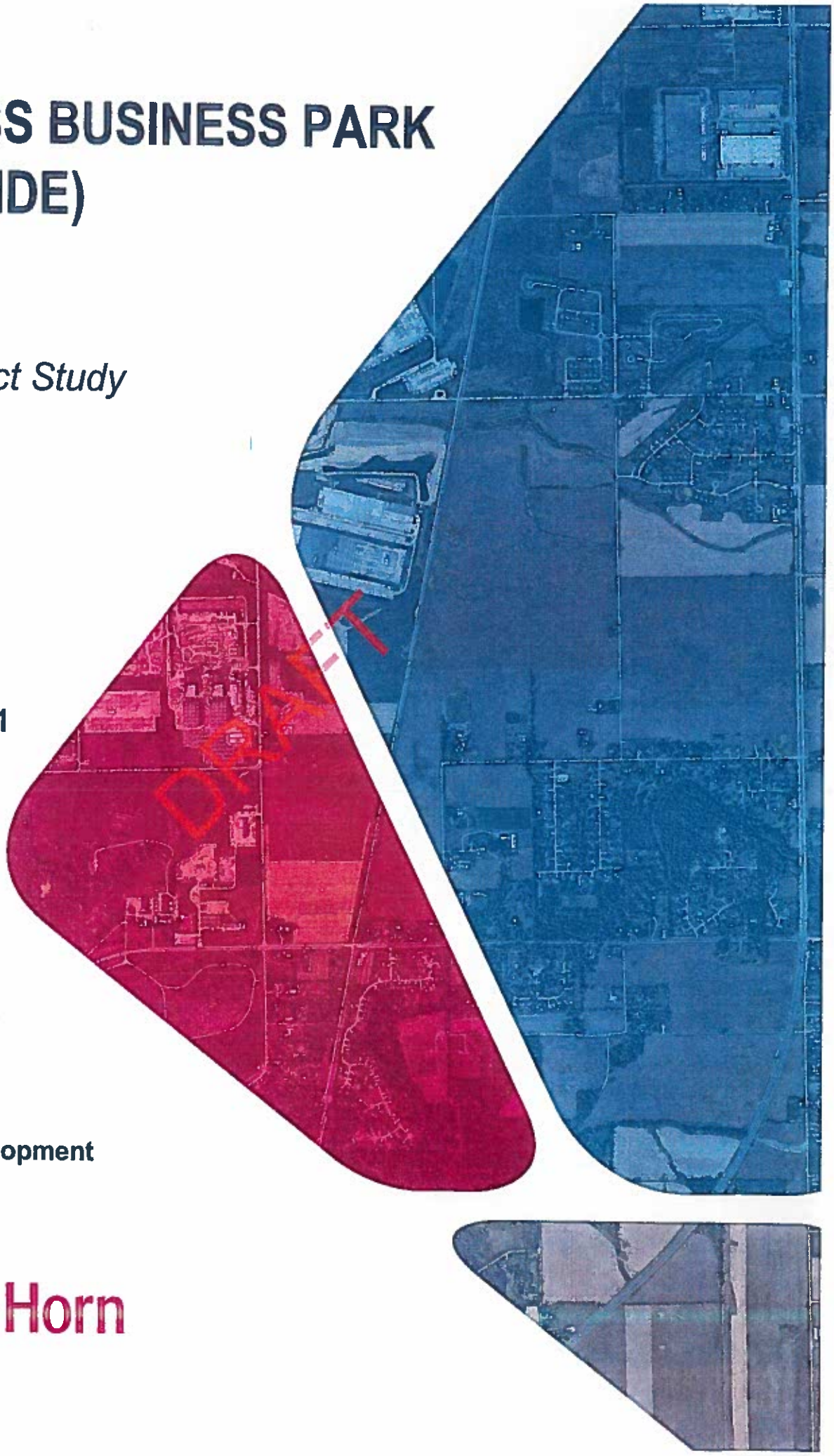
COMPASS BUSINESS PARK (WEST SIDE)

Traffic Impact Study

Joliet, Illinois

December 2021



Prepared for:

NorthPoint Development

Kimley»Horn

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EXECUTIVE SUMMARY

Kimley-Horn and Associates, Inc., (Kimley-Horn) has prepared a traffic impact study for the initial phase of the proposed NorthPoint Compass Business Park (CBP), an industrial development located in the City of Joliet, Illinois. The proposed initial phase of development is generally bounded by IL Route 53 (IL 53) to the east, the existing Union Pacific Railroad (UPRR) to the west, existing residential developments along Noel Road to the south, and Millsdale Road to the north. The proposed development includes approximately 4.2 million square feet of industrial warehouse/distribution use split between four different buildings. Access to the site would be provided via two, new full-access driveways. One driveway would be located along Millsdale Road east of the UPRR and west of Bridge Road (Access A). While the driveway would be designed for car and truck traffic, truck access to and from the east on Millsdale Road would be prohibited by a physical truck barrier located east of the proposed access. The second access point would be located along IL 53 approximately 1,450 ft south of the existing IL 53 / Millsdale Road intersection (Access B). This proposed access driveway would be exclusively utilized by automobiles; access by truck traffic would be restricted. The proposed initial development is expected to be completed in 2024.

The proposed NorthPoint CBP development is expected to be completed in phases. The purpose of this traffic study is to quantify the impact of the initial phase of CBP and to define improvements necessary to support the portion of the development west of IL 53 prior to the completion of additional access infrastructure (UPPR grade separated bridge, IL 53 overpass bridge, new truck route alignment, etc.).

As part of this study, the existing roadway network was analyzed to determine the current operations at the study intersections. In order to assess the potential impact on the area roadway network, site-generated trips were established and added to future background traffic projections. Consistent with Illinois Department of Transportation (IDOT) practices, traffic conditions were evaluated for Future Year 2029, which represents build year plus five years.

Based on a review of future traffic conditions, site-generated traffic is expected to be adequately accommodated by the study intersections. The new intersection at Millsdale Road / Access A should provide one inbound lane and one outbound lane (shared left-right-turn lane) on the south leg with minor leg stop control and a stop sign and stop bar. The new intersection at IL 53 / Access B should include a northbound left-turn lane and a southbound right-turn lane, each with 265 feet of storage and 265 feet of taper. The new west leg should provide one inbound lane and two outbound lanes (separated left and right-turn lanes with 100 feet of storage) with minor leg stop control and a stop sign and stop bar.

There are no changes warranted at the other study intersections of IL 53 / Millsdale Road, IL 53 / Breen Road, and IL 53 / Noel Road as site-generated traffic does not significantly contribute toward these intersections. It should be noted that during the evening peak hour at the IL 53 / Millsdale Road intersection under all analysis scenarios (existing, no-build, and build), the eastbound approach is anticipated to operate at LOS F. This is due to the heavy existing eastbound left-turn movement during the afternoon. Additionally, truck traffic was observed travelling along Millsdale Road west of

IL 53, which is currently restricted. Stricter enforcement may be necessary to ensure trucks do not utilize this route.

1. INTRODUCTION

Kimley-Horn and Associates, Inc. (Kimley-Horn) was retained by NorthPoint Development to perform a traffic impact study for the initial phase development of the proposed CBP, an industrial development located within the City of Joliet, Illinois. The existing site is currently undeveloped agricultural land. The project site contains the portion of the development west of IL 53, which is generally bounded by IL 53 to the east, the existing UPRR to the west, existing residential developments along Noel Road to the south, and Millsdale Road to the north. The proposed development includes approximately 4.2 million square feet of industrial warehouse/distribution use split between four buildings. An aerial view of the study location and surrounding area roadway network is presented in **Exhibit 1**.

