicle trip generation for the development
- Future traffic conditions including access to the site
- Traffic analyses for the weekday morning, weekday evening and Saturday midday peak hours
- Recommendations with respect to adequacy of the site access system and adjacent street network



Site Location

Figure 1

DR



Aerial View of Site Location

Figure 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, an inventory of alternative modes of transportation serving the area and existing peak hour traffic volumes.

Site Location

The site, which previously contained a Hines Lumber Yard, is located on the south side of Grace Street bounded by the CTA Brown rapid transit line on the west and the Union Pacific - North Line railroad tracks on the east. Area land uses generally consist of single family and multi-family residential properties with commercial and industrial uses located south and west of the site. The Trader Joe's shopping center is located directly west of the site. The Addison Station and the Irving Park station serving the CTA Brown rapid transit line are located three to four blocks south and north of the site.

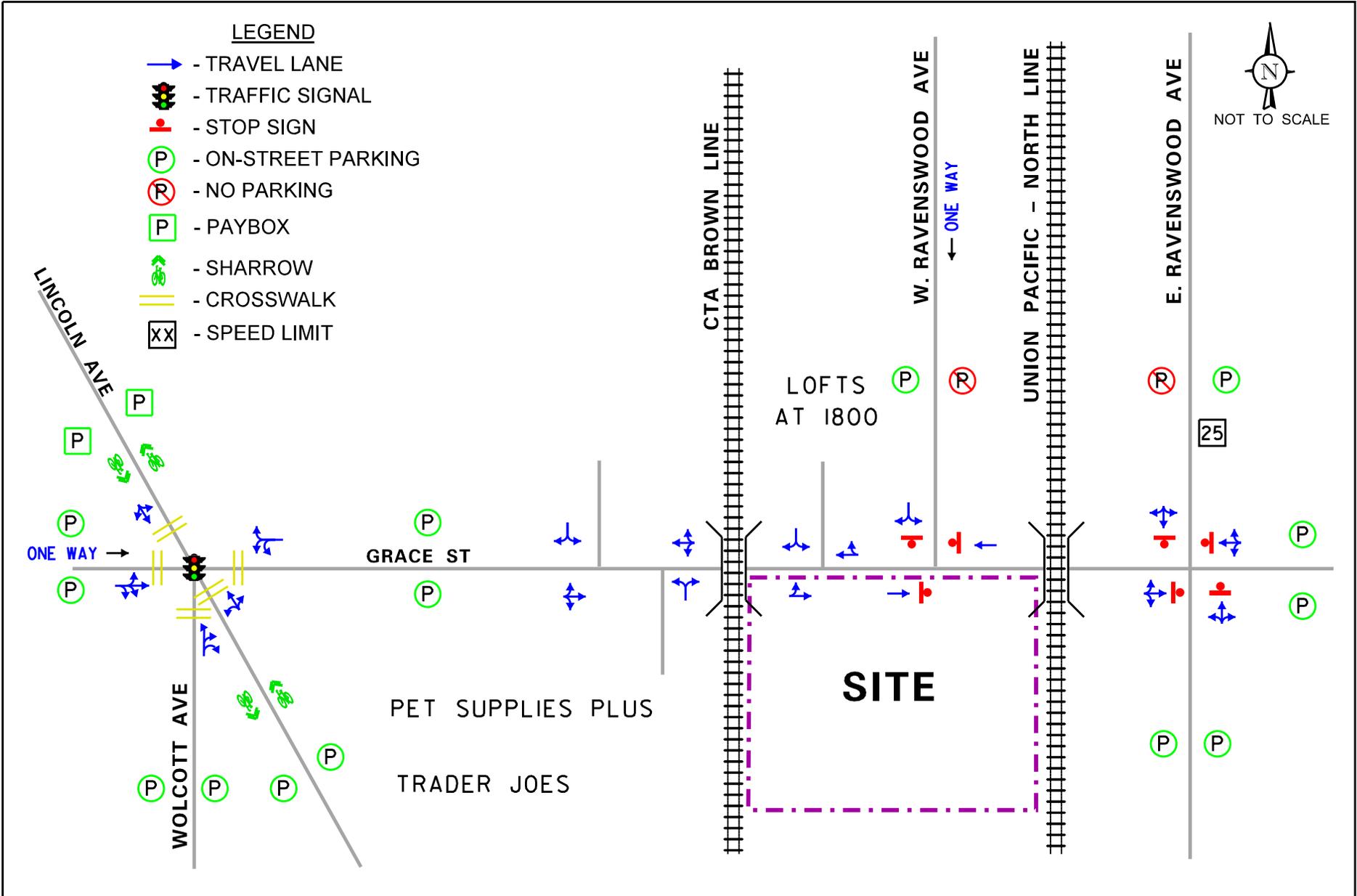
Existing Street System Characteristics

Figure 3 illustrates the existing street characteristics within the vicinity of the site. The characteristics of the existing streets near the site are described below.

