Corporate Reserve of St. Charles

Traffic Impact Study

Prepared for:

The City of St. Charles
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TABLE OF CONTENTS

I. EXECUTIVE SUMMARY 1

II. INTRODUCTION 3

III. EXISTING CONDITIONS 3

IV. SITE TRAFFIC CHARACTERISTICS OF PROPOSED DEVELOPMENT 7

V. FUTURE TRAFFIC OPERATIONS 9

VI. TOTAL TRAFFIC OPERATIONS 10

VII. FINDINGS AND RECOMMENDATIONS 13

I. Executive Summary

This report presents the findings and conclusions of a traffic impact study conducted for a proposed residential development located on the north side of Illinois Route 64 (IL 64), the second phase of the Corporate Reserve of St. Charles, approximately 1,500 feet east of Peck Road.

The proposed development will utilize the existing full access, Corporate Reserve Boulevard, onto IL 64 approximately 1,500 feet east of Peck Road and the existing right-turn in only/right-turn out only (RIRO) entrance approximately 2,000 feet east of Peck Road. Access to Peck Road is provided via Woodward Drive.

The findings of this report are as follows:

IL Route 64 & Peck Road: This intersection is currently operating over capacity with the existing traffic volumes. Site traffic will be an incremental addition to this over-saturated condition. The addition of the site traffic along with a re-optimization of the signal timings will result in improved intersection operations, though the traffic volumes will still exceed the capacity of the intersection. In order to bring all movements of this intersection to an acceptable LOS for all scenarios (Existing, 2022 Base Traffic, 2022 Build Traffic, and 2022 Total Traffic) an additional through lane is needed in each direction on IL 64 along with traffic signal timing optimization.

IL Route 64 & Campton Hills Road: This intersection is currently operating over capacity with the existing traffic volumes. The large amount of east/west traffic leaves very few gaps for drivers from Campton Hills Road to turn on to IL 64. The IL 64 & Oak Street improvement will provide an additional through lane to both the east- and westbound approaches of this intersection. Once completed, all movements at this intersection will operate at an acceptable LOS. The addition of the site traffic will not noticeably affect the delay observed at this intersection. No additional changes are needed to accommodate the proposed site traffic.

IL Route 64 & Corporate Reserve Boulevard:
With the assumption that an additional through lane in each direction on IL 64 will be added and this intersection will be signalized, this intersection has the overall capacity to accommodate the 2022 Total Traffic.

Peck Road & Woodward Drive:
This intersection has the overall capacity to accommodate the 2022 Total Traffic. No changes are needed from the existing geometrics.

Woodward Drive & Corporate Reserve Boulevard:
This intersection has the overall capacity to accommodate the 2022 Total Traffic. No changes are needed from the existing geometrics.

Woodward Drive & Cardinal Drive:
This intersection has the overall capacity to accommodate the 2022 Total Traffic. No changes are needed from the existing geometrics.

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Comparison to the Cardinal Property Traffic Impact Study:
The results of this study were compared to the Cardinal Property Traffic Impact Study (TIS) performed in 2008. The key difference between the original Cardinal Property TIS and this report is a modification of the proposed site plan to replace 490,000 s.f. of office space with 331 residential apartments. This results in a lower volume of trips generated by the site. Overall, the delay and LOS are improved with the change from office to residential. When the intersections included in both studies are compared, all intersections except for one observe a decrease in average delay. The exception is the AM peak period of IL 64 & Corporate Reserve Boulveard, which increases from 8 to 21 seconds.

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II. Introduction

This report presents the findings and conclusions of a traffic impact study conducted for a proposed residential development located on the north side of Illinois Route 64 (IL 64), the second phase of the Corporate Reserve of St. Charles, approximately 1,500 feet east of Peck Road. A general location map of the study area is provided as Exhibit 1 in the Appendix. A preliminary site plan of the proposed development is provided as Exhibit 2.

The proposed development will utilize the existing full access, Corporate Reserve Boulevard, onto IL 64 approximately 1,500 feet east of Peck Road and the existing right-turn in only/right-turn out only (RIRO) entrance approximately 2,000 feet east of Peck Road. Access to Peck Road is provided via Woodward Drive.

III. Existing Conditions

A field reconnaissance of the site was conducted to inventory information of surrounding land uses and the area roadway network. In addition, traffic counts were conducted during the morning and evening peak periods at four critical intersections.

Surrounding Land Uses

Land uses surrounding the site to the west include predominantly residential and office properties. The land uses along IL 64 to the east of the site become more dense, consisting of commercial/retail and industrial/manufacturing uses. Immediately north of the site is the Leroy Oakes Forest Preserve. The Great Western Trail multi-use path separates the proposed development from the forest preserve. To the south of the site, at the intersection of Peck Road and Campton Hills Road, is the Campton Hills Park operated by the St. Charles Park District. This is a regional park that offers a variety of recreation opportunities.

Surrounding Roadway Network

The primary roadways servicing the study area are IL 64, Peck Road, and Woodward Drive. As mentioned above, access is proposed to/from both IL 64 and Peck Road. A brief description of the primary roadways is provided below:

- **Illinois Route 64** is a two-lane east-west principal arterial roadway with continuity throughout DeKalb, Kane, Dupage, and Cook counties. Because of its regional significance in the Chicago metropolitan area, the Illinois Department of Transportation (IDOT) has designated IL 64 as a Strategic Regional Arterial (SRA). Near the proposed development, IL 64 consists of rural cross-section with one lane in each direction with exclusive left-turn lanes at Peck Road and other critical intersections. Sidewalks are not present along IL 64. IL 64 near the site has a posted speed limit of 45 miles per hour (mph). IL 64 is under the jurisdiction of IDOT and, according to IDOT traffic maps, carries approximately 22,700 vehicles per day in the vicinity of the proposed development.

- **Peck Road** is a two-lane north-south collector roadway that extends from Kaneville Road in the City of Geneva north to Dean Street. The north Peck Road approach to the IL 64 intersection consists of an urban cross-section with curb and gutter which then

transitions to a rural cross-section with aggregate/ turf shoulders and open ditch drainage north to Dean Street. There is an existing bike path along the west side of Peck Road adjacent to the existing residential subdivision. At the IL 64 intersection, Peck Road consists of a wider urban cross-section that includes one through lane in each direction with separate left-turn lane for vehicles turning onto IL 64. Peck Road is posted with a 35 mph speed limit in the vicinity of the site and is under the jurisdiction of the City of St. Charles.

The intersection of Peck Road with IL 64 was improved about ten years ago to include exclusive left-turn lanes and span-wire mounted traffic signals. Actuated (push-button) pedestrian signals are present along the west side of Peck Road to cross IL 64. Abbreviated or "Chicago" style left-turn lane tapers are striped on both the north and south approaches.

- **Woodward Drive** is a two-lane, two-way, east-west collector street that extends from Peck Road east to a dead end approximately 500 feet west of Randall Road. Woodward Drive is ultimately planned to connect to Randall Road as this area develops further. Woodward Drive is under the jurisdiction of the City of St. Charles and is posted with a 25 mph speed limit.

<u>Existing Traffic Conditions</u>
Peak period turning movement traffic counts were conducted on weekdays from 6:30 – 8:30 AM and from 4:30 – 6:30 PM March 2012 at the following intersections:

- IL Route 64 & Peck Road
- IL Route 64 & Campton Hills Road
- Peck Road & Woodward Drive
- Woodward Drive & Cardinal Drive

Exhibit 3 in the Appendix presents the existing peak hour volumes at these intersections. Using these counts and knowledge of the surrounding area, traffic volumes were estimated at the intersections of IL 64 & Corporate Reserve Boulevard and Woodward Drive & Corporate Reserve Boulevard. In order to gain an understanding of existing traffic operations, capacity analyses were conducted for the existing morning and evening peak hours at each of these intersections. The results of these analyses are discussed later in this report.

Historical traffic data in the area near the project site were reviewed to determine if there were any growth trends. After this review and in conjunction with City of St. Charles staff comments, it was determined that an annual growth rate of 0.5% would be applied linearly (5% total over 10 years) to the existing volumes to develop the 2022 Base Traffic volumes shown in Exhibit 4.

Capacity analyses for the 2022 Base Traffic scenario were performed at each of the project intersections. Note that the capacity analysis for IL 64 & Campton Hills Road includes improvements from the IL 64 & Oak Street Traffic Signal Installation project. The improvements include an additional through lane on the both the east- and westbound approaches of IL 64.

