LAKELAND MEADOWS – PHASE 2
1626 OLD PRESCOTT ROAD, GREELY
CITY OF OTTAWA

TRANSPORTATION IMPACT STUDY
REVISED

Prepared for:

Lakeland Meadows Ltd.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LAKELAND MEADOWS – PHASE 2
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1. INTRODUCTION

The Lakeland Meadows subdivision is located on the west side of Old Prescott Road, south of Parkway Road in the Village of Greely. Phase 1 of the development will consist of 34 village size lots at the west portion of the development. The subdivision application for Phase 1 has received approval from the City of Ottawa. Construction of Phase 1 has been started with substantial completion of the development expected by the year 2017/2018.

This Transportation Impact Study report will be examining the impact of Phase 2 of the Lakeland Meadows subdivision. Phase 2 is located at 1626 Old Prescott Road adjacent to the east limit of Phase 1. Phase 2 will contain a mixture of single family, semi-detached and townhouses, with two proposed apartment buildings. The subdivision will have direct access to the east to Old Prescott Road, and to Stagecoach Road to the west through Phase 1 and along Lakeshore Drive. The development would also include a connection to a proposed collector road which would link the site to Parkway Road to the north through the future phases of the Quinn Farm subdivision. The development is expected to be substantially completed by the year 2025. The location of the proposed development is shown in Figure 1.1.

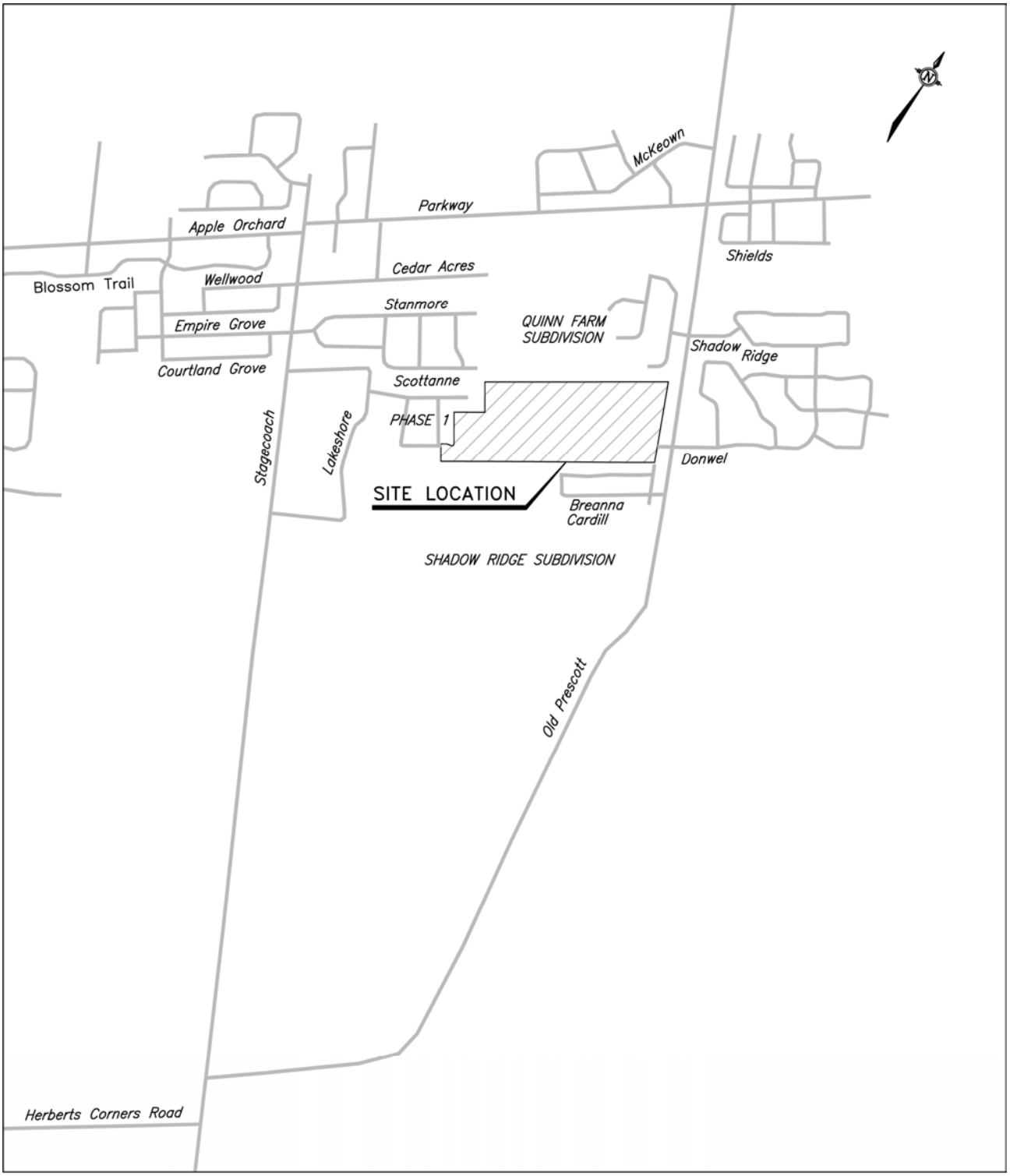
The review and approval process for the development has required that a Transportation Impact Study be prepared as part of the rezoning of the lands and Site Plan Application. A Transportation Impact Study (TIS) report dated March 31, 2013 was prepared which addressed the proposed development. This revised TIS report will examine the proposed development utilizing the assumptions of the March 21, 2013 TIS report, and will incorporate updated background traffic counts and the revised completion date for the development as requested by staff of the City of Ottawa.

1.1 Scope of Work

The scope of the Transportation Impact Study was determined during conversations with staff of the City of Ottawa. The study area has included all major intersections within approximately 1.5 kilometres of the site. The study area will comprise of the following intersections:

- The proposed Site Access (Street No. 1) onto Old Prescott Road
- The proposed intersection of the new north-south collector road (Street No. 2) and Parkway Road
- Lakeshore Drive and Stagecoach Road
- Stagecoach Road and Parkway Road
- Old Prescott Road and Parkway Road

FIGURE 1.1
SITE LOCATION PLAN



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The analysis will be conducted for the peak traffic period which would occur during the weekday peak AM and PM hours. The study will examine the operation of the intersections for the existing traffic, the expected traffic volumes at substantial build out of the development which is expected at the year 2025, and at the year 2030 which represents five years beyond completion.

2. ROADWAY NETWORK

Phase 2 of the Lakeland Meadows subdivision will have direct access onto Old Prescott Road. Old Prescott Road is designated as a collector road in the City of Ottawa *Transportation Master Plan*, November 2008. Old Prescott Road is a two lane rural road with a pavement width of approximately 6 meters and gravel shoulders. There are no cycling lanes or sidewalks along the road. The posted speed limit at the site is 60 km./h., which increases to 80 km./h. approximately 150 meters south of the site.

To the west of the site is Stagecoach Road (Ottawa Road 25). Stagecoach Road is a north-south arterial road. The road has a two lane rural cross section with gravel shoulders. The posted speed limit in the proximity of the Stagecoach/Lakeshore intersection is 60 km./h., which increases to 80 km./h. approximately 315 meters south of the north access to Lakeshore Drive. There are no cycling lanes or sidewalks along the road.

Parkway Road is an east-west collector road located approximately 1,000 meters north of the site. The road is a two lane road with gravel shoulders and no cycling lanes or pedestrian sidewalks. The posted speed limit along Parkway Road is 60 km./h. The speed limit reduces to 50 km./h. at the Old Prescott/Parkway intersection and for Parkway Road east of Old Prescott Road. Signs are posted prohibiting truck travel along Parkway Road east of Old Prescott Road.

The site access onto Old Prescott Road will be at the existing intersection of Donwel Drive. Old Prescott Road would form the northbound and southbound approaches to the intersection, and Donwel Drive the westbound approach. The proposed Lakeland Meadows subdivision would form the eastbound approach. The intersection is currently controlled by a stop sign at the westbound Donwel Drive approach. The following is the lane configuration of the intersection:

Northbound Old Prescott Rd. Approach -	One shared through/right lane
Southbound Old Prescott Rd. Approach -	One shared left/through lane
Westbound Donwel Drive Approach -	One shared left/right turn lane

The site will have access onto Stagecoach Road at Lakeshore Drive. The Stagecoach/Lakeshore intersection has Stagecoach Road forming the northbound and southbound approaches, and Lakeshore Drive the stop controlled westbound approach. The Cedar Lakes subdivision has been approved for development with access to the subdivision forming the eastbound approach when the development is built. The following is the existing lane configuration of the intersection:

Northbound Stagecoach Rd. Approach -	One shared through/right lane
Southbound Stagecoach Rd. Approach -	One shared left/through lane
Westbound Lakeshore Drive Approach -	One shared left/right turn lane

The intersection of Old Prescott Road and Parkway Road is controlled by traffic signals. Old Prescott Road forms the northbound and southbound approaches and Parkway Road the eastbound and westbound approaches. The following is the lane configuration of the intersection:

Northbound Old Prescott Rd. Approach -	One exclusive left turn lane
	One shared through/right lane
Southbound Old Prescott Rd. Approach -	One exclusive left turn lane
	One shared through/right lane
Eastbound Parkway Road Approach -	One shared left/right turn lane
Westbound Parkway Road Approach -	One shared left/right turn lane

The intersection of Stagecoach Road and Parkway Road has Stagecoach Road forming the northbound and southbound approaches, and Parkway Road the westbound approach and Apple Orchard Road the eastbound approach. The intersection is controlled by stop signs at the Parkway Road and Apple Orchard Road approaches, which are offset from each other by approximately 20 meters. The following is the lane configuration of the intersection:

Northbound Stagecoach Rd. Approach -	One shared left/through/right lane
Southbound Stagecoach Rd. Approach -	One shared left/through/right lane
Eastbound Apple Orchard Rd. Approach -	One shared left/through/right lane
Westbound Parkway Road Approach -	One shared left/through/right lane

Staff of the City of Ottawa is currently examining the reconstruction of the Stagecoach/Parkway intersection. The modifications would include the aligning of the eastbound Old Orchard and westbound Parkway approaches. The intersection would be controlled by two-way stop controls with stop signs installed at the eastbound Old Orchard Road and westbound Parkway Road approaches.

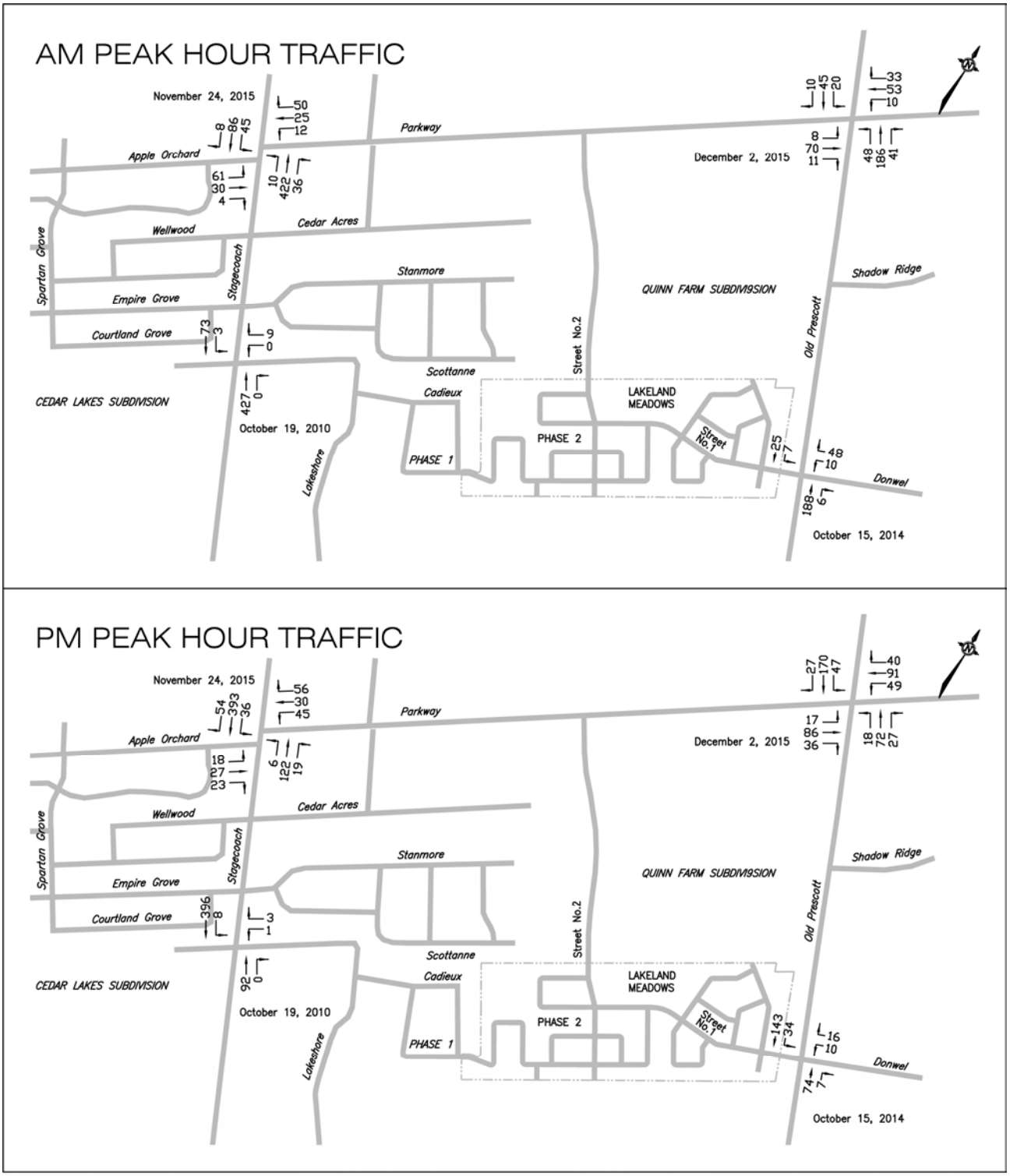
Figure 2.1 shows the unbalanced 2015 weekday peak AM and PM hour traffic counts taken by the City of Ottawa at the Stagecoach/Parkway and Old Prescott/Parkway intersections, and the 2010 count at the Stagecoach/Lakeshore and 2014 count at the Old Prescott/Donwel intersection taken by the consultant.

