

Mount Pleasant Block 51-1
Collector Road Environmental Assessment Study
and Transportation Study

Volume 1: Study Report



Prepared For:
Mount Pleasant Block 51-1 Landowner's Group

Final Submission
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Table of Contents

1.0	Executive Summary	1
1.1	Study Scope.....	1
1.2	Municipal Class Environmental Assessment Requirements.....	2
1.3	Findings of the Study	3
1.3.1	Structure and Staging of the Community	3
1.3.2	Transportation Performance Assessment	8
1.3.3	Road Standards	9
1.3.4	Transit	9
1.3.5	Active Transportation	10
1.3.6	Environmental Impacts and Mitigation.....	10
1.3.7	Next Steps and Commitment to Further Work.....	11
2.0	Introduction	13
2.1	Transportation Study and Collector Road EA.....	14
2.2	Report Structure.....	15
3.0	Planning Background	19
3.1	Mount Pleasant Secondary Plan and Block Plan	19
3.1.1	Mount Pleasant Secondary Plan (SPA 51).....	19
3.1.2	“Infrastructure Funding Strategy” Memorandum of Understanding.....	20
3.1.3	Block Plan and Supporting Studies.....	22
3.2	Phase 1 and 2 Transportation Master Plan Study	27
3.3	Other Planning Studies	30
3.3.1	Transportation and Transit Master Plan, 2009 Sustainable Update.....	30
3.3.2	Long Range Transportation Plan	30
3.4	City of Brampton Arterial Road EA Studies	31
3.4.1	James Potter / Creditview Road Re-alignment.....	31
3.4.2	Creditview Road Widening.....	31
3.4.3	Sandalwood Parkway Westward Extension	32
3.4.4	Wanless Drive	49
3.5	Region of Peel Arterial Road EA Studies	50
3.5.1	Mississauga Road.....	50
3.5.2	Bovaird Drive.....	51
3.5.3	Mayfield Road	51
3.6	Summary of Road Works: Status and Timing.....	53
3.7	Collector Road EA Requirements and Process.....	54
3.7.1	Notification of Study Commencement	55
3.7.2	Public Consultation	55
3.7.3	Changes in Phase 1 and 2 EA Recommendations.....	55

3.7.4	Next Steps.....	57
4.0	Community Structure	59
4.1	Objectives	59
4.2	Planning a Transit Oriented Community	59
4.2.1	Supportive Land Use Plan	59
4.2.2	Mixed Use Nodes.....	59
4.2.3	Spine Road	60
4.2.4	Mount Pleasant Village Mobility Hub	60
4.3	Staging of the Community.....	61
4.3.1	Block Development Sequence within the Mount Pleasant Secondary Plan.....	61
4.3.2	Block 51-1 Staging Objectives	62
5.0	Community Transportation Network.....	65
5.1	Existing Transportation Context.....	65
5.2	Planning Principles.....	66
5.3	Implementation Principles	66
6.0	Interim (2014) Road Network Performance	69
6.1	Development Prior to Completion of CNR Grade Separation	69
6.1.1	Road Network Context.....	70
6.1.2	Background Traffic Assumptions	71
6.1.3	Land Use & Travel Behaviour Assumptions	75
6.1.4	Zone 1 Development.....	77
6.1.5	Zone 2 Development.....	79
6.1.6	Zone 3 and 4 Development.....	80
6.1.7	Road Network Assessment.....	80
6.1.8	Conclusions.....	88
6.2	Optional Area 1 Conditions	91
7.0	Community Build-Out (2016) Road Network Performance.....	95
7.1	Analysis Details.....	95
7.1.1	2016 Road Network	95
7.1.2	Background Traffic.....	95
7.1.3	Land Use.....	98
7.1.4	Trip Generation	99
7.1.5	Trip Distribution	99
7.1.6	2016 Forecast Traffic Volumes	101
7.2	Analysis Results.....	102
7.2.1	Intersection Performance Analysis Results	102
7.2.2	Road Link Performance Analysis Results.....	102
7.3	Conclusions.....	107
7.3.1	Adequacy of the Proposed Road Network.....	107

	7.3.2	Timing of Municipal Roads Delivery.....	107
8.0		Long Term (2031) Road Network Performance.....	111
8.1		Analysis Details.....	111
	8.1.1	Road Network.....	111
	8.1.2	Background Traffic.....	112
	8.1.3	Site Traffic.....	117
	8.1.4	Pedestrian Activity.....	119
8.2		Analysis Results.....	122
8.3		Conclusions.....	122
9.0		The Spine Road.....	129
9.1		Planning Background.....	129
	9.1.1	Mount Pleasant Secondary Plan Transportation Study and Phase 1 and 2 Environmental Assessment.....	129
	9.1.2	2009 TTMP Sustainable Update and Development Charges Update.....	135
9.2		Spine Road Objectives.....	137
	9.2.1	Performance.....	137
	9.2.2	Design Standards.....	137
	9.2.3	Neighbourhood Role and Function.....	137
	9.2.4	Bus Transit Priority.....	138
	9.2.5	Active Transportation.....	138
	9.2.6	Land Use Intensification and Pedestrian Scale Environment.....	139
9.3		The Challenge.....	139
	9.3.1	Rationalization of Objectives.....	139
	9.3.2	The “Road Diet” Paradigm.....	140
9.4		Spine Road Performance.....	141
	9.4.1	Forecast Screenline / Link Performance.....	141
	9.4.2	Forecast Intersection Performance.....	142
9.5		Assessment of Alternative Cross Sections.....	144
	9.5.1	Alternative Cross Sections.....	144
	9.5.2	Evaluation Criteria.....	148
	9.5.3	Evaluation of Alternative Cross Sections.....	149
	9.5.4	Recommended Spine Road Cross Section.....	150
9.6		Proposed Implementation.....	153
	9.6.1	Mid-Block Sections.....	153
	9.6.2	Refinement of the Mid-Block Section.....	154
	9.6.3	Arterial Road Intersections.....	155
	9.6.4	Collector Road Intersections.....	163
	9.6.5	Local Road Intersections.....	163
9.7		Multi-Modal Transportation Supportive Measures.....	163

9.7.1	Transit Supportive Elements.....	163
9.7.2	Active Transportation Supportive Elements.....	164
10.0	Mixed Use Nodes	165
10.1	Shared Characteristics.....	165
10.1.1	Major Intersections.....	165
10.1.2	Transit Prioritization at Major Intersections.....	171
10.1.3	Lay-By Parking.....	172
10.2	Mixed Use Node 1: North-South Spine Road and Sandalwood Parkway	175
10.2.1	Functional Road Details.....	175
10.2.2	Operational Assessment.....	175
10.3	Mixed Use Node 2: North-South Spine Road and Wanless Drive.....	181
10.3.1	Functional Road Details.....	181
10.3.2	Operational Assessment.....	181
10.4	Mixed Use Node 3: East-West Spine Road and Creditview Road	187
10.4.1	Functional Road Details.....	187
10.4.2	Operational Assessment.....	187
10.5	Selected Access Assessments	191
10.5.1	Commercial Properties	191
10.5.2	Schools	191
10.5.3	Creditview Sandalwood Park.....	192
11.0	Collector Roads.....	195
11.1	Collector Road Characterization	195
11.1.1	Typical Collector Roads	195
11.1.2	Collector Road North of Intersection of N-S and E-W Spine Roads.....	196
11.1.3	Buick Boulevard	203
11.2	Assessment of Collector Road Alignment Alternatives.....	207
11.2.1	Phase 1 and 2 TMP Findings and Recommendations	207
11.2.2	Development of Alternatives	208
11.2.3	Evaluation of Alternative Alignments	208
11.2.4	Evaluation Criteria.....	209
11.2.5	Spine Road Alignment: Alternative Configurations North of Wanless Drive	210
11.2.6	SOUTH Section – Evaluation of Collector Road Alternative Alignments.....	214
11.2.7	CENTRAL Section - Evaluation of Collector Road Alternative Alignments	219
11.2.8	NORTH Section – Evaluation of Collector Road Alternative Alignments	223
11.2.9	Recommended Collector Road Network Alignments.....	227
11.3	Collector Road Intersections.....	228
11.3.1	Collector / Regional Arterial Intersections.....	228
11.3.2	Roundabout Assessment.....	230

12.0	Local and Other Lower Order Roads	233
12.1	Minor Local Roads	233
12.2	Public Rear Lanes.....	233
12.3	Buffer Roads	233
12.4	Slip-Off Lanes	233
13.0	Community Staging	243
13.1	Staging and Sequencing Assumptions	243
13.2	Staging and Sequencing Details.....	244
	13.2.1 Proposed Area 1 and 2 Sequence of Development	244
	13.2.2 James Potter / Creditview Road Grade Separation Development Limit.....	245
	13.2.3 Optional Area 1	257
14.0	Community Transit Service	261
14.1	Routing and Stop Locations	261
14.2	Service Coverage.....	261
14.3	Interim Service Arrangements	262
	14.3.1 Spine Road Service	262
	14.3.2 Creditview Road Service.....	263
	14.3.3 Diversion of Existing Transit Service	263
14.4	Community Build-Out Service Arrangements	269
	14.4.1 Spine Road Service	269
	14.4.2 Creditview Road Service.....	269
14.5	Long Term Corridor Based Service Arrangements.....	269
	14.5.1 Spine Road Service	269
	14.5.2 Creditview Road / James Potter Road Service.....	270
15.0	Active Transportation System	275
15.1	Sidewalks	275
15.2	On Street Bicycle Support.....	275
	15.2.1 Dedicated Bicycle Lanes.....	275
	15.2.2 Bicycle Friendly Travel Lanes	276
15.3	Off Street Trails and Pathways	279
	15.3.1 Trail Network.....	279
	15.3.2 Trail Crossings of Arterial and Collector Roads.....	279
16.0	Transportation Network Impacts and Concerns.....	287
16.1	Natural Environmental	287
	16.1.1 NHS Crossings.....	287
	16.1.2 NHS Crossing Design	288
16.2	Cultural and Heritage Impacts	290
	16.2.1 Creditview Sandalwood Park	290
	16.2.2 Heritage Impacts	290
17.0	Conclusions.....	291

17.1	Key Results	291
17.1.1	Collector Road Alignment Changes.....	291
17.1.2	Road Cross Sections	291
17.1.3	Operations and Timing.....	292
17.2	Findings of the Study	293
17.2.1	Structure and Staging of the Community	293
17.2.2	Transportation Performance Assessment	298
17.2.3	Road Standards	299
17.2.4	Transit	299
17.2.5	Active Transportation	300
17.2.6	Environmental Impacts and Mitigation.....	300
17.2.7	Next Steps and Commitment to Further Work.....	301

AppendixAttached Volume 2

1.0 Executive Summary

The purpose of this study is to assess and recommend the collector road network and associated transportation infrastructure required to support the development of Block 51-1 in the Mount Pleasant Secondary Plan Area. It is also intended to fulfill the Phase 3 and 4 requirements of a Collector Road Environmental Assessment (EA) process. As such, it is a continuation and refinement of the work conducted in the Mount Pleasant Secondary Plan Transportation Master Plan Phases 1 and 2 Environmental Assessment Study (TMP), completed in June of 2009.

The results of this study have contributed to the development and approval of a Community Block Plan and Draft Plans in accordance with the requirements of Policies 5.4.6, and 5.5.7 of the City of Brampton Official Plan, and those of the Mount Pleasant Secondary Plan.

1.1 Study Scope

As noted above, the purpose of this study has been to both inform the development of a Block Plan for Block 51-1, and to complete Phases 3 and 4 of the EA process for the collector road network contained within the block.

Transportation work in support of Block Plan, as well as the Draft Plans, has been ongoing since 2009. This has included the development of long term travel forecasts on the Block 51-1 collector road network, and a comprehensive functional assessment of the proposed collector road network, including road sections, alignments, and intersections. This report summarizes many of the findings and conclusions that have been reached as this work has progressed.

With respect to the Collector Road EA Process, an assessment of alternatives to the recommended network has been completed, as well as of the cross sections of key roads, with particular focus on the Spine Road. The findings of this assessment were presented at a Public Information Centre on June 7th, 2010, and are documented in this report. Included in the Appendices to this report (attached in a separate volume) are all correspondence, comments, and feedback received with respect to this study. The final submission of this report will comprise an ESR, in conjunction with the ***Mount Pleasant Secondary Plan Area Transportation Master Plan Final Report*** (TMP) completed in June 2009 by Entra Consultants in fulfilment of Phase 1 and 2 EA requirements. In this manner, the requirements of the EA process will be fulfilled.

With respect to the approvals process, the work in this report comprises sufficient detail to be considered as having met “Traffic Impact Study” (TIS) requirements for most of Block 51-1. The exceptions to this are sites which require additional site specific planning and design, including Schools, Places of Worship, Commercial blocks, and Multi-unit Residential blocks. Additional traffic studies will be required for these sites.

1.2 Municipal Class Environmental Assessment Requirements

The Mount Pleasant Secondary Plan Block 51-1 community is being developed using an integrated EA review process as per Section A.2.9 of the Municipal Environmental Assessment (MEA) which combines *Planning Act* and *Environmental Assessment Act* requirements. As part of this comprehensive approach, the development of a collector road network has followed the requirements set out in the Municipal Class Environmental Assessment planning process for Road Projects.

This Block 51-1 Collector Road Environmental Assessment and Transportation Study meets the Phase 3 and 4 requirements of the Integrated EA process for the internal collector road network. Once approved, it will allow the draft plans to be processed and approved without any further EA approvals required. This study, together with the approved ***Mount Pleasant Secondary Plan Area Transportation Master Plan*** (TMP) study (as per Section A.2.9 of the MCEA) will take on the role of the Environmental Study Report (ESR) required for the Schedule C collector road projects as identified in the TMP.

Coordination with other background studies undertaken for the proposed Block 51-1 area ensures that the Transportation Study addresses all requirements under the Environmental Assessment Act for minor collector roads within Mount Pleasant Block 51-1, and fulfills requirements through the Block Planning process. In particular, this has been co-ordinated with the findings of Environmental Implementation Report, and the Community Design Guidelines.

A Public Information Centre (PIC) was held for this study on Monday June 7th, 2010. The purpose of this Public Information Centre was to provide information to both Review Agencies and interested members of the public about the Collector Road Environmental Assessment (EA) study currently underway in support of Block 51-1. In addition, this PIC was held to ensure that appropriate opportunities for public consultation and input to the study have been provided. Public notification of the PIC was done through local media, and direct notices were mailed to concerned agencies as well as to individuals and groups identified during the ***Mount Pleasant Secondary Plan Area Transportation Master Plan*** study. The PIC coincided with the Statutory Public Meeting for the Block Plan, the associated Draft Plans, and Zoning Bylaw Amendments.

Upon completion of this report and the associated collector road design drawings, a Phase 4 Notice of Study Completion will be issued to initiate the mandatory 30 day period for public review and comment. The notice will advise of the details for submitting a Part II Order request in accordance with the Municipal Class Environmental Assessment.

This study has also considered and documented modest changes to the future alignment of Sandalwood Parkway within Block 51-1 between Creditview Road and Mississauga Road, as originally recommended in the ***Phase 3 & 4 Environmental Assessment for Sandalwood Parkway*** that was completed, and filed for approval in October of 2010. Discussion and findings with respect to changes in the alignment of this road can be found in Sections 1.3.1.3 and 3.4.3 of this report.

1.3 Findings of the Study

1.3.1 Structure and Staging of the Community

1.3.1.1 Interim Road Network, Prior to James Potter / Creditview Road Link

1. Prior to the completion of construction of the James Potter / Creditview Road re-alignment (including the CNR grade separation) between Bovaird Drive and the connection with existing Creditview Road to the north of Fairhill Avenue, it is possible to construct approximately 3,000 residential units in Block 51-1. In order to accomplish this:
 - a. before any units to the south of the Mixed Use Node centred on Sandalwood Parkway and the Spine Road are occupied (shown as Phase 1A in Figure 13.1):
 - the north-south Spine Road must be completed from James Potter / Creditview Road north to Collector Road “C”
 - Collector Road “C” must be completed from the Spine Road to Mississauga Road
 - b. before any units to the north of the Mixed Use Node centred on Sandalwood Parkway are occupied, Sandalwood Parkway must be completed from Creditview Road to Mississauga Road.
 - c. a program of traffic monitoring counts is to be undertaken every 6 months in the area of the Fletchers Meadows community lying generally to the east of Creditview Road and south of Fairhill Drive commencing in April 2012, and ending once the James Potter / Creditview Road link between Bovaird Drive and Fairhill Avenue is operational. This will allow any traffic issues related to the development of Block 51-1 and the Mount Pleasant Village during this period to be identified, and associated mitigation measures to be put in place. These counts were commenced in April 2011 on behalf of Mount Pleasant Village, with Block 51-1 taking responsibility for the count program in April 2012.
 - d. it is recommended that construction work on the Mississauga Road widening and CNR grade separation to the north of Bovaird Drive be coordinated, insofar as is possible, such that it does not commence until the James Potter / Creditview Road re-alignment between Bovaird Drive and Fairhill Avenue has been completed.
2. Should it be deemed appropriate to do so by the City, an optional initial development program in the northeast area of Block 51-1 is supportable on the existing arterial road network.

1.3.1.2 Ultimate Road Network

1. A Block 51-1 collector road network has been identified and assessed that meets the future needs of the community with respect to internal circulation and access to the higher order arterial road network (see Figure 1-1)
2. A detailed plan has been developed for the implementation of Block 51-1 in a manner that does not depend on sequential development from one area to the next. It is anticipated that once the initial road works are in place (most notably the construction of Sandalwood

Parkway from Creditview Road to Mississauga Road) development may occur in several disparate areas of the block simultaneously.

3. The existing City of Brampton and Region of Peel capital roads programs and schedules are generally adequate to meet the functional, capacity, and timing needs of Block 51-1. In particular, based on the Brampton 2011-2020 Roads Capital Program (dated January 26th, 2011):
 - a. the timing that is currently planned for the City of Brampton roads comprising the boundaries of this community is consistent with the needs of the community:
 - i. the widening of Creditview Road between Bovaird Drive and Mayfield Road between 2013 and 2014
 - ii. the widening of Wanless Drive between Creditview Road and Mississauga Road in 2014, with the Phase 3 and 4 EA commencing in 2011.
 - b. the timing for Development Charge funding for the roads to be delivered by the Block 51-1 landowner's group is somewhat consistent with the planned delivery of these roads:
 - i. funding for the CNR underpass on Creditview Road is identified for 2015. This project is being targeted for completion around the end of 2013.
 - ii. funding for Sandalwood Parkway between Creditview Road and Mississauga Road is identified for 2014. This road will likely be built in 2012 and 2013.
 - iii. funding for the North-South Spine Road between Creditview Road and Sandalwood Parkway is identified for 2013. This road will likely be built in 2012.
 - iv. funding for the North-South Spine Road between Sandalwood Parkway and the connection with the East-West Spine Road to the north of Wanless Drive is identified for 2016. This road will likely be built in 2013 and 2014
 - v. funding is identified for the North-South Spine Road between the connection with the East-West Spine Road and Mayfield Road in 2016. This section of road is not part of the Spine Road. The Development Charge funding for this section of road needs to be applied to the East-West Spine Road between the connection with the North-South Spine Road and Creditview Road to the north of Wanless Drive. This road will likely be built in 2013 and 2014.



Mount Pleasant Block 51-1
Job # 6374-26 August, 2011

Mount Pleasant Block Plan 51-1 Recommended Collector Road Network

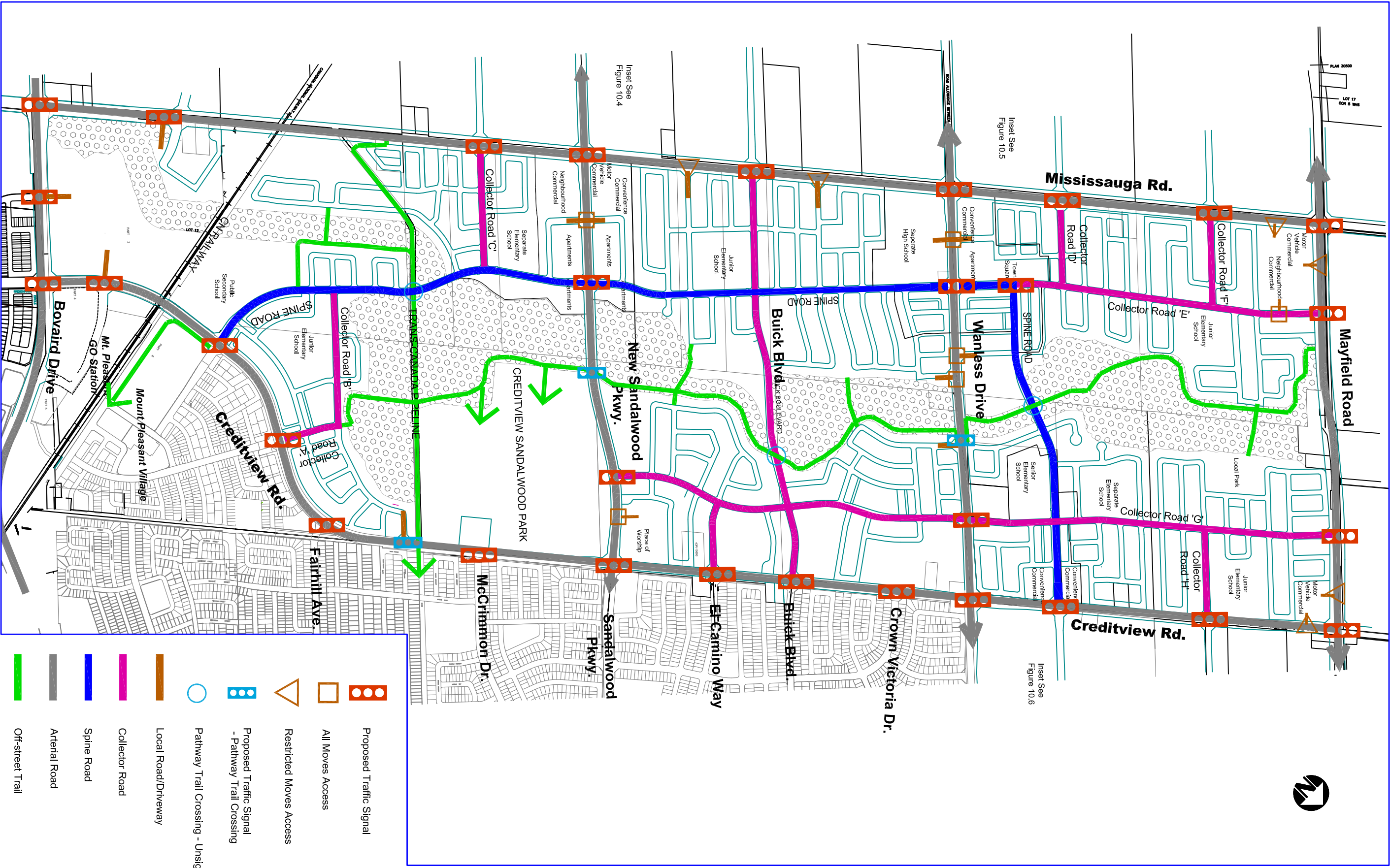


Figure 1-1

4. Appropriate arterial road rights of way have been identified through ongoing and completed Environmental Assessment studies, and accommodated in the Block 51-1 plan. Where EA study information is not yet available (Wanless Drive and Mayfield Road) appropriate assumptions regarding anticipated rights of way have been made on the basis of the best information available, including agreements reached between Region of Peel staff, City of Brampton staff, and representatives of the development industry.
5. An east-west collector road was proposed in the TMP Study through the area to the south of the CNR line bounded by James Potter / Creditview Road, Bovaird Drive, and Mississauga Road. Given that the City of Brampton has given this area a “Special Policy Area” designation, and the fact that this area is isolated from the remainder of Block 51-1 by the CNR line, it has been determined that this collector road is not required for the functioning of the Block 51-1 community; nor is it required to support the potential commercial land uses within the “Special Policy Area” as each of the two sub-areas (divided by the future NHS as illustrated in Figure 11.5) have direct access to adjacent arterial roads .

1.3.1.3 Revised Conclusions With Respect to Phase 3 & 4 Sandalwood Parkway Environmental Assessment

The need, justification and potential alignments of the Sandalwood Parkway Extension were assessed in the City’s *Mount Pleasant Secondary Plan Area Transportation Master Plan (TMP)* in accordance with Class Environmental Assessment requirements. It identified the extension of Sandalwood Parkway as a Schedule C project that required further study in compliance with Phases 3 and 4 of the Class Environmental Assessment process. This work was completed through the *Sandalwood Parkway Extension from Creditview Road to Mississauga Road Class Environmental Assessment – Environmental Study Report (ESR)* completed by ENTRA Consultants and Philips Engineering in November 2010. The Study assessed alternative road alignments and recommended a location and preliminary preferred design of the Sandalwood Parkway extension through the Mount Pleasant lands. The recommended location was noted to cross the NHS generally south of existing Wetland 9 (W9). A small portion of the staked boundary of this wetland lies within the proposed ESR Sandalwood Parkway right-of-way and associated transitional grading area. The ESR concluded that the minor loss of a portion of W9 could be readily compensated for within the NHS design as currently proposed. It further noted that necessary adjustments to the design, inclusive of details of cross-section and alignment of Sandalwood Parkway that are generally in accordance with the preferred alternative alignment, will be considered during the detailed design phase in association with the Block Plan process and addressed through required component studies, including but not limited to the Environmental Implementation Report (EIR) and Transportation Study.

Following completion of the ESR, the ‘preferred’ alignment of Sandalwood Parkway was reviewed as a part of the development of the Block Plan for Sub-Area 51-1. A review of the road alignment with respect to the integration of various land uses in this vicinity including the extent and form of the NHS, maintenance of the Creditview Park facilities, the development of an ‘urban node’ in conjunction with the alignment of the community Spine Road and the consideration of land use efficiencies resulted in the proposal for several adjustments to the Sandalwood Parkway alignment (as illustrated in Figure 3.6). These adjustments can be generally described as adjusting the road

alignment northward from the ESR alignment by 18m to 45m depending on location. This moves the road further north into portions of W9.

1.3.2 Transportation Performance Assessment

1. A collector road network generally based on the road network recommended in the preceding TMP study, and with some modest changes to alignments and cross sections (as documented in Figure 11.16), is appropriate and sufficient to meet the transportation needs of Block 51-1.
2. Future 2014 traffic forecasts have been developed to assess the performance of the collector and arterial road network assuming the construction of approximately 3,000 residential units occurs by this year, and prior to the completion of the James Potter / Creditview Road link between Bovaird Drive and the connection with existing Creditview Road to the north of Fairhill Avenue. The results indicate that the collector road network required to support this development includes (refer to Figure 11.16):
 - a. the completion of a connection to Mississauga Road comprised of the north-south Spine Road from James Potter / Creditview Road to Collector Road 'C' and Collector Road 'C' from the Spine Road to Mississauga Road prior to occupancy of any residential units south of Sandalwood Parkway.
 - b. the completion of Sandalwood Parkway between Creditview Road and Mississauga Road prior to occupancy of any residential units to the north of Sandalwood Parkway.
3. Future 2016 traffic forecasts have been developed to assess the performance of the collector and arterial road network assuming full build-out of the community occurs by this year. The results indicate that the recommended collector road network, and its connecting intersections to the adjacent arterial road network, will operate at an appropriate and acceptable level of service.
4. Future 2031 traffic forecasts have been developed to assess the performance of the collector and arterial road network assuming full build-out of northwest Brampton. The results indicate that the recommended collector road network, and its connecting intersections to the adjacent arterial road network, will operate at an appropriate and acceptable level of service. Background traffic volumes for 2031 were developed utilizing the City of Brampton forecast model. In order to confirm its reliability for this purpose, 2006 output from the forecast model was checked against ground counts at selected locations and found to be appropriately accurate.
5. Intersection turning movement requirements, including storage lengths, have been determined on the basis of the intersection performance analysis conducted for this study.
6. The relatively close spacing of several intersections within the Mixed Use Nodes has been tested, and found to be compatible with the left turn storage requirements.

1.3.3 Road Standards

1. A four lane collector road cross section was previously recommended for the Spine Road in the TMP. This present study has further refined the configuration of the Spine Road so as to deliver reliable and regular transit service to the community, while best meeting the many City of Brampton objectives for the Block 51-1 community. This refined configuration consists of:
 - a. a three lane cross section comprising two 3.75m wide travel lanes, and a 3.0m left turn lane at all intersections
 - b. dedicated bicycle lanes on both sides
 - c. generally no provision for parking, (except in lay-bys in selected and limited areas within the Mixed Use Nodes)
 - d. limited direct driveway access
 - e. transit prioritization lanes at key intersections
2. Other roads in the Block 51-1 community generally conform to existing City of Brampton Standards, except for minor increases in pavement width so as to better accommodate active transportation.
3. Right-of-way requirements have been confirmed for all internal collector roads and boundary arterial roads using the best information available from completed or ongoing Environmental Assessment Studies.
4. The results of the traffic analysis conducted in this study have been used to confirm turning lane requirements, as well as turning lane storage length requirements for both the internal collector road network as well as Sandalwood Parkway and Creditview Road.
5. The collector road network has been designed according to City of Brampton standards. Spacing of intersections meets both Brampton standards, and, where appropriate, Region of Peel standards.
6. Preliminary access opportunities have been identified for all commercial sites, including those adjacent to Region of Peel arterial roads, and based on current Peel intersection and driveway spacing requirements.

1.3.4 Transit

1. Approximately 97% of the units in the proposed block plan are located within a 400m walk distance of the nearest transit stop. The units not within this range are primarily located in a development pocket to the east of Mississauga Road and north of the CNR line, to which it is not feasible to provide more direct service.
2. Potential transit service delivery plans have been prepared for:
 - a. Interim transit service while development of Block 51-1 is underway
 - b. Build-out transit service once the Block 51-1 collector road network is completed
 - c. Long Term transit service reflecting corridor based transit service to all of Northwest Brampton.

1.3.5 Active Transportation

1. The block plan, as proposed, provides a well connected, logical, pedestrian and cyclist friendly system of active transportation facilities including dedicated bicycle lanes, bicycle friendly travel lanes, sidewalks, and off road trails. These will connect the community to adjacent communities, including Mount Pleasant Village to the south, at the heart of which lie the Mount Pleasant GO Station and transit terminal.
2. Dedicated bicycle lanes are recommended on the Spine Road so as to facilitate active transportation in this corridor while minimizing interference with transit operations.
3. Conceptual road crossing designs have been prepared for six locations where the off road trail system must cross a collector or arterial road within or on the perimeter of Block 51-1. This will ensure that trail connectivity is maintained within this community, and between this community and adjacent communities.

1.3.6 Environmental Impacts and Mitigation

1. The collector road network in Block 51-1 has been designed so as to minimize encroachment into or impact upon areas that have been identified as environmentally sensitive. These areas are being consolidated within Block 51-1 into a continuous and connected Natural Heritage System (NHS), as outlined in Appendix F in the document “Implementation Principles for the Mount Pleasant Sub Watershed” of the Mount Pleasant Secondary Plan, and now clarified and expanded in the companion Block 51-1 Environmental Implementation Report (EIR).

Notwithstanding the desire to minimize road related impacts, the size and scale of the NHS is such that there are five locations where road crossings must be accomplished. Two of these are arterial road crossings:

- The Sandalwood Parkway crossing of the NHS has been dealt with in the Phase 3 & 4 ESR for that road, and is elaborated upon further in Section 3.4.3 of this report
- The Wanless Road crossing will be dealt with in the forthcoming Phase 3 & 4 ESR for that road, scheduled for commencement in 2011. The Phase 1 & 2 EA requirements for this road were dealt with in the ***Mount Pleasant Secondary Plan Area Transportation Master Plan*** (TMP) study.

The remaining three crossings are collector road crossings, and as such are identified in this Phase 3 & 4 Collector Road EA:

- North- South Spine Road to the south of Collector Road ‘C’
- East-West Spine Road about mid-way between Creditview Road and the North-South Spine Road
- Buick Boulevard about mid-way between Mississauga Road and Creditview Road

The nature of these crossings, impacts on the NHS, and required mitigation measures are being considered and documented within the EIR.

1.3.7 Next Steps and Commitment to Further Work

1. Upon completion of this report and the associated collector road design drawings, a Phase 4 Notice of Study Completion will be issued to initiate the mandatory 30 day period for public review and comments. The notice will advise of the details for submitting a Part II Order request in accordance with the Municipal Class Environmental Assessment.
2. The Block 51-1 landowner's group has committed to undertaking semi-annual traffic monitoring studies within the south west area of the Fletcher's Meadows community. The purpose of these studies is to monitor impacts that may be attributable to Block 51-1 traffic infiltrating this community prior to completion of the Creditview Road / CNR underpass to the north of Bovaird Drive. These studies, already underway on behalf of the Mount Pleasant Village developer, Mattamy (Credit River) Limited, will become the responsibility of the Block 51-1 landowner's group in April 2012, and will be continued until the section of Creditview Road from Bovaird Drive to the North-South Spine Road is operational.

2.0 Introduction

The Mount Pleasant Secondary Plan Area (SPA 51), located in Northwest Brampton, is being designed and developed as a sustainable community. Support for non automobile based travel, including both transit and active transportation modes, is a key principle in the planning of the community transportation system.

This principle is expressed in the form of elements that create an innovative, walkable, transit-supportive community with strategic cycling connections, in an urban, compact form with mixed-uses and a variety of housing types and densities.

Planned from the start as a transit and active transportation oriented community, it is strategically situated near the Mount Pleasant Village Mobility Hub, comprising a commuter rail station on GO Transit's expanding Georgetown line, and a combined GO Transit and City of Brampton bus transit terminal. Future plans call for all day 2 way commuter rail service, and direct access to the City of Brampton Züm Bus Rapid Transit system.

The Mount Pleasant Secondary Plan is divided into two Block Plan Areas, namely 51-1 to the west of Creditview Road, and Block 51-2 to the east. Block Plan Area 51-1 is comprised of approximately 516 hectares (1,276 acres) and is bounded on the west by Mississauga Road, to the north by Mayfield Road, on the east by Creditview Road and James Potter Road, and to the south by Bovaird Drive West.

Current plans call for the construction of approximately 7,000 residential housing units on lands controlled by participating landowners in Block 51-1. The units comprise a range of densities consistent with the vision of promoting transit and active transportation in the community.

A number of supporting reports and studies are being filed in support of the approval process for Block 51-1, including this Transportation Study, which also comprises a Collector Road Environmental Assessment. The other reports include:

- ***Land Use Planning Justification Report;***

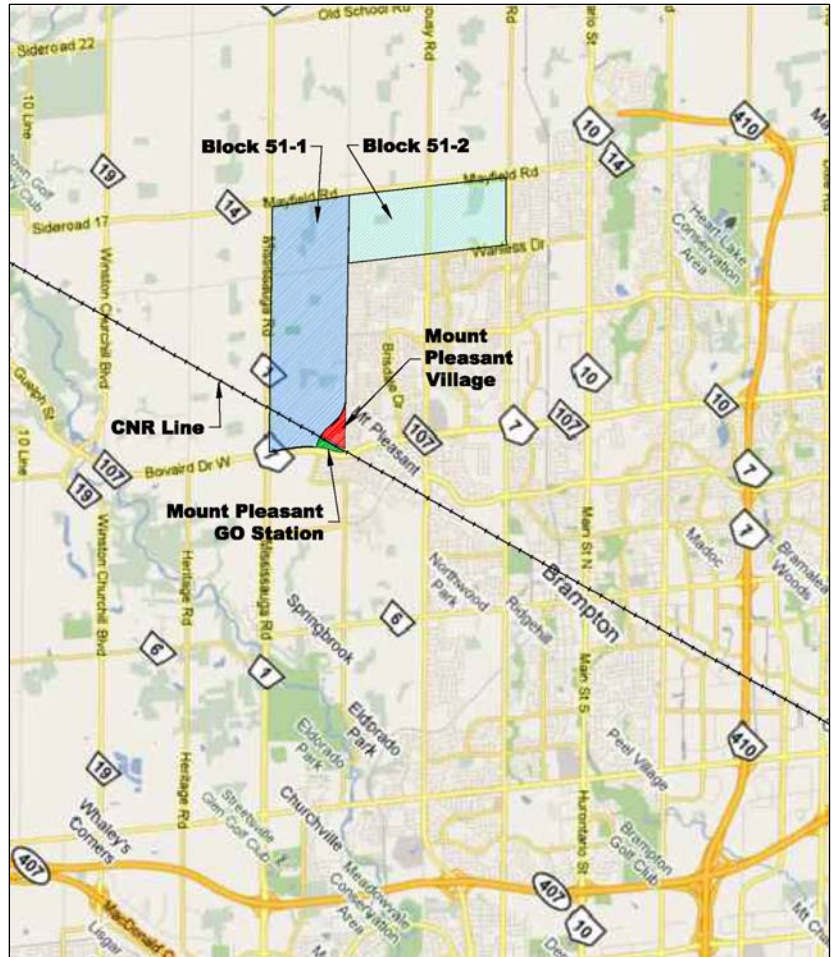


Figure 2.1 - Mount Pleasant Secondary Plan Area (SPA 51)

- *Growth Management Staging and Sequencing Strategy Report;*
- *Community Design Guidelines Document*, including Architectural Control Guidelines;
- *Environmental Implementation Report*, including Tree Inventory.

2.1 Transportation Study and Collector Road EA

The Block 51-1 Transportation Study and Collector Road Environmental Assessment, hereafter referred to as the *Transportation Study* is one of several component studies being undertaken as input to the Block Planning process for the Mount Pleasant Community. A key objective for the Mount Pleasant community (as identified in the Mount Pleasant Secondary Plan) is to support non-automobile transportation choices for its residents. As such, much of the planning effort related to Block 51-1 has gone into ensuring that the combination of land uses, built form, and infrastructure both encourage and support the choices of residents and employees within the community to use alternative transportation modes.

Through this study, a community collector road network has been developed that will achieve the following key objectives:

- provide suitable access to the existing external road network

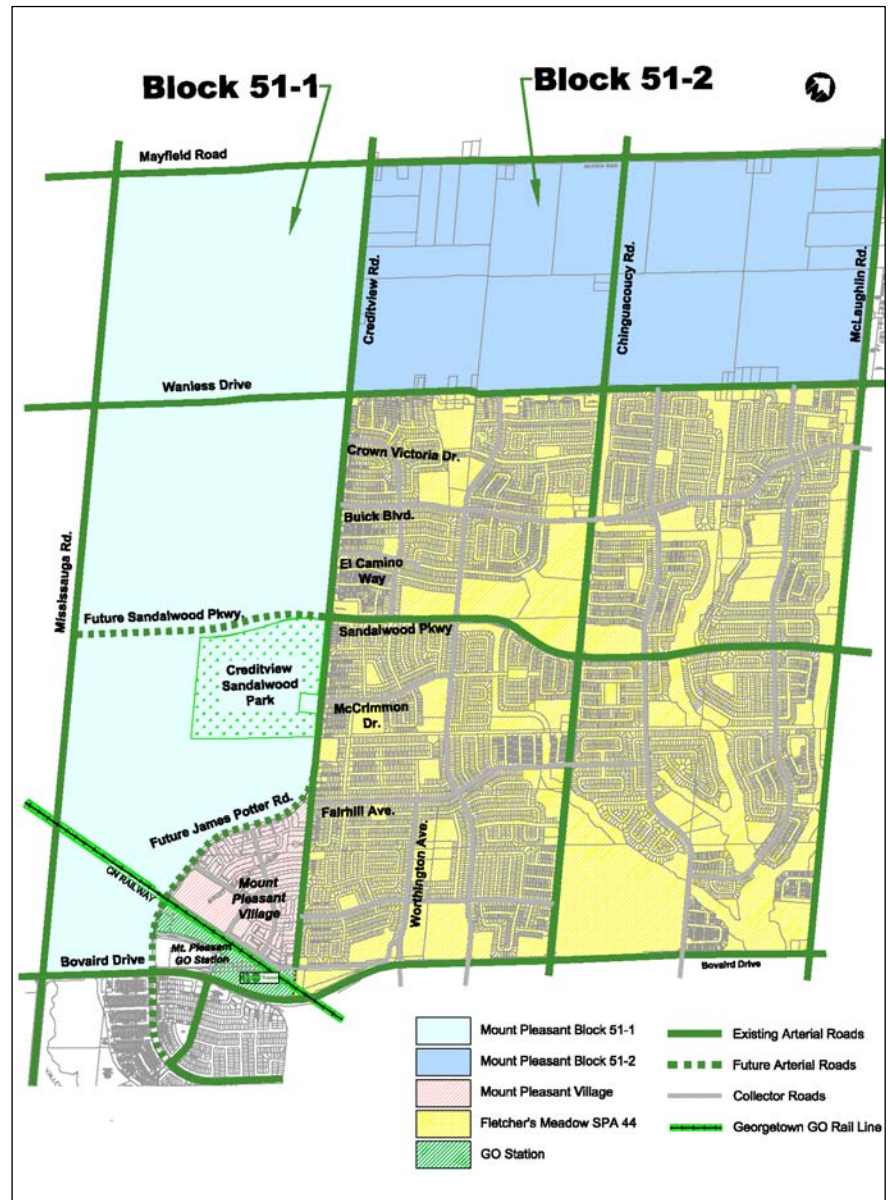


Figure 2.2 – Block 51-1 Site Context

- facilitate safe, efficient and convenient vehicular connectivity between and within the neighbourhoods within the community
- facilitate the establishment of efficient and well integrated public transit routes
- encourage use of alternate modes of travel such as cycling and walking
- support the proposed land uses and community layout (vision)
- minimize external traffic infiltration through the community, and discourage infiltration of adjacent communities so far as is possible
- avoid, minimize or mitigate adverse impacts on the environment
- achieve all of the above in a cost effective manner

Since some of the future collector roads within the Secondary Plan area are subject to an integrated Environmental Assessment review process (per Section A.2.9 of the Municipal Class Environmental Assessment), the Block 51-1 Transportation Study has been expanded to include documentation and analyses as required to meet the Phase 3 and 4 requirements of the integrated EA process.

The purpose of the Collector Road EA study is to assess and recommend the Collector Road Network and associated transportation infrastructure required to support the development of Block 51-1 in the Mount Pleasant Secondary Plan Area. This study is a continuation and refinement of the work conducted in the Mount Pleasant Secondary Plan Transportation Master Plan Phases 1 and 2 Environmental Assessment Study (TMP), completed in June of 2009.

The results of this Transportation Study will contribute to the development and approval of a Community Block Plan in accordance with the requirements of Policies 5.4.6, and 5.5.7 of the City of Brampton Official Plan, and those of the Mount Pleasant Secondary Plan.

2.2 Report Structure

This report has been structured in the following manner:

- Section 3, “**Planning Background**”, explains the planning context in which the Mount Pleasant Block 51-1 transportation network is being planned, and describes the various planning and roads EA studies that have a direct bearing on the Block 51-1 area.
- Section 4, “**Community Structure**”, describes:
 - the planning and transportation objectives for the community,
 - the specific aspects of the community planning process as they relate to the creation of a ‘transit oriented’ community,
 - the proposed sequencing of development of the community as it relates to the transportation network,

- the relationship of the community transportation network to the natural environment, delivery of municipal services, and cultural heritage elements.
- Section 5, “**Community Transportation Network**”, describes the existing and proposed elements of the community transportation network, including road cross sections, intersections, transit elements, and active transportation supportive infrastructure.
- Section 6, “**Interim (2014) Road Network Performance**”, provides traffic volume forecasts and performance assessments for a Phase 1 of development of Block 51-1 that precedes completion of the James Potter / Creditview Road grade separated underpass at the CNR line. It also assesses an option for early build-out of the northeast area of Block 51-1.
- Section 7, “**Community Build-Out (2016) Road Network Performance**”, documents the forecasting of future traffic volumes and assessment of intersection performance for the currently planned 2016 road network and build-out of the Block 51-1 community.
- Section 8, “**Ultimate (2031) Road Network Performance**”, documents the forecasting of future traffic volumes and assessment of intersection performance for the currently planned 2031 road network and build-out of the Block 51-1 community and surrounding area.
- Section 9, “**The Spine Road**”, focuses on this key road within the community. The competing objectives for this road are discussed, followed by a rationalization and assessment of the proposed cross section. The transit supportive measures and active transportation elements that are proposed to ensure this road fulfills its objectives are also documented.
- Section 10, “**Mixed Use Nodes**”, deals with the issues of intersections, transit prioritization, parking and site access in the three Mixed Use Nodes as well as access requirements for the satellite commercial parcels planned for the Block 51-1 community.
- Section 11, “**Collector Roads**”, deals with the collector roads other than the Spine Road that will serve Block 51-1. The proposed cross sections and intersection arrangements are documented and discussed, as is an assessment of alternative road alignments for each of the collector road segments comprising the proposed community road network.
- Section 12, “**Local and Other Lower Order Roads**”, describes characteristics of the local roads and local road intersections in the community.
- Section 13, “**Community Staging**”, describes the staging strategy for the community, and provides details regarding the road infrastructure requirements as each area is developed.
- Section 14, “**Community Transit Service**”, provides an overview of the proposed transit service in Block 51-1, including potential transit routes, stop locations, and coverage.
- Section 15, “**Active Transportation System**”, provides an overview of the community wide active transportation facilities that are proposed.

- Section 16, “**Transportation Network Impacts and Concerns**”, documents the impacts that the proposed collector road network will have with respect to the Natural Heritage System, as well as locations of Cultural and Heritage value within the community.
- Section 17, “**Conclusions**”, summarizes the findings of the study, and the next steps with respect to adoption of the Block 51-1 transportation system and associated collector road network.
- The Appendices attached separately to this report comprise technical background information, as well as documentation related to the EA process. These are provided in a second volume.

3.0 Planning Background

3.1 Mount Pleasant Secondary Plan and Block Plan

3.1.1 Mount Pleasant Secondary Plan (SPA 51)

The Mount Pleasant Secondary Plan (MPSP) was approved by City of Brampton Council on February 10, 2010 through Amendment OP2006-038. The entire Secondary Plan Area consists of approximately 846 hectares (2,090 acres). The MPSP is bounded on the west by Mississauga Road, to the north by Mayfield Road, on the east by McLaughlin Road, Creditview Road, and James Potter Road, and to the south by Wanless Drive and Bovaird Drive West (see Figure 3.1. A copy of the Mount Pleasant Secondary Plan is included in Appendix A.5.1 attached separately to this report).

The MPSP is intended to be a transit oriented and pedestrian friendly community that promotes environmental sustainability and superior community design. As such, the proposed community includes significant lands set aside for natural heritage purposes. There are a number of major structural elements which help define the community; including:

- A transit supportive Spine Road linking the community to the Mount Pleasant GO Station;
- An integrated, safe, effective and efficient multi-modal transportation system that includes Sandalwood Parkway extension, Creditview Road, the northerly extension of James

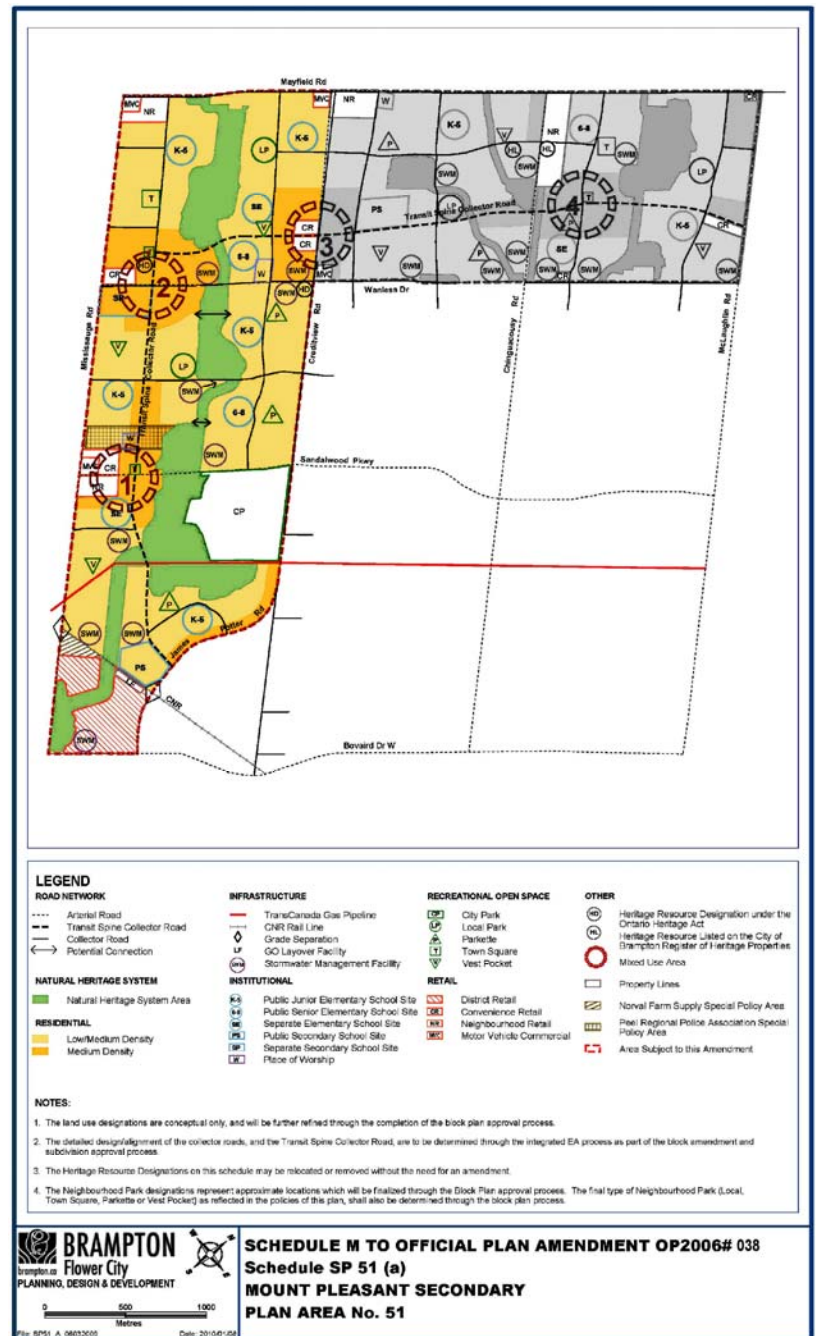


Figure 3.1 Mount Pleasant Secondary Plan Area 51 with Block 51-1 highlighted

Potter / Creditview Road from Bovaird Drive West to existing Creditview Road, an internal collector road network, trail system and bike lanes;

- A Natural Heritage System (NHS) that identifies, protects, restores and enhances the diversity and connectivity of significant natural areas and features;
- A variety of housing types and densities, including live-work units in strategic locations;
- Mixed-use nodes located along the Spine Road, helping to achieve compact urban forms of housing, retail, commercial, office, and live-work units;
- Community uses and features including elementary, middle and secondary schools, and Place of Worship;
- A retail hierarchy consisting of district, neighbourhood, convenience and motor vehicle retail commercial sites; and
- A hierarchy of parks and open spaces consisting of Town Squares, Parkettes, Local Parks, and Vest Pocket Parks

Consistent with the sustainable City structure found in the Brampton Official Plan, the principles of sustainable development and the promotion of a holistic approach to planning is a key objective behind the MPSP. Ultimately, the MPSP seeks to achieve a balance between the social and economic needs of the community and environmental conservation. To this end, the **Mount Pleasant Secondary Plan**, as adopted, foresees and supports the application of Alternative Design Standards to be used with respect to the road network. Specifically, citing section 12.5.1:

“The application of Alternative Development Standards for roads and municipal infrastructure shall be considered for use in the Mount Pleasant Secondary Plan. This includes, but is not limited to, the application of public rear laneway based housing, modified right-of-way standards, cross walk construction and decorative treatments, pavement construction materials and stormwater management ponds. Operational and maintenance requirements and related costs arising from the implementation of Alternative Development Standards shall be identified and addressed to the satisfaction of City Council, prior to the issuance of final Block Plan Approval. The Alternative Development Standards for roads within Secondary Plan Area 51 will involve a local road right-of-way width of 16.5 metres and a requirement for one sidewalk only adjacent to local roads, the locations of which will be determined at the Block Plan Stage. The Alternative Development Standards for roads within Secondary Plan Area 51 will involve a Minor Collector Road right of way width of 21.5 metres and a requirement for the construction of two (2) sidewalks, the locations of which will be determined at the Block Plan Stage.”

3.1.2 “Infrastructure Funding Strategy” Memorandum of Understanding

In January 2009 the Federal Government tabled a budget which included funding of public infrastructure as part of an economic stimulus plan. The City of Brampton has been successful in receiving funding for two projects under the Federal Government’s public infrastructure stimulus funding program. One of these projects is related to the Mount Pleasant Village Mobility Hub which was awarded a total of \$23.0 million from the Federal Government, Provincial Government, and City

of Brampton. This package includes funding towards transit infrastructure in the Mount Pleasant Village Mobility Hub area, which must be complete by October 2011 under the current arrangement.

The development proposed within the Mount Pleasant Village and Mount Pleasant Secondary Plan is integrally tied and dependant upon the timely construction of public infrastructure and community facilities, the dedication of land for community purposes and the provision of public transportation services. Accordingly, the respective landowners in both MPSP and the MPV have made an additional contribution of \$7.0 million toward works within and beyond the village. This commitment is articulated in an **"Infrastructure Funding Strategy" Memorandum of Understanding** (MOU) between the MPV and MPSP Landowners and the City of Brampton. This agreement comprises Appendix G to the MPSP (a copy of Appendix G can be found in Appendix A.5.2 attached separately to this report). Among other items, the funds being contributed by the MPSP Landowners will go towards:

- The acquisition by Brampton Transit of three 30' Diesel- Electric -Hybrid Buses with Bike Racks, at a cost of \$2,000,000.00. This contribution will be made in three payments, triggered based upon registration of Draft Plans of Subdivisions within Area 51 of 3,000 units, 6,000 units and 9,000 units respectively.
- The completion of the James Potter / Creditview Road grade separated underpass at the CNR line just north of Bovaird Drive.

The MOU also addresses the following specific transportation related matters with a bearing on the implementation of the Block 51-1 transportation system:

- **Implementation of Sandalwood Parkway and the Spine Road:** Section 3 of the MOU deals with the implementation and funding of both Sandalwood Parkway and the Spine Road within Block 51-1. Specifically, it speaks to:

- "The transfer of land and the construction of,*
- (i) *Sandalwood Parkway within Block 51-1 to the City's standards for an arterial road having a right of way width of 36 metres, and*
 - (ii) *the Spine Road within Area 51 to the City's standard for a major collector road."*

Commitments on the part of both the landowners and the City of Brampton are articulated as follows:

"The Participating Owners within Area 51 and the MPV Owner will transfer and construct Sandalwood Parkway and the Spine Road in accordance with the required Municipal Class Environmental Assessment."

"The City acknowledges that its capital budget forecast provides for development charge recoveries for Sandalwood Parkway in 2016 and the Spine Road in 2019. The City may, at its sole discretion, consider advancing the timing for the payment of recoveries to the Participating Owners within Area 51. Development charge recoveries will be available for 50% of the cost to construct Sandalwood Parkway within Block 51-1 and the Spine Road within Area 51."

- **Role and Function of the Spine Road:** Further clarification regarding the implementation of the Spine Road is provided in Section 4.g of the MOU. More specifically:

“Based on additional secondary plan transportation work and a Municipal Class Environmental Assessment to be completed through the Block Planning process, the role and function of the Spine Road will be confirmed. The City acknowledges that the Participating Owners support a 24 metre right of way for the Spine Road within Area 51. The City will consider an alternative standard to the Spine Road, and may adopt and/or adapt its existing Spine Collector Alternative Development Standard that has been applied elsewhere in the City.”

The additional work required to support an alternative standard section for the Spine Road comprises a significant part of the work documented in this study, and can be found in Section 9.0.

- **Allocation and Final Approvals Prior to James Potter / Creditview Road Works:** Section 4.c of the MOU speaks to early development of portions of Block 51-1 prior to completion of the James Potter / Creditview Road grade separated underpass with the CNR line. As cited on page 12 of the *Growth Management Staging and Sequencing Strategy Report*:

“The City confirms that land within the MPV and Block Plan Area 51-1 will receive allocation or exemption in accordance with the City’s Growth Management and Development Allocation Program. It is understood that approximately 3,000 units may be developed in Area 51-1 before the James Potter Road/Creditview Road (including the underpass) works are fully operational.”

This issue of early development of a portion of Block 51-1 has been the subject of a previous assessment by BA Group which was provided to the City as part of the MOU negotiation process, and is documented in this study in Section 13.2, “**Staging and Sequencing Details**”.

- **Local and Collector Road Rights of Way and sidewalks:** In Section 4.g, the City agrees to:

“impose a local road cross section with a minimum 16.5 metre right of way and a requirement for one (1) sidewalk only adjacent to local roads, the locations of which will be determined at the block plan stage. The City will impose a minor collector road cross section with a 21.5 metres right of way which will require the construction of two (2) sidewalks.”

Consistent with this agreement Section 11, “**Collector Roads**” and Section 12, “**Local and Other Lower Order Roads**” of this study speak to the proposed standards for Collector and Local roads within Block 51-1. Section 15.1 deals with the community sidewalk network as an integral and connected part of the active transportation network connecting within and beyond the community.

3.1.3 Block Plan and Supporting Studies

The City of Brampton has advanced a Modified Block Planning Process within MPSP which is designed to streamline the approvals process. The Modified Block Planning Process has demonstrated the potential for increased efficiency and effectiveness related to the streamlining of approvals and the avoidance of duplication.

The goal is to approach community planning in a more comprehensive manner which will include the concurrent processing of subdivision applications. The objective of this initiative is the early delivery of key infrastructure, facilities and services in accordance with growth management principles and the MOU. Section 10.3 of the MPSP specifically addresses the Modified Block Planning Process. Specific component studies are required at the Block Plan Stage, while a separate set of reports are required in support of Draft Plan of Subdivision approval.

Community Block Plans are meant to implement the policies of Secondary Plans and the recommendations of the SWS on a sub-area basis by coordinating the completion of detailed environmental, servicing, transportation, urban design and growth management analysis and approvals.

It is important to note that the Block Plan and individual Draft Plans of Subdivision which were filed on May 3, 2010 on behalf of the participating landowners are meant to be processed and approved as a comprehensive package as per the MOU. The Plans are the subject of an ongoing review which has and will include a number of multidisciplinary workshops which are meant to assist in the evolution of the planning vision with a view to ensuring that the goals and objectives of the MPSP are implemented in a seamless and transparent manner.

While this Report references the Block Plan which was filed on May 3rd, 2010, the free-standing Community Design Guidelines (CDG) references the evolving Block Plan (see Figure 3.2). The Transportation Study examines the Block Plan road network which, while evolving, is essentially identical for the purposes of analysis to the layout found in the original submission. The final Growth Management Staging and Sequencing Strategy Report (GMSSSR), the EIR, the CDG and the Transportation Study all include plans which reflect the final layout of the community.

As of May 20th, 2011 the Block Plan for this community has now been approved.

MOUNT PLEASANT BLOCK 51-1 - BLOCK PLAN



LEGEND

- BOUNDARY OF BLOCK PLAN (S/S)
- NODE BOUNDARY
- NATURAL HERITAGE SYSTEM
- CITY PARK
- GO STATION
- NON PARTICIPATING PROPERTIES
- FIREWALL
- LIBRARY
- LOW/MEDIUM DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COMMERCIAL
- SWIM PONDS
- OPEN SPACE (NMS)
- SPORTSPROVISIONS
- PARKS/POCKET PARKETTES/ TOWN SQUARE
- INSTITUTIONAL
- SPECIAL POLICE AREA
- MULTI-USE PATH WITHIN BLDGS (CLASS 1) AS PER OFFICIAL PLAN (CITY WIDE PATHWAY NETWORK)
- ON-STREET BIKE LANE (CLASS 2)
- POTENTIAL SIGNED BIKE ROUTE (CLASS 3)
- GREEN SYSTEM TRAIL (MULTI-USE PATH) (REFLECTS CHANNEL ALIGNMENT VIGNETTES)

BLOCK PLAN LAYOUT
MOUNT PLEASANT SECONDARY PLAN AREA
BLOCK PLAN AREA NO. 51-1

P.N.: 98.566.00 MAY 20, 2011
 File No: 566P_MV20_11 Scale: 1:4,000

Gagnon & Lavoie
 2200 Steeles East, Suite 100
 Scarborough, Ontario M1V 4Z9
 Tel: (416) 291-1111
 Fax: (416) 291-1112

Figure 3.2

3.2 Phase 1 and 2 Transportation Master Plan Study

In June 2009, ENTRA Consultants completed a **Transportation Master Plan Study for the Mount Pleasant Secondary Plan Area** (TMP). This study comprised Phases 1 and 2 of the Class Environmental Assessment requirements. The objectives of this work, as cited in the study, were to:

- “present a comprehensive transportation strategy for the Mount Pleasant Secondary Plan area comprising roads, transit, transportation demand management and trails and cycleways
- establish the need and justification for proposed arterial and collector roads in compliance with Phases 1 and 2 of the Class EA
- identify a preferred road network for the Mount Pleasant Secondary Plan area, including improvements to Creditview Road and Sandalwood Parkway, that provides the foundation for further more detailed studies for these and other area roads in accordance with Phases 3 and 4 of the Class EA
- identify potential additional projects (road and transit) in Brampton, beyond the boundaries of the Study Area, that may be required to accommodate development of the Mount Pleasant Secondary Plan area
- identify a group of Schedule “C” projects that will be required for construction in the Mount Pleasant Secondary Plan area at stages over the long-term (i.e., to 2031) development of the secondary plan”

The completed TMP made recommendations regarding:

- growth supportive improvements to the arterial road network in the vicinity of Block 51-1,
- the need for an appropriate internal collector road network, including a transit supportive mid block collector road, or Spine Road, and
- a strategy for providing comprehensive transit service to the community, including bus service on the Spine Road with headways in the range of 5 to 7.5 minutes.

Four alternative community transportation solutions were assessed, comprising two alternative alignments of future James Potter Road and Creditview Road, coupled with two alternative regimes of transit service road network.

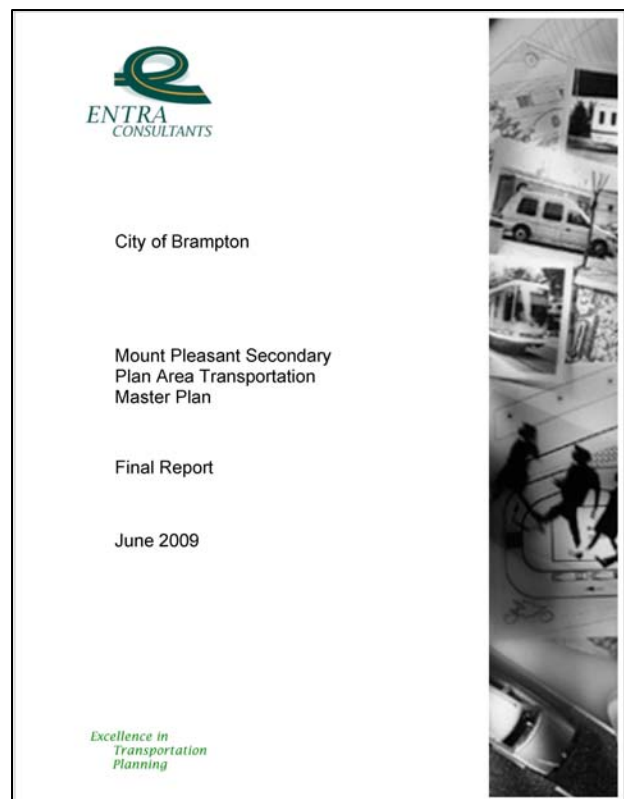
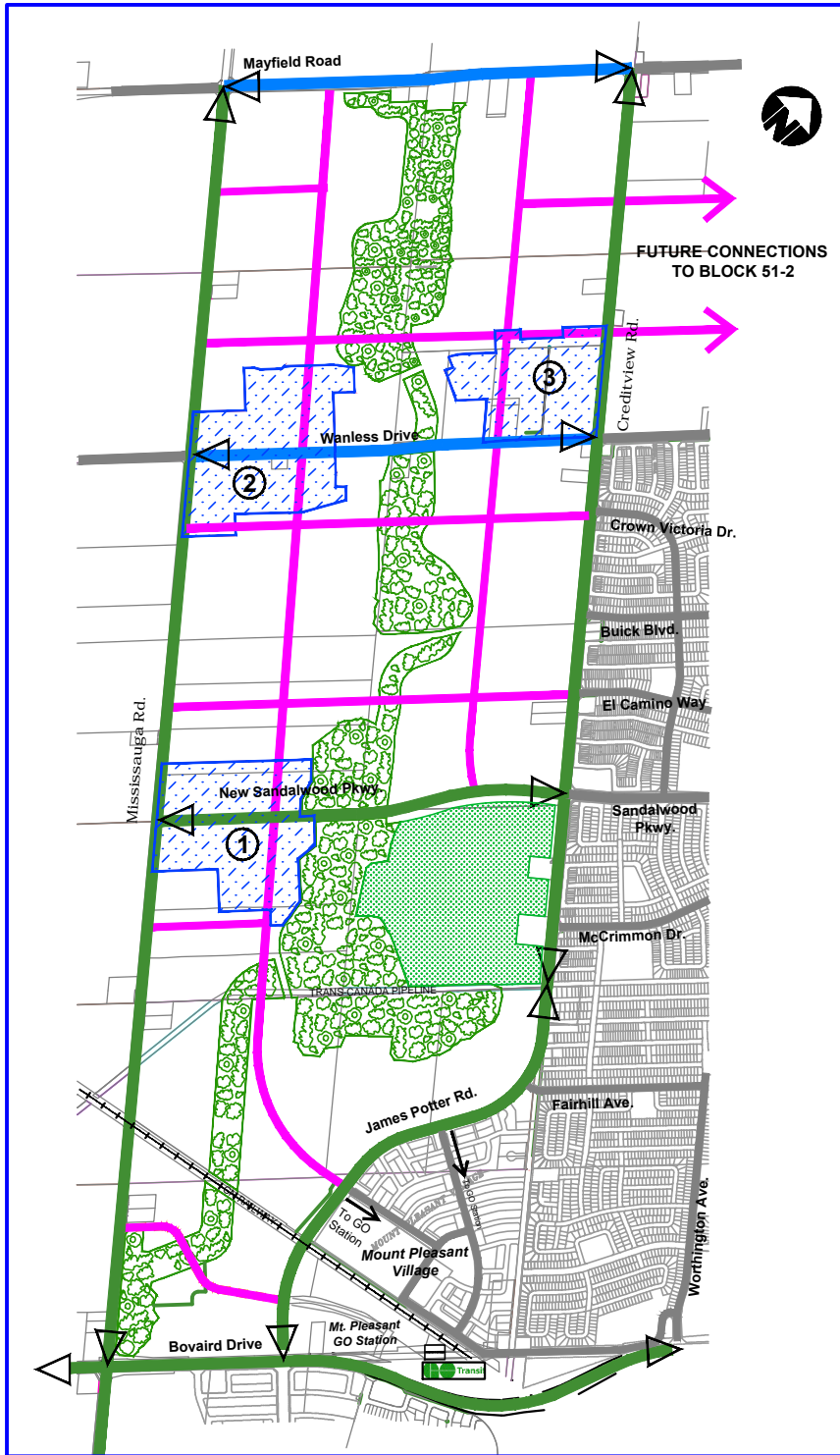


Figure 3.3 - Mount Pleasant SPA Transportation Master Plan Study

The Preferred Alternative that was identified in the TMP Study included:

- improvements to the supporting arterial road network (notably Sandalwood Parkway, James Potter Road, and Creditview Road)
- a transit supportive collector road running generally north-south and east-west through both Blocks 51-1 and 51-2
- a logical grid of collector roads providing connectivity to the arterial road network

The following Figure 3-4 illustrates the “Preferred Transportation Alternative” for the Mount Pleasant Community as determined through the Phase 1 and 2 TMP study. It also indicates the present status of those arterial roads identified in the TMP as warranting construction or widening.



- 2009 Transportation Master Plan (TMP) Block 51-1 Conceptual Road Network
- Arterial Road Environmental Assessments Completed or Under Way
- Future Arterial Road Environmental Assessments
- 1 Mixed Use Nodes
- NHS Natural Heritage System (NHS)
- Park Creditview Sandalwood Park

MOUNT PLEASANT TRANSPORTATION MASTER PLAN STUDY PRELIMINARY PREFERRED ROAD NETWORK

3.3 Other Planning Studies

3.3.1 Transportation and Transit Master Plan, 2009 Sustainable Update

The City of Brampton completed their original *Transportation and Transit Master Plan Study* (TTMP) in 2004. This study assessed the anticipated transportation demand in the city in 2016, 2021, and 2031. For each horizon year, it recommended road network and transit service improvements that addressed the anticipated demand. The findings of this study underpinned the transportation network improvements included in the City's 2003 Development Charges study, as well as the 2008 Development Charges update.

In 2009 the City of Brampton undertook a *Sustainable Update* to the TTMP. While still charged with identifying future transportation infrastructure and service needs, the updated study focused more on solutions that promoted sustainability through greater adoption of transit and active transportation modes. This follow-up study informed the capital transportation program used in the 2009 Development Charges update.

Among the changes in the 2009 TTMP and DC updates was the identification and inclusion of strategic mid-block collector roads in several proposed communities, including the Mount Pleasant Secondary Plan Area. In particular, the north-south and east-west sections of the collector Spine Road that is planned for both Mount Pleasant Blocks 51-1 and 51-2 were explicitly identified as four lane collector roads that were eligible for DC funding.

The relevant road works identified in the 2009 TTMP and DC updates are summarized in Section 3.6, "**Summary of Road Works: Status and Timing**".

3.3.2 Long Range Transportation Plan

The Region of Peel completed their *Long Range Transportation Plan* (LRTP) Study in 2005. This study identified the need for and timing of improvements to the Region's arterial road network. The two Region of Peel roads of direct importance to the Mount Pleasant Block 51-1 community are:

- Mississauga Road between Bovaird Drive and Mayfield Road
- Mayfield Road between Mississauga Road and Creditview Road

The current planning status of these roads is discussed in sections 3.5.1 and 3.5.3.

3.4 City of Brampton Arterial Road EA Studies

A number of other Environmental Assessment Studies related to the arterial road network directly adjacent to Block 51-1 are at various stages of completion. These studies are shown in Figure 3.3.

Three of these studies commenced directly upon completion of the 2009 Transportation Master Plan Study and have now been completed. These comprise the Phase 3 and 4 Environmental Study Reports (ESR's) for:

- the re-alignment and widening of James Potter / Creditview Road from Bovaird Drive (where it will connect to a future extension of James Potter Road from the south) to just north of Fairhill Avenue where it will connect to the existing Creditview Road, and to a short extension of Fairhill Avenue at a 3 legged intersection,
- the widening of Creditview Road from where the James Potter / Creditview Road re-alignment terminates (just to the north of Fairhill Avenue) north to Mayfield Road, and
- the extension of Sandalwood Parkway west from Creditview Road to Mississauga Road.

The Phase 3 and 4 Collector Road Environmental Assessment that is the subject of this study comprises the fourth transportation study conducted in support of the Mount Pleasant Community, and the final component of work required to fulfill the Transportation Environmental Assessment requirements for Block 51-1 of the Mount Pleasant Secondary Plan Area.

3.4.1 James Potter / Creditview Road Re-alignment

A Phase 3 & 4 Environmental Study Report (ESR) has been completed supporting the re-alignment of James Potter / Creditview Road from Bovaird Drive (where it will connect to a future extension of James Potter Road) to just north of Fairhill Avenue, where it connects to existing Creditview Road. This study included an assessment and preliminary design of the grade separated underpass of James Potter / Creditview Road and the CN Rail line.

The study was completed and approved as of April 2010. Detailed design is underway for this section of James Potter Road / Creditview Road, and arrangements are underway to commence design of the grade separated underpass.

3.4.2 Creditview Road Widening

An Environmental Study Report (ESR) has been completed in fulfilment of Phase 3 and 4 requirements of the MCEA for the widening of Creditview Road from just north of Fairhill Avenue to Mayfield Road. As noted above, this work follows on from the Phase 1 and 2 work completed as part of the 2009 Transportation Master Plan Study for the Mount Pleasant Secondary Plan Area.

This study was completed and approved as of November 2010, and detailed design of the road has commenced in 2011. Construction of these works is anticipated to take place between 2013 and 2014 according to the *City of Brampton 2011-2020 Roads Capital Program* dated January 26th, 2011.

3.4.3 Sandalwood Parkway Westward Extension

The need, justification and potential alignments of the Sandalwood Parkway Extension were assessed in the City's *Mount Pleasant Secondary Plan Area Transportation Master Plan (TMP)* in accordance with Class Environmental Assessment requirements. It identified the extension of Sandalwood Parkway as a Schedule C project that required further study in compliance with Phases 3 and 4 of the Class Environmental Assessment process. This work was completed through the *Sandalwood Parkway Extension from Creditview Road to Mississauga Road Class Environmental Assessment – Environmental Study Report (ESR)* completed by ENTRA Consultants and Philips Engineering in November 2010. The Study assessed alternative road alignments and recommended a location and preliminary preferred design of the Sandalwood Parkway extension through the Mount Pleasant lands. The recommended location was noted to cross the NHS generally south of existing Wetland 9 (W9). A small portion of the staked boundary of this wetland lies within the proposed ESR Sandalwood Parkway right-of-way and associated transitional grading area. The ESR concluded that the minor loss of a portion of W9 could be readily compensated for within the NHS design as currently proposed. It further noted that necessary adjustments to the design, inclusive of details of cross-section and alignment of Sandalwood Parkway that are generally in accordance with the preferred alternative alignment, will be considered during the detailed design phase in association with the Block Plan process and addressed through required component studies, including but not limited to the Environmental Implementation Report (EIR) and Transportation Study.

The boundaries of the Block 51-1 NHS reflect findings of the North West Brampton Landscape Scale Analysis, the Huttonville and Fletcher's Creeks Subwatershed Study (HFSWS) and principles outlined in the "*Implementation Principles for the Subwatershed Study, November 24, 2009*", attached as Appendix F to the approved Mount Pleasant Secondary Plan. The Implementation Principles were agreed to by the City, the Credit Valley Conservation (CVC), the Ministry of Natural Resources (MNR) and the Mount Pleasant Landowners' Group. It sets out agreement and direction on several design requirements for the Mount Pleasant lands including NHS boundaries, woodlands and wetlands protection, buffers, channel relocation, lowering and widths, NHS restoration/enhancement, trails, stormwater management (SWM), Comprehensive Fisheries Compensation Plan (CFCP), drainage density, road crossing design and implementation considerations. Mount Pleasant Landowners' Group NHS Vignettes, that formed part of the Implementation Principles (1(c)), illustrated that a portion of W9 was proposed to be altered through the proposed NHS design, with the construction of new open water/marsh wetlands north and south of Sandalwood Parkway; see Figure 3.5. The Implementation Principle (1(c)) states that the extent of habitat enhancement and wetland creation is to be implemented as per the concepts/principles illustrated on the Landowners' Group vignettes (2009) and that implementation and additional design details will be established at the EIR stage. Through Block 51-1 EIR Workshops in 2010, the MNR requested that the proposed open water/marsh wetland, north of Sandalwood Parkway, be removed and that the existing wetland area of W9 be left as is. Figure 3.5 also illustrates the resulting revised vignette for the W9 area.

3.4.3.1 Proposed Realignment of Sandalwood Parkway

Following completion of the ESR, the 'preferred' alignment of Sandalwood Parkway was reviewed as a part of the development of the Block Plan for Sub-Area 51-1. A review of the road alignment with respect to the integration of various land uses in this vicinity including the extent and form of

the NHS, maintenance of the Creditview Park facilities, the development of an ‘urban node’ in conjunction with the alignment of the community Spine Road and the consideration of land use efficiencies resulted in the proposal for several adjustments to the Sandalwood Parkway alignment as illustrated in Figure 3.6. These adjustments can be generally described as adjusting the road alignment northward from the ESR alignment by 18m to 45m depending on location. This moves the road further north into portions of W9. The nature and rationale for these changes are summarized below.

- Reduce Impacts on the City’s Sports Park- The preferred alignment for Sandalwood Parkway, as documented in the ESR, cuts through the northwest corner of the City’s Sports Park, located in the southwest quadrant of the future Creditview Road/Sandalwood Parkway intersection. The preferred alignment was such that an existing illuminated lacrosse field, in which the City had made significant investment, will be eliminated.

After discussions were held with City staff as to how this impact might be mitigated, an alternative alignment was developed that flattened the back to back curves in the preferred ESR alignment so as to shift the required road right-of-way northwards, clear of the affected playing field.

- Balance Property Impacts - From the mid-block property boundary to Mississauga Road, the preferred ESR alignment for Sandalwood Parkway located the right-of-way completely to the south of a significant east-west property boundary that separates two participating landowners, and bisects one of the Mixed Use Nodes in the Block Plan. By virtue of the road not being centered on this property line, a problem was created with respect to a fair division of the constraints imposed by this road on the efficiency of two adjacent draft plans. Compounding the problem was the desire to create a particularly efficient, more urban built form within the areas identified as Mixed Use Nodes in Block 51-1, one of which is located at the intersection of the North-South Spine Road and Sandalwood Parkway.

By shifting the road alignment north such that it was centred on this east-west property boundary, and further straightening the road in co-ordination with the effort to remove it from the City’s Sports Park, as discussed above, these inefficiencies are resolved.

- Road Geometry Benefits - From a road design perspective, the preferred alignment for Sandalwood Parkway, as documented in the ESR, has two back to back curves that, while meeting the City and the TAC’s (Technical Advisory Committee) standards, do not create an ideal alignment for a busy arterial road. The adjustments to these curves, noted in the preceding two sections, have the benefit of flattening them, creating a generally straighter alignment for this section of road. In addition, the flattening of the easternmost of the two curves creates a more desirable intersection configuration at the point where Collector Road ‘G’ intersects from the north. By reducing the curvature and improving sightlines, this also creates the flexibility to add a fourth leg to this intersection, which would allow the City’s desired new access from Sandalwood Parkway into the north side of the City’s Sports Park.

Required Road Grades – The ESR alignment does not appear to have considered overall site grading requirements to service the Block 51-1 lands. The Draft Environmental Implementation Report for the Block 51-1 lands (Stonybrook Consulting et al, January 2011) includes a detailed site grading assessment to establish channel, road and lot grades. This analysis identified proposed road grades for Sandalwood Parkway in the context of servicing of the adjacent lands. Resulting road grades differ from those shown in the ESR. The ESR road grades, established without the benefit of a detailed site assessment, show lower road grades than what is needed. Based on the ESR alignment and EIR road grades, 4% of W9 would be removed through road construction. The resulting road realignment (both plan and profile) and cross sections are illustrated on Figure 3.8.

3.4.3.2 Environmental Review of Realignment

As part of the assessment of the realigned Sandalwood Parkway, environmental implications of the road realignment on Wetland 9 (W9) were evaluated. W9 is a wetland unit within the Provincially Significant Huttonville Creek and Area Wetland Complex and is classified as a palustrine wetland, with intermittent inflow and outflow. It has no well-defined storage basin or measurable outlet rating curve. W9 is a complex of several herbaceous and shrub communities. The intricate mosaic is formed by variously shaped, connected or separate, patches of reed-canary grass meadow marsh, meadowsweet thicket swamp, sedge meadow marsh, as well as areas of forb and mixed meadow marsh, and willow and dogwood thickets. The latest aerial photography was reviewed and updated vegetation units as per Ecological Land Classifications (ELC)) were identified. Figure 3.7 illustrates the wetland and upland vegetation units in and around W9.

Winter wildlife surveys, winter raptor surveys, breeding amphibian surveys, amphibian movement surveys and breeding bird surveys were completed by either Dougan & Associates or Savanta Inc. between 2005 and 2009. Based on this extensive inventory work and MNR evaluation, American Toads, Chimney Crayfish, Pond Snails, Bobolink, Yellowlegs, Red-winged Blackbirds, Song Sparrow, Cowbird, American Goldfinch, Eastern Kingbird, Yellow Warbler, Willow Flycatcher and Tree Swallow were observed in, or in the vicinity of, W9. Virginia Rail was heard in a June 2011 site visit by MNR and Savanta Inc.

Based on fieldwork completed as part of the Draft Environmental Implementation Report for Block 51-1 (Stonybrook et al, January 2010), surface water and groundwater conditions in and around W9 were identified. This work concluded that surface water from agricultural fields to the north and a tile drain discharge flows to a ditch that directs surface flows into the northwest corner of W9. The ditch continues a short distance into W9 and then the channel disappears and the flow disperses broadly across the grassy area. Flows out of W9 drain southerly across existing agricultural fields in ill-defined swales. Direct precipitation and surface water runoff are estimated to provide 99% of the water supply to this feature. Shallow standing water is observed in the linear depressions that are present in W9 (remnants of agricultural furrows and farm vehicle tire tracks from past agricultural uses in this area) during and following the snowmelt period (March/April) and following storm events in the late fall. W9 is typically dry by May/June; its hydroperiod is estimated to be 4 months in the spring.

There is no evidence of groundwater discharge to W9, however, the water table will vary seasonally and is expected to rise closer to grade, particularly under spring conditions when there is standing water in the wetland and recharge of the seasonal surface water ponding will contribute to the local high water table conditions. There is no direct response of the shallow groundwater levels to rainfall

events, illustrating the tight nature of the clay soils. The potential groundwater contribution from the high water table conditions is estimated to be less than 1% of the total water supply to the wetland feature.

3.4.3.3 Wetland Delineation

In 2005 and 2006, the MNR conducted wetland inventories and fieldwork in the North West Brampton area and vicinity. Through air photo interpretation, both the external wetland polygon boundary and internal vegetation community boundaries were determined by MNR. In the field, the wetland vegetation communities were determined to vegetation unit (ELC), where access was available, and flora and fauna (i.e., amphibians and incidental wildlife) were recorded. In December 2007, the MNR released a Draft Huttonville Creek and Area Wetlands Map and background data summary of Candidate Provincially Significant Wetland (PSW) Units. Fourteen Candidate PSW areas are located in Block 51-1, including W9. The MNR deferred a final determination regarding their status (i.e., they remain candidates) until completion of NHS planning through the Mount Pleasant Secondary Plan work. This approach was adopted to allow for a more broad consideration of the functions performed by the individual wetland units in the context of the larger terrestrial and aquatic ecological system and adjacent urban development proposed in Mount Pleasant.

In 2009, the external W9 boundary was staked and confirmed by MNR. Between the summer 2006 and the summer 2007, a southern portion of W9 was converted to agricultural uses (former lake-sedge meadow marsh). The 2009 wetland staking included an estimated southern boundary that included the new agricultural field in the boundary; it is noted as “disturbed/agriculture” on Figure 3.7. Savanta has updated the ELC polygons, including the disturbed/agricultural area, based on review of latest (year) aerial photography, as shown on Figure 3.7.

3.4.3.4 Species at Risk - Bobolink

As noted above, Bobolink have been observed in the vicinity of W9. As of September 2010, Bobolink was listed as Threatened in Ontario under the Endangered Species Act (2007). Prior to its listing of Threatened in Ontario, protection for the species was limited to that offered under the Significant Wildlife Habitat (SWH) designation as per the Natural Heritage Reference Manual. The Endangered Species Act protects both the species and its habitat. The MNR is in the process of preparing a Recovery Strategy for Bobolink with the proposed timeline for completion of the Draft Recovery Strategy being October 2011 and the Final Recovery Strategy in Summer 2012. There currently is no specific habitat regulation for Bobolink.

Bobolink (*Dolichonyx oryzivorus*) is a member of the blackbird family that lives year-round in grassland habitats ranging from abandoned pasture and grassy edges of wetlands to active hay fields. The species breeds across North America in a rough band, primarily between 40° and 50° latitude wherever suitable habitat occurs. Presently much of the historical core range is in intensive crop agriculture and is unsuitable for this species. Their current range and strongholds are in many areas strongly tied to past and present agricultural practices (e.g., presence of large hayfields).

Breeding Bird Surveys were conducted as part of the Huttonville and Fletcher’s Creeks Subwatershed Study (HFSWS) by Dougan & Associates in 2005, 2006 and 2007, and for the North West Brampton lands in support of the HFSWS (including Mount Pleasant) by Savanta Inc. in 2008 and 2009. These surveys were conducted in accordance with Ontario Breeding Bird Atlas protocol. Through the five-year study period, bobolink were recorded in 2005, 2006, 2008 and 2009 as

“breeding possible” in a couple of vegetation communities near Wetland 9 on the Block 51-1 lands. While historic records noted the limited observations of bobolink in the vicinity of W9, these lands were re-examined by the CVC, MNR and Savanta on June 8th, 2011 and based on site inspection, no bobolink or their habitat were observed within W9. It was further agreed by CVC, MNR and Savanta Inc. that lands along and in the vicinity of the proposed Sandalwood Parkway alignment and within W9 itself do not comprise suitable habitat for this species.

3.4.3.5 Species at Risk – Redside Dace

Redside Dace (*Clinostomas elongates*), an endangered species as per the provincial *Endangered Species Act, 2007*, occurs in the East and Main Huttonville Creeks. Ontario Regulation 293/11, made under the *Endangered Species Act, 2007* on June 22, 2011, amends Ontario Regulation 242/08 to provide Redside Dace habitat definition (Section 29.1) and transition provisions for development and infrastructure affecting Redside Dace habitat (Section 23.1). Redside Dace habitat is defined by Regulation 293/11, Section 29.1, to include a stream, permanent or intermittent headwater drainage feature, groundwater discharge area or wetland that augments or maintains the baseflow, coarse sediment supply or surface water quality of a part of a stream or other watercourses that is being used by redside dace or was used by redside dace at any time during the previous 20 years and that provides suitable conditions for a redside dace to carry out its life processes, provided that the part of stream or watercourse has an average bankfull width of 7.5 metres or less. Based on Section 29.1 1.v., W9 and stream reaches through W9 are regulated Redside Dace habitat.

3.4.3.6 Impact Assessment of Block Plan Sandalwood Pkwy Alignment on W9

Based on an engineering assessment of the road design and community grading requirements, a road plan/profile and a cross section through the W9 area were established. They are shown on Figure 3.8. The transition grading from the northern boundary of the road right-of-way into W9, 3:1 (H:V) sloping, is shown.

Based on the limits of W9 as staked and surveyed in the field with agency representatives in 2009, W9 is a total of 2.49 ha in size. As described earlier, the southern portions of this wetland were historically cultivated and again farmed sometime between 2005 and 2007. Considering the removal of some wetland vegetation, approximately 2.17 ha of the wetland staked limit contains wetland vegetation. Based on the latest aerial photography and staked W9 limits, the realigned Sandalwood Parkway and associated grading encroaches approximately 0.98 ha or approximately 39% into W9. Of this area, 0.32 ha is disturbed by recent agricultural uses and 0.66 ha is wetland vegetation. The road realignment will remove 26% of existing wetland vegetation and 13% of historic wetland area.

Neither pre-development nor post development drainage that support W9 will be impacted by road construction. However, an appropriate right-of-way drainage design is required to maintain the existing wetland outlets for surface flows. To maintain drainage from W9 to downstream areas, culvert(s) under Sandalwood Parkway will be required that will direct flows to the new wetland to be created south of Sandalwood Parkway.

3.4.3.7 Proposed Realignment and Mitigative Measures

The proposed Sandalwood Parkway realignment presented herein and in the Block 51-1 EIR is the result of an integrated analysis of the extent and form of the NHS, land use design for the Mixed Use Node and Spine Road, road geometry and design, maintenance of existing parkland infrastructure

and development land use efficiencies as discussed in Section 3.4.3.2. This alignment encroaches further into W9 than the approved ESR alignment. Considering all land use planning, design, and engineering implications of road realignment, the Sandalwood Parkway realignment is preferred as shown on the Block Plan.

At detailed design, road design will be reviewed to minimize grading impacts into W9 and maintain drainage from W9 into the newly created wetland south of Sandalwood Parkway. Opportunities to minimize grading impacts into W9 including lowering the road grade and using alternative SWM treatment for road drainage, steepening the slope north of the road, using retaining walls, and/or starting transition grading within the right-of-way will be investigated at detailed design in consultation with the City of Brampton, CVC and MNR. Vegetation community edge management including native species restoration plantings will be implemented along the right-of-way. In addition, as agreed by the MNR, City and Mount Pleasant Owners' Group (See City of Brampton correspondence to MNR dated March 16th, 2011 in Appendix), wetland replacement will occur elsewhere in the NHS. More specifically, the loss of 0.98 hectares of W9 will be mitigated through the construction of an approximately 2.0 ha replacement wetland and associated buffers in the area referred to as the 'tooth' in the vicinity of the woodlands/wetlands (W13) to the west and south of the Creditview Park shown on Figure 3.9. Further discussions are required with MNR, initially through the completion of the Block 51-1 EIR and subsequently through detailed design on the affected draft plan, to identify specific replacement wetland details including design, timing of construction and other implementation considerations. The preparation of detailed landscape plans for implementation will be the responsibility of the Mount Pleasant Landowners' Group.

3.4.3.8 Regulatory Approvals

The detailed design of Sandalwood Parkway extension will require future approvals from the City of Brampton, the Credit Valley Conservation and the Ministry of Natural Resources.

Permits pursuant to the *Conservation Authorities Act*, Regulation 160/06, Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, are required for, "*straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse, or changing or interfering in any way with a wetland caused by site grading, and/or the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere*". Through the implementation of Regulation 160/06, the CVC identified regulated areas, as defined in Regulation 160/06, where these types of activities would require CVC approval. Watercourses and wetlands within the Mount Pleasant lands, including W9, lie within the CVC regulated areas, hence, alterations to W9 as described herein will require approvals under Regulation 160/06.