Level of Service (LOS) criteria for signalized and stop-sign controlled intersections are based on the methodologies presented in the "Highway Capacity Manual" published by the Transportation Research Board (TRB). LOS criteria range from "A" (good) to "F" (poor) and are based on

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average delay in seconds per vehicle. It should be noted that the LOS thresholds are different for signalized and stop-sign controlled intersections. At two-way stop intersections, LOS criteria for stop-sign controlled intersections are defined for each minor movement and are ***not*** defined for the intersection as a whole. The LOS delay thresholds for stop-sign controlled intersections are also lower than for signalized intersections since driver expectation at a signalized intersection is for a greater delay. The LOS criteria for signalized and stop-sign controlled intersections are presented below in Table 1.

Table 1
Level of Service Criteria for Signalized and Stop-Sign Controlled Intersections[1]
Signalized Intersections

Level of Service	Type of Operating Condition	Average Vehicle Delay (seconds)
A	Very low delay, most vehicles arrive during the green and do not stop at all.	≤ 10.0
B	More vehicles stop at the traffic signal than LOS "A", but otherwise good progression of traffic through the intersection.	10.1 – 20.0
C	Congestion starts to occur; number of vehicles stopping at the intersection is significant.	20.1 – 35.0
D	Congestion is more noticeable, longer delays; some vehicles may not clear on a single cycle.	35.1 – 55.0
E	High delays, poor progression through intersection. Most vehicles do not clear the intersection on a single cycle.	55.1 – 80.0
F	Unacceptable high delay to drivers, demand exceeds capacity, increasing queue lengths.	> 80.0

Stop-Sign Controlled Intersections

Level of Service	Average Control Delay (sec/veh.)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	>50

Table 2 below presents the existing and 2022 Base Traffic operations at IL 64 & Peck Road. Analysis of existing traffic was conducted using existing signal controller settings and existing intersection geometry. Analysis of 2022 Base Traffic retained existing intersection geometry *but assumed that the traffic signal timings would be re-optimized*. Copies of the capacity analysis summaries conducted for the existing critical intersections are contained in the Appendix.

[1] Source: Highway Capacity Manual 2010, Transportation Research Board, National Research Council, Washington, D.C

Table 2
Summary of Existing and 2022 Base Traffic Conditions
Intersection Level of Service (LOS) and Delay (seconds)
Signalized Intersections

Intersection	Existing 2012 Traffic		2022 Base Traffic	
	AM Peak	PM Peak	AM Peak	PM Peak
IL 64 & Peck Rd.	F (104)	D (47)	E (56)	D (42)

It should be noted that some individual movements operate at LOS E or F. Table 3 below gives a detailed breakdown of the 2022 Base Traffic, showing each individual movement's Level of Service.

Table 3
LOS & Delay by Movement for 2022 Base Traffic

Intersection	Peak Hour	Overall LOS & (delay)	LOS & (delay) by Movement							
			Eastbound		Westbound		Northbound		Southbound	
			L	TR	L	TR	L	TR	L	TR
IL 64 & Peck Rd.	AM	E (56)	A (7)	E (60)	C (34)	B (15)	D (45)	F (98)	D (46)	E (61)
	PM	D (42)	C (25)	C (28)	B (16)	D (40)	D (53)	D (53)	D (48)	E (66)

Analysis results show that under the existing conditions and signal timings, this intersection operates at an overall LOS F during the AM peak and LOS D during the PM peak. With background traffic growth projected to 2022, *and signal timings re-optimized*, there will be a noticeable decrease in delay during the AM peak and a slight decrease during the PM peak. Vehicle queues (stacking) exceed the provided left turn lane storage in both the existing and 2022 Base Traffic scenarios. *Traffic volumes currently exceed the capacity of the intersection.*

Table 4 on the following page shows a summary of analysis results for stop-sign controlled intersections. Capacity analyses of stop-sign controlled intersections provide Levels of Service and delays for individual intersection movements, but not the intersection as a whole. Results for the most critical movement at each intersection are shown in the table on the following page.

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Table 4
Summary of Existing and 2022 Base Traffic Conditions
Level of Service (LOS) and Delay (seconds)
Stop-sign Controlled Intersections

	Existing 2012 Traffic		2022 Base Traffic	
Critical Movement	AM Peak	PM Peak	AM Peak	PM Peak
Campton Hills Rd. at IL 64*	N.B. F (271)	N.B. C (20)	N.B. D (28)	N.B. B (13)
Corp. Reserve Blvd. at IL 64	S.B.Left C (17)	S.B.Left C (18)	S.B.Left C (18)	S.B.Left C (18)
Woodward Dr. at Peck Rd.	W.B. B (11)	W.B. B (11)	W.B. B (10)	W.B. B (12)
Cardinal Dr. at Woodward Dr.	N.B. A (9)	N.B. A (9)	N.B. A (9)	N.B. A (9)
Corp. Reserve Blvd. at Woodward Dr.	N.B. A (8)	N.B. A (8)	N.B. A (8)	N.B. A (8)

* Northbound movement represents eastbound Campton Hills Road

Analysis of existing conditions and 2022 Base Traffic shows that the critical movements at the majority of the stop-controlled intersections included in the analysis operate at acceptable LOS C or better. There is one exception described below, which operates below an acceptable Level of Service.

Campton Hills Road at IL Route 64: The northbound (eastbound Campton Hills Road) movement during the AM peak hour currently operates at LOS F. Delays up to 271 seconds (4.5 minutes) may be observed. This delay can be attributed to the large IL 64 east- and westbound through traffic conflicting with the northbound (eastbound Campton Hills Road) movement. The expected 95% queue (vehicle stacking) approaches 595 feet.

This condition is alleviated with the IL 64 & Oak Street improvement. The IL 64 & Oak Street improvement adds an additional through lane to both the east- and westbound approaches of the Campton Hills Road intersection. With this geometric improvement, the expected delay and LOS improve to an acceptable level.

IV. Site Traffic Characteristics of Proposed Development

Proposed Land Uses
The site plan for phase 2 of the proposed development consists of 331 residential apartments and a clubhouse.

Estimated Site-Generated Traffic
Site-generated traffic was estimated using the ITE *Trip Generation Manual, 8th Edition*. The volume generated by the apartments was modeled with ITE Code 220, Apartment. The anticipated number of units, 331, was used to estimate morning and evening peak hour trips to and from the site. The resulting generated traffic is shown in Table 5 on the following page.

Table 5
Trip Generation Table

Land Use	ITE Code	Units	Qty	AM Peak Hour Volumes (veh/hr)			PM Peak Hour Volumes (veh/hr)		
				In	Out	Total	In	Out	Total
Residential	220	D.U.	331	34	135	169	133	72	205

Source: ITE Trip Generation Manual, 8th Edition

Estimated Trip Distribution

The direction by which traffic will approach and depart the site is dependent on a variety of factors. These factors include existing travel patterns, characteristics and operating conditions of the surrounding roadways, ease of access, and location of population and employment centers. Based on these factors and a familiarity with the sites and the environs, trip distribution estimates were developed and are presented in Table 6 below and on Exhibit 5 in the Appendix.

It should be noted that the intersection of IL 64 & Oak Street will be signalized by the time this site is developed. It is assumed that until the out lots of the Corporate Reserve are developed and occupied, all traffic traveling from the site to the east during the peak hours will utilize the new traffic signal at Oak Street. Once the proposed site and out lots are developed and occupied, it is expected that a traffic signal at IL 64 & Corporate Reserve Boulevard will be warranted and installed. At this time, it is assumed that traffic traveling from the site to the east during peak hours will utilize this new signal.

Table 6
Trip Distribution Estimates

Direction To/From	Percentage of Trips
West on IL 64	5%
East on IL 64	70%
North on Peck Rd.	10%
South on Peck Rd.	15%

Site Traffic Assignments

The estimated site-generated traffic volumes from the proposed development were assigned to the area roadway system based on the directional distribution identified above and on Exhibit 5. The site generated trip assignments for the proposed Corporate Reserve development are illustrated on Exhibit 6 in the Appendix.

Total Traffic Assignments

The development's generated site traffic assignment was then combined with the 2022 Base Traffic projected traffic to develop a 2022 Build Traffic assignment, shown on Exhibit 7 in the Appendix.