3. PROPOSED DEVELOPMENT

The Lakeland Meadows Phase 2 subdivision is located at 1626 Old Prescott Road in the Village of Greely. The lands for the development are essentially tree and bush covered or is used as agricultural lands, with one house present along Old Prescott Road. The lands are approximately 41.14 hectares in size and are currently zoned “DR”.

The land use surrounding the Phase 2 development is mainly a residential use with the Shadow Ridge subdivision to the south, the Quinn Farm subdivision to the north which is beginning construction, and Phase 1 of the Lakeland Meadows subdivision along the west limit of the site which has already begun construction. Lands on the east side of Old Prescott Road across from the proposed subdivision have been developed as a residential subdivision.

FIGURE 2.1
EXISTING PEAK AM AND PM HOUR TRAFFIC COUNTS



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The Lakeland Meadows Phase 2 subdivision will consist of 164 single family homes, 86 semi-detached homes, and 136 townhouses. There will be two apartment buildings on Block 231 and Block 232, each with an estimated 46 apartment units.

The subdivision will have a direct access along Street No. 1 to the existing intersection of Old Prescott Road and Donwel Drive. A second main access to the development would be along Street No. 2 which is a proposed north-south collector road passing through the Quinn Farm subdivision and will connect to Parkway Road. A minor access along Street No. 8 will be to/from the west through Phase 1 of the Lakeland Meadows subdivision which connects to Lakeshore Drive and eventually to Stagecoach Road. The circuitous route of Street No. 8 would deter most residents to use this route except for the housing at the west limit of the development. This would reduce the number of vehicles which would cut through Phase 1 to Lakeshore Drive and Stagecoach Road. Figure 3.1 presents a conceptual Site Plan of the subdivision.

3.1 Trip Generation

The proposed Lakeland Meadows Phase 2 subdivision will consist of a combination of single-family homes, semi-detached homes, townhouses, and two apartment buildings estimated at 46 units each. The expected trips from the site were determined utilizing the trip generation statistical data published in the Institute of Transportation Engineers (ITE) document, *Trip Generation, 9th Edition*. The analysis used the average trip rates to determine the trips for each land use. Table 3.1 shows an inventory of the expected units within Phase 2 of the development.

TABLE 3.1
SITE INVENTORY

HOUSING TYPE	NUMBER OF UNITS
SINGLE FAMILY HOUSES	164
SEMI-DETACHED HOUSING	86
TOWNHOUSES	136
APARTMENT UNITS	92
TOTAL	478 Units

Table 3.2 presents the average trip generation rates for the various land uses of the subdivision for the weekday peak AM and PM hours of the adjacent roads. With the subdivision development consisting of residential housing units, the time period which would experience the highest volume of site trips would be the weekday peak AM and PM hours when residents are travelling to and from work. A block of land is designate for a future school (Block 233) with most of the site generated trips being internal to the total development area. With school hours generally outside the peak hours of the adjacent roads, the analysis did not assign any trips related to the school lands.

FIGURE 3.1
CONCEPTUAL SITE PLAN

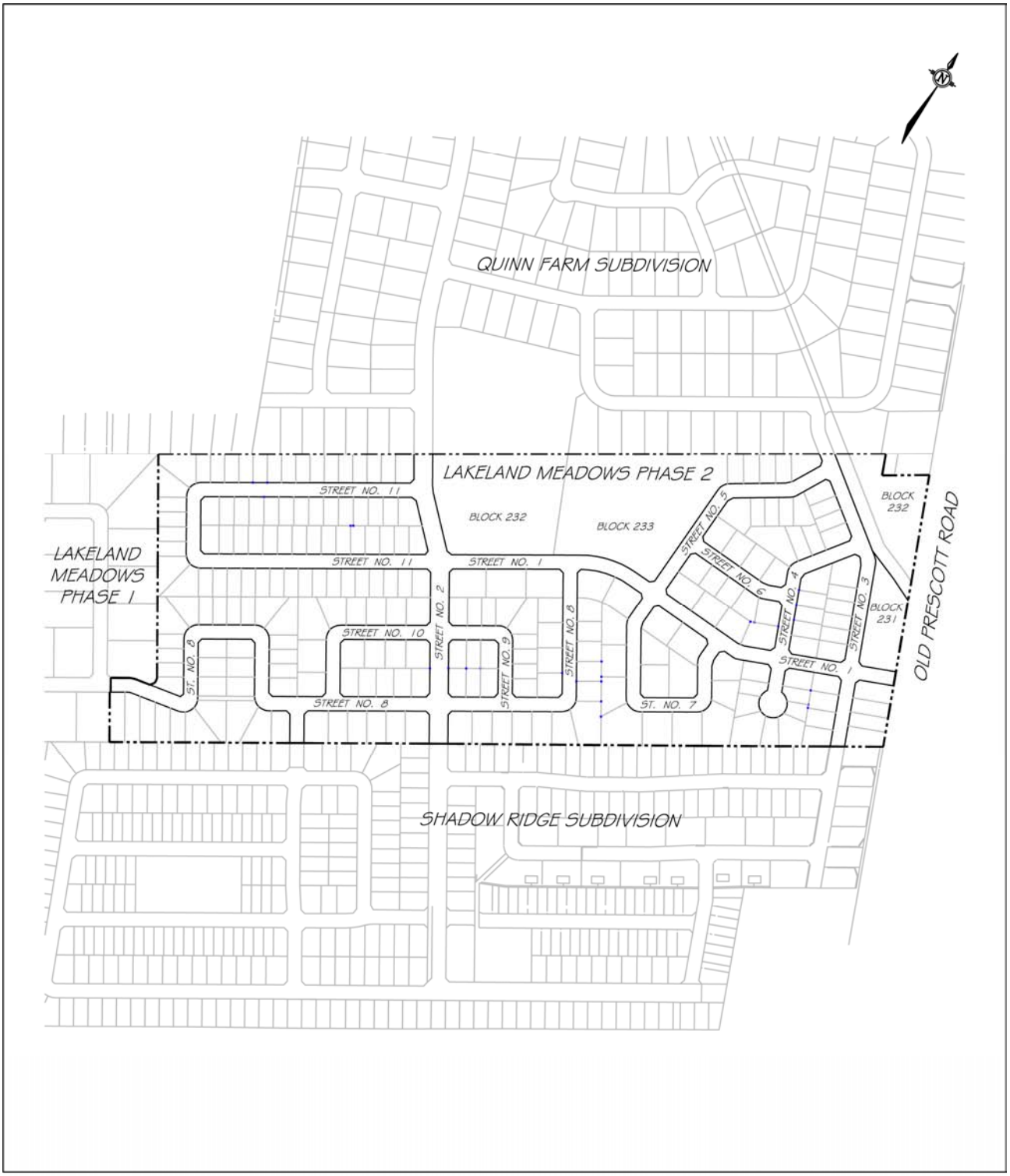

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TABLE 3.2
TRIP GENERATION RATES

LAND USE	TRIP RATE (Average Trip Rate)	
	Peak AM Hr.	
Single-Family Detached Housing (ITE 210)	0.75 T/Unit	1.00 T/Unit
Semi-Detached Housing (ITE 230)	0.44 T/Unit	0.52 T/Unit
Low-Rise Apartment (ITE 221)	0.46 T/Unit	0.58 T/Unit

The above trip rates were applied to the total number of proposed housing units for the subdivision to determine the number of new site generated trips. The expected site generated trips are presented in Table 3.3, which utilize the trip generation rates and distribution which are documented in the ITE trip generation manual. Since there currently is no OC Transpo bus service in the Village of Greely, there was no adjustments applied for public transit. In the future there may be transit service in the area which would reduce the number of site generated trips.

TABLE 3.3
PEAK HOUR SITE TRIPS GENERATED

TRIPS	PEAK AM HR.			PEAK PM HR.		
	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
Single Family Houses (210)	123	31 (25%)	92 (75%)	164	103 (63%)	61 (37%)
Semi-Detaches Housing (230)	38	6 (17%)	32 (83%)	45	30 (67%)	15 (33%)
Townhouses (230)	60	10 (17%)	50 (83%)	71	48 (67%)	23 (33%)
Apartment Units (221)	42	9 (21%)	33 (79%)	53	34 (65%)	19 (35%)
Total Trips	263	**56**	**207**	333	**215**	**118**

3.2 Trip Distribution

The distribution of expected site generated trips entering and exiting the development were determined from existing weekday peak AM and PM hour traffic counts taken at intersections along Stagecoach Road, Bank Street, Manotick Station Road and Mitch Owens Road. The traffic distribution at the intersections would represent the trip patterns of commuters travelling to and from work during the weekday peak AM and PM hours. The site generated trips were proportioned to the distribution below which was determined from the traffic counts:

To/From the northeast 55%
To/From the northwest 35%
To/From the south 10%

The above distribution was used to distribute the site generated trips of Table 3.3 onto the surrounding roads. The distribution assumed the construction of the north-south collector road to Parkway Road, and the shortest and most convenient route for residents in various parts of the development. Figure 3.2 shows the expected weekday peak AM and PM hour site generated trips for Phase 2 of the Lakeland Meadows development.

4. TRANSPORTATION IMPACT

The study will examine the operation of the subdivision access (Street No. 1) onto Old Prescott Road, and the Street No. 2/Parkway, Lakeshore/Stagecoach, Stagecoach/Parkway and Old Prescott/Parkway intersections. The analysis will use the *Highway Capacity Software,* which utilizes the intersection capacity analysis procedure as documented in the *Highway Capacity Manual 2010*. For unsignalized intersections, the level of service of each lane movement is determined as a function of the delay of vehicles at the approach. The following relates the level of service of each lane movement with the expected delay at the approach.

LEVEL OF SERVICE	DELAY	
Level of Service A	0-10 sec./vehicle	Little or No Delay
Level of Service B	>10-15 sec./vehicle	Short Traffic Delays
Level of Service C	>15-25 sec./vehicle	Average Traffic Delays
Level of Service D	>25-35 sec./vehicle	Long Traffic Delays
Level of Service E	>35-50 sec./vehicle	Very Long Traffic Delays
Level of Service F	>50 sec./vehicle	Extreme Delays – Demand Exceeds Capacity

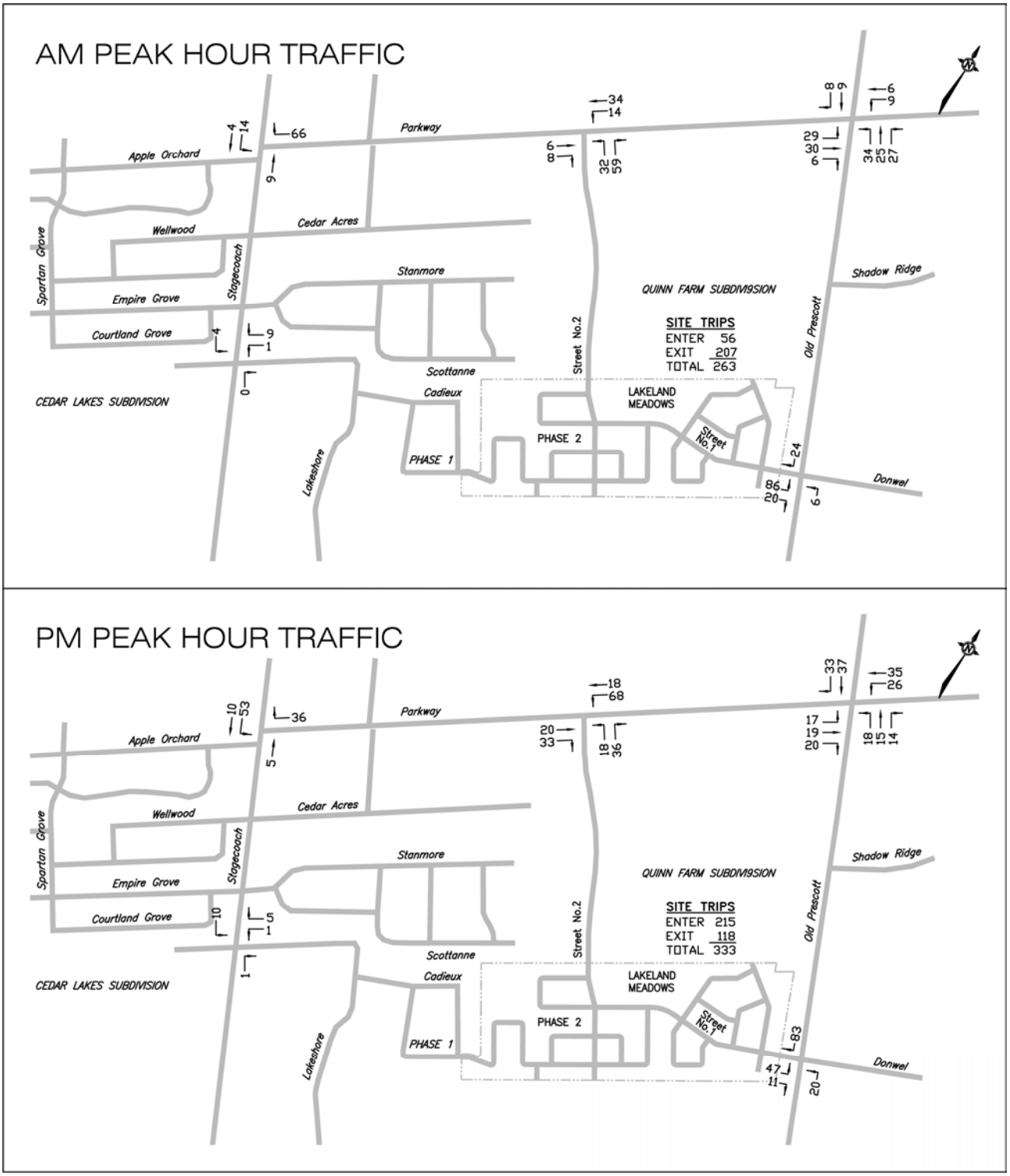
The expected length of queue at the critical lane movements for an unsignalized intersection was determined by the calculation of the 95th percentile queue at the lane approach. The 95th percentile queue length is the calculated 95th greatest queue length out of 100 occurrences at a movement during a 15-minute peak period. The 95th percentile queue length is a function of the capacity of a movement and the total expected traffic, with the calculated value determining the magnitude of the queue by representing the queue length as fractions of vehicles.

For intersections controlled by traffic signals, the operation or level of service of an intersection is determined from the volume to capacity ratio (v/c) for each lane movement as documented by the City of Ottawa in the *Transportation Impact Study Assessment Guidelines, October 2006*.

