

**Residential Development  
175 Richmond Road  
Ottawa, ON**

**TRANSPORTATION BRIEF**

Prepared By:

**NOVATECH ENGINEERING CONSULTANTS LTD.**

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September 2011

Novatech File: 111130  
Ref No. R-2011-160

September 30, 2011

City of Ottawa  
Planning and Growth Management Department  
Development Review (Urban) Services Branch  
Infrastructure Approvals Division  
110 Laurier Ave. W., 4<sup>th</sup> Floor,  
Ottawa, Ontario K1P 1J1

**Attention:** Mr. Wally Dubyk  
Project Manager, Infrastructure Approvals

Dear Sir:

**Reference:** Residential Development, 175 Richmond Road  
Transportation Brief  
Our File No. 111130

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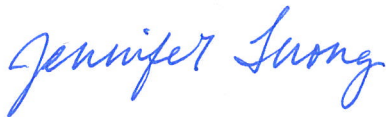
We are pleased to submit the following Transportation Brief in support of Zoning By-law Amendment and Site Plan applications for 175 Richmond Road.

The structure and format of this report follows the 2006 City of Ottawa Transportation Impact Assessment (TIA) Guidelines for a Transportation Brief. A checklist of the documentation requirements as outlined in Appendix C of the TIA guidelines is attached overleaf.

A .pdf version of this report and copies of the electronic software files are provided on the enclosed disk. Please call if you have any questions as you complete your review.

Yours truly,

**NOVATECH ENGINEERING CONSULTANTS LTD.**



Jennifer Luong, P.Eng  
Project Manager

Cc. Neil Malhotra, Claridge Homes

## Documentation and Reporting Checklist

### Report Context

Description of the development (include all of the following that are known at the time of the application):

- Municipal address;
- Location relative to major elements of the existing transportation system (e.g., the site is located 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 Registration of 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).

The TB must include a key plan that shows the general location of the development in relation to the surrounding area. The TB must also provide a draft site plan or development concept of a suitable scale that shows the general location of the development and the proposed access locations. If the proposed development/ redevelopment is to be constructed in phases, a description must be provided for each phase, identifying the proposed timing of implementation.

### Existing Conditions

- Existing roads and ramps in the study area, including jurisdiction, classification, number of lanes, and posted speed limit;
- Existing intersections, indicating type of control, lane configurations, turning restrictions, and any other relevant data (e.g., 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.

The TB report must include figures documenting the existing travel demands by mode. A photographic inventory of the transportation network elements in the vicinity of the proposed access points would be beneficial to staff in their review of the Consultant's report.

#### Demand Forecasting

- Trip generation forecasts

#### Impact Analysis

- Qualitative assessment of impacts on capacity; non-auto modes; on-site circulation; community

#### Mitigation Measures and Site Design Characteristics

The TB must identify all mitigation measures required to offset network impacts from the development. The TB must also identify key site design features required to implement the Official Plan and Transportation Master Plan policies regarding site development.

The TB must include all of the following, where they are required by the subject development:

- Location and timing of proposed changes to existing traffic controls at intersections (e.g., new traffic signals, Stop signs, etc.);
- Mitigation measures required to offset impacts on the surface and Rapid Transit networks;
- New or modified elements of the bicycle and pedestrian networks;
- Community impact mitigation measures; and
- Proposed TDM features or programs to support the site development.

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## EXECUTIVE SUMMARY

Claridge Homes is proposing a residential/commercial development at 175 Richmond Road and 350 Kirkwood Avenue in Ottawa.

The development will replace a one to two storey building which contains specialty retail uses such as a travel agency, hair salon, dance academy, yoga studio, paint store, electrical equipment wholesaler, and sign shop, as well as an engineering office. The site currently has an access onto Richmond Road and has five loading bays on Wilber Street. Access on Wilber Street is poorly defined as there is no curb line and no differentiation between the asphalt loading area and the paved roadway.

The proposed development will consist of a 9 storey residential building with ground floor commercial at 175 Richmond Road and a 6 storey residential building at 350 Kirkwood Avenue. The two buildings will be adjoined at levels two through five and will have a common underground parking garage. The development is to be constructed in two phases. Phase 1 will include the 6 storey building at 350 Kirkwood Avenue with 140 residential units. A two-level underground parking garage with access onto Wilber Street will also be constructed as part of Phase 1 and will provide a total of 310 vehicle parking spaces for both buildings. Phase 2 will include the 9 storey building at 175 Richmond Road with 99 residential units and 6,622 ft<sup>2</sup> of ground floor commercial.

Occupancy of Phase 1 is planned for 2013 and occupancy of Phase 2 is planned for 2016.

An urban cross section is proposed for Kirkwood Avenue with curb bulb-outs and parking along the west side. The proposed roadway section will accommodate an 8.5 meter asphalt driving surface, 2.5 meter on-street parking, a 1.8 meter sidewalk and a 2.8 meter boulevard on the west side. An urban cross section with on-street parking, sidewalk and boulevard is also proposed on Wilber Street adjacent to the site.

The intersections to be evaluated in this report were discussed with City staff prior to the initiation of the assessment. The time periods for analysis include the weekday a.m. and p.m. peak hours. Analysis has been completed for the existing and total traffic conditions.

Traffic generated by other study area developments is not typically reviewed within the context of a Transportation Brief; however in consultation with City staff it was determined that it would be appropriate to consider an ongoing development application at 114 Richmond Road, known locally as the Convent site. Trips generated by the Convent Site were taken from the *Community Transportation and Traffic Impact Study* produced for that development. Trips generated by the subject development have been estimated using peak hour rates identified in the *ITE Trip Generation Manual, 8<sup>th</sup> Edition*. Total traffic volumes have been calculated by summing the existing traffic volumes, site traffic volumes generated by the Convent site, and net site traffic volumes generated by the subject development.

Intersection capacity analysis was undertaken for the existing and total traffic conditions. Provisions for non-auto travel modes were assessed, including access to local pedestrian, bicycle and transit systems. The proposed on-site design was reviewed in terms of vehicle access, on-site parking, and loading activities. Potential for community impacts and conformance to TDM principles were also evaluated. The main conclusions and recommendations of this report are as follows:

- The net site traffic represents 1 to 2% of the total traffic volumes at the upstream and downstream intersections of Scott Street/Clifton Road and Richmond Road/Kirkwood Avenue.
- Based on the assumptions outlined in this report, the net traffic added to Clifton Road as a result of the proposed development is expected to be in the order of 5 to 10 vehicle trips per hour.
- No significant increases in v/c ratios and queue lengths are expected at study area intersections as a result of the net site traffic.
- The proposed development includes adequate provisions for non-auto travel modes, including easy access to local pedestrian, bicycle, and transit systems.
- The proposed access will be within 0.9 meters of the westerly property line measured at the Wilber Street right-of-way limit and will require a waiver of the Private Approach By-law.
- The proposed number of vehicle parking spaces satisfies the minimum and maximum requirements of the Zoning By-law. On-site bicycle parking will be provided in accordance with the requirements of the by-law.
- Garbage collection, loading activities and moving operations are expected to take place at the curb on the west side of Kirkwood Avenue.
- Parking infiltration onto area roadways is not anticipated. The proposed development will result in a net loss of four marked on-street parking spaces.
- Possible TDM measures that could help achieve the community-wide auto share reduction target of 13% have been highlighted for review.



## 1.0 INTRODUCTION

### 1.1 Proposed Development

Claridge Homes is proposing a residential/commercial development at 175 Richmond Road and 350 Kirkwood Avenue in Ottawa. The site has an area of 6,386 m<sup>2</sup> (68,745 ft<sup>2</sup>) and is located west of Kirkwood Avenue between Richmond Road and Wilber Avenue, as shown in Figure 1.

**Figure 1 – Key Plan**



Photo courtesy of [www.bing.com/maps](http://www.bing.com/maps)

The development will replace a one to two storey building which contains specialty retail uses such as a travel agency, hair salon, dance academy, yoga studio, paint store, electrical equipment wholesaler, and sign shop as well as an engineering office at the north end of the site. The site currently has an access onto Richmond Road and has five loading bays on Wilber Street. Access on Wilber Street is poorly defined as there is no curb line and no differentiation between the asphalt loading area and the paved roadway. The existing conditions are shown in Figure 2.

Surrounding land uses include single family dwellings to west, the West Village Subdivision to the north (two and three storey semi-detached and townhouse units), the Canadian Bank Note Company to the east and the Real Canadian Superstore to the south.

