

CONCESSION ROAD 3



Newcastle North Village Secondary Plan

Phase 3 – Transportation Needs Report
May 2023





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Appendices

- Appendix A - Turning Movement Counts
- Appendix B - Synchro Reports
- Appendix C - Signal Warrant Analyses



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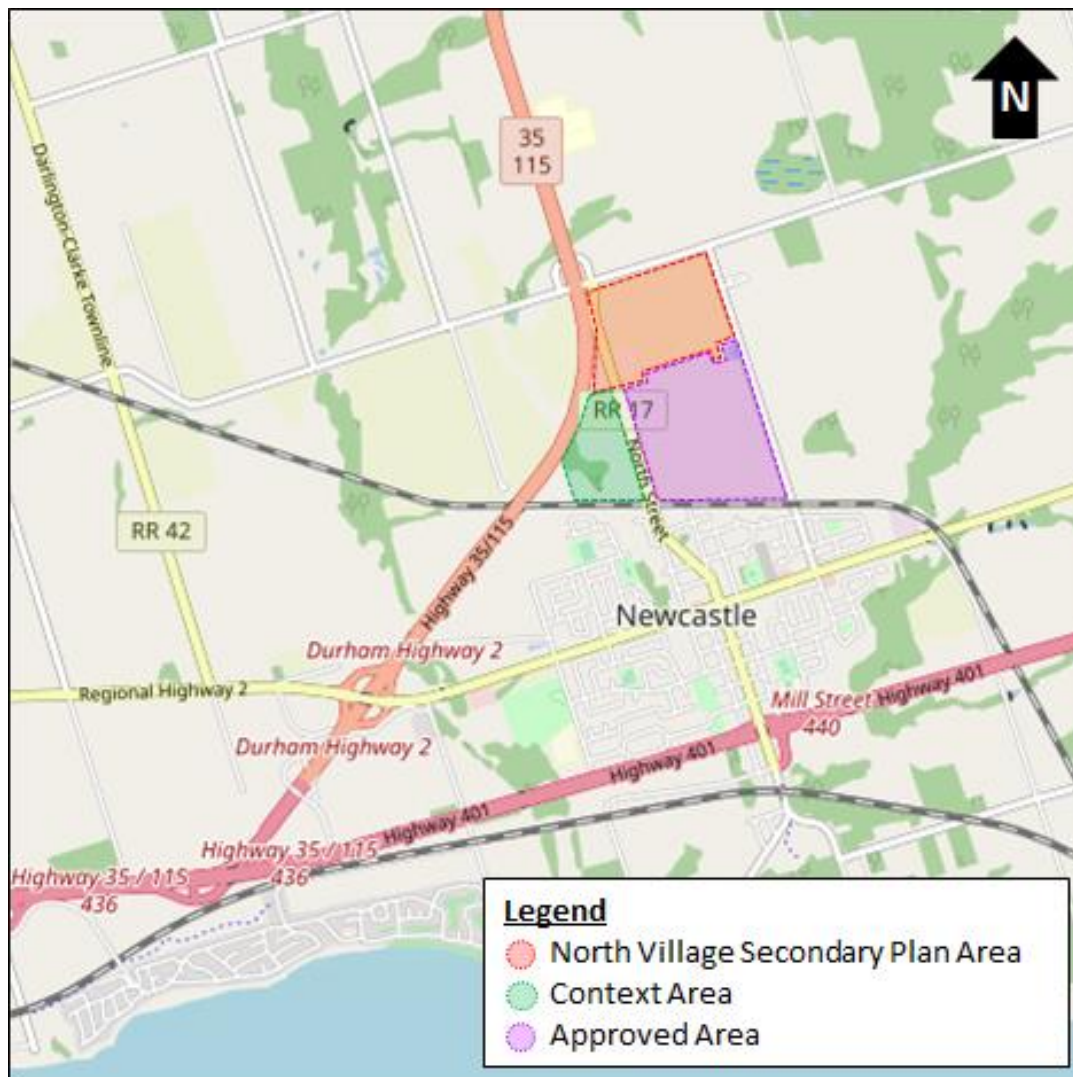
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1 Introduction and Purpose

The Municipality of Clarington has initiated a Secondary Plan for the North Village area. The North Village Secondary Plan (NVSP) Area borders Concession Road 3 to the north, Highway 35/115 to the west, Arthur Street to the east and a planned low-density residential neighbourhood to the south. The Secondary Plan touches on several key priorities: sustainability and climate change, urban design, affordable housing, and community engagement. This report outlines the current state of transportation planning for the project and Study Area. Initially, a background review was completed identifying key planning and policy documents and summarizing the findings for both the lower (Clarington) and upper tier (Durham) municipalities. A review of existing and future links is identified in accordance with relevant policy documents, as well as particular consideration of active transportation opportunities. The second part of the report identifies potential considerations and opportunities to ensure the development of a future robust and well-rounded transportation network to serve the community, as well as potential constraints within the Broader Study Area that should be considered in developing the overall transportation network plan. **Figure 1** presents the Study Area which includes the NVSP Area, Context Area, and Approved Area.

Figure 1: North Village Secondary Plan Study Area





2 Integrated Environmental Assessment Process

The Secondary Plan study also includes an Integrated Environmental Assessment (EA) process in order to document the need and justification for transportation network elements within the Secondary Plan area. The integrated EA approach is a cost-effective method of meeting the requirements of both the Planning Act and Class EA processes and meets the "integrated approach" as set out in Section A.2.9 and Appendix 8 of the Municipal Class Environmental Assessment (MCEA) document prepared by the Municipal Engineers Association (October 2000, as amended in 2007, 2011 and 2015) which addresses combined Planning Act and Environmental Assessment Act requirements.

For this Secondary Plan, the outcomes of the planning process can be applied towards the EA process to reduce duplication of the efforts. The key to this integration is to identify when and how the EA process is addressed to ensure both the Planning and EA criteria are met, and preparation of a supplementary document of this approach in a Monitoring Report. The steps of the integration include:

- **Data Collection and Background Document Review:** Previous and ongoing land use planning and technical environmental documents will be collected and reviewed as evidence of inventory and assessment efforts. These documents and their review will be referenced in the Monitoring Report.
- **Identification of Opportunities and Constraints (Phase 1 EA):** Based on review of the background documents along with public comments received from the Project Kick-off Public Information Centre (PIC), problems and opportunities associated with the development of North Village lands will be used to create the Problem and Opportunity Statement.
- **Identification of Alternative Solutions to Problem or Opportunity (Phase 2 EA):** Alternative methods to address the project need (as identified in Phase 1 EA) will be documented, such as do nothing, limit development, improve transit, build new roads, etc. This will also consider the NVSP's goals to promote a sustainable natural environment through the protection of the identified natural heritage system within an urban setting. In addition, it is the intent of this plan to promote the community planning and design features along with practical road layouts for the Secondary Plan.
- **Notifications:** All project notices and communications will demonstrate clear indication of the integrated approach procedure in regard to the NVSP. Content is incorporated into the combined Planning Notices.
- **Consultation Events & Meetings:** Consultation is a key component for both the Planning and EA process.
- **Consultation Documentation:** Work will be synchronized with the Municipality of Clarington to provide documentation supporting the Planning process in accordance with A.2.9.4 of the MCEA.
- **Monitoring Report:** Work will be coordinated with the Municipality of Clarington to incorporate the commitments made (including Monitoring) into the appropriate planning documents which will serve as the basis of approvals for the associated infrastructure.



3 Existing Conditions

3.1 Existing Roads

Newcastle is a community in the Municipality of Clarington, Ontario located along Highway 401 and east of Highway 35/115. The Study Area is under the municipal jurisdiction of Clarington and the regional jurisdiction of Durham. Some of the pertinent road network elements within the Study Area are displayed in **Figure 2**. This includes the following major roadways:

- **Highway 35/115** is a north-south provincial highway under the jurisdiction of the Ministry of Transportation Ontario (MTO). Highway 35/115 is a four-lane controlled access highway extending from Highway 401 to the Highway 35/115 split, with Highway 115 continuing as a controlled access freeway north of the split to its terminal at Highway 7 / Television Road. The highway operates with a posted speed of 90km/h.
- **Concession Road 3** is an east-west municipal road under the jurisdiction of the Municipality of Clarington within the defined Study Area. Concession Road 3 is a Type B and C Arterial Road, east and west of Regional Road 17, respectively. Concession Road 3 continues as a local road west of Highway 35/115 to Darlington Clarke Townline, and east of Arthur Street to Morgans Road. The posted speed is 70km/h and 60km/h, east and west of Highway 35/115, respectively. No active transportation is currently present.
- **North Street / Manvers Road / Mill Street (Regional Road 17)** is a north-south regional road under the jurisdiction of Durham Region and is classified as a Type B Arterial Road within the defined Study Area. Regional Road 17 extends from Highway 401 to Concession Road 3 with a posted speed of 60 km/h and 50km/h north and south of Grady Drive, respectively. Sidewalk provisions are present south of Grady Drive.
- **King Avenue (Durham Regional Highway 2)** is an east-west regional road under the jurisdiction of Durham Region and is classified as a Type A Arterial Road within the defined Study Area. Durham Regional Highway 2 is a major connection between Bowmanville to the west and Newtonville to the east, also acting as a transit spine. King Avenue has a posted speed of 50 km/h within Newcastle with sidewalks on both sides present between Rudell Road and Arthur Street.
- **Arthur Street** is a north-south municipal road under the jurisdiction of the Municipality of Clarington. Arthur Street is classified as a Type C Arterial Road with a posted speed of 70 km/h and 50 km/h, generally north and south of the CP Rail crossing, respectively. Sidewalk provisions and cycling lanes are present south of Andrew Street.
- **Grady Drive / Monroe Street West** is an east-west road under the jurisdiction of the Municipality of Clarington with a posted speed limit of 50km/h. Grady Drive is a collector road to the west of Regional Road 17 and Monroe Street West is a local road to the east of Regional Road 17.

Figure 2: Existing Road Network



3.2 Existing Transit

At the time of developing the Phase 1 – Transportation report (August 2022), within the vicinity of the NVSP Area there are three Durham Region Transit (DRT) bus routes and one GO Transit bus route. These existing routes are displayed in **Figure 3**.

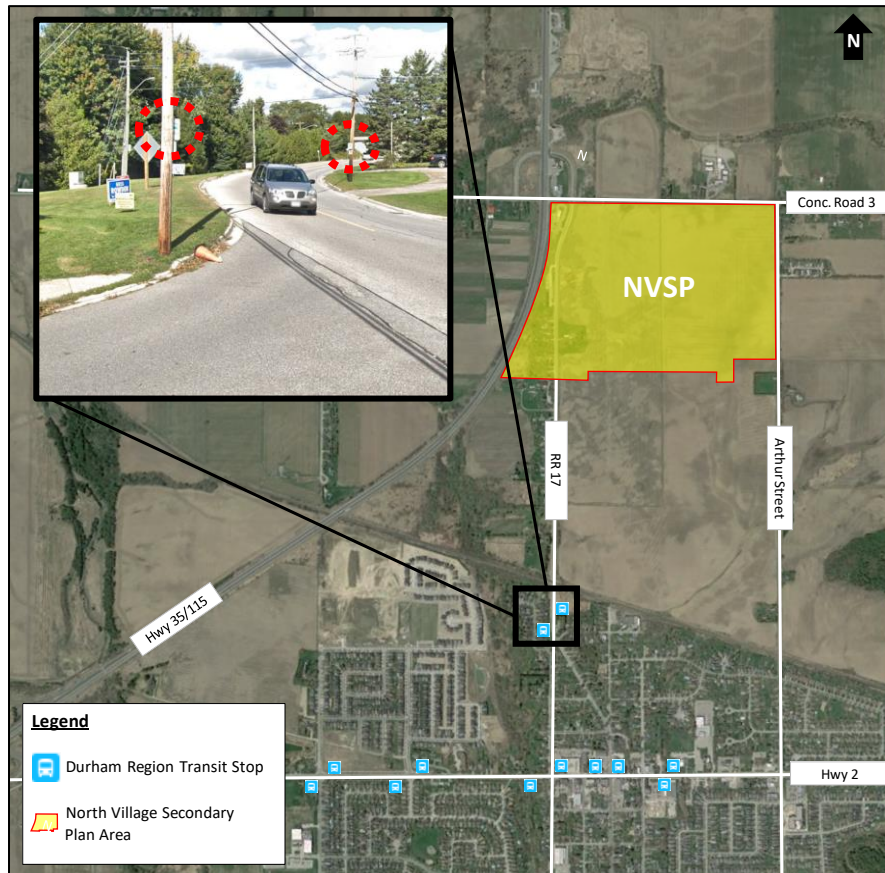
- **DRT Route 506** – Weekday service connecting the Bowmanville Park and Ride and Orono via Newcastle, with two westbound trips and two eastbound trips daily. DRT 2020 Budget and Service Plan will see Route 506 replaced with On-Demand 7-day service as of September 2020.
- **GO Bus Route 90** – 7-day operation with frequent peak period weekday service and hourly off-peak and weekend service. Route connects Union Station and Newcastle primarily via Highway 401 and Highway 2.
- An additional DRT route will be introduced on Highway 2 between Oshawa GO Station, Oshawa Centre Terminal, and Bowmanville. The service will operate with 30 to 60-minute headways.

Figure 3: Existing Transit Routes



Figure 4 outlines the location of the nearest transit locations to the North Village Secondary Plan area. The closest transit stop is located at Grady Drive and Regional Road 17 approximately 1 kilometer south of the subject site.

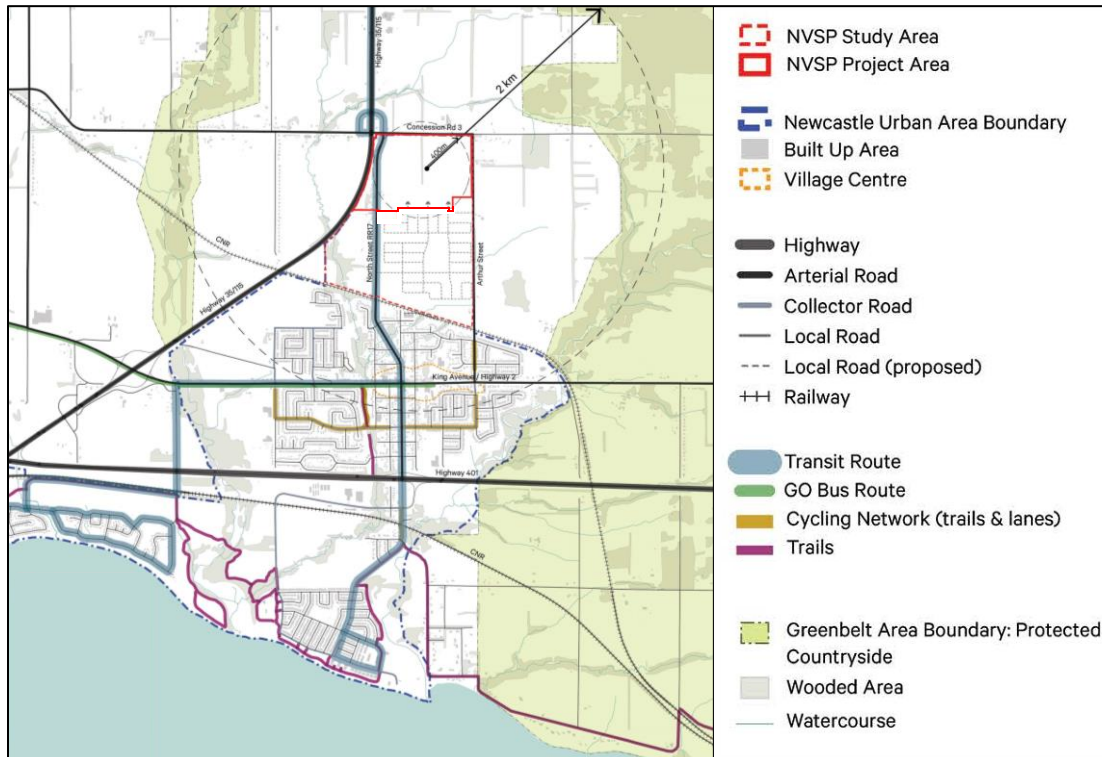
Figure 4: Existing Transit Stop Locations



3.3 Existing Active Transportation

Figure 5 illustrates the existing circulation network, including active transportation facilities and trail network, within the Newcastle Urban Area the NVSP Study Area identified in red. Marked edge line signed cycling routes are shown on Edward Street and sections of Brookhouse Drive and Arthur Street.

Figure 5: Existing Active Transportation Facilities



3.4 Existing Schools

The North Village Secondary Plan Area is located in Ward 4 of the Municipality of Clarington currently with no existing elementary, middle, or high schools within the NVSP Area. The NVSP is within two major school boards districts, which include the Kawartha Pine Ridge District School Board (KPRDSB) and the Peterborough, Victoria, Northumberland and Clarington Catholic District School Board (PVNCCDSB). Presently, the following schools encompass and serve the Study Area.

Table 1: Existing Relevant Neighborhood Schools

School District	School Name	Grades	Population	Address
KPRDSB	Newcastle Public School	JK to 6	605	50 Glass Court
KPRDSB	The Pines Senior Public School	7 & 8	196	3421 Highway 35/115
KPRDSB	Clarke High School	9 to 12	284	3425 Highway 35/115
PVNCCDSB	St. Francis of Assisi Catholic Elementary School	JK to 8	N/A	1774 Rudell Road
PVNCCDSB	St. Stephen Secondary School	9 to 12	N/A	300 Scugog Street, Bowmanville



3.5 Notable Other Future Developments

Newcastle is experiencing growth in population through other area residential developments. The following developments are proposed or underway within the Newcastle area, and are displayed below within **Figure 6** to **Figure 9**.

- Foster North Development is currently partially built and will consist of approximately 500 low density residential units and multiple parks/open spaces. The development also includes a collector road connection to Grady Drive.
- Foster Northwest Development will consist of approximately 700 residential units of mixed density, a secondary or elementary school and multiple parks/open spaces.
- A residential neighborhood is approved directly south of the NVSP area and will consist of approximately 900 residential units including single family detached homes and townhouses. The development will also include multiple parks and an elementary school.
- A development is proposed at 355 North Street, just south of the CP Rail crossing. The proposed development consists of 29 townhouse units accessed by a private lane that will be part of a common elements plan of a condominium to be applied for at a later date.
- A residential subdivision is proposed at 688A and 688B North Street, consisting of 57 single-family detached units, 48 semi-detached units, and 26 street townhouse units.

Figure 6: Future Developments

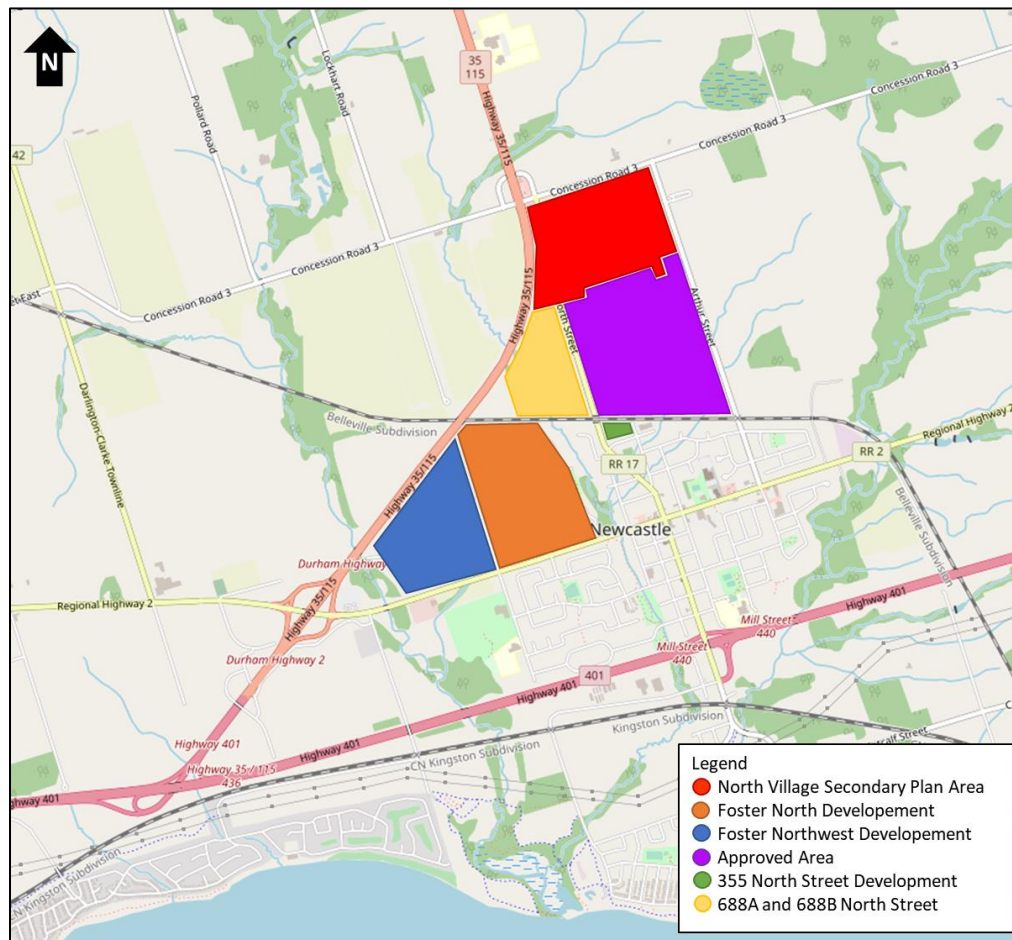


Figure 7: Foster North & Foster Northwest Developments

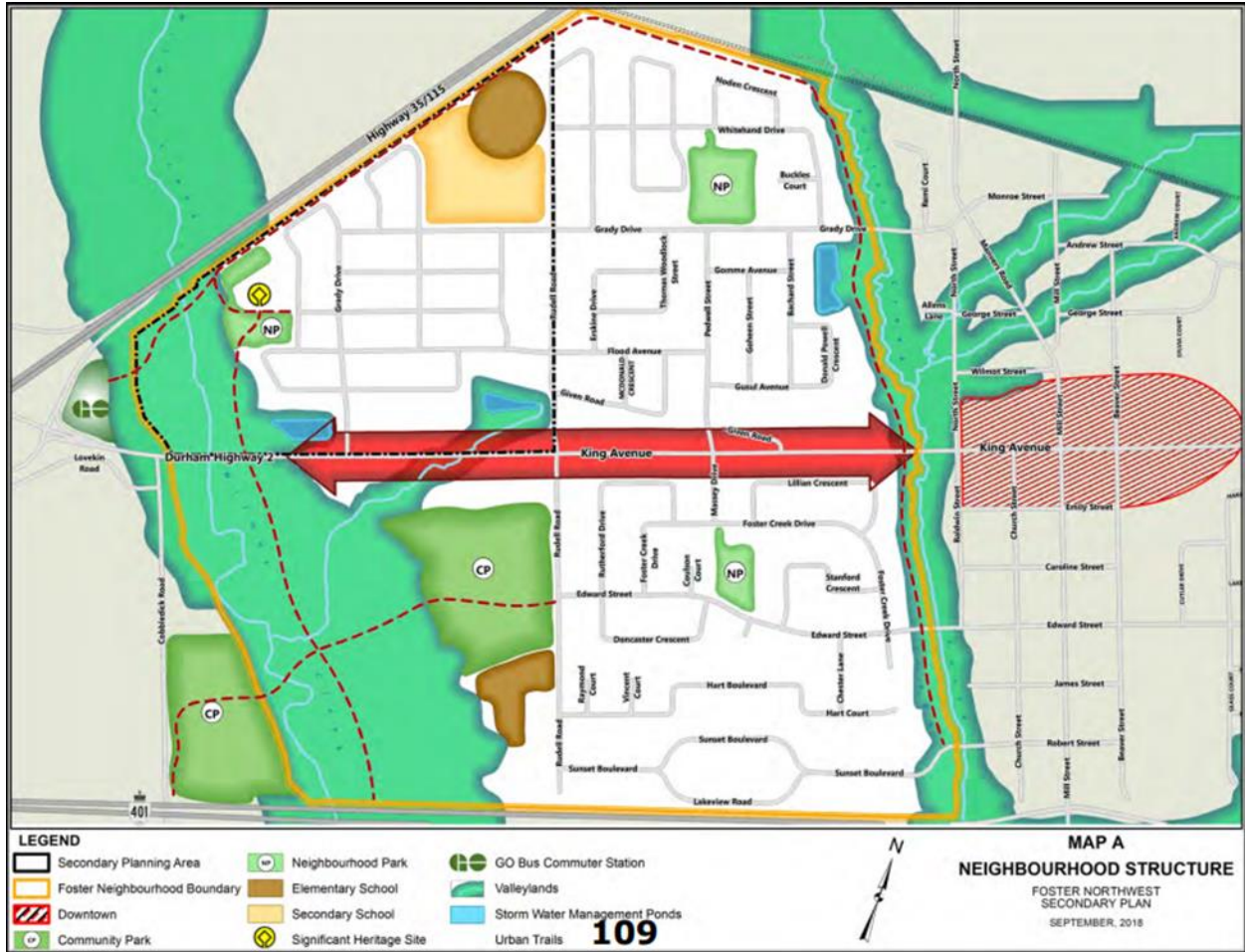




Figure 8: Approved Development South of the North Village Secondary Plan Area

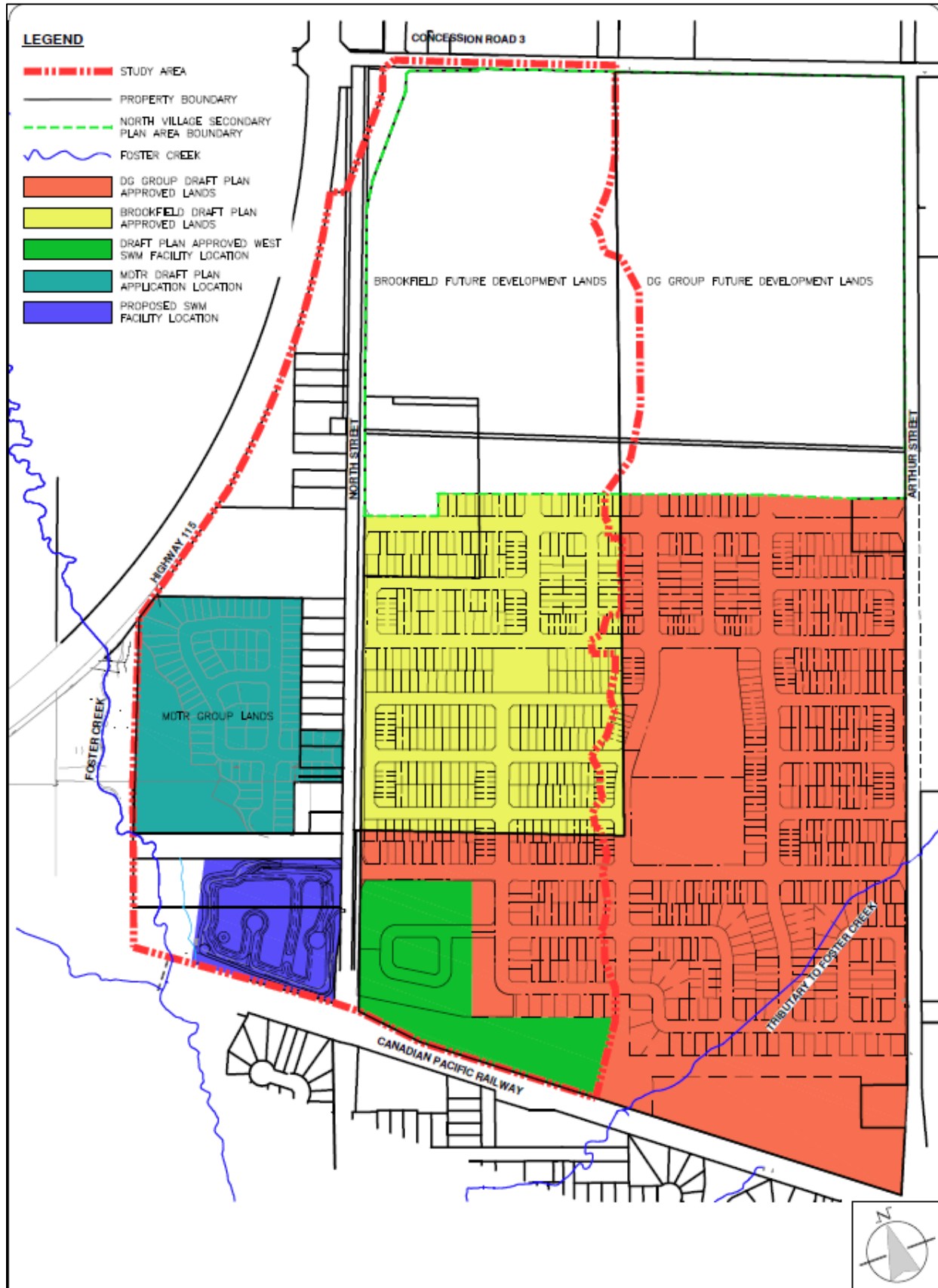
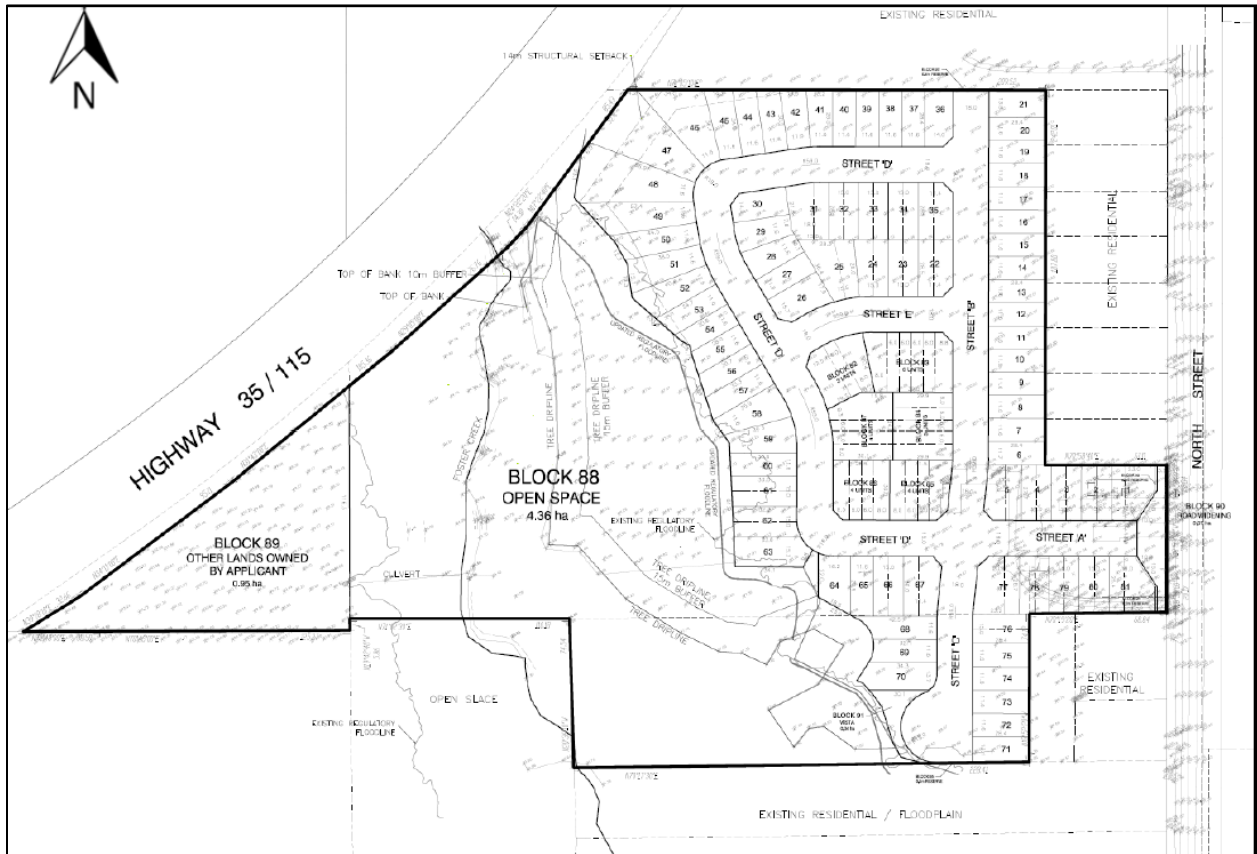


