

Traffic Impact Study

1925 Wilmette Avenue
Proposed Cleland Place Apartments

PREPARED FOR:
Village of Wilmette

November 18, 2015
Rev. September 30, 2016



I. Introduction

This report presents the findings and conclusions of a traffic impact study conducted for the redevelopment of 1925 Wilmette Avenue in the Village of Wilmette, Illinois. The existing site is currently occupied by the American Legion Wilmette Post 46 building that houses their activities and is periodically used as a banquet hall facility. The proposed redevelopment, Cleland Place consists of a three story, 16-unit apartment building. The proposed apartment building will be owned and managed by the Housing Opportunity Development Corporation. A general location map of the study area is provided as Exhibit 1 in the Appendix.

II. Area Conditions

A field reconnaissance of the site was conducted to inventory information on surrounding land uses and the area roadway network. Field observations of traffic operations within the study area were conducted during the morning and evening weekday peak periods in August and again in October. The most recent traffic counts conducted at the Wilmette Ave./ Ridge Rd. intersection were conducted on November 10, 2015 and September 22, 2016. The results of the September 2016 and November 2015 counts are similar. The most recent traffic counts (September 2016) have been utilized in this report.

Surrounding Land Uses

The site is located on the south side of Wilmette Ave., approximately 350 feet west of the Wilmette Ave./ Ridge Rd. intersection. Three of the four quadrants of the Wilmette Ave./ Ridge Rd. intersection are occupied by commercial/service land uses. The northwest quadrant is occupied by a four story multi-unit residential building. Immediately west of the site is a townhome/ condominium development. North of the site is another multi-unit townhouse/ condominium development.

Surrounding Roadway Network

The site is serviced by Wilmette Ave., an east-west arterial roadway under the jurisdiction of the Illinois Department of Transportation (IDOT). In the vicinity of the site, Wilmette Ave. consists of an urban cross-section approximately 44 feet wide, with curb and gutter, a grassed parkway, roadway lighting and sidewalk on both sides of the roadway. Wilmette Ave. typically operates with one lane of traffic in each direction. The road is posted with a 30 mile-per-hour (mph) speed limit and the right-of-way is approximately 80 feet wide. West of the site, on-street parking is permitted with time restrictions. East of the site, an eastbound left-turn lane for the Wilmette Ave./ Ridge Rd. intersections develops. It should be noted that during peak periods (on-street parking prohibited) Wilmette Ave. functioned as a three lane section at times with traffic passing vehicles stopped to make left-turns.

The Wilmette Ave./ Ridge Rd. intersection is under traffic signal control with mast-arm mounted traffic signals on all approaches. The west, north and south approaches to the intersection consist of an auxiliary left-turn lane and a single combined through/right-turn lane. The east approach consists of a single left-turn, through and right-turn lane. The traffic signal is maintained by the Village of Wilmette and provides for actuated left-turn arrow (protected-permissive) phasing. Marked crosswalks with pedestrian signals (walk/don't walk) are present on all four approaches.

Ridge Rd. is a north-south arterial roadway consisting of one-lane in each direction. South of the Wilmette Ave. intersection, there is a center median/two-way left-turn lane along Ridge Rd. North of the intersection Ridge Rd. consists of one lane in each direction with marked on-street parking.

Public Transportation Facilities

Pace bus route 421 services Wilmette Ave. There is a marked stop with shelter located east of the project site on the south side of the roadway. Pace route 421 originates at Northfield Plaza and extends east to the Linden CTA station, including stops at Edens Plaza and the Wilmette Metra station (Union Pacific North Line).

Existing Traffic Conditions

Capacity analyses were conducted for the Wilmette Ave./ Ridge Rd. intersection utilizing the peak hour traffic counts (Exhibit 2). Level of Service (LOS) criteria for signalized and stop controlled intersections are based on 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 average delay. LOS thresholds are different for signalized and stop sign controlled intersections. The thresholds at stop sign controlled intersections are lower since driver expectation for delays at a signalized intersection is higher than a stop controlled intersection. The LOS criteria for signalized and stop sign controlled intersections are presented below in Tables 1 and 2.

Level-of-Service Criteria for Signalized and Stop Sign Controlled Intersections¹

Table 1: Signalized Intersections

Level of Service	Operating Condition	Average Vehicle Delay (seconds/ vehicle)
A	Very low delay, most vehicles arrive during the green and do not stop at all.	Less than 10
B	More vehicles stop 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, although many vehicles still pass through the intersection without stopping.	20.1 – 35.0
D	Congestion is more noticeable with longer delays; some vehicles may not clear the intersection on a single cycle. LOS D is typical of urban and suburban areas.	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 motorist delays, demand exceeds capacity, increasing queue lengths (back-ups).	Greater than 80

Table 2: Stop Sign Controlled Intersections

Level of Service	Average Vehicle Delay (seconds/ vehicle)
A	Less than 10
B	10.1 – 15.0
C	15.1 – 25.0
D	25.1 – 35.0
E	35.1 – 50.0
F	Greater than 50

¹Source: HCM2010 Highway Capacity Manual, Transportation Research Board, National Academy of Sciences, Washington, D.C.

The results of the capacity analysis indicate that the Wilmette Ave./ Ridge Rd. intersection operates at LOS C during the morning and evening peak hour. Copies of the capacity analysis are included in the Appendix.

Observations of traffic during the heaviest peak hour (evening) did not reveal any significant operational issues at the intersection or adjacent to the site. Eastbound Wilmette Ave. traffic would occasionally queue past the driveway to the site, but cleared on each cycle. The observation of queues past driveway was approximately once every 5 cycles.

Crash Analysis

Crash reports were previously reviewed from the Village of Wilmette. Three crashes occurred at the intersection. All crashes were minor and did not reveal any discernable patterns or need for countermeasures.

III. Forecasted Site Traffic Characteristics

Proposed Land Use

The site plan for the development indicates that the project will consist of a three-story apartment building with 16 apartment units. This is a reduction of 4 units over the previously proposed development. The first floor will contain an office/lobby area with the individual units located on the second and third floor. Parking will be provided on the first/ground floor under the building (below the second floor).