The following relates the level of service with the volume to capacity ratio at each lane movement.

LEVEL OF SERVICE	VOLUME TO CAPACITY RATIO
Level of Service A	0 to 0.60
Level of Service B	0.61 to 0.70
Level of Service C	0.71 to 0.80
Level of Service D	0.81 to 0.90
Level of Service E	0.91 to 1.00
Level of Service F	> 1.00

FIGURE 3.2
WEEKDAY PEAK AM AND PM HOUR SITE GENERATED TRIPS



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4.1 Background Traffic Volumes

The background traffic volumes along the surrounding roads would represent the expected traffic volumes which would not include the expected trips from the Lakeland Meadows Phase 2 subdivision. The background traffic volumes would be a combination of the annual increase in traffic as a percentage of the existing traffic, and the expected traffic generated from the proposed subdivisions in close proximity to the site. The background traffic was determined for the year 2025 when substantial completion of Phase 2 is expected, and at 2030 which is five years beyond build out of the subdivision.

The increase in traffic from areas outside the vicinity of the site was determined from traffic growth patterns in rural municipalities which typically experience an annual increase in traffic of between 1 and 2 percent. These counts were substantiated by examination of the historical traffic counts at intersections along Stagecoach Road which determined that traffic experienced an annual growth of approximately 2 percent during peak hours. The study has utilized an annual growth rate of 1.5 percent which does not include the expected traffic from adjacent proposed subdivision development. The following are the background traffic growth factors which were applied to the existing traffic (Figure 2.1) at all approaches to the intersections examined.

1.5 Percent Annual Growth	To 2025	To 2030
2010 Counts	1.250	1.347
2014 Counts	1.178	1.269
2015 Counts	1.161	1.250

To account for the proposed development from within the immediate area, trips from the Cedar Lakes Subdivision on the west side of Stagecoach Road at Lakeshore Drive, Lakeland Meadows Phase 1, Shadow Ridge Phases 1 to 3 to the south of the site, and Quinn Farm subdivision to the north of the site were all accounted for in the 2025 and 2030 background traffic volumes. All of the subdivisions were assumed to be completed by the year 2025. The number and distribution of site generated trips for the Cedar Lakes and Lakeland Meadows Phase 1 developments were determined from traffic assessment reports prepared by this firm. The number of trips for the Shadow Ridge and Quinn Farm subdivisions was determined from the available Site Plans for the developments. The analysis has assumed the Shadow Ridge Subdivision to consist of 227 single family homes, 120 semi-detached homes, and 108 townhouses. The Quinn Farm subdivision would consist of 195 single family homes. The study has utilized the same distribution of trips as the analysis for Phase 2 of the Meadow Lakes Subdivision. The trips from the proposed development in the immediate area were added onto the 2025 and 2030 background traffic from outside the lands in the vicinity of the site. Figure 4.1 shows the expected 2025 background traffic volumes and Figure 4.2 the 2030 background traffic volumes.

4.2 Total Traffic Volumes

The total expected weekday peak AM and PM hour 2025 and 2030 traffic volumes were determined by the addition of the expected site trips from Phase 2 of the Lakeland Meadows Subdivision which are shown in Figure 3.2, and the 2025 and 2030 background traffic shown in

FIGURE 4.1
2025 WEEKDAY PEAK AM AND PM HOUR BACKGROUND TRAFFIC

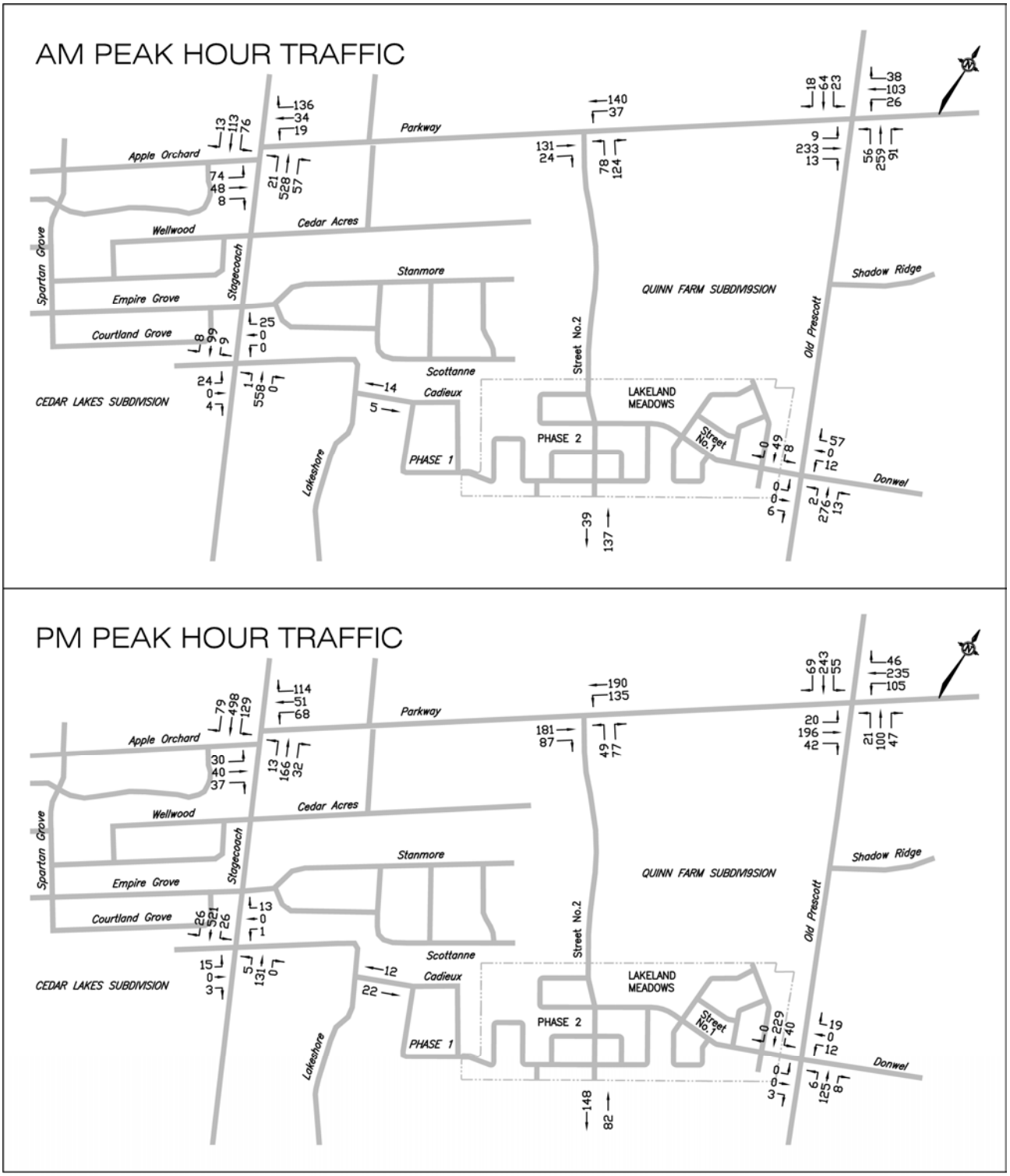

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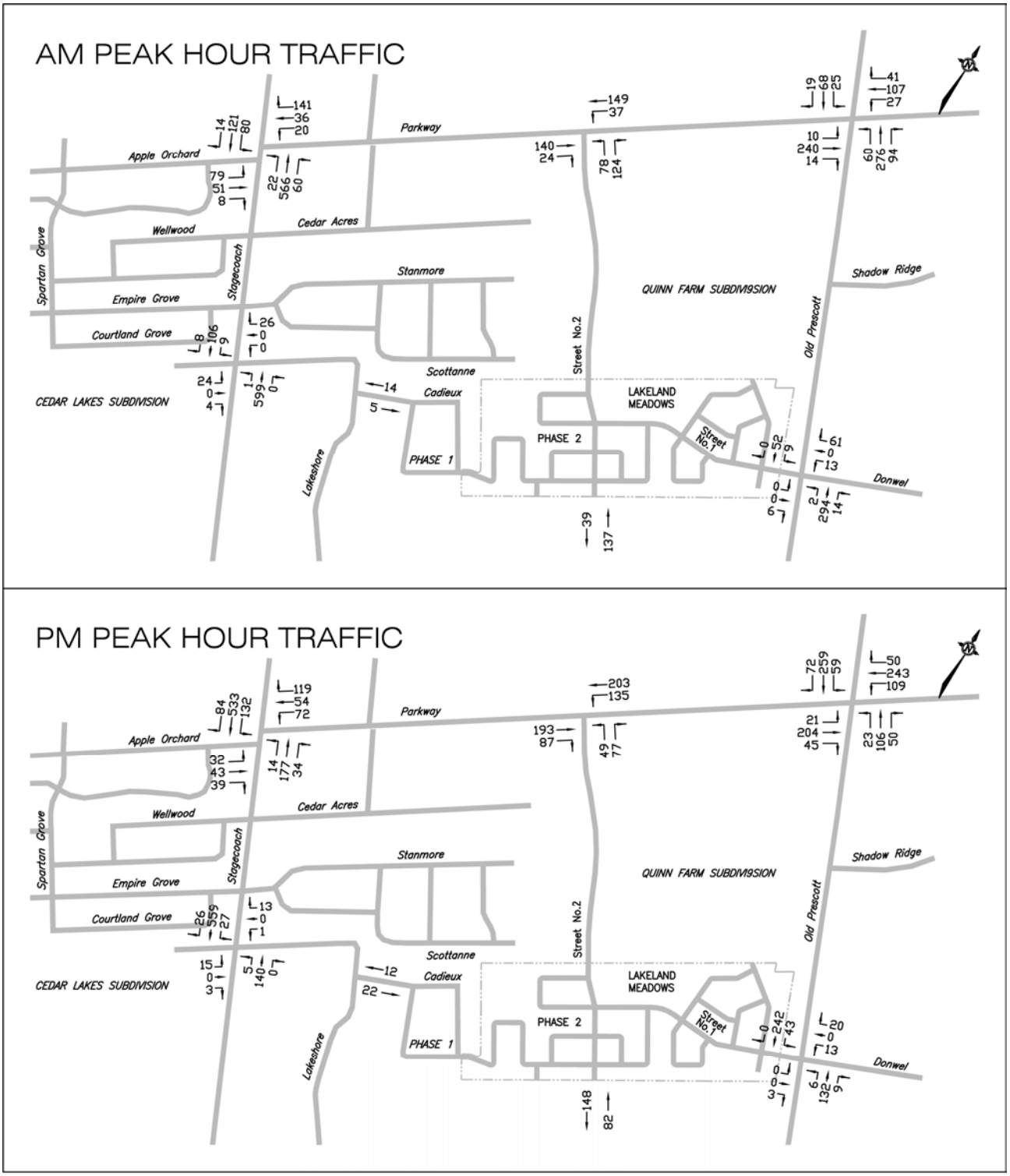
FIGURE 4.2
2030 WEEKDAY PEAK AM AND PM HOUR BACKGROUND TRAFFIC



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Figures 4.1 and 4.2 respectively. The result is the expected total traffic volumes at the site access points and intersections in the vicinity of the site which will be examined in the study. The unbalanced year 2025 total traffic volumes are shown in Figure 4.3, and the 2030 total traffic in Figure 4.4.

4.3 Traffic Analysis

The study will be examining the operation of the intersections stated in the scope of work for the existing traffic counts, and at the expected total traffic volumes at the years 2025 and 2030. The time period for the analysis would be the weekday peak AM and PM hours of the adjacent roads. For the 2025 and 2030 analysis the study has assumed that the intersection of Stagecoach Road and Parkway Road has been reconstructed with Apple Orchard Road aligned with Parkway Road and the installation of two-way stop control signs. Also assumed is the completion of the north-south collector road (Street No. 2) with a connection to Parkway Road. The results of the analysis are discussed in detail in the following sections:

Street No. 1 (Donwel Drive) and Old Prescott Road Intersection

The intersection of Street No. 1 and Old Prescott Road is an existing intersection with Old Prescott Road forming the northbound and southbound approaches, and Donwel Drive the westbound approach. Street No. 1 will be an access point to the Lakeland Meadows Subdivision and will form the eastbound approach to the intersection. There are no exclusive turn lanes at any of the approaches to the intersection. The intersection is controlled by a stop sign at the westbound Donwel Drive approach. Traffic counts taken on October 15, 2014 determined that the intersection currently operates well with the southbound left/through Old Prescott movement functioning at a Level of Service (LoS) "A" during the peak AM and PM hours, and the Donwel left/right movement at a LoS "A" during the peak AM and PM hours. The operation of the intersection is summarized in Table 4.1 with the operational analysis sheets provided in the Appendix as Exhibit 1 for the peak AM hour and Exhibit 2 the peak PM hour.