At a provincial level, Species at Risk and their habitats are afforded protection under the *Endangered Species Act, 2007*. As noted in Section 3.4.3.5, W9 and the stream reach through W9 are regulated Redside Dace habitat. Under Section 10(1) of the Ontario Endangered Species Act legislation:

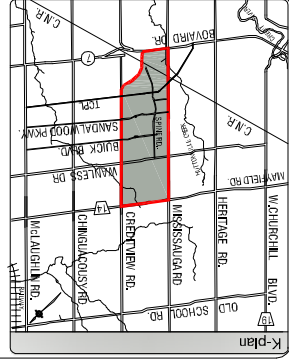
- "No person shall damage or destroy the habitat of,
- a) a species that is listed on the Species at Risk in Ontario List as an endangered or threatened species; or
 - b) a species that is listed on the Species at Risk in Ontario List as an extirpated species, if the species is prescribed by the regulations for the purpose of this clause."

Despite the provisions against damage or destruction of Endangered species habitat, Section 17(1) of the Act specifies that:

“The Minister may issue a permit to a person that, with respect to a species specified in the permit that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species, authorizes the person to engage in an activity specified in the permit that would otherwise be prohibited by section 9 or 10...if:

- c) the Minister is of the opinion that the main purpose of the activity authorized by the permit is not to assist in the protection or recovery of the species specified in the permit, but,
 - i. the Minister is of the opinion that an overall benefit to the species will be achieved within a reasonable time through requirements imposed by conditions of the permit,*
 - ii. the Minister is of the opinion that reasonable alternatives have been considered, including alternatives that would not adversely affect the species, and the best alternative has been adopted, and*
 - iii. the Minister is of the opinion that reasonable steps to minimize adverse effects on individual members of the species are required by conditions of the permit.”**

The construction of Sandalwood Parkway through W9 and across East Huttonville Creek will affect Redside Dace habitat and therefore discussions with MNR should be pursued to determine permit requirements or alternatively the applicability of Section 23.1 of Ontario Regulation 293/11 to these works that would require the preparation of a mitigation plan to be approved by District Manager of MNR, Aurora District.

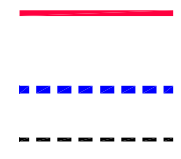


LEGEND:

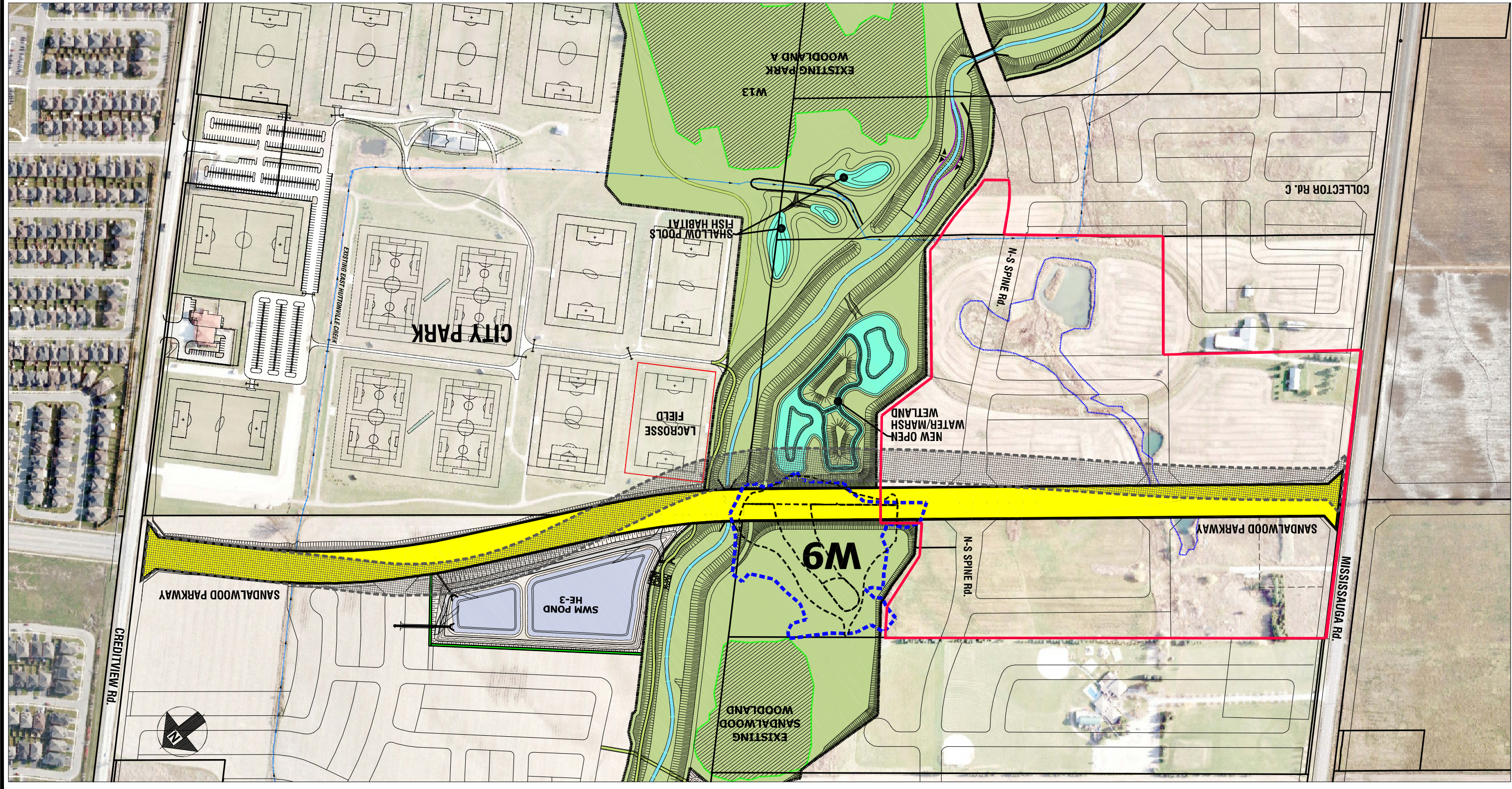
- Proposed NHS
- ESR Sandalwood Alignment
- Block Plan Transportation Study

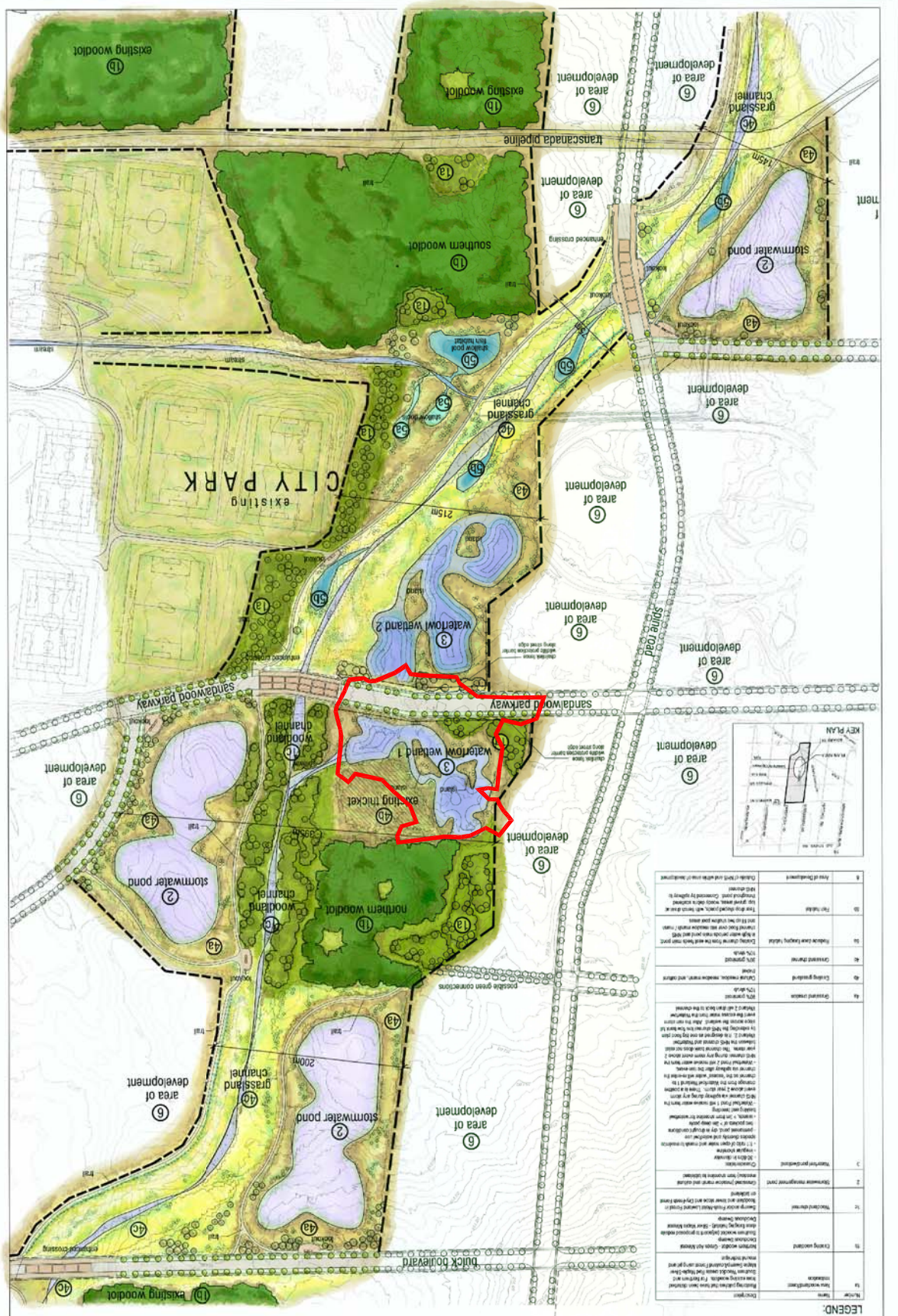


- MNR Wetland Boundary 2007
- Staked Wetland Boundary 2009 (by RPE Surveying)
- Urban Node Boundary



SANDALWOOD PARKWAY ALIGNMENT
Figure 3.5
 Mount Pleasant Sub-Area 51-1
 N.T.S.
 June 2011





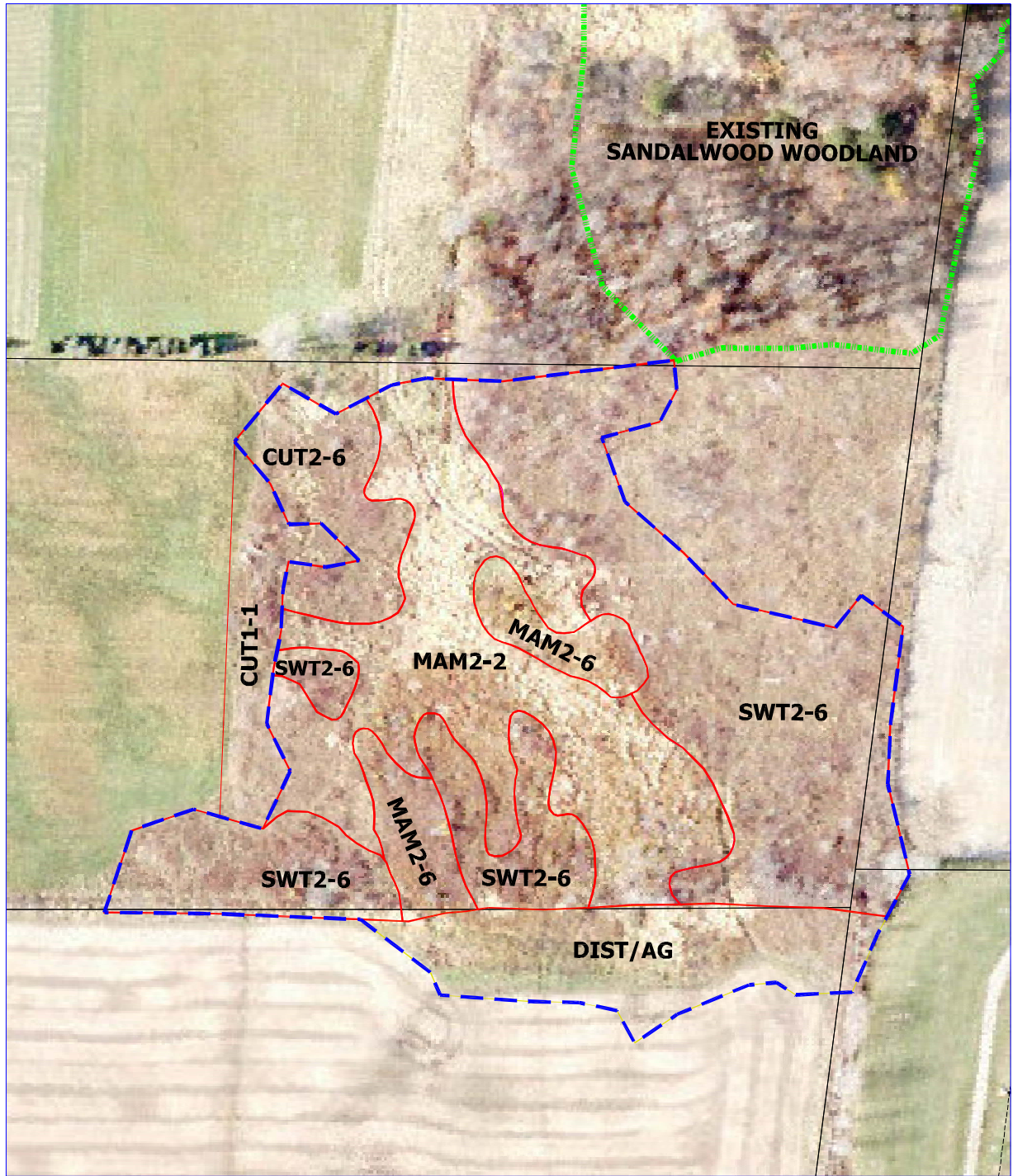
NHS Vignette for W9 and Adjacent Areas, November 2009



NHS Vignette for W9 and Adjacent Areas, January 2011

NHS Vignettes
 Figure 3.6
 N.T.S.





ECOLOGICAL LAND CLASSIFICATION LEGEND:

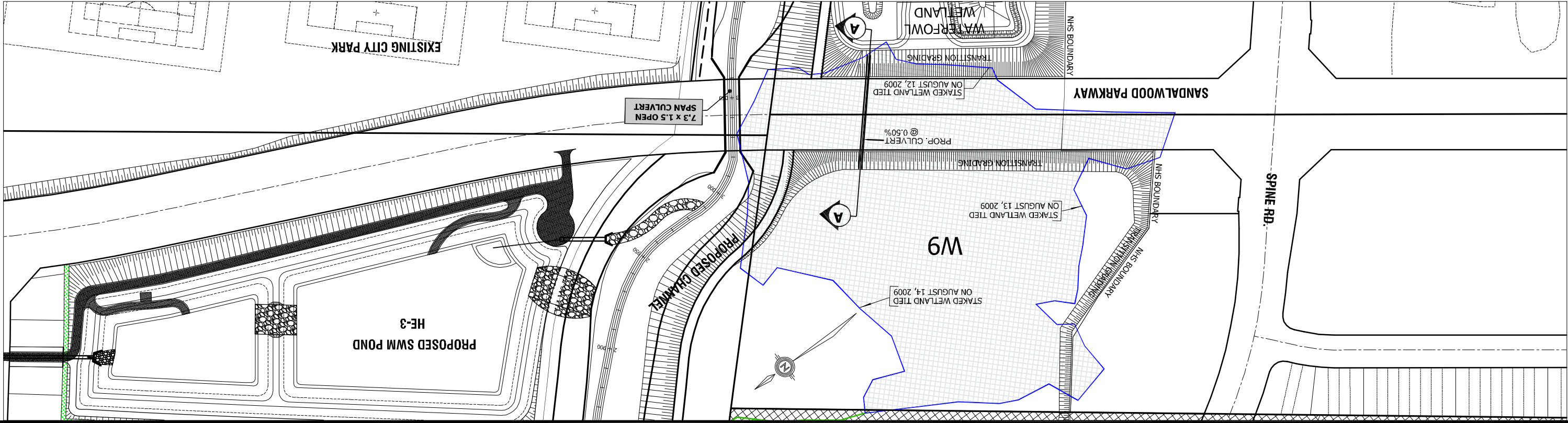
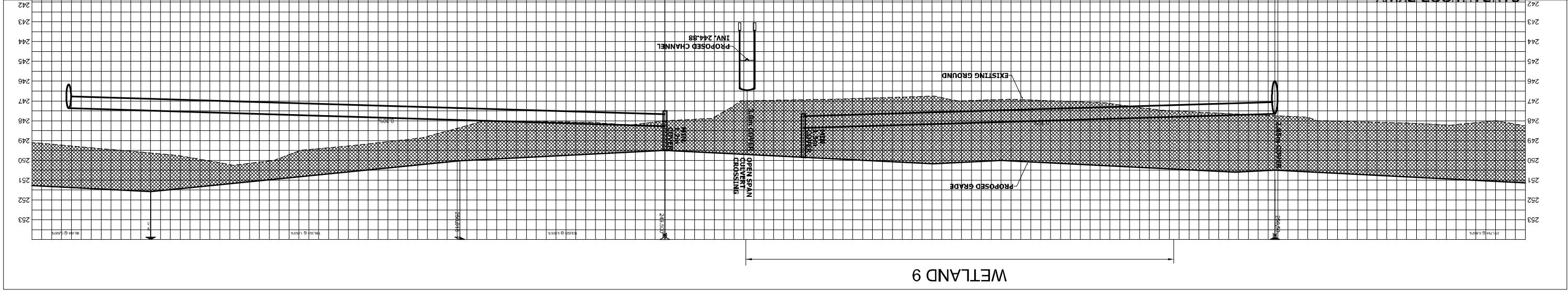
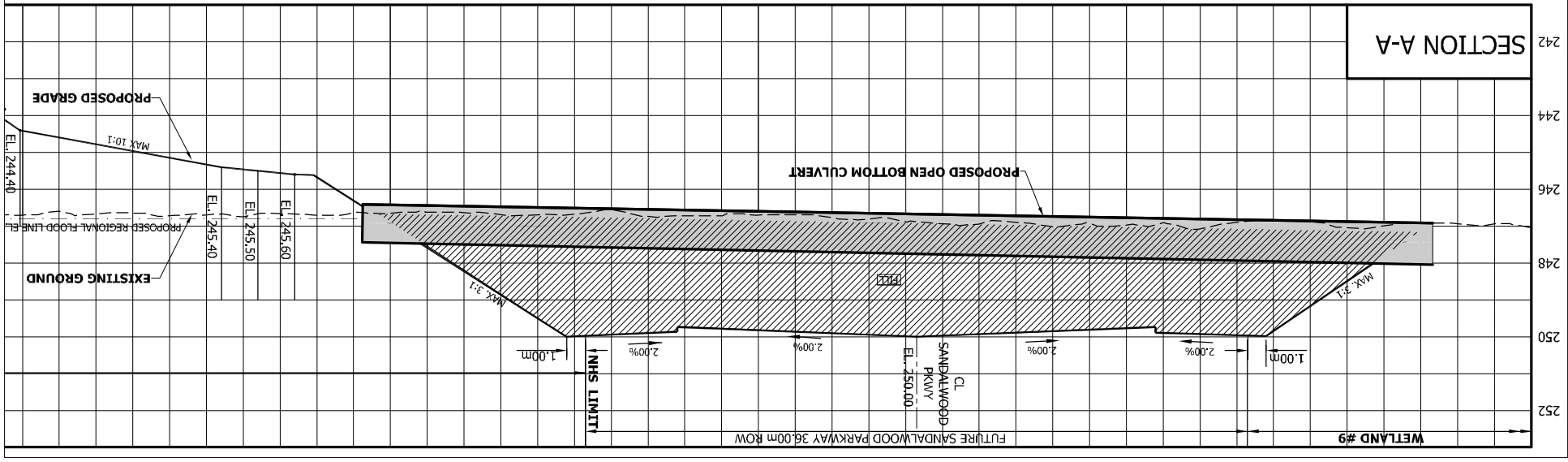
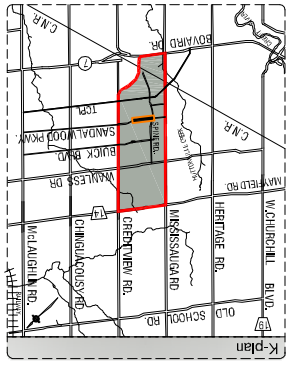
ELC CODE	ELC NAME
CUM1-1	Fresh-Moist Cultural Old-Field Meadow
MAM2-2	Reed Canary Grass Mineral Meadow Marsh
MAM2-6	Broad-Leaved Sedge Mineral Meadow Marsh
SWT2-6	Meadowsweet Mineral Thicket Swamp
DIST/AG	Disturbed Agriculture

SCALE: N.T.S.

Mount Pleasant Sub-Area 51-1

Figure 3.7
WETLAND 9 ELC COMMUNITIES

June 2011



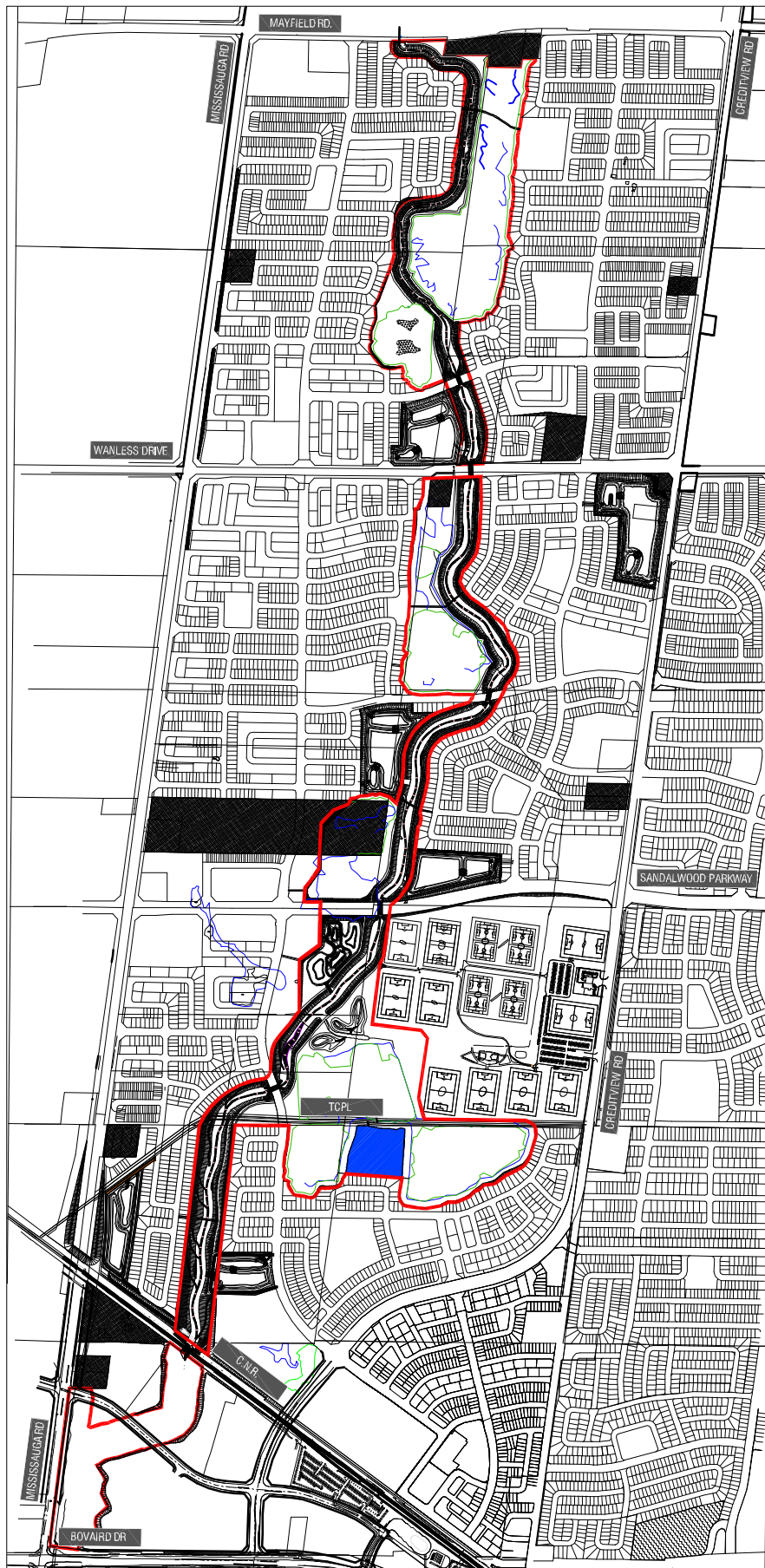
SANDALWOOD PARKWAY
ALIGNMENT
Figure 3.8

Mount Pleasant Sub-Area 51-1
N.T.S.



Legend:

-  NHS BOUNDARY
-  WETLAND RESTORATION AREA



N.T.S.
Environmental Implementation Report
Mount Pleasant Sub-Area 51-1

WETLAND RESTORATION AREA

Figure 3.9

3.4.4 Wanless Drive

3.4.4.1 Between Chinguacousy Road and Creditview Road

This section of Wanless Drive is the subject of a completed and approved Environmental Assessment Study for the widening of the existing road from 2 to 4 lanes. It has subsequently undergone detailed design, and is currently under construction.

It is important to note that the section of Wanless Road included in this work extends about 200m to the west of Creditview Road, and includes the construction of the full intersection at Creditview Road and Wanless Drive. The design of this intersection is based on road and transit requirements identified in both the Wanless Drive EA study and the completed and approved Creditview Road (Fairhill Avenue to Mayfield Road) EA Study noted above.

3.4.4.2 Between Creditview Road and Mississauga Road

The Phase 1 and 2 Environmental Assessment requirements for this road have been fulfilled by means of the Mount Pleasant Secondary Plan Area Transportation Master Plan study (June 2009). A future study will be undertaken by the City of Brampton in order to fulfill the Phase 3 and 4 Environmental Assessment requirements for the widening of Wanless Drive between Creditview Road and Mississauga Road to 4 lanes. This study has commenced in August 2011, and will be completed in 2012. Construction of this project is scheduled for 2014 according to the *City of Brampton 2011-2020 Roads Capital Program* dated January 26th, 2011.

For purposes of proceeding with the Block 51-1 plan, it has been assumed that:

- The future right-of-way requirements for Sandalwood Parkway will be generally identical to those determined for Sandalwood Parkway through the EA process for that road as described above.
- The future alignment of Wanless Drive, while subject to a future EA study, will generally follow the centreline of the existing right-of-way. The exception to this is at the mid-block property line where the existing Wanless Drive alignment negotiates a double curve. The radius of these curves have been assumed to increase to about 2500 metres in order to ensure that the horizontal alignment requirements for a road of this type and anticipated design speed are fulfilled.

3.5 Region of Peel Arterial Road EA Studies

3.5.1 Mississauga Road

3.5.1.1 Between Queen Street and Bovaird Drive

An Environmental Assessment study for the widening of this section of road from 2 to 4 lanes was completed in 2007. Design work has been completed, and construction is scheduled for 2011. It is important to note that this work extends about 200m to the north of Bovaird Drive, and will include the construction of the Bovaird Drive and Mississauga Road intersection. This work is being coordinated with the widening of Bovaird Drive from 2 to 4 lanes from the Canadian National Railway (CNR) overpass to a point just to the west of the Mississauga Road intersection. The intersection will be constructed as a full 4 lane by 4 lane intersection, with provision in the built up base for the ultimate widening to 6 lanes by 6 lanes.

3.5.1.2 Between Bovaird Drive and Mayfield Road

An Environmental Assessment study is underway on behalf of the Region of Peel for the widening of Mississauga Road between Bovaird Drive and Mayfield Road to 4 lanes, and ultimately to 6 lanes between Bovaird Drive and Sandalwood Parkway. The scope of the study includes a grade separation with the Canadian National Railway (CNR) line. It is anticipated that this study will be completed in the first quarter of 2011. Construction of the first section of this project (Bovaird Drive to Sandalwood Parkway, including the CNR grade separation) is currently scheduled by the Region of Peel for 2014. The section from Sandalwood Parkway to Wanless Drive will follow in 2015, and the section between Wanless Drive and Mayfield Road in 2016.

Although this EA study is ongoing, it was necessary in order to proceed with the Block 51-1 plan to make assumptions with respect to the future road alignment and right of way requirement along the west boundary of the block. The assumptions made herein in this regard were made by the Block 51-1 consulting team, and were based on the most up to date information made available by Region of Peel staff and their consulting team.

- The future right-of-way required for a 6 lane cross section on Mississauga Road has been assumed to be 50.5 metres, based on an agreement reached after discussions between Region of Peel staff, City of Brampton staff, and representatives of the development industry in the fall of 2010 (a copy of this material is include in Appendix A.4.3 attached separately to this report). This 50.5 metre right-of-way accommodates intersection approaches with all required turning lane, transit, and boulevard amenities with the exception of dual left turn lanes. It has been confirmed (through the analysis documented in this report) that dual left turn lanes will not be required at any of the intersections along either Mississauga Road or Mayfield Road.
- The future alignment of Mississauga Road is assumed to follow the centreline of the existing right-of-way.
- The grade separation at the CNR line is assumed to be an overpass. As such, the potential grading requirements for a crossing of this type have been estimated, and used to augment the assumed right-of-way requirements for Mississauga Road.

- It is assumed that the Region of Peel will provide access from the improved and grade separated Mississauga Road right-of-way to the Block 51-1 properties on the east side of the road that have existing access today.

3.5.2 Bovaird Drive

An Environmental Assessment study was completed in 2003 for the widening of Bovaird Drive between Highway 410 and Mississauga Road to 6 lanes. A follow-up Environmental Assessment study has now commenced to examine the widening of Bovaird Drive between Worthington Avenue and the City of Brampton limits to between 4 to 6 lanes as required. It is anticipated that this study will be completed in spring of 2011.

3.5.3 Mayfield Road

A future Environmental Assessment study will be undertaken by the Region of Peel for the widening of Mayfield Road between Chinguacousy Road and Mississauga Road to 4 lanes, and possibly 6 lanes ultimately. At this time, this study is anticipated to commence in 2013 as a part of a broader study. The widening of this section of Mayfield Road from 2 to 4 lanes is currently scheduled to be undertaken in 2019.

As with the Mississauga Road right-of-way along the west side of Block 51-1, it has been necessary for purposes of planning Block 51-1 to make assumptions regarding the future alignment and right-of-way required for Mayfield Road. Consistent with the assumptions made regarding Mississauga Road, it has been assumed that:

- The future right of way required for a 6 lane cross section on Mayfield Road has been assumed to be 50.5 metres, based on conceptual cross sections provided by Region of Peel staff. As with the Mississauga Road right-of-way, this right-of-way width is based on an agreement reached after discussions between Region of Peel staff, City of Brampton staff, and representatives of the development industry in the fall of 2010.
- The future alignment of Mayfield Road is assumed to generally follow the centreline of the existing right-of-way.

In the course of developing the Block 51-1 plan the above general principles were discussed and agreed to with Region of Peel staff. In addition, two specific issues were also discussed and agreed to:

- The ability to undertake a future widening of Mayfield Road on the centreline of the existing right-of-way in the vicinity of the intersection with Creditview Road is challenged by the presence of a church in the northeast corner of the intersection. So as to avoid having to expropriate this property in order to implement the future widening, Region of Peel staff requested that additional property be provided by the Block 51-1 landowners to the south of the existing Mayfield Road right-of-way and west of Creditview Road. Subsequent discussions between the Block 51-1 landowners and their consultants with Region of Peel staff resulted in an agreed upon preliminary functional design for this intersection which features:

- a southward shift of the existing Mayfield Road right-of-way to the east and west of Creditview Road
- a reduced right-of-way width on the east intersection approach directly in front of the church
- a reduced sight triangle requirement on the northeast corner

The resulting functional design for this intersection is included with the Block 51-1 road design drawings included in the Appendix to this report.

- Existing Mayfield Road between Mississauga Road and Creditview Road incorporates mid-block back to back curves. The future widening of Mayfield Road is likely to encounter constraints imposed by existing property ownership to the south of the right-of-way, and the presence of the Alloa School to the north. In addition, if the same radius is maintained for these curves when the road is widened, it will require substantial superelevation of the road, and subsequently the development of additional tangent distance between the curves so as to allow for an appropriate transition between the oppositely superelevated sections. In order to address these issues, it was proposed to Region of Peel staff that the assumed future right-of-way centreline be adjusted so as to:
 - split the difference between the nearest existing structures to the north and south of the road at the current narrowest point
 - assume that the widened road will incorporate curves with radii broad enough to alleviate the need for superelevation in this area.

Region of Peel staff concurred that this was a reasonable allowance to make for the future widening of this road. The resulting proposed future centreline of the Mayfield Road right-of-way was drawn up, along with revised property limits on the south side of the right-of-way consistent with the modified centreline and the Regions anticipated need for a 50.5m right-of-way width. This information is shown on the Mayfield Road drawing discussed above and included in the Appendix of this report.

The Block 51-1 Block Plan drawing was subsequently updated so as to reflect both of the above described and agreed upon property line adjustments.

3.6 Summary of Road Works: Status and Timing

The following tables summarize the information presented in the above sections. The timing of these projects is based either on information available through published capital plans, or estimated on the basis of discussions with City of Brampton and Region of Peel staff. The information is consistent with that found in the Growth Management Report recently filed in support of Block 51-1.

Table 3.1 - Municipal Delivered Roads

Roadway and Section	Jurisdiction	EA Status / (Completion)	Width (lanes)	Construction	
				Commence	Complete
Mississauga Road	Region of Peel				
Queen Street to 200 m North of Bovaird Dr. W. (including intersection)		Completed	2 to 4	2011	2013
200 m north of Bovaird Dr. W. to Sandalwood Pkwy W.		Underway (2011)	2 to 4 (incl Grade Sep'n)	2014	2015
Sandalwood Pkwy W. to Wanless Dr.		Underway (2011)	2 to 4	2015	2016
Wanless Dr. to Mayfield Rd.		Underway (2011)	2 to 4	2016	2017
Bovaird Drive West	Region of Peel				
James Potter Rd. to Mississauga Rd.		Completed Underway (2011)	2 to 4 4 to 6	2012 unknown	2013 unknown
Wanless Drive	City of Brampton				
Chinguacousy Rd. to Creditview Rd. (incl Creditview Rd. intersection)		Completed	2 to 4	2010	2012
Creditview Rd. to Mississauga Rd.		Phases 1 & 2 - Done Phases 3 & 4 – Underway (2012)	2 to 4	2018	2019
Creditview Road	City of Brampton				
Fairhill Ave. to Mayfield Rd.		Completed (2010)	2 to 4	2013	2015
Mayfield Road	Region of Peel				
Chinguacousy Rd. to Mississauga Rd.		Future (2013)	2 to 4	2019	2020

Table 3.2 - Landowner Delivered Roads

Roadway and Section	Jurisdiction	EA Status / (Completion)	Width (lanes)	Construction	
				Commence	Complete
James Potter / Creditview Rd	City of Brampton				
Ganton Hts. To Creditview Rd./Fairhill Ave. Intersection		Completed	Southern 2	2010	2011
Ganton Hts. To Creditview Rd./Fairhill Ave. Intersection		Completed	Northern 2	2011	2012
Underpass – Ganton Hts. To Bovaird Dr. W.		Completed	0 to 4	2012	2013
Spine Road	City of Brampton				
James Potter / Creditview Rd. to 150 m north of Sandalwood Pkwy W.		Phases 1 & 2 - Done Phases 3 & 4 (2011)	0 to 3	2011	2012
150 m north of Sandalwood Pkwy W. to Creditview Rd. north of Wanless Dr.		Phases 1 & 2 – Done Phases 3 & 4 (2011)	0 to 3	2012	2013
Sandalwood Parkway West	City of Brampton				
Creditview Rd. to Mississauga Rd.		Completed (2010)	0 to 4	2012	2013

It should be noted that the timing of some of the roads projects identified above is not completely consistent with the anticipated timing for the development of Block 51-1. As noted in the conclusions to the 2016 community build-out performance analysis (Section 7.3 below), while these arterial roads improvements are not required to support development of the community from a strict road capacity perspective, they are important to the seamless implementation of the Block Plan.

To this end, a letter requesting that consideration be given to adjusting the timing of certain of these roads was submitted to the City of Brampton by the Landowner's Group in November 2010. A copy of this letter can be found in the correspondence section of the Appendices attached separately to this report. Subsequently, the timing of several key City of Brampton arterial road projects have been adjusted (per the *City of Brampton 2011-2020 Roads Capital Program*" dated January 26th, 2011) and are now more consistent with the anticipated development timeline for Block 51-1.

3.7 Collector Road EA Requirements and Process

The Mount Pleasant Secondary Plan Block 51-1 community is being developed using an integrated EA review process as per Section A.2.9 of the Municipal Environmental Assessment (MEA) which combines *Planning Act* and *Environmental Assessment Act* requirements. As part of this comprehensive approach, the development of a collector road network will follow the requirements set out in the Municipal Class Environmental Assessment planning process for Road Projects. Figure 3.10 illustrates this process.

The *Mount Pleasant Secondary Plan Area Transportation Master Plan* (TMP) study was completed by ENTRA Consultants in June 2009 (see section 3.2). This study addressed the Phase 1 and 2 requirements of the Integrated EA process for all City of Brampton roads within and adjacent to Block 51-1.

Since some of the future collector roads within the Secondary Plan area are also deemed subject to an integrated Environmental Assessment review process (per Section A.2.9 of the Municipal Class Environmental Assessment), this Block 51-1 Transportation Study has been expanded to include documentation and analyses as required to meet the Phase 3 and 4 requirements of the integrated EA process for the collector road network.

This Block 51-1 Transportation Study therefore addresses not only the transportation related Block Planning requirements, but also meets the Phase 3 and 4 requirements of the Integrated EA process for the internal collector road network. Once approved, it will allow the draft plans to be processed and approved without any further EA approvals required.

Together, the approved TMP and this study report will take on the role of the Environmental Study Report (ESR) required for the Schedule C collector road projects identified in the TMP (as per Section A.2.9 of the MCEA).

Coordination with other background studies undertaken for the proposed Block 51-1 area ensures that the Transportation Study addresses all requirements under the Environmental Assessment Act for minor collector roads within Mount Pleasant Block 51-1, and fulfills requirements through the

Block Planning process. In particular, this has been co-ordinated with the findings of Environmental Implementation Report, and the Community Design Guidelines.

3.7.1 Notification of Study Commencement

A formal notification of commencement for this Phase 3 and 4 Collector Road Environmental Assessment Study was not required, as it comprises a continuation of the EA process that began with the Phase 1 and 2 Transportation Master Plan (TMP) study, completed in June of 2009.

3.7.2 Public Consultation

A Public Information Centre (PIC) was held for this study on Monday June 7th, 2010. The purpose of this Public Information Centre was to provide information to both Review Agencies and interested members of the public about the Collector Road Environmental Assessment (EA) study currently underway in support of Block 51-1. In addition, this PIC was held to ensure that appropriate opportunities for public consultation and input to the study have been provided.

Public notification of the PIC was done through local media, and direct notices were mailed to concerned agencies as well as to individuals and groups identified during the Transportation Master Plan Study. Copies of the PIC notifications, notification list, presentation material, and received comments can be found in Appendix A.3.0 attached separately to this report.

The PIC coincided with the Statutory Public Meeting for the Block Plan, the associated Draft Plans, and Zoning Bylaw Amendments.

3.7.3 Changes in Phase 1 and 2 EA Recommendations

A collector road network was identified in the TMP Study that was deemed to provide appropriate road capacity, and generally fulfill the objectives for the community, particularly insofar as support for community transit was concerned (see Figure 3.3).

The TMP study provided support for the proposed collector road network on the basis of a high level screenline analysis that was developed primarily to examine the need for arterial road improvements in the vicinity of the Mount Pleasant Secondary Plan area. As such, the analysis utilized generic carrying capacities for each of the road links in the network, and did not address intersection configurations or performance analysis.

Since the completion of that report, much more detailed planning work has been undertaken in support of the development of Block 51-1. As this work has proceeded, some potential changes to the TMP recommended collector road network have been identified. Since these constitute changes to the collector road network that was recommended through the Phase 1 and 2 EA assessment (as documented in the TMP study), the EA process requires that a comparison and assessment against the TMP recommended road network be undertaken and documented, and the new recommendations presented to stakeholders.

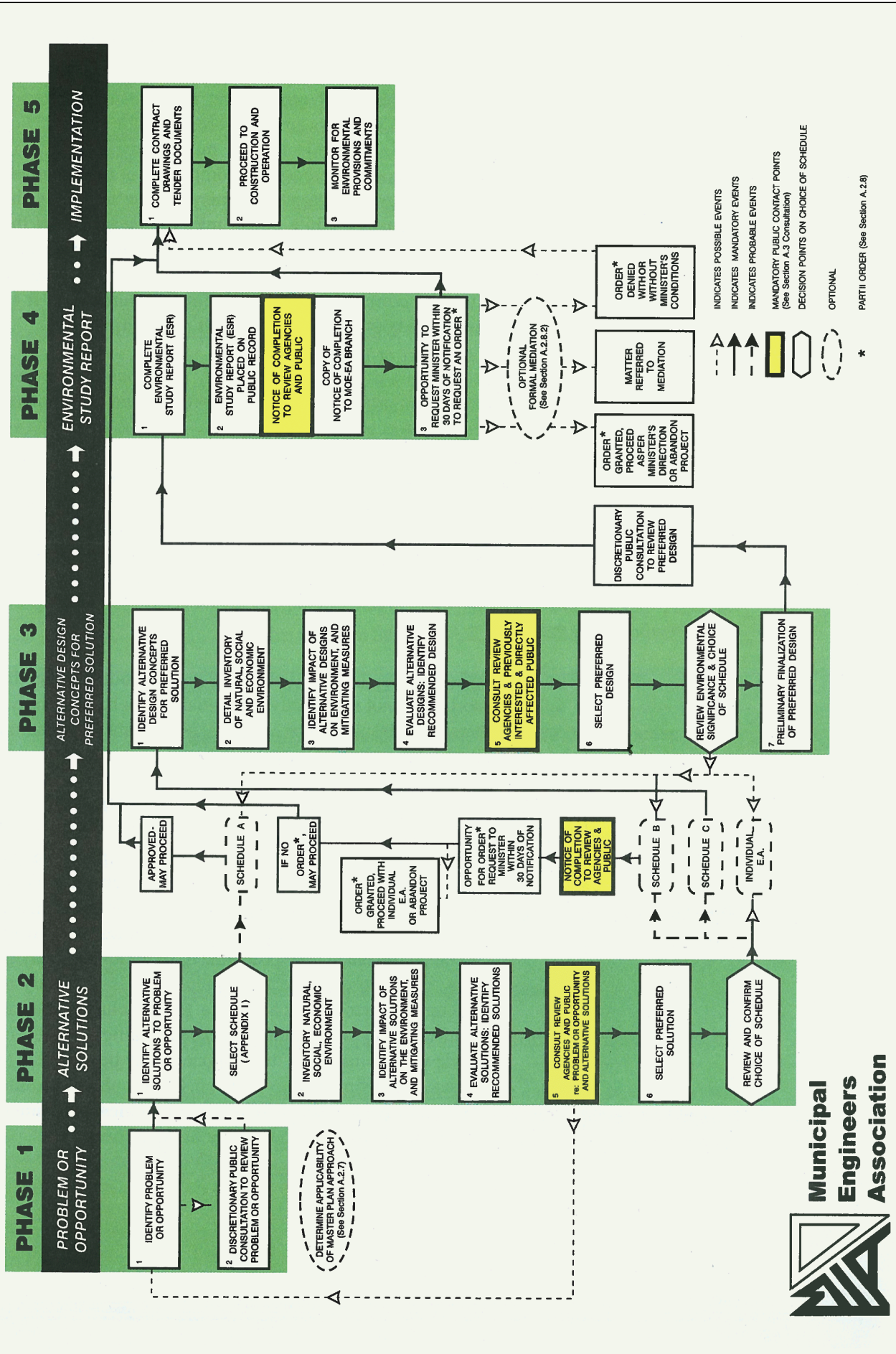


Figure 3.10

Changes to the Phase 1 and 2 recommendations have been assessed and are documented in this report as follows:

- Refinement of the character and cross section of the key mid-block transit supportive can be found in Section 9, “**The Spine Road**”.
- Refinement of the configuration and alignment of other collector road network elements can be found in Section 11, “**Collector Roads**”.

The details of the assessment of alternatives, as well as the updated recommended cross sections and alignments, were presented to stakeholders at the Public Information Centre held for this study on the evening of June 7th, 2010.

3.7.4 Next Steps

Upon completion of this report and the associated collector road design drawings, a Phase 4 Notice of Study Completion will be issued to initiate the mandatory 30 day period for public review and comments. The notice will advise of the details for submitting a Part II Order request in accordance with the Municipal Class Environment Assessment.

4.0 Community Structure

4.1 Objectives

The Block Plan 51-1 community is intended to be consistent with the vision incorporated into the Mount Pleasant Secondary Plan (MPSP) for a transit oriented and pedestrian friendly community that supports the principles of sustainability. In this regard, the Block Plan is also compatible with the Provincial objectives embedded in both the Growth Plan and the Provincial Policy Statement.

A significant objective for the Mount Pleasant community is that of sustainability. In the context of transportation requirements, this objective is best addressed through the promotion of and support for non-automobile transportation choices for residents of the community. Much of the planning effort related to Block 51-1 has therefore gone into ensuring that the combination of land uses, built form, and supporting infrastructure both encourage and support the choices of residents and employees within the community to use alternative transportation modes, particularly transit.

4.2 Planning a Transit Oriented Community

The Block 51-1 plan incorporates a variety of elements that are intended to promote transit usage. These include the overall land use plan as well as specific transit supportive land use and infrastructure elements.

4.2.1 Supportive Land Use Plan

One of the elements of a transit oriented community is a land use plan that supports and encourages and facilitates access to and use of transit services. This can include:

- spatially allocating and concentrating densities and housing types so as to minimize the walk distance that the average resident encounters to the nearest transit stop;
- designing pedestrian friendly streets and path systems that encourage residents to walk to transit rather than drive;
- creating transit corridors that facilitate transit service, and ensure that the higher density areas likely to generate the highest transit demand receive the highest level of service.

The Block 51-1 plan has been designed with these objectives in mind.

4.2.2 Mixed Use Nodes

Part of the strategy to promote sustainable transportation in the MPSP is by the creation of mixed-use nodes located along the Spine Road. These areas will be characterized by a mix of land uses, a compact urban environment with a greater density of people and a diversity of uses. Buildings will

have reduced setbacks and a strong orientation with the street. This will help to achieve compact urban forms of housing, retail, commercial, and office space.

4.2.3 Spine Road

A key element of the community transit solution was identified in the TMP Study, and comprises a transit supportive collector road, located centrally within the Secondary Plan Area. This road, referred to hereafter as the “Spine Road”, will play a significant role in determining the ability of this community to meet its multi-modal transportation objectives. Oriented as two mid-block collector roads oriented generally north-south within Block 51-1, and east-west within Block 51-2, the key objective for this road is to provide a high level of community transit service with respect to both reliability and frequency. At the same time, the road must retain a suitable travel environment for pedestrians and cyclists, and retain compatibility with the built form and density objectives for the community.

As is discussed in section 9.0, a balanced approach has been taken with respect to the selection of cross sectional roadway elements as well as to the design and configuration of the built form adjacent to the Spine Road. In this manner, interference with transit vehicle operations due to “side friction” is minimized. At the same time, neither vehicular traffic operations nor active transportation users are significantly impeded.

4.2.4 Mount Pleasant Village Mobility Hub

Block 51-1 is located immediately adjacent to Mount Pleasant Village, within which will be located a future mobility hub, hereinafter referred to as the Mount Pleasant Village Mobility Hub. This facility embodies a planning vision which encourages intensification, mixed-uses, increased densities and a multi-modal transit terminal. Key elements and design include an extension of the Block 51-1 transit-oriented Spine Road to a bus terminal area on the north side of the CNR line, with direct passenger access to the GO train platforms and existing south side City of Brampton and GO bus terminal. The north side bus terminal in the Village will provide frequent bus service with a direct connection to the GO station, and will include transit supportive features such as shelters and services for passengers, pedestrians and cyclists. It is envisaged that the transit facilities will encourage alternative travel modes, as well as intermodal connections to North West Brampton. The transit facilities will incorporate sophisticated transit communications and an Intelligent Transportation System (ITS).

The Mount Pleasant Village Mobility Hub is key to achieving the goals and objectives of both Mount Pleasant Village and the adjacent Mount Pleasant Secondary Plan of creating a transit-oriented community that promotes environmental sustainability and superior design. As such, direct surface transit and road connectivity to it are critical.

4.3 Staging of the Community

The manner in which the development of the Mount Pleasant Community, and in particular Block 51-1, will be staged will play a key role in allowing the community to reach the transit oriented and sustainability objectives identified in the Mount Pleasant Secondary Plan. The appropriate transportation infrastructure and services must be delivered in coordination with construction of each stage of the community.

4.3.1 Block Development Sequence within the Mount Pleasant Secondary Plan

Section 10.2 of the Mount Pleasant Secondary Plan describes the Staging and Sequencing of development within the MPSP Area. Block Plan Area 51-1 is to proceed in advance of Block Plan Area 51-2, on the basis that the success of the entire MPSP as a transit-oriented community is dependent on it. Given that the Spine Road, critical for delivery of transit service to the community, is anchored in the Mount Pleasant Village Mobility Hub adjacent to the south end of Block 51-1, it is logical that this Block Plan Area be developed first.

In addition to the Spine Road, there is a bundle of significant road and transportation infrastructure items that are necessary for the development of the MPSP. These items can only be delivered in conjunction with the development of Block 51-1:

- The Sandalwood Parkway West extension between Creditview Road and Mississauga Road. This arterial road will eventually be extended west of Mississauga Road to provide transportation and transit service to the remainder of the North West Brampton Urban Development Area.
- The James Potter / Creditview Road re-alignment including the grade separated CNR underpass, followed by the widening of Creditview Road north to Mayfield Road;
- As already noted, the mid-block Spine Road commences at James Potter / Creditview Road and serves as an important linkage to the Mount Pleasant GO Station, Mount Pleasant Village and the future mobility hub. The Spine Road is fundamental to the delivery of the transit-oriented community.

The south to north staging and construction of the Spine Road and surrounding community from the MPV and continuing through Block Plan Area 51-1 will provide an initial critical mass of housing, people and business necessary to promote transit ridership. Two and one half of the four Mixed-Use Nodes shown on Schedule SP 51(a) are located on the segment of the Spine Road within Block Plan Area 51-1.

4.3.2 Block 51-1 Staging Objectives

4.3.2.1 Growth Management Program

The City of Brampton has in place a Growth Management Program, the intention of which is to ensure that for a particular Block Plan, essential services will be provided in a cost-effective, logical and functional sequence in conjunction with development. The goal is to ensure that there is adequate transportation infrastructure and other essential services in place as the community builds out.

In accordance with the requirements of the Growth Management Program, a “**Growth Management Staging and Sequencing Strategy Report**” (GMSSSR) has been filed on behalf of Block 51-1 as one of the technical reports accompanying this Transportation Study. The following principles are identified in section 9.2 of the GMSSSR:

- *“Coordination of the planned Arterial and Collector Road network improvements with the level and distribution of development such that components of the transportation system required for any portion of the sub area are committed or operational prior to, or coincident with development;*
- *Accommodation to allow the early and efficient delivery of transit service”*

In Block Plan Area 51-1, the high rate of landowner participation coupled with the relatively small cohesive number of participants will ensure that development and the timely, coordinated delivery of necessary infrastructure will be well managed.

Given the significance of the MPSP Block Plan Area 51-1 from an environmental sustainability perspective and in light of the Landowners’ contribution towards infrastructure stimulus funding, as per the MOU, the entire MPSP Block Plan Area 51-1 is exempt from the City’s Growth Management and Development Allocation Program.

4.3.2.2 Delivery Principles for Complete Neighbourhoods

As discussed in the Block 51-1 Community Design Guidelines Document (CDG), and illustrated in Figure 4.1, the Block 51-1 plan is organized around a series of neighbourhoods. Each neighbourhood is roughly defined as encompassing an area with a radius of 400 metres, corresponding to a comfortable walking distance for the residents. Note that the labelling of the neighbourhoods ‘A’ through ‘J’ is for identification only, and does not imply a particular implementation sequence.

A number of guiding principles have been identified with

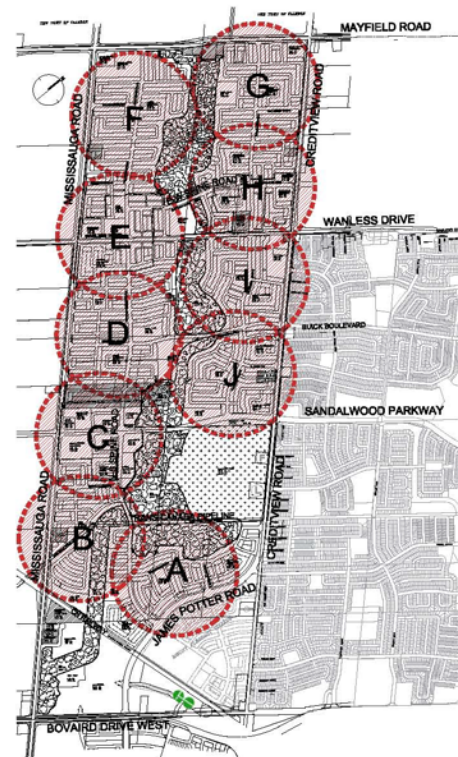


Figure 4.1 – Block 51-1 Neighbourhood Structure (Source: Block 51-1 Community Design Guidelines Report, Fig 3.1.7a)

respect to the scope and sequence of delivery of these neighbourhoods. These principles are set out below.

1. **Coordination of Development with Infrastructure and Amenities**
As each neighbourhood is developed, delivery of all of the hard and soft services required to create a complete neighbourhood will be undertaken. More specifically, within each neighbourhood there will be a range of residential dwelling types supported by roads, stormwater management ponds, sanitary sewers, watermains, commercial facilities, schools, parks, trails, and open spaces.
2. **Logical, Well Connected Transportation Infrastructure Delivery**
It is critical that all of the roads proposed within Block Plan Area 51-1 connect appropriately with existing surrounding roads and that access points be coordinated. Furthermore the sequencing and phasing of development shall proceed in a pattern which allows interim transit service to be provided. The objective is to ensure that transit and all other services are provided to service demand as efficiently and cost effectively as possible, minimizing public expense and optimizing benefit.
3. **Mixed Use Node Delivery**
Neighbourhoods C, E, and H represent the Mixed-Use Nodes. As these neighbourhoods are developed, opportunities for the release of commercial, retail, office, institutional, recreational open space, medium and high density residential and live-work units are created. These uses, which will be developed in response to market demand, will contribute significantly to the development of a complete and compact, transit supportive community.
4. **Rapid Progression of Neighbourhoods**
Once the hard infrastructure (roads and utilities) is in place for a particular neighbourhood, development will likely commence. Land development in any given neighbourhood will not be contingent on ‘completion’ of development in prior neighbourhoods but strictly on the availability of the necessary hard service. It is anticipated that within 5 years development will be underway or completed in all of the neighbourhoods.
5. **Parallel Sequencing of Neighbourhood Delivery**
The development of the neighbourhoods will likely be undertaken in two areas, demarcated by the future Sandalwood Parkway alignment. Once the hard infrastructure (roads and utilities) up to and including Sandalwood Parkway is in place in Area 1, work on the neighbourhoods in Area 2 will proceed in several different sub-areas simultaneously.

The characteristics, configuration, and performance of the proposed community road network are documented in the following few sections of this report. A detailed description is then provided of the coordination between the delivery of specific road infrastructure and development of each specific neighbourhood in Section 13, “**Community Staging**”. An even more comprehensive treatment defining the development triggers for areas roughly equivalent to this neighbourhood structure is provided in Section 9.0 of the GMSSSR.

5.0 Community Transportation Network

5.1 Existing Transportation Context

The existing transportation context for Block 51-1 is illustrated in Figure 5-1. The key roads on the periphery of Block 51-1 are summarized in Table 5.1.

Perhaps the most significant transportation related feature in the vicinity of Block 51-1 is the Mount Pleasant GO Station (on the Georgetown line) and associated transit bus terminal. This facility has been in operation for a number of years, and is extremely well utilized. GO Transit currently operates one way peak period service on the Georgetown line, but is in the process of upgrading the line to ultimately support all day two way service.

The existing bus terminal on the south side of the CNR line contains 12 platforms serving both Brampton Transit and GO Transit buses. Long term plans for this facility include using it as a terminal on the Bovaird line of Brampton's planned Züm bus service.

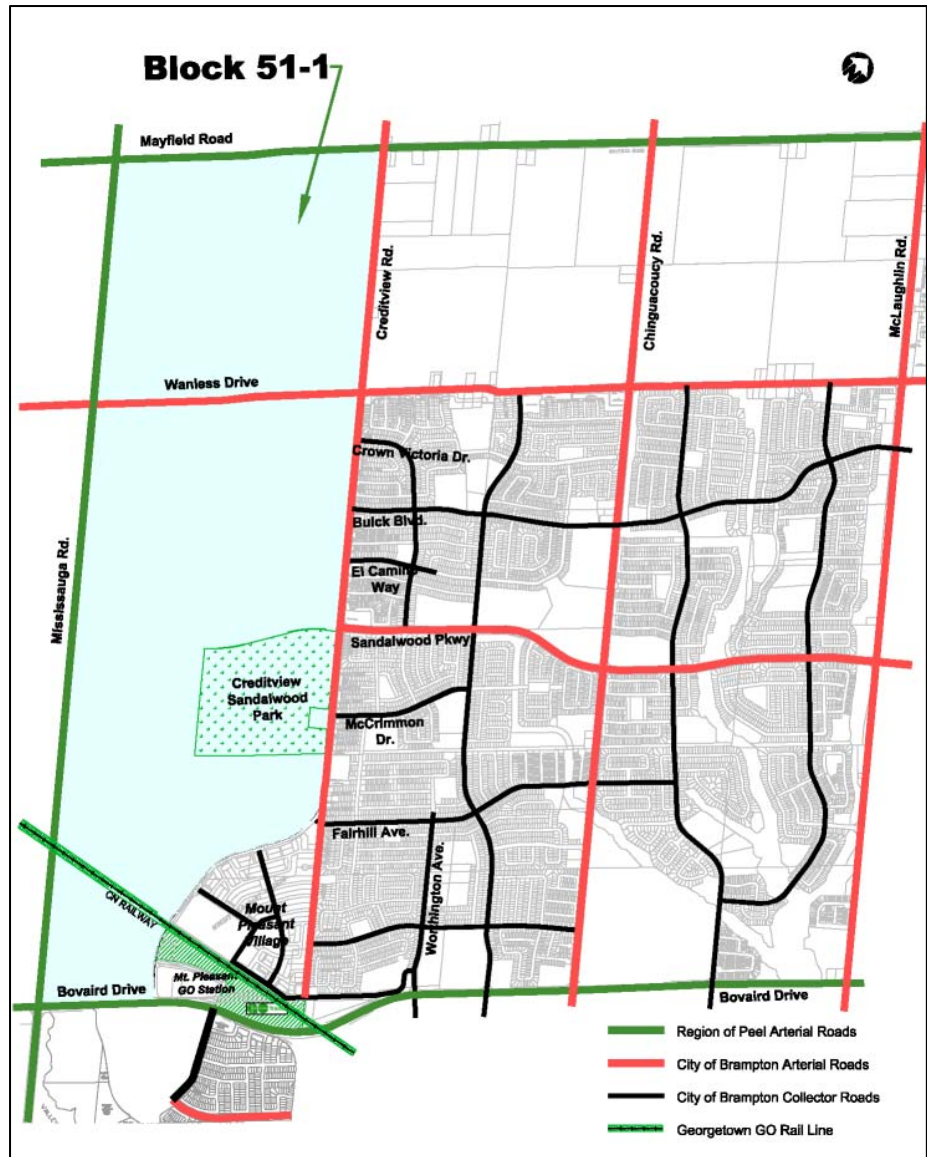


Figure 5.1 – Existing Transportation Context

The presence of this facility has been a key driving force in the planning of both the Mount Pleasant Village (which is currently under construction and will incorporate significant improvements to the north side interface of the GO Station), as well as the Mount Pleasant Secondary Plan Area as transit oriented communities.

Table 5.1
Existing Road Context

Road	Jurisdiction	Classification	Right of Way		Lanes		Speed (Posted)	Section
			Ultimate (OP)	Anticipated	Existing	Ultimate		
Bovaird Drive	Peel	Major Arterial	45m	50.5m	2	6	80 kmh	Rural
Mississauga Road	Peel	Major Arterial	45m	50.5m	2	6	80 kmh	Rural
Mayfield Road	Peel	Major Arterial	50m	50.5m	2	6	80 kmh	Rural
Creditview Road	Brampton	Minor Arterial	36m	36m	2	4	60-70 kmh	Rural
Wanless Drive	Brampton	Minor Arterial	36m	36m	2	4	60 kmh	Rural

5.2 Planning Principles

Guidance as to the intended functions of an appropriate community collector road network is provided in Brampton’s Official Plan:

“Collectors are to be planned, designed, constructed and designated to accommodate moderate volumes of short to medium distance traffic travelling at moderate speeds between residential or business and employment areas, or to and from the arterial system, including transit services. Through traffic will generally be discouraged from using these roadways. Direct access from abutting residential properties will not be permitted near intersections with arterials, and will be appropriately managed elsewhere along residential sections of collector roads. Direct access from abutting industrial and commercial properties will be permitted.”

Building on these principles, the Mount Pleasant Secondary Plan identifies some key objectives for the community which rely on implementation of an appropriate road network, comprised of roads built to standards that meet these objectives as well as City of Brampton standards.

A coherent transportation network provides for convenient and efficient connections that will help establish a logical community structure. Emphasis must be on creating vibrant, walkable streets with safe and convenient cycling opportunities and extensive bus transit connections that optimize important neighbourhood features.

5.3 Implementation Principles

A key sustainability objective for the Mount Pleasant Secondary Plan community is the promotion of non-automobile transportation choices for its residents. As such, much of the planning effort related to Block 51-1 has gone into ensuring that the combination of land uses, built form, and supporting

infrastructure both encourage and support the choices of residents and employees within the community to use alternative transportation modes.

An important part of this plan is the determination of appropriate road design elements. Functionally, they must support the basic transportation needs of the community by automobile and transit, as well as provide for active transportation by cyclists and pedestrians. At the same time, the form and scale of the roads must be consistent with the built form and somewhat higher densities that are envisaged.

To this end, the **Mount Pleasant Secondary Plan**, as adopted, foresees and supports the application of Alternative Design Standards to be used with respect to the road network. Following upon and consistent with this, the **Memorandum of Understanding** agreed to between the City of Brampton and the Block 51-1 Landowner's Group (comprising Appendix G of the Mount Pleasant Secondary Plan, a copy of which can be found in Appendix A.5.2 attached separately) further reinforces the need to approach the design of the road network using Alternative Design Standards as deemed necessary.

The planning of the Block 51-1 road network has been undertaken with the above stated transportation planning objectives for the community in mind. This applies in particular to the development of the characteristic cross sections of the various roads required to meet the multi modal transportation needs of the Mount Pleasant Block 51-1. These have been based, insofar as is possible, on existing and approved City of Brampton standard road cross sections and requirements.

In some cases, and only as necessary, minor modifications have been made to the City standard sections. For the most part these involve the addition or removal of elements from the section so as to ensure that the multi-modal transportation requirements for that type of road can be met. As these modifications were considered, the following principles were followed:

1. No roadway elements necessary for the conveyance of automobiles, transit vehicles, or cyclists should be removed or reduced in width below City of Brampton standard requirements.
2. No changes should impede the conveyance of cyclists and pedestrians
3. The sizing and placement of below grade services within the boulevards should be according to existing City of Brampton standards.

The minor changes to City standard road sections that are proposed for the Mount Pleasant Block 51-1 community (documented in Section 9, "**The Spine Road**", Section 11, "**Collector Roads**", and Section 12, "**Local and Other Lower Order Roads**") are intended to ensure that these important community objectives can be met, while not compromising the City's mandate to deliver infrastructure that is functionally, operationally, and economically appropriate.

6.0 Interim (2014) Road Network Performance

The ultimate arterial road network planned in and around the Mount Pleasant Secondary Plan Area has been determined to be sufficient for full build-out of the community through both the *Mount Pleasant Secondary Plan Transportation Master Plan Study* (TMP) completed by Entra Consultants in June 2009, and the *City of Brampton Transportation and Transit Master Plan Sustainable Update* of 2009 (see Sections 3.2 and 3.3 above for a discussion of these studies).

This section is the first of three sections in this present study documenting the more detailed traffic analyses undertaken in support of the Block 51-1 Transportation Study and Collector Road Environmental Assessment. The analysis in this section focuses on a near term analysis horizon of 2014, and addresses two scenarios related to the initial development of the community.

The first analysis, presented in Section 6.2, concerns the preliminary development of Block 51-1, starting just north of Mount Pleasant Village, prior to the completion of the James Potter / Creditview Road link between Bovaird Drive and existing Creditview Road to the north of Fairhill Avenue, including the grade separated underpass at the CNR line. The purpose of the analysis is to test the ability of the existing and proposed road network to support the development of approximately 3,000 units in this pre-grade separation scenario. Though anticipated to be operational by the end of 2013, it has been conservatively assumed for purposes of this analysis that the connection will be operational at the end of 2014.

The second near term analysis considers the impact of commencing development of Block 51-1 in the area located generally from south of Wanless Drive to Mayfield Road, and west of Creditview Road. The circumstances under which this might happen, along with the anticipated impacts with respect to road infrastructure, are documented in Section 6.3.

6.1 Development Prior to Completion of CNR Grade Separation

With respect to transportation considerations related to an early phase of development, the key issue is one of the timing of the required road elements. Of specific interest is the James Potter / Creditview Road grade separated CNR underpass to the north of Bovaird. This is a significant project, the design and construction of which is likely to require a minimum of 3 years to complete. Design work has commenced in 2010, and so accordingly, the earliest this infrastructure would likely be in place is by the end of 2013. For purposes of this staging analysis, it has been conservatively assumed that the underpass is completed and open to traffic by late 2014.

Traffic generated by any development in the Mount Pleasant Block 51-1 area prior to the completion of this underpass will have to make its way into and out of the area by routes other than the James Potter / Creditview Road connection to Bovaird Drive. This is the situation that the analysis presented here is intended to address.

6.1.1 Road Network Context

For purposes of this analysis, the following key assumptions were made:

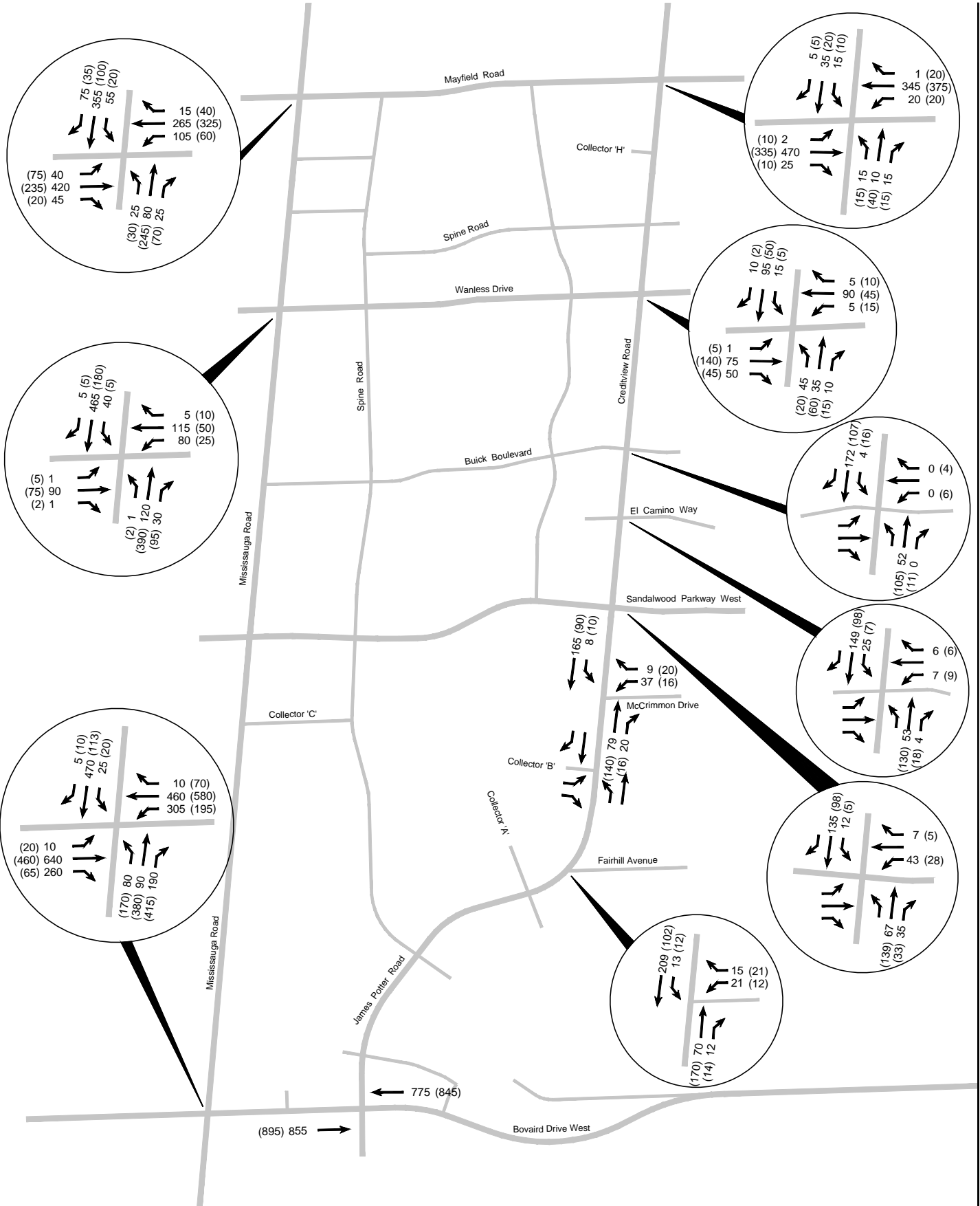
- The Mount Pleasant Village is assumed to be almost fully built-out according to the Interim C2 scenario described and analyzed in the *Traffic Impact Study for Mount Pleasant Village Draft Plan* submitted in October 2009. This scenario entails the completion of 315 single detached units, 430 townhouse units, and 260 low rise apartment units (totalling 1005 residential units). As detailed in the TIS, it was concluded that this development could be supported on a road network that did not include the James Potter / Creditview Road link and grade separation. The traffic was largely assigned to the existing collector road network through the Fletchers Meadows Secondary Plan area, of which the Village is a part.

To put this in a more current context, Mount Pleasant Village is currently draft approved for 632 residential units, and will be seeking approval for a further 199 units over the next 18 months. A final block comprising 103 units cannot be developed until completion of the underpass and Creditview Road connection to Bovaird Drive. This means that the Village will contain a **maximum** of 831 residential units (comprising 277 single detached, and 554 townhouse units) prior to completion of the underpass, compared to the 1005 units included in the traffic analysis in this study.

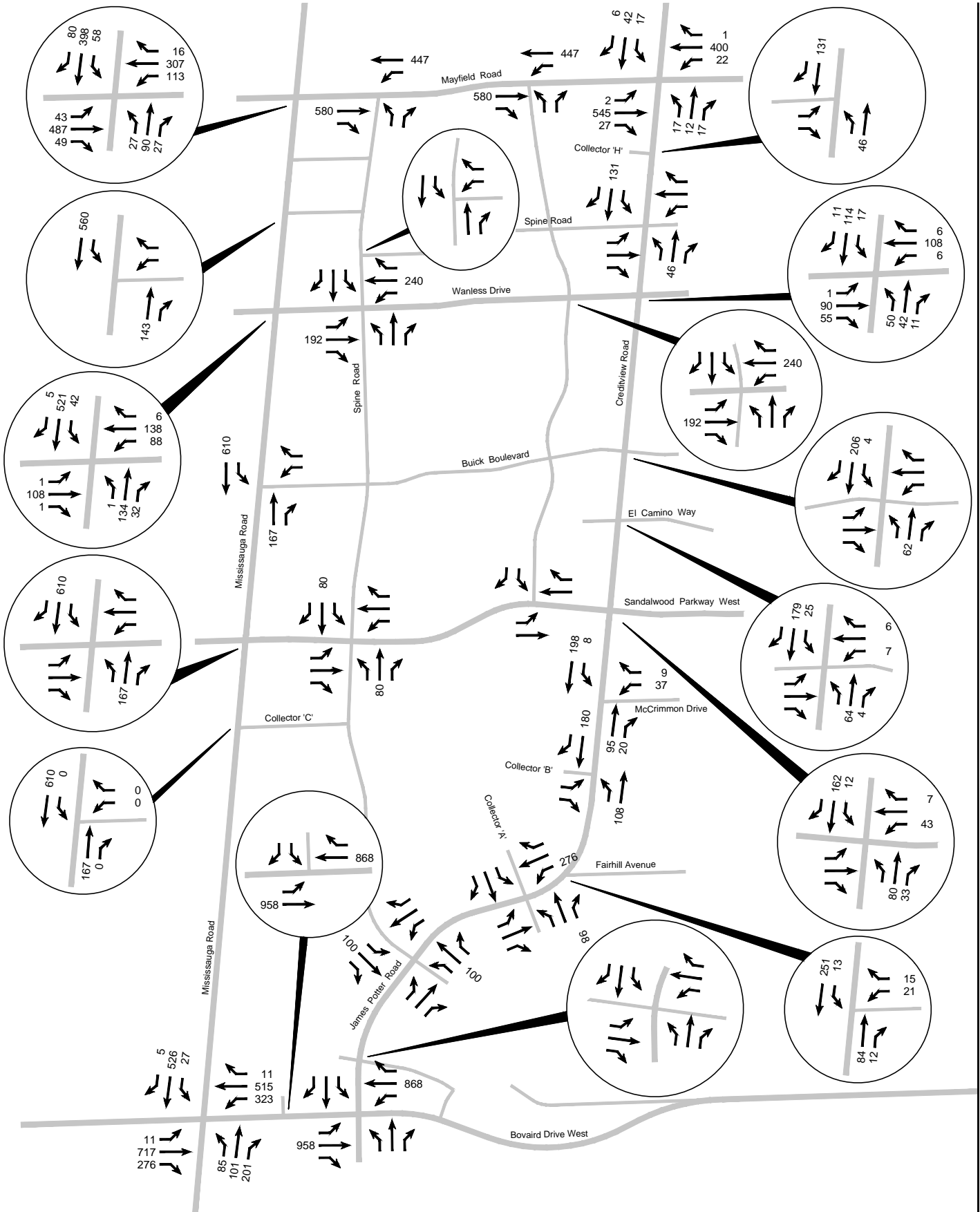
- The following assumptions were made with respect to the road network elements in place within the 2014 timeframe:
 - The intersection of Mississauga Road and Bovaird Drive is re-built as a 4 lane arterial intersection on all approaches.
 - Mississauga Road is re-built as a 4 lane road from Queen Street to a point about 200m north of Bovaird Drive.
 - To the north of the above widening, Mississauga Road still operates as a 2 lane rural road
 - The James Potter / Creditview Road realignment from the Spine Road north to its connection with Creditview Road to the north of Fairhill Avenue has been completed as a four lane road.
 - Sandalwood Parkway from Creditview Road to Mississauga Road has been completed as a 4 lane arterial road.
 - The north south Spine Road in Block 1 has been completed from James Potter / Creditview Road to a point north of Sandalwood Parkway consistent with the extent of development. Note that development cannot proceed northwards independently of the Spine Road as the municipal services to the west side of the community are being delivered within the right of way of this road.
 - Collector Road “C” has been completed between the Spine Road and Mississauga Road

6.1.2 Background Traffic Assumptions

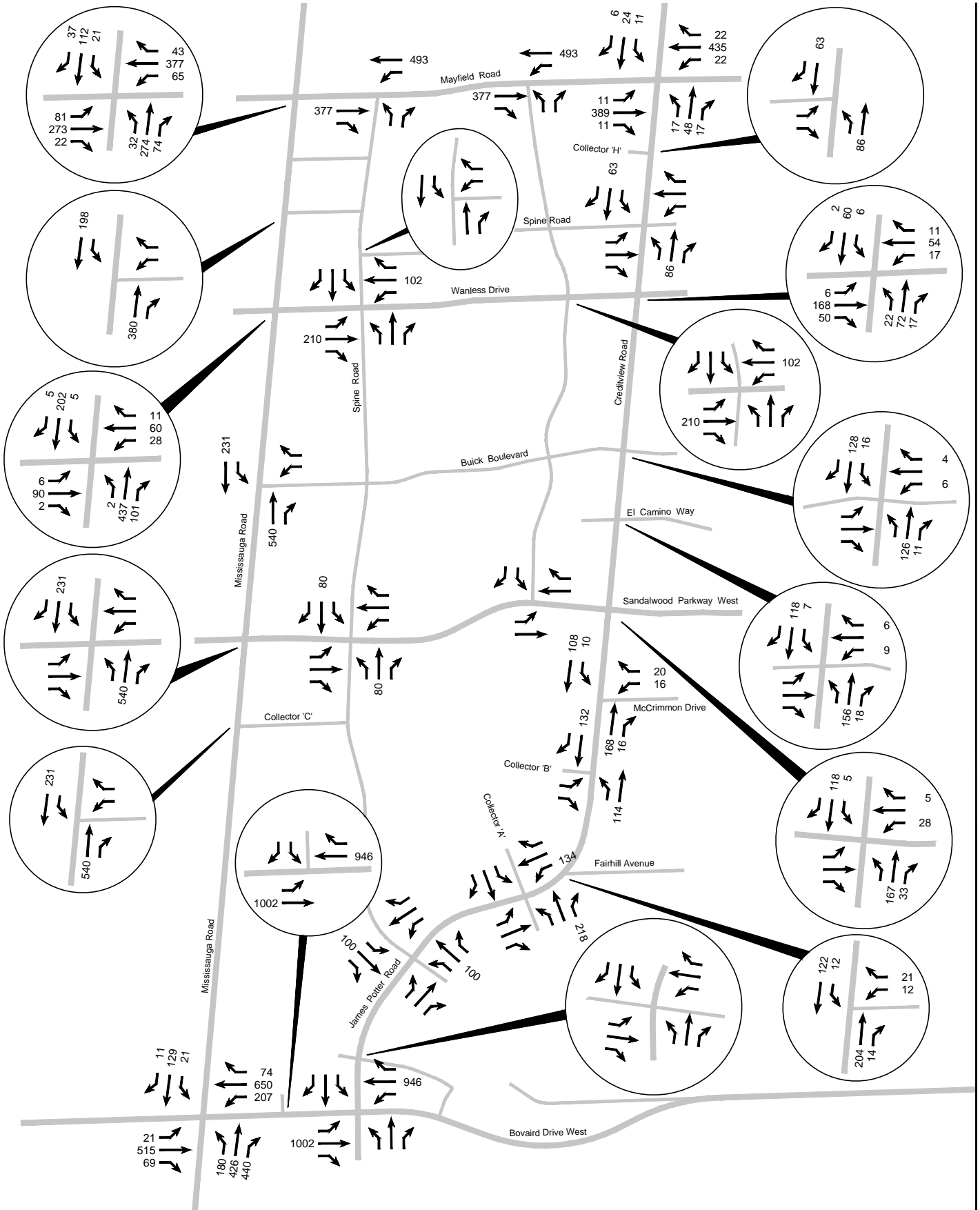
Background traffic for this 2014 analysis has been calculated on the basis of counts of existing traffic volumes at key intersections on the periphery of the Block 51-1 Study Area. Recent intersection turning movement counts were obtained for as many locations as were available from either the City of Brampton or the Region of Peel. In several cases, where recent counts were not available, BA Consulting Group undertook supplementary counts. The traffic volumes determined from these counts are shown in Figure 6.1. (all traffic counts used in this study have been included in Appendix A.6.0 attached separately to this report).



EXISTING TRAFFIC VOLUMES
AM & (PM) Peak Hour Traffic Volumes



FUTURE BACKGROUND TRAFFIC VOLUMES
AM Peak Hour Traffic Volumes, 2014



FUTURE BACKGROUND TRAFFIC VOLUMES
 PM Peak Hour Traffic Volumes, 2014

Table 6.1
Turning Movement Count Summary

Intersection	Date of Count	Source
Bovaird Drive and Mississauga Road	Dec. 3, 2009	Horizon
Sandalwood Parkway and Creditview Road	Apr. 10, 2008	City of Brampton
Wanless Drive and Creditview Road	Apr. 10, 2008	City of Brampton
Wanless Drive and Mississauga Road	Sept. 30, 2008	Region of Peel
Mayfield Road and Creditview Road	Oct. 15, 2008	Region of Peel
Mayfield Road and Mississauga Road	Oct. 8, 2008	Region of Peel
Creditview Road and Buick Boulevard	May 19, 2009	BA Group
Creditview Road and El Camino Way	May 19, 2009	BA Group
Creditview Road and Fairhill Avenue	Sept. 29, 2009	BA Group

At several key intersection locations, turning movement counts from multiple years were obtained, and assessed in order to establish appropriate annual corridor growth rates. These were determined to be 3% per annum for each of the key corridors, namely Bovaird Drive, Mississauga Road, Wanless Drive, Mayfield Road, and Creditview Road.

The annual growth rates were applied to the most recent traffic count from each existing intersection so as to forecast the 2014 through movements at each location. Turning movements at these key locations were then adjusted so as to balance the volumes between orthogonal corridors. The resulting 2014 Background Traffic volumes can be seen in Figures 6.2 and 6.3.

6.1.3 Land Use & Travel Behaviour Assumptions

For purposes of this analysis, preliminary estimates of the likely built residential units by area were made from the formally submitted Block 51-1 plan and associated draft plans. Note that the filed Block Plan is a working version that has already been superseded with respect to some minor design details, none of which impact the analysis conclusions. Notwithstanding the changing status of the plan, the estimates of built units by area have changed very slightly, and are reasonable for the purposes of this analysis.

For purposes of identifying an appropriate target development threshold for 2014, build-out rates consistent with those set out in the *Growth Management Staging and Sequencing Strategy Report* have been used. Thus it has been assumed that build-out of the community will proceed with about 500 units in 2012, and 1,250 units in each subsequent year. Assuming three seasons of construction (2012 through 2014), approximately 3,000 of the units identified in zones 1 to 4 could potentially be completed.

As shown in Figure 6.4, the south end of the Block 1 plan was partitioned into four zones, and estimated unit counts for single unit and townhouse residences developed for each of them. The units were allocated starting with Zone 1, then Zone 2, then equally balanced between Zones 3 and 4 until a total of 3,000 was reached. Table 6.2 shows the resulting allocation.

Note that the unit allocations to Zones 1 and 2 do not precisely match what is ultimately planned (see Table 8.3) but are somewhat conservatively high, and certainly close enough for purposes of this sensitivity analysis. Further note that the Zone 3 and 4 unit counts do not reflect full projected build-out of these zones, but rather the number of units required to bring the total unit count to 3,000. Assuming contiguous development from south to north, and based on the formally submitted Block Plan used as the basis for this phasing analysis, the northern edge of development in these zones would likely lie somewhere between future Buick Drive and Wanless Drive.

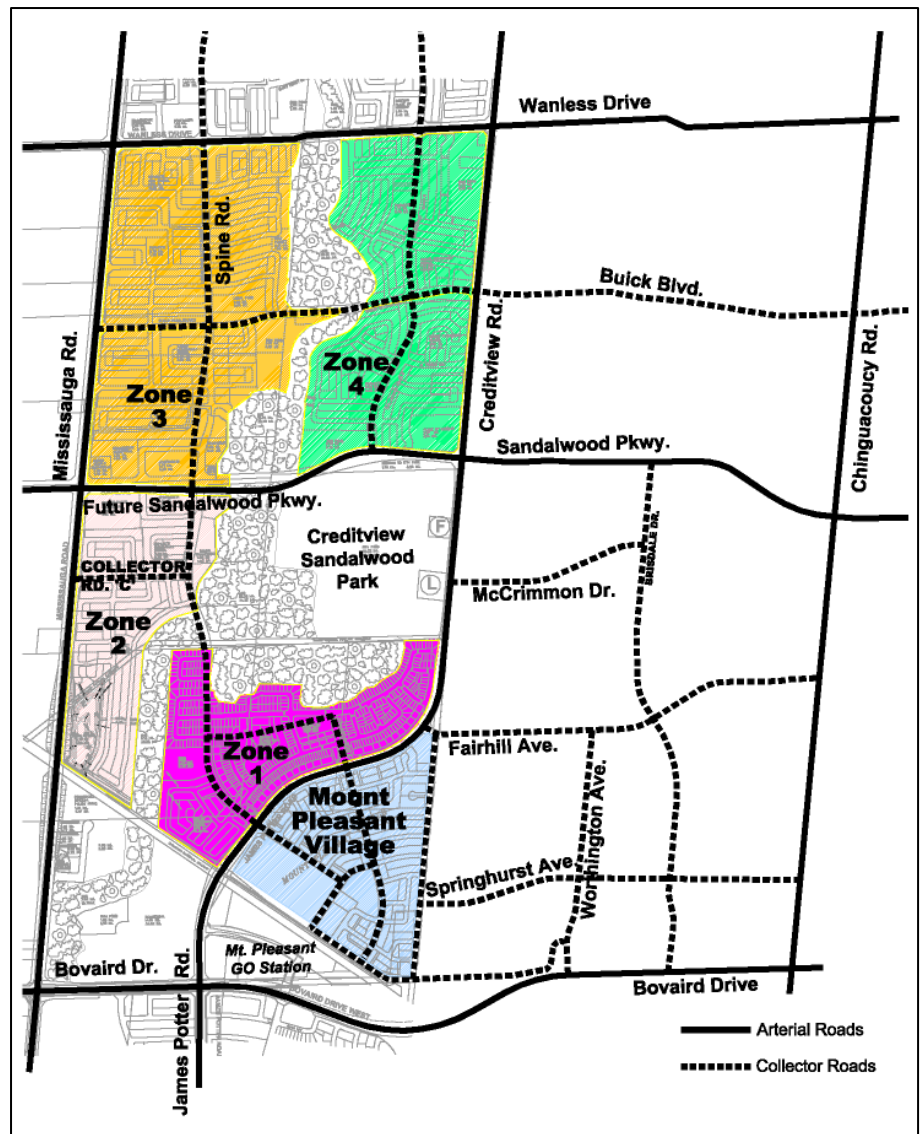


Figure 6.4 – Phase 1 Development

Table 6.2
2014 Interim Development

Zone	Single Units	Townhouses	Total
Zone 1	655	105	760
Zone 2	275	325	600
Zone 3 & 4	1,310	330	1,640
Total	2,230	760	3,000

Trip Generation rates for this analysis were drawn from both the ITE Trip Generation Handbook and the results of trip generation surveys undertaken by BA Consulting Group in similar circumstances. These rates are consistent with those previously used in the Mount Pleasant Village Traffic Impact Study. Table 6.3 shows the Trip Generation Rates that were used, and 3 the resulting trips generated by the residential units in each zone.

Table 6.3
Trip Generation

Type of Unit	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Zone 1						
Single Family 655 Units	0.16 105	0.48 315	0.64 420	0.51 335	0.29 190	0.80 525
Townhouses 105 Units	0.14 15	0.45 55	0.59 70	0.45 55	0.23 25	0.68 80
Sub total	120	370	490	390	215	605
Zone 2						
Single Family 275 Units	0.16 45	0.48 135	0.64 180	0.51 155	0.29 85	0.80 240
Townhouses 325 Units	0.14 50	0.45 165	0.59 210	0.45 165	0.23 80	0.68 245
Sub total	95	300	390	320	165	485
Zone 3 & 4						
Single Family 1310 Units	0.16 210	0.48 625	0.64 835	0.51 625	0.29 350	0.80 975
Townhouses 330 Units	0.14 50	0.45 165	0.59 215	0.45 165	0.23 85	0.68 250
Sub total	260	790	1050	790	435	1225
Total	475	1460	1930	1500	815	2315

Note that as the purpose of this assessment is the estimation of an approximate upper limit to **residential** development prior to the end of 2014, no consideration has been given to any commercial development that might occur within this time frame. In any case, any commercial development likely to be developed within this timeframe would be local in nature, and would not have an impact on trip making beyond the boundaries of Block 51-1.

For purposes of this analysis, distribution assumptions have been made that are consistent with those previously made for the assessment of the Mount Pleasant Village traffic (Table 6.4). These were based on results from the 2001 Transportation Tomorrow Survey, and have been rationalized using Origin-Destination information from the City of Brampton's travel demand forecasting model.

6.1.4 Zone 1 Development

The plan for construction of the Block 1 community relies on the delivery of services by way of the Spine Road alignment. For this reason, this road will be constructed starting at its connection with

James Potter / Creditview Road, and thereafter heading north as development proceeds. The area immediately to the north of James Potter / Creditview Road that has been identified as Zone 1 is thus the first area that will be developed. From a transportation access viewpoint, it is this area that is the most challenging to serve.

Table 6.4
2014 Trip Distribution

Location (to/from)	PM In	PM Out
Within Brampton		
West	3%	8%
East	16%	24%
South West	2%	6%
South East	11%	14%
South	11%	11%
Outside Brampton		
Hamilton/Niagara	3%	1%
Waterloo/Guelph	6%	4%
North Region	1%	2%
York	4%	1%
Caledon	2%	5%
Toronto	8%	2%
Mississauga	16%	6%
Internal Block Trips	17%	16%
Total	100%	100%

The assignment of trips to the road network acknowledges that traffic attributable to Mount Pleasant Village will be more likely to use the collector road routes through Fletchers Meadows, including the south leg of Creditview Road, Springhurst Avenue, and Fairhill Avenue.

