

17 May 2018

Shenkman Corporation
4899 Uplands Drive
Ottawa, ON K1V 2N6

Attention: Peter Hume

Dear Peter:

**Re: Shenkman/Cavanagh – Kanata West
195 Huntmar Community Transportation Study – Addendum #1**

The proposed Concept Plan for this development has been revised through several iterations with the project team and in consultation with various City departments. While the final plan has several changes from that submitted in the original Community Transportation Study (CTS), the analysis undertaken continues to be relevant. As such, this addendum builds on the analysis submitted as the part of the CTS. Section 1 of this addendum provides updates to the transportation analysis related to the proposed land use changes and transportation network.

Section 2 of this addendum addresses the comments received from the City of Ottawa, dated November 24, 2016 in order to complete the file.

1. UPDATED CONCEPT PLAN

There have been significant review and revisions to the proposed Concept Plan with the goal of achieving a successful plan for the development of the subject lands. The transportation-related revisions include:

- Re-alignment of Palladium Drive and re-located of its intersection with the North-South Arterial;
- Revision to land uses including the number of residential units, the amount and type of commercial, an addition of a proposed school, and the relocation of the district park;
- Revisions to the access roads for the school and the auto dealerships as well as a realignment of the east-west collector roadways through the site;

An update to the original CTS regarding these proposed changes to the Concept Plan are provided herein. In addition, a review of the planned developments located adjacent to the subject lands and their related vehicle and active mode accesses is provided below. The revised Concept Plan is provided as Figure 1 (for context, the original Concept Plan is provided as Attachment #1).

1.1. PALLADIUM DRIVE EXTENSION

Within the original CTS, the location of the Palladium Drive extension to the North-South Arterial was proposed approximately 350m north of the planned North-South Arterial/Stittsville Main roundabout intersection and approximately 300m south of the HWY 417 eastbound off-ramp. Through consultation with the Ministry of Transportation of Ontario (MTO), we were advised that the location of the proposed Palladium Drive extension to North-South Arterial is too close to the HWY 417 eastbound off-ramp. Through further consultation with the project team, the City, and adjacent land owners, a revised location of the proposed Palladium Drive extension to North-South Arterial is proposed. The revised location is approximately 400 m south of the HWY 417 off-ramp and approximately 250 m north of the North-South Arterial/Stittsville Main intersection. The original proposed location and the revised location are shown as Figures 2 and 3, respectively.

Figure 2: Original Palladium Drive Extension Alignment

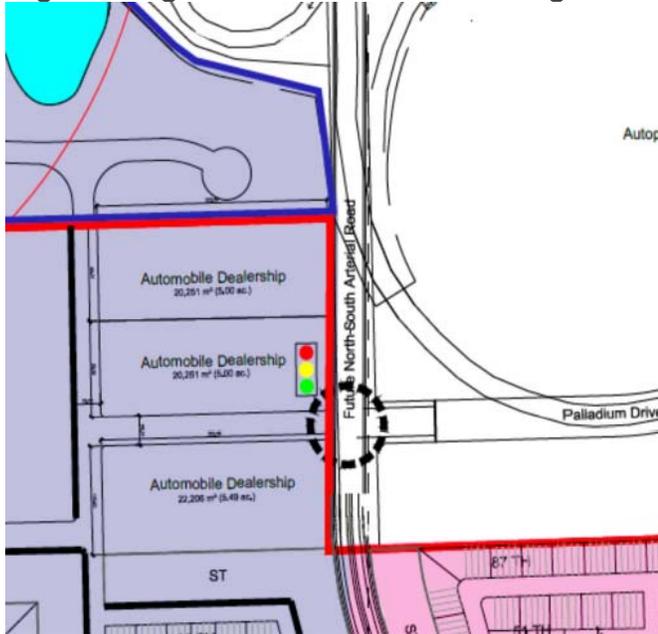
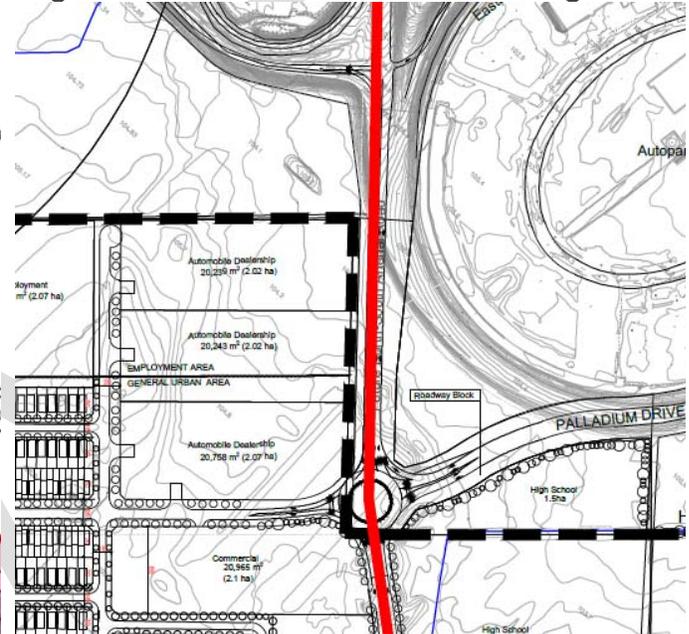