Under the City of Ottawa's Zoning By-Law, the site is designated as General Industrial permitting a wide variety of uses including:

- daycare
- drive-through facility
- emergency services
- heavy equipment and vehicle sales



- rental and servicing
- light industrial
- office
- research and development center
- parking garage or parking lot
- service and repair shop
- storage yard, and
- training center.

The developer is seeking to rezone the site to Traditional Mainstreet permitting mid to high-rise apartments, dwelling units, retail, retail food, restaurant, personal service business, office, daycare, convenience store, bank, bank machine, and artist studio uses.

The proposed development will consist of a 9 storey residential building with ground floor commercial at 175 Richmond Road and a 6 storey residential building at 350 Kirkwood Avenue. The two buildings will be adjoined at levels two through five and will have a common underground parking garage. The development is to be constructed in two phases. Phase 1 will include the 6 storey building at 350 Kirkwood Avenue with 140 residential units. A two-level underground parking garage with access onto Wilber Street will also be constructed as part of Phase 1 and will provide a total of 310 vehicle parking spaces for both buildings. Phase 2 will include the 9 storey building at 175 Richmond Road with 99 residential units and 6,622 ft<sup>2</sup> of ground floor commercial. The proposed site plan is shown in Figure 3. Proposed building elevations are shown in Figures 4 and 5.

Occupancy of Phase 1 is planned for 2013 and occupancy of Phase 2 is planned for 2016.

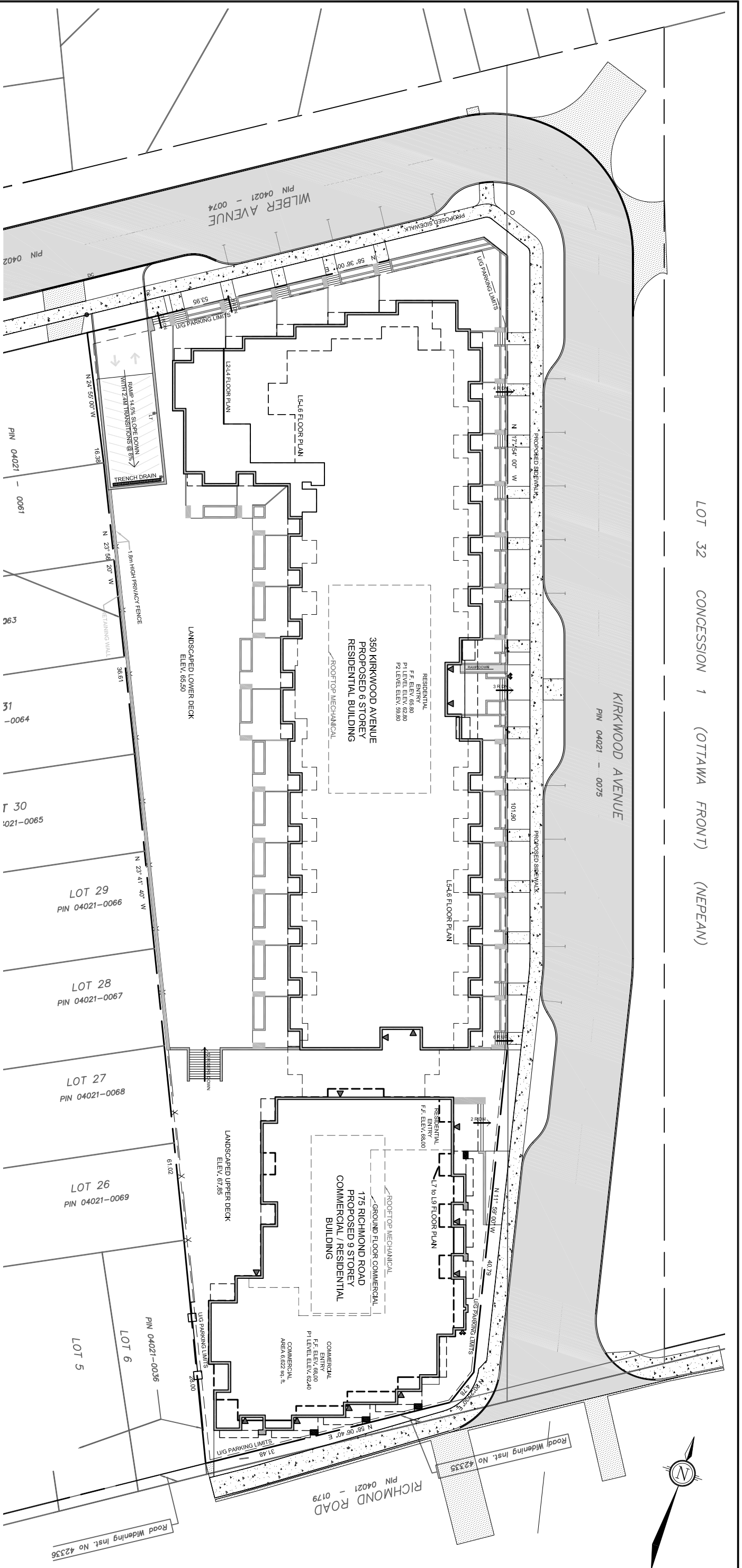
Based on discussions with FoTenn Consultants, it is our understanding that at the pre-consultation meeting City staff requested that an urban cross section with curb bulb-outs and parking along the west side be implemented on Kirkwood Avenue adjacent to the site. As shown in the Site Plan, a 4.5 meter shift to the east is proposed to accommodate an 8.5 meter road with on-street parking, a 1.8 meter sidewalk and a 2.8 meter boulevard along the west side. An urban cross section with on-street parking, sidewalk and boulevard is also proposed on Wilber Street adjacent to the site. The proposed road modifications should be constructed in accordance with City standards.

As discussed with City staff, a corner sight triangle of 3 meters by 3 meters should be provided at the corner of Wilber Street and Kirkwood Avenue.

## 1.2 Analysis Methods

The 2006 City of Ottawa *Transportation Impact Assessment (TIA) Guidelines* identify three types of reports that may be required depending on the type and size of development proposal. Zoning By-law (ZBL) Amendment applications for developments expected to generate fewer than 75 vehicle trips per hour require no TIA report, as the City is satisfied that the transportation impacts can be accommodated without the need for roadway accommodations. Applications for Site Plan Control generally represent more developed concepts and the City is concerned about operational and safety issues as well as capacity.

As the subject development proposal requires ZBL and SP approval and is expected to generate 25 to 40 net vehicle trips per hour (outlined in Section 3.0 of this report), a Transportation Brief



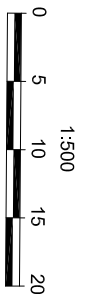
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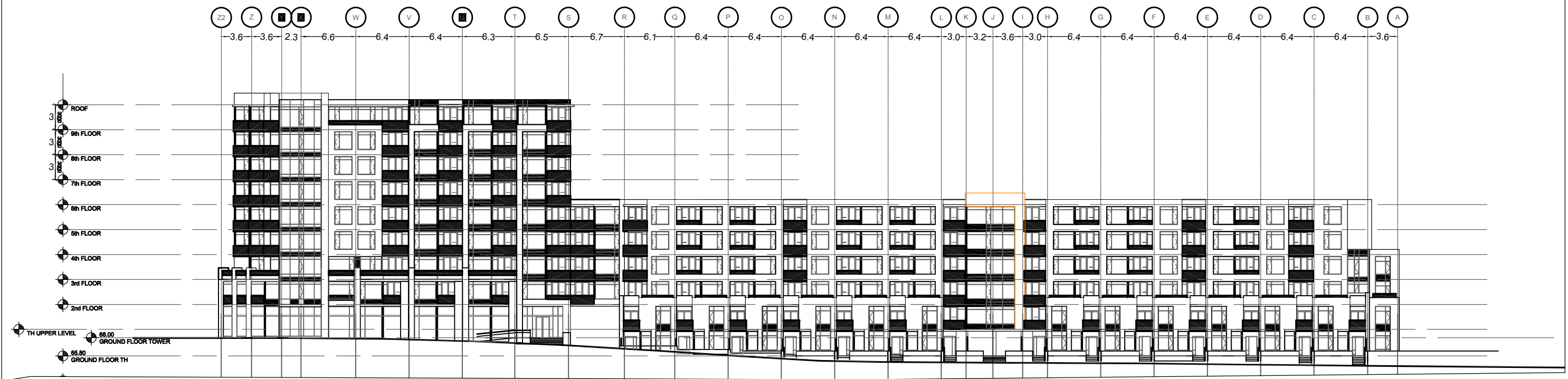