TABLE 4.1
STREET No. 1/OLD PRESCOTT – LoS & 95th Percentile Queue

Intersection Approach	WEEKDAY PEAK AM HR. YEAR *2014* 2025 (2030)		WEEKDAY PEAK PM HR. YEAR *2014* 2025 (2030)	
	LoS	Q_{95} (Veh.)	LoS	Q_{95} (Veh.)
NB Left/Through/Right – Old Prescott *	- A (A)	- 0.02 (0.02)	- A (A)	- 0.07 (0.07)
SB Left/Through/Right – Old Prescott	*A* A (A)	*0.02* 0.02 (0.02)	*A* A (A)	*0.07* 0.09 (0.10)
WB Left/Through/Right – Donwel	*A* B (B)	*0.24* 0.36 (0.40)	*A* B (B)	*0.10* 0.17 (0.19)
EB Left/Through/Right – Street No. 1 *	- B (B)	- 0.83 (0.88)	- B (C)	- 0.52 (0.54)

* The northbound and eastbound approaches were only analyzed following the construction of Street No. 1

FIGURE 4.3
2025 WEEKDAY PEAK AM AND PM HOUR TOTAL TRAFFIC

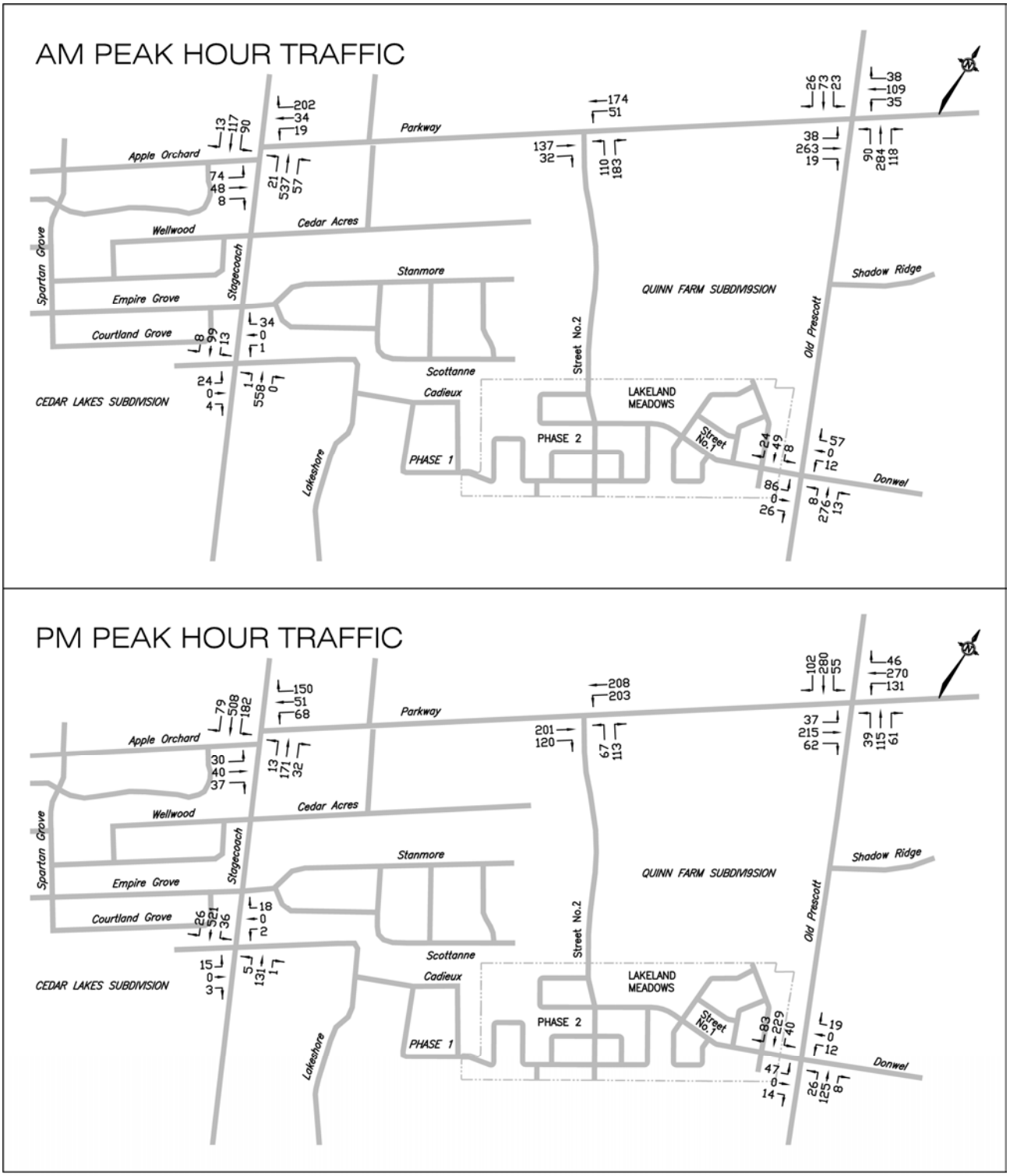

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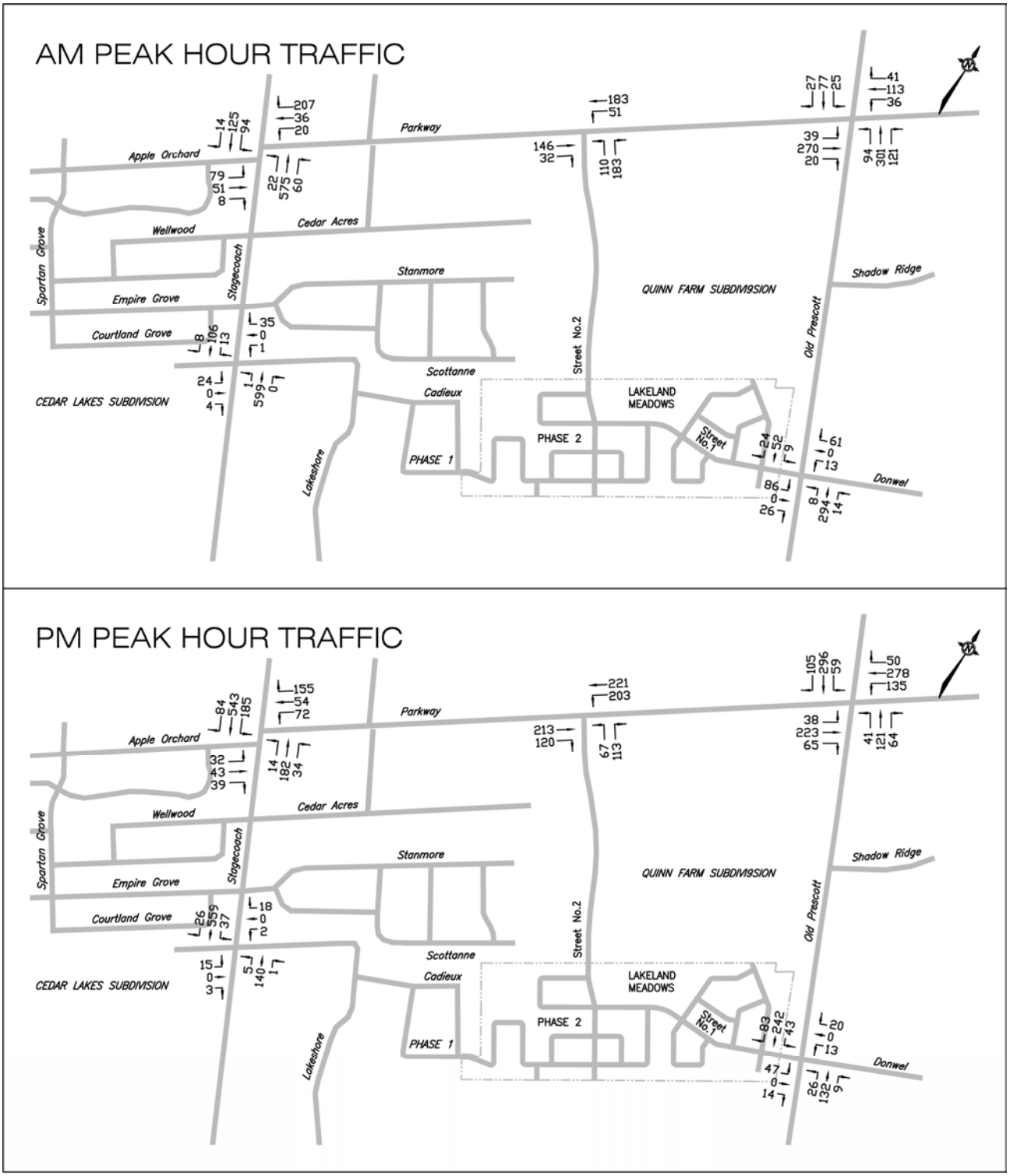
FIGURE 4.4
2030 WEEKDAY PEAK AM AND PM HOUR TOTAL TRAFFIC



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A left turn lane warrant analysis was conducted for the northbound Old Prescott Road left turn movement onto Street No. 1. The analysis utilized the expected traffic volumes at the year 2030 and the analysis graphs provided in the Ministry of Transportation Ontario publication (MTO), *Geometric Design Standards for Ontario Highways*. The analysis, which is presented as Exhibit 3 in the Appendix, determined that a northbound left turn lane was not warranted during either the peak AM or PM hours. The operational analysis for the years 2025 and 2030 were conducted assuming the current intersection lane geometry, with the eastbound Street No. 1 approach comprising of a shared left/through/right lane.

For the expected traffic volumes at the year 2025 (build out of the subdivision) the intersection would be controlled by stop signs at both the westbound Donwel Drive approach and eastbound Street No. 1 approach. The operational analysis determined that the northbound and southbound Old Prescott Road approaches functioned at a LoS "A", and the westbound Donwel Drive and eastbound Street No. 1 approaches at a LoS "B" during the both the peak AM hour and PM hour. Table 4.1 summarizes the operation of the intersection with the analysis sheets provided as Exhibits 4 and 5.

At the year 2030 (5 years beyond build out) the northbound and southbound Old Prescott Road approaches functioned at a LoS "A", and eastbound and westbound approaches at a LoS "B" during the peak AM hour. During the peak PM hour, the northbound and southbound Old Prescott Road approaches functioned at a LoS "A", the eastbound approach at a LoS "C", and westbound approach at a LoS "B". The Street No. 1 left/through/right lane approach would experience a 95th percentile queue of 0.88 vehicles during the weekday peak AM hour. Table 4.1 summarizes the 2030 operation of the intersection with the analysis sheets provided as Exhibit 6 for the peak AM hour and Exhibit 7 for the peak PM hour.

There would be no requirement for exclusive turn lanes on Old Prescott Road due to the development. A southbound Old Prescott Road right turn taper is recommended due to the speed and volume of traffic. The taper would have a length of 74 meters (70 km./h. design speed) as per the Transportation Association of Canada (TAC) publication, *Geometric Design Guide for Canadian Roads*. The eastbound Street No. 1 approach would consist of a shared left/through/right lane.

Stagecoach Road and Lakeshore Drive (North) Intersection

Stagecoach Road forms the northbound and southbound approaches to the Stagecoach/Lakeshore intersection, Lakeshore Drive the westbound approach, and the proposed access to the Cedar Lakes subdivision the eastbound approach. Lakeshore Drive is a crescent with both a north and south approach to Stagecoach Road. The analysis was completed only for the northerly approach which would align with the future access to the Cedar Lakes Subdivision. The intersection is controlled by a stop sign at the westbound Lakeshore Drive approach. Using the 2010 traffic counts, the southbound Stagecoach Road approach would function at a LoS "A" and the westbound Lakeshore Drive approach at a LoS "B" during the peak AM hour. During the peak PM hour both the southbound Stagecoach Road and westbound lakeshore Drive approaches would function at a LoS "A". Table 4.2 summarizes the operation of the Stagecoach/Lakeshore intersection, with the analysis sheets provided as Exhibit 8 and Exhibit 9.

TABLE 4.2
STAGECOACH/LAKESHORE – LoS & 95th Percentile Queue

Intersection Approach	WEEKDAY PEAK AM HR. YEAR *2010* 2025 (2030)		WEEKDAY PEAK PM HR. YEAR *2010* 2025 (2030)	
	LoS	Q_{95} (Veh.)	LoS	Q_{95} (Veh.)
NB Left/Through/Right – Stagecoach *	- A (A)	- 0.00 (0.00)	- A (A)	- 0.02 (0.02)
SB Left/Through/Right – Stagecoach	*A* A (A)	*0.01* 0.04 (0.05)	*A* A (A)	*0.02* 0.08 (0.09)
WB Left/Through/Right – Lakeshore	*B* B (B)	*0.05* 0.24 (0.27)	*A* A (B)	*0.02* 0.09 (0.09)
EB Left/Through/Right – Cedar Lakes *	- C (C)	- 0.30 (0.33)	- C (C)	- 0.20 (0.22)

* The northbound and eastbound approaches were only analyzed following the completion of the Cedar Lakes development

The road layout for Phase 2 of the Lakeland Meadows Subdivision is designed to minimize cut-through traffic to Lakeshore Drive and Stagecoach Road. Street No. 8, which is a local street connecting to Phase 1 of the subdivision, is designed with a curvilinear alignment which would provide traffic calming measures and deter cut-through traffic. A portion of the development traffic along Street No. 8 at the west limit of the site was proportioned to Stagecoach Road to destinations to the northwest and south. At the year 2025 the Stagecoach/Lakeshore intersection would operate well with the northbound and southbound Stagecoach Road approaches functioning at a LoS "A" and the Lakeshore Drive approach at a LoS "B" during the peak AM hour. During the peak PM hour the northbound and southbound Stagecoach Road and Lakeshore Drive approaches would all function at a LoS "A". Table 4.2 summarizes the operation of the Stagecoach/Lakeshore intersection with the analysis sheets provided as Exhibit 10 for the peak AM hour and Exhibit 11 the peak PM hour.

At the year 2030 the northbound and southbound Stagecoach Road approaches functioning at a LoS "A" and the Lakeshore Drive approach at a LoS "B" during both the peak AM and PM hours. The westbound Lakeshore Drive approach would experience a 95th percentile queue of 0.27 vehicles during the peak AM hour, and southbound Stagecoach Road approach a 95th percentile queue of 0.09 vehicles during the peak PM hour. Table 4.2 summarizes the operation of the Stagecoach/Lakeshore intersection, with the analysis sheets provided as Exhibit 12 for the peak AM hour and Exhibit 13 for the peak PM hour.

There would be no requirement for modifications to the intersection of Stagecoach Road and Lakeshore Drive due to the development of the site.

Street No. 2 and Parkway Road Intersection

Street No. 2 is a proposed north-south collector road which travels north from the Shadow Ridge subdivision and through the Lakeland Meadows and Quinn Farm subdivisions connecting to Parkway Road. Parkway Road would form the eastbound and westbound approaches to the "T"

intersection, and Street No. 2 the northbound approach. A left turn lane warrant analysis determined that the intersection would require an exclusive westbound Parkway Road left turn lane due to the volume of westbound left turn movements during the peak PM hour for a combination of trips from the Lakeland Meadows, Shadow Ridge, and Quinn Farm subdivisions. The analysis is provided as Exhibit 14 in the Appendix.

The operational analysis of the intersection for the expected 2025 and 2030 traffic volumes has assumed that the intersection is controlled by a stop sign at the northbound Street No. 2 approach, and has the following lane configuration:

Northbound Street No. 2 Approach -	One shared left/right turn lane
Westbound Parkway Road Approach -	One left turn lane (25m of vehicular storage) One through lane
Eastbound Parkway Road Approach -	One shared through/right lane

The operational analysis for the year 2025 has assumed full build out of the Lakeland Meadows, Shadow Ridge, and Quinn Farm subdivisions. The analysis determined that the westbound Parkway left turn lane functioned at a LoS "A" and northbound Street No. 2 left/right turn lane at a LoS "B" during the peak AM hour. During the peak PM hour the westbound Parkway left turn lane functioned at a LoS "A" and northbound Street No. 2 approach at a LoS "C". Table 4.3 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 15 for the peak AM hour and Exhibit 16 the peak PM hour.