An additional scenario, 2022 Total Traffic, was developed combining the 2022 Build Traffic with the traffic generated by the outlots of the Corporate Reserve. The outlots of the Corporate Reserve are described in a previous traffic impact study performed by Hampton, Lenzini & Renwick, Inc. (HLR)[2]. These outlots are anticipated to include 60,000 s.f. of office space and

[2] Cardinal Property Traffic Impact Study dated July 14, 2008

20,000 s.f. of restaurant (no breakfast service). Trip generation rates and distributions used in this study remain unchanged from the original report and are shown in Table 7 below. The 2022 Total Traffic assignment can be seen in Exhibit 8.

Table 7
Trip Generation Table

Land Use	ITE Code	Units	Qty	AM Peak Hour Volumes (veh/hr)			PM Peak Hour Volumes (veh/hr)		
				In	Out	Total	In	Out	Total
General Office	710	1000 s.f.	30,000	62	8	70	20	100	120
General Office	710	1000 s.f.	45,000	88	12	100	24	116	140
Quality Restaurant	931	1000 s.f.	20,000	10	5	15	100	50	150
Restaurant Pass-by Trips				0	0	0	(15)	(15)	(30)
Total Trips				160	25	185	129	251	380

Source: ITE Trip Generation Manual, 7th Edition

V. Future Traffic Operations

Traffic Operations

Capacity analyses were conducted using the estimated 2022 Build Traffic volumes at the five intersections included in this study. Table 8 below presents the results of the capacity analyses at IL 64 & Peck Road and provides a comparison to the year 2022 Base Traffic discussed earlier in this report.

Table 8
Summary of 2022 Base Traffic and 2022 Build Traffic Conditions
Intersection Level of Service (LOS) and Delay (seconds)
Signalized Intersections

Intersection	2022 Base Traffic		2022 Build Traffic	
	AM Peak	PM Peak	AM Peak	PM Peak
IL 64 & Peck Rd.	E (56)	D (42)	E (57)	D (42)

Note that when site traffic is added, the overall average intersection delay during the AM peak increases by approximately one second and remains unchanged during the PM peak.. Table 9 below shows a detailed breakdown of individual movements for the 2022 Build Traffic.

Table 9
LOS & Delay by Movement for 2022 Build Traffic

Intersection	Peak Hour	Overall LOS & (delay)	LOS & (delay) by Movement							
			Eastbound		Westbound		Northbound		Southbound	
			L	TR	L	TR	L	TR	L	TR
IL 64 & Peck Rd.	AM	E (57)	A (7)	E (60)	D (35)	B (15)	D (45)	F (105)	D (46)	E (61)
	PM	D (42)	C (25)	C(29)	B (17)	D (41)	D (53)	D (55)	D (48)	E (66)

Analysis of the 2022 Build Traffic shows that with the projected site traffic and re-optimized signal timings, the intersection operates at an overall LOS E during the AM peak and LOS D during the PM peak. These are the same levels of service calculated for the 2022 Base Traffic. Some individual movements operate at LOS E and F during peak times. Individual movements observe either no increase or small increases in average delay when compared to the 2022 Base Traffic. Like the existing condition, vehicle queues are expected to exceed the provided left-turn storage lanes during peak times. As is the case with the existing conditions, vehicle volumes are expected to exceed the capacity of the intersection.

Table 10 shows a summary of analysis results for stop-sign controlled intersections. As noted before, capacity analyses of stop-sign controlled intersections provide Levels of Service and delays for individual intersection movements, but not the intersection as a whole. Results for the most critical movement at each intersection are shown in Table 10 below.

Table 10
Summary of 2022 Base Traffic and 2022 Build Traffic Conditions
Level of Service (LOS) and Delay (seconds)
Stop-sign Controlled Intersections

	2022 Base Traffic		2022 Build Traffic	
Critical Movement	AM Peak	PM Peak	AM Peak	PM Peak
Campton Hills Rd. at IL 64*	N.B. D (28)	N.B. B (13)	N.B. D (28)	N.B. B (13)
Corp. Reserve Blvd. at IL 64	S.B.Left C (18)	S.B.Left C (18)	S.B.Left C (18)	S.B.Left C (19)
Woodward Dr. at Peck Rd.	W.B. B (10)	W.B. B (12)	W.B. A (10-)	W.B. B (12)
Cardinal Dr. at Woodward Dr.	N.B. A (9)	N.B. A (9)	N.B. A (10-)	N.B. A (9)
Corp. Reserve Blvd. at Woodward Dr.	N.B. A (8)	N.B. A (8)	S.B. A (10-)	N.B. B (11)

* Northbound movement represents eastbound Campton Hills Road

Analysis of 2022 Build Traffic shows that critical movements at the stop-controlled intersections included in the analysis all operate at LOS D or better. LOS D is considered an acceptable LOS.

VI. Total Traffic Operations

In order to compare the traffic impacts from this study to the previous Cardinal TIS referenced earlier in this report, capacity analyses were conducted using the estimated 2022 Total Traffic volumes at the five intersections included in this study. The 2022 Total Traffic condition includes the proposed residential site as well as the office and restaurant uses in the outlots of the Corporate Reserve. Table 11 on the following page presents the results of the capacity analyses at IL 64 & Peck Road and provides a comparison to the year 2022 Build Traffic discussed earlier in this report.

Table 11
Summary of 2022 Build Traffic and 2022 Total Traffic Conditions
Intersection Level of Service (LOS) and Delay (seconds)
Signalized Intersections

Intersection	2022 Build Traffic		2022 Total Traffic	
	AM Peak	PM Peak	AM Peak	PM Peak
IL 64 & Peck Rd.	E (57)	D (42)	E (72)	D (53)

When compared to the Build Traffic, the overall average intersection delay increases by 12 seconds during the AM peak and 11 seconds during the PM peak. Table 12 below shows a detailed breakdown of individual movements for the 2022 Total Traffic.

Table 12
LOS & Delay by Movement for 2022 Total Traffic

Intersection	Peak Hour	Overall LOS & (delay)	LOS & (delay) by Movement							
			Eastbound		Westbound		Northbound		Southbound	
			L	TR	L	TR	L	TR	L	TR
IL 64 & Peck Rd.	AM	E (72)	A (7)	E (79)	D (36)	B (15)	D (45)	F (129)	D (46)	E (62)
	PM	D (53)	C (32)	C (31)	B (18)	E (61)	E (66)	E (57)	D (48)	E (78)

Analysis of the 2022 Total Traffic shows that with the projected site traffic, the Corporate Reserve out lot traffic, and re-optimized signal timings, the intersection operates at an overall LOS E during the AM peak and LOS D during the PM peak. Some individual movements operate at LOS E and F during peak times. Like the existing and 2022 Build Traffic conditions, vehicle queues are expected to exceed the provided left-turn storage lanes during peak times. As is the case with the existing and 2022 Build Traffic conditions, vehicle volumes are expected to exceed the capacity of the intersection.

It is anticipated that with the 2022 Total Traffic, a traffic signal will be warranted and installed at the intersection of IL 64 & Corporate Reserve Boulevard. A traffic signal warrant analysis is presented later in this report. Table 13 below provides a summary of the capacity analysis at this intersection with traffic signal control. It is assumed that when this traffic signal is installed that IL 64 will be widened to two through lanes in each direction.

Table 13
LOS & Delay by Movement for 2022 Total Traffic

Intersection	Peak Hour	Overall LOS & (delay)	LOS & (delay) by Movement				
			Eastbound		Westbound	Southbound	
			L	TR	TR	L	R
IL 64 & Corp. Reserve Blvd.	AM	C (21)	A (9)	C (21)	B (17)	C (32)	C (31)
	PM	C (23)	B (14)	B (18)	C (24)	C (33)	C (33)

Table 14 shows a summary of analysis results for the stop-sign controlled intersections. As noted before, capacity analyses of stop-sign controlled intersections provide Levels of Service

and delays for individual intersection movements, but not the intersection as a whole. Results for the most critical movement at each intersection are shown in Table 14 below.