Figure 9: Proposed Subdivision at 688A and 688B North Street



3.6 Existing At-Grade and Grade-Separated Crossings

Directly south of the Study Area, the CP Rail line spans east-west with multiple at-grade and grade-separated roadway crossings. In addition, a grade separation exists at the Highway 35/115 & Concession Road 3 interchange. **Figure 10** below summarizes these locations. **Figure 11** to **Figure 13** contain displaying photos of each and depict if they are at-grade or grade-separated.

Figure 10: At-Grade and Grade-Separated Crossings within Study Area

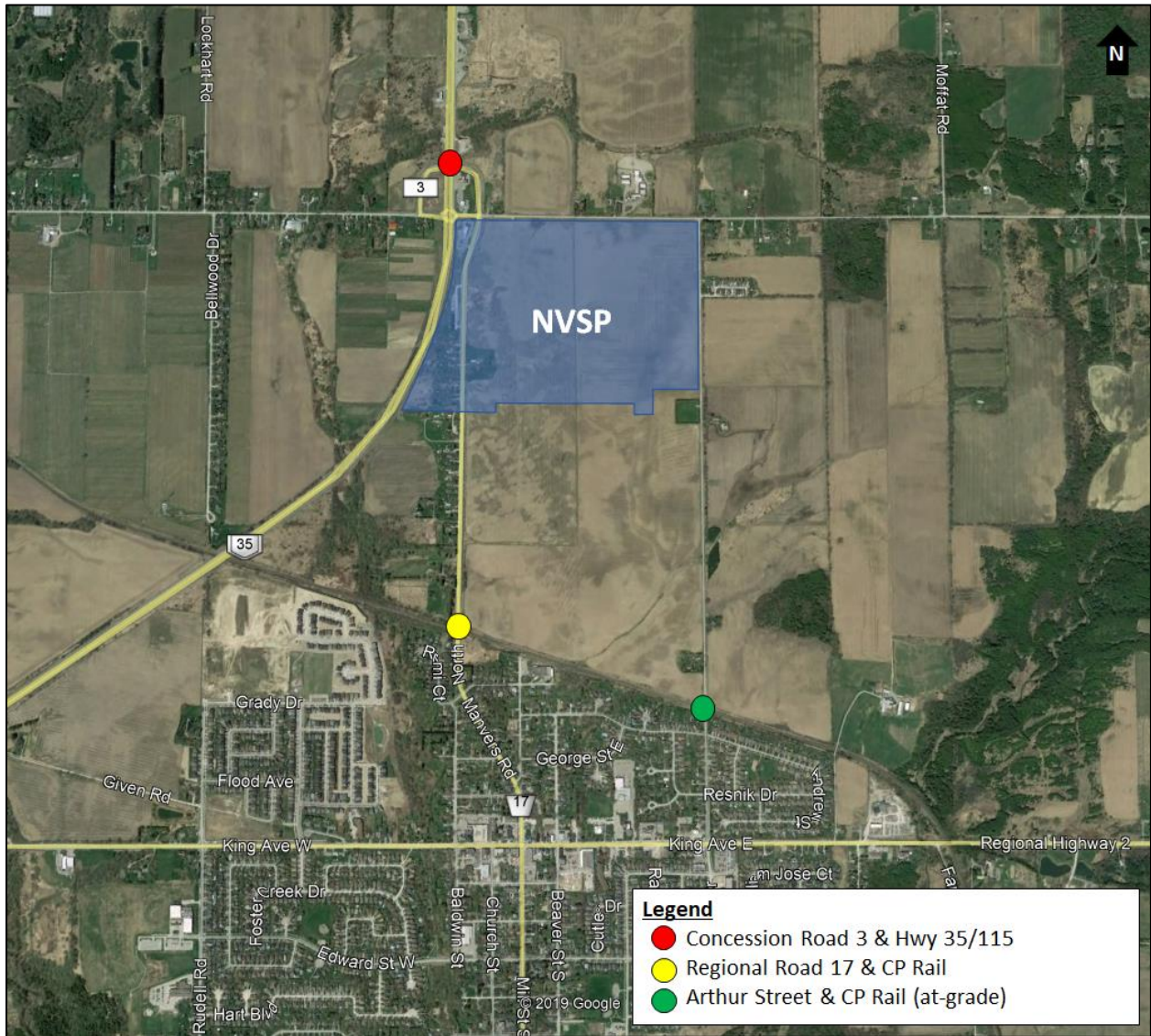


Figure 11: North Street & CP Rail Grade-Separated Crossing





Figure 12: Arthur Street & CP Rail At-Grade Crossing



Figure 13: Concession Road 4 & Highway 34/115 Grade-Separated Crossing





3.7 Existing Traffic Operations

3.7.1 Existing Traffic Data

Traffic data for the Study Area intersections was collected by Accu-Traffic Inc. on behalf of AECOM at the initiation of this study and preceded traffic related impacts arising from the COVID pandemic (traffic impacts arising from the pandemic started March 2020). The data was collected on January 9, 2020 during AM (7:00AM – 10:00AM) and PM (4:00PM – 7:00PM) peak periods. Although these counts were obtained immediately prior to the COVID pandemic, it is expected these are generally representative of current conditions. Based on a review of available traffic counts from Durham Region, AECOM reviewed an October 6, 2021 turning movement count undertaken along North Street at the McDonald’s entrance. Based on comparison of north-south volumes on North Street between the entrance and Concession Road 3, it was observed that 2021 volumes are lower than January 2020 counts, albeit it is acknowledged the 2021 volumes are not completely post-pandemic. That said, given the lower 2021 volumes and since the 2020 volumes are not aged more than three years, it is deemed that the base counts for this study are appropriate for the analysis. The respective AM and PM Peak Hours are summarized in **Table 2**. Turning movement count data can be found in **Appendix A**.

Table 2: Turning Movement Survey Dates and Peak Hours

Intersection	AM Survey Date	AM Peak Hour	PM Survey Date	PM Peak Hour
Concession Road 3 & Highway 35/115 West Interchange	January 9 th , 2020 at 6:00 AM – 9:00 AM	7:15 AM – 8:15 AM	January 9 th , 2020 at 4:00 PM – 7:00 PM	4:15 PM – 5:15 PM
Concession Road 3 & Highway 35/115 East Interchange	January 9 th , 2020 at 6:00 AM – 9:00 AM	7:15 AM – 8:15 AM	January 9 th , 2020 at 4:00 PM – 7:00 PM	4:15 PM – 5:15 PM
Concession Road 3 & Arthur Street	January 9 th , 2020 at 6:00 AM – 9:00 AM	7:45 AM – 8:45 AM	January 9 th , 2020 at 4:00 PM – 7:00 PM	4:15 PM – 5:15 PM
North Street / Manvers Road & Grady Drive / Monroe Street W	January 9 th , 2020 at 6:00 AM – 9:00 AM	7:30 AM – 8:30 AM	January 9 th , 2020 at 4:00 PM – 7:00 PM	4:15 PM – 5:15 PM
Arthur Street & Andrew Street	January 9 th , 2020 at 6:00 AM – 9:00 AM	7:45 AM – 8:45 AM	January 9 th , 2020 at 4:00 PM – 7:00 PM	4:15 PM – 5:15 PM

3.7.2 Traffic Operations Analysis Methodology

Traffic operations were analyzed using Synchro version 9 software. The Highway Capacity Manual (HCM 2000) methodology for signalized intersections was utilized. The Synchro parameters such as peak hour factor, heavy vehicle percentage, and pedestrian volumes for each intersection approach were input based on the available TMC data, with Synchro defaults utilized in instances where the data was unavailable. The intersection level of service (LOS) describes the driver experience during the use of a transportation facility. The LOS criteria for signalized and unsignalized intersections are summarized in **Table 3**.



Table 3: Description of Level of Service

LOS	Description	Signalized Average Delay	Stop Controlled Average Delay
A	Very seldom does a vehicle wait longer than one red light. The approach appears open, turns are easily made, and drivers have freedom of operation.	≤ 10 sec	0 ≤ 10 sec
B	An occasional green light is fully used and many greens approach full use. Many drivers begin to feel somewhat restricted within groups of vehicles approaching the intersection.	≤ 20 sec	10 ≤ 15 sec
C	Intersection operation is stable but often has fully used greens. Drivers feel more restricted and occasionally may wait for more than one red light. Queues may develop behind turning vehicles.	≤ 35 sec	15 ≤ 25 sec
D	Drivers experience increasing restrictions and instability of traffic flow. There are substantial delays to vehicles during short peaks within the peak hour, but there is enough time with lower demand to permit occasional clearing of queues and prevent excessive backups.	≤ 55 sec	25 ≤ 35 sec
E	The capacity of the road is reached. There are long queues of vehicles waiting upstream of the intersection and delays to vehicles may extend to several signal cycles.	≤ 80 sec	35 ≤ 50 sec
F	Vehicle demand exceeds the available capacity and delays extending through the peak hour are experienced.	>80 sec	>50 sec

The volume-to-capacity (v/c) ratio represents how saturated a road or intersection movement and is based on the actual volume using a movement divided by the maximum volume which could be accommodated by that movement. A v/c ratio between 0.00 and 0.49 means that less than half of the capacity is being used by vehicles; generally, this indicates good operating conditions. As the v/c ratio approaches 1.00, traffic conditions worsen until capacity is reached, at which operations are deemed 'very poor'. Vehicles using an intersection operating near or at capacity will typically see high average delays and/or excessive queueing.

A v/c ratio can theoretically exceed 1.00, indicating oversaturated conditions and extended traffic delays. The critical movements for signalized intersections identified in the capacity analysis summary tables are those having a LOS of "E" or "F" and/or a v/c ratio of 0.85 or greater. Since the analysis is based on actual volumes, a v/c ratio typically should not exceed 1.00. Higher than 1.00 v/c ratios indicate that the counted traffic volumes exceeded the capacity calculated by the analysis procedure/software. Individual movements at intersections with calculated v/c ratios greater than 1.00 are operating essentially at capacity and can be expected to experience significant recurring queues and congestion during peak period.

3.7.3 Existing Traffic Conditions

The existing traffic conditions were analyzed based on the existing lane configurations and traffic control presented in **Figure 14** and on the basis of the traffic volumes presented in **Figure 15** and **Figure 16** for AM and PM peak hours, respectively. The traffic figures illustrate the observed turning movement



volumes as well as the total sum volume on each intersection leg. It should be noted that the presented traffic volumes represent raw data, as volume balancing was not performed prior to undertaking the existing conditions assessment due to the broad geospatial spacing of the intersections (and intermediate entrances and/or intersections). Link volumes at adjacent intersections are shown to balance well, with the exception of the south leg of Concession Road 3 & Regional Road 17 and the north leg of North Street / Regional Road 17 & Grady Drive / Monroe Street West. The volume imbalance is likely attributed to pass-by volumes between Highway 35/115 and the McDonald's Restaurant on the southwest corner of the intersection at Concession Road 3. Although operations at Concession Road 3 & Regional Road 17 reflect the volumes to and from this high traffic oriented fast-food establishment, it was noted that the observed intersection operations are good.

Figure 14: Existing Lane Configurations and Traffic Control

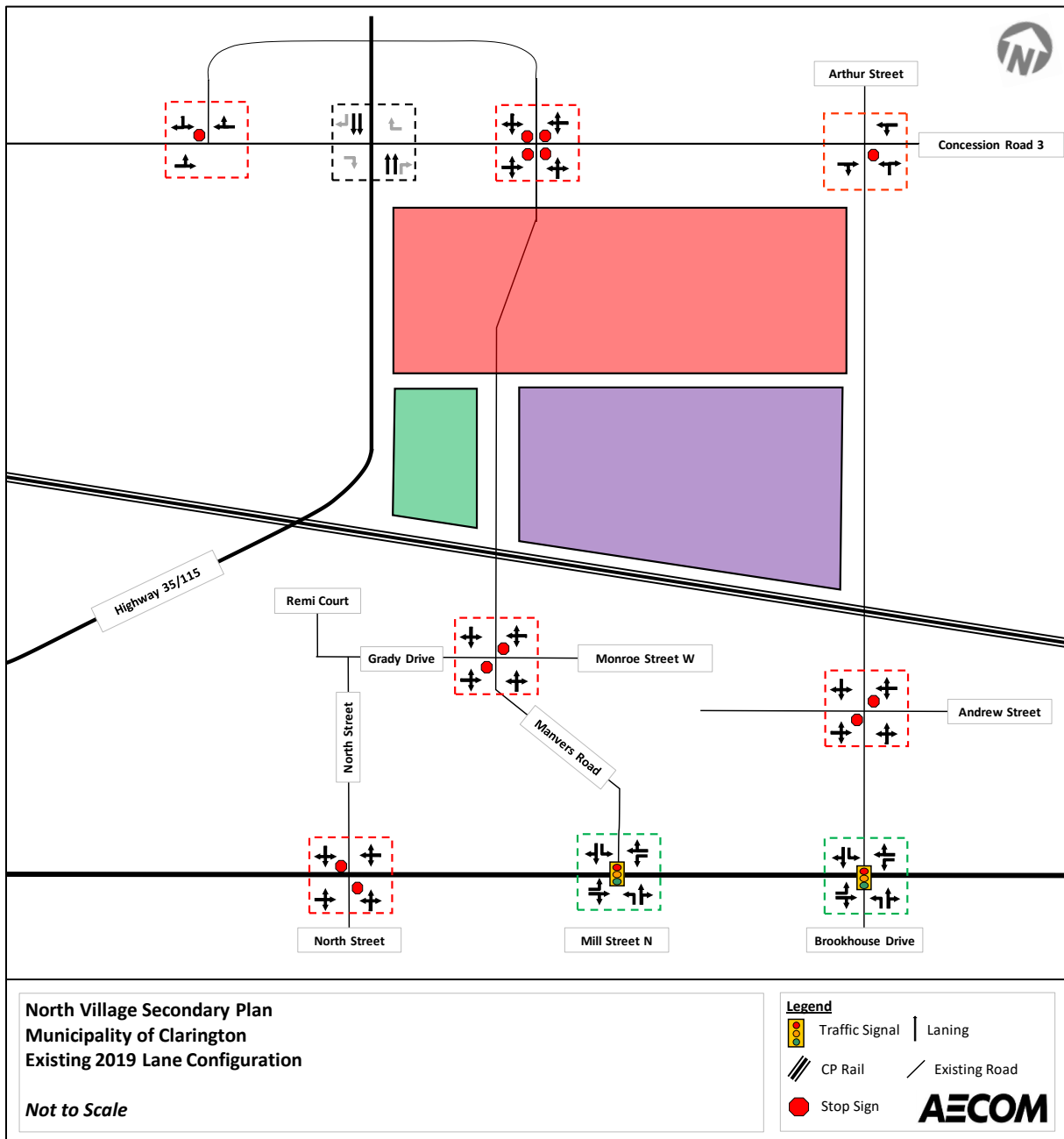




Figure 15: Existing Conditions Turning Movement Volumes - AM Peak Hour

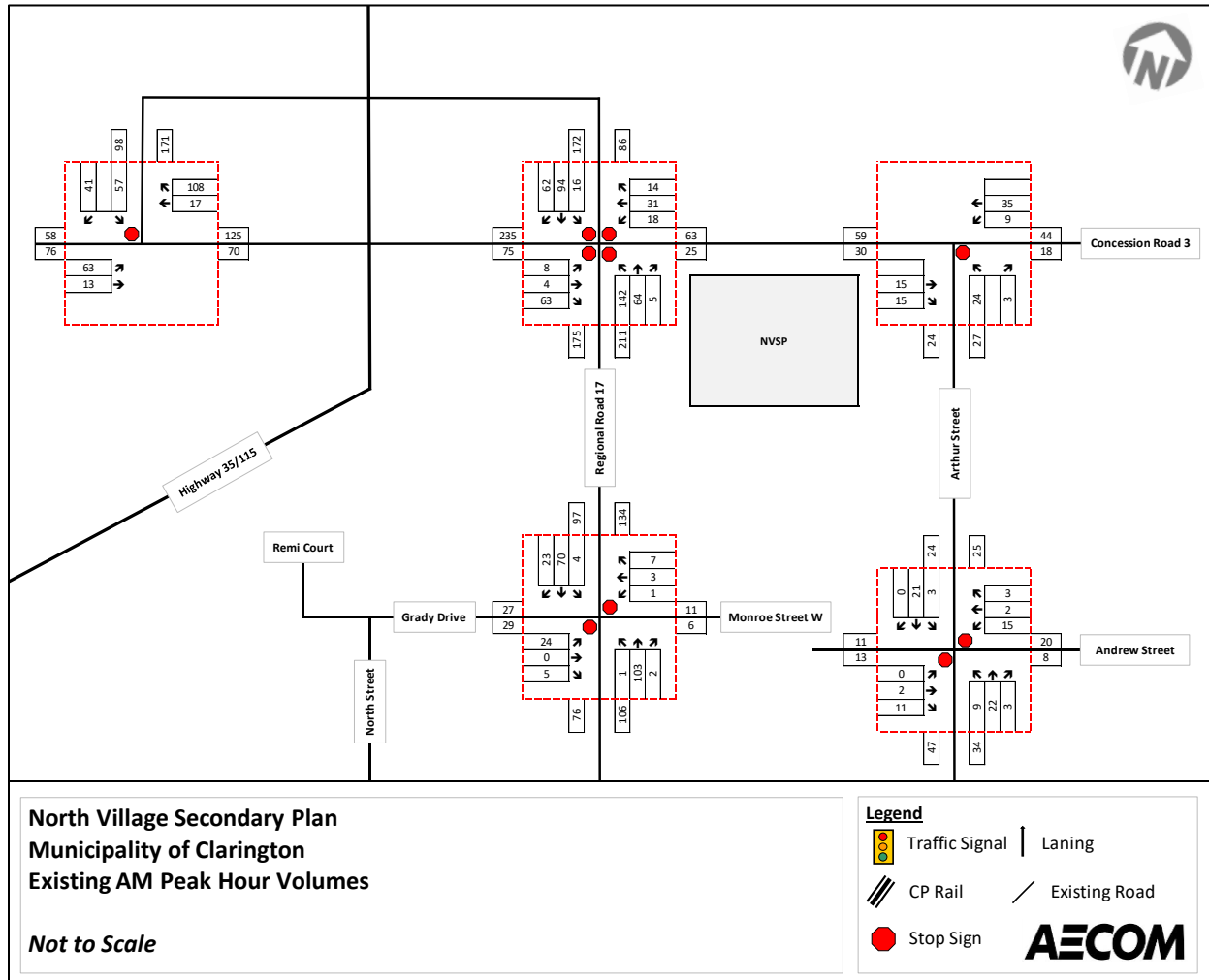
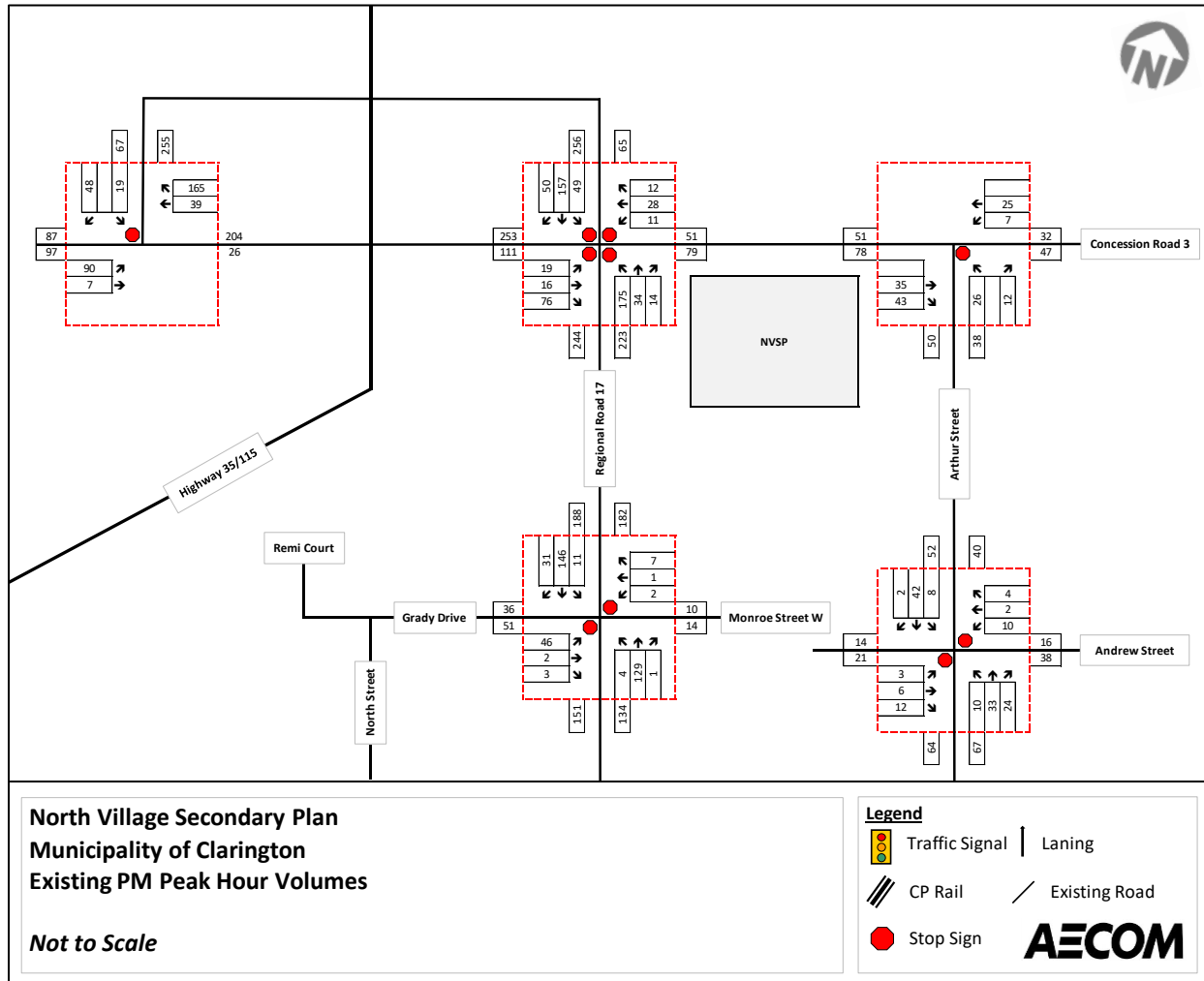




Figure 16: Existing Conditions Turning Movement Volumes - PM Peak Hour



3.7.4 Summary and Conclusion

The results of the intersection analysis under existing traffic conditions are summarized in **Table 4** and **Table 5**. The current traffic operations maintain excellent overall Levels of Service (LOS) with no critical movements or major queueing issues. Detailed Synchro reports for the traffic operations assessment are included in **Appendix B**.



