Kimley»Horn

December 18, 2015

Mr. William Heniff
Village of Lombard
255 E. Wilson Avenue
Lombard, Illinois 60148

RE: Response to Project Review Comments
Gas Station + Diesel Fueling Facility
North Avenue/Broadview Avenue (SW Corner)
Lombard, Illinois

Dear Mr. Heniff,

Kimley-Horn is in receipt of a memorandum from Kenig, Lindgren, O'Hara, Aboona, Inc., (KLOA, Inc.) dated December 10, 2015, regarding project review for the proposed gas station and diesel fueling facility at the southwest corner of the North Avenue/Broadview Avenue intersection in Lombard, Illinois. Based on the review provided, we offer the following summary of the provided comments with a response or status update.

1. **The traffic study was conducted following all industry guidelines set forth by the Institute of Transportation Engineers (ITE).**

   Noted.

2. **We would like to see a discussion on the peak period traffic observations. Based on our observations, northbound traffic on IL 53 during the morning peak hour routinely backs up over 630 feet extending beyond the proposed three quarter access. Conversely, during the evening peak hour, southbound traffic would occasionally queue very close to the proposed three quarter access drive due to its narrowing from two through lanes to one lane and the occasional left-turning vehicle into one of the homes along IL 53.**

   Similar conditions were observed for northbound IL Route 53 in the morning peak hour and confirmed with review of video recorded as part of the traffic count data collection. The northbound queue lengthens and shortens as the traffic signal cycles through its phases. During the weekday morning peak period, vehicles exiting at the IL Route 53 access may need to wait for gaps and shorter northbound queues on IL Route 53 that coincide with the signal phase changes. For southbound traffic during the evening peak hour, observed queuing at the lane drop was infrequent. During off-peak times, these issues were not observed.

   It should be noted that the IL Route 53 access will convert to allow right-in/right-out movements only when IDOT improves the North Avenue/IL Route 53 intersection and a barrier median extends south past the proposed access. Northbound U-turns will be permitted at the North Avenue/IL Route 53 intersection to provide access from the site to southbound IL Route 53.

3. **We generally concur with the trip generation estimates. However, based on our experience with numerous gas stations that offer dedicated diesel lanes, the trip generation for trucks will be almost the same during all three peak hours particularly given that the das station will be providing a service that currently is only provided at the Speedway gas station in the northeast corner of the intersection of North Avenue and Swift Road.**

   Less delivery/service activity and industrial/warehouse businesses operate on Saturdays relative to weekdays; thus, diesel truck traffic is expected to be less than Saturday levels. Client experience in working with multiple diesel fueling operators further supports this based on their experience with other similar sites. In any case, if the diesel truck projections were consistent with weekday peak hour volumes, the resulting increase in expected trucks visiting the site during the Saturday midday peak hour would only be four or five more trucks per hour and the impact on peak hour traffic conditions would likely be quite limited.

4. **We do not agree with the estimated directional distribution of traffic. Very little traffic is assigned to the north and to the east. Typically, gas customers will look for the most convenient and easy maneuvers which would involve a right-in and a right-out of the site. We believe the directional distribution should be reevaluated.**

   We agree that in most cases, gas station patrons utilize the most convenient maneuvers to enter and exit a site (such as right-in/right-out movements). The site traffic assignment for the gas station is categorized in two categories; pass-by and diverted link trips. Pass-by traffic, already driving by the site on their way to/from a primary destination, are projected for this site to consist largely of right-in/right-out movements such as west-to-east and south-to-north patterns consistent with currently traffic levels on the adjacent streets. The diverted linked trips, in this case, are influenced by the proximity of the North Avenue/I-355 interchange west of the site. Thus, for this site, the diverted link trips primarily reflect a commuter diversion east of the interchange and back after refueling to contribute to the 60 percent anticipated distribution from/to the west. We feel that this approach presents a more conservative analysis than assuming more right-in/right-out movements that travel back through the North Avenue/IL Route 53 intersection.

