

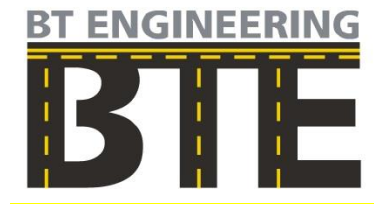


Environmental Study Report

Bell Farm Road EA Study

Schedule 'C' Municipal Class Environmental Assessment

July 2017



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Table of Contents

1.0 INTRODUCTION	1	5.2.1 Tree Survey	19
1.1 Multi-Modal Active Transportation Master Plan	1	5.3 Social Environment	19
1.2 Bell Farm Road Class EA	6	5.3.1 Land Use Planning	19
1.2.1 Study Area	7	5.3.2 Noise	19
1.2.2 Study Design	7	5.4 Cultural/ Heritage Environment	19
1.3 Phases 3 & 4 of the Class EA Study	8	5.4.1 Archaeology	19
2.0 CONSULTATION	9	5.4.2 Built Heritage and Cultural Heritage Landscape	19
2.1 Phases 1 & 2	9	5.4.3 Natural Heritage Impact Assessment	19
2.2 Phase 3	9	5.5 Economic Environment	20
2.2.1 Contact List	9	6.0 EVALUATION OF DESIGN ALTERNATIVE CONCEPT	21
2.2.2 Property Owners	9	6.1 Impact Mitigation	25
2.2.3 Interest Groups and Agencies	9	6.2 Next Steps	28
2.2.4 First Nations	10	7.0 RECOMMENDED PLAN	29
3.0 EXISTING TRAFFIC OPERATIONS ASSESSMENT	11	7.1 Description of Recommended Plan	29
3.1 Existing Conditions	11	7.2 Technically Preferred Alternative	29
3.2 Existing Traffic Operations	11	7.2.1 Roadway Alternative	29
3.3 Future Traffic Operations	12	7.2.2 Refinements	29
4.0 DESIGN ALTERNATIVES	14	7.2.3 Effects and Mitigation	29
4.1 Planning Alternatives	14	7.3 Property Requirements	29
4.2 Bell Farm Road Cross Section Alternatives	14	7.4 Statement of Flexibility	29
4.3 Roadway Preliminary Design Alternatives	14	8.0 FUTURE ACTIVITIES	30
4.4 Curve Radii Geometric Review	14	9.0 PLATES	31
4.5 Other Considerations	15		
5.0 PROJECT ENVIRONMENTS	19	Glossary of Terms	
5.1 Physical Environment	19	List of Figures	
5.1.1 Water Supply	19	Figure 1: Project Location	1
5.1.2 Sanitary Sewer	19	Figure 2: Municipal Class EA Planning and Design Process	3
5.1.3 Storm Sewer	19	Figure 3: Preferred Road Network 2031 (from MMATMP)	4
5.2 Natural Environment	19	Figure 4: Preferred Cycling, Pathways & Trails Network 2031 (from MMATMP)	4

Figure 5: Preferred Sidewalk Network 2031 (from MMATMP)..... 5
 Figure 6: Preferred Road Network 2051 (from MMATMP)..... 5
 Figure 7: 2031 ROW Widths for Bell Farm Road (Source: City of Barrie Official Plan 2014)..... 6
 Figure 8: 2031 ROW Widths for Bell Farm Road (Source: City of Barrie MMATMP 2014)..... 7
 Figure 9: Study Area..... 7
 Figure 10: Existing Lane Configuration and Traffic Control 11
 Figure 11: Bell Farm Road Pedestrian Traffic..... 11
 Figure 12: Existing (2016) Traffic Volumes – PM Peak Hour..... 11
 Figure 13: 2031 Future Traffic Volumes – PM Peak Hour 12
 Figure 14: Reverse Curves on Bell Farm Road 15
 Figure 15: Cross Section Alternatives..... 16
 Figure 16: Concept Plan - Bell Farm Road Alternative 1: MMATMP Recommendation 17
 Figure 17: Concept Plan - Bell Farm Road Alternative 2: Improved Geometrics 17
 Figure 18: Concept Plan - Bell Farm Road Alternative 3: Constrained ROW 18

List of Tables

Table 1: Active Transportation Measures 2
 Table 2: MMATMP Recommended Improvements for Bell Farm Road – 2031 Horizon..... 6
 Table 3: Traffic Analysis Results – Existing, PM Peak Hour, Signalized 12
 Table 4: Traffic Analysis Results – Existing, PM Peak Hour, Unsignalized 12
 Table 5: Traffic Analysis Results – 2031 Projection, PM Peak Hour, Signalized 13
 Table 6: Traffic Analysis Results – Existing, PM Peak Hour, Unsignalized 13
 Table 7: Design Criteria 14
 Table 8: Preliminary Design Alternative Comparison..... 14
 Table 9: Assessment of Design Alternatives 22
 Table 10: Summary of Potential Environmental Effects and Proposed Mitigations 26

List of Appendices

Appendix A Study Design
 Appendix B Record of Consultation
 Appendix C Traffic Operations Assessment Report
 Appendix D Municipal Infrastructure Review Report
 Appendix E Arborist Report
 Appendix F Land Use Planning Report
 Appendix G Traffic Noise Impact Report
 Appendix H Stage 1 Archaeology Report
 Appendix I Built Cultural Heritage Report
 Appendix J Natural Heritage Impact Assessment
 Appendix K Design Alternative – Cost Estimates
 Appendix L Staff Report

1.0 INTRODUCTION

This report has been prepared to meet the requirements of the Municipal Class EA (Amended 2015) for a roadway project in the City of Barrie within the urban area along Bell Farm Road (from Duckworth Street westerly to St. Vincent Street), as shown in **Figure 1**. These improvements were identified as a need in the City's Multi-Modal Active Transportation Master Plan and have been carried forward for completion of the remaining phases of the Class EA process. The planning process has been open and transparent including providing a draft study design report (see **Appendix A**) as an initial step in the consultation process, providing agencies and the public an opportunity to review and comment on the work program before technical activities were initiated. This work program also included a discretionary initial public information meeting to allow the public to review alternatives before the technical evaluation, and the EA Team to listen to members of the public and property owners early in the decision-making process. The purpose of the Environmental Assessment (EA) is to document the planning process, evaluation of alternatives, and technical recommendations and to define mitigation measures for residual effects. Mitigation includes staged implementation of the long term official plan right-of-way to carry out improvements as adjacent properties are developed. This report describes the planning process, technical recommendations and commitments by the City for mitigation.

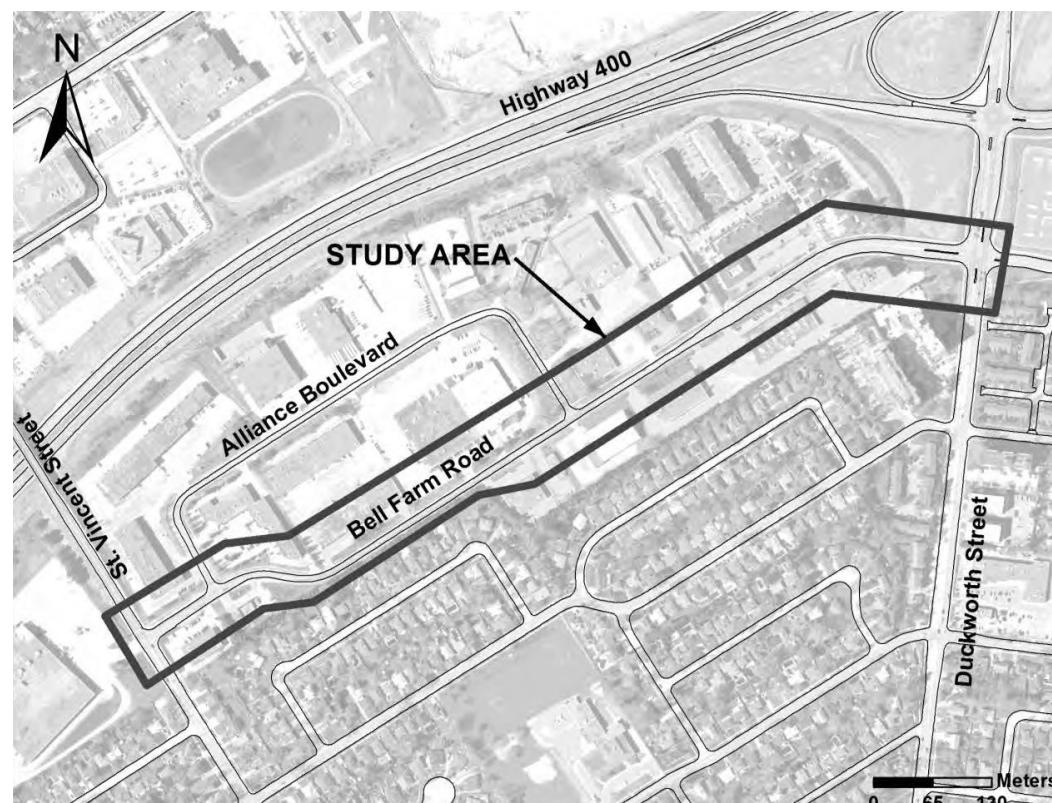


Figure 1: Project Location

1.1 Multi-Modal Active Transportation Master Plan

This section summarizes the recommendations from the City of Barrie's Multi-Modal Active Transportation Master Plan (MMATMP) completed in January, 2014. For a full assessment, please refer to the original report available on line at

<http://www.barrie.ca/City%20Hall/growth/Pages/DocumentsResources.aspx>.

The MMATMP was conducted in accordance with the Master Plan process as prescribed in the "Class Environmental Assessment for Municipal Road projects, October 2000, as amended in 2007 and 2011" (the Class EA) document. The MMATMP addressed Phases 1 and 2 of the five-phase Municipal Class EA Process, as shown in **Figure 2**, for City-wide transportation improvements, and identified the need for a roadway and intersection improvements to accommodate growth to 2031 and beyond.

Alternative Planning Solutions represent alternative ways or methods of addressing the problem to be solved by the project. These reflect different strategies and include the "Do Nothing" alternative (maintaining the status quo). Following the assessment of Alternative Planning Solutions, those alternatives judged to address the problem statement will be carried forward and will form the Recommended Planning Solution. The recommended planning solution will address the problem statement to ensure the safety of the travelling public, while providing the best overall balance between transportation engineering objectives, life cycle costs, and other environmental, cultural, socio-economic, and land use planning objectives.

In determining the preferred planning alternative for the City, Transportation Network Alternatives (Alternative Planning Solutions) were analyzed in the MMATMP. These included:

- 1) Alternative 1: Do nothing.
- 2) Alternative 2: Low/existing modal share – auto-oriented "status quo" approach.
- 3) Alternative 3: Medium modal share – increased emphasis on non-auto modes.
- 4) Alternative 4: High modal share - strong emphasis on non-auto modes.

A detailed evaluation of the Transportation Network Alternatives (Alternative Planning Solutions) is contained in **Section 5.0** of the MMATMP.

Upon evaluation of the four alternatives, Alternative 3 was identified as the preferred option. An overall vision for active transportation was developed based on parameters developed with the City in order to achieve the medium modal share alternative goals. The parameters used as the basis for developing the active transportation network are summarized in **Table 1**.

Table 1: Active Transportation Measures

Area	Sidewalk	Cycling and Pathways
Annexed Lands	New local streets (except for short cul-de-sacs) will have sidewalks on both sides	Integrated pathway network Maximum on-road network mesh width: 1000m–1500m
Citywide	Arterials and collectors will have sidewalks on both sides (new sidewalks to be 2.0m wide where feasible) Local streets: sidewalks on local streets should be 1.5m wide.	Arterials and 4+ lane collectors: Buffered bicycle lanes to be constructed only if road is being widened or reconstructed; regular bicycle lanes or multi-use pathways to be put in place if no widening is required 2-3 lane Collectors: Bicycle lanes connecting links to schools
Pre-2010 Barrie	Local streets will have at least one sidewalk; two sidewalks if street segment is within approximately 250m of a school. Infill program to implement additional sidewalks where other road construction is not planned	Addition of pathways in major park corridors Ideal maximum on-road network mesh width: 1000m–1500m, adjusted according to physical constraints

The preferred multi-modal active transportation network for the 2031 time horizon, as presented in the MMATMP, is provided in **Figure 3 to Figure 5**. While the MMATMP was developed based on the 2031 time horizon, 2051 was also considered in identifying corridors which may potentially exceed capacity post-2031. The potential road network for 2051, as presented in the MMATMP, is provided in **Figure 6**.

