



## **Project File**

Centennial Road (CR 28) / Elm Line (CR 56) Intersection Improvements Municipal Class Environmental Assessment

August 2020

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Appendix C	Select Correspondence
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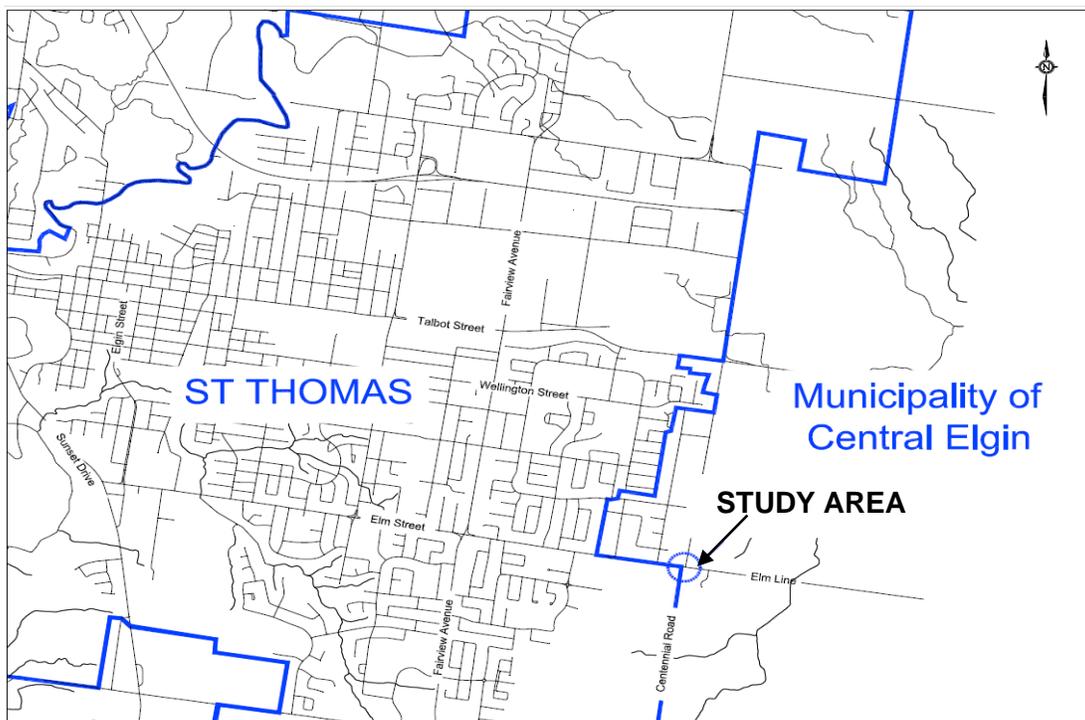
## 1.0 INTRODUCTION

The County of Elgin (County) is undertaking a Schedule B Class Environmental Assessment (EA) to develop a transportation plan for intersection improvements at Centennial Road (County Road 28) and Elm Line (County Road 56) in the Municipality of Central Elgin. Intersection improvements are required to improve the operation, safety and capacity of the existing intersection. The Study has developed and evaluated alternatives for the future intersection design including intersection alternatives, active transportation and drainage, and has determined the property requirements to implement the project.

This Project File Report documents the transportation need and the Recommended Plan to address current and future operational needs, considering all modes of travel and incorporating environmental mitigation measures as required. These intersection improvements will provide all users (pedestrians, bicycles, and vehicular traffic) with a safe and efficient route to travel.

### 1.1 Study Area

The Study Area is located in the County of Elgin and is illustrated on **Figure 1**. The Study Area includes the Centennial Road / Centennial Avenue (CR 28) and Elm Street / Elm Line (CR 56) intersection. For the purposes of this report, the names Centennial Road and Elm Line will be used to describe the roadways. This intersection is located in the Municipality of Central Elgin at the eastern boundary limits of the City of St. Thomas.