Figure 3: Revised Palladium Drive Extension Alignment



The following revisions to the Palladium Drive Extension and North-South Arterial intersection are presented:

- The revised Palladium/N-S Arterial intersection is proposed to be a multi-lane roundabout;
- The intersection is located approximately 400 m south of the HWY 417 eastbound off ramp;
- The intersection is located approximately 250 m north of the proposed N-A Arterial/Stittsville Main intersection;
- To accommodate this alignment, the land south of the Palladium Drive extension has been acquired by the proponent and will be incorporated into the proposed development as part of the high school lands;
- This revised alignment improves east-west connectivity to the site by aligning Palladium Drive with the east-west collector roadway that continues through the site to Stittsville Main Street extension.

1.2. UPDATED LAND USES AND RELATED TRIP GENERATION ANALYSIS

As shown in the proposed Concept Plan (Figure 1), the land uses have been revised in terms of location and size. As the road network was refined throughout the development lands, the land uses were arranged to accommodate the proposed changes to the road alignments. The following land use revision are proposed:

- Relocation of the district park from the northwest corner of the development lands to the eastern side of the development lands, fronting Huntmar Drive;
- Proposed high school along the east side of the N-S Arterial;
- Approximate 45% reduction in residential units;

- Proposed employment lands planned at in the northwest quadrant;
- Increase in size of commercial retail lands; and
- Planned Stormwater Management Pond in the northwest corner of the lands.

1.2.1. REVISED TRIP GENERATION ANALYSIS

The trip generation analysis outlined in the original TIA was updated to reflect the changes to the revised Concept Plan. The details of the land use revisions are outlined in Table 1.

Table 1: Revisions of Land Use Size

Concept Plan	Development Land Size					
	Residential	Commercial	Office	School	Auto Dealerships	Park
Original	1,237 units	24,400 m ²	-	-	3 dealerships	11.2 ha
Revised	691 units	40,845 m ²	20,729 m ²	7.6 ha	3 dealerships	5.9 ha

As shown in Table 1, the number of planned residential units has decreased significantly, and the size of the park has also been reduced. The commercial retail and office have increased, and a school has been introduced into the plan. Following the trip generation method outlined in the original CTS, the projected number of vehicle trips was calculated based on the foregoing land use revisions. The ITE Trip Generation Rates for the proposed land uses are summarized in Table 2 and were obtained from the 10th Edition of the ITE Trip Generation Manual.

Table 2: ITE Trip Generation Rates

Land Use	Data Source	Trip Rates	
		AM Peak	PM Peak
Multi-Family (Low-Rise) Housing	ITE 220	$T = 0.46(du);$ $\ln(T) = 0.95 \ln(du) - 0.51$	$T = 0.56(du);$ $\ln(T) = 0.89 \ln(du) - 0.02$
Multi-Family (Mid-Rise) Housing	ITE 221	$T = 0.36(du);$ $\ln(T) = 0.98 \ln(du) - 0.98$	$T = 0.44(du);$ $\ln(T) = 0.96 \ln(du) - 0.63$
Single-Family Housing	ITE 210	$T = 0.74(du);$ $T = 0.71(du) + 4.80$	$T = 0.99(du);$ $\ln(T) = 0.96 \ln(du) + 0.20$
Car Dealership	ITE 840	$T = 1.87(X)$	$T = 2.43(X);$ $T = 1.80(X) + 21.60$
Shopping Centre	ITE 820	$T = 0.94(X)$	$T = 3.81(X)$
Office	ITE 710	$T = 1.16(X);$ $T = 0.94(X) + 26.49$	$T = 1.15(X);$ $\ln(T) = 0.95 \ln(X) + 0.36$
High School	ITE 530	$T = 3.38(X)$	$T = 0.97(X)$
Notes: T = Average Vehicle Trip Ends du = Dwelling Units X = 1000 ft ² Gross Floor Area			

Based on the above trip generation rates and applying the mode share values summarized in the original CTS, the following Table 3 provides the total projected site-generated vehicle trips for the proposed development.

