



A3. Kleinburg-Nashville

A3.1 Existing Conditions Review

A3.2 Future Conditions Review



A3.1 Existing Conditions Review

City of Vaughan

**Transportation Master Plan Study
Kleinburg - Nashville Focus Area
Existing Conditions Review**

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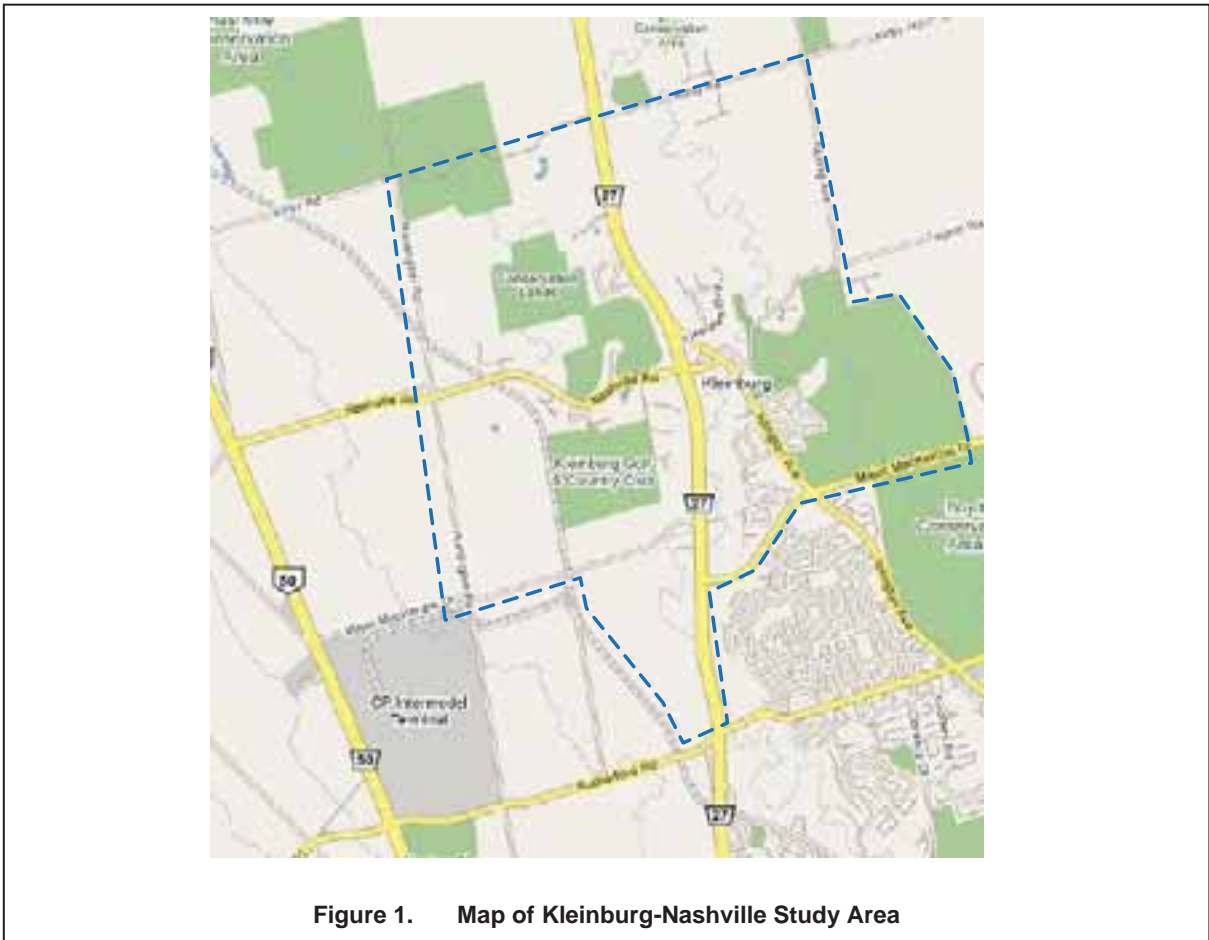
1. Introduction

1.1 Background

The City of Vaughan is undertaking a Transportation Master Plan (TMP) Study as part of the Official Plan Update to govern growth in the City to the year 2031. The TMP is being prepared to identify the infrastructure requirements necessary to accommodate the population and employment growth expected from the implementation of the Growth Management Strategy of the Official Plan. As part of the TMP, the City identified three areas with significant growth pressure that require more detailed transportation and urban planning and design analysis. This memorandum reviews the existing transportation conditions in the Kleinburg-Nashville area which is one of the three areas identified.

1.2 Study Area

Figure 1 shows a map of the Kleinburg-Nashville Study Area in the City of Vaughan. The Study Area is generally enclosed by Huntington Road to the west, Kirby Road to the north, Kipling Avenue and the East Humber River Valley to the east, and generally Major Mackenzie Drive to the south.



1.3 Background Documents

1.3.1 Region of York OP and TMP

The York Official Plan identifies Kleinburg as a local centre that should have specific amenities including commercial core, pedestrian environment and an appropriate focus on residential, commercial, institutional and community uses. The plan further identifies the area of Nashville as a hamlet that should retain its rural character while permitting growth primarily through infilling.

The updated York TMP prepared in May 2009 (draft version) recommends a number of roadway improvements within the community as follows:

- Improvements to Highway 27 to increase capacity;
- Widening of Highway 50 from Rutherford to Kirby Road to six lanes; and
- Realignment of Major Mackenzie Drive in Kleinburg to eliminate the jog between the two legs.

The transit improvements recommended include:

- Extension of GO Train service on the CP Line to Bolton with stations proposed at Major Mackenzie Drive and Rutherford Road; and
- Transit priority network along Major Mackenzie Drive and Highway 27 south of Major Mackenzie Drive.

1.3.2 OPA 601

The Official Plan Amendment 601 was adopted by Council in September 25, 2000 to replace OPA 160 which had been in effect since 1982. The Plan spells out approved land use patterns in the Kleinburg-Nashville area with new residential developments in the northwest and northeast sections of the area. The Transportation objectives of OPA 601 are outlined as follows:

- To ensure the provision of adequate and sufficient infrastructure for the overall community and individual neighbourhoods;
- To ensure coordination between the transportation requirements and community objectives with respect to urban design; and
- To provide opportunity for enhanced transit service to the community.

OPA 601 identifies extension of Major Mackenzie Drive and improvements on Islington Avenue as primary areas to be followed up with the Region of York. It lays emphasis on the provision of adequate pedestrian and bicycle facilities and identifies Islington Avenue and Nashville Road as roads that should function as pedestrian friendly village main streets. Requirements for traffic management strategies including traffic calming installations are noted to regulate traffic and address increased traffic volumes.

The document recommends 20m right of way (ROW) widths for primary roads connecting communities with neighbourhood streets ranging from 18.5 to 20m in ROW widths.

2. Existing Conditions Review

2.1 Data Collection

The traffic data used in the analysis in this memorandum was obtained for the City of Vaughan as well as from various documents related to on-going studies within the area including:

- The West Vaughan Individual EA; and
- Nashville West Community Plan Study (Block 6)

The data include traffic volume counts at specific screenlines as well as turning movement volumes at a number of intersections.

2.2 Existing Transportation Network

2.2.1 Road Network

The transportation system in the Study Area consists of a network of Regional arterial roads and local and collector roads belonging to the City. The City roads include Nashville Road, Kirby Road, Huntington Road and Teston Road. The main arterial roads including Islington, Highway 27, Highway 50, Major Mackenzie Drive and Rutherford Drive are under the jurisdiction of the Regional Municipality of York. Table 1 provides a list of the major roadways within the Study Area.

Table 1. Primary Roadways within the Study Area

Street	Jurisdiction	Posted Speed	# Lanes
Major Mackenzie Drive	Regional Road	60/80	4
Rutherford Road	Regional Road	60	4
Nashville Road	City Road	70	2
Kirby Road	City Road	60	2
Highway 27	Regional Road	80	2
Huntington Road	City Road	60	2
Highway 50	Regional Road	80	4
Teston Road	City Road	60	2
Islington Avenue	Regional Road	60	2

Highway 27 is the major arterial road that provides north-south access from the Study Area to Toronto as well as providing vital connections to Highway 407 and Highway 7 to the south. East-west travel is provided primarily by Major Mackenzie Drive to the east, and Nashville Road to the west. The west leg of Major Mackenzie Drive is a minor road that does not attract much traffic because of the jog at Highway 27.

2.2.2 Transit Facilities

York Transit provides limited service to the area with Bus Route 13 running along Islington Avenue to Kleinburg during the weekday peak periods. During the off-peak periods the bus service terminates south of Major Mackenzie Drive, looping along Napa Valley Avenue back onto Islington Avenue. Figure 2 shows the York Region Transit map for the Study Area.