Estimated Site Generated Traffic

The volume of traffic generated by a development is dependent on the characteristics of the proposed land use(s) and the intensity (size) of the use(s). Estimates of site-generated traffic were developed utilizing the Institute of Transportation Engineers (ITE) report entitled Trip Generation, 9th edition. The ITE report is a compilation of numerous statistical studies conducted at various size and types of land uses throughout the United States and is a standard for traffic impact analyses.

Table 3 below summarizes the estimated number of trips to be generated by the development based on ITE statistics.

Table 3
Estimated Site Generated Traffic

Peak Period	In	Out	Total
AM Peak Hour	2	10	12
PM Peak Hour	18	9	27

Information provided by Housing Opportunity Corporation indicates that at affordable housing facilities, in general, a large percentage of residents utilize public transportation (bus, transit) and do not utilize private automobile. Therefore, the ITE estimates provided in Table 3 above, which are utilized for this study, are conservative in value and represent a greater impact that what will likely occur.

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, location of population and employment centers and other competing uses. Based on the land use and roadway network characteristics, trip distribution estimates were developed and are presented on Table 4 below:

Table 4
Trip Distribution Estimates

Route To/from the ...	Percentage of Traffic (%)
West on Wilmette Ave	40%
East on Wilmette Ave.	60%

Site Traffic Assignment

The estimated site generated traffic volumes were assigned to the area roadway system based on the directional distribution estimates identified above. The site traffic assignment for the project is illustrated on Exhibit 3 in the Appendix.

Total Traffic Assignment

The site traffic assignment was then combined with the existing traffic to develop a Total Traffic assignment. The results of the Total Traffic assignment are depicted on Exhibit 4 in the Appendix.

IV. Forecasted Traffic Operations

Capacity analyses were conducted based on the Total Traffic assignment at the following locations:

- Wilmette Ave./ site access driveway
- Wilmette Ave./ Ridge Rd.

Table 5 presents the results of the capacity analyses at Wilmette Ave./ Ridge Rd. for both the existing and proposed (Total Traffic). Complete copies of the capacity analyses are included in the Appendix.

Table 5
Comparison of Capacity Analyses
Level of Service (LOS) and Delay (sec.)
Wilmette Ave./ Ridge Rd.

Peak Period	Existing Conditions	Proposed Development Total Traffic
AM Peak Hour	C (31.2)	C (31.4)
PM Peak Hour	C (29.5)	C (31.0)

As can be seen from Table 2, there will be no discernable change to the operating characteristics of the Wilmette Ave./ Ridge Rd. intersection from the development. As noted above, the trip generation estimates are based on 100% automobile use (no public transit) and therefore the change in delay is conservative.

The proposed site plan for the development consolidates the two existing driveways into a single access driveway. This follows good access management practices. Capacity analyses conducted for the proposed site driveway on Wilmette Ave. are summarized on Table 6 below. At minor intersections (stop control on minor approach driveway), LOS and delay are defined for the minor approaches and left-turns into the site from the major route.

Table 6
Level of Service (LOS) and Delay (sec.)
Wilmette Ave./ site driveway

Peak Period	Proposed Development (November Counts)	
	LT into site	Driveway Out
AM Peak Hour	A (0.0)	C (20.9)
PM Peak Hour	A (0.3)	C (19.5)

As can be seen from Table 6, the proposed access driveway will operate with an acceptable LOS and delay.

V. Parking and Internal Site Circulation Review

A review of the site circulation and parking was conducted. The site plan (see Appendix) provides a single access driveway between the property and Wilmette Ave. Parking is provided on the ground level, under the second floor of the building, with 20 proposed parking spaces. Based on the nature of the proposed development a supply of one space per unit appears adequate. As noted above, the developer has indicated that affordable housing developments in general, experiences an appreciable share of tenants that rely on public transportation and do not own a vehicle. The proposed development provides for a surplus of 4 spaces or approximately 1.25 spaces per unit.

Pick-up/drop off, deliveries and refuse removal will occur near the front of building. While the parking area will provide room and area for a passenger vehicle to maneuver and turn around, larger delivery

trucks and refuse trucks will not be able to turn around in the parking lot, as there will be inadequate vertical clearance. The revised site plan identifies an easement with the commercial property to the east to allow larger vehicles to turnaround utilizing the existing adjacent parking lot aisle.

VI. Recommendations and Conclusions

Based on the analyses and review conducted as part of this traffic impact study, the proposed development will not create any appreciable traffic impacts on the surrounding roadway network.

Wilmette Ave. is under the jurisdiction of the Illinois Department of Transportation (IDOT). As such, an access permit will be required in order to construct the new driveway or make any modifications within the Wilmette Ave. right-of-way.

The Village of Wilmette should be provided evidence of the cross-easement agreement with the adjacent property to the east to allow for larger vehicles to turnaround.