Table 4: AM Peak Hour Intersections Level of Service Summary

Intersection	Movement	Delay (sec)	LOS	v/c	95th Percentile Queue (m)
Concession Road 3 & Highway 35/115 Underpass West	EBLT	6.4	A	0.05	1.2
	WBTR	0.0	A	0.08	0.0
	SBLR	10.2	B	0.14	3.7
	<i>Overall</i>	<i>5.0</i>	<i>A</i>	<i>-</i>	<i>-</i>
Concession Road 3 & Highway 35/115 Underpass East / North Street	EBLTR	8.2	A	0.11	0.4
	WBLTR	8.8	A	0.10	0.4
	NBLTR	10.0	A	0.32	1.4
	SBLTR	9.1	A	0.26	1.0
	<i>Overall</i>	<i>9.3</i>	<i>A</i>	<i>-</i>	<i>-</i>
Concession Road 3 & Arthur Street	EBTR	0.0	A	0.02	0.0
	WBLT	1.6	A	0.01	0.2
	NBLR	9.2	A	0.04	0.9
	<i>Overall</i>	<i>3.2</i>	<i>A</i>	<i>-</i>	<i>-</i>
North Street / Manvers Road & Grady Drive / Monroe Street West	EBLTR	10.0	B	0.04	1.1
	WBLTR	9.5	A	0.01	0.3
	NBLTR	0.1	A	0.00	0.0
	SBLTR	0.3	A	0.00	0.1
	<i>Overall</i>	<i>1.8</i>	<i>A</i>	<i>-</i>	<i>-</i>
Arthur Street & Andrew Street	EBLTR	8.8	A	0.02	0.4
	WBLTR	9.2	A	0.03	0.7
	NBLTR	2.0	A	0.01	0.2
	SBLTR	1.0	A	0.00	0.1
	<i>Overall</i>	<i>4.3</i>	<i>A</i>	<i>-</i>	<i>-</i>



Table 5: PM Peak Hour Intersections Level of Service Summary

Intersection	Movement	Delay (sec)	LOS	v/c	95th Percentile Queue (m)
Concession Road 3 & Highway 35/115 Underpass West	EBLT	7.3	A	0.07	1.7
	WBTR	0.0	A	0.13	0.0
	SBLR	9.9	A	0.09	2.2
	<i>Overall</i>	<i>3.7</i>	<i>A</i>	<i>-</i>	<i>-</i>
Concession Road 3 & Highway 35/115 Underpass East / North Street	EBLTR	8.7	A	0.15	0.5
	WBLTR	8.7	A	0.08	0.2
	NBLTR	9.9	A	0.31	1.3
	SBLTR	9.9	A	0.34	1.5
	<i>Overall</i>	<i>9.6</i>	<i>A</i>	<i>-</i>	<i>-</i>
Concession Road 3 & Arthur Street	EBTR	0.0	A	0.05	0.0
	WBLT	1.6	A	0.01	0.1
	NBLR	9.1	A	0.05	1.2
	<i>Overall</i>	<i>2.7</i>	<i>A</i>	<i>-</i>	<i>-</i>
North Street / Manvers Road & Grady Drive / Monroe Street West	EBLTR	11.9	B	0.10	2.5
	WBLTR	9.7	A	0.01	0.3
	NBLTR	0.3	A	0.00	0.1
	SBLTR	0.5	A	0.01	0.2
	<i>Overall</i>	<i>2.2</i>	<i>A</i>	<i>-</i>	<i>-</i>
Arthur Street & Andrew Street	EBLTR	9.2	A	0.03	0.6
	WBLTR	9.4	A	0.02	0.5
	NBLTR	1.1	A	0.01	0.2
	SBLTR	1.2	A	0.01	0.1
	<i>Overall</i>	<i>3.0</i>	<i>A</i>	<i>-</i>	<i>-</i>

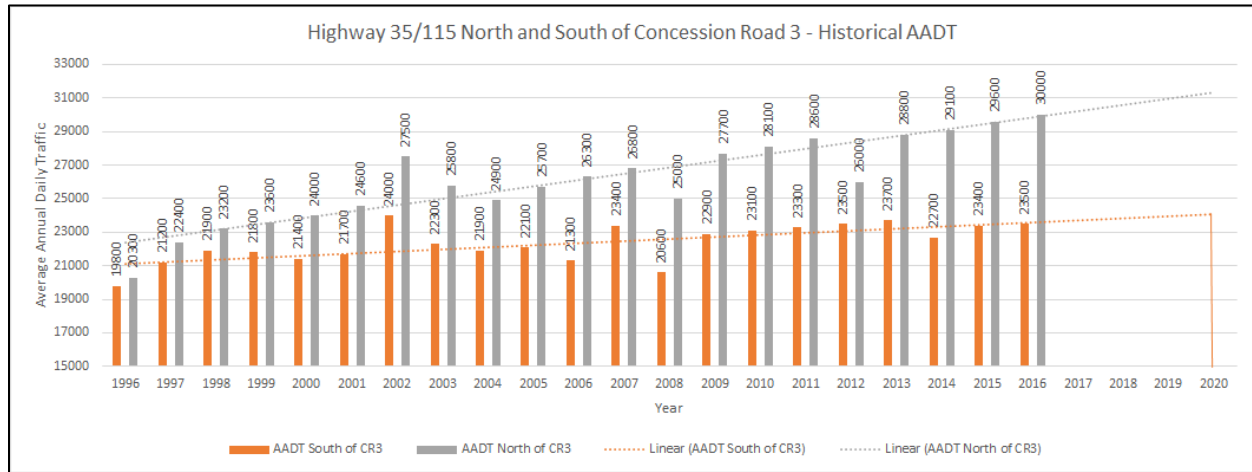
As noted, Highway 35/115 is a controlled access highway that runs north-south to the west of the NVSP Area with connections to Highway 407 and Highway 401 for Newcastle residents. Based on the historical MTO provincial highway traffic data presented in **Figure 17**, existing Average Annual Daily Traffic (AADT) volumes can be estimated at approximately 24,000 vehicles per day south of Concession Road 3 and just over 31,000 vehicles per day north of Concession Road 3. Steady growth in traffic was observed along this section of Highway 35/115 over the last five recorded years. However, with the recent completion of the Highway 407 Extension connecting to Highway 35/115 to the north, traffic growth on the corridor may change as Highway 407 alters traffic patterns in the area.

MTO classifies the traffic patterns on Highway 35/115 south of Concession Road 3 as Commuter Tourist Recreation (CTR). A review of MTO seasonal variation graphs for CTR traffic patterns indicates variation factors as low as 0.8 in January and as high as 1.3 in July. Thus, traffic on the highway could be as much as 60% higher during the summer months in comparison to the winter months.



North Village Secondary Plan Phase 3 - Transportation Report

Figure 17: Historical and Forecast AADT on Highway 35/115 at Concession Road 3



4 Policy Direction

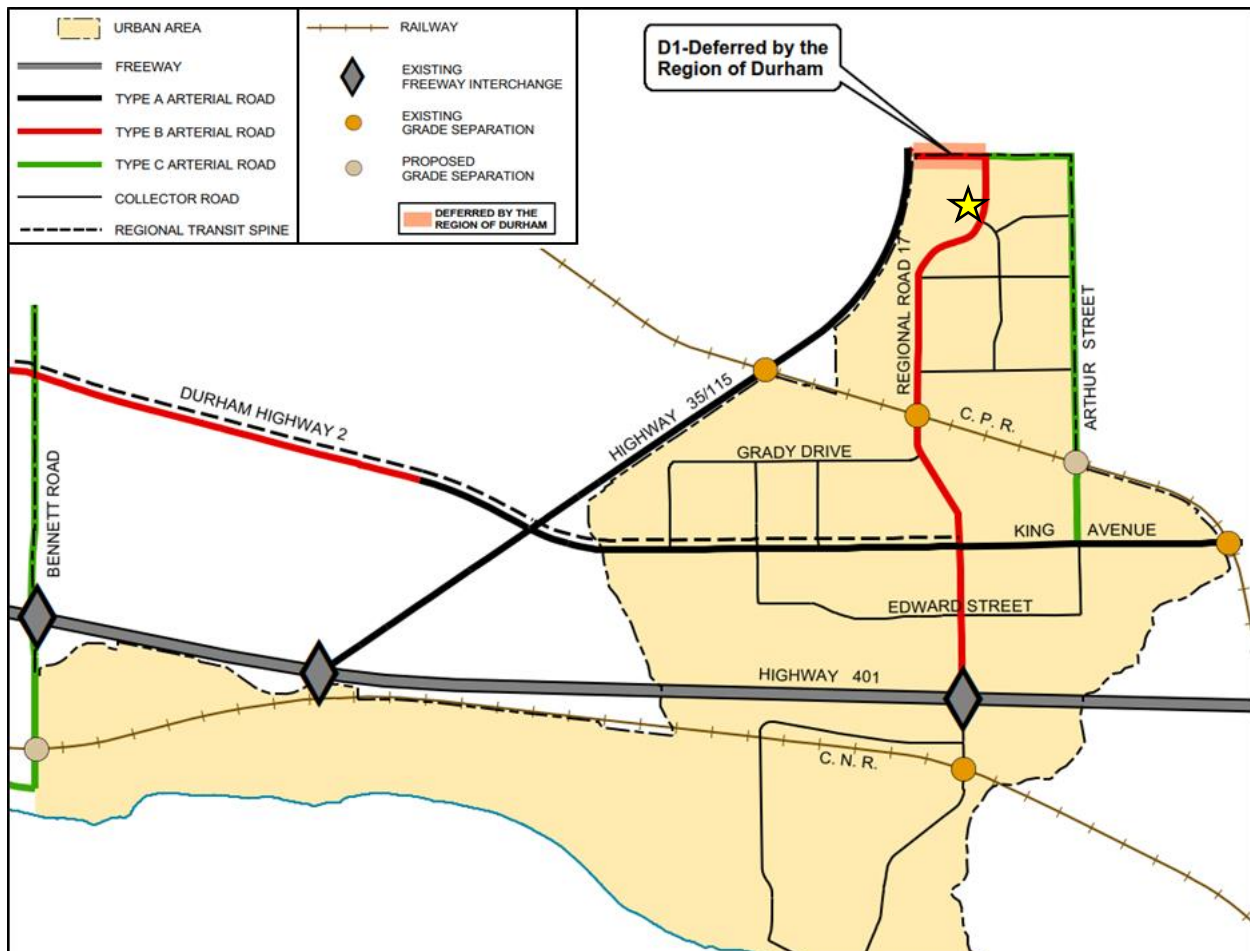
4.1 Municipality of Clarington

4.1.1 Official Plan (2018)

The Municipality of Clarington Official Plan (OP) provides a discussion on a number of transportation-related items in Section 19, Connected Transportation Systems. The goal of the Official Plan relating to connected transportation systems is to facilitate the movement of people and goods by means of an integrated, accessible, safe, and efficient transportation system, providing a full and practical range of mobility options. Particular to the Study Area, the OP notes how public transportation will be the responsibility of the Province and Region of Durham. Relating to active transportation, the Municipality will be responsible for updating and implementing all plans. Finally, the Municipality will encourage the future growth of Clarington, which can be accommodated through key freeway and arterial roadways, particularly the new Highway 418 directly west of the NVSP Area, and also having Regional Highway 2 as a main commercial goods corridor.

Figure 18 is an extract from the Official Plan illustrating the existing and planned road network in the vicinity of the NVSP Area.

Figure 18: Clarington Official Plan - Map J4 - Transportation Network





4.1.2 Transportation Master Plan (2016)

The Clarington Transportation Master Plan identifies several municipal and other road/highway additions. **Figure 19** is an extract from Clarington’s Transportation Master Plan (TMP) illustrating the existing and conceptual road network in the vicinity of the NVSP Study Area.

Figure 19: Clarington Transportation Master Plan - Future Recommended Improvements



4.1.3 Regional Road 17 Environmental Assessment (in partnership with Region of Durham)

The Newcastle North Village Neighbourhood Design Plan (2012) identified the need to realign Regional Road 17 (North Street) south of Concession Road 3. Also, the Region of Durham and MTO have identified transportation operation and safety issues with the Concession Road 3 intersection with existing Regional Road 17 (North Street). MTO has also requested the relocation of the Regional Road 17 / Concession Road 3 intersection farther to the east.

In 2021, Clarington retained BT Engineering to undertake an Environmental Assessment (EA) Study for the realignment of Regional Road 17 and related roadway changes to Concession Road 3. Given that Regional Road 17 is under the jurisdiction of the Region of Durham, the Region will be a key participant of the study and involved in decision-making and approvals of the key deliverables for the study.

The Environmental Assessment will follow the Class EA process, meeting requirements for Provincial Transportation Facilities (2000) (MTO) and Municipal Class Environmental Assessment (2000 as amended in 2007, 2011 and 2015). The Study is being conducted as a Harmonized MTO Group B/



Municipal Schedule C project based on the range of anticipated effects and capital cost. The consultation process will be integrated with the planning consultation events for the North Village Secondary Plan.

4.1.4 Active Transportation

Future active transportation policy is a combination of both regional and municipal initiatives. As the majority of infrastructure within the Study Area is without active transportation facilities, the following major works displayed in **Figure 20** are planned active transportation initiatives for the area:

- Primary cycling spine along North Street / Manvers Road / Mill Street (Regional Road 17) between Concession Road 3 and Edward Street;
- Primary cycling spine along King Avenue between Rudell Road and Arthur Street;
- Cycling lanes or shared route along Arthur Street between King Avenue East and Concession Road 3;
- Cycling lanes or shared route along Concession Road 3 west of Arthur Street; and
- Potential Regional trail connection generally along Fosters Creek to the west of Regional Road 17 in the study area. This would extend from Newcastle village in the south to beyond Orono in the north.

Figure 20: Clarington Transportation Master Plan - Future Recommended Active Transportation

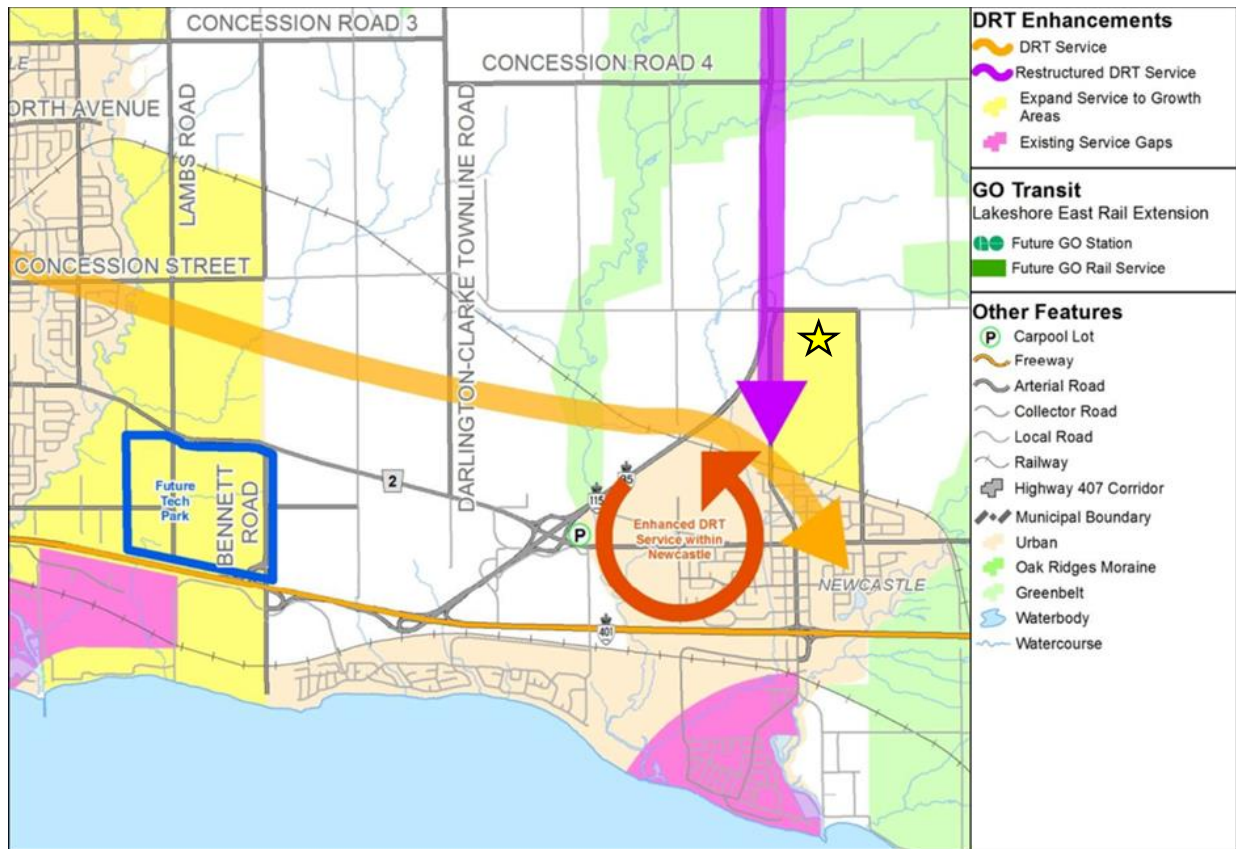




4.1.5 Transit

The Clarington TMP emphasizes transit as a major alternative mode of transportation and shares planned improvements meant to promote the use of transit within the region. **Figure 21** illustrates the high-level future improvements to transit in the area, including local and intra-regional DRT service, as well as GO Transit service.

Figure 21: Clarington Transportation Master Plan - Future Transit Plan



4.1.6 Clarington Budget (2020)

The Municipality of Clarington documents the annual financial plan as a broad overview of the operations, financial position, and capital and operating budgets of the Municipality. More specifically, the capital budget is a five-year forecast that focuses on infrastructure needs, timing and financing of future projects. Noted notable projects in the capital budget in the vicinity of the NVSP study area include:

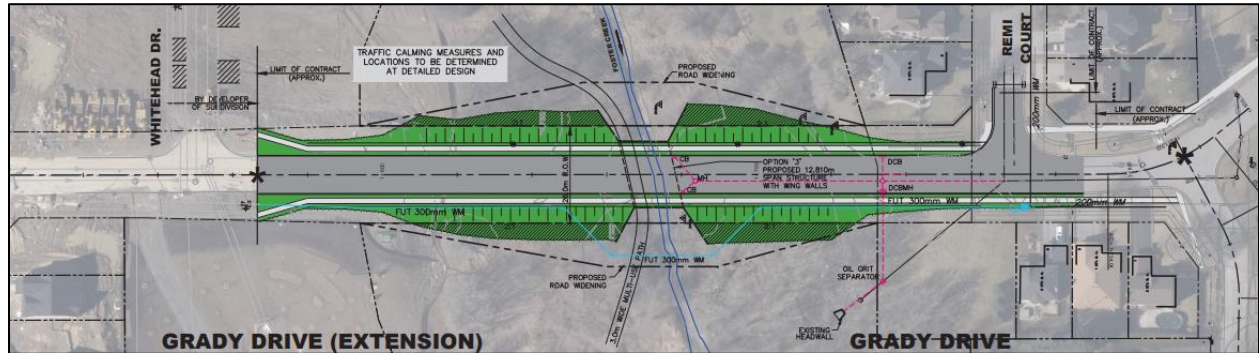
- Rudell Road construction (Grady Drive northerly to south of Highway 35/115) – the road will be built to an urban standard. The project is being advanced at this time to coordinate with the timing of development;
- Regional Road 17 (Mill Street to CPR) – construction of a sidewalk on the east side of Regional Rd 17 (Manvers Road) to service existing and future development and improve safety. This sidewalk will serve as a connection to future development in north Newcastle;
- Streetlighting along Regional Road 17 (North of CPR to Concession Road 3);



- Grady Drive (Foster Creek) will be extended to the west of Remi Court to make a connection between Ruddell Road and North Street, shown in **Figure 22**; and
- Arthur Street reconstruction (CPR level crossing north 1.13km).

It is noted that the above projects may change as the municipality reviews and updates the annual capital budget.

Figure 22: Grady Drive Extension (Source: Grady Drive Extension Over Foster Creek, Newcastle - Municipal Class EA Schedule 'B' report, December, 2019)



4.2 Region of Durham

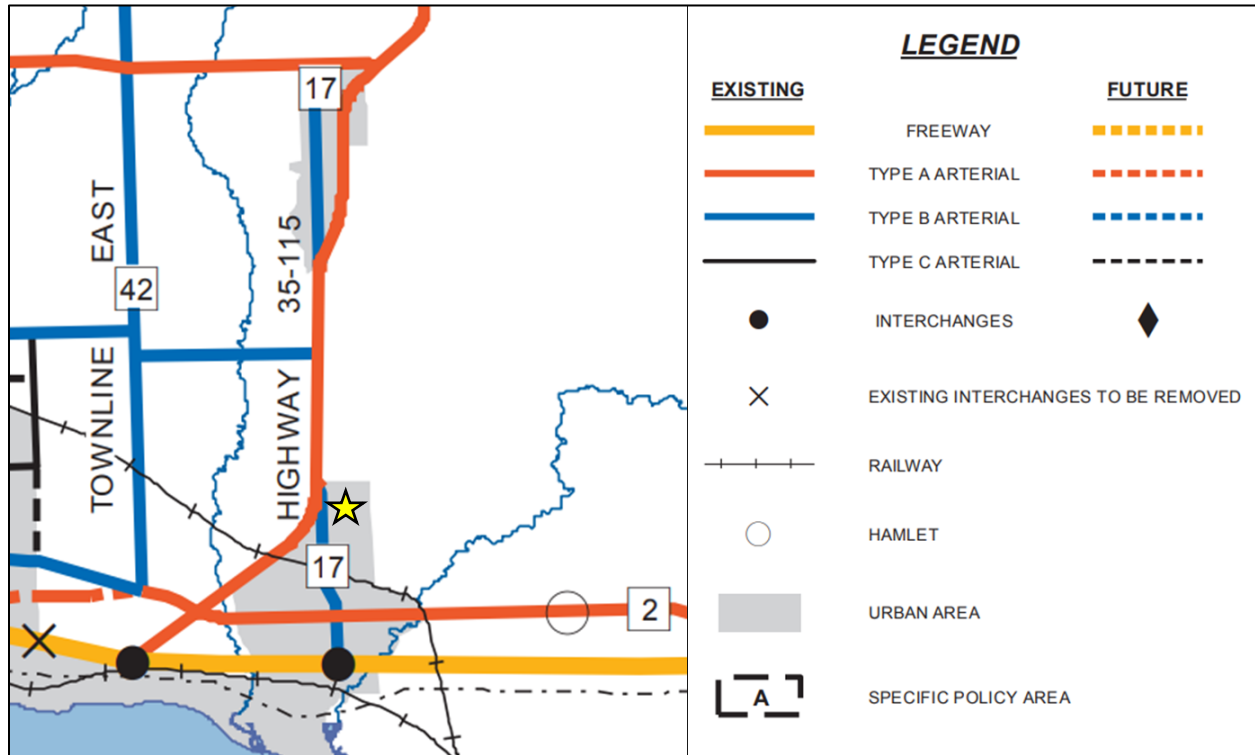
A number of documents were reviewed outlining the Region of Durham’s policies and transportation-related growth, specifically the Official Plan (OP) and Transportation Master Plan (TMP). The Region’s TMP contains detailed information pertaining to road infrastructure planning as well as active transportation or transit plan needs. The Region also recently published the Regional Cycling Plan (2021). The Region of Durham identifies seven directions as goals for the future transportation network within Durham:

- **Direction #1:** Strengthen the relationship between land use and transportation.
- **Direction #2:** Elevate the role of integrated public transit including Rapid Transit.
- **Direction #3:** Make walking and cycling more practical and attractive.
- **Direction #4:** Optimize road infrastructure and operation.
- **Direction #5:** Promote sustainable travel choices.
- **Direction #6:** Invest strategically in the transportation system.
- **Direction #7:** Improve goods movement to support economic development.

4.2.1 Regional Official Plan (1993; 2020 Office Consolidation)

The Region of Durham Official Plan, released for public review in February 2023, identifies a number of goals to guide its regional transportation system into the future. Most importantly, the OP identifies that safe and reliable mobility choices should be made available for all residents with respect to the natural, social, and cultural environments. The Region also notes the importance of the Provincial freeway system and the completion of the Highway 418 connection. **Figure 23** below is an extract from the current Durham Official Plan illustrating the existing and planned transportation network in the vicinity of the NVSP Area.

Figure 23: Durham Official Plan - Schedule C - Road Network



A key element of the proposed February 2023 draft Official Plan is that it depicts a proposed re-alignment of North Street/Regional Road 17 at its north terminus with Concession Road 3, such that it shows increased spacing from the Regional Road 17/Concession Road 3 intersection to Highway 35/115.

4.2.2 Transportation Master Plan (2017)

The Durham Region TMP identifies one significant network improvement by 2031. Regional Road 17 is the focus of two regional initiatives along the portion of roadway from the CP Rail crossing north to Concession Road 3. This portion of Regional Road 17 will be realigned to connect to Concession Road 3 further east and widened to three lanes.

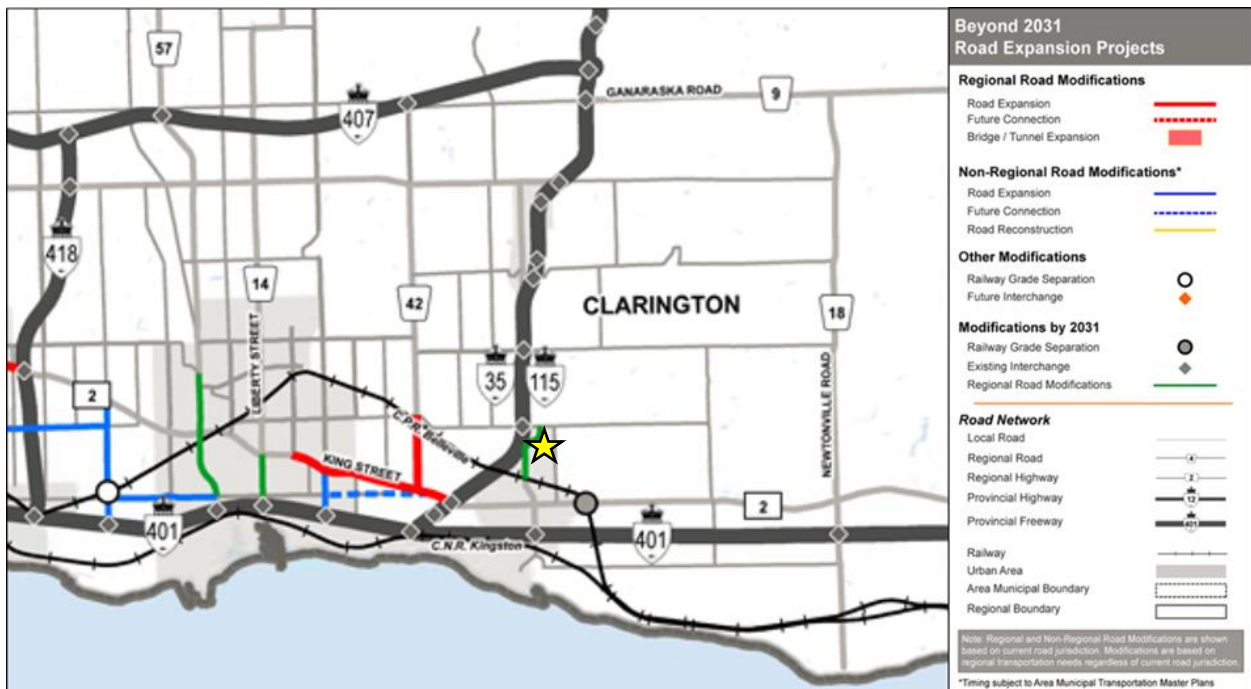
The realignment has been a topic of discussion with MTO due to concerns over the planned intersection spacing on Concession Road 3 between Regional Road 17 and Highway 35/115. MTO's current position is to request intersection spacing of 800 metres between highway and municipal intersections. However, a discussion dated April 10, 2008 saw MTO's approval of a 360-metre spacing (generally between Highway 35/115 and Regional Road 17), accepting the currently proposed intersection location. The relocation design is being coordinated with MTO through an ongoing Regional Road 17 Realignment Environmental Assessment.

Figure 24 and **Figure 25** are extracts from the Durham Transportation Master Plan illustrating the existing and planned transportation network for 2031 and beyond 2031, respectively, in the vicinity of the NVSP Study Area.

Figure 24: Durham Transportation Master Plan - Future Proposed Road Network 2031



Figure 25: Durham Transportation Master Plan - Future Proposed Road Network Beyond 2031



4.2.3 Active Transportation

Active transportation modes are recognized in the Durham Region Official Plan, the Transportation Master Plan and the Regional Cycling Plan as providing significant benefits above and beyond the immediate relief to congestion. These benefits include health, air quality, better spaces and increased public safety amongst others. The TMP identifies a desire for active transportation to see an increase in



mode share over the years and recognizes that measures will be required that support objective number three: **Direction #3:** Make walking and cycling more practical and attractive. The TMP identifies the following actions as important in supporting Direction 3:

- Integrate the Primary Cycling Network (PCN) of the 2012 Regional Cycling Plan (RCP), the Regional Trail Network and the Greenbelt Cycling Route into the TMP.
- Prioritize continuous routes within the PCN by identifying Short-Term Cycling Routes (Maps 3a and 3b) to be implemented within 10 years.
- Consider stand-alone infill projects to complete critical links in the Short-Term Cycling Routes in the Region’s annual Regional Road Program Capital Budget and Nine-Year Forecast process.
- Support planning and design for walking and cycling through the development review process and implementation of design and policy documents.
- Provide enhanced active transportation promotion and improved route mapping.