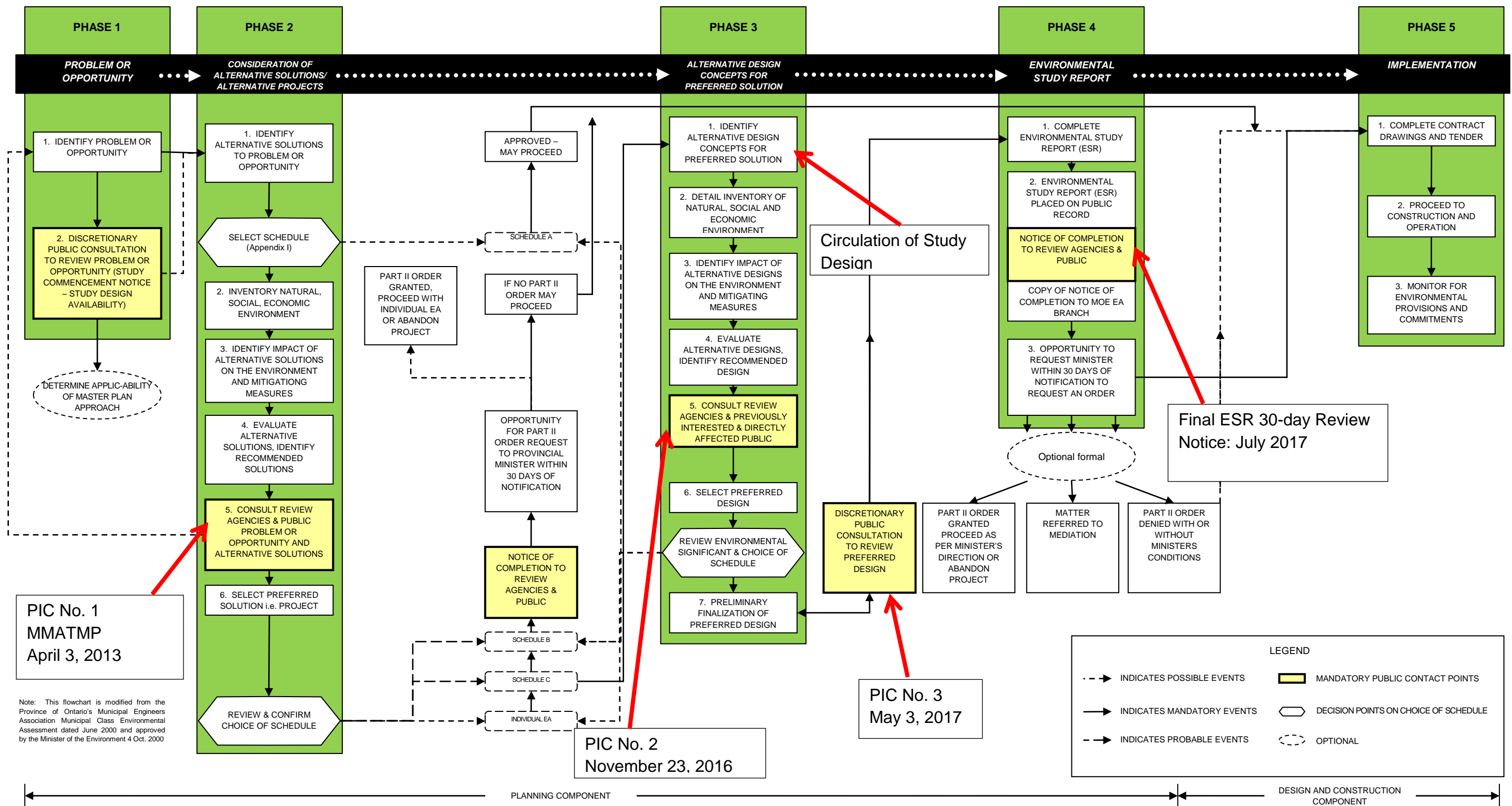


Figure 2: Municipal Class EA Planning and Design Process

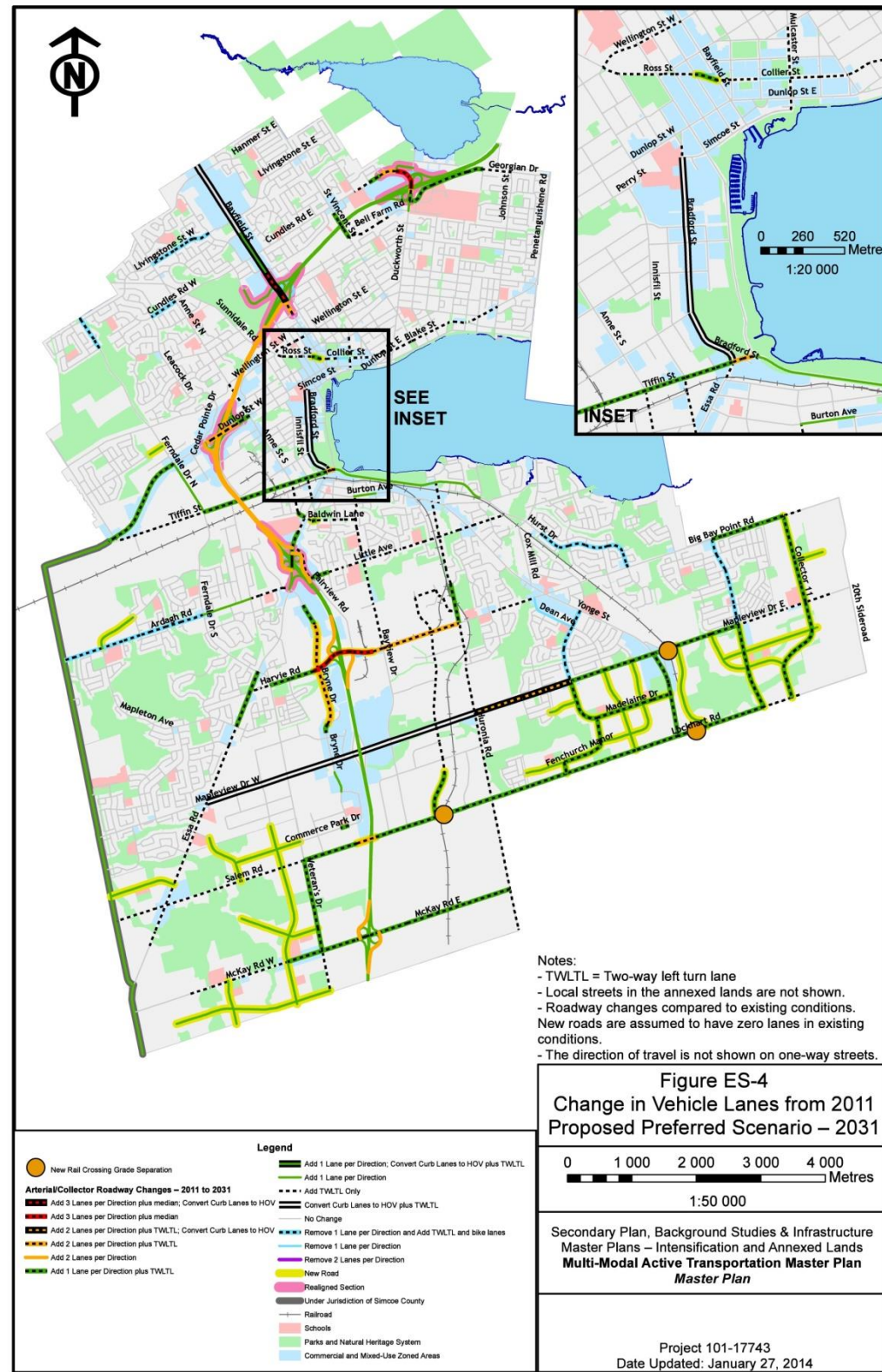


Figure 3: Preferred Road Network 2031 (from MMATMP)

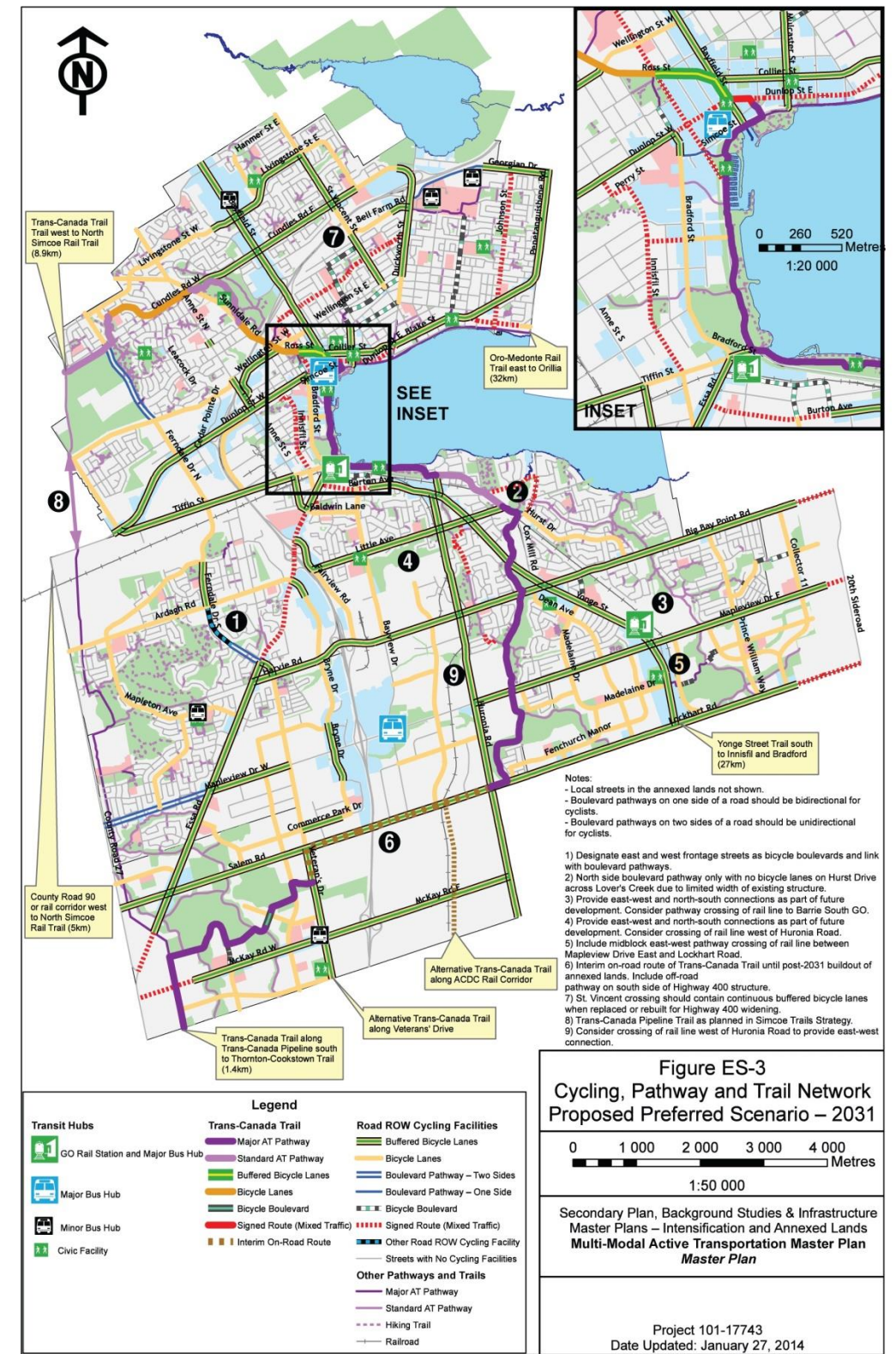


Figure 4: Preferred Cycling, Pathways & Trails Network 2031 (from MMATMP)



Figure 5: Preferred Sidewalk Network 2031 (from MMATMP)

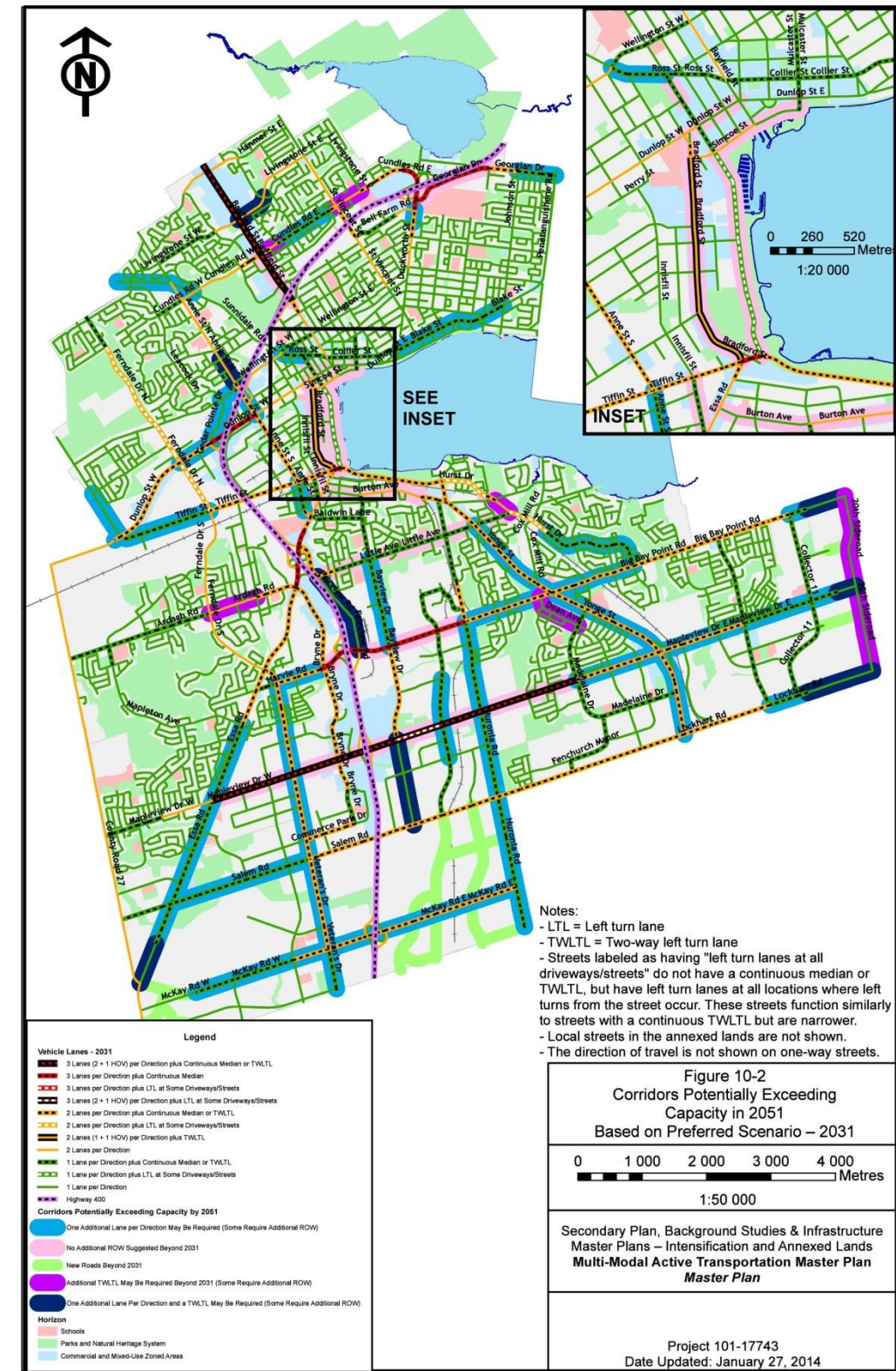


Figure 6: Preferred Road Network 2051 (from MMATMP)

1.2 Bell Farm Road Class EA

A Class Environmental Assessment (EA) was initiated by the City of Barrie in July 2016 to review the previously completed Phases 1 and 2 and then to undertake the completion of Phases 3 and 4 of the Municipal Class EA Process for the widening of Bell Farm Road, with provisions for pedestrians and cyclists, from St. Vincent Street easterly to the existing 4-lane cross section east of Alliance Boulevard, and maintaining the 4-lane cross section with improvements for pedestrians and cyclists from east of Alliance Boulevard to Duckworth Street. The recommended improvements for the sections of Bell Farm Road as identified in the MMATMP are in **Table 2** below.

Table 2: MMATMP Recommended Improvements for Bell Farm Road – 2031 Horizon			
Section	Road Network	Cycling, Pathway & Trails Network	Sidewalk Network
St. Vincent to east of Alliance Blvd (within existing 2-lane section)	Add Two-way Continuous Left Turn Lane (TWCLTL)	Bicycle Lanes	Add Sidewalks
East of Alliance Blvd (within existing 4-Lane section)	No Additional general lanes	Buffered Bicycle Lanes	No Change

The Official Plan and MMATMP right-of-way (ROW) widths recommended for protection are illustrated in **Figure 7** and **Figure 8** and are 26 m and 26 m/29 m respectively.

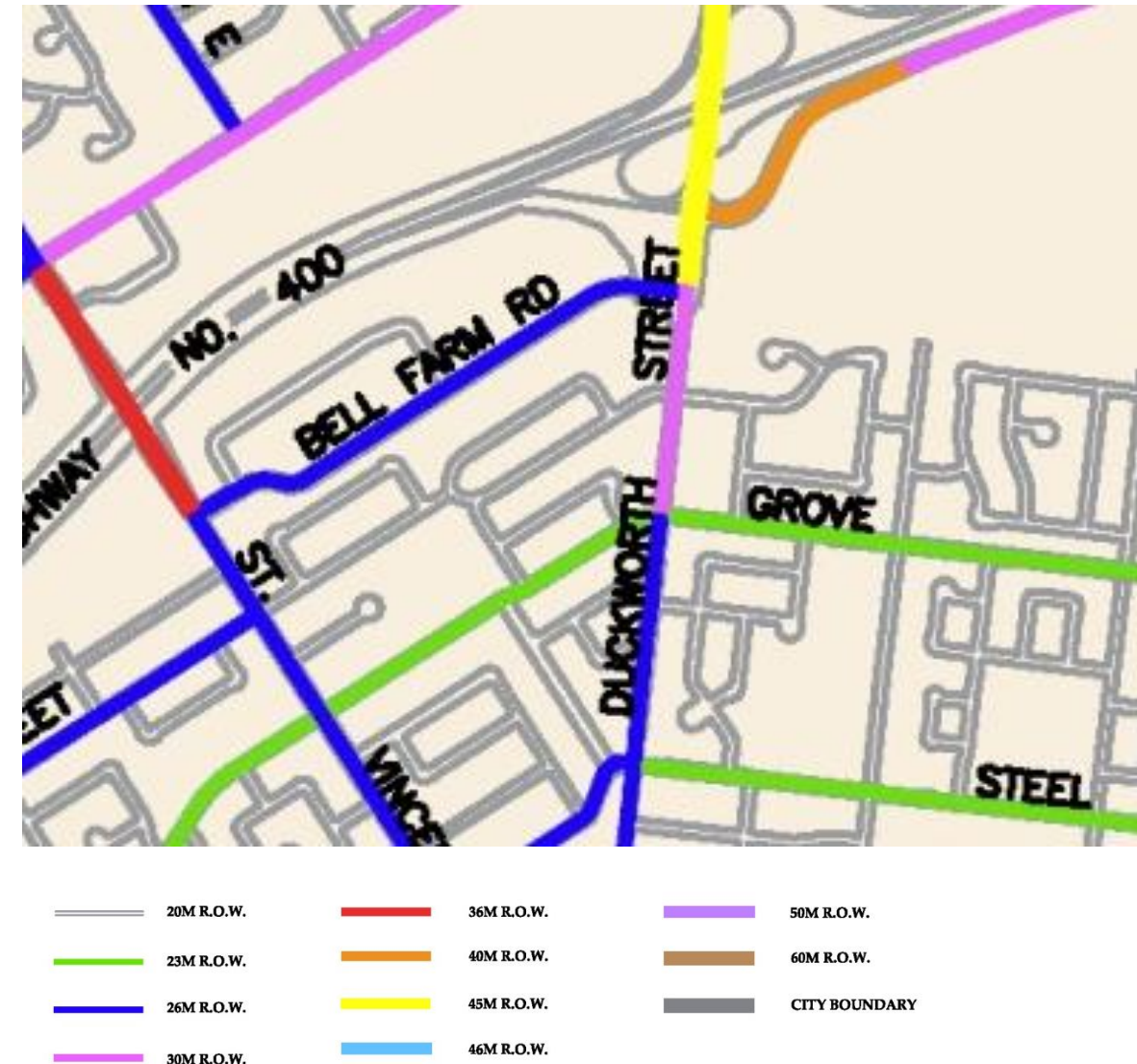


Figure 7: 2031 ROW Widths for Bell Farm Road (Source: City of Barrie Official Plan 2014)

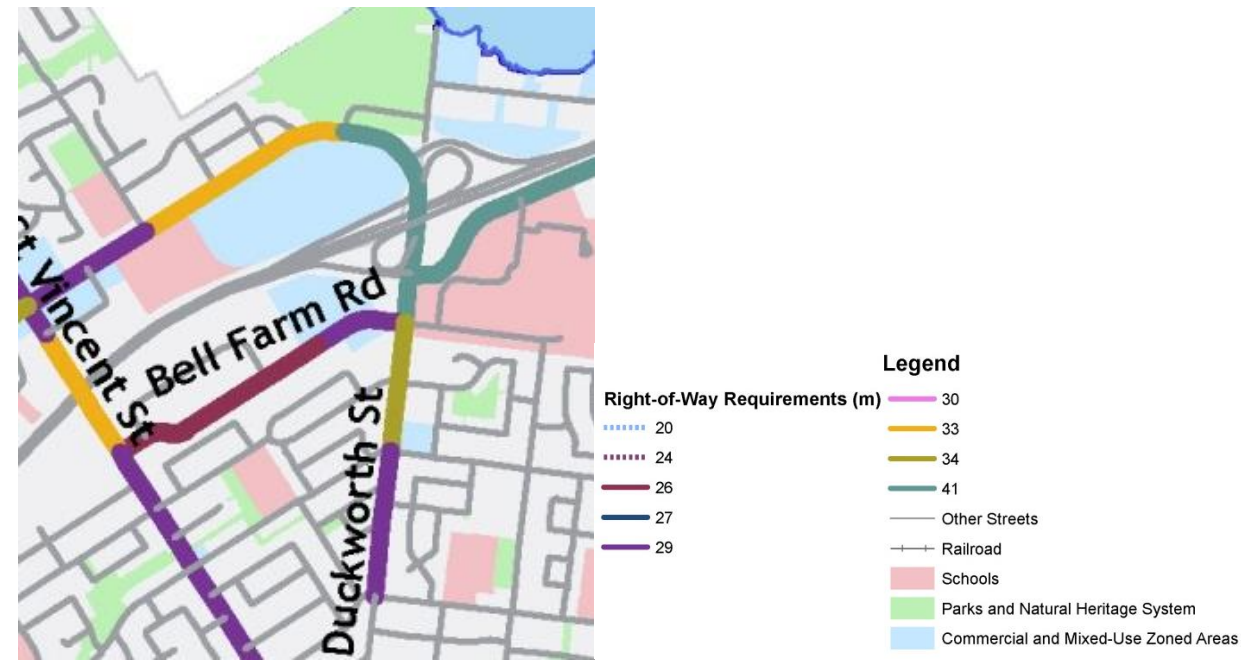


Figure 8: 2031 ROW Widths for Bell Farm Road (Source: City of Barrie MMATMP 2014)

This EA study documents the transportation need and the Recommended Plan to address current and future operational needs considering all modes of travel. The improvements will provide all users (pedestrians, bikes and vehicular traffic) with a safe and convenient route to travel within the City. The roadway plan will establish the servicing for the land use plan to accommodate the residential, industrial and commercial uses for the next 30-50 years. The plan will need to have flexibility to accommodate future modifications to the lot fabric and land uses.