Table 3: Total Projected Site-Generated Vehicle Trips

Land Use	Area	AM Peak (Veh/h)			PM Peak (Veh/h)		
		In	Out	Total	In	Out	Total
Multi-Family (Low-Rise) Housing	432 du	35	116	151	107	63	170
Multi-Family (Mid-Rise) Housing	128 du	9	26	35	27	18	45
Single-Family Housing	131 du	19	58	77	65	39	104
Car Dealership	90,000 ft ²	112	42	154	67	101	168
Shopping Centre	110,000 ft ²	50	31	81	157	171	328
Office	100,000 ft ²	88	15	103	15	82	97
High School	106,563 ft ²	216	89	305	47	41	88
<i>Less Shopping Centre Pass-by (30%)</i>		-12	-12	-24	-49	-49	-98
Total Person Trips		517	365	882	436	466	902

Note: 1.28 factor to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%
**Assumptions of GFA for the car dealerships, shopping centre, and office were made given the size of the development lands.*

As shown in Table 3, the resulting number of potential ‘new’ two-way vehicle trips for the proposed development is approximately 900 veh/h during both the weekday morning and afternoon peak hours. These land use sizes and related trip generation analysis will be further refined during the Site Plan Application.

As shown in the original CTS, these proposed land uses are consistent with the Kanata West TMP, with the exception of a portion of the ‘business park’ and all of the ‘intensive employment area’. Within the original CTS, the projected number of vehicle trip expected to be generated by the business park and intensive employment area was calculated to be approximately 1,270 and 1,575 veh/h during the weekday commuter peak hours for the area. As the original plan assumed more office than what is proposed, the total number of vehicle trips is less than what was assumed in the Kanata West TMP.

1.3. OTHER AREA DEVELOPMENTS

There is significant development planned within the Kanata West area as outlined in the Kanata West TMP. The following Figure 4 shows the location of the area developments adjacent to the subject site.

Details regarding the development of these adjacent lands is provided below:

- 2499 and 2500 Palladium and 675 Autopark Private
 - A Zoning By-Law Amendment application has been submitted for these lands which are located adjacent to the north and east of the subject development;
 - The subject lands currently consist of the existing Palladium Autopark and some vacant land. There are currently plans to continue to expand the Autopark with additional car dealerships;
 - As shown in Figure 4, part of this land parcel is proposed to be used for the realignment of the Palladium Drive extension. There is an agreement between the proponent and the owner of the Autopark lands to acquire the necessary lands to accommodate the proposed realignment of the Palladium Drive extension. As part of this agreement, the lands to the south of the Palladium Drive extension will be incorporated into the subject development as part of the high school lot.
- 180 Huntmar Drive
 - Application has been submitted for the construction of a school and medical facility.
- 130 Huntmar Drive
 - Location of future planned subdivision.

Figure 4: Adjacent Land Developments



- 173 Huntmar Drive
 - A mixed-use development is being planned at 173 Huntmar Drive which is located adjacent to the south and east of the subject development;
 - Access to these lands is planned to the North-South Arterial and internal roadways are proposed to connect to any future development to the north (i.e. to connect to the 195 Huntmar development);
 - Given the current Concept Plan for the subject development, the lands to the north are planned as a park, as such, the roadways connecting to the 173 Huntmar Drive development could provide vehicle access to a parking lot for the district park.
- 1981 Maple Grove
 - No application for this subdivision has been submitted, however through consultation with the City, we are aware that a subdivision is planned for these lands, which are located adjacent to the south of the subject development;
 - Vehicle access is understood to be to the north-south and east-west portions of the Stittsville Main Street extension. Coordination between the subject development and the future Maple Grove subdivision will be required to refine the locations of the driveway accesses to Stittsville Main Street and the type of intersection control. This is planned to be done during the SPA stage of development at which time more information will likely be available regarding access requirements for both sites.
- Existing Subdivision
 - The subdivision located adjacent to the south of the proposed development has an existing driveway access to the future North-South Arterial (along Maestro Avenue);
 - The location of this driveway is within close proximity of the proposed N-S Arterial/Stittsville Main Street roundabout intersection. As such, it is recommended that this access be closed to vehicles and revised to be an active mode connection to Stittsville Main Street only.