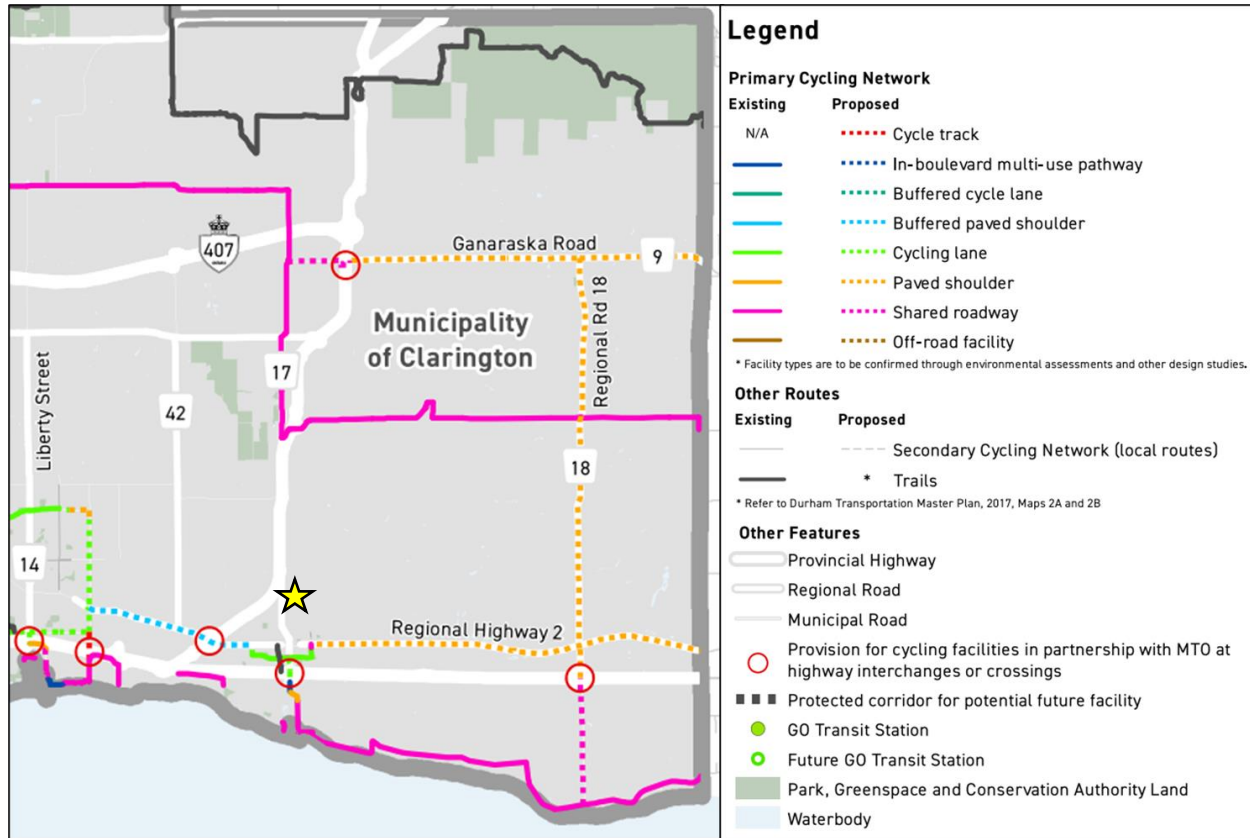
Outlined in **Figure 26** is an extract from Durham’s Transportation Master Plan illustrating the existing and planned active transportation network in the vicinity of the NVSP Study Area.

Figure 26: Durham Transportation Master Plan - Active Transportation Network



The Region’s Regional Cycling Plan was updated in October 2021 reflecting a number of changes. The proposed Primary Cycling Network (PCN) did not see any changes for the Newcastle area; however, new cycling routes include Concession Road 7 / Ganaraska Road from Best Road to the Durham / Northumberland boundary, Newtonville Road (Regional Road 18) from Regional Highway 2 to Ganaraska Road, and the Waterfront Trail, previously included as the Regional Trail Network in the Durham TM). An extract of Map 1 – Primary Cycling Network by Facility Type is shown in **Figure 27**.

Figure 27: Durham Regional Cycling Plan - Primary Cycling Network



4.2.4 Transit

Promoting transit as an alternative travel mode via Durham Region Transit (DRT) is one of the key goals for the Region. A number of documents guide transit growth throughout the Region; the TMP, 2010 Long Term Transit Strategy (LTTS) and the DRT Five Year Service Strategy. As identified in the Durham TMP, Highway 2 is a key corridor considered for high-frequency bus service. Dedicated lanes are already provided in Pickering and Ajax within the Region. Further to that and subject to both funding commitments and approvals, Durham Region plans to implement dedicated bus lanes extending from Altona Road in Pickering through to downtown Oshawa. Construction timing for the elements closest to Clarington at the eastern limits in Oshawa are still to be determined.

Figure 28 displays the Durham TMP future proposed transit.



Figure 28: Durham Transportation Master Plan - Future Proposed Transit Network

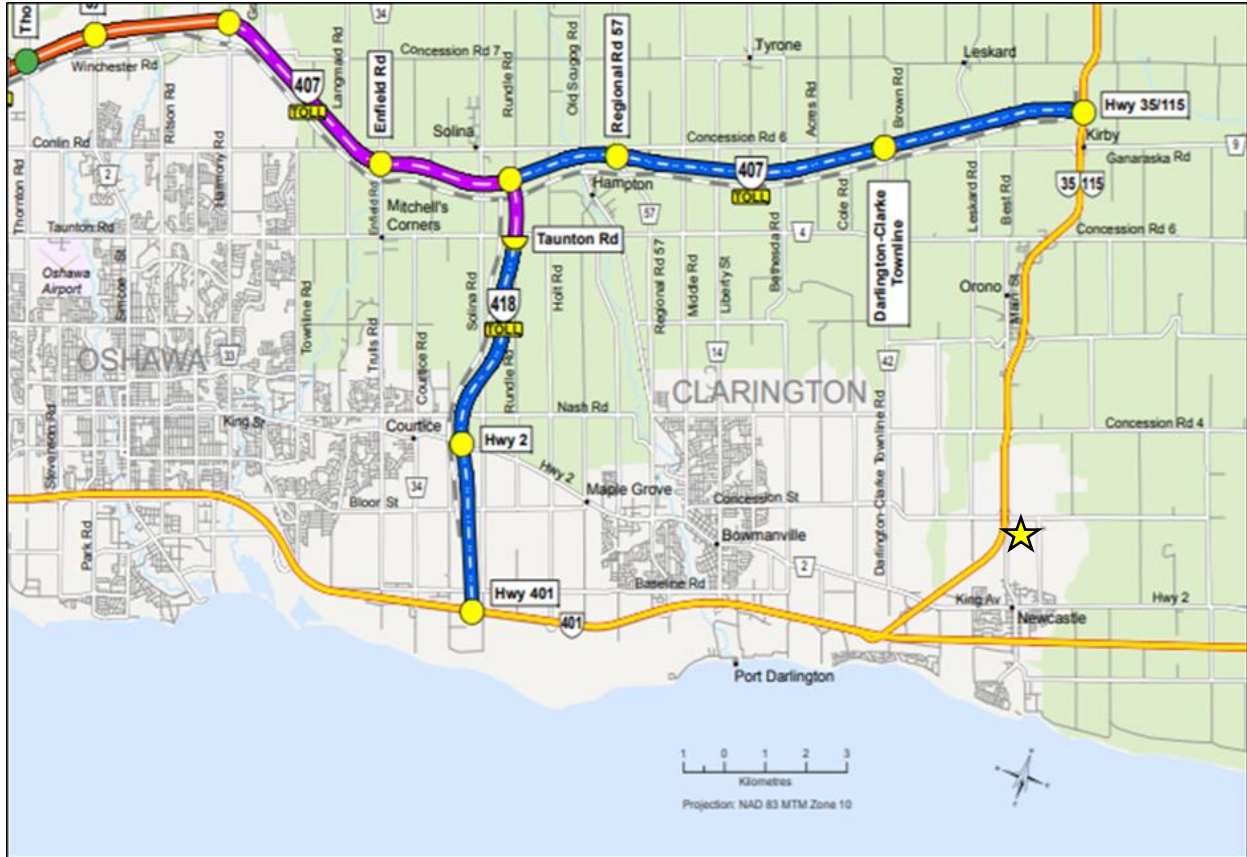


4.3 Province of Ontario

4.3.1 Ministry of Transportation (MTO)

The MTO has minimal improvements planned to their infrastructure that would affect the NVSP Area or the immediate area. The Highway 407 Phase 2B construction has been completed and provides a link to Highway 35/115. This recent improvement is north of the Study Area; however, the improvement may have minor impacts to traffic volumes on Highway 35/115 in the vicinity of the subject site. The only other short-term improvement as per the Southern Highways Program is the 2.95 km resurfacing of Highway 35/115 from the Main Street (Durham Road 17) junction near Orono to Newcastle within the 2019-2021 time period. **Figure 29** presents the network of MTO highway network in the vicinity of the NVSP Study Area.

Figure 29: MTO Highway Network



4.3.2 Active Transportation

The MTO has developed its Province-wide Cycling Network alongside the Province’s Cycling Strategy. There are a number of provincial facilities within the Municipality; however, they are located to the south of Highway 401 and to the north along Concession Road 6 and are situated well outside of the NVSP Area.

4.3.3 Metrolinx

As part of the Metrolinx 2041 Regional Transportation Plan (RTP), there is a proposed GO Lakeshore East Rail Extension. This also includes several GO stations:

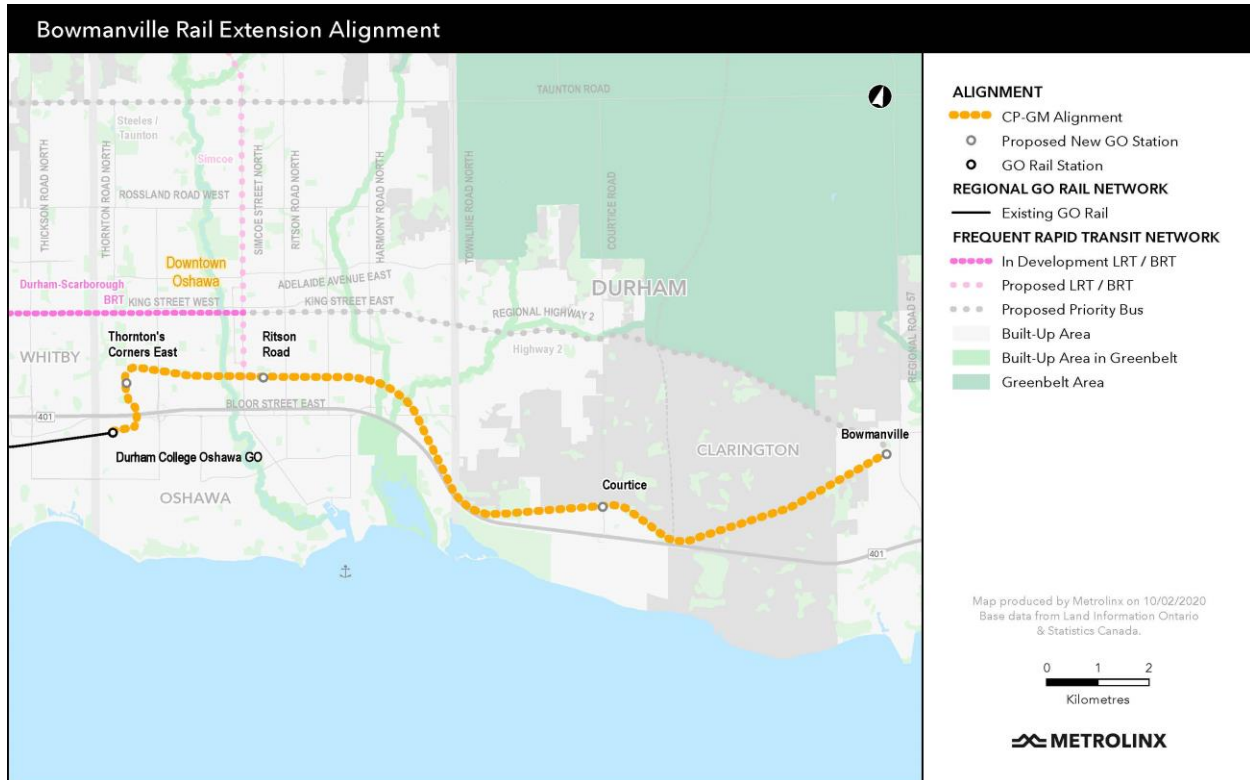
- Thornton Road, Oshawa
- Ritson Road, Oshawa
- Courtice Road, Courtice, Clarington
- Bowmanville Avenue, Bowmanville, Clarington

Although Newcastle is not subject to a new proposed GO Station, GO Transit will be relevant to Newcastle commuters, and will integrate with enhanced Durham Region Transit service to connect Newcastle and Bowmanville. **Figure 30** illustrates the proposed GO stations along the Lakeshore East GO Line extension as proposed in the February 20, 2020 Initial Business Case Update: Bowmanville Rail



Service Extension by Metrolinx. In Spring 2022, Metrolinx started the procurement process to find a design and construction partner for the required rail infrastructure for the Bowmanville Extension project. Near the end of the design stage, the contractor will provide an estimated construction schedule for the proposed work.

Figure 30: Metrolinx Future GO Train Stations





5 Opportunities and Constraints

5.1 Opportunities

The planning for the transportation network within the NVSP Area should provide for a robust, connected and flexible network that serves the mobility and accessibility of all road users (motorists, transit, cyclists, and pedestrians). Key planning opportunities and considerations in developing a transportation network to serve the NVSP Area include:

- Build upon the previously contemplated and planned road network elements identified in both Clarington's and Durham's Official Plans and Transportation Master Plans.
- Promote spine road capacity improvements along the existing grid system arterial road network.
- Promote Arterial connections to existing and planned freeway infrastructure.
- Extend Collector roads from existing adjacent planned/developed areas into the NVSP Project Area to create continuous Collector roads that integrate and connect communities.
- Plan Collector road alignments to respect the topography of the NVSP Area and capitalize on view and window corridors adjacent to natural heritage lands or features, where appropriate.
- Create a Collector road network that creates appropriate block sizes that allow for high transit coverage with most residences/jobs within a reasonable walking distance.
- Layout communities to promote walking and cycling in lieu of vehicular movements.
- Plan cycling facilities that reflect the utilitarian versus recreational nature of different cyclists, as well as the variability in cycling skills.
- With development of the North Village Secondary Plan Area, the opportunity exists to realign Regional Road 17 farther east in order to improve operations and safety conditions between Regional Road 17 and Highway 35/115. As noted, Clarington has initiated an Environmental Assessment Study for the realignment of Regional Road 17 and related roadway changes to Concession Road 3.
- An opportunity exists to reinforce Arthur Street as a future north-south corridor from Highway 2 to Concession Road 3 for automobile traffic, transit and active transportation.
- A potential trail proceeding north from Newcastle is identified within **Figure 26**. To accommodate a Northern Trail Route without the addition of grade-separated crossing of Highway 35/115, an alignment along Regional Road 17 can be considered.
- An opportunity for an active transportation connection between NVSP and Newcastle Carpool lot and cycling spine.
- With the anticipated Grady Drive bridge connection to the west of the Study Area, an opportunity will exist to revisit operations at the North Street / Manvers Road & Grady Drive / Monroe Street West intersection and identify the need for auxiliary lanes and signalization.



5.2 Constraints

The planning for the NVSP Area should also acknowledge and consider a variety of area constraints that impact the planning of the area transportation network. Key considerations in the NVSP overall area include:

- Noise attenuation measures for Highway 35/115 traffic could pose a constraint on residential and other noise sensitive land uses adjacent to the highway, potentially requiring the provision of a berm or berm/barrier combination, or other noise mitigation measures. If only a noise barrier is required, it could still constrain the flexibility to orient lots and provide outdoor amenity areas that comply with Ministry of Environment, Conservation, and Parks guidelines (NPC-300).
- Maintain acceptable intersection spacing along arterial and collector roads.
- Avoid cultural and built heritage resources, where possible.

5.3 Summary

The review of the existing transportation conditions within the North Village Secondary Plan Broader Study Area reveals a well operating network with significant potential. The existing road and active transportation networks provide an effective system of connections on which additional growth could be accommodated through new connections and improvements. Many opportunities and considerations were identified to facilitate the growth expected within the region and allow North Village to fit into the Broader Study Area.



6 Alternative Land Use Plans

6.1 Concept Development Considerations

The following vision and guiding principles were developed by SVN and form the core tenets for the land use development concepts for the NVSP area.

A LIVEABLE NEIGHBOURHOOD

- Provide a mix of housing options that are available to a wide range of ages, abilities, incomes, and household sizes.
- Provide an appropriate mix of uses, amenities, and services at the heart of the neighbourhood to encourage active, sociable lives and support a sense of well-being and connection.
- Provide a range of community facilities and co-locate these facilities where possible.

A CONNECTED NEIGHBOURHOOD

- Prioritize pedestrian mobility and comfort by designing a neighbourhood that is well connected internally and provides safe and walkable links to surrounding neighbourhoods.
- Design the movement network to safely and comfortably accommodate all modes of travel (pedestrians, cyclists, transit vehicles, loading and private vehicles).

A BEAUTIFUL AND INVITING NEIGHBOURHOOD

- Design a variety of open spaces linked by a beautiful and functional public realm.
- Encourage a high standard of design.
- Utilize the existing topography to optimize views of the surrounding areas.

A RESILIENT NEIGHBOURHOOD

- Minimize contribution to climate change by incorporating green design principles related to energy, water, and waste at the building and neighbourhood scale.
- Where economically feasible, utilize materials from sustainable sources for construction and infrastructure projects, account for positive and negative life-cycle impacts of materials when assessing their contribution.
- Integrate indigenous and pollinator-friendly species into the development.
- Support resilience and future adaptability by designing homes and buildings to accommodate different uses and densities with diverse unit configurations.

A UNIQUE NEWCASTLE NEIGHBOURHOOD

- Foster a unique identity by celebrating the rural heritage of the area.
- Engage the Newcastle community in planning the future of North Village.



From a transportation perspective, in order to accommodate the new development and help meet these planning tenets, robust transportation service is to be provided and would need to address the following general problem and opportunity statement:

- Strategically located along a provincial freeway and two regional corridors, the Study Area is positioned to absorb a significant portion of the projected growth in the Newcastle area.
- A combination of corridor improvements and new roads will be required to support the development of the NVSP study area.
- Streets with a range of transportation options, including public transit and active transportation to accommodate all users of all abilities, will be a priority in addressing the policy focus of moving towards a low carbon environment.
- Cycling facilities and active transportation additions are desired for active transportation to see an increase in mode share over the years, by making walking and cycling more practical and attractive.

A variety of alternative area plans based on the above land use planning tenets and the problem and opportunity statement, such as road-based solutions, new or improved transit service, active transportation provisions (walking and cycling), and land development strategies and policies were considered in the development of alternative methods to address the problem/opportunity statement.

It was determined by the team that a comprehensive transportation service for the NVSP area must be multi-modal and consider both transit and active transportation opportunities (for pedestrians and cyclists). It was recognized that while transit-based solutions and active transportation facilities will not solely address the future mobility and access needs for the NVSP development area, they are important transportation services to complement road network-based solutions and are also sustainable transportation solutions to achieve reduced environmental impacts in the area.

The area land use planning and layout of the road network for the NVSP area were also developed with consideration for the existing policy and planning in terms of already planned or proposed improvements or new roads.

The framework for the development and review of these land use and road network concepts was based on a detailed inventory of the environment (natural, social, economic, cultural and transportation / engineering) in a variety of Phase 1 supporting studies for this NVSP. These include studies pertaining to the following:

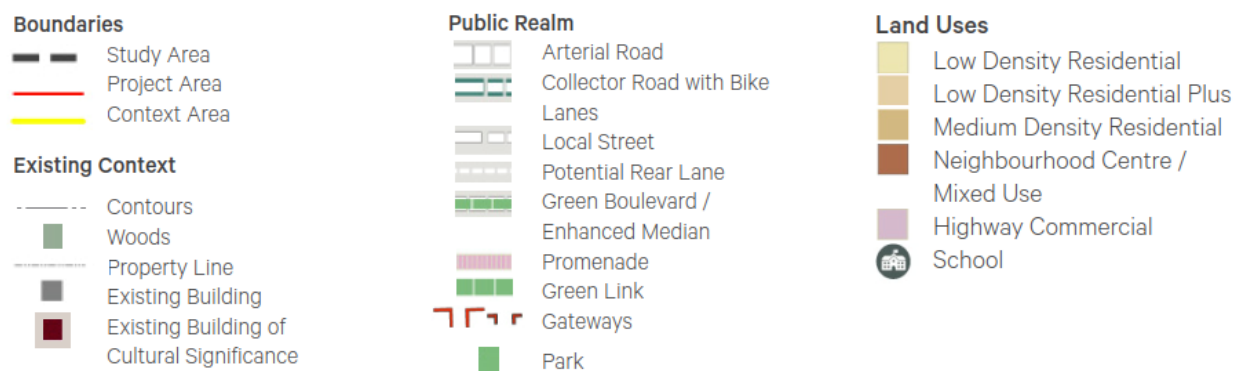
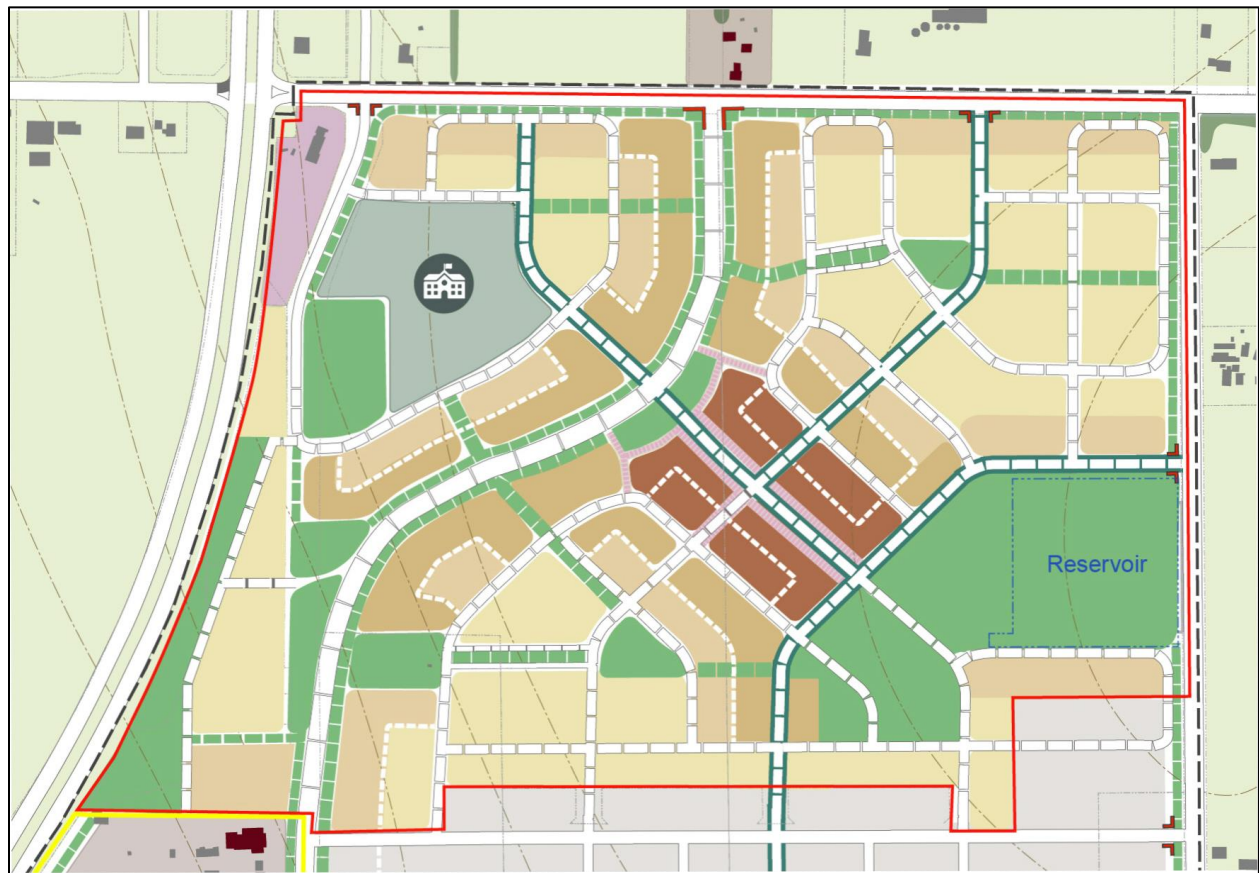
- Agricultural Impact Assessment
- Archeological Assessment Report
- Cultural Heritage and Landscape Screening Report
- Natural Environment Report
- Planning Report
- Servicing Report
- Sustainability Report
- Transportation Report

After confirming the need for a balanced transportation plan (incorporating new roads, active transportation, transit servicing, and balanced planning policies promoting an environmentally sustainable development plan), three land use plans and road networks were developed based on varying levels of development yield, preserving environmental features, and creating a community focus (creation of landmark nodes and elements).

The following is a summary of the three land use concepts:

- Alternative 1 - Green Corridors + Community Courtyards:** Alternative 1 is defined by key green corridors through the neighbourhood, including Regional Road 17 and Street A, which create a welcoming and comfortable environment for all road users. These corridors link to destinations that integrate the neighbourhood with the approved area to the south. The plan is also defined by a distributed network of smaller open spaces that function as local gathering spaces, or courtyards, framed by surrounding development.

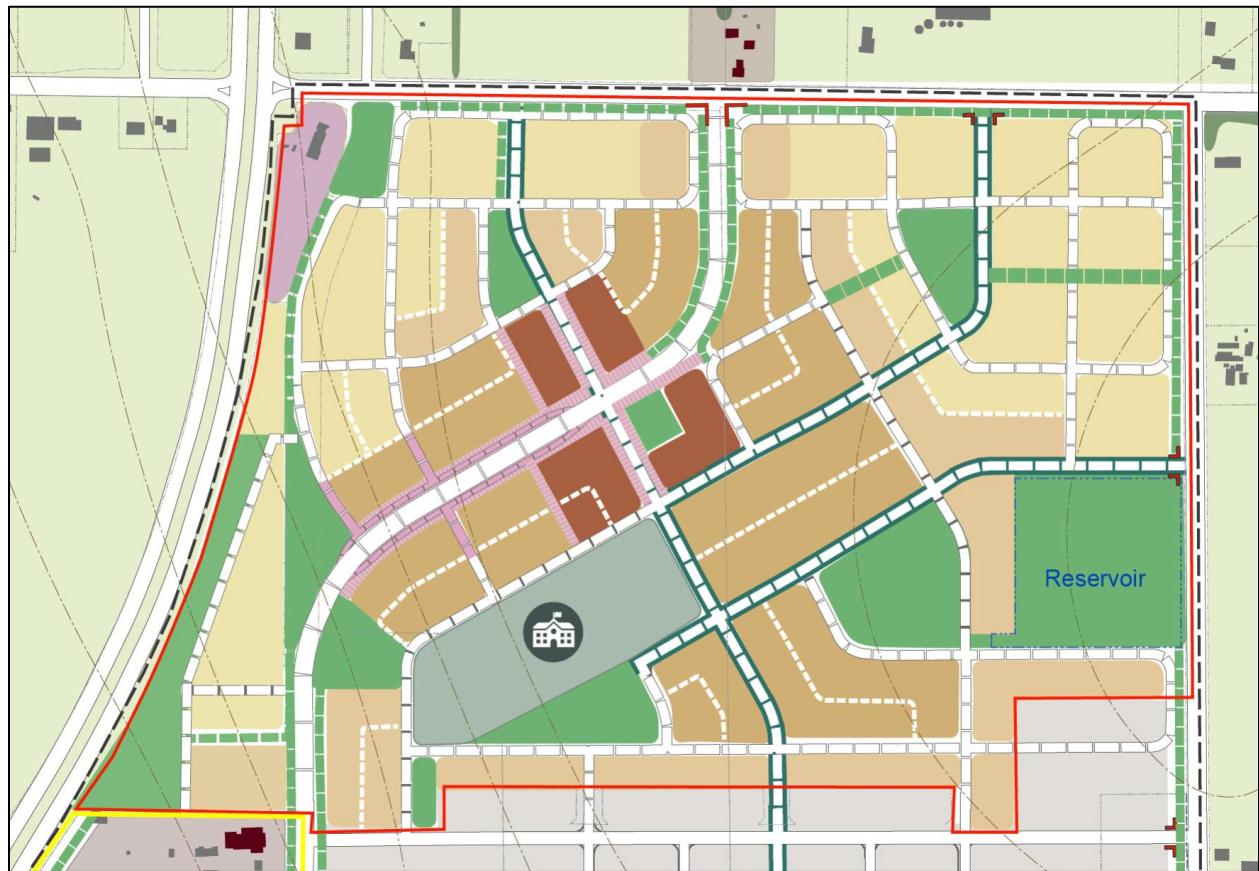
Figure 31: Land Use Plan Alternative 1





- Alternative 2 - Four Corners + Green Corridors:** Land Use Alternative 2 uses a central hub and green corridors as its organizing elements and locations of greater activity and density. Importantly, Regional Road 17 is animated by creating a pedestrian-focused area around the four corners of the neighbourhood centre, which helps to enliven and urbanize the street.