The EA has examined alternatives for roadway improvements to Bell Farm Road, taking into account property impacts, transportation safety and traffic operations.

As part of the transportation improvements, municipal infrastructure renewal is required. The existing 200 mm DI watermain is recommended to be replaced. The 250 mm AC sanitary sewer will be assessed for capacity. A stormwater management system is required for this roadway including a minor piped system that can convey the 5 year critical storm event and a major system that will convey the regulatory storm overland within the right-of-way. Stormwater quantity control (via oversized sewers) and quality control via low impact development is required.

1.2.1 Study Area

The study area is located on Bell Farm Road within the City of Barrie. The study area extends along Bell Farm Road from St. Vincent Street to Duckworth Street. The Study Area is illustrated in **Figure 9**.

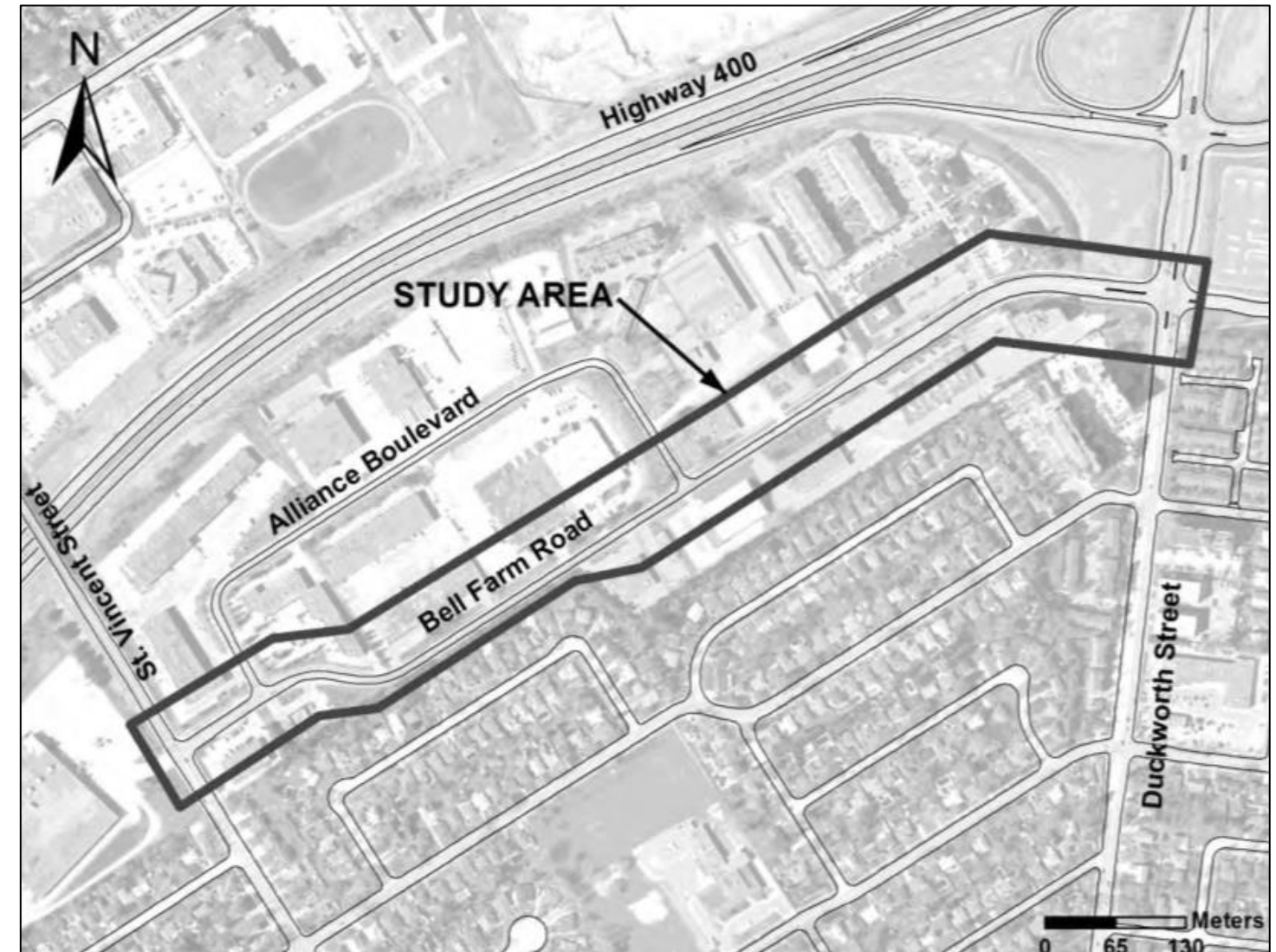


Figure 9: Study Area

1.2.2 Study Design

A draft Study Design was circulated to the public, agencies and stakeholders for comments at the outset of the project. The Study Design presented the work program, intended approach to complete the study, consultation plan, and detailed project schedule and identified the scope of the study's technical requirements.

The Study Design document established the foundation for all of the remaining environmental planning and public consultation processes. The Study Design allows the early identification of the major issues and concerns, and in addition, recognizes areas of consensus or agreement. The preliminary identification and assessment of Planning Solutions/Alternatives to the Undertaking in the Study Area were presented in the Study Design for public/agency review and comment.

The final Study Design can be found in **Appendix A**.

1.3 Phases 3 & 4 of the Class EA Study

This project was undertaken as a standalone EA study and meets the requirements of the provincial EA Act following the “Municipal Class Environmental Assessment” process for a Schedule ‘C’ project as amended in 2015. This document specifies the procedures required to plan specific road projects according to an approved planning process. This is a self-assessment process that includes mandatory public consultation.

The EA has examined alternatives for the roadway improvements along Bell Farm Road from St. Vincent Street to Duckworth Street.

The approach to the study includes the MOECC’s five guiding principles for EA studies, namely:

- Consider all reasonable alternatives;
- Provide a comprehensive assessment of the environment;
- Utilize a systematic and traceable evaluation of net effects;
- Undertake a comprehensive public consultation program; and
- Provide clear and concise documentation of the decision-making process and public consultation program.

The Class EA process includes an evaluation of all reasonable alternatives and the selection of a preferred alternative(s) with acceptable effects (including avoidance and mitigation of any residual effects) on the natural and social/cultural environments.

The EA process entails five phases. Phases 1 and 2 were previously completed during the Multi-modal Active Transportation Master Plan (MMATMP) and this EA study subsequently completed Phases 3 and 4, finalizing the ESR in 2017.

The following is the specific breakdown of tasks by phase for a Schedule ‘C’ project¹:

Phase 1: Identify the Problem (completed by MMATMP)

- Step 1: Identification and description of the problem or opportunity
- Step 2: Discretionary Public consultation (Draft Study Design available on the City’s website)

Phase 2: Alternative Solutions (completed by MMATMP)

- Step 1: Identification of alternative solutions to the problem
- Step 2: Identify the Study Area and a general inventory of the natural, social and cultural environments.
- Step 3: Identification of the net positive and negative effects of each alternative solution
- Step 4: Review and validation of Alternative Solutions considered by TMP and preliminary recommendation of a preferred solution
- Step 5: Identification of reasonable design alternatives for the preferred solution
- Step 6: Public consultation at PIC No.1.
- Step 7: Confirmation; finalization of Study Design for work program; and refinements and/or addition of design alternatives to be carried forward for Phase 3.
- Step 8: Selection of the preferred solution, following public and agency review.

Phase 3: Alternative Design Concepts for the Preferred Solution

- Step 1: Public consultation at PIC No. 2.
- Step 2: Identification of alternative designs.
- Step 3: Preparation of a detailed inventory of the social and economic environments.
- Step 4: Identification of the potential impact of the alternative designs.
- Step 5: Evaluation of the alternative designs.
- Step 6: Public consultation at PIC No. 3.

Phase 4: Environmental Study Report (ESR)

- Step 1: Completion of the ESR
- Step 2: File the ESR and Notice of Completion
- Step 3: 30-day public review period

Phase 5: Implementation

Future phase after this Study

The Municipal Class EA process is illustrated in **Figure 2**.

This study will only be completed to the end of the municipal EA process (i.e. Phase 4).

¹ Municipal Class Environmental Assessment, Municipal Engineers Association, 2011.

2.0 CONSULTATION

The following sections provide a summary of the consultation activities held during the study.

2.1 Phases 1 & 2

PIC No. 1 for this project was previously held during the MMATMP.

2.2 Phase 3

Notices for the Study Commencement, Public Information Centres (PIC), and Notice of Filing Study Completion were publicized as follows:

- Study Commencement Notice – Barrie Examiner, September 22, 2016 and September 24, 2016
- PIC No. 1 – occurred as part of the MMATMP
- PIC No. 2 – Barrie Examiner on November 10, 2016 and November 12, 2016
- PIC No. 3 – Barrie Examiner on April 20, 2017 and April 22, 2017
- Filing of Study Completion – July 2017

The second PIC was held on Wednesday November 23, 2016 from 4:00 pm to 7:00 pm.

All property owners within the Study Area were mailed individual flyers and comment sheets inviting them to attend PIC No. 2; those who have indicated they wished to be kept informed of the study progress were informed of PIC No. 3 via mailed letter or email (email utilized if provided by resident).

Display panels (text, photos and drawings) were set up around the perimeter of the room for leisurely viewing. The Municipal Class EA Process, Study Objectives and Purpose, Project Purpose, Study Area & Existing Conditions, MMATMP Recommendations, Preliminary Alternatives Concepts and Next steps were presented and public/agency input/feedback was encouraged.

Twelve (12) people registered at the second PIC. Each person was encouraged to provide a written response to any issues or concerns. A total of twelve (12) comment sheets, letters or e-mails were submitted at the PIC and during the subsequent 2 week comment period.

Refer to **Appendix B** for the Notice of Study Commencement, full PIC No. 2 and No. 3 Summary Reports and the Notice of Study Completion.

2.2.1 Contact List

A property owner/public mailing list was provided by the City at the outset of the study. Additions to the list were sought via the EA Commencement Notice and Notices of PIC's in addition to comment sheets at the PIC's. The lists were updated throughout the duration of the study.

An agency contact list was developed and expanded throughout the study. See **Section 2.2.3** Interest Groups and Agencies for the list of agencies contacted and contact persons.

2.2.2 Property Owners

No individual meetings were held with adjacent property owners outside the public PIC events.

2.2.3 Interest Groups and Agencies

All agencies or groups that may have had an interest in the project or any documentation to contribute to the study were contacted at the start of the EA for their input. All agencies were invited to attend the three PIC meetings.

The following agencies were contacted for information and/or input into the project:

- EA Coordination, Environmental Unit Lands & Economic Development Indigenous & Northern Affairs Canada
- A Channel Barrie
- Albarrie Canada Limited
- Bell Canada
- Canadian Home Builders Association-Simcoe County
- Ducks Unlimited
- Enbridge
- Fisheries and Oceans Canada
- Greater Barrie Chamber of Commerce
- Hydro One Network
- Innisfil Hydro Distribution Systems Ltd.
- Ministry of Tourism, Culture and Sport
- Ministry of Economic Development, Employment & Infrastructure
- Ministry of the Environment and Climate Change
- Ministry of Energy and Infrastructure
- Ministry of Municipal Affairs and Housing
- Ministry of Transportation
- Ministry of Agriculture, Food and Rural Affairs
- Ministry of Natural Resources and Forestry
- Lake Simcoe Region Conservation Authority
- Nottawasaga Valley Conservation Authority
- Ontario Clean Water Agency
- Ontario Provincial Police
- Ontario Realty Corporation
- PowerStream
- Rogers Cable Inc.
- Service Ontario
- Simcoe County Admin. Centre
- Simcoe County District School Board

- Simcoe County Heavy Construction Association
- Simcoe Muskoka Catholic District School Board
- Springwater Township
- Tourism Barrie
- Town of Innisfil

Appendix B includes select correspondence received from interested agencies and First Nations contacts.

2.2.4 First Nations

The following First Nations groups were contacted at various milestones throughout the project, including EA Commencement, the PIC's and Study Completion.

- Ontario Ministry of Aboriginal Affairs
- Algonquins of Ontario Consultation Office
- Barrie Friendship Centre
- Alderville First Nation
- Beausoleil First Nation (Christian Island)
- Chippewas of Georgina Island First Nation
- Chippewas of Mnjikaning (Rama)
- Curve Lake First Nation
- Georgian Bay Métis Council
- Hiawatha First Nation
- Mississauga's of Scugog Island First Nation
- Moose Deer Point First Nations
- Wahta Mohawk First Nation
- William Treaties First Nation
- Metis Nation of Ontario
- Moon River Metis Council

Appendix B includes select correspondence.

3.0 EXISTING TRAFFIC OPERATIONS ASSESSMENT

3.1 Existing Conditions

Bell Farm Road is an existing 2-lane major collector with a rural cross section servicing commercial/industrial properties (Section A). The east end of Bell Farm Road includes a 280 m section that is primarily urbanized with 4 lanes (Section B) and serves a mix of commercial and multi-unit residential properties. The pavement structure of Bell Farm Road is approaching the end of its service life and requires reconstruction. The road structure will require renewal activities in the near future.

The existing lane configuration and traffic control at each intersection within the study area is presented in **Figure 10**.

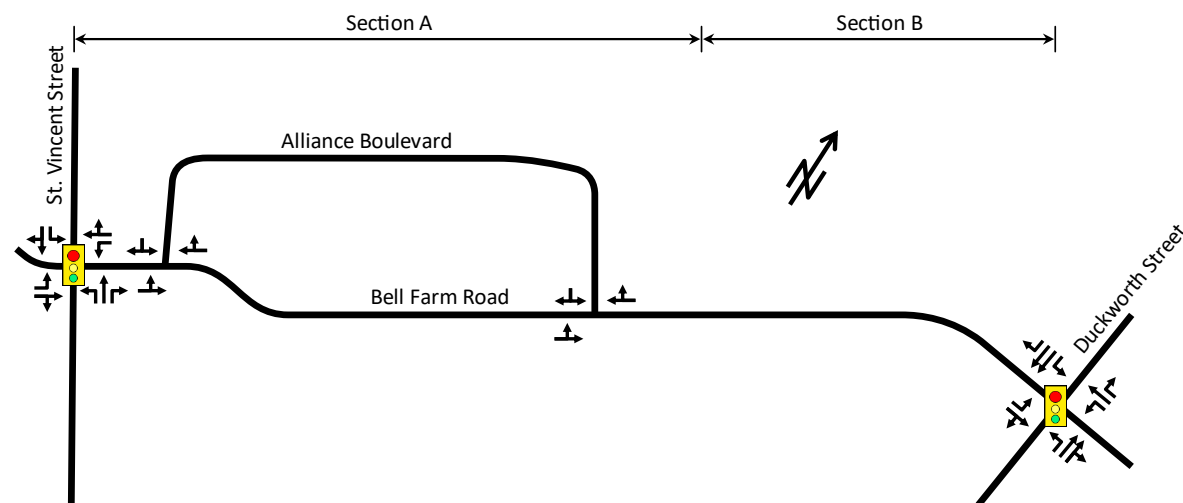


Figure 10: Existing Lane Configuration and Traffic Control

Sidewalks exist on the north side only from Duckworth Street to the east intersection with Alliance Boulevard. Along the remainder of the corridor, pedestrians are required to use the shoulder area of the road as shown in **Figure 11**. Bell Farm Road is also used by cyclists as an access route to Georgian College.