APPENDIX

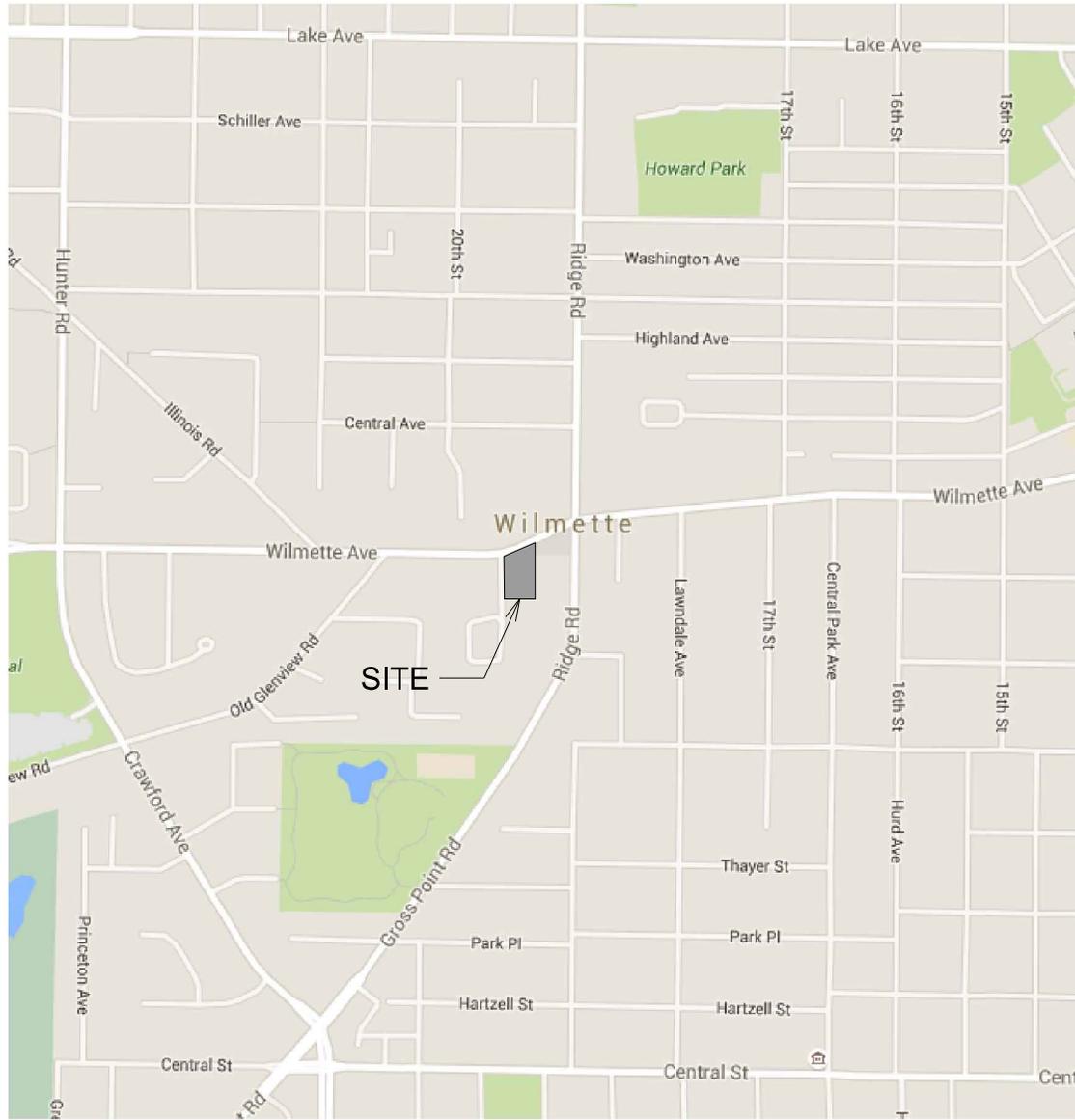
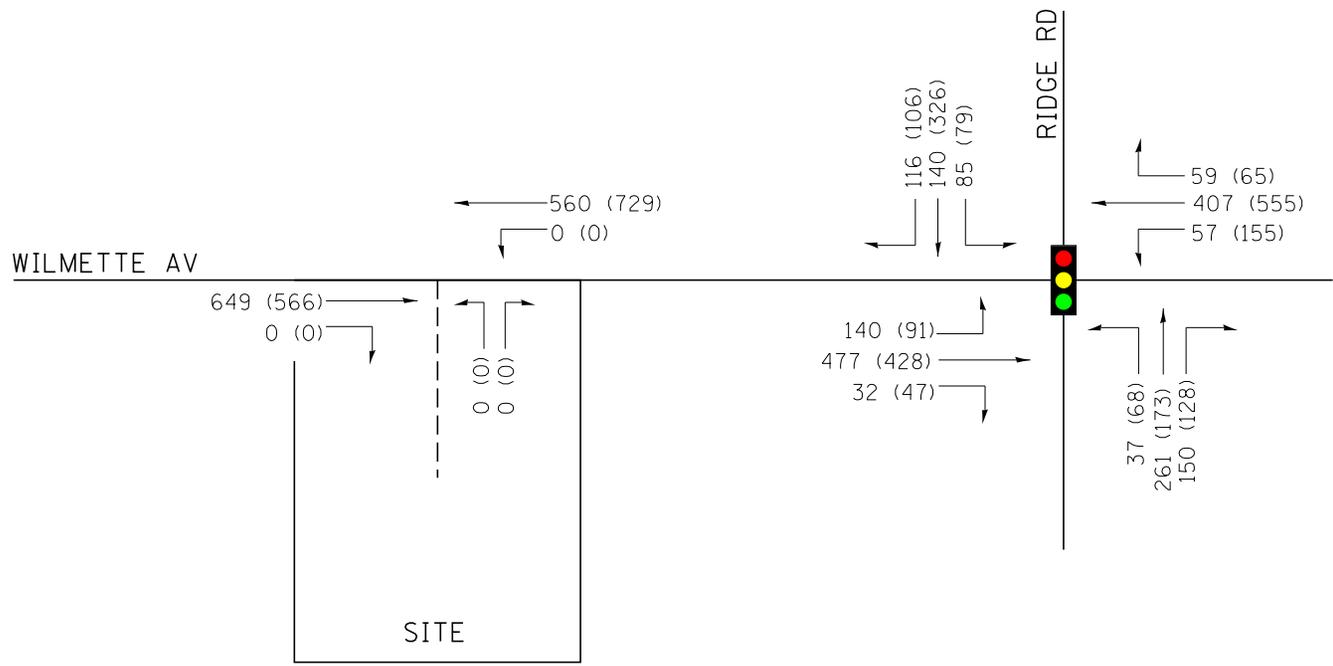
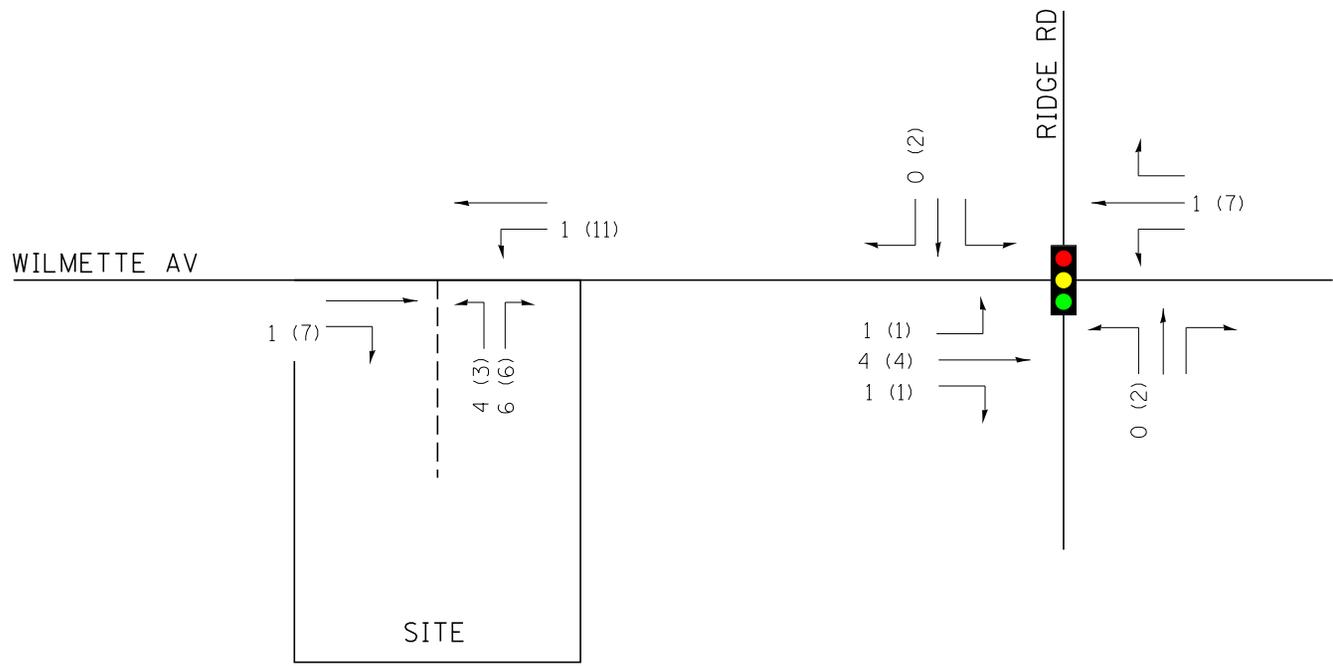