Table 14
Summary of 2022 Build Traffic and 2022 Total Traffic Conditions
Level of Service (LOS) and Delay (seconds)
Stop-sign Controlled Intersections

	2022 Build Traffic		2022 Total Traffic	
Critical Movement	AM Peak	PM Peak	AM Peak	PM Peak
Campton Hills Rd. at IL 64*	N.B. D (28)	N.B. B (13)	N.B. D (35-)	N.B. B (14)
Corp. Reserve Blvd. at IL 64	S.B.Left C (18)	S.B.Left C (19)	Signalized	
Woodward Dr. at Peck Rd.	W.B. A (10-)	W.B. B (12)	W.B. B (10)	W.B. B (13)
Cardinal Dr. at Woodward Dr.	N.B. A (10-)	N.B. A (9)	N.B. A (10-)	N.B. B (11)
Corp. Reserve Blvd. at Woodward Dr.	N.B. A (10-)	N.B. B (11)	S.B. B (10)	N.B. C (16)

* Northbound movement represents eastbound Campton Hills Road

Analysis of 2022 Total Traffic shows that critical movements at the stop-controlled intersections included in the analysis all operate at LOS D or better. LOS D is considered an acceptable LOS.

Traffic Signal Warrants:

A traffic signal warrant was analyzed for IL 64 & Corporate Reserve Boulevard per Chapter 4 of the Manual on Uniform Traffic Control Devises (MUTCD) and IDOT guidelines[3]. IL Route 64 is designated an SRA route by IDOT. IDOT uses higher thresholds on SRA routes for signal warrants 1A & 1B than are in the MUTCD and does not allow the use of warrants 2 & 3. In order to produce 8th maximum hour traffic volumes for warrant 1, IDOT guidelines allow using 55% of the peak hour traffic volumes[4]. The traffic signal warrant summary sheets are Exhibit 9 in the Appendix.

IL Route 64 & Corporate Reserve Boulevard (2022 Build Traffic): The traffic signal warrant analysis for this intersection was performed with all eastbound traffic from the site using this intersection rather than Oak Street. Using the 55% factor to estimate 8th maximum hour traffic along with the required IDOT right turn reduction, projected traffic at this intersection does not meet a traffic signal warrant.

IL Route 64 & Corporate Reserve Boulevard (2022 Total Traffic): Using the 55% factor to estimate 8th maximum hour traffic along with the required IDOT right turn reduction, it is anticipated that this intersection will warrant a traffic signal once all phases of the development are occupied.

[3] IDOT Signal Warrant Worksheet Procedures
[4] IDOT BDE Manual, 2002 Ed., p. 14-3(3), item 4c. Proposed Volumes

VII. Findings and Recommendations

The estimates and analyses discussed in the preceding pages, based on the proposed site layout and access as shown in Exhibit 2, indicate the following:

IL Route 64 & Peck Road:

This intersection is currently operating over capacity with the existing traffic volumes. Site traffic will be an incremental addition to this over-saturated condition. Re-optimization of the signal timings will result in improved intersection operations, though the traffic volumes will still exceed the capacity of the intersection.

In order to bring all movements of this intersection to an acceptable LOS for all scenarios (Existing, 2022 Base Traffic, 2022 Build Traffic, and 2022 Total Traffic) an additional through lane is needed in each direction on IL 64 along with traffic signal timing optimization. Table 15 below shows how the additional through lanes would improve the intersection operations.

Table 15
IL 64 and Peck Road
LOS & Delay by Movement for 2022 Total Traffic

Condition	Peak Hour	Overall LOS & (delay)	LOS & (delay) by Movement							
			Eastbound		Westbound		Northbound		Southbound	
			L	TR	L	TR	L	TR	L	TR
No Improvements	AM	E (69)	A (7)	E (76)	D (36)	B (15)	D (45)	F (127)	D (46)	E (62)
	PM	D (53)	C (32)	C(31)	B (18)	E (60)	E (65)	E (57)	D (48)	E (77)
With Improvements	AM	C (32)	B (12)	C (29)	B (17)	C (20)	C (34)	D (55)	C (34)	D (48)
	PM	D (35)	B (20)	C (29)	B (18)	C (32)	D (37)	D (44)	D (41)	D (54)

Table 15 shows that with traffic signal timing optimization and one additional through lane in each direction on IL 64, all movements of the intersection can operate at an acceptable LOS D or better.

The proportion of projected 2022 traffic that is due to the new development is shown in Table 16 on the following page. The overall percentage of peak period traffic that can be attributed to the proposed residential development in the Corporate Reserve site is 1.8% for the AM peak and 1.7% for the PM peak.

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Table 16
IL Route 64 and Peck Road
Site Trips as Percent of Projected 2022 Total Traffic

Intersection Approach	AM Peak Hour				PM Peak Hour			
	Base	Site	Total	%	Base	Site	Total	%
Eastbound IL 64	1096	2	1098	0.2%	658	7	665	1.1%
Westbound IL 64	270	27	297	9.1%	948	15	963	1.6%
Southbound Peck Rd.	182	0	182	0%	301	0	301	0%
Northbound Peck Rd.	318	5	323	1.5%	531	20	551	3.7%
Total Intersection	1866	34	1900	1.8%	2438	42	2480	1.7%

IL Route 64 & Campton Hills Road:
This intersection is currently operating over capacity with the existing traffic volumes. The large amount of east/west traffic leaves very few gaps for northbound (eastbound Campton Hills Road) vehicles to turn on to IL 64. This intersection is expected to operate at an acceptable LOS D or better after the completion of the IL 64 & Oak Street improvement. This intersection will have the overall capacity to accommodate the 2022 Total Traffic. No changes beyond what is included in the IL 64 & Oak Street improvement are needed.

IL Route 64 & Corporate Reserve Boulevard:
With the assumption that an additional through lane in each direction on IL 64 will be added and this intersection will be signalized, this intersection has the overall capacity to accommodate the 2022 Total Traffic.

Peck Road & Woodward Drive:
This intersection has the overall capacity to accommodate the 2022 Total Traffic. No changes are needed from the existing geometrics.

Woodward Drive & Corporate Reserve Boulevard:
This intersection has the overall capacity to accommodate the 2022 Total Traffic. No changes are needed from the existing geometrics.

Woodward Drive & Cardinal Drive:
This intersection has the overall capacity to accommodate the 2022 Total Traffic. No changes are needed from the existing geometrics.

Traffic Calming:
Traffic calming measures are not anticipated to be needed on Woodward Drive. Should measures be required in the future, the City of St. Charles has a traffic calming policy in place that should be followed at that time.

On-site Traffic Circulation:
A detailed review of the site plan should be conducted by City staff and by the Fire Department to ensure that adequate access is provided for emergency vehicles throughout the site. When geometric plans for the access lanes within the site are finalized, they should be reviewed for access by the largest St. Charles Fire Department truck, which can be approximated with a WB-50 turning template.

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Comparison to the Cardinal Property Traffic Impact Study:
The results of this study were compared to the Cardinal Property TIS referenced earlier in this report to see how the impacts changed when the proposed site's land use was changed from office to residential. The key difference between the original Cardinal Property TIS and this report is a modification of the proposed site plan to replace 490,000 s.f. of office space with 331 residential apartments. This results in a reduction in the volume of trips generated by the site. Table 17 below shows a comparison of the total trips generated by the Corporate Reserve and it's outlots.

Table 17
Comparison of Cardinal Property TIS and Corporate Reserve TIS
2022 Total Traffic
Total Site Trips Generated

Study	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
2008 Cardinal Property TIS	670	95	765	220	650	870
2012 Corporate Reserve TIS	194	160	354	262	323	585

Table 18 below shows a comparison between the average delays at intersections included in both studies. For the signalized intersections, the delay and LOS shown are for the intersection as a whole. For the stop-sign controlled intersection, the delay and LOS are for the critical movement.

Table 18
Comparison of Cardinal Property TIS and Corporate Reserve TIS
2022 Total Traffic
Level of Service (LOS) and Delay (seconds)

	Cardinal TIS		Corp. Reserve TIS	
Critical Movement	AM Peak	PM Peak	AM Peak	PM Peak
Peck Rd. at IL 64	F (111)	F (120)	E (69)	D (53)
Corp. Reserve Blvd. at IL 64*	A (8)	D (44)	C (21)	C (23)
Campton Hills Rd. at IL 64**	N.B. F (736)	N.B. F (***)	N.B. D (35-)	W.B. B (14)

* Analyzed as a signalized intersection
** Northbound movement represents eastbound Campton Hills Road
*** Report does not provide delay due to capacity software limits.

Table 18 shows that for most situations, the delay and LOS are improved with the new proposed residential use. The delay at IL 64 & Corporate Reserve Boulevard is increased for the AM peak hour period. This is because residential uses have a larger exiting volume in the AM than office uses. Therefore, there is a larger amount of traffic on the minor approach to this intersection, increasing the delay.

