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September 12, 2014

Mr. George Russell, P.E.
Village of Lake Bluff
40 East Center Avenue
Lake Bluff, Illinois 60044-2597

Subject: Village of Lake Bluff - Stonebridge Development Traffic Study Review

Dear Mr. Russell:

At your request, we have reviewed the traffic impact study performed by KLOA for The Roanoke Group for the revised Stonebridge Development. We understand that the Stonebridge Development is changing composition to include 96 single family homes and 2 duplex units. The traffic impact report identifies the development would be occupied by “conventional families with conventional work-patterns” instead of the previous assumption of “active adult buyers.”

Upon review of the traffic impact study, we concur with the following findings in the report:

- Projected traffic volumes generated by the development (79 vehicles in the AM peak hour and 103 vehicles in the PM peak hour).
- Two-way stop control at the proposed intersection of Jensen Lane/W. Witchwood Lane with Green Bay Road.

However, we offer the follow comments and recommendations:

Directional Distribution

1. We concurred with the directional distribution presented in KLOA’s original report in 2005, with 55% of traffic going to or coming from the south and 45% to and from the north; however, this report utilizes the opposite distribution (45% to and from the south and 55% to and from the north). The actual peak hour traffic counts conducted at this intersection also show a distribution of roughly 55% to the south in the AM and from the south in the PM. We recommend using the original directional distribution for analysis of projected development traffic.

Impact to Green Bay Road

2. The report states that development traffic would contribute only 5-8% of peak hour traffic. However, adding 79 vehicles per hour (vph) to the 655 existing vph that pass through this intersection in the AM peak adds 12% to AM peak hour traffic, and adding 103 vph to the 697 existing vph that pass through the intersection in the PM peak adds almost 15% to the PM peak hour traffic. We recommend this impact be re-evaluated in consideration of the need for a northbound Green Bay Road left turn lane.

Capacity Analysis

3. The report identifies the two-way stop controlled intersection will operate at a level of service (LOS) B after completion of the development (see attached Level of Service tables). This may be true with current traffic levels on Green Bay Road; however, if Green Bay Road traffic is projected to increase at the rate needed to meet CMAP's 2040 ADT projection, this intersection will likely operate at a LOS C upon completion of the development several years in the future, which will be similar to LOS C calculated by Baxter & Woodman, Inc. in our 2006 report.

Traffic Levels on Green Bay Road and Need for northbound Left Turn Lane

4. Although ADT on Green Bay Road has dropped from 12,700 in 2006 to 7,150 in 2011, the report assumes that traffic on Green Bay Road will remain at this level and did not adjust for near future growth. Since this reduction in volume can be mostly attributed to the economy during this time and CMAP has projected a 2040 ADT of 13,000, which is near the 2006 level, it is very unlikely the traffic on Green Bay Road will remain at this low level. Furthermore, the report states that the ADT was taken from the IDOT ADT website and not from actual 24-hour counts. We recommend collecting actual 24-hour counts on Green Bay Road to verify the current ADT since ADTs on a non-IDOT route on their website may not be accurate.

The report provided no timeline for completion of the development and traffic on Green Bay Road will likely increase over the next several years as the economy improves. Increasing the ADT from the 7,150 in 2011 to the CMAP projected ADT of 13,000 in 2040 results in approximately a 2% per year increase on Green Bay Road. We recommend that the April 2013 counts be projected at 2% per year to the anticipated completion date of the development before analyzing the need for a left turn lane or capacity of the intersection. In addition, the memo provided by TADI on May 1, 2013 anticipated up to an additional 20 vph on Green Bay Road generated by the proposed Target store at US41/IL176, so 20 vph should be added to current volumes to account for this future traffic.