EXHIBIT 1
LOCATION MAP



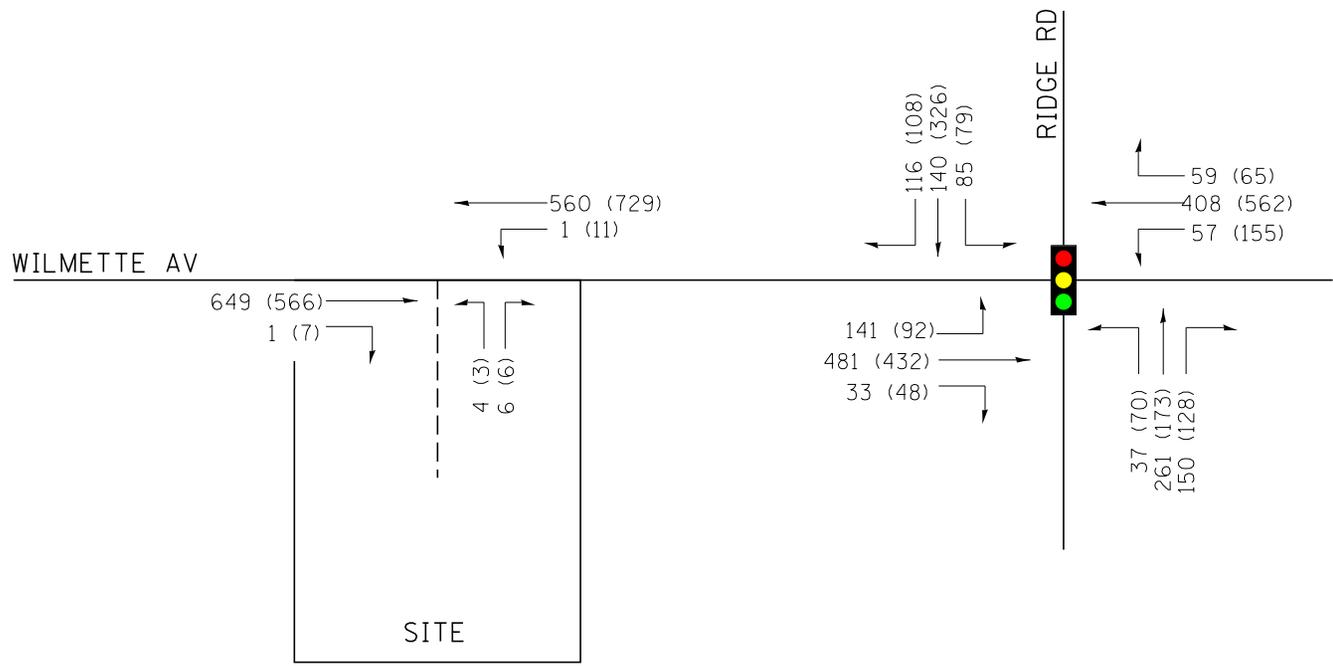
COUNTS CONDUCTED SEPTEMBER 22, 2016
A.M. (P.M.) PEAK HOUR VOLUME

EXHIBIT 2 EXISTING TRAFFIC



A.M. (P.M.) PEAK HOUR VOLUME
- (-) LESS THAN 5 VPH

EXHIBIT 3 SITE GENERATED TRAFFIC

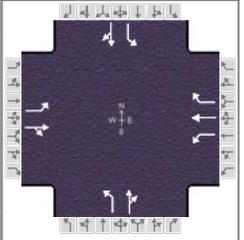


A.M. (P.M.) PEAK HOUR VOLUME
(BASED ON COUNTS CONDUCTED SEP. 22, 2016)

EXHIBIT 4 TOTAL TRAFFIC

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency		Duration, h	0.25			
Analyst		Analysis Date	Sep 22, 2016		Area Type	Other
Jurisdiction		Time Period		PHF	0.91	
Urban Street	Wilmette Ave	Analysis Year	2015	Analysis Period	1 > 7:00	
Intersection	Wilmette Ave & Ridge Rd	File Name	09222016Wilmette-Ridge REV Ex AM.xus			
Project Description	Existing AM Peak Hour- UPDATED2016					



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	140	477	32	57	407	59	37	261	150	85	140	116

Signal Information				Signal Timing Diagram								
Cycle, s	100.8	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
Green	2.4	2.7	32.9	3.5	0.7	37.5						
Yellow	3.0	0.0	4.5	3.0	3.0	4.5						
Red	0.0	0.0	1.5	0.0	0.0	1.5						