175 RICHMOND ROAD

SITE PLAN

SEPT. 2011 111130 FIGURE 3

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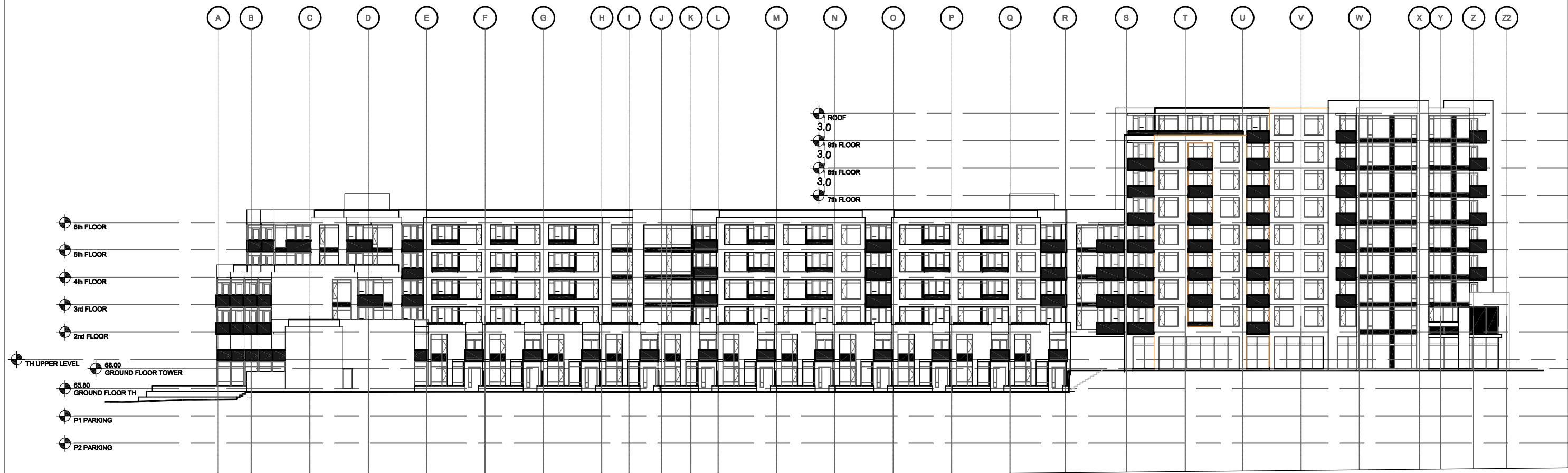
EAST ELEVATION - KIRKWOOD AVENUE  
N. T. S.



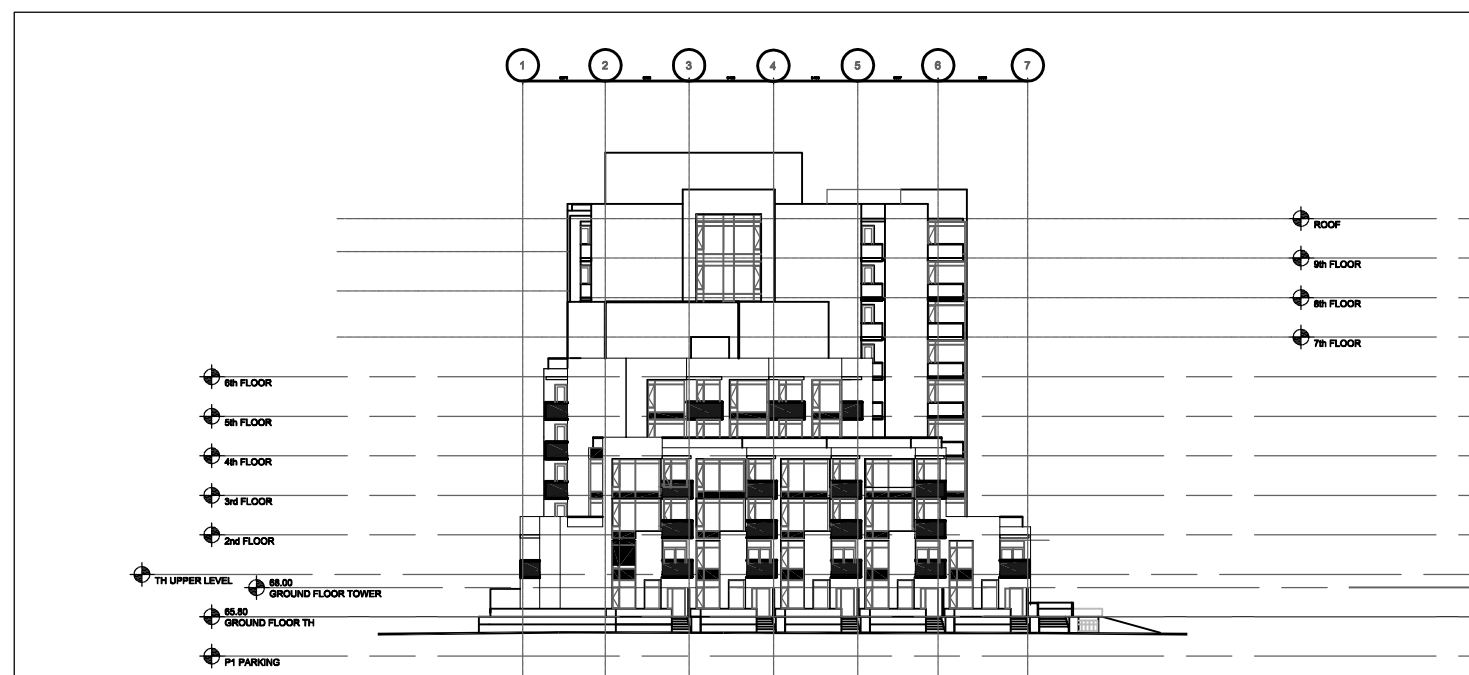
SOUTH ELEVATION - RICHMOND ROAD  
N. T. S.

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SCALE	RICHMOND ROAD (175 RICHMOND ROAD)	
(NTS)	BUILDING ELEVATIONS - EAST AND SOUTH	
SEP/30/2011	111105	FIGURE 4



WEST ELEVATION  
N. T. S.



NORTH ELEVATION - WILBER STREET  
N. T. S.

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SCALE	RICHMOND ROAD (175 RICHMOND ROAD)	
(PROFILE NTS)	BUILDING ELEVATIONS - WEST AND NORTH	
	SEP/30/2011	FIGURE 5

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should provide the appropriate level of analysis. This was discussed and confirmed with City staff prior to the preparation of this report.

Intersection capacity analysis has been completed using the Synchro 6.0 software package. This software uses methodology from the *Highway Capacity Manual 2000* (HCM) published by the Transportation Research Board to evaluate signalized and unsignalized intersections.

Intersection operating conditions are commonly described in terms of a Level of Service (LOS). LOS is a quality measure of speed, freedom to manoeuvre, interruptions, comfort and convenience. Letters are assigned to six levels with LOS 'A' representing optimal operating conditions and LOS 'F' representing failing operating conditions.

The City of Ottawa has adopted criteria that directly relate the LOS of a signalized intersection to a volume to capacity (v/c) ratio. Vehicle capacity is defined as the maximum number of vehicles that can pass a given point during a specified period under prevailing traffic conditions. The City's criteria are as follows:

LOS	v/c ratio
A	0 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	>1.00

The LOS for an unsignalized intersection is based on average control delay and is defined for individual movements. Control delay includes initial deceleration, queue move-up time, stopped time and final acceleration. The HCM presents the following criteria relating the LOS for individual movements to average control delay:

LOS	Delay (sec/veh)
A	<10
B	10 to 15
C	15 to 25
D	25 to 35
E	35 to 50
F	>50

In this study, movements at signalized and unsignalized intersections have been evaluated in terms of the LOS as defined in the above tables. Mitigation measures in the form of additional lane capacity and/or signal adjustments have been identified for movements with a LOS E or F.

Other types of analysis undertaken to assess the transportation impacts of the proposed development are as follows:

- assessment of provisions for non-auto travel modes, including access to local pedestrian, bicycle and transit systems,
- review of on-site design including vehicle access, parking and loading/unloading activities,
- evaluation of potential community concerns including neighbourhood infiltration, parking impacts, and conformance with Transportation Demand Management (TDM) principles.