The report acknowledges that a left turn lane is required by the Lake County DOT Highway Access Ordinance for the PM Peak hour (see attached chart from KLOA report). Furthermore, using the IDOT BDE manual, their PM peak was close to requiring a left turn lane as shown; but if the directional distribution is reversed, as suggested in comment 1 above, this will make the PM advancing volume (Va) 416, and the percent left turns in Va at 8.6%. When graphed on Figure 36-3.G (see attached chart), this would show that consideration for a northbound left turn lane is very close. If Green Bay Road is projected to increase at 2% per year to the development's anticipated completion date, the point graphed on Figure 36-3.G would likely warrant a left turn lane (an example projection assuming a 2020 completion is shown). Based on both of these guidelines, a northbound left turn lane on Green Bay Road should be considered.

Conclusion

Based on traffic levels on Green Bay Road that will likely increase, current volume data meeting requirements for a left turn lane in the Lake County DOT Highway Access Ordinance and future volumes meeting the requirements for a left turn lane in the IDOT BDE Manual; and providing a directional distribution of development traffic that coincides with previous projections and current traffic patterns,; we recommend a northbound left turn lane be constructed on Green Bay Road at the intersection with the Stonebridge development entrance.

If you have any questions or require additional information, please contact us.

Very truly yours,

BAXTER & WOODMAN, INC.
CONSULTING ENGINEERS



John V. Ambrose, P.E.

JVA/DSH:xxx

STONEBRIDGE DEVELOPMENT TRAFFIC ANALYSIS

Table 1 - Level of Service Rating Descriptions

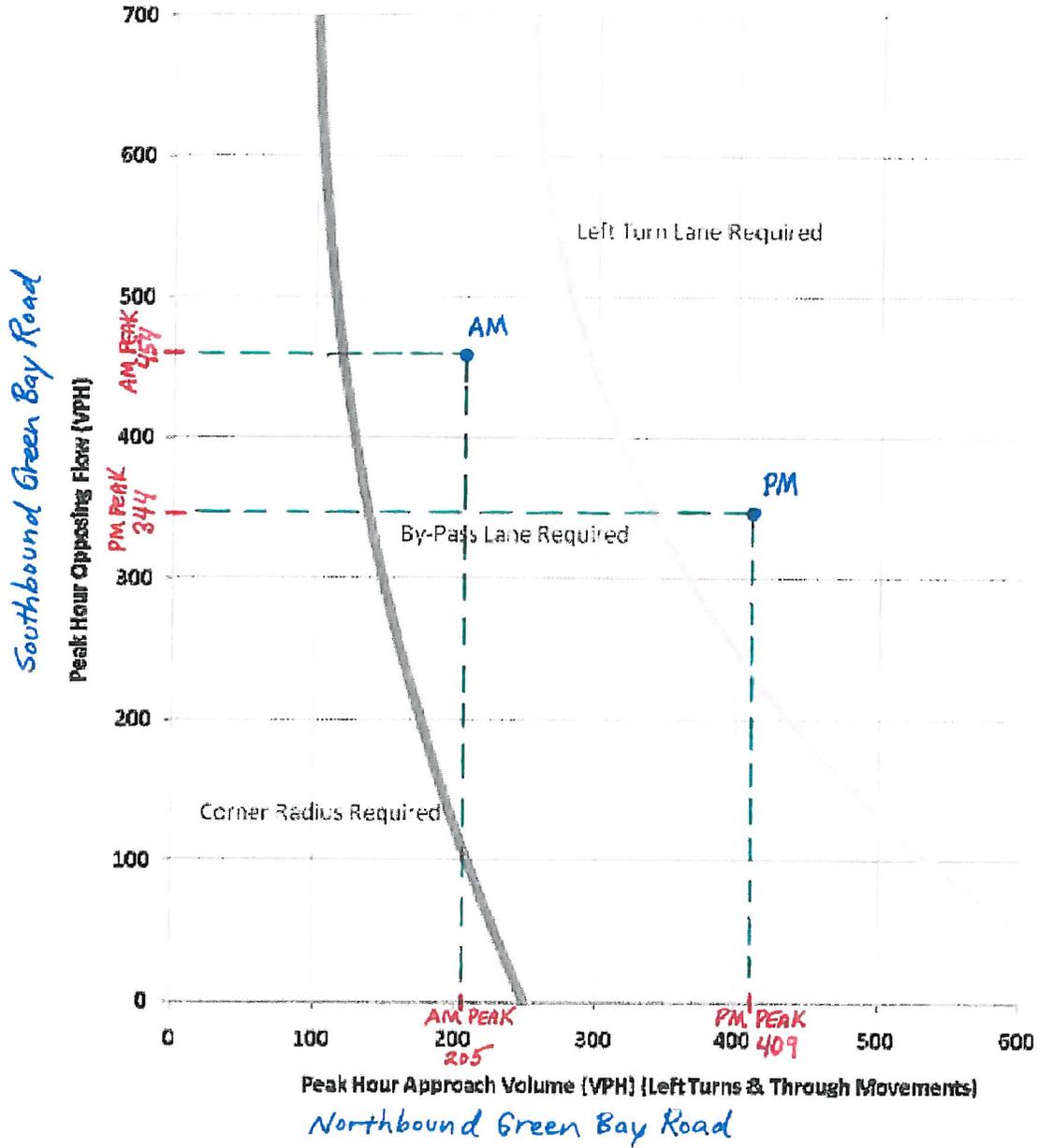
Level of Service	Description
A	Minimal control delay; traffic operates at primarily free-flow conditions; unimpeded movement within traffic stream.
B	Minor control delay at signalized intersections; traffic operates at a fairly unimpeded level with slightly restricted movement within traffic stream.
C	Moderate control delay; movement within traffic stream more restricted than at LOS B; roads remain below capacity and posted speed limit is maintained.
D	Considerable control delay that may be substantially increased by small increases in flow; roadways are at capacity. LOS D is a common goal for urban streets during peak hours.
E	High control delay; average travel speed no more than 33 percent of free flow speed. Flow becomes irregular and speed varies rapidly, but rarely reaches the posted speed limit.
F	Extremely high control delay; extensive queuing and high volumes create exceedingly restricted traffic flow. A road in a constant traffic jam would be at LOS F.