As part of this study, the existing network was analyzed to determine the current operations at the study intersections. Site trip generation characteristics were established for the development and added to projected background traffic volumes in order to assess the site's potential impact of the area roadway network. This report presents and documents the study methodology, summarizes data collection and development traffic characteristics, highlights the evaluation of traffic conditions on the study intersections and roadways, and identifies recommendations to address operational impacts and integrate the proposed development into the surrounding transportation system.

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EXHIBIT 1
SITE LOCATION MAP

2. EXISTING CONDITIONS

Based on aerial imagery as well as a site visit, Kimley-Horn conducted a review of the subject site including existing land uses in the surrounding area, the adjacent street system, current traffic volumes and operating conditions, lane configurations and traffic conditions at nearby intersections, and other key roadway characteristics. This section of the report details information on the existing conditions.

2.1. Area Connectivity & Land Uses

The subject property is generally bounded by IL 53 to the east, the existing UPRR to the west, existing residential developments along Noel Road to the south, and Millsdale road to the north. The project site is located within the City of Joliet, Illinois. The subject site is largely agricultural in nature. The southwest quadrant of the IL 53 / Millsdale Road intersection, which is located northeast of the subject site, is developed with residential uses. Additionally, residential properties front Noel Road south of the subject site.

Local connectivity is provided in the east and westbound directions via Millsdale Road, while connectivity in the north and southbound direction is provided via IL 53. Regional access to the subject site is provided via Interstate 55 (I-55), which provides a full interchange with Arsenal Road southwest of the subject site. Access is also provided via Interstate 80 (I-80) to the north via a full interchange provided at IL 53, less than five miles north of the proposed full-access driveway of the site. It should be noted that truck traffic generated by the site will be restricted from accessing IL 53.

2.2. Existing Roadway Characteristics

A summary of the existing roadway network in the vicinity of the subject site is outlined below.

Illinois Route 53 (IL 53) is a north-south roadway that runs along the eastern frontage of the subject property. IDOT classifies IL 53 as a Strategic Regional Arterial (SRA) roadway. The SRA system was established by IDOT to promote mobility on key routes throughout the Chicagoland area by applying various strategies, such as access control and limited signalization. Through the study area, IL 53 provides two travel lanes in each direction with a landscape center median. At its intersection with Millsdale Road, IL 53 provides dedicated left- and right-turn lanes on both the north and south legs of the intersection. This intersection is operated under minor-leg stop control. At its intersections with both Breen Road and Noel Road, IL 53 does not provide dedicated turn lanes. Similarly, minor-leg stop control is provided at these intersections. Through the study area, IL 53 has a posted speed limit of 55 MPH. IL 53 is under IDOT jurisdiction.

Breen Road is an east-west local road located east of the site and extends from its western terminus at IL 53 to Ridge Road on the east. At its T-intersection with IL 53, Breen Road operates under minor-leg stop-control and provides a shared travel lane on the east leg. There is no posted speed limit on Breen Road, so 55 MPH is assumed for analysis purposes. Near its intersection with IL 53, a portion of Breen Road is under the jurisdiction of the City of Joliet. The east segment of Breen Road is under the jurisdiction of Jackson Township.

Millsdale Road is an east-west local road located north of the site and extends from its western terminus at Centerpoint Way to a dead-end into an industrial development east of IL 53. At its intersection with IL 53, Millsdale Road operates under minor-leg stop-control and provides shared travel lanes on the east and west legs. Through the study area, Millsdale Road has a posted speed limit of 35 MPH. Millsdale Road is generally under the jurisdiction of the City of Joliet or Jackson Township. Truck traffic is restricted from travelling along Millsdale Road west of IL 53 via signage.

Bridge Road is a north-south local road that currently bisects the project site. Bridge Road extends from its southern terminus at Noel Road to Sharp Road on the north. Between Gladys Drive and an existing driveway north of its intersection with Noel Road, Bridge Road is a gravel road and not paved. At its intersection with Millsdale Road, Bridge Road operates under all-way stop-control and provides one shared travel lane. A speed limit is not posted on the facility. The north and south segments of Bridge Road are under the jurisdiction of Jackson Township while the unpaved segment of Bridge Road is under the jurisdiction of the City of Joliet.

Noel Road is an east-west local road located south of the subject site and extends from its eastern terminus at IL 53 and terminates at Bush Road. At its T-intersection with IL 53, Noel Road operates under minor-leg stop-control and provides a shared travel lane on the west leg. Through the study area, Noel Road has a posted speed limit of 35 MPH. Noel Road is under the jurisdiction of Jackson Township. Truck traffic is restricted from travelling along Noel Road west of IL 53 via signage.

2.3. Traffic Count Data

Turning movement count data was collected in November 2021 at the following intersections:

- IL 53 / Millsdale Road
- IL 53 / Breen Road
- IL 53 / Noel Road
- Millsdale Road / Union-Pacific Railroad crossing

24-hour counts were conducted on a typical weekday to document daily traffic behavior on the roadway facilities in the area. The traffic data revealed that peak traffic conditions occur within the study area from 6:00-7:00AM and 3:30-4:30PM.

Due to circumstances associated with the COVID-19 public health crisis, traffic volumes have been atypically low since mid-March 2020 with volumes increasing closer to normal in some areas over the past several months. An analysis was performed to evaluate current traffic conditions of the area and compare these results with typical results before the COVID-19 crisis. This was completed by comparing historical IDOT Annual Average Daily Traffic (AADT) volumes from 2019 along IL 53 with the 24-hour volume count collected as part of this study. The IDOT AADT along IL 53 in 2019 was 14,800 vehicles per day (vpd), while the 24-hour volume count collected at IL 53 / Millsdale Road was 17,292 vpd. Seeing as how the present volume was higher than the historic volume published by IDOT, it was assumed that traffic patterns in the project area have normalized; and therefore, the traffic count data is assumed to represent typical conditions.

The peak hour vehicle traffic volumes were rounded to the nearest multiple of five and balanced between the study intersections. The existing traffic volumes are presented in **Exhibit 2**. A summary of the traffic count data is provided in the appendix.

2.4. Existing Capacity Analyses

Capacity analysis for the existing and future conditions was performed using Synchro Version 11. The capacity of an intersection quantifies its ability to accommodate traffic volumes and is expressed in terms of level of service (LOS), measured in average delay per vehicle. LOS grades range from A to F, with LOS A as the highest (best traffic flow and least delay), LOS E as saturated or at-capacity conditions, and LOS F as the lowest (oversaturated conditions). The lowest LOS grade typically accepted by jurisdictional transportation agencies in Northeastern Illinois is LOS D, and a minimum LOS C is required for through movements on SRA routes such as IL 53.

The LOS grades shown below, which are provided in the Transportation Research Board's Highway Capacity Manual (HCM), quantify and categorize the driver's discomfort, frustration, fuel consumption, and travel times experienced as a result of intersection control and the resulting traffic queuing. A detailed description of each LOS rating can be found in **Table 2.1**.

Table 2.1. Level of Service Grading Descriptions[1]

Level of Service	Description
A	Minimal control delay; traffic operates at primarily free-flow conditions; unimpeded movement within traffic stream.
B	Minor control delay at signalized intersections; traffic operates at a fairly unimpeded level with slightly restricted movement within traffic stream.
C	Moderate control delay; movement within traffic stream more restricted than at LOS B; formation of queues contributes to lower average travel speeds.
D	Considerable control delay that may be substantially increased by small increases in flow; average travel speeds continue to decrease.
E	High control delay; average travel speed no more than 33 percent of free flow speed.
F	Extremely high control delay; extensive queuing and high volumes create exceedingly restricted traffic flow.