Figure 11: Bell Farm Road Pedestrian Traffic

At the east intersection of Bell Farm Road and Alliance Boulevard, pedestrians can often be observed crossing Bell Farm Road. These pedestrians result in part from the location of a transit stop, the proximity of Mom's Restaurant on the south side of the road, and a concentration of area employment predominantly on the north side.

3.2 Existing Traffic Operations

The adjusted traffic volumes used for the analysis of the existing conditions are presented in **Figure 12**. The PM peak hour was examined as a worst case scenario since that period is generally busier than during the morning peak hour.

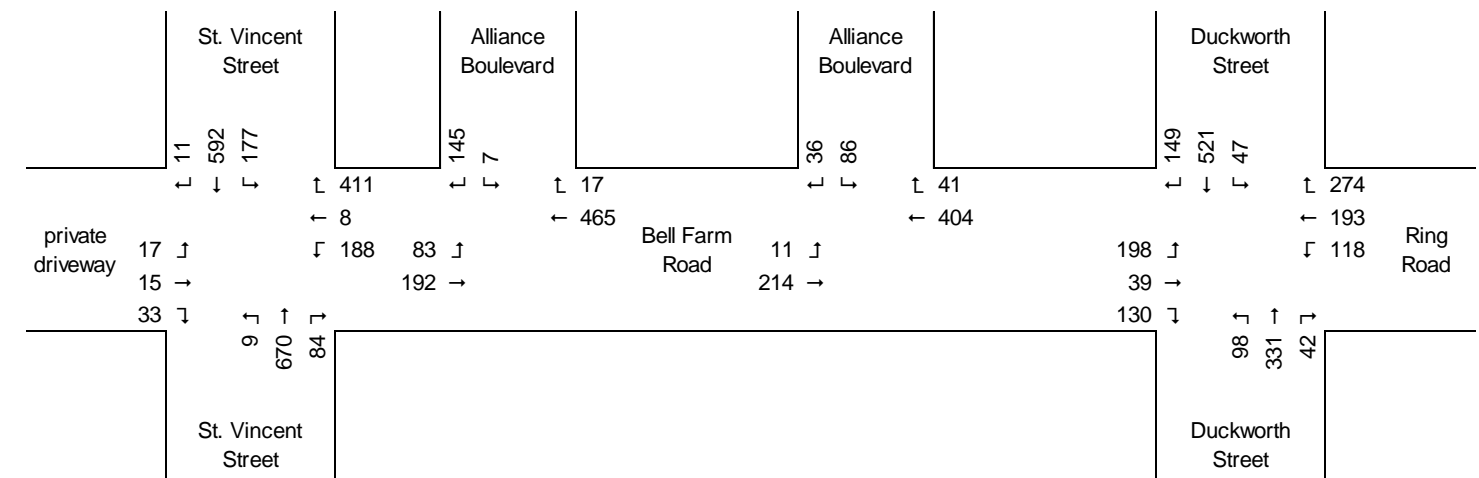


Figure 12: Existing (2016) Traffic Volumes – PM Peak Hour

The results of the traffic analysis are presented in Table 3 for signalized intersections and Table 4 for unsignalized intersections.

Intersections	Movement	V/C	Average	LOS	95th
			Delay (s)		Queue (m)
1 Bell Farm Road / St. Vincent Street	EBL	0.23	37	D	8
	EBT/R	0.16	15	B	10
	WBL	0.82	60	E	60
	WBT/R	0.88	33	C	33
	NBL	0.03	11	B	11
	NBT	0.79	25	C	25
	NBR	0.12	3	A	3
	SBL	0.58	13	B	13
SBT/R	0.58	11	B	11	
	Overall	-	24	C	-
4 Bell Farm Road / Duckworth Street / Ring Road	EBL	0.51	21	C	35
	EBT/R	0.35	9	A	19
	WBL	0.34	19	B	12
	WBT	0.64	40	D	48
	WBR	0.61	10	A	19
	NBL	0.29	15	B	18
	NBT/R	0.33	20	B	37
	SBL	0.11	13	B	10
SBT	0.49	24	C	54	
SBR	0.26	4	A	10	
	Overall	-	19	B	-

Intersection	Movement	V/C	Average Delay (s)	LOS
2 Bell Farm Road / Alliance Boulevard (west)	SBL/R	0.31	15	B
3 Bell Farm Road / Alliance Boulevard (east)	SBL/R	0.31	17	C

The results for the signalized and unsignalized intersections indicate that all intersections currently operate within capacity during the afternoon peak hour. It is noted that the westbound through/right turn movement at the intersection at St. Vincent Street operates near capacity (V/C = 0.88).

3.3 Future Traffic Operations

The MMATMP recommends that Section A be widened to 3 lanes to introduce a continuous two-way left turn lane with bicycle lanes and sidewalks on both sides. Section B is to be maintained as 4 lanes, but with buffered bicycle lanes and sidewalks on both sides of the road.

The MMATMP also recommend that St. Vincent Street be widened to 4 lanes to address the heavy traffic currently experienced on this street.

The 2031 traffic volume projections used for the analysis of the future conditions are presented in **Appendix C**. The results of the traffic analysis are presented in Table 5 for signalized intersections and Table 6 for unsignalized intersections. **Figure 13** illustrates the 2031 future traffic volume projections for PM peak hour.

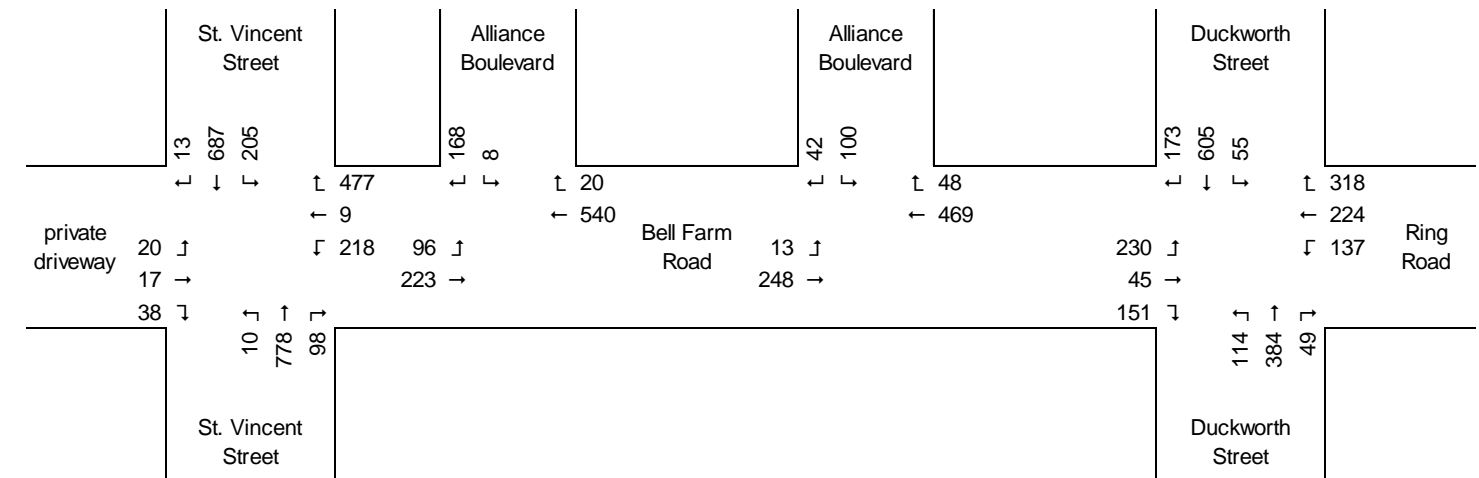


Figure 13: 2031 Future Traffic Volumes – PM Peak Hour

Table 5: Traffic Analysis Results – 2031 Projection, PM Peak Hour, Signalized					
Intersections	Movement	V/C	Average Delay (s)	LOS	95th Queue (m)
1 Bell Farm Road / St. Vincent Street	EBL	0.25	28	C	8
	EBT/R	0.13	10	A	9
	WBL	0.70	36	D	48
	WBT/R	0.81	19	B	54
	NBL	0.05	21	C	5
	NBT	0.79	29	C	117
	SBL	0.66	22	C	45
	SBT/R	0.41	12	B	56
	Overall	–	22	C	–
4 Bell Farm Road / Duckworth Street / Ring Road	EBL	0.61	23	C	41
	EBT/R	0.41	10	A	21
	WBL	0.39	20	B	25
	WBT	0.69	42	D	56
	WBR	0.65	10	A	21
	NBL	0.39	18	B	21
	NBT/R	0.42	23	C	43
	SBL	0.15	14	B	12
	SBT	0.59	26	C	64
SBR	0.31	5	A	13	
	Overall	–	21	C	–

ratio (V/C = 0.81) for the shared westbound through / right-turn lane during the afternoon peak hour but does not require mitigation measures within the 2031 planning horizon.

Table 6: Traffic Analysis Results – Existing, PM Peak Hour, Unsignalized				
Intersection	Movement	V/C	Average Delay (s)	LOS
2 Bell Farm Road / Alliance Boulevard (west)	SBL/R	0.41	18	C
3 Bell Farm Road / Alliance Boulevard (east)	SBL/R	0.42	22	C

The results for the signalized and unsignalized intersections indicate that all intersections would still operate within capacity during the afternoon peak hour.

With the planned widening of St. Vincent Street, and with appropriate traffic signal timing adjustment, the intersection with Bell Farm Road will operate more efficiently and with delays similar to existing conditions despite the increase of traffic. The westbound right-turn movement is identified as a critical movement because of the significant traffic volume (477 veh/h) resulting in a high volume-to-capacity

4.0 DESIGN ALTERNATIVES

4.1 Planning Alternatives

Based on traffic demands, the “Do Nothing” alternative and Limited Land Use Planning are not recommended to be carried forward.

TDM is not carried forward as standalone solution, but rather will be incorporated with the Provide Transportation/Municipal Infrastructure alternative as a Recommended Solution. This recommendation is consistent with the findings of the MMATMP and was presented to the public at PIC No. 2 where no objections were received.

4.2 Bell Farm Road Cross Section Alternatives

Based on the existing environmental conditions and constraints identified from the inventories of existing conditions, several preliminary design alternatives were developed to improve the roadway operation of Bell Farm Road. Preliminary design alternatives are site specific design solutions to implement the recommended planning solution.

The preliminary design alternatives were developed based on the following design criteria presented in **Table 7**.

Table 7: Design Criteria	
Road Class	Major Collector
Posted Speed	50 km/h
Design Speed	60 km/h
Minimum Horizontal Curve Radius	200 m
Maximum Superelevation	4%
Minimum Vertical Crest Curve:	
Crest:	K=24
Sag (headlight control):	K=20
Stopping Sight Distance	100 m
Lane Width	3.5 m
Bike Lane	1.5-2.0 m
Shared Bicycle Lane	4.5 m
Sidewalks	1.5 m to 2.0 m
Right-of-way	26m (3 lanes) to 29m (4 lanes) - midblock
Side Street Day-Lighting Distance	5 m (local to major collector)
Triangles:	10 m (major collector to arterial)
Watermain Cover to Obvert	1.7 m
Storm Cover to Obvert	1.5 m
Sanitary Cover to Obvert	2.5 m or 2% from basement elevation
Truck Route	Yes
Boulevard	Varies by cross-section
Continuous Two Way Left Turn Lane	4.2 m

4.3 Roadway Preliminary Design Alternatives

The assessment of roadway improvements was presented at PIC No. 3. The alternatives carried forward for evaluation were:

- Alternative 1: MMATMP Recommendation
- Alternative 2: Improved Geometrics
- Alternative 3: Constrained Right-of-Way (ROW).

Characteristics of each alternative can be found in **Table 8**. Cross sections for each alternative can be found in **Figure 15**. Concept plans for each alternative can be found on **Figure 16** to **Figure 18**. All roadway alternatives include improvements for active transportation (sidewalks and bike lanes) and a two-way continuous left turn lane (TWCLTL).

	Alternative 1 – MMATMP Recommendation	Alternative 2 – Improved Geometrics	Alternative 3 – Constrained ROW
A) ROW East Section	29 m	29 m	26 m
B) ROW West Section	26 m	27 m	26 m
Property Requirements	Includes property required for roadways and widening for curve flattening	Includes property required for roadways and widening for curve flattening	No curve flattening and utilize median for speed control mitigation measure
Sidewalks	sidewalks on both sides	sidewalks on both sides	Excludes south sidewalk from Alliance Boulevard to St. Vincent Street
Cycling Facilities	2 Buffered Bike Lanes	2 Bike Lanes	2 Bike Lanes
Property Protection Plan	Property required for daylighting and east section widening.	Property required for daylighting; ROW widening along entire corridor.	Property required for daylighting; future protection based on Official Plan Schedule E.

4.4 Curve Radii Geometric Review

The existing horizontal alignment of the road includes reverse curves with radii of 90 m and 75 m as shown in **Figure 14**. The current posted speed limit of this road is 50 km/h and the proposed design speed of the collector road is 60 km/h. The design speed for the horizontal alignment is related to the superelevation of these curves and in an urban environment for a collector road this would typically be 4%. Superelevation for the 90 m radius curve (R-90) is designed at 3.2% and the superelevation for

the R-75 curve is 4%. On these two horizontal curves the design speed would be 50 km/h (accepting and matching the posted speed in this)². As a countermeasure to improve safety, the design will utilize a raised median for westbound traffic on the approach to the two curves. This physical design element will induce lower operating speeds and reduce the potential for median crossovers by drivers travelling downhill. To further enhance safety, curve advisory signs with 40 km/h speed tabs will be installed.

crossover layouts are for low speed (maximum 60 km/h posted speed) and low volume streets as is the case for Bell Farm Road. The crossing design should accommodate accessibility requirements.

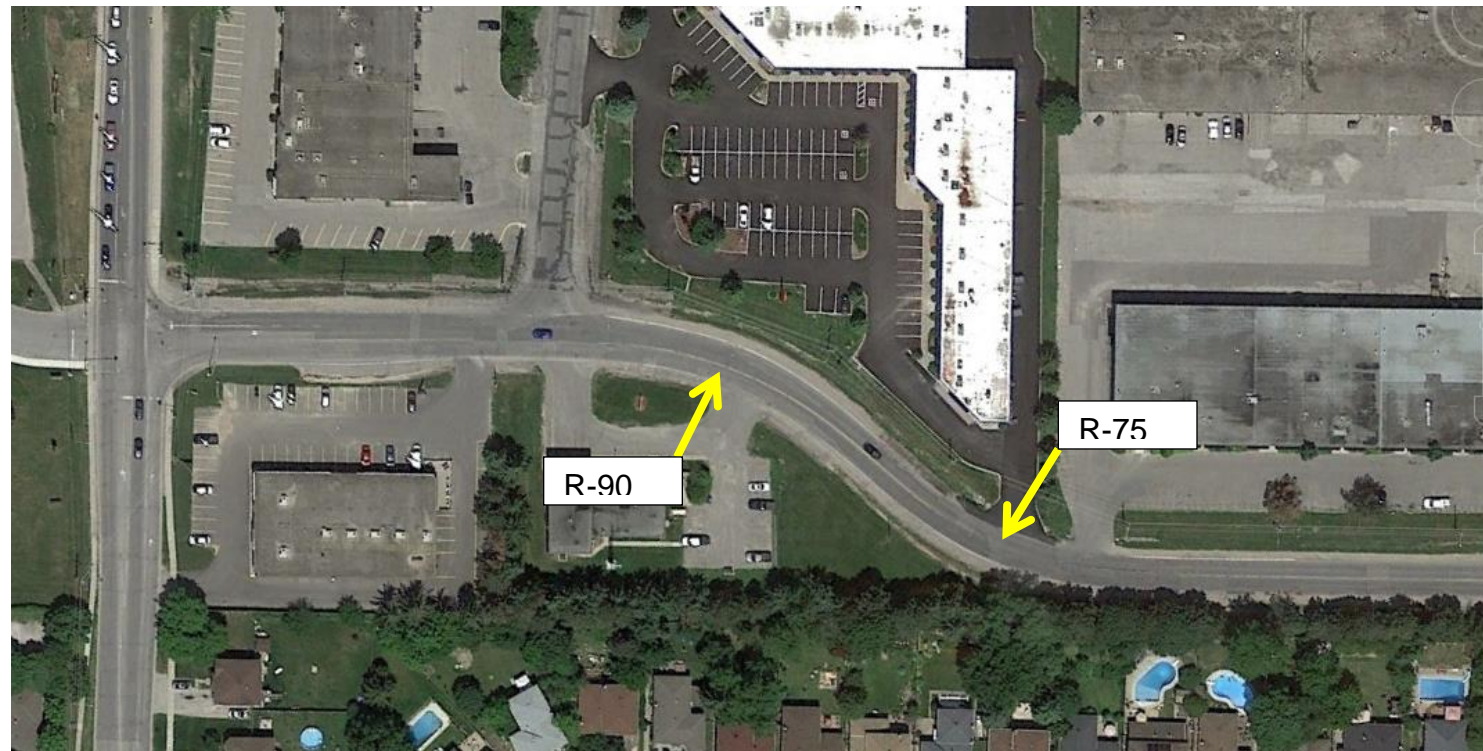


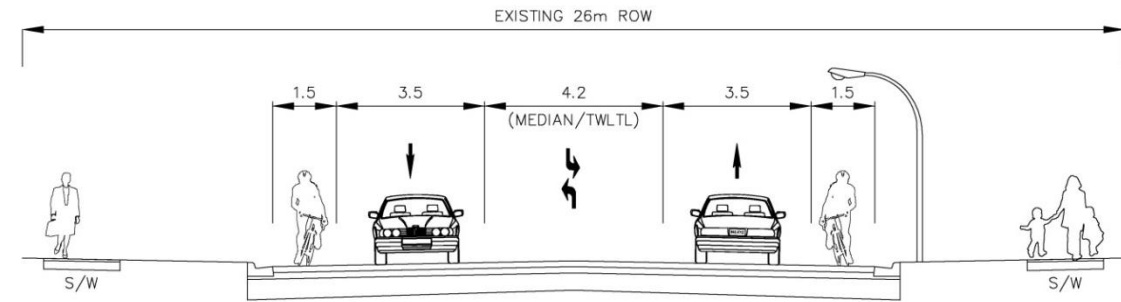
Figure 14: Reverse Curves on Bell Farm Road

Alternatives presented to the public at PIC No. 2 that involved flattening these curves (increasing the curve radii and acquiring additional property). The recommended horizontal alignment is to maintain the existing curve radii to minimize property impacts.