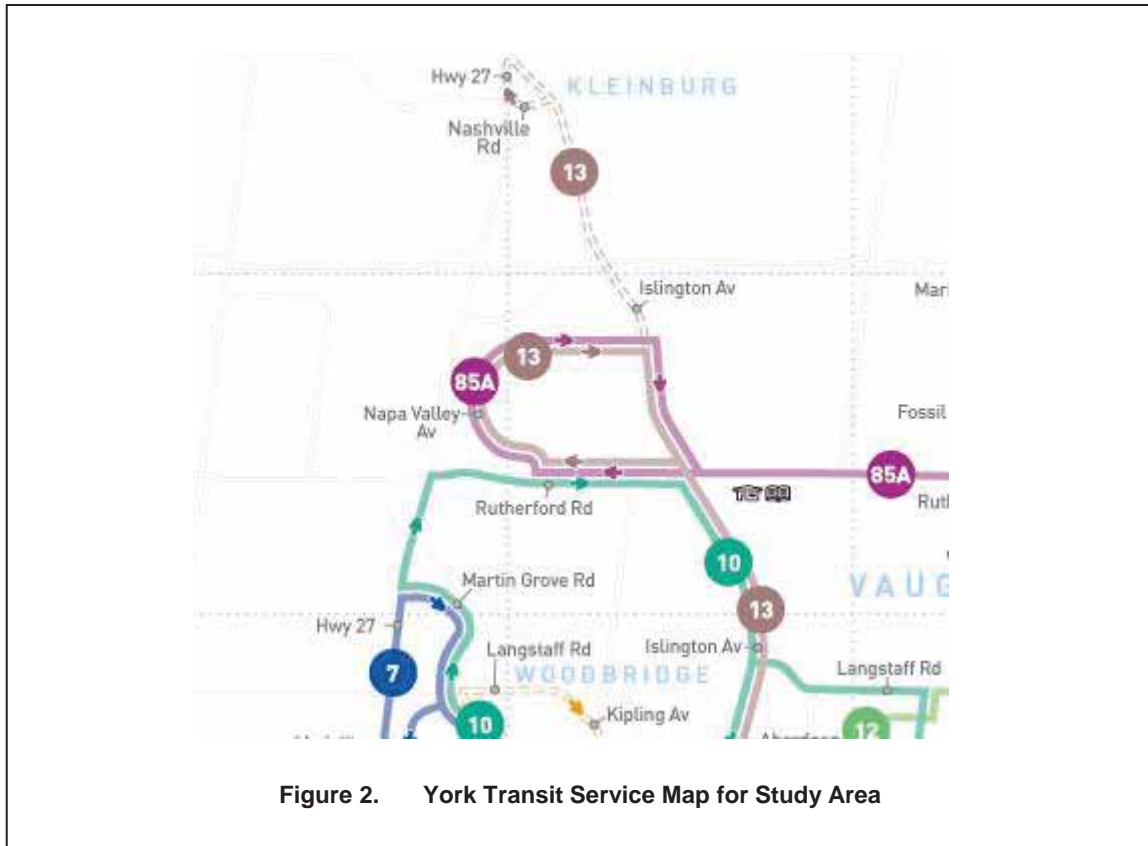


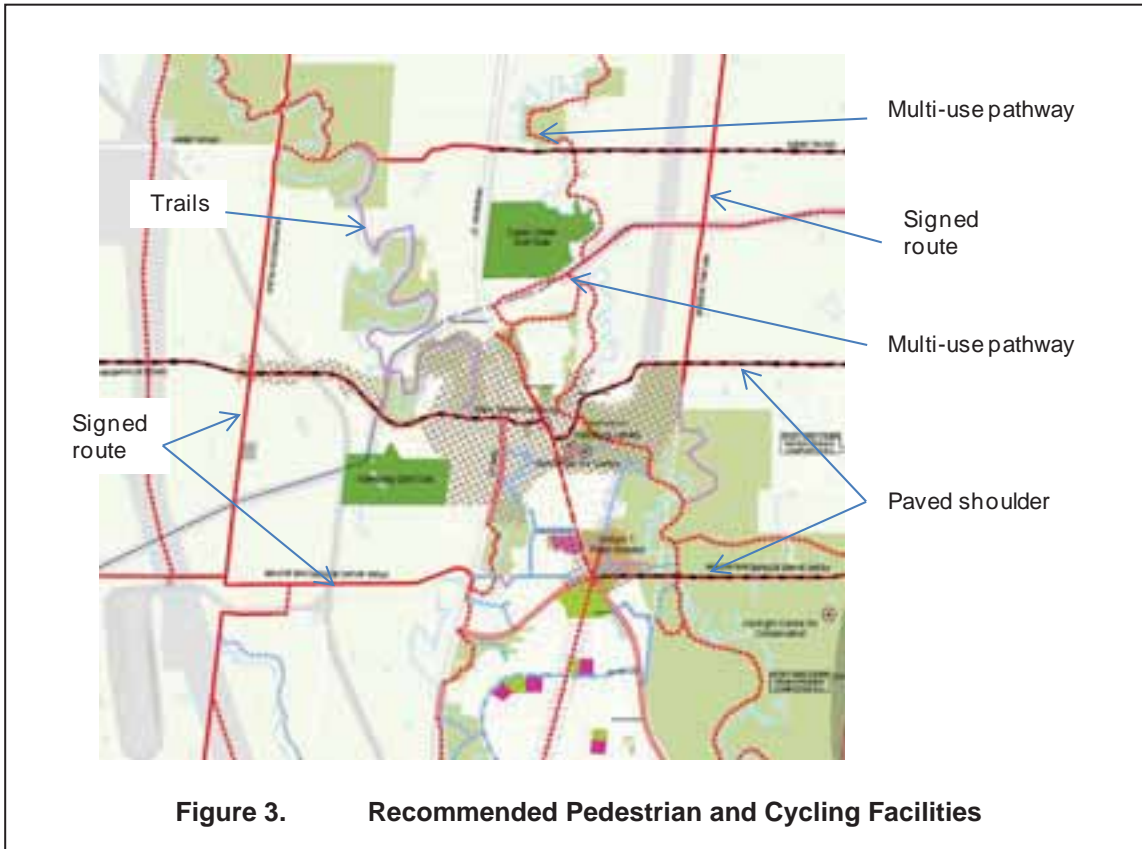
Figure 2. York Transit Service Map for Study Area

2.2.3 Cycling and Pedestrian Facilities

As part of the Pedestrian and Bicycle Master Plan Study adopted by the City in 2007, a number of facilities are proposed in the Kleinburg-Nashville Study Area including:

- Multiuse pathways and trails in the East Humber River valley;
- Signed bicycle route on Major Mackenzie Drive (west leg), Huntington Road and Islington Avenue;
- Paved shoulders on Nashville Road, Major Mackenzie Drive (east leg), and Teston Road.

These facilities are illustrated in Figure 3.



2.3 Traffic Operations Review

2.3.1 Roadway Sections

Operations on roadway sections were assessed based on their volume to capacity (v/c) ratios. The assessment was based on existing traffic volumes and typical lane capacities. For collector and arterials roads, planning capacities are typically in the range of 700 to 1,000 vehicles per hour per lane (vph/l) depending on the class of the road and the traffic controls at intersections. The surrounding environment, the number of accesses and the presence of turning lanes are among other factors that influence arterial road capacities. On that basis, existing capacities on minor roads such as Huntington Road and Kirby Road were estimated to be 700 vph/l, while a value of 800 vph/l was assumed for major arterials such as Major Mackenzie Drive, Islington Avenue and Highway 27.

The results of the assessment are summarized in Table 2. While most City roads operate with low v/c ratios, most of the arterial roads have v/c ratios greater than 0.5 with those of Highway 27 and Highway 50 greater than 0.9. Those operations indicate existing problems on Highway 50 and Highway 27 that require interventions. With background growth and future developments, traffic volumes on the other roadways are expected to increase and some improvements will most likely be required to maintain satisfactory operations.

Table 2. Operations on Roadway Sections

Street	Traffic Volume	Year	2009 * Volumes	#Lanes per direction	Capacity	V/c
Major Mackenzie Drive	750	2005	810	2	1,600	0.51
Rutherford Road	950	2005	1,030	2	1,600	0.64
Nashville Road	200	2007	210	1	800	0.26
Kirby Road	50**	-	50	1	700	0.07
Highway 27	1,350	2005	1,460	2	1,600	0.91
Huntington Road	50	2005	60	1	700	0.09
Highway 50	1,800	2007	1,890	2	1,600	1.18
Teston Road	150	2005	160	1	700	0.23
Islington Avenue	450	2004	500	1	800	0.63

*Assumes 2% growth

**Assumed value, actual data was not available

2.3.2 Intersection Operations

Existing operations at intersections were also assessed on the basis of level of service (LOS) criteria. The LOS is based on the Highway Capacity Manual procedures which provide a measure for the quality of service experienced at intersections on the basis of the average delay per vehicle. LOS is measured on a six letter scale with A representing excellent conditions and F representing over-capacity conditions. LOS is a direct measure of the delay experienced by the average motorist at signalized and unsignalized intersections. While level of service C or better is desirable in rural and semi-urban communities such as Nashville and Kleinburg, in dense urban areas with good levels of transit service intersections operating at Level of Service D or E (representing capacity) are often considered to be acceptable.

A summary of the resultant traffic operations is provided in Table 3 for the AM and PM peak hours. These operations are based on the analysis undertaken in the Nashville West Community Plan (Block 61) Study.

Table 3. Traffic Operations at Intersections

Intersection	Type	LOS - AM	LOS - PM
Nashville/Highway 50	Signalized	B	E
Nashville/Huntington Road	Unsignalized	C	D
Nashville Road/Highway 27	Signalized	B	A
Highway 50 /Major Mackenzie	Signalized	B	B
Highway 27/Major Mackenzie	Signalized	F	C
Huntington Road/Major Mackenzie	Unsignalized	B	B

The results indicate relatively good operations at most intersections except at the Highway 27/ Major Mackenzie Drive intersection with LOS F during the AM peak hour. Improvements will be required to address existing problems and to provide extra capacity necessary to accommodate future growth at similar or enhanced levels of service.

2.4 Heavy Truck Operations

Area residents and business owners have raised concerns about heavy truck traffic in the Study Area. Generally, truck traffic demand within the study area is high relative to other arterial facilities with elevated truck volumes on Study Area streets including Nashville Road. Heavy truck volumes on Highway 50 are in

excess of 100 heavy vehicles per hour per direction within the general vicinity of the Study Area. High truck volumes travel to and from the CP Intermodal Terminal, and to the Petro-Pass site on Highway 50 at Rutherford Road / Castlemore Road contribute to traffic congestion, constrained truck manoeuvres, and pavement deterioration. Heavy vehicles represent 6-8% of peak direction demand and over 10% of off-peak direction demand.

3. Major Transportation Studies and Issues

The major transportation issues within the Study Area include traffic operational concerns, traffic volumes and heavy truck traffic. The operational concerns include poor operations with reduced levels of service on sections of Highway 50 and Highway 27 and at the Highway 27/ Major Mackenzie Drive intersection. Issues related to high volumes of heavy truck on Study Area streets have also been noted in Section 2.4 above. A number of studies are currently underway and could address some of the identified issues, while also impacting the future travel patterns within the area. These studies include:

- Highway 427 Extension EA by Ministry of Transportation (MTO): This Study is examining extension of Highway 427 from Highway 7 to Major Mackenzie Drive. The proposed Highway 427 extension will be 6.6 km long and includes 3 interchanges at Langstaff Road, Rutherford Road and Major Mackenzie Drive. The freeway will have 6 lanes from Steeles Avenue to Rutherford Road and 4 lanes from Rutherford Road to Major Mackenzie Drive. There is a provision of median HOV lanes in each direction and a carpool lot at Rutherford Road interchange. The current preferred design alternative involves an alignment that passes through the Huntington Road and Major Mackenzie Avenue intersection. That alternative will involve discontinuation of Huntington Road to the north and south of the proposed interchange.
- Nashville West Community Plan Study (Block 61): This Study was commissioned by the Nashville West Landowners Group to investigate alternative configurations of Highway 427 Interchange at Major Mackenzie Drive and Huntington Road in view of the recommendations of the Highway 427 EA Study. As part of this Study, various transportation network modifications are being considered. The recommendations include several potential connections to Major Mackenzie Drive which in turn may impact the configuration of the eastern Major Mackenzie and Highway 427 ramp terminal intersection. A significant proposal involves construction of a new Huntington Road alignment west of the existing alignment between Major Mackenzie Drive and Nashville Road. The option would provide better connectivity of Huntington Road to Highway 427 extension thus ensuring a continuous north-south route to the proposed residential lands located north-west of the Study Area. The proposal is currently being reviewed by MTO.
- Western Vaughan Individual EA Study: This Study is being undertaken by the Regional Municipality of York to identify transportation deficiencies in Western Vaughan and to develop alternatives to address the problems. Specifically, the Study is examining improvements to Highway 27 and Major Mackenzie Drive which will include widening of both Highway 27 and Major Mackenzie Road to six lanes and inclusion of HOV lanes on Highway 27 south of Major Mackenzie Drive. In addition, elimination of the jog on Major Mackenzie Drive at Highway 27 is recommended.

- GTA West Corridor Study by MTO. The purpose of this Study is to examine a northern transportation corridor connecting the western cities of Kitchener, Waterloo and Guelph with the GTA. A preliminary corridor has been identified to run north of Kirby Road extending easterly to Highway 400 in the vicinity of the King Vaughan Line;
- Peel Highway 427 Extension Area Transportation Master Plan Study: This Study is a joint study between the Region of Peel, City of Brampton and Town of Caledon in coordination with MTO, York Region and City of Vaughan. The objective is to carry out a comprehensive review of the future transportation network needs in Northeast Brampton and Southeast Caledon. Specific goals and objectives of the study are to identify the best ways to connect from municipal roads in the Region of Peel to Highway 427 and serve the future transportation demands in the southern Peel-York boundary area. The Study recommends a combination of road widening and the provision of a new road connection from Highway 50 and Major Mackenzie Drive to Mayfield Road. The proposed arterial road will connect Mayfield Road in Peel and Major Mackenzie Drive to form a continuous route across both Regions of York and Peel. It will handle Provincial traffic to and from the Highway 427 extension. Traffic volumes are expected to be as high as 2,500 vehicles per hour in the morning peak period and truck volumes could represent 10 to 20 percent of the total vehicular traffic, given the proximity to the CP Vaughan Intermodal Terminal.
- Metrolinx/GO Transit Feasibility Study for New Commuter Rail Service on the CP Line to Bolton: This study has been ongoing for some time and has been assessing the feasibility of commuter rail stations at various locations, including at Nashville Road, which would serve the Nashville community.