Lincoln Avenue is a northwest-to-southeast arterial street. Within the vicinity of the site, Lincoln Avenue provides one through lane in each direction with parking generally provided on both sides of the street. A shared bike lane is provided in each direction on Lincoln Avenue via "sharrow" pavement markings. Lincoln Avenue is under traffic signal control at its five-legged intersection with Grace Street and Wolcott Avenue. The street has a posted speed limit of 25 mph.

Grace Street is an east-west collector street that is signed for one-way eastbound traffic flow between Damen Avenue and Lincoln Avenue. In the vicinity of the site, Grace Street generally provides one through lane in each direction with parking provided on both sides of the street. The section between Damen Avenue and Lincoln Avenue provides one wide eastbound lane with parking provided on both sides of the street. Speed humps are provided along Grace Street between Lincoln Avenue and Ashland Avenue. Grace Street is under all-way stop sign control at its intersection with both the east and west sections of Ravenswood Avenue and traffic signal control at its five-legged intersection with Lincoln Avenue and Wolcott Avenue.

Wolcott Avenue is a north-south local street that terminates at its five-legged intersection with Lincoln Avenue and Grace Street. In the vicinity of the site, Wolcott Avenue provides one through lane in each direction with parking generally provided on both sides of the street.



PROJECT:
Proposed Residential Development
Chicago, Illinois

TITLE:
Existing Street Characteristics

KLOA
Job No: 14-033
Figure: 3

Ravenswood Avenue (east section) is an east-west collector street. In the vicinity of the site, Ravenswood Avenue provides one through lane in each direction with parking provided on both sides of the street south of Grace Street and on the east side of the street north of Grace Street. Trucks over five tons are prohibited on Ravenswood Avenue north of Grace Street. The intersection of Grace Street and Ravenswood Avenue is under all-way stop sign control. Ravenswood Avenue has a posted speed limit of 25 mph.

Ravenswood Avenue (west section) is a one-way southbound local road that terminates at Grace Street. It provides one southbound through lane with parking permitted on the west side of the street. Ravenswood Avenue is under stop sign control at its intersection with Grace Street.

Alternative Modes of Transportation

Accessibility to and from the area is enhanced by the various alternative modes of transportation serving the area as summarized below.

Public Transportation. The area is served by the CTA Brown rapid transit line. Local stops are provided on Addison Street just west of Ravenswood Avenue and Irving Park Road just west of Ravenswood Avenue. Both stations are located approximately three to four blocks from the site. In addition the following CTA bus routes serve the immediate area and all have stops within walking distance of the site.

- *Route Number 9 - Ashland* primarily runs along Ashland Avenue between Irving Park Road and 95th Street. Service is provided seven days a week and on holidays.
- *Route Number 50 - Damen* primarily runs along Damen Avenue between Bryn Mawr Avenue and Archer Avenue/35th Street. Service is provided seven days a week and on holidays.
- *Route Number 50 - Irving Park* primarily runs along Irving Park Road between Broadway and Cumberland Avenue. Service is provided seven days a week and on holidays.
- *Route Number 152 - Addison* primarily runs along Addison Avenue between Lake Shore Drive and Cumberland Avenue. Service is provided seven days a week and on holidays.

Bicycle Routes. *Chicago's Streets for Cycling Plan 2020* identifies Lincoln Avenue and Damen Avenue as Crosstown Bike Routes and Grace Street as a Neighborhood Bike Route. Lincoln Avenue is currently marked and signed as a shared vehicle/bike lane.

Mode-Sharing Transportation Availability. Within the vicinity of the site, a Divvy bike sharing station is located on Lincoln Avenue between Grace Street and Waveland Avenue which is two blocks from the site. Car-sharing programs have vehicles within walking distance of the site.

Pedestrian Facilities. All of the streets in the immediate area generally have sidewalks on both sides of the street. In addition, crosswalks and pedestrian traffic signals are provided at the signalized intersection of Lincoln Avenue/Grace Streets/Wolcott Avenue. It should be noted that a sidewalk is only provided on the east side of the east section of Ravenswood Avenue and the west side of the west section of Ravenswood Avenue.

Existing Traffic Volumes

In order to determine current transportation conditions on the existing roads, KLOA, Inc. conducted peak period traffic, bicycle and pedestrian counts at the following intersections.

- Grace Street with Lincoln Avenue and Wolcott Avenue
- Grace Street with the Trader Joe's access drive
- Grace Street with the Lofts at 1800 access drive
- Grace Street with the west section of Ravenswood Avenue
- Grace Street with the east section of Ravenswood Avenue

The traffic counts were conducted on Thursday, February 6, 2014 during the weekday morning (7:00 to 9:00 A.M.) and evening (4:00 to 6:00 P.M.) peak periods and on Saturday, February 22, 2014 during the Saturday midday (noon to 2:00 P.M.) peak period. The results of the traffic counts showed that the weekday morning peak hour of traffic occurs from 7:45 to 8:45 A.M., the weekday evening peak hour of traffic occurs from 5:00 to 6:00 P.M. and the Saturday peak hour of traffic occurs from 12:00 to 1:00 P.M. **Figure 4** illustrates the existing peak hour traffic volumes and **Figure 5** illustrates the existing peak hour bicycle and pedestrian volumes.