[1]Highway Capacity Manual, 6th Edition

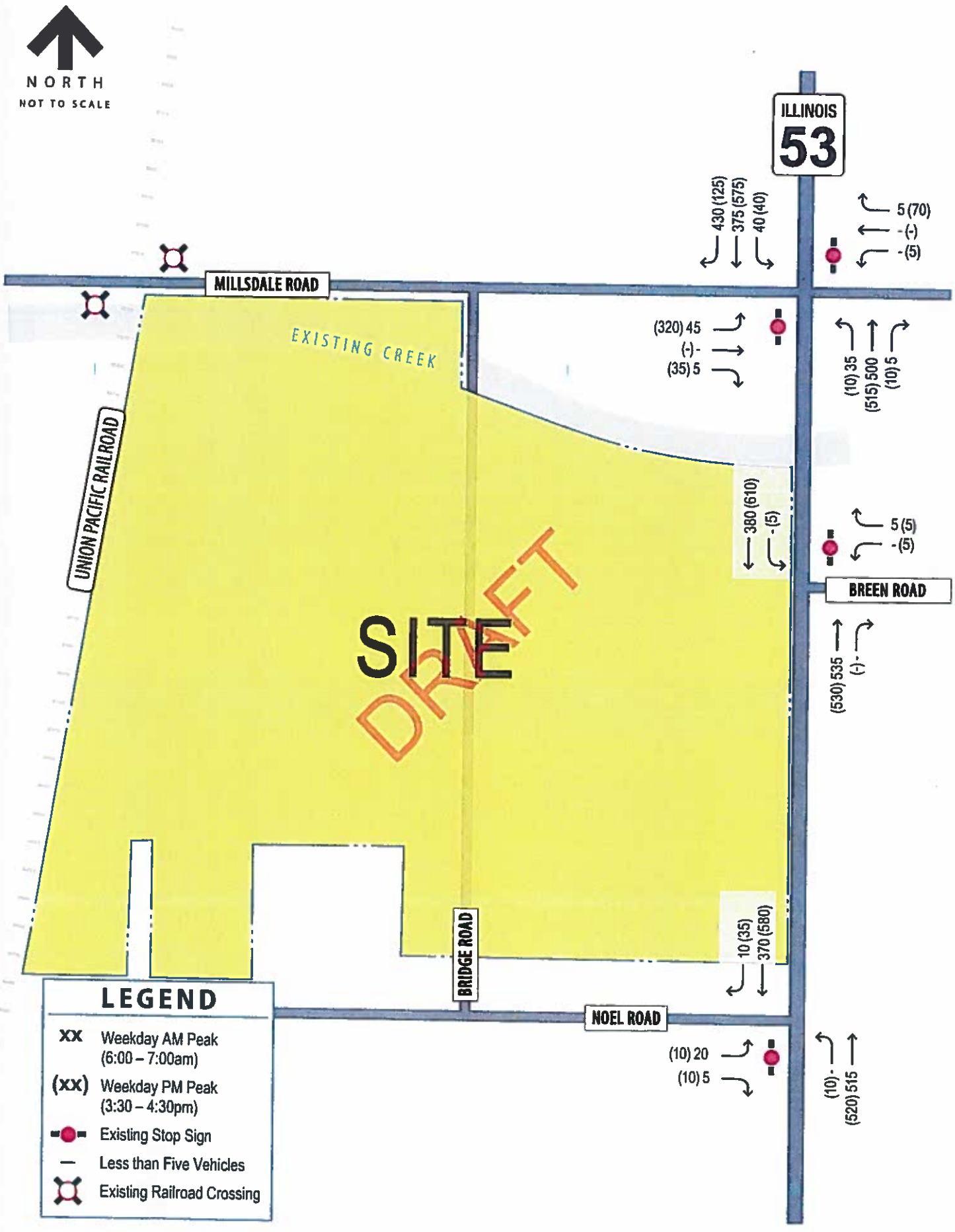

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EXHIBIT 2
EXISTING (2021) VOLUMES

The range of control delay for each rating (as detailed in the HCM) is shown in **Table 2.2**. Because signalized intersections are expected to carry a larger volume of vehicles and stopping is required during red time, note that higher delays are tolerated for the corresponding LOS ratings.

Table 2.2. Level of Service Grading Criteria[1]

Level of Service	Average Control Delay (s/veh) at	
	Unsignalized Intersections	Signalized Intersections
A	0 – 10	0 – 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F[2]	> 50	> 80

[1]Highway Capacity Manual, 6th Edition

[2]All movements with a Volume to Capacity (v/C) ratio greater than 1 receive a rating of LOS F.

Based on these standards, capacity results were identified for the study intersections under existing conditions. The results of capacity analysis for existing conditions are summarized in **Table 2.3**. In this table, operation on each approach is quantified according to the average delay per vehicle and the corresponding level of service. The results for the study intersections are based on HCM 6th Edition capacity analysis. Copies of the Synchro reports are provided in the appendix.

Table 2.3 Existing (Year 2021) Levels of Service

Intersection	Weekday AM Peak		Weekday PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
IL 53 / Millsdale Road △				
Eastbound	16	C	>120	F
Westbound	14	B	11	B
Northbound (Left)	10	A	9	A
Southbound (Left)	9	A	9	A
IL 53 / Breen Road △				
Westbound	11	B	12	B
Southbound	<1	A	<1	A
IL 53 / Noel Road △				
Eastbound	12	B	13	B
Northbound	<1	A	<1	A

△-Minor-Leg Stop-Controlled Intersection

Based on the analysis, traffic operation is generally satisfactory throughout the study area. The north-south through movements on IL 53 currently operate under free-flow conditions without delay, which is consistent with IDOT requirements for an SRA route.

IL 53 / Millsdale Road

The northbound and southbound left-turn movements along IL 53 at Millsdale Road operate at LOS A during both the morning and evening peak hours. The existing 95th percentile queue for these

movements is less than one vehicle. The westbound approach operates at LOS B during each peak hour with 95th percentile queues less than one vehicle. The eastbound approach operates at LOS C during the morning peak hour with a 95th percentile queue of less than one vehicle. During the evening peak hour, the eastbound approach operates at LOS F, with a 95th percentile queue of 17 vehicles (425 feet). This is likely due to the heavy eastbound left-turn movements (320 vehicles) attempting to find adequate gaps in the north and southbound traffic on IL 53. Restriping the west leg of the intersection to incorporate separate left and through-right turn lanes could help to alleviate some of the capacity constraints. There is approximately 38 feet of pavement width on the west leg, which is enough to accommodate the change to one inbound lane and two outbound lanes. However, there are no known plans for improvement at this intersection; therefore, the existing geometry was assumed.

It should be noted that truck traffic was observed travelling along Millsdale Road west of IL 53, which is currently restricted and illegal. During the 24-hour count period, 54 articulated trucks were counted traveling through the west leg of the intersection. Stricter enforcement may be necessary to ensure trucks do not utilize this route.

Signal warrant analysis was also performed for this intersection according to criteria set by the *Manual on Uniform Traffic Control Devices* (MUTCD) for existing traffic volumes. The volumes do not satisfy warrant criteria at this location.

IL 53 / Breen Road

The southbound approach along IL 53 at Breen Road operates at LOS A during both the morning and evening peak hours. The westbound approach operates at LOS B during each peak hour with 95th percentile queues less than one vehicle.

IL 53 / Noel Road

The northbound approach along IL 53 at Noel Road operates at LOS A during both the morning and evening peak hours. The eastbound approach operates at LOS B during each peak hour with 95th percentile queues less than one vehicle.

3. DEVELOPMENT CHARACTERISTICS

This section of the report evaluates buildout of the initial phase of the proposed industrial park, summarizes site-specific traffic characteristics, and develops future traffic projections for analysis.