Table 2 – Level of Service Rating Criteria

Level of Service	Control Delay per Vehicle (s/veh) at:	
	Stop Controlled 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	>50	>80

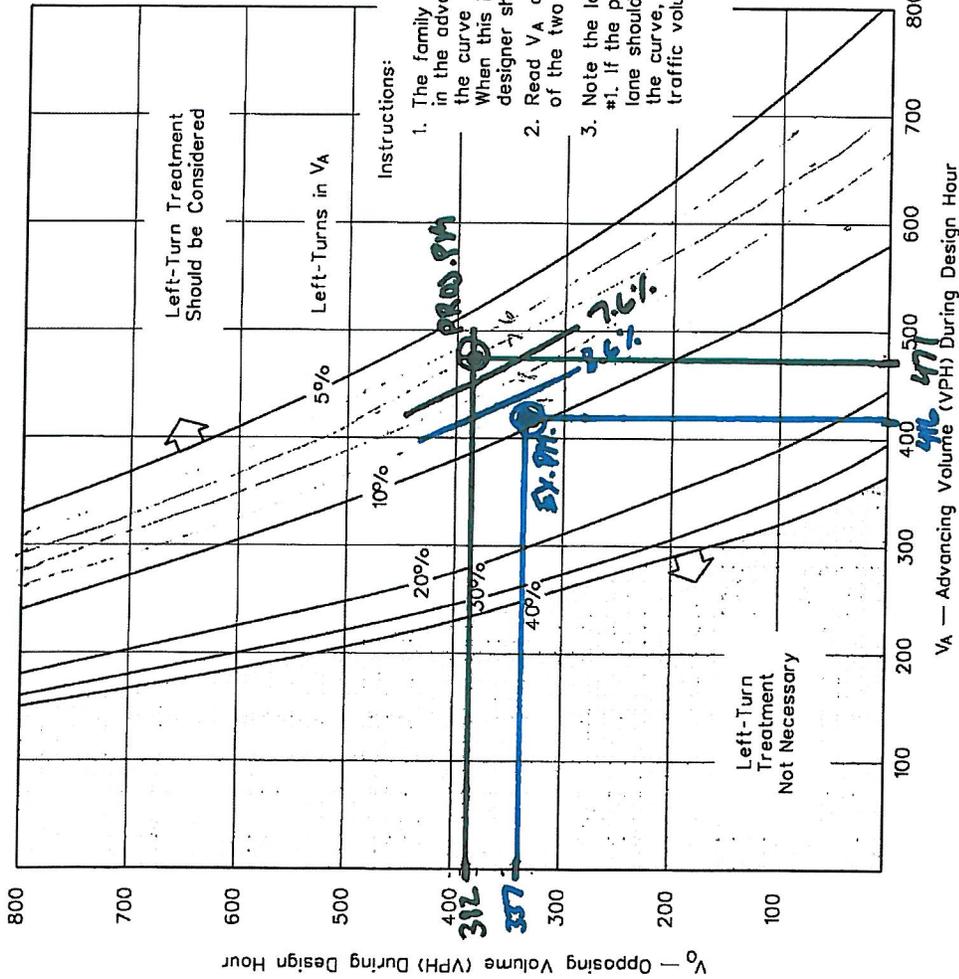
Figure 11.1

Lake County Division of Transportation
Highway Access Regulation Ordinance
Left Turn Treatments For Various Volumes



V_A = Total advancing traffic volume which includes all turning traffic
EX. PM = 416
PROJ. PM = 471

V_0 = Total opposing traffic volume which includes all turning traffic
EX. PM = 337
PROJ. PM = 382



VOLUME GUIDELINES FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON TWO-LANE HIGHWAYS (40 mph Design Speed)

Figure 36-3.G

* DISTRIB-D-N 55% T/FROM SOUTH
 * * 2% / YR FOR 7 YRS (ASSUMING 2020 CAPACITY)



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September 12, 2014

By Email

Mr. Drew Irvin
Village Administrator
Village of Lake Bluff
40 E. Center Avenue
Lake Bluff, IL 60044

Re: Stonebridge - Responses to Village Traffic Comments

Dear Mr. Irvin:

Village staff has requested responses to certain comments they have provided. My responses, on behalf of Stonebridge, are set forth below.

Turning Radius and Traffic Circulation in Cottage Area

Stonebridge's traffic consultant, KLOA, addressed this issue in a memo, which is attached as Attachment A. As stated in the memo, two-way traffic will be able to maneuver safely on the streets, automobiles will be able to turn in and out of garages without meandering across the center line of the street, and fire trucks will be able to circulate unimpeded. The memo is accompanied by technical drawings demonstrating these conditions.

Left Turn Lane on Green Bay Road

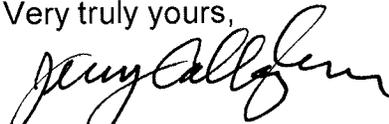
Although it is not certain that a left-turn lane on northbound Green Bay Road will be necessary or required, the current developer has agreed to honor the commitment made by the prior developer to contribute \$70,000 to the Village for the cost of construction of the turn lane. In addition, the attached memo and drawing from KLOA confirm that the revised Stonebridge plan accommodates the addition of the lane and provides all necessary right-of-way for installation. See Attachment B

Potential Traffic Impacts from Stonebridge and Target

KLOA has reviewed this issue and prepared the responsive memo attached as Attachment C. The bottom line is that there would be no measurable impact. The memo assumes the unrealistic condition of all site traffic traveling through the Rockland Road-Green Bay Road

intersection to and from the west on Rockland Road. Even under these conditions, there would be only one additional car per minute on Rockland Road.