Traffic Characteristics of the Proposed Development

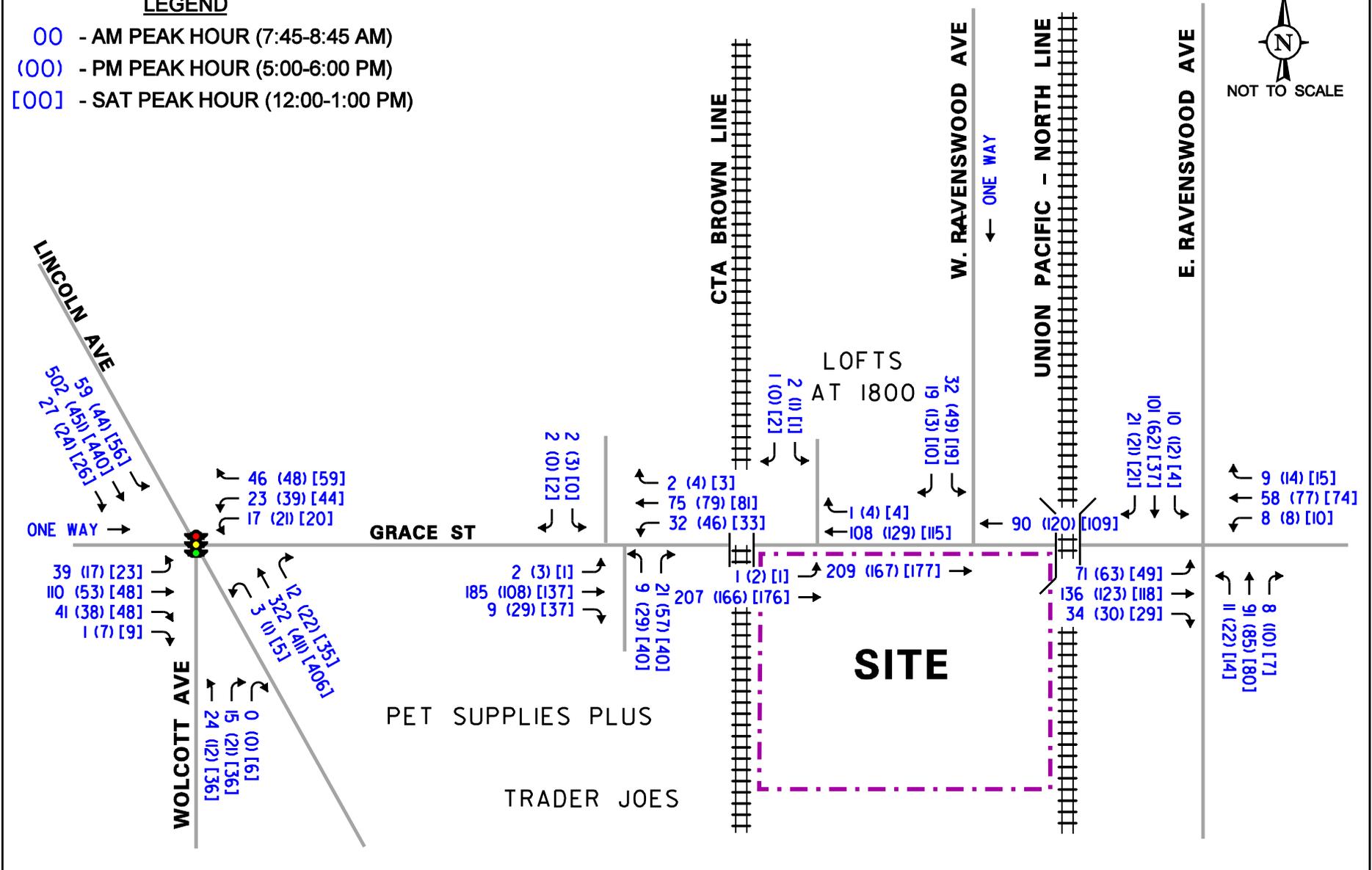
In order to properly evaluate future traffic conditions in the surrounding area, it was necessary to determine the traffic characteristics of the proposed development, including the directional distribution and volumes of traffic that it will generate.

Proposed Development Plan

As proposed, the development is to consist of 62 apartment units and 66 parking spaces. Access to the parking spaces and the loading dock will be provided via a circulation road that will extend along the west side of the development. Access to the circulation road will be provided via a single access drive located on the south side of Grace Street aligned opposite the Lofts at 1800 access drive. The access drive will provide one inbound lane and one outbound lane with the outbound lanes under stop sign control.