Woodward Drive Extension:
It is in the City's long range plans to extend Woodward Drive to Randall Road and construct a new signalized intersection at this location. When this happens, there will be a benefit to several of the study intersections. A majority of vehicles traveling to and from the north as well as some of the vehicles traveling to and from the south on Randall Road will utilize this new intersection. This will divert some of the traffic using Woodward Drive & Peck Road and IL 64 & Corporate Reserve Boulevard. A more detailed analysis will be required to determine the anticipated level of benefit to sites along Woodward Drive, including the Corporate Reserve.

It should be noted that if this extension and new intersection are completed before the proposed Corporate Reserve development, the traffic signal warrants anticipated at IL 64 & Corporate Reserve Boulevard may be affected. If this situation occurs, it is recommended that the traffic distributions be reevaluated and a new traffic signal warrant analysis be prepared.

Respectfully Submitted,

P. Brien Funk, EI
Hampton, Lenzini and Renwick, Inc.

Alexander S. Garbe, PE, PTOE
Hampton, Lenzini and Renwick, Inc.

Diane Lukas, PE
Hampton, Lenzini and Renwick, Inc.

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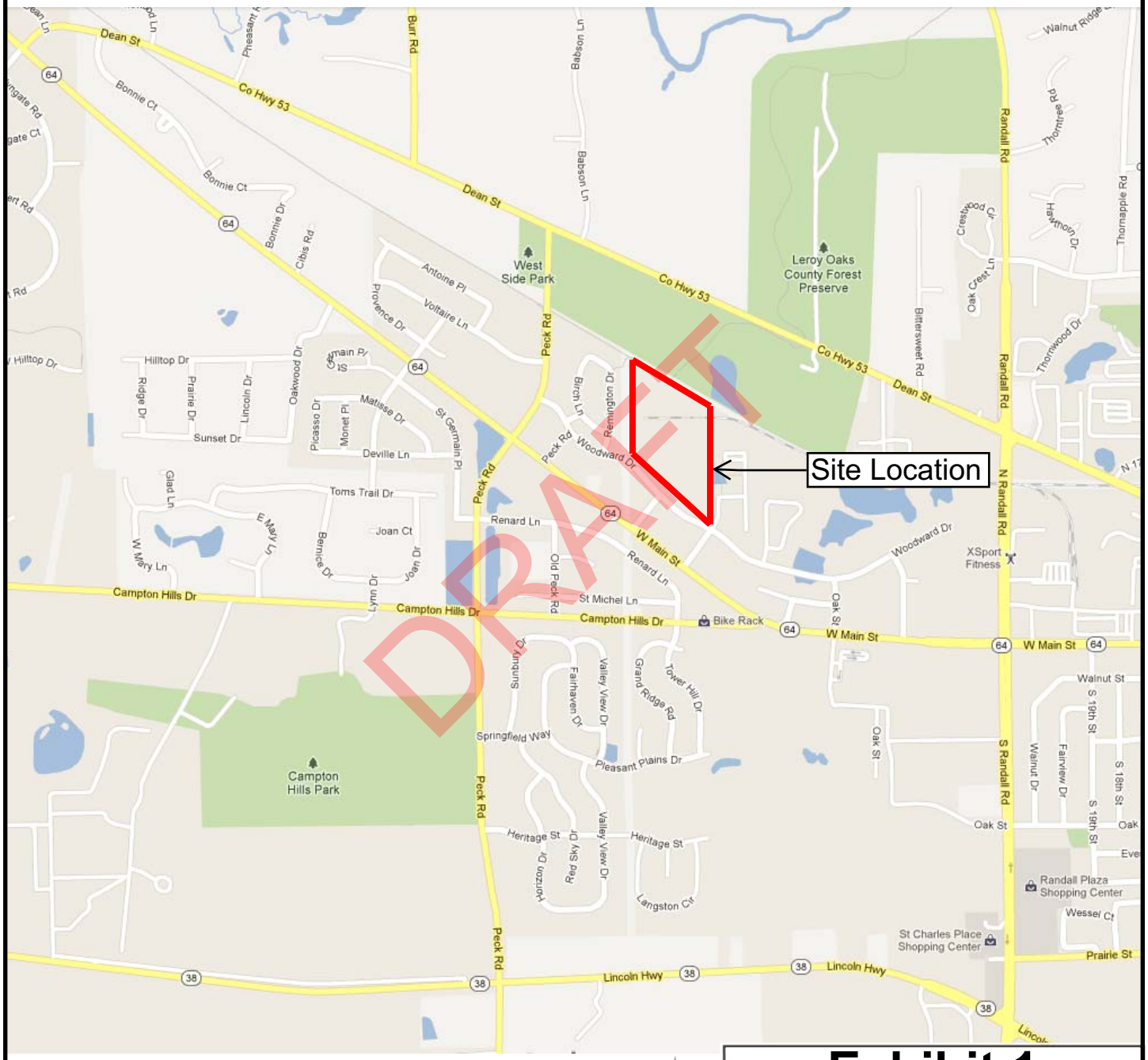

Exhibit 1

Corporate Reserve of St. Charles

Location Map

Hampton, Lenzini and Renwick, inc.
Civil & Structural Engineers . Land Surveyors . Environmental Services
ELGIN . SPRINGFIELD . ROMEOVILLE
www.hlrengineering.com

SITE DATA

Total Site Bedroom Count	Total # Units	Total Unit %	Total Parking Req.		Total Parking Provided	
STUDIO	16	4.8%	1.2/du	20	Surface	406
1 BR	160	48.4%	1.2/du	192	Garage	120
2 BR	155	46.8%	1.7/du	264	Total	526 (1.6:1)
Tot. Rental Units	331	100.0%		476		
Rental Site Lot Area/Unit	20.30 Ac. 2,671 SF/Unit					

Exhibit 2

Corporate Reserve Of St. Charles

Preliminary Site Plan

Hampton, Lenzini and Renwick, inc.
Civil & Structural Engineers . Land Surveyors . Environmental Sevices
ELGIN . SPRINGFIELD . ROMEOVILLE
www.hlrengineering.com

North
Scale: 1" = 60'
0 60 120 240

Sheet LP-1
Corporate Reserve of St. Charles
Concept Site Plan

Date: March 21, 2012
© 2012 BSB Design, Inc.