Very truly yours,



Gerald P. Callaghan

GPC

3187984v1/29899-0001

ATTACHMENT A

**TURNING RADIUS AND TRAFFIC
CIRCULATION IN COTTAGE AREA**

MEMORANDUM TO: Peter Kyte
The Roanoke Group

FROM: Luay R. Aboona, PE
Principal

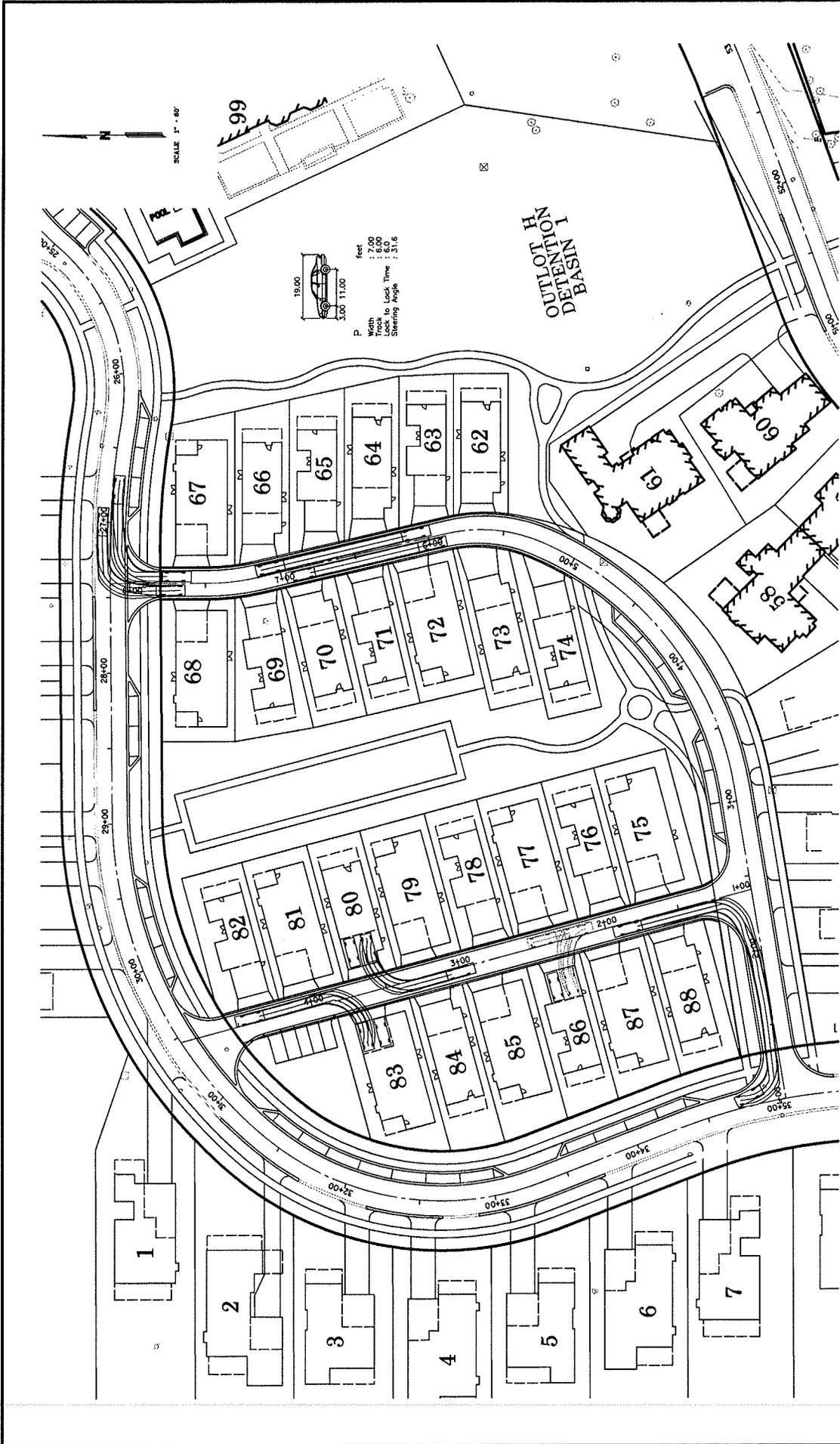
DATE: June 19, 2014

SUBJECT: Adequacy of Cottage Area Streets
Proposed Stonebridge Development
Lake Bluff, Illinois

This memorandum summarizes the results of an evaluation of the adequacy of the proposed Cottage area street system within the Stonebridge development in Lake Bluff, Illinois. This memorandum is an addendum to the January 2014 Site Traffic Analysis conducted by Kenig, Lindgren, O'Hara, Aboona, Inc. (KLOA, Inc.).

The Cottage areas of the development will consist of approximately 27 units with two car garages that will access twenty feet back to back two-way streets (Streets A and B depicted on the site plan) with a 22-foot right-of-way. The garages will be set back seven feet providing 36 feet of separation. The proposed streets are adequate for the following reasons:

- The width of the streets will allow for safe passage of two-way traffic.
- Restricting the streets to one-way traffic is not necessary as it will impede accessibility resulting in unnecessary circulation and is difficult to enforce.
- Fire trucks will be able to access the Cottage area adequately.
- Passenger cars will be able to maneuver in and out of the garages adequately.
- The width of these streets will force traffic to slow down and, as such, safety will not be compromised.
- The attached exhibits prepared by Mackie Consultants reflect the ability of passenger vehicles and fire trucks to maneuver within the Cottage area street system.