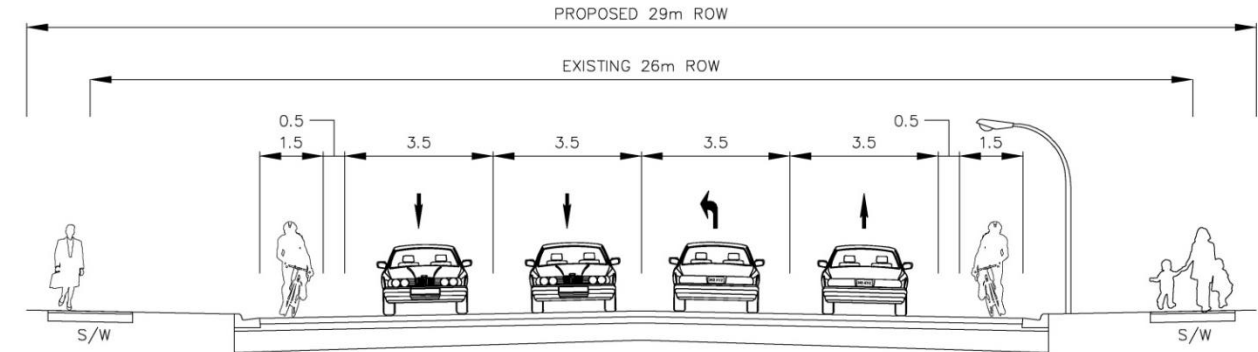
4.5 Other Considerations

A secondary issue identified at PIC No. 2 was the pedestrian traffic to/from Alliance Boulevard (east leg) opposite the Original Mom's restaurant and Barrie Police Station. In this area there are pedestrians crossing the street as well as parking on Alliance Boulevard. In this area a technical recommendation was to add a pedestrian crossover reflecting the recent changes to the Highway Traffic Act as described in OTM Book 15 for Pedestrian Crossing Treatments. These new pedestrian

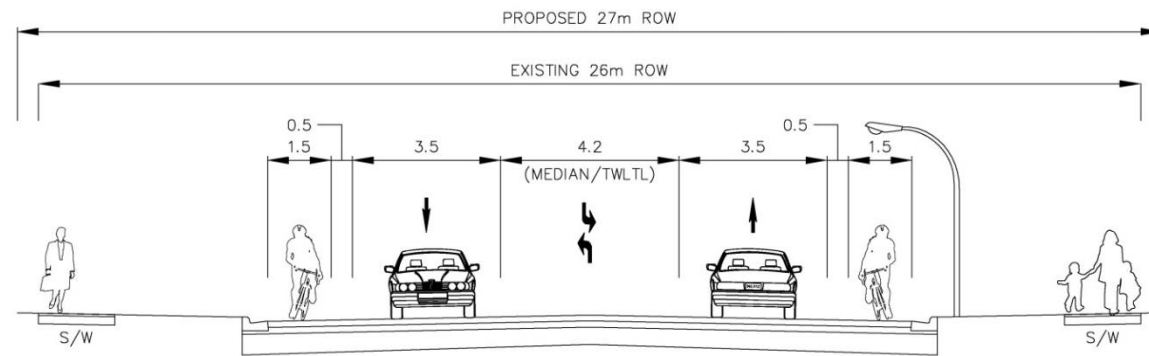
² Transportation Association of Canada Geometric Design Guide for Canadian Roads R=75, e=0.06, Design Speed 50 km/h (Table 2.1.2.9)



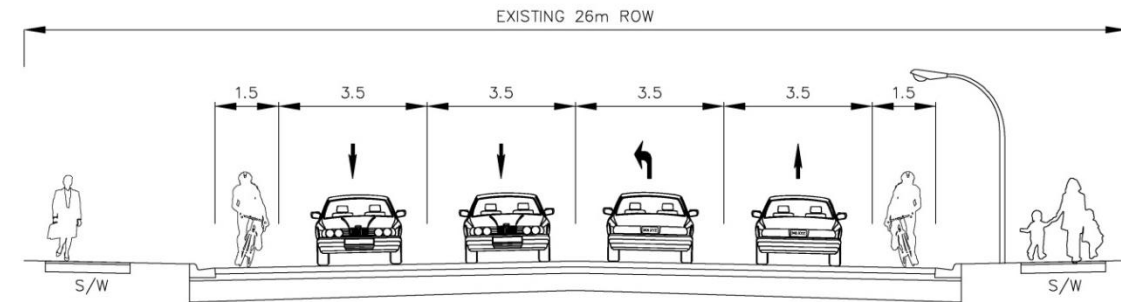
WEST ALTERNATIVE 1 - 26m R.O.W.



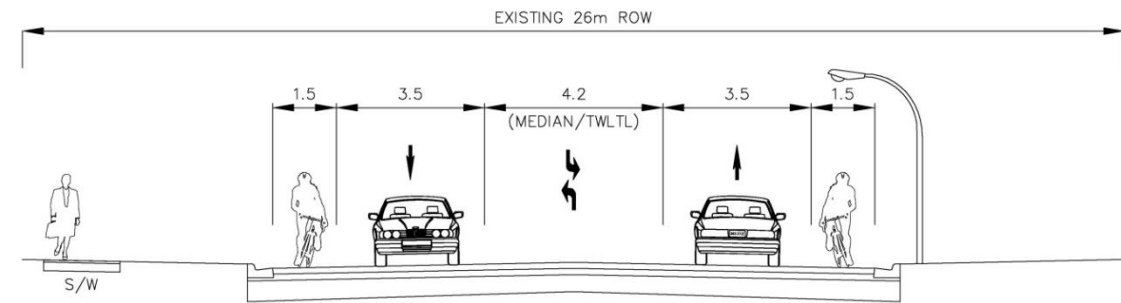
EAST ALTERNATIVE 1 - 29m R.O.W.



WEST ALTERNATIVE 2 - 27m R.O.W.



EAST ALTERNATIVE 2 - 26m R.O.W.



WEST ALTERNATIVE 3 - 26m R.O.W.
 MITIGATION OPTION

Figure 15: Cross Section Alternatives

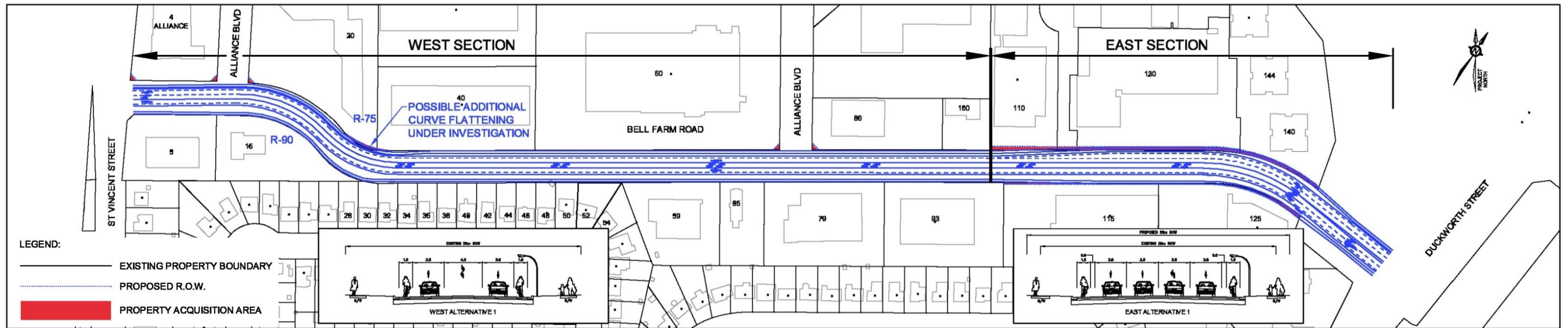


Figure 16: Concept Plan - Bell Farm Road Alternative 1: MMATMP Recommendation

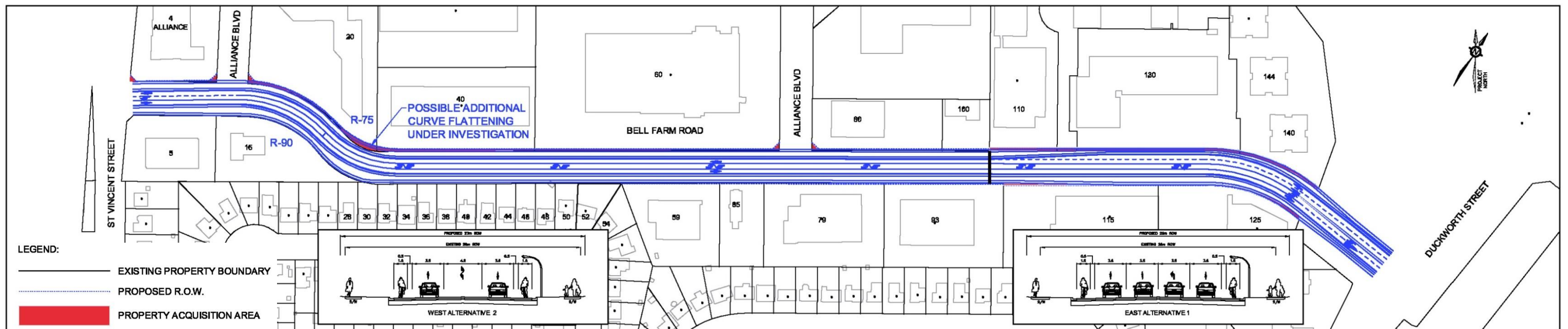


Figure 17: Concept Plan - Bell Farm Road Alternative 2: Improved Geometrics

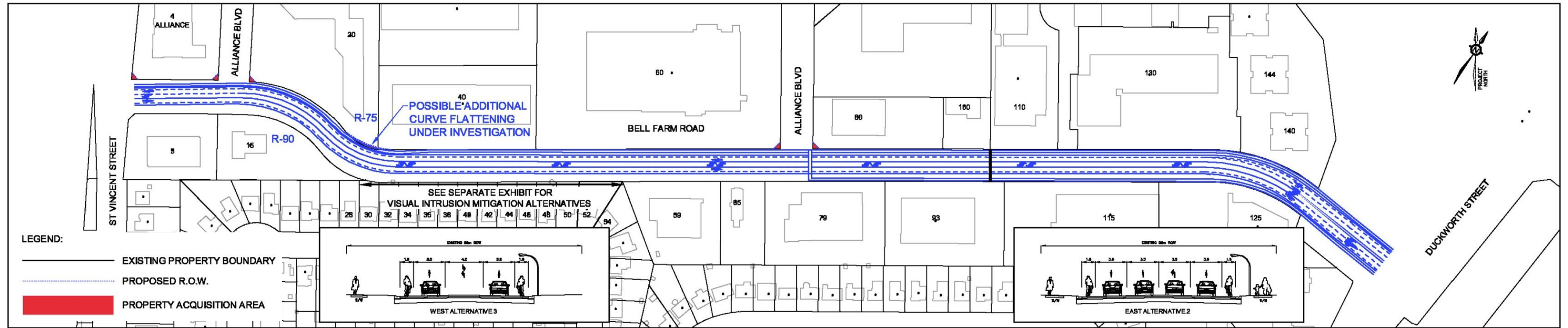


Figure 18: Concept Plan - Bell Farm Road Alternative 3: Constrained ROW

5.0 PROJECT ENVIRONMENTS

5.1 Physical Environment

5.1.1 Water Supply

A water supply investigation was completed in 2016.

The water supply background report is documented in **Appendix D**.

5.1.2 Sanitary Sewer

A sanitary sewer investigation was completed in 2016.

The sanitary sewer background report is documented in **Appendix D**.

5.1.3 Storm Sewer

A storm sewer investigation was completed in 2016.

The storm sewer background report is documented in **Appendix D**.

5.2 Natural Environment

5.2.1 Tree Survey

A tree survey was completed in fall 2016 for Bell Farm Road from St. Vincent Street to Duckworth Street. During the field inventory component and site visits for this project no endangered or species at risk were located or observed. A few trees are recommended for removal based on condition and all of the trees recommended for retention should be protected.

An Arborist report and detailed tree inventory are included in **Appendix E**.

5.3 Social Environment

5.3.1 Land Use Planning

The land uses in the study area are commercial, industrial and residential.

Bell Farm Road is located north of downtown Barrie and is classified as a Major Collector road running parallel to Highway 400. It is designated: General Commercial to the east; General Industrial to the west; and the land along Cynthia Court, which backs onto Bell Farm Road, is designated Residential in the Official Plan (OP).

A full Land Use Planning Report can be found in **Appendix F**.

5.3.2 Noise

A noise assessment for Bell Farm Road was conducted in 2017 by BTE using acoustical modelling software, STAMSON Version 5.03. The expected increase in sound level as a result of the project is less than 5 dBA and therefore noise attenuation is not warranted for residential units along Bell Farm Road.

The Noise Assessment Report is documented in **Appendix G**.

5.4 Cultural/ Heritage Environment

5.4.1 Archaeology

A property inspection was undertaken on December 1, 2016 to determine if there were any areas of disturbance which would affect archaeological potential and to determine which survey strategies would be appropriate for a Stage 2 property survey, if required. A number of potentially undisturbed areas were noted based on the presence of an archaeological site less than 250 m north, historic farmsteads, historic transportation routes (early concession roads) and its proximity to an ancient beach/shorecliff. Stage 2 recommendations will be subject to clearance of previous utility disturbances (if any) in these areas during the Stage 2 review. The areas of archaeological potential are illustrated in the Stage 1 Archaeology Report, documented in **Appendix H**.

5.4.2 Built Heritage and Cultural Heritage Landscape

The City of Barrie lies within the former Township of Vespra and is situated at the head of Kempenfelt Bay (Lake Simcoe). The City of Barrie began as an outpost for the Hudson's Bay Company with the first structure erected in 1812. The town continued to grow and was incorporated as a city in 1959.

The heritage screening consisted of the completion of the Ministry of Tourism, Culture and Sport's (MTCS) *Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes* (the Checklist). Completion of the Checklist included consultation with the municipality and relevant agencies, review of available online materials, and a site inventory. Consultation with the City of Barrie, Ontario Heritage Trust (OHT), and MTCS determined that there are no previously identified heritage properties within, or adjacent to, the Bell Farm Road study area.

The Cultural Heritage Screening Checklist is documented in **Appendix I**.

5.4.3 Natural Heritage Impact Assessment

A row of Austrian pine plantings in fair condition is on the south side of Bell Farm Road beginning 200 m east of St. Vincent Street and continuing east for 100 m. Bird sightings were limited to the most common of urban species including English sparrow, robin, starling, grackle and rock dove. No herptiles were observed as anticipated due to the lack of moist habitats. None of the 38 identified Provincial SAR for the Simcoe region would normally be present in an urban setting other than as a casual visitor.

The Natural Heritage Impact Assessment is documented in **Appendix J**.

5.5 Economic Environment

The parametric planning level cost estimates for the design alternatives are documented in **Appendix K**.

6.0 EVALUATION OF DESIGN ALTERNATIVE CONCEPT

The evaluation of the alternatives was completed using a qualitative assessment to compare the net effects and performance of the alternatives. This method considers the advantages and disadvantages of each of the alternatives using evaluation criteria as descriptors to measure the relative differences of the options being considered.