Figure 32: Land Use Plan Alternative 2

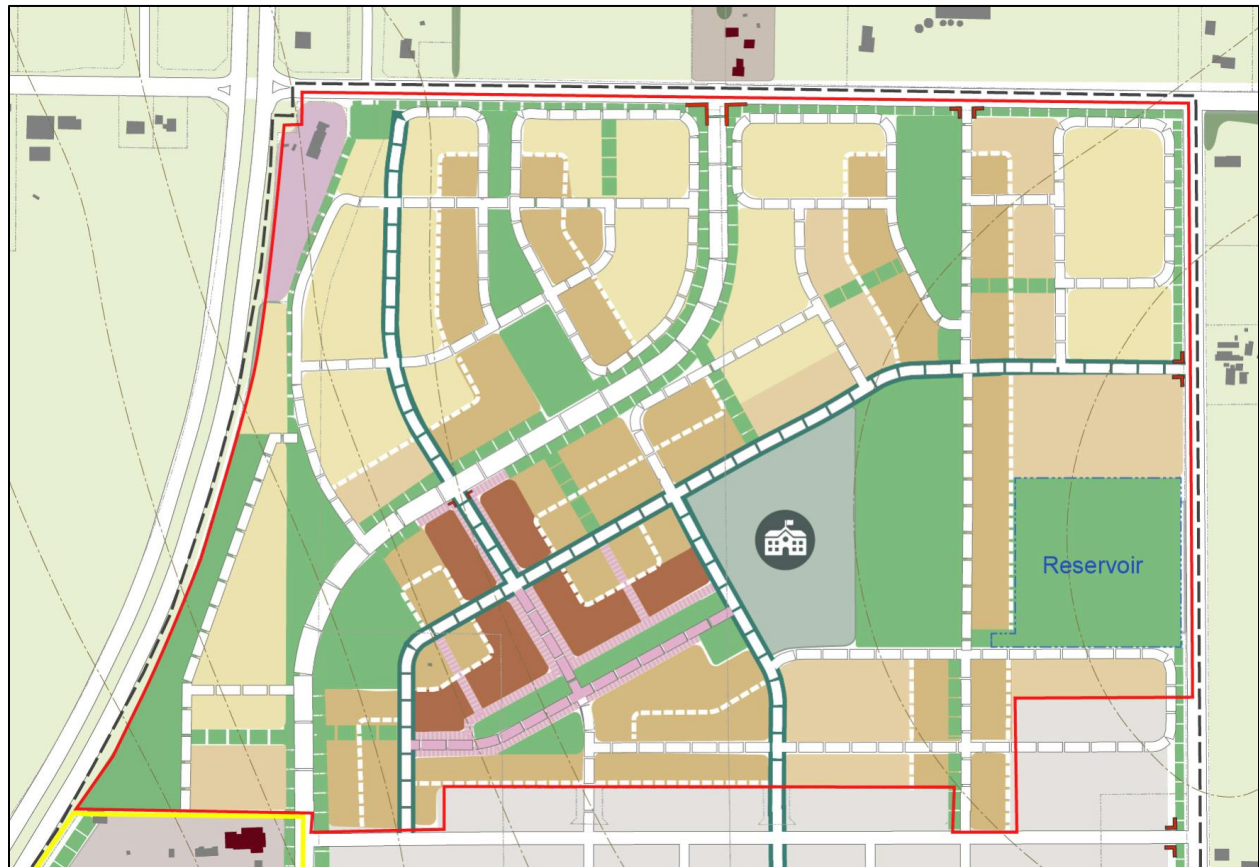


<p>Boundaries</p> <ul style="list-style-type: none"> Study Area Project Area Context Area <p>Existing Context</p> <ul style="list-style-type: none"> Contours Woods Property Line Existing Building Existing Building of Cultural Significance 	<p>Public Realm</p> <ul style="list-style-type: none"> Arterial Road Collector Road with Bike Lanes Local Street Potential Rear Lane Green Boulevard / Enhanced Median Promenade Green Link Gateways Park 	<p>Land Uses</p> <ul style="list-style-type: none"> Low Density Residential Low Density Residential Plus Medium Density Residential Neighbourhood Centre / Mixed Use Highway Commercial School
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- Alternative 3 - Neighbourhood Centre + Promenade:** Alternative 3 provides a central hub of activity and density, organized around the neighbourhood centre and a linear promenade and park that are the focal point for community life. These are complemented by several distinct nodes for activity and interconnected linear parks, or “green fingers.”

Figure 33: Land Use Plan Alternative 3



<p>Boundaries</p> <ul style="list-style-type: none"> Study Area Project Area Context Area <p>Existing Context</p> <ul style="list-style-type: none"> Contours Woods Property Line Existing Building Existing Building of Cultural Significance 	<p>Public Realm</p> <ul style="list-style-type: none"> Arterial Road Collector Road with Bike Lanes Local Street Potential Rear Lane Green Boulevard / Enhanced Median Promenade Green Link Gateways Park 	<p>Land Uses</p> <ul style="list-style-type: none"> Low Density Residential Low Density Residential Plus Medium Density Residential Neighbourhood Centre / Mixed Use Highway Commercial S School
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6.2 Evaluation Criteria of Alternative Land Use Plans

The alternative community plans and road networks for the NVSP area were reviewed by the project team in order to ultimately identify the optimal community and road structure plan that balances and achieves Clarington's and the area stakeholders' goals. The following factors were considered by the overall project team.

Livable

- Minimum residential densities
- Provide a variety of housing types
- Complete community
- Mitigate potential conflicts with agricultural operations
- Affordable housing

Connected

- Walkability
- Maximize the number of pedestrian connections to arterial roads
- Provide a variety of route options
- Provide a connected cycling network

Beautiful

- Maintain views and vistas of visible landmarks, including Natural Heritage System features, where possible
- Building frontages oriented to the street
- Distribute parks throughout the Plan Area for accessibility to residents
- Provide an adequate amount of parkland and open space

Unique

- Neighbourhood Centres are "gathering places" and shall incorporate public squares. Public squares will have the right of public access and will be designed as a high quality and interactive urban environment
- Visual connections to destinations and amenities

Resilient

- Promote the integration of transit and active transportation modes
- Use of green infrastructure, lot level controls, and Low Impact Development techniques
- Promote ecological diversity and limit the urban heat island effect through tree plantings
- Maximize passive solar energy opportunities

Additional information pertaining to the derivation and description of the above evaluation framework and criteria is contained in the NVSP Land Use Alternatives Summary Report prepared by SVN for this study.



6.3 Transportation Evaluation

From a transportation perspective, the three land use plans have some similarities as well as some discerning and differentiating attributes.

A summary of key similarities that form the basis of all alternatives is:

- Curvilinear realignment of Regional Road 17 to provide increased spacing of the Regional Road 17 / Concession Road 3 intersection to the Highway 35 / 115 on- and off-ramps.
- New Collector roads within the NVSP Project Area that extend and connect to adjacent planned / developed areas in order to provide for integrated and connected communities.
- The Regional Road 17 re-alignment and the new Collector roads are configured to accommodate future transit service.
- New Collector roads include dedicated bicycle facilities.
- All new roads include dedicate walking facilities.

Despite the above similarities, there are several attributes of the plans that differ including a variety of pros and cons associated with each alternative.

Alternative 1 - Green Corridors + Community Courtyards:

- **Pro:**
 - Provides a broad spine network of collector roads. The configuration of this network can accommodate all modes of traffic mobility, including autos, cyclists and pedestrians, and potential future transit service.
 - The collector road network layout provides several intersections with the adjacent arterial roads, namely Regional Road 17, Concession Road 3, and Arthur Street. Specifically, there are three new collector road intersections, one each on Regional Road 17, Concession Road 3, and Arthur Street.
- **Pro/Con:**
 - The collector road intersections along Concession Road 3 and Arthur Street are reasonably spaced to be mid-block, and optimize the spacing and block length. However, the new collector street intersection along Regional Road 17 is not mid-distance along Regional Road 17 and is also located in proximity to the curved alignment of Regional Road 17 (just south of Concession Road 3) which is less desirable for operations and safety.
- **Con:**
 - Retains an existing street connection at the existing Concession Road 3 underpass intersection in proximity to Highway 35/115. This is less desirable since it does not optimize the opportunity to increase the spacing adjacent to Highway 35/115 nor significantly improve the safety and operations at the on- and off-ramps.
 - Although the alternative provides a number of potential local street connections to the planned and approved lands directly south of the NVSP, there is only one collector road connection to the approved lands, which is less desirable.



Alternative 2 - Four Corners + Green Corridors

- **Pro:**
 - Removes the existing street connection at the existing Concession Road 3 underpass intersection in proximity to Highway 35/115, which improves safety and operations at the on- and off-ramps.
 - Similar to Alternative 1, this Alternative provides a broad spine network of collector roads. The configuration of this network can accommodate all modes of traffic mobility, including autos, cyclists and pedestrians, and potential future transit service.
 - Similar to Alternative 1, the collector road network layout provides several intersections with the adjacent arterial roads, specifically one each on Regional Road 17, Concession Road 3, and Arthur Street.
- **Pro/Con:**
 - Similar to Alternative 1, the collector road intersections along Concession Road 3 and Arthur Street are reasonably spaced to be mid-block, and optimize the spacing and block length. However, the new collector street intersection along Regional Road 17 is not mid-distance along Regional Road 17 which is less desirable for operations and block permeability.
- **Con:**
 - Similar to Alternative 1, although the alternative provides a number of potential local street connections to the planned and approved lands directly south of the NVSP, there is only one collector road connection to the approved lands, which is less desirable.
 - The mixed-use Neighbourhood Centre is located around the intersection of the Collector Road and Regional Road 17 which causes some transportation concerns regarding on-street parking and access demands which may result in traffic operational impacts at the intersection.

Alternative 3 - Neighbourhood Centre + Promenade:

- **Pro:**
 - Removes the existing street connection at the existing Concession Road 3 underpass intersection in proximity to Highway 35/115, which improves safety and operations at the on- and off-ramps.
 - Similar to Alternatives 1 and 2, the collector road network layout provides several intersections with the adjacent arterial roads, specifically one each on Regional Road 17, Concession Road 3, and Arthur Street.
 - The collector road intersections along Regional Road 17 and Concession Road 3 are reasonably spaced to be mid-block, and optimize the spacing and block length. However, the new collector street intersection along Arthur Street is not mid-distance which is less desirable for operations and block permeability. Given that Regional Road 17 is a higher priority corridor (that is, it is a Type B Arterial, whereas Arthur Street is a lower classification Type C Arterial), Alternative 3 has the preferred collector road intersection spacing along arterial roads in comparison to Alternatives 1 and 2.



– Alternative 3 provides a number of potential local street connections to the planned and approved lands directly south of the NVSP, including two collector road connections to the approved lands, which is most desirable.

- **Pro/Con:**

- Similar to Alternatives 1 and 2, this Alternative provides a broad spine network of collector roads. The configuration of this network can accommodate all modes of traffic mobility, including autos, cyclists and pedestrians, and potential future transit service. However, the north-south collector road is discontinuous and requires turning at two adjacent intersections in order to achieve continuous north-south mobility.

Further to the general summary noted above, the alternatives were also considered within a broad multi-factor evaluation using the technical criteria developed by SVN. The following summary lists the above transportation based evaluation criteria that were considered and evaluated by AECOM:

Connected

- Walkability (1): Percentage of residential dwellings within 200 metres to a minimum of three amenities (parks, trails, schools, neighbourhood centre; including those in the approved area). Alternative 2 puts neighbourhood amenities within the shortest walking distance of the most people.
- Walkability (2): Meets an average maximum block length of 250m or less. All of the Alternatives meet the minimum standard of 250 m for a walkable block. Alternative 2 has the shortest average block length and therefore performs slightly better.
- Maximize the number of pedestrian connections to arterial roads: Number of through-streets and / or non-motorized rights-of-way (trails) intersecting or terminating at arterial roads, providing permeability into the plan area. All of the Alternatives have a similar number of connections to arterial roads, spaced roughly equally apart. Alternative 2 has slightly more than Alternative 1 or 3.
- Provide a variety of route options: Meets or exceeds a minimum intersection density of 0.5 intersections / hectare. This indicator is measuring the intersection density of local, collector, and arterial roads and does not include private lanes or mid-block connections. Alternative 3 has the highest intersection density, providing the greatest amount of connectivity and variety of travel options.
- Provide a connected cycling network: Percentage of residential dwellings within 200 metres of cycling routes that connect to the larger network. All of the Alternatives perform well on this indicator, with all homes being within 200 metres of connected cycling routes.

Beautiful

- Distribute parks throughout the Plan Area for accessibility to residents: Meets or exceeds a standard of 80% of dwellings within 200 metres of a park. All of the Alternatives perform very well on this indicator, which demonstrates that all of the Alternatives have a good distribution of parks.

Unique

- Neighbourhood Centres are “gathering places” and shall incorporate public squares. Public squares will have the right of public access and will be designed as a high quality and



interactive urban environment: Meets or exceeds a standard of 40% of residential dwellings within 200 m walking distance of the Neighbourhood Centre. Alternatives 1 and 2 perform equally well on this indicator because of the concentration of medium density around the Neighbourhood Centre, however Alternative 3 disperses the medium density more, which means that there are not as many dwellings within 200 metres of the Neighbourhood Centre. Regardless, the whole Secondary Plan area is less than 500 metres across, which means that the vast majority of homes will be within a five-minute walk of the Neighbourhood Centre, which is acceptable.

Resilient

- Promote the integration of transit and active transportation modes: Meets or exceeds a standard of 40% of People and Jobs within 200 metres of transit stops. All Alternatives exceed the threshold, with Alternative 1 providing the greatest proportion within 200 metres of transit stops.
- Use of green infrastructure, lot level controls, and Low Impact Development (LID) techniques: Percentage of open spaces that overlay with natural low points and drainage areas (i.e., favourable candidate sites for LIDs). All Alternatives perform similarly, with Alternative 3 having a slightly greater proportion of open spaces in locations available for green infrastructure and/or also groundwater recharge opportunities.

6.4 Emerging Land Use Plan

The collective evaluation from the transportation review and from other technical specialists, as well as insight from the Project Team and through stakeholder and public feedback, was subsequently used by the project team to inform the development of an emerging land use plan that integrates the best features of the three Alternatives.

Based on review of the three alternatives and resultant evaluation, the following are key transportation related recommendations were identified to be carried forward into the Emerging Plan:

- The re-alignment of Regional Road 17 must be configured to be consistent with the recommended alignment as being developed through the Regional Road 17 Environmental Assessment. This proposed alignment includes a tangent (straight) section at Concession Road 3, then reverse curves separated by a tangent section, and then matching into existing Regional Road 17.
- Intersection spacing should be consistent with MTO and Region of Durham practices and guidelines, including no new intersections along Concession Road 3 between Highway 35/115 and the new relocated Regional Road 17 intersection.
- Upon re-alignment of Regional Road 17, the remnant existing section would not be retained in a manner that provides a continuous connection between Concession Road 3 and Regional Road 17 in order to avoid short-cutting traffic through the NVSP lands, and instead promote traffic to travel via Concession Road 3 and Regional Road 17. Likewise, and for the same reason, no new roads should be planned west of Regional Road 17 that provide a continuous connection between Concession Road 3 and Regional Road 3.
- The NVSP collector road intersection with the re-aligned Regional Road 17 would typically be located midblock along the tangent section between the two above noted reverse curves in order to be as far away from the curves possible and to optimize visibility. However, the optimal intersection location should be confirmed to optimize these



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stopping sight distances to and from the curves. This intersection location will be slightly refined and confirmed through the Regional Road 17 EA process, and also through development of the future area plans in order to optimize safety of the road corridor operations.

- Provide a spine network of collector roads. The configuration of this network would accommodate all modes of traffic mobility, including autos, cyclists and pedestrians, and potential future transit service. The road network should yield reasonable walking distances to key destinations such as parks, schools, the neighbourhood centre, and potential future transit services along the collector and/or arterial road network.
- Where possible, the collector road network would be configured so that it is continuous for ease of mobility.
- Provides street connections to the planned and approved lands directly south of the NVSP.
- New intersections would be planned to be at or as close to right-angles as possible.

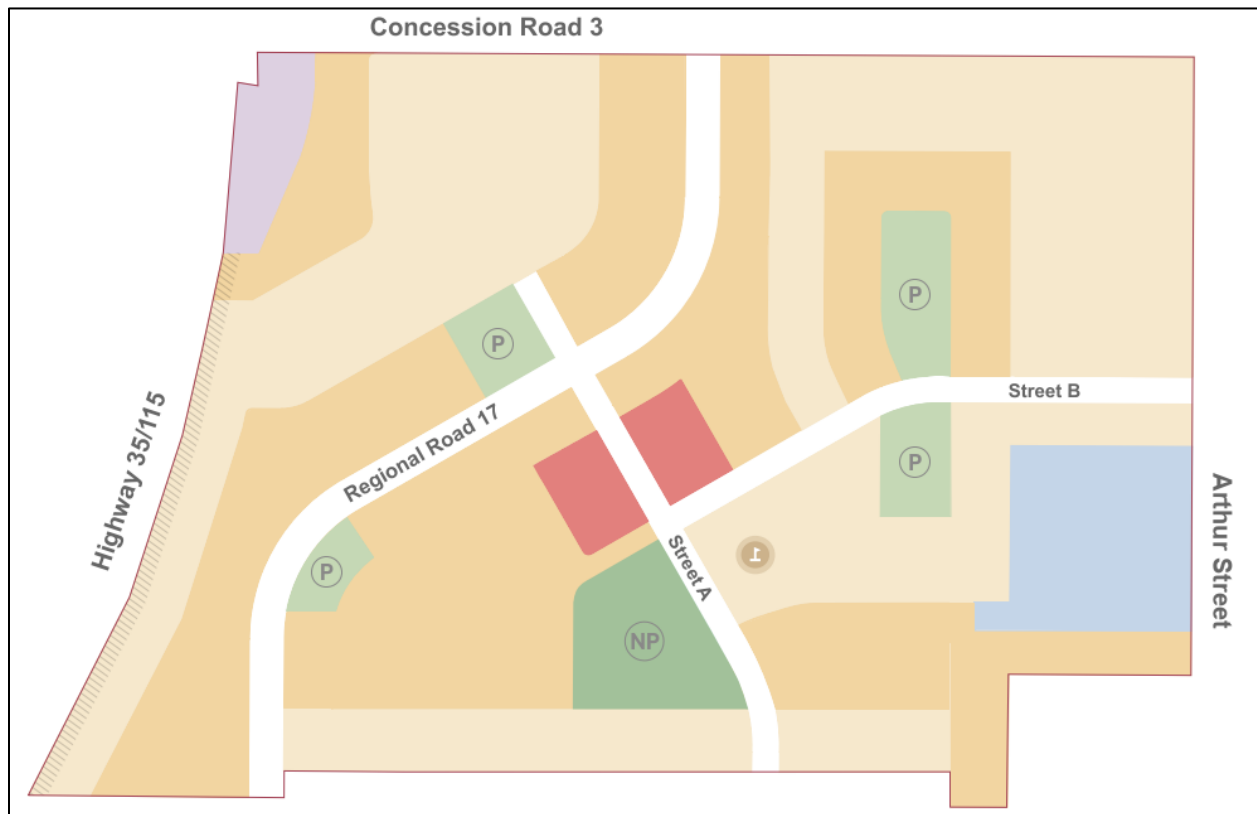


7 Preferred Plan

Following Public Information Centre #3 held in June 2022, feedback on the three Land Use Alternatives and evaluation results were reviewed to develop an Emerging Land Use Plan (i.e., the Preferred Land Use Plan). A Mixed-Use Neighbourhood Centre will be the centre of North Village, anchored by a school, public park, and small-scale shops and services. Each quadrant of the plan also features a unique park to serve as a community node and gathering place. Medium density housing lines Regional Road 17 and surrounds the Neighbourhood Centre, also dispersed through other areas of the Plan. The school is proposed at a location away from Regional Road 17.

The Preferred Land Use Plan is shown in **Figure 34**. The image shows the land uses for the NVSP area as well as the core Collector Road network that would be enshrined in the Secondary Plan community structure. The subsequent image after outlines a Demonstration Plan with a network of local streets, including potential rear lanes in the medium density blocks.

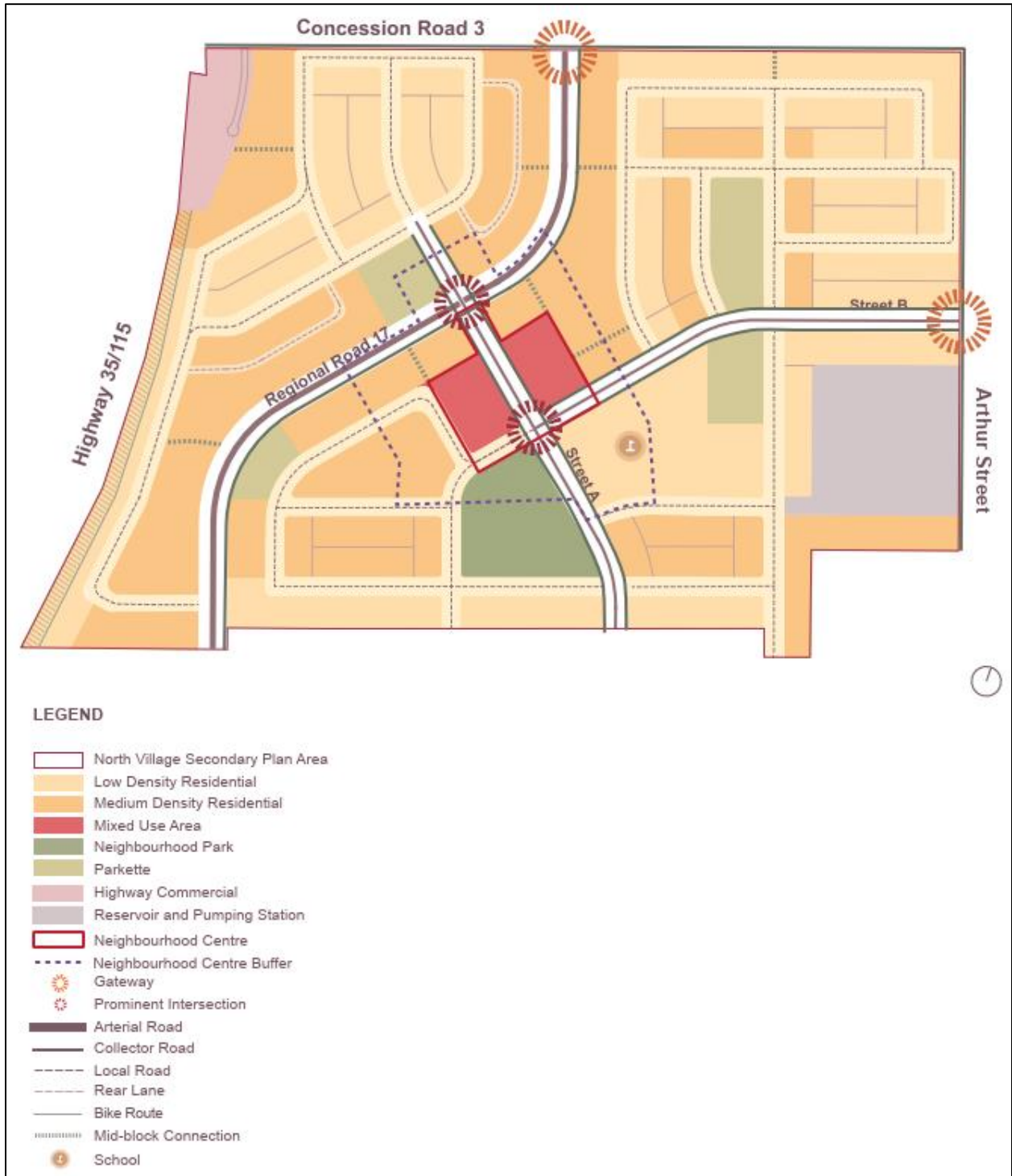
Figure 34: Preferred Land Use Plan



LEGEND

- North Village Secondary Area
- Low Density Residential
- Medium Density Residential
- Mixed Use Area
- Neighbourhood Park
- Parkette
- Highway Buffer
- Highway Commercial
- Reservoir and Pumping Station
- School

Figure 35: Demonstration Plan





7.1 Road Network

The road network supporting and shown in the Demonstration Plan in **Figure 35** will facilitate travel within and through the North Village Secondary Plan area.

Regional Road 17 provides a gateway into the community from Concession Road 3 while providing an arterial connection to the established neighbourhoods of Newcastle to the south. The final alignment of Regional Road 17 is subject to an Environmental Assessment Study which is currently underway. The intersection of Regional Road 17 & Concession Road 3 is shown as 300 metres measured from the eastern edge of the existing North Street right-of-way to the centreline of the future Regional Road 17. It is noted that in 2008 MTO had approved a 360-metre spacing (generally between Highway 35/115 and the new Regional Road 17 alignment). The final location of the proposed intersection and the Regional Road 17 alignment will be coordinated with MTO through the ongoing Regional Road 17 Realignment Environmental Assessment. This will be subject to further analysis and discussion with the key stakeholders.

Collector Roads Street A and Street B further connect the internal local road network of North Village and create a prominent intersection surrounded by the mixed-use area, school, and neighbourhood park. The intersection of the NVSP collector roads with Regional Road 17 will be refined through coordination with Durham Region based on road safety considerations including sight distance and intersection spacing/geometric design requirements.

Local roads service the low and medium density residential areas in a modified grid pattern which provides a variety of travel options for pedestrians and cyclists. Roads are designed as complete streets that are safer and comfortable for all travelers. The road network is also well integrated with the Approved Area subdivision located to the south of the NVSP lands.

The Collector Roads form a key structural element that are to be provided as part of the North Village Secondary Plan lands. However, the Local Road street layout shown on this Demonstration Plan are an illustration of one possible configuration that meets the intent of the Secondary Plan. The final Local Road configuration will be determined through detailed study as part of the plan of subdivision approvals process. However, it is noted the area landowners are to develop the Land Use Plan and the Collector Road network in conformance with the Land Use Plan. The local street network is encouraged to be consistent or similar to the Demonstration Plan in order to ensure that the Land Use Plan and Collector Road network are realized in conformance with the Secondary Plan.

The general cross-section typology for the various roads are illustrated in the following figures. The cross-sections illustrate the proposed width of the road right-of-way, the travelled way for motorists, cycling facilities and pedestrian sidewalks. Additional details pertaining to the role and functions for each of the road types are contained in the North Village Urban Design and Sustainability Guidelines. Although the Municipality does not have standard drawings for all the noted roads, it is noted that the identified provisions are generally consistent with the Official Plan (including Official Plan Table C-2). These concept elements will be developed and refined through the Draft Plan of Subdivision and engineering submission process for the subject lands. Further to this, where achievable and supportable from a civil servicing and geotechnical perspective, roads may be designed to include Low Impact Development (LID) treatments to mitigate urban stormwater runoff. This will also be confirmed through subsequent study as well as the development and approvals process.