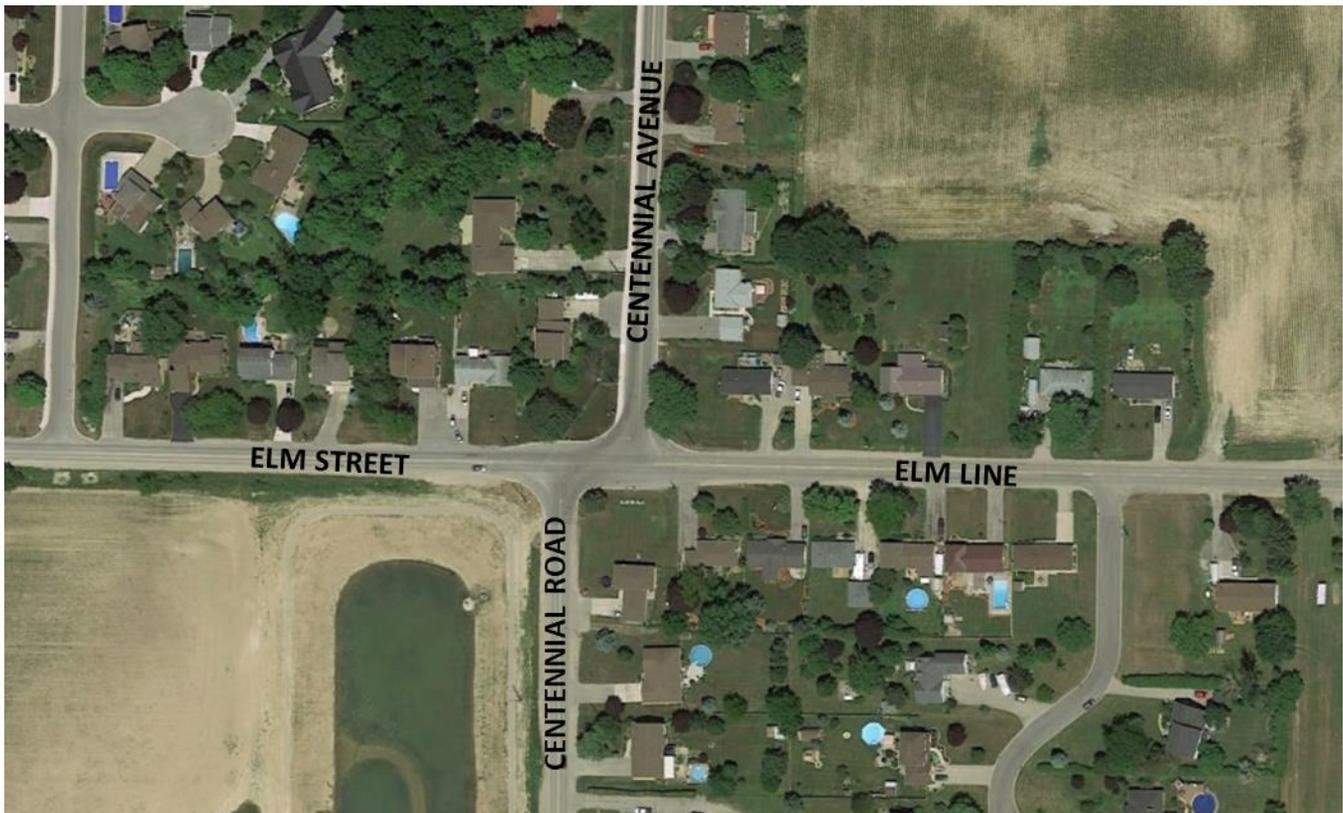


**Figure 1: Project Location**

## 2.0 NEED AND JUSTIFICATION

Improvements are required to the Centennial Road and Elm Line Intersection (see **Figure 2**) as a result of development growth within Central Elgin and the City of St. Thomas. This Project File Report defines a transportation management plan for the intersection that accommodates existing and long-term travel demand, and provides safe operation for all modes of transportation including vehicular traffic, pedestrians, cyclists and farm equipment.

This Study will: improve the geometry, operational capacity, and safety of the intersection for all road users; define a transportation management plan to support travel within the County; and implement active transportation facilities that address AODA requirements.