BSB DESIGN

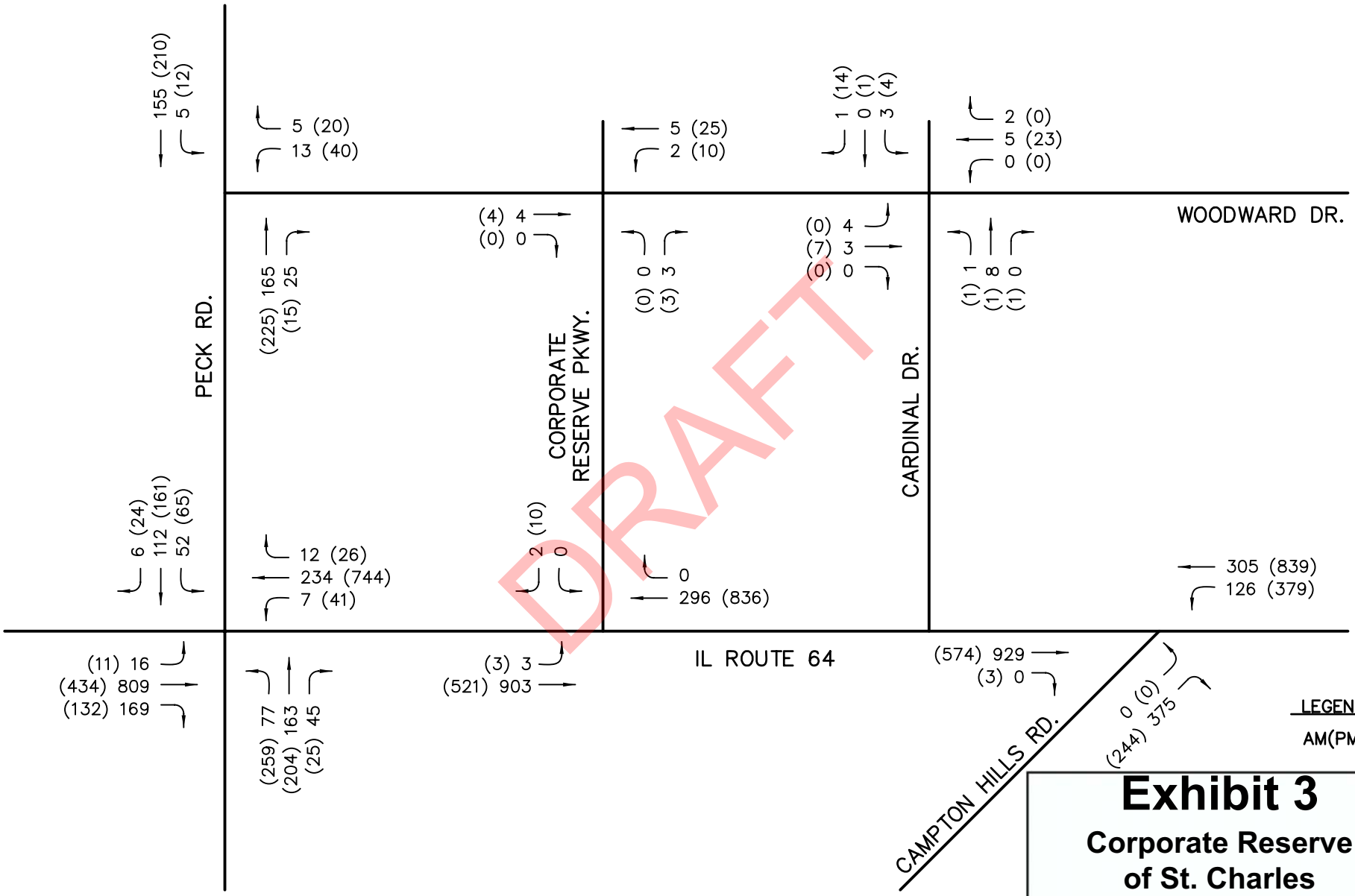

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Exhibit 3

Corporate Reserve of St. Charles

Existing Traffic

Hampton, Lenzini and Renwick, inc.
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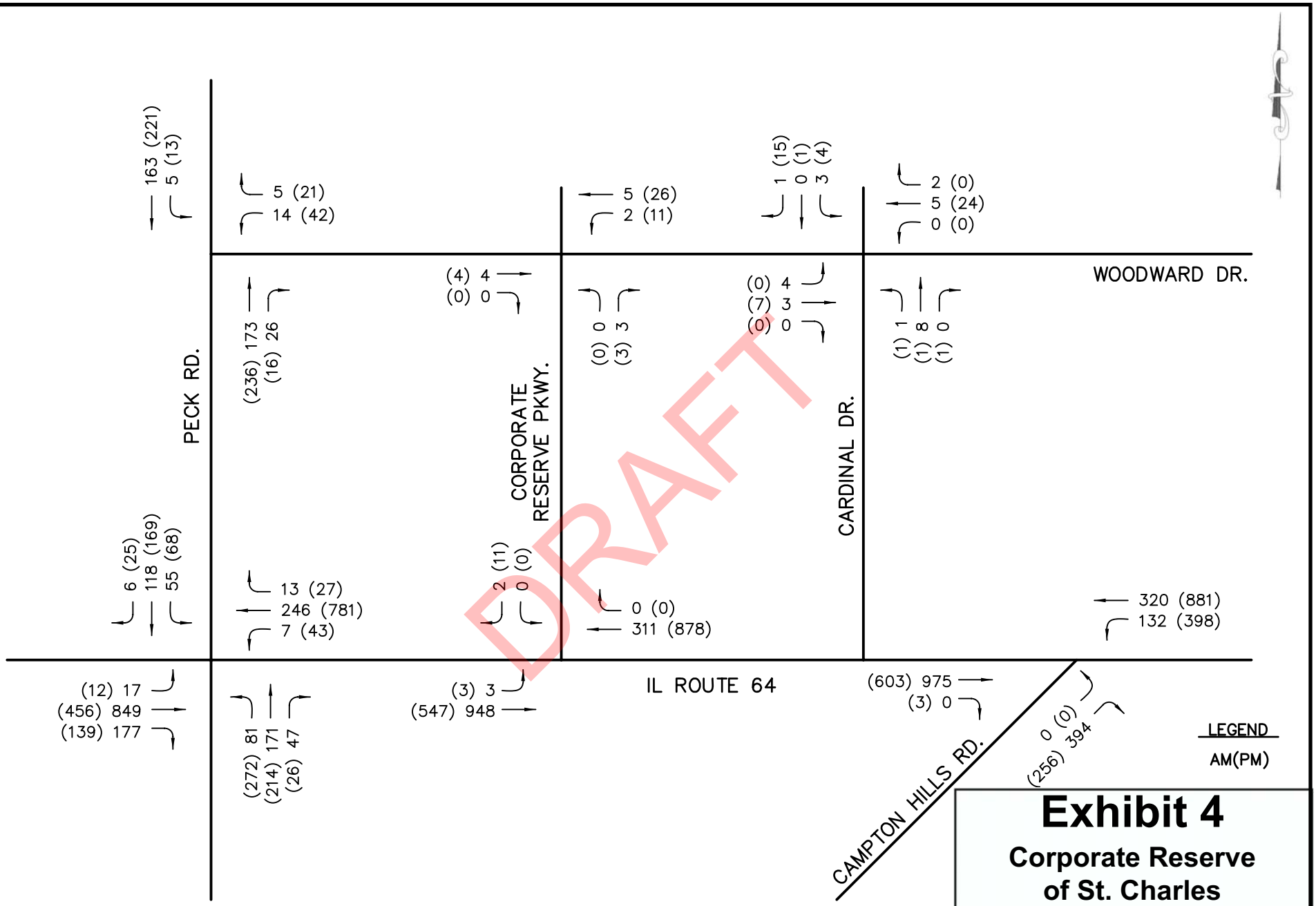

Exhibit 4

Corporate Reserve of St. Charles

2022 Base Traffic

Hampton, Lenzini and Renwick, inc.
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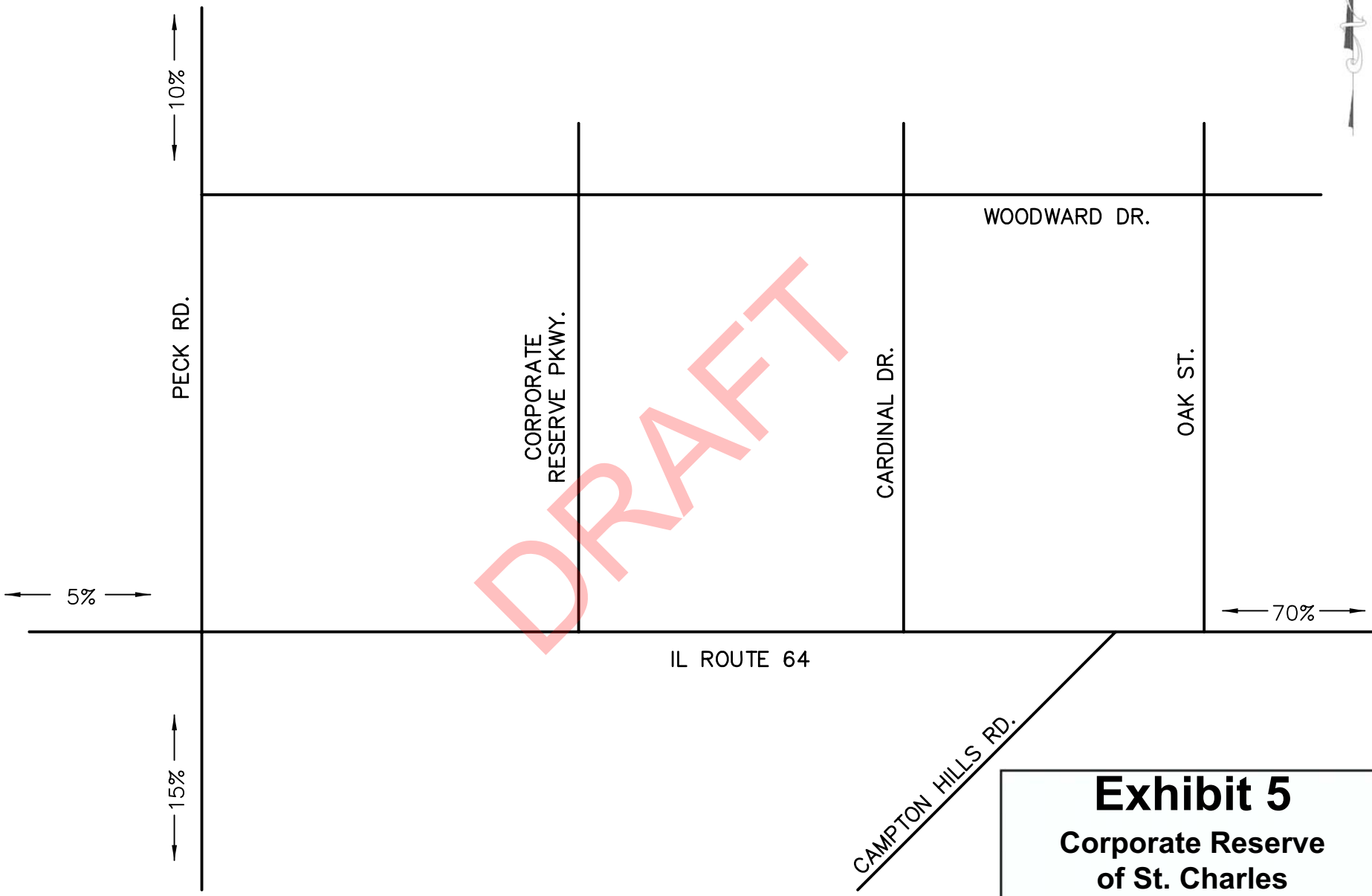