5. **Kimley-Horn should conduct a gap study during the morning and evening peak period on IL 53 to determine how many left turns and right turns out of the proposed access drive can really be expected.**

   The proposed access locations and turn restrictions have been coordinated with IDOT, and after initial review, IDOT did not provide any objections or require a gap study. When queues extend south from North Avenue during the morning peak period (as discussed in Comment #2), vehicles will use courtesy gaps or wait for acceptable gaps provided by the traffic signal phase changes. During other times of day, observations suggest that gaps are more readily available. All delay experienced by exiting vehicles waiting for a gap in traffic will occur on site and are not expected to impact traffic conditions on IL Route 53.

6. **AutoTURN runs should be provided to ensure that heavy vehicles are able to circulate within the site.**

   An AutoTURN analysis illustrating truck maneuvers through the proposed site has since been provided for review. Our understanding is that KLOA has reviewed the AutoTURN analysis and agrees that the proposed site will adequately accommodate truck circulation patterns on site.

7. **How is the left-turn in maneuver from IL 53 into the proposed three-quarter access drive going to be restricted? The mountable median along IL 53 at its intersection with the proposed three-quarter access drive is barely wide enough to accommodate one vehicle without encroaching into the through lanes. In order to ensure no inbound left-turn movements occur at this location, it is recommended that the access drive be physically designed to provide a half "pork chop" island. While it is understood that by providing a wide (35 feet) access drive the desire is to be able to capture truck traffic coming from the south, we have serious concerns with vehicles traveling southbound and attempting to perform a left-turn movement into the site and impacting through traffic on IL 53.**

   The revised plan includes raised channelization at the proposed IL Route 53 access driveway that allows only right turns entering and both left and right turns exiting. Once IDOT improves the planned improvements at the North Avenue/IL Route 53 intersection, the IL Route 53 access will be restricted to right-in/right-out movements due to a new barrier median extending to south of the driveway.

8. **It appears that the capacity analysis were conducted using an older version of HCS 2010. The new version (6.70) allows the user to analyze unsignalized intersections with three lanes in each direction. Please revise using the new version.**

   Analysis for this study was initiated prior to the release of HCS 2010 Version 6.7. For the purpose of responding to this letter, revised capacity analysis using Version 6.7 for the unsignalized intersections on North Avenue under future build conditions. The revised analysis worksheets are attached to this letter for review.

   It should be noted that a conservative approach was taken by excluding the upstream signal effects of the North Avenue/IL Route 53 intersection. The study area defined for this project does not include the next signal to the east on North Avenue (at Lombard Road), which is required to produce the necessary Percent Time Blocked values that allow HCS to incorporate platooning from upstream signals. The results in the attached reports reveal higher delays than anticipated in previous analyses, but it is worth noting that 95th percentile queues on Broadview Avenue and on the Right-In/Right-Out Driveway are expected to be less than one vehicle length. Projected queues for the westbound left-turn movement on at North Avenue/Broadview Avenue are no more than 2.3 vehicle lengths and would be accommodated within the available storage bay. A preliminary evaluation of these two intersections with estimated upstream signal data reveals significant improvements in delay due to the effect of platooning on mainline North Avenue, as would be expected to occur in the field.

9. **We concur with the recommendation of providing a dedicated eastbound right-turn lane that extends from Broadview Avenue extending east and wrapping around the southeast corner of the North Avenue intersection with IL 53.**

   Noted.

The revised HCS 2010 analysis worksheets for the unsignalized intersections along North Avenue are attached to this letter for review. Thank you for your feedback and assistance on this project. Please do not hesitate to contact us if you have any questions, comments, or require additional information.

Sincerely,

Peter Lemmon, P.E., PTOE
Senior Transportation Engineer

Enclosure

cc: Mike MacKinnon – Bluestone Single Tenant Properties
Javier Millan – KLOA, Inc.