**Figure 2: Existing Offset Intersection at Centennial Road and Elm Line**

### 3.0 STUDY PROCESS

The *Environmental Assessment Act of Ontario* (EA Act) provides for “the protection, conservation and wise management in Ontario of the environment”<sup>1</sup>. Municipal infrastructure projects, including road projects, within the Province of Ontario must follow the process prescribed by the EA Act. The EA process includes: the identification of the problem/opportunity; evaluation and selection of the preferred alternative while minimizing environmental effects; and consultation with stakeholders in the decision-making process.

The environmental impacts of municipal projects are varied. Therefore, projects are classified into Schedules based on the scope and complexity of the project as well as the estimated capital cost. This study was completed to satisfy the Municipal Class EA process for a Schedule B Study. Schedule B projects generally include improvements and minor expansions to existing facilities and have the potential for some adverse environmental effects.

At the start of the study, a draft Study Design document was prepared that described the proposed work plan, public consultation and process to be followed to complete the Class Environmental Assessment. The Final Study Design report, included in **Appendix A**, was initially circulated in draft form for public and agency comment and revised based on input received.

#### 3.1 Class Environmental Assessment Process

The Class EA document specifies the procedures required to plan specific transportation projects according to an approved planning process. The study approach included the Ministry of the Environment, Conservation and Parks (MECP) 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 was undertaken in a series of phases commencing with problem identification and culminating in the filing of a Project File Report. The Planning and Design Process for the Municipal Class EA is illustrated in **Figure 3**. 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. This study involved three of the five phases of the Schedule B EA process:

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<sup>1</sup> Municipal Class Environmental Assessment, Municipal Engineers Association (2015)

- Phase 1: Identify the Problem
- Phase 2: Alternative Solutions
- Phase 5: Implementation

The project will be approved for design and construction if no written concerns are submitted during the 30-day public review period.

### **3.2 Consultation Program**

Over the course of the study, input was solicited from the public, stakeholders, agencies and Indigenous Communities. Input was collected through meetings, the project website, and discussions/communication with interested parties. The Study approach was to work collaboratively with interested parties to address issues and reach a consensus on the preferred design.

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

### **3.3 Notices**

Notices for the Study Commencement, Online Public Information Centre and Filing of Study Completion were published on the County's website and mailed/emailed to the project contact list. The Notice of Public Information Centre No. 1 was advertised in the St. Thomas Journal on May 15 and 20, 2020.

See **Appendix B** for copies of the Notice of Study Commencement, PIC report, and the Notice of Filing of Study Completion.

**Appendix C** includes select correspondence received from interested individuals, ministries, agencies, and Indigenous Peoples.

### **3.4 Contact List**

A public/agency mailing list was developed at the start of the study and was updated throughout the duration. The following Sections identify the stakeholders, agencies and communities contacted.

#### **3.4.1 Stakeholder Consultation**

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 Study for their input. The following ministries, agencies and stakeholders were invited to attend the online PIC meeting:

- Ministry of the Environment, Conservation and Parks (MECP)
- Ministry of Natural Resources and Forestry (MNRF)
- Ministry of Indigenous Affairs
- Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)
- Catfish Creek Conservation Authority (CCCA)

- Kettle Creek Conservation Authority (KCCA)
- City of St. Thomas
- Municipality of Central Elgin
- Infrastructure Ontario
- Emergency Services
- School Boards/Bus Services

### **3.4.2 Indigenous Peoples Consultation**

The County of Elgin has a constitutional duty to consult with Indigenous Communities with traditional land use or interests within the Study Area. Notices were sent to the Indigenous Communities within the vicinity of the Study Area notifying them of the Study start-up and key milestones. Those contacted included:

- Munsee-Delaware Nation
- Walpole Island First Nation
- Chippewas of Kettle and Stony Point First Nation
- Oneida Nation of the Thames
- Aamjiwnaang First Nation (Chippewas of Sarnia)
- Chippewas of the Thames First Nation
- Caldwell First Nation
- Delaware Nation
- Metis Nation of Ontario
- Southern First Nations Secretariat