The general recommendations of these studies together with those of the Regional initiatives including the Updated Regional TMP are illustrated in Figure 4. It should be noted that some of those recommendations are preliminary and may be subject to detailed Environmental Assessment considerations. Nevertheless, they provide a good context for consideration of additional transportation options as part of the City's TMP Study.



Figure 4. Improvements Recommended by Various On-going or Recently Completed Studies

4. Summary of Opportunities and Constraints

4.1 Opportunities

Considerable work has been undertaken or is underway that addresses some of the transportation issues in the Kleinburg - Nashville area. The findings of these studies offer good opportunities for enhancements of the overall transportation system in this focus area. They narrow down the range of options that can be considered as part of the current TMP study and focus it to filling in gaps and addressing new issues at the local level.

The approved land use pattern is also considered an opportunity in that the land available for future development and intensification is small in comparison to the total acreage of the Study Area. The bulk of the available land is designated as protected valley areas, woodlots and parks that are not expected to generate significant additional traffic. Consequently growth in traffic demands from the area is expected to be moderate and so the need for improvements to provide additional capacity, as well as potential neighbourhood traffic problems are expected to be modest.

4.2 Constraints

There follows constraints were identified:

- Existing layout of roadways that make it difficult to provide a grid system with jogs on Major Mackenzie Drive; Nashville Road/Stegman's Mill Road and Islington Avenue;
- Existing land use patterns consisting of dispersed heritage communities, woodlots and protected lands in river valleys make it more difficult to provide efficient transportation systems;
- The natural environmental factors including river valleys pose challenges and limitations in the implementation of road network and other infrastructure improvements;
- The fact most of the roads with the greatest traffic operational problems are Regional arterial roads could limit the ability of the City to implement certain improvements/interventions on them.

5. Next Steps

The next steps in the transportation analysis in the Kleinburg-Nashville Area include:

1. Confirming the urban design and land use proposals;
2. Assessment of future traffic demands and identification of deficiencies;
3. Development and evaluation of transportation alternatives; and
4. Final Recommendations to be included in the TMP

These will be undertaken in Phase 2 of the Vaughan TMP Study in concert with the on-going work of urban planning and design by The Planning Partnership.



A3.2 Future Conditions Review

The City of Vaughan

Transportation Master Plan Study Kleinburg – Nashville Focus Area Future Conditions Review

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1. Introduction

The City of Vaughan is undertaking a Transportation Master Plan (TMP) Study as part of the Official Plan Update to govern growth in the City to the year 2031. The TMP is being prepared to identify the infrastructure requirements necessary to accommodate the population and employment growth expected from the implementation of the Growth Management Strategy, upon which the Official Plan is based. As part of the TMP, the City identified three areas with significant growth pressure that require more detailed transportation and urban planning and design analysis. One of those areas is the Kleinburg-Nashville Area.

Figure 1 shows a map of the Kleinburg-Nashville Study Area in the City of Vaughan. The Study Area is generally enclosed by Huntington Road to the west, Kirby Road to the north, Kipling Avenue and the East Humber River Valley to the east, and generally Major Mackenzie Drive to the south.



Figure 1. Map of Kleinburg-Nashville Study Area

An initial report was prepared last year examining existing conditions, operational issues and opportunities and constraints within the Study Area. The Study found that the existing road network is generally operating well and can accommodate existing traffic volumes to good levels of service. However, specific areas are beginning to experience congestion and will require improvements to accommodate future traffic growth. It also noted major transportation issues within the Study Area include traffic operational concerns, traffic volumes and heavy truck traffic. The operational concerns include poor operations with reduced levels of service on several roadway sections. Issues related to high volumes of heavy truck on Study Area streets were also noted.

The report also reviewed a number of studies that are currently underway and could address some of the identified issues, while also impacting the future travel patterns within the area. It was noted that the general recommendations of those studies are preliminary and may be subject to detailed Environmental Assessment considerations. Nevertheless, they provide a good context for consideration of additional transportation options as part of the City's TMP Study. These studies include:

- Highway 427 Extension EA by Ministry of Transportation (MTO) that is proposing extension of Highway 427 from Highway 7 to Major Mackenzie Drive. The preferred design alternative involves an alignment that passes through the Huntington Road and Major Mackenzie Avenue intersection. That alternative will involve discontinuation of Huntington Road to the north and south of the proposed interchange.
- Nashville West Community Plan Study (Block 61): This Study was commissioned by the Nashville West Landowners Group to investigate alternative configurations of Highway 427 Interchange at Major Mackenzie Drive and Huntington Road in view of the recommendations of the Highway 427 EA Study. The Study proposes construction of a new Huntington Road alignment west of the existing alignment between Major Mackenzie Drive and Nashville Road. The option would provide better connectivity of Huntington Road to Highway 427 extension thus ensuring a continuous north-south route to the proposed residential lands located north-west of the Study Area. The proposal is currently being reviewed by MTO.
- Transportation impact study for the Lakeview sub-division north of Major Mackenzie Drive and east of the CP rail corridor.
- Western Vaughan Individual EA Study: This Study was being undertaken by the Regional Municipality of York and recommends widening of both Highway 27 and Major Mackenzie Road to six lanes and inclusion of HOV lanes on Highway 27 south of Major Mackenzie Drive. In addition, elimination of the jog on Major Mackenzie Drive at Highway 27 is also recommended.
- GTA West Corridor Study by MTO that is examining a northern transportation corridor connecting the western cities of Kitchener, Waterloo and Guelph with the GTA. A preliminary corridor has been identified to run north of Kirby Road extending easterly to Highway 400 in the vicinity of the King Vaughan Line;
- Peel Highway 427 Extension Area Transportation Master Plan Study that recommends a combination of road widening and the provision of a new road connection from Highway 50 and Major Mackenzie Drive to Mayfield Road. The proposed arterial road will connect Mayfield Road in Peel and Major Mackenzie Drive to form a continuous route across both Regions of York and Peel. It will handle Provincial traffic to and from the Highway 427 extension.

This subsequent report examines future operations in the year 2031 and identifies specific network requirements necessary to accommodate expected traffic demands. The report assesses the expected demands arising from the proposed land use plans in this Focus Area together with background traffic growth, and examines the roadway improvements necessary to accommodate them.

Analysis and assessment in this document are undertaken at a broad level, commensurate with the requirements of a Secondary Plan Study as opposed to what would be expected in a Traffic Impact Study. While the broader Study Area extends south to Major Mackenzie Drive as shown in Figure 1, the analysis in this study will focus on the area between Kirby Road and Nashville Road/Teston Road which is most impacted by the proposed developments.

2. Future Traffic Demands

Future traffic volumes were assessed for the 2031 horizon year which represents a 20 year planning horizon from the present date (2010). The assessment involved estimation of future background volumes and assessment of trips generated from the planned developments within the Kleinburg-Nashville Area.

2.1 Data Collection

The traffic data used in the analysis in this report was obtained from the City of Vaughan and included traffic volumes on roadway sections and turning movement counts at some intersections. Additional data collection was undertaken in April 2010 to complement the information obtained from the City. The data collected included intersection turning movement counts (TMCs) and Automatic Traffic Recorder (ATR) volumes at mid-link locations. **Figure 2** provides a summary of the existing turning volume counts at intersections.

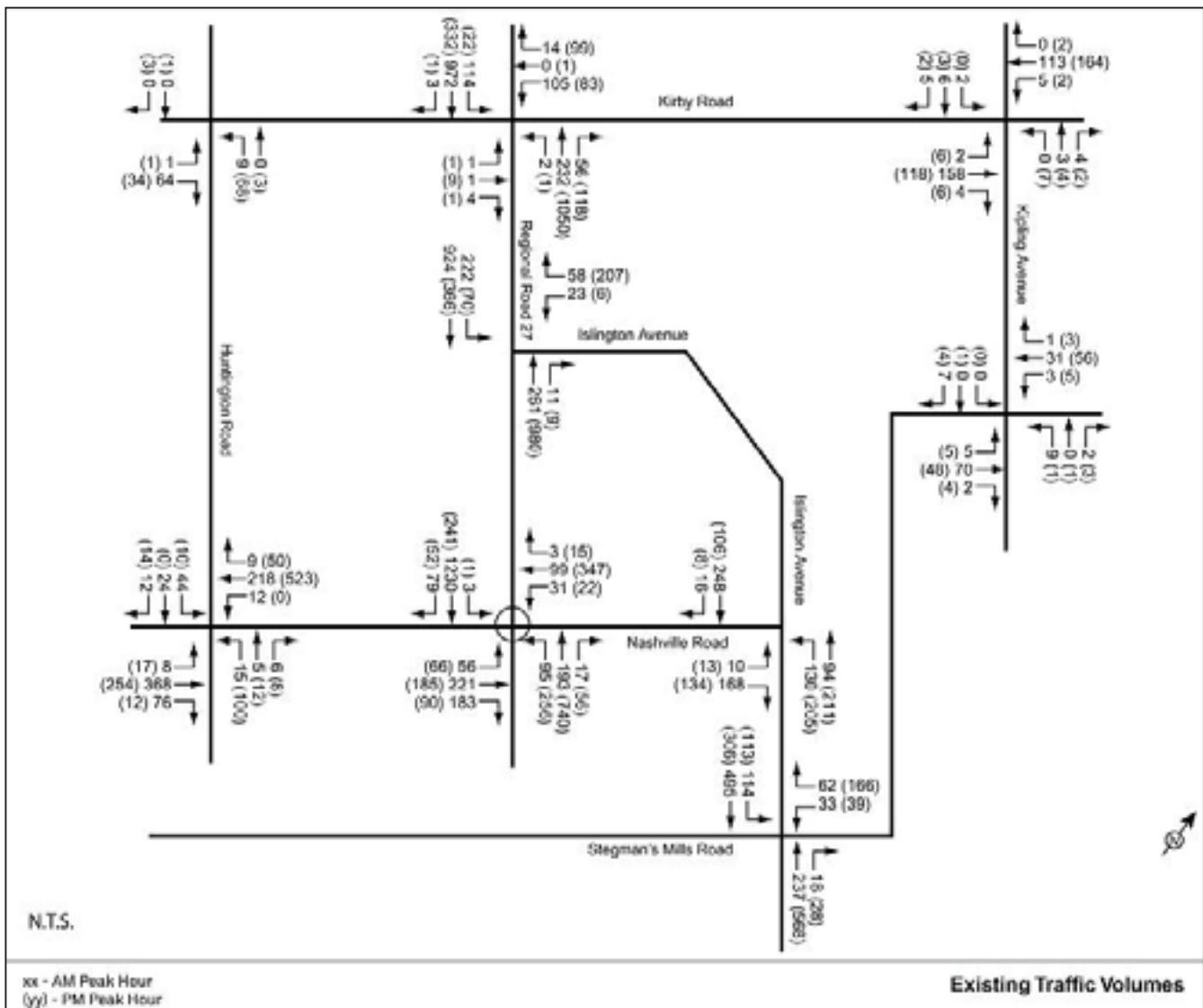


Figure 2. Summary of Existing Traffic Volumes

2.2 Background Traffic

Future traffic volumes for the year 2031 were assessed from the EMME/2 demand forecasting model undertaken for the entire City of Vaughan Transportation Master Plan Study as well as from projection of existing traffic volumes. Since the modelling was undertaken for the entire City network, it could not include all pertinent details required for a Focus Area like Kleinburg-Nashville. It was therefore necessary to complement the results with projections of existing traffic volumes obtained from ATR and TMC counts.