LEGEND

- 00 - AM PEAK HOUR (7:45-8:45 AM)
- (00) - PM PEAK HOUR (5:00-6:00 PM)
- [00] - SAT PEAK HOUR (12:00-1:00 PM)



PROJECT:
Proposed Residential Development Chicago, Illinois

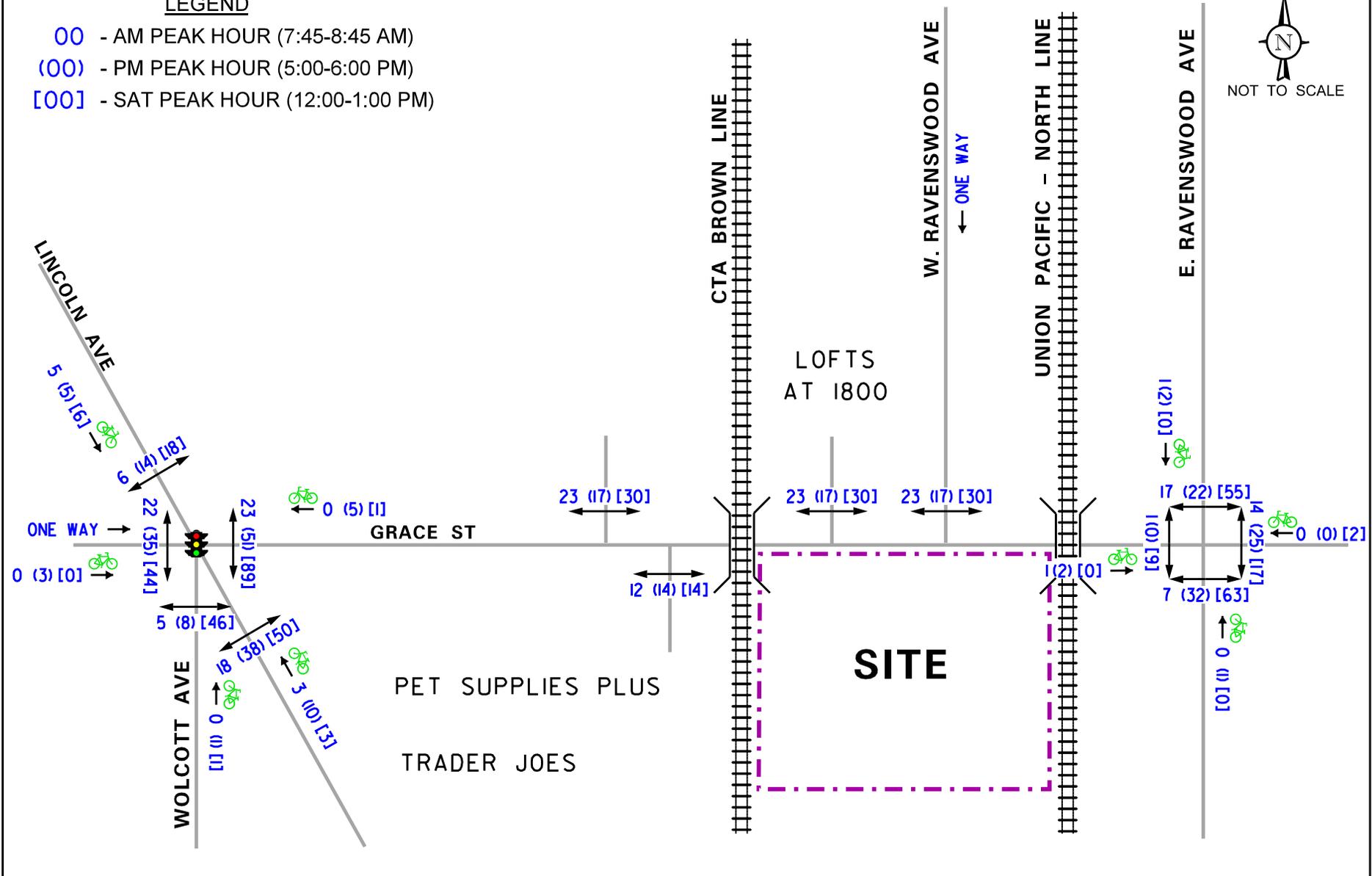
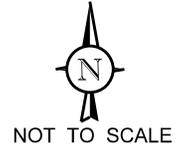
TITLE:
Existing Traffic Volumes

Job No: 14-033

Figure: 4

LEGEND

- 00 - AM PEAK HOUR (7:45-8:45 AM)
- (00) - PM PEAK HOUR (5:00-6:00 PM)
- [00] - SAT PEAK HOUR (12:00-1:00 PM)



PROJECT:
Proposed Residential Development Chicago, Illinois

TITLE:
Existing Pedestrian & Bicycle Volumes

KLOA
Job No: 14-033
Figure: 5

Directional Distribution of Site Traffic

The directions of approach and departure of the future site generated traffic was estimated based on the existing travel patterns, as determined from the traffic counts. **Figure 6** illustrates the estimated directional distribution for both the residential and commercial uses.