1.4. ADDITIONAL CONCEPT PLAN DETAILS

Through further refinements of the proposed Concept Plan, the following transportation-related specifics are provided.

Vehicle Access:

- Driveway access for the auto dealerships was previously proposed to the N-S Arterial. The revised plan shows full movement to the three auto dealerships along a new internal north-south access roadway. This will minimize the number of driveways along the N-S Arterial and provide full movement access for the proposed car dealerships;
- Access to the proposed commercial sites fronting the N-S Arterial will be planned as right-in/right-out only, controlled by a centre median along the N-S Arterial between the two proposed roundabouts. Access to the commercial sites fronting the internal collector roadway (Street 1) will likely be full-movement driveways. Driveway access for these developments will be refined as part of the Site Plan Application.

Internal and Public Roadways:

- The school will not have vehicle access to the N-S Arterial. A north-south roadway is planned connecting the N-S Arterial to Palladium Drive along the eastern boundary of the school lands. This road will provide access for school-related traffic. Details regarding the intersection control for the connection of this roadway to the N-S Arterial and Palladium Drive will be refined as part of the Site Plan Application. There is a desire to have full-movement access to this roadway, however, it is projected that a right-in/right-out connection to the N-S arterial is appropriate;
- As shown on the proposed Concept Plan (Figure 1), the Stittsville Main Street extension is assumed to be designated as a major collector roadway. Intersection control for the Stittsville Main Street extension at the southwest corner of the development lands is recommended to be roundabout control. This roundabout would be a single lane roundabout and will need to be refined as the road network is further planned and constructed.
- An additional minor collector roadway is planned through the site (Street 1), which represents the 4th leg of the N-S Arterial/Palladium intersection. Control at the minor collector is planned as STOP control only. Analysis of the intersections along this minor collector corridor will be provided as part of the Site Plan Approval.

2. CITY COMMENTS

2.1. TRANSIT SERVICE

Comment 1: *Please expand on the potential ROW conflict between the extension of Stittsville Main Street north of the N-S Arterial to Palladium Drive. This argument is used to exclude a portion of the future Stittsville Main Street extension, yet details of this statement are not presented.*

Response 1: The Kanata West Concept Plan shows the extension of Stittsville Main Street continuing past the North South Arterial, intersecting with Huntmar Drive and continuing east to intersect with Palladium Drive at Cyclone Taylor Boulevard. During the EA process for the West Transitway Extension, to accommodate the geometry of the transit alignment, the segment between Huntmar Drive and Cyclone Taylor Boulevard was removed, and it was deemed to be redundant to the network. By extension and given the lack of connectivity of Stittsville Main Street extension through Huntmar Drive, the segment between the North South Arterial and Huntmar Drive ends at a three-legged intersection at Huntmar Drive and provides little to no gain in terms of vehicle capacity, given the capacity along Huntmar. Huntmar is not planned for any reconstruction until post 2031.

As described in section 1 of the addendum, the land use patterns and resulting transportation network has been modified within the Concept Plan to provide more of a grid pattern. This effort follows the goals of the Building Better Smarter Suburbs direction from the City. While the geometry of the major roadways differs from older plans, the use of proposed roundabouts has enabled the formation of a grid.

The resulting roadway pattern continues to provide similar connectivity as the older Kanata West transportation plan. From the point where the Stittsville Main Street extension reaches this development, it splits into two paths, namely Streets 14 and 1 & 3. These collectors then intersect the North South Arterial at the two proposed roundabouts, which both continue east to provide connectivity to Huntmar Drive via the North-South Arterial and the Palladium Drive extension. As such, east-west capacity that would have been accommodated by the extension of Stittsville Main Street extension to Palladium Drive is accommodate via the two proposed collectors (Streets 1 & 3 and 14) and their revised intersections with the Palladium Drive extension and the N-S Arterial.

Figure 5: Kanata West TMP Road Alignment (collector stops at Huntmar)



Figure 6: Proposed Road Alignment



Comment 2: Clarification would be required about the bus turn-around for the transit priority corridor and its potential conflict with the ROW for the Stittsville Main Street Extension.

Response 2: The Kanata LRT EA has recently been completed and transit operations in this area will evolve following EA recommendations.