3.1. Development Characteristics & Site Access

The proposed development phase would include four warehouse buildings totaling an approximately 4.2 million square feet of combined floor area. Access to the site would be provided via two, new full-access driveways. One driveway would be located along Millsdale Road east of the UPRR and west of Bridge Road (Access A). While the driveway would be designed for car and truck traffic, truck access to and from the east on Millsdale Road would be prohibited by a physical truck barrier located east of the proposed access. The second access point would be located along IL 53 approximately 1,500 feet south of the existing IL 53 / Breen Road intersection (Access B). This proposed access driveway would be exclusively utilized by automobiles; access by truck traffic would be restricted. A conceptual site plan is provided in the appendix.

As part of the development, the portion of Bridge Road that runs through the site would be removed. Local access to existing driveways along Bridge Road would be maintained, but through access along the facility would be eliminated. Bridge Road would be reconfigured with cul-de-sacs near the North and South terminuses of the existing roadway to facilitate this access.

3.2. Trip Generation

In order to calculate trips generated by the proposed site, data was referenced from the Institute of Transportation Engineers (ITE) manual titled Trip Generation, Eleventh Edition. Trip generation data for the proposed use, ITE Land Use Code (LUC) 154 – High-Cube Transload and Short-Term Storage, is shown in **Table 3.1**.

Table 3.1 ITE Trip Generation Data by Land Use

ITE Land Use	Unit	Type	Trip Generation Rate		
			Daily	AM Peak	PM Peak
High-Cube Transload and Short-Term Storage Warehouse (LUC 154)	Per 1,000 sq. ft.	Passenger Vehicles	1.18X 50% in/50% out	0.06X 77% in/23% out	0.09X 28% in/72% out
		Heavy Vehicles	0.22X 50% in/50% out	0.02X 49% in/51% out	0.01X 47% in/53% out

X – 1,000 square feet gross floor area

The site-generated trips generated during the peak hours were rounded to the nearest multiple of five for the purposes of this analysis, and daily trips were rounded to the nearest multiple of ten. Projected site traffic volumes are summarized in **Table 3.2.**

Table 3.2 Site-Generated Traffic Projections[1]

Size	Trip Type	Site-Generated Trips (Weekday)						
		Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
4,219,400 sq. ft.	Cars	4,980	195	60	255	105	275	380
	Trucks	930	40	45	85	20	20	40
Total New Trips (Initial Phase)		*5,910*	*235*	*105*	*340*	*125*	*295*	*420*

[1]In/Out volumes are rounded to the nearest multiple of five. For rounding purposes, the total volumes are a sum of in and out trips.

3.3. Directional Distribution

The estimated distribution of site-generated traffic on the surrounding roadway network as it approaches and departs the site is a function of several variables, such as access and parking locations, prevailing traffic volumes/patterns, the location of employees' residences, characteristics of the street system, and the ease with which vehicles can travel over various sections of that system. As such, **Table 3.3** presents the anticipated directional distribution from which vehicles will travel to and from the site.

Table 3.3 Estimated Trip Distribution

Traveling to/from	Estimated Trip Distribution	
	Passenger Vehicles	Heavy Vehicles
North on IL 53	65%	0%
South on IL 53	20%	0%
West on Millsdale Road	15%	100%
Total	100%	100%

Passenger vehicle traffic entering and exiting the site is restricted from utilizing Millsdale Road between Access A (just east of the UPRR) and IL 53. Additionally, truck traffic is prohibited from utilizing IL 53 to enter or exit the site. All truck traffic will access the site via Access A to/from the west on Millsdale Road.

Based on the preceding assumptions and trip distribution percentages, site traffic (Table 3.4) was assigned to the study intersections. Car trips for the proposed development are shown in **Exhibit 3,** while truck trips are depicted in **Exhibit 4,** and total site-generated trips for the initial phase of development are shown in **Exhibit 5.**