Based on the conclusions of the Mount Pleasant Village traffic study, it would not be possible to accommodate Zone 1 traffic from Block 1 solely on the Fletchers Meadows collector road network. It will be necessary, therefore, to provide a viable alternative route. This can be done by ensuring that a connection to Mississauga Road is completed prior to occupation of the Zone 1 units.

This connection to Mississauga Road will be achieved by constructing the Spine Road as far north as Collector Road 'C', and constructing Collector Road 'C'. Collector Road 'C' is the east-west collector located about 300 metres south of Sandalwood Parkway and connecting the north-south Spine Road

and Mississauga Road (see Figure 13-1).

Early construction of this connection will serve two critical functions:

- It will provide a convenient alternative route for traffic from Zone 1 that is oriented to the west or south.
- It will provide a convenient alternative route for Mount Pleasant Village traffic that is oriented to the west or south, and that would otherwise be forced to double back along Bovaird Drive after passing through Fletchers Meadows.

While Mississauga Road to the north of Bovaird Drive was assumed to remain a 2 lane rural road within the 2014 timeframe, the intersection of Mississauga Road and Bovaird Drive is scheduled to be upgraded in 2011 as a part of the Mississauga Road widening from Queen Street to Bovaird, which appears in the 2010 Region of Peel Capital Budget and was in the detailed design stage in 2009. For purposes of this analysis, the improved intersection configuration is assumed to be in place.

Having assumed that the Collector Road 'C' connection to Mississauga Road from the north-south Spine Road to be in place, the assignment of Zone 1 traffic to the road network was undertaken as follows:

1. Mount Pleasant Village traffic that is ultimately oriented to the south (to the City of Mississauga) and west, was re-assigned to use Mississauga Road via the north-south Spine Road and Collector Road 'C'.
2. The remaining Mount Pleasant Village traffic was consolidated to ensure that it made full use of Springhurst Avenue.
3. Zone 1 traffic that is ultimately oriented to the south and west was similarly assigned to Mississauga Road.
4. Zone 1 traffic oriented to Brampton, was assigned primarily to Fairhill Avenue, taking advantage of the fact that the Mount Pleasant Village traffic demand on this route would now be reduced (as per the re-assignment in steps 1 and 2). From Fairhill Avenue, this Zone 1 traffic is assigned either directly through to Chinguacousy Road, or to Bovaird Drive via Brisdale Road.
5. Zone 1 traffic oriented primarily to the east beyond Brampton was assigned primarily to James Potter / Creditview Road and Sandalwood Parkway, utilizing the excellent connectivity to Highway 410 now provided by Sandalwood Parkway and Mayfield Road.

Note that the assignment of eastbound Zone 1 traffic to Fairhill Avenue rather than Springhurst Avenue or the south leg of Creditview Road (per step 4) is a reflection of the greater convenience of Fairhill Avenue from the perspective of automobile users living in Zone 1. In addition to the two excellent collector road connections to James Potter / Creditview Road, drivers will have direct access to Creditview Road at a tee intersection just to the north of Fairhill Avenue. Furthermore, accessing Fairhill Avenue directly from James Potter / Creditview Road means they do not first have to infiltrate the Mount Pleasant Village collector road network.

6.1.5 Zone 2 Development

The construction of Zone 2 brings with it the opportunity to take advantage of, and build upon the road network elements already in place in support of Zone 1 traffic. Zone 2, being located directly adjacent to Mississauga Road, provides excellent access directly to the arterial road network by way of Collector Road 'C' without automobile users having to find infiltrate the Fletcher's Meadows collector road network.

In addition, the development of Zone 2 will require that the north-south Spine Road be completed so as to intersect with Sandalwood Parkway, and that Sandalwood Parkway be completed between the Spine Road and Mississauga Road. This additional connection to Mississauga Road will ensure that sufficient capacity exists for Zone 2 traffic to access Mississauga Road.

While work will be underway to complete the entire Sandalwood Parkway extension between Creditview Road and Mississauga Road during this time period (2012-2013), this link is not required to be complete in order to commence development of Zone 2. It is not anticipated that any traffic from this zone would seek access to Chinguacousy Road or Bovaird Drive by using the Fletcher's Meadows collector road network to the south of Sandalwood Parkway.

Once the Sandalwood Parkway extension has been completed, Zone 2 traffic that is generally bound towards the east will certainly adjust their preferred travel routes to utilize it. However, for purposes of this analysis, all Zone 2 traffic has been assigned to Mississauga Road by way of Collector Road ‘C’ and Sandalwood Parkway.

6.1.6 Zone 3 and 4 Development

Development in Zones 3 and 4 will not commence until the Sandalwood Parkway extension has been completed between Creditview Road and Mississauga Road. In this manner development traffic from the areas to the north of Sandalwood Parkway will have direct, convenient access to the east via Sandalwood Parkway, and to the south via Mississauga Road as well as Chinguacousy Road. In addition, development of these zones will require the construction of the internal collector roads, notably the continued extension of the Spine Road to the north. Detailed documentation of the relationship between the development of these areas and the collector road requirements can be found in Section 13, “Community Staging”.

6.1.7 Road Network Assessment

6.1.7.1 Block 51-1 Impacts

Figures 6.5 and 6.6 show the total site traffic produced using the above assumptions. As discussed above, traffic attributable to approximately 1,000 units within Mount Pleasant Village, as documented in the *Traffic Impact Study for Mount Pleasant Village Draft Plan* submitted in October 2009, was added and adjusted as described in the section on Zone 1 traffic above.

Having assigned the Block 51-1 traffic components to the proposed 2014 road network as described above, this site traffic was added to the 2014 background traffic. Figures 6.7 and 6.8 show the resulting total 2014 traffic forecast on the Block 51-1 road network.

This 2014 total traffic projection was then assessed using the Synchro 7 analysis software, at key signalized intersection locations. Figure 6.9 shows the results of this analysis. Acceptable levels of service are forecast at each of these intersections. The detailed Synchro reports as well as intersection performance summary tables are included in Appendix A.7.1 attached separately to this report.

6.1.7.2 Fletchers Meadows Impacts

In the period dealt with in this near term analysis, the lack of a direct connection to Bovaird Drive by way of James Potter / Creditview Road means that a certain amount of both Mount Pleasant Village traffic and Block 51-1 traffic must find their way to Bovaird Drive and Chinguacousy Road by way of the collector road network in Fletcher’s Meadows. As a result of this additional traffic demand, albeit temporary, these collector roads will be called upon to carry more traffic than they do today.

Figure 6.10 shows the forecast traffic volumes that are predicted on the basis of this interim 2014 performance assessment. Note that these volumes are conservatively high as they are based on the assumption that

- the James Potter / Creditview Road link to Bovaird Drive and CNR underpass is not completed until late 2014,
- that development within Block 51-1 continues at an aggressive pace to approximately 3,000 units.
- that Mount Pleasant Village is built out within the same time period

Furthermore, these volumes represent a “short duration” condition in that they would dissipate immediately once the 4 lane arterial road link to Bovaird Drive has opened, and traffic from both Mount Pleasant Village and Block 51-1 are able to reach Bovaird Drive by way of this much more convenient and direct route.

The collector road network within Fletchers Meadows was assessed using both unsignalized intersection analysis at key intersections (see Table 6.5), and AADT traffic volumes (see Table 6.6) on each collector road link to which Mount Pleasant traffic has been assigned.

As can be seen, the overall intersection performance measures for the unsignalized intersections are generally good at levels of service ‘A’ to ‘D’. There are, however a few movements, generally with low demand volumes, that are forecast to reach level of service ‘E’ in this conservative, relatively short duration loading condition. These include:

- the Springhurst Avenue and Worthington Avenue intersection: the eastbound left-through-right movement in the AM Peak Hour is forecast to operate at level of service ‘E’
- the Creditview Road and Worthington Avenue: the westbound left movement from the shopping centre driveway. This movement operates at a level of service of ‘D’ today, and the volumes of traffic experiencing this level of service are quite low. There are three other accesses to this shopping centre, which provide reasonable alternative routes during this short duration loading condition.

It is important to note that these results are consistent with the findings of the *Mount Pleasant Village Traffic Impact Study* (October 2009). That TIS reported the same issues at these locations within the Fletcher’s Meadows collector road network.

Furthermore, the additional Block 51-1 traffic that has been assigned to these collector roads in this analysis scenario has been assigned primarily to Fairhill Avenue, not to Springhurst Drive or Worthington Avenue. This was done for the reason that these roads were already deemed to be carrying a great deal of Mount Pleasant Village traffic. Table 6.5 indicates that the two intersections on Fairhill Avenue are forecast to operate at a good level of service.

Table 6.5
Fletcher's Meadows Collector Road Network
Unsignalized Intersection Capacity Summary
2014 Interim Conditions

Intersection	Morning Peak Hour		Afternoon Peak Hour	
	Delay	LOS	Delay	LOS
Crediview & Worthington Avenue				
EB L	22.5	C	46.8	E
EB TR	21.2	C	16.3	C
WB L	67.2	F	160.9	F
WB TR	13.1	B	21.9	C
NB L	9.0	A	8.2	A
SB L	7.6	A	8.7	A
Overall	6.6	B	12.0	B
Groveswood Drive & Brisdale Drive				
EB	21.0	C	17.9	C
WB	14.4	B	30.8	D
NB	14.1	B	34.9	D
SB	17.1	C	18.4	C
Overall	17.3	A	27.3	C
Springhurst Drive & Worthington Avenue				
EB TR	19.2	C	12.0	B
EB L	12.7	C	10.0	B
WB	15.9	C	22.5	C
NB L	10.8	B	12.60	C
NB TR	12.1	B	19.5	C
SB	34.5	D	15.1	C
Overall	21.3	C	17.2	C
Fairhill Avenue & Brisdale Drive				
EB	11.9	B	12.6	B
WB	10.2	B	15.3	C
NB	12.1	B	18.9	C
SB	14.4	B	12.9	B
Overall	12.7	B	15.7	A
Fairhill Avenue & Worthington Avenue				
EB	8.9	A	8.6	A
WB	8.7	A	9.1	A
NB	8.5	A	9.2	A
SB	8.6	A	8.4	A
Overall	8.7	A	8.9	A

Overall, given the short duration during which these conditions will occur, these results represent busy but acceptable peak period operations.

This conclusion is reinforced by the forecast AADT link volumes shown in Table 6.6. While busy, these results are acceptable given the short duration during which these conditions will occur.

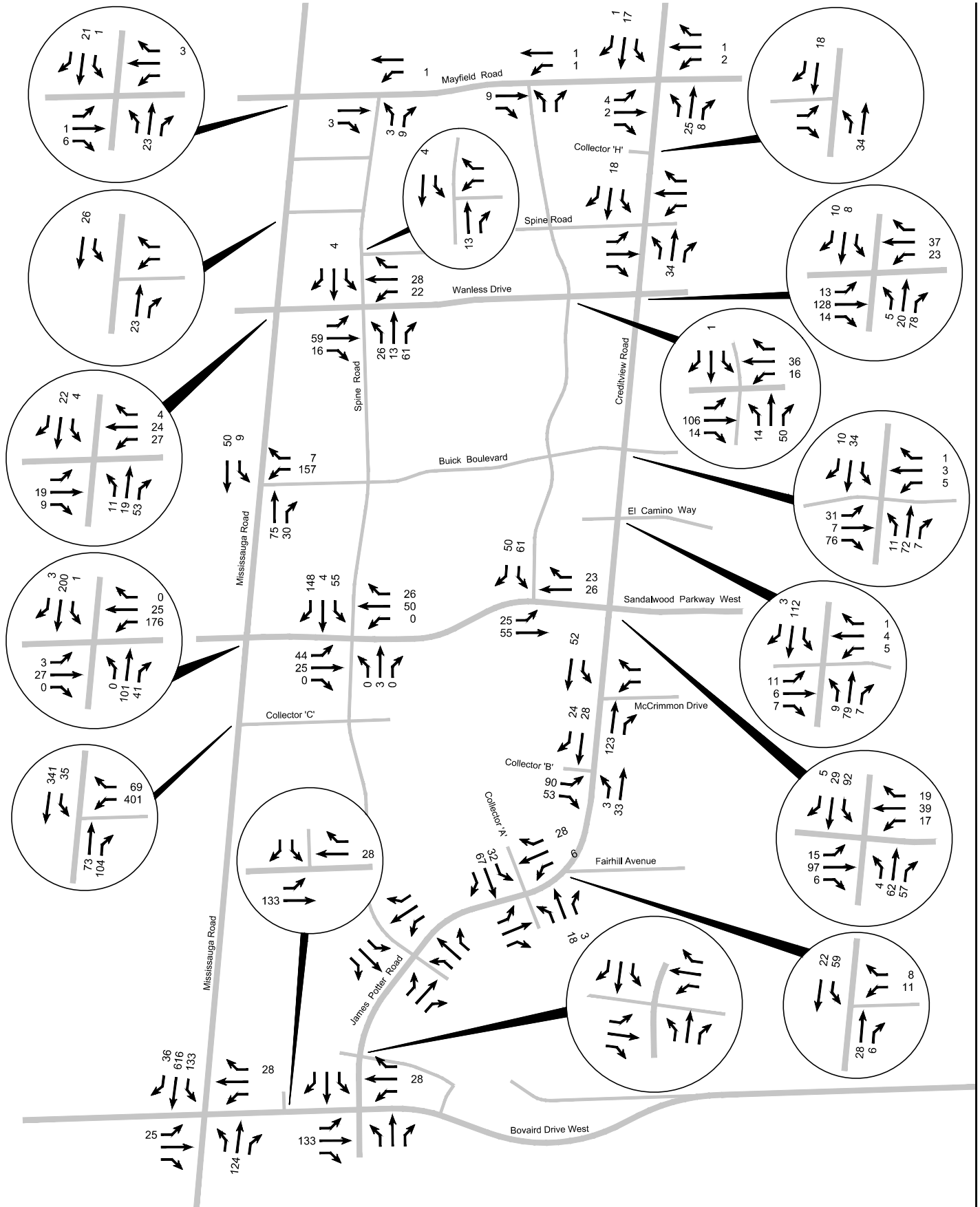
It has been concluded that no capital intersection works are required to the east of Creditview Road as a result of these forecast traffic volumes.

Table 6.6
Link Volume and AADT Summary

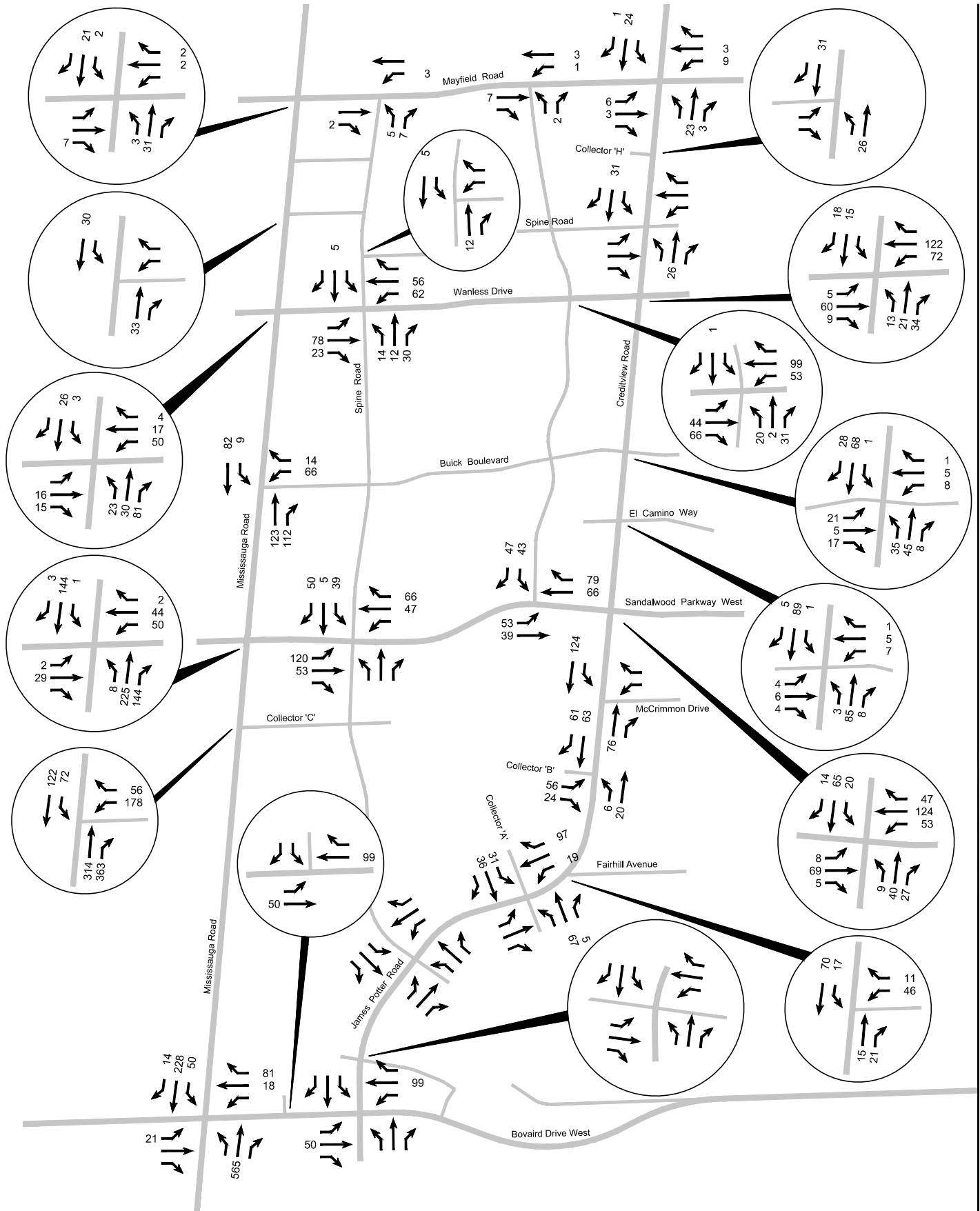
	Link Volume	AADT ²
Worthington Avenue		
South of Fairhill Avenue	270 (320)	2,700 (3,200)
South of Springhurst Avenue	785 (760)	7,850 (7,600)
Brisdale Drive		
South of Fairhill Avenue	585 (635)	5,850 (6,350)
South of Springhurst Avenue	620 (730)	6,200 (7,300)
Fairhill Avenue		
West of Chinguacousy Road	395 (540)	3,950(5,400)
West of Brisdale Drive	535 (595)	5,350 (5,950)
Springhurst Avenue		
West of Chinguacousy Road	305 (405)	3,050 (4,050)
West of Brisdale Drive	610 (615)	6,100 (6,150)

Notes:

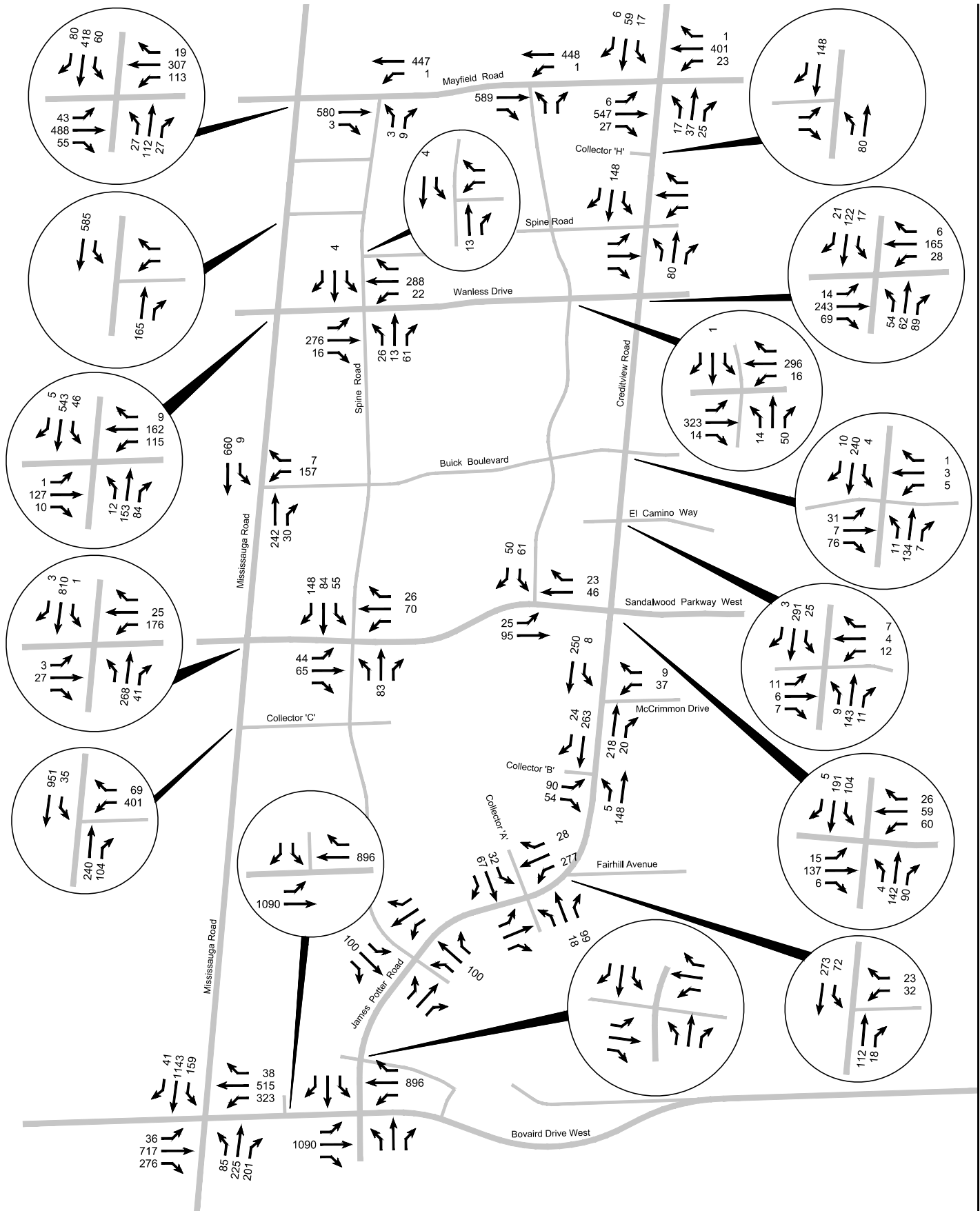
1. 00 (00) – Morning Peak Hour (Afternoon Peak Hour)
2. AADT based on 10 percent of the peak hour volume



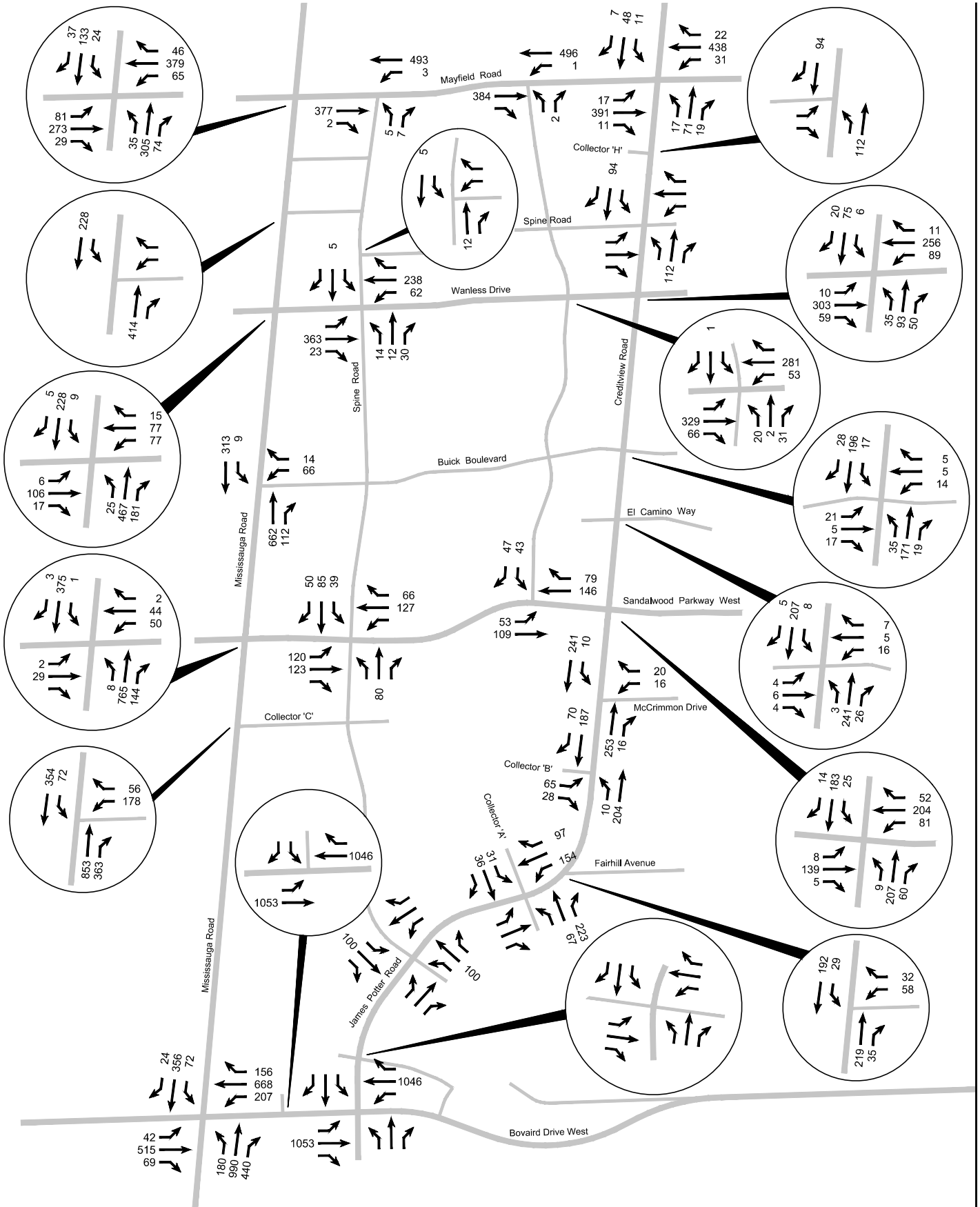
TOTAL SITE TRAFFIC VOLUMES
 AM Peak Hour Traffic Volumes, 2014



TOTAL SITE TRAFFIC VOLUMES
 PM Peak Hour Traffic Volumes, 2014



FUTURE TOTAL TRAFFIC VOLUMES
AM Peak Hour Traffic Volumes, 2014



FUTURE TOTAL TRAFFIC VOLUMES
 PM Peak Hour Traffic Volumes, 2014

6.1.8 Conclusions

The analysis conducted for the interim 2014 horizon year seeks to establish the possible travel behaviour of Block 51-1 residents in the period of time prior to completion of the James Potter / CNR underpass. The assumptions made in this analysis have been generally conservative with respect to the timing of completion of the underpass, and the pace of development in Block 51-1 as well as in Mount Pleasant Village in this period.

The results of this assessment indicate that prior to completion of the James Potter / Creditview Road link between Bovaird Drive and the Spine Road, the 2014 road network defined in Section 6.1.1 is capable of supporting the traffic attributable to

- approximately 3,000 residential units in Block 51-1,
- Mount Pleasant Village under the “Interim C2” development scenario (as documented in the traffic study cited above and submitted for that development in October of 2009).

Some proportion of the Block 51-1 trips made during this interim period will undoubtedly rely on the existing road network in the Fletcher’s Meadow community. Reasonable traffic assignment assumptions have been made in the above analysis, and while busy, none of the road network elements in Fletcher’s Meadow are predicted to experience levels of service that are unacceptable over the short duration during which these conditions will occur.

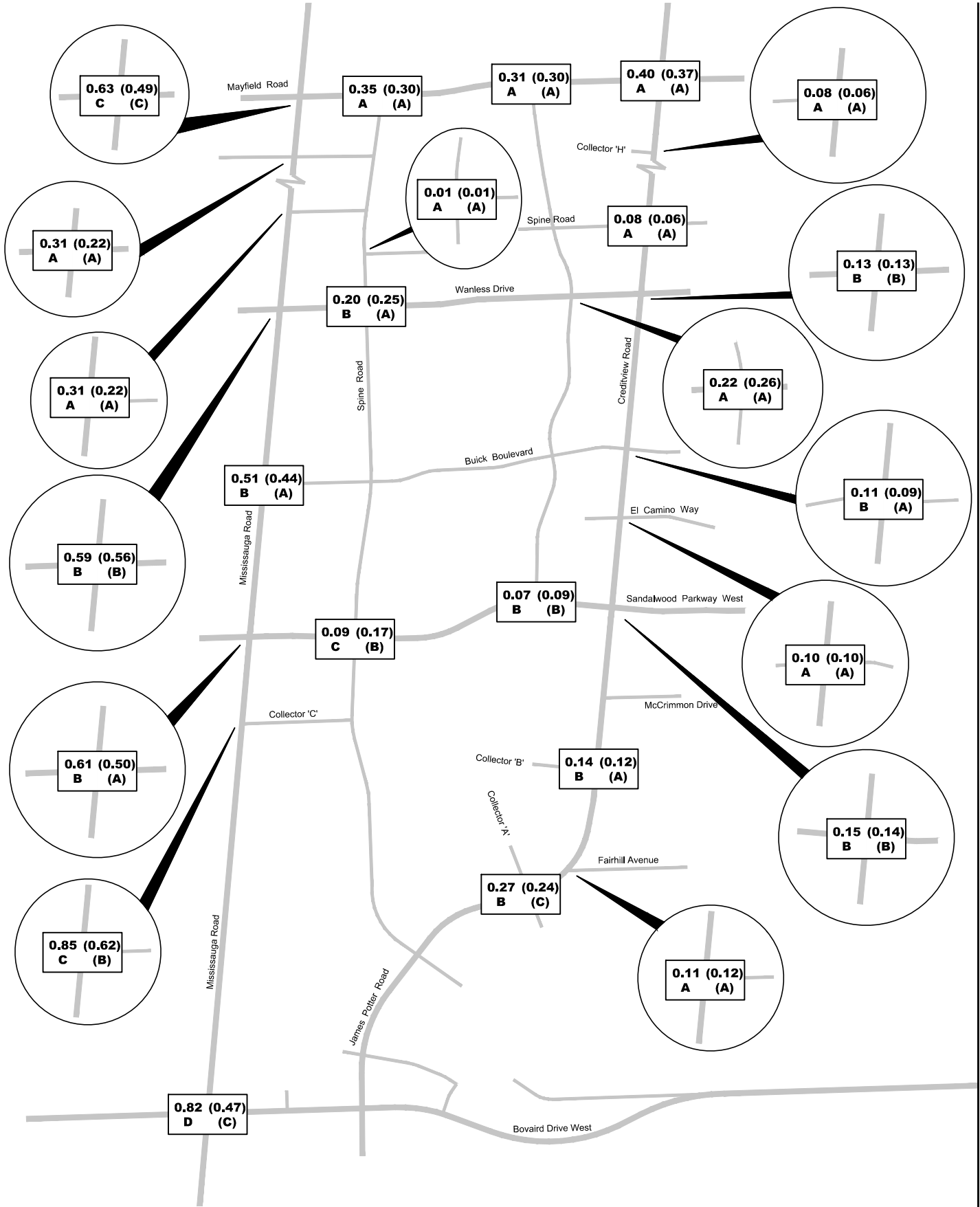
A program of traffic monitoring counts is to be undertaken every 6 months in the area of the Fletchers Meadows community lying generally to the east of Creditview Road and south of Fairhill Drive commencing in April 2012, and ending once the James Potter / Creditview Road link between Bovaird Drive and Fairhill Avenue is operational. This will allow any traffic issues related to the development of Block 51-1 and the Mount Pleasant Village during this period to be identified, and associated mitigation measures, subject to review and approval by the City, to be put in place. All costs associated with monitoring, reporting, and proposed mitigation measures are to be borne by the developer.

Furthermore, they are committed to delivering the necessary road network elements as assumed in the above analysis:

- In order to support Zone 1 traffic:
 - James Potter / Creditview Road completed as a four lane road from the north-south Spine Road intersection to existing Creditview Road
 - north-south Spine Road completed as far as Collector Road ‘C’
 - Collector Road ‘C’ connection from the Spine Road to Mississauga Road
- In order to support Zone 2 traffic:
 - Sandalwood Parkway completed between the north-south Spine Road and Mississauga Road
 - north-south Spine Road completed to Sandalwood Parkway
- In order to support Zone 3 and 4 traffic:
 - Sandalwood Parkway completed between Creditview Road and Mississauga Road

- Internal collector roads completed in coordination with build-out of the zones, including Buick Boulevard, the Spine Road, and the north south collector road to the east of the NHS.

It should be noted that Mississauga Road provides an essential and well utilized link during this interim period. Commencement of construction of the Mississauga Road widening and CNR grade separation during this period would pose a challenge due to the likelihood of reduced speeds and delays due to construction related diversion and activity. It is recommended that this construction should not commence until the James Potter / Creditview Road connection between Spine Road and Bovaird Drive is operational. At this time, the proposed commencement of these works by the Region of Peel is 2014, which is consistent with completion of the James Potter Road grade separation in 2013.



FUTURE ANALYSIS RESULTS
Total Traffic Volumes, 2014

A	- Level of Service
00	- AM Volume/Capacity Ratio
(00)	- PM Volume/Capacity Ratio



Figure 6.9

6.2 Optional Area 1 Conditions

As discussed later in this report in Section 13.2.3, “**Optional Area 1 Staging**”, it is envisaged that approximately 82% of Block Plan Area 51-1 will be serviced by the Mississauga Road Sanitary Trunk Sewer. As this sewer is currently under construction, there is a possibility that this sewer capacity will not be available to service Block 51-1 as expected by Q2 2012. Should this occur, or for any other reason deemed appropriate by the City, the landowners located within the north-eastern quadrant of the Block Plan Area representing approximately 18% of the Block Plan Area (shown on Figure 14 in the *Growth Management Staging and Sequencing Strategy Report*), wish to be able to proceed by way of available capacity which exists in the Fletcher's Meadow Sanitary Trunk Sewer.

An assessment has been conducted of the implications of this optional Area 1 being constructed ahead of the scheduled widening of Creditview Road, Wanless Drive, or Mayfield Road. The premise of the analysis is that the area (north and south of Wanless Road, and labelled 2 in Figure 6.10) could be the first area to be built in Block 51-1.

This may occur ahead of the road widening works on Creditview Road and Wanless Drive. To address this, the collector to arterial intersections would be constructed along with the internal collector road network. The intersections would be constructed either as interim intersections, or if the design of the roads is sufficiently advanced, constructed to meet the ultimate requirements.

The roadways between these intersections would be left as two lane rural arterial roads.

The purpose of this Optional Area 1 assessment is to show that the existing two lane arterial roads will function at an appropriate level of service as long as the collector to arterial intersections are constructed appropriately.

The horizon year for this analysis is 2014. As such, the analysis has been conducted assuming the same 2014 road network as in the analysis in Section 6.1. This comprises:

- The intersection of Mississauga Road and Bovaird Drive is re-built as a 4 lane arterial intersection on all approaches.

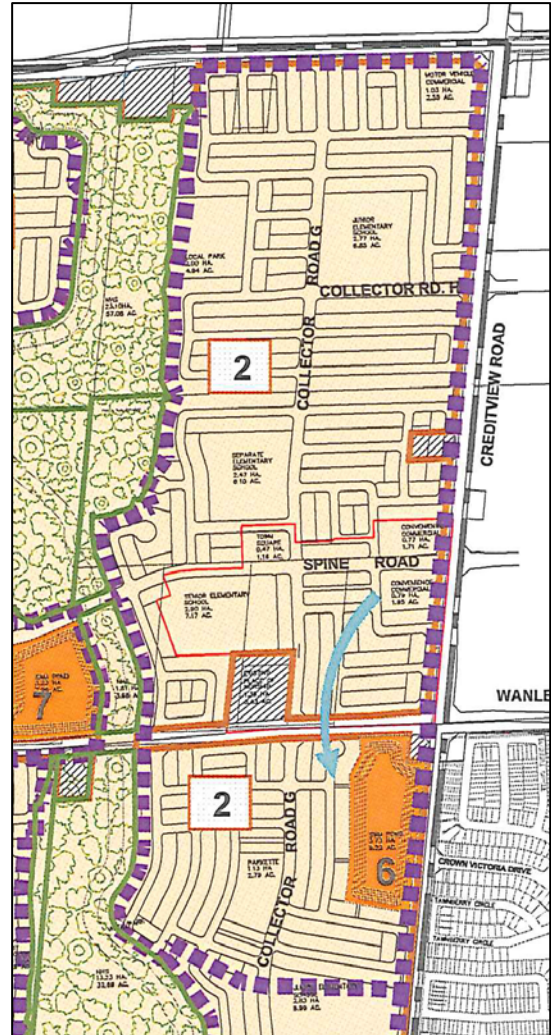


Figure 6.10-Optional Area 1
(Source: Block 51-1 Growth Management Staging and Sequencing Strategy Report, Fig14)

- Mississauga Road is re-built as a 4 lane road from Queen Street to a point about 200m north of Bovaird Drive.
- Sandalwood Parkway from Creditview Road to Mississauga Road has been completed as a 4 lane arterial road.
- Creditview Road from Fairhill Avenue to Sandalwood Parkway has been widened to 4 lanes.

Although the *City of Brampton 2011-2020 Roads Capital Program* shows that both Creditview Road and Wanless Drive are scheduled to be widened to 4 lanes in 2014, to be conservative for purposes of this analysis the following roads are assumed to remain as 2 lane rural roads at the end of 2014:

- Creditview Road from Sandalwood Parkway to Mayfield Road
- Wanless Drive from about 100m west of Creditview Road to Mississauga Road
- Mississauga Road from about 200m north of Bovaird Drive to Mayfield Road
- Mayfield Road from Creditview Road to Mississauga Road

Notwithstanding that this is a 2014 analysis, to be conservative, the forecast volumes and intersection performance analysis results from the 2016 full build-out analysis documented in Section 7 have been used for purposes of this review.

This is an appropriately conservative approach to take, since:

- The 2016 analysis presumes full build-out of the entire Block 51-1, not just the northeast corner
- The background traffic used in the 2016 analysis is developed on the same basis as the background traffic in the 2014 analysis in this section. It is “grown” using corridor growth factors derived from historic counts.
- The intersection analyses in the 2016 analysis anticipate that intersections will be built to their ultimate configurations with respect to turning lane requirements. In some cases these may be built as temporary intersections pending widening and improvement of the arterial road corridor.

The intersection performance results can be seen in Figure 7.8 in the next section of the report. It is clear that from an intersection performance point of view, full development of the northeast area can be supported.

This leaves the issue of link performance of the arterial roads adjacent to this area, namely Wanless Drive, Creditview Road, and Mayfield Road. While both Wanless Road and Creditview Road are currently scheduled to be widened to 4 lanes during 2014 as noted above, it is possible that all of these roads will remain as 2 lane rural arterial roads for some period of time as the northeast area of Block 51-1 develops.

Table 6.7 shows the forecast 2-way hourly link volumes and AADT volumes for these 2 lane roads based on the 2016 analysis in Section 7.

Table 6.7
Link Volume and AADT Summary

	Link Volume	AADT ²
Wanless Drive		
West of Creditview Road	860 (920)	8,600 (9,300)
Creditview Road		
North of Wanless Drive	545 (550)	5,450 (5,500)
Mayfield Road		
West of Creditview Road	1,215 (1105)	12,150 (11,050)

Notes:

1. 00 (00) – Morning Peak Hour (Afternoon Peak Hour)
2. AADT based on 10 percent of the peak hour volume

The Highway Capacity Manual uses a basic lane capacity of about 1,400 to 1,600 vehicles per hour , or a two way capacity of 2,800 to 3,200 vehicles per hour, as the basis for assessing rural 2 lane roads such as these.

Given that the highest forecast 2 way volume in this area is on the order of just 1,200, it is clear that these volumes do not represent a problem with respect to the carrying capacity of these roads. This is supported by the excellent intersection performance forecast at the key intersections.

It is thereby concluded that the existing arterial road network, conservatively assumed to comprise 2 lane rural roads in 2014, with the addition of appropriate turning lanes at the key collector / arterial intersections, will appropriately support the Optional Area 1 development.

7.0 Community Build-Out (2016) Road Network Performance

In this section, the second of three documenting traffic analyses undertaken in support of this study, the results of an analysis of full build-out of the Block 51-1 community by the end of the year 2016 are presented. Notwithstanding that this is an ambitious target for full build-out, this analysis conservatively assumes full occupancy and completion of all uses that are planned within the block, so as to test the impact of this traffic on the boundary arterial road network likely to be in place in that timeframe.

7.1 Analysis Details

7.1.1 2016 Road Network

The 2016 road network has been assumed to comprise the currently planned and approved arterial road network resulting from recommendations from previous studies, as discussed earlier in this report in Section 3.0, “**Planning Background**”. Table 7.1 summarizes these improvements.

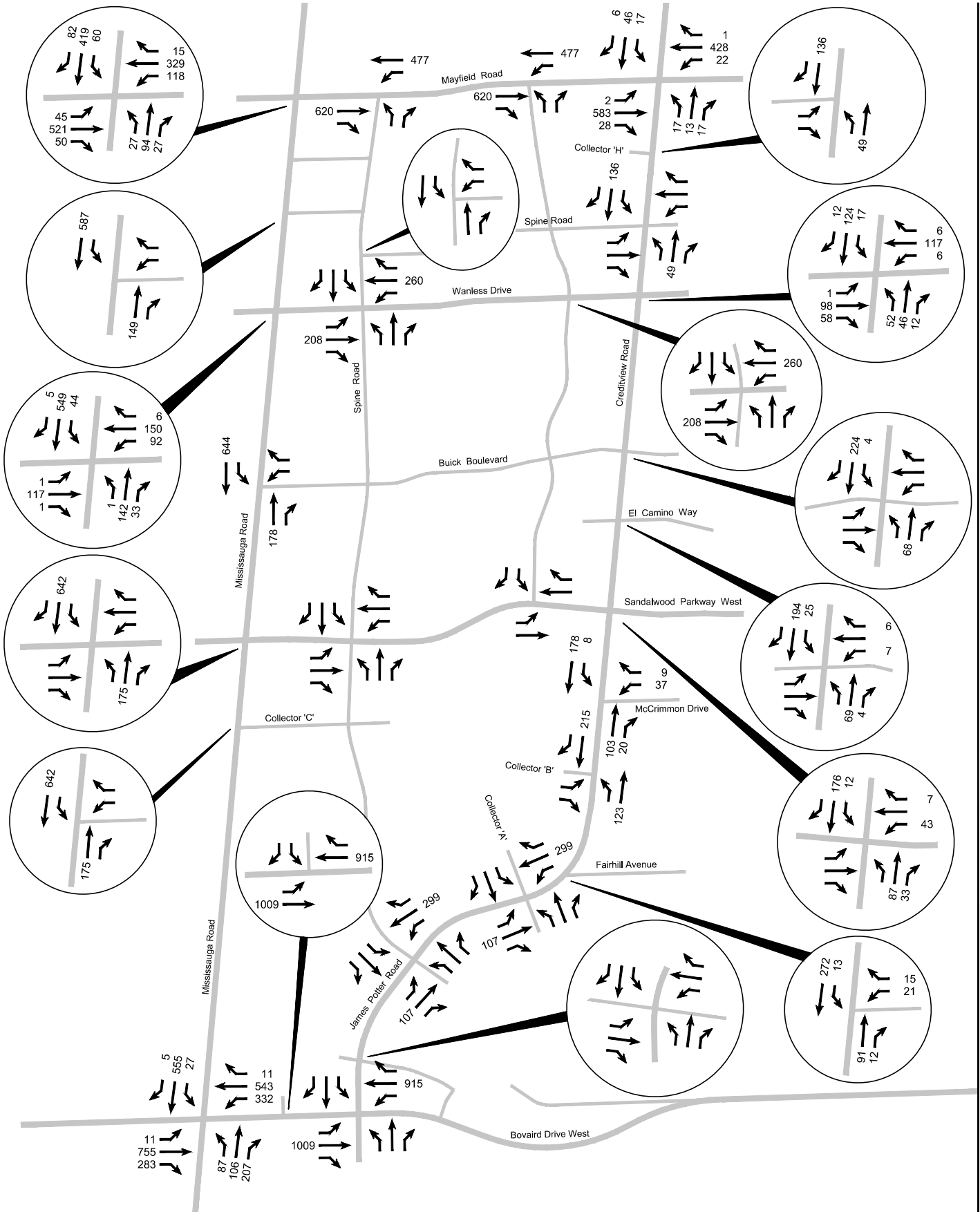
Table 7.1
2031 Arterial Road Improvements

Road	From	To	Lanes (2 way)
Bovaird Drive	CNR Overpass	Mississauga Rd	4
Mississauga Road	Bovaird Drive	Sandalwood Parkway	4
	Sandalwood Parkway	Mayfield Road	4
Sandalwood Parkway	Creditview Road	Mississauga Road	4
James Potter / Creditview Road	Bovaird Drive	Wanless Drive	4
	Wanless Drive	Mayfield Road	2
Wanless Drive	Creditview Road	Mississauga Road	2
Mayfield Road	Creditview Road	Mississauga Road	2

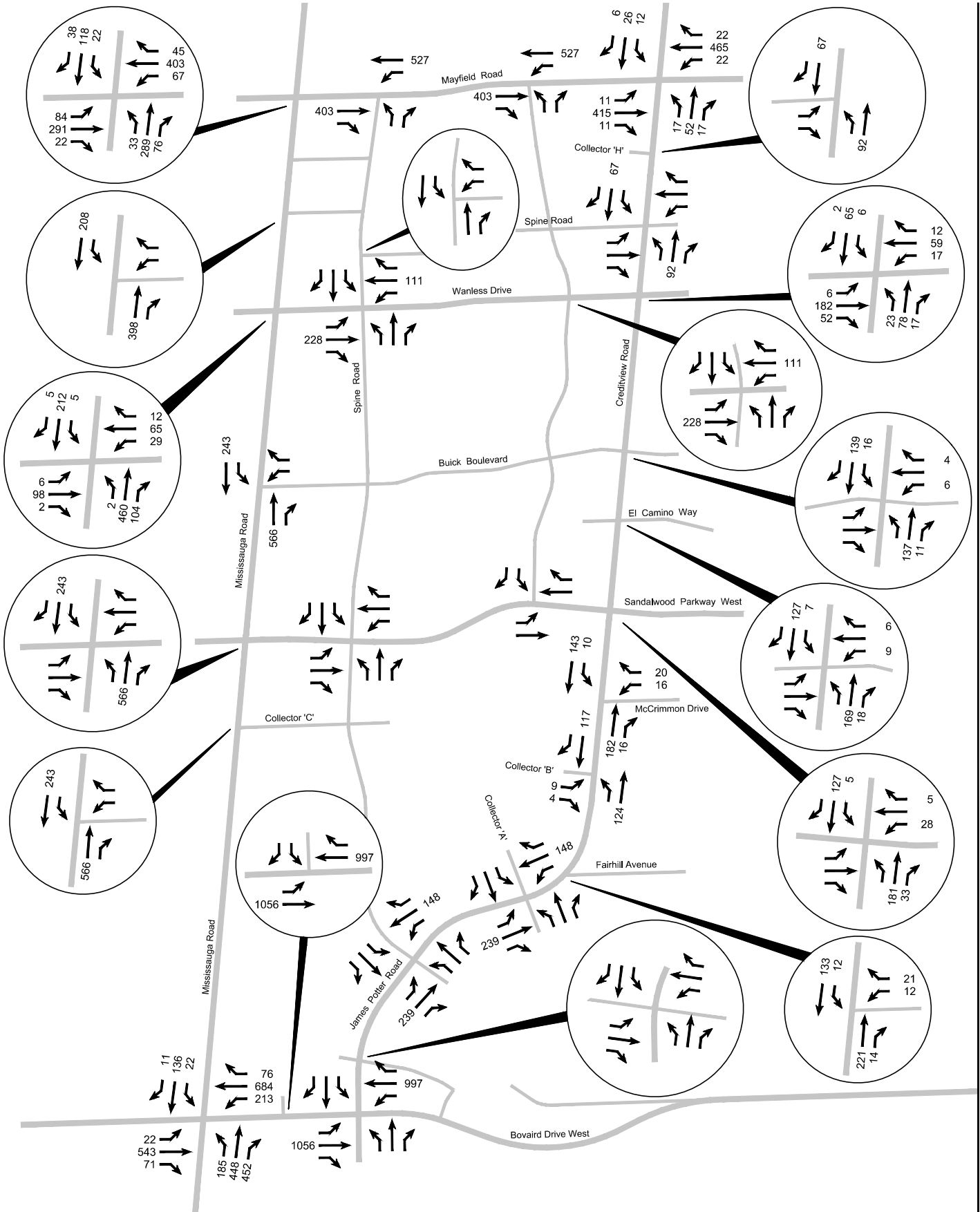
7.1.2 Background Traffic

As with the 2014 analysis documented in the preceding Section 6.0 above, background traffic for the 2016 analysis has been calculated on the basis of counts of existing traffic volumes at key intersections on the periphery of the Block 51-1 Study Area. Recent intersection turning movement counts were obtained for as many locations as were available from either the City of Brampton or the Region of Peel. In several cases, where recent counts were not available, BA Consulting Group undertook supplementary counts. These counts are documented fully in Appendix A.6.0 attached separately to this report.

At several key intersection locations, turning movement counts from multiple years were obtained, and assessed in order to establish appropriate annual corridor growth rates. These were determined to be 3% per annum for each of the key corridors, namely Bovaird Drive, Mississauga Road, Wanless Drive, Mayfield Road, and Creditview Road.



FUTURE BACKGROUND TRAFFIC VOLUMES
AM Peak Hour Traffic Volumes, 2016



FUTURE BACKGROUND TRAFFIC VOLUMES
 PM Peak Hour Traffic Volumes, 2016

The annual growth rates were applied to the most recent traffic count from each existing intersection so as to forecast the 2016 through movements at each location. Turning movements at these key locations were then adjusted so as to balance the volumes between orthogonal corridors. The resulting 2016 Background Traffic volumes can be seen in Figures 7.1 and 7.2.

7.1.3 Land Use

Having produced a background traffic layer, site traffic representing full build-out of Block 51-1 was added to it. The Block was divided into seven traffic zones, and the land uses for each zone tabulated from the Draft Plans filed with the Block Plan submission in May 2010. The traffic zone system used for this analysis is illustrated in Figure 7.3. Table 7.2 summarizes the land use assumptions that were used for each zone.

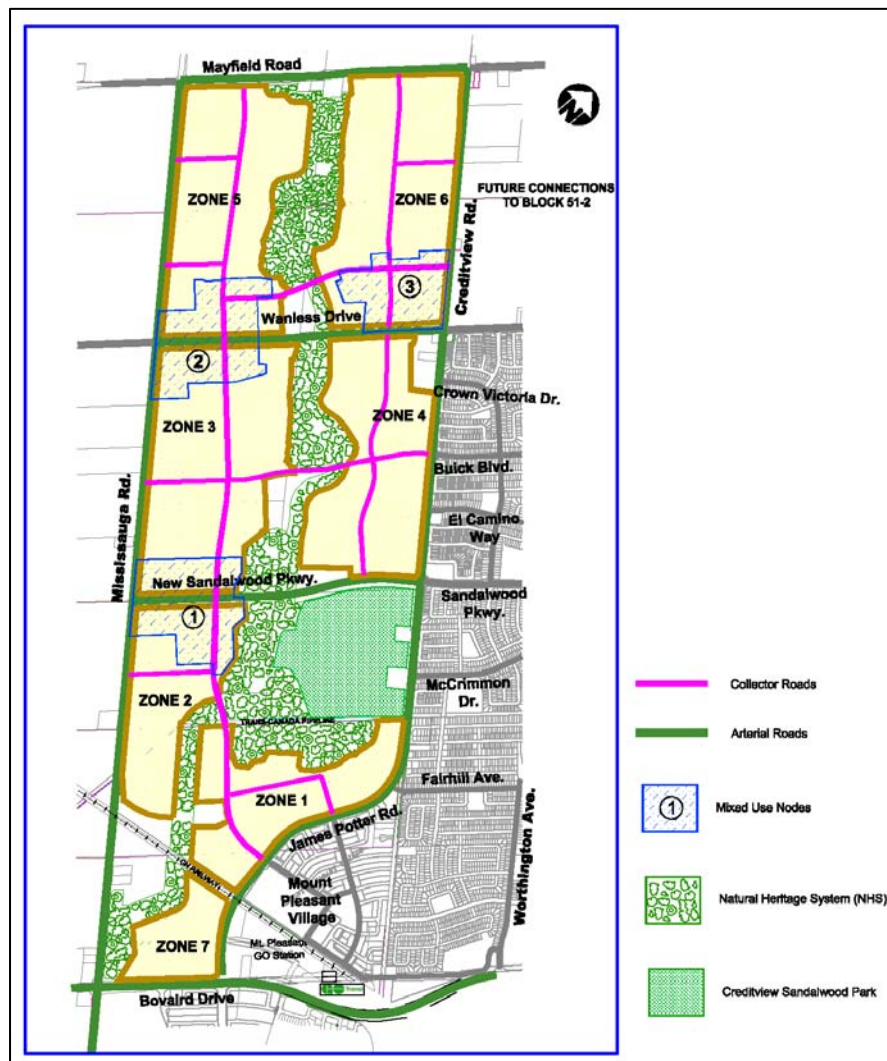


Figure 7.3 Traffic Analysis Zone System

Note that the total number of units assumed for this analysis differs from the 5,502 units attributed in the *Growth Management Staging and Sequencing Strategy Report*. The numbers used herein have been conservatively tabulated to include estimated unit counts and mixes for the properties belonging to non-participating landowners, and in cases where alternative developments scenarios are being considered (for example in Mixed Use Node #1 where a high-rise condominium tower is being considered as an option) the most intense development scenario has been assumed.

Development in Zone 7, for purposes of this analysis, is assumed to comprise 350,000 square feet of commercial retail space.

7.1.4 Trip Generation

Vehicular trip generation rates were based upon data published in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 8th Edition, and the results of trip generation surveys undertaken by BA Consulting Group in similar circumstances. These rates are consistent with those previously used in the Mount Pleasant Village Traffic Impact Study. Table 7.2 on the following page shows the residential trip generation rates that were used, and the resulting residential trips generated by the units in each zone.

Trip generation rates for proposed commercial retail uses were developed using ITE Shopping Centre Code 820 equation rates. These rates are also documented in Table 7.2

Trips generated by school uses within Block 51-1 have not been explicitly modelled. The peak school trip-making hours in both the AM and the PM tend to lie outside the street peak hours.

7.1.5 Trip Distribution

The distribution of trips to and from Block 51-1 was based on an automobile trip Origin-Destination matrix from the City of Brampton travel forecast model. The distribution that has been applied is shown in Table 7.3.

Table 7.3
2016 Macro Trip Distribution – (from 2031 Model)

Location (to/from)	PM In	PM Out
Within Brampton		
W	3%	8%
E	16%	24%
SW	2%	6%
SE	11%	14%
S	11%	11%
Outside Brampton		
Hamilton/Niagara	3%	1%
Waterloo/Guelph	6%	4%
North Region	1%	2%
York	4%	1%
Caledon	2%	5%
Toronto	8%	2%
Mississauga	16%	6%
Internal Block Trips	17%	16%
Total	100%	100%

Table 7.2
2016 Trip Generation Summary – (Full Build-Out)

Land Use	# of Units	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Selected Rates							
Per Unit							
Single and Semi-Detached		0.19	0.56	0.75	0.51	0.30	0.81
Condominium / Townhouse		0.12	0.47	0.59	0.44	0.24	0.68
Apartment		0.09	0.32	0.41	0.34	0.18	0.52
Condominium Townhouse		0.12	0.47	0.59	0.44	0.24	0.68
High-Rise Condominium		0.06	0.25	0.31	0.21	0.13	0.34
Per 1000 sq. ft. GFA							
Commercial		0.56	0.36	0.92	2.06	2.15	4.21
Zone 1 Land Use							
Single	373	70	210	280	190	110	300
Townhouse	258	30	120	150	115	60	175
Zone 2 Land Use							
Single	340	65	190	255	175	100	275
Semi-Detached	16	5	10	15	10	5	15
Townhouse	185	20	90	110	80	45	125
Condo Townhouse	87	10	40	50	40	20	60
Apartment	259	25	80	105	90	45	135
Zone 3 Land Use							
Single	681	130	380	510	345	205	550
Semi-Detached	100	20	55	75	50	30	80
Townhouse	369	45	175	220	160	90	250
Apartment ¹	234	20	75	95	80	40	120
High-Rise Condominium	705	40	175	215	150	90	240
Zone 4 Land Use							
Single	679	130	380	510	345	205	550
Townhouse	365	45	170	215	160	90	250
Zone 5 Land Use							
Single	537	100	300	400	275	160	435
Semi-Detached	228	45	125	170	115	70	185
Townhouse	443	50	210	260	195	105	300
Apartment	121	10	40	50	40	20	60
Zone 6 Land Use							
Single	462	90	260	350	235	140	375
Semi-Detached	422	80	235	215	215	125	340
Townhouse	316	40	150	190	140	75	215
Zone 7 Land Use							
Commercial ²	350,000 sq. ft	195	125	320	720	750	1470

Notes:

1. Back-to-back stacked townhouses were identified as an apartment land use
2. GFA based on 14.21 hectares with an fsi of 2.5

A notable feature of the distribution is the internal trip orientation of 16% -17%. The distribution was derived from the City's forecast model using a zone system that placed the Mount Pleasant GO Station within Block 51-1. There are also commercial uses within the block, notably the large commercial block to the south of the CNR line.

Given the large area covered by the block, the significant internal trip orientation, the proximity and clear importance of the Mount Pleasant GO Station, and the presence of the large commercial block a manual trip balancing procedure was designed to deal with the distribution of this significant internal trip component.

A 17% "internal trip-making" component of residential trips was calculated for each of the 6 traffic zones containing residential uses (those zones to the north of the CNR line). Based on the background traffic analysis performed on the 2031 forecast model volumes (refer to Section 8), it was possible to identify the proportion of GO Station based trips that were bound to and from Block 51-1. This "GO Station bound" component of traffic was also evenly divided across the same 6 traffic zones, and matched against a portion of the "internal trip-making" component in each zone. The remainder of the "internal trip-making" component at the residential end was presumed to be oriented to commercial uses within Block 51-1.

Simplifying assumptions were made about the scale and type of commercial development on each commercial parcel, as well as the proportions of new trips from within Block 51-1 versus new external trips and pass-by trips. After a few iterations, a balance was achieved between the internal new commercial trips and the residual "internal trip-making" components in the residential zones. Each residential-to-commercial trip component was then assigned to the network between the appropriate zones.

7.1.6 2016 Forecast Traffic Volumes

Assignment of the site traffic generated by each zone within Block 51-1 was done using a proprietary computer-assisted manual assignment procedure. The site traffic distribution and assignment accounted for traffic due to all residential and commercial uses in each of the of the 7 zones, for Block 51-1 internal trip making between the 7 zones, and for trips to and from the GO Station parking lot. The 2031 site traffic assignment is shown in Figures 7.4 and 7.5.

Finally, the background and site traffic layers were added together to produce 2031 total traffic projections at each of the key intersections. These were checked for consistency, and then the results at each intersection were analyzed using the Synchro 7 intersection analysis software.

The 2031 total traffic is shown in Figures 7.6 and 7.7.

7.2 Analysis Results

7.2.1 Intersection Performance Analysis Results

A summary of the results of the intersection level of service analyses appear in Figure 7.8. Detailed Synchro reports and a summary of the key level of service outputs, including queue storage requirements, can be found in Appendix A.7.2 attached separately to this report.

As can be seen, all of the intersections that have been assessed operate at a reasonable level of service, generally in the range of 'A' to 'B'.

7.2.2 Road Link Performance Analysis Results

Road link performance was assessed for the 2 lane arterial roads at the north end of Block 51-1 that will be potentially unimproved as of 2016 based on the current Region of Peel and City of Brampton capital plans.

Table 7.4 shows the forecast 2-way hourly link volumes and AADT volumes for these 2 lane roads based on the forecast traffic volumes shown in Figure 7.6 and 7.7.

Table 7.4
Link Volume and AADT Summary

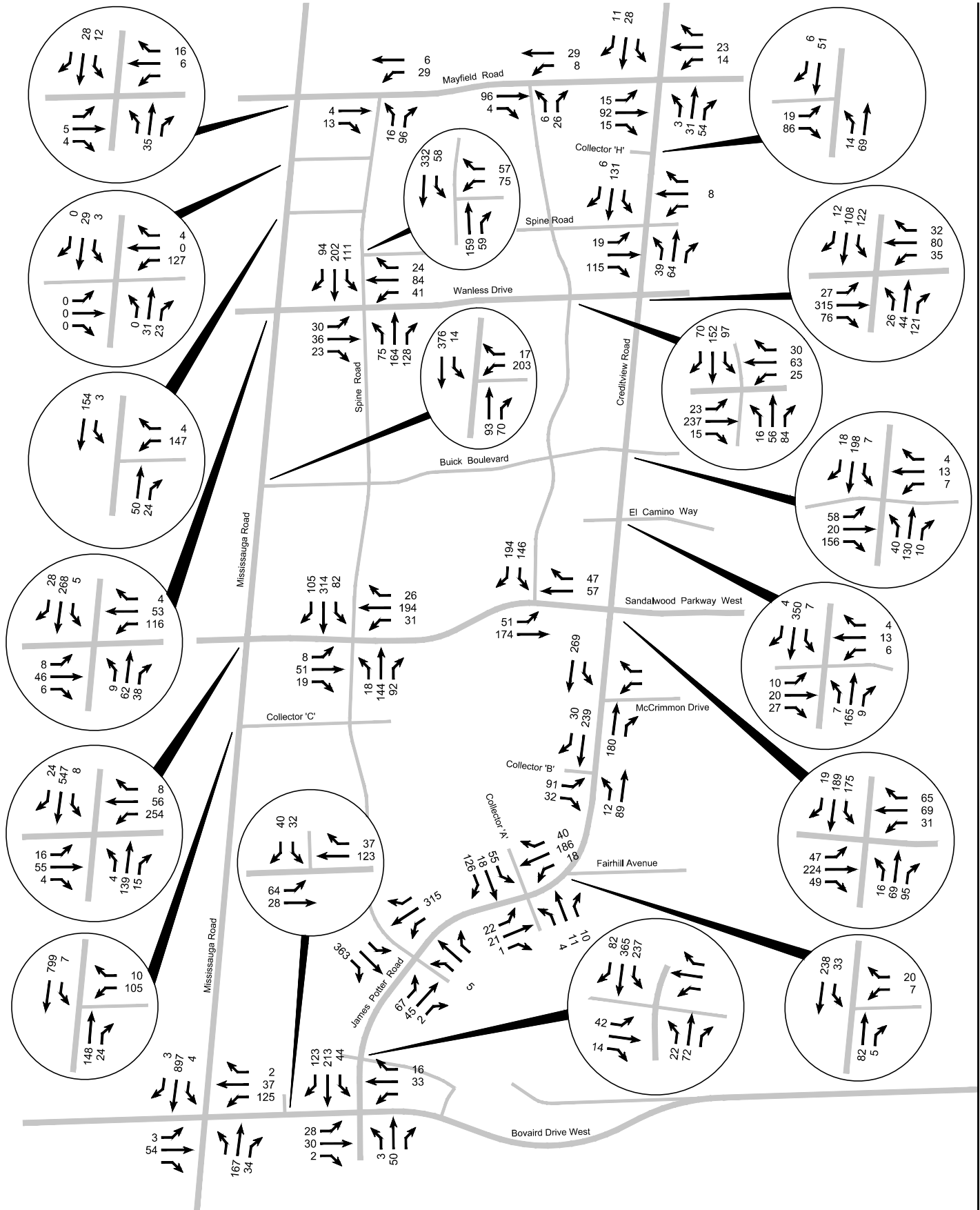
	Link Volume	AADT ²
Wanless Drive:		
West of Creditview Road	920 (1,070)	9,200 (10,700)
East of Mississauga Road	705 (680)	7,050 (6,800)
Creditview Road:		
North of Wanless Drive	555 (550)	5,550 (5,500)
Mayfield Road:		
West of Creditview Road	1,225 (1105)	12,250 (11,050)
East of Mississauga Road	1,110 (950)	11,110 (9,500)
Mississauga Road:		
North of Wanless Drive	1,120 (1,050)	11,120 (10,500)

Notes:

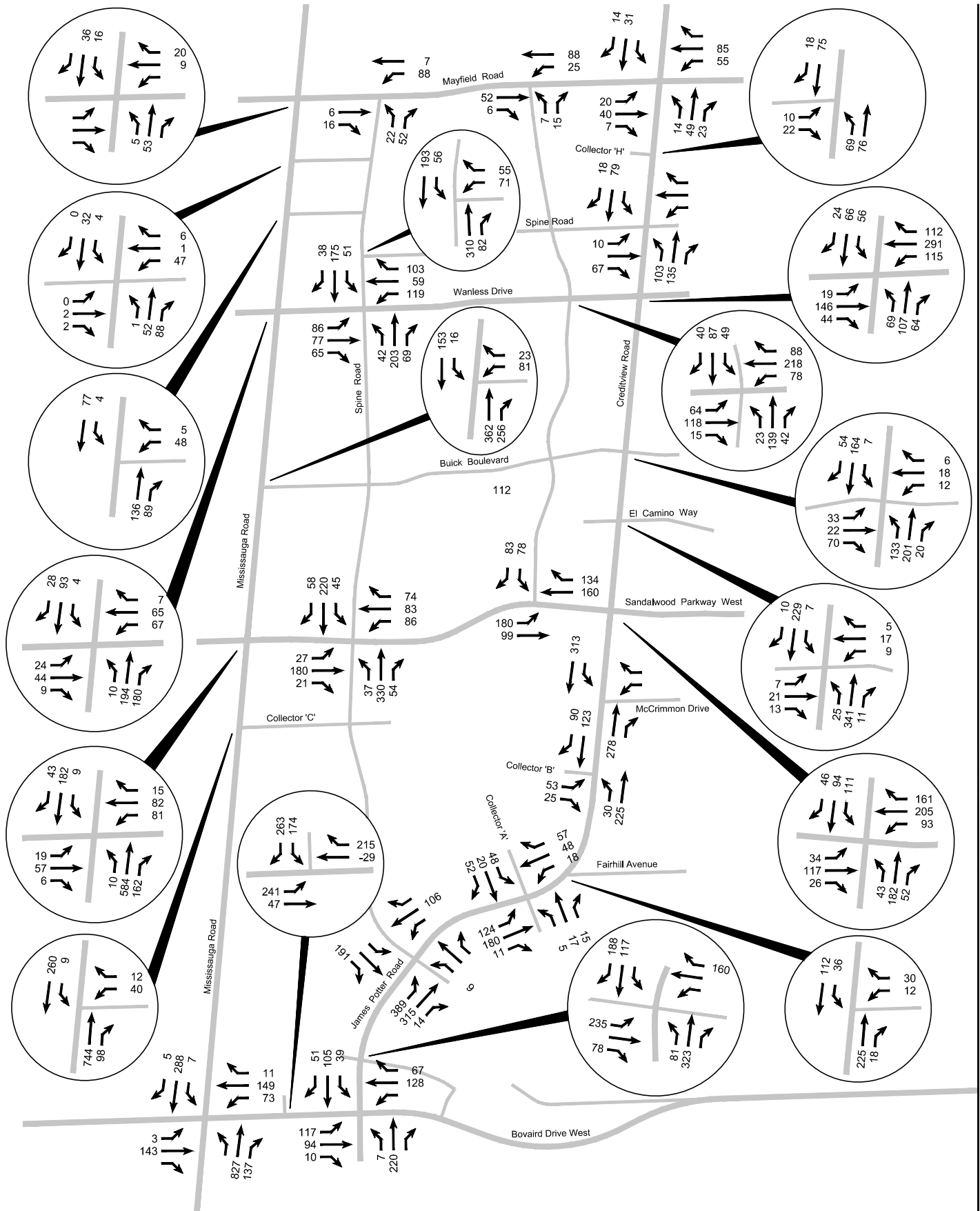
1. 00 (00) – Morning Peak Hour (Afternoon Peak Hour)
2. AADT based on 10 percent of the peak hour volume

The Highway Capacity Manual uses a basic lane capacity of about 1,600 vehicles per hour, or a two way capacity of 3,200 vehicles per hour, as the basis for assessing rural 2 lane roads such as these.

Given that the highest forecast 2 way volume in this area is on the order of just 1,200, it is clear that these volumes do not represent a problem with respect to the carrying capacity of these roads. This is supported by the excellent intersection performance forecast at the key intersections.

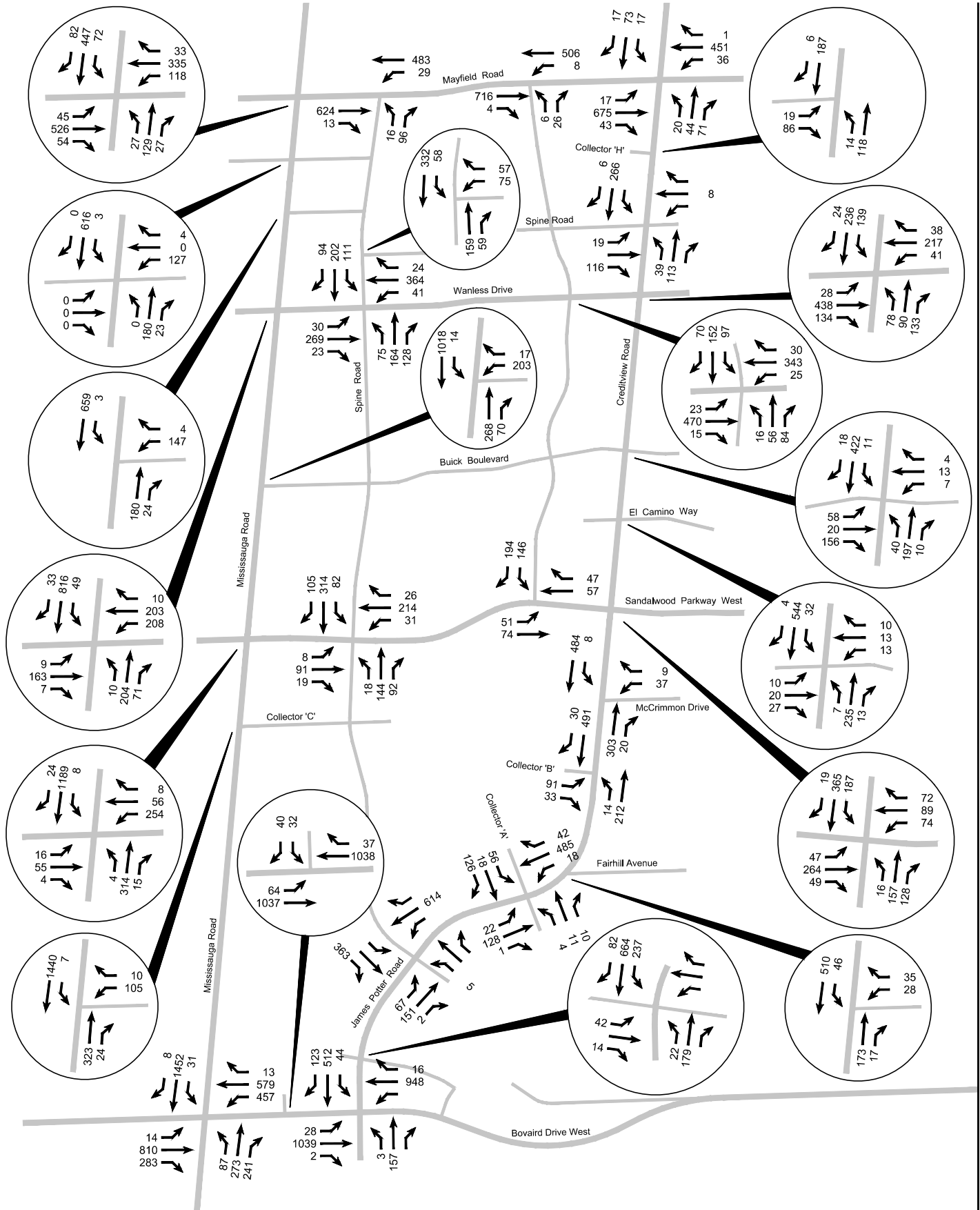


TOTAL SITE TRAFFIC VOLUMES
AM Peak Hour Traffic Volumes, 2016



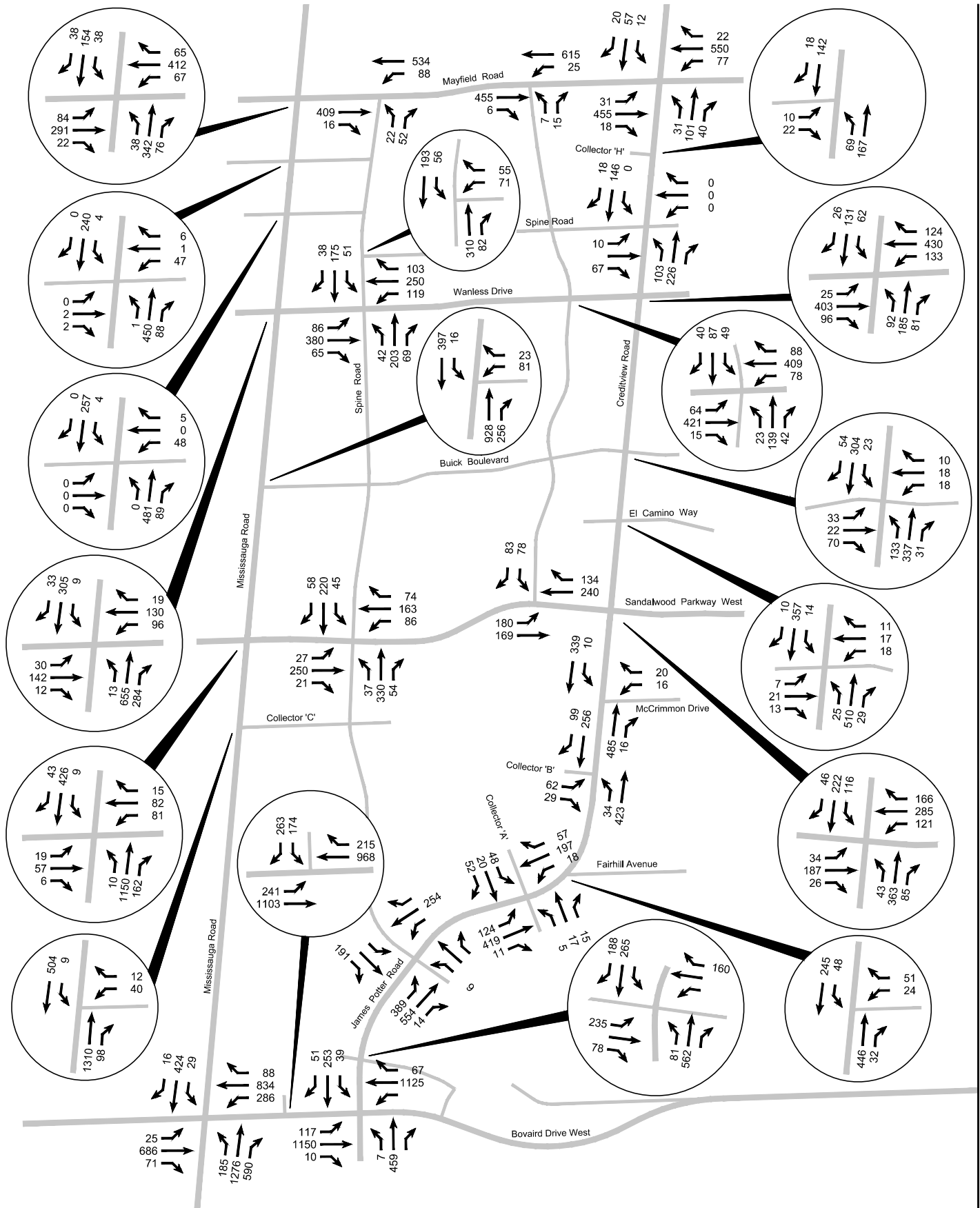
TOTAL SITE TRAFFIC VOLUMES
 PM Peak Hour Traffic Volumes, 2016





FUTURE TOTAL TRAFFIC VOLUMES
 AM Peak Hour Traffic Volumes, 2016





FUTURE TOTAL TRAFFIC VOLUMES
PM Peak Hour Traffic Volumes, 2016

7.3 Conclusions

7.3.1 Adequacy of the Proposed Road Network

The results of the intersection level of service analysis demonstrates that the proposed Block 51-1 collector road network will operate satisfactorily at full build-out of the community in 2016.

7.3.2 Timing of Municipal Roads Delivery

In light of the results of the 2016 road network performance analysis, the schedule for the delivery of municipal roads (Table 3.1) has been reviewed. The traffic analysis done to date has confirmed that the timeframes for delivery of the roads identified in Table 3.1 is consistent with road capacity related requirements of the block.

Notwithstanding this conclusion, the construction of these roads are important to the seamless implementation of Block Plan Area 51-1. As discussed in Section 4.0, “**Community Structure**”, Mount Pleasant Block 51-1 has been designed as a complete community. The land use plan centred around mixed use nodes, the significant natural heritage system, the transit spine based road network, and the active transportation network have all been designed to work together, and in support of the common vision: a transit-oriented and pedestrian friendly community which strives for environmental sustainability.

In order for this community to meet its sustainability goals, it is vital that all of the supporting infrastructure elements are delivered in a timely and coordinated manner. Significant effort has been expended to ensure that Regional and internal servicing will be delivered as required. In a similar fashion, it is desirable that a community supportive arterial road network be delivered in coordination with the build-out of Mount Pleasant.

At present, the *2011-2020 City of Brampton Roads Capital Program* (dated January 26th, 2011) envisages the delivery of most of these roads at dates which are consistent with the development of the Mount Pleasant Community. Notably it shows:

- the widening of Creditview Road to 4 lanes between Fairhill Avenue and Mayfield Road in 2014
- the widening of Wanless Drive to 4 lanes between Creditview Road and Mississauga Road from in 2014

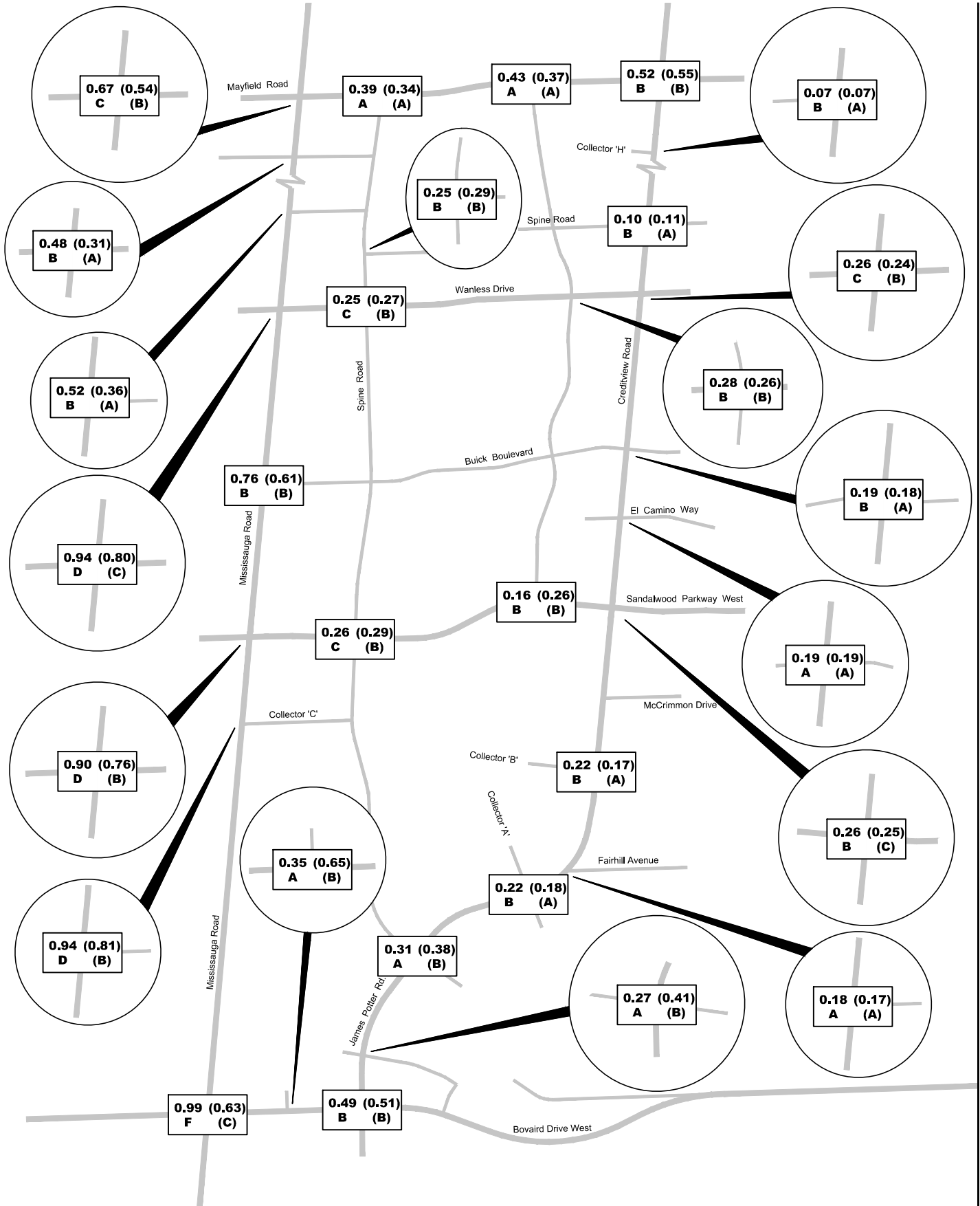
In order to ensure that the entire road program can be delivered as required, it is recommended that the City of Brampton consider moving the timing of the remaining roads forward within the Capital Program. Specifically, it would be desirable to advance the timing of the Development Charge funding for these roads as follows:

- funding for the North-South Spine Road between Creditview Road and Sandalwood Parkway is identified for 2013. This road will likely be built in 2012. Funding for this road

should be adjusted to allow for the NHS crossing as specified in the Block 51-1 Environmental Implementation Report.

- funding for the North-South Spine Road between Sandalwood Parkway and the connection with the East-West Spine Road to the north of Wanless Drive is identified for 2016. This road will likely be built in 2013 and 2014
- **funding is identified for the North-South Spine Road between the connection with the East-West Spine Road and Mayfield Road in 2016. This section of road is not part of the Spine Road. The Development Charge funding for this section of road needs to be applied to the East-West Spine Road between the connection with the North-South Spine Road and Creditview Road to the north of Wanless Drive. This road will likely be built in 2013 and 2014.** Funding for this road should be also adjusted to allow for the NHS crossing as specified in the Block 51-1 Environmental Implementation Report.
- Sandalwood Parkway from 2014 to 2012-2013.
- the CNR underpass on Creditview Road from 2015 to 2013.

To this end, a letter requesting that consideration be given to adjusting the timing of these roads was submitted to the City of Brampton by the Landowner's Group in November 2010. A copy of this letter can be found in Appendix A.4.2 attached separately to this report.



FUTURE ANALYSIS RESULTS

Total Traffic Volumes, 2016

A	- Level of Service
00	- AM Volume/Capacity Ratio
(00)	- PM Volume/Capacity Ratio



8.0 Long Term (2031) Road Network Performance

This section documents the long term (2031) traffic forecast analysis for Block 51-1 that has been conducted as part of this Block 51-1 Transportation Study and Collector Road EA. As there has been very little long term travel forecast work done to date at a turning movement level of detail in the vicinity of Block 51-1, the scope of this forecast has been expanded to include the peripheral arterial roads and intersections. In this section the work that has been done in this regard is summarized, and the results presented of the intersection analysis performed to date.

8.1 Analysis Details

8.1.1 Road Network

The long term road network has been assumed to comprise the currently planned and approved arterial road network resulting from recommendations from previous studies, as discussed earlier in this report in Section 3.0, “**Planning Background**”. Table 8.1 summarizes these improvements.

Table 8.1
2031 Arterial Road Improvements

Road	From	To	Lanes (2 way)
Bovaird Drive	CNR Overpass	Mississauga Rd	6
Mississauga Road	Bovaird Drive	Sandalwood Parkway	6
	Sandalwood Parkway	Mayfield Road	4
Sandalwood Parkway	Creditview Road	Mississauga Road	4
James Potter / Creditview Road	Bovaird Drive	Mayfield Road	4
Wanless Drive	Creditview Road	Mississauga Road	4
Mayfield Road	Creditview Road	Mississauga Road	4

Note that while not explicitly included or assessed within this analysis, the 2031 background traffic information that has been used assumes that the proposed North South Transportation Corridor through Northwest Brampton is in place as an 8 lane high order facility connected to the proposed Bramwest Parkway south of the Credit River Valley and Mayfield Road. This facility, also referred to as the Halton-Peel freeway, is a key recommendation of the Halton-Peel Boundary Area Transportation Study (HPBATS). Funding for this facility is currently being collected through the Region of Peel Development Charges Bylaw.

The collector road network assumed for this analysis is that recommended later in this Block 51-1 Transportation Study and Collector Road EA, specifically the network illustrated in Figure 11.16.

8.1.2 Background Traffic

Background traffic for the 2031 horizon year was derived from the City of Brampton PM peak hour travel forecast model. This model forecasts PM Peak hour traffic volumes.

8.1.2.1 Validation of Forecast Model Volumes

In order to confirm that the forecast volumes from the City of Brampton model were reasonable and appropriate to use for the purpose of forecasting 2031 background traffic, a comparison was performed of the model's forecast volumes for the 2006 horizon year against actual traffic counts obtained at around the same time. The purpose of this check was to establish that the forecast link volumes from the model were reasonable.

Intersection turning movement counts were available for Mississauga Road and Bovaird Drive from 2007, and Mississauga Road and Wanless Drive from 2008. The volumes entering and exiting each of the four intersection approaches were compared to the link volumes predicted by the model for 2006. The results of this comparison are shown in Tables 8.2a and 8.2b.

Table 8.2a
Brampton Forecast Model & Traffic Count Comparison:
Mississauga Road and Bovaird Drive (2007 count)

Approach	Dir'n	2006 Model	2007 Count	+/- Diff	% Diff
East Approach	Entering	704	668	+36	+5.4%
	Exiting	750	799	-49	-6.1%
West Approach	Entering	915	865	+50	+5.8%
	Exiting	906	793	+113	+14.2%
North Approach	Entering	732	741	-9	-1.2%
	Exiting	388	421	-33	-7.5%
South Approach	Entering	187	194	-7	-3.6%
	Exiting	493	455	+38	+8.4%
Total		5,075	4,936	+139	+2.8%

Table 8.2b
Brampton Forecast Model & Traffic Count Comparison:
Mississauga Road and Wanless Drive (2008 count)

Approach	Dir'n	2006 Model	2008 Count	+/- Diff	% Diff
East Approach	Entering	273	81	+192	+237.0%
	Exiting	221	56	+165	+294.6%
West Approach	Entering	201	79	+122	+154.4%
	Exiting	354	172	+182	+105.8%
North Approach	Entering	486	487	-1	-0.2%
	Exiting	184	204	-20	-9.8%
South Approach	Entering	182	190	-8	-4.2%
	Exiting	383	405	-22	-5.4%
Total		2,284	1,674	+610	+36.4

At Mississauga Road and Bovaird Drive, where the existing traffic volumes are relatively large, the forecast model volumes and traffic count volumes are very close, separated by just 2.8% on a weighted average volume basis. Furthermore, the forecast model's tendency in this case is to over predict the volumes, which on a going forward basis is a conservative factor. Given that the traffic count was done in 2007, a year later than the modelled year (2006), the modelled estimate is that much more conservative (by about 3% based on observed annual corridor growth rates in this area).

At Wanless Drive and Mississauga Road, the existing traffic volumes are substantially lower and, as would be expected, show greater variance from the forecast model volumes. In the north-south direction, the forecast model volumes and ground counts are very close, with the model under predicting relative to the ground counts by only about 4%. Given the ground count was recorded in 2008, 2 years more recently than the model forecast, this is exactly what would be expected. From the perspective of the Block 51-1 traffic analysis, this is an important finding. The Mississauga Road corridor is a significant one with respect to serving the transportation needs of this community so it is important that the background traffic estimates be as accurate as possible.

In the east-west direction at this location, the model is over predicting by a substantial amount, about **170%** on average. This is likely due to modelled capacity constraints in other corridors pushing traffic to find alternative east-west routes. From the perspective of this study, it was decided to leave the forecast model volumes alone and not to reduce them to try and correct for this anomaly.

Thus, while the 2031 forecast volumes used to establish background traffic in the Wanless Drive corridor in this analysis are likely to be conservatively high, it would appear as if traffic in the key Mississauga Road and Bovaird Drive corridors are accurately reflected in the background traffic volumes.