Exhibit 5

Corporate Reserve of St. Charles

Trip Distribution

Hampton, Lenzini and Renwick, inc.
Civil & Structural Engineers . Land Surveyors . Environmental Services
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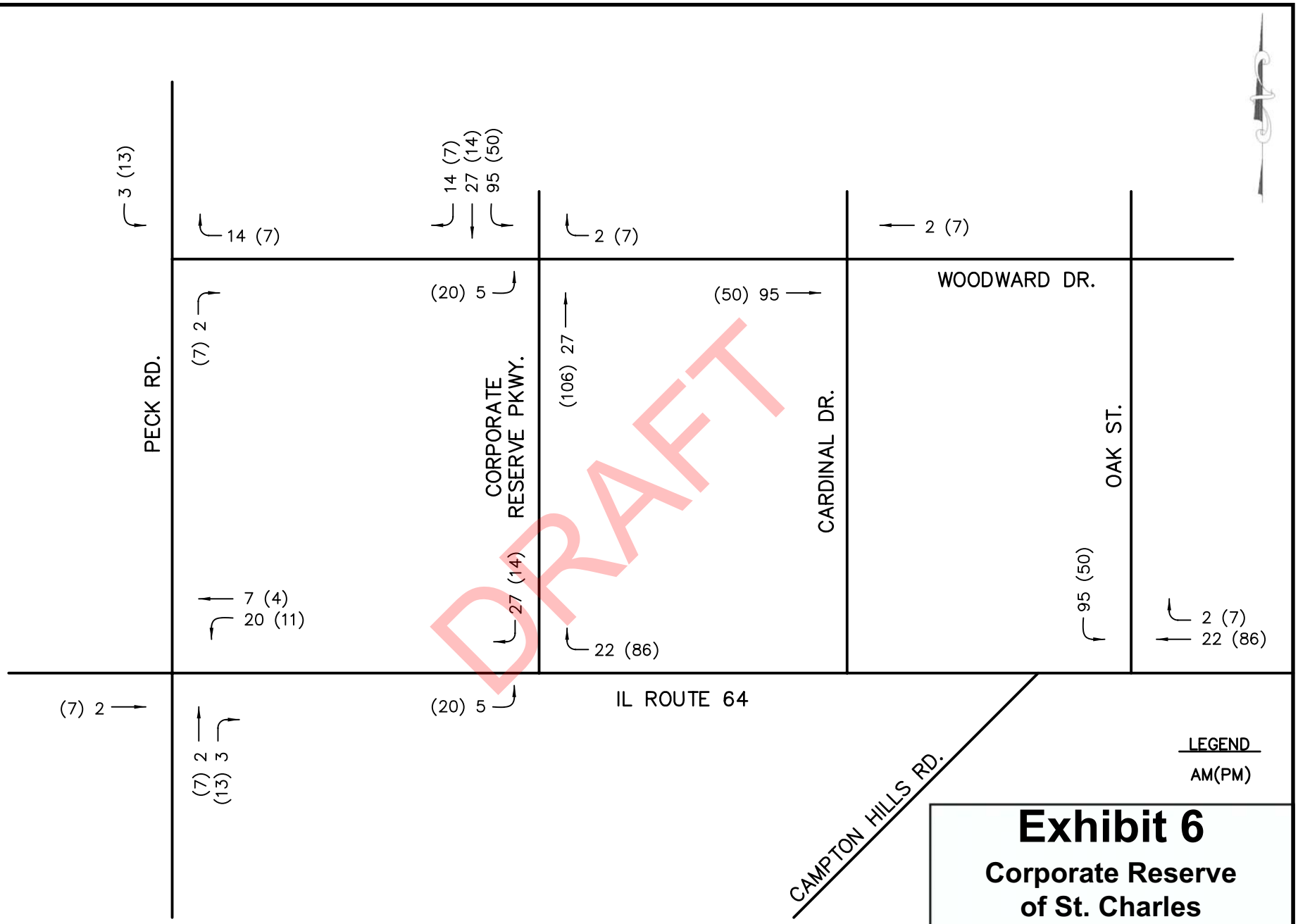

Exhibit 6

Corporate Reserve of St. Charles

Site Traffic

Hampton, Lenzini and Renwick, inc.
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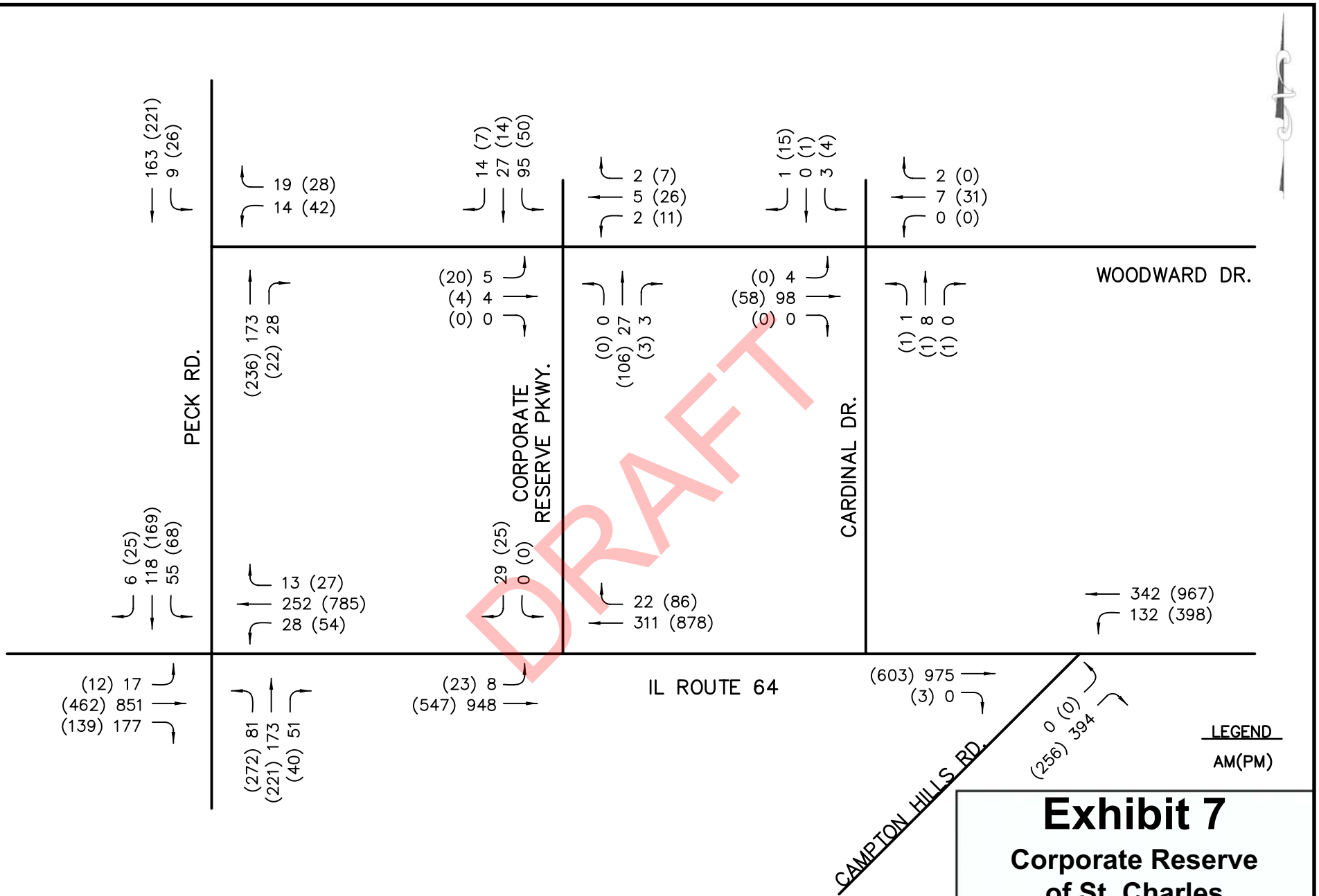