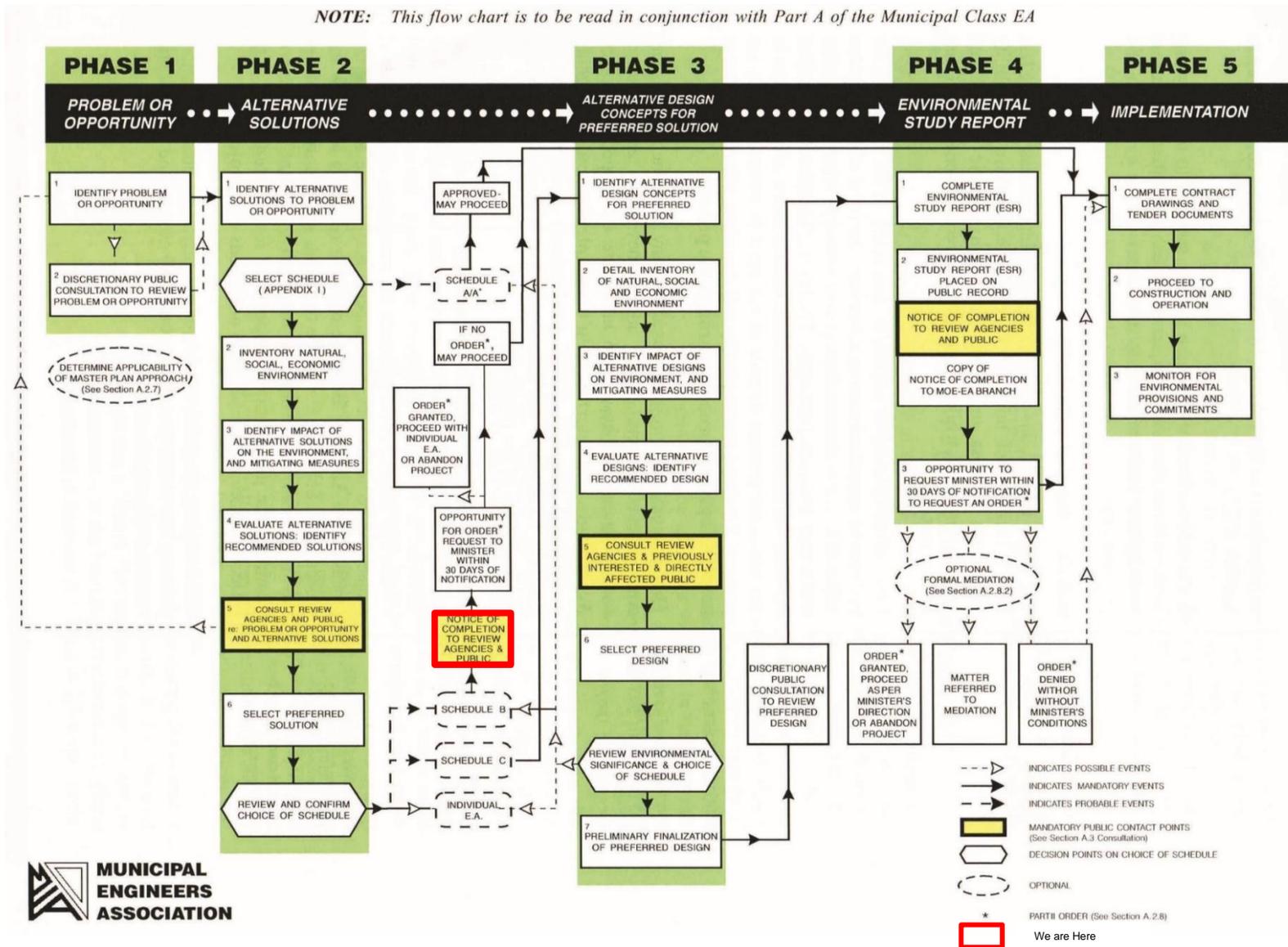
### **3.5 Public Consultation**

An Online Public Information Centre (PIC) was held during the study to present the project, the assessment of opportunities, and the preliminary transportation improvement alternatives. These meetings were an integral component of the study – seeking input and comments from the local road users and stakeholders.