8.1.2.2 Adjustment of Forecast Model Volumes

2031 PM Peak hour traffic volumes were obtained at an intersection turning movement level of detail for all of the major intersections in the vicinity of Block 51-1. The volumes were provided in three components, namely:

- total traffic
- traffic inbound to traffic zones in Block 51-1
- traffic outbound from traffic zones in Block 51-1

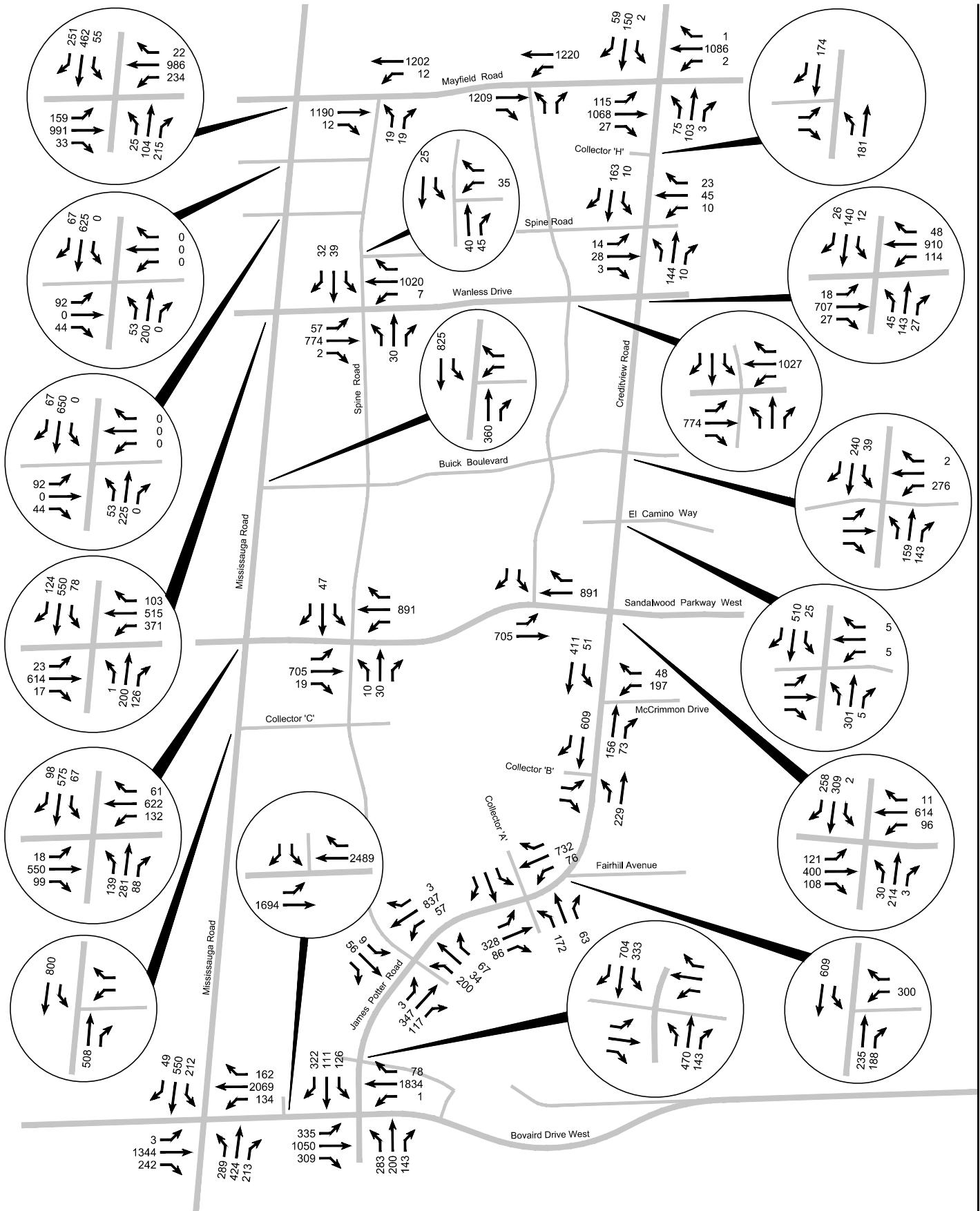
Background traffic volumes were obtained by netting off the inbound and outbound Block 51-1 traffic as identified in the forecast model from the total traffic to produce a future background traffic layer. This layer included all forecast traffic from the model, except for traffic bound to or from zones within Block 51-1.

These traffic volumes were further adjusted to correct for differences between the representation of the 2031 road network included in the model and the currently conceived arterial and collector road network.

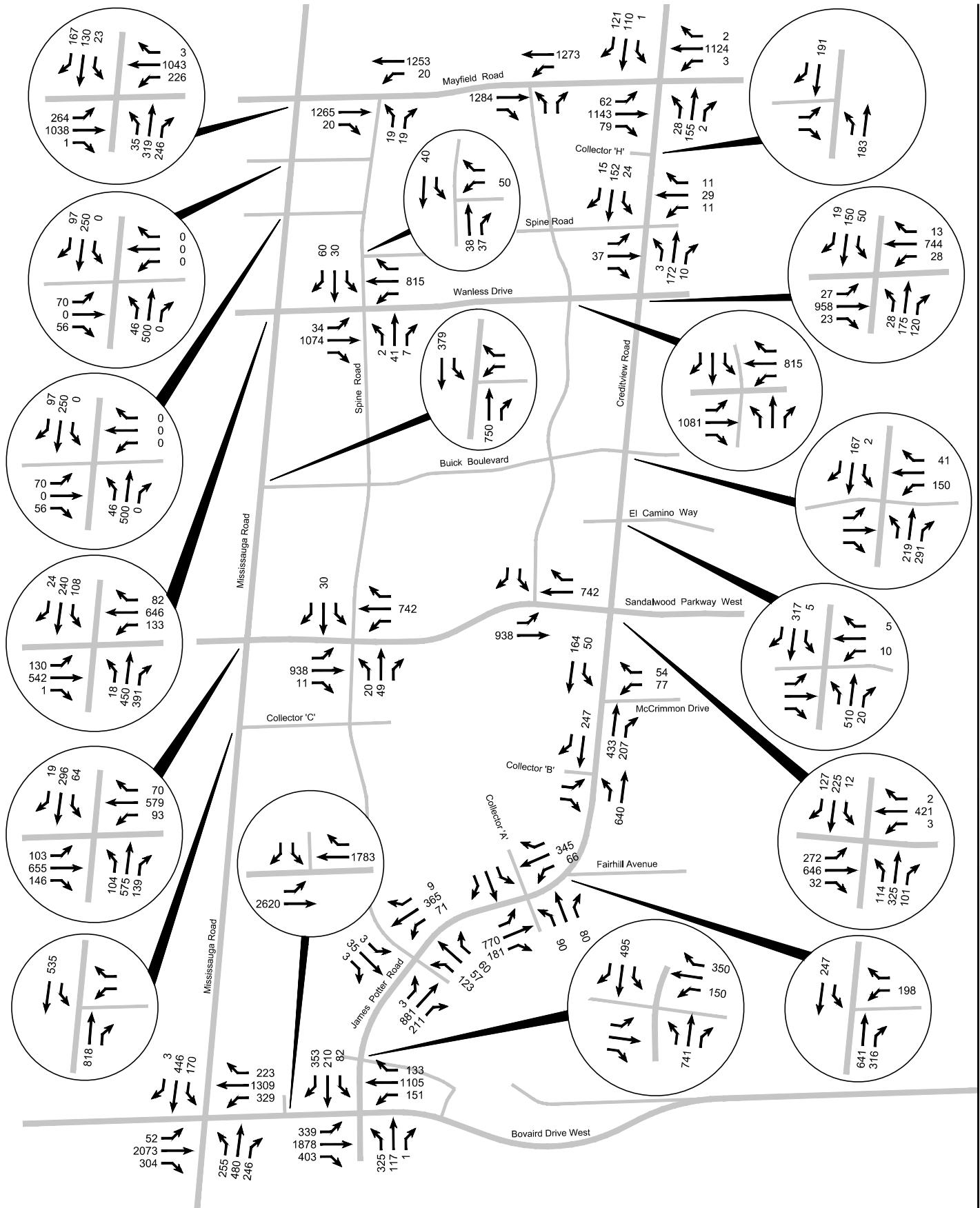
A portion of the traffic bound to and from the GO Station was then netted off of the background traffic, as this component was identified as being oriented internally to Block 51-1. The remainder of this traffic was left in the background traffic layer as it reflects GO Station trips bound outside Block 51-1.

Finally, Mount Pleasant Village traffic volumes were added, based on the “C2” ultimate development scenario documented in the *Traffic Impact Study* (dated October 2009) for that development.

The resulting background traffic volumes are illustrated in Figures 8.1 and 8.2.



FUTURE BACKGROUND TRAFFIC VOLUMES
 AM Peak Hour Traffic Volumes, 2031



FUTURE BACKGROUND TRAFFIC VOLUMES
 PM Peak Hour Traffic Volumes, 2031

8.1.3 Site Traffic

Having produced a background traffic layer, Block 51-1 site traffic was added to it. The Block was divided into seven zones, and the land uses for each zone tabulated from the Draft Plans filed with the Block Plan submission in May 2010. The zone system used for this analysis is illustrated in Figure 8.3. Table 8.3 summarizes the land use assumptions used for each zone.

Note that the total number of units assumed for this analysis differs from the 5,502 units attributed in

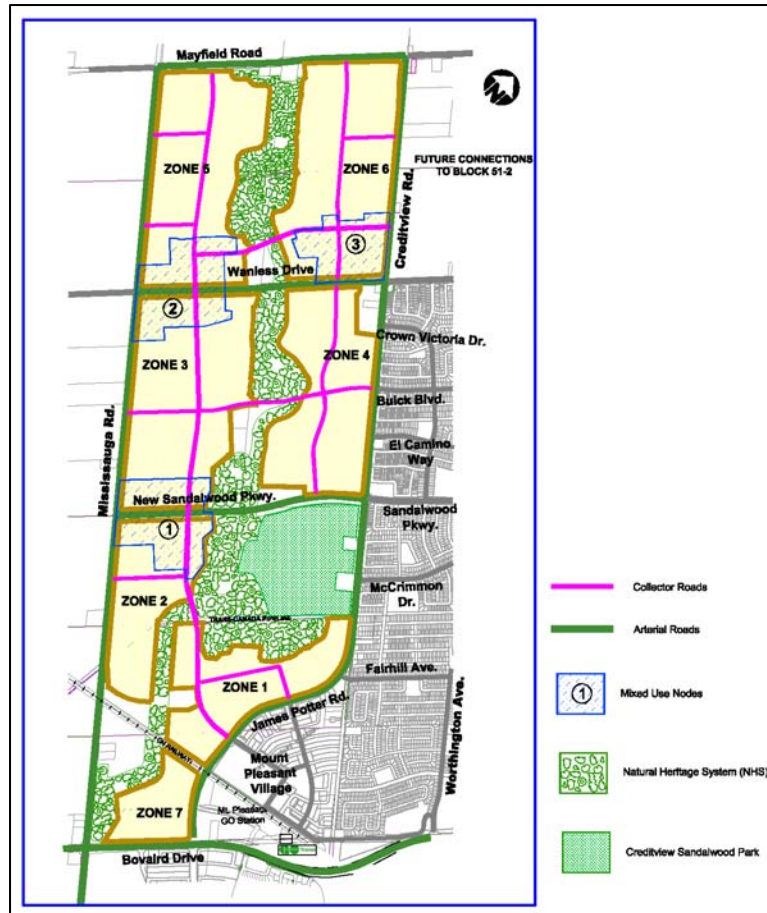


Figure 8.3 Traffic Analysis Zone System

the Growth Management Staging and Sequencing Strategy Report. The numbers used herein have been conservatively tabulated to include estimated unit counts and mixes for the properties belonging to non-participating landowners, and in cases where alternative developments scenarios are being considered (for example in Mixed Use Node #1 where high density residential is being considered as an option) the most intense development scenario has been assumed.

Development in Zone 7, for purposes of this analysis, is assumed to comprise 350,000 square feet of commercial retail space.

Vehicular trip generation rates were based upon data published in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 8th Edition, and the results of trip generation surveys undertaken by BA Consulting Group in similar circumstances.

These rates are consistent with those previously used in the Mount Pleasant Village Traffic Impact Study. Table 8.3 shows the Trip Generation Rates that were used, and the resulting trips generated by the residential units in each zone. Since most of the Village residents are within walking distance of the GO Station, the transit modal split assumed in calculating the Block 51-1 Trip Rates was somewhat lower.

Table 8.3
2031 Trip Generation Summary – (Full Build-Out)

Land Use	# of Units	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Selected Rates							
Per Unit							
Single and Semi-Detached		0.19	0.56	0.75	0.51	0.30	0.81
Condominium / Townhouse		0.12	0.47	0.59	0.44	0.24	0.68
Apartment		0.09	0.32	0.41	0.34	0.18	0.52
Condominium Townhouse		0.12	0.47	0.59	0.44	0.24	0.68
High Density Residential		0.06	0.25	0.31	0.21	0.13	0.34
Per 1000 sq. ft. GFA							
Commercial		0.56	0.36	0.92	2.06	2.15	4.21
Zone 1 Land Use							
Single	373	70	210	280	190	110	300
Townhouse	258	30	120	150	115	60	175
Zone 2 Land Use							
Single	340	65	190	255	175	100	275
Semi-Detached	16	5	10	15	10	5	15
Townhouse	185	20	90	110	80	45	125
Condo Townhouse	87	10	40	50	40	20	60
Apartment	259	25	80	105	90	45	135
Zone 3 Land Use							
Single	681	130	380	510	345	205	550
Semi-Detached	100	20	55	75	50	30	80
Townhouse	369	45	175	220	160	90	250
Apartment ¹	234	20	75	95	80	40	120
High Density Residential	705	40	175	215	150	90	240
Zone 4 Land Use							
Single	679	130	380	510	345	205	550
Townhouse	365	45	170	215	160	90	250
Zone 5 Land Use							
Single	537	100	300	400	275	160	435
Semi-Detached	228	45	125	170	115	70	185
Townhouse	443	50	210	260	195	105	300
Apartment	121	10	40	50	40	20	60
Zone 6 Land Use							
Single	462	90	260	350	235	140	375
Semi-Detached	422	80	235	215	215	125	340
Townhouse	316	40	150	190	140	75	215
Zone 7 Land Use							
Commercial ²	350,000 sq. ft	195	125	320	720	750	1470

Notes:

1. Back-to-back stacked townhouses were identified as an apartment land use
2. GFA based on 14.21 hectares with an fsi of 2.5

Trip generation rates for proposed commercial retail uses were developed using ITE Shopping Centre Code 820 equation rates.

The distribution of trips to and from Block 51-1 was based on an automobile trip Origin-Destination matrix from the City of Brampton travel forecast model. The matrix also informed the decision to assume approximately 17% internal trip-making. For purposes of this analysis, an appropriate component of the internal trips were first associated with the Mount Pleasant GO Station. The remainder were manually balanced between the residential uses and commercial uses in each of the seven zones. The process followed to do this is described in Section 7.1.5.

Assignment of the site traffic generated by each zone within Block 51-1 was done using a proprietary computer-assisted manual assignment procedure. The site traffic distribution and assignment accounted for traffic due to all residential and commercial uses in each of the of the 7 zones, for Block 51-1 internal trip making between the 7 zones, and for trips to and from the GO Station parking lot. The 2031 site traffic assignment is shown in Figures 8.4 and 8.5.

Finally, the background and site traffic layers were added together to produce 2031 total traffic projections at each of the key intersections. These were checked for consistency, and then the results at each intersection were analyzed using the Synchro 7 intersection analysis software.

The 2031 total traffic is shown in Figures 8.6 and 8.7.

8.1.4 Pedestrian Activity

Given the anticipated higher than usual level of pedestrian activity in the Block 51-1 community, particularly along the Spine Road corridor, a simple and conservative assessment has been conducted of the pedestrian volumes that might be anticipated at the signalized intersections in the Block 51-1 study area. The details of the analysis inputs that have been used are as follows:

1. Based on a review of City of Brampton traffic counts, it was decided to assume base or minimum values for every intersection in the network, and then to estimate values that might exceed the minimum at the specific locations of concern, namely the arterial intersections with the Spine Road. It is at these locations that it is anticipated that pedestrian volumes may be higher than typically found in suburban Brampton. The base or minimum values that have been assumed are:
 - **40 pedestrian actuations per hour, which ensures that minimum pedestrian crossing intervals will be used for each cycle.**
 - **100 two-way pedestrians crossings per hour on each approach of the intersection.**
2. The key “driver” of pedestrian volumes in the AM and PM peak hours in this community is assumed to be people walking to and from transit stops. Additional “trip purposes” will be accounted for by factoring up the volumes estimated on the basis of transit access.

3. In the traffic analysis work conducted to date, a conservative transit modal split assumption of 10% has been incorporated into the trip generation rates. In order to ensure that the pedestrian forecast analysis is similarly conservative, **a higher transit mode split of 15%** has been assumed. This 15% of residential trips is further increased by a factor of **1.2** to reflect the fact that they are person trips and not vehicle trips.
4. Assessment of the area to the North of Sandalwood Parkway
 - a. **“Typical” intersections:** In the area from Sandalwood Parkway to the north it is assumed (to be conservative) that all transit users walk to the nearest bus stop, that all transit users are bound to the transit mobility hub at the Mount Pleasant GO Station, and that given the relatively even population density in the community the demand for the available stops along the Spine Road and Creditview Road is evenly distributed in this area. These users appear as pedestrians at the intersection closest to their stop. Based on these principles, the following steps were taken to determine what the resulting pedestrian volumes would be:
 - i. Based on the Trip Generation information used in Block 51-1 study (Zones 3 through 6 in Table 8.3) about 3,580 AM and 3,960 PM two-way vehicle trips are forecast to be generated in this area of the community.
 - ii. Using the mode split factors described in Point 3 above, these were converted to 715 AM and 790 PM two-way pedestrian trips.
 - iii. This area is served by about 18 pairs of stops along Creditview Road and the Spine Road. Each pair of stops serves peak direction and off-peak direction passengers. Given the assumed even distribution of demand, this results in about 40 two-way trips per stop in the AM, and 45 two-way trips in the PM.
 - iv. To be conservative, and to avoid having to make detailed “trip assignment” assumptions”, it was assumed that the resulting two-way pedestrian volumes at a given pair of bus stops travel around each of the four intersection approaches at the nearest intersection to the stop.

Even with these very conservative assumptions, the resulting pedestrian volumes are lower than the Minimum pedestrian volumes (100 two way on each approach) described in Point 1. **Therefore, the minimum volumes are sufficient for most of the intersections**, with the exception of the intersections discussed below.

- b. **Mixed Use Node Intersections:** At the Spine Road / arterial road intersections in the Mixed Use Nodes at Sandalwood, Wanless, and Creditview, it is anticipated that pedestrian volumes will be higher than the typical values estimated in Point 4a above. The typical volumes have therefore been factored up to reflect the following:
 - i. a factor of **2.0** has been applied to reflect the fact that passenger transfers will occur between the Spine Road transit services and the orthogonal arterial road transit service

- ii. a further factor of **2.0** has been applied to reflect the fact that there are other uses in and around the mixed use nodes that may generate some pedestrian activity in both the AM and PM peak hours.

In this manner, the resulting two-way pedestrian volumes at the three intersections within the Mixed Use Nodes have been estimated as 160 in the AM and 180 in the PM. As before, to be conservative it is assumed that this represents the two-way pedestrian volume across each of the four approaches of the intersection.

5. Assessment of the area to the South of Sandalwood Parkway

South of Sandalwood Parkway it is assumed (to be conservative) that all transit users walk to the GO Station in Mount Pleasant Village. These users appear as pedestrians at the key crossing points of James Potter Road at the interface of Block 51-1 with Mount Pleasant Village. Using these principles, the following steps were taken to determine what the resulting pedestrian volumes would be:

- i. Based on the Trip Generation information used in Block 51-1 study (Zones 1 through 2 in Table 8.3) about 965 AM and 1,090 PM two-way vehicle trips are forecast to be generated in this area of the community.
- ii. Using the mode split factors described in Point 3 above, these were converted to 200 AM and 220 PM two-way pedestrian trips.
- iii. It was assumed that from this area, 60% will make their way across James Potter Road to the Mobility Hub in Mount Pleasant Village by way of the Spine Road, and 40% by way of Collector 'A'. At each location, half of the volume will cross on each side of the road.
- iv. An adjustment of 2.0 was made at each location to reflect the fact that this is an arterial road with a multi-use trail, and that there are other uses in the vicinity such as the Secondary School at the Spine Road and James Potter Road.
- v. As with the intersections from Sandalwood Parkway to the north, it was conservatively assumed that the resulting two-way pedestrian volume determined for each location appears on each approach of the intersection.

In this manner the two-way pedestrian volumes across each approach have been estimated as follows:

- **At Spine Road and James Potter, 120 in the AM and 130 in the PM**
- **At Collector 'A' and James Potter, 80 in the AM and 90 in the PM, which are lower than the minimum values (100 two-way) described in Point 1.**

8.2 Analysis Results

Synchro analysis was conducted of the signalized intersections in the Block 51-1 study area. For this 2031 time horizon, the analysis incorporated not only the total forecast vehicular traffic volumes, but also the forecast pedestrian volumes described in section 8.1.4 above. The results of the intersection level of service analyses are shown in Figure 8.8. Detailed Synchro reports and a summary of the key level of service outputs, including queue storage requirements, can be found in Appendix A.7.3 attached separately to this report.

8.3 Conclusions

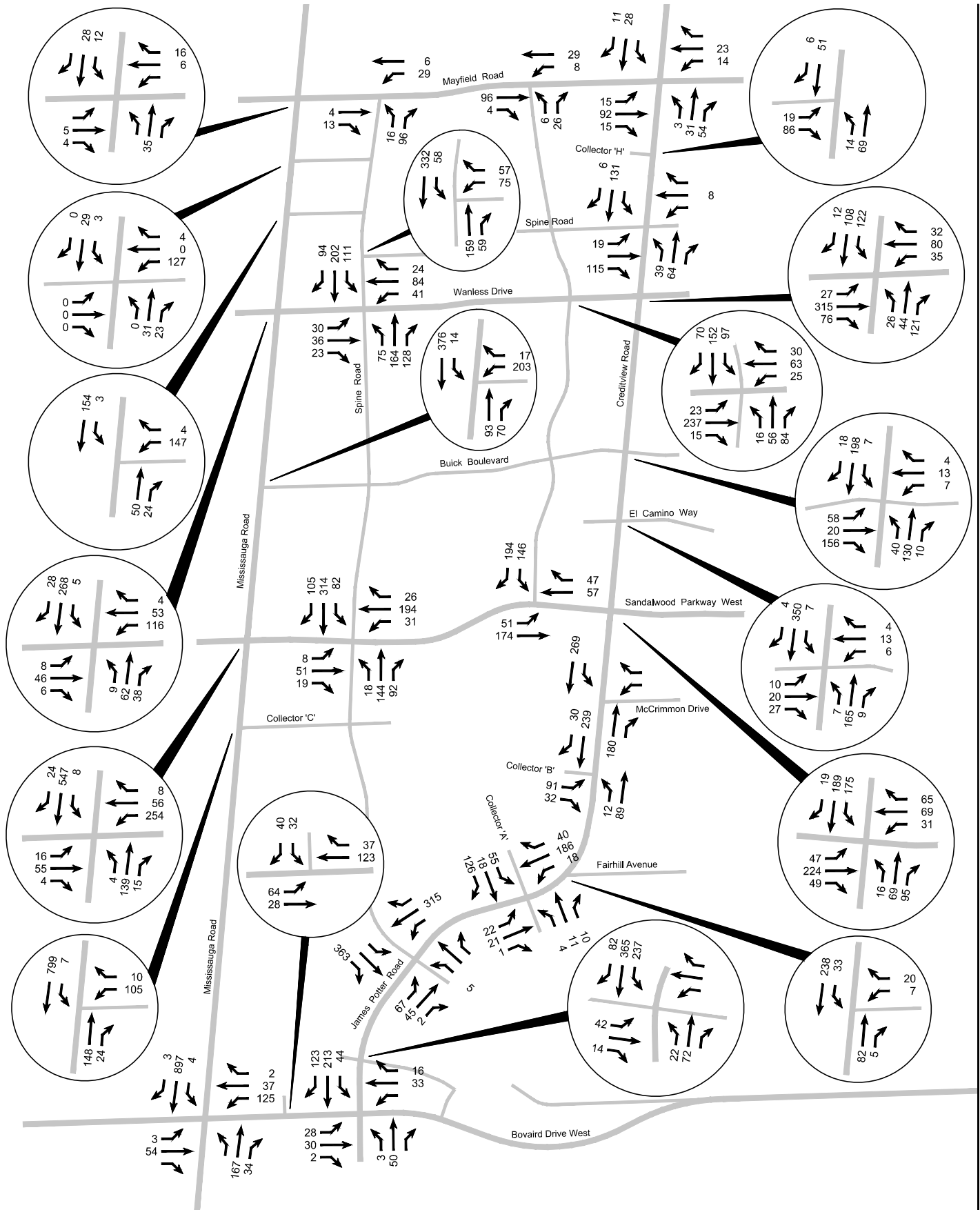
The following conclusions can be drawn from the 2031 traffic assessment:

1. The collector to collector and collector to arterial intersections in and around Block 51-1 all operate at an acceptable level of service.
2. The Spine Road intersections with James Potter / Creditview Road, Sandalwood Parkway, Wanless Drive and Creditview Road all operate at level of service 'A' or 'B', indicating that operations at these intersections are acceptable and consistent with reliable and efficient transit service.

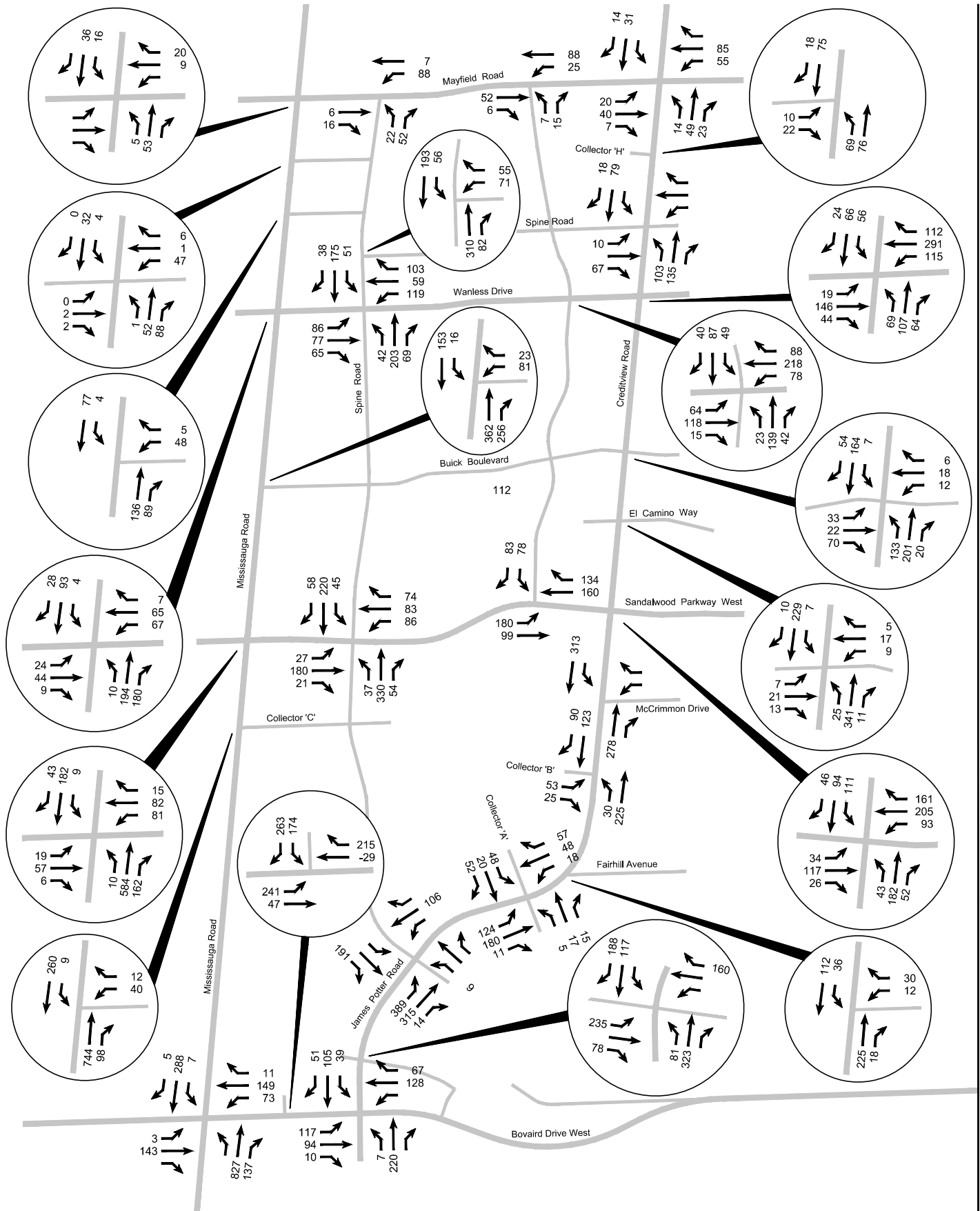
Note that the arterial to arterial intersections along Bovaird Drive are seen to be operating at close to capacity in this analysis. This is a result of the focused analysis of Block 51-1 using a detailed manual assignment methodology. While the methodology is able to provide us with the turning movement volumes required within the site for collector road and intersection assessment, it is not capable of adjusting or re-balancing the through corridor trips on the adjacent arterial roads such as Bovaird Drive.

A more rigorous assessment of these intersection is beyond the scope of this Block 51-1 Collector Road EA Study. This work lies within the scope of the ongoing Bovaird Drive Widening EA being undertaken by the Region of Peel.

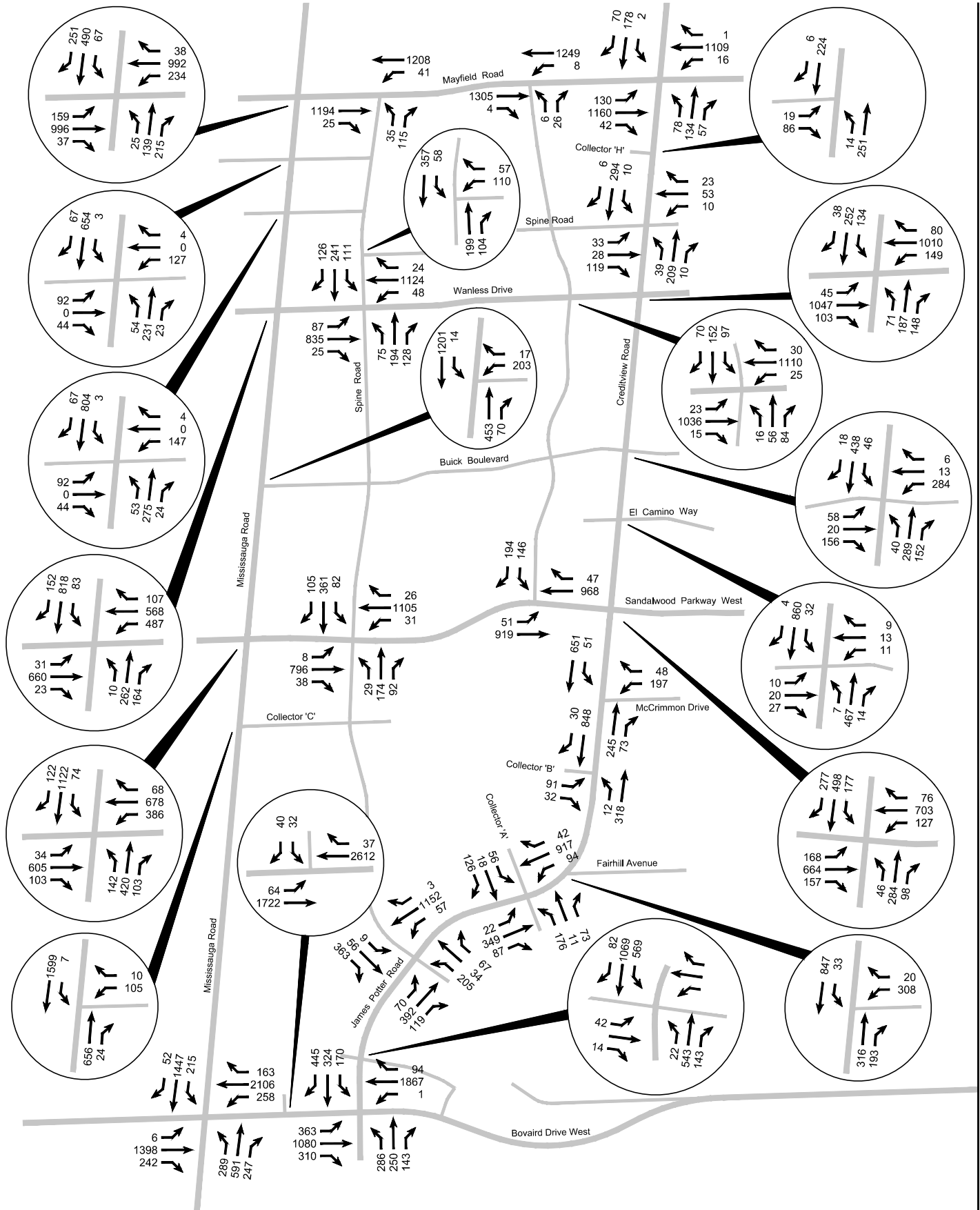
Notwithstanding these results, the conclusions of this study regarding that the proposed Block 51-1 collector road network are not changed. This network is sufficient and appropriate to serve the transportation requirements of Block 51-1.



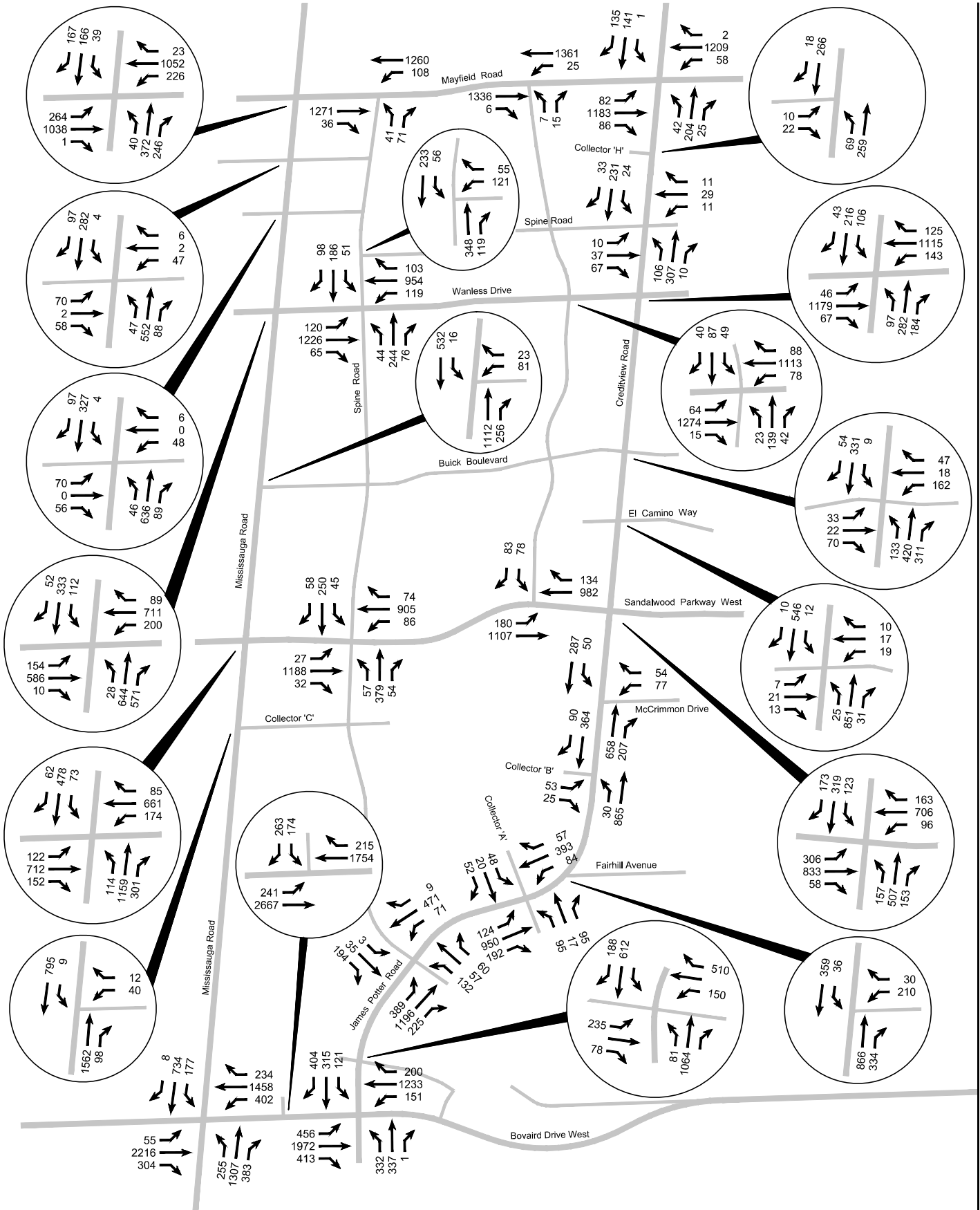
TOTAL SITE TRAFFIC VOLUMES
 AM Peak Hour Traffic Volumes, 2031



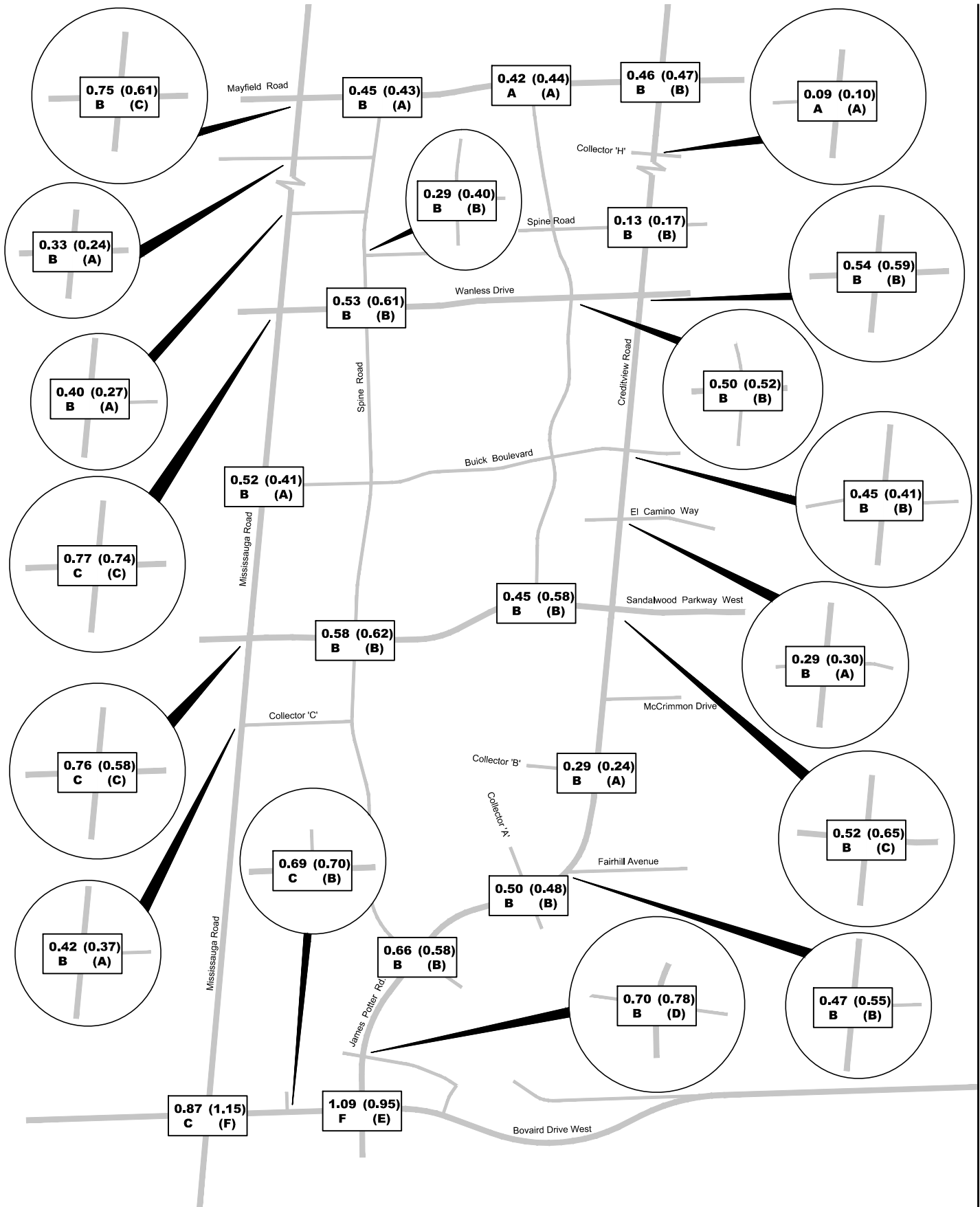
TOTAL SITE TRAFFIC VOLUMES
PM Peak Hour Traffic Volumes, 2031



FUTURE TOTAL TRAFFIC VOLUMES
AM Peak Hour Traffic Volumes, 2031



FUTURE TOTAL TRAFFIC VOLUMES
 PM Peak Hour Traffic Volumes, 2031



FUTURE ANALYSIS RESULTS
Total Traffic Volumes, 2031

A	- Level of Service
00	- AM Volume/Capacity Ratio
(00)	- PM Volume/Capacity Ratio



Figure 8.8

9.0 The Spine Road

The Mount Pleasant Secondary Plan Area Transportation Master Plan identified the implementation of a mid-block, transit supportive collector road, or Spine Road, as a key functional element in determining the ability of this community to meet its sustainable, multi-modal transportation objectives.

The importance of this road has been re-iterated in the Mount Pleasant Secondary Plan and the Memorandum of Understanding between the City of Brampton and the Block 51-1 Landowners Group (see Section 3.1, “**Mount Pleasant Secondary Plan and Block Plan**”). Both of these documents identify the need to consider an alternative standard for this road.

This section documents the manner in which the configuration and alignment of this road (as recommended and incorporated into the Block 51-1 plan) have been developed.

- Section 9.1, “**Planning Background**”, reviews background information regarding the work undertaken in support of the Spine Road prior to this study
- Section 9.2, “**Spine Road Objectives**” documents the multiple functional and planning objectives that have been identified.
- Section 9.3, “**The Challenge**” discusses the problems in achieving multiple objectives that appear to conflict with each other.
- Section 9.4, “**Spine Road Performance**” documents the forecast traffic demand and anticipated vehicular carrying capacity of the Spine Road.
- Section 9.5, “**Assessment of Alternative Cross Sections**” presents a rigorous assessment of six alternative cross sections, in fulfillment of Collector Road EA requirements for this road.
- Section 9.6, “**Proposed Implementation**” illustrates the proposed implementation of the Spine Road along its length.
- Section 9.7, “**Multi-Modal Transportation Supportive Measures**” summarizes the sustainable multi-modal characteristics of the proposed Spine Road implementation.

9.1 Planning Background

9.1.1 Mount Pleasant Secondary Plan Transportation Study and Phase 1 and 2 Environmental Assessment

The general configuration and alignment of the Spine Road within the community road network was established through the *Mount Pleasant Secondary Plan Area Transportation Master Plan* (TMP) study, comprising a Phase 1 and 2 EA, and completed in June 2009. This study also confirmed the class of road that was required (namely a collector road rather than an arterial road), and gave

preliminary consideration to the desired cross section of this road, including the number of lanes and the manner in which they might be operated. Note that excerpts from this study, as referenced below, are included in Appendix A.5.3 attached separately to this report.

9.1.1.1 Description of the Spine Road

A description of the Spine Road first appears on page 95 of the TMP, under the third bullet point describing the road improvements describing Alternative 2:

“a north-south collector road (26.0m ROW) (Creditview Road – Mayfield Road)”

The relevance of the ‘Alternative 2’ bundle of road improvements and transit service levels is that it was ultimately recommended as the “preliminary preferred transportation planning alternative” at the conclusion of the TMP. Figure 9.1 illustrates the Alternative 2 road network (as depicted in the TMP study in Exhibits 7.1 and 7.2). The Spine Road as considered in ‘Alternative 2’ is clearly identified as a 2 lane Collector Road in a 26m right of way.

Further referencing TMP Exhibits 7.5 and 7.6, it is clear that the Spine Road or equivalently functional road in each of the four alternatives considered in the TMP was in every case a 2 lane collector road in a 26m right of way.

9.1.1.2 Capacity Assessment of the Spine Road

The method of analysis used in a long term, broad area transportation study such as the TMP involves the use of a transportation forecast model. These sophisticated models excel at assessing future traffic volumes over a large area.

For purposes of assessing the output results from these forecast models, volume to capacity ratios are typically assessed on the basis of road links that are compiled into strategically defined summary screenlines. This was the procedure



Exhibit 7.2
Alternatives 1 and 2 Required Lanes
Mount Pleasant Secondary Plan Area Transportation Master Plan
City of Brampton



Figure 9.1 –TMP Alternative 1 & 2 Road Network: Inset shows Spine Road ROW and Required Lanes (Source: Mount Pleasant TMP, Exhibit 7.2, Entra Consultants)

used in the TMP study.

The key benefits of this approach relate to the amount of information processed when the model is “run”. In most cases it would not be feasible to undertake and then have to review and report intersection specific level of service analysis at every intersection in the model. Furthermore, the amount of additional information that would have to be input regarding the configuration and signal timing for each intersection would be substantial. Finally, the way in which the model software itself assigns traffic to the network is generally based on the characteristics of the road links rather than that of the intersections.

This last point is significant: in order to ease the data requirements of the forecast modelling process, the modelling algorithms choose routes through the network on the basis of simple road link characteristics (the number of lanes and the capacity per lane) rather than on the basis of the intersection characteristics (number and length of turn lanes, and detailed signal timing plans).

The assignment of traffic to the road network in this “link constrained” manner is akin to the flow of water through a network of pipes: it is the diameter of the pipes that determines the ultimate capacity rather than the configuration of the inter-connections. In the real world, however, traffic does not flow like water, but is rather constrained by the control mechanisms at the intersections in the network. Almost all urban traffic engineering challenges occur with respect to the appropriate design and operation of these intersections.

For this reason, the “link constrained” assignment process in forecast models must be adjusted to account for the impact of the intersection traffic control mechanisms. This is done quite simply by reducing the link capacities so as to approximate the effect of the downstream intersection. Typically the link capacity is reduced by about 50%, implicitly assuming that any given link will, on average, get about half of the available capacity (or green time) at the intersection. Thus, a length of urban roadway which typically has a capacity per lane of 1800-2000 cars per hour will be represented in the model with a link capacity of 800-900 cars per hour.

Thus, while a screenline assessment of road link volume-to-capacity ratios using link capacities derived from a forecast model is a useful approximation in a larger planning context (such as an area wide or city wide planning study) it is **not** comparable in accuracy or community planning value to a more detailed intersection based assessment as is typically found in more focused contexts such as in Traffic Impact Studies, and as has been done and documented in Sections 6.0 through 8.0 of this study. In particular, the link capacities used in the forecast model and screenline assessment are not comparable to the capacities derived through a more detailed intersection based analysis.

The forecast modelling work and screenline assessments conducted for the TMP are documented in Section 7.2 of that report. The results are summarized in Exhibits 7.11 through 7.15, with the results of the ‘Alternative 2’ scenario appearing in Exhibit 7.13 on page 116. Table 9.1, below, is excerpted from Exhibit 7.13, and shows the key performance assessment results for the Spine Road at its “peak load” point to the south of Sandalwood Parkway. This is the section of the road that is anticipated to carry the highest 2-way traffic volumes. Note that for purposes of the TMP analysis “The screenline capacity analyses used a screenline volume-to-capacity ratio of **0.85** as the critical measure of need for an improvement.” (page 110, TMP report).

By calculating the difference between the “Arterial” and “All” screenline results (as has been explicitly added in Table 9.1) it can be seen that the Spine Road has been modelled as a 2 lane road (1 lane in each direction) with a lane capacity of 500 vehicles per hour.

The volume-to-capacity ratio (or V/C) results of the assessment in the peak (northbound) direction can be characterized as follows:

- The overall “South of Sandalwood” screenline is forecast to operate at a V/C of **0.78**, which is quite acceptable.
- The Mississauga Road link is forecast to operate at a V/C of **0.95**, which gives the appearance that this link will be quite busy.
- The Spine Road link, comprising a collector road with just one lane in each direction, easily handles the traffic demands assigned to it, operating at a V/C of just **0.62**.

This assessment demonstrates the ability of the 2 lane Spine Road to easily accommodate the forecast future link traffic volumes at its peak load point.

Table 9.1
2031 PM Peak Hour Traffic Volume/Capacity Assessment for the South of Sandalwood Parkway Screenline, Alternative 2 Analysis from the TMP Study

Screenline Location	Northbound				
	Lanes	Capacity /Lane	Total Capacity	Volume	v/c Ratio
NORTHBOUND DIRECTION (Peak Direction in PM Period)					
<i>South of Sandalwood Parkway (Arterial Roads)</i>					
Mississauga Road	2	900	1800	1704	0.95
Creditview Road	2	800	1600	1026	0.64
Total	4		3400	2730	0.80
<i>South of Sandalwood Parkway (All Roads)</i>					
Total	5		3900	3038	0.78
Difference (Spine Road)	1		500	308	0.62
SOUTHBOUND DIRECTION (Off Peak Direction in PM Period)					
<i>South of Sandalwood Parkway (Arterial Roads)</i>					
Mississauga Road	2	900	1800	1516	0.84
Creditview Road	2	800	1600	490	0.31
Total	4		3400	2006	0.59
<i>South of Sandalwood Parkway (All Roads)</i>					
Total	5		3900	2109	0.54
Difference (Spine Road)	1		500	103	0.21

Note: Results excerpted from “Exhibit 7.13 – Alternative 2 Screenline Traffic Volume-to-Capacity, Roadway PM Peak Hour” of the “Mount Pleasant Secondary Plan Area Transportation Master Plan, Final Report, June 2009”. Some information has been added for purposes of clarification, and is highlighted in yellow.

9.1.1.3 Update to TMP Assessment of the Spine Road

Note that in the TMP assessment documented in Table 9.1, Mississauga Road has been included in this screenline as a 4 lane road, whereas to the south it is included as a 6 lane road (refer to the “North of CNR” and “North of Bovaird” screenlines in Exhibit 7.13 of the TMP). Since this assessment work was done, the Region of Peel has commenced an Environmental Assessment Study for Mississauga Road. Region of Peel staff have indicated that this study, which is scheduled for completion in the fall of 2011, has demonstrated the need for Mississauga Road to be widened to 6 lanes all the way from Bovaird Drive to future Sandalwood Parkway. More recent forecast modelling work undertaken by the City of Brampton (notably the 2009 TTMP Sustainable Update Study, as illustrated in Figure 9.2) have likewise concluded that Mississauga Road should ultimately comprise a 6 lane cross section as far north as Sandalwood Parkway.

Table 9.2 shows the effect that allowing for this additional road improvement would have on the overall screenline performance in the peak direction of travel. (This does not show the precise impact of making this change in the forecast model as this would require another analysis run using the same model. Nonetheless, it is a reasonable approximation). It can be seen that the overall screenline performance at this location is markedly better, dropping from 0.95 to 0.63. This brings it very close to the modelled Spine Road link performance of 0.62.

Table 9.2
2031 PM Peak Hour, Peak Direction Traffic Volume/Capacity Assessment for the South of Sandalwood Parkway Screenline, Alternative 2 Analysis with updated Mississauga Road capacity

Screenline Location	Northbound				
	Lanes	Capacity /Lane	Total Capacity	Volume	v/c Ratio
NORTHBOUND DIRECTION (Peak Direction in PM Period)					
<i>South of Sandalwood Parkway (Arterial Roads)</i>					
Mississauga Road	3	900	2700	1704	0.63
Creditview Road	2	800	1600	1026	0.64
Total	5		4300	2730	0.63
<i>South of Sandalwood Parkway (All Roads)</i>					
Total	6		4800	3038	0.63
Difference (Spine Road)	1		500	308	0.62

Note: Results excerpted from “Exhibit 7.13 – Alternative 2 Screenline Traffic Volume-to-Capacity, Roadway PM Peak ZAAAAAHour” of the “Mount Pleasant Secondary Plan Area Transportation Master Plan, Final Report, June 2009”. Some information has been updated (highlighted in green) as explained in the text. Some information has been added for purposes of clarification, and is highlighted in yellow.

From this update check, it can be concluded that, within the context of the TMP link based assessment:

- **the entire “South of Sandalwood” screenline, notably including the proposed 2 lane Spine Road, will operate at a level of service well below the value of 0.85 identified in the TMP as the threshold for new road improvements.**
- **there is an excellent balance of traffic between the Spine Road and the parallel arterial routes. As such, it is unlikely that traffic either from within Block 51-1 or external to Block 51-1 will tend to favour either the arterial roads or Spine Road in a manner inconsistent with their designated functional roles.**

9.1.1.4 TMP Conclusions: Spine Road Through Traffic

The assessment of the four transportation alternatives considered in the TMP takes place in Section 8.5 of that report. The assessment results in Alternative 2 (see Figure 9.1) being identified as the “*preliminary preferred alternative*”.

Amongst the reasons specifically cited for this preference (TMP, page 152) are:

“The diversion of through traffic away from the planned north-south Transit Oriented Development corridor in the Mount Pleasant Secondary Plan area is in accordance with City-endorsed Community Design Principles. Alternatives 1 and 2 result in very low volumes of through traffic on the (generally) mid-block north-south TOD corridor.”

The basis for this finding was an analysis of the output from the same forecast model as was used in the screenline assessment described in section 9.1.1.2. Recall that in this model it was assumed that the section of Mississauga Road south of future Sandalwood Parkway would be a 4 lane rather than a 6 lane road. Updating this assumption (as has been done in section 9.1.1.3 and Table 9.2) adds even more weight to the through traffic finding.

9.1.1.5 TMP Conclusions: Spine Road Cross Section

Having identified Alternative 2 as the preferred alternative, a summary description of the alternative is provided on page 155 of the TMP. Included in the list of road improvements is the following description of the Spine Road:

“a north-south collector road (i.e., the TOD corridor), comprising four lanes (26.0m ROW) (Creditview Road - Mayfield Road)”

Note that this is the first suggestion in the TMP that the cross section of the Spine Road might require 4 lanes rather than 2 lanes. As described in section 9.1.1.2, the TMP screenline assessment forecast that a 2 lane section for this road would provide an excellent level of service, operating at a V/C of 0.62 in 2031.

The rationale for proposing a 4 lane rather than 2 lane section for the Spine Road was founded not on road capacity but rather on achieving the clear and consistent goal of ensuring that the Spine Road is able to function as a transit corridor by providing for prioritization for transit services. In particular:

- Given the road-link based level of service analysis conducted in the TMP, the best available recommendation that would ensure some degree of transit prioritization was to propose more capacious road links, ergo additional road lanes.
- The scope of the TMP study did not allow for the detailed examination of alternatives to standard City of Brampton road cross sections. As noted in Exhibits 7.1 through 7.8 of the TMP report (see Figure 9.1):
“Note: Collector Road network is conceptual and is intended to demonstrate opportunities based on typical engineering design requirements. Collector Roads are subject to separate design, review and approval process.”

It is clear that given the multiple planning and functional transportation objectives identified for this community, and for the Spine Road in particular, that a road cross section that is not currently provided for in existing City of Brampton standards might well be required. From this viewpoint, and given the context of the TMP as noted above, the 4 lane Spine Road cross section can be seen as a "placeholder" for a transit prioritized corridor.

This current Block 51-1 Transportation Study and Collector Road EA, on the other hand, has been conducted in coordination with the urban planning and design of Block 51-1. This has meant that:

- more detailed turning movement based traffic forecasts can be developed based on detailed land use information,
- intersection based performance assessment can be conducted,
- exploration of alternatives to City of Brampton standard road sections based on the functional design of this critical road can be performed,

With this more detailed information and planning and design context in place, it has been possible to refine the design of the Spine Road from the generic four lane collector road proposed in the TMP into a 3 lane transit supportive corridor designed to best support the needs and objectives of the Block 51-1 community.

9.1.2 2009 TTMP Sustainable Update and Development Charges Update

As noted in section 3.3.1, the City of Brampton undertook a *Sustainable Update* to their Transportation and Transit Master Plan (TTMP) study in 2009. This update informed the capital transportation program used as the basis of the 2009 Development Charges update.

Among the changes made to the road network assessed in the 2009 TTMP was the identification and inclusion of strategic mid-block collector roads in several proposed communities, including the

Mount Pleasant Secondary Plan Area. These collector roads were subsequently included in the Development Charges update.

9.1.2.1 TTMP Assessment of Mid-Block Collector Roads

As can be seen in Figure 9.2, the north-south and east-west sections of the collector Spine Road that is planned for the Mount Pleasant Secondary Plan Area (Blocks 51-1 and 51-2) were explicitly identified as four lane collector roads in the TTMP Study. This was done on the basis of the conclusions of the preceding *Mount Pleasant Secondary Plan Transportation Study (TMP)*.

The scope of the TTMP study was a City of Brampton wide assessment of road network and transit service requirements. As such, this study did not specifically include a sensitivity analysis of the lane requirements for these collector roads.

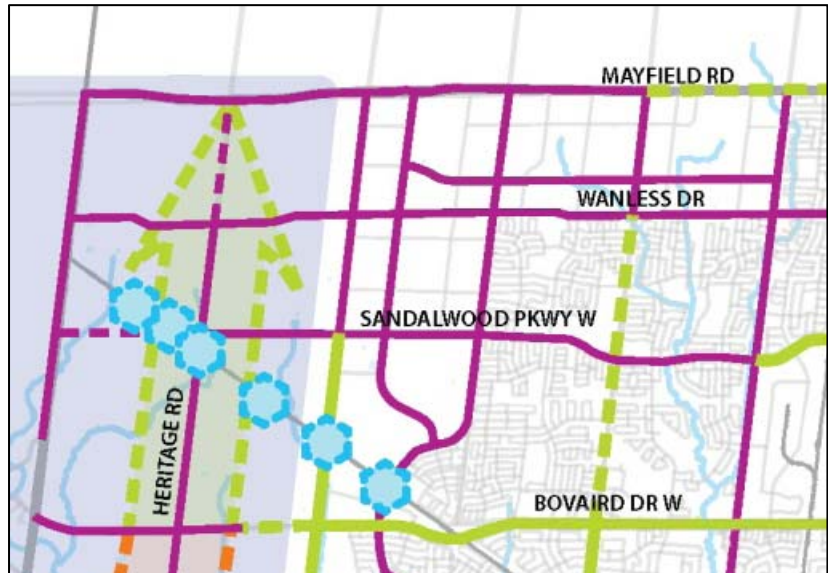


Figure 9.2 TTMP roads in Northwest Brampton

Magenta roads -> 4 lanes planned

Green roads -> 6 lanes planned

Source: Exhibit 7-8, 2009 TTMP Sustainable Update)

9.1.2.2 Development Charge Eligibility of the Spine Road

The analysis underpinning the TTMP study was a screenline based assessment of road links. As such, it was comparable to the TMP analysis, discussed in section 9.1.1.2. As with the TMP, working at this level of detail, and within a scope that included the entire City of Brampton road network, necessitated that the focus of any recommendations regarding roads requirements be on the number of mid-block lanes, rather than the broader function and role of the road within the community it serves.

Since the TTMP informed the subsequent Development Charges Background Study, this distinction between collector roads based primarily on the number of mid-block through lanes (2 lanes versus 4 lanes) became, by default, a simple determinant of collector road eligibility for DC funding. Eligibility criteria for DC funding for 2 lane collector roads is currently under City review.

Notwithstanding this approach, there are additional factors that can speak to the character, role, and function of mid-block collector roads such as the Spine Road: a generally linear alignment, good connectivity with the arterial road network, continuity across arterial roads from one neighbourhood to the next, and support for transit and/or active transportation modes. It is these types of characteristics (discussed in more detail in the next section) that clearly denote the Spine Road as a strategic mid-block collector road link, and as such, eligible for development charge funding as a new road.

9.2 Spine Road Objectives

Over the course of planning the Mount Pleasant Community, the Spine Road has been identified as a key element in creating a community that benefits from multi-modal transportation use. As such, multiple and potentially conflicting objectives have been identified for the Spine Road.

9.2.1 Performance

The key performance objective for any piece of road infrastructure should be that it is able to carry the forecast traffic volumes at an acceptable level of service. This is a doubly important objective for the Spine Road:

- as a community collector road, it must be able to move the forecast automobile traffic volumes through the community and to the adjacent arterial road network at an appropriate level of service.
- as a transit supportive road, it must maintain a vehicular level of service that is sufficient to ensure that transit vehicles encounter minimal delay, and can maintain reliable headways while moving through this corridor.
- as a key element in the community active transportation network, it must explicitly and safely accommodate pedestrian and bicycle users.

9.2.2 Design Standards

In addition to providing sufficient carrying capacity for forecast traffic demand, it is equally important that a road related piece of infrastructure be both safe and comfortable to the road users. The key to achieving this is the application of appropriate engineering design standards.

The City of Brampton Works and Transportation Department maintains a set of road design criteria, and a set of standard cross sections for a variety of road types. These standards generally meet or exceed the industry standards published by the Transportation Association of Canada (TAC) for urban roadways.

The Block 51-1 Spine Road must be configured so as to meet City of Brampton collector road standards.

9.2.3 Neighbourhood Role and Function

In the hierarchy of roads comprising the urban road network, collector roads are those roads whose purpose it is to provide connectivity between local roads and the arterial road network. Due to their intermediate role, they typically exhibit characteristics of both local and arterial roads. Like local roads they generally provide direct driveway access to adjacent land uses, and generally provide for on-street parking. Like arterial roads they can carry a certain amount of through traffic within the community they serve.

With respect to the Spine Road, the “local road” aspects present a potential challenge. Both on-street parking and direct driveway access introduce low speed vehicular manoeuvres at the sides of the roadway. From both a delay and a safety perspective, these types of activities in or adjacent to the outside travel lanes could present a challenge with respect to minimizing delays to transit vehicles.

9.2.4 Bus Transit Priority

The prioritization of bus transit service on the Spine Road has always been identified as being key to achieving the Mount Pleasant community’s multi-modal transportation objectives. The road is anchored directly to the Mount Pleasant GO Station and future multi-modal hub. Its alignment brings it through the heart of the community from end to end, passing directly through the areas of medium density land uses located in and around each of the mixed use nodes.

Providing priority to bus service on this road will require that measures be taken to minimize delay, thereby ensuring minimal travel times, and minimal variation in travel times. There are two approaches to achieving this.

- Road link travel-lane based transit priority, comprising fully or partially dedicated travel lanes. Dedicated travel lanes are applied most often in very busy major arterial corridors due to the amount of dedicated right-of-way width. Buses are given either exclusive or shared (HOV) access to the outside lanes in these corridors.
- Intersection based transit priority, comprising geometric and/or traffic signal improvements at major intersections. Being more localized, provision of transit priority at intersections is generally less space consumptive than link improvements. It has the additional advantage of delivering priority measures at the locations where delays to transit vehicles are most likely to occur.

9.2.5 Active Transportation

The promotion of active transportation is another key Mount Pleasant community objective. Provision for a convenient and well connected sidewalk network encourages walking to and from destinations within the community, including well served and conveniently located transit stops.

Cycling is another important sustainable transportation mode. As with sidewalks, the key to promoting cycling is the provision of appropriately sized, situated, and connected cycling facilities. The Spine Road presents itself as an ideal cycling facility. It is:

- centrally located within the community,
- continuous throughout the Mount Pleasant Community, running through both Blocks 51-1 and 51-2,
- connected directly to the Mount Pleasant Village Mobility Hub

There is clearly an opportunity to take advantage of these circumstances, and provide an ideal cycling route through the provision of on-street bicycle lanes.

9.2.6 Land Use Intensification and Pedestrian Scale Environment

The promotion of active transportation can also be achieved by consciously recognizing the need to maintain a pedestrian friendly scale, particularly in the Mixed Use Nodes, while once again ensuring that the necessary roadway elements are in place to move automobiles, transit vehicles, and bicycles.

This means designing a right of way that allows pedestrians to comfortably walk from one location to another and interact with the built environment. Within the Mixed Use Nodes it involves an effort to create an appropriate relationship between human beings and the size/function of surrounding buildings, and an emphasis on building features and characteristics which can be observed in close proximity, at the speed a pedestrian would travel.

9.3 The Challenge

The range of objectives for the Spine Road identified above demonstrates the challenge in identifying the most appropriate design for this road. A simple approach to supporting multiple modes of transportation would be to combine the facilities deemed appropriate for each mode in an additive fashion, with a commensurate increase in the width of the required right-of-way to well beyond that of a typical collector road (in a limited sense this is the approach taken in the TMP study, as discussed in section 9.1).

However, it must be remembered that this road is a mid-block community collector road, with all of the requirements and constraints implicit in the role and function of a road of that type. And therein lies the potential conflict: an increased right-of-way width is not consistent with the community land use planning targets for built form and density that are also community objectives, and that help create a higher than typical demand for transit services.

9.3.1 Rationalization of Objectives

Clearly, it is essential that the objectives for this road be prioritized, and rationalized to create a functional road cross section that is achievable, and best supports all of the sustainable development goals for the Mount Pleasant community. The highest priority objectives should thus be those that are consistent with the planning objectives for the Block 51-1 Community, namely:

- Support for sustainable transportation modes, namely transit, cycling, and walking
- Compact right of way consistent with a pedestrian friendly environment.

These can be translated into functional requirements or characteristics

- Explicit Transit Prioritization features and measures, particularly at intersections
- Explicit Active Transportation features and measures
- Modest ROW width

Finally, we can identify those characteristics that can be dealt with outside of the right-of-way. These characteristics should be discouraged or avoided, namely:

- on-street parking
- direct driveway access

Given the range of desirable characteristics for this road, and the tight integration of these with Mount Pleasant community planning objectives, the best way to consider and evaluate alternative configurations is to consider the physical roadway as an integrated part of a transit friendly corridor.

9.3.2 The “Road Diet” Paradigm

An example of how the rationalization of competing objectives for a road (as described above) can result in a satisfactory road cross-section is found in the “Road Diet” concept. “Road Diet” refers to a conversion process whereby travel lanes are removed from an existing roadway, and the space utilized for other uses and travel modes. Improvements have been observed to benefit users of all modes of transportation, including transit riders, cyclists, pedestrians and motorists. A recent (2008) paper on this subject has been included for reference in Appendix A.5.4 attached separately to this report.

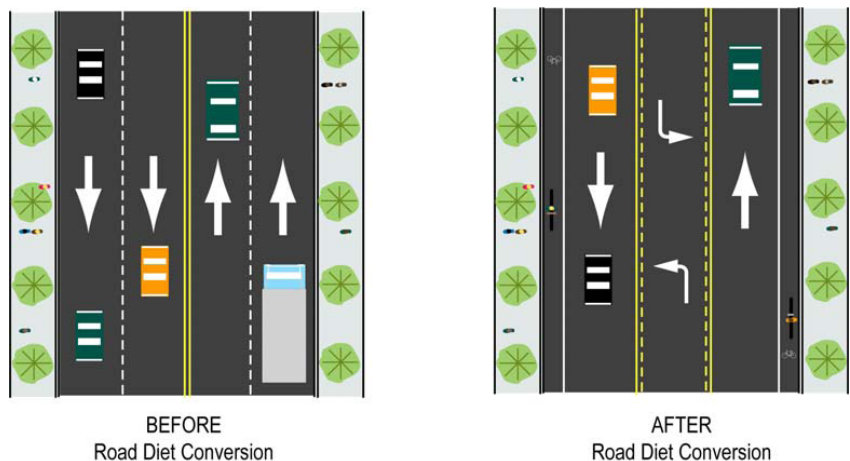


Figure 9.3 - Road Diet Conversion

Source: “Road Diet Handbook – Overview”, Jennifer A. Rosales, P.E, 2008

Typically a “Road Diet” project entails the conversion of a four lane collector or minor arterial road to a three lane collector which includes a two-way centre left turn lane, and dedicated outside bicycle lanes. Successful conversions of this type have been undertaken in a number of cities throughout the world, on roads with AADT traffic volumes as high as 20,000, and with the liveability of adjacent neighbourhoods generally being improved as a result.

The benefits that have been observed as a results of these conversion projects are numerous:

- reductions in speeding, with commensurate traffic calming benefits
- improved mobility, particularly for non-automobile modes, including transit
- increased safety due to simpler turning movements with fewer potential conflicts
- improvements in liveability and quality of life

At the same time, the capacity of the roadways is not significantly reduced. In large part this is due to the separation of left turning vehicles from the through traffic flow.

Although the Mount Pleasant Block 51-1 Spine Road is a new road, it is not unreasonable to infer that similar benefits will occur if the same principles are applied to the functional design of the road.

9.4 Spine Road Performance

9.4.1 Forecast Screenline / Link Performance

The ability of a 2 lane Spine Road to carry 2031 forecast traffic on a screenline road link basis was tested explicitly in the Mount Pleasant Secondary Plan Transportation Master Plan Study (TMP) (see Table 9.1). The Spine Road was also assessed in the more recent city wide Transportation and Transit Master Plan Sustainable Update (TTMP), albeit as a 4 lane facility. Notwithstanding the difference in lane capacity, it is possible to compare the traffic volumes forecast for this road in these two studies, as is done in Table 9.3

Note that the Nominal Link capacity used for purposes of this summary (550 vehicles per hour) is the one way link capacity used in the City of Brampton forecast model for a single collector road lane. As discussed in Section 9.1.1.2 above, this number is a forecast model convention, and is not reflective of the true capacity of the road.

Table 9.3
Forecast Spine Road Link Volumes (south of Sandalwood Parkway)

Source	PM Peak Period			AADT	Nominal Pk Dir Link V/C ¹
	NB	SB	2 Way		
Mount Pleasant Secondary Plan Area Transportation Master Plan EA 2031 traffic per Exhibits 7-13 and 7-17 (Entra, July 2009)	308	103	411	~ 4,100	308 / 550 = 0.56
Brampton Forecast Model 2031 Horizon Year (consistent with 2009 TTMP update analysis)	613	47	660		
Through trip adjustment per GO Station zone connector problem ²	-288	-13	-301		
Net Traffic	325	34	361	~ 3,600	325 / 550 = 0.59
Collector Road EA 2031 Horizon Year, as per Figure 8.7	490	370	860	~8,600	490 / 550 = 0.89

It must also be noted that upon examination of the City of Brampton forecast model used for the TTMP analysis, it was found that a zone connector had been located incorrectly so as to directly connect the zone containing the Mount Pleasant GO Station across the CNR to the Spine Road, effectively creating a second grade separated rail crossing. Obviously this link did not reflect the ultimate configuration of the road network in this area, and as such resulted in significant

shortcutting of through traffic from the GO Station to Sandalwood Parkway and thence to Mississauga Road, via the Spine Road. This assignment of through traffic was not realistic, and is in direct contravention of one of the key objectives for this road (per the first point on page 152 of the Transportation Mater Plan EA Study). This issue was discussed with City staff, and a decision made to correct the forecast Spine Road volume by identifying and subtracting the “shortcutting” traffic volume due to the incorrect model link. This adjustment can be seen in Table 9.3.

As can be seen, these “link volume” based forecasts of Spine Road traffic assessed the future peak direction performance of the road to be on the order of 50% - 60% of theoretical carrying capacity. While these link based assessments are adequate for the long term, broad area planning purposes that were the focus of these studies, more detailed consideration of the functional design for this road must be based on intersection turning movement volumes. Once built, very few roads experience capacity constraints due to excessive link volumes. In almost all cases, it is at the intersections that capacity constraints and associated delays occur. Consequently, it is at the intersections that measures to reduce delay are best deployed.

In Section 8.0, “**Ultimate Road Network Performance**”, 2031 total traffic volumes have been forecast for the entire Block 51-1 collector road network (see Figures 8.6 and 8.7). These traffic forecasts are based on detailed land use information, and the application of appropriate trip generation, distribution, and assignment assumptions.

Using this more up to date and detailed information, a two way PM Peak hour volume of about 860 vehicles per hour, or approximately 8,600 AADT, is forecast for the Spine Road just south of Sandalwood Parkway (see Table 9.3). This AADT volume is close to the threshold for upgrading a two lane collector road to a four lane collector according to City of Brampton standards.

It can be seen that the more detailed analysis in this Collector Road EA study results in a higher forecast travel demand on the Spine Road than do either of the previous high level forecast models. Using the simple link based V/C measure, consistent with the results reported from the forecast models, a link V/C of 0.89 is estimated.

As discussed at length above, and as will be seen in the next two sections, this link based assessment, while providing some benefits in high level forecast modelling studies, is clearly not an appropriate way to assess the detailed performance of a particular collector road.

9.4.2 Forecast Intersection Performance

In this current study, the Spine Road performance has been tested in a detailed fashion:

- Updated traffic volume forecasts based on the detailed land uses from the Draft Plans for Block 51-1 have been prepared at an intersection turning movement level of detail.
- The level of service of the road has been assessed at each of the major intersections along its length.

Details of the traffic analyses and results can be found in Sections 6.0 through 8.0. Table 9.3 summarizes the forecast intersection performance of the Spine Road in the 2031 horizon year.

Table 9.4
2031 Performance of Key Spine Road Intersections

Intersection		AM Peak Hour		PM Peak Hour	
		V/C	LOS	V/C	LOS
Sandalwood Parkway	Overall	0.58	B	0.62	B
	NB Thru	0.35	D	0.74	D
	NB Left	0.24	D	0.30	D
	SB Rt	0.28	C	0.11	C
	SB Thru	0.73	D	0.49	C
	SB Left	0.35	C	0.40	D
James Potter / Creditview Road	Overall	0.66	B	0.58	B
Wanless Road	Overall	0.53	B	0.61	B
N-S & E-W Spine		0.29	B	0.40	B
Creditview Road		0.13	B	0.17	B

Note that the intersection configurations used in the assessments in Sections 6.0 through 8.0 are consistent with those discussed below in Section 9.6, “**Proposed Implementation**”. As such they are not typical collector road intersections, but have been enhanced with the addition of dedicated turn lanes so as to minimize delay and facilitate the prioritization of transit.

The effectiveness of this investment in intersection infrastructure rather than extra lanes on the road links can be seen by comparing the intersection based V/C ratios on the peak direction peak hour north-south through movements at the Sandalwood Parkway intersection (0.74 and 0.73 as highlighted in Table 9.4) with the nominal road link based V/C ratio (0.89 as shown in Table 9.3). Both are calculated using the same forecast volumes, but because the link V/C ratio is based on a capacity that does not reflect the true capacity of the road, it overestimates the utilization of the road by about 50%.

9.5 Assessment of Alternative Cross Sections

Notwithstanding the preceding sections, consideration is being given in this study to a Spine Road cross section that differs from “*preliminary preferred transportation planning alternative*” as identified in the Mount Secondary Plan Transportation Master Plan (TMP) study. Thus, a formal assessment of alternative sections must be undertaken.

9.5.1 Alternative Cross Sections

For purposes of this assessment, six alternative cross sections have been identified for assessment. These comprise three standard City of Brampton standard sections (a four lane collector, a two lane collector, and a three lane “Transit” collector) plus one alternative variation of each. The “alternative” sections have been devised so as to depart only minimally from City standard designs, and only insofar as is required to improve the ability of the section to meet the functional objectives identified in Section 9.2 above.

In the development of the variations in the three City of Brampton standard sections, three principles have been used, based on the conclusions reached in Section 9.3:

- provide travel lanes that meet the stated preference of Brampton Transit for 3.75m wide lanes
- provide dedicated and striped bicycle lanes
- do not provide for roadside parking or stopping

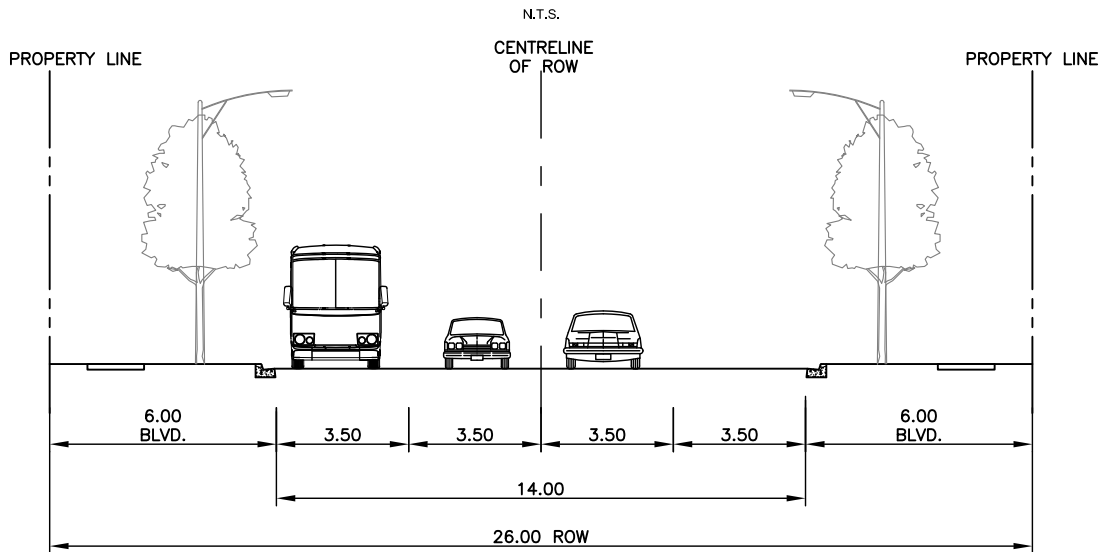
The four lane alternatives assessed here are based on the City of Brampton’s Standard Drawing 204 for a four lane collector road with 14.0m of pavement in a 26.0m right of way (see Figure 9.5). The variation developed for consideration widens the road elements so as to provide improved support for transit and bicycles. The outside travel lanes are widened from 3.50m to 3.75m, which is Brampton Transit’s stated preferred width for travel lanes carrying buses. In addition, 1.50m wide designated bicycle lanes have been added to the section. The total added width of this transit and bicycle supportive alternative is 3.50m, for a total section width of 29.50m.

The two lane alternatives are based on the City of Brampton’s Standard Drawing 202 for a two lane collector road with 10.0m of pavement in a 23.0m right of way (see Figure 9.6). The variation developed for consideration in this assessment maintains sufficient pavement width for two 3.75m travel lanes, but re-assigns the 2.50m of pavement allowed for parking on one side with designated bicycle lanes on both sides. The resulting section is thus just 0.50m wider at 23.50m, and is significantly more bicycle supportive.

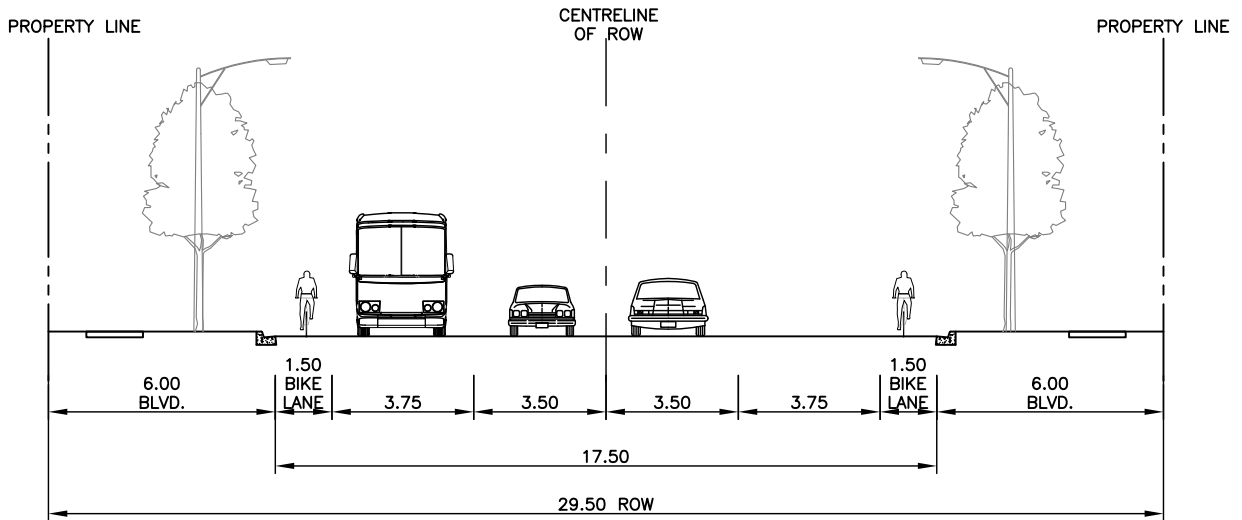
The three lane alternatives are based on City of Brampton Standard Drawing 202c, a hybrid transit collector road developed for the Countryside Villages community (see Figure 9.7). The section includes two 3.75m travel lanes, a 3.00m left turn lane, 1.50m bicycle lanes, and 2.50m parking bays on each side. The section thus comprises 18.50m of pavement in a 29.0m right of way that is both transit and bicycle supportive. The variation developed for consideration in this assessment is one in which the parking bays are removed from both sides so as to eliminate the delay and safety concerns related to vehicle undertaking parking manoeuvres that cross the bicycle lanes.

4 LANE SECTION

City of Brampton Standard Dwg. 204
26m ROW - 4 Lanes



Alternative Design - A1
(Modified Dwg. 204)
29.5m ROW - 4 Lanes with Bike Lanes
N.T.S.



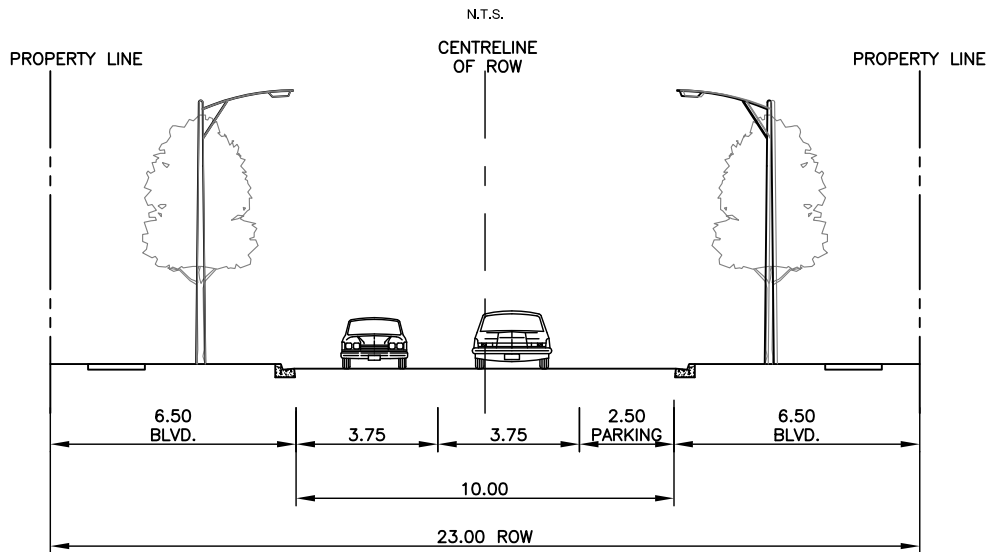
Spine Road, 4 Lane Collector Road Cross Section Options

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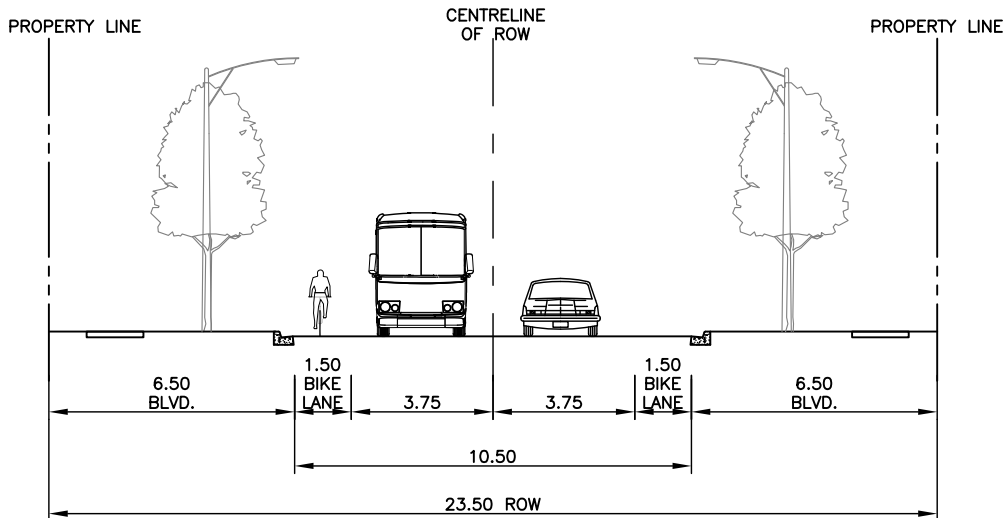
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2 LANE SECTION

City of Brampton Standard Dwg. 202
23m ROW - 2 Lanes with Parking



Alternative Design Standard - C1
23.5m ROW - 2 Lanes with Bike Lanes
N.T.S.



Spine Road, 2 Lane Collector Road Cross Section Options

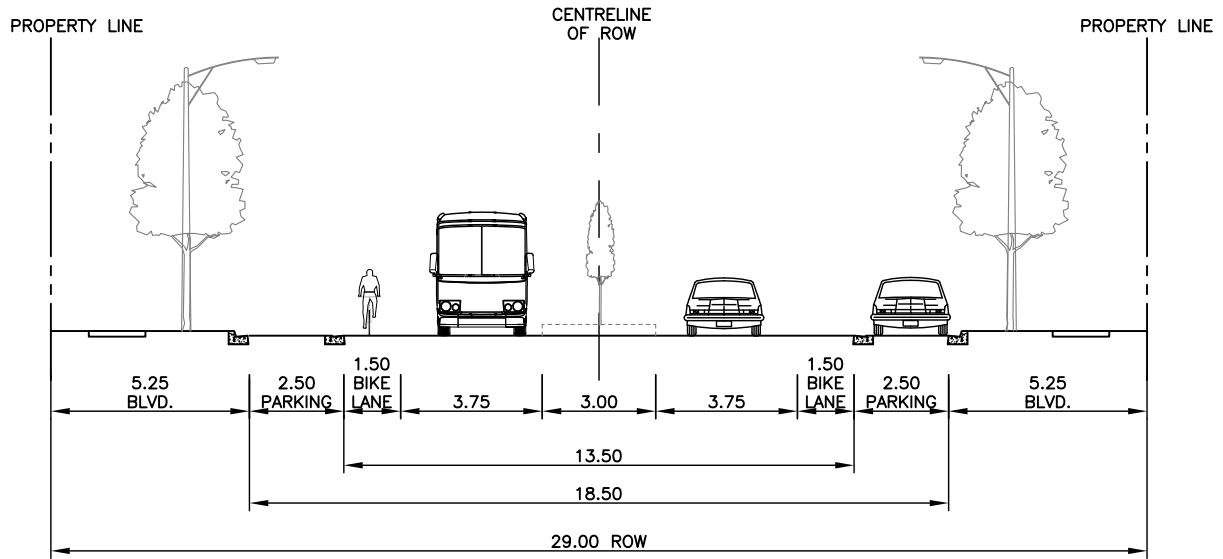
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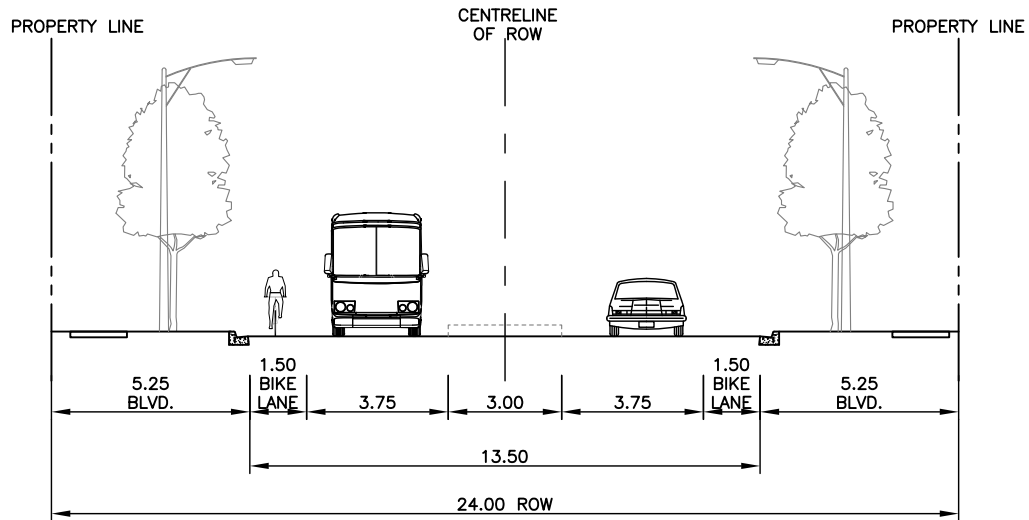


3 LANE SECTION

City of Brampton Standard Dwg. 202C
 29m ROW - 3 Lanes with Bike Lanes & Parking Both Sides
 N.T.S.



Alternative Design Standard - B1
 24m ROW - 3 Lanes with Bike Lanes
 N.T.S.



Spine Road, 3 Lane Collector Road Cross Section Options

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9.5.2 Evaluation Criteria

The evaluation of the alternative Spine Road cross sections was undertaken by taking into consideration criteria that are consistent with the functional objectives identified in Section 9.2, as well as introducing measures related to the potential impact of the road.