The evaluation of the alternatives included an assessment of the: Physical Environment; Natural Environment; Social Environment; Cultural Environment; and, Economic Environment. The evaluation of alternatives can be found in **Table 9**.

Table 9: Assessment of Design Alternatives

Evaluation Criteria	How Criterion is being assessed	Alternative 1- MMATMP Recommendations 26/29m ROW + Bike Lanes	Alternative 2 – Improved Geometrics 27/29m ROW + Buffered Bike Lanes	Alternative 3 – Constrained ROW 26m ROW + Road Diet + Bike Lanes
Physical Environment				
Pedestrians	Impact to pedestrian facilities along study corridor	Provision of sidewalks on both sides of the road and midblock pedestrian crossing.	Provision of sidewalks on both sides of the road and midblock pedestrian crossing.	Provision of sidewalks on both sides of the road between Duckworth and Alliance Boulevard (east intersection). Single sidewalk (to protect trees) on north side of the road between Alliance Boulevard and St. Vincent Street and midblock pedestrian crossing.
Bicycle Infrastructure	Provision of cycling facilities along study corridor	Provides cycling facilities as per MMATMP recommendations.	Wider ROW accommodates wider (buffered) cycling lanes.	Provides cycling facilities as per MMATMP recommendations.
Transit	Impact to transit services	Bus stops accommodated. No difference between alternatives.	Bus stops accommodated. No difference between alternatives.	Bus stops accommodated. No difference between alternatives.
Traffic Operations	Impact to intersection operations and road capacity	Centre turn lane removes turning vehicles from through lane, thus increasing capacity and ease of access to fronting properties.	Centre turn lane removes turning vehicles from through lane, thus increasing capacity and ease of access to fronting properties.	Road diet (reduction of lanes from 4 to 3) on east section reduces road capacity.
Roadway Geometrics	Improvement of geometrics of reverse curve	Existing geometrics of reverse curve to remain.	The reverse curve radii are increased to accommodate higher design speed.	Existing geometrics of reverse curve to remain. Traffic calming measures to be implemented to reduce vehicle speed including a centre median.
Municipal Infrastructure (Water, Sanitary, Storm)	Improvements to existing municipal infrastructure	Identified improvements include watermain replacement and provision of stormwater management. Existing drainage issues would be addressed. No difference between alternatives.	Identified improvements include watermain replacement and provision of stormwater management. No difference between alternatives.	Identified improvements include watermain replacement and provision of stormwater management. No difference between alternatives.
Utilities	Impact to utilities (i.e. relocation)	Utility relocations required.	Utility relocations required.	Utility relocation primarily confined to west section. East section will require minimal utility relocation.
Driveway Grades	Impact to driveway grades as a result of required road widening/curve flattening	Wider road platform will increase gradient on driveways.	Flattening of reverse curves will specifically increase driveway gradients at 20 and 40 Bell Farm Road; general gradient increases elsewhere	Wider road platform will increase gradient on driveways.
Driveway Operations	Impact to driveway operations	Two-way left turn lane will facilitate access to properties. No difference between alternatives.	Two-way left turn lane will facilitate access to properties. No difference between alternatives.	Two-way left turn lane will facilitate access to properties. No difference between alternatives.
Natural Environment				
Fish Habitat	Impact to fish habitat, if applicable, and other aquatic features within the Study Area	No fish habitat.	No fish habitat.	No fish habitat.
Wildlife / Terrestrial	Impact to wildlife species within the Study Area	Minimal impact associated with removal of coniferous trees.	Minimal impact associated with removal of coniferous trees.	No measurable impact as existing trees would remain.

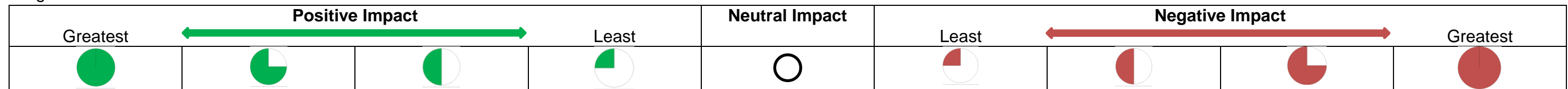
Table 9: Assessment of Design Alternatives

Evaluation Criteria	How Criterion is being assessed	Alternative 1- MMATMP Recommendations 26/29m ROW + Bike Lanes		Alternative 2 – Improved Geometrics 27/29m ROW + Buffered Bike Lanes		Alternative 3 – Constrained ROW 26m ROW + Road Diet + Bike Lanes	
Species at Risk (SAR)	Impact on SAR's and endangered species		No SAR within corridor.		No SAR within corridor.		No SAR within corridor.
Vegetation Impacts	Impact to vegetation communities on adjacent properties (i.e. existing coniferous trees adjacent to residential subdivision)		Existing coniferous trees adjacent to residential subdivision to be removed to accommodate road platform.		Existing coniferous trees adjacent to residential subdivision to be removed to accommodate road platform.		Existing coniferous trees to be protected during construction. Unhealthy trees to be replaced during construction.
Land Use	Impact of proposed works on surrounding land use (i.e. are improvements consistent with surrounding land uses)		Improvements would enhance the existing land use through the provision of enhanced streetscape aesthetics due to roadway urbanization. No difference between alternatives.		Improvements would enhance the existing land use through the provision of enhanced streetscape aesthetics due to roadway urbanization. No difference between alternatives.		Improvements would enhance the existing land use through the provision of enhanced streetscape aesthetics due to roadway urbanization. No difference between alternatives.
Social Environment							
Property Impacts	Impacts to property based on widening of road platform and/or ROW. All alternatives include the same property to be acquired for daylighting at Alliance Boulevard and St. Vincent Street		West Section: Minor property acquisition required to accommodate road platform and daylighting improvements for intersections. East Section: Property acquisition required along corridor for wider ROW (existing 26m / proposed 29m).		West Section: Property acquisition required along corridor for wider ROW (existing 26m / proposed 27m). Minor property acquisition required to accommodate road platform and daylighting improvements for intersections. East Section: Property acquisition required along corridor for wider ROW (existing 26m / proposed 29m).		Minor impacts associated with wider road platform and daylighting improvements for intersections. Both the east and west section would be constructed within the existing ROW. Official Plan requirements for 29m ROW remains (east section only).
Aesthetics	Visual impacts		Urbanized cross-section will greatly enhance corridor aesthetics through the replacement of ditches with curb/gutter and inclusion of sidewalks and cycling lanes. No difference between alternatives.		Urbanized cross-section will greatly enhance corridor aesthetics through the replacement of ditches with curb/gutter and inclusion of sidewalks and cycling lanes. No difference between alternatives.		Urbanized cross-section will greatly enhance corridor aesthetics through the replacement of ditches with curb/gutter and inclusion of sidewalks and cycling lanes. No difference between alternatives.
Noise Impact	Impacts to residents/businesses during construction phase and future impacts.		Construction: Temporary noise impacts during construction. Post-Construction: No significance difference between alternatives.		Construction: Temporary noise impacts during construction. Post-Construction: No significance difference between alternatives.		Construction: Temporary noise impacts during construction. Post-Construction: No significance difference between alternatives.
Construction Impact	Impacts to adjacent properties through construction phase		Temporary access restrictions during construction. No difference between alternatives.		Temporary access restrictions during construction. No difference between alternatives.		Temporary access restrictions during construction. No difference between alternatives.
Cultural Environment							
Cultural Heritage	Impacts to the built heritage and cultural heritage landscapes as		No cultural heritage features identified.		No cultural heritage features identified.		No cultural heritage features identified.

Table 9: Assessment of Design Alternatives

Evaluation Criteria	How Criterion is being assessed	Alternative 1- MMATMP Recommendations 26/29m ROW + Bike Lanes		Alternative 2 – Improved Geometrics 27/29m ROW + Buffered Bike Lanes		Alternative 3 – Constrained ROW 26m ROW + Road Diet + Bike Lanes	
	per the cultural heritage assessment.						
Archaeology	Impacts as per the results of the Stage 1 Archaeological Assessment completed for the study corridor		6 areas of archaeological potential are impacted.		9 areas of archaeological potential are impacted.		1 area of archaeological potential is impacted.
Economic Environment							
Property Acquisition	Costs to acquire property to facilitate proposed improvements.		Moderate land acquisition cost.		Highest land acquisition cost.		Lowest land acquisition cost.
Construction Costs	Costs to construct individual alternatives excluding property.		Moderate Cost to Construct. \$10.6 M		Highest Cost to Construct. \$11.0 M		Least Cost to Construct. \$8.9 M
Maintenance Cost	Future maintenance requirements		Increased maintenance costs associated with bike lanes and additional sidewalks. No significant difference between alternatives.		Increased maintenance costs associated with bike lanes and additional sidewalks. No significant difference between alternatives.		Increased maintenance costs associated with bike lanes and additional sidewalks. No significant difference between alternatives.
Preliminary Preferred Alternative		X		X		Preliminary Preferred Alternative with property protection for the 29m 4-lane cross-section (east section) as per the Official Plan	

Legend:



6.1 Impact Mitigation

Effects on the environment were considered in accordance with the Municipal Class EA process.

The remaining areas of concern, related to the Recommended Plan, will be mitigated to minimize or remove any detrimental effects. **Table 10** provides a description of areas of concern and responses to issues that were identified with the Recommended Plan. No other effects requiring mitigation were identified in this study.

Table 10: Summary of Potential Environmental Effects and Proposed Mitigations

I.D #	Factors	Agency/Authority	Issue and Potential Effects	Proposed Mitigation Measure
1.0 Natural Environments				
1.1	Species at Risk	MNRF	<ul style="list-style-type: none"> Potential disruption to habitat (terrestrial, freshwater) and SAR. No SAR or significant habitat areas were identified that may undergo disruption or reduction of woodland as a result of construction. 	<ul style="list-style-type: none"> Ensure contractor's staff are trained to recognize potential SAR and are required to notify authorities if any are encountered on site.
1.2	Terrestrial	Public	<ul style="list-style-type: none"> No significant woodland areas were identified that may undergo disruption or reduction of woodland as a result of construction. Loss of existing vegetation to accommodate recommended design and / or construction access and staging / layout areas. 	<ul style="list-style-type: none"> Salvage or replanting of trees along the southern right-of-way along the rear lots of residential properties (salvaging of healthy mature trees where possible).
1.3	Erosion and Sediment	MOECC	<ul style="list-style-type: none"> Potential for erosion / sedimentation during construction. 	<ul style="list-style-type: none"> Incorporate standard erosion and sediment control measures into the construction contract, including measures to prevent off-site transport of sediment and prompt restoration of disturbed areas.
1.4	Groundwater Source Protection	MOECC, LSRCA, NVCA	<ul style="list-style-type: none"> The City of Barrie Official Plan (OP) indicates the entire Study Area is not located within Source Protection Plan Areas under the LSRCA and NVCA. No wellhead protection areas or municipal wells were identified in the study area. Review of the Drinking Water Source Protection Plan for the Lakes Simcoe and Couchiching/Black River and Nottawasaga Valley Source Protection Areas (watersheds), effective July 1, 2015, indicates that the Study Area is not within a Well Head Protection Area. 	Not applicable
1.5	Wetland Hydrology	LSRCA, NVCA	<ul style="list-style-type: none"> No provincially significant wetlands were identified within the Study Area. 	Not applicable
2.0 Cultural Environments				
2.1	Archaeology	MTCS	<ul style="list-style-type: none"> The Stage 1 Archaeological Assessment has identified areas of archaeological potential. 	<ul style="list-style-type: none"> A Stage 2 Archaeological Assessment should be carried out for identified areas of archaeological potential which are within the area of disturbance of the TPA. If archaeological remains are encountered during construction, the contractor must notify the Ministry of Tourism, Culture and Sport. Stage 2 recommendations will be subject to clearance of previous utility disturbances (if any) in these areas during the Stage 2 review.

Table 10: Summary of Potential Environmental Effects and Proposed Mitigations

I.D #	Factors	Agency/Authority	Issue and Potential Effects	Proposed Mitigation Measure
2.2	Heritage	MTCS	<ul style="list-style-type: none"> No potential heritage resources were identified in the area. 	Not applicable
2.3	Stormwater	MOECC, LSRCA, NVCA	<ul style="list-style-type: none"> Potential changes to stormwater drainage as a result of construction of the proposed roadway improvements, such as increased peak flows, and impact on the Sophia Creek and Willow Creek watersheds. 	<ul style="list-style-type: none"> Stormwater management plan, in accordance with best management practices, City and Conservation policies, regulations and guidelines, including measures to improve stormwater runoff quality and attenuate flows.
3.0 Socio-Economic Environments				
3.1	Property Impacts – Permanent	Property Owner	<ul style="list-style-type: none"> Property impacts as a result of partial property acquisition. 	<ul style="list-style-type: none"> Early coordination / communication with owner(s) and tenants to minimize disruption associated with property acquisition.
3.2	Property Impacts – Temporary	Property Owner	<ul style="list-style-type: none"> Property impacts (i.e. loss of access, loss of parking, encroachment, nuisance, etc) for properties as a result construction. 	<ul style="list-style-type: none"> Early coordination / communication with owner(s) and tenants to minimize disruption associated with construction activities.
3.3	Noise Quality	MTO, MOECC, City of Barrie	<ul style="list-style-type: none"> Noise nuisance from construction equipment and vehicles during construction. Sound level changes as a result of construction of the proposed roadway improvements. 	<ul style="list-style-type: none"> Contractor will be required to abide by noise control bylaws for day-to-day operations. Noise analysis determined no meaningful change in sound levels that would require mitigation.
4.0 Transportation Environment				
4.1	Safety of Pedestrian / Cycling Public	MTO, City of Barrie	<ul style="list-style-type: none"> Potential for restricted movement during construction. 	<ul style="list-style-type: none"> Provide alternate detour routes and advance notifications of temporary closures. Use of protective hoarding and temporary protected walkways to maintain pedestrian passage where possible.
4.2	Utilities	City of Barrie, Utilities	<ul style="list-style-type: none"> Potential for impacts to existing utilities as a result of construction. 	<ul style="list-style-type: none"> Ensure advance coordination with utility companies and approval for any utility relocations / protection.

6.2 Next Steps

At the end of the 30-day review period, should there be no objections to the project, the City may proceed with design and construction of the recommended plan, subject to availability of funding and construction priorities.

Following EA clearance, this project, or any individual element of this project, may proceed to detail design and construction. A Stage 2 Archaeological Assessment is required to be completed during detail design.

7.0 RECOMMENDED PLAN

7.1 Description of Recommended Plan

The Recommended Plan for the Bell Farm project has three elements:

- Underground municipal services;
- Widening the road platform to 3 lanes to accommodate turning vehicles; and
- Provision of cycling and pedestrian facilities to accommodate active modes of transportation.

This Plan reflects a cross section that is narrower than targeted by the Official Plan; however, property for road widenings will be protected through Schedule E of the Official Plan (29 m right-of-way east of Alliance Boulevard to Duckworth Street; the recommendations in the ESR do not supercede right-of-way requirements identified in the Official Plan. This staged approach reduces the project cost and impacts to private landowners and physical elements (utilities and retaining walls, etc.) in this corridor.

Elements of the Recommended Plan to reduce effects include:

- Provision of a pedestrian crossover at Alliance Boulevard;
- Salvage or replanting of trees along the southern right-of-way along the rear lots of residential properties (salvaging of healthy mature trees where possible); and
- Construction of a raised centre median within the 3-lane cross section east of the reverse horizontal curves.

This Recommended Plan is illustrated in **Section 8.0 – Plates**. It will accommodate physical space for pedestrians by providing new 1.5 m to 2.0 m sidewalks (replacing sections of substandard widths at or below 1.2 m), providing bicycle lanes, and accommodating turning vehicles in a new 4.2 m two-way continuous left turn lane. Sidewalks may need to be reduced to 1.5m in constrained areas such as the reverse curve.

7.2 Technically Preferred Alternative

7.2.1 Roadway Alternative

The Technically Preferred Alternative (TPA) for this project is Alternative 3 with future property protection as identified in Schedule E of the City's Official Plan.

7.2.2 Refinements

The TPA and the refinements combine to create the Recommended Plan.

7.2.3 Effects and Mitigation

Effects on the environment were considered in accordance with the Municipal Class EA process.

The remaining areas of concern, related to the Recommended Plan, will be mitigated to minimize or remove any detrimental effects. **Table 10** provides a description of areas of concern and responses to issues that were identified with the Recommended Plan. No other effects requiring mitigation were identified in this study.

7.3 Property Requirements

Land acquisition is required for daylighting at Alliance Boulevard (east and west of intersection) and St. Vincent Street. Property is also required in the vicinity of the reverse curve to accommodate the standard road platform. Property protection will be required for future widening of Bell Farm Road to reflect Schedule E of the Official Plan.

7.4 Statement of Flexibility

The EA recommendations have been to maintain a buffer area along the residential properties along Cynthia Court. The ESR recommends the flexibility to either:

- 1) Maintain healthy trees with infilling of unhealthy trees with new plantings; or
- 2) Create a landscape plan of entirely new trees that would provide uniform tree types and allow the introduction of the most salt resistant tree types.