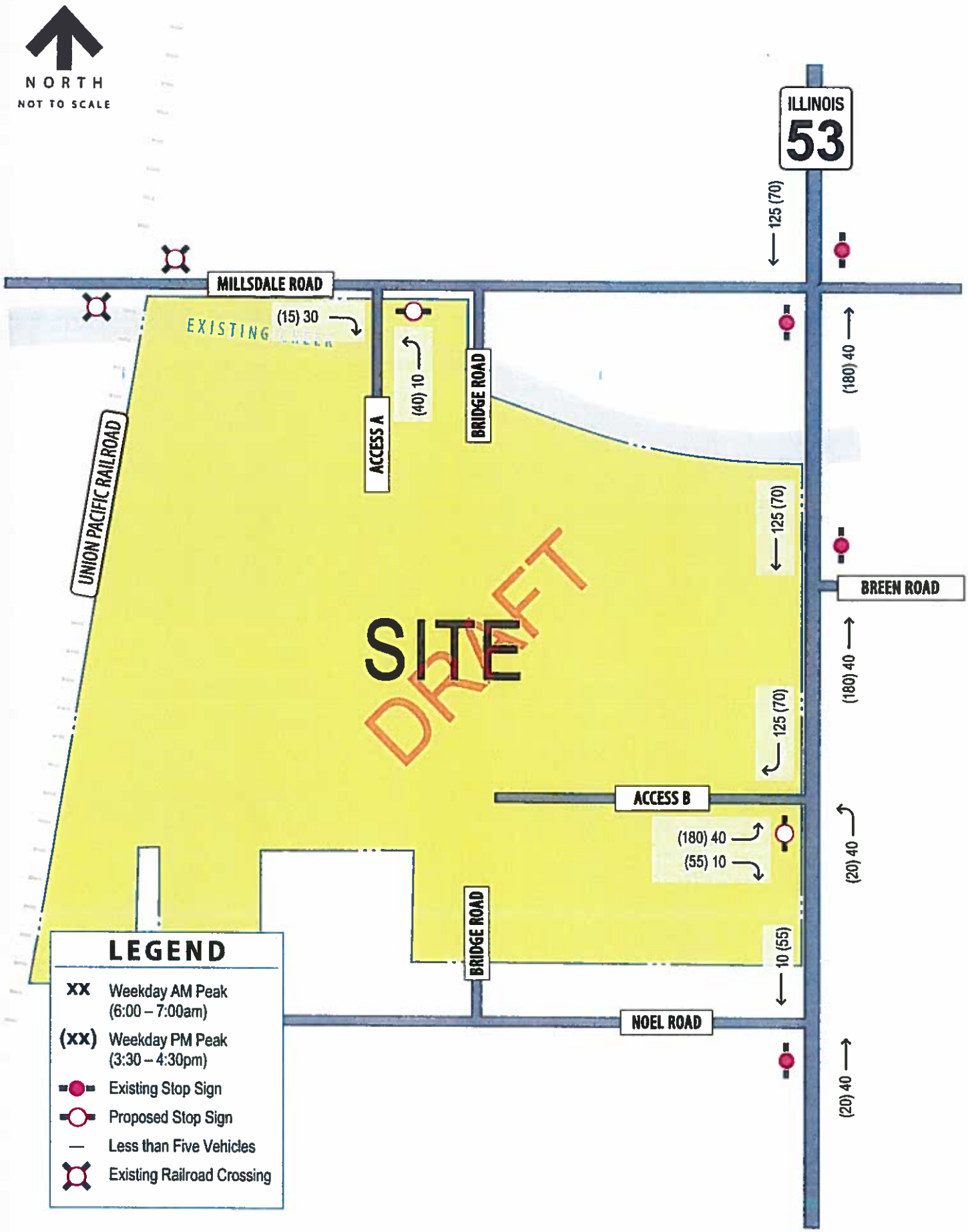

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EXHIBIT 3

SITE TRIP ASSIGNMENT- CARS

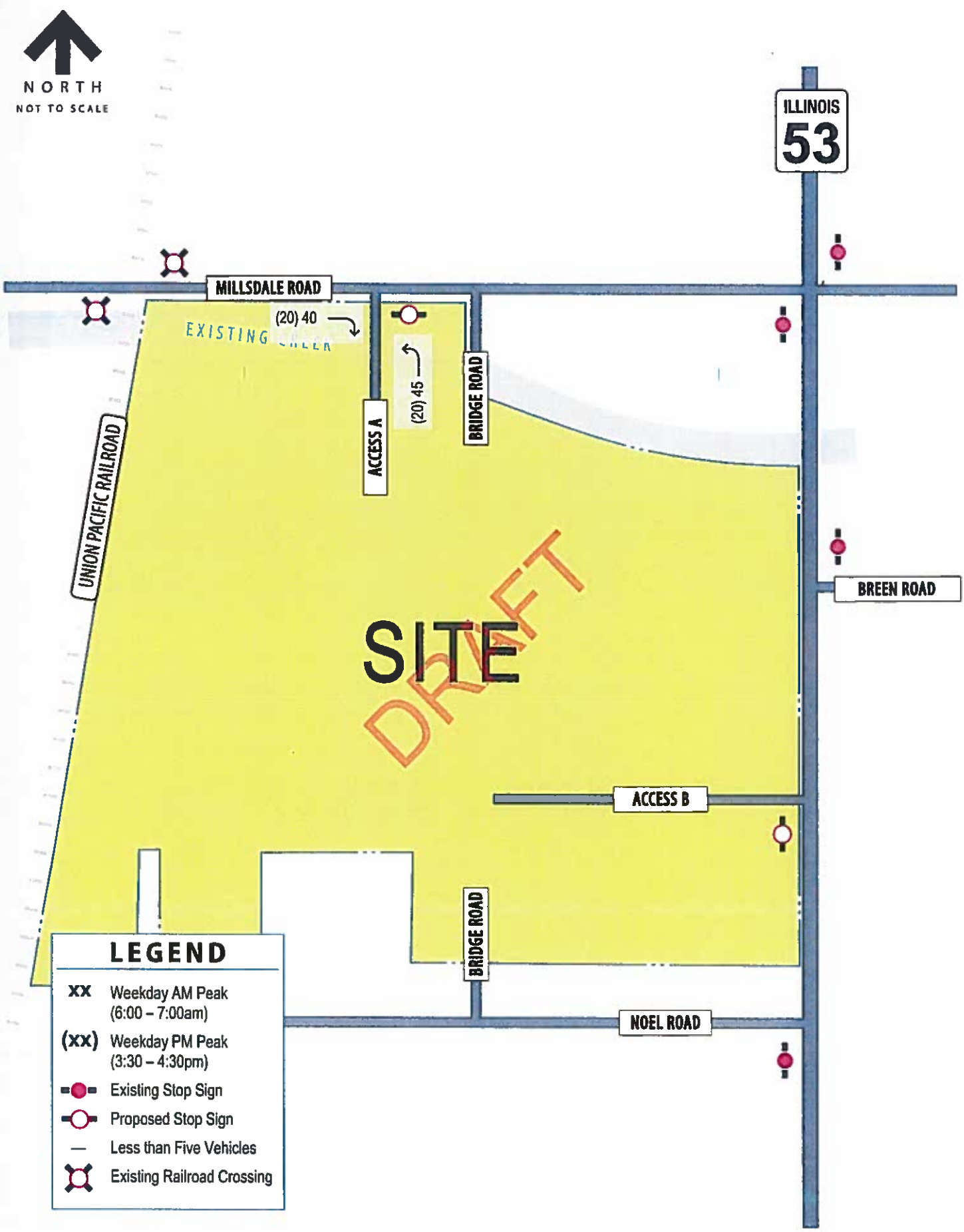

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EXHIBIT 4

SITE TRIP ASSIGNMENT - TRUCKS

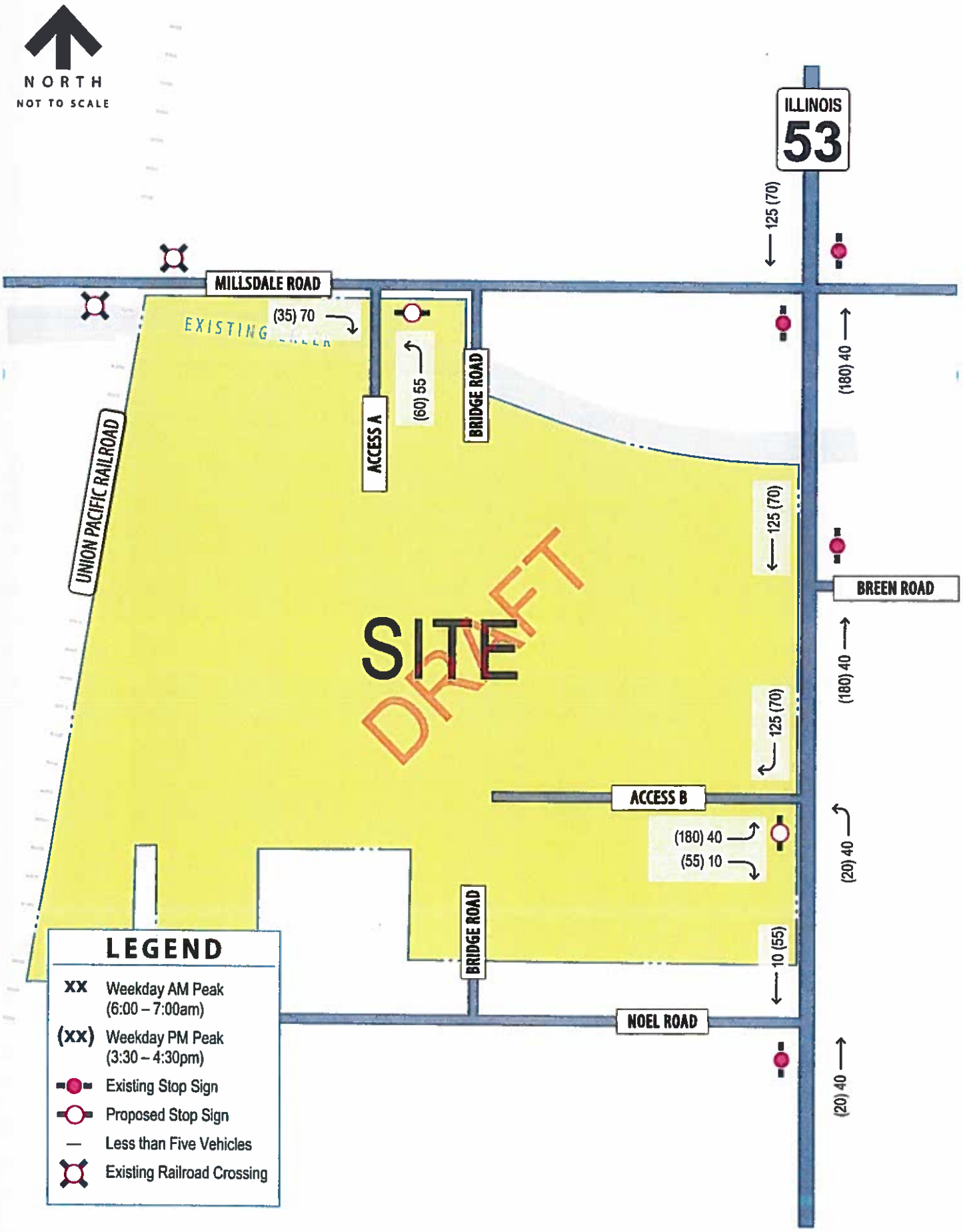

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EXHIBIT 5

SITE TRIP ASSIGNMENT - TOTAL

4. FUTURE CONDITIONS

This section of the report outlines the proposed site plan, summarizes site-specific traffic characteristics, and develops future projections for analysis.