Public Information Centre (PIC) No. 1 for this Study was held online from May 19 to June 5, 2020. At the time of the PIC, the Province of Ontario had implemented a State of Emergency requiring measures to deal with the COVID-19 pandemic, and public gatherings were prohibited. As a result, the Public Information Centre relied on web-based communications. All members of the public and interest groups were invited to view the Online Public Information Centre material and were encouraged to provide a written response to any issues or concerns.

Eleven (11) comment sheets were submitted during the PIC. These comments were recorded and used as input for subsequent steps in the Environmental Assessment Study.

Individual property owners in close proximity to the project were met with in person or using online conferencing meetings to engage them in the process.



**Figure 3: Municipal Class EA Process**

## **4.0 EXISTING CONDITIONS**

The existing conditions of the natural and built environment, land use and property, and socio-economic environment in the Study Area are described in this Section.

### **4.1 Transportation**

The Centennial Road / Elm Line intersection currently operates as a 4-legged intersection with the north and south approaches offset by approximately 25 m. The north and south approaches are Stop controlled, and all legs of the intersection have single-lane approaches with exception of the north leg which has a dedicated southbound left-turn lane.

Centennial Road and Elm Line are 2-lane rural roadways providing access to residential, agricultural and commercial properties as well as connecting the County to the City of St. Thomas and the wider transportation network. The roadway serves all modes of travel including vehicular traffic, goods movement, cycling and pedestrians. A sidewalk has been in place on the west side of Centennial Avenue (north leg of the intersection) since 2016 and sidewalks have just been installed on the north and south sides of Elm Street (west leg of the intersection) as part of a current City of St. Thomas construction project. Centennial Road (south approach) has a posted speed of 60 km/h. All other road approaches have a posted speed limit of 50 km/h.

#### **4.1.1 Active Transportation**

The subject sections of Elm Street and Elm Line form part of the Trans Canada Trail through Elgin County. Bicycle lanes are currently being constructed by the City of St. Thomas on Elm Street, west of the intersection. The Elgin - St. Thomas Cycling Master Plan (2014) identifies Elm Line and Centennial Road as Active Transportation Routes. The Master Plan recommendations include:

- A proposed signed route along Elm Line connecting the City of St. Thomas to Oxford County and Tillsonburg.
- A proposed multi-use path along the southern leg of Centennial Road connecting the Southwest St. Thomas Area to Elm Line and the proposed network of trails.

### **4.2 Land Use**

The County of Elgin Official Plan describes the Study Area as follows:

- Tier 1 Settlement Area (see Schedule A of the County's Official Plan): These settlement areas have the largest populations and are fully serviced.
- Elm Line is identified as a County Collector Road and Centennial Avenue is identified as a Suburban Link. This intersection is identified for "County Future Intersection Improvements" in the Official Plan (Reference Schedule B of the County's Official Plan).

The Municipality of Central Elgin Official Plan describes the Study Area as follows:

- Eastwood Urban Settlement Area (Reference Schedule 1 of the Municipality's Official Plan). This area is a focus of urban growth in Central Elgin.
- Residential Land Use (Reference Schedule D of the Municipality's Official Plan). These are the main locations for housing in Central Elgin and are fully serviced.

Section 2.8.5.1.1 of the Municipality's Official Plan indicates that vehicular transportation will continue to be the dominant mode of transportation in the Municipality; however, alternative modes of transportation are encouraged in Urban Settlement Areas.

#### **4.2.1 Development**

Several developments are planned/approved in the areas adjacent to the intersection. This includes the Harvest Run Subdivision, which is a planned 150 acre subdivision located in the southwest quadrant of the Centennial Road/Elm Line intersection. Upon full development this subdivision is planned to include 1150 dwelling units and a 1.3 hectare commercial/retail block.