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Exhibit 7

Corporate Reserve of St. Charles

2022 Build Traffic

Hampton, Lenzini and Renwick, inc.
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April 12, 2012

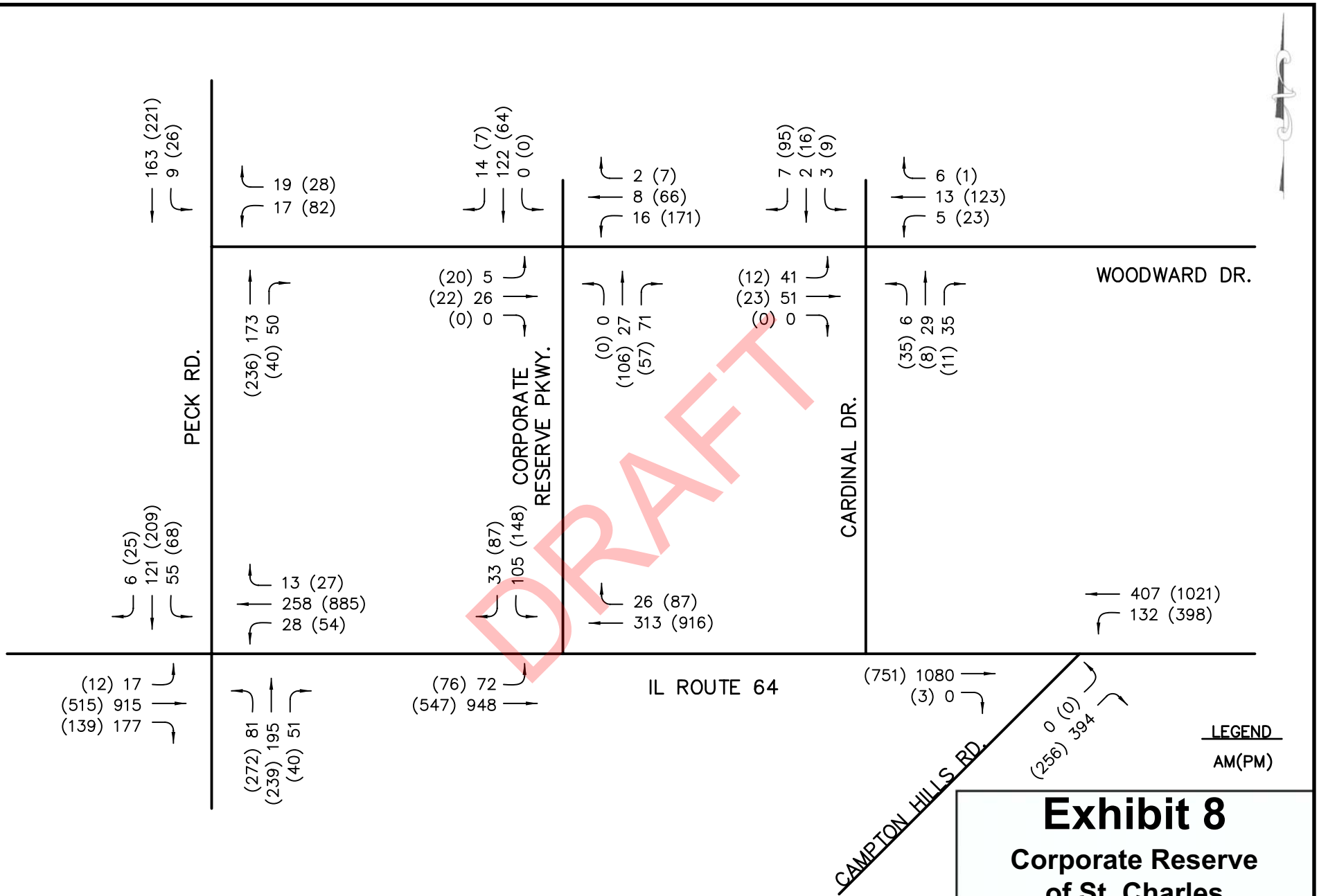

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Exhibit 8

Corporate Reserve of St. Charles

2022 Total Traffic

Hampton, Lenzini and Renwick, inc.
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April 12, 2012

TRAFFIC SIGNAL WARRANT REVIEW SHEET

Intersection: IL Route 64 & Corporate Reserve Blvd **2022 Build Traffic**

Municipality: City of St. Charles/IDOT

Speed limit of major route: 45 **Isolated Community with population <10,000? No**

Number of lanes for major approach: 1 **Number of lanes for minor approach: 1**

SRA: Yes **MUTCD: 2009**

Hour	Veh. per hr. on major street (total of both approaches)	Veh. per hr. on higher volume minor street approach (one direction only)	Check any hours that meet the following warrants				
			Warrant 1 Condition A	Warrant 1 Condition B	Warrant 2	Warrant 3	Warrant 4
7:00 AM	1289	102		x			
55% of DHV	844	35					
5:00 PM	1534	64	x	x			

Volume Requirements: Major Street 500 750

Minor Street 150 100

Completed By: P. Brien Funk, EI

Hampton, Lenzini and Renwick, Inc.

Date: 5/9/2012

Warrant Number	Requirement Satisfied?
Warrant 1 Condition A Minimum Vehicular Volume	Yes **No**
Warrant 1 Condition B Interruption of Continous Traffic	Yes **No**
Warrant 2 Four Hour Volume	Not Allowed Yes No
Warrant 3 Peak Hour	Not Allowed Yes No
Warrant 4 Pedestrian Volume	Yes **No**
Warrant 5 School Crossing	Yes **No**
Warrant 6 Coordinated Signal System	Yes **No**
Warrant 7 Crash Experience	Not Evaluated Yes No
Warrant 8 Roadway Network	Yes **No**
Warrant 9 Grade Crossing	Yes **No**

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ST. CHARLES
Corporate Reserve of St. Charles
Traffic Signal Warrant Review
EXHIBIT 9A

TRAFFIC SIGNAL WARRANT REVIEW SHEET

Intersection: IL Route 64 & Corporate Reserve Blvd **2022 Total Traffic**

Municipality: City of St. Charles/IDOT

Speed limit of major route: 45 **Isolated Community with population <10,000? No**

Number of lanes for major approach: 1 **Number of lanes for minor approach: 1**

SRA: Yes **MUTCD: 2009**

Hour	Veh. per hr. on major street (total of both approaches)	Veh. per hr. on higher volume minor street approach (one direction only)	Check any hours that meet the following warrants				
			Warrant 1 Condition A	Warrant 1 Condition B	Warrant 2	Warrant 3	Warrant 4
7:00 AM	1359	113	X	X			
55% of DHV	894	108		X			
5:00 PM	1626	196		x			

Volume Requirements:			
	Major Street	600	750
	Minor Street	150	100

Completed By: P. Brien Funk, EI
Hampton, Lenzini and Renwick, Inc.

Date: 5/9/2012

Warrant Number	Requirement Satisfied?
Warrant 1 Condition A Minimum Vehicular Volume	Yes **No**
Warrant 1 Condition B Interruption of Continous Traffic	**Yes** No
Warrant 2 Four Hour Volume	Not Allowed Yes No
Warrant 3 Peak Hour	Not Allowed Yes No
Warrant 4 Pedestrian Volume	Yes **No**
Warrant 5 School Crossing	Yes **No**
Warrant 6 Coordinated Signal System	Yes **No**
Warrant 7 Crash Experience	Not Evaluated Yes No
Warrant 8 Roadway Network	Yes **No**
Warrant 9 Grade Crossing	Yes **No**

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ST. CHARLES
Corporate Reserve of St. Charles
Traffic Signal Warrant Review
EXHIBIT 9B