4.1. Future (2029) Background Traffic Projections

Background traffic volumes were estimated using data from the Chicago Metropolitan Agency for Planning (CMAP). Based on information received from CMAP, traffic growth on IL 53 is projected at a compounded rate of roughly 2 percent annual through Year 2050. Accordingly, an annual growth rate of 2 percent was applied to all movements at the study intersections to account for background traffic growth. An official letter from CMAP documenting the projected Year 2050 traffic volume on IL 53 is included in the appendix. The future background traffic projections for Year 2029 (build year + five years) are presented in **Exhibit 6**.

4.2. Future (2029) No-Build Traffic Projections

Capacity analyses were conducted using the no-build traffic volumes presented in Exhibit 6 to determine the impact of background traffic growth and other development traffic on the study intersections. Consistent with the existing conditions analysis, the capacity results are based on Synchro's HCM 6th Edition reports; copies of the reports are provided in the appendix.

Table 4.1 Future (Year 2029) No-Build Levels of Service

Intersection	Weekday AM Peak		Weekday PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
IL 53 / Millsdale Road △				
Eastbound	19	C	>120	F
Westbound	15+	C	15-	B
Northbound (Left)	11	B	10-	A
Southbound (Left)	9	A	9	A
IL 53 / Breen Road △				
Westbound	11	B	13	B
Southbound	<1	A	<1	A
IL 53 / Noel Road △				
Eastbound	13	B	14	B
Northbound	<1	A	<1	A

△-Minor-Leg Stop-Controlled Intersection

Based on the analysis, traffic operation is generally consistent with existing conditions throughout the study area. The north-south through movements on IL 53 are projected to continue to operate under free-flow conditions without delay, which is consistent with IDOT requirements for an SRA route.

IL 53 / Millsdale Road

The northbound and southbound left-turn movements along IL 53 at Millsdale Road are projected to operate at LOS B or better during both the morning and evening peak hours. The 95th percentile

queue for these movements is projected to remain less than one vehicle. The westbound approach is projected to operate at LOS C or better during each peak hour with 95th percentile queues remaining at less than one vehicle. The eastbound approach is projected to operates at LOS C during the morning peak hour with a 95th percentile queue of less than one vehicle, which is consistent with existing conditions. During the evening peak hour, the eastbound approach is projected to continue operating at LOS F, with a 95th percentile queue of 30 vehicles (750 feet) (compared to 17 vehicles under existing conditions). This is likely due to the heavy eastbound left-turn movement (375 vehicles).

Signal warrant analysis was also performed for this intersection according to criteria set by the *Manual on Uniform Traffic Control Devices* (MUTCD) for Future (2029) No-Build traffic projections. The volume projections do not satisfy warrant criteria at this location.

IL 53 / Breen Road

The southbound approach along IL 53 at Breen Road is projected to continue operating at LOS A during both the morning and evening peak hours. The westbound approach is projected to operate at LOS B during each peak hour with 95th percentile queues remaining at less than one vehicle.

IL 53 / Noel Road

The northbound approach along IL 53 at Noel Road is projected to continue operating at LOS A during both the morning and evening peak hours. The eastbound approach is projected to continue operating at LOS B during each peak hour with 95th percentile queues remaining at less than one vehicle.

4.3. Future (2029) Build Traffic Projections

To develop future build traffic projections, total new site trips (Exhibit 5) were added to the No-Build traffic projections (Exhibit 6) to calculate future build traffic projections. Traffic projections for 2029 build conditions scenario are illustrated in **Exhibit 7**.