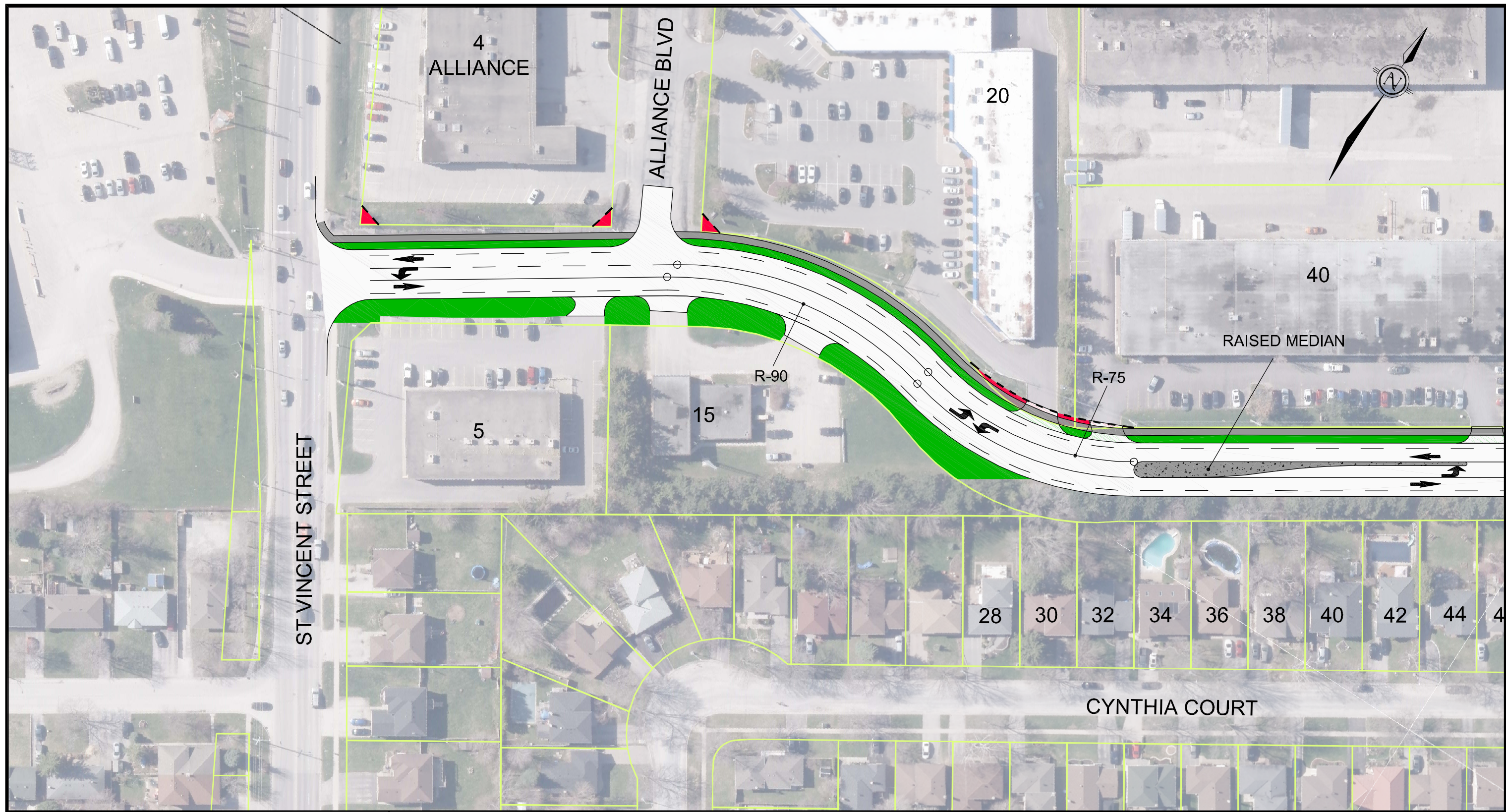
8.0 FUTURE ACTIVITIES

Future activities for the project will include:

- Stage 2 Archaeological Assessment
- Geotechnical investigation
- Property purchase and grading easements/consents
- Utility Relocations
- Applications to MOECC for Environmental Compliance Approval
- Preparation of Detail Design
- Construction subject to Council approval

9.0 PLATES

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Legend:

	EXISTING PROPERTY BOUNDARY
	PROPOSED R.O.W.
	PROPERTY REQUIRED
	LONG TERM 27m ROW PROPERTY PROTECTION IDENTIFIED IN OFFICIAL PLAN
	PROPOSED SIDEWALK
	PROPOSED RAISED CONCRETE ISLAND
	PROPOSED BOULEVARD

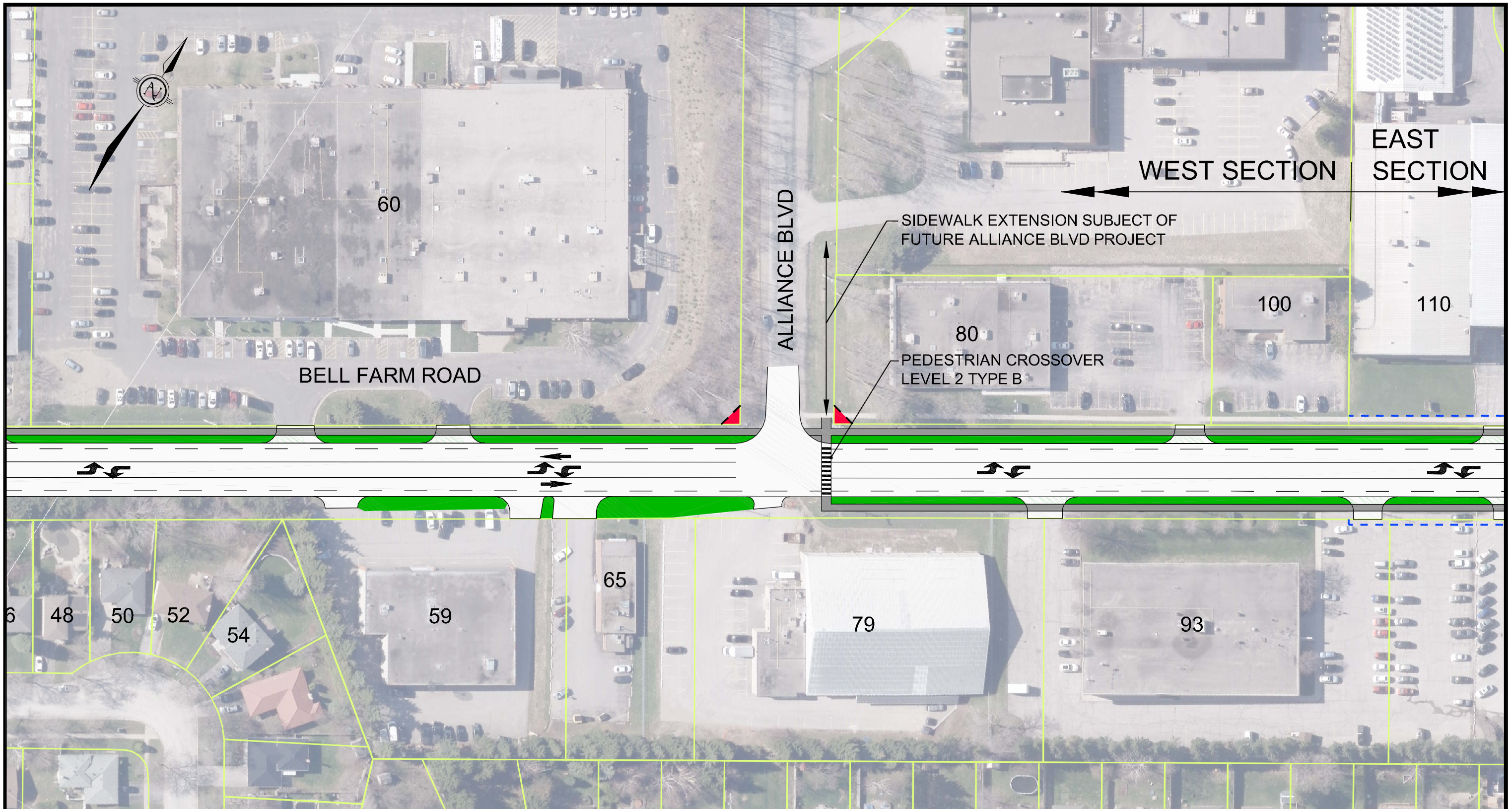
PLATE 1
RECOMMENDED PLAN - BELL FARM ROAD
WEST SECTION

BELL FARM ROAD EA STUDY
Schedule 'C' Municipal Class Environmental Assessment



 	<p>SCALE</p> <p>HORIZONTAL 1:1,000</p>
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Legend:

- EXISTING PROPERTY BOUNDARY
- PROPOSED R.O.W.
- PROPERTY REQUIRED
- LONG TERM 27m ROW PROPERTY PROTECTION IDENTIFIED IN OFFICIAL PLAN
- PROPOSED SIDEWALK
- PROPOSED RAISED CONCRETE ISLAND
- PROPOSED BOULEVARD

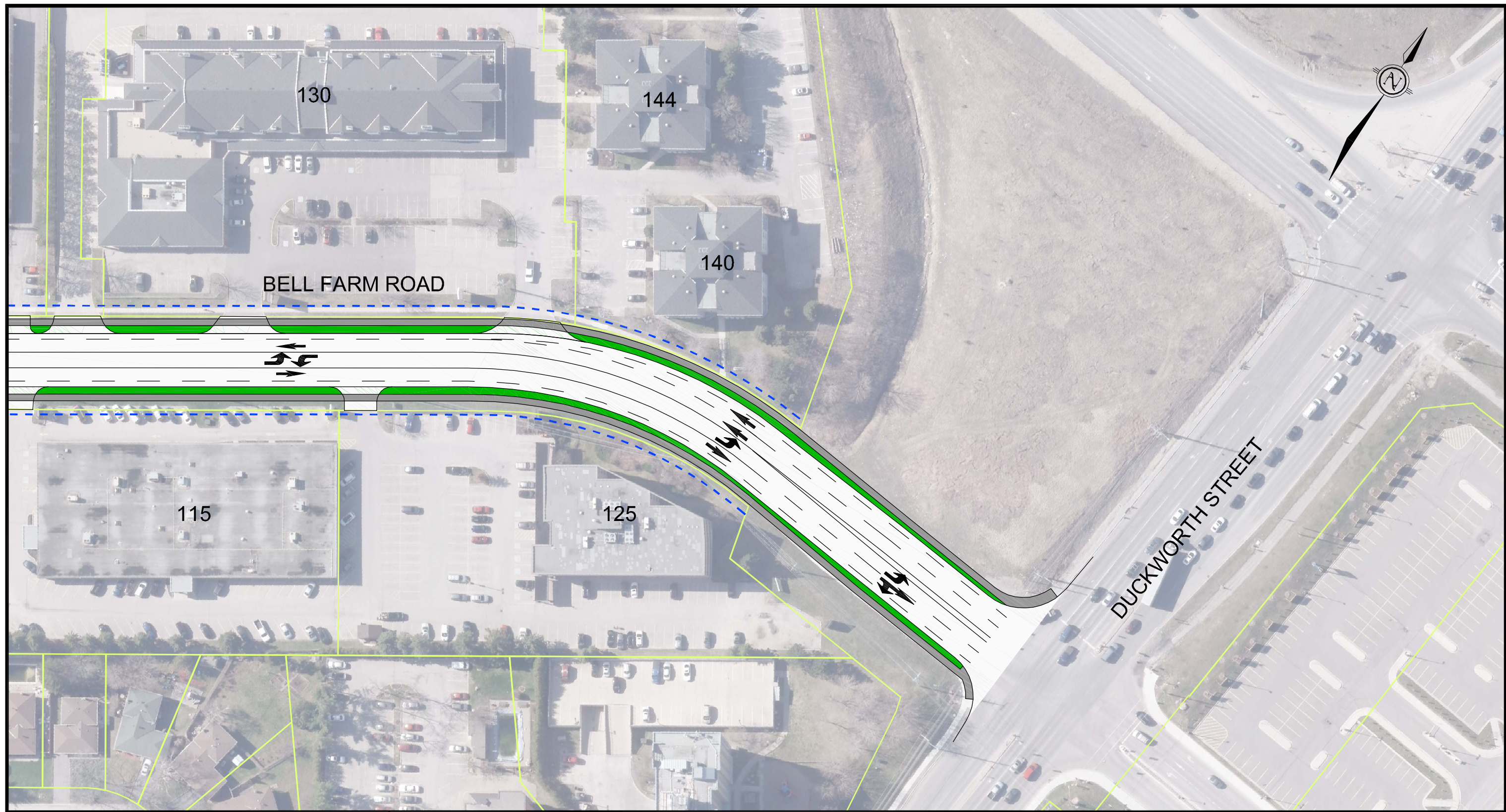
PLATE 2
RECOMMENDED PLAN - BELL FARM ROAD
WEST/EAST SECTION

BELL FARM ROAD EA STUDY
Schedule 'C' Municipal Class Environmental Assessment



SCALE
0m 5m 10m
 HORIZONTAL 1:1,000

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Legend:

	EXISTING PROPERTY BOUNDARY
	PROPOSED R.O.W.
	PROPERTY REQUIRED
	LONG TERM 27m ROW PROPERTY PROTECTION IDENTIFIED IN OFFICIAL PLAN
	PROPOSED SIDEWALK
	PROPOSED RAISED CONCRETE ISLAND
	PROPOSED BOULEVARD

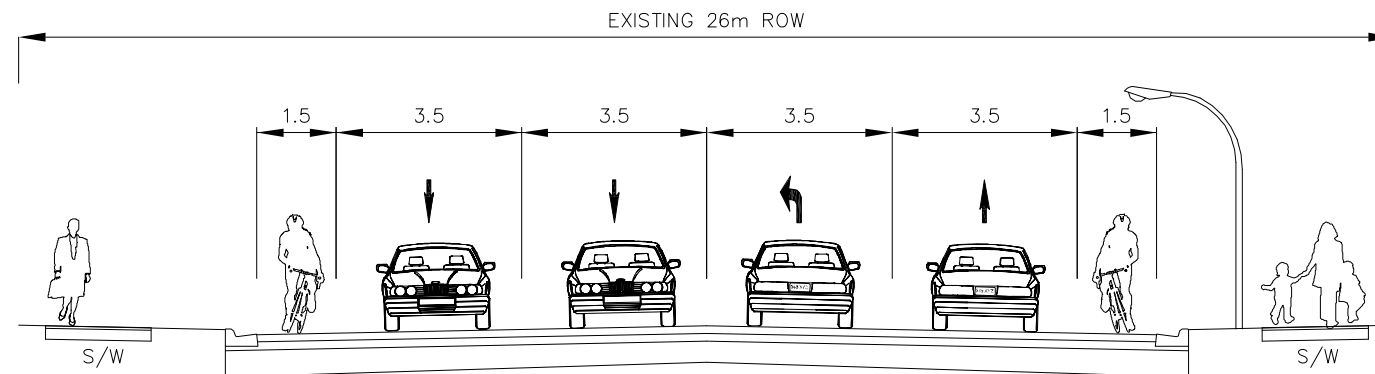
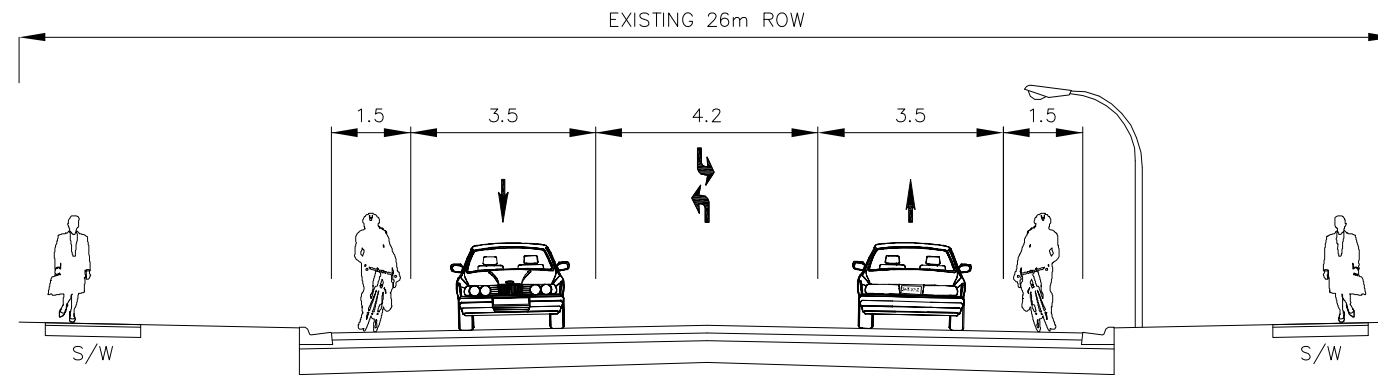
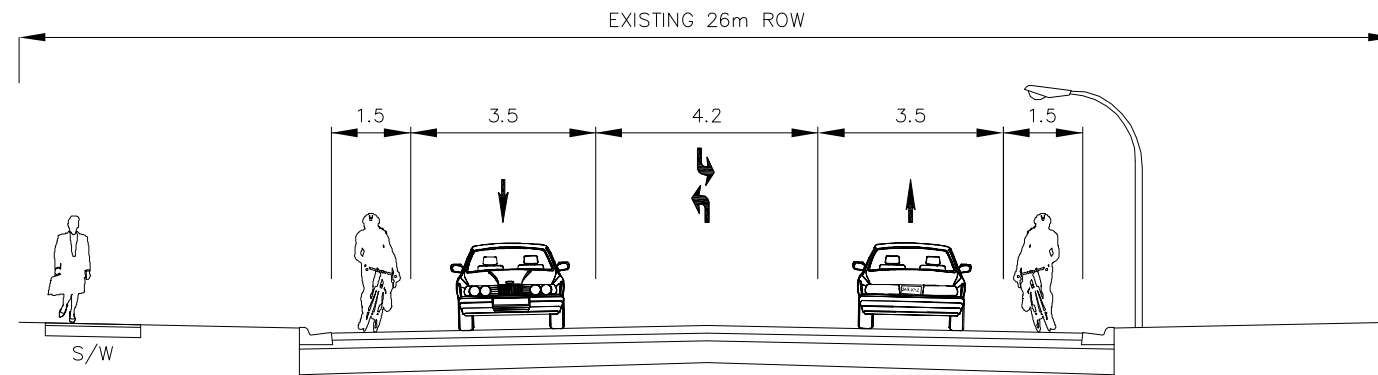
PLATE 3
RECOMMENDED PLAN - BELL FARM ROAD
EAST SECTION