Table 9.5
Evaluation Criteria for Spine Road Cross Section Assessment

Evaluation Criteria	
Transportation	
T-1	Provides sufficient capacity for Forecast Traffic Volumes: based on the assessment conducted in Section 8.0 and discussed in Section 9.4.
T-2	Supports Transit: By reducing delays:
T-2a	Left Turning Traffic: Does it interfere with traffic in the lane used by buses?
T-2b	On Street Parking Manoeuvres: Do they interfere with traffic in the lane used by buses?
T-3	Supports Active Transportation: provision of dedicated bike lanes
T-4	Operational and Safety Issues:
T-4a	Left Turn Offsets: Are mid-block left turn manoeuvres offset, thereby reducing visibility?
T-4b	Left Turn Conflicts: How many conflicting movements do left turning vehicles have to avoid?
T-4c	Desired Operating Speed: Is there a traffic calming benefit?
T-4d	Left Turn Delays to Through Traffic: Do left turning vehicles interfere with through traffic movements?
Natural Environment	
N-1	Width of non-permeable surface: Which section has the widest paved area?
N-2	Landscaping Opportunities: Which section provides the best opportunities for incorporating landscaping?
Socio-Economic	
S-1	Pedestrian Scale
S-2	Supportive of Active Transportation and Transit
S-3	Minimal Capital Cost
S-4	Minimal Operating / Maintenance Cost
S-5	Minimal Property Requirements

9.5.3 Evaluation of Alternative Cross Sections

Table 9.6 summarizes the evaluation of the Spine Road cross sections under consideration.

**Table 9.6
Spine Road – Evaluation of Cross Sections**

Evaluation Criteria		4 Lane Options		3 Lane Options		2 Lane Options	
		Std 204	Option 'A1'	Std 202C	Option 'B1'	Std 202	Option 'C1'
Transportation							
T-1	All Options provide sufficient capacity for future forecast traffic volumes, as discussed in Section 9.4	M	M	M	M	M	M
T-2	Transit Supportive:						
	Delays due to Left Turning Traffic	M	M	M	M	L	L
	Interference from On Street Parking	M	M	S	M	S	S
T-3	Bicycle Supportive	L	M	M	M	L	M
T-4	Operation / Safety:						
	Left Turn offsets reduce visibility	L	L	M	M	M	M
	Left Turn conflicts	L	L	S	S	S	S
	Desired Operating Speed	L	L	M	M	M	M
	Left Turns delaying thru traffic	M	M	M	M	L	L
Ranking		6	5	2	1	4	3
Natural Environment							
N-1	Width of non permeable Surface	S	L	L	S	M	S
N-2	Landscaping Opportunities	S	S	M	M	S	S
Ranking		4	6	4	2	1	2
Socio-Economic							
S-1	Pedestrian Scale	L	L	L	S	M	M
S-2	Supportive of Active Transportation & Transit	L	S	L	M	S	M
S-3	Capital Cost	S	L	L	S	M	S
S-4	Operating / Maintenance Costs	S	L	L	S	M	S
S-5	Property Requirement	S	L	L	M	M	M
Ranking		4	6	5	3	1	2
Overall Ranking		5	6	4	1	3	2

Notes:

Option rating symbols represent 'Most Preferred' (M), 'Somewhat Preferred' (S), and 'Least Preferred' (L)

9.5.4 Recommended Spine Road Cross Section

Based on the forgoing evaluation, the recommended cross section for the Spine Road is option 'B1', a modified version of the 3 lane City Standard 202C "Countryside Transit Collector Road". In conjunction with appropriately configured arterial road intersections, this cross section provides sufficient capacity for the forecast community traffic, accommodates and provides excellent support for both transit and active transportation modes, and supports community objectives with respect to walkability and built form.

9.5.4.1 Comparison with Phase 1 and 2 TMP Study Recommendations

The Mount Pleasant Secondary Plan Transportation Master Plan study identified a Spine Road cross section with 4 lanes as a component of the "*preliminary preferred transportation planning alternative*". As described in Section 9.1.1.3, this recommendation was arrived at in the context of a high level screenline based analysis, the primary focus of which was the assessment of arterial roads needs. Specifically:

- no more than 2 lanes of traffic capacity on the Spine Road was found to be required.
- on the basis of the high level, screenline based road link analysis that was conducted, adding 2 additional lanes for some form of prioritized transit operation was the best available feasible recommendation.
- no assessment of alternative road cross sections was done, notwithstanding the general recognition that something different from existing City roads standards might well be required.

With the more detailed planning information and design context available to this current study, it has been possible to identify and recommend a Spine Road corridor design, within which:

- the arrangement of the built form and movement of most direct access to adjacent local streets,
- the prohibition of parking (except in a few designated bays),
- the incorporation of left turn opportunities at all intersections,
- the design of major intersections to afford transit prioritization, and
- the provision of continuous designated bicycle lanes

all work together to create an integrated, transit prioritized solution. This finding is consistent with the road performance assessment and builds upon the need for prioritization of transit and active transportation in this corridor as identified in the TMP.

9.5.4.2 Comparison with TTMP and DC Study Recommendations

As noted in Section 9.1.2, both the 2009 Transportation and Transit Master Plan Sustainable Update Study (TTMP) and the 2009 Development Charges Background (DC) study considered the entire City of Brampton road network, and included a number of future mid-block collector roads (including the Block 51-1 Spine Road) that were assumed to have 4 lane cross sections.

As with the TMP, the TTMP analysis was road link based, with needs assessment conducted across screenlines. Furthermore, taking into consideration as it did the entire City of Brampton road network, the scope of this study did not include the assessment of alternative cross sections of every collector road included.

Thus, for the same reasons cited above in regard to the Phase 1 and 2 TMP study, the findings of the TTMP are not inconsistent with, nor do they preclude the finding of this present Phase 3 and 4 study that a non-standard 3 lane cross section implemented within a corridor designed to prioritize and encourage transit use is appropriate for the Spine Road.

9.5.4.3 Development Charge Eligibility

Notwithstanding the fact that the recommended mid-block Spine Road cross section comprises 2 rather than 4 vehicular travel lanes, there are additional factors that identify it as fulfilling strategic role and function of a mid-block collector road, namely

- a generally linear alignment,
- good connectivity with the arterial road network,
- continuity across arterial roads from one neighbourhood to the next, and
- support for both transit and active transportation modes.

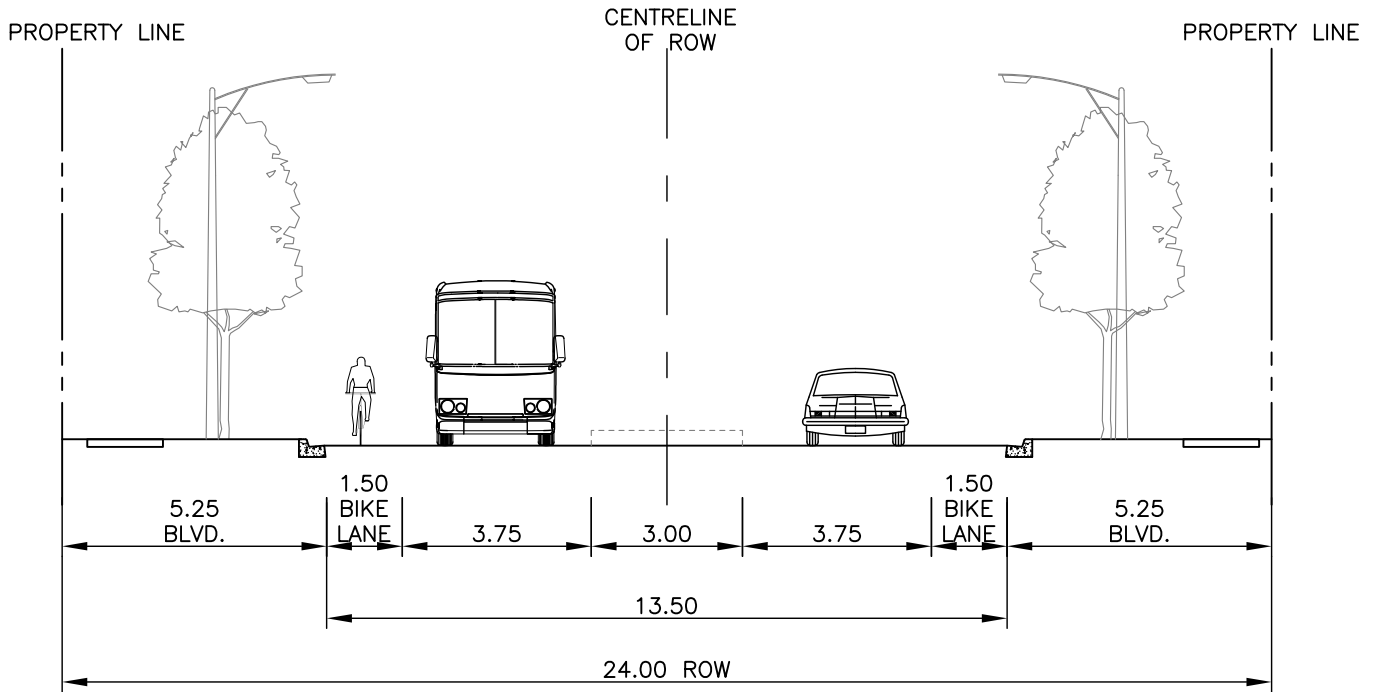
Furthermore, as discussed in Sections 9.2 and 9.4, implementing a road of this type so as to enable a transit priority corridor does not necessitate building additional continuous travel lanes. It has been determined, in this case, that a better strategy is to identify the potential sources of delay, typically due to vehicles waiting to make turning movements, and then deal directly with those sources. In the case of the Spine Road this has been done through the provision of additional turning lanes and bus bays at intersections, and a centre left turn lane at all intersections along the length of the road.

Finally, it is estimated that from a construction cost perspective, this facility, taking into account the larger intersections, will be roughly equivalent in cost to that of a City of Brampton standard 4 lane collector road. It thus represents a shift in investment to providing for left turn lanes at every intersection (continuous left and enhanced intersection turn lanes) rather than unnecessary through lanes.

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DATE PLOTTED: August 09, 2011

Alternative Design Standard - B1
24m ROW - 3 Lanes with Bike Lanes
N.T.S.



Recommended Cross Section for Spine Road



9.6 Proposed Implementation

As described in the previous section and illustrated in both Figure 9.8 and Table 9.7 below, it is proposed to use City Standard 202C (Countryside Transit Spine Collector Road) as the basis for both the north-south and east-west sections of the Block 51-1 Spine Road. In this section the manner in which the recommended Spine Road cross section is to be implemented in the Block 51-1 plan is described in detail, including locations where variations on the basic section are required (Section 9.6.2) and the treatment of intersections (Sections 9.6.3 to 9.6.5).

Note that detailed functional plan and profile drawings of the proposed Spine Road implementation are included in the Appendix to this report.



Figure 9.9 – Spine Road Concept: Typical Mid-Block Section

9.6.1 Mid-Block Sections

The City of Brampton Standard 202C cross section includes 2.50m lay-bys for parking on each side of the road. In light of the need to minimize interference with transit, it is proposed to prohibit on-street parking for most of the length of the road.

Parking lay-by areas will be provided only on a limited basis, directly adjacent to live-work units and rear lane town house units within the Mixed Use Nodes.

Table 9.7
Spine Road: Comparison with City Standard 202C

Road Element	City Standard (202C)	Proposed Section in Block 51-1	Variance
Transit friendly travel lanes	2 @ 3.75m	2 @ 3.75m	0m
Left turn lane at intersections	3.00m	3.00m	0m
Striped bicycle lanes	2 @ 1.50m	2 @ 1.50m	0m
Lay By Parking Lanes on both sides	2 @ 2.50m	No Parking	-5.00m
Boulevards, incorporating sidewalks and landscaping on both sides	2 @ 5.25m	2 @ 5.25m	0m
Right of Way Width	29.00m	24.00m	-5.00m

The overall width of the right of way is thus reduced from 29.0m to 24.0m. This change has no impact on the remaining travel lanes, boulevards, or underground services, and will result in a net

benefit with respect to the ability to keeping transit vehicles moving and minimizing conflicts with cyclists.

The design criteria that are proposed for this road are summarized in Table 9.8. These are identical to those used for standard City of Brampton collector roads.

**Table 9.8
Spine Road: Design Criteria**

Road Element	Spine Road	Brampton Collector Road
Design Speed	60 km/h	60 km/h
Posted Speed	40-50 km/h	40-50 km/h
Min. Centreline Radius	225m	190m
Min. Vertical Curve: Length Sag Crest	60m K-15 K-8	60m K-15 K-8
Allowable Grades	0.5% - 5.0%	0.5% - 6.0%
Min. Stopping Sight Distance	85m	85m
Travel Lane Width (min.)	3.75m	3.5m
Turn Lane Width (min.)	3.00m	3.00m
Bike Lane Width	1.50m	1.50m

9.6.2 Refinement of the Mid-Block Section

9.6.2.1 Continuous Centre Median

As appropriate, in sections of the Spine Road that are adjacent to open space areas such as parks, the Natural Heritage System (NHS), or schools it is proposed that the centre left turn lane be converted into a centre median. In addition to creating an attractive streetscaping feature, this treatment would also:

- serve as a traffic calming measure,
- provide a pedestrian refuge and safety feature, and
- allow for the prohibition of left turn movements at selected locations. This measure, illustrated in Figure 9.13, comprises one of a package of transit supportive features of this road, as discussed in more detail in Section 9.7.1.



Figure 9.10 – Spine Road Concept: Selective Use of Centre Median

9.6.2.2 Left Turn Considerations

For most of the length of the Spine Road, it is anticipated that no direct property frontage or driveway access will be provided. Turning movements will therefore occur at appropriately spaced intersections, and as such, the demand for ‘conflicting’ left turns will be separated. The centre left turn lane, therefore, will not generally be operating as a ‘two-way’ continuous left turn lane.

In a few localized circumstances, constraints imposed by natural features or community built form have required that direct driveway access to the Spine Road be provided. In these circumstances, if and when a review of the traffic operations reveals that conflicting left turn movements are possible, the width of the centre left lane will be adjusted from 3.0m to 3.5m (an accepted minimum width for two-way centre left turn operations) in the appropriate area.

The resulting right-of-way width in these localized sections of the Spine Road will be 24.5m.

9.6.2.3 Lay-By Parking Considerations

As noted above, on-street parking on the Spine Road will be limited to lay-by areas to be designated on a limited basis directly adjacent to live-work units and rear lane town house units within the Mixed Use Nodes. In order to ensure that appropriate space is provided for utilities and other municipal requirements (such as snow storage), the right-of-way width in these areas will be constructed to the full 202C standard, resulting in a 29m right-of-way.

9.6.3 Arterial Road Intersections

Along its length within Block 51-1, the Spine Road intersects with four higher order arterial roads. Of these intersections, those with Sandalwood Parkway, Wanless Drive, and Creditview Road occur within designated Mixed Use Nodes, and are discussed in detail in Section 10.1.

The fourth arterial intersection is at the south end of the Spine Road where it meets the future re-alignment of James Potter / Creditview Road, just north of the CNR grade separation. This intersection is a strategic one as it also comprises the key road access point to Mount Pleasant Village and to the north side area of the Mount Pleasant GO Station.

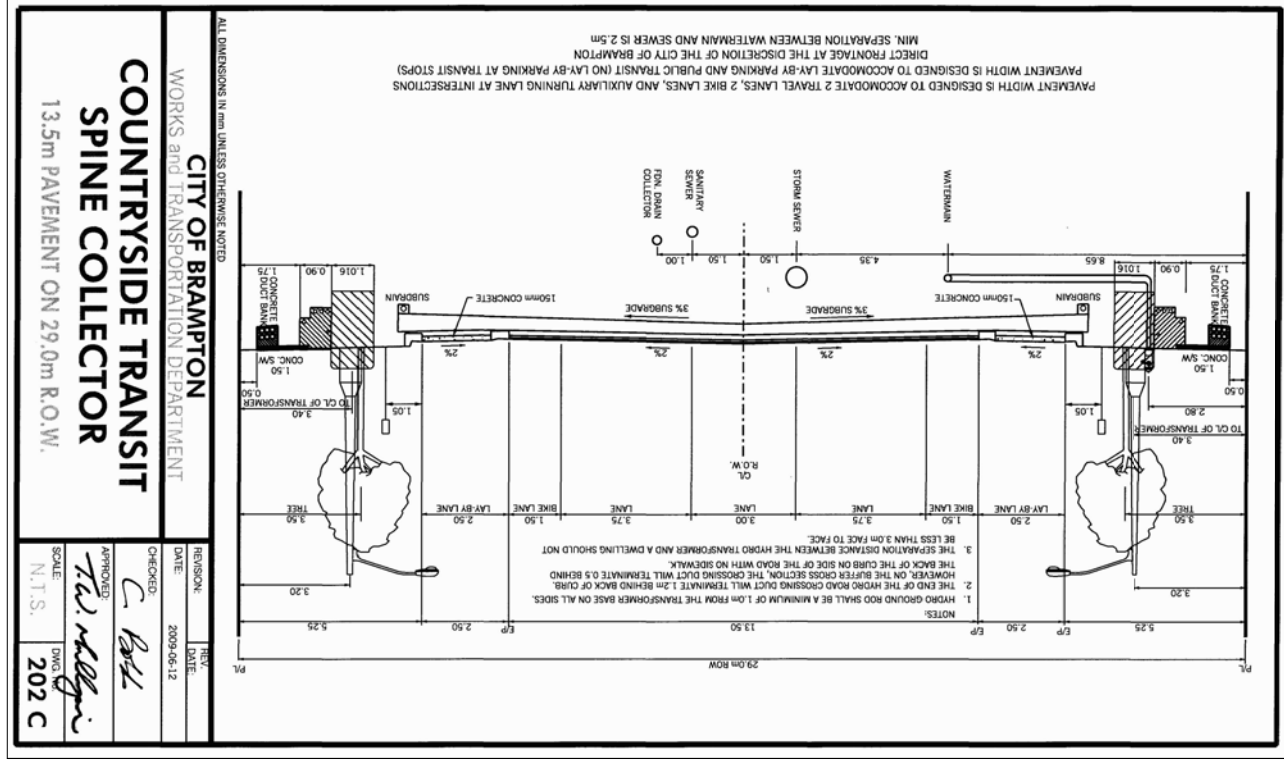
A preliminary design for this intersection was done as a part of the “**Creditview Road Re-alignment Environmental Study Report**”. In addition, a preliminary design for the south approach of this intersection has been prepared through the Mount Pleasant Village draft plan process.

The configuration of the Spine Road (north) approach of this intersection must be consistent with both of these prior designs in terms of alignment and general arrangement. In addition, it must also meet the unique requirements placed upon it insofar as it is the key connecting point of the Spine Road to the broader arterial road network, and the “portal” for transit access between the Spine Road and the Mount Pleasant Village Mobility Hub, both to the north and south side areas of the GO Station.

Based on the community planning that has taken place to date, and the future traffic volumes that have been forecast, Figure 9.12 illustrates the proposed functional design for this intersection. The basic design elements are drawn from City of Brampton Standard 244 for a 4 lane divided arterial to collector road intersection.

Note that at all arterial road intersection locations, a right-of-way wider than 24.0m will be required on Spine Road approaches in order to accommodate the requisite dedicated turning lanes and, where proposed, bus bays.

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BLOCK 51-1
SECTION

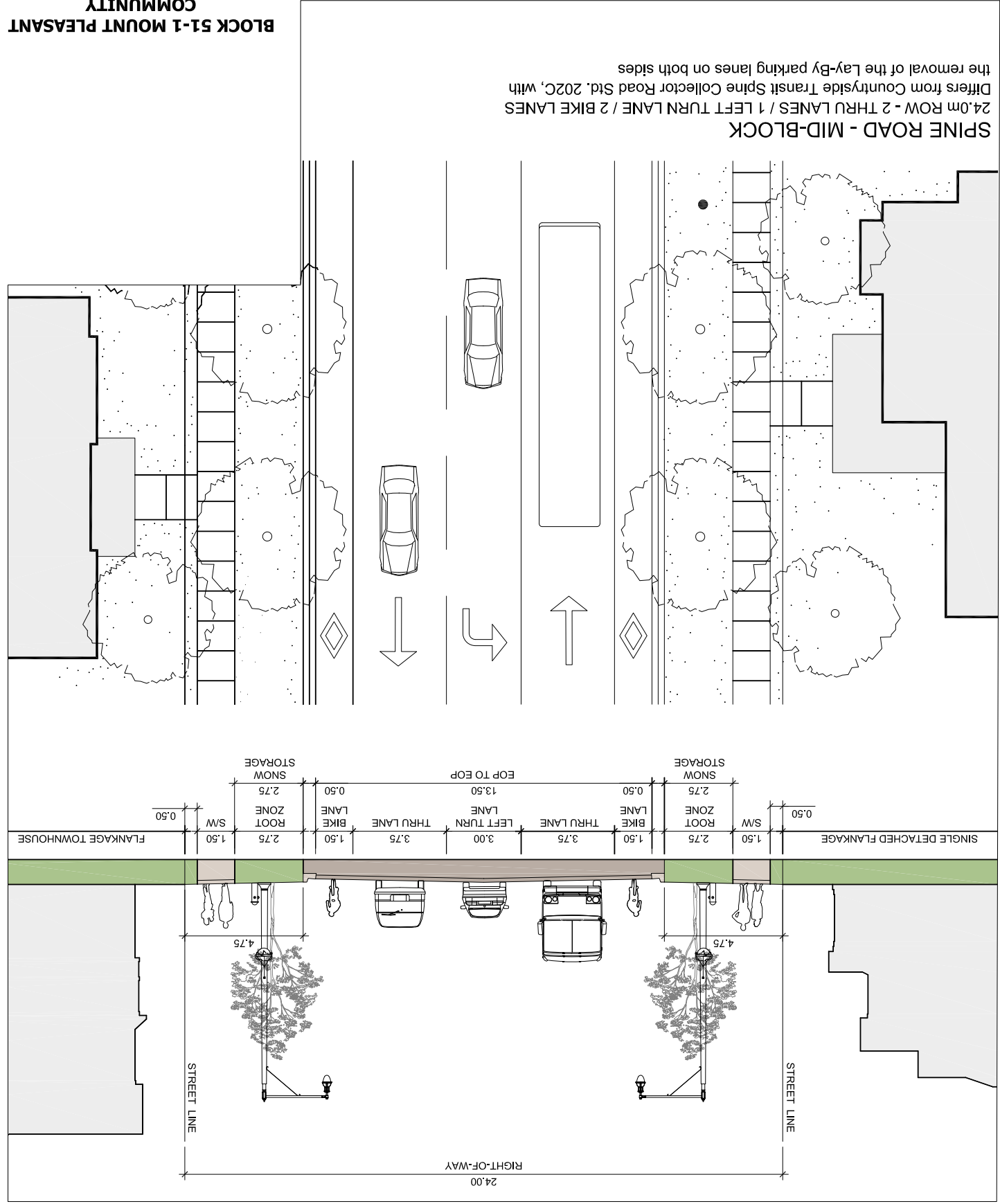
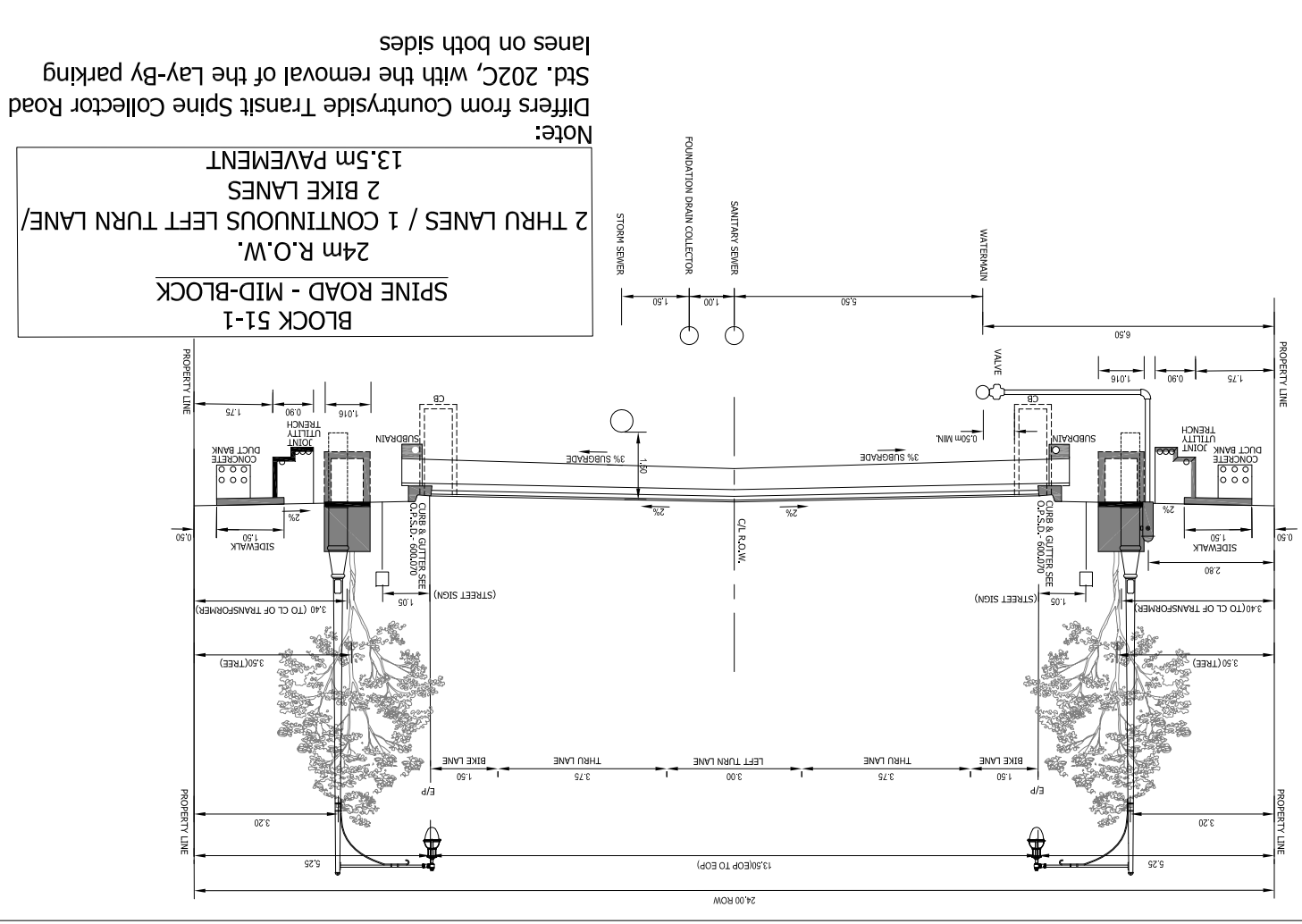
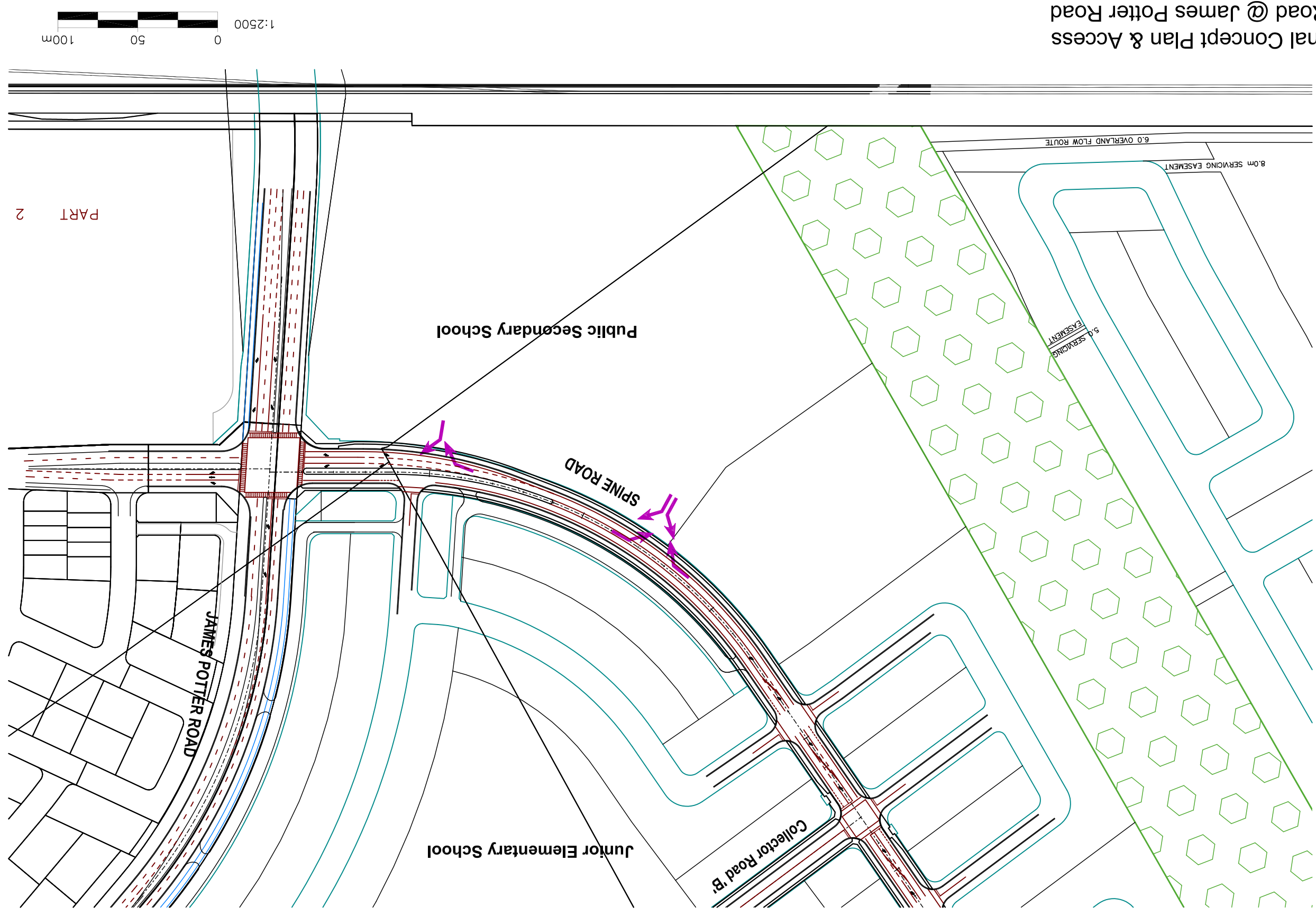


Figure 9.11

Functional Concept Plan & Access Spine Road @ James Potter Road

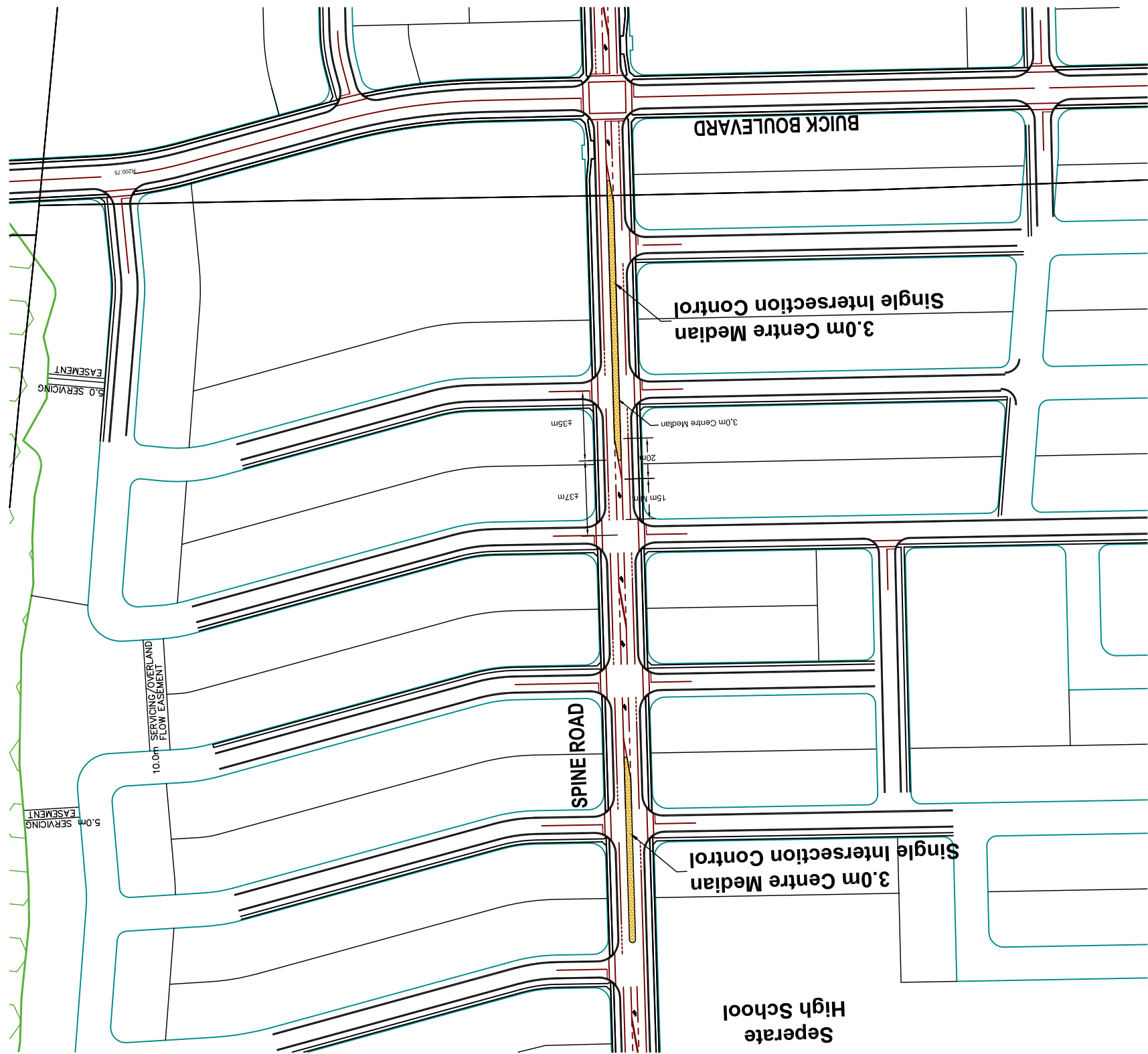


PART 2



Figure 9.12

Spine Road - Median Island Concept Plan



Median Island - NHS Crossing

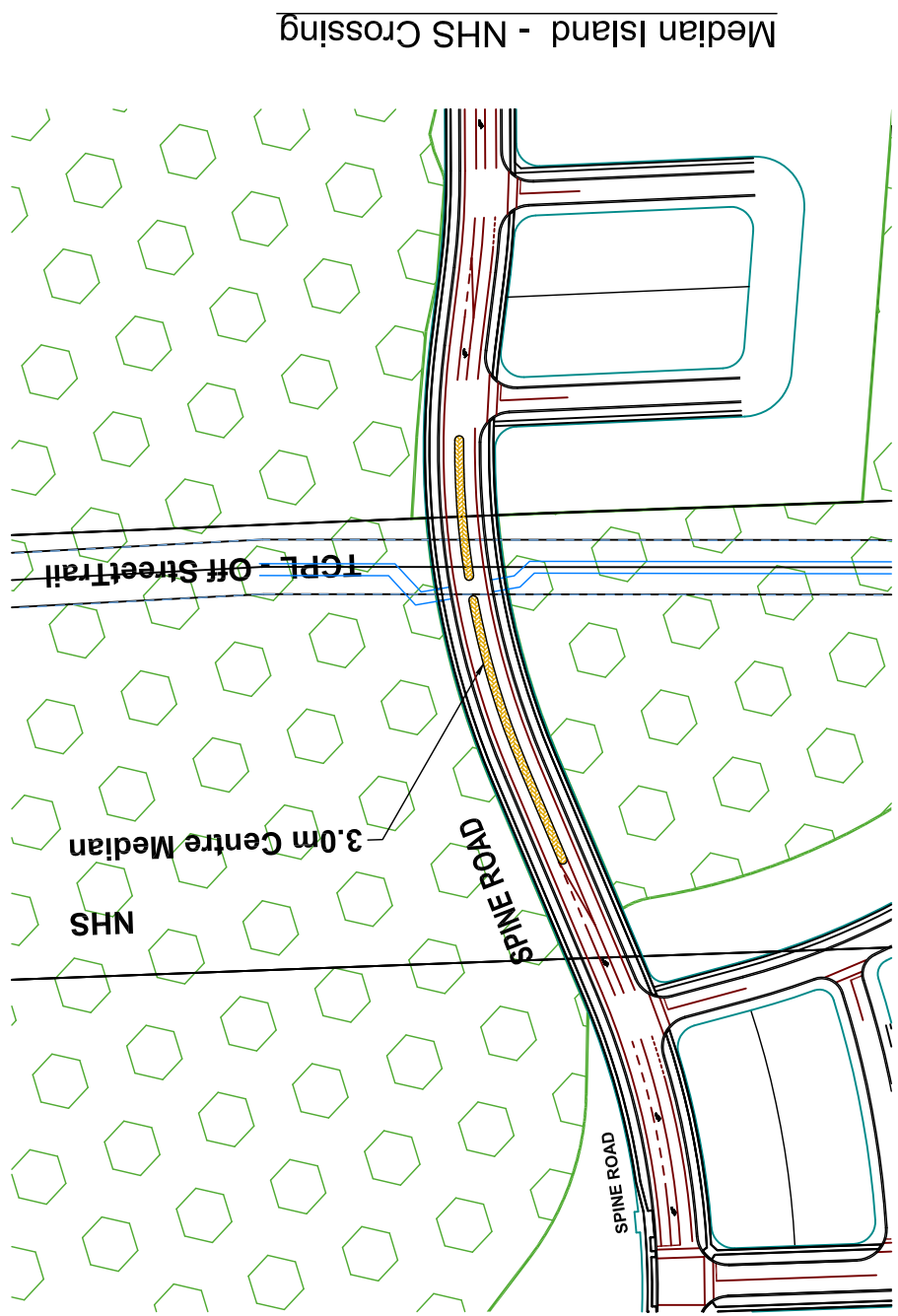


Figure 9.13

9.6.4 Collector Road Intersections

It is proposed to design Spine Road intersections with other collector roads using Brampton design standards. The Spine Road approaches to these intersections can be accommodated within the proposed 24.0m right of way.

9.6.5 Local Road Intersections

Local road intersections with the Spine Road will be designed according to City of Brampton design standards.

In conjunction with certain local intersections locations along the Spine Road it is proposed to introduce a 3.0m centre median in place of the centre left turn lane (see Figure 9.10). In this situation, the objective is to restrict left turn movements to and from selected local roads so as to reduce interference with transit vehicles. In all cases, this treatment will only be applied when traffic from the side street has a relatively convenient alternative location to make their left turn.

9.7 Multi-Modal Transportation Supportive Measures

9.7.1 Transit Supportive Elements

The success of the Spine Road as a transit corridor will depend on the ability of transit vehicles with headways on the order of 5 to 7.5 minutes (as recommended in the TMP study) to move along rapidly and reliably, with minimal delays. While a standard two lane collector road may not be up to this challenge, the Spine Road has been designed specifically to accommodate this objective. A number of measures are proposed to ensure that minimal delays to transit vehicles occur both along the road, and at major intersections. Measures proposed to reduce delay along the length of this road include:

- The width of the travel lanes will meet Brampton Transit's stated preference for 3.75m wide lanes.
- A 3.0m left turn lane will be provided along almost the entire length of the road (the exceptions, as discussed in Section 9.6.2 above, are areas where there are no left turn opportunities, in which case the centre lane will be replaced by a centre median, and a few localized areas where a 3.5m lane will be provided due to the presence of residential driveways). Coupled with dedicated left turn lanes at each of the major intersections, this means that all left turning vehicles will have the opportunity to move out of the travel lane and avoid obstructing through vehicles.
- Explicitly striped 1.5m bicycle lanes. Although the perception is that this is primarily to the benefit of the cyclist, it is generally of great assistance to bus and automobile drivers as well. The clearly striped lane divider provides greater certainty as to the intentions of the cyclist, and greater certainty results in safer, more efficient street operations.

- No provision for on street parking will be made, except in limited cases adjacent to live-work units in the Mixed Use Nodes where modest parking lay-bys are proposed. In all other areas along the Spine Road, parking will be prohibited.
- Minimizing the number of driveways. This will be done in many cases tightening the spacing of local road intersections such that generally flankage conditions occur on the Spine Road. Although this increases the number of intersections, there will be relatively fewer turning movements at each intersection. In any case, turning movements in and out of local roads will cause far fewer and shorter delays than would manoeuvres in and out of driveways.



Figure 9.14 – Spine Road Concept

- Reducing the number of left turn movements onto and off of the Spine Road by strategically introducing a 3.0m centre median in key locations.
- Eliminating reasons for vehicles to stop on the street. For example, it is proposed to locate community mailboxes on the local side streets to avoid having mail vans and home owners pull over on the Spine Road to deliver or pick up mail.

9.7.2 Active Transportation Supportive Elements

The recommended Spine Road cross section is tremendously supportive of active transportation. The presence of clearly marked bicycle lanes on both sides of the road results in safer and quicker travel for cyclists, and as noted in the previous section reduce uncertainty for drivers as to the intentions of a cyclist.

The road also has sidewalks on both sides as do all Brampton standard collector roads

The 3 lane section coupled with the provision of 3.0m centre medians at strategic locations means that safe and attractive crossings can be created for pedestrians at locations other than intersections. For example, this might be done in the areas where the Spine Road crosses the Natural Heritage System.

10.0 Mixed Use Nodes

An important structuring element of the Mount Pleasant Secondary Plan is the presence of nodal areas comprising medium density, mixed uses, including residential, commercial, institutional, and recreational uses (see Figure 3-1). These nodes have been strategically centred on the intersections of the Spine Road with the arterial roads that serve the area. In Block 51-1, there are three nodes centred on the intersection of the Spine Road with Sandalwood Parkway, Wanless Drive, and Creditview Road.

By locating these areas of intensified development, comprising both trip originators and destinations, along the Spine Road with its enhanced transit service and direct connectivity to the Mount Pleasant Village Mobility Hub, it is anticipated that greater support for the adoption of transit based travel can be achieved.

10.1 Shared Characteristics

10.1.1 Major Intersections

From a transportation point of view, the key elements of the Mixed Use Nodes are the Spine Road / arterial road intersections.

The significance of these signalized intersections, as discussed at length in Section 9.0, “**The Spine Road**”, is that they are the most significant determinants of traffic performance, and therefore transit reliability along the Spine Road. It is at these intersections that the most significant delays will be incurred if sufficient capacity is not provided to keep both vehicular traffic and transit vehicles moving.



Figure 10.1 – Spine Road Concept: Mixed Use Node

At each of these intersections, the Spine Road approaches are proposed to be dealt with as illustrated in Figure 10.2. While maintaining the 3.75m through travel lanes and 1.50m bike lanes, the following road elements will be added on these approaches:

- the 3.00m left turn lanes will be transitioned into back to back left turn bays by the introduction of a 2.00m island median
- 3.50m shared right turn lane bus bays will be added on the near side of the intersection to facilitate right turning vehicles, and to align buses with the far side bus bays with a reasonable measure of prioritization.
- 3.50m bus bays will be added on the far side of the intersection. These bus bays will be designed to meet Brampton Transit requirements for far side bus stops.

With regard to the boulevards on the intersection approaches, within the Mixed Use Nodes, the character of the Spine Road is intended to reflect an urban streetscape treatment, responding to a greater level of pedestrian traffic associated with adjacent higher density residential, street related retail/service functions, public transit stops and open space amenities.

At these locations, it is proposed to minimize the right-of-way widths so as to create a more comfortable pedestrian scale with reduced building setbacks that frame the road, yet still balancing transit and vehicular movement objectives. The proposed boulevard width in these areas is 3.00m. Through material selection and the strategic placement of streetscape elements such as street trees with grates, street furniture, transit shelters, and paving, the boulevard character will be designed to both encourage and respond to greater pedestrian activity.

Table 10.1
Spine Road at Major Intersection Approaches in Mixed Use Nodes:
Comparison with City Standard 202C

Road Element	City Standard (202C)	Proposed Section in Block 51-1	Variance
Centre Island Median	<i>no</i>	2.00m	+2.00m
Left Turn Lane	3.00m	3.00m	<i>same</i>
Travel Lanes	2 @ 3.75m	2 @ 3.75m	<i>same</i>
Bike Lanes	2 @ 1.50m	2 @ 1.50m	<i>same</i>
Shared Right Turn / Bus Lane	<i>no</i>	3.50m	+3.50m
Bus Stop Lay-By	<i>no</i>	3.50m	+3.50m
Lay-By Parking	2 @ 2.50m	<i>no</i>	-5.00m
Boulevard Width	2 @ 5.25m	2 @ 3.50m	-3.50m
Landscaping on Boulevard	Typical "soft" landscaping	Urban hardscaping	
Street lighting on Boulevard	Yes	Integrated with traffic signal poles as practical	
Right of Way Width	29.00m	29.50m	+0.50m

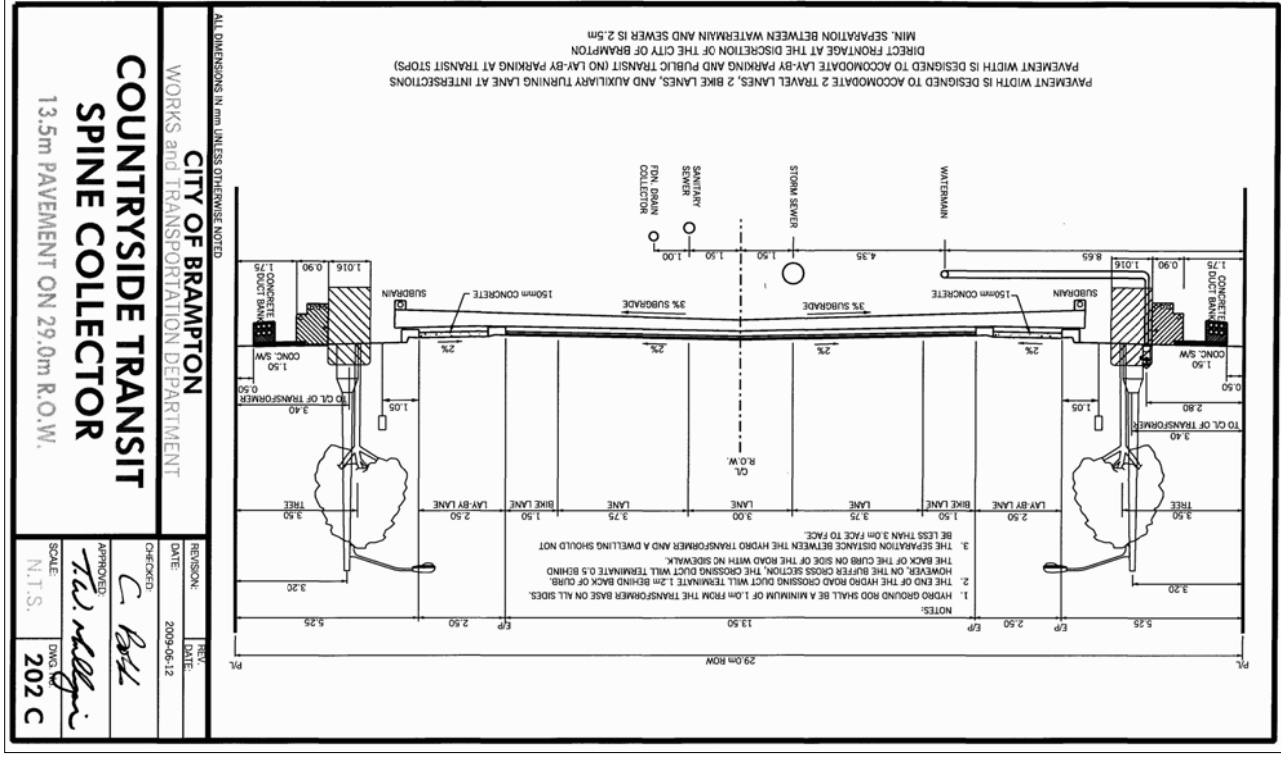
As with the Lay-By parking cross section discussed above, sufficient boulevard width will exist between the property line and the curb that underground utilities will be accommodated. As it widens out, the offset of the utility trench from the property line will remain constant.

Discussions with Brampton Transit staff identified the need to provide sufficient buffer space around transit shelters to allow for cleaning and maintenance work. For this reason, an additional 0.6m of right-of-way width is to be provided where transit shelter locations have been identified in the Mixed Use Nodes. This additional width is applied for a length 1.2m greater than the length of the shelter, thus ensuring that appropriate clearance is provided for maintenance access from all sides of the shelter.

Street lighting at the intersections can be accommodated by integrating it onto the same poles used for traffic signalization at these locations.

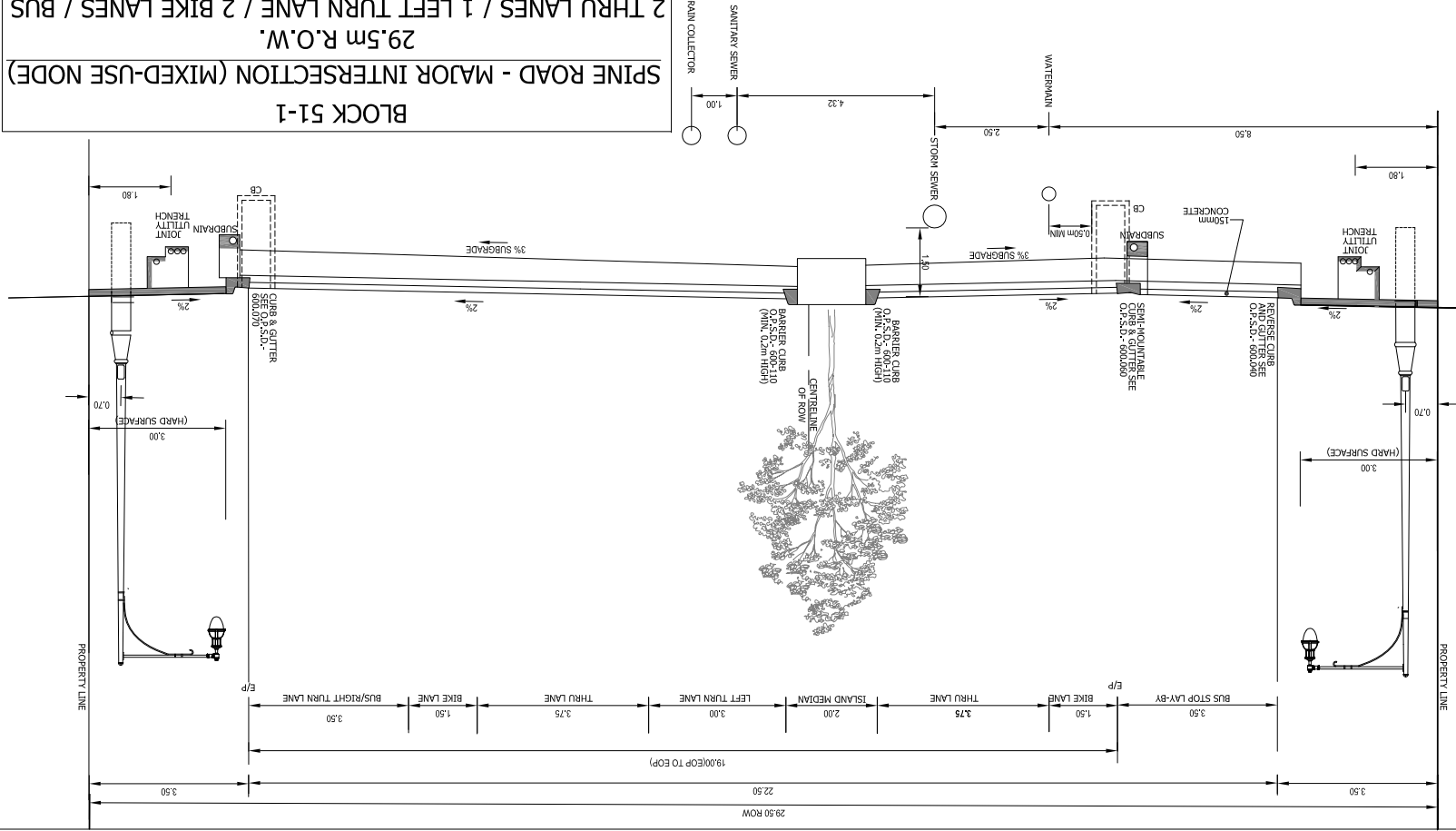
The positioning and sizing of key features such as the transit shelters, as well as streetscaping elements including street furniture, and landscaping will require careful design consideration. An idea of the manner in which it is proposed to tie together the roadway elements described above with the built form and streetscaping elements in the mixed use node areas can be found illustrated in the conceptual node drawings in the *Community Design Guidelines Report*.

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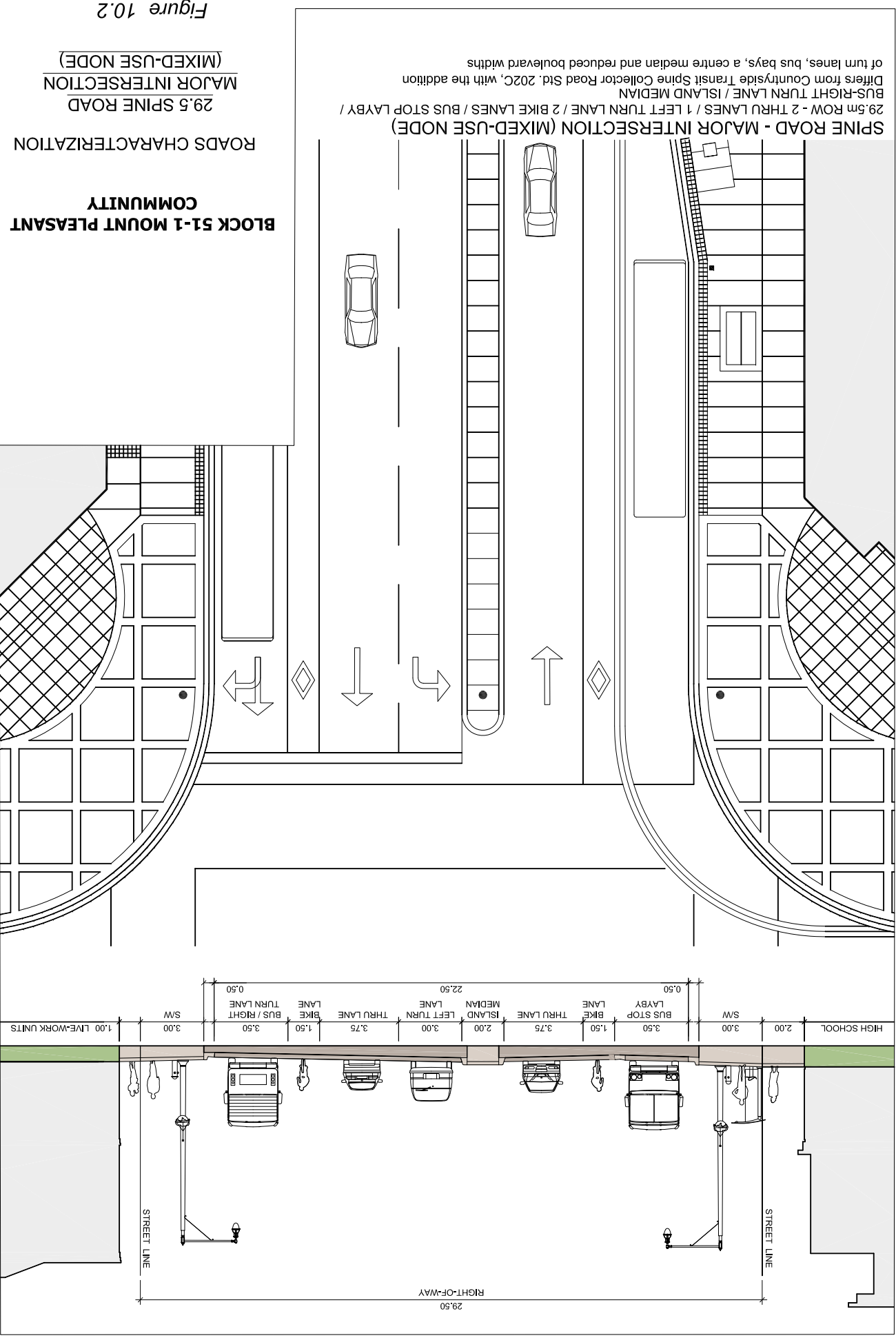


Note:
Differs from Countryside Transit Spine Collector Road Std. 202C,
with the addition of turn lanes, bus bays, a centre median and
reduced boulevard widths

SPINE ROAD - MAJOR INTERSECTION (MIXED-USE NODE)
29.5m R.O.W.
2 THRU LANES / 1 LEFT TURN LANE / 2 BIKE LANES / BUS
STOP LAYBY / BUS RIGHT TURN LANE / ISLAND MEDIAN
19.00m PAVEMENT



PROPOSED
BLOCK 51-1
SECTION



ROADS CHARACTERIZATION
BLOCK 51-1 MOUNT PLEASANT
COMMUNITY
29.5 SPINE ROAD
MAJOR INTERSECTION
(MIXED-USE NODE)
Figure 10.2

10.1.2 Transit Prioritization at Major Intersections

In order to ensure that bus transit service operates rapidly and reliably along the Spine Road, it is essential that the buses be able to negotiate the major intersections with some degree of flexibility, and even priority relative to the non-transit vehicles.

To this end, the intersection designs proposed for the major signalized intersections of the Spine Road in each of the Mixed Use Nodes incorporate features to provide this priority (See Figures 10.4, 10.5, and 10.6). Far side bus bays will be built on each Spine Road approach, and aligned with near side right turn lanes. As buses approach the intersection, the driver can choose to proceed through the intersection in one of two ways:

- Stay in the through travel lane, bypassing vehicles in the right turn that might be caught waiting for pedestrians. Once in the intersection, the driver can then move to the right and enter the far side bus bay.
- Move into the right turn lane, but travel straight through the intersection to the bus bay instead of turning right. This means that if there is a queue of vehicle waiting to travel straight through the intersection, the bus driver can choose to pass them on the right if there is less traffic in the right turn lane.

This flexibility means that the driver can pick and choose the best way to traverse each intersection depending on the relative volumes of through and right turning vehicles at the time the bus arrives.

In the longer term, if warranted, it would be possible to introduce a simple signal priority scheme at these locations. If a bus was detected in one of the right turn lanes, the right turn movement would be given priority treatment on the next cycle.

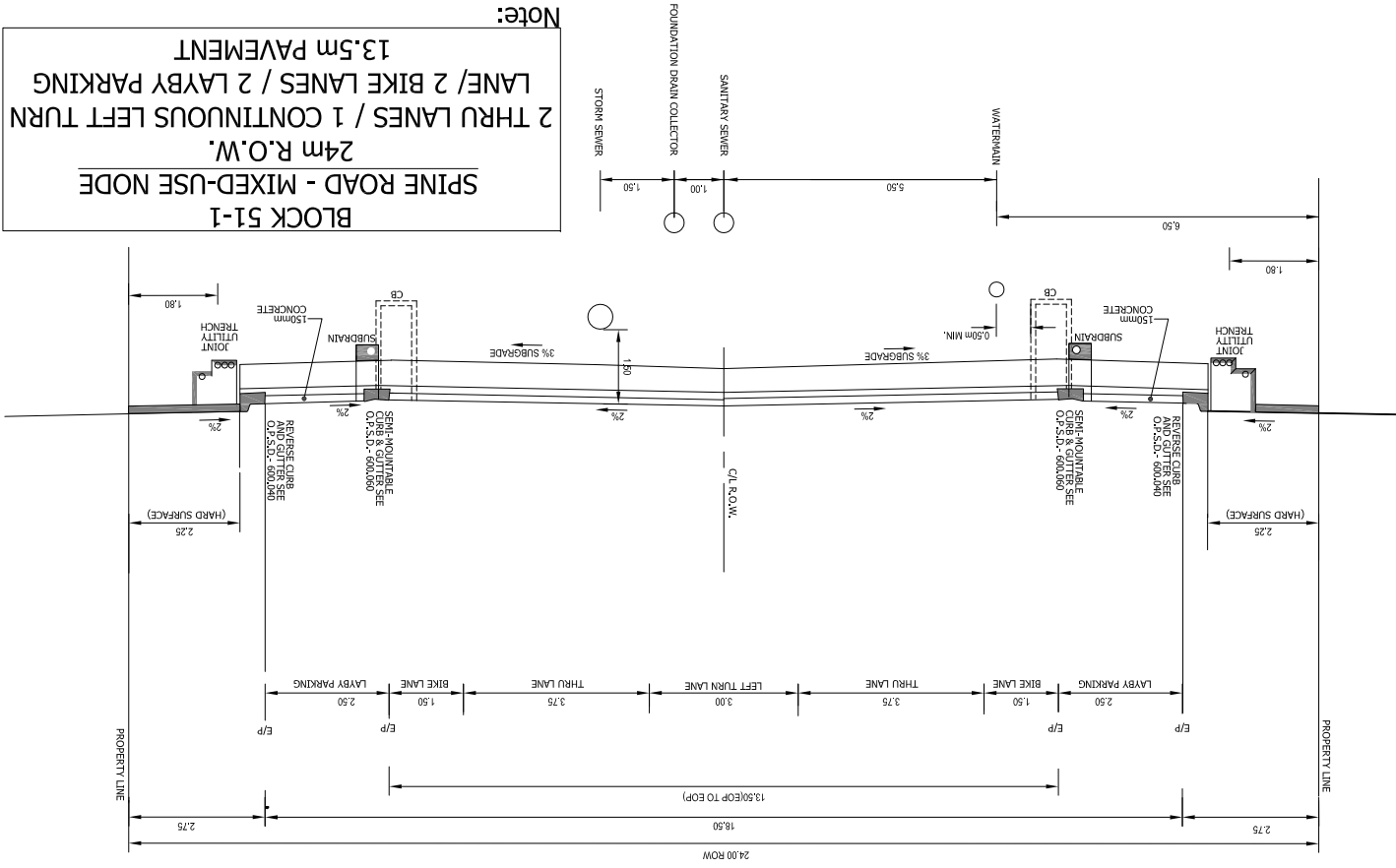
10.1.3 Lay-By Parking

Within the Mixed Use Nodes there are a number of locations where the opportunity for the development of live-work units is being proposed. This land use is consistent with the character of these nodes, and has been identified as a highly desirable land use in this context. In order to ensure the viability of these units, some limited and convenient short term parking supply is necessary. As such, in these limited situations it is proposed to accommodate short lengths of this lay-by parking by reverting the cross section to City Standard 202C, as shown in Figure 10.3.

Table 10.2
Spine Road with Lay-By Parking: Differences from City Standard

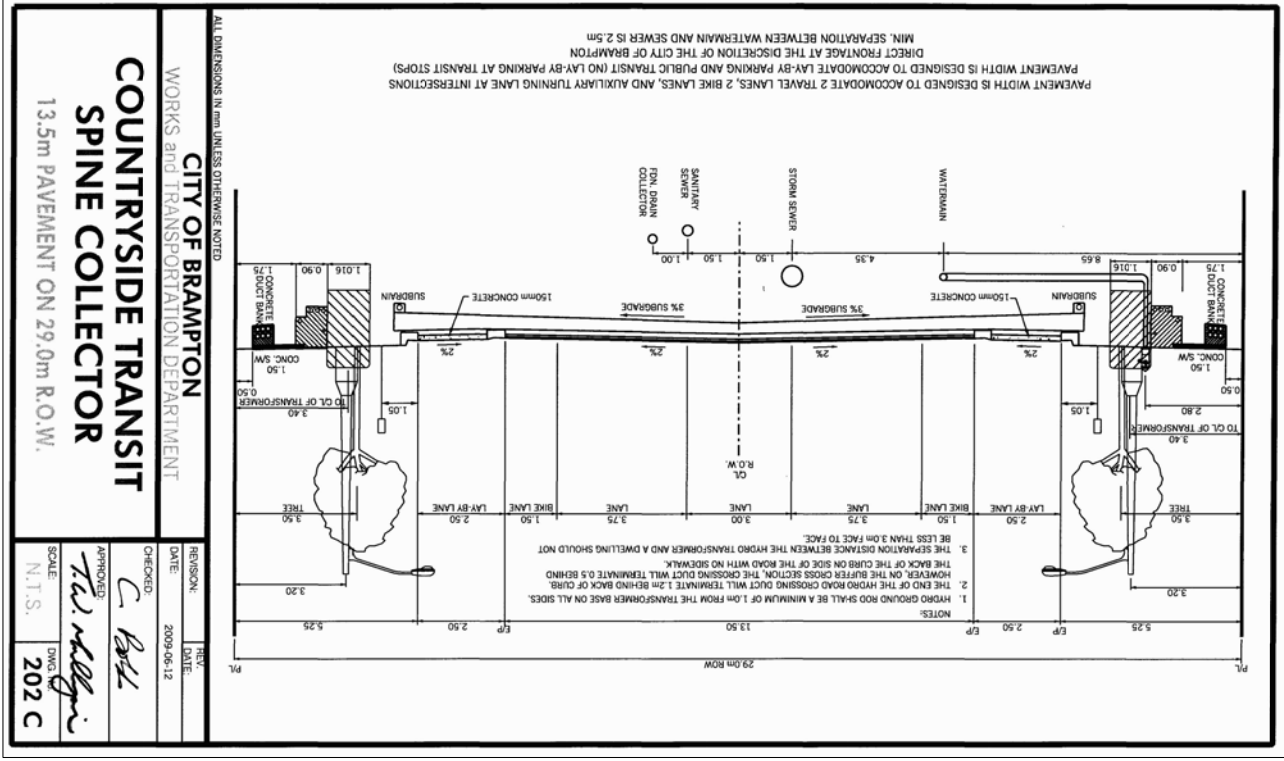
Road Element	City Standard (202C)	Proposed Section in Block 51-1	Variance
Boulevard Width	5.25m x 2	5.25m x 2	0m
Landscaping on Boulevard	Yes	Between Lay-by Parking Bays	
Street lighting on Boulevard	Yes	Between Lay-by Parking Bays	
Right of Way Width	29.00m	29.00m	0m

The streetscape character will emphasize an urban treatment consisting primarily of hardscape materials to better accommodate increased pedestrian use in the nodes. Street trees with tree grates are proposed at both ends of the lay-by parking bays, and will be coordinated with street lighting pole locations.



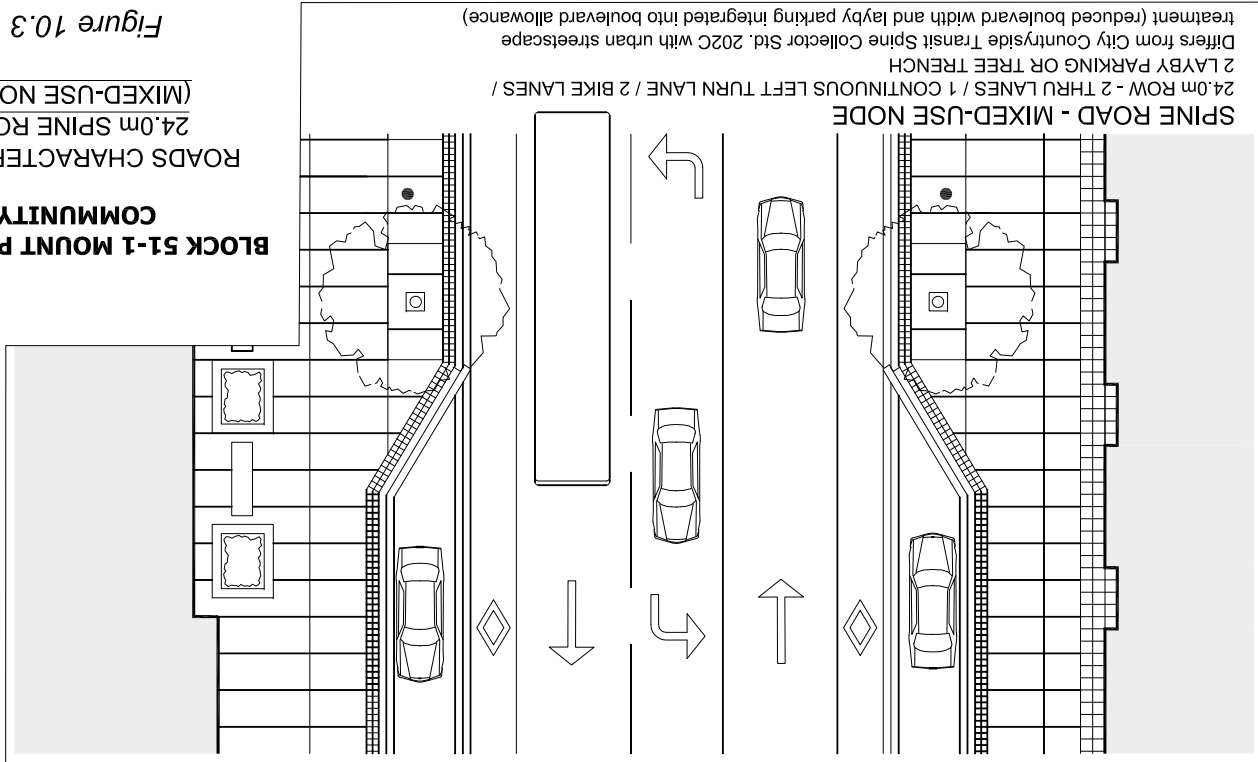
**BLOCK 51-1
SPINE ROAD - MIXED-USE NODE**
24m R.O.W.
2 THRU LANES / 1 CONTINUOUS LEFT TURN
LANE/ 2 BIKE LANES / 2 LAVYBY PARKING
13.5m PAVEMENT

Note:
Differs from City Countryside Transit Spine Collector
Std. 202C with urban streetscape treatment (reduced
boulevard width and layby parking integrated into
boulevard allowance)



CITY OF BRAMPTON
WORKS and TRANSPORTATION DEPARTMENT
**COUNTRYSIDE TRANSIT
SPINE COLLECTOR**
13.5m PAVEMENT ON 29.0m R.O.W.

APPROVED <i>T.A. Moly</i>	CHECKED <i>C. Bell</i>	REVISION:	DATE:
SCALE N.T.S.	DWG 202 C		2009-06-12



**BLOCK 51-1 MOUNT PLEASANT
COMMUNITY**
ROADS CHARACTERIZATION
24.0m SPINE ROAD
(MIXED-USE NODE)
Figure 10.3

Differs from City Countryside Transit Spine Collector Std. 202C with urban streetscape treatment (reduced boulevard width and layby parking integrated into boulevard allowance)

10.2 Mixed Use Node 1: North-South Spine Road and Sandalwood Parkway

10.2.1 Functional Road Details

The proposed functional roadway and site access details in the vicinity of the of Mixed Use Node #1 at the Spine Road and Sandalwood Parkway are shown in Figure 10.4. Note that the site access details shown are conceptual at this time, and will be subject to site plan approvals.

The key elements required to access the sites in the node as currently planned are as follows:

- an all moves intersection on Sandalwood Parkway, between the Spine Road and Mississauga Road. The centreline to centreline distance between Mississauga Road and the Spine Road is about 430m in this plan. As it stands, locating an all moves access within this distance would require careful planning. Note that:
 - the all moves accesses required for the two properties (commercial and apartment) on each sides of the road have been consolidated to a single local road access onto Sandalwood
 - the local roads on the north and south sides have been aligned so that the turning movements can occur without conflict
 - the location of the local road access is approximately mid-way between the Spine Road and Mississauga Road.
 - this location could ultimately be signalized if warranted. The signal would have to be coordinated with the signals at Mississauga Road and the Spine Road, but this should not present a problem
 - in addition to the all moves local road access, there is adequate space to provide right turn in/out driveways directly to the commercial properties.It should be noted that negotiations are underway with the Peel Police Association pertaining to the construction of the north-south Spine Road through their property.
- the local roads described above bend around the centre of the node to come back to the Spine Road to the north and south of Sandalwood Parkway respectively. It is proposed to align these 3 legged intersections with all moves access driveways to the apartment parcels on the east side of the Spine Road, effectively creating 4 legged all moves intersection.
 - The southern of these intersections is spaced an appropriate distance away from Sandalwood Parkway
 - The northern intersection is spaced closer to Sandalwood (about 90m) due to parceling constraints at the edge of the Peel Police property. Given the low volumes of traffic likely to use these local roads, this is not deemed to present a problem
- further to the south, two all moves driveways are shown aligned between a separate elementary school and a condo townhouse block. The actual location of the aligned driveways could be determined through a coordinated site plan review of both parcels.

10.2.2 Operational Assessment

As noted in the previous section, the spacing between the intersections of Sandalwood Parkway with Mississauga Road and the north-south Spine Road is approximately 430m. As illustrated in Figure

10.4, an intersection is required approximately mid-way between these two intersections in order to provide access to sites within Mixed Use Node #1.

Given the potential challenge in providing appropriate storage for left turn movements at these three closely spaced intersections, an assessment has been undertaken of the likely turning movement volumes in order to assess the likely storage requirements through this stretch of Sandalwood Parkway.

This assessment is based on a set of reasonable assumptions about the specific land use intensities on the sites within this node, and on the ultimate configuration of access driveways and permitted movements. All of these will ultimately be subject to site plan approval.

10.2.2.1 Trip Generation

For purposes of this analysis the following trip generation assumptions were made with regard to the land uses within this mixed node:

**Table 10.3
Node #1 Trip Generation Summary**

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Applied Trip Rates						
<i>Residential</i> per Apartment unit	0.09	0.32	0.41	0.34	0.18	0.52
per Townhouse unit	0.12	0.47	0.59	0.44	0.24	0.68
<i>Commercial</i> (per 1000sq. ft.)	0.56	0.36	0.92	2.06	2.15	4.21
Residential - 114 apartment units	10	35	45	40	20	60
- 234 stacked townhouse units ¹	20	75	95	80	40	120
- 31 townhouses	5	15	20	15	5	20
Commercial - 234, 740 sq. ft. GFA	130	85	215	480	505	985
Total	645	465	1110	870	825	1695

Notes:

1. These are stacked back-to-back townhouse units which, for the purposes of trip generation, were assumed to operate like apartment units.

10.2.2.2 Trip Distribution

Conservative and simplifying assumptions were made regarding the direction of approach for each of the uses within the node. For the retail uses it was assumed that 50% of trips arrive and depart by way of the two right in / right out driveways, and the remaining 50% by way of the all-moves driveways accessed from the mid-node local road (as shown in Figure 10.4). Of the 50% of traffic using the all-moves driveway, approximately 40% was assumed to be oriented towards Mississauga Road, while the remaining 10% was oriented to the east in the community.

For the high density residential uses it was assumed that approximately 70% of traffic used the access points from the mid block local road, with the remaining 30% accessing the site via Spine Road driveways. Of the 70% oriented towards the local road access points, approximately 50% are assumed to be oriented to the east and 50% to the west.

10.2.2.3 Analysis Results

Site specific turning movements were calculated based on the above assumptions, and then conservatively superimposed over the 2031 total forecast traffic volumes in order to generate turning movement volumes at the mid-block intersection on Sandalwood Parkway in Mixed Used Node #1. Table 10.4 summarizes the Synchro analysis results for this intersection, along with those for the adjacent intersections at Mississauga Road and at the Spine Road.

Table 10.4
Synchro Queue Analysis Summary

	Morning Peak Hour			Afternoon Peak Hour		
	Volume	50 th -ile Queue	95 th -ile Queue	Volume	50 th -ile Queue	95 th -ile Queue
Mississauga / Sandalwood						
EBL	35	4.7	14.6	120	9.1	28.4
WBL	385	50.5	99.8	175	20.4	56.3
NBL	140	16.7	37.1	115	12.6	25.0
SBL	75	10.9	25.2	75	8.9	27.4
Spine Road / Sandalwood						
EBL	10	0.5	2.6	25	1.3	3.5
WBL	30	1.1	3.2	85	7.3	29.9
NBL	30	3.8	11.0	55	5.7	14.8
SBL	80	6.7	14.0	45	5.1	12.6
Driveway Access / Sandalwood						
EBL	40	2.8	10.3	145	7.5	16.4
WBL	10	0.6	2.8	45	1.7	3.9
NBL	40	4.0	11.0	90	10.6	24.5
SBL	25	2.4	7.8	35	3.9	11.3

Based on a conservative interpretation of these forecast volumes and queue statistics, estimates of the queue storage requirements along this section of Sandalwood Parkway can be determined.

The available total storage space between the westbound stop bar at Mississauga Road and the eastbound stop bar at the Spine Road is about 390m.

In the morning peak hour, and using the 95th percentile queue estimates from the above table, the total estimated storage requirement would be:

- WB Left queue at Mississauga Road 100m
- Length of taper 80m
- EB Left queue at Local Road 10m
- WB Left queue at Local Road 3m
- Length of taper 80m
- EB Left queue at Spine Road 3m

The total estimated length required for morning peak hour storage in this section of Sandalwood using these conservative assumptions is thus **276m**.

In the afternoon peak hour, and using the 95th percentile queue estimates from the above table, the total estimated storage requirement would be:

- WB Left queue at Mississauga Road 56m
- Length of taper 80m
- EB Left queue at Local Road 16m
- WB Left queue at Local Road 4m
- Length of taper 80m
- EB Left queue at Spine Road 4m

The total estimated length required for morning peak hour storage in this section of Sandalwood using these conservative assumptions is thus **240m**.

As both of these forecast total storage requirements are well below the available length of **390m**, the required storage lengths can thus be accommodated within this section of road. There is, therefore, not an issue with respect to left turn storage along Sandalwood Parkway within Mixed Use Node #1, in spite of the fact that the intersection to intersection spacing is tighter than normally permitted on an arterial road in Brampton. Note that the opportunity to undertake more detailed traffic assessment and road design will happen as site plan applications are submitted for the commercial and high density residential uses in this node.

Mixed Use Node 1 - Functional Concept Plan & Access Spine Road @ Sandalwood Parkway

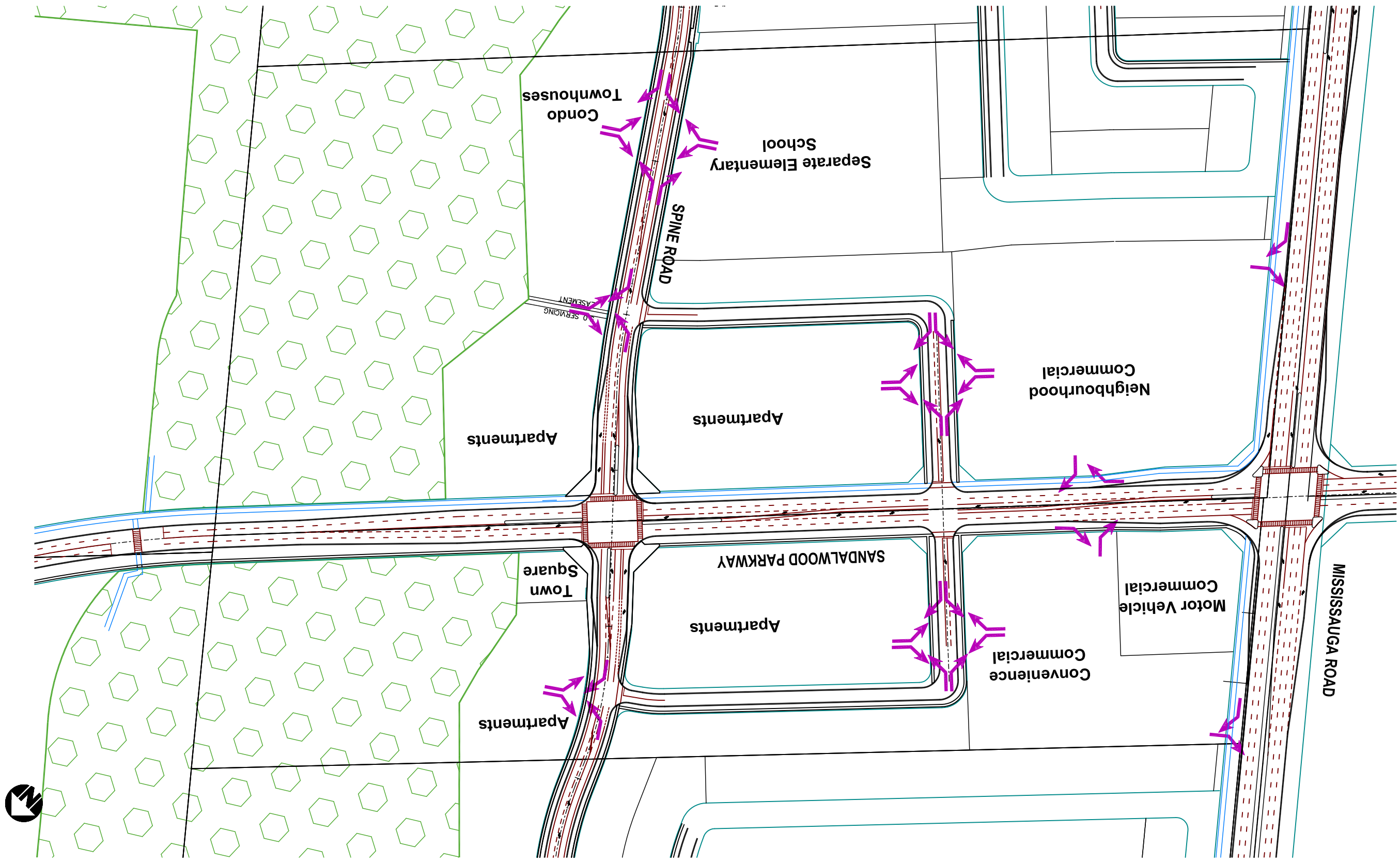


Figure 10.4

10.3 Mixed Use Node 2: North-South Spine Road and Wanless Drive

10.3.1 Functional Road Details

The proposed functional roadway and site access details in the vicinity of the of Mixed Use Node #2 at the Spine Road and Wanless Drive are shown in Figure 10.5. Note that the site access details shown are conceptual at this time, and will be subject to site plan approvals.

The key element required to access the sites in the node as currently planned is an all moves intersection on Wanless Drive, between the Spine Road and Mississauga Road. The distance between Mississauga Road and the Spine Road is about 330m in this plan. As it stands, locating an all moves access within this distance would require special consideration. Note that:

- on the south side , it is proposed that an all moves access to a Separate High School be provided. This aligns with a local road on the north side that provides access to a commercial parcel and an apartment
- there is some flexibility to shift the location of this intersection further east as may be needed to provide additional storage for the westbound left turn at Mississauga Road

The benefits of providing this access to and from Wanless is two-fold:

- with the apartment block getting access from the west, and with no road connection between the apartment block and the Town Square to the north, the west edge of the Spine Road between Wanless Drive and the east-west Spine Road intersection is completely clean of driveways and access points. Coupled with the “clean” east side (achieved by placing rear loaded townhouses on this side) this means that this short stretch of north-south Spine Road will operate quite well in spite of the relatively close intersection spacing. This is important for ensuring that delays to transit are minimized.
- the all moves mid block access driveway to the Separate High School in Wanless Drive is critical to the success of this node. The presence of the school adds significant and beneficial activity to the Mixed Use Node. The Separate School Board has indicated that they can only support placing the school in this location if the all moves access is permitted.

10.3.2 Operational Assessment

As noted in the previous section, the spacing between the intersections of Wanless Drive with Mississauga Road and the north-south Spine Road is approximately 330m. As illustrated in Figure 10.5, an intersection is required approximately mid-way between these two intersections in order to provide access to sites within Mixed Use Node #2.

Given the potential challenge in providing appropriate storage for left turn movements at these three closely spaced intersections, an assessment has been undertaken of the likely turning movement volumes in order to assess the likely storage requirements through this stretch of Wanless Drive.

This assessment is based on a set of reasonable assumptions about the specific land use intensities on the sites within this node, and on the ultimate configuration of access driveways and permitted movements. All of these will ultimately be subject to site plan approval.

10.3.2.1 Trip Generation

For purposes of this analysis the following trip generation assumptions were made with regard to the land uses within this mixed node:

Table 10.6
Trip Generation Summary

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Applied Trip Rates						
<i>Residential</i> per Apartment unit	0.09	0.32	0.41	0.34	0.18	0.52
per Townhouse unit	0.12	0.47	0.59	0.44	0.24	0.68
<i>Commercial</i> (per 1000sq. ft.)	0.56	0.36	0.92	2.06	2.15	4.21
<i>High School</i> (per student)	0.29	0.13	0.42	0.06	0.07	0.13
Residential - 121 apartment units	10	40	50	40	20	60
Commercial - 61,570sq. ft. GFA	35	20	55	125	130	255
School - 1,500 students	435	195	630	90	105	195

Notes:

1. These are stacked back-to-back townhouse units which, for the purposes of trip generation, were assumed to operate like apartment units.
2. All uses are assumed to peak at the same time. This is particularly conservative with respect to the school traffic which typically would peak later in the morning and earlier in the afternoon than the traffic attributable to the other uses.

10.3.2.2 Trip Distribution

Conservative and simplifying assumptions were made regarding the direction of approach for each of the uses within the node. For the retail uses it was assumed that 50% of trips arrive and depart by way of the two right in / right out driveways, and the remaining 50% by way of the all-moves driveways accessed from the mid-node local road (as shown in Figure 10.4). Of the 50% of traffic using the all-moves driveway, approximately 40% was assumed to be oriented towards Mississauga Road, while the remaining 10% was oriented to the east in the community.

For the high school it was assumed that 60% of traffic was likely to use the Spine Road access driveway, and the remaining 40% the Wanless Drive access. Of that 40%, approximately 25% of the traffic was assumed to be coming from within the community from the east with the remainder coming from Mississauga Road.

For the high density residential uses it was assumed that 15% of the traffic was oriented to the north by way of the local road connection. The remaining traffic was assumed to be split approximately 50-50 between the east and west directions on Wanless Drive.

10.3.2.3 Analysis Results

Site specific turning movements were calculated based on the above assumptions, and then conservatively superimposed over the 2031 total forecast traffic volumes in order to generate turning movement volumes at the mid-block intersection on Wanless Drive in Mixed Used Node #2. Table 10.7 summarizes the Synchro analysis results for this intersection, along with those for the adjacent intersections at Mississauga Road and at the Spine Road.

Table 10.7
Synchro Queue Analysis Summary

	Morning Peak Hour			Afternoon Peak Hour		
	Volume	50 th -ile Queue	95 th -ile Queue	Volume	50 th -ile Queue	95 th -ile Queue
Mississauga / Wanless Drive						
EBL	30	3.0	11.3	155	14.6	43.2
WBL	565	59.3	105.5	200	19.4	54.1
NBL	10	1.4	5.9	30	3.6	10.7
SBL	85	13.6	26.4	110	13.4	26.4
Spine Road / Wanless Drive						
EBL	85	7.4	23.9	120	3.6	5.7
WBL	35	2.3	7.0	120	7.9	33.6
NBL	75	6.0	20.9	45	6.5	12.3
SBL	110	13.6	20.3	50	6.1	16.6
Driveway Access / Wanless Drive						
EBL	15	0.9	3.8	60	4.0	12.5
WBL	110	8.0	24.0	25	1.4	3.9
NBL	30	3.1	9.4	15	1.5	5.7
SBL	20	2.1	7.1	40	4.1	11.4

Based on a conservative interpretation of these forecast volumes and queue statistics, estimates of the queue storage requirements along this section of Wanless Drive can be determined.

The available total storage space between the westbound stop bar at Mississauga Road and the eastbound stop bar at the Spine Road is about 280m.

In the morning peak hour, and using the 95th percentile queue estimates from the above table, the total estimated storage requirement would be:

- WB Left queue at Mississauga Road 106m
- Length of taper 80m
- EB Left queue at Driveway Access 4m
- WB Left queue at Driveway Access 24m
- Length of taper 80m
- EB Left queue at Spine Road 24m

The total estimated length required for morning peak hour storage in this section of Wanless Drive using these conservative assumptions is thus **318m**.

In the afternoon peak hour, and using the 95th percentile queue estimates from the above table, the total estimated storage requirement would be:

- WB Left queue at Mississauga Road 54m
- Length of taper 80m
- EB Left queue at Driveway Access 13m
- WB Left queue at Driveway Access 4m
- Length of taper 80m
- EB Left queue at Spine Road 6m

The total estimated length required for morning peak hour storage in this section of Wanless Drive using these conservative assumptions is thus **237m**.

In the AM Peak Period, the forecast queue storage requirements exceed the available length of about 280m in this stretch of Wanless. Because of this, the City standard taper length of 80m may have to be relaxed somewhat in this instance. Note that the need for a spacing tighter than normally permitted in Brampton between the all moves intersections on both Wanless Road and Sandalwood Parkway between the Spine Road and Mississauga Road is a result of:

- the limited space available between Mississauga Road and the Natural Heritage System
- the location of the Spine Road in this area, and the desire to limit direct driveway access to the Spine insofar as is possible
- the limited accessibility to and from Mississauga Road that results from the Region of Peel's access control bylaw
- the need to provide appropriate access to the various land uses (commercial, medium and high density residential, and schools) comprising the Mixed Use Nodes. Without the all moves access points in these locations (mid-way between Mississauga Road and the Spine Road), the Mixed Use nodes cannot be serviced appropriately and may not therefore develop as intended.

The results of the additional analysis undertaken for these locations (see Sections 10.2 and 10.3) indicates that storage requirements can likely be met, but taper requirements may have to be relaxed somewhat. This would be consistent with the more urban built form and design context intended for the Mixed Use Nodes. Note that the opportunity to undertake more detailed traffic assessment and road design will happen as site plan applications are submitted for the commercial and high density residential uses in this node.