Estimated Site Traffic Generation

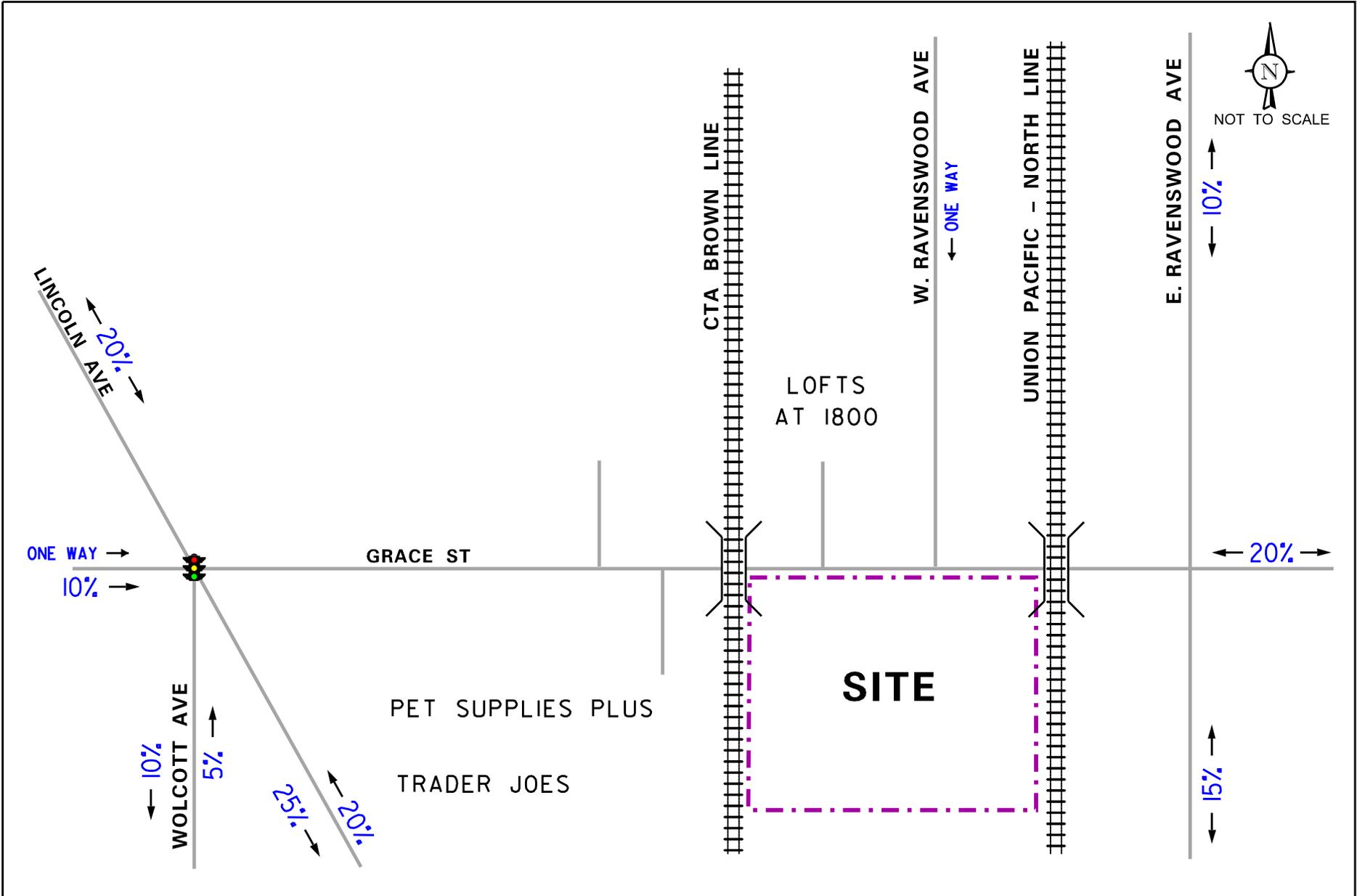
The number of new peak hour vehicle trips estimated to be generated by the proposed development was based on the Apartment (Land-Use Code 220) vehicle trip generation rates contained in *Trip Generation Manual*, 9th Edition, published by the Institute of Transportation Engineers (ITE). However, the ITE rates are based on suburban developments where the primary mode of transportation is the automobile. Given the dense urban nature of the neighborhood and the alternative modes of transportation serving the area, the number of vehicle trips to be generated by the development will be reduced. Based on census data and previous studies conducted in the area, the estimated traffic to be generated by the apartments were reduced by 60 percent. **Table 1** shows the estimated number of new peak hour trips to be generated by the proposed development.

Table 1
PROJECTED SITE-GENERATED TRAFFIC VOLUMES

ITE Land-Use Code	Land Use	Weekday Morning Peak Hour		Weekday Evening Peak Hour		Saturday Midday Peak Hour	
		In	Out	In	Out	In	Out
220	Apartment - 62 units	7	27	34	18	22	22
	60% Reduction	<u>4</u>	<u>16</u>	<u>21</u>	<u>11</u>	<u>13</u>	<u>13</u>
	Total	3	11	13	9	9	9

From Table 1 it can be seen that the proposed development is projected to generate a limited volume of traffic. The development is projected to generate approximately 14 two-way trips during the morning peak hour, 21 two-way trips during the evening peak hour and 18 two-trips during the Saturday midday peak hour. This averages to only one trip every three to four minutes.