Comment 3: While we can appreciate that the traffic generated from the Canadian Tire Centre has not been included with the study, it is important to recall that the top choice for LeBreton redevelopment was backed by the Ottawa Senators. This means that there is a potential for a revitalization of this space. Specifically, the parking spots could transition over time to a number of uses, including housing, retail or office space, which may result in additional traffic during the peak periods.

Response 3: Agreed. As the area develops, Transportation Impact Assessment reports will be required to assess the capacity of the road network. As the LeBreton development has not been finalized, there is a considerable amount of uncertainty of the future of the Canadian Tire Centre lands. In addition, as the road network is constructed, there will be a better understanding of the capacity of these roadways (i.e. North-South Arterial) and the Canadian Tire Centre lands should be planned accordingly.

Comment 4: Transit service is currently provided in the vicinity of the site. The nearest transit service is located along Huntmar Drive and provided by Routes 92, 162, 261 and 263.

- The base route network will have to be expanded because it is anticipated that 500 new housing units will be beyond 800m walking distance from existing service. The peak route network will also have to be expanded because 250 new housing units will be located more that 400m walking distance from existing service.

Response 4: Agreed. As each parcel of land is developed, the developer will work with OC Transpo through the Site Plan Approval process to provide appropriate bus routes and stops for the subdivisions.

Comment 5: The North-South Arterial and the Stittsville Main Street Extension shall be designated as transit streets.

- The applicant shall design and construct, at no cost to the City, any streets which have been identified for potential transit service to Transportation Association of Canada standards including right-of-way width,

horizontal and vertical geometry, pavement structure and the construction of sidewalks on both sides of the streets.

Response 5: Noted and the proponent has been advised.

Comment 6: *The Owner agrees to implement a Transit Service Strategy in accordance with the Official Plan. The Owner, together with the City, will determine the method and means by which the developments, as well as adjacent areas, can be efficiently and effectively serviced by transit. The Owner shall enter into an agreement with the Transit Services Branch, prior to the registration of the subdivision, to outline the provision of interim bus service. Said agreement shall include, but not be limited to, the following: establishment of routes and stops and levels of service and provision and maintenance of stops and turnarounds. The agreement may include: funding and cost-sharing arrangements and timing and triggers for the transfer of responsibility to City.*

- *Considering that a temporary turn-around located at the end of designated transit streets may conflict with the ROW for the Stittsville Main Street Extension, the developer should consider alternatives to accommodate interim transit routes. For instance, the Kanata West N-S arterial extension and/or the Stittsville Main Street extension from the existing Stittsville Main Street to the N-S arterial could be built ahead of schedule.*

Response 6: Noted. Appropriate roadways should be constructed as developments are planned. This is to be refined during the SPA stage of development.

Comment 7: *The Owner shall design and construct, at no cost to the City, paved passenger standing areas and/or concrete shelter pads at the locations identified as bus stops to the specification of Transit Services. Specific bus stop locations will be identified during the CUP and/or site plan phase.*

Response 7: Noted and the proponent has been advised.

Comment 8: *The Owner shall ensure that the staging of the subdivision, including dwellings, roadways, walkways, and paved passenger standing areas, or shelter pads and shelters, will be constructed in a sequence that permits the operation of an efficient, high quality transit service at all stages of development. Note that wherever a bus stop must be located adjacent to a home it is preferred that the bus stop be located adjacent to a side-lot.*

Response 8: Noted and the proponent has been advised.

Comment 9: *The Owner shall ensure that the staging of the subdivision, including dwellings, roadways, walkways, and paved passenger standing areas, or shelter pads and shelters, will be constructed in a sequence that permits the operation of an efficient, high quality transit service at all stages of development.*

Response 9: Noted and the proponent has been advised.

2.2. TRANSPORTATION PLANNING

Comment 10: *Extension of North-South arterial north of Abbott Street is slated in the TMP as a Phase 2 project (2020 – 2025). Similarly, extension of Stittsville Main Street is identified in the TMP as a Phase 3 project (2026 – 2031).*

- *Clarification is required on how the proposed development phases would be rolled out and show the ultimate built-out year of the subject development.*

Further, how it corresponds to the implementation time of the future road network identified in the TMP in the vicinity of the subject site.

Response 10: Despite the projected timing in the TMP, the phasing of this development is still being considered and will be refined following approval of the subdivisions. The required transportation network will be provided to support the development phases.

Comment 11: *Where the proposed development abuts the existing/future roadways, please ensure to protect the following right-of-way:*

- 26 m along Future Main Street Extension
- 37.5 m along future North-South arterial
- 37.5 m along Huntmar Drive.