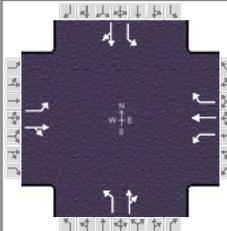
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	10.3	47.3	6.5	43.5	5.4	38.9	8.1	41.6
Change Period, ($Y+R_c$), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Allow Headway (MAH), s	4.1	7.1	4.1	7.1	4.1	6.2	4.1	6.2
Queue Clearance Time (g_s), s	7.1	29.3	4.2	22.0	3.5	28.2	5.3	15.2
Green Extension Time (g_e), s	0.3	11.9	0.1	14.3	0.0	4.7	0.2	6.8
Phase Call Probability	0.99	1.00	0.83	1.00	0.68	1.00	0.93	1.00
Max Out Probability	0.05	0.56	0.00	0.41	0.00	0.52	0.00	0.11

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	154	559		63	447	65	41	452		93	281	
Adjusted Saturation Flow Rate (s), veh/h/ln	1792	1778		1774	1863	1506	1810	1623		1810	1669	
Queue Service Time (g_s), s	5.1	27.3		2.2	20.0	2.8	1.5	26.2		3.3	13.2	
Cycle Queue Clearance Time (g_c), s	5.1	27.3		2.2	20.0	2.8	1.5	26.2		3.3	13.2	
Green Ratio (g/C)	0.46	0.41		0.41	0.37	0.37	0.35	0.33		0.39	0.35	
Capacity (c), veh/h	365	728		234	694	561	341	530		227	589	
Volume-to-Capacity Ratio (X)	0.421	0.769		0.268	0.645	0.116	0.119	0.852		0.412	0.477	
Back of Queue (Q), ft/ln (50 th percentile)	52.4	313.3		23	232.4	25.2	16.1	288.6		36.2	132.2	
Back of Queue (Q), veh/ln (50 th percentile)	2.1	12.5		0.9	8.9	1.0	0.6	11.5		1.4	5.3	
Queue Storage Ratio (RQ) (50 th percentile)	0.55	0.00		0.20	0.00	0.22	0.21	0.00		0.33	0.00	
Uniform Delay (d_1), s/veh	18.7	25.7		21.9	26.1	20.8	22.6	31.7		23.8	25.4	
Incremental Delay (d_2), s/veh	0.8	7.7		0.6	2.1	0.2	0.2	11.3		1.2	1.3	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	19.5	33.3		22.5	28.3	21.0	22.7	43.0		25.0	26.7	
Level of Service (LOS)	B	C		C	C	C	C	D		C	C	
Approach Delay, s/veh / LOS	30.3	C		26.8	C		41.4	D		26.3	C	
Intersection Delay, s/veh / LOS	31.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.4	B	2.3	B
Bicycle LOS Score / LOS	2.7	B	2.5	B	2.4	B	2.2	B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency		Duration, h	0.25			
Analyst		Analysis Date	Sep 22, 2016		Area Type	Other
Jurisdiction		Time Period		PHF	0.98	
Urban Street	Wilmette Ave	Analysis Year	2015	Analysis Period	1 > 7:00	
Intersection	Wilmette Ave & Ridge Rd	File Name	09222016Wilmette-Ridge REV Ex PM.xus			
Project Description	Existing PM Peak Hour- REV09222016					



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	91	428	47	155	555	65	68	173	128	79	326	106

Signal Information												
Cycle, s	97.1	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	4.1	0.4	29.9	4.8	2.4	37.5		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
				Red	0.0	0.0	1.5	0.0	0.0	1.5		

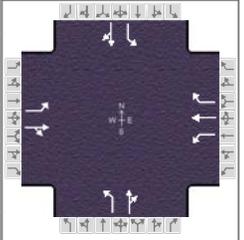
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	7.8	43.5	10.2	45.9	7.1	35.9	7.5	36.3
Change Period, (Y+R _c), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Allow Headway (MAH), s	4.1	6.9	4.1	6.9	4.1	6.2	4.1	6.2
Queue Clearance Time (g _s), s	5.0	23.5	7.0	27.0	4.8	17.9	4.9	24.7
Green Extension Time (g _e), s	0.2	13.9	0.3	12.8	0.1	6.6	0.1	5.5
Phase Call Probability	0.92	1.00	0.99	1.00	0.85	1.00	0.89	1.00
Max Out Probability	0.00	0.44	0.05	0.51	0.00	0.16	0.00	0.35

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	93	485		158	566	66	69	307		81	441	
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1826		1774	1863	1505	1660	1604		1810	1737	
Queue Service Time (g _s), s	3.0	21.5		5.0	25.0	2.6	2.8	15.9		2.9	22.7	
Cycle Queue Clearance Time (g _c), s	3.0	21.5		5.0	25.0	2.6	2.8	15.9		2.9	22.7	
Green Ratio (g/C)	0.44	0.39		0.48	0.41	0.41	0.35	0.31		0.35	0.31	
Capacity (c), veh/h	273	705		354	765	618	195	495		316	542	
Volume-to-Capacity Ratio (X)	0.340	0.687		0.446	0.740	0.107	0.355	0.621		0.255	0.813	
Back of Queue (Q), ft/ln (50 th percentile)	31.5	248.6		50.7	281.9	22.8	27.9	156.9		31.5	257.6	
Back of Queue (Q), veh/ln (50 th percentile)	1.2	9.9		2.0	11.2	0.9	1.1	6.3		1.2	10.3	
Queue Storage Ratio (RQ) (50 th percentile)	0.33	0.00		0.43	0.00	0.20	0.39	0.00		0.29	0.00	
Uniform Delay (d ₁), s/veh	19.9	24.9		18.0	24.2	17.6	24.7	28.7		22.6	30.8	
Incremental Delay (d ₂), s/veh	0.7	5.4		0.9	3.6	0.2	1.1	2.7		0.4	7.8	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	20.6	30.3		18.9	27.9	17.8	25.8	31.5		23.0	38.6	
Level of Service (LOS)	C	C		B	C	B	C	C		C	D	
Approach Delay, s/veh / LOS	28.8	C		25.2	C		30.4	C		36.2	D	
Intersection Delay, s/veh / LOS	29.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.4	B	2.3	B
Bicycle LOS Score / LOS	2.5	B	2.9	C	2.2	B	2.4	B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information			
Agency		Duration, h	0.25				
Analyst		Analysis Date	Sep 22, 2016		Area Type	Other	
Jurisdiction		Time Period				PHF	0.91
Urban Street	Wilmette Ave	Analysis Year	2015		Analysis Period	1 > 7:00	
Intersection	Wilmette Ave & Ridge Rd	File Name	09222016Wilmette-Ridge REV Pr AM.xus				
Project Description	Total Traffic AM Peak Hour- UPDATED2016						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	141	481	33	57	408	59	37	261	150	85	140	116