It is also important to note that the site is currently zoned M1-2 and could contain a building with a maximum floor area of approximately 61,000 square feet. As such, a number of manufacturing and commercial uses permitted under the existing zoning could be developed on the site that would generate a similar, if not, more traffic than the proposed residential development. In addition, many of these manufacturing and commercial uses would also generate truck traffic.



PROJECT:
Proposed
Residential Development
Chicago, Illinois

TITLE:
Estimated Directional Distribution

KLOA
Job No: 14-033
Figure: 6

Projected Traffic Volumes

The estimated weekday morning, weekday evening and Saturday midday 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** shows the development generated traffic volumes. In addition, the existing traffic was increased by 2.5 percent to account for other growth in the area. **Figure 8** illustrates the projected traffic volumes which include the existing traffic volumes, the proposed development traffic and traffic from other area developments.

Traffic Analysis

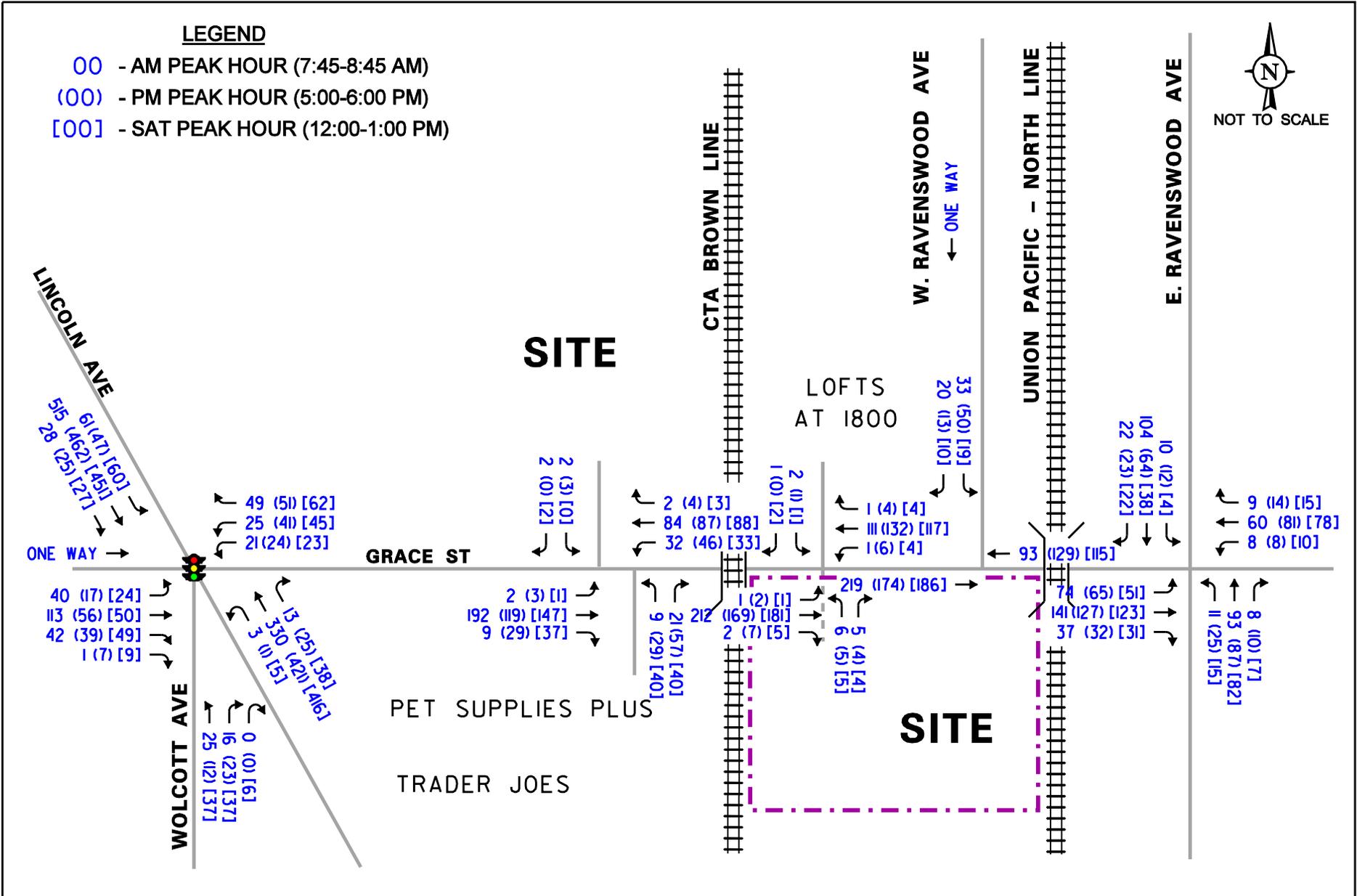
Traffic analyses were performed for the intersections within the study area to determine the operation of the existing street system, evaluate the impact of the proposed development and determine the ability of the existing street system to accommodate projected traffic demands. Analyses were performed for the existing and the projected traffic volumes.