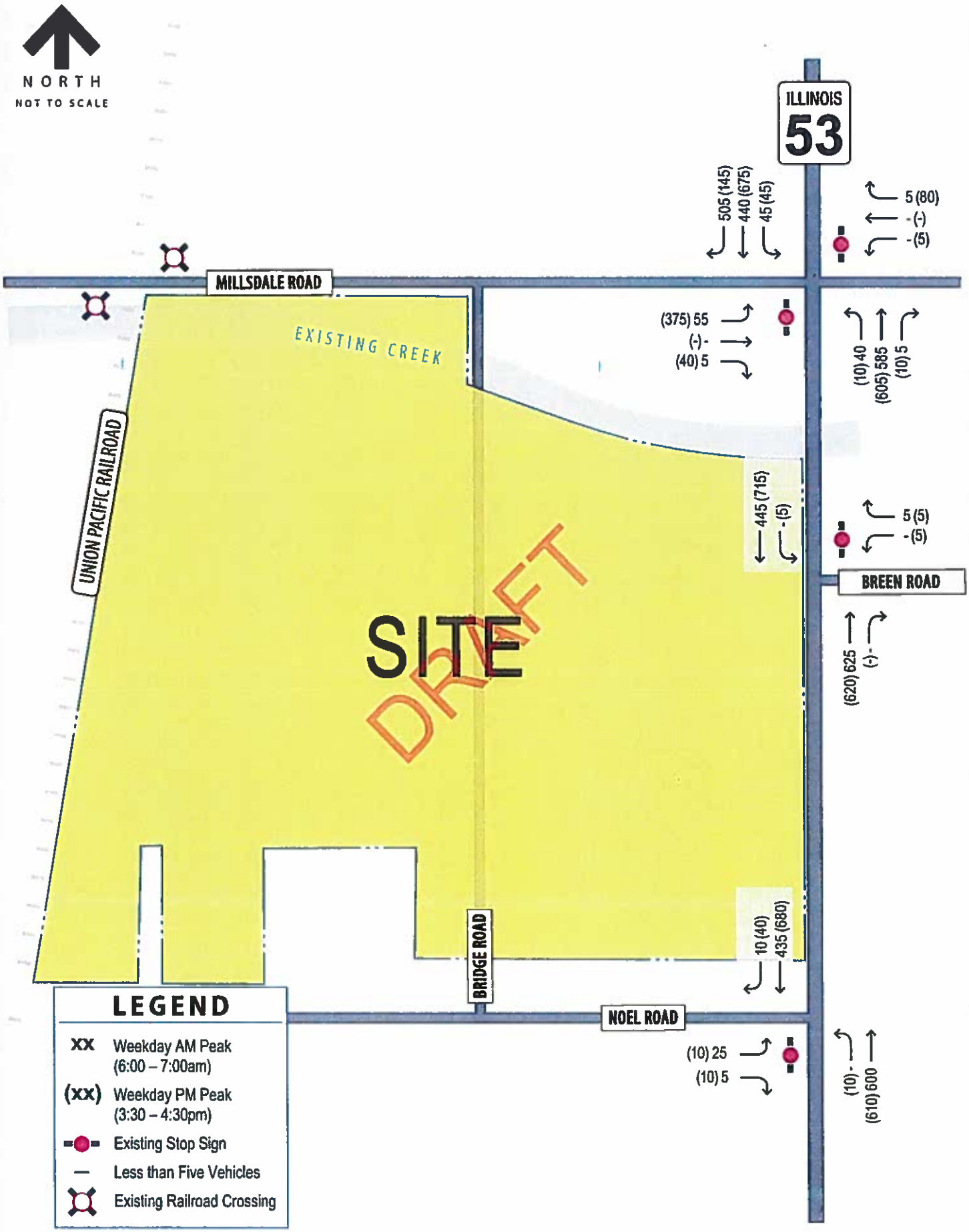

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EXHIBIT 6

FUTURE (2029) NO-BUILD PROJECTIONS

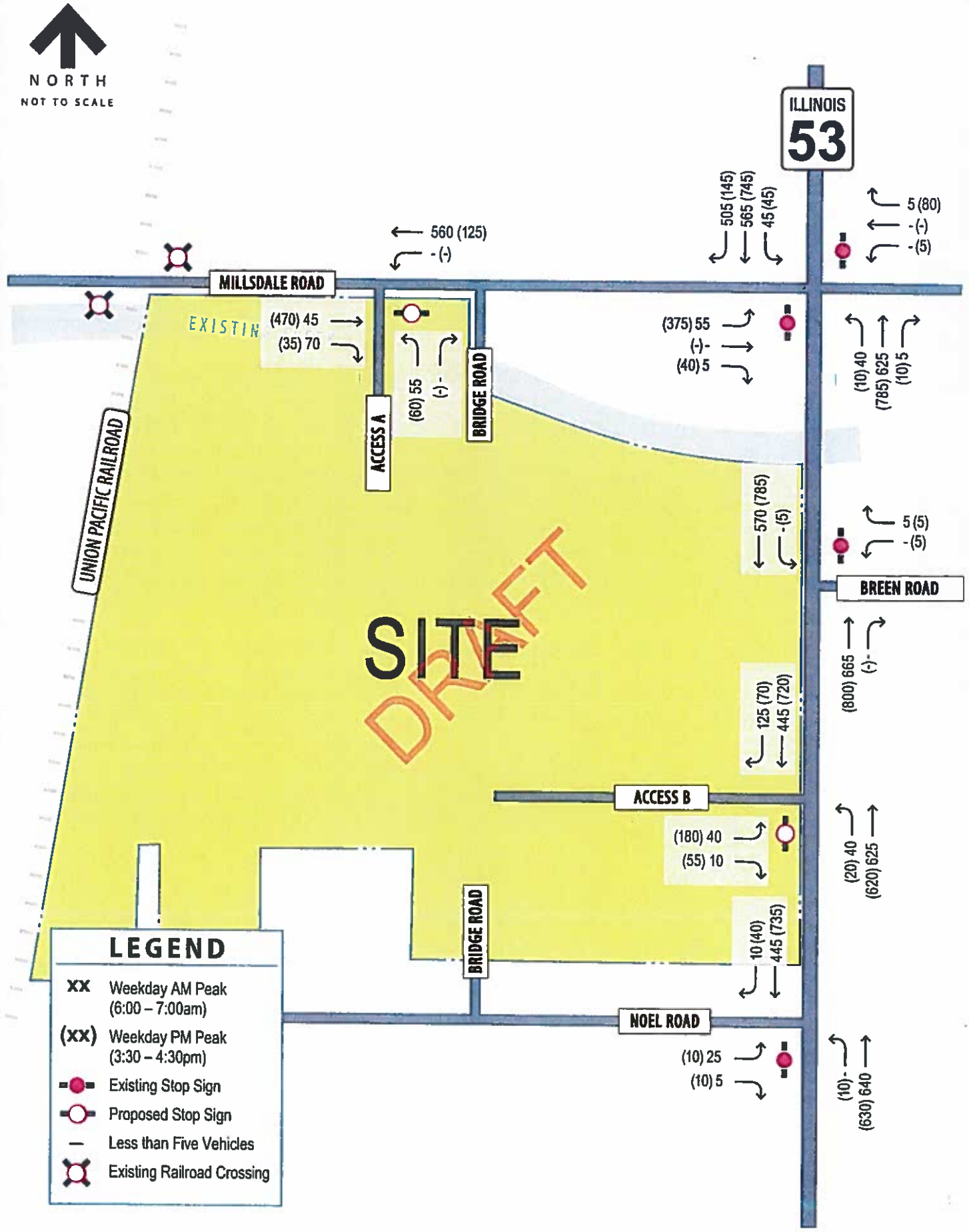

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EXHIBIT 7

FUTURE (2029) BUILD PROJECTIONS

4.4. Future Geometry

Turn Lane Warrants

For the analysis of future traffic conditions, turn lane warrants were evaluated at the proposed site driveways using guidelines in the IDOT *Bureau of Design and Environment (BDE) Manual*.

An eastbound right-turn lane and westbound left-turn lane were evaluated on Millsdale Road at Access A. Based on volume guidance provided in the *BDE Manual*, future traffic volumes do not warrant an either turn lane along Millsdale Road. This laneage was not included in the analysis of future conditions.

A southbound right-turn lane was evaluated on IL 53 at Access B. Based on volume guidance provided in the BDE Manual for right-turn lanes on four-lane roadways, future traffic volumes warrant a southbound right-turn lane along IL 53 at Access B. The BDE Manual was further referenced to determine this lane should provide 265 feet of storage with a 265-foot taper. This is dictated by the 60 MPH design speed along IL 53 at this location. Furthermore, a northbound left-turn lane was evaluated on IL 53 at Access B. The *BDE Manual* does not provide specific guidance for left-turn lanes on four-lane highways; however, there is an existing landscaped median in that location. To help accommodate traffic entering Access B, a northbound left-turn lane is recommended; and therefore, was included in the analysis of future conditions. The left-turn lane should provide 265 feet of storage and a 265-foot taper.

Additionally, it is recommended that the eastbound approach (west leg) of Access B at IL 53 provide separated left and right turning lanes with 100 feet of storage. This laneage was included in the analysis of future conditions.

Signal Warrants

Future traffic projections were compared to criteria provided in the *Manual on Uniform Traffic Control Devices* (MUTCD) to determine whether a traffic signal may be warranted under the Year 2029 build conditions at the intersections of Millsdale Road / Access A, IL 53 / Access B, and IL 53 / Millsdale Road.

Signal warrant analyses were performed according to criteria set by the MUTCD for Warrant 1 (Eight-Hour Warrant), Condition A (Minimum Vehicular Volume) and Condition B (Interruption of Continuous Traffic). Warrant 1 can be satisfied by meeting the following conditions: Condition A (Minimum Vehicular Volume), Condition B (Interruption of Continuous Traffic), or the combined Condition A & B. The signal warrant analysis is typically completed with at least eight hours of traffic count data for an intersection. Because only peak hour projections can be formulated for the proposed development, typical IDOT practice allows a signal warrant to instead be evaluated by reducing evening peak hour volumes to 55 percent of their projected total to represent the minimum volume during a given eight-hour period. Minor-street right-turning volumes were also reduced at the study intersections in accordance with Pagone's Theorem, per IDOT requirements. These reduced volumes were compared to MUTCD criteria for signal warrant analysis. **Table 4.1** reports the signal warrant analyses conducted for the intersections of Millsdale Road / Access A and IL 53 / Access B.

Table 4.1 Signal Warrant Analyses (Peak-Hour Criteria)

Intersection / Warrant Criteria	Traffic Volume		Meets Warrant?
	Major Street	Higher-Volume Minor-Leg Approach	
Millsdale Road / Access A			
One-Lane Major Street/One-Lane Minor Street at 100%			
MUTCD Criteria			
Warrant 1A	500	150	--
Warrant 1B	750	75	--
Combination			
Warrant 1A	400	120	--
Warrant 1B	600	60	--
Build (Year 2029)	402	33	No
IL 53 / Access B			
Two-Lane Major Street/Two-Lane Minor Street at 100%			
MUTCD Criteria			
Warrant 1A	600	150	--
Warrant 1B	900	100	--
Build (Year 2029)	787	123	No

As shown in the table above, based on projected future traffic volumes at Millsdale Road / Access A and IL 53 / Access B, a traffic signal is not warranted at either intersection under future (2029) build conditions scenario; and therefore, was not included in the analysis of future build conditions and minor-leg stop control was assumed.