The volume projection was undertaken on the basis of a 2% growth rate every year. On average, traffic volumes are expected to grow by up to 50% within the Study Area over the 20 year horizon, although volume forecasts from the EMME/2 model indicated higher growth on certain road sections. The existing and future background 2031 traffic volumes are shown in **Table 1**. The existing volumes are an envelope of intersection turning movement counts (TMCs) and Automatic Traffic Recorder (ATR) mid-link data available for each roadway section.

Table 1. Existing and Future Peak Hour Traffic Volumes on Roadway Sections

Street	Section	2010 AM Volume	2010 PM Volume	2031 AM Volume	2031 PM Volume
Kirby Rd	East of Kipling Ave	159	164	240	250
Kirby Rd.	Kipling Ave and Hwy 27	165	200	250	300
Kirby Rd	Huntington Rd and Cold Creek Rd	63	70	100	110
Kipling Ave	Kirby Rd and Teston Rd	17	11	30	20
Kipling Avenue	North of Kirby Road	13	10	20	20
Islington Ave	Nashville Rd and Hwy 27	327	301	500	460
Islington Ave	Nashville Rd and Stegman's Mills Rd	659	795	1,000	1,210
Islington Ave	South of Stegman's Mills Rd	572	667	870	1,010
Stegman's Mill Rd	Kipling Ave and Islington Ave	162	204	250	310
Teston Road	East of Kipling Avenue	75	67	110	100
Nashville Rd	Huntington Rd and Hwy 50	470	663	710	1,010
Nashville Rd	Hwy 27 and Huntington Rd	616	698	930	1,060
Nashville Rd	Islington Ave and Hwy 27	226	254	340	390
Huntington Rd	Nashville Rd and Kirby Rd	62	69	90	110
Huntington Rd	South of Nashville Rd	98	115	150	170
Hwy 27	North of Kirby Road	1066	1105	1,620	1,680
Hwy 27	Kirby Rd and Islington Ave	1096	1160	1,660	1,760
Hwy 27	Islington Ave and Nashville Rd	1365	1003	2,070	1,520
Hwy 27	South of Nashville Rd	1502	1095	2,280	1,660

A similar approach was used to estimate future turning volumes at intersections. **Figure 3** provides a summary of the future turning movement volumes at intersections.

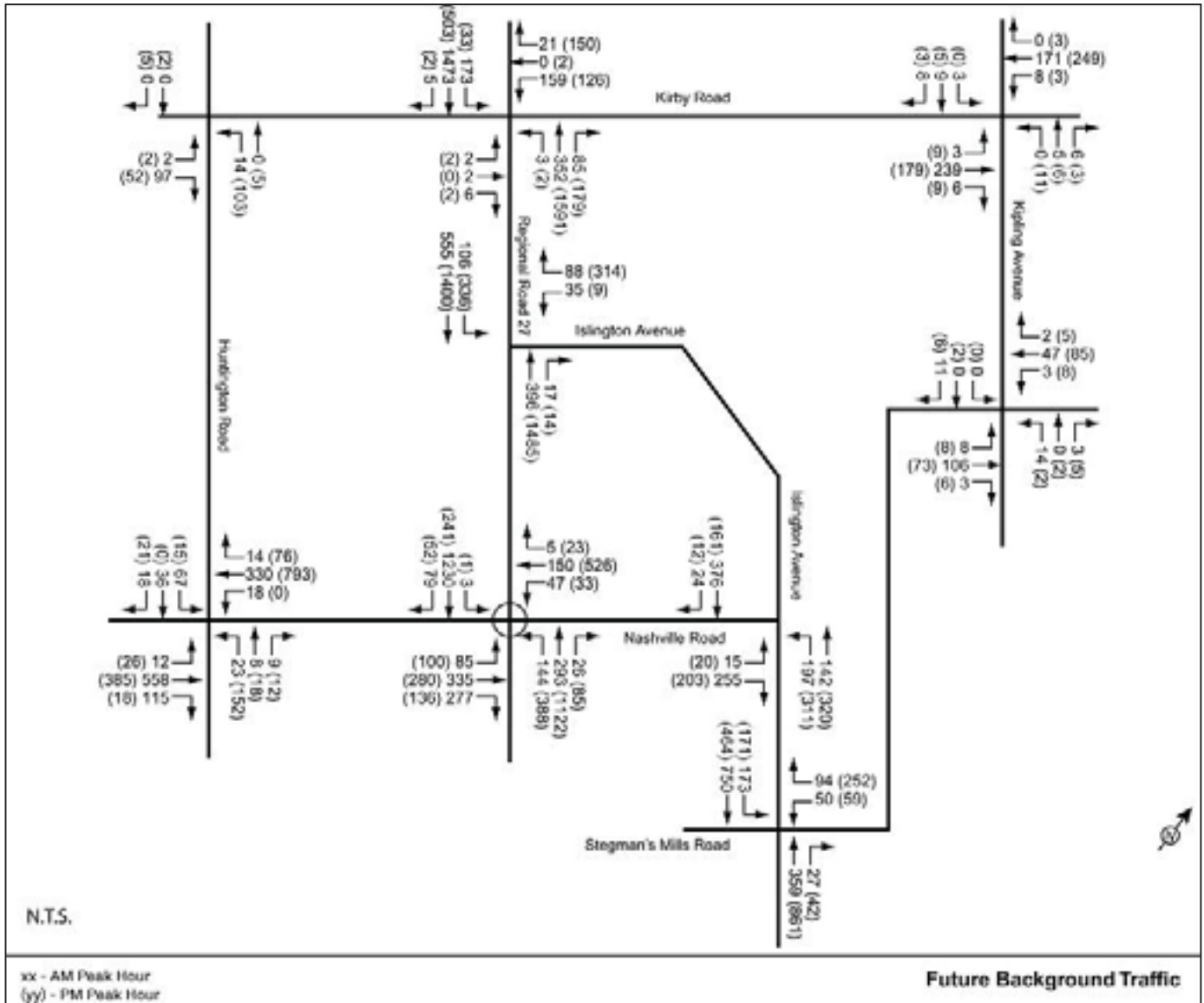


Figure 3. Future 2031 Peak Hour Background Traffic Volumes

2.3 Generated Traffic

The future travel demand generated by the planned developments was established from the land use scenarios outlined in the Draft Secondary Plan prepared by Planning Partnership for the City of Vaughan. The land use plan relates to specific development proposals in Area 1, Area 2 and Area 5/6 as shown in **Figure 4**. Whereas Areas 1 and 2 are located on Huntingdon Road to the west of the Study Area, Areas 5/6 are on the east limits along Kipling Avenue.



Figure 4. Proposed Development Areas in Kleinburg – Nashville

2.3.1 Land Use Pattern

Within each proposed development Area, different types of land uses were envisioned. **Table 2** provides a summary of the types of land use categories contemplated for the Secondary Plan lands. Although most of the lands will be used for residential purposes, a good proportion will be put to other uses including commercial, retail and institutional developments. Specific proposals include:

- Over 1,500 units of a low-density residential area consisting of single-family dwellings and semi-detached houses spread in a total area of over 100 hectares in the three areas shown above;
- Over 320 units of residential townhouses in Areas 2 and 5/6. Area 1 will have only single or semi-detached residential units;
- Low Rise Apartment Neighbourhood is proposed in Area 2 and will consist of over 50 units covering a total area of 1.2 hectares;
- Close to 10,000 square metres of commercial development including office space and mixed use developments consisting of condominium apartments and amenities located primarily in Area 2 and Area 5/6; and
- An elementary school with an employment of up to 30 people in Area 2.

These developments are expected to bring in a total of about 6,600 into the area, with the most located in Area 2 which will have about 3,120 persons.

Table 2. Proposed Land Use Plan for the Focus Areas

Development Type	Focus Areas 5 & 6 West of Kipling Ave	Focus Area 2 East of Huntington Rd	Focus Area 1 Nashville Core Interface	Totals
Employment Generating Uses				
Commercial / Office Mixed Uses and Elementary School Components				
Total Commercial Area (sq.m)	4,300	5,670		9,970
Total Office Area (sq.m)	1,235	0		1235
Commercial/Office (persons employed)	30	30		60
Elementary School (persons employed)	0	30		30
Residential Component				
Total Residential Area (sq.m)	8,720	7,040		15,760
Number of Units (Residential)	57	46		103
Number of People	99	80		179
Low Rise Apartment				
Land Area (ha)		1.20		1.2
Number of Units		51		51
Number of People		88		88
Townhouses				
Land Area (ha)	3.35	5.60		8.95
Density (units/ha)	35.7	35.7		
Number of Units	120	200		320
Persons Per Unit (ppu)	2.96	2.96		
Number of People	354	592		946
Single-Detached / Semi-Detached				
Land Area (ha)	19.82	21.48	6.89	41.3
Number of Units	371	402	103	773
Number of People	1,260	1,366	356	2,626
Single-Detached				
Land Area (ha)	24.56	21.73	3.45	49.74
Number of Units	356	315	50	721
Number of People	1,225	1,084	172	2,481
TOTAL PERSONS	2,938	3,122	528	6,588

2.3.2 Trip Generation

Trip generation was carried out using the Institute of Transportation Engineers (ITE) guidelines as documented in the *ITE Trip Generation Manual, 8th Edition*. The manual provides a method for estimating trip ends as a function of various independent variables depending on the type of development. For residential developments, trip ends are determined based on the number of units that will be constructed at the site, whereas for commercial properties, trips are based on the Gross Floor Area (GFA).

The trip rates and total trips generated from the various proposed development Areas under the different land uses are provided in **Table 3** through to **Table 5**. A total of over 1,000 trips will be generated from Areas 1 and 2 onto Huntington Road during the PM peak hour while Areas 5/6 will generate up to 940 trips onto Kirby Road and Kipling Avenue. A higher number of trips will be generated during the AM peak hour, with about 1,160 and 970 trips from Area 2 and Area 5/6 respectively. Amongst the various land uses, residential and speciality retail will account for over 80% of the generated trips during both AM and PM peak hours.