Signal Information													
Cycle, s	101.3	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	2.4	2.7	33.0	3.6	0.8	37.9			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	0.0	4.5	3.0	3.0	4.5			
				Red	0.0	0.0	1.5	0.0	0.0	1.5			

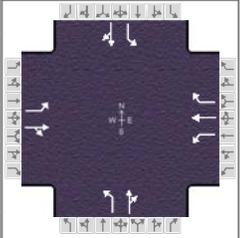
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	10.3	47.6	6.6	43.9	5.4	39.0	8.1	41.7
Change Period, (Y+R _c), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Allow Headway (MAH), s	4.1	7.1	4.1	7.1	4.1	6.2	4.1	6.2
Queue Clearance Time (g _s), s	7.1	29.8	4.2	22.1	3.5	28.4	5.3	15.3
Green Extension Time (g _e), s	0.3	11.8	0.1	14.4	0.0	4.7	0.2	6.8
Phase Call Probability	0.99	1.00	0.83	1.00	0.68	1.00	0.93	1.00
Max Out Probability	0.05	0.58	0.00	0.42	0.00	0.53	0.00	0.11

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	155	565		63	448	65	41	452		93	281	
Adjusted Saturation Flow Rate (s), veh/h/ln	1792	1778		1774	1863	1506	1810	1623		1810	1669	
Queue Service Time (g _s), s	5.1	27.8		2.2	20.1	2.9	1.5	26.4		3.3	13.3	
Cycle Queue Clearance Time (g _c), s	5.1	27.8		2.2	20.1	2.9	1.5	26.4		3.3	13.3	
Green Ratio (g/C)	0.47	0.41		0.41	0.37	0.37	0.35	0.33		0.39	0.35	
Capacity (c), veh/h	366	730		231	696	563	340	529		225	588	
Volume-to-Capacity Ratio (X)	0.423	0.773		0.271	0.644	0.115	0.120	0.853		0.414	0.478	
Back of Queue (Q), ft/ln (50 th percentile)	52.9	318.9		23.1	234.2	25.3	16.3	290.8		36.5	133.2	
Back of Queue (Q), veh/ln (50 th percentile)	2.1	12.8		0.9	9.0	1.0	0.6	11.6		1.4	5.3	
Queue Storage Ratio (RQ) (50 th percentile)	0.56	0.00		0.20	0.00	0.22	0.21	0.00		0.34	0.00	
Uniform Delay (d ₁), s/veh	18.7	25.8		22.0	26.2	20.8	22.7	31.9		24.0	25.6	
Incremental Delay (d ₂), s/veh	0.8	7.8		0.6	2.1	0.2	0.2	11.5		1.2	1.3	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	19.5	33.6		22.6	28.3	21.0	22.9	43.4		25.2	26.9	
Level of Service (LOS)	B	C		C	C	C	C	D		C	C	
Approach Delay, s/veh / LOS	30.6	C		26.9	C		41.7	D		26.4	C	
Intersection Delay, s/veh / LOS	31.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.4	B	2.3	B
Bicycle LOS Score / LOS	2.7	B	2.5	B	2.4	B	2.2	B

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency		Duration, h	0.25			
Analyst		Analysis Date	Sep 22, 2016		Area Type	Other
Jurisdiction		Time Period		PHF	0.96	
Urban Street	Wilmette Ave	Analysis Year	2015	Analysis Period	1 > 7:00	
Intersection	Wilmette Ave & Ridge Rd	File Name	09222016Wilmette-Ridge REV Pr PM.xus			
Project Description	Prop PM Peak Hour- REV09222016					



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	92	432	48	155	562	65	70	173	128	79	326	108

Signal Information													
Cycle, s	100.7	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	4.4	0.3	31.4	5.0	2.5	39.1			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	0.0	4.5	3.0	0.0	4.5			
				Red	0.0	0.0	1.5	0.0	0.0	1.5			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	8.0	45.1	10.5	47.6	7.4	37.4	7.7	37.7
Change Period, (Y+R _c), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Allow Headway (MAH), s	4.1	6.9	4.1	6.9	4.1	6.2	4.1	6.2
Queue Clearance Time (g _s), s	5.2	25.3	7.3	29.1	5.0	18.8	5.1	26.3
Green Extension Time (g _e), s	0.2	13.8	0.3	12.4	0.1	6.7	0.1	5.3
Phase Call Probability	0.93	1.00	0.99	1.00	0.87	1.00	0.90	1.00
Max Out Probability	0.00	0.50	0.06	0.58	0.00	0.19	0.00	0.43

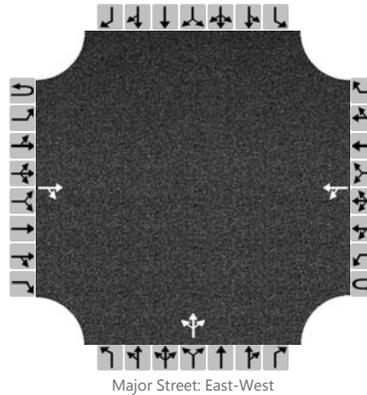
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	96	500		161	585	68	73	314		82	452	
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1826		1774	1863	1505	1660	1604		1810	1735	
Queue Service Time (g _s), s	3.2	23.3		5.3	27.1	2.8	3.0	16.8		3.1	24.3	
Cycle Queue Clearance Time (g _c), s	3.2	23.3		5.3	27.1	2.8	3.0	16.8		3.1	24.3	
Green Ratio (g/C)	0.44	0.39		0.48	0.41	0.41	0.36	0.31		0.36	0.31	
Capacity (c), veh/h	262	709		344	769	621	191	501		313	546	
Volume-to-Capacity Ratio (X)	0.366	0.705		0.469	0.762	0.109	0.381	0.626		0.263	0.828	
Back of Queue (Q), ft/ln (50 th percentile)	33.9	270		54.4	310.7	24.3	30.5	167		33.4	279.5	
Back of Queue (Q), veh/ln (50 th percentile)	1.3	10.8		2.1	12.3	1.0	1.2	6.7		1.3	11.2	
Queue Storage Ratio (RQ) (50 th percentile)	0.36	0.00		0.46	0.00	0.21	0.43	0.00		0.30	0.00	
Uniform Delay (d ₁), s/veh	20.8	26.0		18.9	25.4	18.2	25.5	29.6		23.2	32.0	
Incremental Delay (d ₂), s/veh	0.9	5.8		1.0	4.4	0.2	1.2	2.7		0.4	9.0	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	21.7	31.8		19.9	29.7	18.4	26.8	32.4		23.7	41.0	
Level of Service (LOS)	C	C		B	C	B	C	C		C	D	
Approach Delay, s/veh / LOS	30.2	C		26.8	C		31.3	C		38.3	D	
Intersection Delay, s/veh / LOS	31.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.3	B	2.4	B	2.3	B
Bicycle LOS Score / LOS	2.5	B	2.9	C	2.2	B	2.4	B