TABLE 4.3
STREET No. 2/PARKWAY – LoS & 95th Percentile Queue

Intersection Approach	WEEKDAY PEAK AM HR. YEAR 2025 (2030)		WEEKDAY PEAK PM HR. YEAR 2025 (2030)	
	LoS	Q_{95} (Veh.)	LoS	Q_{95} (Veh.)
WB Left – Parkway	A (A)	0.12 (0.12)	A (A)	0.66 (0.66)
NB Left/Right – Street No. 2	B (B)	2.30 (2.37)	C (C)	2.38 (2.50)

For the expected traffic volumes at the year 2030, the intersection would operate at the same level of service as the 2025 traffic. The westbound Parkway left turn lane would operate at a LoS "A" and northbound Street No. 2 left/right lane at a LoS "B" during the peak AM hour. During the peak PM hour the westbound Parkway left turn movement would function at a LoS "A" with a 95th percentile queue of 0.66 vehicles, and the northbound Street No. 2 left/right turn movement at a LoS "C" with a 95th percentile queue of 2.50 vehicles. Table 4.3 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 17 and Exhibit 18.

Modifications to Parkway Road due to the development of the Shadow Ridge, Lakeland Meadows and Quinn Farm subdivisions would comprise of the construction of a westbound

Parkway Road left turn lane with 25 meters of vehicular storage, 40 meter parallel lane, and 115 meter taper for a design speed of 70 km./h. as per the MTO publication, *Geometric Design Standards for Ontario Highways*. The northbound Street No. 2 approach would comprise of a shared left/right turn lane.

Old Prescott Road and Parkway Road Intersection

The intersection of Old Prescott Road and Parkway Road is located approximately 1.2 kilometres north of the intersection of Street No. 1 and Old Prescott Road. The intersection is currently controlled by traffic signals. The traffic signal timing plan was obtained from the City of Ottawa which showed a two phase operation with a cycle length of 80.7 seconds. The intersection has exclusive left turn lanes at the northbound and southbound Old Prescott Road approaches. Utilizing the 2015 traffic counts which were obtained from the City of Ottawa and the existing signal timing, it was determined that the intersection would function at a LoS "A" during both the peak AM and PM hours. Table 4.4 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 19 for the 2015 peak AM hour and Exhibit 20 the peak PM hour.

TABLE 4.4
OLD PRESCOTT/PARKWAY – LoS and Volume/Capacity (v/c)

Intersection Approach	WEEKDAY PEAK AM HR. YEAR *2015* 2025 (2030)		WEEKDAY PEAK PM HR. YEAR *2015* 2025 (2030)	
	LoS	**v/c**	**LoS**	**v/c**
EB Left/Through/Right – Parkway	*A* A (A)	*0.13* 0.48 (0.49)	*A* A (A)	*0.21* 0.44 (0.46)
WB Left/Through/Right – Parkway	*A* A (A)	*0.15* 0.29 (0.31)	*A* C (C)	*0.29* 0.71 (0.75)
NB Left – Old Prescott	*A* A (A)	*0.10* 0.19 (0.20)	*A* A (A)	*0.04* 0.19 (0.21)
NB Through/Right – Old Prescott	*A* B (B)	*0.35* 0.62 (0.65)	*A* A (A)	*0.15* 0.32 (0.33)
SB Left – Old Prescott	*A* A (A)	*0.05* 0.09 (0.10)	*A* A (A)	*0.10* 0.15 (0.16)
SB Through/Right – Old Prescott	*A* A (A)	*0.08* 0.15 (0.16)	*A* B (C)	*0.30* 0.68 (0.71)
Intersection Level of Service	***A* A (A)**	***0.25* 0.55 (0.57)**	***A* B (C)**	***0.30* 0.70 (0.73)**

With the expected traffic volumes at the year 2025, the intersection was determined to function at a LoS "A" during the peak AM hour, and with a slight adjustment to the signal timing the intersection would function at a LoS "B" during the peak PM hour. Table 4.4 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 21 and Exhibit 22.

Utilizing the existing lane geometry and traffic signal timing from the 2025 analysis, the intersection would operate at a LoS "A" during the peak AM hour and LoS "C" during the peak

PM hour at the year 2030. Table 4.4 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 23 for the peak AM hour and Exhibit 24 the peak PM hour.

There would be no requirement for modifications to the intersection due to the development of the site.

Stagecoach Road and Parkway Road Intersection

Stagecoach Road forms the northbound and southbound approaches to the Stagecoach/Parkway intersection. Parkway Road forms the westbound approach and Apple Orchard Road the eastbound approach. Parkway Road and Apple Orchard Road are offset from each other by approximately 20 meters. All intersection approaches comprise of one shared left/through/right lane movement. The intersection of Stagecoach/Parkway is currently controlled by stop signs at the Parkway Road and Apple Orchard Road approaches. Traffic counts taken in 2015 by the City of Ottawa determined that during the peak AM and PM hours both the northbound and southbound Stagecoach Road approaches functioned at a LoS "A", the westbound Parkway Road and eastbound Apple Orchard Road approaches at a LoS "C". Table 4.5 summarizes the operation of the intersection with Exhibit 25 in the Appendix providing the analysis sheet for the peak AM hour and Exhibit 26 the peak PM hour.

TABLE 4.5
STAGECOACH/PARKWAY – LoS & 95th Percentile Queue

Intersection Approach	WEEKDAY PEAK AM HR. YEAR *2015* 2025 (2030)		WEEKDAY PEAK PM HR. YEAR *2010*2025 (2030)	
	LoS	Q_{95} (Veh.)	LoS	Q_{95} (Veh.)
NB Left - Stagecoach *	*A* A (A)	*0.02* 0.05 (0.05)	*A* A (A)	*0.02* 0.05 (0.05)
SB Left – Stagecoach *	*A* A (A)	*0.14* 0.35 (0.39)	*A* A (A)	*0.09* 0.52 (0.54)
WB Left – Parkway *	*C* D (E)	*0.81* 0.44 (0.55)	*C* F (F)	*1.39* 4.33 (5.60)
WB Through/Right – Parkway *	- D (D)	- 4.10 (5.05)	- D (D)	- 3.55 (4.42)
EB Left – Apple Orchard *	*C* F (F)	*1.51* 5.67 (7.26)	*C* F (F)	*0.72* 2.03 (2.62)
EB Through/Right – Apple Orchard *	- D (D)	- 1.03 (1.24)	- D (E)	- 1.69 (2.10)

* For the 2015 traffic analysis the left turn movement at all approaches to the intersection would comprise of Left/Through/Right turning movements

The City of Ottawa is planning intersection modifications to the Stagecoach/Parkway intersection. The modifications would include the alignment of the westbound Parkway Road and eastbound Apple Orchard Road approaches. Traffic controls would initially comprise of two-way stop controls with stop signs at the eastbound and westbound approaches. The roadway modifications are expected to be completed by the build out of the subdivision in 2025.

For the 2025 and 2030 intersection analysis, the study has assumed full build out of the Lakeland Meadows, Shadow Ridge, and Quinn Farm subdivisions, and that the intersection has been realigned and includes stop signs at the eastbound and westbound approaches. The approaches would comprise of the following lane configuration:

Eastbound Apple Orchard Road Approach -	One left turn lane
	One shared through/right lane
Westbound Parkway Road Approach -	One left turn lane
	One shared through/right lane
Northbound Stagecoach Road Approach -	One left turn lane
	One shared through/right lane
Southbound Stagecoach Road Approach -	One left turn lane
	One shared through/right lane

The analysis for the expected 2025 traffic volumes determined that during both the peak AM and PM hours, the northbound and southbound Stagecoach approaches functioned at a LoS "A" and the eastbound and westbound approaches at a LoS "D" to "F". Table 4.5 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 27 and Exhibit 28.

For the expected 2030 traffic volumes, the operational analysis determined that the northbound and southbound Stagecoach approaches would continue to operate at a LoS "A" and the eastbound and westbound approaches at a LoS "D" to "F" during both the peak AM and PM hours. The results of the analysis are shown in Table 4.5 with the analysis sheets provided as Exhibit 29 for the peak AM hour and Exhibit 30 for the peak PM hour.

The City of Ottawa is planning to modify the Stagecoach/Parkway intersection. The modifications are expected to be completed before full build out of the Lakeland Meadows subdivision. The analysis has assumed the full build out of the Lakeland Meadows, Shadow Ridge, and Quinn Farm subdivisions, and two-way stop control signs at the eastbound and westbound approaches. The City of Ottawa will be monitoring the intersection to determine if further changes to the traffic controls are required. There would be no requirement for interim modifications to the Stagecoach/Parkway intersection due to the development of the site.

4.4 Internal Streets

Street No. 1

Street No. 1 is an internal road to the development which connects Street No. 2 to Old Prescott Road. Both Street No. 2 and Old Prescott Road are collector roads. The TAC guidelines, *Geometric Design Guide for Canadian Roads*, suggests that the characteristics of an urban residential local street is to provide land access as the primary function with a typical AADT (Average Annual Daily Traffic) volume of <1,000 vehicles, where as a residential collector road would have an equal function of traffic movement and land access with a typical AADT volume of <8,000 vehicles. Street No. 1 meets the hierarchy of road structure with local streets channelling traffic onto collector roads. The expected volume of traffic of Street No. 1 conforms best to the "local residential street" classification, with the expected AADT at the west Street No. 1 approach to Old Prescott Road to be approximately 1,570 vehicles. The expected traffic was

estimated using an AADT factor of 10 percent, where the average peak AM and PM hour traffic is assumed to be 10 percent of the AADT traffic. The calculated AADT along Street No. 1 was calculated at the subdivision access at Old Prescott Road which would experience the highest volume of traffic. It is recommended that Street No. 1 be designed as a local residential street with a 20 metre right-of-way and a pedestrian sidewalk along the north side of the road adjacent to the school and park lands.

Street No. 2

Street No. 2 is a new north-south road connecting the Shadow Ridge Subdivision to the south, Lakeland Meadows Phase 2 and Quinn Farm subdivisions to Parkway Road to the north. Street No. 2 would be a collector road with a 26 meter right-of-way. Pedestrian sidewalks would be constructed along both sides of the road.

Street No. 8

Street No. 8 is a local street connecting Street No. 2 (north-south collector road) to the Lakeland Meadows Phase 1 development. Issues have been raised concerning cut-through traffic through Phase 1 and Lakeshore Drive to Stagecoach Road. In order to reduce the attractiveness of this route, Street No. 8 has been designed with a circuitous alignment. This would deter cut-through traffic and provide traffic calming measures which would reduce outside traffic from traveling along local streets to Lakeshore Drive and Stagecoach Road. The alignment would promote traffic to travel along Street No. 2 which is designed as a collector road. A pedestrian walkway is provided between two sections of Street No. 8 which would reduce the walking distance from Phase 1 to the school and park lands.

4.5 Pedestrian, Cycling, and Transit Facilities

The roadway system within the Lakeland Meadows Phase 2 Subdivision would have an urban cross section. Pedestrian sidewalks would be provided along both sides of Street No. 2 which is designated as a collector road. Sidewalks would be provided on the north side of Street No. 1 between Street No. 2 and Old Prescott Road.

There are no cycling facilities along Stagecoach Road, Old Prescott Road or Parkway Road. The rural roads provide a paved surface and gravel shoulders for cyclists. The interior subdivision streets will not provide dedicated cycling facilities.

There currently is no public transit service in the Greely area. As development continues, transit service may be provided in the future which would reduce the weekday peak AM and PM hour traffic in the area.

5. FINDINGS AND RECOMMENDATIONS

The Lakeland Meadows Phase 2 development is located along the west side of Old Prescott Road at the south end of the Village of Greely. Lakeland Meadows Ltd. has proposed the construction of a subdivision which will comprise of 164 single family homes, 86 semi-detached

homes, 136 townhouses and 92 apartment units on a 41.14 hectare site. Phase 2 of the Lakeland Meadows subdivision is expected to be substantially completed by the year 2025.

The time period for study analysis would be the weekday peak AM and PM hours. The analysis will examine the operation of the intersections for the traffic volumes from the existing traffic counts, at build out of the site in 2025, and at 2030 which represents five years beyond the completion of Phase 2 of the development.

The Transportation Impact Study (TIS) is being prepared in support of the rezoning of the lands and Site Plan Application. The findings and recommendations of the study are summarized in the following:

1) Phase 2 of the Lakeland Meadows subdivision is expected to generate 263 new trips during the weekday peak AM hour and 335 new trips during the peak PM hour.

2) The development will have one access point onto Old Prescott Road at Street No. 1, one access point onto Parkway Road along a new collector road (Street No. 2) which travels through the Quinn Farm subdivision, and one access to Stagecoach Road through Phase 1 of the Lakeland Meadows subdivision and along Lakeshore Drive to Stagecoach Road.

3) Site Access (Street No. 1) and Old Prescott Road Intersection - Street No. 1 will provide access/egress to the development from the existing intersection of Old Prescott Road and Donwel Drive. The access will form the eastbound approach to the intersection. The intersection will be controlled by stop signs at the eastbound Street No. 1 and westbound Donwel approaches. There would be no requirement for exclusive turn lanes along Old Prescott Road. It is recommended that a southbound Old Prescott Road right turn taper be constructed which would aid in the deceleration of vehicles making the right turn onto Street No. 1, and to reduce any gravel spillage from the gravel shoulder onto the road from right turning vehicles. The right turn taper would be 74 meters in length. The eastbound Street No. 1 approach would comprise of a shared left/through/right lane.

4) Stagecoach Road and Lakeshore Drive Intersection - The intersection is currently a "T" intersection with Stagecoach Road forming the northbound and southbound approaches, and Lakeshore Drive the westbound approach. The construction of the Cedar Lakes subdivision will include a new access which will form the eastbound approach to the Stagecoach/Lakeshore intersection. Due to the interior roadway layout, few vehicles would travel through Phase 1 and along Lakeshore Drive to Stagecoach Road. The intersection would continue to operate at a good level of service with no roadway modifications required due to the development.