Table 3. Trip Generation from Area 1

Development Type	Rate / Trip	AM			PM		
		In	Out	Total Trips	In	Out	Total Trips
Semi-Detached / Single Detached & Single Detached Estate	Rate	0.224	0.671	0.895	0.709	0.417	1.126
	Trips	11	34	45	35	21	56
Total Trip	Trips	11	34	45	35	21	56

Table 4. Trip Generation from Area 2

Development Type		Rate / Trip	AM			PM		
			In	Out	Total Trips	In	Out	Total Trips
Low Rise Apartments	Rate	0.130	0.490	0.620	0.476	0.256	0.732	
	Trips	7	25	32	24	13	37	
Semi Detached & Townhouse	Rate	0.076	0.373	0.449	0.356	0.175	0.531	
	Trips	15	75	90	71	35	106	
Semi-Detached / Single Detached & Single Detached Estate	Rate	0.178	0.535	0.714	0.544	0.319	0.863	
	Trips	128	384	512	390	229	619	
Employment Generating Uses <i>(Commercial / Office Mixed Uses, Elementary Schools, etc.)</i>	<i>Residential Component of Mid-Rise Commercial / Mixed Use Buildings</i>	Rate	0.039	0.087	0.126	0.139	0.101	0.239
		Trips	2	4	6	6	5	11
	<i>Specialty Retail</i>	Rate	3.266	3.539	6.805	1.211	1.541	2.752
		Trips	199	216	415	74	94	168
	<i>Elementary School</i>	Rate	1.974	1.682	3.656	0.887	0.923	1.810
		Trips	59	50	110	27	28	54
	<i>Park – Not included in Calculation of Total Trips</i>	Rate	0.795	0.795	1.590	0.795	0.795	1.590
		Trips	3	3	6	3	3	6
Total Trip		Trips	410	754	1164	592	403	995

Table 5. Trip Generation from Area 5/6

Development Type		Rate / Trip	AM			PM		
			In	Out	Total Trips	In	Out	Total Trips
Semi Detached & Townhouse	Rate	0.085	0.413	0.498	0.390	0.192	0.582	
	Trips	10	50	60	47	23	70	
Semi-Detached / Single Detached & Single Detached Estate	Rate	0.178	0.535	0.713	0.543	0.319	0.862	
	Trips	130	389	519	395	232	626	
Employment Generating Uses <i>(Commercial / Office Mixed Uses, Elementary Schools, etc.)</i>	<i>Residential Component of Mid-Rise Commercial / Mixed Use Buildings</i>	Rate	2.471	0.337	2.808	1.198	5.850	7.048
		Trips	33	4	37	16	78	94
	<i>General Office</i>	Rate	0.056	0.125	0.181	0.166	0.120	0.286
		Trips	3	7	10	9	7	16
	<i>Specialty Retail</i>	Rate	3.563	3.860	7.423	1.260	1.459	2.605
		Trips	164	178	341	58	74	133
	<i>Park - Not included in Calculation of Total Trips</i>	Rate	0.795	0.795	1.590	0.795	0.795	1.590
		Trips	3	3	6	3	3	6
Total Trip		Trips	340	628	967	525	414	939

2.3.3 Trip Distribution and Assignment

Trip distribution patterns were assessed from the results of the 2006 Transportation Tomorrow Survey which also provided the basis for the calibration of the demand forecasting model. The trip distribution was established by considering trips to/from the many zones within Vaughan, trips to/from the rest of York Region (excluding Vaughan) and trips to/from the remaining regional municipalities (excluding York Region), and their relative location to the Study Area and the City of Vaughan.

Table 6 provides the obtained trip distribution patterns to and from the Study Area. The trip origins and destinations were organized into categories (North, South, East and West) relative to the location of the Study Area. During the AM peak hour, the majority of trips coming into Kleinburg Nashville originate from the west, while 59% of trips from the Study Area travel to the south toward Toronto and Highway 407. The trends reverse during the PM peak hour with two thirds of all trips into the area originating from the south.

Table 6. Trip Distribution

Direction	AM Peak		PM Peak	
	In	Out	In	Out
North	11%	3%	5%	6%
South	33%	59	67%	42%
East	11%	16%	9%	6%
West	45%	22%	19%	46%
Total	100%	100%	100%	100%

Trips from the various areas were then assigned to the network as follows:

- Trips from Areas 1 and 2 were assigned onto Huntington Road. Virtually all trips will proceed south to Nashville Road and then turn right, left or go through depending on the desired destinations. Traffic travelling south toward Toronto and Highway 407 will proceed on Huntington Road to Hwy 427 extension. A small proportion travelling to and from the north may use Cold Creek Road and Kirby Road to access Huntington Road. East-west trips were assumed to use Nashville Road and Teston Road;
- East-west travel from Areas 1 and 2 was assumed to use Nashville Road, Stegman's Mill Road and Teston Road as Kirby Road is not continuous and Major Mackenzie Drive is considerably south of the Study Area.
- Trips from Area 5/6 will use both Kipling Avenue and Kirby Road. Southbound trips will use Kirby Road to access Highway 27. Some southbound trips will proceed south to Islington Avenue and Pine Valley Drive, thereby making turning manoeuvres at the Kipling/Teston intersection. East-west trips from this area were assumed to use Kirby Road and Teston Road;

Site trips were assigned to the road network on the basis of the above assumptions. **Figure 5** shows the site trip assignment on to the road network.

2.4 Total Future Traffic

The site generated trips were added to the future background trips to obtain the total future traffic volumes for the 2031 horizon year. The resulting turning volumes at intersections during the peak hours are shown in **Figure 6**.

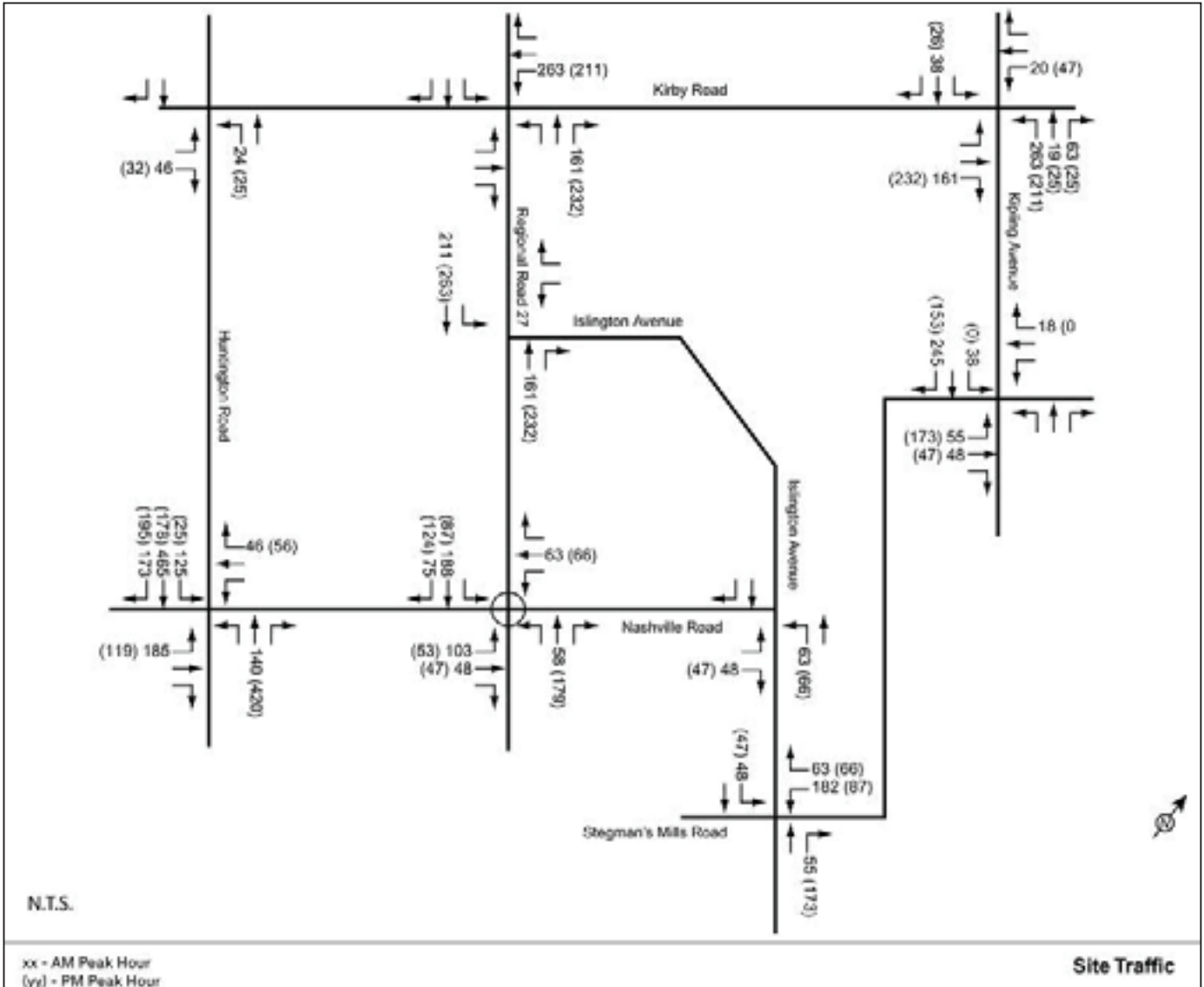


Figure 5. Site Trips in the Study Area

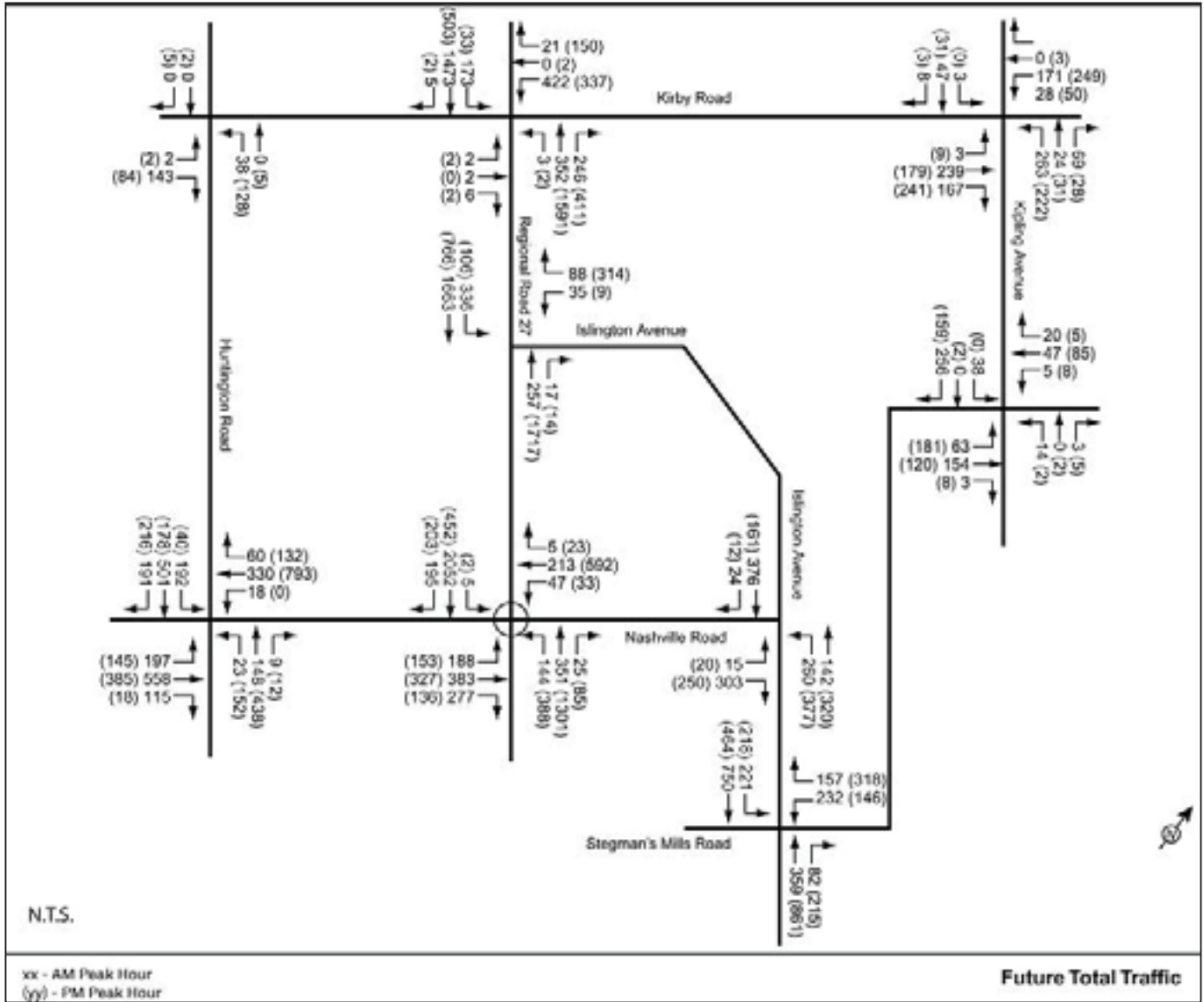


Figure 6. Total Future Trips

3. Future Operations Review

3.1 Roadway Sections

Analysis of future conditions for roadway sections was undertaken using the same approach employed for existing conditions. Operations on roadway sections were assessed based on their volume to capacity (v/c) ratios. The assessment was based on existing typical lane capacities. For collector and arterials roads, planning capacities are typically in the range of 700 to 1,000 vehicles per hour per lane (vph/l) depending on the class of the road and the traffic controls at intersections. The surrounding environment, the number of accesses and the presence of turning lanes are among other factors that influence arterial road capacities.