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	M. Magnuson	Intersection	1925 Wilmette Ave
Agency/Co.	Alfred Benesch	Jurisdiction	
Date Performed	09/22/2016	East/West Street	Wilmette Ave
Analysis Year	2015	North/South Street	
Time Analyzed	PROPOSED AM Peak UPDATED	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LTR					
Volume (veh/h)			649	1		1	560			4	0	6				
Percent Heavy Vehicles						0				0	0	0				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

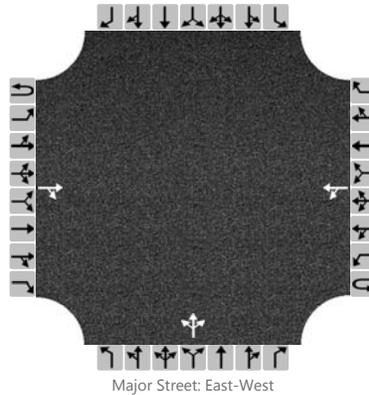
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						623						11				
Capacity						889						238				
v/c Ratio						0.70						0.05				
95% Queue Length						0.0						0.1				
Control Delay (s/veh)						9.1						20.9				
Level of Service (LOS)						A						C				
Approach Delay (s/veh)					0.0				20.9							
Approach LOS									C							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	M. Magnuson	Intersection	1925 Wilmette Ave
Agency/Co.	Alfred Benesch	Jurisdiction	
Date Performed	09/30/2016	East/West Street	Wilmette Ave
Analysis Year	2015	North/South Street	
Time Analyzed	PR PM Peak UPDATED	Peak Hour Factor	0.96
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

Lanes

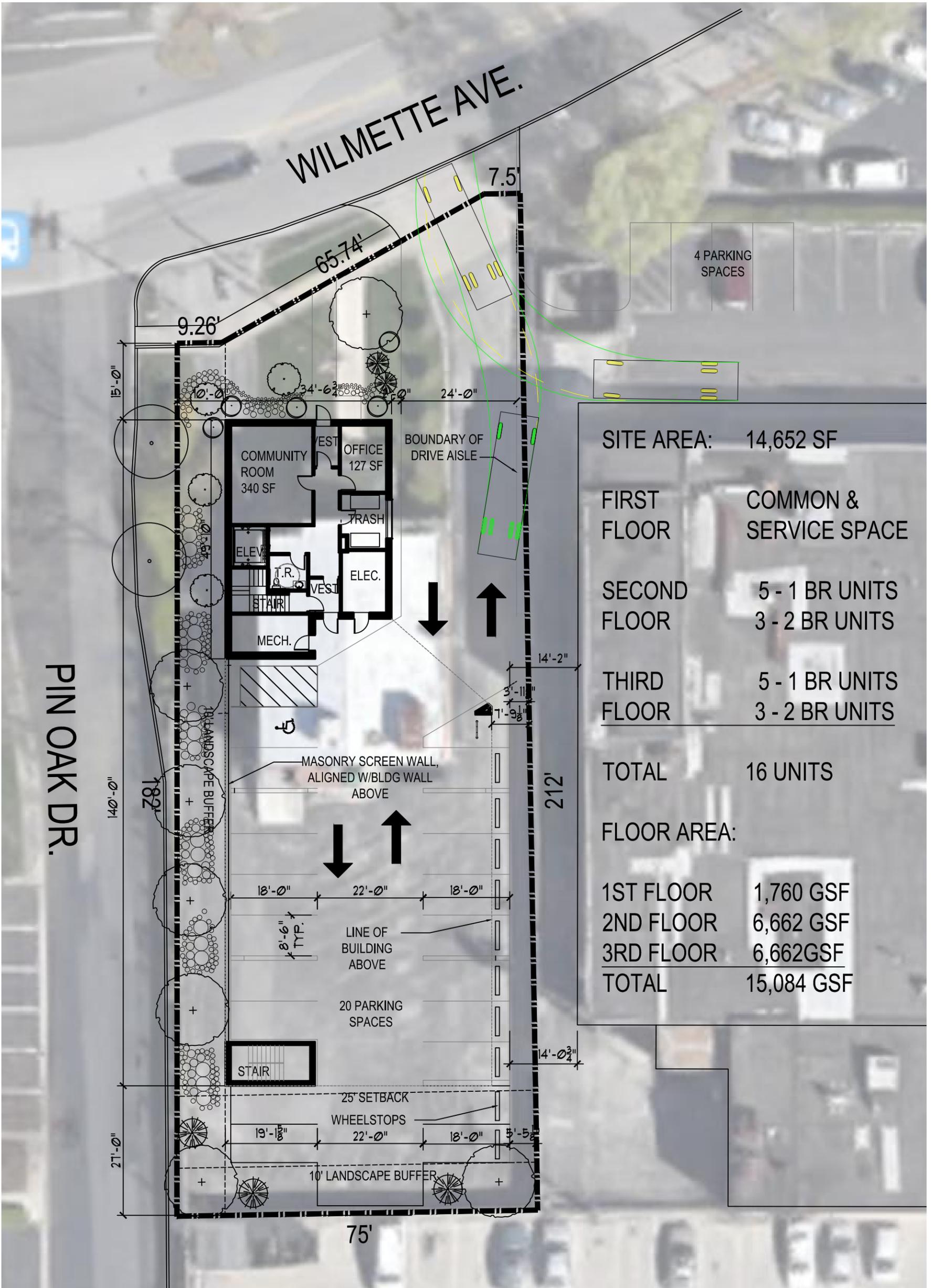


Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LTR					
Volume (veh/h)			566	7		11	729			3	0	6				
Percent Heavy Vehicles						0				0	0	0				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