5) Street No. 2 and Parkway Road Intersection - The Street No. 2/Parkway intersection is a new intersection which will be constructed with the proposed north-south collector (Street No. 2) which will be required for the development of the Shadow Ridge, Lakeland Meadows, and Quinn Farm subdivisions. The intersection would be a "T" intersection controlled by a stop sign at the northbound Street No. 2 approach. An exclusive Parkway Road left turn lane with 25 meters of storage is recommended at the westbound approach. The northbound Street No. 2 approach would comprise of a shared left/right turn lane.

6) Old Prescott Road and Parkway Road Intersection - The Old Prescott/Parkway intersection is currently controlled by traffic signals. The intersection would continue to operate well with no modifications required due to the development of the lands.

7) Stagecoach Road and Parkway Road Intersection - The Stagecoach/Parkway intersection is currently controlled by stop signs at the eastbound and westbound approaches. The City of Ottawa is preparing plans which will modify the intersection to align the eastbound Apple Orchard Road and westbound Parkway Road approaches. Following the realignment of the intersection, the intersection will initially be controlled by two-way stop controls at the eastbound and westbound approaches. The City of Ottawa will be monitoring the operation of the intersection to determine if further modifications to the intersection are required. The operational analysis determined that with full development of the Shadow Ridge, Lakeland Meadows, and Quinn Farm subdivisions, some movements at the intersection would operate at a poor level of service and further modifications to the traffic controls would be required.

8) Street No. 1 - Street No. 1 is recommended to be designated as a local street due to the expected volume of traffic, and the primary function of the road which is to provide access to land. City of Ottawa Council has approval to an update to the Village of Greely Community Design Plan (CDP) which has realigned the north-south collector road (Street No. 2) as shown on the draft plan, and eliminated the curve that was to align the street with the Donwel/Old Prescott intersection. As a local road, Street No. 1 will have a 20 meter right-of-way and a sidewalk along the north side of the road.

9) Street No. 2 - Street No. 2 will be a north-south collector road providing access to Parkway Road for the Shadow Ridge, Lakeland Meadows, and Quinn Farm subdivisions. The collector road would have a 26 meter right-of-way and a sidewalk along both sides of the road.

10) Street No. 8 - Street No. 8 is designed to have a circuitous alignment which will provide a form of traffic calming and deter vehicles from using Street No. 8 as a cut-through route to Lakeshore Drive and eventually to Stagecoach Road.

11) A Transportation Impact Study Check List is provided in the Appendix as Exhibit 31.

Prepared by:

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APPENDIX

OPERATIONAL ANALYSIS WORK SHEETS

LEFT TURN LANE WARRANT ANALYSIS

TRANSPORTATION IMPACT STUDY – CHECK LIST

EXHIBIT 1
2014 PEAK AM HOUR EXISTING TRAFFIC – Street No. 1/Old Prescott

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak AM Hour**
Intersection: **Old Prescott/Street No. 1**
Analysis Year: **October 15, 2014**
Project ID: Lakeland Meadows Phase 2
East/West Street: Street No. 1 (Donwel Drive)
North/South Street: Old Prescott Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		188	6	7	25	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		204	6	7	27	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	10		48			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	10		52			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		7		62				
C(m) (vph)		1373		821				
v/c		0.01		0.08				
95% queue length		0.02		0.24				
Control Delay		7.6		9.7				
LOS		A		A				
Approach Delay				9.7				
Approach LOS				A				

EXHIBIT 2
2014 PEAK PM HOUR EXISTING TRAFFIC – Street No. 1/Old Prescott

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
Intersection: **Old Prescott/Street No. 1**
Analysis Year: **October 15, 2014**
Project ID: Lakeland Meadows Phase 2
East/West Street: Street No. 1 (Donwel Drive)
North/South Street: Old Prescott Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		74	7	34	143	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		80	7	36	155	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR		LT	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	10		16			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	10		17			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		36		27				
C(m) (vph)		1522		837				
v/c		0.02		0.03				
95% queue length		0.07		0.10				
Control Delay		7.4		9.4				
LOS		A		A				
Approach Delay				9.4				
Approach LOS				A				

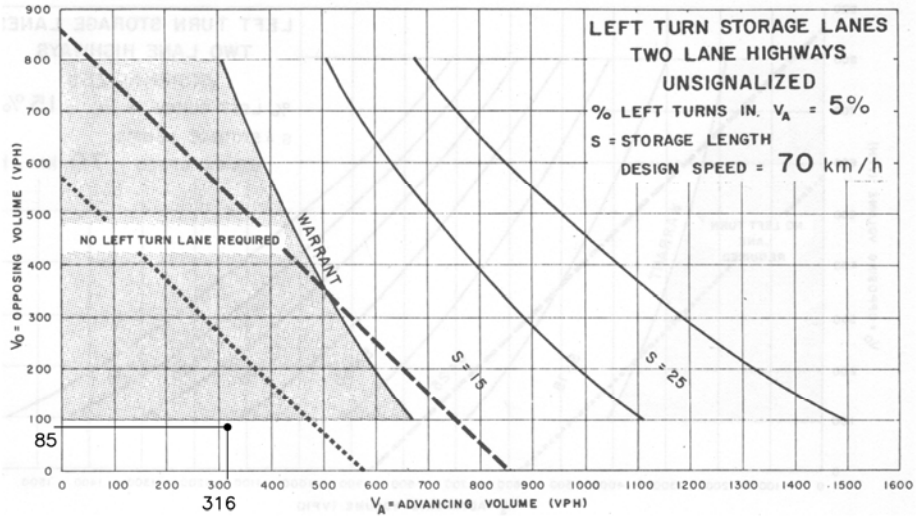
EXHIBIT 3
NORTHBOUND LEFT TURN WARRANT – Street No. 1/Old Prescott (2030 Traffic)

TRAFFIC

V_o = 85 vph
V_A = 316 vph
V_L = 8 vph

V_L/V_A = 2.5%

POSTED SPEED
60 km/h



WARRANT

NO LEFT TURN
LANE REQUIRED

TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

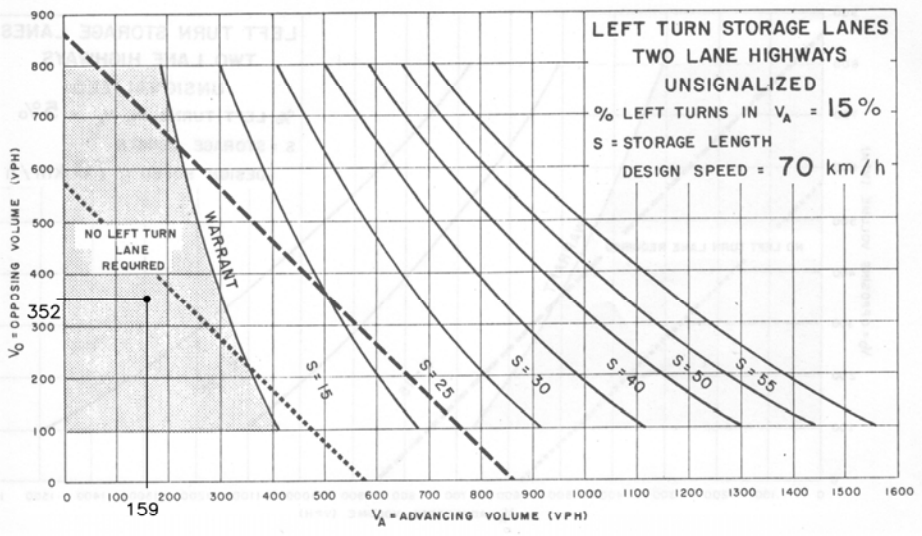
NORTHBOUND LEFT
PEAK AM HOUR

TRAFFIC

V_o = 352 vph
V_A = 159 vph
V_L = 26 vph

V_L/V_A = 16.4%

POSTED SPEED
60 km/h



WARRANT

NO LEFT TURN
LANE REQUIRED

NORTHBOUND LEFT
PEAK PM HOUR

EXHIBIT 4
2025 PEAK AM HOUR TOTAL TRAFFIC – Street No. 1/Old Prescott

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak AM Hour**
Intersection: **Old Prescott/Street No. 1**
Analysis Year: **Year 2025**
Project ID: Lakeland Meadows Phase 2
East/West Street: Street No. 1 (Donwel Drive)
North/South Street: Old Prescott Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	8	276	13	8	49	24
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	8	299	14	8	53	26
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	12	0	57	86	0	26
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	13	0	61	93	0	28
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No /			No /	
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	8	8		74			121	
C(m) (vph)	1532	1259		691			553	
v/c	0.01	0.01		0.11			0.22	
95% queue length	0.02	0.02		0.36			0.83	
Control Delay	7.4	7.9		10.8			13.3	
LOS	A	A		B			B	
Approach Delay				10.8			13.3	
Approach LOS				B			B	

EXHIBIT 5
2025 PEAK PM HOUR TOTAL TRAFFIC – Street No. 1/Old Prescott

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
Intersection: **Old Prescott/Street No. 1**
Analysis Year: **Year 2025**
Project ID: Lakeland Meadows Phase 2
East/West Street: Street No. 1 (Donwel Drive)
North/South Street: Old Prescott Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	26	125	8	40	229	83
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	28	135	8	43	248	90
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	12	0	19	47	0	14
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	13	0	20	51	0	15
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No /			No /	
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	28	43		33			66	
C(m) (vph)	1232	1452		607			445	
v/c	0.02	0.03		0.05			0.15	
95% queue length	0.07	0.09		0.17			0.52	
Control Delay	8.0	7.6		11.3			14.5	
LOS	A	A		B			B	
Approach Delay				11.3			14.5	
Approach LOS				B			B	

EXHIBIT 6
2030 PEAK AM HOUR TOTAL TRAFFIC – Street No. 1/Old Prescott

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak AM Hour**
Intersection: **Old Prescott/Street No. 1**
Analysis Year: **Year 2030**
Project ID: Lakeland Meadows Phase 2
East/West Street: Street No. 1 (Donwel Drive)
North/South Street: Old Prescott Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	8	294	14	9	52	24
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	8	319	15	9	56	26
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	13	0	61	86	0	26
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	14	0	66	93	0	28
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No /			No /	
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	8	9		80			121	
C(m) (vph)	1528	1237		671			527	
v/c	0.01	0.01		0.12			0.23	
95% queue length	0.02	0.02		0.40			0.88	
Control Delay	7.4	7.9		11.1			13.9	
LOS	A	A		B			B	
Approach Delay				11.1			13.9	
Approach LOS				B			B	

EXHIBIT 7
2030 PEAK PM HOUR TOTAL TRAFFIC – Street No. 1/Old Prescott

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
Intersection: **Old Prescott/Street No. 1**
Analysis Year: **Year 2030**
Project ID: Lakeland Meadows Phase 2
East/West Street: Street No. 1 (Donwel Drive)
North/South Street: Old Prescott Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	26	132	9	43	242	83
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	28	143	9	46	263	90
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	13	0	20	47	0	14
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	14	0	21	51	0	15
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No /			No /	
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	28	46		35			66	
C(m) (vph)	1217	1441		583			425	
v/c	0.02	0.03		0.06			0.16	
95% queue length	0.07	0.10		0.19			0.54	
Control Delay	8.0	7.6		11.6			15.0+	
LOS	A	A		B			C	
Approach Delay				11.6			15.0+	
Approach LOS				B			C	

EXHIBIT 8
2010 PEAK AM HOUR EXISTING TRAFFIC – Stagecoach/Lakeshore

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak AM Hour**
Intersection: **Stagecoach/Lakeshore**
Analysis Year: **October 19, 2010**
Project ID: Lakeland Meadows Phase 2
East/West Street: Lakeshore Drive
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		427	0	3	73	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		464	0	3	79	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR		LT	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0		9			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	0		9			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		3		9				
C(m) (vph)		1108		602				
v/c		0.00		0.01				
95% queue length		0.01		0.05				
Control Delay		8.3		11.1				
LOS		A		B				
Approach Delay				11.1				
Approach LOS				B				

EXHIBIT 9
2010 PEAK PM HOUR EXISTING TRAFFIC – Stagecoach/Lakeshore

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
Intersection: **Stagecoach/Lakeshore**
Analysis Year: **October 19, 2010**
Project ID: Lakeland Meadows Phase 2
East/West Street: Lakeshore Drive
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		92	0	8	396	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		99	0	8	430	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR		LT	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	1		3			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	1		3			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		8		4				
C(m) (vph)		1507		781				
v/c		0.01		0.01				
95% queue length		0.02		0.02				
Control Delay		7.4		9.6				
LOS		A		A				
Approach Delay				9.6				
Approach LOS				A				

EXHIBIT 10
2025 PEAK AM HOUR TOTAL TRAFFIC – Stagecoach/Lakeshore

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak AM Hour**
Intersection: **Stagecoach/Lakeshore**
Analysis Year: **Year 2025**
Project ID: Lakeland Meadows Phase 2
East/West Street: Lakeshore Drive
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	1	558	0	13	99	8
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	1	606	0	14	107	8
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	1	0	34	24	0	4
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	1	0	36	26	0	4
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No /			No /	
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	1	14		37			30	
C(m) (vph)	1487	982		494			326	
v/c	0.00	0.01		0.07			0.09	
95% queue length	0.00	0.04		0.24			0.30	
Control Delay	7.4	8.7		12.9			17.2	
LOS	A	A		B			C	
Approach Delay				12.9			17.2	
Approach LOS				B			C	

EXHIBIT 11
2025 PEAK PM HOUR TOTAL TRAFFIC – Stagecoach/Lakeshore

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
Intersection: **Stagecoach/Lakeshore**
Analysis Year: **Year 2025**
Project ID: Lakeland Meadows Phase 2
East/West Street: Lakeshore Drive
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	5	131	1	36	521	26
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	5	142	1	39	566	28
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	2	0	18	15	0	3
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	2	0	19	16	0	3
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No	/		No	/
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	5	39		21			19	
C(m) (vph)	992	1452		755			302	
v/c	0.01	0.03		0.03			0.06	
95% queue length	0.02	0.08		0.09			0.20	
Control Delay	8.6	7.5		9.9			17.7	
LOS	A	A		A			C	
Approach Delay				9.9			17.7	
Approach LOS				A			C	