### **1.3 Analysis Parameters**

The study area for this report was discussed with City staff and includes the proposed access as well as the following intersections:

- Richmond Road and McRae Avenue
- Richmond Road and Kirkwood Avenue
- Richmond Road and Patricia Avenue
- Scott Street and Clifton Road
- Byron Avenue and Kirkwood Avenue

The time periods for analysis include the weekday a.m. and p.m. peak hours, as these periods represent the “worst case” combination of site-generated traffic and adjacent roadway traffic.

Analysis has been completed for the existing and “total” traffic conditions. The total traffic condition includes existing traffic, projected site traffic and traffic generated by other known developments within the study area.

## **2.0 EXISTING CONDITIONS**

### **2.1 Roadways**

Richmond Road is an east-west arterial extending between Robertson Road and Island Park Drive. It is designated as an urban truck route east of Holly Acres Road. Within the study area Richmond Road has a four-lane cross section with a posted speed of 50 km/hr and a right-of-way (ROW) protection of 20 meters. One-hour on-street parking is permitted from 7 a.m. to 7 p.m. on the south side of Richmond Road and on the north side, west of Kirkwood Avenue. East of Kirkwood Avenue one hour on-street parking is permitted on the north side from 7 a.m. to 3:30 p.m. with no stopping between 3:30 p.m. and 5:30 p.m.

Scott Street is an east-west arterial extending between Churchill Avenue and Bayview Road. It is designated as an urban truck route. Within the study area Scott Street has a two-lane cross section with a posted speed of 50 km/hr and a ROW protection of 26 meters.

Byron Avenue is an east-west collector extending between Holland Avenue and Woodroffe Avenue. Byron Avenue continues west of Woodroffe Avenue as a local roadway and terminates at Richardson Avenue. Within the study area Byron Avenue has a two-lane cross section with an unposted speed of 50 km/hr.



Wilber Street is an east-west local extending between Clifton Road and Kirkwood Avenue. It has a rural two-lane cross section and an unposted speed of 50 km/hr.

Kirkwood Avenue is a north-south arterial extending between Merivale Road and Richmond Road. Kirkwood Avenue continues north of Richmond Road as a local roadway and terminates at Wilber Street. Within the study area Kirkwood Avenue has a two-lane cross section with a posted speed of 50 km/hr. South of Richmond Road Kirkwood Avenue has a ROW protection of 26 meters. North of Richmond Road, on-street parallel parking is permitted on the west side of Kirkwood Avenue for a distance of approximately 25 meters. North of this, on-site angled parking is provided for patrons and employees of the existing stores and office. A total of 16 angled parking spaces are painted along the east side of Kirkwood Avenue immediately north of Richmond Road. North of these spaces, additional angled parking occurs within the City's ROW. This area does not appear to meet current standards for legal on-street parking.

McRae Avenue, Clifton Road and Patricia Avenue are north-south local roadways within the study area. All have an unposted speed limit of 50 km/hr. McRae Avenue is designated as an urban truck route with restricted loads. One-hour on-street parking is permitted on the east side of Clifton Road from 7 a.m. to 7 p.m., Monday to Friday. Traffic calming measures have been implemented along Clifton Road including mid-block and intersection narrowings, as well as mid-block speed humps. These measures were implemented per the recommendations of the 1996 *Island Park, Kirkwood and Churchill Avenue Area Transportation Assessment and Traffic Calming Plan*. The report identified Clifton Road as having excessive traffic volumes that impacted the quality of life of the residents. Issued addressed by the traffic calming measures included cut through traffic and speeding. Excerpts from the report regarding the recommended measures are included in Appendix A.

Photos of Wilber Street, Kirkwood Avenue and Clifton Road are included in Appendix B.

## 2.2 Intersections

Intersection control, auxiliary turning lanes and turn restrictions are described as follows for each of the study area intersections:

- Richmond Road/McRae Avenue operates under traffic signal control; designated left-turn lanes are provided on the west, east and south approaches.
- Richmond Road/Kirkwood Avenue operates under traffic signal control; a designated left-turn lane is provided on the south approach. Pedestrian priority markings are provided at the crosswalks on the west and south legs.
- Richmond Road/Patricia Avenue operates under traffic signal control; no auxiliary turn lanes are provided.
- Scott Street/Clifton Road is a tee intersection with stop control on the side street approach (Clifton Road) and free flow along Scott Street. The northbound right turn movement is restricted from 3 p.m. to 6 p.m., Monday to Friday and the westbound left turn movement is restricted from 7 a.m. to 9 a.m., Monday to Friday.



travels between Britannia Park in the west and Pretoria Avenue in the east on 20 to 30 minute headways during weekday peak hours.

## 2.4 Bicycle Facilities

A City-owned recreational pathway runs parallel to the Transitway along the north side of Scott Street between the Ottawa River Parkway and Island Park Drive. A City-owned pathway also runs along the north side of Byron Avenue between Churchill Avenue and Holland Avenue.

Richmond Road and Scott Street are identified as an on-road cycling routes in Ottawa's 2008 *Transportation Master Plan* (TMP).

Richmond Road has recently been reconstructed and now provides shared-use lanes in both directions.

The recommended cycling network outlined in the 2008 *Ottawa Cycling Plan* (OCP) designates Scott Street and Richmond Road as Spine or City-wide cycling routes. Byron Avenue, Clifton Road north of Wilber Street, Wilber Street and Kirkwood Avenue are designated as Community cycling routes. A signed bicycle route with shared use lanes are proposed on Byron Avenue, Kirkwood Avenue and on Clifton Road north of Wilber Street. The recommended width for shared use lanes is 3.75 meters to 4.25 meters. An off-road pathway is proposed along Wilber Street and bicycle lanes are proposed on Scott Street.

The following facilities are part of the ten-year implementation plan (2008-2018):

- shared use lanes on Byron Avenue
- shared use lanes on Clifton Road north of Wilber Street and on Kirkwood Avenue
- off-road pathway along Wilber Street

The following facilities are part of the long-term implementation plan (2018-2028):

- bicycle lanes on Scott Street

## 2.5 Pedestrian Facilities

Concrete sidewalks are provided along both sides of Richmond Road and Kirkwood Avenue south of Richmond Road within the study area. Concrete sidewalk is provided on the south side of Byron Avenue and the east side of McRae Avenue. Asphalt sidewalk is provided on the west side of McRae Avenue, the west side of Clifton Road south of Wilber Street and the west side of Kirkwood Avenue north of Richmond Road for a distance of 40 meters. An asphalt pathway is provided on the east side of Patricia Avenue connecting Richmond Road with Scott Street. An asphalt pathway also connects Wilber Street with the West Village subdivision north of the subject site.

As indicated in the previous section, recreational pathways run along the north side of Scott Street between the Ottawa River Parkway and Island Park Drive and along the north side of Byron Avenue between Churchill Avenue and Holland Avenue.

## 2.6 Existing Traffic Volumes

Eight-hour traffic counts were completed by the City of Ottawa at study area intersections as noted below:

- Richmond Road and McRae Avenue (August 2009)
- Richmond Road and Kirkwood Avenue (June 2011)
- Richmond Road and Patricia Avenue (June 2011)
- Scott Street and Clifton Road (June 2011)
- Kirkwood Avenue and Byron Avenue (August 2010)

Copies of the above counts were obtained from the Transportation, Utilities and Public Works Department. Peak hour summary sheets are included in Appendix C.

Existing traffic volumes are shown in Figure 7 for the weekday a.m. and p.m. peak hours.

## 3.0 TRAVEL DEMAND FORECASTING

### 3.1 Other Study Area Developments

Traffic generated by other study area developments is not typically reviewed within the context of a Transportation Brief; however in consultation with City staff it was determined that it would be appropriate in this case given the size and nature of an ongoing development application at 114 Richmond Road, known locally as the Convent site. The site is southeast of the Richmond Road/Patricia Avenue intersection and has an area of approximately 2.2 ha (5.46 acres).

The *114 Richmond Road: Mixed-Use Redevelopment Project Community Transportation and Traffic Impact Study* was published in April 2010 and describes the proposal as a mixed-use development consisting of the following components:

#### **Residential**

Senior Condos	96 units
Senior Suites	88 units
Retirement Units	96 units
Residential Condo Apartments	<u>428 units</u>
<b>Total</b>	<b>708 units</b>

#### **Non-Residential**

Retail	1393.5 m <sup>2</sup> (15,000 ft <sup>2</sup> )
Commercial	4737.9 m <sup>2</sup> (51,000 ft <sup>2</sup> )
Communal	4645 m <sup>2</sup> (50,000 ft <sup>2</sup> )
Common in Seniors	<u>2787 m<sup>2</sup> (30,000 ft<sup>2</sup>)</u>
<b>Total</b>	<b>13563.4 m<sup>2</sup> (146,000 ft<sup>2</sup>)</b>



Excerpts from the CTS/TIS showing the latest concept plan and site-generated traffic assignments are included in Appendix D. Background traffic assignments for development projects at 119 and 121 Richmond Road and 1433 and 1451 Wellington Street are also included.