HCS 2010 Two-Way Stop Control Summary Report

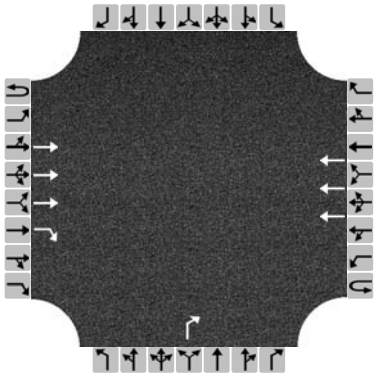
General Information

Analyst	SDH
Agency/Co.	Kimley-Horn
Date Performed	12/17/2015
Analysis Year	2021 Build
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	168359000 Bluestone Lombard

Site Information

Intersection	North/RIRO
Jurisdiction	IDOT
East/West Street	North Avenue (IL 64)
North/South Street	Right-In/Right-Out Access
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	3	1	0	0	3	0		0	0	1		0	0	0
Configuration			T	R			T					R				
Volume (veh/h)			2270	65			1650					20				
Percent Heavy Vehicles												2				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)												21				
Capacity												154				
v/c Ratio												0.14				
95% Queue Length												0.5				
Control Delay (s/veh)												32.1				
Level of Service (LOS)												D				
Approach Delay (s/veh)									32.1							
Approach LOS									D							

HCS 2010 Two-Way Stop Control Summary Report

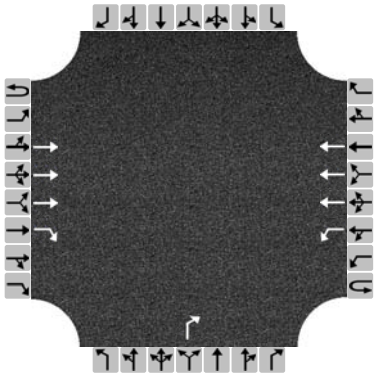
General Information

Analyst	SDH
Agency/Co.	Kimley-Horn
Date Performed	12/17/2015
Analysis Year	2021 Build
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	168359000 Bluestone Lombard

Site Information

Intersection	North & Broadview
Jurisdiction	IDOT
East/West Street	North Avenue (IL 64)
North/South Street	Broadview Avenue
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	3	1	0	1	3	0		0	0	1		0	0	0
Configuration			T	R		L	T					R				
Volume (veh/h)			2280	10	10	20	1650					15				
Percent Heavy Vehicles					6	10						12				
Proportion Time Blocked																
Right Turn Channelized	No				No				Yes				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						32						16				
Capacity						83						141				
v/c Ratio						0.38						0.11				
95% Queue Length						1.5						0.4				
Control Delay (s/veh)						72.9						33.8				
Level of Service (LOS)						F						D				
Approach Delay (s/veh)					1.3				33.8							
Approach LOS					A				D							

HCS 2010 Two-Way Stop Control Summary Report

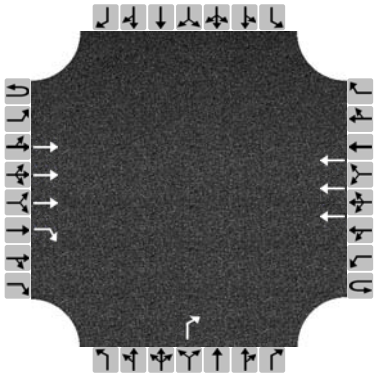
General Information

Analyst	SDH
Agency/Co.	Kimley-Horn
Date Performed	12/17/2015
Analysis Year	2021 Build
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	168359000 Bluestone Lombard

Site Information

Intersection	North/RIRO
Jurisdiction	IDOT
East/West Street	North Avenue (IL 64)
North/South Street	Right-In/Right-Out Access
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	3	1	0	0	3	0		0	0	1		0	0	0
Configuration			T	R			T					R				
Volume (veh/h)			1955	80			2230					20				
Percent Heavy Vehicles												2				
Proportion Time Blocked																
Right Turn Channelized	No				No				Yes				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)												21				
Capacity												198				
v/c Ratio												0.11				
95% Queue Length												0.3				
Control Delay (s/veh)												25.3				
Level of Service (LOS)												D				
Approach Delay (s/veh)									25.3							
Approach LOS									D							