EXHIBIT 12
2030 PEAK AM HOUR TOTAL TRAFFIC – Stagecoach/Lakeshore

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak AM Hour**
Intersection: **Stagecoach/Lakeshore**
Analysis Year: **Year 2030**
Project ID: Lakeland Meadows Phase 2
East/West Street: Lakeshore Drive
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	1	599	0	13	106	8
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	1	651	0	14	115	8
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	1	0	35	24	0	4
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	1	0	38	26	0	4
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No /			No /	
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	1	14		39			30	
C(m) (vph)	1477	945		465			298	
v/c	0.00	0.01		0.08			0.10	
95% queue length	0.00	0.05		0.27			0.33	
Control Delay	7.4	8.9		13.4			18.4	
LOS	A	A		B			C	
Approach Delay				13.4			18.4	
Approach LOS				B			C	

EXHIBIT 13
2030 PEAK PM HOUR TOTAL TRAFFIC – Stagecoach/Lakeshore

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
Intersection: **Stagecoach/Lakeshore**
Analysis Year: **Year 2030**
Project ID: Lakeland Meadows Phase 2
East/West Street: Lakeshore Drive
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	5	140	1	37	559	26
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	5	152	1	40	607	28
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	2	0	18	15	0	3
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	2	0	19	16	0	3
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No	/		No	/
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	5	40		21			19	
C(m) (vph)	958	1440		733			278	
v/c	0.01	0.03		0.03			0.07	
95% queue length	0.02	0.09		0.09			0.22	
Control Delay	8.8	7.6		10.1			18.9	
LOS	A	A		B			C	
Approach Delay				10.1			18.9	
Approach LOS				B			C	

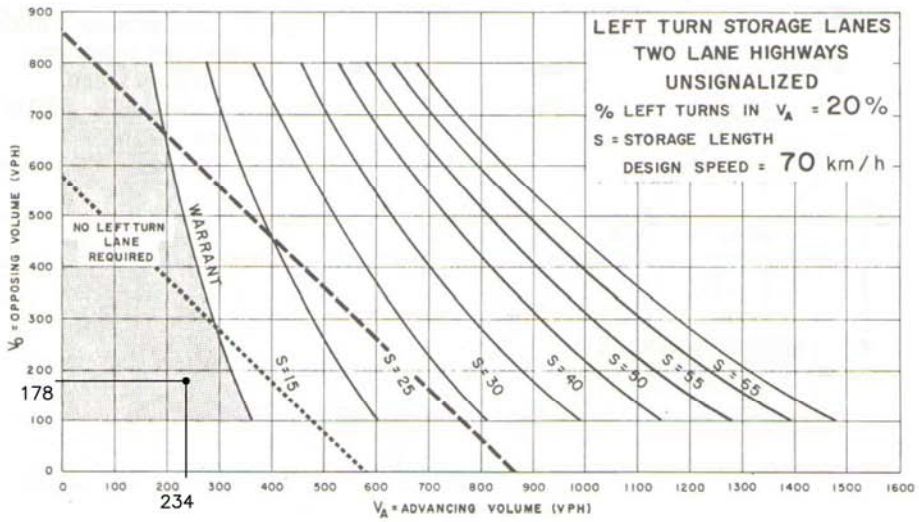
EXHIBIT 14
WESTBOUND LEFT TURN WARRANT – Street No. 2/Parkway (2030 Traffic)

TRAFFIC

V_o = 178 vph
V_A = 234 vph
V_L = 51 vph

V_L/V_A = 21.7%

POSTED SPEED
60 km/h



WARRANT

NO LEFT TURN
LANE REQUIRED

TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

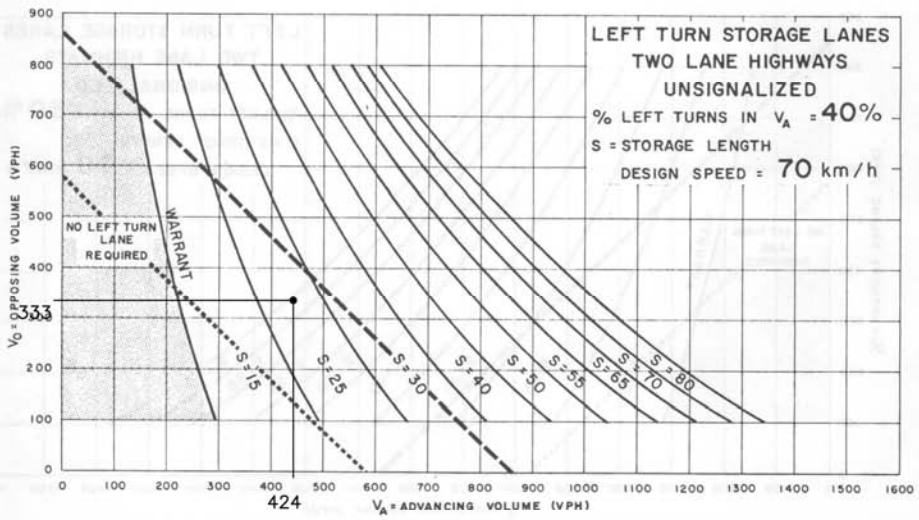
WESTBOUND LEFT
PEAK AM HOUR

TRAFFIC

V_o = 333 vph
V_A = 424 vph
V_L = 203 vph

V_L/V_A = 47.9%

POSTED SPEED
60 km/h



WARRANT

25m LEFT
TURN LANE REQUIRED

WESTBOUND LEFT
PEAK PM HOUR

EXHIBIT 15
2025 PEAK AM HOUR TOTAL TRAFFIC – Street No. 2/Parkway

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak AM Hour**
Intersection: **Parkway/Street No. 2**
Analysis Year: **Year 2025**
Project ID: Lakeland Meadows Phase 2
East/West Street: Parkway Road
North/South Street: Street No. 2
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		137	32	51	174	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		148	34	55	189	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	1	1	
Configuration			TR	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	110		183			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	119		198			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		55		317				
C(m) (vph)		1405		712				
v/c		0.04		0.45				
95% queue length		0.12		2.30				
Control Delay		7.7		14.1				
LOS		A		B				
Approach Delay				14.1				
Approach LOS				B				

EXHIBIT 16
2025 PEAK PM HOUR TOTAL TRAFFIC – Street No. 2/Parkway

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
Intersection: **Parkway/Street No. 2**
Analysis Year: **Year 2025**
Project ID: Lakeland Meadows Phase 2
East/West Street: Parkway Road
North/South Street: Street No. 2
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		201	120	203	208	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		218	130	220	226	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	1	1	
Configuration			TR	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	67		113			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	72		122			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		220		194				
C(m) (vph)		1222		420				
v/c		0.18		0.46				
95% queue length		0.66		2.38				
Control Delay		8.6		20.7				
LOS		A		C				
Approach Delay				20.7				
Approach LOS				C				

EXHIBIT 17
2030 PEAK AM HOUR TOTAL TRAFFIC – Street No. 2/Parkway

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak AM Hour**
Intersection: **Parkway/Street No. 2**
Analysis Year: **Year 2030**
Project ID: Lakeland Meadows Phase 2
East/West Street: Parkway Road
North/South Street: Street No. 2
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		146	32	51	183	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		158	34	55	198	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	1	1	
Configuration			TR	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	110		183			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	119		198			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		55		317				
C(m) (vph)		1394		699				
v/c		0.04		0.45				
95% queue length		0.12		2.37				
Control Delay		7.7		14.4				
LOS		A		B				
Approach Delay				14.4				
Approach LOS				B				

EXHIBIT 18
2030 PEAK PM HOUR TOTAL TRAFFIC – Street No. 2/Parkway

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
Intersection: **Parkway/Street No. 2**
Analysis Year: **Year 2030**
Project ID: Lakeland Meadows Phase 2
East/West Street: Parkway Road
North/South Street: Street No. 2
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		213	120	203	221	
Peak-Hour Factor, PHF		0.92	0.92	0.92	0.92	
Hourly Flow Rate, HFR		231	130	220	240	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	1	1	
Configuration			TR	L	T	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	67		113			
Peak Hour Factor, PHF	0.92		0.92			
Hourly Flow Rate, HFR	72		122			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		L		LR				
v (vph)		220		194				
C(m) (vph)		1209		407				
v/c		0.18		0.48				
95% queue length		0.66		2.50				
Control Delay		8.6		21.6				
LOS		A		C				
Approach Delay				21.6				
Approach LOS				C				

EXHIBIT 19
2015 PEAK AM HOUR EXISTING TRAFFIC – Old Prescott/Parkway

HCS+: Signalized Intersections Release 5.4

Analyst: Inter.: **Old Prescott/Parkway**
Period: **Peak AM Hour** Year: **December 2, 2015**
Project ID: Lakeland Meadows Phase 2
E/W St: Parkway Road N/S St: Old Prescott Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	8	70	11	10	53	33	48	186	41	20	45	10
Lane Width		3.6			3.6		3.6	3.6		3.6	3.6	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	P			
Thru	A				Thru	P			
Right	A				Right	P			
Peds	X				Peds	X			
WB Left	A				SB Left	P			
Thru	A				Thru	P			
Right	A				Right	P			
Peds	X				Peds	X			
NB Right					EB Right				
SB Right					WB Right				
Green	35.0					35.0			
Yellow	3.7					4.2			
All Red	1.5					1.3			

Cycle Length: 80.7 secs

CAPACITY AND LOS WORKSHEET

Capacity Analysis and Lane Group Capacity

Appr/ Mvmt	Lane Group	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	--Lane Group-- Capacity (c)	v/c Ratio
Eastbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	97	1661	0.06	0.45	741	0.13
Right							
Westbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	105	1614	# 0.07	0.45	720	0.15
Right							
Northbound							
Prot							
Perm							
Left	L	52	1219	0.04	0.45	544	0.10
Prot							
Perm							
Thru	TR	247	1602	# 0.15	0.45	715	0.35
Right							
Southbound							
Prot							
Perm							
Left	L	22	982	0.02	0.45	438	0.05
Prot							
Perm							
Thru	TR	60	1602	0.04	0.45	715	0.08
Right							

Sum of flow ratios for critical lane groups, Yc = Sum (v/s) = 0.22
Total lost time per cycle, L = 8.70 sec
Critical flow rate to capacity ratio, **Xc = (Yc)(C)/(C-L) = 0.25**

EXHIBIT 20
2015 PEAK PM HOUR EXISTING TRAFFIC – Old Prescott/Parkway

HCS+: Signalized Intersections Release 5.4

Analyst: Inter.: **Old Prescott/Parkway**
Period: **Peak PM Hour** Year: **December 2, 2015**
Project ID: Lakeland Meadows Phase 2
E/W St: Parkway Road N/S St: Old Prescott Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	17	86	36	49	91	40	18	72	27	47	170	27
Lane Width		3.6			3.6		3.6	3.6		3.6	3.6	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	P			
Thru	A				Thru	P			
Right	A				Right	P			
Peds	X				Peds	X			
WB Left	A				SB Left	P			
Thru	A				Thru	P			
Right	A				Right	P			
Peds	X				Peds	X			
NB Right					EB Right				
SB Right					WB Right				
Green	35.0					35.0			
Yellow	3.7					4.2			
All Red	1.5					1.3			

Cycle Length: 80.7 secs

CAPACITY AND LOS WORKSHEET

Capacity Analysis and Lane Group Capacity

Appr/ Mvmt	Lane Group	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	--Lane Group-- Capacity (c)	v/c Ratio
Eastbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	150	1579	0.09	0.45	704	0.21
Right							
Westbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	195	1489	# 0.13	0.45	664	0.29
Right							
Northbound							
Prot							
Perm							
Left	L	20	1015	0.02	0.45	453	0.04
Prot							
Perm							
Thru	TR	107	1585	0.07	0.45	707	0.15
Right							
Southbound							
Prot							
Perm							
Left	L	51	1202	0.04	0.45	536	0.10
Prot							
Perm							
Thru	TR	214	1611	# 0.13	0.45	719	0.30
Right							

Sum of flow ratios for critical lane groups, Yc = Sum (v/s) = 0.26
Total lost time per cycle, L = 8.70 sec
Critical flow rate to capacity ratio, **Xc = (Yc)(C)/(C-L) = 0.30**

EXHIBIT 21
2025 PEAK AM HOUR TOTAL TRAFFIC – Old Prescott/Parkway

HCS+: Signalized Intersections Release 5.4

Analyst: Inter.: **Old Prescott/Parkway**
Period: **Peak AM Hour** Year: **Year 2025**
Project ID: Lakeland Meadows Phase 2
E/W St: Parkway Road N/S St: Old Prescott Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	38	263	19	35	109	38	90	284	118	23	73	26
Lane Width		3.6			3.6		3.6	3.6		3.6	3.6	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	P			
Thru	A				Thru	P			
Right	A				Right	P			
Peds	X				Peds	X			
WB Left	A				SB Left	P			
Thru	A				Thru	P			
Right	A				Right	P			
Peds	X				Peds	X			
NB Right					EB Right				
SB Right					WB Right				
Green	35.0					35.0			
Yellow	3.7					4.2			
All Red	1.5					1.3			

Cycle Length: 80.7 secs

CAPACITY AND LOS WORKSHEET

Capacity Analysis and Lane Group Capacity

Appr/ Mvmt	Lane Group	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	--Lane Group-- Capacity (c)	v/c Ratio
Eastbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	348	1624	# 0.21	0.45	724	0.48
Right							
Westbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	197	1498	0.13	0.45	668	0.29
Right							
Northbound							
Prot							
Perm							
Left	L	98	1168	0.08	0.45	521	0.19
Prot							
Perm							
Thru	TR	437	1581	# 0.28	0.45	705	0.62
Right							
Southbound							
Prot							
Perm							
Left	L	25	646	0.04	0.45	288	0.09
Prot							
Perm							
Thru	TR	107	1587	0.07	0.45	708	0.15
Right							

Sum of flow ratios for critical lane groups, Yc = Sum (v/s) = 0.49
Total lost time per cycle, L = 8.70 sec
Critical flow rate to capacity ratio, **Xc = (Yc)(C)/(C-L) = 0.55**

EXHIBIT 22
2025 PEAK PM HOUR TOTAL TRAFFIC – Old Prescott/Parkway

HCS+: Signalized Intersections Release 5.4

Analyst: Inter.: **Old Prescott/Parkway**
Period: **Peak PM Hour** Year: **Year 2025**
Project ID: Lakeland Meadows Phase 2
E/W St: Parkway Road N/S St: Old Prescott Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L		TR	L		TR
Volume	37	215	62	131	270	46	39	115	61	55	280	102
Lane Width		3.6			3.6		3.6	3.6		3.6	3.6	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	P			
Thru	A				Thru	P			
Right	A				Right	P			
Peds	X				Peds	X			
WB Left	A				SB Left	P			
Thru	A				Thru	P			
Right	A				Right	P			
Peds	X				Peds	X			
NB Right					EB Right				
SB Right					WB Right				
Green	40.0					30.0			
Yellow	3.7					4.2			
All Red	1.5					1.3			