### 3.2 Trip Generation

Trips generated by the existing specialty retail uses and engineering office to be replaced by the proposed development have been estimated using peak hour rates identified in the *ITE Trip Generation Manual, 8<sup>th</sup> Edition*. Trips generated by the proposed uses have been estimated using the ITE rates for residential condominiums/townhouses (Land Use Code 230) and specialty retail (Land Use Code 814).

The trip generation surveys compiled in the *ITE Trip Generation Manual* only record vehicle trips, and the sites surveyed are typically located in suburban locations in the United States where non-auto modes of transportation typically have a modal share of 10% or less. For urban infill developments where multiple modes of transportation are readily available, it is considered good practice to express projected trip generation volumes in terms of person trips, instead of vehicle trips. To convert ITE vehicle trip rates to person trip rates, a vehicle occupancy factor and non-auto usage factor have been applied.

The ITE office land use specifies a vehicle occupancy factor of 1.1. A vehicle occupancy factor of 1.23 (taken from the TRANS O-D survey Report) has been applied for all other uses in the absence of use-specific data. As non-auto trips are not recorded in the ITE surveys, a non-auto usage factor of 1.1 has been assumed for all existing and proposed uses. Combining the two factors gives an overall vehicle trip to person trip adjustment factor of 1.21 for the existing office use and 1.35 for all other existing and proposed uses. These factors were applied to the vehicle trips projected by the ITE rates to estimate the number of person trips generated by the site in the a.m. and a.m. peak hours. The estimated peak hour person trips are shown in the following table.

**Table 1: Person Trip Generation**

Land Use	Code	Units	AM Peak			PM Peak		
			In	Out	Total	In	Out	Total
<i>Existing</i>								
Office <sup>2</sup>	715	58 staff	50	6	56	10	60	70
Specialty Retail	814	31,200 ft <sup>2</sup>	20	12	32	57	73	130
<b>Existing</b>			<b>70</b>	<b>18</b>	<b>88</b>	<b>67</b>	<b>133</b>	<b>200</b>
<i>Proposed</i>								
Residential Condos/Towns	230	239	24	116	140	112	55	167
Specialty Retail <sup>3</sup>	814	6,622 ft <sup>2</sup>	9	5	14	23	30	53
<b>Proposed</b>			<b>33</b>	<b>121</b>	<b>154</b>	<b>135</b>	<b>85</b>	<b>220</b>

Notes:

1. The office ITE trip generation rate has been adjusted using a person trip adjustment factor of 1.21; other ITE trip generation rates have been adjusted using a factor of 1.35.
2. Number of employees confirmed with tenant via telephone conversation.
3. No data available for the 7 a.m. to 9 a.m. peak hour of adjacent street traffic. Rate approximated using the a.m. to p.m. proportion of the Shopping Center related land use (Code 820).

The number of auto, transit and non-auto mode trips was then estimated based on the total number of person trips generated by the development.

The Traffic Impact Study prepared in support of the *Richmond Road/Westboro Community Design Plan, 2006*, determined that a 40% transit modal split would be required by 2021 to accommodate anticipated community growth and avoid the need for road widening along Richmond Road. This was based on the assumption that all trips exceeding the capacity of the Richmond Road corridor were shifted from private automobile to transit. The *Richmond Road/Westboro Transportation Management Implementation Plan (TMIP), October 2010*, re-framed the 40% transit modal split target in terms of a target reduction to auto modal share in order to include other modes such as walking, cycling and other transportation demand management (TDM) techniques. A target p.m. peak period auto modal share reduction of 13% was set to accommodate projected growth and provide an adequate level of service. A number of pedestrian, cycling, transit and other TDM initiatives are recommended in the TMIP to achieve the targeted auto modal share reduction.

As the developer has no control over the implementation of community-wide pedestrian, cycling, transit and parking initiatives, the observed modal shares identified in the *2005 Trans O-D Survey Report* specific to the Ottawa West district were used to break the number person trips into auto, transit and non-auto trips. Possible measures that may be implemented at the site plan level to help achieve the community-wide auto share reduction target are outlined in Section 8.0 of this report.

The modal share values applied to trips generated by the existing and proposed specialty retail relate specifically to the observed trips from the TRANS O-D survey that had an origin and destination within the Ottawa West district, as it is considered unlikely that specialty retail would generate a significant volume of trips with an origin or destination beyond the Ottawa West district. The modal shares for trips generated by the existing office and proposed residential units relate to all observed trips within the Ottawa Inner Area, including those with an origin or destination beyond that area.

A breakdown of existing and proposed trips by modal share is given in the tables below.

**Table 2: Existing Site-Generated Trips by Modal Share**

Travel Mode	Modal Share	AM Peak			PM Peak		
		In	Out	Total	In	Out	Total
<i>Existing Office</i>							
Total Person Trips		50	6	56	10	60	70
<b>Auto Driver</b>	<b>55%</b>	<b>27</b>	<b>3</b>	<b>30</b>	<b>5</b>	<b>33</b>	<b>38</b>

Travel Mode	Modal Share	AM Peak			PM Peak		
		In	Out	Total	In	Out	Total
Auto Passenger	15%	7	1	8	1	8	9
Transit	25%	13	2	15	3	15	18
Non-Auto	5%	3	0	3	1	4	5
<i>Existing Specialty Retail</i>							
Total Person Trips		20	12	32	57	73	130
<b>Auto Driver</b>	<b>40%</b>	<b>8</b>	<b>5</b>	<b>13</b>	<b>23</b>	<b>29</b>	<b>52</b>
Auto Passenger	10%	2	1	3	5	8	13
Transit	10%	2	1	3	6	7	13
Non-Auto	40%	8	5	13	23	29	52
<i>Total Existing</i>							
Total Person Trips		70	18	88	67	133	200
<b>Auto Driver</b>		<b>35</b>	<b>8</b>	<b>43</b>	<b>28</b>	<b>62</b>	<b>90</b>
Auto Passenger		9	2	11	6	16	22
Transit		15	3	18	9	22	31
Non-Auto		11	5	16	24	33	57

**Table 3: Proposed Site-Generated Trips by Modal Share**

Travel Mode	Modal Share	AM Peak			PM Peak		
		In	Out	Total	In	Out	Total
<i>Proposed Residential Condos/Towns</i>							
Total Person Trips		24	116	140	112	55	167
<b>Auto Driver</b>	<b>55%</b>	<b>13</b>	<b>64</b>	<b>77</b>	<b>62</b>	<b>30</b>	<b>92</b>
Auto Passenger	10%	3	11	14	11	6	17
Transit	25%	6	29	35	28	13	41
Non-Auto	10%	2	12	14	11	6	17
<i>Proposed Specialty Retail</i>							
Total Person Trips		9	5	14	23	30	53
<b>Auto Driver</b>	<b>40%</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>9</b>	<b>12</b>	<b>21</b>
Auto Passenger	10%	1	0	1	3	3	6
Transit	10%	1	1	2	2	3	5
Non-Auto	40%	3	2	5	9	12	21



Travel Mode	Modal Share	AM Peak			PM Peak		
		In	Out	Total	In	Out	Total
<i>Total Proposed</i>							
Total Person Trips		33	121	154	135	85	220
<b>Auto Driver</b>		<b>17</b>	<b>66</b>	<b>83</b>	<b>71</b>	<b>42</b>	<b>113</b>
Auto Passenger		4	11	15	14	9	23
Transit		7	30	37	30	16	46
Non-Auto		5	14	19	20	18	38

The existing and proposed specialty retail uses likely (and will likely) generate primary and pass-by trips. Primary trips are made for the specific purpose of visiting the site and pass-by trips are made as an intermediate stop on the way to another destination. It is assumed that 20-30% of the auto trips generated by the specialty retail will consist of pass-by trips that are already reflected in the existing study area traffic volumes. Of the 6 auto trips generated by the proposed retail space during the a.m. peak hour, approximately 2 trips may be considered pass-by traffic. Of the 21 auto trips generated by the proposed retail space during the p.m. peak hour, approximately 6 trips may be considered pass-by traffic. Since the number of pass-by trips represents a small portion of the total auto trips, no reduction in site generated traffic has been made to account for pass-by trips.