HCS 2010 Two-Way Stop Control Summary Report

General Information

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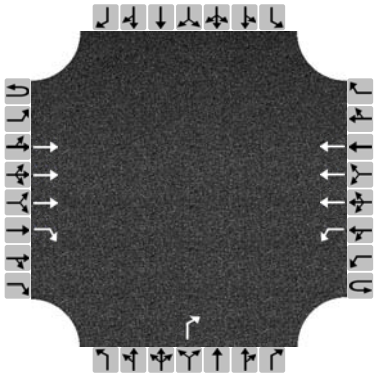
Agency/Co.	Kimley-Horn
Date Performed	12/17/2015
Analysis Year	2021 Build
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	168359000 Bluestone Lombard

Site Information

Intersection	North & Broadview
Jurisdiction	IDOT
East/West Street	North Avenue (IL 64)
North/South Street	Broadview Avenue
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	3	1	0	1	3	0		0	0	1		0	0	0
Configuration			T	R		L	T					R				
Volume (veh/h)			1965	10	30	35	2230					20				
Percent Heavy Vehicles					3	3						9				
Proportion Time Blocked																
Right Turn Channelized	No				No				Yes				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						69						21				
Capacity						141						187				
v/c Ratio						0.49						0.11				
95% Queue Length						2.3						0.4				
Control Delay (s/veh)						52.7						26.6				
Level of Service (LOS)						F						D				
Approach Delay (s/veh)					1.5				26.6							
Approach LOS					A				D							

HCS 2010 Two-Way Stop Control Summary Report

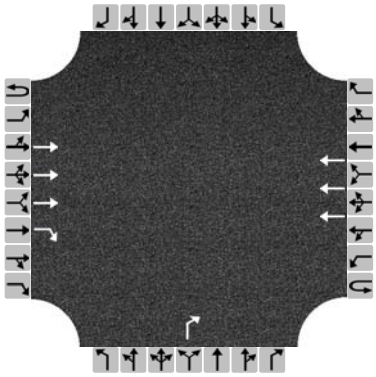
General Information

Analyst	SDH
Agency/Co.	Kimley-Horn
Date Performed	12/17/2015
Analysis Year	2021 Build
Time Analyzed	SAT Peak Hour
Intersection Orientation	East-West
Project Description	168359000 Bluestone Lombard

Site Information

Intersection	North/RIRO
Jurisdiction	IDOT
East/West Street	North Avenue (IL 64)
North/South Street	Right-In/Right-Out Access
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	3	1	0	0	3	0		0	0	1		0	0	0
Configuration			T	R			T					R				
Volume (veh/h)			1510	90			1540					20				
Percent Heavy Vehicles												2				
Proportion Time Blocked																
Right Turn Channelized	No				No				Yes				No			
Median Type	Undivided															
Median Storage																

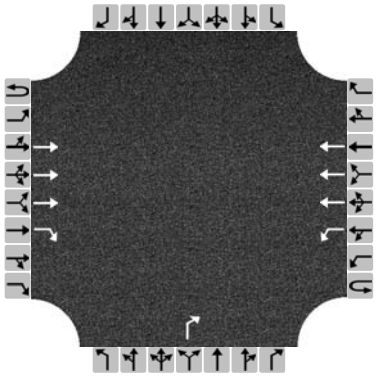
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)												21				
Capacity												284				
v/c Ratio												0.07				
95% Queue Length												0.2				
Control Delay (s/veh)												18.7				
Level of Service (LOS)												C				
Approach Delay (s/veh)									18.7							
Approach LOS									C							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	SDH	Intersection	North & Broadview
Agency/Co.	Kimley-Horn	Jurisdiction	IDOT
Date Performed	12/17/2015	East/West Street	North Avenue (IL 64)
Analysis Year	2021 Build	North/South Street	Broadview Avenue
Time Analyzed	SAT Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	168359000 Bluestone Lombard		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	3	1	0	1	3	0		0	0	1		0	0	0
Configuration			T	R		L	T					R				
Volume (veh/h)			1530	1	25	35	1540					20				
Percent Heavy Vehicles					5	3						5				
Proportion Time Blocked																
Right Turn Channelized	No				No				Yes				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						63						21				
Capacity						231						274				
v/c Ratio						0.27						0.08				
95% Queue Length						1.1						0.2				
Control Delay (s/veh)						26.4						19.2				
Level of Service (LOS)						D						C				
Approach Delay (s/veh)					1.0				19.2							
Approach LOS					A				C							