Mixed Use Node 2 - Functional Concept Plan & Access Spine Road @ Wanless Drive

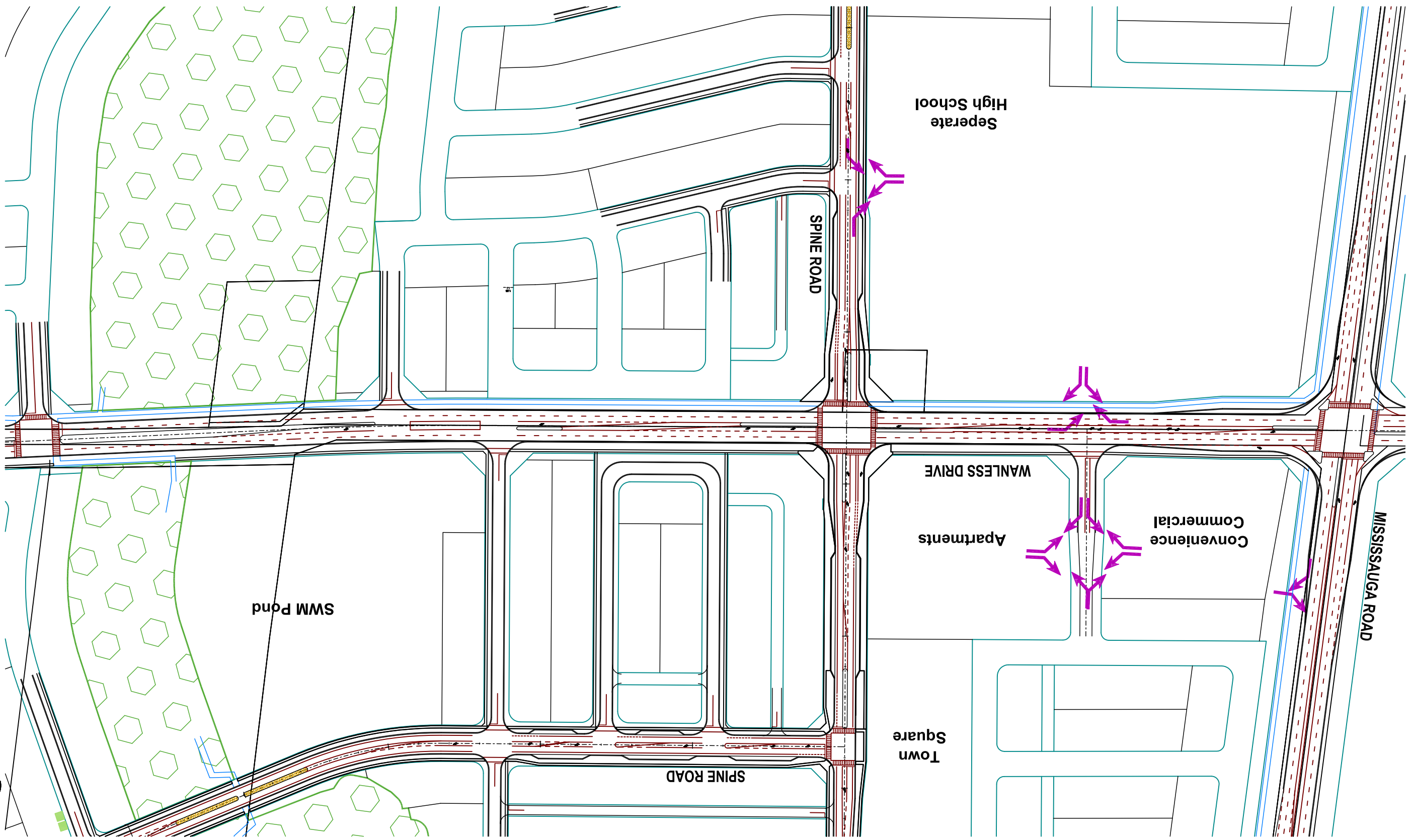


Figure 10.5

10.4 Mixed Use Node 3: East-West Spine Road and Creditview Road

10.4.1 Functional Road Details

The proposed functional roadway and site access details in the vicinity of the of Mixed Use Node #3 at the east-west Spine Road and Creditview Road are shown in Figure 10.6. Note that the site access details shown are conceptual at this time, and will be subject to site plan approvals.

The key element required to access the sites in the node as currently planned is an all moves intersection on the east-west Spine Road, about 140m from Creditview Road. The two local roads that intersect with the Spine Road at this location are required to provide all moves access to the small Convenience Commercial sites on the corners of Creditview Road and the Spine Road.

Locating an all moves access at this distance while not ideal, should not present difficulties. There is sufficient room to store vehicles in the eastbound left turn lane; the volume of overlapping left turns to go southbound at the local road intersection will not be nearly as great. Right turn in/out movements off of Creditview Road are an appropriate access treatment for these small commercial blocks.

10.4.2 Operational Assessment

As can be seen in Figure 10.6, Mixed Use Node #3 does not present the same left turn lane storage challenge as do Mixed Use Nodes #1 and #2. This is a result of :

- a different intensity of land uses, with Mixed Use Node #3 notably lacking high density residential and high school uses
- a different class of roads within the node. While Nodes #1 and #2 are centred on an east-west arterial road, and “book ended” by two more arterial roads, Node #3 is centred on a collector road (the Spine Road) and “book ended” by just one arterial road.

For these reasons, a more detailed operational analysis of Mixed Use Node #3 has not been deemed necessary at this time. As noted above, and determined through the work documented in Section 8.0, there is sufficient room to store vehicles in the eastbound left turn lane on the Spine Road at Creditview Road.

As with Nodes #1 and #2, details regarding access to the Convenience Commercial sites adjacent to the Spine Road will ultimately be subject to site plan approval.

Mixed Use Node 3 - Functional Concept Plan & Access Spine Road @ Creditview Road

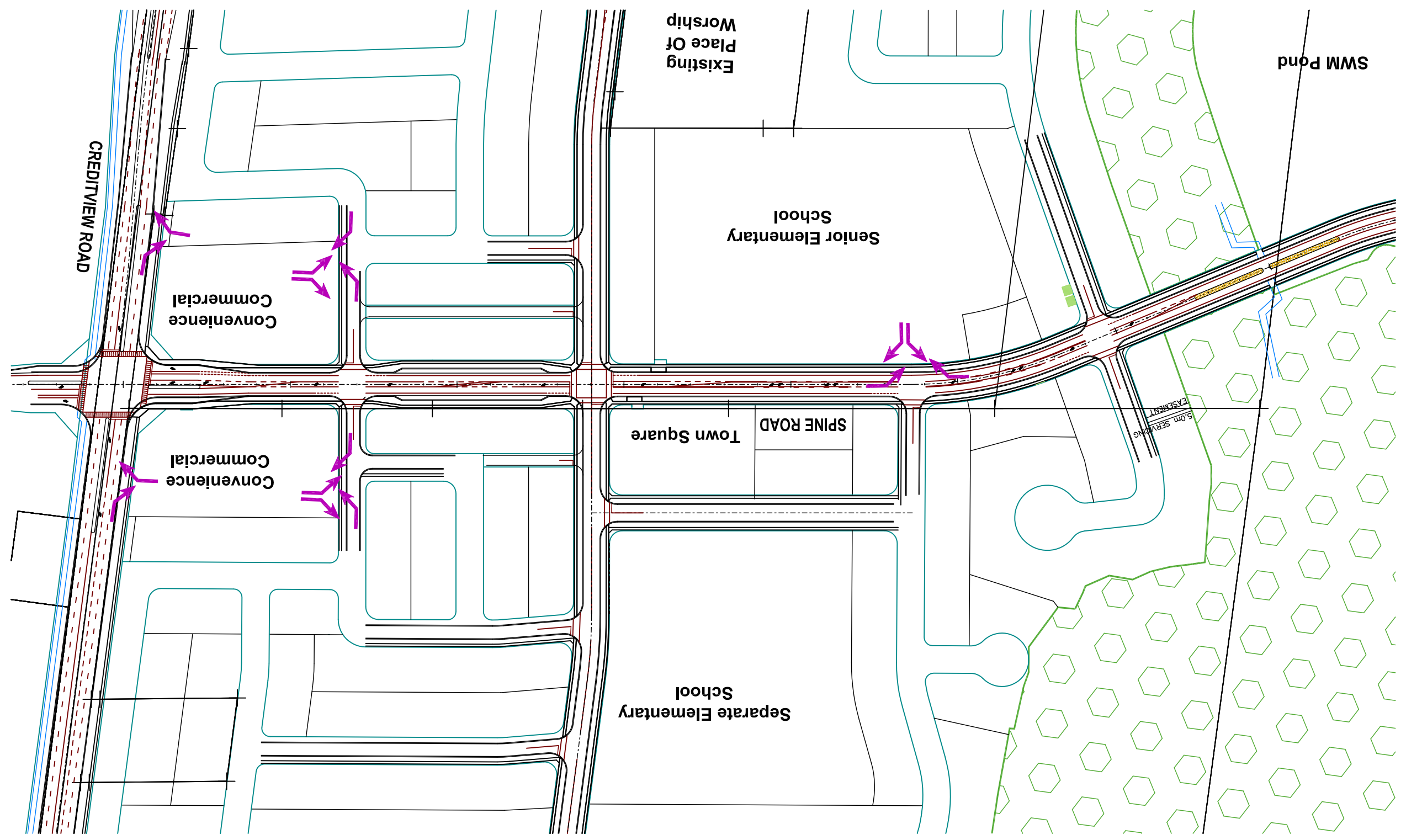


Figure 10.6



10.5 Selected Access Assessments

Figure 10.7 shows proposed access schemes from the arterial road network at various locations, both inside and outside of the Mixed Use Nodes. The figure also summarizes the proposed intersection control modes at all arterial road intersections.

10.5.1 Commercial Properties

There are several commercial blocks proposed outside of the Mixed Use Nodes within Block 51-1.

Two of these are located along Mayfield Road at the extreme corners of the block plan. At Mayfield and Mississauga Road, it is anticipated as can be seen in Figure 10.7, that this site can be accessed from the regional arterial network from right turn in/out driveways, with all moves access occurring on the internal collector road network. The somewhat smaller second site located at Mayfield Road and Creditview Road will be accessible from the adjacent arterial roads by means of two right turn in/out driveways only. In both of these cases, site specific plans and traffic studies will be required before development can occur.

The significant commercial block in the “Special Policy Area” to the south of the CNR line has also been dealt with in this study insofar as it is likely to attract Block 51-1 traffic. For purposes of this study, it has been assumed that 350,000 square feet of retail space are developed in this area. While there will ultimately be three all moves signalized access driveways into this area, namely from James Potter / Creditview Road, Bovaird Drive, and Mississauga Road (as shown in Figure 10.7) it has been conservatively assumed for the analysis in this study that the entire development is accessible only from the first two of these access points.

10.5.2 Schools

Most of the schools are located on collector roads away from the major arterial intersections. The exceptions are:

- the Secondary School on the west side of the Spine Road just to the north of James Potter / Creditview Road. Potential all moves access to this site can be achieved at the north end of the school site, as shown in Figure 9.12. This access point works well because it creates a 3 legged intersection towards the outside of the Spine Road curve, and spaced well away from the busy intersection at James Potter / Creditview Road. An additional right turn in/out access might be provided further to the south along the Spine Road.
- access to the Separate Secondary School located in Mixed Use Node #2 is discussed in Section 10.3.

10.5.3 Creditview Sandalwood Park

City staff have indicated the need to protect for and rationalize access to the existing City park located in the southwest quadrant of the intersection of Creditview Road and Sandalwood Parkway, in the context of the overall Block 51-1 planned road network.

10.5.3.1 Sandalwood Parkway Access

As noted in Section 3.4.3.3 above, a new access point is being introduced to this park directly from the extended Sandalwood Parkway. This access driveway would be aligned as a southern fourth leg of the future intersection of Sandalwood Parkway and Collector Road 'G'. As discussed in detail in Section 3.4.2 above, in the Sandalwood Parkway ESR a curved alignment was proposed for Sandalwood Parkway in the vicinity of this intersection. As part of this current study, and the development of a Block 51-1 recommended road network that meets the needs of all stakeholders, the Sandalwood Parkway alignment proposed in the ESR has been reviewed and refined. It is now recommended to be straightened somewhat in the section to the north of the park so as to facilitate achieving this future park access driveway at a full intersection. It is contemplated that this intersection would ultimately be signalized so as to facilitate full movements in and out of the park.

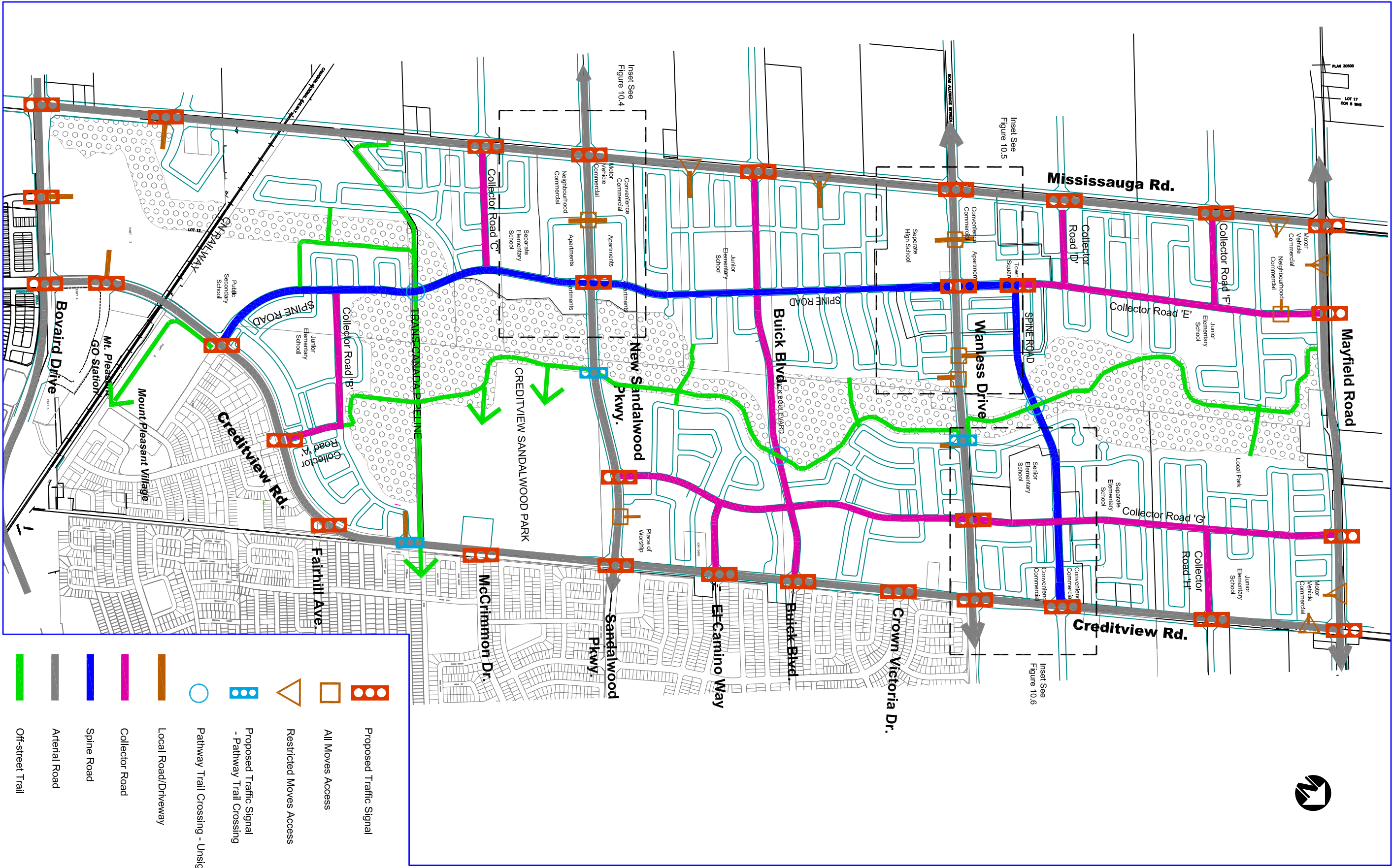
10.5.3.1 Creditview Road Access

Another park access point is contemplated to be on Creditview Road at the existing parking lot access, currently generally aligned as a fourth leg of the existing intersection with McCrimmon Drive. This location would also be an appropriate candidate for signalization, and as such is spaced sufficiently far from the proposed traffic signal on Creditview Road to the south of the Trans Canada Pipeline (TCPL). This latter signal is proposed to allow users of the trail that follows the TCPL alignment to cross Creditview Road (see Section 15.3.2.6 below).



Mount Pleasant Block 51-1
Job # 6374-26 August, 2011

Mount Pleasant Block Plan 51-1 Arterial Road Signalization and Access Plan



- Proposed Traffic Signal
- All Moves Access
- Restricted Moves Access
- Proposed Traffic Signal - Pathway Trail Crossing
- Pathway Trail Crossing - Unsignalized
- Local Road/Driveway
- Collector Road
- Spine Road
- Arterial Road
- Off-street Trail



Figure 10.7

11.0 Collector Roads

For purposes of this Phase 3 and 4 Collector Road Environmental Assessment Study, an assessment has been conducted of the proposed configuration and alignment of sections of the collector road network that is proposed for the Mount Pleasant Block 51-1 Community. The starting point for this assessment is the collector road network identified as part of the “Preferred Alternative 2” road network in the *Mount Pleasant Secondary Plan Area Transportation Master Plan* (TMP) study. This network, illustrated in Figure 3.3, was deemed to provide appropriate road capacity, and generally fulfill the objectives for the Mount Pleasant community. Insofar as a set of alternative transportation networks was assessed, documented, and presented to stakeholders, the TMP fulfilled Phase 1 and 2 requirements of the Municipal Class Environmental Assessment (EA) process.

Having dealt with the function and character of the Spine Road in Section 9.0 of this report, this section considers the character and alignment of the remainder of the Block 51-1 collector road network. Section 11.1 discusses recommendations regarding cross sectional characteristics for these roads. None of the recommended sections vary from the 2 lane cross section recommended for these roads in the TMP. As such they do not require a detailed exploration of alternatives as was conducted for the Spine Road in Section 9.

Section 11.2 revisits the configuration and alignment of the collector road network as recommended in the TMP. In some cases, work conducted through the Block 51-1 planning process suggests that changes to the TMP network may be warranted. For this reason, a detailed assessment of alternative alignments has been conducted.

11.1 Collector Road Characterization

Figure 11.1 provides a key to the application of the various roads standards considered in this report to the Block 51-1 network. For the most part these roads are consistent with City of Brampton collector road standards.

11.1.1 Typical Collector Roads

Figure 11.2 illustrates the cross section that will be applied to most of the collector roads in Block 51-1 (aside from the Spine Road, which is addressed separately in Section 9.0, “**The Spine Road**”).

As per the Secondary Plan and Memorandum of Understanding documents referenced in Section 3.2, it is intended to use City of Brampton Standard 202A for these roads, comprising 10.0m of pavement in a 21.5m right-of-way. This section allows for two travel lanes, on street parking, and accommodates transit vehicles. The streetscape treatment allows for a sidewalk on both sides with trees in grass boulevards between curb and sidewalk.

As indicated in the standard, and illustrated in the plan view in Figure 11.2, parking would be prohibited on intersection approaches so as to allow exclusive left turn lanes where required within the same 10.0m pavement width.

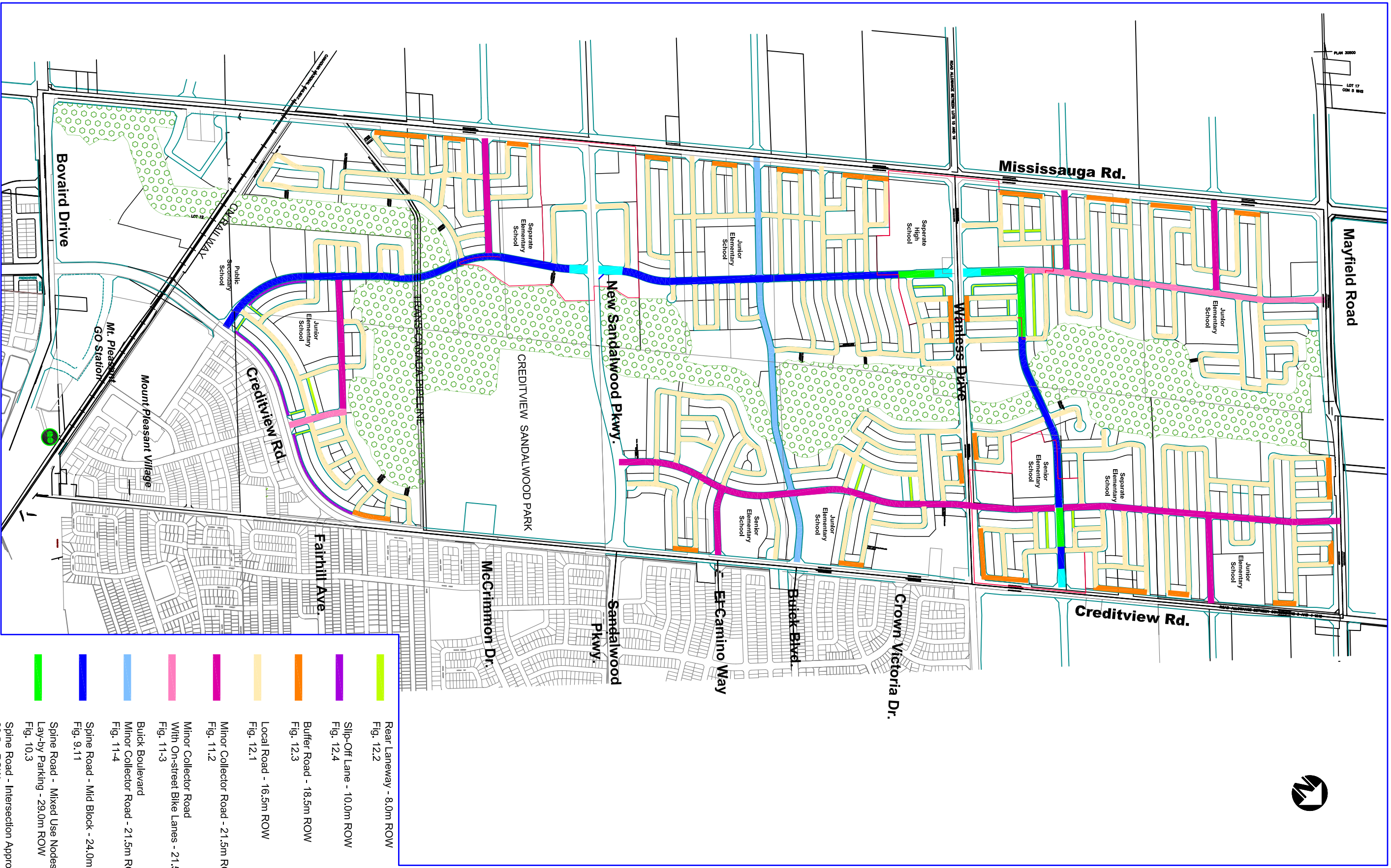
11.1.2 Collector Road North of Intersection of N-S and E-W Spine Roads

To the north of Wanless Drive, the Spine Road oriented roughly north-south intersects with its east-west counterpart at a three legged intersection. To the north of this intersection, it is not anticipated that the level of traffic and transit vehicular demand on the north-south collector will be comparable to the volumes and level of service expected to the south. However, this section of road is still identified as a Class 2 Bike Route in the City of Brampton *PathWays Master Plan* report, requiring on street bike lanes.

In order to meet these requirements, it is proposed to use the road section illustrated in Figure 11.3. A minor variation from the same City Standard 202A for Minor Collector Roads used elsewhere in Block 51-1, this section of road will be constructed with an additional 0.50m of pavement, and corresponding 0.25m narrower boulevards. This will allow for transit friendly 3.75m travel lanes, as well as 1.50m striped bike lanes on the outside. As with the Spine Road to the south, parking will not be permitted on this street, with much of the built form presenting flankage conditions. Streetscape treatment will continue to include sidewalks on both sides and trees within ample grass boulevards.

Table 11.1
Minor Collector Road north of the North-South / East-West Spine Road intersection: Comparison with City Standard

Road Element	City Standard (202C)	Proposed Section in Block 51-1	Variance
Paved Width	10.00m	10.50m	+0.50m
Boulevard Width	5.75m x 2	5.50m x 2	-0.50m
Landscaping on Boulevard	Yes	Yes	
Street lighting on Boulevard	Yes	Yes	
Right of Way Width	21.50m	21.50m	0.00m



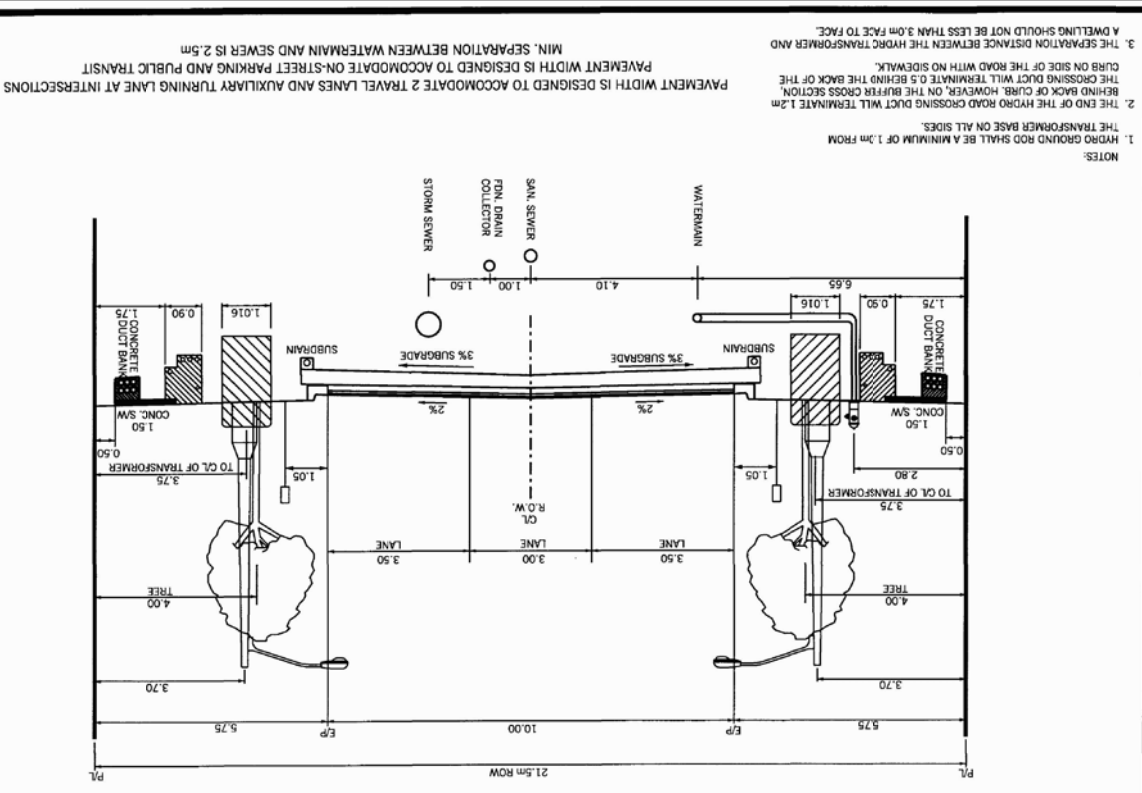
Mount Pleasant Block Plan 51-1
Road Characterization Key Plan



Mount Pleasant Block 51-1
Job # 6374-26 August, 2011

Figure 11.1

APPROVED
CITY
SECTION



CITY OF BRAMPTON
WORKS and TRANSPORTATION DEPARTMENT

MINOR COLLECTOR ROAD

1.0m PAVEMENT ON 21.5m R.O.W.

REVISION:	REV:
DATE:	DATE:
CHECKED:	APPROVED:
DATE:	DATE:
SCALE:	DWG. NO.:
N.T.S.	202A

PROPOSED
BLOCK 51-1
SECTION

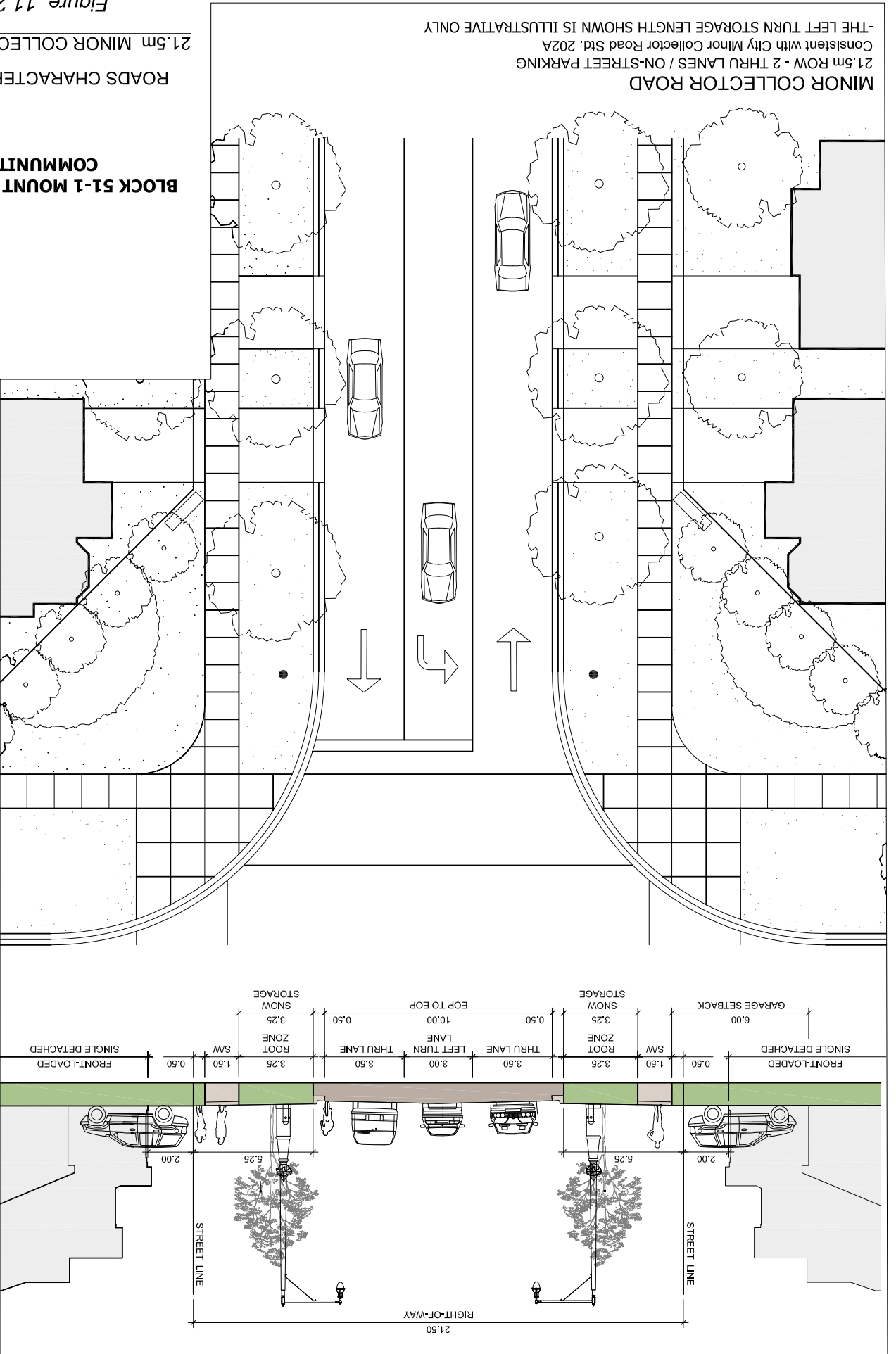
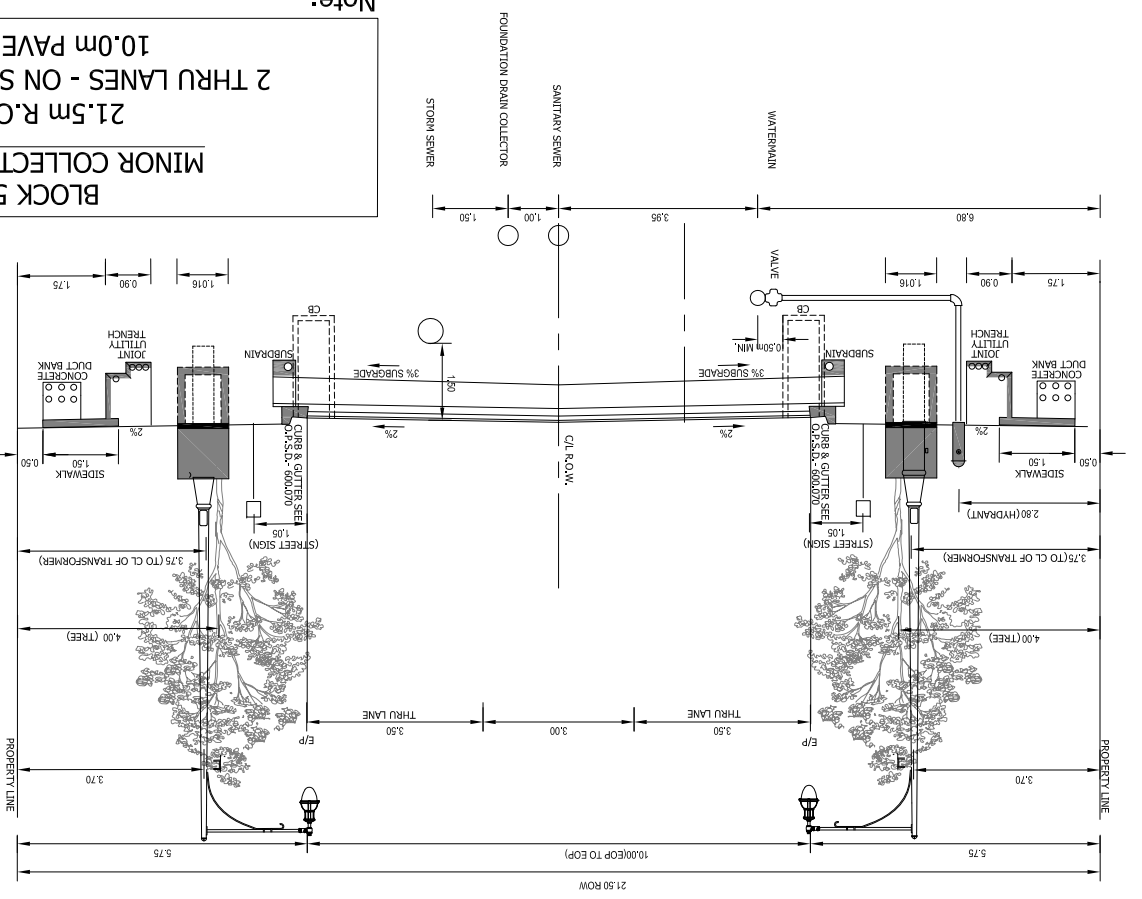
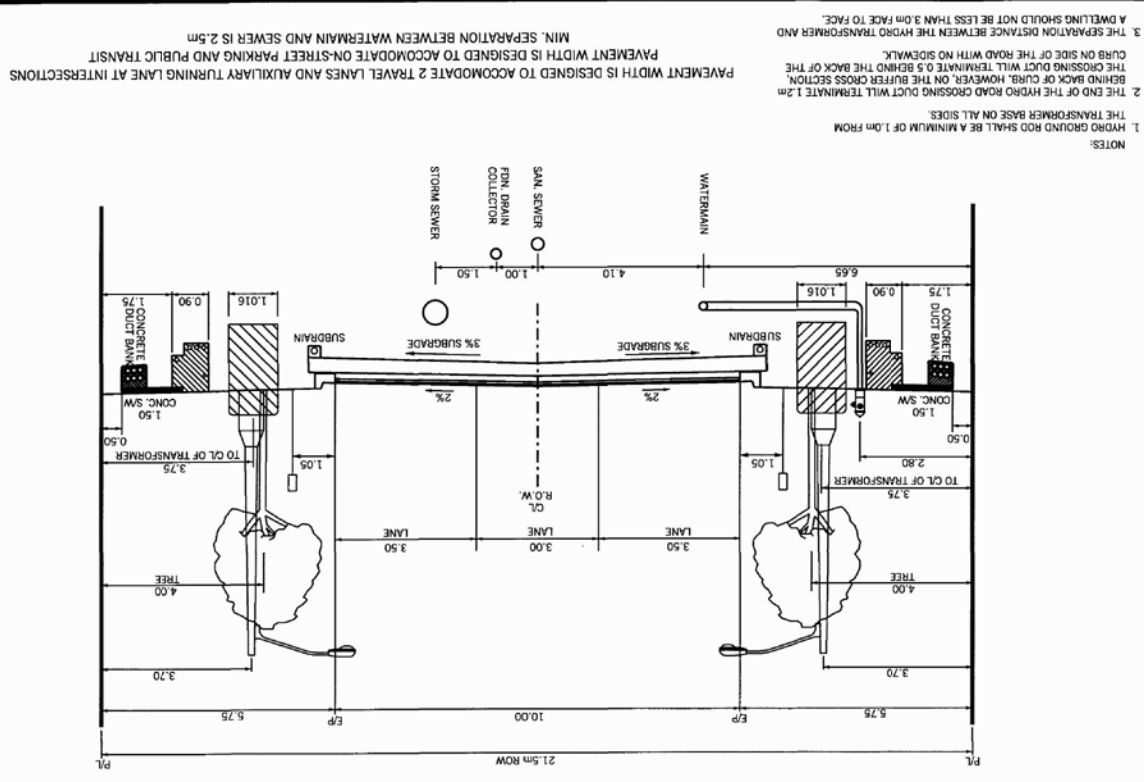


Figure 11.2

APPROVED
CITY
SECTION

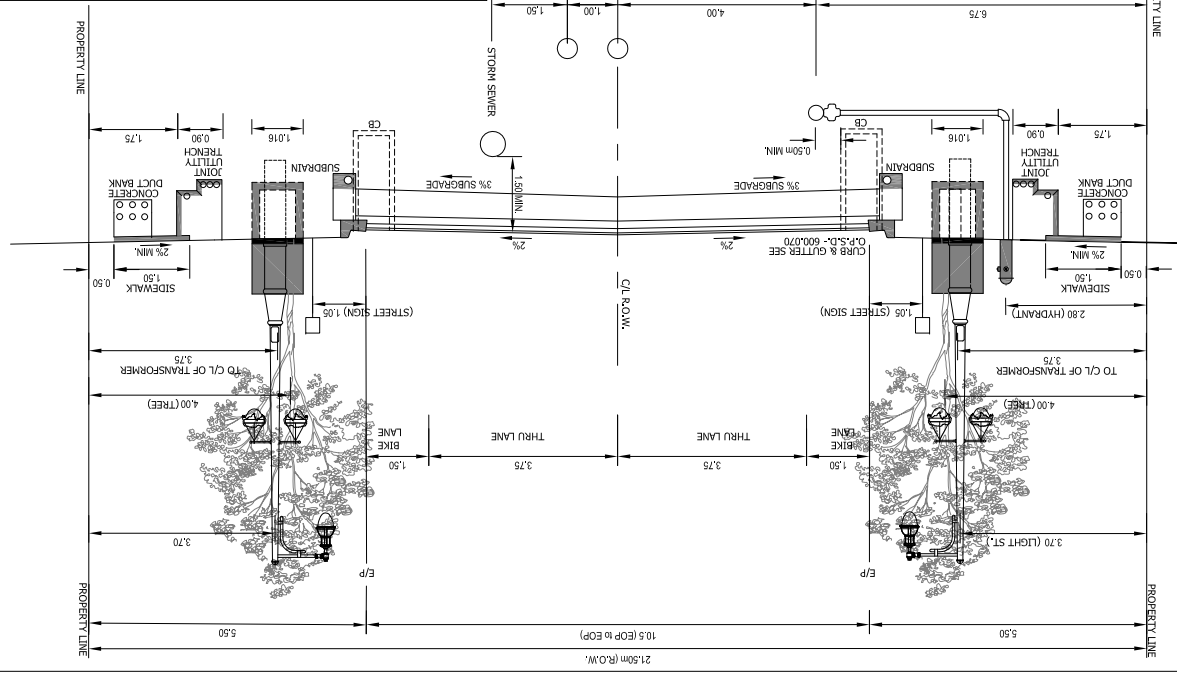


CITY OF BRAMPTON
 WORKS and TRANSPORTATION DEPARTMENT
MINOR COLLECTOR ROAD
 10m PAVEMENT ON 21.5m R.O.W.

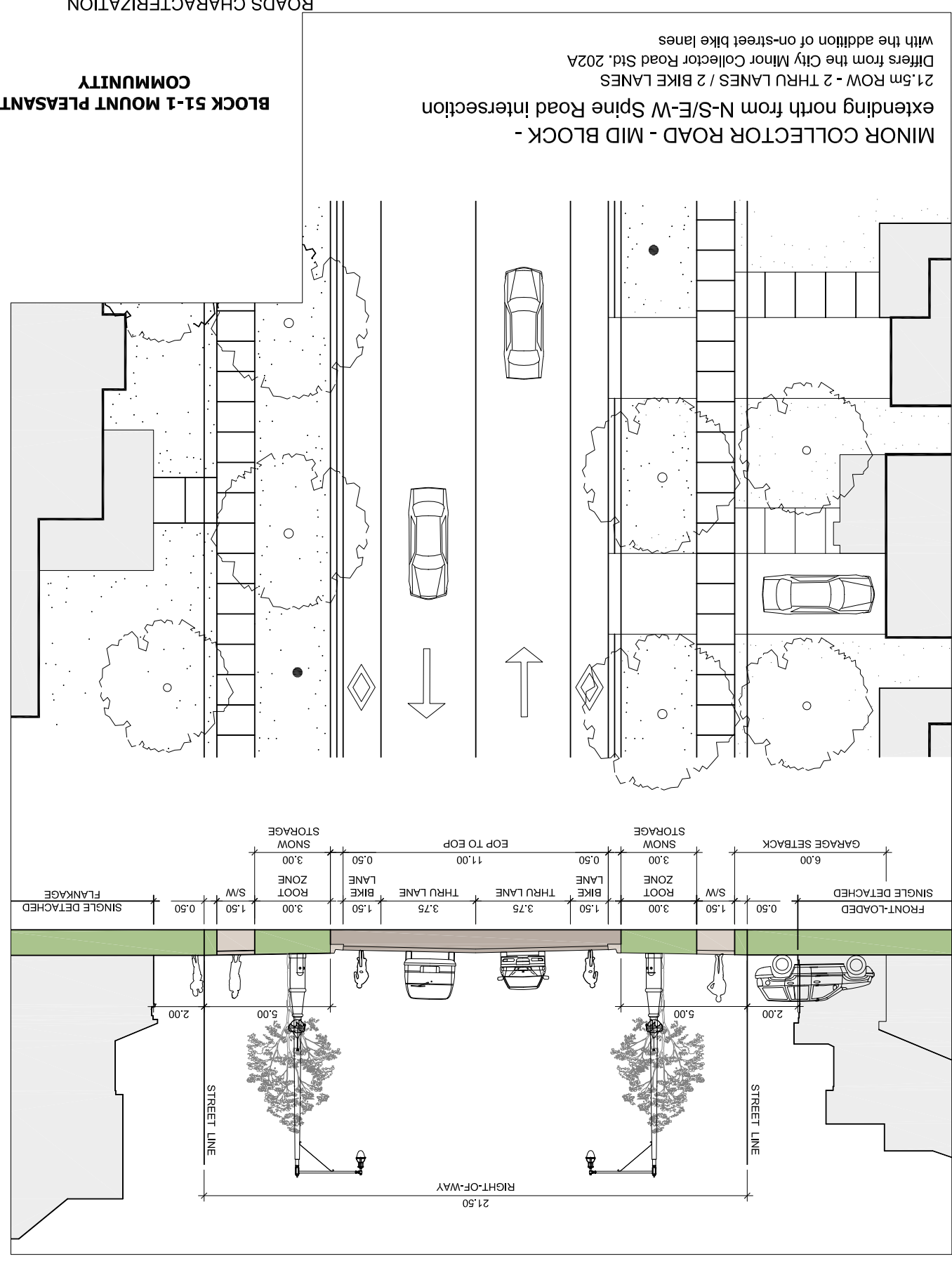
REVISION:	REV:
DATE:	DATE:
CHECKED:	APPROVED:
2009-06-12	<i>T. J. Molyneux</i>
SCALE:	DWG:
N.T.S.	202A

PROPOSED
BLOCK 51-1
SECTION

Block 51-1
 21.5m R.O.W.
 2 THRU LANES / 2 BIKE LANES
 10.50m PAVEMENT
 Extending North from N-S/E-W Spine Road Intersection
 Differs from the City Minor Collector Road Std. 202A with the addition of on-street bike lanes -Pavement width increased by 0.5m -Boulevard width reduced by 0.25m on each side



MINOR COLLECTOR ROAD - MID BLOCK -
 extending north from N-S/E-W Spine Road intersection
 21.5m ROW - 2 THRU LANES / 2 BIKE LANES
 Differs from the City Minor Collector Road Std. 202A
 with the addition of on-street bike lanes



ROADS CHARACTERIZATION
 21.5m COLLECTOR ROAD
 MINOR COLLECTOR ROAD-MID BLOCK
 EXTENDING NORTH FROM N-S/E-W SPINE ROAD INTERSECTION
 Figure 11.3

BLOCK 51-1 MOUNT PLEASANT
 COMMUNITY

11.1.3 Buick Boulevard

Buick Boulevard is a minor collector road within Block 51-1, but is likely to be designated as a Class 3 Signed Bike Route. The section proposed for this road is consistent with City Standard 202A for Minor Collector Roads, but with 11.00m of paved width to accommodate the mix of buses and bicycles it is likely to carry. The additional 1.00m of pavement, as shown in Figure 11.4, will allow intersection approaches to be configured with a centre 3.00m turn lane, leaving room for 4.00m travel lanes. In the City of Brampton *PathWays Master Plan* report, 4.00m is recommended as a minimum curb lane width for Signed Routes of this type.

Table 11.2
Buick Boulevard: Comparison with City Standard

Road Element	City Standard (202C)	Proposed Section in Block 51-1	Variance
Paved Width	10.00m	11.00m	+1.00m
Boulevard Width	5.75m x 2	5.25m x 2	-1.00m
Landscaping on Boulevard	Yes	Yes	
Street lighting on Boulevard	Yes	Yes	
Right of Way Width	21.50m	21.50m	0.00m

Between intersections, the wider section will allow for on street parking as is currently permitted, while still accommodating bicycles. Streetscape treatment will remain consistent with sidewalks on both sides and trees within grass boulevards.

11.2 Assessment of Collector Road Alignment Alternatives

11.2.1 Phase 1 and 2 TMP Findings and Recommendations

11.2.1.1 Review of Collector Road Network Configuration

As discussed in Section 3.7.3, “Changes in Phase 1 and 2 Recommendations”, the more detailed planning work that has been undertaken in support of Block 51-1 since the completion of the Phase 1 and 2 TMP has led to a number of refinements and changes to the configuration and alignment of the collector road network that is recommended in that report (see Figure 11.5).

In light of these changes, a thorough re-assessment of collector road alignment options is conducted in this section, thereby ensuring that Phase 1 and 2 Municipal Class Environmental Assessment requirements continue to be met.

11.2.1.2 Area South of CNR Line

It should be noted that the area within Block 51-1 that is bounded to the north by the CN Rail Line, to the east by James Potter / Creditview Road, to the south by Bovaird Drive, and to the west by Mississauga Road is subject to a “Special Policy Area” (Norval Farm Supply) section 5.1.3.2 and policy 5.3.2.5 in the MPSP, the latter of which provides for the continued protection and future planning of an east-west connection from Creditview Road (James Potter Road) to Mississauga Road consistent with the Mount Pleasant Area Secondary Plan Transportation Master Plan. The need for an east-west connection in association with and in support of potential development is subject to future comprehensive planning studies addressing land use, massing, design, environmental and transportation for lands south of the CN tracks.

The designated land use in this area is primarily district commercial, in keeping with the proximity to the GO Station and the major intersection at Bovaird Drive and Mississauga Road. However residential uses are permitted and may well be developed as plans for this area are refined.

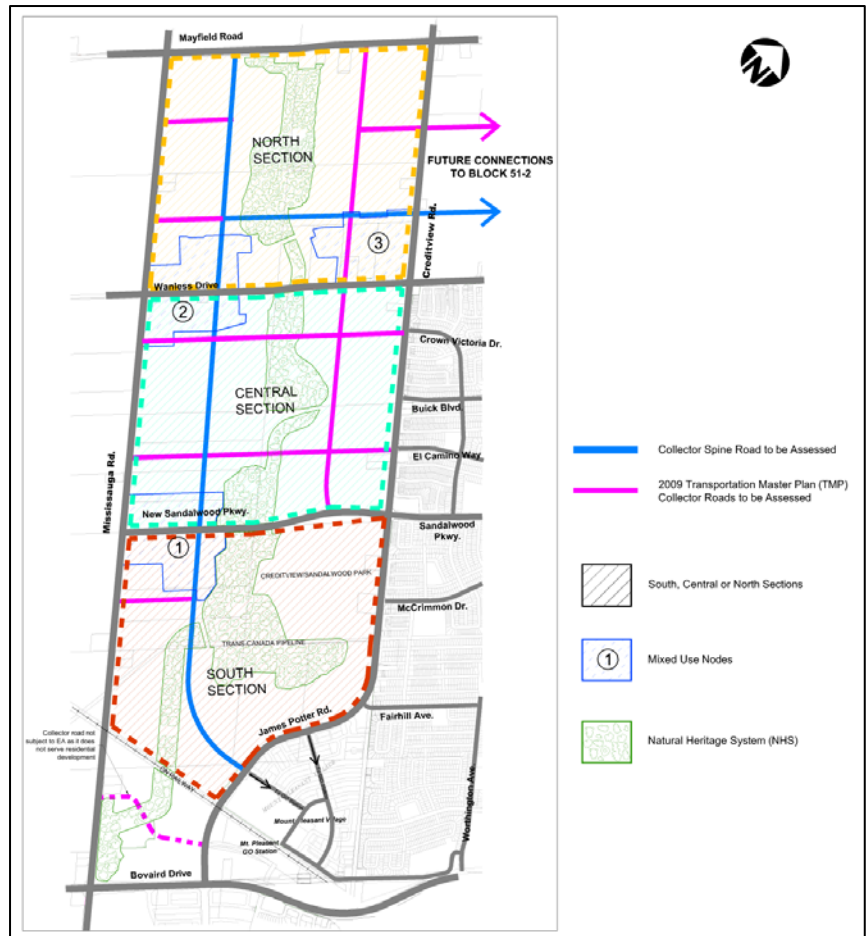


Figure 11.5 – Collector Road Evaluation Sections

An east-west collector road, shown as a dashed magenta line in Figure 11.5, was proposed for this area in the TMP Study. Given the “Special Policy Area” designation, and the fact that this area is isolated from the remainder of Block 51-1, it has been determined that this road is not required for the functioning of the Block 51-1 community. Nor is it required to support the potential commercial land uses within the “Special Policy Area” as each of the two sub-areas (divided by the future NHS as illustrated in Figure 11.5) have direct access to adjacent arterial roads (as has been assumed for purposes of the network performance analysis in Section 8.0). In recognition of this situation, this road was not included in the Mount Pleasant Secondary Plan (see Figure 3.1).

For these reasons, this east-west collector road has not been included for assessment in this study, nor, therefore, is it included within the Phase 3 and 4 Collector Road EA process. Ultimately, if this road were to be built as proposed in the TMP, its primary function would be to provide a more direct link between the Mount Pleasant GO Station and future development and communities to the west of Mississauga Road. It is in this context, subject to an approvals process yet to be determined, that this road might ultimately be implemented.

11.2.2 Development of Alternatives

Given the fact that there are several differences between the collector road network configuration proposed for the Block 51-1 and the TMP recommended collector road network, it was decided that in order to ensure that EA requirements are fulfilled, a comprehensive review of all collector road elements in the network should be undertaken.

For each collector road section, alternative alignments, linkages, or configurations have been identified for evaluation and comparison with the element as recommended in the TMP study. In each case, a recommended alternative has then been identified.

11.2.3 Evaluation of Alternative Alignments

To facilitate the assessment of alternative collector road network configurations, the Block 51-1 community was divided into three evaluation sections (south, central, and north), as shown in Figure 11.5 superimposed over the TMP recommended collector road network.

As the primary role of collector roads is to facilitate movement between the local roads within the community and the arterial road network, the evaluation section boundaries were determined on the basis of the planned future arterial road network. Note that the evaluation sections were not determined by, nor are they intended to inform the phasing of the community.

Note that the proposed Spine Road, shown in blue in Figure 11.5, has a role that is somewhat different from the other collector roads in the network. It plays a key role in promoting and supporting non-automobile mode choices by providing a corridor for relatively high quality transit service. As such, it is important that the continuity of this road be maintained throughout the Block, and through each of the evaluation sections described above. It is for this reason that the Spine Road alignment has not been divided into evaluation sections for purpose of assessment.

11.2.4 Evaluation Criteria

The evaluation of the alternative collector road alignments was undertaken by taking into consideration criteria in the categories:

Table 11.3
Evaluation Criteria for Collector Road Alignment Assessments

Evaluation Criteria	
Transportation	
T-1	Hierarchy - Creates an appropriate community road hierarchy. The collector road network must appropriately connect the local roads and the surrounding arterial road network.
T-2	Connectivity – Provides appropriate connectivity between local community roads, and to the arterial road network.
T-3	Design Standards - Meets appropriate road design, geometric, and safety standards.
T-4	Capacity - Provides sufficient capacity for future forecast traffic volumes. The collector road network must provide an appropriate operational level of service.
T-5	Transit - Supports an appropriate level of transit service. This is of particular importance with respect to the Spine Road.
T-6	Active Transportation – Provides opportunities for safe and convenient active transportation. Integration with facilities outside of road rights of way is an important consideration.
Natural Environment	
N-1	Natural Heritage System - Minimizes impacts on the future Natural Heritage System. In order to preserve the integrity of the NHS, road crossings and encroachments within the designated NHS boundaries (as identified through the EIR process and documented in the EIR) are to be minimized.
N-2	Streetscaping - Provides opportunities for landscaping within the road right of way.
N-3	Paved Surface Area - Minimizes the area of hard (paved) surfaces.
Socio-Economic	
S-1	Encourages Alternative Travel Modes - Encourages a higher than typical adoption of both transit and active transportation modes.
S-2	Pedestrian Scale – Supports a pedestrian friendly built environment.
S-3	Community Objectives – Consistent with and supportive of key structural community elements identified in the Mount Pleasant Secondary Plan, notably the Mixed Use Nodes and Natural Heritage System.
S-4	Cost – Minimizes capital and ongoing operational costs.
S-5	Property – Minimizes land requirements.

For each collector road alignment alternative examined in the following sections, the above criteria are used. For each criteria, a qualitative rating is applied to each of the alternatives under consideration. The qualitative ratings that are used are:

-  **'Most Preferred'**,
-  **'Somewhat Preferred'**
-  **'Least Preferred'**

In some cases, there may be no discernible difference between the alternatives under consideration for a particular criteria. Generally, only those criteria that serve to differentiate the alternatives have been considered, and assigned ratings.

11.2.5 Spine Road Alignment: Alternative Configurations North of Wanless Drive

11.2.5.1 Mayfield Road or Creditview Road Spine Road Terminus

The Mount Pleasant Secondary Plan Transportation Master Plan Study recommended a particular configuration for this road, represented as Option 1 in Figure 8.6. To the north of Wanless Drive, the transit supportive Spine Road continues directly north until it intersects with Mayfield Road, Just to the north of Wanless, an east-west oriented minor collector road intersects with the Spine Road, and continues easterly to Creditview Road, taking advantage of a narrowing of the Natural Heritage System to achieve a low impact crossing.

While this configuration of the Spine Road provides a direct transit supportive connection to Mayfield Road, it also runs parallel and relatively closely for most of its length to the adjacent Mississauga Road. This regional arterial is likely to include its own high capacity transit corridor in the future.

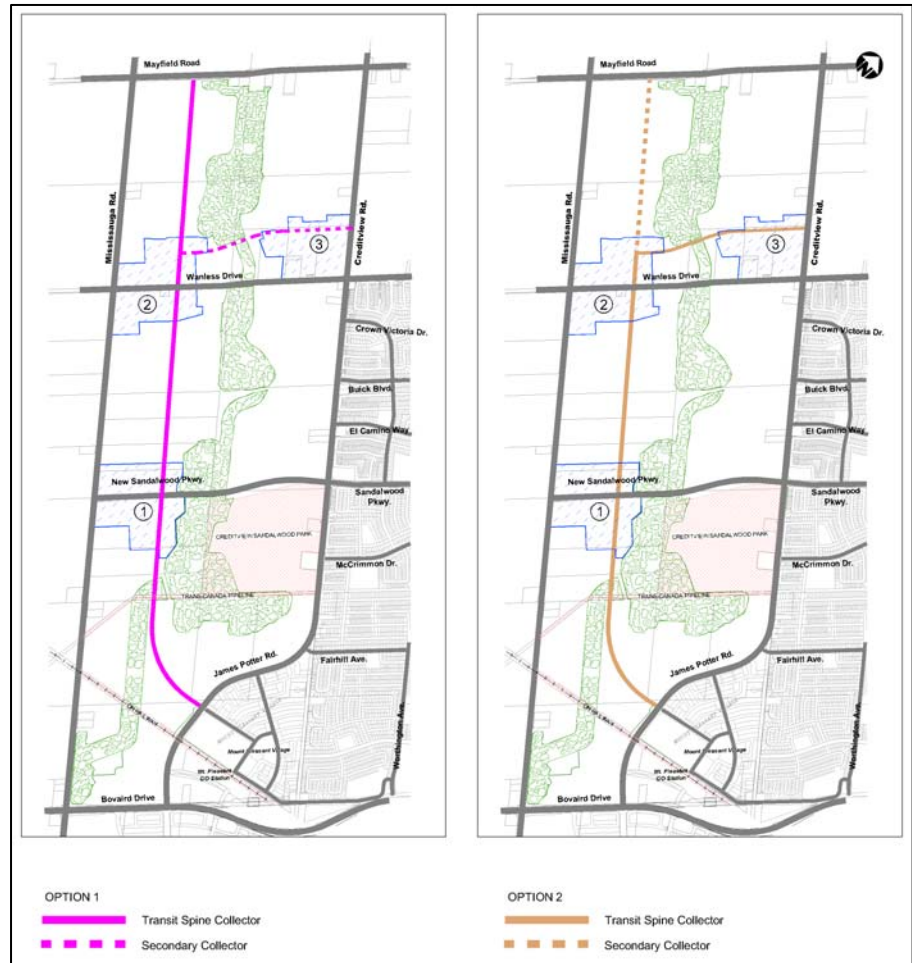


Figure 11.6 - Spine Road Alignment: Alternatives North of Wanless Drive

Option 2 is a logical alternative that was explored during the TMP study process, but ultimately rejected in favour of Option 1. In this option, there are two collector roads as before, but it is now the east-west collector that takes on the Spine Road character. The significant advantage of this alternative lies in the ability to ultimately extend this transit priority corridor through both Blocks 1 and 2 of the Mount Pleasant Secondary Plan Area. This alternative has been subject to a more detailed scrutiny as a part of the more detailed block planning work that has been done in this study.

The following table summarizes the evaluation of these two alternative alignments on the basis of those criteria that serve to differentiate them.

Table 11.4
Evaluation of Spine Road Alignment Alternatives North of Wanless

Evaluation Criteria	Options	
	1	2
Transportation		
T-4 Both options provide sufficient capacity for future forecast traffic volumes	M	M
T-5 Option 2 better supports transit connectivity to the future Block 51-2-of the Mount Pleasant Secondary Plan Area to the east, and thereby allows for future Spine Road based transit service throughout the entire Secondary Plan Area.	S	M
Natural Environment		
There is no appreciable difference between these two options. Both configurations involve a single collector road crossing of the proposed Natural Heritage System, and roads of similar length and cross section.	S	S
Socio-Economic		
S-1 Extending the Spine Road into Block 51-2 will better encourage adoption of transit and active transportation modes in that area.	S	M
S-3 Option 2 provides better connectivity between the Mixed Use Nodes, notably the node at Creditview Road.	S	M
Overall Ranking	2	1

Notes:

Option rating symbols represent '**Most Preferred**' (M), '**Somewhat Preferred**' (S), and '**Least Preferred**' (L)

Based on this evaluation, the Option 2 alignment, comprising an eastward continuation of the Spine Road towards the Mixed Use Node at Creditview Road, and ultimately Block 51-2, is recommended for implementation in Block 51-1.

11.2.5.2 Spine Road “Corner” Configuration

Given the result of the previous assessment, and the selection of a Spine Road alignment that makes a 90° turn from a generally north-south alignment to an east-west alignment, there then follows the question of how to best achieve this change of direction.

From the perspective of optimizing through movement capacity along this transit supportive corridor, the ideal solution would appear to be that portrayed as Option ‘A’: a broad curve of an appropriate radius connects the two sections of Spine Road, with the northerly collector road extension joining it in a tee configuration.

Unfortunately the horizontal geometry of this approach is difficult. Given the minimum radius required for the curve, and the minimum tangent sections for the intersections at Wanless Drive and the northerly collector extension, the crossing of the NHS gets pushed further to the north, into an area requiring a much longer crossing, with commensurately greater impacts.

The Option ‘B’ alternative implements a traditional intersection. While requiring Spine Road “through traffic” to make turning movements at this location, this alternative has the advantage that NHS impacts are minimized, and the orthogonal configuration of the collector roads in Mixed Use Node #2 is more supportive of the intensified urban form being sought in this area.

Option ‘C’ employs a roundabout as a solution. While enjoying the advantages of Option ‘B’ with respect to minimizing NHS impacts and preserving an orthogonal collector road structure, implementation of a roundabout within Mixed Use Node #2 would require more space than an intersection, in an area for which compact urban form is a key principle. In addition, while roundabouts generally provide a reasonable level of service for vehicular traffic, they do so at the cost of reduced convenience to pedestrians and bicycles. A more fulsome discussion regarding the implementation of roundabouts in Block 51-1 can be found in Section 11.3.2.

The following table summarizes the evaluation of these three alternative alignments on the basis of those criteria that serve to differentiate them.

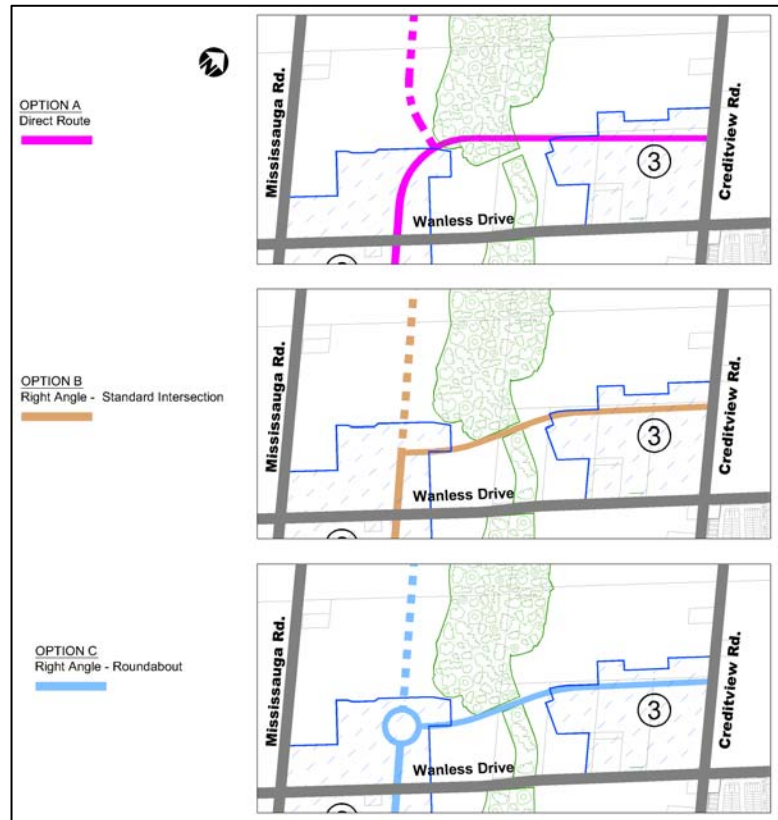


Figure 11.7 - Spine Road “Corner” Configuration Alternatives

Table 11.5
Evaluation of Spine Road “Corner” Options

Evaluation Criteria		Options		
		A	B	C
Transportation				
T-2	Options ‘A’ and ‘C’ provide better spine road continuity for auto and bus traffic	M	S	M
T-4	All Options provide sufficient capacity for future forecast traffic volumes	M	M	M
T-6	Option ‘C’ does not lend itself to fully controlled pedestrian crossings	M	M	L
Natural Environment				
N-1	Option ‘A’ requires a longer crossing of the NHS: the minimum horizontal geometric requirements (curve radius and tangents) mean that the NHS crossing is pushed further to the north.	L	S	S
Socio-Economic				
S-2	Option ‘C’ is least supportive of a pedestrian scale environment.	M	M	L
S-3	Option ‘B’ provides the best structural framework for development of the adjacent mixed use node.	S	M	S
S-4	Option ‘A’ is more expensive to construct due to the more significant NHS crossing.	L	S	S
S-5	Option ‘B’ requires the least amount of land.	L	M	S
Overall Ranking		2	1	3

Notes:

Option rating symbols represent ‘**Most Preferred**’ (M), ‘**Somewhat Preferred**’ (S), and ‘**Least Preferred**’ (L)

Based on this evaluation, the Option ‘B’ alignment, comprising a standard 3 legged intersection is recommended for implementation in Block 51-1.

11.2.6 SOUTH Section – Evaluation of Collector Road Alternative Alignments

The South evaluation section of Block 51-1 lies south of Sandalwood Parkway, and north of the CNR line and the future James Potter / Creditview Road re-alignment. Within this section, two possible east-west collector alignments have been identified for assessment, and a single north-south collector alignment.

11.2.6.1 East-West Collectors, Route 1 Alternatives

Provision of an east-west collector to serve the area between future James Potter / Creditview Road and the Trans Canada Pipeline was not addressed in the TMP study. An east-west collector road is clearly required in order to serve the area to the east of the Spine Road. Options 1a through 2b have been devised to examine two alternative connection points at each end of this road.

At the east end, the collector road will connect to James Potter / Creditview Road. It can be configured to connect at one of two likely locations, each of which align with a collector road on the other side of James Potter.

Option 1 considers a connection opposite to a new collector road currently under construction in Mount Pleasant Village. This collector provides direct access to the transit facilities at the heart of the Village, will be equipped with dedicated bike lanes, and meets James Potter / Creditview Road on a tangent section that mitigates any potential sightline issues.

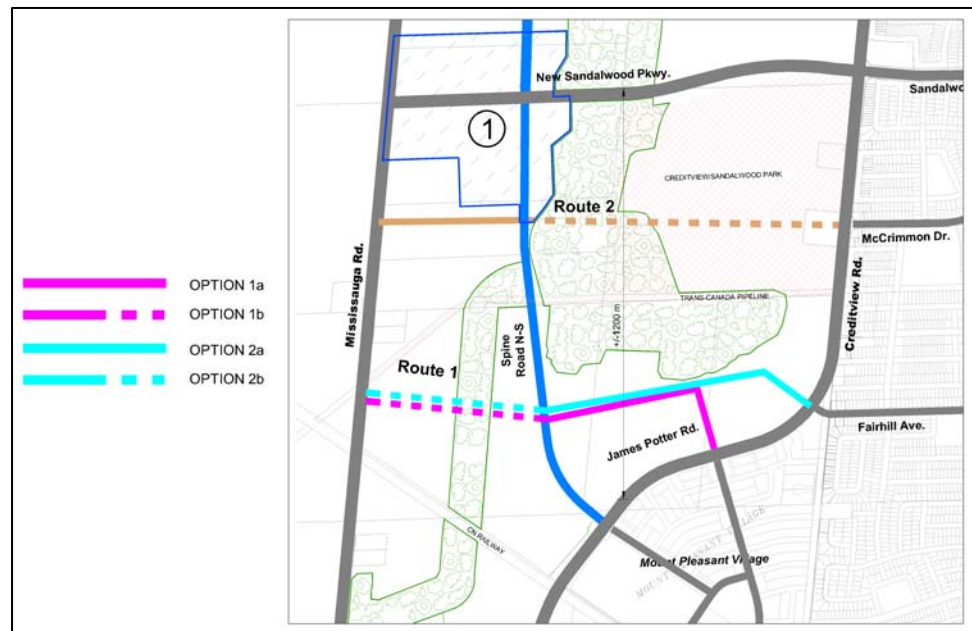


Figure 11.8 - SOUTH Section East-West Collectors, Route 1 Alternatives

Option 2 considers a connection opposite to existing Fairhill Avenue. As the James Potter / Creditview Road re-alignment is constructed to connect to existing Creditview Road, Fairhill Avenue will be extended and appropriately curved so as to meet James Potter Road at a 90° angle. Given the fact that this connection is made on the outside of the curve, the EA conducted for the re-alignment of James Potter / Creditview Road concluded that a three legged intersection could be safely implemented in this location. The Option 1 alternative in Figure 11.8 envisages a connection of the east-west collector road so as to form the fourth leg of this intersection. Given the location of the connection on the inside of the curve, this presents a sightline issue.

Both Options '1a' and '2a' terminate at the Spine Road. Options '1b' and '2b' extend to the west past the Spine Road to Mississauga Road, providing additional east-west capacity, and excellent

connectivity to a major regional arterial road. However, this involves an additional crossing of the NHS, and would require a connection to Mississauga Road that is in an area likely to be affected by the future CNR grade separation.

The following table summarizes the evaluation of these alternative alignments on the basis of those criteria that serve to differentiate them.

Table 11.6
Evaluation of SOUTH Section – East-West Route 1 Collector Road Alignment Alternatives

Category		Options			
		1a	1b	2a	2b
Transportation					
T-2	Options '1b' & '2b' provide better collector road to arterial road connectivity.	S	M	S	M
T-2	Options '1a' & '1b' provide an additional direct collector road connection to Mount Pleasant Village	M	M	S	S
T-3	Options '1b' & '2b' require an intersection at Mississauga Road that may be difficult or impossible to construct due to the future CNR grade separation	S	L	S	L
T-3	Options '2a' & '2b' intersect James Potter / Creditview Road on an inside curve at Fairhill Ave. This is not desirable with respect to sightlines.	S	S	L	L
T-4	All Options provide sufficient capacity for future forecast traffic volumes	M	M	M	M
T-6	Options '1a' & '1b' provide an opportunity to connect the active transportation facilities in Mount Pleasant Village to the NHS.	M	M	S	S
Natural Environment					
N-1	Options '1b' & '2b' require an additional crossing of the NHS	S	L	S	L
Socio-Economic					
S-4	Options '1b' & '2b' are more expensive to construct and maintain.	M	L	S	L
S-5	Options '1b' & '2b' require more land	M	L	S	L
Overall Ranking		1	2	2	4

Notes:

Option rating symbols represent **'Most Preferred'** (M), **'Somewhat Preferred'** (S), and **'Least Preferred'** (L)

Based on this evaluation, the Option '1a' alignment, comprising a collector road aligned to the east of the Spine Road, with no connection to Mississauga Road, and connected to the eastern active transportation corridor in the Mount Pleasant Village is recommended for implementation in Block 51-1.

11.2.6.2 East-West Collectors, Route 2 Alternatives

The TMP study identified that a collector road is required in order to serve the community to the west of the Spine Road and NHS, and to the south of Sandalwood Parkway. This collector road serves to connect this community to both the Spine Road and to Mississauga Road. The connection to Mississauga Road is far enough north that it will not conflict with the proposed CNR grade separation, which is anticipated to be an overpass. This is shown as Option 1 in the figure to the right.

An extension of this collector road east to Creditview Road, connecting in the vicinity of McCrimmon Drive (shown as Option 2) would provide considerably improved connectivity in this section.

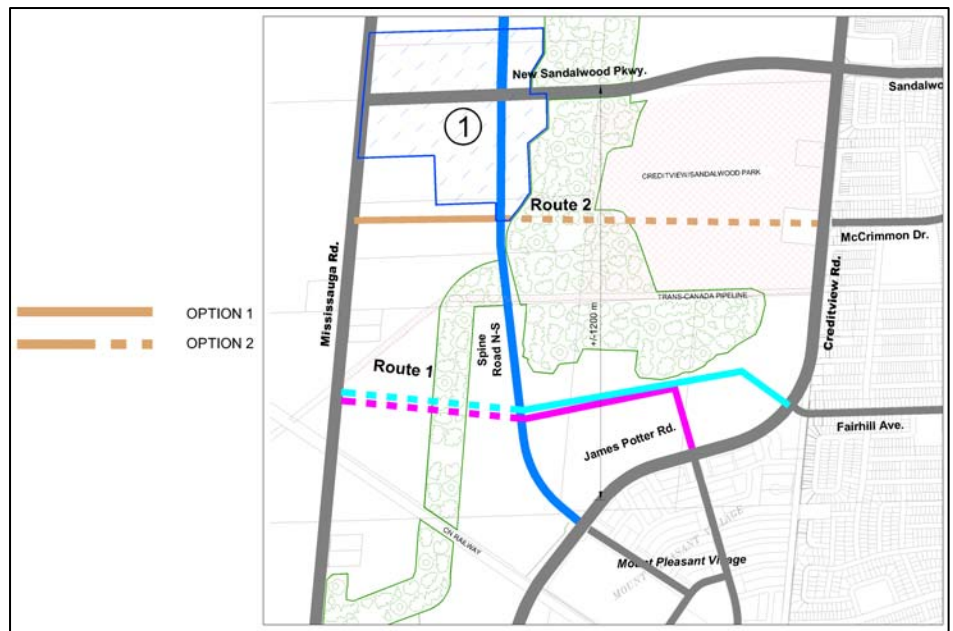


Figure 11.9 - SOUTH Section: East-West Collectors, Route 2 Alternatives

However, there are clearly impediments to doing this. An additional crossing of the NHS in this vicinity would be costly and disruptive.

In addition, an alignment through the Creditview Sandalwood Park would cause serious impacts to that facility, taking away valuable space and dividing the facility into two pieces.

The following table summarizes the evaluation of these two alternative alignments on the basis of those criteria that serve to differentiate them.

Table 11.7
Evaluation of SOUTH Section – East-West Route 2 Collector Road Alignment Alternatives

Category	Options	
	1	2
Transportation		
T-2 Option '2' provides better collector road to arterial road connectivity.	S	M
T-4 All Options provide sufficient capacity for future forecast traffic volumes	M	M
Natural Environment		
N-1 Option '2' requires an additional crossing of the NHS, as well as of the Sandalwood / Creditview Community Park.	M	L
Socio-Economic		
S-3 Option '2' negatively impacts the existing Sandalwood / Creditview Community Park by consuming existing recreational space, and dividing the park into two separate pieces.	M	L
S-4 Option '2' is more expensive to construct and maintain.	S	L
Overall Ranking	1	2

Notes:

Option rating symbols represent **'Most Preferred'** (**M**), **'Somewhat Preferred'** (**S**), and **'Least Preferred'** (**L**)

Based on this evaluation, the Option '1' alignment, comprising a connection between Mississauga Road and the Spine Road only, is recommended for implementation in Block 51-1.

11.2.6.3 North-South Collectors

To the north of Sandalwood Parkway within Block 51-1, there are north-south collector roads located approximately mid way between the NHS and the boundary arterial roads (Mississauga Road to the west and Creditview Road to the east). South of Sandalwood Parkway, however, the TMP study did not recommend a north-south collector connection to the east of the NHS. This was due to the obvious problems that would be encountered in attempting to cross the Sandalwood / Creditview Community Park, as well as the extensive NHS area to the south of it. As part of this review of the collector road network, this alternative is being assessed once again in order to confirm the TMP conclusion.

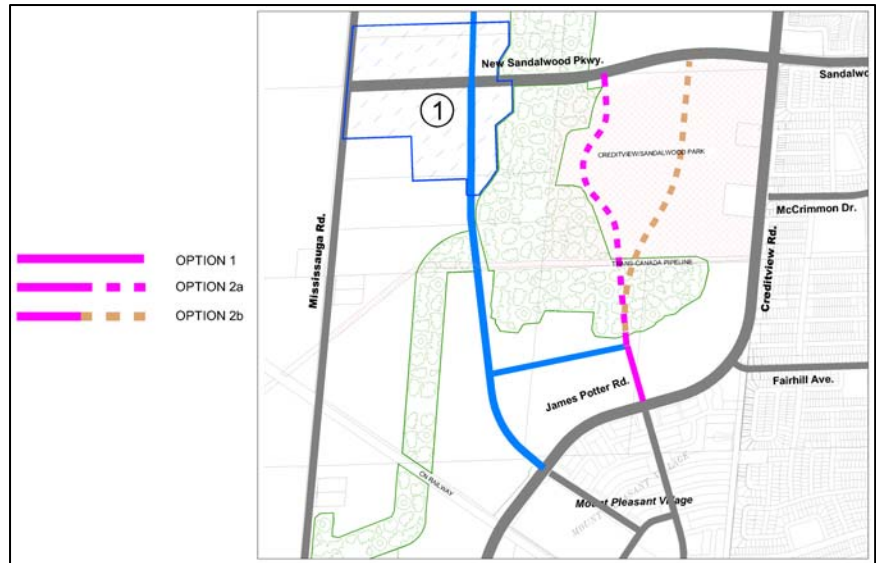


Figure 11.10 - SOUTH Section: North-South Collector Alternatives

Option 1 reflects the TMP recommendation to avoid aligning a collector road north through the NHS and Community Park.

Option 2a and 2b consider two possible alignments for a northward extension. Option 2a follows the western edge of the park to avoid subdividing it, but nevertheless would have a significant impact on both the park and the NHS to the west.

Option 2b has less of an impact on the NHS to the west of the park, but subdivides the park into two areas.

The following table summarizes the evaluation of these alternative alignments on the basis of those criteria that serve to differentiate them.

Table 11.8
Evaluation of SOUTH Section – North-South Collector Road Alignment Alternatives

Category	Options			
	1	2a	2b	
Transportation				
T-2	Options '2a' and '2b' provide better collector road to arterial road connectivity.	L	M	M
T-4	All Options provide sufficient capacity for future forecast traffic volumes	M	M	M
Natural Environment				
N-1	Options '2a' and '2b' require an additional crossing of and intrusion into the NHS.	M	L	L
Socio-Economic				
S-3	Options '2a' and '2b' negatively impact the existing Sandalwood / Creditview Community Park. Option '2a', located along the west edge of the park would have less impact than Option '2b'.	M	S	L
S-4	Options '2a' and '2b' are substantially more expensive to construct and maintain.	M	L	L
Overall Ranking		1	2	3

Notes:

Option rating symbols represent '**Most Preferred**' (M), '**Somewhat Preferred**' (S), and '**Least Preferred**' (L)

Based on this evaluation, the Option '1' alignment, which is confined to the developed area just to the north of future James Potter / Creditview Road and does not extend into the NHS or cut through the Sandalwood / Creditview Community Park, is recommended for implementation in Block 51-1.

11.2.7 CENTRAL Section - Evaluation of Collector Road Alternative Alignments

The Central evaluation section of Block 51-1 lies north of the future Sandalwood Parkway alignment, and south of Wanless Drive.

11.2.7.1 East-West Collectors

In this Central section of the Block 51-1 community, the NHS creates a clear division into an east and a west area. In order for the community to function, there needs to be one or more east-west collector roads that internally connect these east and west portions. Without this connection, residents of the two areas would be required to use the adjacent arterial roads to travel between them.

In the Fletcher's Meadow community directly to the east of Block 51-1, there are three east-west collector roads that connect with Creditview Road, namely Crown Victoria Drive, Buick Boulevard, and El Camino Way. Any of these three could potentially be extended into Block 51-1, and aligned westward to provide connections across the NHS, and ultimately to Mississauga Road. However, Buick Boulevard is the best connected route as it extends on a generally mid-block alignment through the entire Fletcher's Meadow community to Chinguacousy Road, and then renamed as Earlsbridge Boulevard to McLaughlin Road.

The collector road network recommended in the Phase 1 and 2 Transportation Master Plan Study included extensions of the northern and southern pair of these collector roads: Crown Victoria Drive and El Camino Way. This configuration is shown as Option 1. While providing excellent connectivity



Figure 11.11 - CENTRAL Section: East-West Collector Alternatives

between the two areas of the community, this configuration necessitates two crossings of the NHS.

Further consideration of this issue was undertaken during the preparation of the Mount Pleasant Secondary Plan, as a result of which it is an extension of just Buick Boulevard that is shown on the Secondary Plan road network (see Figure 3.1). This configuration is shown as Option 2 in the above figure. The very clear advantages of this option are the single NHS crossing, and the continuation of the already very well connected mid-block collector Buick Boulevard.

Table 11.9 documents the evaluation of these two alternatives.

As noted in the evaluation, while Option 2 is superior to Option 1 in most regards, Option 1 is actually superior to Option 2 with respect to criteria **T-2; Connectivity**. It is important that all areas of Block 51-1 be appropriately connected to the arterial road network in order that drivers have redundant routing options, and that the potential for critically loaded, single mid-block intersections be avoided. As a general rule, it is desirable to have 2-3 collector to arterial connections on any given block face. In order to ensure that the recommended Option 2 (Buick Boulevard) configuration does not lead to connectivity problems of this kind, the following additional connections have been made in the proposed Block Plan.

On the section of Creditview Road between Sandalwood Parkway and Wanless Drive, a second collector to arterial connection is created by extending El Camino way into Block 51-1 as far as the eastern north-south collector road.

On Mississauga Road, the problem is more challenging due to the Region of Peel’s intersection spacing requirements (see section 8.3.3). Along this edge of Block 51-1, between Sandalwood Parkway and Wanless Drive, additional collector to arterial connectivity has been provided by introducing two additional access points, one to the south and one to the north of Buick Boulevard. Both of these comprise right-turn-in / right-turn-out access points that will be designed to an appropriate standard.

Table 11.9
Evaluation of CENTRAL Section – East-West Collector Road Alternative Alignment Options

Category		Options	
		1	2
Transportation			
T-2	Option 1 provides better collector road to arterial road connectivity within Block 51-1.	M	S
T-2	Option 2 provides better connectivity through the community to the east via Buick Boulevard.	S	M
T-4	Both Options provide sufficient capacity for future forecast traffic volumes	M	M
T-6	Option 2 connects more directly to the existing bicycle route along Buick Boulevard.	S	M
Natural Environment			
N-1	Option '2' has a single crossing of the NHS at its narrowest point. Option 1 requires two crossings of the NHS.	L	M
Socio-Economic			
S-4	Option 1 is substantially more expensive to construct and maintain.	L	M
Overall Ranking		2	1

Notes:

Option rating symbols represent **'Most Preferred'** (M), **'Somewhat Preferred'** (S), and **'Least Preferred'** (L)

Based on this evaluation, the Option '2' alignment, comprising a single east-west collector road aligned with Buick Boulevard at Creditview Road is recommended for implementation in Block 51-1.

11.2.7.2 North-South Collector

In the area to the east of the NHS, the TMP collector road network included a single, continuous north-south collector road connection, shown as Option 2 in Figure 11.12.

While this area is clearly not sufficiently wide to warrant two such connections, it is by the same token narrow enough at the mid point that the possibility of a non-continuous collector, as shown in Option 1, could be considered. While this latter option does not provide the same road network continuity or connectivity, it is slightly less expensive to build.

The following table documents the evaluation of the two alternatives.

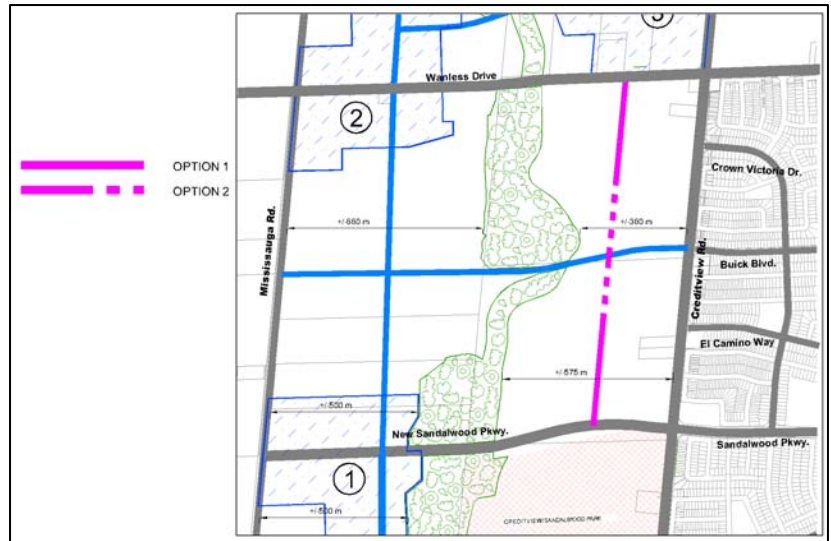


Figure 11.12 - CENTRAL Section: North-South Collector Alternatives

Table 11.10

Evaluation of CENTRAL Section – North-South Collector Road Alternative Alignment Options

Category		Options	
		1	2
Transportation			
T-2	Option 2 provides better collector road to arterial road connectivity.	S	M
T-4	Both Options provide sufficient capacity for future forecast traffic volumes	M	M
T-5	Option 2 provides better opportunities for potential community bus service.	S	M
Natural Environment			
There is no appreciable difference between these two options.		M	M
Socio-Economic			
S-4	Option 2 is somewhat more expensive to construct and maintain.	M	S
Overall Ranking		2	1

Notes:

Option rating symbols represent 'Most Preferred' (M), 'Somewhat Preferred' (S), and 'Least Preferred' (L)

Based on this evaluation, the Option '2' alignment, comprising a continuous north-south oriented collector road connection, is recommended for implementation in Block 51-1.

11.2.8 NORTH Section – Evaluation of Collector Road Alternative Alignments

The North evaluation section of Block 51-1 lies south of Mayfield Road, and north of Wanless Drive.

11.2.8.1 East-West Collectors, Route 1 Alternatives

The TMP study recommends a single east-west collector connection across the NHS in this section of Block 51-1. The case against such a connection is straightforward; it entails an additional NHS crossing, and provides only modest additional benefit with respect to collector road capacity and connectivity within the Block.

The following table documents the evaluation of the two alternatives.

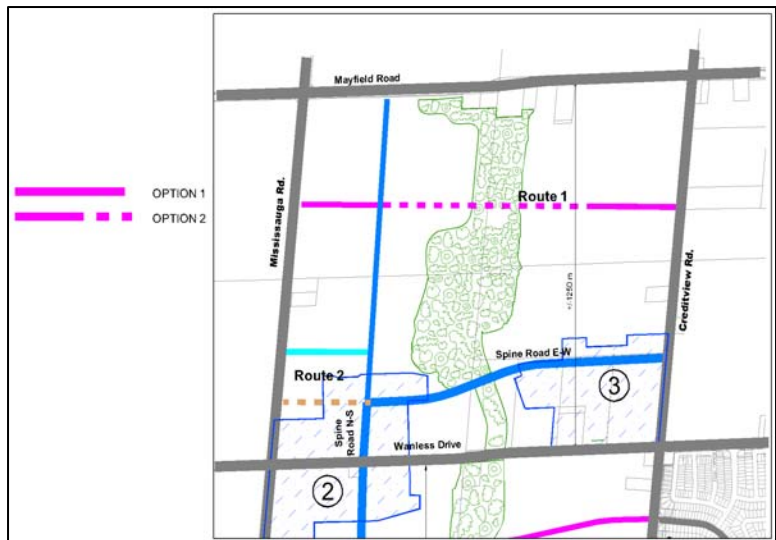


Figure 11.13 - NORTH Section: East-West Collectors, Route 1 Alternatives

Table 11.11
Evaluation of NORTH Section – East-West Route 1 Collector Road Alternative Alignment Options

Category		Options	
		1	2
Transportation			
T-2	Option 2 provides better collector road to arterial road connectivity.	S	M
T-4	Both Options provide sufficient capacity for future forecast traffic volumes	M	M
Natural Environment			
N-1	Option '2' requires an additional crossing of the NHS.	M	L
Socio-Economic			
S-4	Option 2 is substantially more expensive to construct and maintain.	S	L
Overall Ranking		1	2

Notes:

Option rating symbols represent '**Most Preferred**' (M), '**Somewhat Preferred**' (S), and '**Least Preferred**' (L)

Based on this evaluation, the Option '1' alignment is recommended for implementation in Block 51-1.

11.2.8.2 East-West Collectors, Route 2 Alternatives

The southern east-west collector in this section largely comprises the east-west Spine Road, which extends from the north-south Spine Road to Creditview Road. To the west of the north-south Spine Road, and the collector extension of it to Mayfield Road, there should ideally be an additional collector to arterial connection, for the reasons discussed in Section 11.2.7.1.

Option 1 does not align with the east-west Spine Road, but also stays clear of Mixed Use Node #2 and observes minimum intersection spacing requirements on Mississauga Road.

Option 2 reflects the recommendation in the TMP study. It has the advantage of providing a direct extension of the east-west Spine Road to Mississauga Road, however it introduces an additional, unnecessary collector road into Mixed Use Node #2, and does not respect intersection spacing requirements on Mississauga Road.

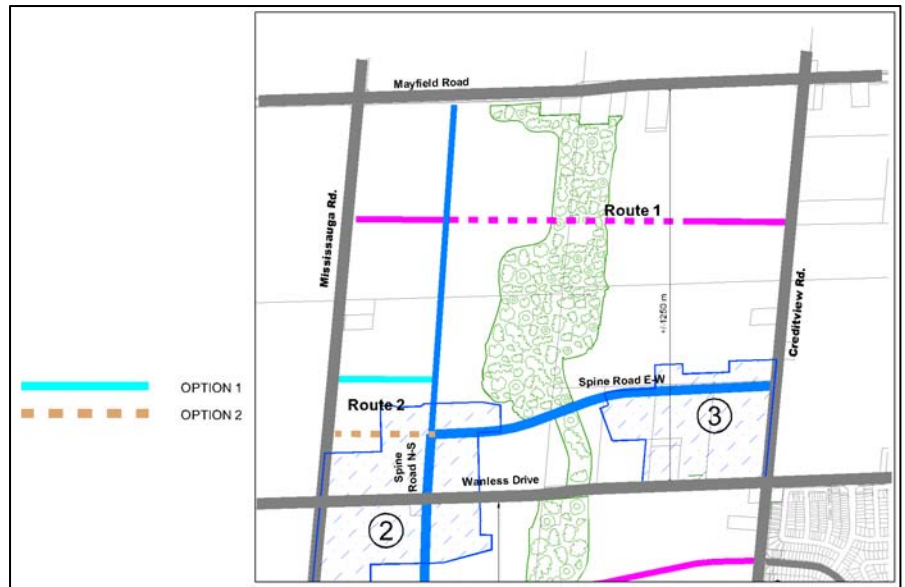


Figure 11.14 - NORTH Section: East-West Collectors, Route 2 Alternatives

The following table documents the evaluation of the two alternatives.