When the existing trips are deducted from the proposed trips, Tables 2 and 3 show that the development is expected to generate a net total of 40 additional auto trips in a.m. peak hour and 23 additional auto trips in the p.m. peak hour.

### 3.3 Trip Distribution

The distribution of trips generated by the existing and proposed land uses has been estimated based on existing peak hour travel patterns within the study area and is summarized as follows:

- Existing and proposed retail
  - 50% to/from the west via Richmond Road; 50% to/from the east via Richmond Road
- Existing office
  - 25% to/from the east via Scott Street
  - 25% to/from the east via Richmond Road
  - 25% to/from the south via Kirkwood Avenue
  - 25% to/from the west via Richmond Road
- Proposed residential
  - 25% to/from the east via Scott Street
  - 30% to/from the east via Richmond Road
  - 25% to/from the south via Kirkwood Avenue
  - 20% to/from the west via Richmond Road

Existing, proposed and net peak hour site traffic is shown in Figures 8, 9, and 10.

Total traffic volumes have been calculated by summing the existing traffic volumes, site traffic volumes generated by development projects at 114 Richmond Road, 119 and 121 Richmond Road, 1433 and 1451 Wellington Street, and net site traffic volumes generated by the subject development.

Total traffic projections are shown in Figure 11.

#### 4.0 INTERSECTION ANALYSIS

Intersection capacity analysis has been completed for the study area intersections using the Synchro 6.0 software package.

##### 4.1 Existing Traffic

Intersection capacity analysis has been completed for the existing traffic conditions.

The analysis is based on existing lane configurations and traffic signal timing plans obtained from the Public Works & Services Department for each intersection.

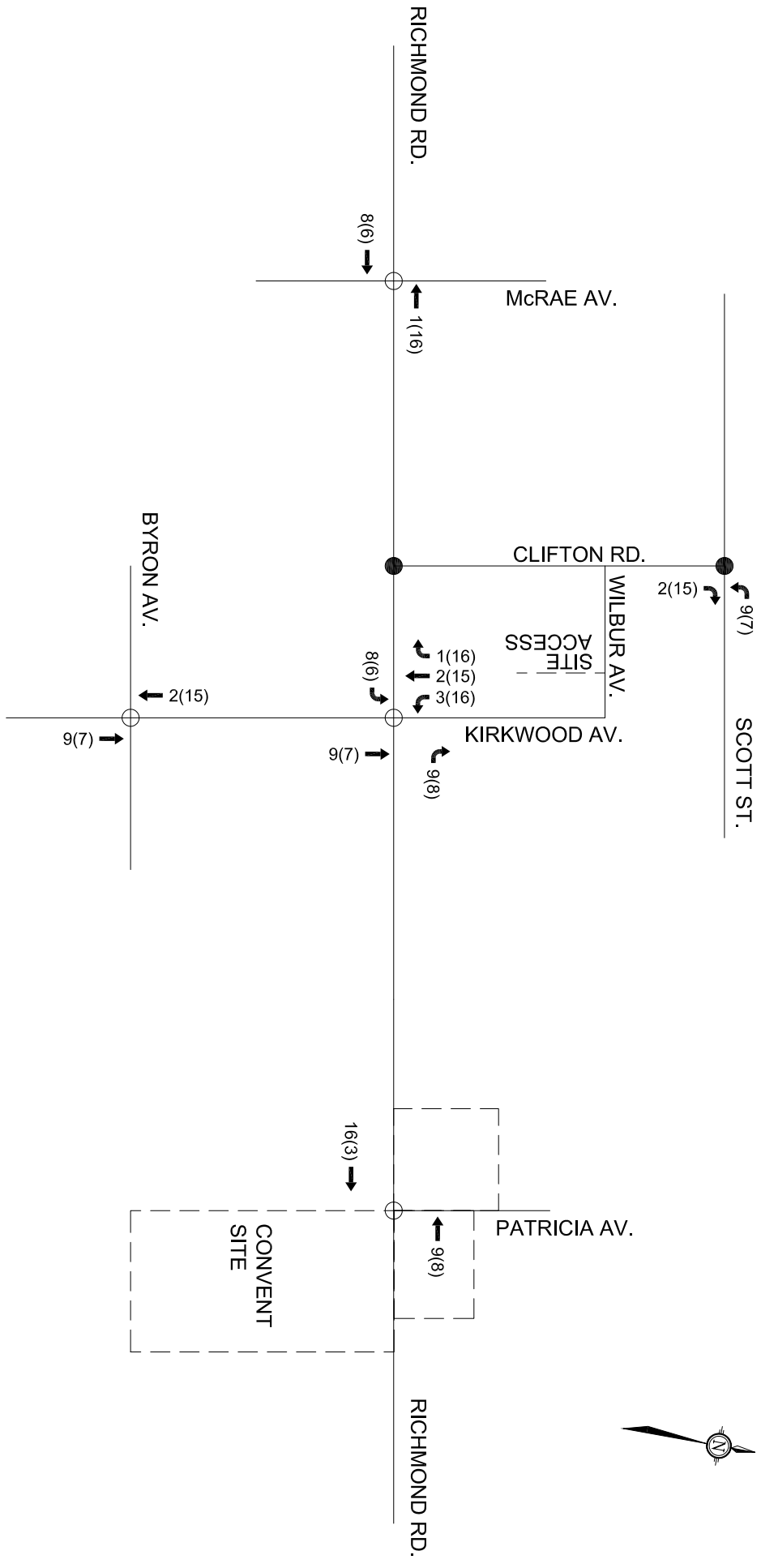
The results of the analysis are summarized in the following table for the weekday a.m. and p.m. peak hours. Detailed reports are included in Appendix E.

**Table 4: Intersection Analysis – Existing Traffic**

Intersection	AM Peak			PM Peak		
	max. v/c	LOS	movement	max. v/c	LOS	movement
Scott / Clifton	0.27	A	EB	0.30	A	EB
Richmond / McRae	0.29	A	SB	0.55	A	WBT/R
Richmond / Kirkwood	0.62	B	NBL	0.55	A	NBL
Richmond / Patricia	0.15	A	EB & WB	0.26	A	WB
Kirkwood / Byron	0.59	A	EB	0.81	D	WBT/L

As shown in the above table, all movements at study area intersections are operating at a LOS D or better, which reflects acceptable operating conditions according to City standards.

The Synchro software estimates queue lengths of approximately 80 meters at the westbound approach of the Richmond Road/Kirkwood Avenue intersection during the p.m peak. This extends just short of the Richmond Road/Hilson Avenue intersection to the east. This is consistent with observations made during a site visit conducted on Wednesday, September 21, 2011 between 5 p.m. and 6 p.m.