Figure 36: Type B Arterial Road Cross Section (Regional Road 17 and West Part of Concession Road 3; Planned 30 to 36m; 30 m Concept Depicted)

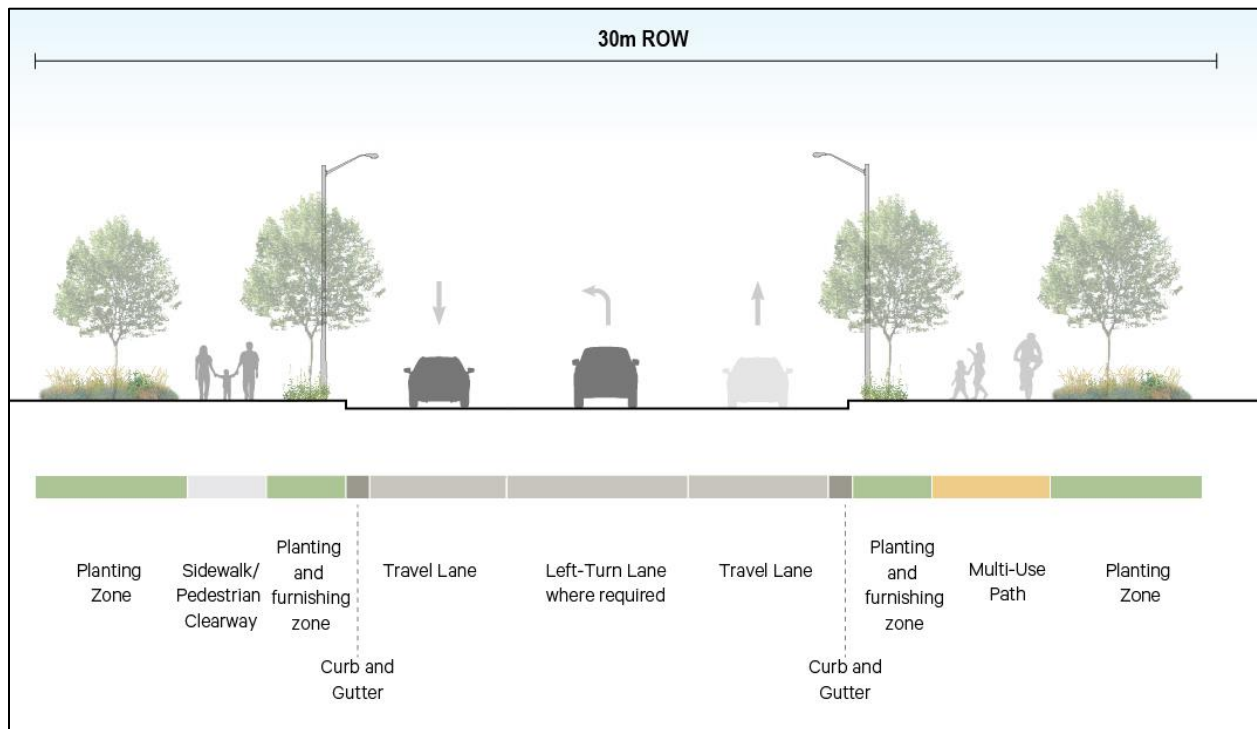


Figure 37: Type C Arterial Road Cross Section (Arthur Street, and East Part of Concession Road 3)

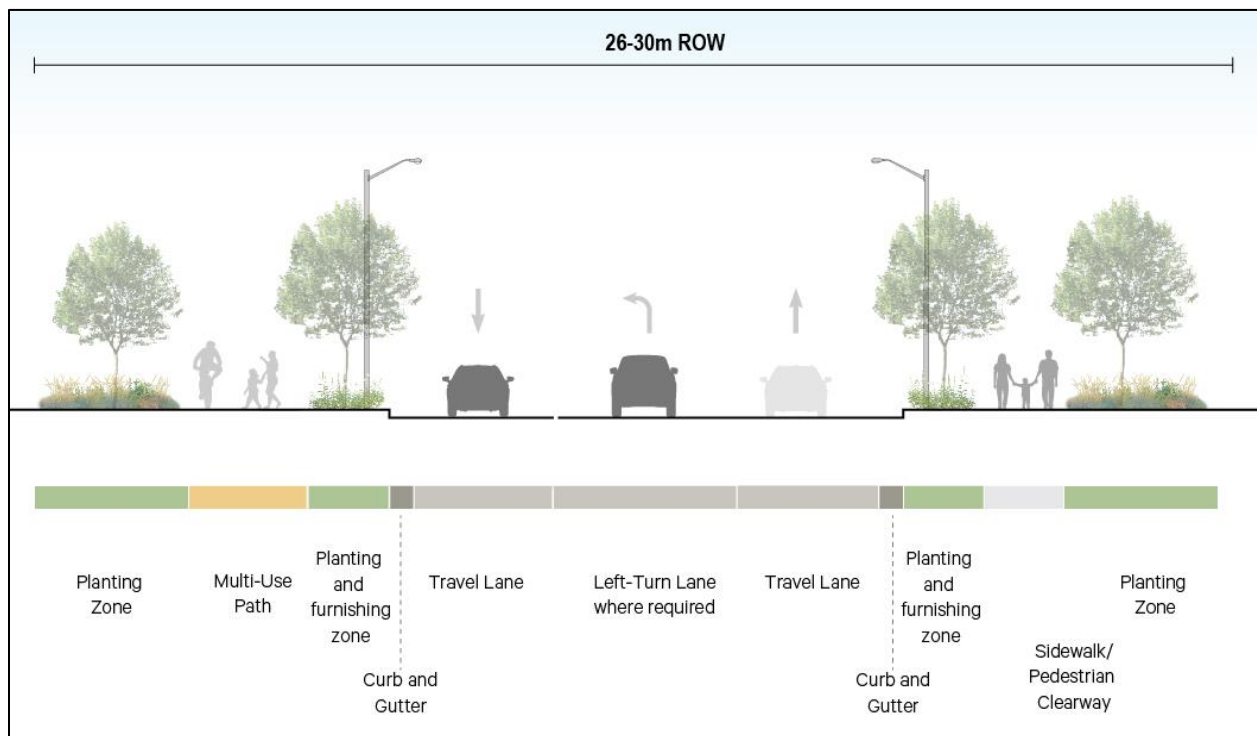




Figure 38: Collector Road Cross Section

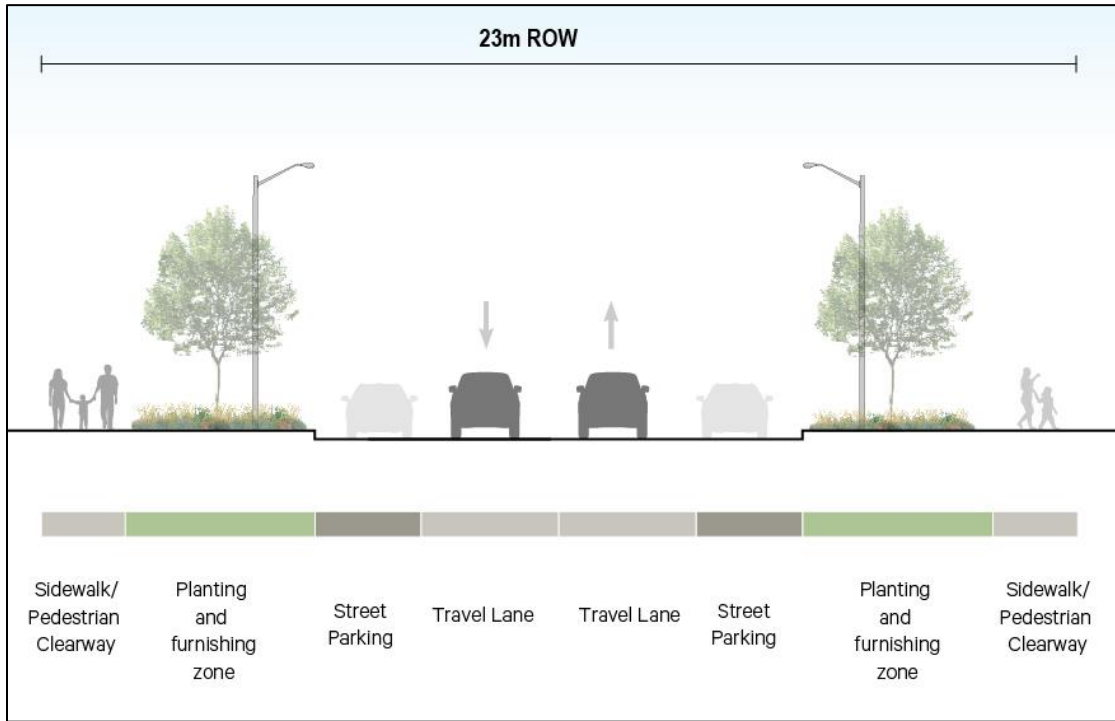


Figure 39: Local Road Cross Section

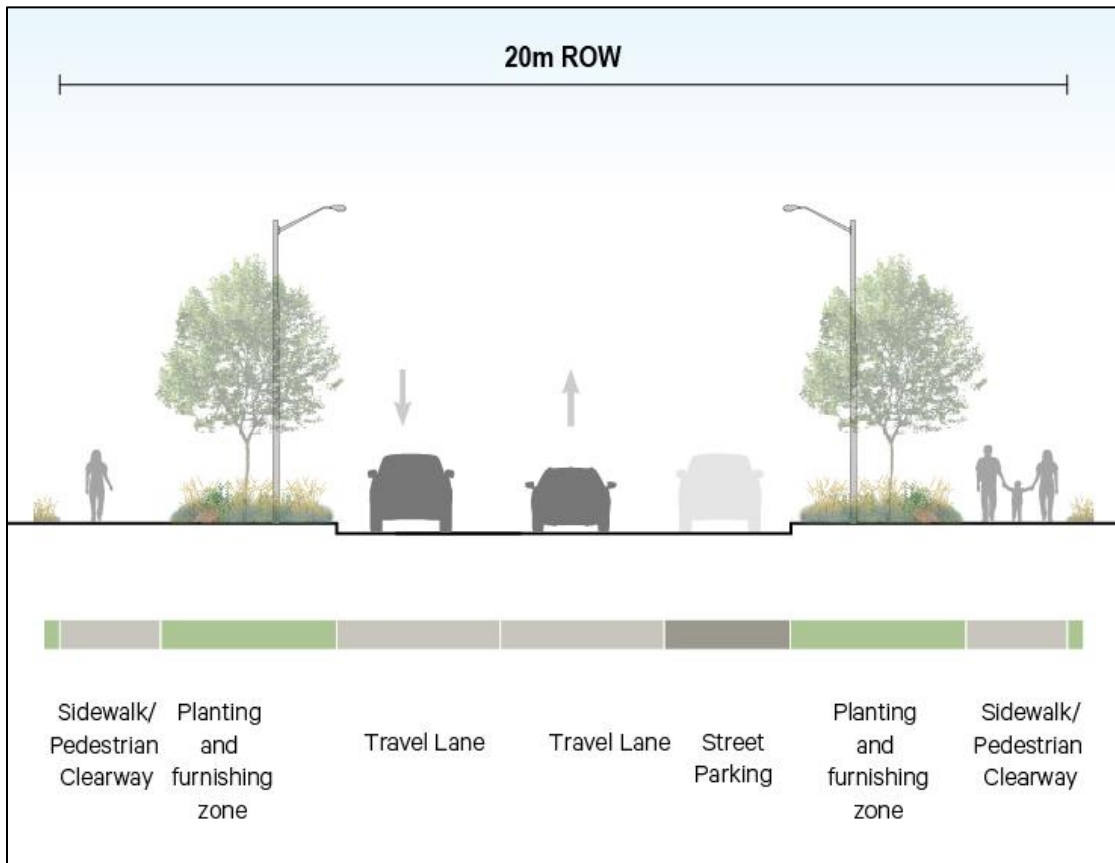




Figure 40: Local Road with Multi-use Path Cross Section (Adjacent to Highway 35/115 Setback)

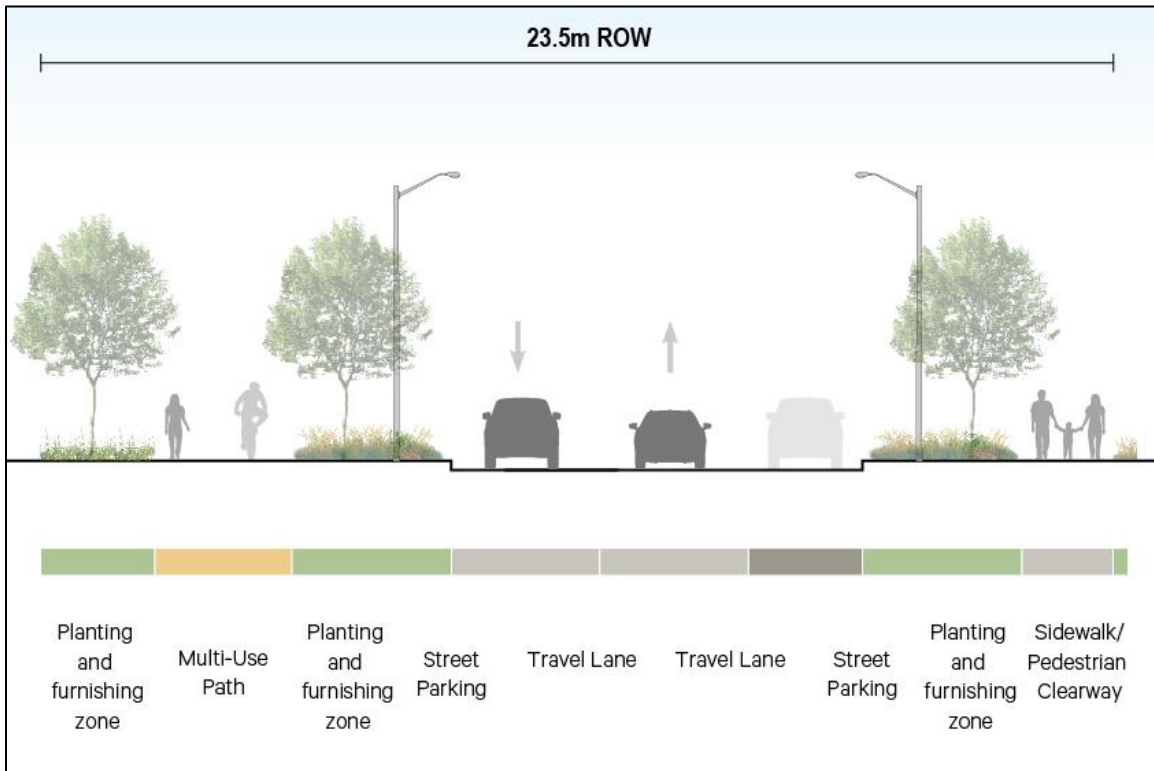
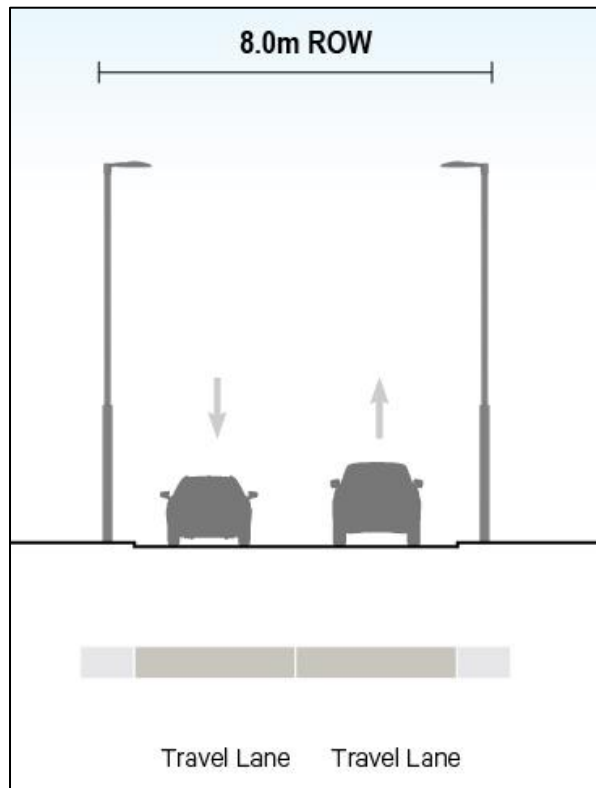


Figure 41: Rear Lane Cross Section





7.2 Potential Future Transit Network

As discussed in **Sections 4.1** and **4.2**, the Clarington TMP and Durham Region TMP both identify Highway 35/115 and Regional Road 17 for future transit service by the 2031 horizon year. To be provided by Durham Region Transit (DRT), service along Regional Road 17 in particular would strongly benefit the North Village Secondary Plan area. Connections to Orono via Highway 35/115 and Bowmanville via Highway 2, potentially providing access to the future Bowmanville GO Station expansion, would integrate the various communities within Clarington and provide an alternate mode of travel to commuters and recreational trips. Connectivity to the GO commuter lot in Newcastle on Regional Highway 2 at Highway 35/115 would also provide an improved overall transit network.

Through The Route Ahead, 2022-2025 Service Strategy, Durham Region Transit has identified that Local Area Transit Plans will be developed for specific growth areas in the Region, which includes Newcastle and the NVSP area. This is a means to implement local transit routes along Regional Road 17 including connections to Orono and Highway 2 in Newcastle.

The TMPs also identify enhanced service within Newcastle in general, providing connections between North Village and the business district along King Avenue East would be integral to effective transit planning.

7.3 Active Transportation

As noted, roads are to be designed as complete streets which provide safer and comfortable travel for all modes.

Regional Road 17 and Concession Road 3 will feature multi-use paths for pedestrians and cyclists while clear and accessible pedestrian walkways will accommodate walking throughout the community. The modified grid pattern provided in the Preferred Land Use Plan facilitates a variety of travel options through and within North Village, serving both pedestrians and cyclists. Cycle paths and trails connect the community to the boundary road network while the five parks provide further connections only accessible to active transportation modes.

A trail will be located along the buffer between Highway 35/115 and the local road network at the west side of North Village, connecting to the valley lands to the south.

Midblock pedestrian/cyclist connections are provided throughout the plan, connecting the northeastern quadrant of the neighbourhood to Concession Road 3 and to Regional Road 17. On the west side, Regional Road 17 is connected to a local road which extends to a cul-de-sac, providing pedestrians and cyclists with a direct route to the arterial road network.

Public roads should include a vibrant and healthy tree canopy to provide shade for pedestrians and cyclists. Double rows of trees are planned for Regional Road 17.

The following is a summary of general considerations for the active transportation network:

- The active transportation network should accommodate all abilities, and facilitate all self-powered forms of mobility and provide alternatives to automobile transportation.
- The active transportation network should integrate with the Municipality's Active Transportation Network and connects residents of North Village to other destinations in Newcastle and throughout Clarington.



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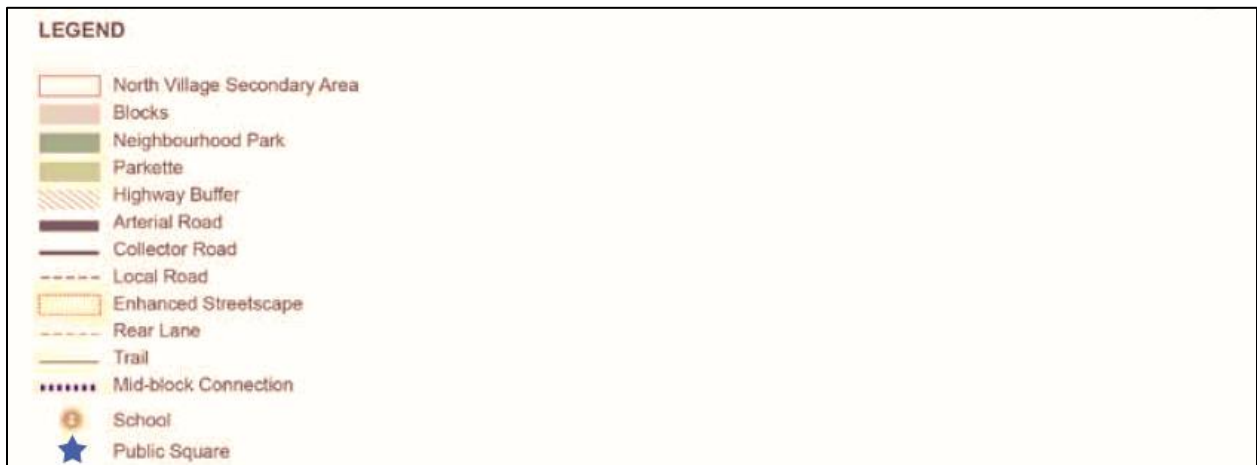
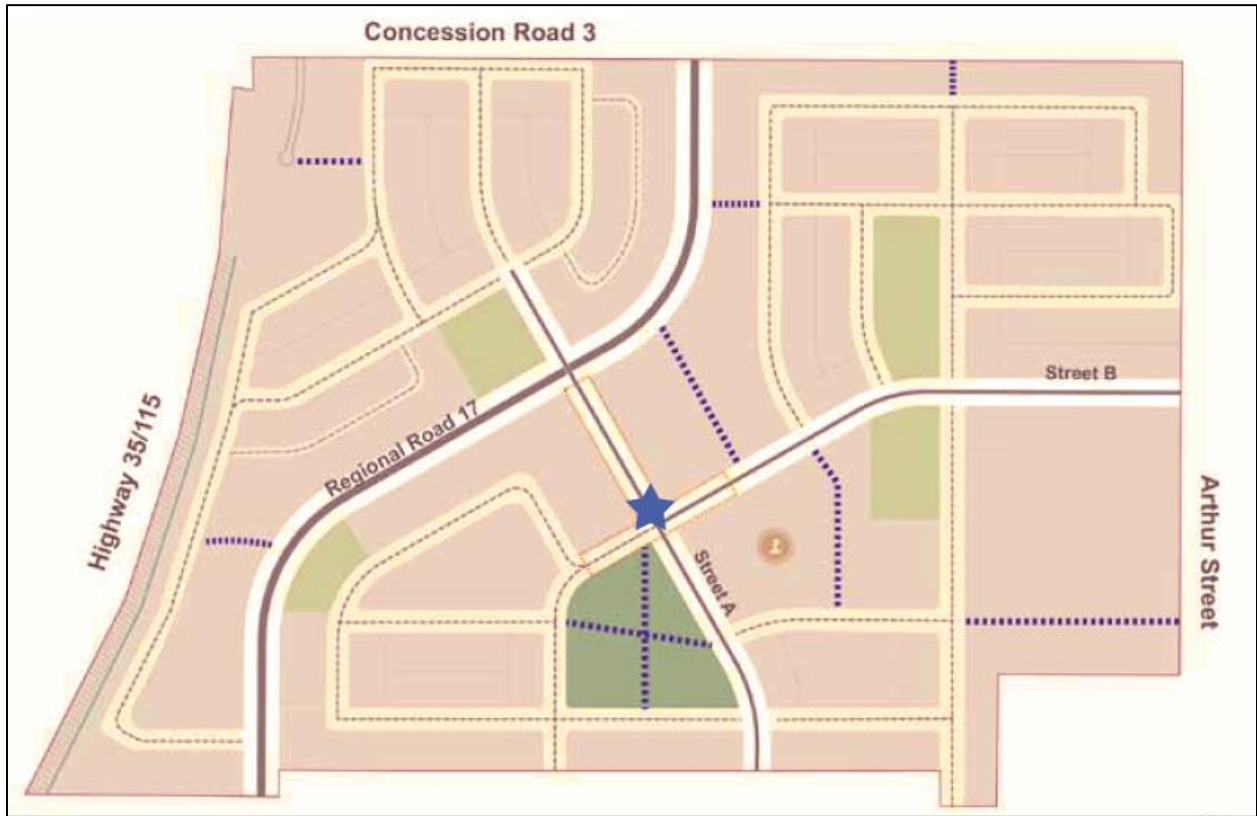
- Mid-block connections will be established to increase porosity and travel route choices.
- Provide connections within parks, schools, and the Neighbourhood Centre to the broader area on- and off-street active transportation network.
- Optimize safety and minimize conflicts with other modes of transportation through signage, appropriate grades, separation and /or protection, paved surface, surfacing width and delineation of rights-of-way, and well-designed transitions where facilities merge with roads. The design of pedestrian and cycling infrastructure will follow the required design standards and guidance, including AODA standards.
- Bicycle parking should be provided in proximity to mixed-use buildings, at parks and schools. Provide judiciously located bicycle parking for employees and residents within larger buildings (for example, located at grade with direct or ramped access to the adjacent street).
- Implement wayfinding methods that include signage to direct users at key intersections, landmarks and attractions, for both on- and off-street facilities.

The active transportation network consisting of the pedestrian, cycling and trail networks, is illustrated in the following exhibit. Although not depicted in the figure, it is further noted that all Arterial roads (Regional Road 17, Concession Road 3, and Arthur Street) will include a sidewalk and multi-use path (one of either element on each side); all Collector roads will include sidewalks on both sides and shared cycling route signs; and all Local roads will include two sidewalks (except in one special case adjacent to Highway 35/115 where a sidewalk will be replaced with a multi-use path).

The multi-use paths along Concession Road 3 should be planned along the south side of the corridor, and connect with the proposed multi-use path along Arthur Street, which should be located along the west side. The provision of the multi-use path along the west side of Arthur Street has judiciously been located since the boulevard treatments on the east side of Arthur Street may not come to fruition with the development of the NVSP lands. As such, the east side may retain a rural configuration with a road shoulder and drainage ditch until the lands on the east side ever come to develop. Thus, by planning the multi-use path along the west side of Arthur Street, the corridor will feature a viable separated active transportation facility with development of the NVSP lands.

Although this study is focused on the subject study area for active transportation planning, it is noted that continuity and appropriate transitions beyond the study area should be considered. That is, the active transportation network should also be planned and configured with a broader network in mind with extension of the facilities considered beyond this plan in order to provide a contiguous network with optimum attraction for new users. Importantly, this should also include safer protected crossings/grade-separation of the CN Rail corridor to the south of the study area along Regional Road 17 and Arthur Street.

Figure 42: Open Space, Trail and Mid-block Connections





8 Future Traffic Operations

8.1 Future Background Traffic Volumes

8.1.1 Future Background Development Volumes

As described in Section 3.5, a number of background developments are proposed for the lands surrounding the NVSP area. Information on the proposed developments was used to estimate background development traffic for incorporation into the Future Background traffic volumes.

Approved Plans for Subdivision S-C-2005-003 and S-C-2005-004 (Approved Area)

Adjacent to the south of the NVSP area, proposed plan of subdivisions located on the east side of North Street immediately to the north of the CP Rail tracks were approved. The subdivisions consist of 603 low-rise residential dwelling units and 323 medium density residential dwelling units. Access is provided onto North Street and onto Arthur Street via two roadways located approximately 225 metres and 750 metres north of the CP Rail tracks.

The Transportation Impact Studies (TIS) in support of the subdivisions were completed in 2008. For the purpose of this assessment, the trip generation for the subdivisions was estimated based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. The trip distribution and assignment are based on data from the 2016 Transportation Tomorrow Survey (TTS) as well as the TISs for the proposed townhouse development and the proposed residential subdivision at 688A and 688B North Street prepared by Tranplan Associates and NexTrans Consulting Engineers, respectively.

Proposed Townhouse Development at 355 North Street

An application for 29 townhouse units located on the east side of North Street immediately south of the CP Rail tracks has been submitted to the Municipality of Clarington. Information from the TIS prepared by Tranplan Associates in October 2017 will be incorporated into the Future Background traffic volumes.

Proposed Residential Subdivision at 688A and 688B North Street

An application for a new residential subdivision at 688A & 688B North Street, located on the west side of North Street between Highway 35/115 and the CP Rail track has been submitted to the Municipality of Clarington. The proposed development for 131 residential dwelling units consists of 57 single-family detached units, 48 semidetached units, and 26 street townhouse units. Information from the TIS prepared by Nextrans Consulting Engineers in May 2021 will be incorporated into the Future Background traffic volumes.

Future Background Development Trip Generation and Assignment

The ITE Trip Generation Manual, 10th Edition was used to estimate the trips generated by the noted background developments surrounding the North Village Secondary Plan area. A summary of the trips by development is shown in **Table 6**.

The trip distribution and assignment for the developments were taken from their respective TIS reports. Traffic associated with the Approved Plans for Subdivision S-C-2005-003 and S-C-2005-004 was assigned according to the methodology employed in the TIS for 688A and 688B North Street. The background development volumes for the AM and PM peak hour are shown in **Figure 43** and **Figure 44**, respectively.