On that basis, capacities on minor arterials such Huntington Road and Kirby Road were estimated to be 700 vph/l, while a value of 800 vph/l was assumed for Islington Avenue and Nashville Road. As a major arterial, Highway 27 was assigned a capacity of 1,000 vph assuming that the section through the Study Area will be improved to accommodate higher flows. Stegman's Mill Road was assigned a lower capacity of 600 vph to account for the roadway characteristics including its alignment, roadway widths and the lack of continuity past Islington Avenue in the west direction.

The analysis was based on existing roadway capacities and did not take into consideration the planned widening on sections of the Regional arterial roads including Highway 27. The results of the assessment are summarized in **Table 7**.

Table 7. Future Operations on Existing Roadway Sections

Street	Section	Future 2031 Volume		No. of Lanes	Lane Capacity	v/c -AM	v/c - PM
		AM	PM				
Kirby Rd	East of Kipling Ave	300	300	1	700	0.43	0.43
Kirby Rd.	Kipling Ave and Hwy 27	510	540	1	700	0.73	0.77
Kirby Rd	Huntington Rd and Cold Creek Rd	140	140	1	700	0.20	0.20
Kipling Ave	Kirby Rd and Teston Rd	370	320	1	700	0.53	0.46
Kipling Ave	North of Kirby Road	60	40	1	700	0.09	0.06
Islington Ave	Nashville Rd and Hwy 27	500	460	1	800	0.63	0.58
Islington Ave	Nashville Rd and Stegman's Mills Rd	1,060	1,250	1	800	1.33	1.56
Islington Ave	South of Stegman's Mills Rd	1,050	1,180	1	800	1.31	1.48
Stegman's Mill Rd	Kipling Ave and Islington Ave	490	530	1	600	0.82	0.88
Teston Road	East of Kipling Avenue	180	170	1	600	0.30	0.28
Nashville Rd	Huntington Rd and Hwy 50	900	1,120	1	800	1.13	1.40
Nashville Rd	Hwy 27 and Huntington Rd	1,090	1,250	1	800	1.36	1.56
Nashville Rd	Islington Ave and Hwy 27	410	450	1	800	0.51	0.56
Huntington Rd	Nashville Rd and Kirby Rd	860	700	1	700	1.23	1.00
Huntington Rd	South of Nashville Rd	610	590	1	700	0.87	0.84
Hwy 27	North of Kirby Road	1,670	1,730	1	1,000	1.67	1.73
Hwy 27	Kirby Rd and Islington Ave	1,920	1,990	1	1,000	1.92	1.99
Hwy 27	Islington Ave and Nashville Rd	2,330	1,750	2	1,000	1.17	0.88
Hwy 27	South of Nashville Rd	2,470	1,840	2	1,000	1.24	0.92

The results indicate that Kirby Road, Kipling Avenue, Teston Road and Stegman Mill Road will operate satisfactorily with volume to capacity ratios ranging from 0.43 to 0.88. That implies that the existing roadway sections will be adequate to accommodate the future traffic demands. However, v/c ratios on sections of Kirby Road and Stegman Mill Road will be approaching one (over 0.8) and minor operational improvements may be required to increase the assumed capacities.

Volume to capacity ratios will be higher than one on sections of Huntington Road, Nashville Road, Islington Avenue and Highway 27 indicating capacity deficiencies (as highlighted in Table 7). The existing two lane sections on Huntington Road, Nashville Road and Islington Avenue were assumed to remain in the future years. The results indicate that the existing roadway sections will not be adequate to accommodate future traffic volumes. As such, Huntington Road widening should be further evaluated as part of the development process for Area 2 and upon completion of on-going Studies identified in Section 1. Similarly, Nashville Road will require widening to four lanes to accommodate the additional east-west demands that must use the road to access Highway 27 and Highway 50. Further improvements beyond widening to four lanes may also be necessary on Highway 27 to ensure that it can accommodate the additional demands from the planned developments.

Although the analysis shows that it will be necessary to widen Nashville Road to four lanes to accommodate future traffic demands, widening may not be feasible because of the special historical character of Nashville Village. Should that be the case, then the section of Nashville Road between Huntington Road and Islington Road will accommodate traffic volume up to its 800 vph capacity. Since the forecasted demand is higher than that capacity, the excess traffic volume would be diverted to other routes.

It is apparent from existing travel patterns that a high proportion of the traffic travelling on Nashville Road is through traffic travelling east-west between Islington Avenue and Highway 50. One possible route available for the extra traffic is to travel north-south on Huntington Road, then east-west on Major Mackenzie Drive to Islington Avenue. The intersection of Huntington Drive and Nashville Road could be modified to emphasize the desired travel pattern. Alternatively, traffic could also continue north-south on Highway 50 without entering Nashville Road, and then east-west on Major Mackenzie Drive.

While it is expected that sufficient network capacity will exist to accommodate the excess traffic demands from Nashville Road, a more detailed transportation analysis should be undertaken to confirm this preliminary conclusion. The proposed study should be undertaken following completion of the Highway 427 Extension EA and GTA West Corridor studies by MTO and the West Vaughan Individual EA Study by the Region to allow consideration of the recommendations from these studies and, specifically, the diversionary benefits of new and/or improved Provincial and Regional road facilities. The new study should examine travel patterns at both micro and macro levels, and assess more detailed demand scenarios for the subarea to fully understand the diversion impacts of demand restrictions on Nashville Road, and the travel pattern changes that will arise from the proposed improvements.

3.2 Roadway Classification

Roadway reclassification was considered for Kirby Road, Huntington Road and Kipling Avenue because they serve as the primary accesses for the proposed developments. While traffic from Area 1/2 will all use Huntington Road, traffic from Area 5/6 will predominantly use Kirby Road and Kipling Avenue. Because of these specific developments, traffic growth on these roads is expected to be higher than on other roads within the Study Area. For that reason, there is need to confirm that the roles they play will be consistent with their classification. Classification of the other roadways within Kleinburg-Nashville Area is expected to remain unchanged.

With peak traffic volumes on Huntington Road forecasted to be close to 1,300 vph and considering that the lands to the west will also likely be eventually developed, future traffic volumes are expected to be higher. Assuming that peak hour volumes account for 10% of the daily traffic volumes, daily traffic volumes are expected to be over 13,000 vehicles. Those traffic volumes are consistent with an arterial road designation, in accordance with *Transportation Association of Canada* (TAC) guidelines.

Kirby Road and Kipling Avenue on the other hand is expected to carry from 600 to 700 vehicles per hour translating to between 7,000 to 10,000 vehicles per day under the same assumption that peak hour volumes account for 10% of the daily traffic volumes. Those traffic volumes are consistent with a major collector or minor arterial road designation, in accordance with TAC guidelines. Given that Kipling Avenue extends from King-Vaughan Road to Teston Road and does not continue further, its function as an arterial road will be impeded. Consequently, the subject section will function more as a major collector than an arterial road. In contrast, Kirby Road is expected to play an important role in east-west traffic movement within the City.

The Right of Way (ROW) width on Kirby Road and King-Vaughan Road should be consistent with an arterial road designation. The City has protected for up 36 m ROW width for the two roads. The final width will be confirmed in the future in consideration of the need for additional services such as transit, bike facilities and streetscaping within the ROW.

The minimum intersection spacing on the two roads should range from 200 to 400 m. Consequently, direct access to Huntington Road or Kipling Avenue should be eliminated except at intersections with collector roads. A maximum of three or four intersections should be provided on the roads within each Area boundary. Some of those intersections will most likely be signalized in the future.

3.3 Intersection Operations

Future operations at intersections were also assessed on the basis of level of service (LOS) criteria as outlined in the previous report. The LOS is based on the Highway Capacity Manual procedures which provide a measure for the quality of service experienced at intersections on the basis of the average delay per vehicle. LOS is measured on a six letter scale with A representing excellent conditions and F representing over-capacity conditions. LOS is a direct measure of the delay experienced by the average motorist at signalized and unsignalized intersections. In rural and semi-urban communities such as Nashville and Kleinburg level of service C or better is desirable although in dense urban areas with good levels of transit service, intersections operating at Level of Service D or E (representing capacity) are often considered to be acceptable.

A summary of PM peak hour traffic operations during the 2031 horizon year is provided in **Table 8**. The LOS analysis was undertaken with the assumptions that Huntington Road will be widened to a four lane section. It was assumed that left turn lanes will be provided at major intersections with significant left turning volumes to enhance capacity and safety.

Table 8. Traffic Operations at Intersections

Intersection	Type	AM Peak Hour	PM Peak Hour	Comments
Kirby Road/Huntington Rd	Unsignalized	A	A	
Kirby Road/Regional Rd 27	New Signals	C	C	New signals in 2031
Kirby Road/Kipling Ave	Unsignalized	A	B	Improvements required
Regional Rd 27 / Islington Ave	Unsignalized	A	D	
Teston Road/Kipling Ave	Unsignalized	A	A	Minor improvements required
Nashville Road/Huntington Rd	New Signals	D	D	New signals in 2031
Nashville Road/Regional Road 27	Signalized	F	D	Improvements required
Nashville Road/Islington Ave	New Signals	B	D	New signals in 2031
Stegman’s Mills Road/Islington Ave	New Signals	C	D	New signals in 2031

Note: * AM peak period has higher traffic volumes

The results indicate relatively good operations at most intersections during both AM and PM peak periods although a number of intersections will start to experience congestion and operate at LOS D, E or F. Because of the high

volumes of up to 2,500 per hour expected at the Nashville Road/Huntington Road intersection, the intersection will need to be signalized to ensure satisfactory operations at LOS D. Similarly, the Highway 27/Kirby Road, Nashville Road/Islington Avenue and Stegman's Mills Road/Islington Avenue intersections will require signalization to minimize average delays.

Some improvements will also be required at the unsignalized intersections to provide sufficient capacity to accommodate future demands. The improvements will include widening the approaches to accommodate additional turning and auxiliary lanes. Minor improvements including provision of right turn tapers will also be necessary on some of the intersections to enhance capacity.

At the CP Railway line crossing at Huntington Road, grade separation is proposed to enhance safety and minimize delays. Under existing conditions, traffic on Huntington Road and Nashville often suffer prolonged delays when trains are passing. With increased traffic volumes in the future, total delays and the potential for train/car collisions would increase tremendously without grade separation.

4. Recommended Network

4.1 Road Network

The recommended road network is shown in **Figure 7**. The proposed plan relies on the existing network that should be improved to enhance capacity and does not require construction of additional links. The road classification and lane requirements for the recommended network were assessed as discussed in Section 3. Future lane (capacity) requirements were assessed for the new streets based on future traffic volumes and typical lane capacities. The surrounding environment, the number of accesses and the presence of turning lanes are among other factors that influence arterial road capacities.

The lane requirements are the minimum based on vehicle operational requirements and do not take into consideration additional requirements normally included in the road right of way. Recommendations for future road right of way widths are included in overall Transportation Master Plan Study. **Table 9** provides the recommended lane requirements and roadway classification within the Study Area.