The traffic analyses were performed using Synchro/SimTraffic software which is based on the methodologies outlined in the Transportation Research Board's *Highway Capacity Manual (HCM), 2010*. The ability of an intersection to accommodate traffic flow is expressed in terms of level of service, which is assigned a letter grade from A to F based on the average control delay experienced by vehicles passing through the intersection. Control delay is that portion of the total delay attributed to the traffic signal or stop sign control operation and includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Level of Service A is the highest grade (best traffic flow and least delay), Level of Service E represents saturated or at-capacity conditions and Level of Service F is the lowest grade (oversaturated conditions, extensive delays). For two-way stop controlled (TWSC) intersections, levels of service are only calculated for the approaches controlled by a stop sign (not for the intersection as a whole).

The *Highway Capacity Manual* definitions for levels of service and the corresponding control delay for signalized intersections and unsignalized intersections are shown in the Appendix. The results of the capacity analysis are summarized in **Table 2** for both the existing and projected traffic volume conditions.

LEGEND

- 00 - AM PEAK HOUR (7:45-8:45 AM)
- (00) - PM PEAK HOUR (5:00-6:00 PM)
- [00] - SAT PEAK HOUR (12:00-1:00 PM)



PROJECT:
Proposed Residential Development Chicago, Illinois

TITLE:
Total Projected Traffic Volumes

Job No: 14-033

Figure: 8

Table 2

INTERSECTION CAPACITY ANALYSIS

Intersection	Weekday Morning		Weekday Afternoon		Saturday Midday	
	LOS	Delay	LOS	Delay	LOS	Delay
Existing Conditions						
Grace/Lincoln/Wolcott ¹	C	20.9	B	16.8	C	22.6
Grace/Shopping Center Drive ²	B	10.4	B	12.3	B	10.9
Grace/Lofts at 1800 Drive ²	B	10.2	B	10.5	A	9.5
Grace/Ravenswood (west) ²	A	8.3	A	8.1	A	8.0
Grace/Ravenswood (east) ²	A	9.3	A	9.0	A	8.6
Projected Conditions						
Grace/Lincoln/Wolcott ¹	C	21.9	B	17.7	C	23.3
Grace/Shopping Center Drive ²	B	10.5	B	12.5	B	11.0
Grace/Lofts at 1800 Drive/Site Drive ²	B	10.7	B	11.3	B	10.2
Grace/Ravenswood (west) ²	A	8.3	A	8.3	A	8.1
Grace/Ravenswood (east) ²	A	9.4	A	9.1	A	8.7
LOS = Level of Service						
Delay = Seconds						
1 - Signalized Intersection						
2 - Unsignalized Intersection						

Evaluation of the Existing Street Operations

The results of the weekday morning and evening peak hour capacity analyses show that all of the intersections in the study area are operating at a good Level of Service. Overall, the intersections are generally operating well with minimal delay and queuing. However, field observations indicate that some localized queuing and delays are currently experienced on some approaches as well as certain individual movements during the peak periods, particularly during the Saturday peak period. This is primarily due to the traffic generated by the Trader Joe's store located in the southeast corner of the Lincoln Avenue/Grace Street/Wolcott Avenue intersection. Additional queuing and delays occur along Lincoln Avenue and Grace Street as vehicles wait to turn into the Trader Joe's parking lot or vehicles parallel park on these streets. Further, the Trader Joe's store can add to the circulation along the area streets as patrons search for a parking space. It is important to note that the additional queuing, delays and circulation as well as the on-street parking associated with the Trader's Joe store is not unique to this area and is inherent with other commercial centers or along commercial streets within the City.

Evaluation of Projected Conditions

Assuming the total projected traffic volumes, all of the intersections are projected to continue to operate similar to existing conditions during the weekday morning and evening peak hours. All of the intersections have sufficient reserve capacity to accommodate the limited additional traffic to be generated by the proposed development and the projected growth in the area. Further, the additional traffic estimated to be generated by the development during the weekday morning and evening peak hours represent less than a one percent increase in traffic at the Lincoln Avenue/Grace Street/Wolcott Avenue intersection and less than a two percent increase at the Grace Street/Ravenswood Avenue (east section) intersection.

To further enhance the operation of Grace Street and its intersections with the development's access drive and the Trader Joe's access drive, parking should be prohibited on the south side of Grace Street between the development access drive and the Trader Joe's access drive. In addition, parking should be restricted on the south side of Grace Street a minimum of twelve to fifteen feet east of the development access drive and a minimum of twelve to fifteen feet west of the Trader Joe's access drive. Further, the parking restrictions along Grace Street should be better enforced, particularly in proximity to the intersection of Lincoln Avenue/Wolcott Avenue.