Table 6: Background Development Trip Generation

Description / ITE Code	Students / Units / GFA (sqft)	Calculation Method	Trip Generation Rates & Distributions						Generated Trips		Distribution of Generated Trips			
			AM	PM	AM In	AM Out	PM In	PM Out	AM Peak	PM Peak	AM In	AM Out	PM In	PM Out
Single-Family Detached Housing (210)	603	Fitted Curve Equation	$T = 0.71(X)+4.80$	$\ln(T) = 0.96*\ln(X)+0.2$	25%	75%	63%	37%	433	570	108	325	359	211
Multifamily Housing (Low-Rise) (220)	323	Fitted Curve Equation	$\ln(T) = 0.95*\ln(X)-0.51$	$\ln(T) = 0.89*\ln(X)-0.02$	23%	77%	63%	37%	145	167	33	112	105	62
Multifamily Housing (Low-Rise) (220)	29	Fitted Curve Equation	$\ln(T) = 0.95*\ln(X)-0.51$	$\ln(T) = 0.89*\ln(X)-0.02$	23%	77%	63%	37%	15	20	3	11	12	7
Single-Family Detached Housing (210)	57	Fitted Curve Equation	$T = 0.71(X)+4.80$	$\ln(T) = 0.96*\ln(X)+0.2$	25%	75%	63%	37%	45	59	11	34	37	22
Multifamily Housing (Low-Rise) (220)	74	Fitted Curve Equation	$\ln(T) = 0.95*\ln(X)-0.51$	$\ln(T) = 0.89*\ln(X)-0.02$	23%	77%	63%	37%	36	45	8	28	28	17
Total:									674	861	165	509	543	319

ITE Trip Generation Manual, 10th Edition



Figure 43: Future Background Development Volumes – 2041 AM Peak Hour

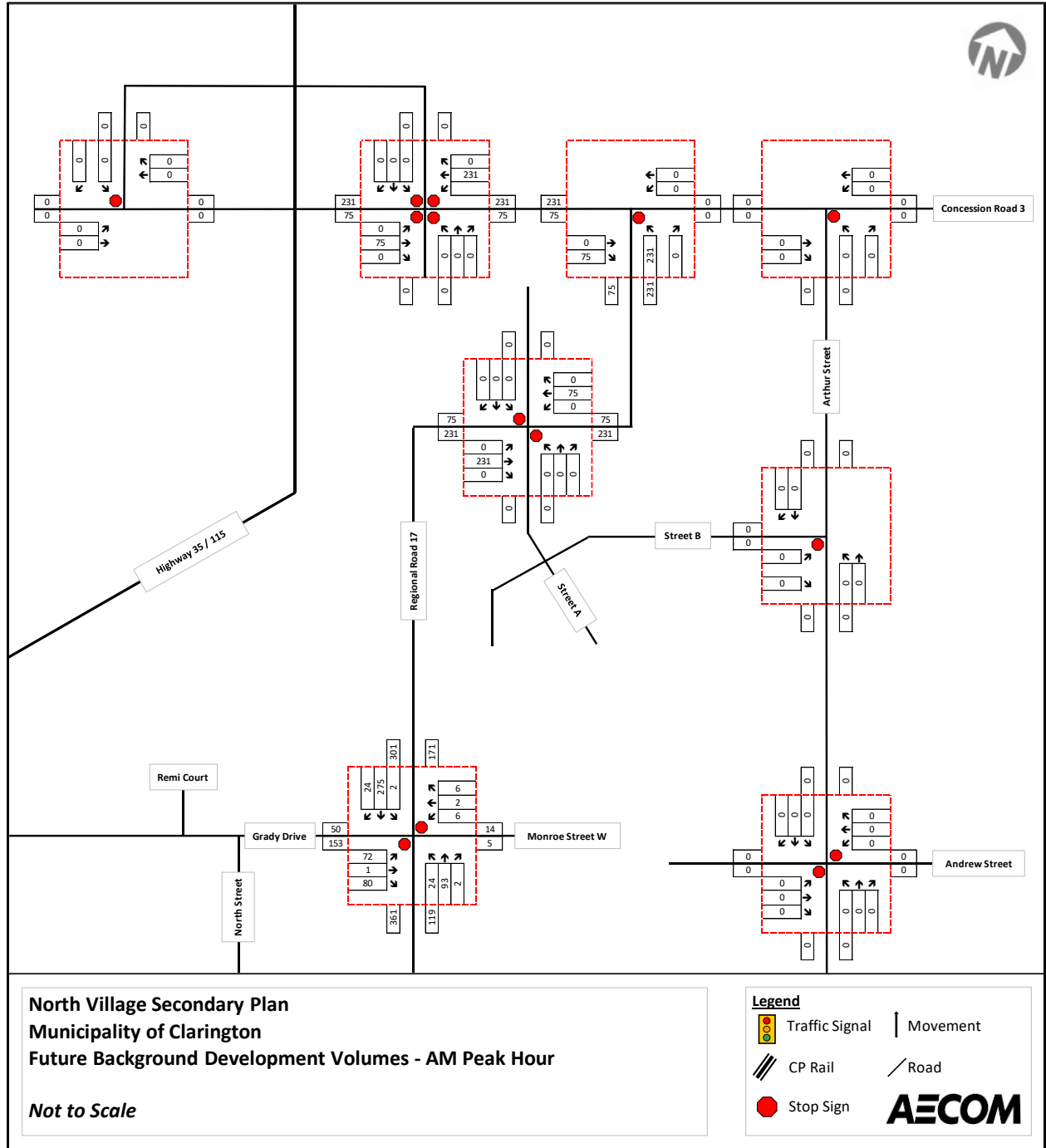
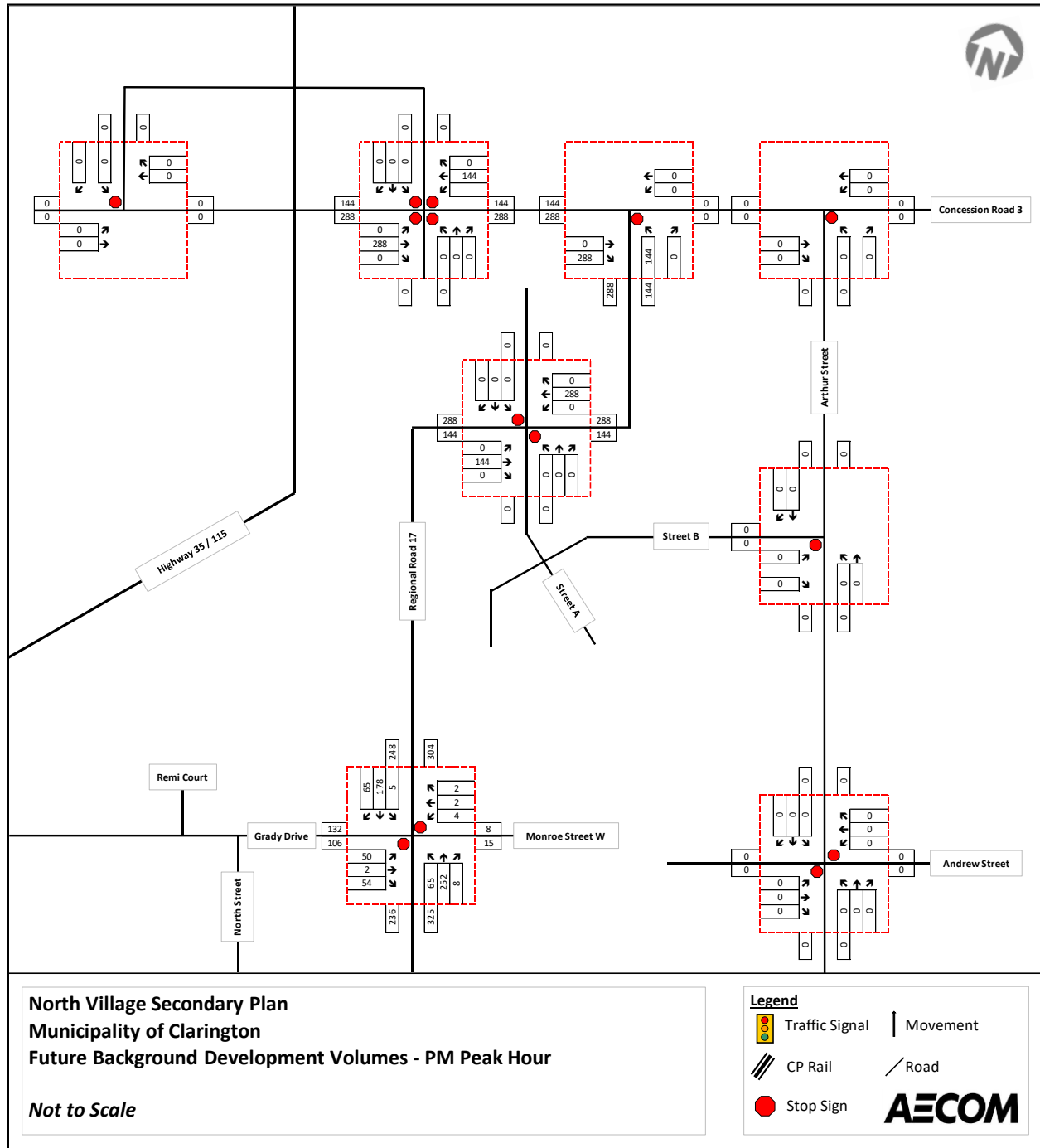




Figure 44: Future Background Development Volumes – 2041 PM Peak Hour



8.1.2 Future Background Turning Movement Volumes

The anticipated build out horizon year for the North Village Secondary Plan area was assumed to be 2041 for the purpose of the traffic operations assessment. This reflects time for municipal and regional approvals, sales and absorption, as well as construction. The turning movement volumes in **Figure 15** and **Figure 16** under the Existing Conditions were grown from 2020 to 2041 using an annual growth rate of 1% to reflect further background growth and any potential future developments in the area. With the realignment of Regional Road 17 and formation of a new intersection at Concession Road 3, traffic



volumes on the south leg of Concession Road 3 & Highway 35/115 East Underpass / North Street were split up between the planned cul-de-sac that will remain in the place of North Street and the realigned Regional Road 17. The split was determined based on volume balancing between the intersection and the adjacent intersection to the south to reflect traffic associated with the remaining McDonald's franchise. The background development volumes in **Figure 43** and **Figure 44** were added to the grown volumes to obtain the final Future Background Conditions turning movement volumes. The Future Background Conditions turning movement volumes for the 2041 AM and PM peak hours are shown in **Figure 45** and **Figure 46**, respectively.

Figure 45: Future Background Conditions Turning Movement Volumes – 2041 AM Peak Hour

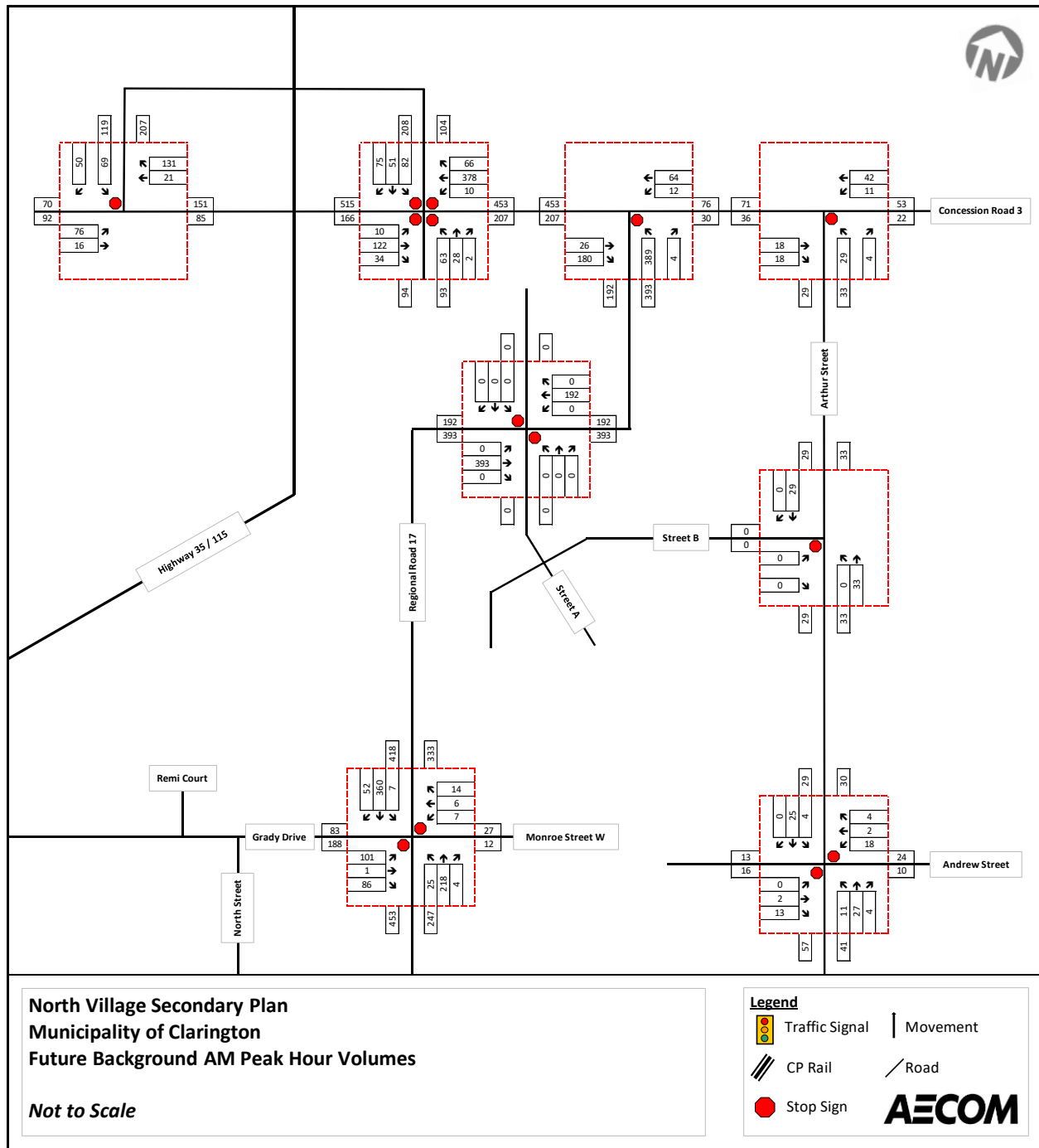
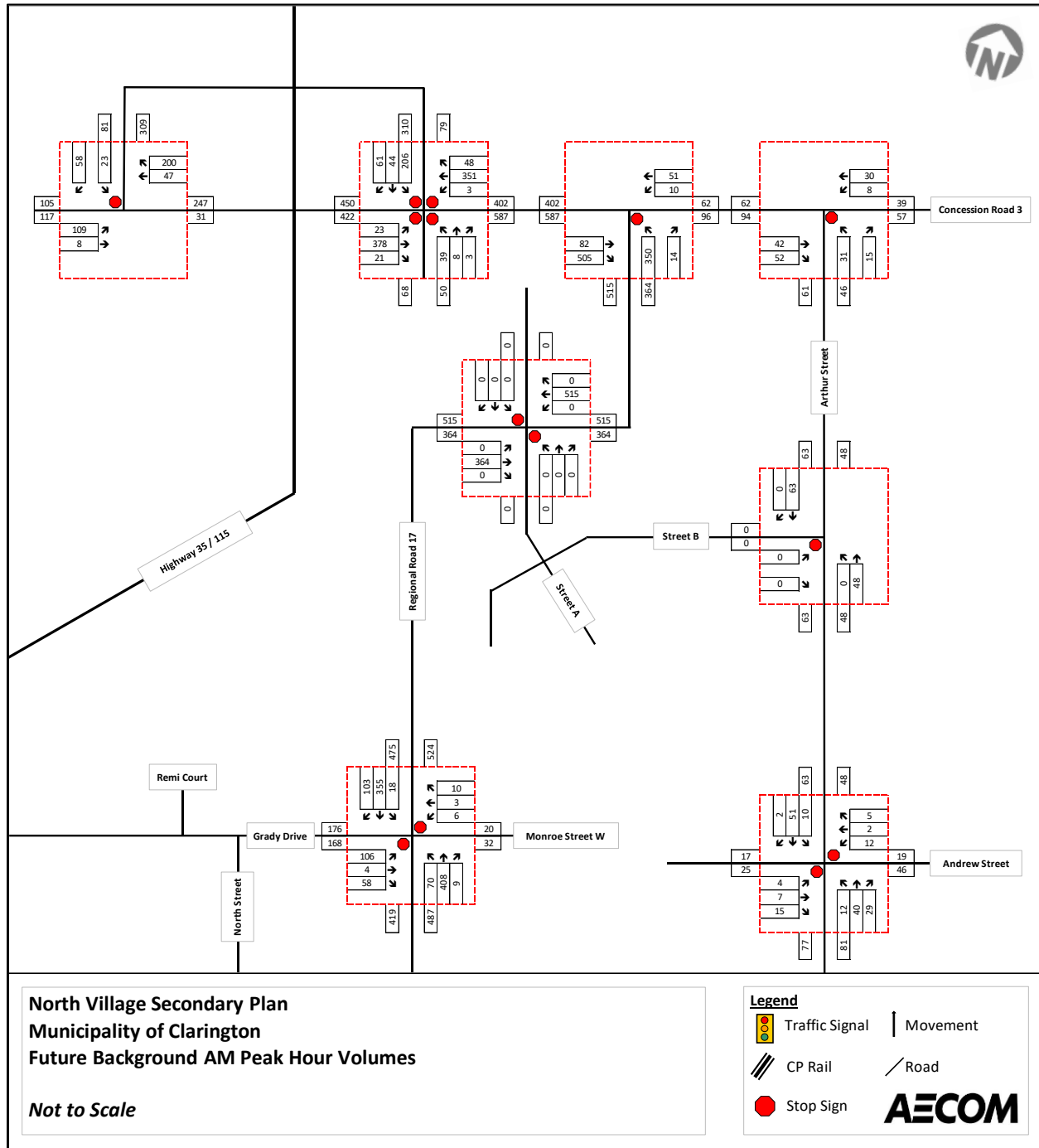




Figure 46: Future Background Conditions Turning Movement Volumes – 2041 PM Peak Hour



8.2 Future Background Traffic Operations

The Future Background Conditions turning movement volumes shown in **Figure 45** and **Figure 46** were used in a modified version of the Existing Conditions Synchro model to assess traffic operations in the 2041 AM and PM weekday peak hours. No modifications to the lane configurations or traffic control device were made to the Synchro models. The new intersection of the realigned Regional Road 17 & Concession Road 3 was coded with stop control and a left-turn storage lane on the south approach. The detailed Synchro reports are included in **Appendix B**.



The 2041 AM peak hour traffic operations under the Future Background Conditions are summarized in **Table 7**. During the AM peak hour, all movements are shown to operate at LOS C or better, with the exception of the shared westbound left/through/right-turn movement at Concession Road 3 & Highway 35/115 Underpass East / North Street which operates at an acceptable LOS D. The intersection also operates at an overall LOS C, with all other intersections operating at an overall LOS A.

The 2041 PM peak hour traffic operations under the Future Background Conditions are summarized in **Table 8**. During the PM peak hour, some operational issues are shown to arise. All intersections operate at an overall LOS A with the exception of Concession Road 3 & Highway 35/115 Underpass East / North Street which operates at LOS C and North Street / Manvers Road & Grady Drive / Monroe Street West which operates at LOS B. With the planned Grady Drive extension creating a new connection to the neighbourhood to the west, as noted in **Section 4.1**, an increase in traffic volume on the eastbound approach to the intersection of North Street / Manvers Road & Grady Drive / Monroe Street West results in the shared eastbound left/through/right-turn movement operating at LOS F with a v/c ratio of 0.91. All other movements operate acceptably at LOS D or better.

Table 7: Future Background Conditions Traffic Operations – 2041 AM Peak Hour

Intersection	Movement	Delay (sec)	LOS	v/c	95 th Percentile Queue (m)
Concession Road 3 & Highway 35/115 Underpass West	EBLT	6.5	A	0.06	1.5
	WBTR	0.0	A	0.10	0.0
	SBLR	10.8	B	0.18	5.0
	<i>Overall</i>	5.2	A	-	-
Concession Road 3 & Highway 35/115 Underpass East / North Street	EBLTR	11.7	B	0.32	1.3
	WBLTR	28.8	D	0.82	8.1
	NBLTR	11.5	B	0.21	0.8
	SBLTR	14.0	B	0.43	2.1
	<i>Overall</i>	20.6	C	-	-
Concession Road 3 & Arthur Street	EBTR	0.0	A	0.03	0.0
	WBLT	1.6	A	0.01	0.2
	NBLR	9.3	A	0.05	1.2
	<i>Overall</i>	3.2	A	-	-
North Street / Manvers Road & Grady Drive / Monroe Street West	EBLTR	24.6	C	0.54	23.6
	WBLTR	15.0	B	0.08	1.9
	NBLTR	1.1	A	0.03	0.6
	SBLTR	0.2	A	0.01	0.1
	<i>Overall</i>	6.1	A	-	-
Arthur Street & Andrew Street	EBLTR	8.9	A	0.02	0.5
	WBLTR	9.4	A	0.04	0.9
	NBLTR	1.9	A	0.01	0.2
	SBLTR	1.1	A	0.00	0.1
	<i>Overall</i>	4.3	A	-	-
Regional Road 17 & Concession Road 3	EBTR	0.0	A	0.13	0.0
	WBLT	1.3	A	0.01	0.2
	NBL	15.6	C	0.56	26.5
	NBR	8.9	A	0.00	0.1
	<i>Overall</i>	9.2	A	-	-



Table 8: Future Background Conditions Traffic Operations – 2041 PM Peak Hour

Intersection	Movement	Delay (sec)	LOS	v/c	95 th Percentile Queue (m)
Concession Road 3 & Highway 35/115 Underpass West	EBLT	7.5	A	0.09	2.2
	WBTR	0.0	A	0.16	0.0
	SBLR	10.4	B	0.12	3.0
	<i>Overall</i>	3.9	A	-	-
Concession Road 3 & Highway 35/115 Underpass East / North Street	EBLTR	25.5	D	0.75	6.3
	WBLTR	23.0	C	0.71	5.5
	NBLTR	11.7	B	0.11	0.4
	SBLTR	19.2	C	0.60	3.8
	<i>Overall</i>	22.4	C	-	-
Concession Road 3 & Arthur Street	EBTR	0.0	A	0.06	0.0
	WBLT	1.6	A	0.01	0.1
	NBLR	9.3	A	0.06	1.4
	<i>Overall</i>	2.7	A	-	-
North Street / Manvers Road & Grady Drive / Monroe Street West	EBLTR	88.2	F	0.91	56.7
	WBLTR	22.0	C	0.09	2.2
	NBLTR	2.0	A	0.08	1.9
	SBLTR	0.5	A	0.02	0.4
	<i>Overall</i>	14.4	B	-	-
Arthur Street & Andrew Street	EBLTR	9.3	A	0.03	0.8
	WBLTR	9.6	A	0.03	0.6
	NBLTR	1.1	A	0.01	0.2
	SBLTR	1.2	A	0.01	0.2
	<i>Overall</i>	3.1	A	-	-
Regional Road 17 & Concession Road 3	EBTR	0.0	A	0.38	0.0
	WBLT	1.6	A	0.10	0.3
	NBL	23.3	C	0.67	38.1
	NBR	10.4	B	0.02	0.5
	<i>Overall</i>	8.3	A	-	-

8.3 Trip Generation and Distribution

The land use planning statistics and development yields developed by SvN were used to estimate the total trip generation for full build-out of the North Village Secondary Plan lands. **Table 9** summarizes the total number of residential units, residents, commercial gross floor area (GFA), etc. associated with the Land Use Plan.



Table 9: NVSP Estimated Development Yield for the Land Use Plan

Land Use	Area (sqm)	Residential		Mixed-use Retail		Institutional Area
		Units	Residents	GFA (sqm)	Jobs	Jobs
School	22,438	-	-	-	-	-
Low-Density Residential	182,990	371	1119	-	-	-
Medium-Density Residential	183,893	690	1613	-	-	-
Mixed-Use Neighbourhood Centre	10,438	47	67	3251	81	-
<i>Total</i>	<i>526,144</i>	<i>1107</i>	<i>2799</i>	<i>3251</i>	<i>81</i>	<i>30</i>

The statistics in **Table 9** were used in combination with the ITE Trip Generation Manual, 10th Edition trip generation rates to estimate total trips associated with each land use within the NVSP lands. ITE trip generation rates for Land Use Codes (LUC) for Elementary School (520), Single-Family Detached Housing (210), Multifamily Housing (Low-Rise) (220), Multifamily Housing (Mid-Rise) (221), and Shopping Centre (820) were used to calculate the trips based on the number of students, residential units, and commercial GFA as per the Land Use Plan.

Based on the mixed-use nature of the neighbourhood and central location of the planned elementary school within the NVSP area, a reduction rate for auto trips generated by the school was applied to reflect the higher proportion of walking, cycling, and trip chaining (i.e., drop-offs and pick-ups as part of a longer trip to/from work, etc.) typically associated with schools. The reduction of 75% also reflects the higher proportion of trips taken within the internal local road network which do not impact the traffic operations analysis study intersections on the broader road network.

Further, internal capture rates based on the 3rd Edition of the ITE Trip Generation Handbook for residential and retail land uses were applied to reflect trips made between the land uses. The internal capture rates resulted in overall reductions of approximately 1.7% of AM peak hour trips (2.5% inbound and 1.3% outbound) and approximately 8.7% of PM peak hour trips (7.4% inbound and 10.6% outbound).

Table 10 summarizes the ITE trip generation calculations and total number of inbound and outbound trips associated with the NVSP area.



Table 10: NVSP Trip Generation

Description / ITE Code	Students / Units / GFA (sqft)	Calculation Method	Trip Generation Rates & Distributions						Generated Trips		Distribution of Generated Trips			
			AM	PM	AM In	AM Out	PM In	PM Out	AM Peak	PM Peak	AM In	AM Out	PM In	PM Out
Elementary School (520)	600	Average Rate	0.67	0.17	54%	46%	48%	52%	402	102	217	185	49	53
		<i>Less 75% Reduction:</i>							101	26	54	46	12	13
Single-Family Detached Housing (210)	371	Fitted Curve Equation	$T = 0.71(X)+4.80$	$\ln(T) = 0.96*\ln(X)+0.2$	25%	75%	63%	37%	268	358	67	201	225	132
		Average Rate	0.74	0.99					275	367	69	206	231	136
		<i>Maximum:</i>							275	367	69	206	231	136
Multifamily Housing (Low-Rise) (220)	690	Fitted Curve Equation	$\ln(T) = 0.95*\ln(X)-0.51$	$\ln(T) = 0.89*\ln(X)-0.02$	23%	77%	63%	37%	299	329	69	230	207	122
		Average Rate	0.46	0.56					317	386	73	244	243	143
		<i>Maximum:</i>							317	386	73	244	243	143
Multifamily Housing (Mid-Rise) (221)	47	Fitted Curve Equation	$\ln(T) = 0.98*\ln(X)-0.98$	$\ln(T) = 0.96*\ln(X)-0.63$	26%	74%	61%	39%	16	21	4	12	13	8
		Average Rate	0.36	0.44					17	21	4	13	13	8
		<i>Maximum:</i>							17	21	4	13	13	8
Shopping Centre (820)	34,993	Fitted Curve Equation	$T = 0.5(X)+151.78$	$\ln(T) = 0.74*\ln(X)+2.89$	62%	38%	48%	52%	169	250	105	64	120	130
		Average Rate	0.94	3.81					33	133	20	12	64	69
		<i>Maximum:</i>							169	250	105	64	120	130
Total:								879	1,050	305	573	620	430	
<i>Less Internal Capture Trips:</i>								864	959	298	566	574	385	

ITE Trip Generation Manual, 10th Edition



Data from the 2016 Transportation Tomorrow Survey (TTS) was reviewed for in order to estimate the general trip distribution for auto driver mode trips. The trips originating from and destined to Greater Golden Horseshoe Model (GGHM) v4 Traffic Analysis Zones (TAZ) 2210, 2186, and 2189 representing the NVSP area and adjacent lands during the AM peak hour were used to estimate the trip distribution. **Table 11** and **Table 12** summarize the trip distribution by planning district.

Table 11: TTS Auto Driver Mode Trip Distribution for Trips Outbound from Zones 2210, 2186, and 2189 during AM Peak Hour

Toronto	Pickering	Ajax	Whitby	Oshawa	North & West GTA	Brock, Uxbridge, Scugog	Clarington
4%	2%	1%	6%	11%	3%	0%	74%

Table 12: TTS Auto Driver Mode Trip Distribution for Trips Inbound to Zones 2210, 2186, and 2189 during AM Peak Hour

Toronto	Pickering	Ajax	Whitby	Oshawa	North & West GTA	Brock, Uxbridge, Scugog	Clarington
5%	2%	1%	5%	13%	3%	1%	69%

Based on the boundary road network and trip distribution, the traffic assignment for the generated trips for the AM and PM peak hours is summarized in **Table 13**.

Table 13: North Village Secondary Plan Site Trip Assignment

Origin / Destination	AM Outbound / PM Inbound	AM Inbound / PM Outbound
North on Highway 35/115	12%	12%
South on Highway 35/115	51%	53%
South on Regional Road 17	25%	23%
South on Arthur Street	12%	12%

The resulting site trips associated with the development of the North Village Secondary Plan area are shown in **Figure 47** and **Figure 48** for the AM and PM peak hours, respectively.