Table 11.12
Evaluation of NORTH Section – East-West Route 2 Collector Road Alternative Alignment Options

Category	Options	
	1	2
Transportation		
T-3 Option '2' requires an intersection with Mississauga Road that is spaced too close to the future major intersection of Mississauga Road with Wanless Drive.	M	L
T-4 Both Options provide sufficient capacity for future forecast traffic volumes	M	M
Natural Environment		
There are no appreciable differences between the two options with respect to the Natural Environment	S	S
Socio-Economic		
There are no appreciable Socio-Economic differences between the two options.	S	S
Overall Ranking	1	2

Notes:

Option rating symbols represent 'Most Preferred' (M), 'Somewhat Preferred' (S), and 'Least Preferred' (L)

Based on this evaluation, the Option '1' alignment is recommended for implementation in Block 51-1.

11.2.8.3 North-South Collectors

In the area to the east of the NHS, the TMP collector road network included a single, continuous north-south collector road connection, shown as Option 2 in Figure 11.15.

This area is clearly not sufficiently wide to warrant two such connections. It is possible that a non-continuous collector, as shown in Option 1, could be considered. While this latter option does not provide the same road network continuity or connectivity, it is slightly less expensive to build.

The following table documents the evaluation of the two alternatives.

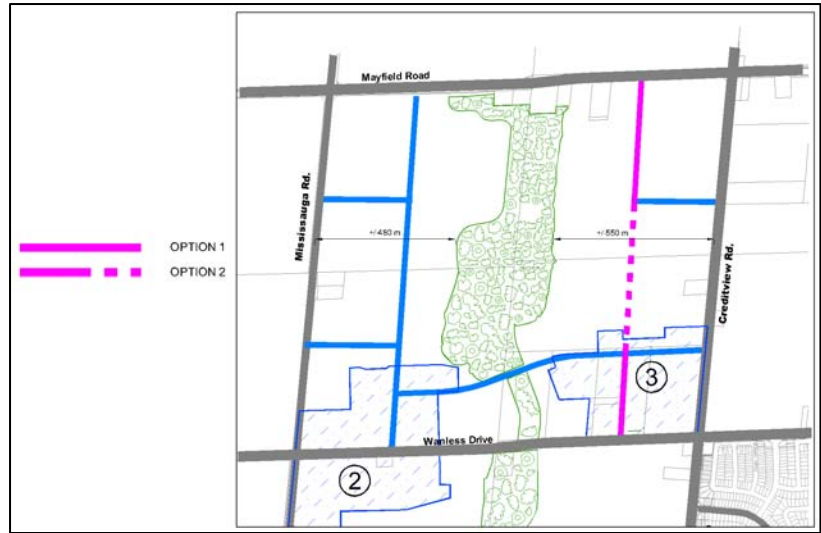


Figure 11.15 - NORTH Section: North-South Collector Alternatives

Table 11.13
Evaluation of NORTH Section –
North-South Collector Road Alternative Alignment Options

Category		Options	
		1	2
Transportation			
T-2	Option 2 provides better collector road to arterial road connectivity.	S	M
T-4	Both Options provide sufficient capacity for future forecast traffic volumes	M	M
T-5	Option 2 provides better opportunities for potential community bus service.	S	M
Natural Environment			
There are no appreciable differences between the two options with respect to the Natural Environment		S	S
Socio-Economic			
S-4	Option 1 is somewhat more expensive to construct and maintain.	S	M
Overall Ranking		2	1

Notes:

Option rating symbols represent 'Most Preferred' (M), 'Somewhat Preferred' (S), and 'Least Preferred' (L)

Based on this evaluation, the Option '2' alignment is recommended for implementation in Block 51-1.

11.2.9 Recommended Collector Road Network Alignments

Figure 11.16 summarizes the complete recommended collector road network for Mount Pleasant Block 51-1, based on the foregoing assessments of alternative alignments.

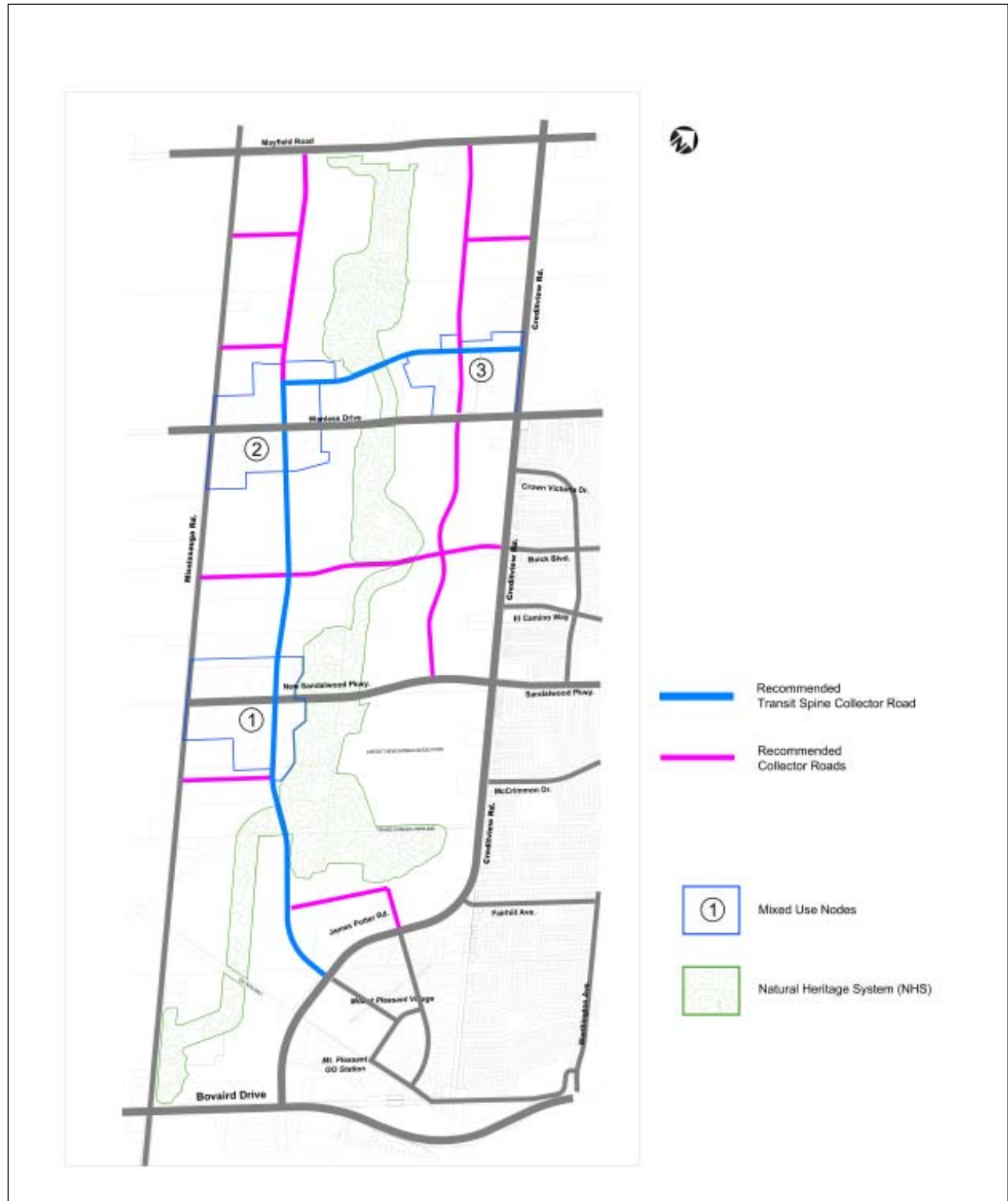


Figure 11.16 - Recommended Collector Road Network

11.3 Collector Road Intersections

Generally, all intersections between City roads in Block 51-1 will be designed to meet City standards. In most cases, the intersection requirements can be met within the standard right-of-way for the class of road under consideration.

Spine Road intersections with arterial roads are an exception to this, and are explicitly dealt with in Sections 9.6.2 and 10.1.1.

11.3.1 Collector / Regional Arterial Intersections

The Block 51-1 road network complies with Region of Peel intersection spacing requirements as documented in the Region's Controlled Access By-law 59-77, as amended in 1993. This stipulates that all moves intersection on Regional roads must be spaced a minimum of 300m apart. It also lays out the requirements for commercial site access onto Regional Roads.

As mentioned in the evaluation of the east-west Buick Boulevard extension in Section 11.2.7.1, it is important that all areas of Block 51-1 be appropriately connected to the arterial road network in order that:

- drivers have redundant routing options. Insofar as is possible, they should not be forced to use a particular route,
- the risk of having critically loaded, monolithic mid-block intersections be minimized. Additional connections provide the ability for the network to undergo "load balancing" when there is a problem due to accidents, construction, and so on.

As a general rule, it is desirable to have 2-3 collector to arterial connections on any given major block face (for example along Mississauga Road between Sandalwood Parkway and Wanless Drive).

Table 11.14 summarizes the collector road access points to the Regional Road Network, indicating the spacing from adjacent arterial intersections and/or access points, and any turn restrictions that are proposed. (Figure 10.7 in the previous section of the report also illustrates the location where turn restrictions are proposed, as well as potential commercial access locations and configurations.)

The enumeration of collector road intersections in the table starts at Bovaird Drive and future James Potter Road, and moves clockwise around Block 51-1.

**Table 11.14
Collector to Regional Arterial Access Point Summary**

Arterial Corridor	Intersecting Arterial	Distance	Collector Road	Moves	Control
Bovaird Drive	James Potter Road				
		300m			
			Collector Access to Commercial Block	All Moves	Signalized
		300m			
	Mississauga Road				
Mississauga Road	Bovaird Drive				
		1,475m			
			Collector Road 'C'	All Moves	Signalized
		350m			
	Sandalwood Parkway				
		350m			
			Local Road, restricted moves	Right In / Right Out	Yield
		225m			
			Buick Boulevard	All Moves	Signalized
		225m			
			Local Road, restricted moves	Right In / Right Out	Yield
		450m			
	Wanless Drive				
		375m			
			Collector Road 'D'	All Moves	Signalized
		500m			
			Collector Road 'F'	All Moves	Signalized
	375m				
Mayfield Road					
Mayfield Road	Mississauga Road				
			300m		
			Collector Road 'E'	All Moves	Signalized
		750m			
			Collector Road 'G'	All Moves	Signalized
	310m				
Creditview Road					

11.3.2 Roundabout Assessment

As a part of the design and planning work for Block Plan Area 51-1 in the Mount Pleasant Community, the consulting team have considered the implementation of roundabouts as an alternative to traditional intersections at several key locations. For example, refer to the evaluation of alternatives conducted in Section 11.2.5.

For a variety of context sensitive reasons, discussed in detail below, no locations have been identified in the Block 51-1 plan at which the implementation of roundabouts is deemed to provide a superior intersection solution.

11.3.2.1 Regional Arterial intersections

There are a number of locations in Block 51-1 where community collector roads intersect with Region of Peel arterial roads. The Region of Peel is currently investigating the potential for the introduction of multi-lane roundabouts on regional arterial roads through the arterial road Environmental Assessment process. As of this writing, they have not yet selected any locations at which to implement intersection treatments of this type. With respect to Mississauga Road between Bovaird Drive and Mayfield Road, for which the Environmental Assessment study is close to completion, Region of Peel staff have confirmed that no roundabouts will be implemented.

Should it be desired to consider a roundabout treatment at an intersection between a community collector road and a regional arterial road, it must be recognized that the operational impacts and implementation challenges are of more significance within the arterial road right-of-way. Thus, it is through the Environmental Assessment study for the arterial road that this alternative treatment should be considered, not through this Collector Road EA study.

11.3.2.2 City Arterial intersections

There are a number of locations in Block 51-1 where community collector roads intersect with City of Brampton arterial roads. As with the regional arterial roads discussed above, the operational impacts and implementation challenges associated with the introduction of a multi-lane roundabout are of more significance within the arterial road right-of-way. It is thus through the arterial road Environmental Assessment study process that consideration of these intersection treatments must be considered.

To date, the City of Brampton has completed Environmental Assessment studies for the following arterial road adjacent to Block 51-1:

- the re-alignment of James Potter Road / Creditview Road from Bovaird Drive to north of Fairhill Avenue,
- the widening of Creditview Road from 2 to 4 lanes between Fairhill Avenue and Mayfield Road, and
- the extension of Sandalwood Parkway from Creditview Road to Mississauga Road

None of these studies identified roundabouts as a preferred treatment for any of the intersections along their length. Furthermore, as of this writing, the City of Brampton has not yet implemented a roundabout on a multi-lane arterial road facility.

Should it be desired to consider a roundabout treatment at an intersection between a community collector road and a City arterial road, it must be recognized that the operational impacts and implementation challenges are of more significance within the arterial road right-of-way. Thus, it is through the Environmental Assessment study for the arterial road that this alternative treatment should be considered, not through the Collector Road EA.

11.3.2.3 Community Collector - Collector Road intersections

There are a number of locations in the Block 51-1 plan where collector / collector road intersections occur. These are circumstances in which there are precedents within the City of Brampton for roundabout treatments.

A review was conducted of the literature regarding Roundabouts in new development areas. Of note in this review was:

- a report prepared for the City of Brampton by Ourston Roundabouts Canada, and titled *'Appropriateness of Roundabouts in New Development Areas, Phase 1 Report(Springbrook Block Plan)'*
- a US Department of Transportation, Federal Highway Administration publication entitled *'Roundabouts, an Informational Guide'*

Both reports concur regarding the appropriateness of considering roundabouts for application in areas such as the Block 51-1 community. Roundabouts are a "design solution" to the transportation challenge posed by intersecting streams of traffic, bicycles, and pedestrians. Like any other solution to a challenge, there are both positive aspects and negative aspects: no solution is perfectly applicable in all situations.

While acknowledging the positive aspects of roundabouts with respect to managing traffic flow, reducing delays to vehicular traffic, and increasing safety for most road users, two aspects of roundabout implementation were noted in these reports that have a particular bearing on the collector-collector road intersections in Block 51-1.

First of all neither report recommends routing bicycle lanes through a roundabout. While the Ourston report recommends integrating the bicycle traffic within the vehicular traffic stream in the roundabout, the FHWA report suggests accommodating the bicycles in a path segregated from traffic, and possibly shared with pedestrians.

Secondly, while pedestrian safety records are consistently better at roundabouts than at traditional intersections, it is not clear that it is desirable or appropriate to place roundabouts near schools. There are no examples of roundabouts in close proximity to schools in the Greater Toronto Area, and very few in the United States. There is thus very little safety data for this circumstance. What is clear, however, is that crossing guards would be required at these locations due to:

- the yield control nature of roundabouts (as opposed to stop control at traditional intersections),

- the fact that most children are not experienced with roundabouts or with yield traffic control situations, and
- the fact that children do not necessarily behave as responsibly or safely as the typical adult pedestrian.

Deployment of crossing guards at a roundabout is a challenge. Whereas the average collector intersection generally requires no more than one crossing guard, some jurisdictions require the placement of two crossing guards per approach road since the traffic is free flowing in both directions on each approach.

In light of these concerns, City of Brampton staff have taken the position in the past on behalf of both the City and the Peel school boards that roundabouts should not be placed in proximity to schools.

The collector-collector road intersections to be found in the Block 51-1 plan are listed in Table 11.15. The presence of Bicycle Lanes on either of the two intersecting roads is noted, as is the proximity to any nearby schools. If either of these two situations exist, then the intersection location is rejected as a candidate for a roundabout treatment.

Table 11.15
Collector-Collector Intersections in Block 51-1

1 st Street	2 nd Street	Bicycle Lanes	School Proximity	Roundabout Candidate
Collector Rd 'A'	Collector Rd 'B'	Yes	Somewhat	No
N-S Spine Rd	Collector Rd 'B'	Yes	Yes	No
N-S Spine Rd	Collector Rd 'C'	Yes	Yes	No
N-S Spine Rd	Buick Blvd	Yes	Yes	No
N-S Spine Rd	E-W Spine Rd	Yes	No	No
Collector Rd 'E'	Collector Rd 'D'	Yes	No	No
Collector Rd 'E'	Collector Rd 'F'	Yes	Yes	No
Collector Rd 'G'	Collector Rd 'H'	No	Yes	No
Collector Rd 'G'	E-W Spine Rd	Yes	No	No
Collector Rd 'G'	Buick Blvd	No	Yes	No
Collector Rd 'G'	El Camino Way	No	Yes	No

As can be seen, all of the candidate intersections either have bicycle lanes, or are located in close proximity to a school. As a result, it has been agreed that there are no collector-collector road intersections that make good candidates for roundabout treatment in Block 51-1.

12.0 Local and Other Lower Order Roads

12.1 Minor Local Roads

The standard to be used for local roads in the Block 51-1 community was established in the *Memorandum of Understanding* between the Landowner's Group and the City of Brampton, as described in Section 3.1, "**Mount Pleasant Secondary Plan and Block Plan**". It is proposed to construct local roads within Block 51-1 as per City Standard 200A for Minor Local Roads, and as shown in Figure 12.1. Comprising 7.50m of pavement in a 16.50m right of way, these roads accommodate two travel lanes, and parking on one side. A sidewalk is located on one side with street trees with grass boulevards on both sides.

12.2 Public Rear Lanes

Within some areas of Block 51-1, notably within the Mixed Use Nodes, it is proposed to build some rear-loaded housing, primarily comprising townhouses. The public laneways introduce a traditional urban form that benefits the community by minimizing interruptions along the street front, creating an urban street edge, and providing opportunities for curbside street parking. With respect to the rear lane standards to be used in these cases, it is proposed to construct them using City Standard 219A for Rear Laneways with Garages Both Sides, as shown in Figure 12.2. The design of these laneways has been undertaken in such a way as to address operational considerations related to visibility, and large vehicle access such as might be required for fire fighting, garbage collection, and snow removal.

12.3 Buffer Roads

City Standard 201B for Buffer Roads is proposed to be applied to all window and buffer road situations as shown in Figure 12.3. The 3.00m buffer strip associated with these roads can accommodate grade differences as may be necessary between the local road and adjacent arterial road, while filtering noise and visual impacts through landscaping.

12.4 Slip-Off Lanes

Figure 12-4 illustrates the current road section design for a series of Slip Off lanes or Eyebrow Roads that are proposed on the south side of re-aligned James Potter / Creditview Road on the periphery of the Mount Pleasant Village. These roads allow for houses to be constructed with frontage onto an arterial road, while mitigating the need for direct driveway access. By integrating the Slip Off lanes with adjacent rear lane townhouse blocks, they have been configured so as to allow convenient access in all directions, while limiting access at the arterial road to right turns in and out. They also provide for parking on one side. While this type of road is a new one in Brampton, it has been extensively reviewed by staff as a part of the Mount Pleasant Village approval process.

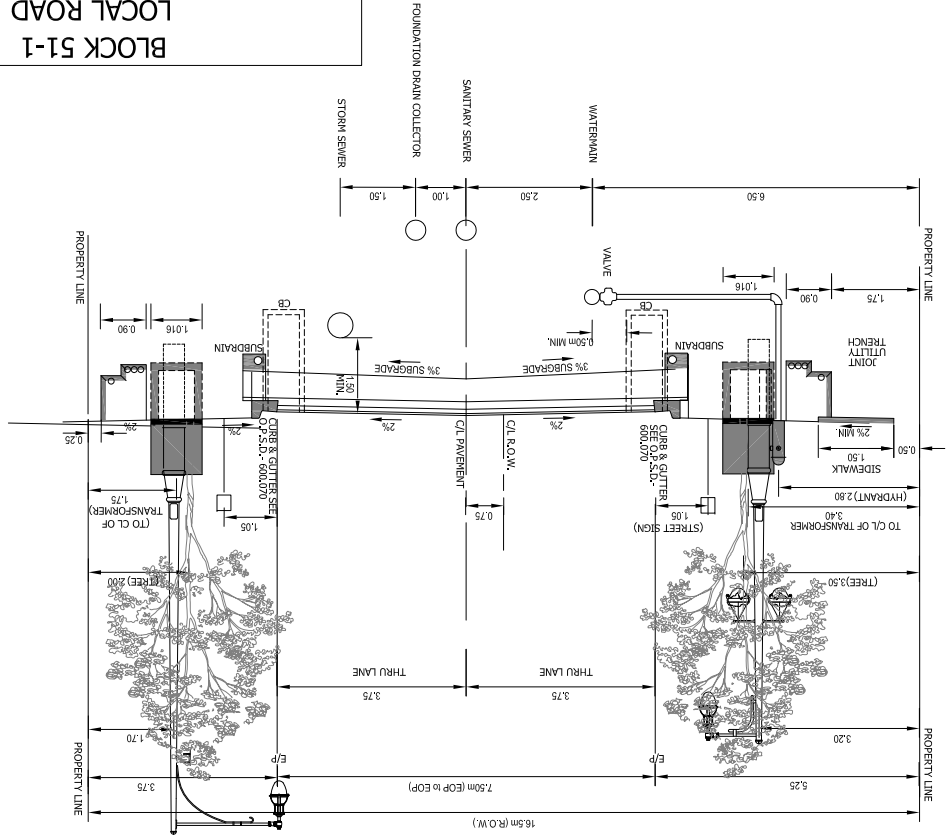
As can be seen on the key plan in Figure 12-4 it is proposed to mirror these Slip Off lanes on the opposite (north) side of re-aligned James Potter / Creditview Road. This will allow frontage conditions to be created on both sides of the road, without the safety and operational problems associated with individual driveways.

It is also proposed to use Slip Off lanes in just one other circumstance in Block 51-1; that is on the east side of the Spine Road just to the north of James Potter / Creditview Road. A unique circumstance on this stretch of road warrants considering Slip Off lanes:

- the area of interest is located on the inside of a long curve which precludes locating local road intersections here
- there is a desire to avoid residential driveway access to the Spine Road in order to minimize interference with transit vehicle operations

In these two localized circumstances in Block 51-1 it is proposed to use Slip Off lanes, and to ensure that they conform to the same standard as is approved for application on the south side of James Potter / Creditview Road.

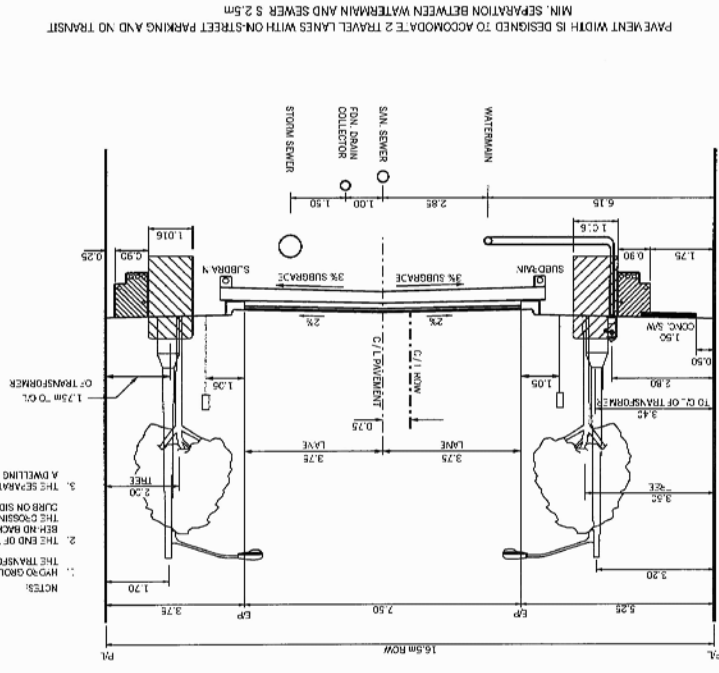
PROPOSED
SECTION
BLOCK 51-1



Block 51-1
LOCAL ROAD
16.5m R.O.W.
2 THRU LANES / PARKING ON ONE SIDE
7.50m PAVEMENT

Note:
Consistent with City Minor Local Road Std.200A

APPROVED
CITY
SECTION

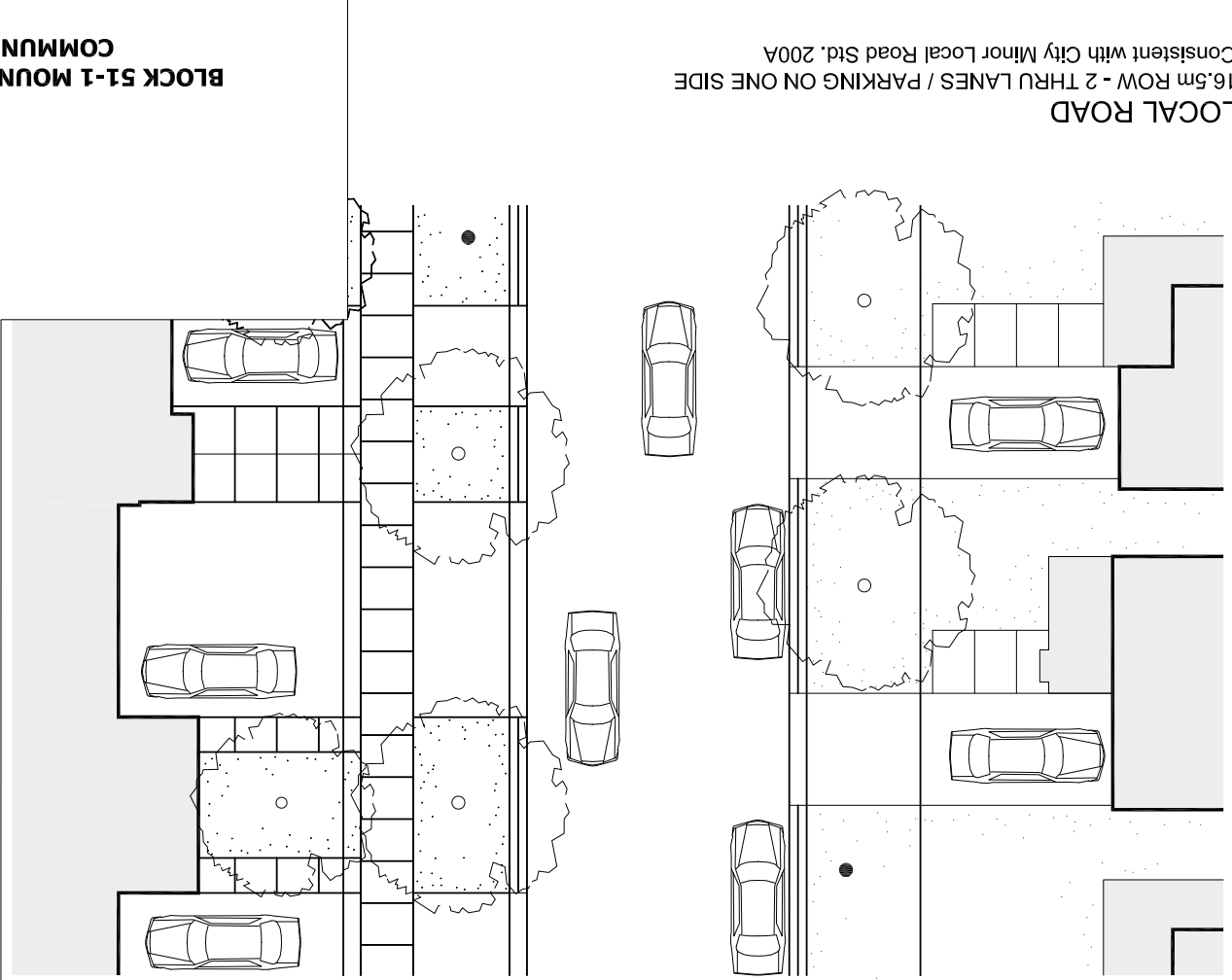


- PAVEMENT WIDTH IS DESIGNED TO ACCOMMODATE 2 TRAVEL LANES WITH ON-STREET PARKING AND NO TRANSIT
MIN. SEPARATION BETWEEN WATERMAIN AND SEWER IS 2.5m
- H2O2 GROUND RODS - ALL BE A MIN. 1.0m FROM THE TRANSFORMER BASE ON ALL SIDES.
 - THE END OF THE HYDRANT CROSSING DIST. WILL TERMINATE 1.2m BEHIND BACK OF CURB WORKING ON THE OTHER CROSS SECTION. THE CROSSING DIST. WILL TERMINATE 0.5m BEHIND THE BACK OF THE CURB ON SIDE OF THE ROAD WITH NO SIDEWALK.
 - THE SEPARATION DISTANCE BETWEEN THE HYDRANT TRANSFORMER AND A DWELLING SHOULD NOT BE LESS THAN 3.0m FACE TO FACE.
- NOTES:

CITY OF BRAMPTON
WORKS AND TRANSPORTATION DEPARTMENT
MINOR LOCAL ROAD
7.5m PAVEMENT ON 16.5m R.O.W.

DATE: 2009 08 12	DATE: 2009 08 12
PREPARED BY: C. Boyle	CHECKED BY: C. Boyle
APPROVED BY: [Signature]	SCALE: N.T.S.
PROJECT NO: 200 A	DATE: 2009 08 12

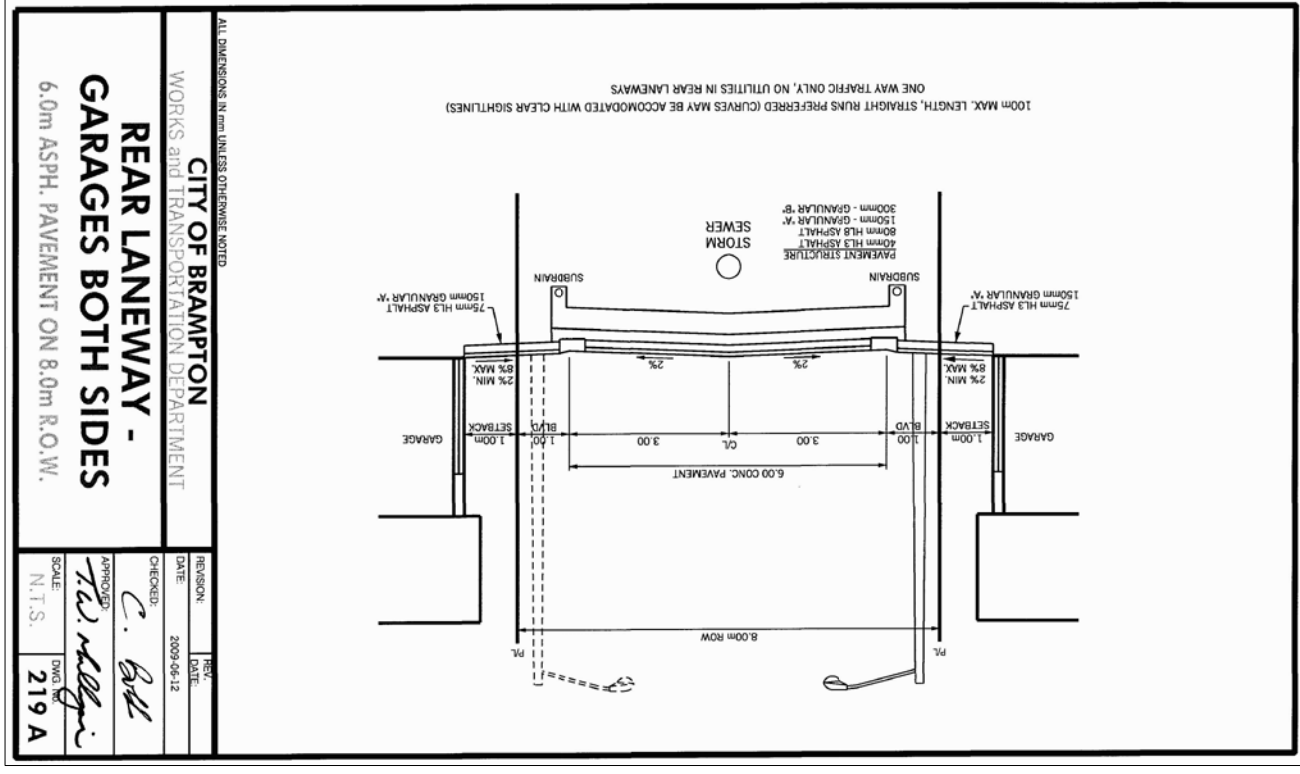
LOCAL ROAD
16.5m ROW - 2 THRU LANES / PARKING ON ONE SIDE
Consistent with City Minor Local Road Std. 200A



ROADS CHARACTERIZATION
16.5m LOCAL ROAD
Figure 12.1

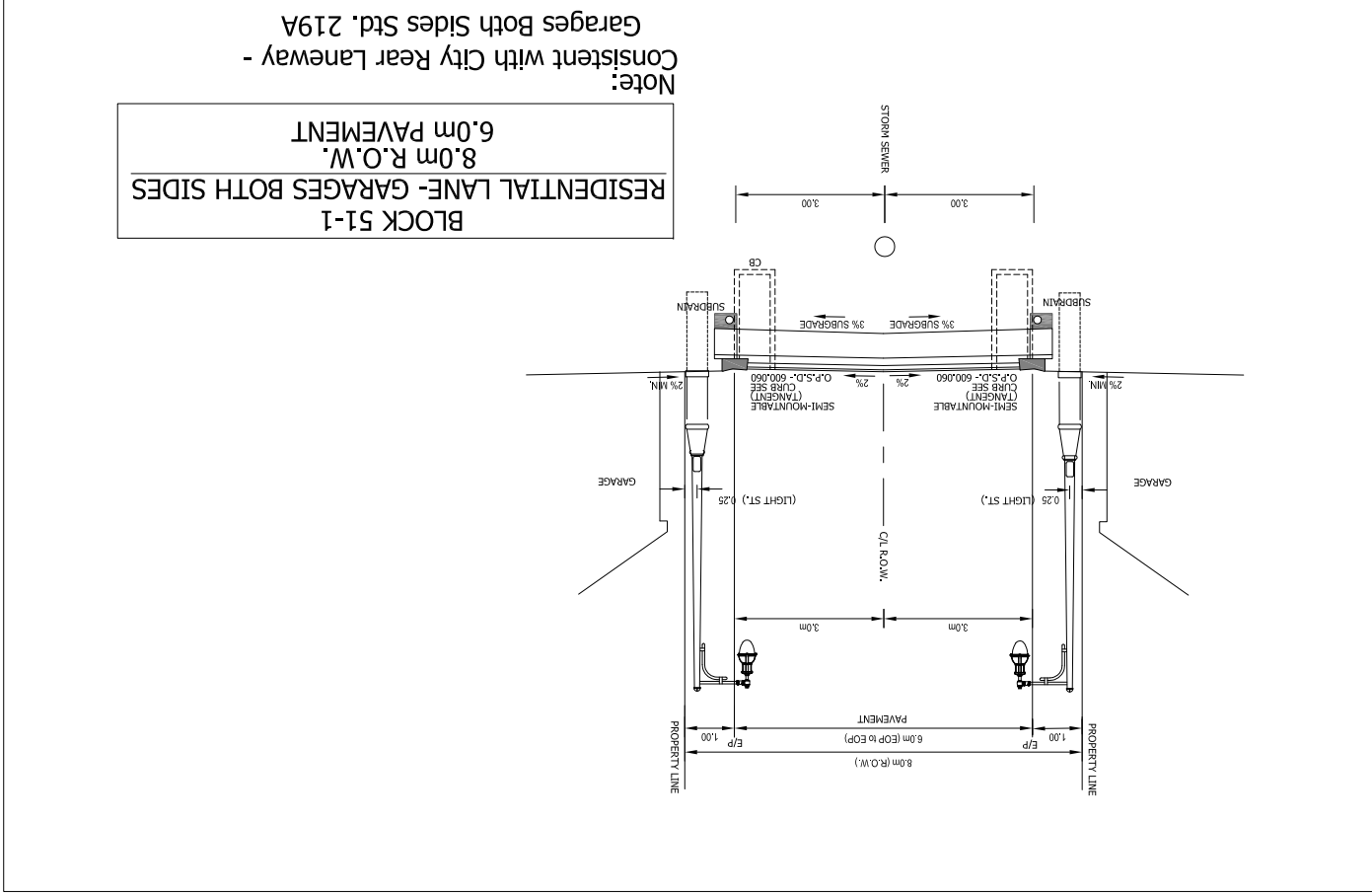
Block 51-1 MOUNT PLEASANT
COMMUNITY

APPROVED
CITY
SECTION



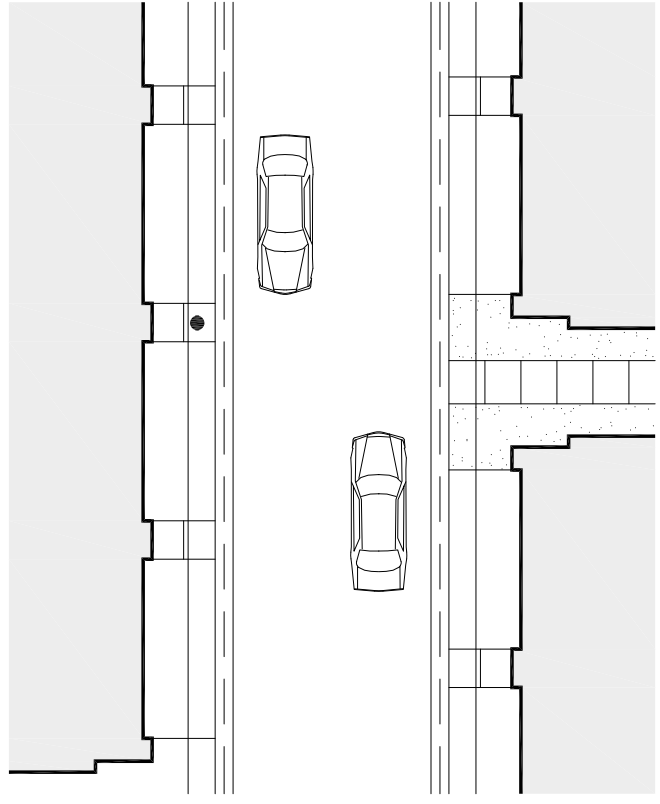
ALL DIMENSIONS IN METERS UNLESS OTHERWISE NOTED
CITY OF BRAMPTON
 WORKS and TRANSPORTATION DEPARTMENT
REAR LANEWAY - GARAGES BOTH SIDES
 6.0m ASPH. PAVEMENT ON 8.0m R.O.W.
 REVISION: REV. DATE: 2009-06-12
 CHECKED: C. BIL
 APPROVED: [Signature]
 SCALE: N.T.S. DWG: 219 A

PROPOSED
BLOCK 51-1
SECTION

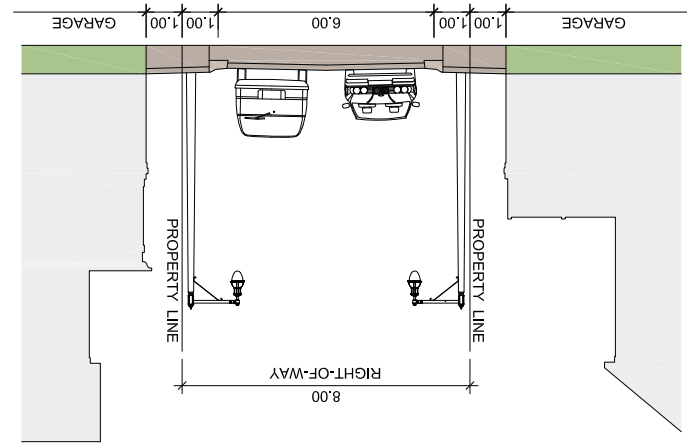


BLOCK 51-1
 8.0m R.O.W.
 6.0m PAVEMENT
 RESIDENTIAL LANE- GARAGES BOTH SIDES

Note:
 Consistent with City Rear Laneway - Garages Both Sides Std. 219A

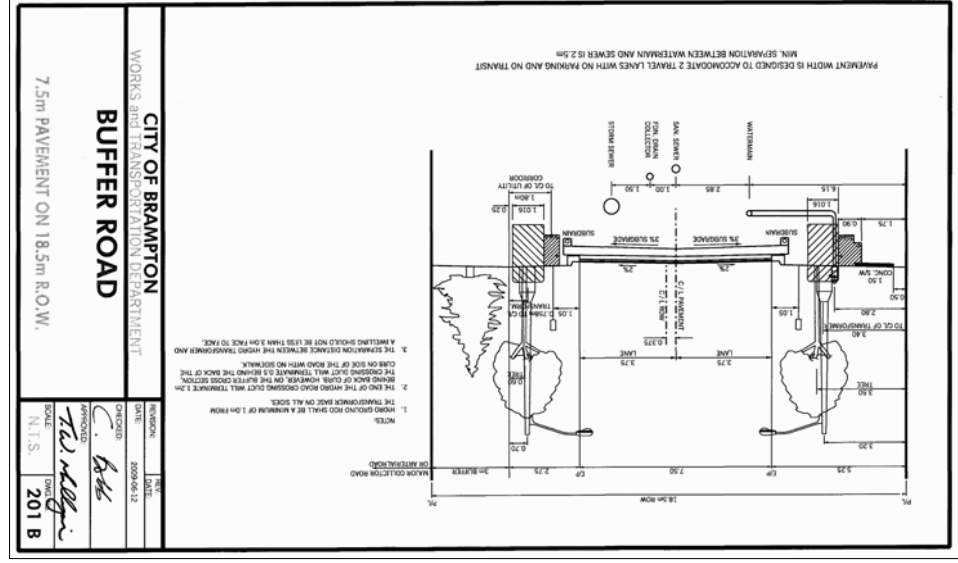


RESIDENTIAL LANE - GARAGES BOTH SIDES
 8.0m ROW W/ 6.0m ROADWAY PAVEMENT
 Consistent with City Rear Laneway - Garages Both Sides Std. 219A

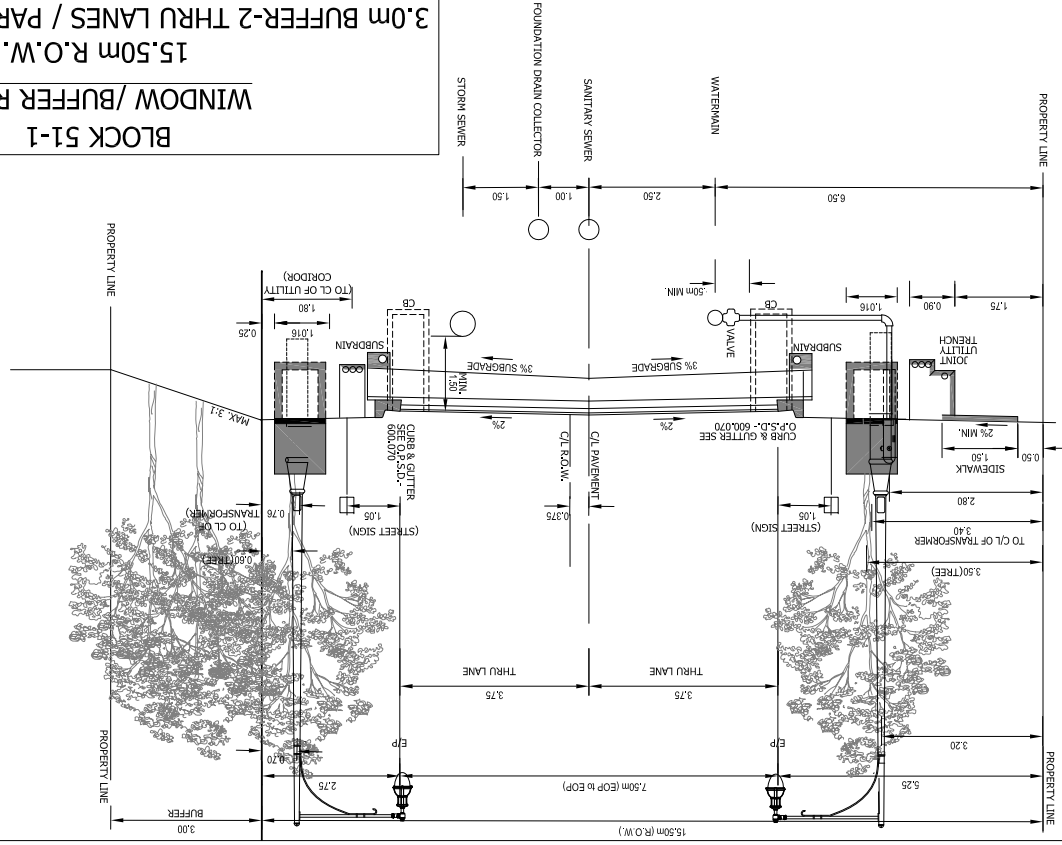


ROADS CHARACTERIZATION
 RESIDENTIAL LANE
 GARAGES BOTH SIDES
 BLOCK 51-1 MOUNT PLEASANT
 COMMUNITY
 Figure 12.2

APPROVED
CITY
SECTION



PROPOSED
BLOCK 51-1
SECTION

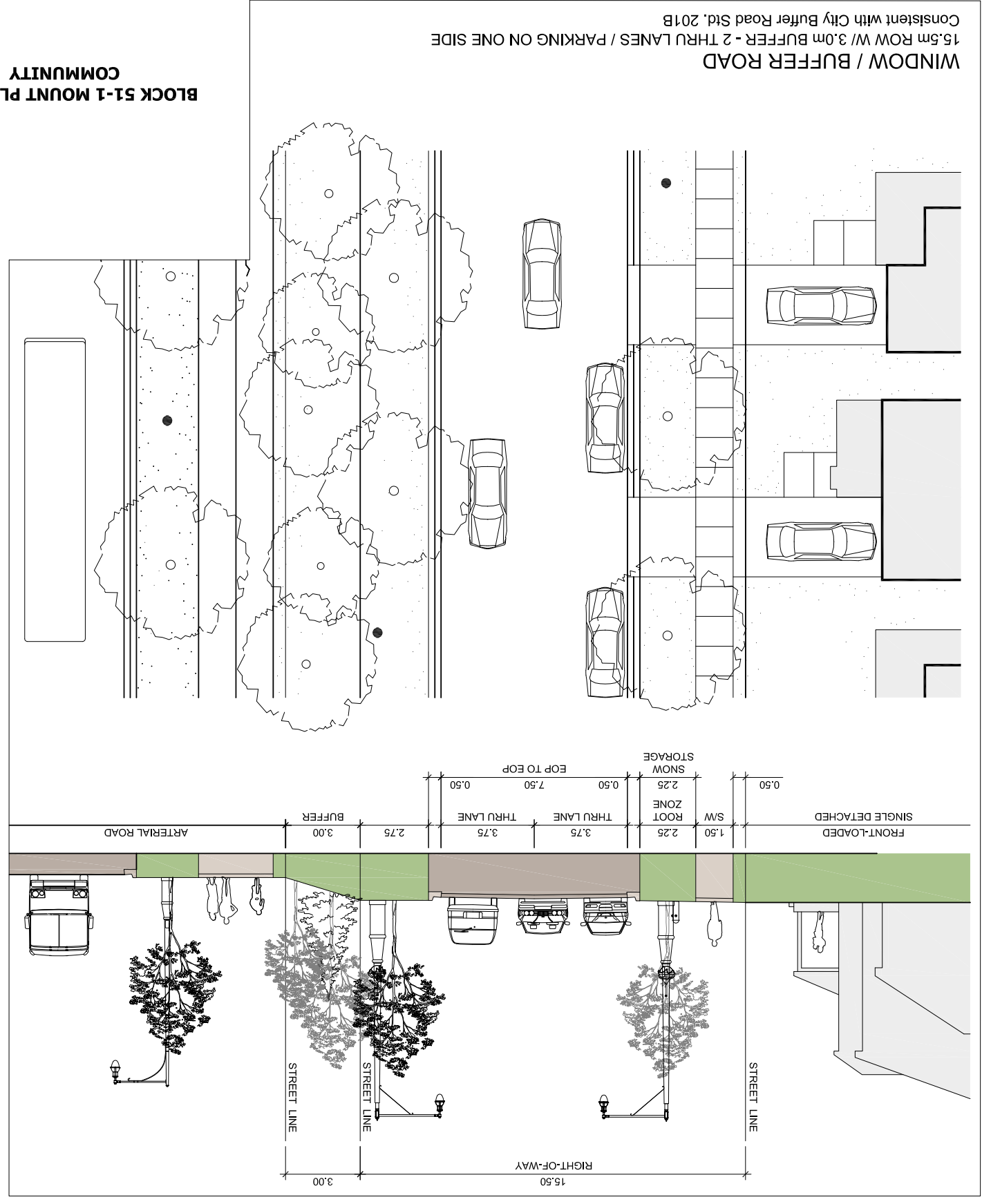


BLOCK 51-1
WINDOW / BUFFER ROAD
15.50m R.O.W.
3.0m BUFFER-2 THRU LANES / PARKING ON ONE SIDE
7.50m PAVEMENT

Note:
Consistent with City Buffer Road Std. 201B

BLOCK 51-1 MOUNT PLEASANT
COMMUNITY

ROADS CHARACTERIZATION
18.5m WINDOW / BUFFER ROAD



WINDOW / BUFFER ROAD
15.5m ROW w/ 3.0m BUFFER - 2 THRU LANES / PARKING ON ONE SIDE
Consistent with City Buffer Road Std. 201B

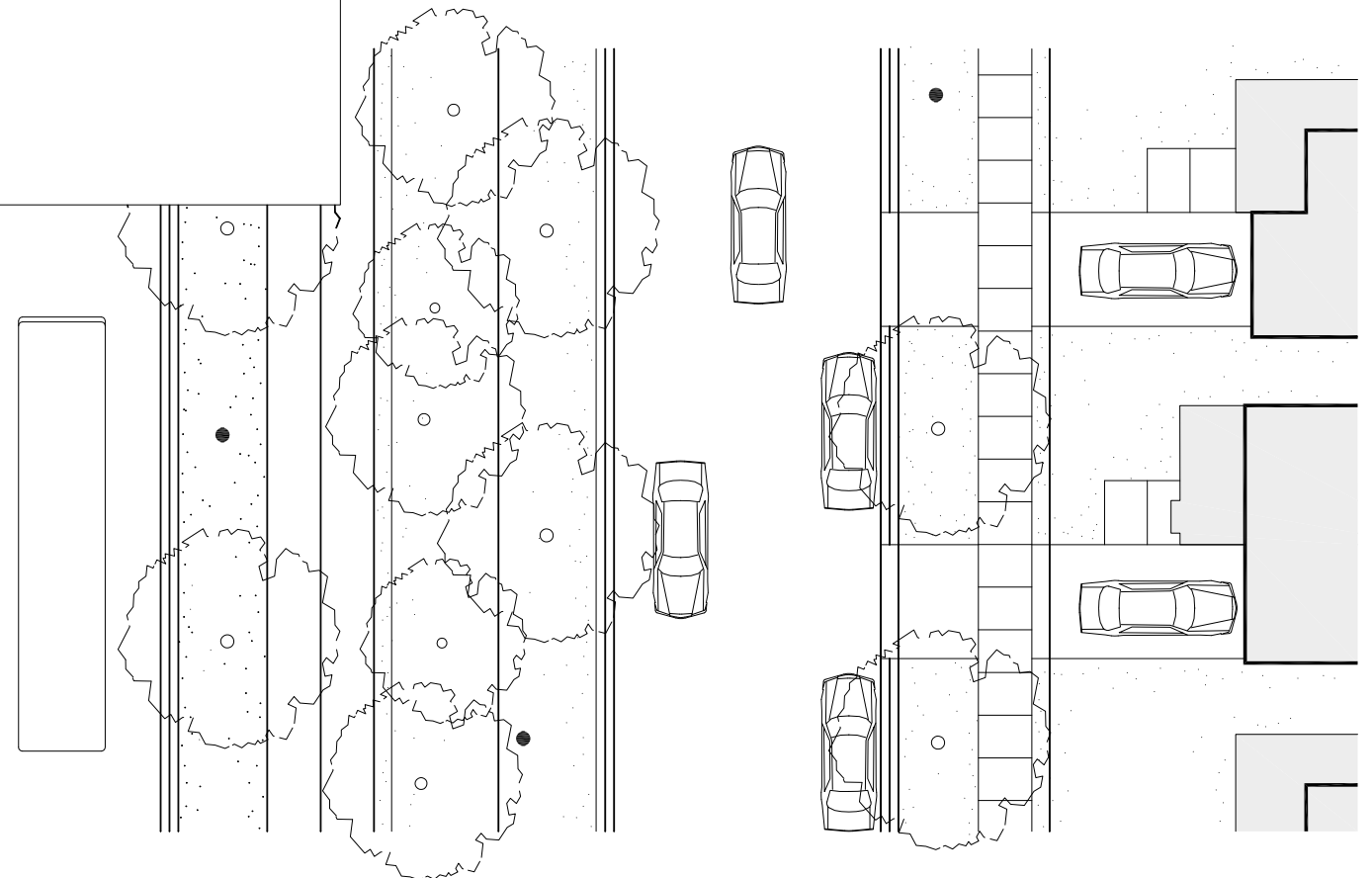
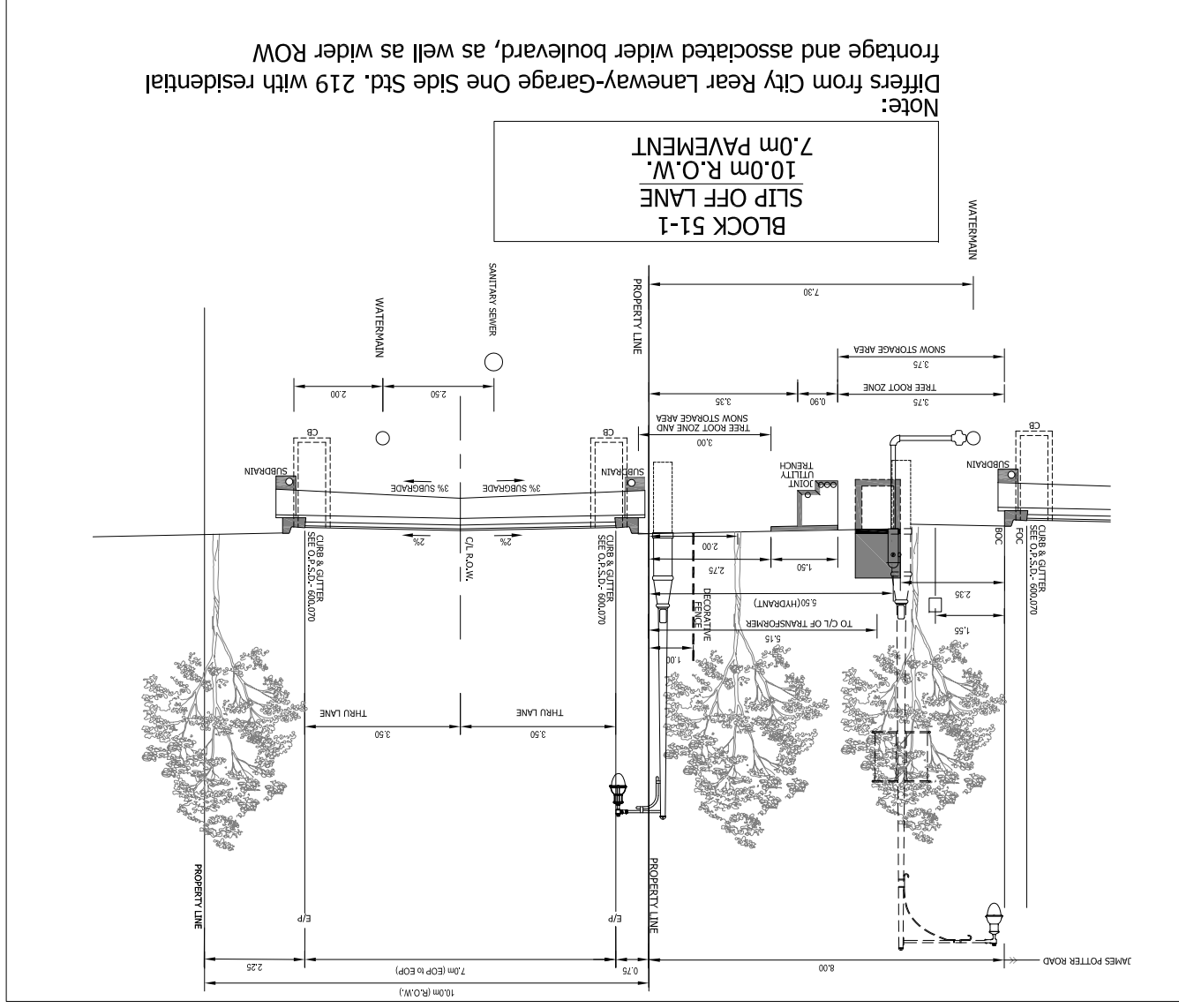
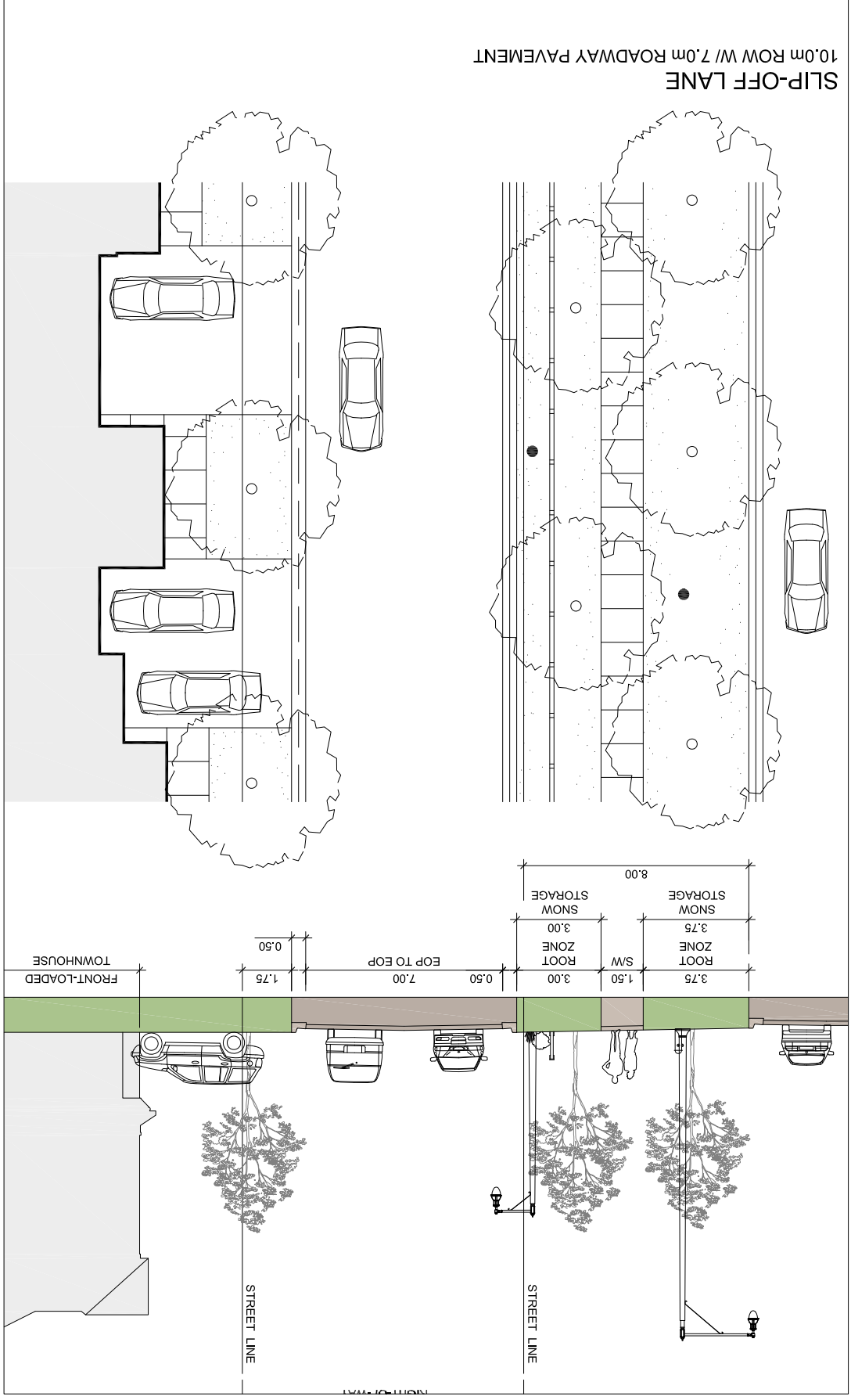


Figure 12.3



N/A



**BLOCK 51-1 MOUNT PLEASANT
COMMUNITY
ROADS CHARACTERIZATION
10.0m SLIP OFF LANE
Figure 12.4**

13.0 Community Staging

As noted in section 4.3, the manner in which the development of the Mount Pleasant Community, and in particular Block 51-1, will be staged will play a key role in allowing the community to reach the transit oriented and sustainability objectives identified in the Mount Pleasant Secondary Plan. In that section, the general community staging principles for Block 51-1 were described in the context of the sustainable transportation objectives for the community.

In this section, a more detailed description is provided regarding the manner in which the Block 51-1 road network is to be delivered in conjunction with the development of the neighbourhoods or areas comprising the community. An even more detailed treatment of the delivery of the road program is provided in Section 10.1 of the Block 51-1 Growth Management Staging and Sequencing Strategy Report (GMSSSR).

13.1 Staging and Sequencing Assumptions

A high proportion of the land in Block 51-1 is controlled by participating landowners. The landowner's group itself is relatively small in size and cohesive in nature. This will contribute significantly to the ability to deliver community supportive infrastructure in a coordinated, effective, and timely manner.

It is expected that the development of the community will progress from one area or neighbourhood to the next on the basis that there will be no requirement for the build-out of one area of the community before progressing to the next area. Build-out of the neighbourhoods will occur throughout the community over approximately 5 years. This pace is projected in Table 13.1 in terms of residential units (exclusive of apartment units).

It is also expected that the build-out of the mixed-use nodes, higher density residential and commercial sites will progress in response to market demand and community build-out.

Table 13.1
Projected Build-out of Residential Units

Year	Units
2012	500
2013	1,250
2014	1,250
2015	1,250
2016	1,250
Total	5,500

There are some key assumptions regarding the advancement of development; including:

- An understanding of the right-of-way requirements for all boundary roads sufficient to facilitate the ultimate build-out of the community will be available, based on the arterial road Environmental Assessments either completed or underway (see Sections 3.4 and 3.5).
- Developer Cost Sharing Agreements will be executed which will provide for the delivery of community use lands; including: schools, parks and stormwater management ponds, as well as the construction and financing of roads.
- Prior to the Registration of each Draft Plan of Subdivision, the Landowners will execute Subdivision Agreements “(and/or other Agreements as appropriate) with the municipality to

ensure that parks, the NHS, schools, roads, municipal water, sanitary sewers and stormwater management facilities are delivered by each relevant plan.

- School sites shall be made available complete with road access and services for acquisition and construction of schools by the School Boards upon Registration of each relevant Draft Plan, or earlier if requested by the School Boards.
- Sole Source Agreements will be used for the delivery of Development Charge related infrastructure.

13.2 Staging and Sequencing Details

13.2.1 Proposed Area 1 and 2 Sequence of Development

Figures 13.1 through 13.5 show the infrastructure required to deliver each area within Block Plan Area 51-1. Note that the terminology ‘**area**’ and ‘**sub-area**’ is introduced here (and in Section 10.1 of the GMSSSR). ‘Area 1’ and ‘Area 2’ correspond to the areas of Block 51-1 generally to the south and north of Sandalwood Parkway. Each of these ‘areas’ has then been subdivided into ‘sub-areas’ with fixed boundaries that, for the most part, correspond to the ‘**Neighbourhoods**’ described and illustrated in the ‘*Community Design Guidelines*’ (CDG) report, as well as in Section 4.3.2 (see especially Figure 4.1) in the “Community Structure” section of this report.

The purpose of Figures 13.1 through 13.6 is to illustrate the “triggering” relationships between the road infrastructure and development within each of the development sub-areas. For purposes of this discussion, ‘development’ within an area is defined according to the trigger mechanism agreed upon between the City of Brampton and the Block 51-1 landowner’s group, this being occupancy of the first unit within the area. As will be seen, there are both sequential and parallel relationships between the sub-areas that have been defined, all of which are documented in the figures and explanatory text below. For this reason, there is no advice in these figures of the timing for a particular sub-area, only of the infrastructure requirements.

13.2.1.1 Area 1 Road Infrastructure

The road and associated servicing infrastructure associated with Area 1 of development (comprising Sub-Areas 1a and 1b as shown in Figure 13.1) are required before development anywhere in Block 51-1 can advance. Development of Area 1 will require:

- a sanitary sewer connection to the Region of Peel’s Mississauga Road Trunk Sanitary Sewer, which is anticipated to be completed by 2012. A connection to this sewer will be made (at a point to be determined in collaboration with the Region of Peel) several hundred metres north of Bovaird Drive. From here the sewer will run eastwards to James Potter / Creditview Road, northwards under the CNR line, ultimately entering the right of way of the collector Spine Road and thence northwards through Block 51-1.

- a road connection between Area 1 and Mississauga Road by way of the North-South Spine Road and Collector Road ‘C’ so as to provide traffic from this area with a viable alternative to infiltration of the Fletcher’s Meadow community to the east. This requirement exists due to the fact that the James Potter / Creditview Road connection from Bovaird Drive to Fairhill Avenue is not likely to be completed until at least a year after development of Area 1 commences.

Having constructed a connection between the Mississauga Road Trunk Sanitary Sewer and the Block 51-1 Spine Road as well as the road-works identified in Figure 13.1, occupancy of units within Sub-Area 1a, followed by Sub-Area 1b can occur.

13.2.1.2 Area 2 Road Infrastructure

With the Area 1 infrastructure in place, Figure 13.2 illustrates the additional works required in order to embark on Area 2 development of Block 51-1. Three sub-areas have been identified (‘2W-A’, ‘2E-A’, and ‘2N-A’) in any or all of which Stage 2 development can commence. Before occupancies can occur in any of these three sub-areas, Sandalwood Parkway must be completed and operational from Creditview Road to Mississauga Road. In addition, there are road-works required within each of the three sub-areas which must be in place before occupancies within the particular sub-area can occur.

Further Area 2 development can proceed independently starting with any or all of these sub-areas. Figure 13.3 illustrates the progression of development and infrastructure triggers for the ‘2W’ sub-areas comprising the west side of the Block. Figure 13.4 illustrates the same for the ‘2E’ sub-areas comprising the east side of the Block between Sandalwood Parkway and Wanless Road. Figure 13.5 illustrates the same for ‘2N’ sub-areas on the east side and to the north of Wanless Drive.

13.2.2 James Potter / Creditview Road Grade Separation Development Limit

Note that Figures 13.1 through 13.5 do not speak to the triggering relationship between specific sub-areas within Block 51-1 and the completion of the James Potter / Creditview Road connection between the Spine Road and Bovaird Drive (including the CNR underpass). As discussed elsewhere in this report, a more general constraint of approximately 3,000 residential units has been agreed to (per the Memorandum of Understanding with the City of Brampton, see Section 3.1.2) as a limit to overall development within the Block, without reference to location, prior to completion of the James Potter / Creditview Road connection.

For most of the build-out of the Block 51-1 community, the construction of the collector road network will commence apace with the build-out of each sub-area within the Block.

Notwithstanding this, there exists a capacity constraint due to the existing lack of a direct connection between Creditview Road and Bovaird Drive. This missing link necessitates that a particular set of road improvements be in place prior to occupancy of first units in Block 51-1. This is discussed fully in Section 6.0 - “Interim Road Network Performance”.



LEGEND

<ul style="list-style-type: none"> BOUNDARY OF BLOCK PLAN AREA 51-1 NODE BOUNDARY NATURAL HERITAGE SYSTEM CITY PARK CO-STATION NON PARTICIPATING PROPERTIES FIRRHALL LIBRARY 	<ul style="list-style-type: none"> LOW/MEDIUM DENSITY RESIDENTIAL MEDIUM DENSITY RESIDENTIAL HIGH DENSITY RESIDENTIAL COMMERCIAL SWM PONDS OPEN SPACE (NHS)/ BUTTERS/CHANNELS PARKS/ WEST POCKETS/ TOWN SQUARE INSTITUTIONAL SPECIAL POLICY AREA 	<ul style="list-style-type: none"> MULTI-USE PATH WITHIN BLVD. (CLASS 1) AS PER OFFICIAL PLAN / CITY WIDE PATHWAY NETWORK ON-STREET BIKE LANE (CLASS 2) POTENTIAL SIGNED BIKE ROUTE (CLASS 3) GREEN SYSTEM TRAIL (MULTI-USE PATH) (REFLECTS CHANNEL ALIGNMENT WIGNETTES)
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NOTE: *THE ALIGNMENT AND RIGHT OF WAYS OF THE ARTERIAL AND COLLECTOR ROADS SHOWN ON THIS DRAWING ARE SUBJECT TO THE RESULTS OF ONGOING AND/OR FUTURE ENVIRONMENTAL ASSESSMENT STUDIES

**BLOCK PLAN LAYOUT
MOUNT PLEASANT SECONDARY PLAN AREA
BLOCK PLAN AREA NO. 51-1**

Plan: 08.06.03	Version: 16. 2010
File: MOUNT_PLEASANT_51.dwg	Scale: 1:4,000

BOUNDARIES

- Area 1A
- Area 1B

ROADS & INTERSECTIONS

- In Place at Commencement of Area 1A
- Required prior to Area 1A Occupancy
- Required prior to Area 1B Occupancy

NHS

- Area 1A
- Area 1B

Note: NHS boundaries & limits subject to EIR & FSR results

OTHER

- NHS Crossings
- School Site Delivered
- Park Delivered
- Mixed Use Nodes Delivered
- Non Participating Landowners

**AREA 1:
Required Road Infrastructure**



LEGEND

- BOUNDARY OF BLOCK PLAN AREA 51-1
- NODE BOUNDARY
- NATURAL HERITAGE SYSTEM
- CITY PARK
- CO-STATION
- NON PARTICIPATING PROPERTIES
- FIRRHALL
- LIBRARY
- LOW/MEDIUM RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COMMERCIAL
- OPEN SPACE (NHS) BUFFERS/CHANNELS
- PARKS
- WEST FLOCKERS/ PARENTS/ TOWN SQUARE
- INSTITUTIONAL
- SPECIAL POLICY AREA
- MULTI-USE PATH WITHIN BLVD. (CLASS 1) AS PER OFFICIAL PLAN / CITY WIDE PATHWAY NETWORK
- ON-STREET BIKE LANE (CLASS 2)
- POTENTIAL SIGNED BIKE ROUTE (CLASS 3)
- GREEN SYSTEM TRAIL (MULTI-USE PATH) (REFLECTS CHANNEL ALIGNMENT WIGNETTES)

NOTE: *THE ALIGNMENT AND RIGHT OF WAYS OF THE ARTERIAL AND COLLECTOR ROADS SHOWN ON THIS DRAWING ARE SUBJECT TO THE RESULTS OF ONGOING AND/OR FUTURE ENVIRONMENTAL ASSESSMENT STUDIES

File No. 08.06.003
 File No. 08.06.010
 Scale: 1:4,000
 November 19, 2010

BOUNDARIES

- Area 2A, comprising 2W-A, 2E-A, and 2N-A

Note: These 3 Sub-Areas can all proceed independently once the required roads are in place.

ROADS & INTERSECTIONS

- In Place at Commencement of Area 2A
- Required prior to any one of 2W-A, 2E-A, or 2N-A
- Required prior to Sub-Area 2E-A Occupancy
- Required prior to Sub-Area 2W-A Occupancy
- Required prior to Sub-Area 2N-A Occupancy
- Required prior to Sub-Area 2W-A or 2E-A
- Required prior to Occupancy of second of Sub-Area 2W-A or 2E-A
- Required prior to Occupancy of second of Sub-Area 2N-A or 2W-C

NHS

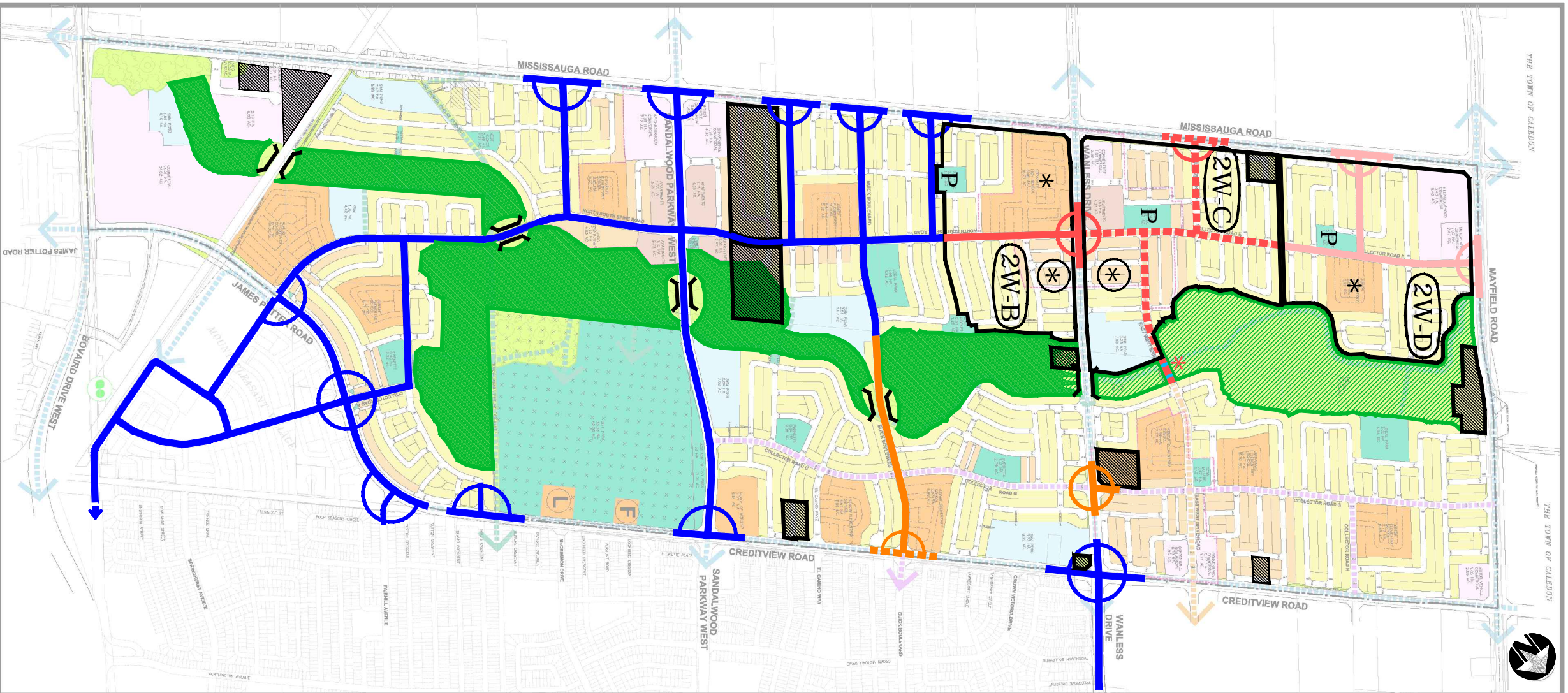
- In place at commencement of Area 2A
- Area 2A

Note: NHS boundaries & limits subject to EIR & FSR results

OTHER

- NHS Crossings
- School Site Delivered
- P Park Delivered
- Mixed Use Nodes Delivered
- Non Participating Landowners

AREA 2A:
Required Road Infrastructure



LEGEND

	BOUNDARY OF BLOCK PLAN AREA 51-1		LOW/MEDIUM RESIDENTIAL		OPEN SPACE (NS)/ BUFFERS/CHANNELS
	NODE BOUNDARY		MEDIUM DENSITY RESIDENTIAL		PARK/FACILITIES/ TOWN SQUARE
	NATURAL HERITAGE SYSTEM		HIGH DENSITY RESIDENTIAL		COMMERCIAL INSTITUTIONAL
	CITY PARK		COMMERCIAL		SPECIAL POLICY AREA
	CO-STATION		SWM PONDS		
	NON-PARTICIPATING PROPERTIES				
	FIREHALL				
	LIBRARY				

MULTI-USE PATH WITHIN BLVDs (CLASS 1) AS PER OFFICIAL PLAN / CITY WIDE PATHWAY NETWORK

- ON-STREET BIKE LANE (CLASS 2)
- POTENTIAL SIGNED BIKE ROUTE (CLASS 3)
- GREEN SYSTEM TRAIL (MULTI-USE PATH) (REFLECTS CHANNEL ALIGNMENT WIGNETTES)

NOTE: *THE ALIGNMENT AND RIGHT OF WAYS OF THE ARTERIAL AND COLLECTOR ROADS SHOWN ON THIS DRAWING ARE SUBJECT TO THE RESULTS OF ONGOING AND/OR FUTURE ENVIRONMENTAL ASSESSMENT STUDIES

**BLOCK PLAN LAYOUT
MOUNT PLEASANT SECONDARY PLAN AREA
BLOCK PLAN AREA NO. 51-1**



Mount Pleasant Block Plan 51-1
6374-26, August 2011

File No. 05-56163	Version 19, 2010
File No. 05-56163	Scale: 1:4,000
File No. 05-56163	Scale: 1:4,000

**SUB-AREAS 2W-B to 2W-D:
Required Road Infrastructure**

BOUNDARIES

- Sub-Areas 2W-B, 2W-C, and 2W-D

Note: * These 3 Sub-Areas are sequential, and require Sub-Area 2W-A infrastructure to be in place.

ROADS & INTERSECTIONS

- Definitely in Place at Commencement of Sub-Area 2W-B
- Required prior to Sub-Area 2W-B Occupancy
- Required prior to Sub-Area 2W-C Occupancy
- Required prior to Sub-Area 2W-A or 2W-C
- Likely in place at Commencement of Sub-Area 2W-B
- Required prior to Occupancy of second of Sub-Area 2W-A or 2W-C

NHS

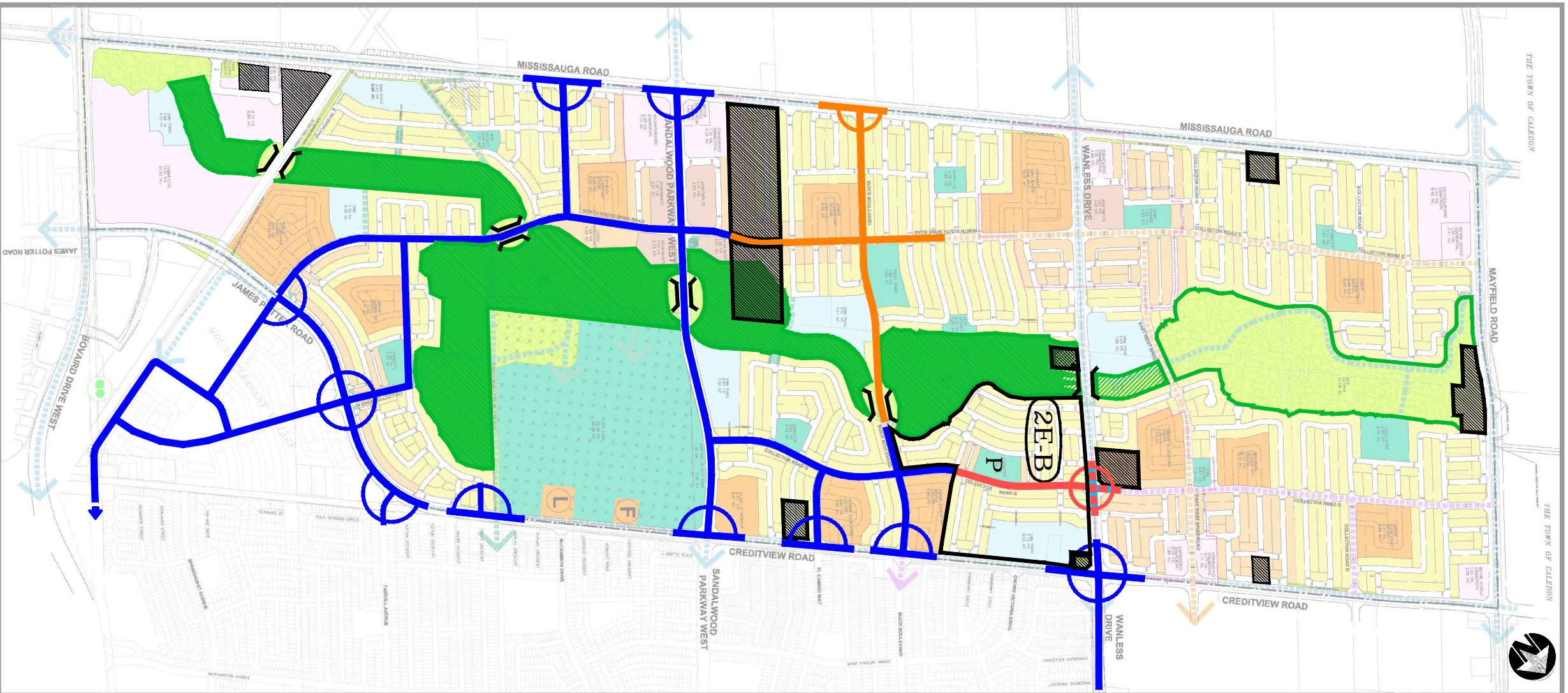
- In place before commencement of Sub-Area 2W-B
- In place before commencement of Sub-Area 2W-D (or 2W-C)

Note: NHS boundaries & limits subject to EIR & FSR results

OTHER

- NHS Crossings
- School Site Delivered
- Park Delivered
- Mixed Use Nodes Delivered
- Non Participating Landowners

Figure 13.3



LEGEND

- BOUNDARY OF BLOCK
- PLAN AREA 51-1
- NODE BOUNDARY
- NATURAL HERITAGE SYSTEM
- CITY PARK
- CO-STATION
- NON PARTICIPATING PROPERTIES
- FIRRHALL
- LIBRARY
- LOW/MEDIUM RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COMMERCIAL
- SWAMPBODS
- OPEN SPACE (NHS) BUFFERS/CHANNELS
- PARKS
- VEST POCKETS/PARENTS/TOWN SQUARE
- INSTITUTIONAL
- SPECIAL POLICY AREA
- MULTI-USE PATH WITHIN BLVD. (CLASS 1) AS PER OFFICIAL PLAN / CITY WIDE PATHWAY NETWORK
- ON-STREET BIKE LANE (CLASS 2)
- POTENTIAL SIGNED BIKE ROUTE (CLASS 3)
- GREEN SYSTEM TRAIL (MULTI-USE PATH) (REFLECTS CHANNEL ALIGNMENT WIGNETTES)

NOTE: *THE ALIGNMENT AND RIGHT OF WAYS OF THE ARTERIAL AND COLLECTOR ROADS SHOWN ON THIS DRAWING ARE SUBJECT TO THE RESULTS OF ONGOING AND/OR FUTURE ENVIRONMENTAL ASSESSMENT STUDIES

BLOCK PLAN LAYOUT
MOUNT PLEASANT SECONDARY PLAN AREA
BLOCK PLAN AREA NO. 51-1

File No. 08.06.003
 File No. 08.06.003
 File No. 08.06.003
 Scale: 1:4,000
 November 19, 2010

BOUNDARIES

- Sub-Area 2E-B

Note: This Sub-Area requires Sub-Area 2E-A infrastructure to be in place.

ROADS & INTERSECTIONS

- Definitely in Place at Commencement of Sub-Area 2E-B
- Required prior to Sub-Area 2E-B Occupancy
- Required prior to Sub-Area 2E-B or 2N-A Occupancy
- Likely in place at Commencement of Sub-Area 2E-B

NHS

- In place prior commencement of Sub-Area 2E-B
- In place before commencement of Sub-Area 2W-D (or 2N-C)

Note: NHS boundaries & limits subject to EIR & FSR results

OTHER

- NHS Crossings
- * School Site Delivered
- P Park Delivered
- * Mixed Use Nodes Delivered
- Non Participating Landowners

SUB-AREA 2E-B:
Required Road Infrastructure



LEGEND

- BOUNDARY OF BLOCK PLAN AREA 51-1
- NODE BOUNDARY
- NATURAL HERITAGE SYSTEM
- CITY PARK
- CO-STATION
- NON PARTICIPATING PROPERTIES
- FIRRHALL
- LIBRARY
- LOW/MEDIUM DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COMMERCIAL
- SWAMPBODIES
- OPEN SPACE (NHS) BUFFERS/CHANNELS
- PARKS
- WEST FLOCKERS/ PARENTS/ TOWN SQUARE
- INSTITUTIONAL
- SPECIAL POLICY AREA
- MULTI-USE PATH WITHIN BLVD. (CLASS 1) AS PER OFFICIAL PLAN / CITY WIDE PATHWAY NETWORK
- ON-STREET BIKE LANE (CLASS 2)
- POTENTIAL SIGNED BIKE ROUTE (CLASS 3)
- GREEN SYSTEM TRAIL (MULTI-USE PATH) (REFLECTS CHANNEL ALIGNMENT WIGNETTES)

NOTE: *THE ALIGNMENT AND RIGHT OF WAYS OF THE ARTERIAL AND COLLECTOR ROADS SHOWN ON THIS DRAWING ARE SUBJECT TO THE RESULTS OF ONGOING AND/OR FUTURE ENVIRONMENTAL ASSESSMENT STUDIES

**BLOCK PLAN LAYOUT
MOUNT PLEASANT SECONDARY PLAN AREA
BLOCK PLAN AREA NO. 51-1**



Mount Pleasant Block Plan 51-1
6374-26, August 2011

File No. 05.560.03
Project No. 05.560.03
Scale: 1:4,000
North Arrow

BOUNDARIES

— Sub-Areas 2N-B and 2N-C

Note: These 2 Sub-Areas are sequential, and require Sub-Area 2N-A infrastructure to be in place.

ROADS & INTERSECTIONS

Definitely in Place at Commencement of Sub-Area 2N-B

Required prior to Sub-Area 2N-B Occupancy

Required prior to Sub-Area 2N-C Occupancy

Likely in place at Commencement of Sub-Area 2N-B

NHS

In place prior to commencement of Sub-Area 2N-B

In place prior to commencement of Sub-Area 2N-C (or 2W-D)

Note: NHS boundaries & limits subject to EIR & FSR results

OTHER

NHS Crossings

* School Site Delivered

P Park Delivered

Mixed Use Nodes Delivered

Non Participating Landowners

**SUB-AREAS 2N-B and 2N-C:
Required Road Infrastructure**

Figure 13.5

13.2.3 Optional Area 1

While it is envisaged that approximately 82% of Block Plan Area 51-1 will be serviced by the Mississauga Road Sanitary Trunk Sewer, there is a possibility that this sewer capacity will not be available as expected by Q2 2012. Should this situation occur, or for any other reason deemed appropriate by the City, the Landowners located within the north-eastern quadrant of the Block Plan Area representing approximately 18% of the Block Plan Area (shown on Figure 13.6, as well as in Figure 14 in the *Growth Management Staging and Sequencing Strategy* report) wish to be able to proceed by way of available capacity which exists in the Fletcher's Meadow Sanitary Trunk Sewer. A connection from Block 51-1 to this sewer network will be constructed across Creditview Road to the south of Wanless Drive in advance of the Creditview Road widening from 2 to 4 lanes.

This optional staging strategy would not invalidate the Staging and Sequencing Strategy outlined in this Report. It would simply mean that the timing and progression of development in the remainder of the lands (outside of the Fletcher's Meadows sewage catchment area) would be temporarily delayed until the Mississauga Road Sanitary Trunk Sewer is operational, or alternative arrangements made with the Region of Peel.

Should the Landowners avail themselves of this optional staging, what is currently envisaged as Sub-Areas 2N-A, 2N-B, and 2N-C within the north-eastern area of the plan would become an Optional Area 1, which would eventually be joined and supplemented by the original proposed Stage 1 area. It is understood that none of the studies/reports prepared in support of the Block Plan as submitted by the landowners would be required to be revised to reflect the optional staging proposal. This is consistent with the process of the concurrent consideration and approval of the Block Plan and Draft Plans of Subdivision and more fundamentally servicing portions of the community starting in 2011 and initiating house construction in 2012, with ultimate build-out in 2016. This arrangement is mutually beneficial insofar as the municipality will be the recipient of substantial Development Charges which are required to deliver critical infrastructure to the communities.

Note that the traffic analysis supporting this optional staging of development can be found in Section 6.3, "**Optional Area 1 Conditions**", of this report.



LEGEND

- BOUNDARY OF BLOCK
- PLAN AREA 51-1
- NODE BOUNDARY
- NATURAL HERITAGE SYSTEM
- CITY PARK
- CO-STATION
- NON PARTICIPATING PROPERTIES
- FIRRHALL
- LIBRARY
- LOW/MEDIUM RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COMMERCIAL
- SWM PONDS
- OPEN SPACE (NHS)/ BUTTERS/CHANNELS
- PARKS/ WEST FLOCKERS/ TOWN SQUARE
- INSTITUTIONAL
- SPECIAL POLICY AREA
- MULTI-USE PATH WITHIN BLVD. (CLASS 1) AS PER OFFICIAL PLAN / CITY WIDE PATHWAY NETWORK
- ON-STREET BIKE LANE (CLASS 2)
- POTENTIAL SIGNED BIKE ROUTE (CLASS 3)
- GREEN SYSTEM TRAIL (MULTI-USE PATH) (REFLECTS CHANNEL ALIGNMENT WIGNETTES)

NOTE: *THE ALIGNMENT AND RIGHT OF WAYS OF THE ARTERIAL AND COLLECTOR ROADS SHOWN ON THIS DRAWING ARE SUBJECT TO THE RESULTS OF ONGOING AND/OR FUTURE ENVIRONMENTAL ASSESSMENT STUDIES

BLOCK PLAN LAYOUT
MOUNT PLEASANT SECONDARY PLAN AREA
BLOCK PLAN AREA NO. 51-1

File No. 05-58163
 Project No. 05-58163
 Date: 1-4-2008
 Scale: 1:4,000
 November 19, 2010

BOUNDARIES

- Sub-Areas 1N-A, 1N-B and 1N-C
- Sub-Area 1E-A to be determined based on Drainage Area

Note: Sub-Areas 1N-B and 1N-C are sequential, and require Sub-Area 1N-A infrastructure to be in place.