As indicated previously, the operation of the Trader Joe's store does add to the queuing and delay along the area street system, particularly during the Saturday midday peak period. However, it is important to note that the proposed development will have a minimal impact on these existing conditions as outlined below.

- The proposed development is projected to generate a low volume of total traffic that is similar, if not, less than other manufacturing and commercial uses that could be developed on the site under the current zoning.

- Given that excellent flexibility of the street system (Grace Street, Lincoln Avenue and the east section of Ravenswood Avenue are all two-way streets) the residents of the development will have multiple ways to access the development which will distribute the traffic along the streets system.

Transportation Sustainability Recommendations

The following summarizes measures to be implemented by the development and/or recommendations to further minimize the impact of the development, foster alternative modes of transportation other than the automobile and to enhance pedestrian/bicycle safety.

- Indoor bike parking will be provided as part of the development.
- One to two parking spaces within the parking garage should be reserved for car-sharing services and/or electric vehicle charging stations.

Site Access

Access to the 66 parking spaces and the loading dock will be provided via a circulation road that will extend along the west side of the development and will intersect Grace Street aligned opposite the Lofts at 1800 access drive. The access drive will be located just east of the access drive to the Trader Joe's shopping center. Given the limited volume of traffic to be generated by the development, the proximity of the access drive will not pose any operational problems. The access drive will provide one inbound lane and one outbound lane with the outbound lanes under stop sign control. The results of the capacity analyses have shown that the access drive is projected to operate at a good level of service.

Depending on negotiations with the CTA, the access drive may have to be located on the east side of the site as opposed to the west side of the site. Similar to the design of the proposed access drive on the west side of the site, the access drive on the east side of the site would provide access to the parking spaces and the loading dock. As proposed, the access drive would intersect Grace Street opposite the west section of Ravenswood Avenue and would form the fourth leg of this existing T-intersection. The proposed four-way intersection would continue to operate under all-way stop sign control. Intersection capacity analyses have shown that the intersection is projected to operate at a very good level of service with the access drive. As such, the intersection will continue to operate well with the addition of the access drive and no street improvements are required.

Conclusion

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

- The volume of vehicle trips generated by the proposed development will be reduced due to dense, urban nature of the neighborhood and the alternative modes of transportation serving the area. Census data indicates that approximately 40 percent of residents in the area drive to work.
- The volume of traffic to be generated by the development is similar, if not, less than many manufacturing and commercial uses that could occupy the site under its current zoning.
- The impact of the development traffic will be further reduced due to the excellent flexibility of the street system (Grace Street, Lincoln Avenue and the east section of Ravenswood Avenue are all two-way streets). Residents will have multiple ways to access the development which will distribute the traffic along the street system.
- The development-generated traffic can be accommodated efficiently with limited impact to the external street system. This is evident in the fact that all of the intersections within the study limits are projected to operate at good levels of service with the addition of the development generated traffic.
- While the Trader Joe's store can add to the queuing and delays within the area, particularly during the Saturday midday peak period, the proposed development will have a reduced impact on these existing conditions as outlined below.
 - ❖ The proposed development is projected to generate a low volume of total traffic that is similar, if not, less than other manufacturing and commercial uses that could be developed on the site under the current zoning.
 - ❖ Given that excellent flexibility of the street system (Grace Street, Lincoln Avenue and the east section of Ravenswood Avenue are all two-way streets), the residents of the development will have multiple ways to access the development which will distribute the traffic along the streets system.
- Access to the 66 parking spaces and loading docks will be provided via a single access drive located on Grace Street which will be adequate to serve the traffic that will be generated by the proposed development.

- The following summarizes measures to be implemented by the development and/or recommendations to further minimize the impact of the development, foster alternative modes of transportation other than the automobile and to enhance pedestrian/bicycle safety.
 - ❖ Indoor bike parking will be provided as part of the development.
 - ❖ One to two parking spaces within the parking garage should be reserved for car-sharing services and/or electric charging stations.

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Appendix

LEVEL OF SERVICE CRITERIA

Signalized Intersections		
Level of Service	Interpretation	Average Control Delay (seconds per vehicle)
A	Favorable progression. Most vehicles arrive during the green indication and travel through the intersection without stopping.	≤10
B	Good progression, with more vehicles stopping than for Level of Service A.	>10 - 20
C	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. Number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	>20 - 35
D	The volume-to-capacity ratio is high and either progression is ineffective or the cycle length is too long. Many vehicles stop and individual cycle failures are noticeable.	>35 - 55
E	Progression is unfavorable. The volume-to-capacity ratio is high and the cycle length is long. Individual cycle failures are frequent.	>55 - 80
F	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.	>80.0
Unsignalized Intersections		
Level of Service	Average Total Delay (SEC/VEH)	
A	0 - 10	
B	> 10 - 15	
C	> 15 - 25	
D	> 25 - 35	
E	> 35 - 50	
F	> 50	

Source: *Highway Capacity Manual*, 2010.