Signal warrant analysis was also performed for IL 53 / Millsdale Road according to similar methodology and criteria mentioned above. Existing 24-hour turning movements described under *Data Collection* were collected at this intersection. This provides the opportunity for future (2029) build traffic projections to be formulated for the 12 hours listed within MUTCD criteria for Warrant 1. Per the above, 55 percent of development volumes were added to the north and south major street movements to reflect project traffic. The criteria to meet Warrant 1 for this intersection are summarized in **Table 4.2** on the following page, while the signal warrant analysis is provided in **Table 4.3**.

Table 4.2 MUTCD Traffic Signal Warrant (Eight-Hour Volume) Criteria – IL 53 / Millsdale Road

Intersection / Scenario (Il 53 / Millsdale Road - 2029 Build)	Major Street (IL 53)	Higher-Volume Minor-Leg Approach (Millsdale Road)	Meets Warrant?
MUTCD Criteria			
Warrant 1A	600	150	No
Warrant 1B	900	100	Yes
Combination[1]			--
Warrant 1A	N/A	N/A	--
Warrant 1B	N/A	N/A	--

[1]To satisfy warrant criteria for the combined Conditions A & B, the minimum volume thresholds for both conditions must be met.

Table 4.3 reports the signal warrant analysis conducted for IL 53 / Millsdale Road for future (2029) build traffic conditions.

Table 4.3 Signal Warrant Analysis (Eight-Hour Criteria)

Time	Traffic Volume		Warrant Satisfied?		
	Major Street	Higher-Volume Minor-Leg Approach	Warrant 1A	Warrant 1B	Combination Warrant 1A & 1B
IL 53 / Millsdale Road					
6:00 AM	1792	60	No	No	No
7:00 AM	1254	95	No	No	No
8:00 AM	1054	76	No	No	No
9:00 AM	1010	100	No	Yes	No
10:00 AM	837	88	No	No	No
11:00 AM	915	114	No	Yes	No
12:00 PM	898	126	No	No	No
1:00 PM	1034	176	Yes	Yes	No
2:00 PM	1439	399	Yes	Yes	No
3:00 PM	1547	378	Yes	Yes	No
4:00 PM	1664	435	Yes	Yes	No
5:00 PM	1187	180	Yes	Yes	No
	Total Number of Hours Warrant is Met		5	7	0
	Meets Warrant Criteria?		**No**	**No**	**No**

As shown in the table on the previous page, based on projected future traffic volumes at IL 53 / Millsdale Road, a traffic signal is not warranted at the intersection under future (2029) build conditions scenario; and therefore, was not included in the analysis of future build conditions and minor-leg stop control was assumed.

Based on these assumptions, future capacity results are provided for the future (2029) build conditions scenario in **Table 4.4**.

4.4. Future Build Capacity Analysis

Capacity results for the Future Year (2029) Build condition are provided in **Table 4.4.** Consistent with the existing conditions analysis, the results are based on *Synchro's* HCM 6th Edition reports. Copies of the capacity analysis reports are provided in the appendix.

Table 4.4 Future (2029) Build Levels of Service

Intersection	Weekday AM Peak		Weekday PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
IL 53 / Millsdale Road △				
Eastbound	22	C	>120	F
Westbound	25	C	16	C
Northbound (Left)	11	B	10	B
Southbound (Left)	9	A	10	B
Millsdale Road / Access A △				
Westbound	<1	A	<1	A
Northbound	19	C	16	C
IL 53 / Breen Road △				
Westbound	15	C	20	C
Southbound	<1	A	<1	A
IL 53 / Access B △				
Eastbound	18	C	28	D
Northbound (Left)	9	A	10-	A
IL 53 / Noel Road △				
Eastbound	16	C	19	C
Northbound	<1	A	<1	A

△-Minor-Leg Stop-Controlled Intersection

Based on the analysis, traffic operation is generally consistent with no-build conditions throughout the study area. The north-south through movements on IL 53 are projected to continue to operate under free-flow conditions without delay, which is consistent with IDOT requirements for an SRA route.

IL 53 / Millsdale Road

The northbound and southbound left-turn movements along IL 53 at Millsdale Road are projected to continue operating at LOS B or better during both the morning and evening peak hours, which is consistent with no-build conditions. The 95th percentile queue for these movements is projected to remain less than one vehicle. The westbound approach is projected to continue operating at LOS C or better during each peak hour with 95th percentile queues projected at one vehicle or less. The eastbound approach is projected to continue operating at LOS C during the morning peak hour with a 95th percentile queue of less than one vehicle, which is consistent with no-build conditions. During the evening peak hour, the eastbound approach is projected to continue operating at LOS F, with a 95th percentile queue of 33 vehicles (825 feet) (compared to 30 vehicles under no-build conditions). This is likely due to the heavy eastbound left-turn movement (375 vehicles).

Millsdale Road / Access A

The westbound approach along Millsdale Road at Access A is projected to operate at LOS A during both the morning and evening peak hours. The northbound approach of this new intersection is projected to operate at LOS C during each peak hour with 95th percentile queues projected at less than one vehicle.

IL 53 / Breen Road

The southbound approach along IL 53 at Breen Road is projected to continue operating at LOS A during both the morning and evening peak hours. The westbound approach is projected to operate at LOS C during each peak hour with 95th percentile queues remaining at less than one vehicle.

IL 53 / Access B

The northbound left-turn movement along IL 53 at Millsdale Road is projected to operate at LOS A during both the morning and evening peak hours. The 95th percentile queue for this movement is projected at less than one vehicle. The eastbound approach of this new intersection is projected to operate at LOS C during the morning peak hour with a 95th percentile queue of less than one vehicle in both turn lanes. During the evening peak hour, the eastbound approach is projected to operate at LOS D with a 95th percentile queue of 4 vehicles or less in both turn lanes.

IL 53 / Noel Road

The northbound approach along IL 53 at Noel Road is projected to continue operating at LOS A during both the morning and evening peak hours. The eastbound approach is projected to operate at LOS C during each peak hour with 95th percentile queues remaining at less than one vehicle.

RECOMMENDATIONS & CONCLUSIONS

Based on Kimley-Horn's review of the proposed site plan and evaluation of existing and future traffic conditions, the existing and proposed study intersections are projected to adequately accommodate the proposed development with the implementation of the following improvements:

- **Millsdale Road / Access A**
  - Provide one inbound lane and one outbound lane (shared left-right-turn lane) with minor leg stop control and a stop sign and stop bar.
  - The access driveway should be designed to accommodate truck traffic (design vehicle WB-65).

- **IL 53 / Access B**
  - Provide a southbound right-turn lane along IL 53 at Access B (265 feet of storage with a 265-foot taper).
  - Provide a northbound left-turn lane along IL 53 at Access B (265 feet of storage and a 265-foot taper).
  - Provide one inbound lane and two outbound lanes on the west leg (separated left and right-turn lanes with 100 feet of storage) with minor leg stop control and a stop sign and stop bar.

Regardless of the final configuration of the intersection geometrics, several additional items should be taken into consideration when preparing roadway improvement plans for the subject development. As the design of the study area improvements and the site progresses, care should be taken with landscaping, signage, and monumentation at the site access locations to ensure that adequate horizontal and vertical sight distance is provided from the new stop bars. If alterations to the site plan or land use should occur, changes to the analysis provided within this traffic impact study may be needed.

TECHNICAL APPENDIX

Conceptual Site Plan

Traffic Count Data

Existing (2021) Capacity Reports

Data from ITE Trip Generation, Eleventh Edition (LUC 154)

CMAP Year 2050 Projections

Future (Year 2029) No-Build Capacity Reports

Future (Year 2029) Build Capacity Reports

Kimley»Horn

DRAFT

CONCEPTUAL SITE PLAN