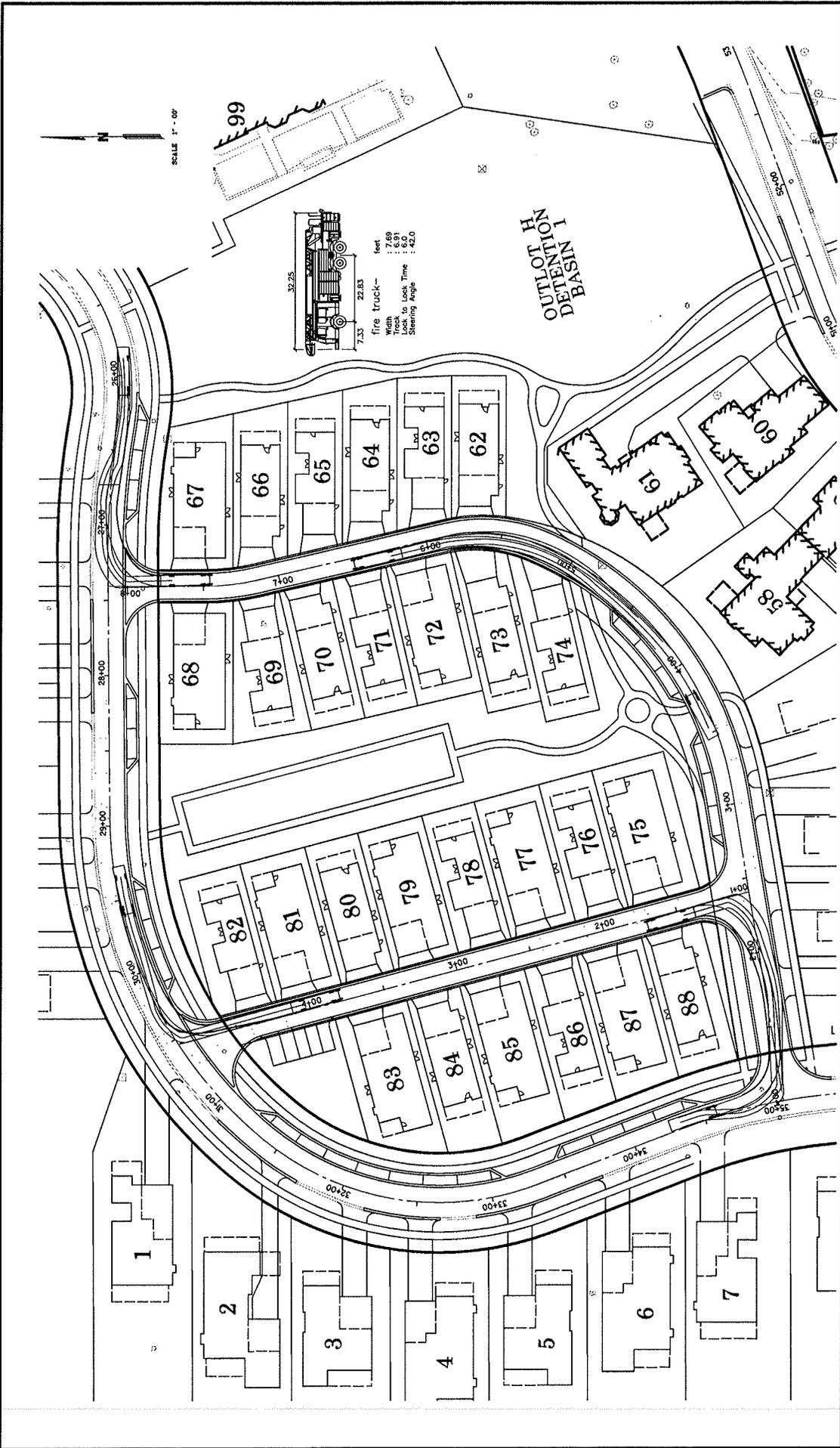
SHEET
1 OF **2**

**AUTOTURN EXHIBIT - PASSENGER VEHICLE
STONEBRIDGE
LAKE BLUFF, ILLINOIS**

DESIGNED	ROB	ROB	ROB
DRAWN	ROB	TJB	TJB
APPROVED	TJB	TJB	TJB
DATE	DATE	DATE	DATE
SCALE	SCALE	SCALE	SCALE
BY	BY	BY	BY
DESCRIPTION OF REVISION	DATE	DATE	DATE

CLIENT: **THERANOKE GROUP**
 22 East Sycamore Avenue
 Phone: 847-497-1253 Fax: 847-497-4848

CLIENT: **M**
Metric Consultants, LLC
 9975 W. Higgins Road, Suite 500
 Rosemont, IL 60018
 www.metricconsultants.com



Autoturn Exhibit - Firetruck Stonebridge Lake Bluff, Illinois

DESIGNED: [] ROE: []
 DRAWN: [] TKB: []
 APPROVED: []
 DATE: 06/06/14
 SCALE: 1" = 60'

DESCRIPTION OF PERSON: []
 DATE: []

CLIENT: **THE RANCK GROUP**
 22 East Starbuck Avenue
 Phoenix, AZ 85016
 Phone: 602-977-3333 Fax: 602-977-4848

ARCHITECT: **Mackie Consultants, LLC**
 8575 W. Higgins Road, Suite 300
 Rosemont, IL 60018
 (847) 958-1400
 www.mackieconsultants.com

DATE: 05/28/14
 PROJECT NUMBER: 13008
 SHEET NUMBER: 2 OF 2
 PROJECT NAME: AUTOTURN EXHIBIT - FIRETRUCK STONEBRIDGE LAKE BLUFF, ILLINOIS
 DRAWN BY: TKB
 CHECKED BY: []
 APPROVED BY: []

ATTACHMENT B

LEFT TURN LANE ON GREEN BAY ROAD

MEMORANDUM TO: Peter Kyte
The Roanoke Group

FROM: Eric D. Russell, P.E., PTOE, PTP, LEED AP ND
Principal

DATE: September 12, 2014

SUBJECT: Potential Northbound Left-Turn Lane on Green Bay Road
Stonebridge Residential Development
Lake Bluff, Illinois

This memorandum reiterates the findings from our Site Traffic Analysis for the Stonebridge development (dated July 17, 2014) pertaining to the need for a northbound left-turn lane on Green Bay Road at the development's access drive opposite W. Witchwood Lane, and The Roanoke Group's (TRG) commitment to the installation of this improvement.