Response 11: Noted and the proponent has been advised.

Comment 12: *The CTS report does not identify implications of not extending the Stittsville Main Street to Huntmar Road as identified in the Kanata West Road Network ESR and the TMP. The report must include an analysis demonstrating that the early termination of Stittsville Main Street at NS arterial would not cause capacity and operational issues in the long run for the future roadway network in the area*

Response 12: See response 1.

2.3. TRAFFIC SIGNALS

Comment 13: *No comments to the initial CTS for this circulation. Traffic Signal Design & Specification reserves the right to make future comments based on subsequent submissions.*

Future considerations:

If there are any future proposed changes in the existing roadway geometry, the City of Ottawa Traffic Operations Unit is required to complete a traffic signal plant design. If the proposed traffic signals are warranted/approved for installation and RMA approved please forward an approved geometry detail design drawings (dwg digital format in NAD 83 coordinates) including base mapping, existing and new underground utilities/sewers, new Catch Basins locations and approved pavement markings drawing in separate files for detail traffic plant design lay out. Please send all digital (CADD) design files to Peter.Grajcar@ottawa.ca 613-580-2424 extension 23035.

Response 13: Noted and the proponent has been advised.

2.4. STREET LIGHTING

Comment 14: *No comments with initial OPA Zoning and Plan Subdivision for this circulation. Street Lighting reserves the right to make future comments based on subsequent submissions.*

Future considerations are as follows:

- *If there are any proposed changes to the existing roadway geometry, the City of Ottawa Street Light Asset Management Group is required to provide a full street light design*
- *Upon completion of proposed roadway geometry design changes, please submit digital Micro Station drawings with proposed roadway geometry changes to the Street Lighting Department, so that we may proceed with the detailed street light design and coordination with the Street Light maintenance provider and all necessary parties. Be advised that the applicant will be 100% responsible for all costs associated with any Street Light design as a result of the roadway geometry change.*

PARSONS

- Alterations and/or repairs are required where the existing street light plant is directly, indirectly or adversely affected by the scope of work under this circulation, due to the proposed road reconstruction process. All street light plant alterations and/or repairs must be performed by the City of Ottawa's Street Light maintenance provider.

Be advised that the applicant will be 100% responsible for all costs associated with any relocations/modifications to the existing street light plant.

Response 14: Noted and the proponent has been advised.

2.5. TRAFFIC ENGINEERING AND CONTROL

Comment 15: The intersection of Palladium Drive and HWY417 WB Ramp has been modified recently. Remove min recall from all Synchro analysis.

Response 15: Noted, the revised SYNCHRO model is included as Attachment #2.

2.6. DEVELOPMENT REVIEW – TRANSPORTATION ENGINEERING SERVICES

Comment 16: As indicated in the report, the location of accesses (in particular Access 2 to Huntmar Drive) will be reviewed at the site plan application stage. Consideration must be given to intersection spacing.

Response 16: Noted.

Comment 17: The intersection of Stittsville Main and North-South Arterial should allow for either the roundabout or traffic control signal (TCS) installation discussed in the report. With the City moving towards implementing protected intersections for pedestrians and cyclists, ensure that there is sufficient space allocated for this option. The consideration of the roundabout providing a gateway feature should not drive the decision towards intersection control.

Response 17: Noted. Designs for the North South Arterial and its intersections will be completed and ultimately approved by the City.

Based on the foregoing, the proposed Concept Plan for 195 Huntmar Drive continues to be recommended from a transportation perspective.