BELL FARM ROAD EA STUDY
Schedule 'C' Municipal Class Environmental Assessment



<p>BT ENGINEERING BTE</p>	<p>SCALE HORIZONTAL 1:1,000</p>
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Legend:

PLATE 4
TYPICAL SECTIONS

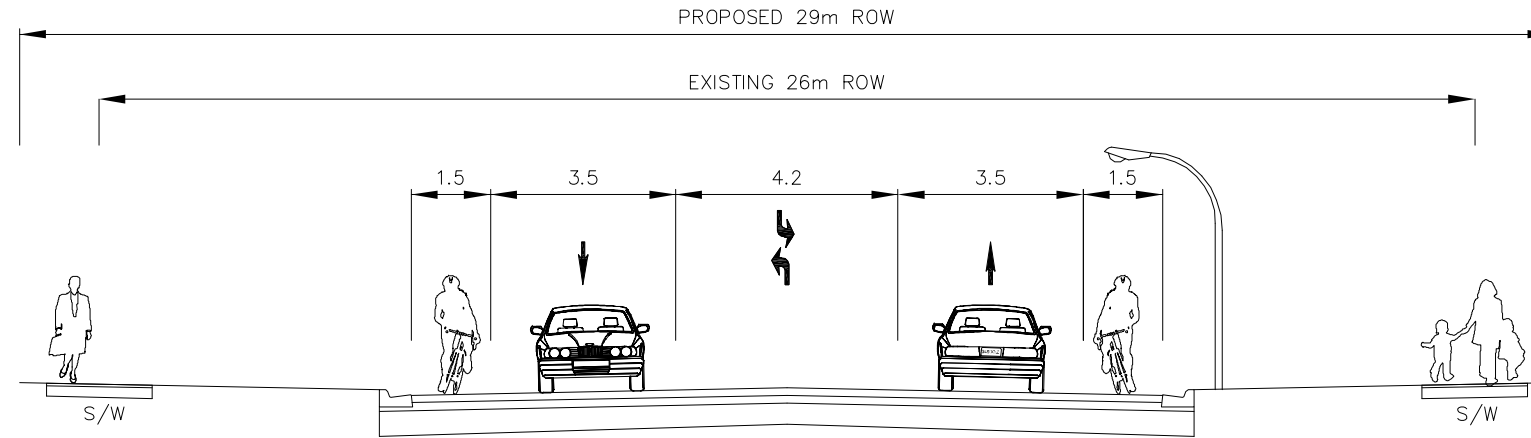
BELL FARM ROAD EA STUDY
Schedule 'C' Municipal Class Environmental Assessment

The City of
BARRIE

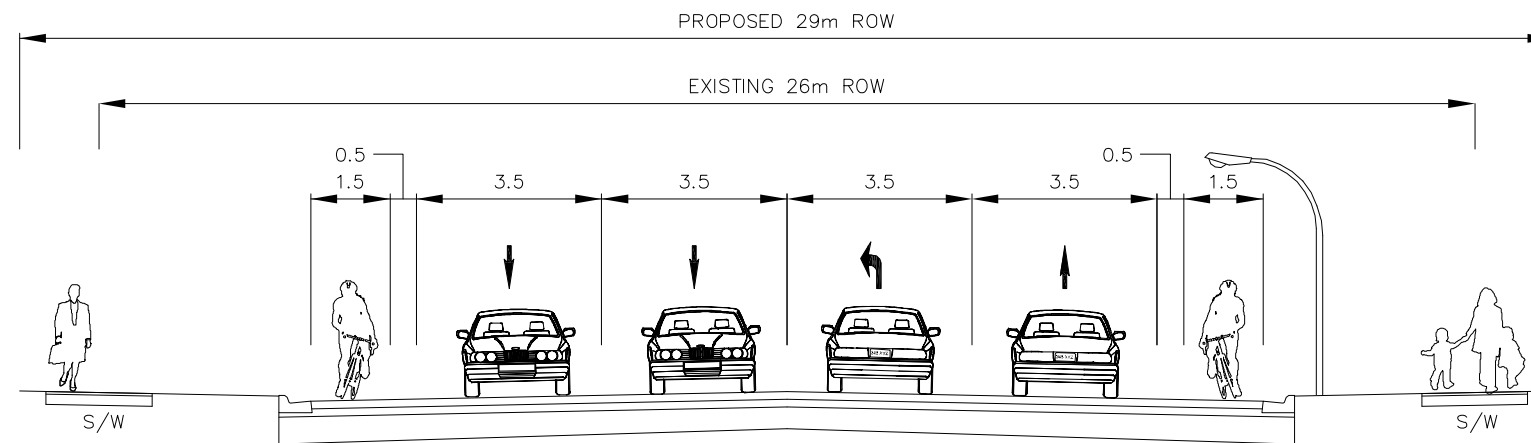
BT ENGINEERING
BTE

SCALE
N.T.S.

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LONG TERM 29m ROW PROPERTY PROTECTION
IDENTIFIED IN OFFICIAL PLAN
EAST SECTION



LONG TERM 29m ROW PROPERTY PROTECTION
IDENTIFIED IN OFFICIAL PLAN
EAST SECTION

Legend:

PLATE 5
TYPICAL SECTIONS
LONG TERM PROPERTY PROTECT IDENTIFIED IN OFFICIAL PLAN

BELL FARM ROAD EA STUDY
Schedule 'C' Municipal Class Environmental Assessment



SCALE
N.T.S.

Glossary of Terms

• AADT	Annual Average Daily Traffic – the average 24-hour, two-way traffic for the period from January 1st to December 31st.
• Alignment	The vertical and horizontal position of a road.
• Alternative	Well-defined and distinct course of action that fulfils a given set of requirements. The EA Act distinguishes between alternatives to the undertaking and alternative methods of carrying out the undertaking.
• Alternative Planning Solutions	Alternative ways of solving problems or meeting demand (Alternatives to the Undertaking).
• Alternative Design Concepts	Alternative ways of solving a documented transportation deficiency or taking advantage of an opportunity. (Alternative methods of carrying out the undertaking).
• Alternative Project	Alternative Planning Solution, see above.
• ANSI	Area of Natural or Scientific Interest
• Berm	Earth landform used to screen areas.
• BMP	Best management practice.
• BRT	Bus Rapid Transit
• Bump-Up	The act of requesting that an environmental assessment initiated as a class EA be required to follow the individual EA process. The change is a result of a decision by the proponent or by the Minister of Environment to require that an individual environmental assessment be conducted.
• Bypass	A form of realignment in which the route is intended to go around a particular feature or collection of features.
• Canadian Environmental Assessment Act (CEAA)	The CEAA applies to projects for which the federal government holds decision-making authority. It is legislation that identifies the responsibilities and procedures for the environmental assessment.
• Class Environmental Assessment Document	An individual environmental report documenting a planning process which is formally submitted under the EA Act. Once the Class EA document is approved, projects covered by the class can be implemented without having to seek further approvals under the EA Act provided the Class EA process is followed.

• Class Environmental Assessment Process	A planning process established for a group of projects in order to ensure compliance with the Environmental Assessment (EA) Act. The EA Act, in Section 13 makes provision for the establishment of Class Environmental Assessments.
• Compensation	The replacement of natural habitat lost through implementation of a project, where implementation techniques and other measures could not alleviate the effects.
• Corridor	A band of variable width between two locations. In transportation studies a corridor is defined area where a new or improved transportation facility might be located.
• Criterion(a)	Explicit feature or consideration used for comparison of alternatives.
• Cultural Heritage Landscape	A defined geographical area of heritage significance that may have been modified by human activity and is valued by a community. It involves a grouping(s) of individual heritage features such as structures, spaces, archaeological sites and natural elements, which together form a significant type of heritage form, distinctive from that of its constituent elements or parts. The Provincial Policy Statements states that significant built heritage resources and significant cultural heritage landscapes shall be conserved.
• Cumulative Effects Assessment	Cumulative Effects Assessment assesses the interaction and combination of the residual environmental effects of the project during its construction and operational phases on measures to prevent or lessen the predicted impacts with the same environmental effects from other past, present, and reasonably foreseeable future projects and activities.
• Decibel (dB)	A logarithmic unit of measure used for expressing level of sound.
• dBA	'A' weighted sound level; the human ear cannot hear the very high and the very low sound frequencies as well as the mid-frequencies of sound, and hence the predicted sound levels, measured in dBA, are a reasonable accurate approximation of sound levels heard by the human ear.

<ul style="list-style-type: none"> • Detail Design 	The final stage in the design process in which the engineering and environmental components of preliminary design are refined and details concerning, for example, property, drainage, utility relocations and quantity estimate requirements are prepared, and contract documents and drawings are produced.
<ul style="list-style-type: none"> • DFO 	Department of Fisheries and Oceans.
<ul style="list-style-type: none"> • EA 	Environmental Assessment
<ul style="list-style-type: none"> • EA Act 	Ontario Environmental Assessment Act (as amended by S.O. 1996 C.27), RSO 1980.
<ul style="list-style-type: none"> • Environment 	<ul style="list-style-type: none"> • Air, land or water, • Plant and animal life, including man, • The social, economic and cultural conditions that influence the life of man or a community, • Any building structure, machine or other device or thing made by man, • Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities or man, or • Any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.
<ul style="list-style-type: none"> • Environmental Effect 	A change in the existing conditions of the environment which may have either beneficial (positive) or detrimental (negative) effects.
<ul style="list-style-type: none"> • Environmentally Sensitive Areas (ESA's) 	Those areas identified by any agency or level of government which contain natural features, ecological functions or cultural, historical or visual amenities which are susceptible to disturbance from human activities and which warrant protection.
<ul style="list-style-type: none"> • Equivalent Sound Level (Leq) 	The level of a continuous sound having the same energy as a fluctuating sound in a given time period. In this report Leq refers to 24-hour, 16 or 18-hour averages.
<ul style="list-style-type: none"> • ESR 	Environmental Study Report.
<ul style="list-style-type: none"> • Evaluation 	The outcome of a process that appraises the advantages and disadvantages of alternatives.

<ul style="list-style-type: none"> • Evaluation Process 	The process involving the identification of criteria, rating of predicted impacts, assignment of weights to criteria, and aggregation of weights, rates and criteria to produce an ordering of alternatives.
<ul style="list-style-type: none"> • External Agencies 	Include Federal departments and agencies, Provincial ministries and agencies, conservation authorities, municipalities, Crown corporations or other agencies other than MTO.
<ul style="list-style-type: none"> • Factor 	A category of sub-factors.
<ul style="list-style-type: none"> • Flyover 	A grade separation with the side road over the freeway. Also described as an underpass.
<ul style="list-style-type: none"> • Freeway 	Freeways are controlled access median divided highway facilities with grade separated crossings and interchanges (e.g. Highway 401).
<ul style="list-style-type: none"> • Grade Separation 	The separation of a cross road with a vertical grade difference from the freeway. Also see overpass, underpass or flyover.
<ul style="list-style-type: none"> • HADD 	Harmful Alteration, Disturbance or Destruction of fish habitat.
<ul style="list-style-type: none"> • Harmonized EA Process 	Harmonized planning process for this project that will meet both the Provincial and Federal EA requirements.
<ul style="list-style-type: none"> • Individual Environmental Assessment 	An environmental Assessment for an undertaking to which Assessment the EA Act applies and which requires formal review and approval under the Act.
<ul style="list-style-type: none"> • Interchange 	The intersection between two roadways at different levels with connecting ramps for traffic turning between them.
<ul style="list-style-type: none"> • LRT 	Light rail transit.
<ul style="list-style-type: none"> • Mitigating Measure 	A measure that is incorporated into a project to reduce, eliminate or ameliorate detrimental environmental effects.
<ul style="list-style-type: none"> • Mitigation 	Taking actions that either remove or alleviate to some degree the negative impacts associated with the implementation of alternatives.
<ul style="list-style-type: none"> • MMATMP 	Multi-Modal Active Transportation Master Plan
<ul style="list-style-type: none"> • MNRF 	Ministry of Natural Resources and Forestry
<ul style="list-style-type: none"> • MOECC 	Ministry of the Environment and Climate Change
<ul style="list-style-type: none"> • MTO 	Ministry of Transportation Ontario

• Noise Attenuation	A mitigation measure used to lessen the intensity of the noise level (dBA) where the noise level is increased in a noise sensitive area greater than 5 dBA 10 years after completion.
• NSA	Noise Sensitive Area is a noise sensitive land use, which has an outdoor living area associated with the residential unit.
• OP	Official Plan
• OLA	Outdoor Living Area is the part of an outdoor amenity area provided for the quiet enjoyment of the outdoor environment.
• Overpass	Cross road goes under the highway.
• Part II Order	The Environmental Assessment Act (EAA) has provisions that allow and interested person, Aboriginal community, or government agency to ask for a higher level of assessment for a class environmental assessment (Class EA) project if they feel that there are outstanding issues that have not been adequately addressed. This is known as a Part II Order
• PLG	Public Liaison Group. This is a group of members of the public who will provide input on local issues, alternatives and values of the community.
• Planning Alternatives	Planning alternatives are “alternative methods” under the EA Act. Identification of significant transportation engineering opportunities while protecting significant environmental features as much as possible.
• Planning Solutions	That part of the planning and design process where alternatives to the undertaking and alternative routes are identified and assessed. Also described as “Alternative Project” under the federal EA Act.
• PIC	Public Information Centre
• Prime Agricultural Areas	Prime agricultural areas as defined in municipal official plans and other government policy sources.
• Project	A specific undertaking planned and implemented in accordance with this Class EA including all those activities necessary to solve a specific transportation problem.

• Project Team	The Project Team will include the City of Barrie and Consultant Technical management team who will lead all technical elements of the study
• Proponent	A person or agency that carries or proposes to carry out an undertaking, or is the owner or person having change, management, or control of an undertaking.
• Public	Includes the general public, interest groups, associates, community groups, and individuals, including property owners.
• RA	Responsible Authority from the Federal government who will act as the lead agency in administering the processing of the federal CEAA screening for this project
• Realignment	Replacement or upgrading of an existing roadway on a new or revised alignment.
• Recommended Plan	That part of the planning and design process, during which various alternative solutions are examined and evaluated including consideration of environmental effects and mitigation; the recommended design solution is then developed in sufficient detail to ensure that the horizontal and vertical controls are physically compatible with the proposed site, that the requirements of lands and rights-of-way are satisfactorily identified, and that the basic design criteria or features to be contained in the design, have been fully recognized and documented in sufficient graphic detail to ensure their feasibility.
• Route Alternatives	Location alternatives within a corridor.
• SADT	Summer Average Daily Traffic – the average 24-hour, two-way traffic for the period from July 1 st to August 31 st including weekends.
• SAR	Species at Risk
• Screening	Process of eliminating alternatives from further consideration, which do not meet minimum conditions or categorical requirements.
• Sub-factor	A single criterion used for the evaluation. Each sub-factor is grouped under one of the factors.
• SWH	Significant Wildlife Habitat
• TPA	Technically Preferred Alternative

• Traceability	Characteristics of an evaluation process which enables its development and implementation to be followed with ease.
• Underpass	Cross road goes over the highway.
• Undertaking	In keeping with the definition of the Environmental Assessment Act, a project or activity subject to an Environmental Assessment.

Disclaimer

All personal information has been removed, including names and addresses, under the Freedom of Information and Protection of Privacy act.