Green Bay Road, south of IL 176, is under the jurisdiction of the Village of Lake Bluff and any geometric requirements will be guided by the Village. To assist the Village in determining if the left-turn lane is needed on Green Bay Road, KLOA reviewed the roadway design guidelines of both the Lake County Division of Transportation and the Illinois Department of Transportation.

The criteria contained in the Lake County Division of Transportation's Highway Access Regulation Ordinance indicates that a dedicated northbound left-turn lane is required on Green Bay Road at the Stonebridge Drive/W. Witchwood Lane intersection for the PM peak hour but not the AM peak hour.

The criteria contained in IDOT's Bureau of Design & Environment (BDE) Manual indicates that a dedicated northbound left-turn lane is not required on Green Bay Road at the Stonebridge Drive/W. Witchwood Lane intersection for either peak hour.

When the Stonebridge development was initially approved by the Village in November 2006, the development agreement required the developer to pay \$70,000 towards the cost of construction to install the northbound left-turn lane on Green Bay Road. The turn lane improvement, which was to be completed by the Village, was never initiated by the Village and no funds were exchanged. The Village did, however, retain Baxter & Woodman Engineering to develop a conceptual design of the road improvement, which is attached to this memorandum for reference.

TRG has never contested the need for the left-turn lane and has indicated from the onset of its first revised development plan for the property that it would continue to honor the \$70,000 cost contribution for the turn lane from the original development agreement.

The revised Stonebridge development plan has been developed to accommodate the proposed northbound left-turn lane on Green Bay Road, as conceived by the Village and their consultant, which limits the widening of Green Bay Road to the west side of the roadway, much of which occurs along the Stonebridge frontage. The Stonebridge project's landscaping plan and gateway features have been designed such that no relocations will be necessary if and when the turn lane is constructed.

ATTACHMENT C

**POTENTIAL TRAFFIC IMPACTS
FROM STONEBRIDGE AND TARGET**

MEMORANDUM TO: Peter Kyte
The Roanoke Group

FROM: Eric D. Russell, P.E., PTOE, PTP, LEED AP ND
Principal

DATE: September 12, 2014

SUBJECT: Potential Traffic Impacts from Stonebridge and Target
Lake Bluff, Illinois

The Traffic Impact Study for the proposed Target development, prepared by TADI, summarizes the traffic generation and traffic impacts from the project. The study area analyzed extends along Rockland Road from Waukegan Road east to Skokie Valley Road. Roadway and traffic signal improvements are recommended in the study to maintain or improve peak hour service levels along Rockland Road. The study did not extend as far east as Green Bay Road and TADI stated in a follow-up memorandum to the Village (dated May 1, 2013) that “due to various considerations, including its distance from the site, it is anticipated that the Rockland Road/Green Bay Road intersection would not be significantly impacted by the proposed development.

The traffic study prepared by KLOA, Inc. for the Stonebridge development estimates that 43-57 vehicle trips that are generated by the project during the weekday morning and evening rush hour periods, respectively, will approach and depart the site from the north on Green Bay Road. Some of these vehicles will travel to/from the west on Rockland Road in the direction of the Target development, while others will travel to/from the north on Green Bay Road or east on Rockland Road. Even if all of the Stonebridge volume traveled through the Rockland Road/Green Bay Road intersection and to/from the west on Rockland Road, it would amount to less than one additional car per minute on Rockland Road, which would have a minimal impact on traffic conditions in the corridor once improved by the Target project.