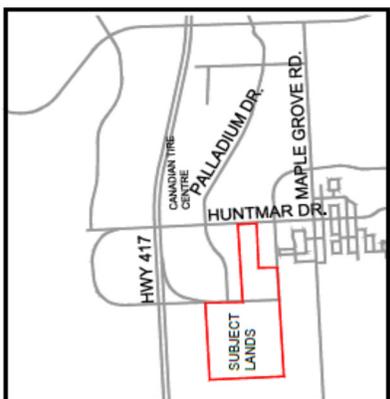
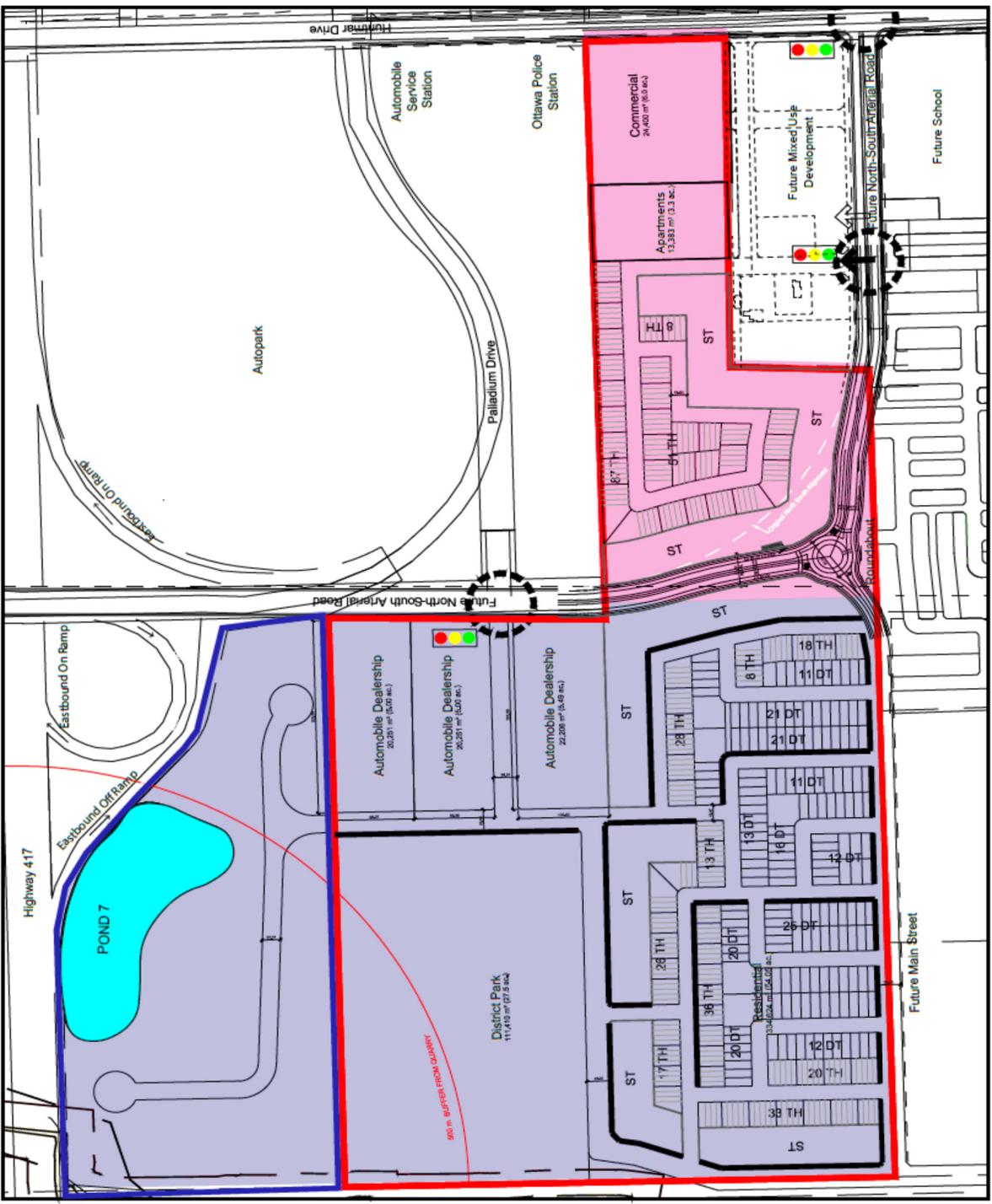
Sincerely,

André Jane Sponder, P.Eng.
Transportation Engineer

Christopher Gordon, P.Eng.
Senior Project Manager

Attachment #1

Previously Proposed Concept Plan



- LEGEND**
- █ Subject Lands
 - █ Ministry of Transportation (MTO) Lands
 - █ Proposed Sidewalk
 - █ Detached Dwellings
 - █ Townhouse Dwellings
 - █ Stacked Townhouse Dwellings
 - Signalized Intersection
 - Enterprise Area Designation
 - Mixed Use Centre Designation
 - Stormwater Pond (28,000 m² / 6.92 ac.)