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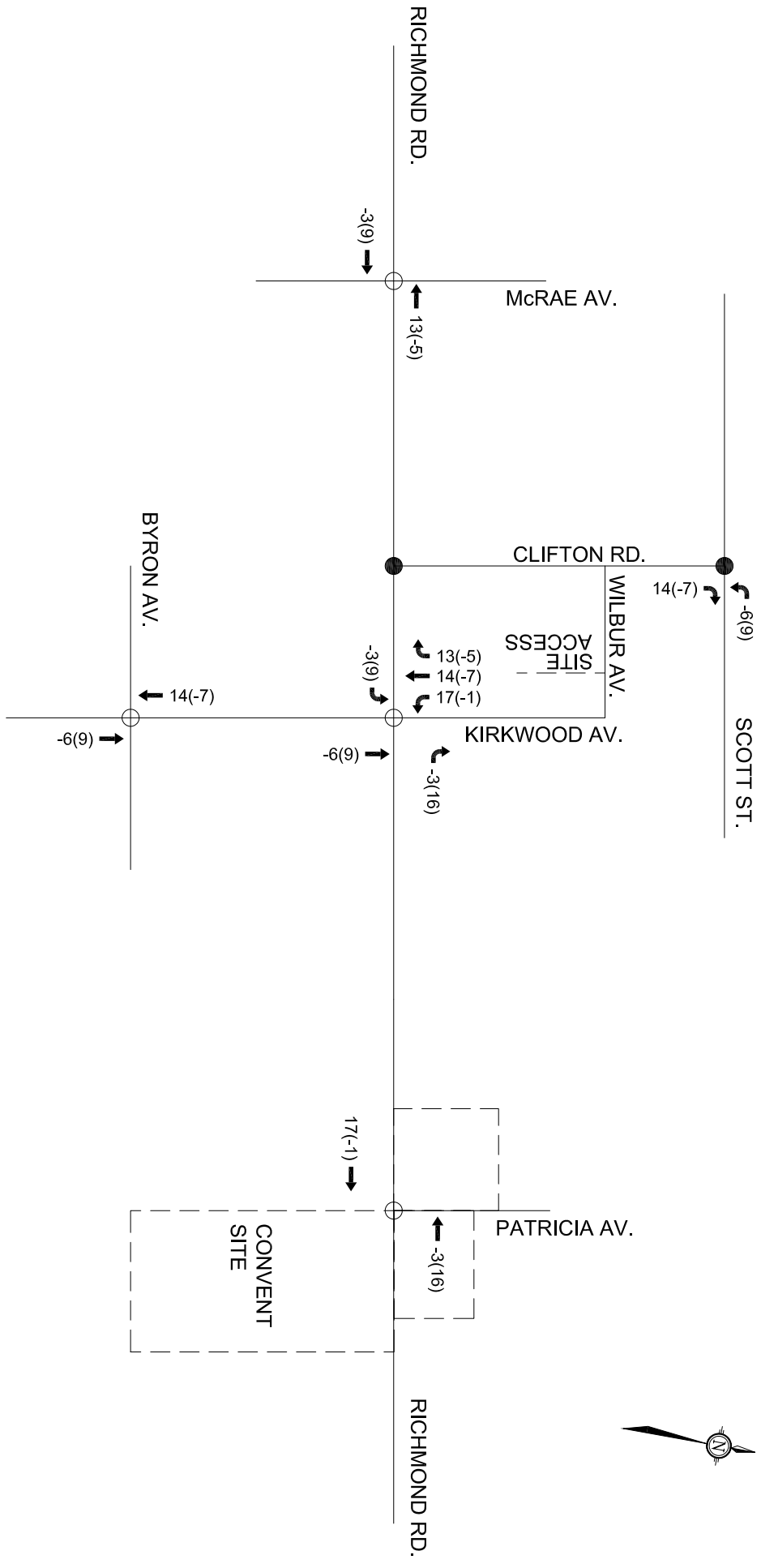
LEGEND	
●	Unsignalized Intersection
○	Signalized Intersection
xx VPH	AM Peak Hour
(xx) VPH	PM Peak Hour

175 RICHMOND ROAD

EXISTING SITE TRAFFIC

SEP 2011 111130 FIGURE 8





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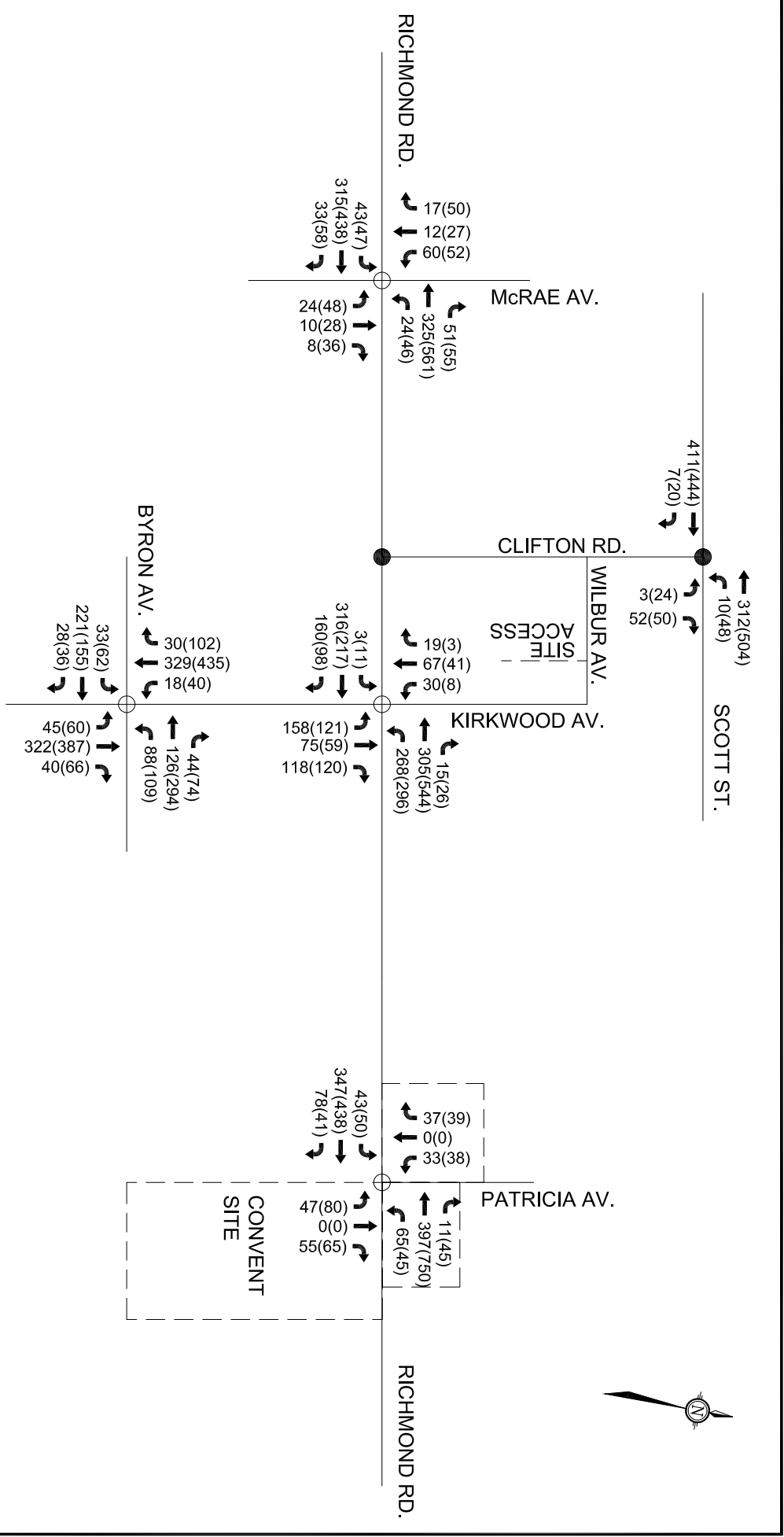
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LEGEND	
●	Unsignalized Intersection
○	Signalized Intersection
xx VPH	AM Peak Hour
(xx) VPH	PM Peak Hour

175 RICHMOND ROAD

NET SITE TRAFFIC

SEP 2011 111130 FIGURE 10



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**LEGEND**

- Unsignalized Intersection
- Signalized Intersection
- xx VPH AM Peak Hour
- (xx) VPH PM Peak Hour

**175 RICHMOND ROAD**

**TOTAL TRAFFIC VOLUMES**

SEP 2011    111130    **FIGURE 11**

The software identifies queue lengths of 80 to 90 meters at the westbound, northbound and southbound approaches of the Kirkwood Avenue/Byron Avenue intersection during the p.m. peak. Similar queues were observed for the westbound and southbound approaches during the aforementioned site visit. Shorter queues were observed for the northbound approach however typical conditions may have been impacted by ongoing construction at the Carling Avenue/Kirkwood Avenue intersection to the south.

## 4.2 Total Traffic

Intersection capacity analysis has been completed for the projected total traffic conditions. The projected total traffic includes existing traffic, site traffic generated by other known developments, and net site traffic generated by the subject development.

The analysis is based on existing lane configurations and traffic signal timing plans obtained from the Public Works & Services Department for each intersection.

The results of the analysis are summarized in the following table for the weekday a.m. and p.m. peak hours. Detailed reports are included in Appendix E.

**Table 5: Intersection Analysis – Total Traffic**

Intersection	AM Peak			PM Peak		
	max. v/c or delay	LOS	movement	max. v/c or delay	LOS	movement
Scott / Clifton	0.27	A	EB	0.30	A	EB
Richmond / McRae	0.35	A	WBT/R	0.56	A	WBT/R
Richmond / Kirkwood	0.65	B	NBL	0.58	A	WB
Richmond / Patricia	0.48	A	NB	0.61	B	NB
Kirkwood / Byron	0.62	B	EB	0.84	D	WBT/L

The net site traffic represents 1 to 2% of the total traffic volumes at the upstream and downstream intersections of Scott Street/Clifton Road and Richmond Road/Kirkwood Avenue. The existing two-way p.m. peak traffic on Clifton Road is 140 vehicles per hour. Based on the assumptions outlined in this report, the net traffic added to Clifton Road as a result of the proposed development is expected to be in the order of 5 to 10 vehicle trips per hour.