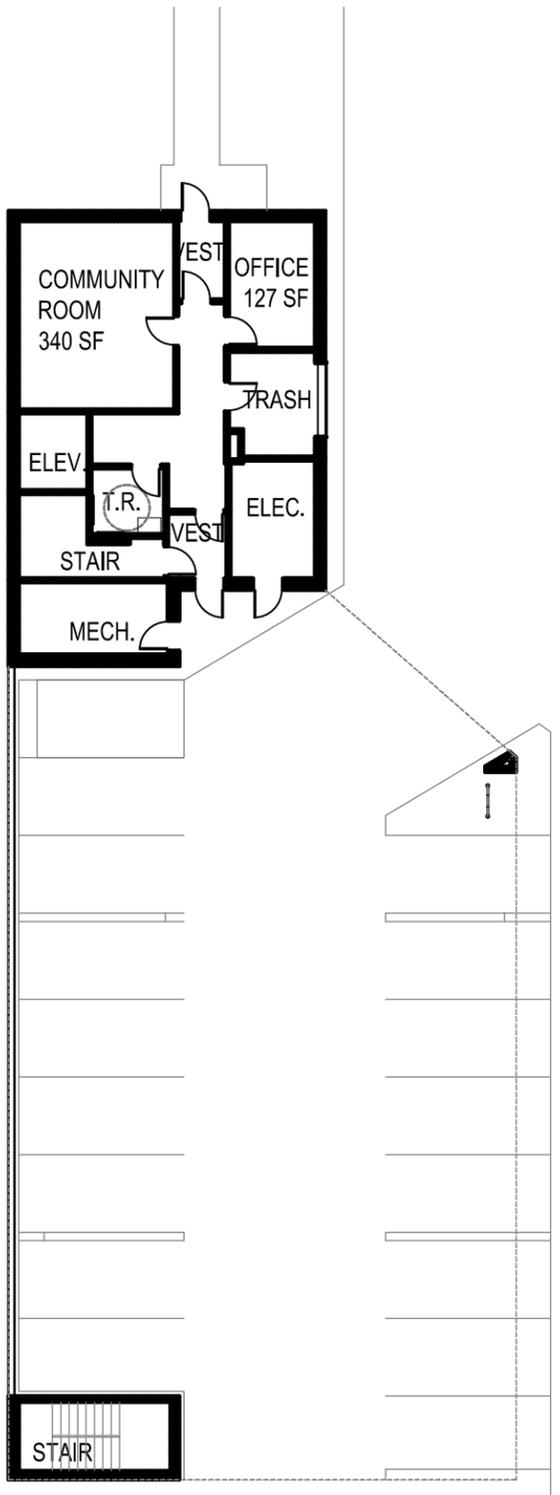
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						770						9				
Capacity						969						257				
v/c Ratio						0.79						0.04				
95% Queue Length						0.0						0.1				
Control Delay (s/veh)						8.8						19.5				
Level of Service (LOS)						A						C				
Approach Delay (s/veh)					0.3				19.5							
Approach LOS									C							

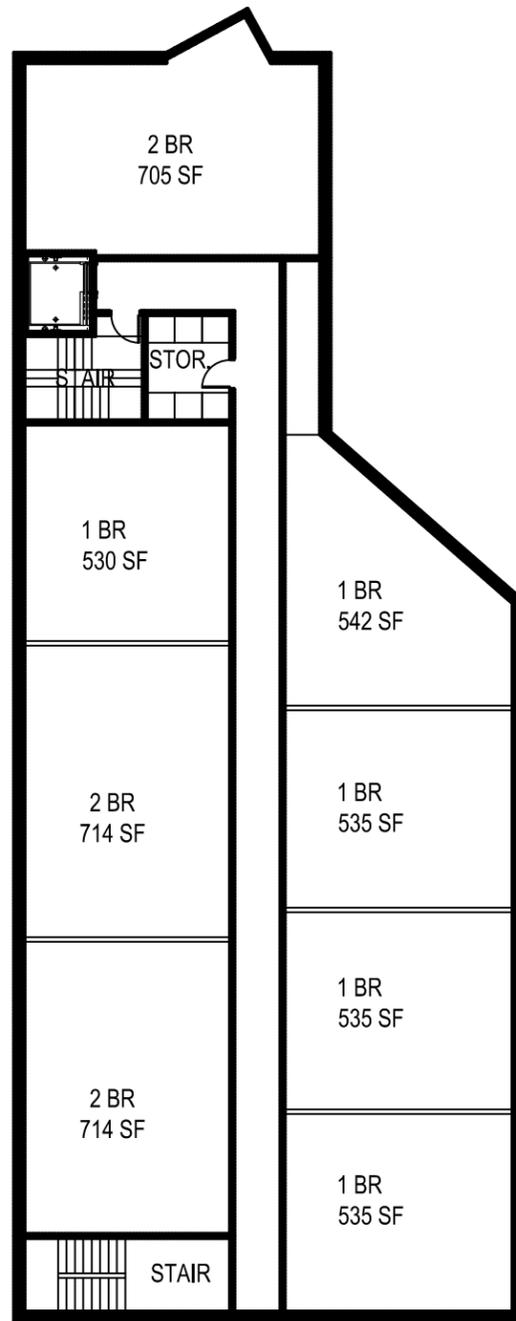


SITE AREA:	14,652 SF
FIRST FLOOR	COMMON & SERVICE SPACE
SECOND FLOOR	5 - 1 BR UNITS 3 - 2 BR UNITS
THIRD FLOOR	5 - 1 BR UNITS 3 - 2 BR UNITS
TOTAL	16 UNITS
FLOOR AREA:	
1ST FLOOR	1,760 GSF
2ND FLOOR	6,662 GSF
3RD FLOOR	6,662 GSF
TOTAL	15,084 GSF





GROUND FLOOR PLAN



TYPICAL FLOOR PLAN