ROADS & INTERSECTIONS

- In Place at Commencement of Sub-Areas 1N-A and 1E-A
- Required prior to Sub-Area 1N-A Occupancy
- Required prior to Sub-Area 1E-A Occupancy
- Required prior to Sub-Area 1N-B Occupancy
- Required prior to Sub-Area 1N-C Occupancy
- Intersection required prior to Occupancy of Sub-Area 1N-A or 1E-A

NHS

- In place prior to commencement of Sub-Area 2N-B
- In place prior to commencement of Sub-Area 2N-C (or 2W-D)

Note: NHS boundaries & limits subject to EIR & FSR results

OTHER

- NHS Crossings
- School Site Delivered
- Park Delivered
- Mixed Use Nodes Delivered
- Non Participating Landowners

OPTIONAL AREA 1:
Required Road Infrastructure

14.0 Community Transit Service

14.1 Routing and Stop Locations

Figure 14-1 illustrates the proposed community wide transit service. It shows the collector and arterial roads on which it is intended that transit service be provided, as well as proposed bus stop locations. Stop locations have been proposed at major intersections, and at reasonably spaced minor intersections in between. Where spacing permits, it is also proposed to provide bus stops at several of the points where trails cross roads, as a way of promoting use of the active transportation system.

With one exception, all of the roads shown with bus service correspond to the transit network recommendation in the *Mount Pleasant Secondary Plan Area Transportation Master Plan* study, and have been discussed in a preliminary fashion with Brampton Transit.

The exception is the north-south collector road located between the NHS and Creditview Road, and running between Mayfield Road and the east-west Spine Road. Based on the service coverage assessment described in the next section, it was found that a number of residential units in this area were not within 400m of bus stops located on the surrounding arterial roads. By running bus service on the section of this road between Mayfield Road and the east-west Spine Road, all of the units in this area are brought within the 400m threshold.

In order to provide service on this stretch of road, it is suggested that a bus service could be run as follows:

- straight up the Spine Road, continuing north on Collector Road “E” to Mayfield Road
- eastbound on Mayfield Road to Collector Road “G”
- south on Collector Road “G” to the east-west Spine Road
- west on the east-west Spine Road to the north-south Spine Road
- return south on the north-south Spine Road

The advantage of this route is that with a single service, it covers both of the north-south collector roads at the north end of the community by operating as a one way loop. By operating clockwise, the buses are executing right turns rather than left turns at the potentially busy intersections on Mayfield Road.

14.2 Service Coverage

In Block 51-1, the proposed network of roads with bus service, and the distribution of bus stops is such that almost the entire community is located within 400m walking distance of the nearest stop. 400m is widely recognized as a useful maximum estimate of the distance users will walk to the nearest transit stop. Using the proposed stop locations and road network, actual (as compared to “straight line”) walk distances were computed throughout the community.

Figure 14.1 identifies three areas in which the 400m walk distance threshold is exceeded.

- to the south of Mayfield Road and east of the Collector Road “E” there is located a Junior Elementary school. Due to the configuration of the school block, and the location of the bus stop on Collector “E” directly in front of the school, there is a small pocket of about **25 residential units** that lie outside the 400m threshold.
- to the south of Buick Boulevard and west of Collector Road “G” there is another small pocket of about **25 residential units** that lie outside the 400m threshold. by virtue of access constraints onto Buick Boulevard, and the proximity to the NHS, it is not feasible to create another connection to Buick to resolve this.
- to the south of the Trans Canada Pipeline, and between Mississauga Road and the NHS, there is an enclave of about 150 residential units that lie outside the 400m threshold. As things stand, it is not feasible to locate bus stops adjacent to this enclave on Mississauga Road, as there is no intersection here. A pair of bus stops at this location would bring almost the entire enclave within the 400m threshold. In order to provide a pair of bus stops here, it would be necessary to provide a safe way for pedestrians to cross Mississauga Road to get to the southbound bus stop on the west side. In this vicinity, there is a trail that follows the Trans Canada Pipeline. Ultimately, it will be desirable to find a way to connect this trail across Mississauga Road. It may be that the solution to the trail crossing issue also provides a solution for providing access to bus stops at this location.

Accounting for the units in all three of these areas, almost 97% of Block 51-1 would be within 400m of a bus stop. Assuming that transit access can be achieved for the enclave adjacent to Mississauga Road, the proportion of the community within the 400m threshold would be over 99%.

14.3 Interim Service Arrangements

In order for transit to be adopted as a reasonable and desirable travel option in Block 51-1, it is vital that good transit service be available to the residents as early as possible. In addition to the availability of the Spine Road, the build-out of the community will trigger financial contributions towards the purchase of three hybrid buses as the community builds out (per the “**Memorandum of Understanding**” described in Section 3.1, “**Mount Pleasant Secondary Plan and Block Plan**”, of this report. The first contribution will be triggered as the community reaches approximately 3,000 units in size.

14.3.1 Spine Road Service

As the Block 51-1 community is built out, the Spine Road will be constructed in a continuous manner from the south end to the north end of the community. This means that Spine Road based transit service can be put in place from the very beginning of development of the community, and incrementally extended as each area of the development unfolds.

Figure 14.2 illustrates the manner in which this might be done. As the road works associated with each of the development areas up the west side of the community are completed, it will be possible to extend the Spine Road based transit service further north into the newly opened area. Bus turn-around areas will be provided at each “maximum point” of service. In Figure 14.2 these are shown as being coordinated with the sequencing of development areas as illustrated in Figures 13.1 through 13.3.

The Bus turn-around areas will be conveniently provided in small areas adjacent to the Spine Road itself. It is anticipated that these will comprise areas about the size of two adjacent lots, and will be appropriately paved so as to support interim bus turn-around activity.

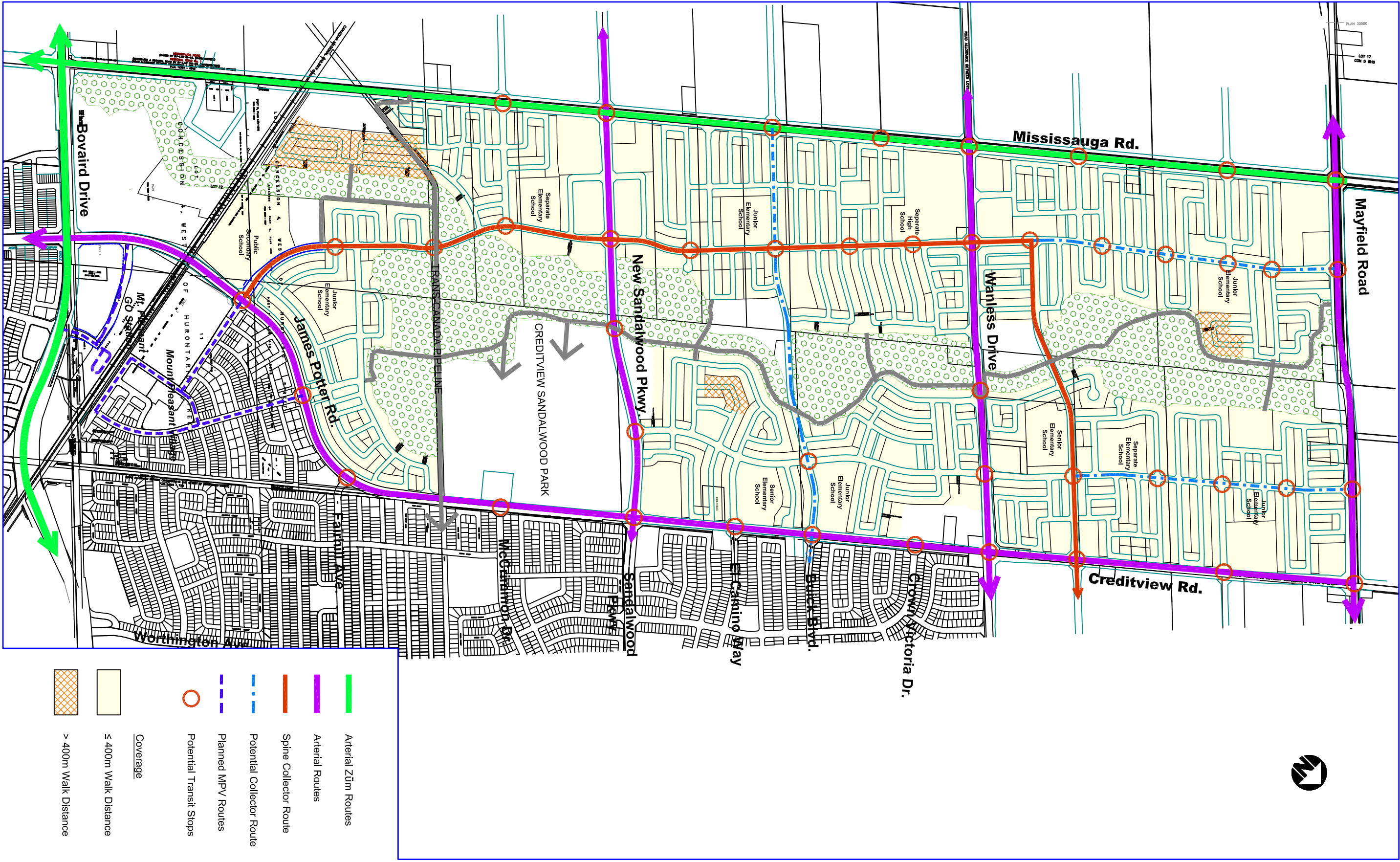
14.3.2 Creditview Road Service

In addition to the staged implementation of Spine Road transit service illustrated on Figure 14.2, it is anticipated that there will be a service operating from the Mount Pleasant Village by way of Creditview Road so as to serve the areas developed on the east side of Block 51-1. With Creditview Road already existing, there is flexibility available right from the start to choose which area or areas to serve. As shown by the green dashed lines, this service could be extended into one or more areas of the community, circulating by way of the internal collector road network as it is completed.

14.3.3 Diversion of Existing Transit Service

Diversion of existing bus routes in this area can be undertaken very early on. The #4A Chinguacousy service travels some distance along Creditview Road south of Wanless Drive. Currently it must find it’s way through Fletchers Meadows and down to Bovaird Drive in order to reach its terminus at the Mount Pleasant GO Station. The initial 2 lane construction of the James Potter / Creditview Road re-alignment is scheduled to be completed in 2011 so as to connect existing Creditview Road with the Mount Pleasant Village collector road network. Once this is done, it will be possible to route the #4A Chinguacousy service directly down Creditview Road from Wanless Drive to the north side GO Station platform in the Village. (shown in yellow in Figure 14.2).

The #23 Sandalwood service likewise finds it’s way through Fletcher’s Meadows to Bovaird Drive, and thence to the Mount Pleasant GO Station. By the end of 2012, it is anticipate that the Spine Road will have been completed to the north of Sandalwood Parkway, and the extension of Sandalwood Parkway completed from Creditview Road to Mississauga Road. At this point, the #23 Sandalwood service can be diverted to the logical routing shown in red in Figure 14.2. It would join the Spine Road Service, and make its way to the north side GO Station platform in the Village.

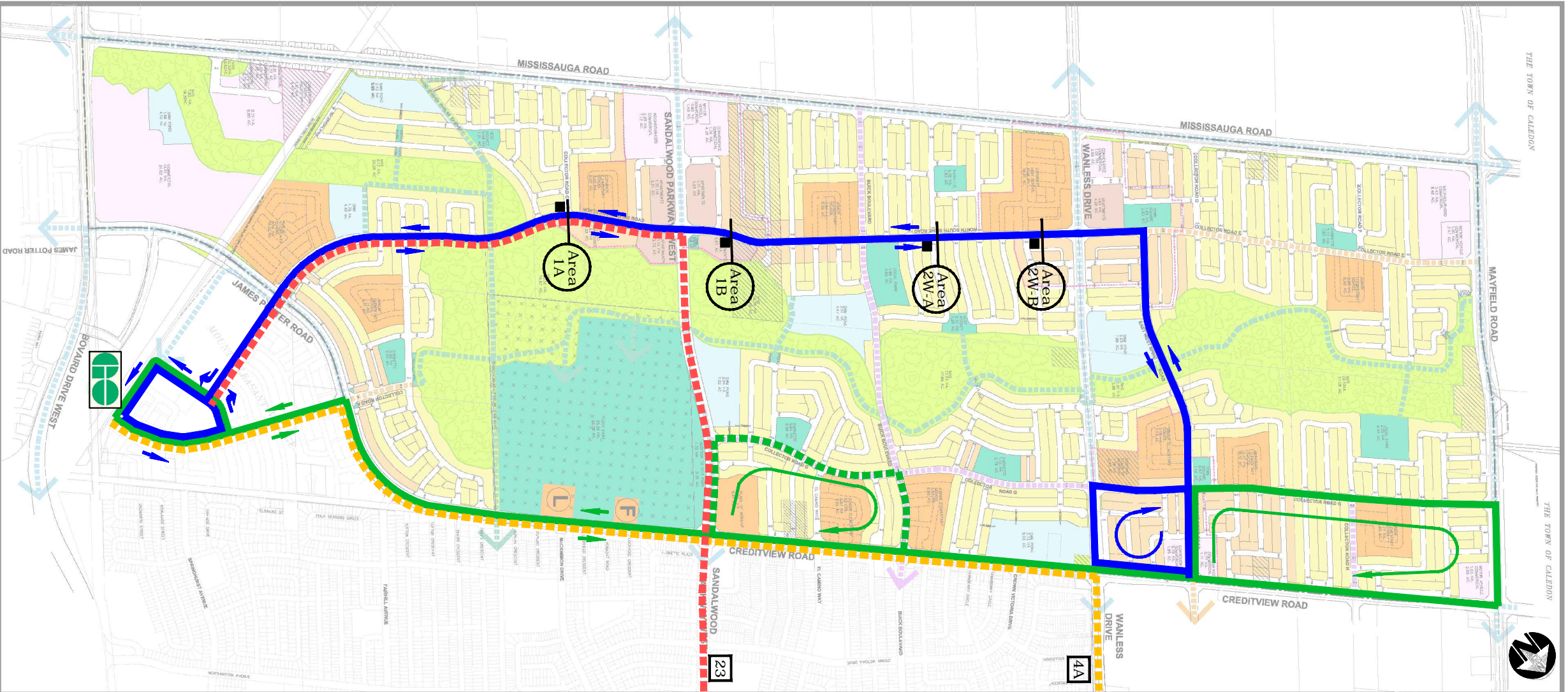


Mount Pleasant Block Plan 51-1
 Potential Transit Routing, Stops & Coverage



Mount Pleasant Block 51-1
 Job # 6374-26 August 2011

Figure 14.1



LEGEND

	BOUNDARY OF BLOCK PLAN AREA 51-1		LOW/MEDIUM RESIDENTIAL		OPEN SPACE (NS)/ BUTTERFLY CHANNELS
	NODE BOUNDARY		MEDIUM DENSITY RESIDENTIAL		PARKS/ VEST POCKETS/ TOWN SQUARE
	NATURAL HERITAGE SYSTEM		HIGH DENSITY RESIDENTIAL		INSTITUTIONAL
	CITY PARK		COMMERCIAL		SPECIAL POLICY AREA
	CO-STATION		SWM PONDS		
	NON-PARTICULATING PROPERTIES				
	FAIRHALL				
	LIBRARY				

MULTI-USE PATH WITHIN BLVDs (CLASS 1) AS PER OFFICIAL PLAN / CITY WIDE PATHWAY NETWORK

ON-STREET BIKE LANE (CLASS 2)

POTENTIAL SIGNED BIKE ROUTE (CLASS 3)

GREEN SYSTEM TRAIL (MULTI-USE PATH) (REFLECTS CHANNEL ALIGNMENT WIGNETTES)

NOTE: "THE ALIGNMENT AND RIGHT OF WAYS OF THE ARTERIAL AND COLLECTOR ROADS SHOWN ON THIS DRAWING ARE SUBJECT TO THE RESULTS OF ONGOING AND/OR FUTURE ENVIRONMENTAL ASSESSMENT STUDIES"

BLOCK PLAN LAYOUT
MOUNT PLEASANT SECONDARY PLAN AREA
BLOCK PLAN AREA NO. 51-1

Plan: 03.504.00	Version: 19, 2010
File No: 6368P-AD/19.10	Scale: 1:4,000



TRANSIT LEGEND

- West Community Service via Spine Road
- East Community Service via Creditview Road
- Diverted Sandalwood Service upon completion of Sandalwood Extension
- Diverted Chinguacousy Service upon completion of James Potter tie-in to Creditview at Fairhill
- Interim Bus turn-around area
- Limit of interim bus service
- Existing Bus Route

POTENTIAL TRANSIT SERVICES
 Interim Construction of Community

Mount Pleasant Block Plan 51-1
 6374-26, August 2011

Figure 14.2

14.4 Community Build-Out Service Arrangements

Figure 14.3 illustrates the potential delivery of transit service upon completion of all of the community collector road infrastructure related to Block 51-1.

14.4.1 Spine Road Service

Upon completion of the Spine Road in Block 51-1, unimpeded continuous service from end to end will be possible as shown in blue. The potential turn-around routing within Mixed Use Node #3 by way of Creditview Road and Wanless provides better coverage within that node, and has the additional advantage of providing a connection with the existing #4A Chinguacousy service at the intersection of Wanless Drive and Creditview Road during Peak Periods (the #4A service is a peak period only service).

The dashed blue line utilizing Collector Road 'E', Mayfield Road, and Collector Road 'G' is potentially an additional peak period Spine Road service that would provide coverage to the north part of Block 51-1.

14.4.2 Creditview Road Service

Figure 14.3 does not show an explicit Creditview Road Service. The diverted #4A Chinguacousy service provides coverage along Creditview Road itself south of Wanless.

If it were deemed desirable, the interim Creditview Road service shown on Figure 14.2 could be kept so as to better serve the east side of Block 51-1 (particularly to the north of Wanless Drive) even after completion of the Spine Road.

14.5 Long Term Corridor Based Service Arrangements

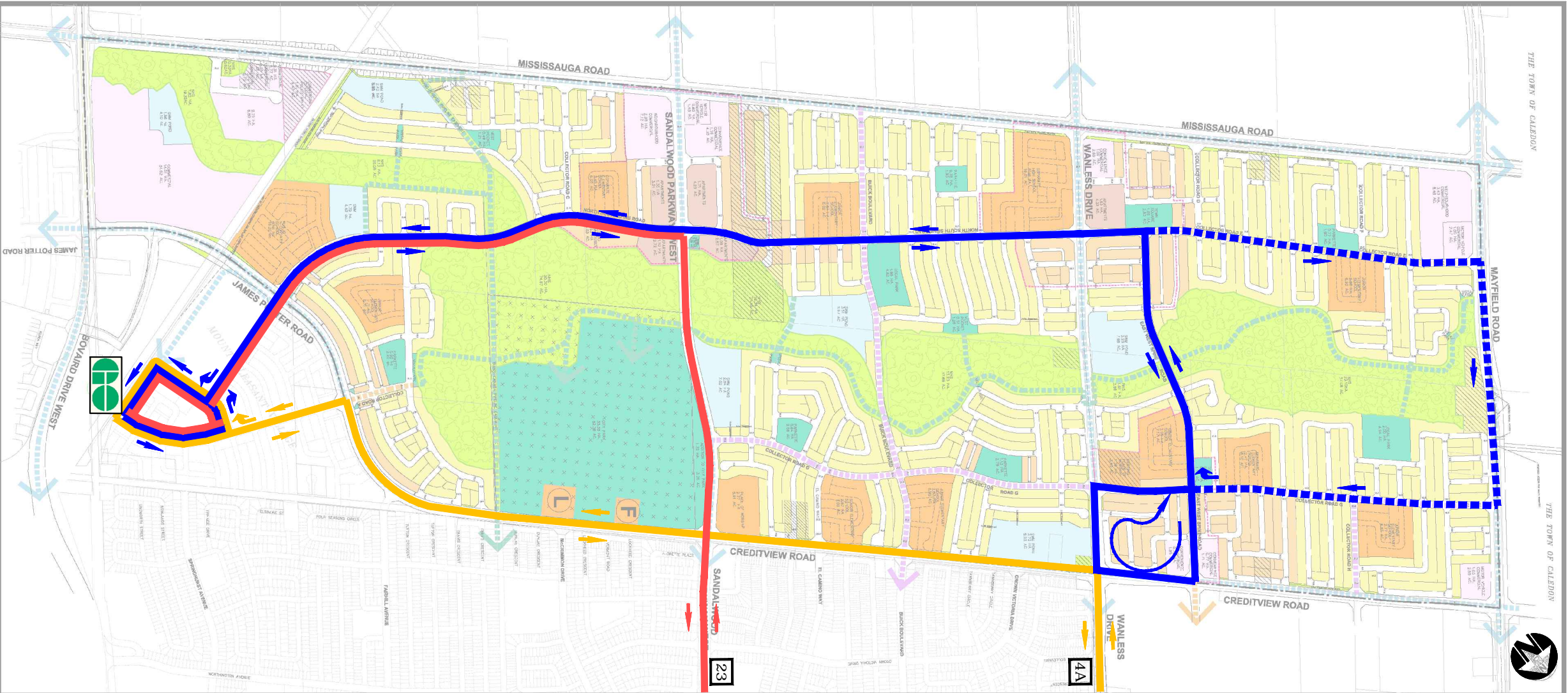
In the longer term, as northwest Brampton builds out, there is the potential for Brampton Transit to introduce corridor based service on major arterial roads as shown in Figure 14.4. This is planned to include Züm bus rapid transit service on Bovaird Drive, and potentially on Mississauga Road.

14.5.1 Spine Road Service

In this longer term service scenario, Block 51-2 of the Mount Pleasant community is built out, and so the Spine Road continues to the east of Creditview Road rather than circling back. The opportunity to provide a peak period service in the north part of Block 51-1 is still available, and is shown in the dashed blue line.

14.5.2 Creditview Road / James Potter Road Service

Once James Potter Road has been fully connected to the south of Bovaird Drive, there will be an opportunity to provide a Creditview Road / James Potter Road service as shown in yellow in Figure 14.4. This service is shown as accessing the north side of the GO Station by way of the Mount Pleasant Village collector road network. It is anticipated that the future intersection of Station Road and James Potter / Creditview Road will be busy, particularly during peak periods when there will be considerable traffic in and out of the GO Station parking lots. By accessing the GO Station on the north side, where there is no GO parking, the buses serving this route would avoid the busy turning movements at Station Road and James Potter / Creditview Road.



LEGEND

<ul style="list-style-type: none"> BOUNDARY OF BLOCK PLAN AREA 51-1 NODE BOUNDARY NATURAL HERITAGE SYSTEM CITY PARK CO-STATION NON-PARTICIPATING PROPERTIES FIRMHALL LIBRARY 	<ul style="list-style-type: none"> LOW/MEDIUM RESIDENTIAL MEDIUM DENSITY RESIDENTIAL HIGH DENSITY RESIDENTIAL COMMERCIAL SWM PONDS OPEN SPACE (NS)/ BUFFERS/ CHANNELS PARKS/ WEST POCKETS/ PARKETTES/ TOWN SQUARE INSTITUTIONAL SPECIAL POLICY AREA 	<ul style="list-style-type: none"> MULTI-USE PATH WITHIN BLVD. (CLASS 1) AS PER OFFICIAL PLAN / CITY WIDE PATHWAY NETWORK ON-STREET BIKE LANE (CLASS 2) POTENTIAL SIGNED BIKE ROUTE (CLASS 3) GREEN SYSTEM TRAIL (MULTI-USE PATH) (REFLECTS CHANNEL ALIGNMENT VIGNETTES)
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NOTE: THE ALIGNMENT AND RIGHT OF WAYS OF THE ARTERIAL AND COLLECTOR ROADS SHOWN ON THIS DRAWING ARE SUBJECT TO THE RESULTS OF ONGOING AND/OR FUTURE ENVIRONMENTAL ASSESSMENT STUDIES

**BLOCK PLAN LAYOUT
MOUNT PLEASANT SECONDARY PLAN AREA
BLOCK PLAN AREA NO. 51-1**

PLAN: 03.58.00	NOVEMBER 19, 2010
FILE NUMBER: A-01916.10	SCALE: 1:4,000
27 GERRISON ROAD, UNIT 104 MISSISSAUGA, ONTARIO L4V 1R5 TEL: (905) 276-2222 FAX: (905) 276-2223	

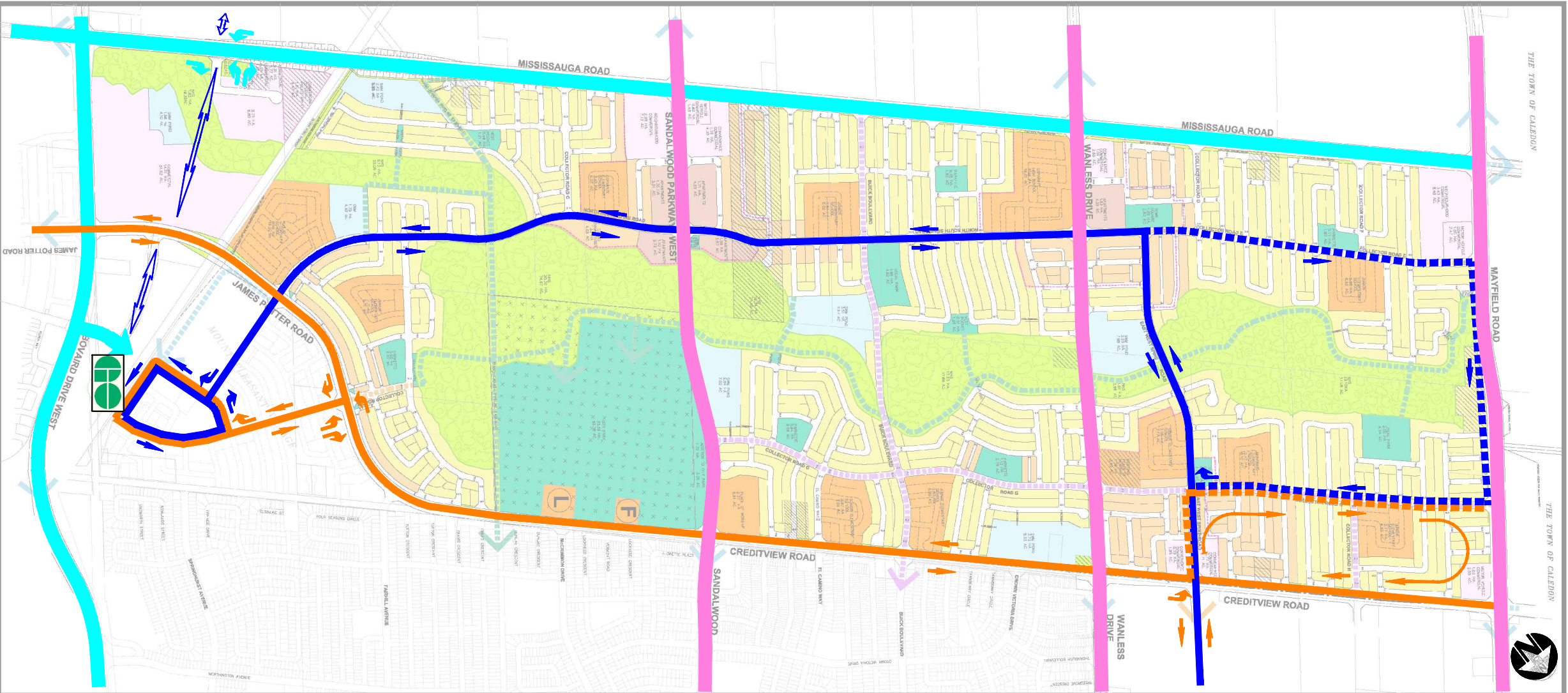
GROUP
Mount Pleasant Block Plan 51-1
6374-26, August 2011

TRANSIT LEGEND

- Spine Road Service
- - - Peak Period Spine Road Service
- Existing Sandalwood Service diverted to north side transit station via Spine Road
- Existing Chinguacousy Service diverted to north side transit station via Creditview Road
- 00 Existing Bus Route

**POTENTIAL TRANSIT SERVICE
Build-Out of Block 51-1**

Figure 14.3



LEGEND

<ul style="list-style-type: none"> BOUNDARY OF BLOCK PLAN AREA 51-1 NODE BOUNDARY NATURAL HERITAGE SYSTEMS CITY PARK CO-STATION NON-PARTICIPATING PROPERTIES FIRMHALL LIBRARY 	<ul style="list-style-type: none"> LOW/MEDIUM RESIDENTIAL MEDIUM DENSITY RESIDENTIAL HIGH DENSITY RESIDENTIAL COMMERCIAL SWM POND OPEN SPACE (NS)/ BUTTRESS/ CHANNELS PARKS/ WEST POCKETS/ PARKETTES/ TOWN SQUARE INSTITUTIONAL SPECIAL POLICY AREA 	<ul style="list-style-type: none"> MULTI-USE PATH WITHIN BLVD. (CLASS 1) AS PER OFFICIAL PLAN / CITY WIDE PATHWAY NETWORK ON-STREET BIKE LANE (CLASS 2) POTENTIAL SIGNED BIKE ROUTE (CLASS 3) GREEN SYSTEM TRAIL (MULTI-USE PATH) (REFLECTS CHANNEL ALIGNMENT WIGNETTES)
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NOTE: THE ALIGNMENT AND RIGHT OF WAYS OF THE ARTERIAL AND COLLECTOR ROADS SHOWN ON THIS DRAWING ARE SUBJECT TO THE RESULTS OF ONGOING AND/OR FUTURE ENVIRONMENTAL ASSESSMENT STUDIES

**BLOCK PLAN LAYOUT
MOUNT PLEASANT SECONDARY PLAN AREA
BLOCK PLAN AREA NO. 51-1**

PLAN: 03.58.03	NOVEMBER 19, 2010
FILE NUMBER: A-019.10	SCALE: 1:4,000
27 GERRARD STREET EAST, SUITE 200 SCARBOROUGH, ONTARIO M1S 1T6 TEL: (416) 291-1111 FAX: (416) 291-1112	

TRANSIT LEGEND

- █ Züm Service
- █ Arterial Corridor Service
- █ Spine Road based Community Service
- █ Short Turn / Peak Period
- █ James Potter / Creditview Service
- ↔ Possible Station Road Transit Corridor

**POTENTIAL TRANSIT SERVICE
Long Term, Corridor Based**

Figure 14.4

15.0 Active Transportation System

Promotion of active transportation modes is a significant sustainability objective for the City of Brampton in general, and for the Mount Pleasant Community in particular. Within Block 51-1, careful consideration has been given to ensuring that a comprehensive and well connected network of facilities is in place for the use of both pedestrians and cyclists. This is illustrated in Figure 15.1.

15.1 Sidewalks

Sidewalks are to be provided as per Brampton standards and the terms of the Memorandum Of Understanding as described in Sections 3.1 and 12.1 of this report.

As such, local roads throughout the community will be built with sidewalks on one side only, the side to be determined at the time of detailed design. This results of the agreement reached between City staff and the landowners at the time of the preparation of the Secondary Plan to use the City of Brampton's narrower and more compact 16.5m Minor Local Road Standard 200A (as shown in Figure 12.1) for all local roads rather than the wider 18m standard. This was seen as one of the key measures implemented to ensure that the density of the community will be consistent with the objective of fostering increased transit and active transportation usage.

Collector roads will be provided with sidewalks on both sides.

As shown in Figure 15.1, connections between the NHS based trails and the community sidewalks are made through strategically located parks and vista blocks. These will allow users to move between areas of the community using both the trail and sidewalk systems.

15.2 On Street Bicycle Support

15.2.1 Dedicated Bicycle Lanes

Cyclists will be accommodated in dedicated on-street bicycle lanes on the central Spine Road that runs through the entire Block 51-1 community.

At the south end, where the Spine Road meets James Potter / Creditview Road, the bicycle lanes will be re-directed on the south side into an off-road cycle trail that connects directly to the north side transit terminal area at the heart of the Mount Pleasant Village.

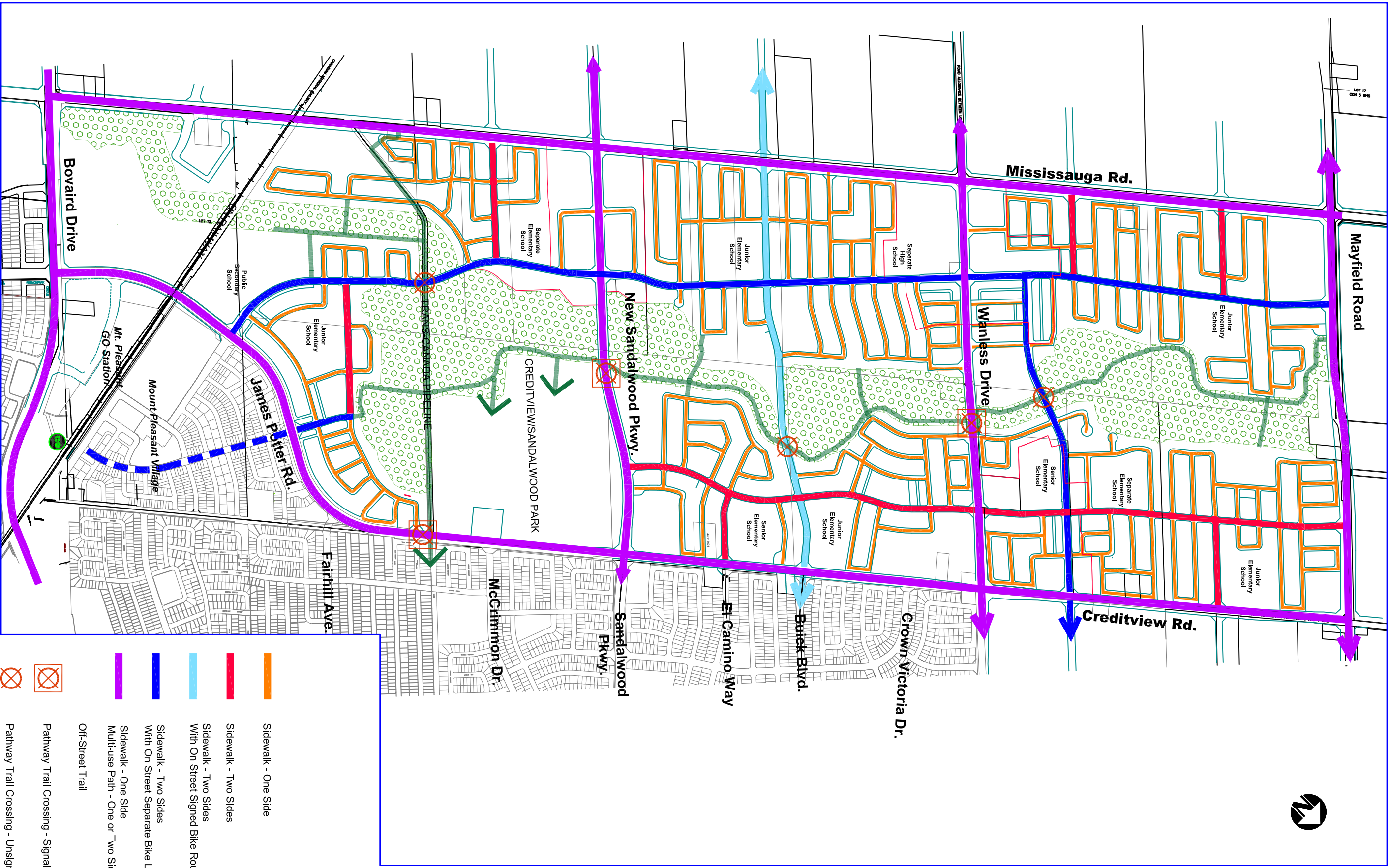
At the opposite end of the Spine Road, where it meets Creditview Road to the north of Wanless Drive, the bicycle lanes will ultimately be connected and continued through the Block 51-2 along the eastward continuation of the east-west Spine Road to McLaughlin Road.









Dedicated bicycle lanes will also be provided on the collector road extension of the north-south Spine Road that connects to Mayfield Road.

There will thus be continuous on-street bicycle lanes through the entire length of Block 51-1.

15.2.2 Bicycle Friendly Travel Lanes

Directly to the east of Block 51-1, Buick Boulevard is designated as a signed bicycle route through the Fletchers Meadows community. Within Block 51-1, a 1.0m wider pavement is proposed for Buick Boulevard so as to ensure that the resulting travel lanes (generally 4.0m in width) are of an appropriate width for shared use by vehicles and bicycles. As noted in Section 11.1.3 of this report, this 4.0m width is the recommended minimum lane width in the City of Brampton *PathWays Master Plan* report for Signed Routes of this type.



-  Sidewalk - One Side
-  Sidewalk - Two Sides
-  Sidewalk - Two Sides With On Street Signed Bike Route
-  Sidewalk - Two Sides With On Street Separate Bike Lanes
-  Sidewalk - One Side Multi-use Path - One or Two Sides
-  Off-Street Trail
-  Pathway Trail Crossing - Signalized
-  Pathway Trail Crossing - Unsignalized

Mount Pleasant Block Plan 51-1
Sidewalk and Pathways Plan



Mount Pleasant Block 51-1
Job # 6374-26 August, 2011

Figure 15.1

15.3 Off Street Trails and Pathways

15.3.1 Trail Network

A system of trails will be put in place as the NHS is developed. These trails follow the NHS through non-sensitive areas, and also provide connections across the NHS in key areas so as to connect public land uses on both sides of the Block 51-1 community. Viewed in the context of an active transportation system, the NHS based trail system provides a complete north-south transportation corridor in the heart of the community, one that is anchored by the transit facilities and GO Station interface in the Mount Pleasant Village. In addition it supports and extends the east-west trail alignment that follows the Trans Canada Pipeline (TCPL) corridor to the east of Block 51-1.

15.3.2 Trail Crossings of Arterial and Collector Roads

A key characteristic of a successful active transit network such as that proposed within Block 51-1 is the appropriate design of safe and convenient roadway crossings. In consultation with City of Brampton staff, functional designs have been prepared for each of the road crossings made by the Block 51-1 trail network.

15.3.2.1 TCPL Trail at North-South Spine Road

The proposed crossing of the north-south Spine Road by the trail that follows the Trans Canada Pipeline easement occurs about 200m south of the Spine Road intersection with Collector Road 'C'.

Details on signage will be determined during the detailed design of the Spine Road and should conform to the latest practices and regulations. The final design should also ensure that future signalization of the crossing is not precluded.

It is proposed to replace the centre left turn lane through this area with a centre median which will provide a centre refuge. The presence of the median will allow crossings to be made in two stages, which makes for an easier and safer crossing. This will ensure that even if traffic does not stop, it will be relatively easy to find gaps in the traffic sufficient to cross safely.

Note that the trail is staggered on both the east and west approaches to the crossing. This is done to alert trail users, cyclists in particular, to the presence of the crossing, and to reduce the likelihood of a trail user riding directly onto the crossing without stopping or slowing down.

15.3.2.2 NHS Trail at Sandalwood Parkway

Figure 15.2a illustrates the proposed crossing of Sandalwood Parkway by the trail that follows the Natural Heritage System (NHS) in a generally north-south alignment. This crossing would be located about 150m east of the intersection of Sandalwood Parkway with the north-south Spine Road.

It is proposed that this crossing be controlled by way of a mid-block traffic signal. This signal would be callable by trail users, but would not necessarily activate immediately. It could be coordinated with the traffic signals at the Spine Road to the west and Collector Road 'G' to the east. In this

manner, traffic flow will not generally be interrupted by this signal, and progression along Sandalwood Parkway can be maintained.

It is also proposed to modify the cross section of Sandalwood Parkway as it passes through the Natural Heritage System by removing the centre median. Given that this crossing would be signal controlled, the centre median would provide no advantage as a safe centre refuge. By removing it, a double benefit would occur:

- The crossing distance for trail users would be reduced by about 5m, which would therefore reduce the time required to cross the road by about 4 seconds.
- Additional landscaping could be provided in the boulevards, thereby creating the opportunity to provide a landscaped screen between the road and the NHS

Note that the trail is proposed to be staggered on both the north and south approaches to the crossing. This is done to alert trail users, particularly cyclists, to the presence of the crossing, and to reduce the likelihood of a trail user riding directly onto the crossing without stopping or slowing down.

Finally, there is an opportunity to provide bus stops on either side of the road at this location. Facilitating connectivity between the active transportation and transit networks in this manner would be of benefit with respect to promoting both modes of transportation. Given that this is not an intersection and that there are no turning movements or queues, the stops have been located as near side stops in Figure 15.2b.

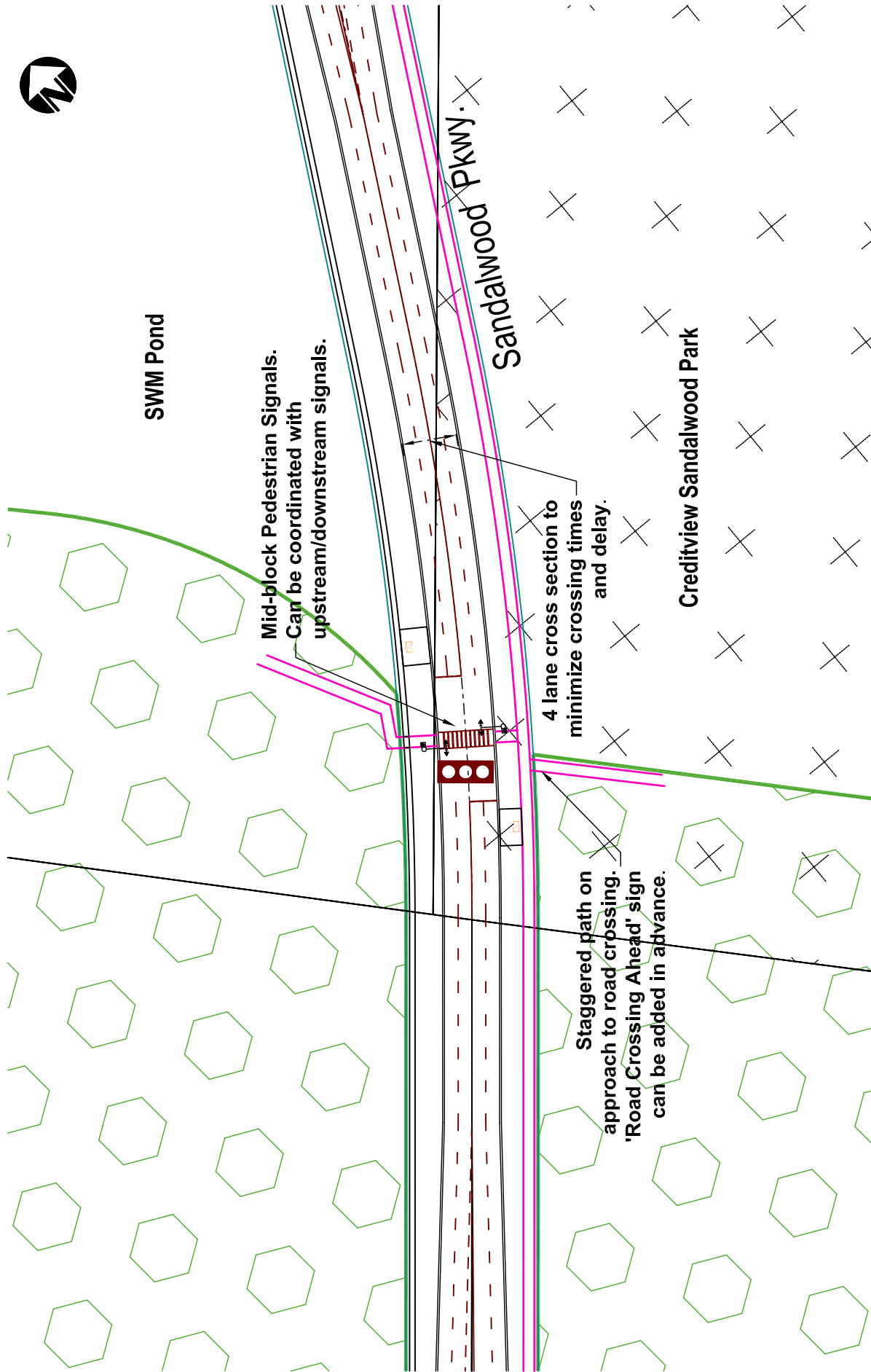
15.3.2.3 NHS Trail at Buick Boulevard

The proposed trail crossing of Buick Boulevard by the trail that follows the alignment of the Natural Heritage System (NHS) would be located about 150m west of the intersection of Buick Boulevard with Collector Road 'G'.

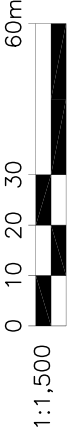
Details on signage will be determined during the detailed design of the Spine Road and should conform to the latest practices and regulations. The final design should also ensure that future signalization of the crossing is not precluded.

Buick Boulevard in this area will be a 2 lane collector road with bicycle lanes striped on the outside. Drivers on this road will likely already be aware of the presence of bicycles within this right-of-way, and therefore more likely to be aware and considerate of users of the trail crossing.

It is proposed that the trail be staggered on both the north and south approaches to the crossing. This would alert cyclists in particular to the presence of the crossing, and reduce the likelihood of a trail user riding directly onto the crossing without stopping or slowing down.



**NHS Trail Crossing -
Sandalwood Parkway**



15.3.2.4 NHS Trail at Wanless Drive

Figure 15.2d illustrates the proposed trail crossing of Wanless Drive by the trail that follows the alignment of the Natural Heritage System (NHS). This crossing would be located immediately to the east of the NHS boundary.

Given the proximity of the trail to the east edge of the NHS boundary, and a convenient local road intersection with Wanless Drive, it is proposed to create a traffic signal controlled crossing at the local road intersection. This would require that the trail be staggered by about 75m on the north side of Wanless, and 30m on the south side.

On the south side, the trail would make use of the proposed multi-use path within the road allowance in order to connect from the NHS trail to the road crossing point. On the north side, it is proposed to replace about 75m of sidewalk with a 3.0m wide multi-use path identical to that on the south side. This would be sufficient to make the connection between the NHS trail and the crossing point at the local road intersection.

Finally, as on Sandalwood Parkway, there is an opportunity here to provide bus stops on either side of the road at this location. Facilitating connectivity between the active transportation and transit networks in this manner would be of benefit with respect to promoting both modes of transportation.

15.3.2.5 NHS Trail at East-West Spine Road

The proposed crossing of the east-west Spine Road by the trail that follows the alignment of the Natural Heritage System (NHS) occurs at about the mid-point of the NHS in this area.

Details on signage will be determined during the detailed design of the Spine Road and should conform to the latest practices and regulations. The final design should also ensure that future signalization of the crossing is not precluded.

It is proposed to replace the centre left turn lane through this area with a sizeable centre median which would provide a centre refuge. The presence of the median would allow crossings to be made in two stages, making for an easier and safer crossing. This would ensure that even if traffic does not stop, it will be relatively easy to find gaps in the traffic sufficient to cross safely.

Note that the trail is staggered on both the north and south approaches to the crossing. This is done to alert trails users, particularly cyclists, to the presence of the crossing, and to reduce the likelihood of a trail user riding directly onto the crossing without stopping or slowing down.

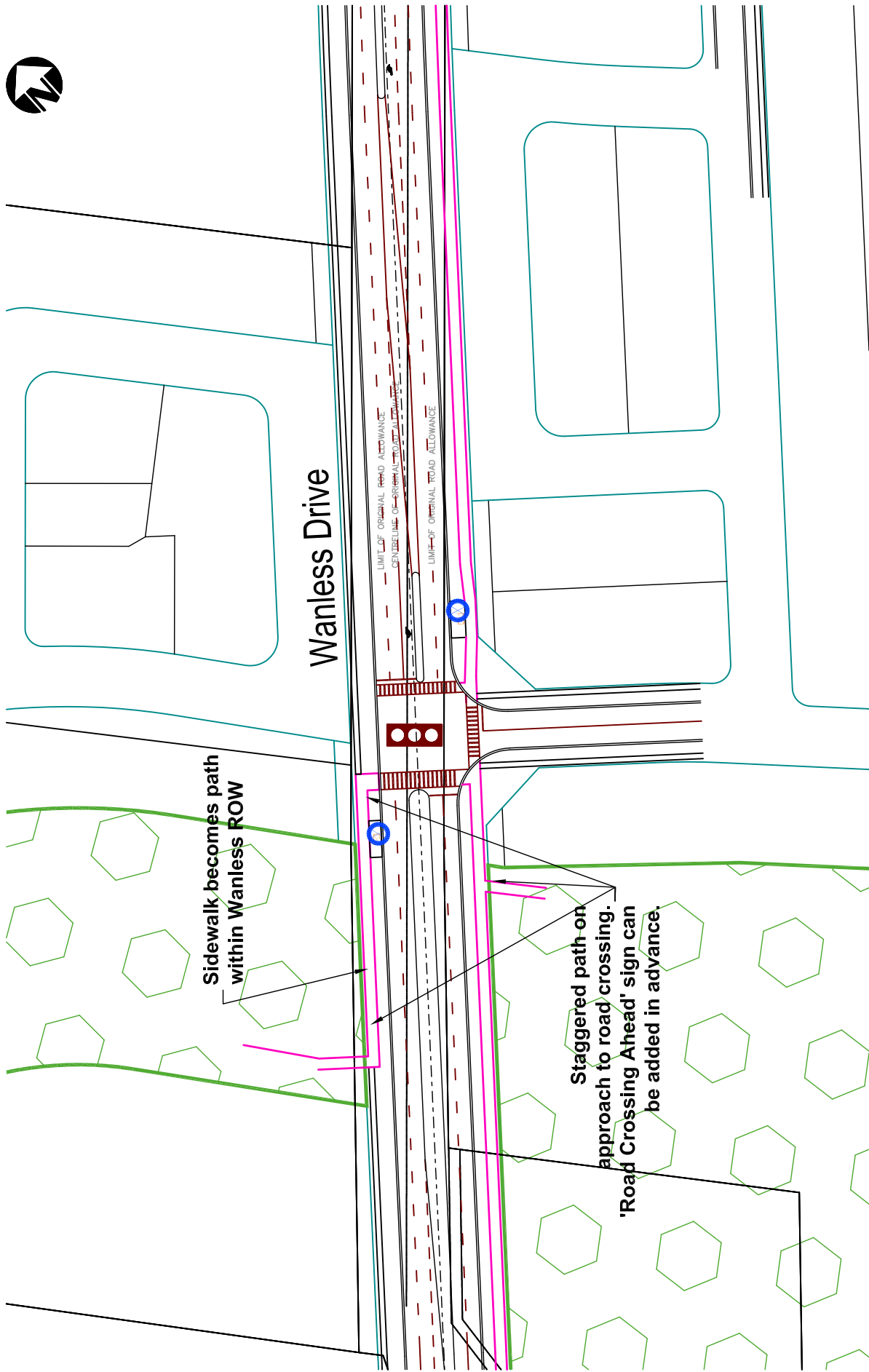
15.3.2.6 TCPL Trail at Creditview Road

Figure 15.2f illustrates the proposed crossing of Creditview Road by the trail that follows the Trans Canada Pipeline (TCPL) easement. This crossing occurs near the southeast corner of the Creditview Sandalwood Park

It is proposed that this crossing be implemented as an east-west pedestrian crossing located on the north leg of the intersection between Creditview Road and the future local street about 50m to the south of the TCPL crossing. This crossing would be controlled by means of a traffic signal, which would be callable by trail users and pedestrians wishing to cross Creditview Road in addition to side street traffic.

Making use of the intersection as a crossing point would provide trail users and pedestrians with the safety of a full traffic signal when crossing Creditview Road. The inconvenience of the offset crossing alignment is modest, requiring only 30-40m of additional walk distance on each side of Creditview between the trail and the crossing. The offset alignment would also alert cyclists to the presence of the crossing, and reduce the likelihood of a trail user riding directly onto the crossing without stopping or slowing down.

On the west side of Creditview Road, the trail offset connection between the TCPL trail and the proposed road crossing would be achieved using the multi-use path already proposed within the road right-of-way. On the east side, the connection would be made by replacing the proposed sidewalk with a short section of 3.0m multi-use path as shown in the figure.

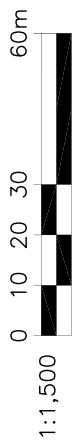


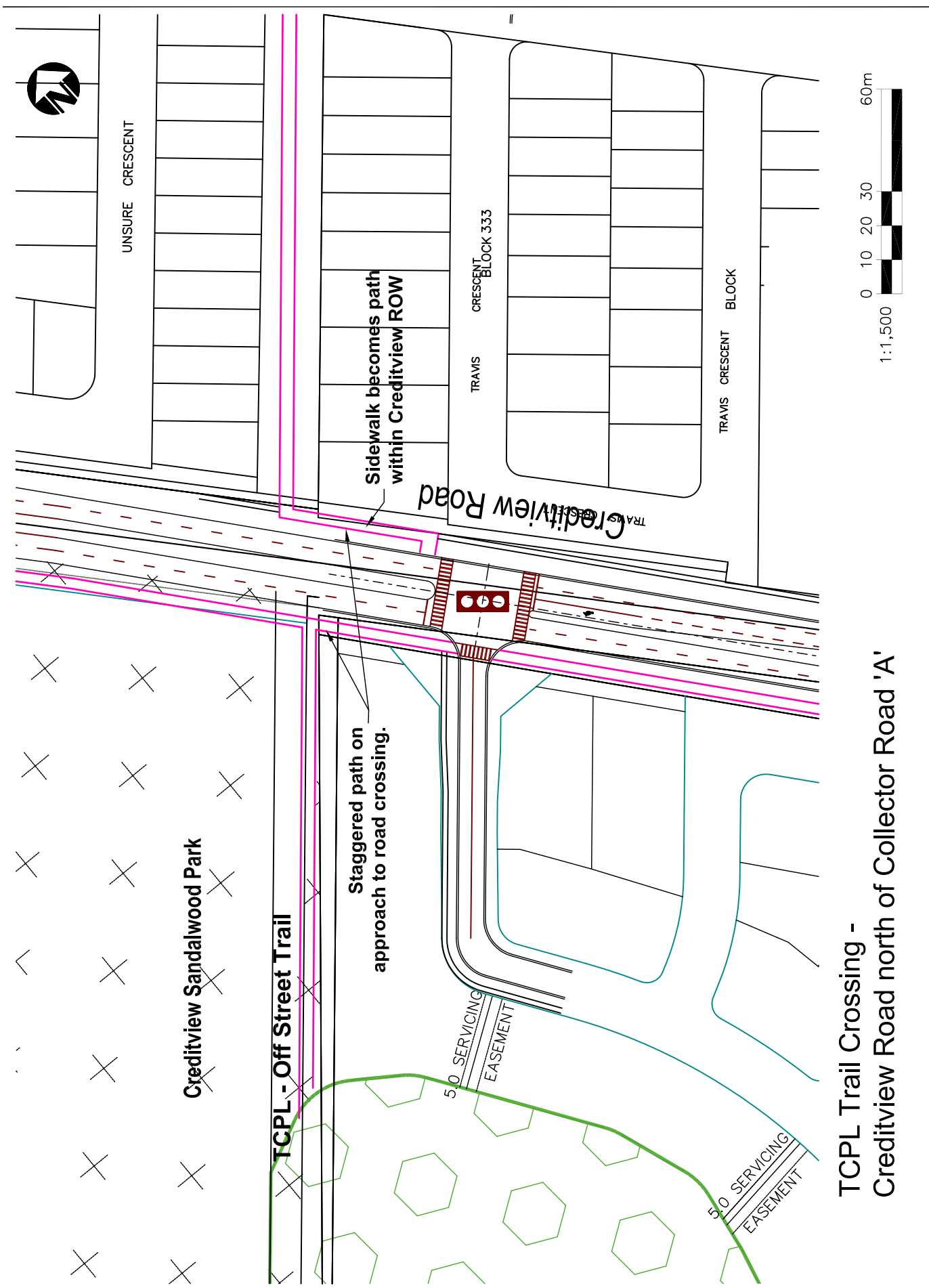
Sidewalk becomes path within Wanless ROW

Staggered path-on approach to road crossing. 'Road Crossing Ahead' sign can be added in advance.

Wanless Drive

NHS Trail Crossing - Wanless Drive





TCPL Trail Crossing -
Creditview Road north of Collector Road 'A'

15.3.2.7 TCPL Trail at Mississauga Road

The west side of Block 51-1 is bounded by Mississauga Road, for which an Environmental Assessment is underway to widen the road to six lanes and to grade separate the crossing at the Canadian National Railway line. As noted in Section 3.5.1 of this report, assumptions have been made regarding the ultimate configuration of this grade separation for purposes of proceeding with the planning of Block 51-1. Of relevance to subject of trail crossings is the assumption that Mississauga Road will cross over rather than under the CNR line.

As illustrated in Figure 15.2g this means that the east-west trail that follows the Trans Canada Pipeline (TCPL) alignment will reach the edge of the future Mississauga Road right-of-way at a point where there is a significant embankment.

Finding a solution to the problem of a trail crossing of Mississauga Road is beyond the scope of this study, and would be more appropriately addressed through the Mississauga Road EA study process.

Furthermore, a Secondary Plan has not yet been prepared for the lands to the west of Mississauga Road, and so it is not possible to identify an appropriate trail connection point on the west side of the right-of-way.

Notwithstanding these factors, it is recommended that the TCPL trail be routed northwards to follow the toe of the future embankment slope until a point is reached where the grades allow the trail to connect into the east side Mississauga Road boulevard.

Furthermore, it is recommended that the 3.0 metre multi-use trail within the Mississauga Road right-of-way be located on the east side of Mississauga Road in this area, that is, between Bovaird Drive and Collector Road 'C' to the north. This placement on the east side is consistent with the recommendations of the Mississauga Road Widening EA Study as they currently stand, pending completion of the study anticipated to occur in the fall of 2011. This placement of the multi-use trail will allow trail users the flexibility to:

- travel south, traversing the future overpass without first crossing Mississauga Road. Having crossed to the south side of the CNR line, there would be two opportunities to cross to the west side Mississauga Road:
 - At a future collector road intersection that has been proposed to be located between Bovaird Drive and the CNR line so as to provide access to lands on both the east and west side of Mississauga Road
 - At the Mississauga Road / Bovaird Drive intersection.
- travel north to cross to the west side of Mississauga Road at the signal at Collector Road 'C'



Figure 15-2d – TCPL Trail connection to East side of future Mississauga Road

16.0 Transportation Network Impacts and Concerns

16.1 Natural Environmental

The Natural Heritage System or NHS comprises one of the most prominent features of the Mount Pleasant Secondary Plan. Through the process of designing and implementing the Block 51-1 NHS, the diversity and connectivity of natural features and areas within the Mount Pleasant community will be identified, protected, restored and enhanced. The NHS will be comprised of valleylands and watercourse corridors, woodlands, wetlands, environmental buffers, as well as restoration areas and connecting corridors.

The proposed Block 51-1 NHS is unique in terms of the emphasis which is being placed on the preservation, enhancement, and creation of natural heritage features within an integrated NHS.

In response to this unique endeavour, the community plan has been designed so as to allow members of the community access to the NHS where appropriate via the trail system, while striving to minimize impacts due to road crossings or encroachments.

16.1.1 NHS Crossings

An important objective during the planning of the road network for this community has been the minimization of road crossings of the NHS in order to preserve its integrity. This is reflected in the evaluation criteria used for the assessment of alternative collector road alignments Section 11.2.4 of this report.

In June 2009, ENTRA Consultants completed the Phase 1 and 2 *Transportation Master Plan Study for the Mount Pleasant Secondary Plan Area* (TMP). That study recommended a road network that included two arterial road crossings and five collector road crossings of the NHS within Block 51-1 (as illustrated in Figure 3.3 of this report).

16.1.1.1 Arterial Road Impacts

The two arterial road crossings, namely Wanless Drive and Sandalwood Parkway, cannot be avoided. The details of these crossings, including mitigation measures, are appropriately dealt with through the respective arterial road Environmental Assessments for these roads. The study for Sandalwood Parkway has been completed as of October 2010. The study for Wanless Drive is anticipated to commence in 2011.

16.1.1.2 Collector Road Impacts

On the other hand, the scope of this present Collector Road Environmental Assessment Study has allowed for a detailed re-evaluation of the collector road network recommended in the TMP. As documented in Section 11 of this report, changes have been made to that collector road network, as a result of which:

- one of the collector road crossings of the NHS (between Sandalwood Parkway and Wanless Drive) has been deemed to be no longer required, and

- another crossing (south of the CNR line) deferred for future study.

16.1.1.3 Local Road Impacts

There are no local road crossings or encroachment into the NHS in the Block 51-1 community plan.

16.1.1.3 Active Transportation Facility Impacts

Opportunities will be provided for pedestrians and cyclists to access the NHS by means of trail connections and linkages to and through the NHS (see Figure 15.1). The alignment, connectivity, and composition of these trails have been designed in close coordination with City of Brampton staff so as to ensure they respect sensitive areas and features within the NHS. The trail system is documented more fully in the *Mount Pleasant Community Design Guidelines Report*.

16.1.2 NHS Crossing Design

A protocol for designing road crossings of the Natural Heritage System that minimize environmental impacts was laid out in “*Implementation Principles for the Mount Pleasant Subwatershed Study*”, comprising Appendix F of the Mount Pleasant Secondary Plan. Specifically, in Section 5:

“Schedule A conceptually illustrates the location of new road crossings of the SPNHS. Road crossings and designs will be confirmed through the Sandalwood Parkway Environmental Assessment and other Integrated Planning/Environmental Assessment(s), where necessary, to be completed as part of the Block Plan process. Spans for road crossings will be designed to address fluvial considerations including watercourse form and functions (not spanning meander belt) and accommodate conveyance and storage of Regional Storm flows, where appropriate, to provide flood free road crossings, and wildlife passage as appropriate. EIR work with respect to road designs shall address wildlife passage for large mammal movement where appropriate. Design considerations will include road signage, road speed, warning lights, fencing, clear passage and/or other measures to accommodate movement across roads.”

Schedule ‘A’, illustrating the Mount Pleasant Secondary Plan Natural Heritage System, appears in Figure 16.1. Within the Block 51-1 portion of the SPA, there are five road crossings of the NHS, indicated by the symbol “+” and labelled “I”. Starting at the south end of Block 51-1 these crossings correspond to:

- Spine Road: a north-south crossing of the NHS just to the north of the Trans Canada Pipeline.
- Sandalwood Parkway: an east-west crossing of the NHS
- Buick Boulevard: an east-west crossing of the NHS
- Wanless Drive: an east-west crossing of the NHS
- Spine Road: an east-west crossing of the NHS

Details of these crossings are included in the Environmental Implementation Report (EIR).

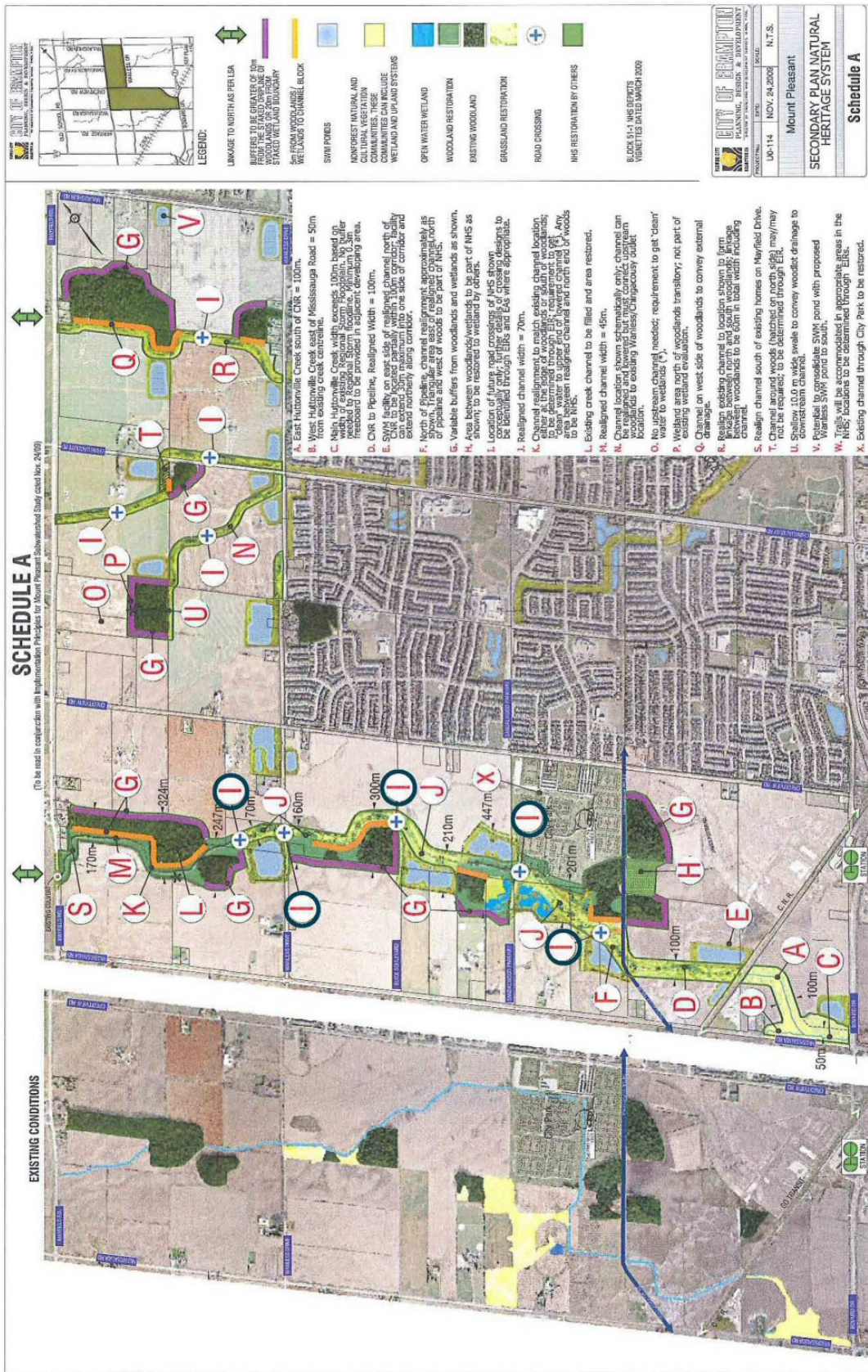


Figure 16.1 - Mount Pleasant Secondary Plan Natural Heritage System (Block 51-1 NHS crossings identified with '+' symbols)

16.2 Cultural and Heritage Impacts

16.2.1 Creditview Sandalwood Park

The Block 51-1 community plan has been developed so as to ensure that there are no collector or local road impacts on the large City wide sports park in the southwest quadrant of Creditview Road and future Sandalwood Parkway. Section 8.2.6 documents an assessment of two alternative collector road connections through the park, both of which were rejected as having too great an impact relative to the value of the connections they achieved.

A potential positive impact on the park is achieved by virtue of the north-south Collector Road ‘G’ connection to Sandalwood Parkway located about mid-way along the north face of the park. The location of this three legged, signalized intersection allows for the ultimate addition of a fourth leg to the south, providing a second road access point to the park.

16.2.2 Heritage Impacts

A review of designated heritage properties in Block 51-1 has found that just one, the James Clark Farmhouse at 1930 Wanless Drive, would be potentially impacted by the collector road network. Specifically, it lies very close to the future intersection of Wanless Drive with the Spine Road.

This property has been the subject of detailed discussions with the City of Brampton, which have culminated in a “Heritage Strategy” agreement between the landowners and the City. This agreement recognizes the fact that the Clark heritage home was recently lost to fire, and that there is limited remaining heritage “value” on the existing property. It is therefore proposed to create an appropriate memorial in the Town Square area to the north of the future intersection of Wanless Drive and the Spine Road to commemorate the Clark family. This is documented in the *Community Design Guidelines* report.

A copy of the proposed *Heritage Strategy* document, dated July 12th, 2010 is included in Appendix A.4.1 attached separately to this report.

17.0 Conclusions

17.1 Key Results

17.1.1 Collector Road Alignment Changes

Since the completion of the Phase 1 and 2 *Mount Pleasant Secondary Plan Area Transportation Master Plan* (TMP) study in June 2009, considerable planning work has been undertaken in regard to the Block 51-1 community. As a result of this process, a much more detailed plan has been created, notably with respect to land use type and form, the configuration and scale of the Natural Heritage System, and storm water management requirements. As a result of this new, more detailed community context, a number of changes to the recommendations of the TMP collector road alignments and cross sections have been considered. These changes provide for a collector road network, and overall community transportation system, that are more in keeping with the objectives identified for Block 51-1 in the Mount Pleasant Secondary Plan.

In this study, these changes have been appropriately assessed as sets of reasonable alternatives to the TMP recommended alignments. As such, it is appropriate to accept these changes to the TMP and move forward incorporating them into the Block 51-1 collector road network, as well as the Draft Plans.

17.1.2 Road Cross Sections

In the collector and local road network design work undertaken to date for the Mount Pleasant Block 51-1 community, priority has been placed on maintaining consistency with City of Brampton road cross sections and standards. At the same time, the need has been recognized to deliver broader community and urban design objectives.

In particular, support for both transit and active transportation is proposed to be accomplished through careful selection of cross sectional elements that are supportive of these modes, while ensuring that overall right-of-way requirements continue to meet the urban built form and pedestrian scale objectives, particularly on the Spine Road and in the Mixed Use Nodes.

The minor changes to City standard road sections that are proposed for the Mount Pleasant Block 51-1 community are intended to ensure that these important community objectives can be met, while not compromising the City's mandate to deliver infrastructure that is functionally, operationally, and economically appropriate.

In particular, the Spine Road which is intended to deliver reliable and regular transit service to the community, best meets the many needs of the Block 51-1 community if it is configured as follows:

- three lane road with a left turn lane at all intersections, and 3.75m wide travel lanes
- dedicated bicycle lanes on both sides
- generally no provision for parking, (except in lay-bys in selected areas within the Mixed Use Nodes)
- limited direct driveway access

17.1.3 Operations and Timing

In this study, future (2031) traffic forecasts have been developed that indicate the recommended collector road network, and its connecting intersections to the adjacent arterial road network, will operate at an appropriate and acceptable level of service.

A staging analysis concludes that a first phase of development comprising approximately 3,000 units can be constructed prior to the opening of the James Potter / Creditview Road grade separated CNR underpass. This is anticipated to be completed by the end of 2013, but conservatively assumed to be in place by the end of 2014 for purposes of this sensitivity analysis.

This first phase is contingent on building:

- the Spine Road from James Potter / Creditview Road as far north as Collector Road “C”, just to the south of Sandalwood Parkway
- the Collector Road “C” connecting link between the Spine Road and Mississauga Road
- Sandalwood Parkway and subsequently Buick Boulevard as development reaches these roads.

The existing City of Brampton and Region of Peel capital roads programs and schedules are generally adequate to meet the functional, capacity, and timing needs of Block 51. Notwithstanding this, it would be desirable to advance the timing and adjust the quantum of Development Charge funding for the Spine Road.

If the extension of sanitary sewer services up Mississauga Road to Block 51-1 is delayed beyond 2012, or for any other reason the City deems appropriate, an optional initial development phase in the northeast area of Block 51-1 is supportable on the existing arterial road network.

17.2 Findings of the Study

17.2.1 Structure and Staging of the Community

17.2.1.1 Interim Road Network, Prior to James Potter / Creditview Road Link

1. Prior to the completion of construction of the James Potter / Creditview Road re-alignment between Bovaird Drive and Fairhill Avenue (including the CNR grade separation), it is possible to construct approximately 3,000 residential units in Block 51-1. In order to accomplish this:
 - a. before any units to the south of the Mixed Use Node centred on Sandalwood Parkway and the Spine Road are occupied (shown as Phase 1A in Figure 13.1):
 - the north-south Spine Road must be completed from James Potter / Creditview Road north to Collector Road “C”
 - Collector Road “C” must be completed from the Spine Road to Mississauga Road
 - b. before any units to the north of the Mixed Use Node centred on Sandalwood Parkway are occupied, Sandalwood Parkway must be completed from Creditview Road to Mississauga Road.
 - c. a program of traffic monitoring counts is to be undertaken every 6 months in the area of the Fletchers Meadows community lying generally to the east of Creditview Road and south of Fairhill Drive commencing in April 2012, and ending once the James Potter / Creditview Road link between Bovaird Drive and Fairhill Avenue is operational. This will allow any traffic issues related to the development of Block 51-1 and the Mount Pleasant Village during this period to be identified, and associated mitigation measures to be put in place. These counts were commenced in April 2011 on behalf of Mount Pleasant Village, with Block 51-1 taking responsibility for the count program in April 2012.
 - d. it is recommended that construction work on the Mississauga Road widening and CNR grade separation to the north of Bovaird Drive be coordinated, insofar as is possible, such that it does not commence until the James Potter / Creditview Road re-alignment between Bovaird Drive and Fairhill Avenue has been completed.
2. Should it be deemed appropriate to do so by the City, an optional initial development program in the northeast area of Block 51-1 is supportable on the existing arterial road network.

17.2.1.2 Ultimate Road Network

1. A Block 51-1 collector road network has been identified and assessed that meets the future needs of the community with respect to internal circulation and access to the higher order arterial road network (see Figure 17-1)

2. A detailed plan has been developed for the implementation of Block 51-1 in a manner that does not depend on sequential development from one area to the next. It is anticipated that once the initial road works are in place (most notably the construction of Sandalwood Parkway from Creditview Road to Mississauga Road) development may occur in several disparate areas of the block simultaneously.
3. The existing City of Brampton and Region of Peel capital roads programs and schedules are generally adequate to meet the functional, capacity, and timing needs of Block 51-1. In particular, based on the Brampton 2011-2020 Roads Capital Program (dated January 26th, 2011):
 - the timing that is currently planned for the City of Brampton roads comprising the boundaries of this community is consistent with the needs of the community:
 - the widening of Creditview Road between Bovaird Drive and Mayfield Road between 2013 and 2014
 - the widening of Wanless Drive between Creditview Road and Mississauga Road in 2014, with the Phase 3 and 4 EA commencing in 2011.
 - the timing for Development Charge funding for the roads to be delivered by the Block 51-1 landowner's group is somewhat consistent with the planned delivery of these roads:
 - funding for the CNR underpass on Creditview Road is identified for 2015. This project is being targeted for completion around the end of 2013.
 - funding for Sandalwood Parkway between Creditview Road and Mississauga Road is identified for 2014. This road will likely be built in 2012 and 2013.
 - funding for the North-South Spine Road between Creditview Road and Sandalwood Parkway is identified for 2013. This road will likely be built in 2012.
 - funding for the North-South Spine Road between Sandalwood Parkway and the connection with the East-West Spine Road to the north of Wanless Drive is identified for 2016. This road will likely be built in 2013 and 2014
 - **funding is identified for the North-South Spine Road between the connection with the East-West Spine Road and Mayfield Road in 2016. This section of road is not part of the Spine Road. The Development Charge funding for this section of road needs to be applied to the East-West Spine Road between the connection with the North-South Spine Road and Creditview Road to the north of Wanless Drive. This road will likely be built in 2013 and 2014.**



Mount Pleasant Block 51-1
Job # 6374-26 August, 2011

Mount Pleasant Block Plan 51-1 Recommended Collector Road Network

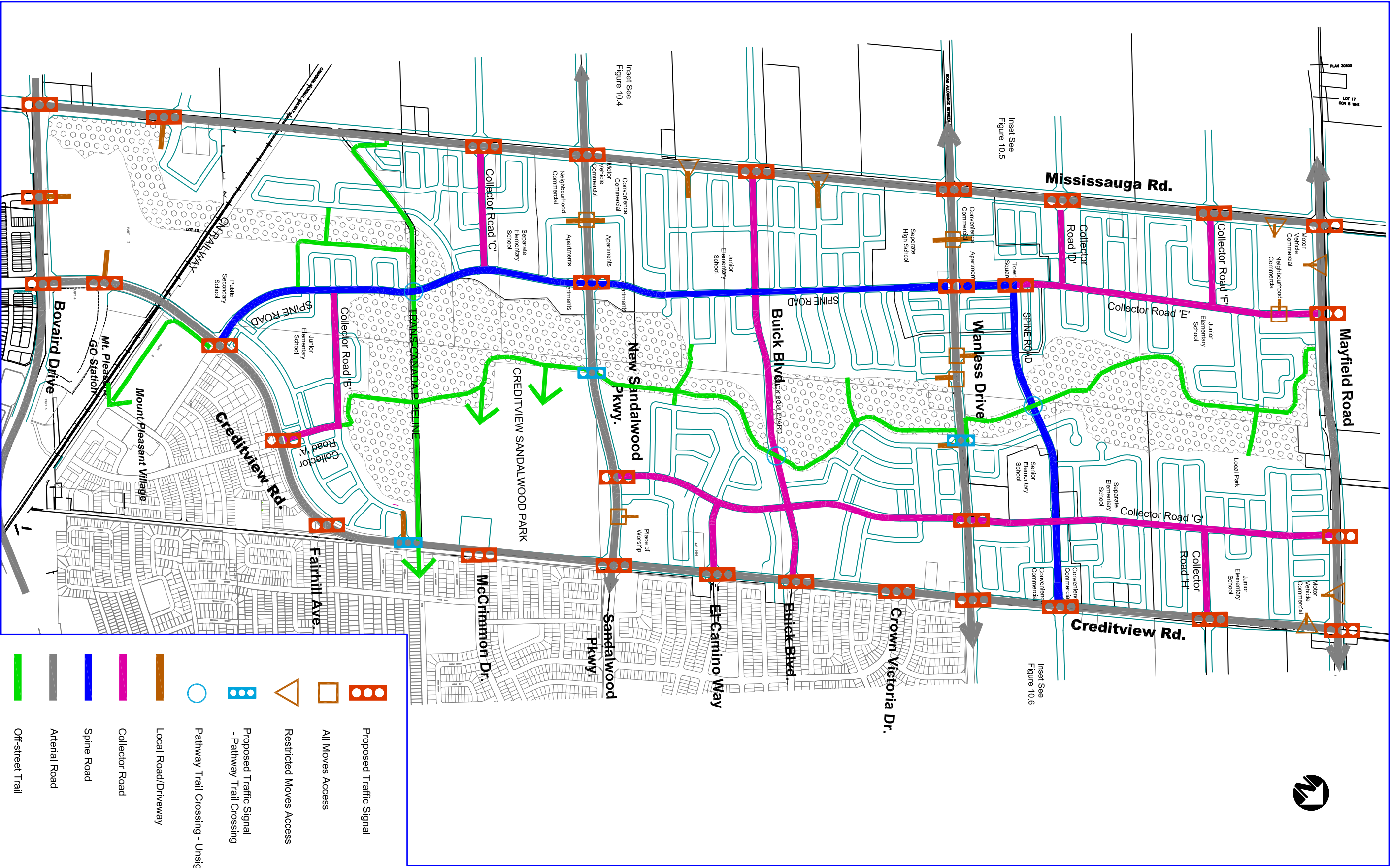


Figure 17-1

4. Appropriate arterial road rights of way have been identified through ongoing and completed Environmental Assessment studies, and accommodated in the Block 51-1 plan. Where EA study information is not yet available (Wanless Drive and Mayfield Road) appropriate assumptions regarding anticipated rights of way have been made on the basis of the best information available, including agreements reached between Region of Peel staff, City of Brampton staff, and representatives of the development industry.
5. An east-west collector road was proposed in the TMP Study through the area to the south of the CNR line bounded by James Potter / Creditview Road, Bovaird Drive, and Mississauga Road. This area is subject to a “Special Policy Area” (Norval Farm Supply) section 5.1.3.2 and policy 5.3.2.5 in the MPSP the latter of which provides for the continued protection and future planning of an east-west connection from Creditview Road (James Potter Road) to Mississauga Road consistent with the Mount Pleasant Area Secondary Plan Transportation Master Plan. The need for an east -west connection in association with and in support of potential development is subject to future comprehensive planning study addressing land use, massing, design, environmental and transportation for lands south of the CN tracks.

Given the fact that this area is isolated from the remainder of Block 51-1 by the CNR line, it has been determined that a crossing of the NHS does not form part of the road network needed to support the Block 51-1 community; nor is it required to support the potential commercial land uses within the “Special Policy Area” as each of the two sub-areas (divided by the future NHS as illustrated in Figure 11.5) are configured to facilitate, and subject to further review, access adjacent arterial roads.

17.2.1.3 Revised Conclusions With Respect to Phase 3 & 4 Sandalwood Parkway Environmental Assessment

The need, justification and potential alignments of the Sandalwood Parkway Extension were assessed in the City’s *Mount Pleasant Secondary Plan Area Transportation Master Plan (TMP)* in accordance with Class Environmental Assessment requirements. It identified the extension of Sandalwood Parkway as a Schedule C project that required further study in compliance with Phases 3 and 4 of the Class Environmental Assessment process. This work was completed through the *Sandalwood Parkway Extension from Creditview Road to Mississauga Road Class Environmental Assessment – Environmental Study Report (ESR)* completed by ENTRA Consultants and Philips Engineering in November 2010. The Study assessed alternative road alignments and recommended a location and preliminary preferred design of the Sandalwood Parkway extension through the Mount Pleasant lands. The recommended location was noted to cross the NHS generally south of existing Wetland 9 (W9). A small portion of the staked boundary of this wetland lies within the proposed ESR Sandalwood Parkway right-of-way and associated transitional grading area. The ESR concluded that the minor loss of a portion of W9 could be readily compensated for within the NHS design as currently proposed. It further noted that necessary adjustments to the design, inclusive of details of cross-section and alignment of Sandalwood Parkway that are generally in accordance with the preferred alternative alignment, will be considered during the detailed design phase in association with the Block Plan process and addressed through required component studies, including but not limited to the Environmental Implementation Report (EIR) and Transportation Study.

Following completion of the ESR, the ‘preferred’ alignment of Sandalwood Parkway was reviewed as a part of the development of the Block Plan for Sub-Area 51-1. A review of the road alignment

with respect to the integration of various land uses in this vicinity including the extent and form of the NHS, maintenance of the Creditview Park facilities, the development of an ‘urban node’ in conjunction with the alignment of the community Spine Road and the consideration of land use efficiencies resulted in the proposal for several adjustments to the Sandalwood Parkway alignment (as illustrated in Figure 3.6). These adjustments can be generally described as adjusting the road alignment northward from the ESR alignment by 18m to 45m depending on location. This moves the road further north into portions of W9.

17.2.2 Transportation Performance Assessment

1. A collector road network generally based on the road network recommended in the preceding TMP study, and with some modest changes to alignments and cross sections (as documented in Figure 11.16), is appropriate and sufficient to meet the transportation needs of Block 51-1.
2. Future 2014 traffic forecasts have been developed to assess the performance of the collector and arterial road network assuming the construction of approximately 3,000 residential units occurs by this year, and prior to the completion of the James Potter / Creditview Road link between Bovaird Drive and Fairhill Avenue. The results indicate that the collector road network required to support this development includes (refer to Figure 11.16):
 - a. the completion of a connection to Mississauga Road comprised of the north-south Spine Road from James Potter / Creditview Road to Collector Road ‘C’ and Collector Road ‘C’ from the Spine Road to Mississauga Road prior to occupancy of any residential units south of Sandalwood Parkway.
 - b. the completion of Sandalwood Parkway between Creditview Road and Mississauga Road prior to occupancy of any residential units to the north of Sandalwood Parkway.
3. Future 2016 traffic forecasts have been developed to assess the performance of the collector and arterial road network assuming full build-out of the community occurs by this year. The results indicate that the recommended collector road network, and its connecting intersections to the adjacent arterial road network, will operate at an appropriate and acceptable level of service.
4. Future 2031 traffic forecasts have been developed to assess the performance of the collector and arterial road network assuming full build-out of northwest Brampton. The results indicate that the recommended collector road network, and its connecting intersections to the adjacent arterial road network, will operate at an appropriate and acceptable level of service. Background traffic volumes for 2031 were developed utilizing the City of Brampton forecast model. In order to confirm its reliability for this purpose, 2006 output from the forecast model was checked against ground counts at selected locations and found to be appropriately accurate.
5. Intersection turning movement requirements, including storage lengths, have been determined on the basis of the intersection performance analysis conducted for this study.

6. The spacing of several closely intersections within the Mixed Use Nodes has been tested, and found to be compatible with the left turn storage requirements.

17.2.3 Road Standards

1. A four lane collector road cross section was previously recommended for the Spine Road in the TMP. This present study has further refined the configuration of the Spine Road so as to deliver reliable and regular transit service to the community, while best meeting the many City of Brampton objectives for the Block 51-1 community. This refined configuration consists of:
 - a. a three lane cross section comprising two 3.75m wide travel lanes, and a centre left turn lane at all intersections
dedicated bicycle lanes on both sides
 - b. generally no provision for parking, (except in lay-bys in selected and limited areas within the Mixed Use Nodes)
 - c. limited direct driveway access
 - d. transit prioritization lanes at key intersections
2. Other roads in the Block 51-1 community generally conform to existing City of Brampton Standards, except for minor increases in pavement width so as to better accommodate active transportation.
3. Right-of-way requirements have been confirmed for all internal collector roads and boundary arterial roads using the best information available from completed or ongoing Environmental Assessment Studies.
4. The results of the traffic analysis conducted in this study have been used to confirm turning lane requirements, as well as turning lane storage length requirements for both the internal collector road network as well as Sandalwood Parkway and Creditview Road.
5. The collector road network has been designed according to City of Brampton standards. Spacing of intersections meets both Brampton standards, and, where appropriate, Region of Peel standards.
6. Preliminary access opportunities have been identified for all commercial sites, including those adjacent to Region of Peel arterial roads, and based on current Peel intersection and driveway spacing requirements.

17.2.4 Transit

1. Approximately 97% of the units in the proposed block plan are located within a 400m walk distance of the nearest transit stop. The units not within this range are primarily located in a development pocket to the east of Mississauga Road and north of the CNR line, to which it is not feasible to provide more direct service.

2. Potential transit service delivery plans have been prepared for:
 - d. Interim transit service while development of Block 51-1 is underway
 - e. Build-out transit service once the Block 51-1 collector road network is completed
 - f. Long Term transit service reflecting corridor based transit service to all of Northwest Brampton.

17.2.5 Active Transportation

1. The block plan, as proposed, provides a well connected, logical, pedestrian and cyclist friendly system of active transportation facilities including dedicated bicycle lanes, bicycle friendly travel lanes, sidewalks, and off road trails. These will connect the community to adjacent communities, including Mount Pleasant Village to the south, at the heart of which lie the Mount Pleasant GO Station and transit terminal.
2. Dedicated bicycle lanes are recommended on the Spine Road so as to facilitate active transportation in this corridor while minimizing interference with transit operations.
3. Conceptual road crossing designs have been prepared for six locations where the off road trail system must cross a collector or arterial road within or on the perimeter of Block 51-1. This will ensure that trail connectivity is maintained within this community, and between this community and adjacent communities.

17.2.6 Environmental Impacts and Mitigation

1. The collector road network in Block 51-1 has been designed so as to minimize encroachment into or impact upon areas that have been identified as environmentally sensitive. These areas are being consolidated within Block 51-1 into a continuous and connected Natural Heritage System (NHS), as documented in the Block 51-1 Environmental Implementation Report (EIR).

Notwithstanding the desire to minimize road related impacts, the size and scale of the NHS is such that there are five locations where road crossings must be accomplished. Two of these are arterial road crossings:

- The Sandalwood Parkway crossing of the NHS was dealt with in the ESR for that road, and is elaborated upon further in Section 3.4.3 of this report
- The Wanless Road crossing will be dealt with in the forthcoming ESR for that road, scheduled for commencement in 2011.

The remaining three crossings are collector road crossings, and as such are identified in this report:

- North- South Spine Road to the south of Collector Road 'C'
- East-West Spine Road about mid-way between Creditview Road and the North-South Spine Road
- Buick Boulevard about mid-way between Mississauga Road and Creditview Road

The nature of these crossings, impacts on the NHS, and required mitigation measures are being considered and documented within the EIR.

17.2.7 Next Steps and Commitment to Further Work

1. Upon completion of this report and the associated collector road design drawings, a Phase 4 Notice of Study Completion will be issued to initiate the mandatory 30 day period for public review and comments. The Notice will advise of the details for submitting a Part II Order request in accordance with the Municipal Class Environmental Assessment.
2. The collector road network will proceed to detailed design and implementation in support of development in Block 51-1, and in association with further planning processes.
3. The Block 51-1 landowner's group has committed to undertaking semi-annual traffic monitoring studies within the south west area of the Fletcher's Meadows community. The purpose of these studies is to monitor impacts that may be attributable to Block 51-1 traffic infiltrating this community prior to completion of the Creditview Road / CNR underpass to the north of Bovaird Drive. These studies, already underway on behalf of the Mount Pleasant Village stakeholder, will become the responsibility of the Block 51-1 landowner's group in April 2012, and will be continued until the section of Creditview Road from Bovaird Drive to the North-South Spine Road is operational.
4. It is recommended that a Development Charge Eligibility Budget Amendment for the Spine Road be put in place in the fall of 2011. This should include clarification of the eligible components and DC share of costs.
5. As the planning and approvals process advances for the commercial, high density residential, and school sites within Block 51-1, Traffic Impact Studies will be prepared on a site specific basis to address the issues of access, on site circulation, parking, traffic operations, control, and mitigation measures in the vicinity of the site, and other appropriate traffic related issues as may be identified by staff.