Figure 47: North Village Secondary Plan Site Trips – AM Peak Hour

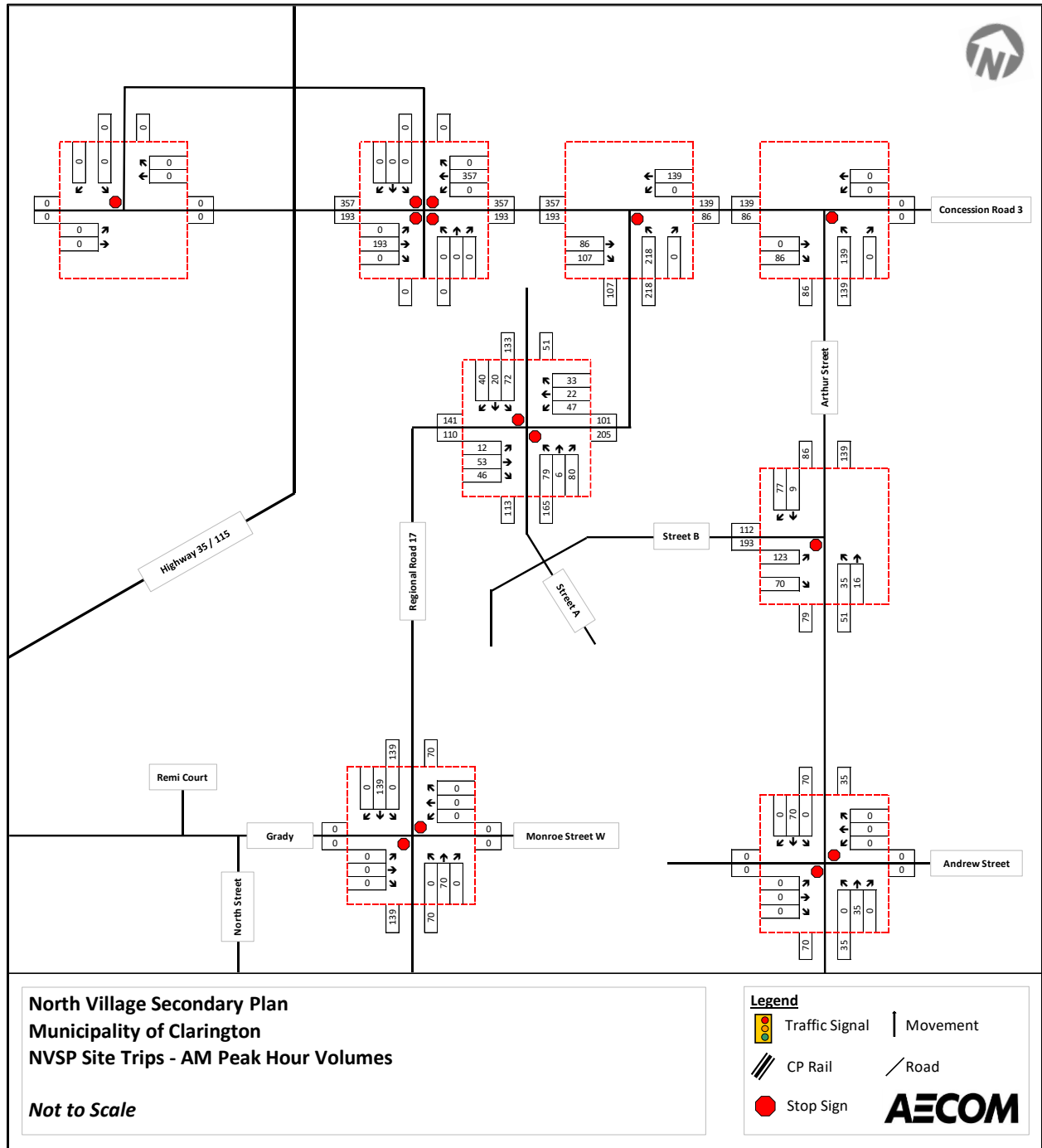
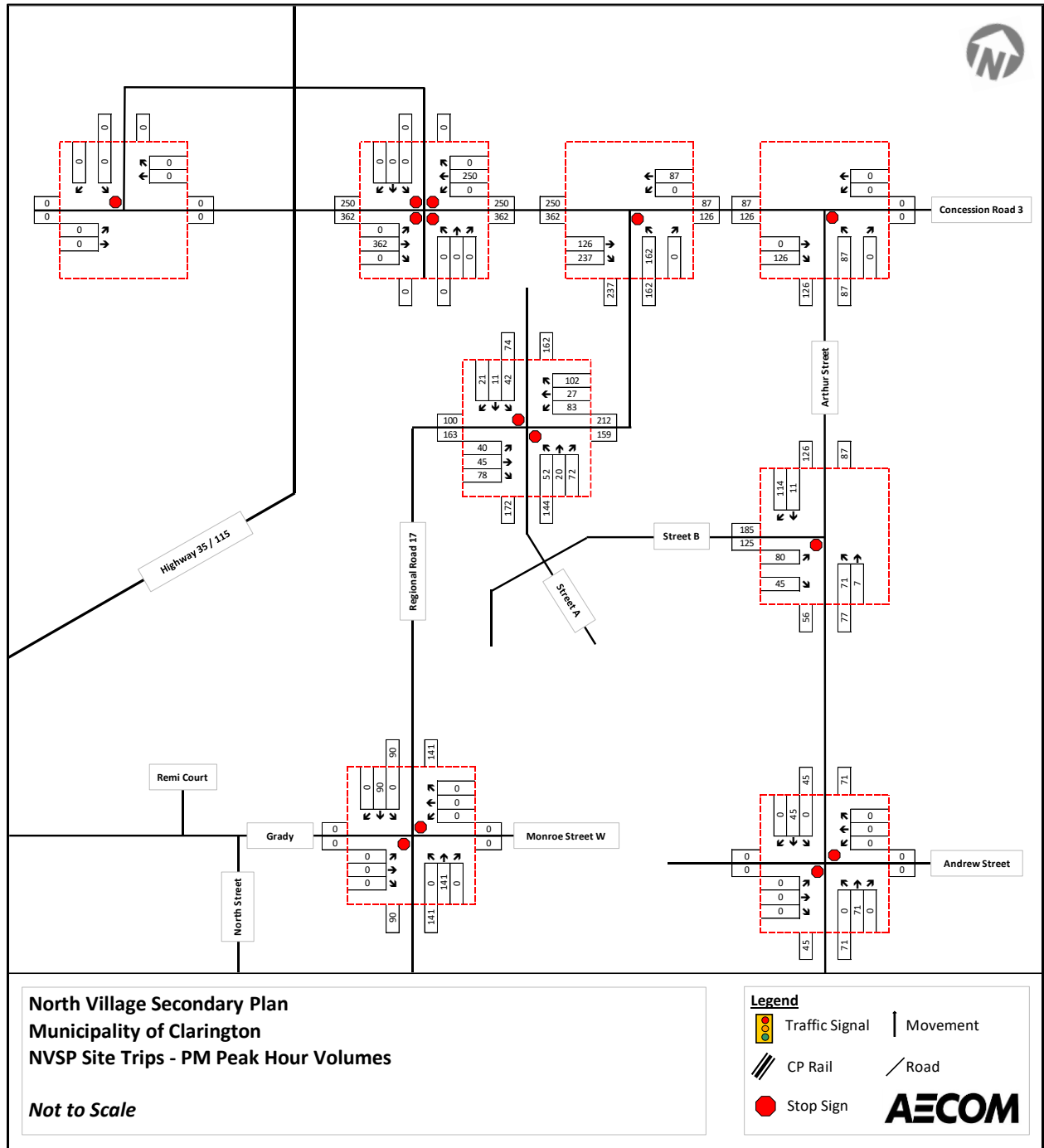




Figure 48: North Village Secondary Plan Site Trips – PM Peak Hour





8.4 Signal Warrant Analysis

In order to assess the need for the installation of traffic signals at the existing and future intersections under the Future Total Conditions volumes in 2041, signal warrant analyses were performed as per the Ontario Traffic Manual (OTM) Book 12 on Traffic Signals.

The signal warrants were conducted using the 2041 AM and PM peak hour volumes for the Future Total Conditions. The sum of the Future Background Conditions turning movement volumes in **Figure 45** and **Figure 46** and the North Village Secondary Plan Site Trips in **Figure 47** and **Figure 48** were used for to develop the Future Total Conditions turning movement volumes.

The signal warrant analysis findings show the need / justification for the installation of traffic signals under the projected 2041 horizon turning movement volumes at four of the study intersections, including two existing intersections (Concession Road 3 & Highway 35/115 Underpass East / North Street and North Street / Manvers Road & Grady Drive / Monroe Street West) and two future intersections (Regional Road 17 & Concession Road 3 and Regional Road 17 & Street A).

It is noted the regional road 17 EA is currently proposing installation of a roundabout at the re-aligned Regional Road 17 / Concession Road 3 intersection. However, construction of the roundabout is still subject to the EA process, approvals, and additional property acquisition needs in the vicinity of the intersection. Given that the EA process is still on-going, this traffic assessment is based on traditional implementable signalized intersection operations at the Regional Road 17 / Concession Road 3 intersection.

The signal warrant analysis findings are summarized in **Table 14**. Signal warrant calculations are included in **Appendix C**.

Table 14: Ramp Terminal Intersection Signal Warrant Analysis Results – 2002 EA Interchange Locations

Intersection	Warranted	Percent Satisfied
Concession Road 3 & Highway 35/115 Underpass West	Not Warranted	-
Concession Road 3 & Highway 35/115 Underpass East / North Street	Warranted	150%
Concession Road 3 & Arthur Street	Not Warranted	-
North Street / Manvers Road & Grady Drive / Monroe Street West	Warranted	150%
Arthur Street & Andrew Street	Not Warranted	-
Regional Road 17 & Concession Road 3	Warranted	150%
Arthur Street & Street B	Not Warranted	-
Regional Road 17 & Street A	Warranted	150%



8.5 Future Total Traffic Volumes

The forecasted turning movement volumes under the Future Total Conditions reflect the sum of the Future Background turning movement volumes in **Figure 45** and **Figure 46** and the North Village Secondary Plan Site Trips in **Figure 47** and **Figure 48**. The final turning movement volumes for the 2041 AM and PM peak hours are shown in **Figure 49** and **Figure 50**, respectively. The figures also show the traffic control device (i.e., signal or stop control) at each intersection. The new intersection at Arthur Street & Street B was coded with a single lane and stop-controlled eastbound approach.

Figure 49: Future Total Conditions Turning Movement Volumes – 2041 AM Peak Hour

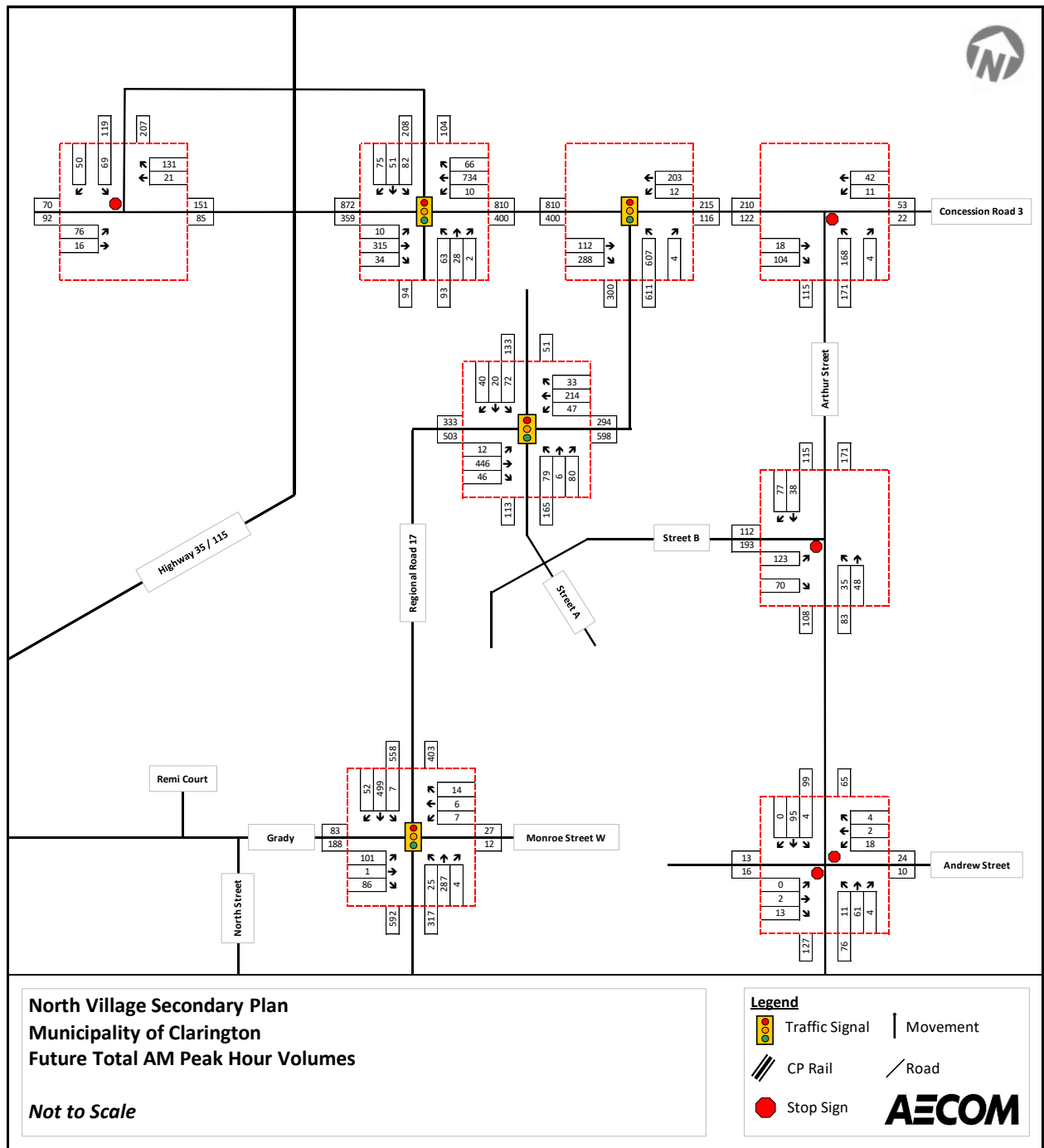
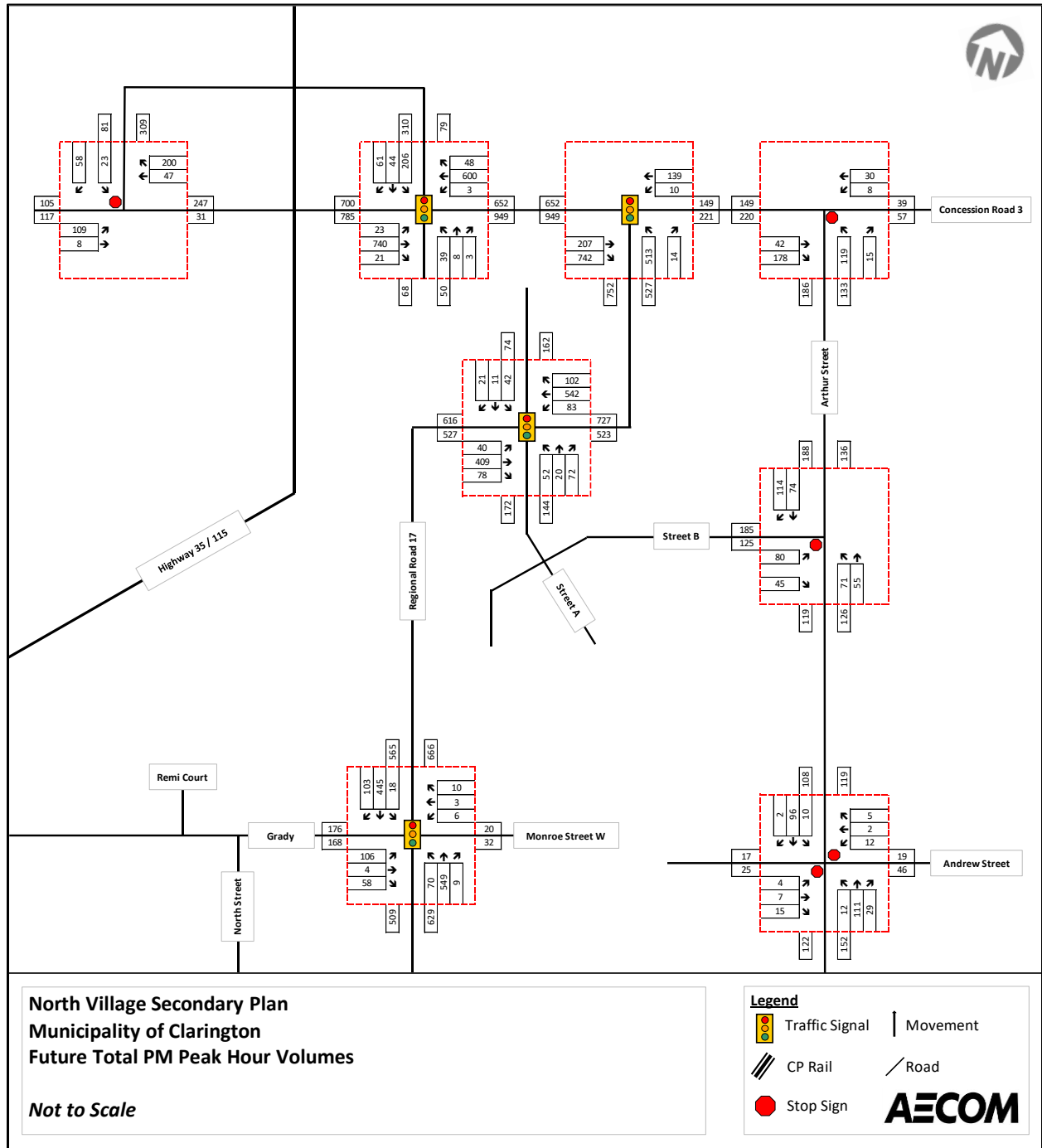




Figure 50: Future Total Conditions Turning Movement Volumes – 2041 PM Peak Hour





8.6 Future Total Traffic Operations

The Future Total Conditions turning movement volumes shown in **Figure 49** and **Figure 50** were used in a further modified version of the Future Background Conditions Synchro model to assess traffic operations in the 2041 AM and PM weekday peak hours. The detailed Synchro reports are included in **Appendix B**.

The 2041 AM peak hour traffic operations under the Future Total Conditions are summarized in **Table 15**. During the AM peak hour, all movements are shown to operate at LOS C or better, with the exception of the shared southbound left/through/right-turn movement at Concession Road 3 & Highway 35/115 Underpass East / North Street which operates at an acceptable LOS D. All of the unsignalized intersections operate at an overall LOS A while all of the signalized intersections operate at an overall LOS B during the AM peak hour.

The 2041 PM peak hour traffic operations under the Future Total Conditions are summarized in **Table 16**. During the PM peak hour, all movements are shown to operate at LOS C or better. At the intersection of Concession Road 3 & Highway 35/115 Underpass East / North Street, the shared eastbound left/through/right-turn movement operates at the critical level threshold (i.e., LOS E or worse or v/c ratio of 0.85 or higher) with a v/c ratio of 0.85. It is also noted that the 95th percentile queue reported for the movement is 138.8 metres in length, extending into the Highway 35/115 speed change lane.

There have been public comments about traffic congestion in the main street area of Newcastle. It is acknowledged that some of the NVSP traffic will be oriented to the main street area, as this is an important and thriving commercial centre that will attract new customers and patrons from the NVSP area. That said, it is noted the primary orientation of travel to/from the NVSP study area is actually via the Highway 35/115 interchange along Concession Road 3.

As noted prior, the Regional Road 17 EA is contemplating installation of a roundabout at the re-aligned Regional Road 17 / Concession Road 3 intersection. Since the roundabout is still subject to the EA process, approvals, and additional property acquisition needs in the vicinity of the intersection, this traffic assessment is based on traditional implementable signalized intersection operations at the Regional Road 17 / Concession Road 3 intersection. In order to maintain acceptable traffic operations, the signalized intersection of regional Road 17 & Concession Road 3 was modified with the addition of an eastbound right-turn storage lane. Like the northbound left-turn storage lane implemented under the Future Background Conditions assessment, the right-turn storage lane accommodates the high volume of traffic travelling between Regional Road 17 and Highway 35/115. The westbound left-turn volume at Regional Road 17 & Concession Road 3 is forecast to be relatively low during the AM and PM peak hours in 2041 and does not require a storage lane to achieve acceptable operations. The noted queueing issue at the eastbound approach to the intersection of Concession Road 3 & Highway 35/115 Underpass East / North Street can be mitigated through intersection improvements to accompany the warranted signalization. The addition of eastbound left- and right-turn storage lanes would allow for a higher capacity, and therefore shorter queues, at the approach. While the Synchro model assessed the intersection using a pretimed (i.e., fixed) signal timing plan, the implementation of an actuated signal with detectors at each approach may also benefit operations by skipping phases which do not see any vehicle demand during certain signal cycles.



Table 15: Future Total Conditions Traffic Operations – 2041 AM Peak Hour

Intersection	Movement	Delay (sec)	LOS	v/c	95th Percentile Queue (m)
Concession Road 3 & Highway 35/115 Underpass West (Unsignalized)	EBLT	6.5	A	0.06	1.5
	WBTR	0.0	A	0.10	0.0
	SBLR	10.8	B	0.18	5.0
	<i>Overall</i>	5.2	A	-	-
Concession Road 3 & Highway 35/115 Underpass East / North Street (Signalized)	EBLTR	7.4	A	0.23	36.5
	WBLTR	19.9	B	0.55	143.3
	NBLTR	28.7	C	0.09	25.8
	SBLTR	36.3	D	0.16	48.9
	<i>Overall</i>	19.7	B	-	-
Concession Road 3 & Arthur Street (Unsignalized)	EBTR	0.0	A	0.09	0.0
	WBLT	1.6	A	0.01	0.2
	NBLR	11.2	B	0.28	8.6
	<i>Overall</i>	5.8	A	-	-
North Street / Manvers Road & Grady Drive / Monroe Street West (Signalized)	EBLTR	18.4	B	0.36	26.3
	WBLTR	14.7	B	0.04	5.9
	NBLTR	9.1	A	0.38	34.6
	SBLTR	10.6	B	0.63	50.4
	<i>Overall</i>	11.6	B	-	-
Arthur Street & Andrew Street (Unsignalized)	EBLTR	9.4	A	0.02	0.6
	WBLTR	10.3	B	0.04	1.0
	NBLTR	1.1	A	0.01	0.2
	SBLTR	0.3	A	0.00	0.1
	<i>Overall</i>	2.4	A	-	-
Regional Road 17 & Concession Road 3 (Signalized)	EBT	16.2	B	0.21	20.4
	EBR	16.2	B	0.20	14.4
	WBLT	18.6	B	0.41	36.6
	NBL	11.0	B	0.68	60.9
	NBR	7.1	A	0.00	0.2
	<i>Overall</i>	14.0	B	-	-
Arthur Street & Street B (Unsignalized)	EBLR	10.9	B	0.25	7.7
	NBLT	3.3	A	0.03	0.6
	SBTR	0.0	A	0.07	0.0
	<i>Overall</i>	6.1	A	-	-
Regional Road 17 & Street A (Signalized)	EBL	5.0	A	0.02	1.3
	EBTR	9.4	A	0.54	67.1
	WBL	7.4	A	0.15	6.1
	WBTR	7.9	A	0.27	32.4
	NBLTR	16.4	B	0.27	20.6
	<i>Overall</i>	10.8	B	-	-



Table 16: Future Total Conditions Traffic Operations – 2041 PM Peak Hour

Intersection	Movement	Delay (sec)	LOS	v/c	95 th Percentile Queue (m)
Concession Road 3 & Highway 35/115 Underpass West (Unsignalized)	EBLT	7.5	A	0.09	2.2
	WBTR	0.0	A	0.16	0.0
	SBLR	10.4	B	0.12	3.0
	<i>Overall</i>	<i>3.9</i>	<i>A</i>	<i>-</i>	<i>-</i>
Concession Road 3 & Highway 35/115 Underpass East / North Street (Signalized)	EBLTR	21.2	C	0.85	138.8
	WBLTR	10.0	B	0.68	96.1
	NBLTR	15.5	B	0.12	10.5
	SBLTR	28.4	C	0.72	64.2
	<i>Overall</i>	<i>18.3</i>	<i>B</i>	<i>-</i>	<i>-</i>
Concession Road 3 & Arthur Street (Unsignalized)	EBTR	0.0	A	0.15	0.0
	WBLT	1.6	A	0.01	0.2
	NBLR	10.7	B	0.20	5.5
	<i>Overall</i>	<i>3.8</i>	<i>A</i>	<i>-</i>	<i>-</i>
North Street / Manvers Road & Grady Drive / Monroe Street West (Signalized)	EBLTR	18.4	B	0.36	25.9
	WBLTR	14.6	B	0.03	4.5
	NBLTR	18.3	B	0.80	99.4
	SBLTR	21.0	C	0.65	102.9
	<i>Overall</i>	<i>19.4</i>	<i>B</i>	<i>-</i>	<i>-</i>
Arthur Street & Andrew Street (Unsignalized)	EBLTR	9.9	A	0.04	0.9
	WBLTR	10.5	B	0.03	0.7
	NBLTR	0.6	A	0.01	0.2
	SBLTR	0.7	A	0.01	0.2
	<i>Overall</i>	<i>2.1</i>	<i>A</i>	<i>-</i>	<i>-</i>
Regional Road 17 & Concession Road 3 (Signalized)	EBT	13.0	B	0.31	19.5
	EBR	19.2	B	0.50	18.4
	WBLT	12.9	B	0.22	22.4
	NBL	17.8	B	0.68	82.7
	NBR	8.4	A	0.01	1.2
	<i>Overall</i>	<i>17.3</i>	<i>B</i>	<i>-</i>	<i>-</i>
Arthur Street & Street B (Unsignalized)	EBLR	11.5	B	0.20	5.6
	NBLT	4.6	A	0.06	1.4
	SBTR	0.0	A	0.12	0.0
	<i>Overall</i>	<i>4.6</i>	<i>A</i>	<i>-</i>	<i>-</i>
Regional Road 17 & Street A (Signalized)	EBL	5.3	A	0.19	1.7
	EBTR	6.8	A	0.54	30.5
	WBL	11.7	B	0.25	8.8
	WBTR	18.3	B	0.71	87.7
	NBLTR	15.6	B	0.21	17.4
	<i>Overall</i>	<i>13.3</i>	<i>B</i>	<i>-</i>	<i>-</i>



8.7 Other Transportation Network Considerations

8.7.1 Arthur Street Rail Crossing

South of the study area, Arthur Street intersects a rail corridor at an at-grade level crossing. A grade-separation of the subject level road-rail crossing is not proposed with this transportation study. However, it is recommended that as development of the NVSP area comes to fruition, and Traffic Impact Studies are submitted, the need for grade-separation should be considered.

This would be based on the warrants and guidelines published by Transport Canada for determining the need for grade-separation. These warrants would consider a variety of factors such as road and rail volumes, rail speeds, traffic queueing, vehicle delays, among other factors.

8.7.2 Regional Road 17 Rail Grade Separation

The existing rail corridor passes over Regional Road 17 in a narrow single-span structure. The edge of the travelled portion of the road extends directly to the bridge abutments (that is, no curbs) and there are no provisions for pedestrians.

Given the limitations of this structure to accommodate two to three lanes of traffic, cycling facilities, and pedestrian infrastructure, Clarington and Durham Region should assess the need for replacing or modifying the structure. This will also need consultation with the rail authority.

Various parameters should be considered, such as the age and condition of the structure, vertical clearance, and horizontal span requirements to accommodate needs for all users (traffic, cycling and pedestrians).

8.7.3 Need for Traffic Calming South of Community

It is noted that traffic along Regional Road 17 and Arthur Street will increase in the future due to general traffic increases, area development such as from the Approved Lands, as well as the NVSP study area development. If concerns arise from the community about traffic volumes, vehicle speeds, or protection of vulnerable users, Clarington and Durham Region should consider the need for traffic calming solutions, such as traffic control devices and minor engineering modifications (for example, pinch points, chicanes, parking zones, textured pedestrian crossings, etc). The implementation of traffic calming measures should be based on detailed study of traffic volumes and speeds, and an assessment of appropriate devices or measures for implementation.



9 Future Work and Commitments

Given the scale of development and long planning horizon for the North Village Secondary Plan area and the surrounding lands, additional transportation review and study is suggested as the development comes to fruition. This should include:

- **Transportation Study:** Completion of additional transportation and traffic impact studies to satisfy the Durham and Clarington development approval process specific to submitted Draft Plans of Subdivision and/or Site Plans. The timing for the need of these studies, as well as the scope of work should be reviewed with municipal and regional staff to confirm the approach and assumptions, but it is generally noted that the work will include a comprehensive and detailed assessment of traffic conditions, demand forecasts, traffic impacts, improvement needs (road widenings, auxiliary turn lanes, traffic controls, pedestrian and bicycle facilities, and transit provisions, as applicable), and basic design elements (e.g. turn lane storage lengths);
- **Transit Planning:** Liaise with Durham Region Transit throughout the future development planning process to:
 - Monitor the future growth and service demand needs;
 - Plan for transit routes along the area arterial and collector road network; and
 - Ensure that sufficient space is protected for transit stops as part of the road right-of-way (per the Region of Durham's Standard Drawings S-500 Series – Transit and / or DRT's Transit Stop Guidelines, as appropriate).