PROJECT
CAVANAGH/ SHENKMAN -
KANATA WEST

DRAWING
CONCEPT PLAN 5

FOTENN
PLANNING+DESIGN
 223 McLeod Street Ottawa ON K2P 0Z8
 Tel: 613 730 5709 Fax: 613 730 1136
 www.fotenn.com

FIGURE No.
A

DESIGNED GV
 DRAWN GV
 DATE 2016.07.19
 SCALE NTS



Attachment #2

Updated SYNCHRO Capacity Analysis

Existing AM

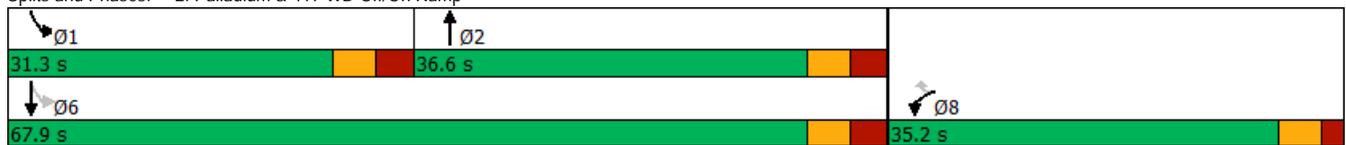
2: Palladium & 417 WB-Off/On Ramp

	↙	↖	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations	↙↖	↖	↕	↘	↘↕
Traffic Volume (vph)	148	64	72	21	67
Future Volume (vph)	148	64	72	21	67
Lane Group Flow (vph)	156	67	150	0	93
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	21.2	21.2	28.3	11.3	16.3
Total Split (s)	35.2	35.2	36.6	31.3	67.9
Total Split (%)	34.1%	34.1%	35.5%	30.4%	65.9%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.2	5.2	6.3		6.3
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?					
Recall Mode	None	None	Max	None	Max
Act Effct Green (s)	10.4	10.4	61.6		61.6
Actuated g/C Ratio	0.12	0.12	0.74		0.74
v/c Ratio	0.38	0.27	0.06		0.04
Control Delay	36.6	12.1	1.7		3.1
Queue Delay	0.0	0.0	0.0		0.0
Total Delay	36.6	12.1	1.7		3.1
LOS	D	B	A		A
Approach Delay	29.2		1.7		3.1
Approach LOS	C		A		A
Queue Length 50th (m)	11.9	0.0	1.3		1.6
Queue Length 95th (m)	20.7	10.9	3.6		3.5
Internal Link Dist (m)	431.2		180.2		445.2
Turn Bay Length (m)		150.0			
Base Capacity (vph)	1182	588	2336		2231
Starvation Cap Reductn	0	0	0		0
Spillback Cap Reductn	0	0	0		0
Storage Cap Reductn	0	0	0		0
Reduced v/c Ratio	0.13	0.11	0.06		0.04

Intersection Summary

Cycle Length: 103.1	
Actuated Cycle Length: 83.5	
Natural Cycle: 65	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.38	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 36.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Palladium & 417 WB-Off/On Ramp



Existing PM

2: Palladium & 417 WB-Off/On Ramp

					
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	237	115	49	65	102
Future Volume (vph)	237	115	49	65	102
Lane Group Flow (vph)	249	121	348	0	175
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	21.2	21.2	28.3	11.3	16.3
Total Split (s)	35.2	35.2	36.6	31.3	67.9
Total Split (%)	34.1%	34.1%	35.5%	30.4%	65.9%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	1.9	1.9	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.2	5.2	6.3		6.3
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
Act Effct Green (s)	11.9	11.9	61.6		61.6
Actuated g/C Ratio	0.14	0.14	0.72		0.72
v/c Ratio	0.54	0.38	0.16		0.09
Control Delay	38.6	10.3	1.0		3.8
Queue Delay	0.0	0.0	0.0		0.0
Total Delay	38.6	10.3	1.0		3.8
LOS	D	B	A		A
Approach Delay	29.3		1.0		3.8
Approach LOS	C		A		A
Queue Length 50th (m)	19.6	0.0	1.0		3.5
Queue Length 95th (m)	30.7	13.9	4.7		7.2
Internal Link Dist (m)	431.2		315.2		445.2
Turn Bay Length (m)		150.0			
Base Capacity (vph)	1159	613	2222		1849
Starvation Cap Reductn	0	0	0		0
Spillback Cap Reductn	0	0	0		0
Storage Cap Reductn	0	0	0		0
Reduced v/c Ratio	0.21	0.20	0.16		0.09

Intersection Summary

Cycle Length: 103.1	
Actuated Cycle Length: 85.1	
Natural Cycle: 65	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 42.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Palladium & 417 WB-Off/On Ramp