Table 9. Lane Requirements for Recommended Road Network

Street	Section	No. of Lanes – Each Travel Directions	Classification
Kirby Rd	East of Kipling Ave	1	Arterial
Kirby Rd.	Kipling Ave and Hwy 27	1	Arterial
Kirby Rd	Huntington Rd and Cold Creek Rd	1	Arterial
Kipling Ave	Kirby Rd and Teston Rd	1	Major Collector
Kipling Ave	North of Kirby Road	1	Major Collector
Islington Ave	Nashville Rd and Hwy 27	1	Arterial
Islington Ave	Nashville Rd and Stegman's Mills Rd	1	Collector
Islington Ave	South of Stegman's Mills Rd	1	Collector
Stegman's Mill Rd	Kipling Ave and Islington Ave	1	Collector
Teston Road	East of Kipling Avenue	1	Arterial
Nashville Rd	Huntington Rd and Hwy 50	1	Arterial
Nashville Rd	Hwy 27 and Huntington Rd	1	Arterial
Nashville Rd	Islington Ave and Hwy 27	1	Arterial
Huntington Rd	Nashville Rd and Kirby Rd	2	Arterial
Huntington Rd	South of Nashville Rd	2	Arterial

Within the respective development Areas, the proposed street network developed by The Planning Partnership is illustrated in **Figure 8**. For each area, the proposed network consists of a hierarchy of roadways to provide connectivity and property access. In Area 1, Huntington Road is designated as an arterial road to provide the primary movement of traffic to and from the area. The arterial road is supported by collector roads running parallel to crossing Huntington Road to provide secondary traffic movement requirements, while supporting property access requirements that are achieved primarily by local roads and laneways. Grade separations with the CP rail line will be required at the crossings of Nashville Road and Huntington Road 3.

In Area 5/6, primary movement of traffic to and from the area will be provided by Kirby Road and Kipling Avenue. Additional north-south capacity will be provided by a collector road running along the Hydro corridor. Two additional collectors will provide connectivity between the north-south collector road and Kipling Avenue. Property access will be provided by local roads and laneways.

4.2 Transit Facilities

Additional transit capacity is required to support the planned developments in the proposed development Areas. At the present time, York Region Transit provides limited service to the area with one bus route running along Islington Avenue to Kleinburg during the weekday peak periods. During the off-peak periods the bus service terminates south of Major Mackenzie Drive, looping along Napa Valley Avenue back onto Islington Avenue. Improved transit service is required to support the new development and provide transportation choice for area residents and reduce reliance on the personal car, thereby contributing to overall Travel Demand Management (TDM) goals.

The recommended transit plan is shown in **Figure 9**. The recommended transit plan consists of two transit circulator routes, one each for Area 2 and Area 5/6. Within Area 2, the service will run along Huntington Road onto collector roads within new subdivision, and then back to Huntington Road to return southbound, possibly connecting to a walk-in commuter rail station (i.e. no commuter parking) on the proposed Bolton line (should such a station be feasible). Within the Area 5/6, the service will run on Kipling Avenue and along the north-south road on the Hydro Corridor up to Kirby Road. The bus would then proceed south along Kipling Avenue.

It is anticipated that bus service routes along Huntington Road and Nashville Road would adequately service Area 1. Should there be demonstrated need in the future, York Region Transit should consider diverting either the north-south or east-west service into the area as shown in dotted lines. That would ensure that walking distances to transit stops are minimized to make the service more accessible and attractive to area residents.

In addition to the proposed bus services, a new GO train service to Bolton has long been proposed, which would provide additional transit service for area residents, particularly for downtown Toronto oriented trips. Although exact station locations have not been finalized, the recently completed Bolton Commuter Rail Feasibility Study recommended that one of three stations be located at Major Mackenzie Drive, which would service the Study Area. While not recommended in the feasibility study, it is understood that a more limited station (i.e. without commuter parking) is feasible at Nashville Road, and such a facility is supported by this TMP to provide enhanced service to Nashville residents.

4.3 Cycling and Pedestrian Facilities

The purpose of the Pedestrian and Cycling network is to provide a pedestrian and cyclist-friendly environment that is safe, convenient, and attractive to both pedestrian and cyclist. The Recommended Road Network can provide pedestrian and cycling connections to other areas within Kleinburg and Nashville, including parks and conservation areas. This proposed Pedestrian and Cycling network has been prepared with a view to integrating it with the Pedestrian and Bicycle Master Plan (PBMP) adopted by the City in 2007. The PBMP proposed a number of facilities within the Kleinburg-Nashville Study Area including:

- Multiuse pathways and trails in the East Humber River valley and Gas Pipeline in Area 5/6;
- Signed bicycle route on Major Mackenzie Drive (west of Highway 27), Huntington Road and Kipling Avenue;
- Paved shoulders on Nashville Road, Major Mackenzie Drive (east of Islington Avenue), and Teston Road;
- Bike lanes on Islington Avenue.

To complement these facilities, additional on and off road facilities are proposed within the focus area roadways to create an integrated system that provides connectivity to the overall City networks and provides convenient access to points of interest including schools, parks, other recreational areas and employment areas.

The Recommended Cycling and Pedestrian Plan is shown in **Figure 10**. The main components of the plan are as follows:

- **Sidewalks** will be provided on both sides of all roadways within the proposed development Areas to promote walking and transit use within Kleinburg-Nashville and should be designed to comply with the City's guidelines. All sidewalks should be provided within the road right of way;
- **Bike Lanes** are recommended on Huntington Road in Areas 1 and 2 instead of a signed route envisioned in the Master Plan. The change recognizes the future function of Huntington Road as an arterial road with high traffic volumes that should separate cyclists from traffic through provision of dedicated lanes for bicycle use only.
- **Multi-Use Pathways** including those that are physically separated from travel lanes are proposed on the collector roads as shown in the plans. In Area 2, a multi-use pathway is proposed in the conservation area. In Area 5/6, a multi-use pathway is recommended on the north-south collector road within the Hydro corridor, and within the Gas pipeline ROW in accordance with the City's Master Plan. Multi-use pathways are designed to accommodate bicyclists, pedestrians, in-line skaters, joggers, etc.
- **Paved shoulders** are recommended on Nashville Road in Area 1 and Kirby Road in Area 5/6 in accordance to the City's Master Plan.