No significant increases in v/c ratios and queue lengths are expected at study area intersections as a result of the net site traffic. The northbound queue at Kirkwood Avenue/Byron Avenue is expected to increase from 90 meters to 130 meters in the p.m. peak. This is primarily a result of the additional traffic generated by other known developments (approximately 50 vph) rather than the subject development (approximately 10 vph).

## 5.0 PROVISIONS FOR NON-AUTO MODES

A new sidewalk is proposed along the west side of Kirkwood Avenue and the south side of Wilber Street, linking residents with the existing sidewalk along Richmond Road. The proposed development will eliminate the vehicle access that pedestrians walking along Richmond Road are currently required to cross. A new curb and sidewalk depression will be provided at the proposed vehicle access on Wilber Street.

On-site bicycle parking will be provided in accordance with the minimum and maximum requirements of the Zoning By-law. The minimum requirements are outlined in Section 6.0 below.

OC Transpo bus stops #7401 and #7402 are within a walking distance of approximately 130 meters from the main entrance of the 6 storey building at 350 Kirkwood Avenue. Bus stop #2389 is within a walking distance of approximately 90 meters from the same entrance.

## 6.0 ON-SITE DESIGN

This section of the report provides a review of the on-site design in terms of vehicle access, on-site parking, and on-site truck movements.

### 6.1 Proposed Access

The proposed access on Wilber Street is 36 meters east of Clifton Road as measured from the nearest edge of the access to the Clifton Road right-of-way limit. The access will have a width of 6.7 meters and will be within 0.9 meters of the westerly property line measured at the Wilber Street right-of-way limit. The City's Private Approach By-law requires a minimum distance of 3 meters from the access to any property line and a waiver of the By-law will be required for the access as shown in the proposed Site Plan.

Access to an adjacent single family home is within 0.75 meters of the site's westerly property limit. An existing cedar hedge separates the adjacent driveway and the subject site.

The existing site access on Richmond Road and the loading area on Wilber Street are to be removed as part of the proposed development.

### 6.2 On-Site Parking

The site is located in Area B of Schedule 1 to the Zoning By-law and within 600 meters of a rapid transit station. A minimum of 0.50 vehicle parking spaces per dwelling unit are required for the proposed residential use. In addition, a minimum of 0.2 visitor parking spaces per dwelling unit are required after the first 12 units. A minimum of 2.5 vehicle parking spaces per 100 m<sup>2</sup> of retail gross floor area (GFA) are required for the proposed commercial use. A minimum of 181 vehicle parking spaces are required for the development.

A maximum of 1.75 vehicle parking spaces per dwelling unit (combined total of resident and visitor parking) and 3.6 vehicle parking spaces per 100 m<sup>2</sup> of GFA are permitted. A maximum of 440 vehicle parking spaces are permitted for the development.



The proposed 310 vehicle parking spaces satisfy the minimum and maximum requirements of the Zoning By-law.

The By-law requires a minimum of 0.50 bicycle parking spaces per dwelling unit and 1 bicycle parking space per 250 m<sup>2</sup> of retail GFA, for a total of 122 bicycle parking spaces. On-site bicycle parking will be provided in accordance with the requirements of the Zoning By-law.

### **6.3 Loading Activities**

Two garbage rooms are proposed on the first underground parking level of the development.

Garbage collection, loading activities for the ground floor commercial and moving operations are expected to take place at the curb on the west side of Kirkwood Avenue. Specific details relating to the frequency and duration of loading activities are not available at this time.

The traffic count completed by the City of Ottawa in June 2011 shows a two-way total of 42 heavy vehicles on Kirkwood Avenue north of Richmond Road during the eight heaviest hours of traffic. Two loading docks for the Canadian Bank Note Company (CBNC) are located at the northeast corner of Wilber Street and Kirkwood Avenue. No stopping signs are currently provided along the north and east sides of both roadways to facilitate the heavy vehicle turning movements. A driveway to the surface parking lot for the CBNC is located approximately 10 meters north of the loading access.

## **7.0 COMMUNITY IMPACTS**

Access to the site will be provided via Wilber Street. Based on the trip distribution assumptions outlined in Section 3.3, approximately 25% of site generated traffic may choose Scott Street and Clifton Road for travel to and from the east. This amounts to a net increase of 5 to 10 vehicle trips in the weekday peak hours. The site-related impact on Clifton Road is expected to be minimal.

On-site parking will be provided in accordance with the minimum requirements of Zoning By-law. Parking infiltration onto area roadways is not anticipated.

On-street parallel parking is permitted on the west side of Kirkwood Avenue north of Richmond Road for a distance of approximately 25 meters. The size of legal on-street parking spaces is defined in the Traffic and Parking By-law as 7 meters for an internal space and 6 meters for an end space. Based on these criteria, there is room for 3 legal parking spaces on the west side of Kirkwood Avenue. These spaces will be maintained as part of the proposed development.

A total of 16 angled parking spaces are marked along the east side of Kirkwood Avenue immediately north of Richmond Road. These spaces provide three-hour parking from 7 a.m. to 7 p.m. North of these spaces, additional angled parking occurs within the City's ROW. This area does not appear to meet current standards for legal on-street parking. The proposed urban cross section will eliminate the 16 angled parking spaces marked along the east side of Kirkwood Avenue. However, a total of 12 parallel parking spaces are proposed along the west side of Kirkwood Avenue and the south side of Wilber Street as shown in the site plan drawing. The proposed development will result in a net loss of four marked on-street parking spaces.

## 8.0 TRANSPORTATION DEMAND MANAGEMENT

As noted in Section 3.2 of this report, the Richmond Road/Westboro TMIP recommends a number of pedestrian, cycling, transit and other TDM initiatives to achieve an auto modal share reduction of 13% by 2021.

Possible measures that may be implemented at the site plan level to help achieve the community-wide auto share reduction target are as follows:

- restrict availability of on-site parking
- unbundle parking space costs from dwelling/commercial units
- offer “bonus zoning” where certain restrictions may be relaxed for developments including TDM measures, ie. permit increased building height if developer provides free transit pass/car share (ie. Vrtucar) memberships to residents for one year.

The TMIP recommends that the City consider changing the parking cap from 1.75 to 1.5 spaces per unit for the areas within 600 meters of transit stations. This would result in a maximum of 381 parking spaces for the proposed development. The proposed number of on-site vehicle parking spaces (310) satisfies the recommended parking cap.

The TMIP suggests that unbundling parking spaces can typically be achieved through the following practices:

- a Condominium Association can own the parking spaces and rent them out to tenants on an as-needed basis;
- parking can be rented or bought separately when the apartment or commercial space is bought or leased;
- parking can be added as a separate line item in the purchase agreement so that it can be negotiated; or
- informally, tenants can rent spaces from each other, in order to match supply with demand.

These practices and the potential to provide free transit passes and/or dedicated car share vehicles in exchange for “bonus zoning” should be considered by the developer.

## 9.0 CONCLUSIONS AND RECOMMENDATIONS

The main conclusions of this report are summarized as follows:

- The net site traffic represents 1 to 2% of the total traffic volumes at the upstream and downstream intersections of Scott Street/Clifton Road and Richmond Road/Kirkwood Avenue.
- Based on the assumptions outlined in this report, the net traffic added to Clifton Road as a result of the proposed development is expected to be in the order of 5 to 10 vehicle trips per hour.

- No significant increases in v/c ratios and queue lengths are expected at study area intersections as a result of the net site traffic.
- The proposed development includes adequate provisions for non-auto travel modes, including easy access to local pedestrian, bicycle, and transit systems.
- The proposed access will be within 0.9 meters of the westerly property line measured at the Wilber Street right-of-way limit and will require a waiver of the Private Approach By-law.
- The proposed number of vehicle parking spaces satisfies the minimum and maximum requirements of the Zoning By-law. On-site bicycle parking will be provided in accordance with the requirements of the by-law.
- Garbage collection, loading activities and moving operations are expected to take place at the curb on the west side of Kirkwood Avenue.
- Parking infiltration onto area roadways is not anticipated. The proposed development will result in a net loss of four marked on-street parking spaces.
- Possible TDM measures that could help achieve the community-wide auto share reduction target of 13% have been highlighted for review.

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