Cycle Length: 80.7 secs

CAPACITY AND LOS WORKSHEET

Capacity Analysis and Lane Group Capacity

Appr/ Mvmt	Lane Group	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	--Lane Group-- Capacity (c)	v/c Ratio
Eastbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	341	1522	0.22	0.51	773	0.44
Right							
Westbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	485	1343	# 0.36	0.51	682	0.71
Right							
Northbound							
Prot							
Perm							
Left	L	42	586	0.07	0.38	225	0.19
Prot							
Perm							
Thru	TR	191	1571	0.12	0.38	603	0.32
Right							
Southbound							
Prot							
Perm							
Left	L	60	1064	0.06	0.38	409	0.15
Prot							
Perm							
Thru	TR	415	1586	# 0.26	0.38	609	0.68
Right							

Sum of flow ratios for critical lane groups, Yc = Sum (v/s) = 0.62
Total lost time per cycle, L = 8.70 sec
Critical flow rate to capacity ratio, **Xc = (Yc)(C)/(C-L) = 0.70**

EXHIBIT 23
2030 PEAK AM HOUR TOTAL TRAFFIC – Old Prescott/Parkway

HCS+: Signalized Intersections Release 5.4

Analyst: Inter.: **Old Prescott/Parkway**
Period: **Peak AM Hour** Year: **Year 2030**
Project ID: Lakeland Meadows Phase 2
E/W St: Parkway Road N/S St: Old Prescott Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	39	270	20	36	113	41	94	301	121	25	77	27
Lane Width		3.6			3.6		3.6	3.6		3.6	3.6	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	A				NB Left	P		
Thru	A				Thru	P		
Right	A				Right	P		
Peds	X				Peds	X		
WB Left	A				SB Left	P		
Thru	A				Thru	P		
Right	A				Right	P		
Peds	X				Peds	X		
NB Right					EB Right			
SB Right					WB Right			
Green	35.0				35.0			
Yellow	3.7				4.2			
All Red	1.5				1.3			

Cycle Length: 80.7 secs

CAPACITY AND LOS WORKSHEET

Capacity Analysis and Lane Group Capacity

Appr/ Mvmt	Lane Group	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	--Lane Group-- Capacity (c)	v/c Ratio
Eastbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	357	1621	# 0.22	0.45	723	0.49
Right							
Westbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	207	1496	0.14	0.45	667	0.31
Right							
Northbound							
Prot							
Perm							
Left	L	102	1162	0.09	0.45	518	0.20
Prot							
Perm							
Thru	TR	459	1582	# 0.29	0.45	706	0.65
Right							
Southbound							
Prot							
Perm							
Left	L	27	610	0.04	0.45	272	0.10
Prot							
Perm							
Thru	TR	113	1588	0.07	0.45	708	0.16
Right							

Sum of flow ratios for critical lane groups, Yc = Sum (v/s) = 0.51
Total lost time per cycle, L = 8.70 sec
Critical flow rate to capacity ratio, **Xc = (Yc)(C)/(C-L) = 0.57**

EXHIBIT 24
2030 PEAK PM HOUR TOTAL TRAFFIC – Old Prescott/Parkway

HCS+: Signalized Intersections Release 5.4

Analyst: Inter.: **Old Prescott/Parkway**
Period: **Peak PM Hour** Year: **Year 2030**
Project ID: Lakeland Meadows Phase 2
E/W St: Parkway Road N/S St: Old Prescott Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	38	223	65	135	278	50	41	121	64	59	296	105
Lane Width		3.6			3.6		3.6	3.6		3.6	3.6	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	P			
Thru	A				Thru	P			
Right	A				Right	P			
Peds	X				Peds	X			
WB Left	A				SB Left	P			
Thru	A				Thru	P			
Right	A				Right	P			
Peds	X				Peds	X			
NB Right					EB Right				
SB Right					WB Right				
Green	40.0					30.0			
Yellow	3.7					4.2			
All Red	1.5					1.3			

Cycle Length: 80.7 secs

CAPACITY AND LOS WORKSHEET

Capacity Analysis and Lane Group Capacity

Appr/ Mvmt	Lane Group	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	--Lane Group-- Capacity (c)	v/c Ratio
Eastbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	354	1518	0.23	0.51	771	0.46
Right							
Westbound							
Prot							
Perm							
Left							
Prot							
Perm							
Thru	LTR	503	1326	# 0.38	0.51	674	0.75
Right							
Northbound							
Prot							
Perm							
Left	L	45	547	0.08	0.38	210	0.21
Prot							
Perm							
Thru	TR	202	1571	0.13	0.38	603	0.33
Right							
Southbound							
Prot							
Perm							
Left	L	64	1039	0.06	0.38	399	0.16
Prot							
Perm							
Thru	TR	436	1587	# 0.27	0.38	610	0.71
Right							

Sum of flow ratios for critical lane groups, Yc = Sum (v/s) = 0.65
Total lost time per cycle, L = 8.70 sec
Critical flow rate to capacity ratio, **Xc = (Yc)(C)/(C-L) = 0.73**

EXHIBIT 25
2015 PEAK AM HOUR TOTAL TRAFFIC – Stagecoach/Parkway

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak AM Hour**
Intersection: **Stagecoach/Parkway**
Analysis Year: **November 24, 2015**
Project ID: Lakeland Meadows Phase 2
East/West Street: Parkway Road
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	422	36	45	86	8
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	10	458	39	48	93	8
Percent Heavy Vehicles	10	--	--	6	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	12	25	50	61	30	4
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	13	27	54	66	32	4
Percent Heavy Vehicles	8	2	9	10	10	10
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No /			No /	
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	10	48		94			102	
C(m) (vph)	1443	1047		436			292	
v/c	0.01	0.05		0.22			0.35	
95% queue length	0.02	0.14		0.81			1.51	
Control Delay	7.5	8.6		15.5			23.8	
LOS	A	A		C			C	
Approach Delay				15.5			23.8	
Approach LOS				C			C	

EXHIBIT 26
2015 PEAK PM HOUR TOTAL TRAFFIC – Stagecoach/Parkway

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
Intersection: **Stagecoach/Parkway**
Analysis Year: **November 24, 2015**
Project ID: Lakeland Meadows Phase 2
East/West Street: Parkway Road
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	6	122	19	36	393	54
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	6	132	20	39	427	58
Percent Heavy Vehicles	10	--	--	6	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	45	30	56	18	27	23
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	48	32	60	19	29	24
Percent Heavy Vehicles	8	2	9	10	10	10
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No /			No /	
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	6	39		140			72	
C(m) (vph)	1038	1405		430			367	
v/c	0.01	0.03		0.33			0.20	
95% queue length	0.02	0.09		1.39			0.72	
Control Delay	8.5	7.6		17.4			17.2	
LOS	A	A		C			C	
Approach Delay				17.4			17.2	
Approach LOS				C			C	

EXHIBIT 27
2025 PEAK AM HOUR TOTAL TRAFFIC – Stagecoach/Parkway

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak AM Hour**
Intersection: **Stagecoach/Parkway**
Analysis Year: **Year 2025**
Project ID: Lakeland Meadows Phase 2
East/West Street: Parkway Road
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	21	537	57	90	117	13
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	22	583	61	97	127	14
Percent Heavy Vehicles	10	--	--	6	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	1	1	0	1	1	0
Configuration	L	TR		L	TR	
Upstream Signal?	No			No		

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	19	34	202	74	48	8
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	20	36	219	80	52	8
Percent Heavy Vehicles	8	2	9	10	10	10
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No /			No /	
Lanes	1	1	0	1	1	0
Configuration	L	TR		L	TR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L	L		TR	L		TR
v (vph)	22	97	20		255	80		60
C(m) (vph)	1394	922	153		409	77		226
v/c	0.02	0.11	0.13		0.62	1.04		0.27
95% queue length	0.05	0.35	0.44		4.10	5.67		1.03
Control Delay	7.6	9.4	32.0		27.3	208.6		26.6
LOS	A	A	D		D	F		D
Approach Delay			27.6			130.6		
Approach LOS			D			F		

EXHIBIT 28
2025 PEAK PM HOUR TOTAL TRAFFIC – Stagecoach/Parkway

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
Intersection: **Stagecoach/Parkway**
Analysis Year: **Year 2025**
Project ID: Lakeland Meadows Phase 2
East/West Street: Parkway Road
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	13	171	32	182	508	79
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	14	185	34	197	552	85
Percent Heavy Vehicles	10	--	--	6	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	1	1	0	1	1	0
Configuration	L	TR		L	TR	
Upstream Signal?	No			No		

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	68	51	150	30	40	37
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	73	55	163	32	43	40
Percent Heavy Vehicles	8	2	9	10	10	10
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No /			No /	
Lanes	1	1	0	1	1	0
Configuration	L	TR		L	TR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L	L		TR	L		TR
v (vph)	14	197	73		218	32		83
C(m) (vph)	909	1327	89		374	63		217
v/c	0.02	0.15	0.82		0.58	0.51		0.38
95% queue length	0.05	0.52	4.33		3.55	2.03		1.69
Control Delay	9.0	8.2	133.7		27.2	110.5		31.5
LOS	A	A	F		D	F		D
Approach Delay			53.9			53.5		
Approach LOS			F			F		

EXHIBIT 29
2030 PEAK AM HOUR TOTAL TRAFFIC – Stagecoach/Parkway

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak AM Hour**
Intersection: Stagecoach/Parkway
Analysis Year: **Year 2030**
Project ID: Lakeland Meadows Phase 2
East/West Street: Parkway Road
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	22	575	60	94	125	14
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	23	624	65	102	135	15
Percent Heavy Vehicles	10	--	--	6	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	20	36	207	79	51	8
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	21	39	224	85	55	8
Percent Heavy Vehicles	8	2	9	10	10	10
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage		No /			No /	
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L	L		TR	L		TR
v (vph)	23	102	21		263	85		63
C(m) (vph)	1384	887	132		379	62		205
v/c	0.02	0.11	0.16		0.69	1.37		0.31
95% queue length	0.05	0.39	0.55		5.05	7.26		1.24
Control Delay	7.6	9.6	37.4		33.4	353.4		30.2
LOS	A	A	E		D	F		D
Approach Delay			33.7			215.8		
Approach LOS			D			F		

EXHIBIT 30
2030 PEAK PM HOUR TOTAL TRAFFIC – Stagecoach/Parkway

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analysis Time Period: **Peak PM Hour**
Intersection: **Stagecoach/Parkway**
Analysis Year: **Year 2030**
Project ID: Lakeland Meadows Phase 2
East/West Street: Parkway Road
North/South Street: Stagecoach Road
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	14	182	34	185	543	84
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	15	197	36	201	590	91
Percent Heavy Vehicles	10	--	--	6	--	--
Median Type/Storage	Undivided /					
RT Channelized?						
Lanes	1	1	0	1	1	0
Configuration	L	TR		L	TR	
Upstream Signal?	No			No		

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	72	54	155	32	43	39
Peak Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	78	58	168	34	46	42
Percent Heavy Vehicles	8	2	9	10	10	10
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	1	1	0	1	1	0
Configuration	L	TR		L	TR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L	L	L		TR	L		TR
v (vph)	15	201	78		226	34		88
C(m) (vph)	875	1311	75		344	52		197
v/c	0.02	0.15	1.04		0.66	0.65		0.45
95% queue length	0.05	0.54	5.60		4.42	2.62		2.10
Control Delay	9.2	8.2	212.1		33.4	158.9		37.2
LOS	A	A	F		D	F		E
Approach Delay				79.3			71.2	
Approach LOS				F			F	

EXHIBIT 31
TRANSPORTATION IMPACT STUDY – CHECK LIST

Address Lakeland Meadows - 1626 Old Preswcott Road

File # 111-527 (TIS) / TB / CTS

Date March 18, 2013

Check list

☒ Municipal address;

☒ Location relative to major elements of the existing transportation system (eg., the site is location in the southwest quadrant of the intersection of Main Street/ First Street, 600 metres from the Maple Street Rapid Transit Station);

☒ Existing land uses or permitted use provisions in the Official Plan, Zoning By-law, etc.;

☒ Proposed land uses and relevant planning regulations to be used in the analysis;

☒ Proposed development size (building size, number of residential units, etc.) and location on site;

☒ Estimated date of occupancy;

☒ Planned phasing of development;

❑ Proposed number of parking spaces (not relevant for Draft Plans of Subdivision); and

☒ Proposed access points and type of access (full turns, right-in / right-out, turning restrictions, etc.

☒ Study area;

☒ Time periods and phasing; and

☒ Horizon years (include reference to phased development).

Existing Contitions

☒ Existing roads and ramps in the study area, including jurisdiction, classification, number of lanes, and posted speed limit;

☒ Existing intersections, including type of control, lane configurations, turning restrictions, and any other relevant data (eg., extraordinary lane widths, grades, etc.);

☒ Existing access points to adjacent developments (both sides of all roads bordering the site);

☒ Existing transit system, including stations and stops;

☒ Existing on- and off-road bicycle facilities and pedestrian sidewalks and pathway networks:

☒ Existing system operations (V/C, LOS); and

☒ Major trip generators / attractors within the Study Area should be indicated.

Demand Forecasting

☒ General background growth;

☒ Other study area developments;

☒ Changes to the study area road network;

❑ Future background system operations (V/C, LOS, queue lengths);

☒ Trip generation rates;

☒ Trip distribution and assignment;

Impact Analysis

☒ Total future system operations (V/C, LOS, queue lengths);

☒ Signal and auxiliary lane (device) warrants;

☒ Operational / safety assessment (eg., sight line assessment where grades are an issue);

☒ Storage analysis for closely spaced intersections;

☒ Pedestrian and bicycle network connections and continuity;

☒ On-site circulation and design;

☒ Potential for neighourhood impacts; and

☒ TDM.

☒ Synchro Files (Highway Capacity Software)

CTS

Impact Analysis

❑ Network Capacity Analysis;

❑ Non-auto network connections and continuity;

❑ Potential for community impacts, and

❑ TDM.

❑ Synchro Files (Highway Capacity Software)

❑ Screenline Analysis