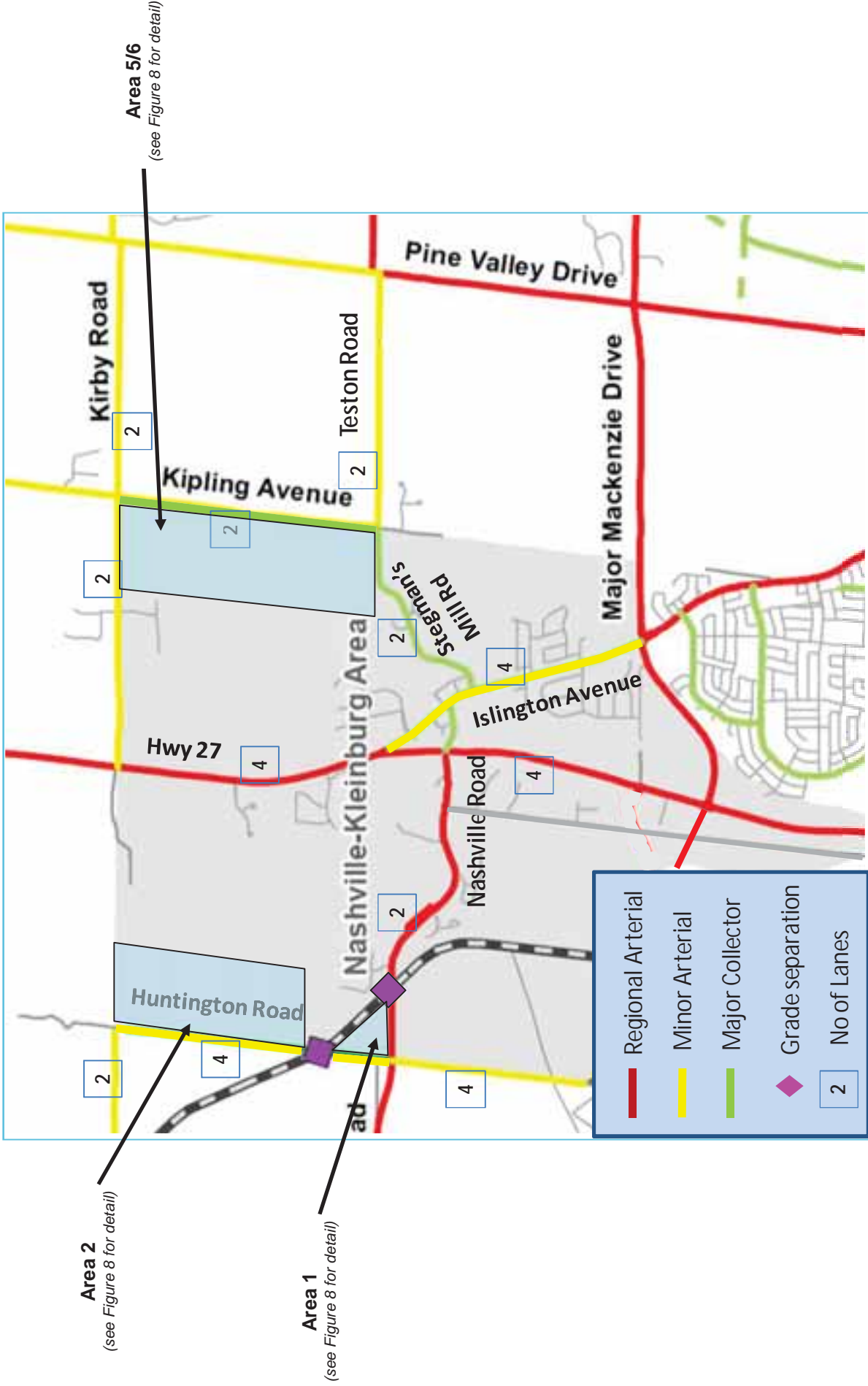


Figure 7. Recommended Road Network in the Study Area

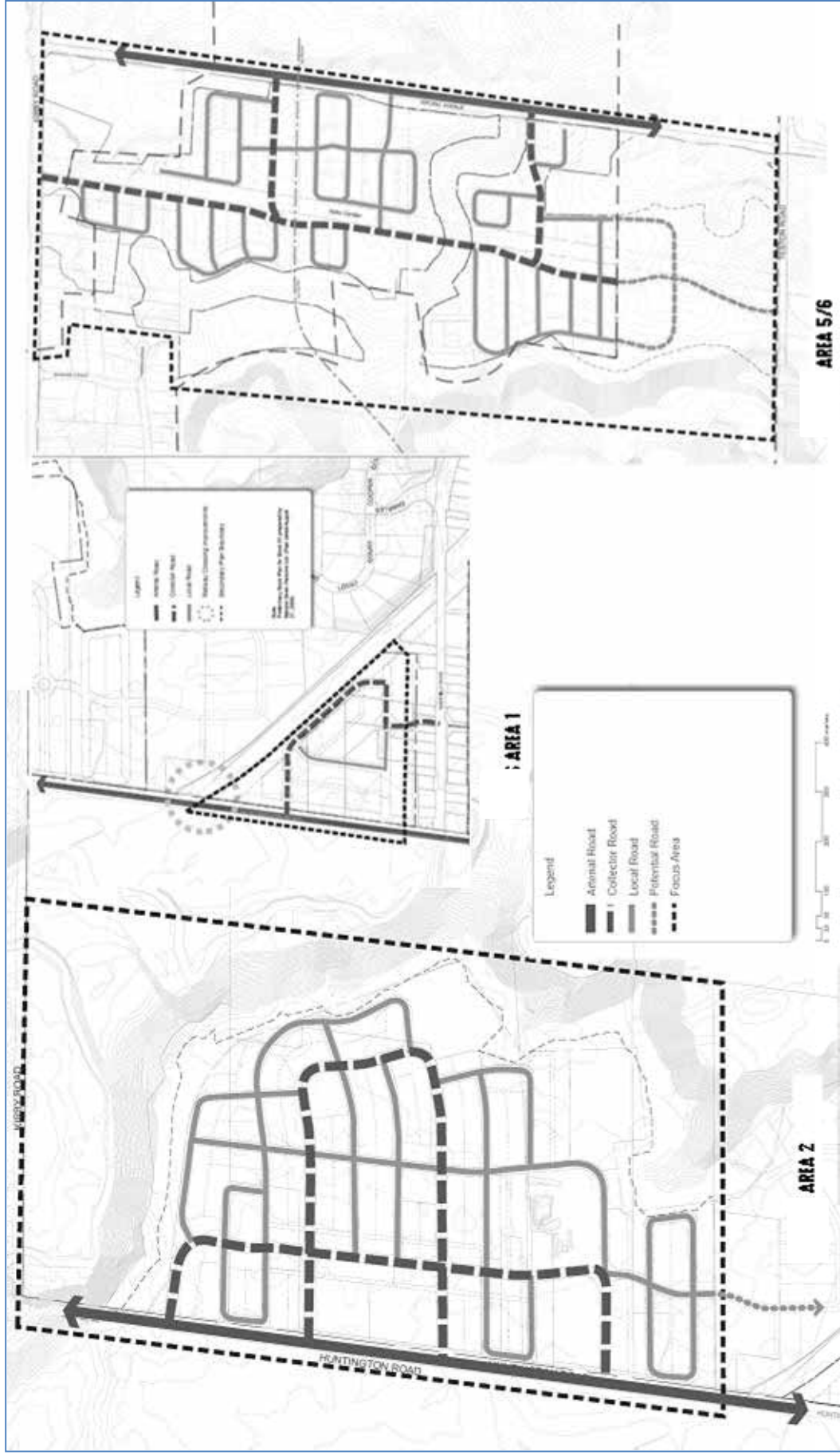


Figure 8. Recommended Street Network within the Focus Areas

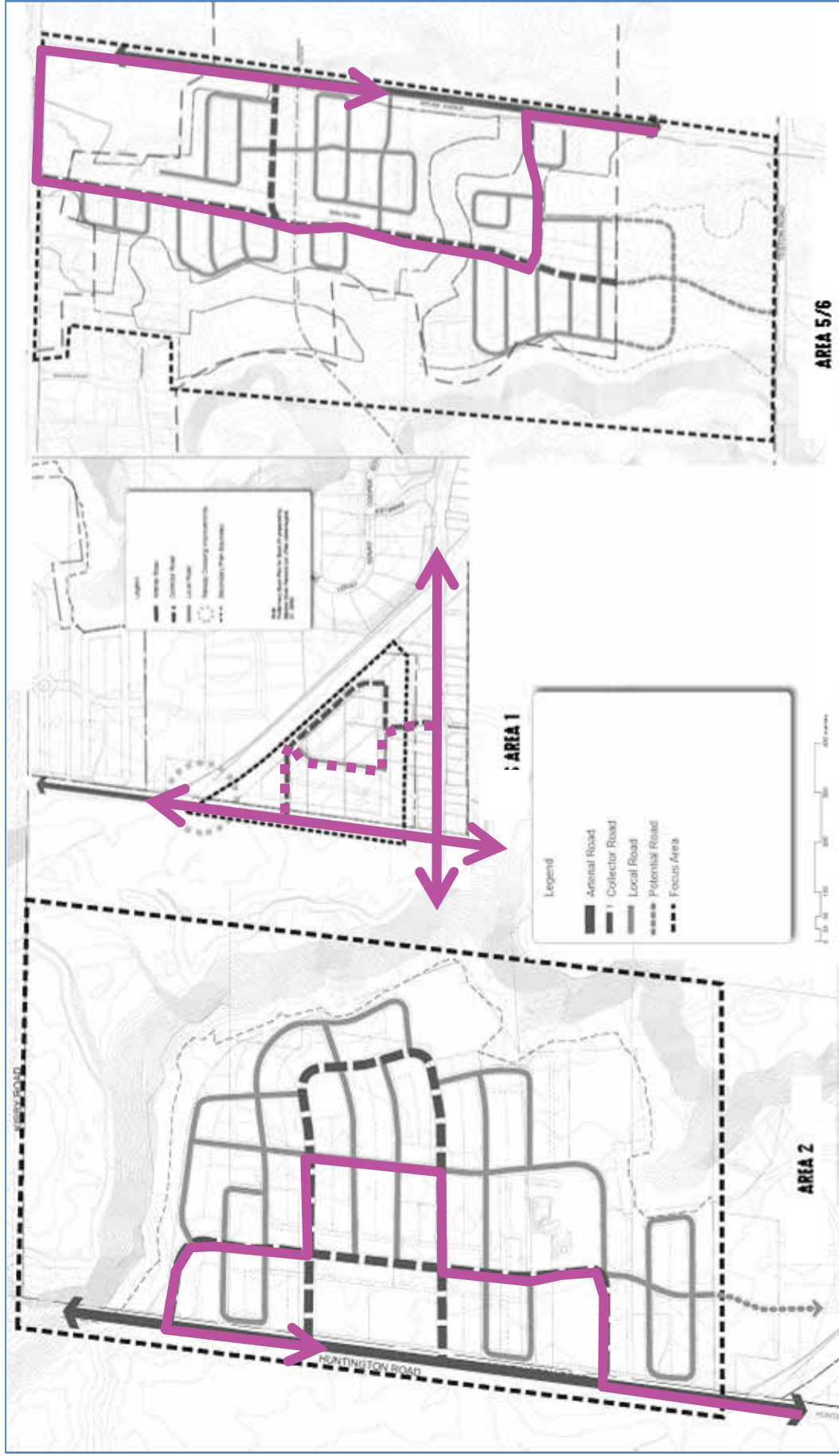


Figure 9. Recommended Transit Routes

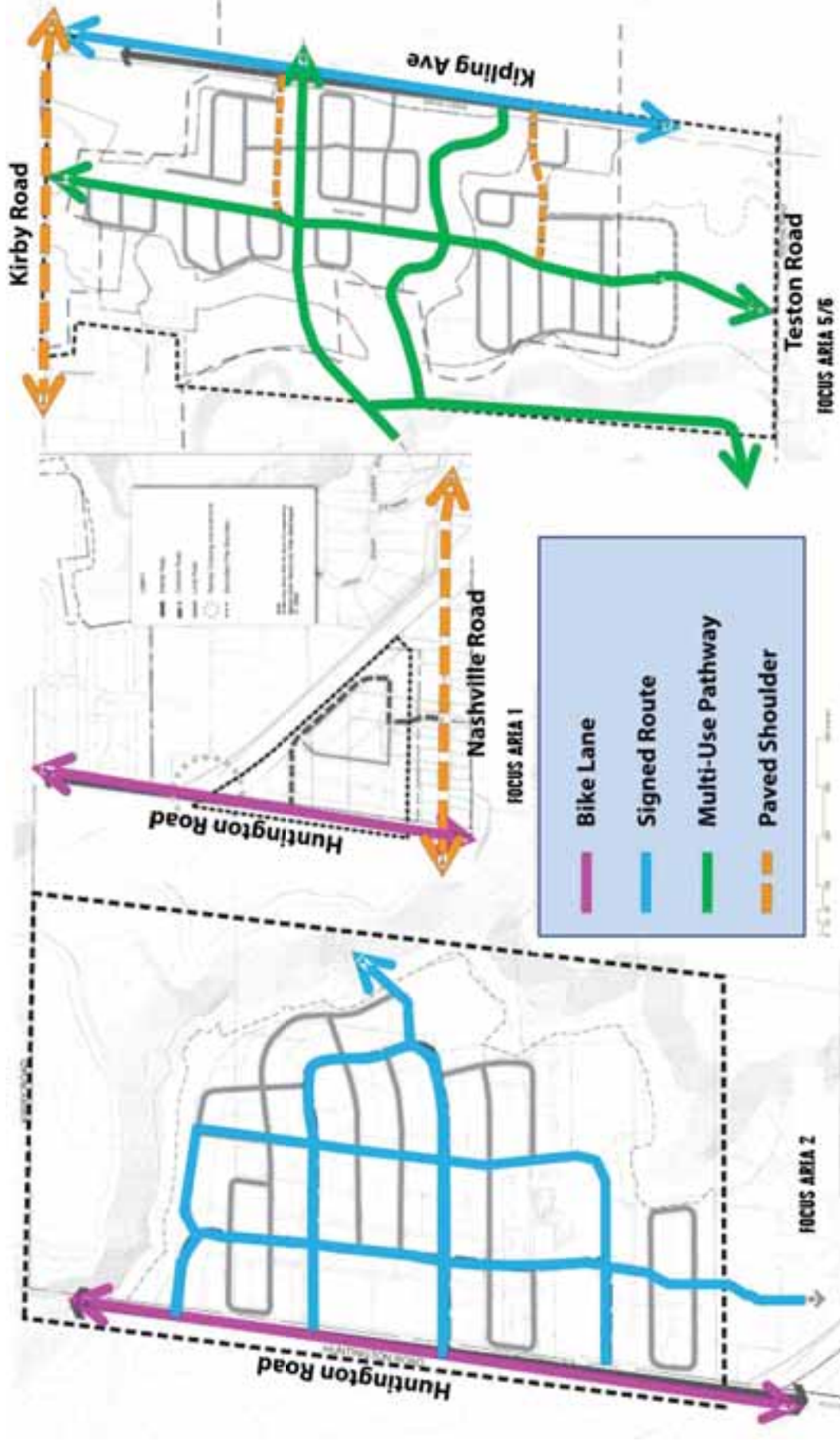


Figure 10. Recommended Pedestrian and Cycling Facilities

5. Conclusions and Recommendations

This document shows that planned developments in the proposed development Areas within Kleinburg -Nashville Area will be accommodated on existing roadways. While new roadway links are not necessary, existing roadways will require improvements to accommodate the future demands. The improvements will involve roadway widening and intersection improvements including installation of traffic signals. Those improvements include:

- Widening of Highway 27 north of Islington Avenue from two to four lanes;
- Major intersection improvements including signalization at Huntington Road/Nashville Road, Nashville Road/Islington Avenue, Highway 27/Kirby Road and Stegman's Mills Road/Islington Ave intersections; and
- Grade separation with the CP railway line at the crossings of Nashville Road and Huntington Road;

In addition minor improvements will be required on roadways sections to enhance capacity and provide more efficient facilities. Those improvements could include shoulder widening, surface improvements and better lane delineations which have been demonstrated to improve capacities. A number of intersections will also need improvements to accommodate left turn and auxiliary lanes.

It was noted that although future traffic demands are expected to exceed available capacity on Nashville Road, widening the road may not be feasible because of the special historical character of Nashville Village. It is anticipated that the extra traffic will be diverted to alternate routes. A more detailed transportation analysis is recommended following completion of the Highway 427 Extension EA and GTA West Corridor studies by MTO and the West Vaughan Individual EA Study to allow consideration of the recommendations from these studies and, specifically, the diversionary benefits of new and/or improved Provincial and Regional road facilities.

A transit network and a Pedestrian and Cycling network are also recommended within the Focus Area to complement the recommended road network. The subsidiary networks will provide vital linkages and connectivity to the overall City network (including any walk-in commuter rail station in the vicinity of Nashville Road on the proposed GO Rail line to Bolton) and access to amenities within Kleinburg-Nashville and in other areas in the City of Vaughan. They will also contribute to the City's overall Transportation Demand Management goals.

The recommendations in this document are intended to complement the other City policies and documents including the evolving Transportation Master Plan, the Pedestrian and Bicycle Master Plan and other planning documents.