#### **4.3 Utilities and Municipal Servicing**

Multiple aerial and underground utilities are present in the Study Area including:

- Buried Rogers and Bell telecommunication infrastructure.
- Gas main on all legs of the intersection
- Watermain on all legs of the intersection
- 250 mm sanitary sewer along Elm Street and Centennial Avenue (west and north legs of intersection)
- 975 mm storm sewer along Elm Street and Centennial Avenue (west and north legs of intersection)
- Aerial hydro lines owned by Entegrus and Hydro One

#### **4.4 Natural Environment**

The Study Area is completely transformed from its natural state with no environmentally sensitive areas or rare vegetation communities.

The majority of the potential impacts to the natural environment are associated with vegetation removal, intersection footprint excavation, and grading activities. The localized intersection improvements are not anticipated to have any long term impacts on wildlife or bird migration, as the work will occur within a residential environment. As such, no impacts to environmentally sensitive areas are anticipated as a result of the undertaking.

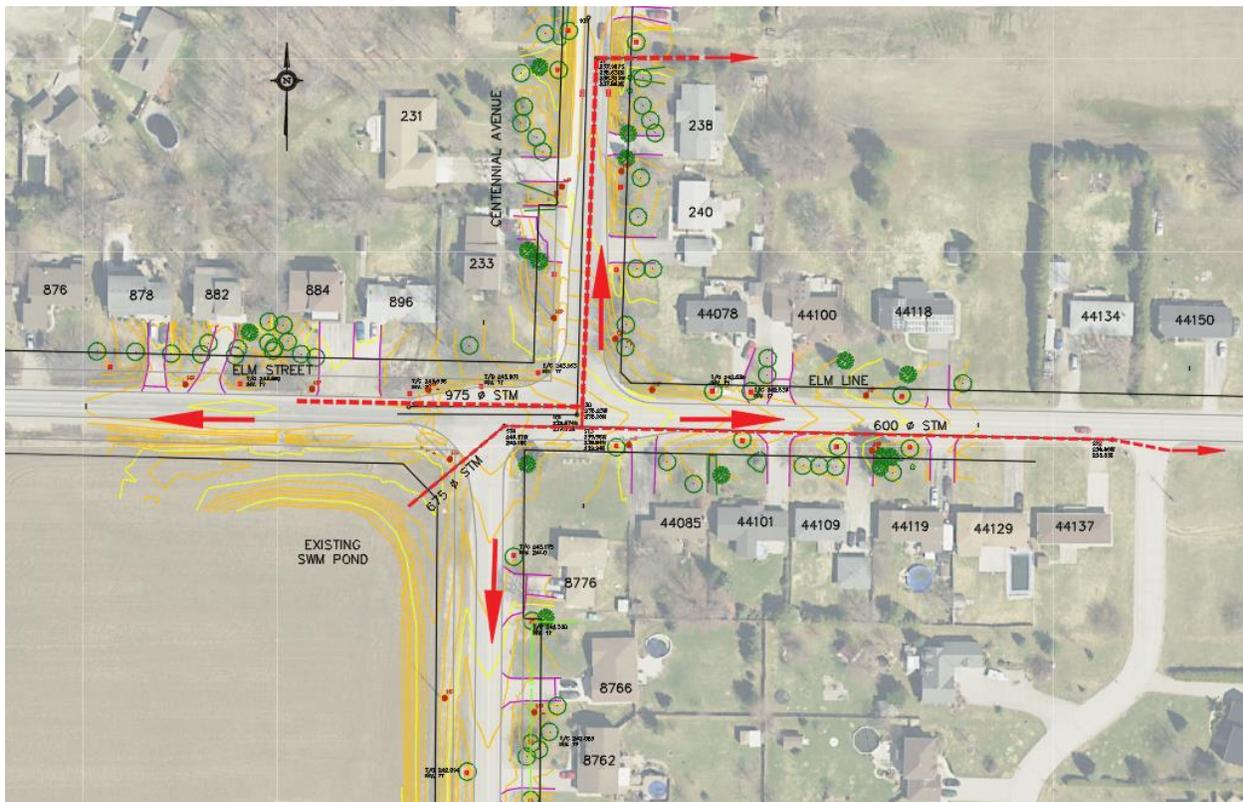
#### **4.5 Social and Cultural Environment**

The Study Area is completely transformed from its natural state and has been previously disturbed. The checklists for Criteria for Evaluating Potential for Built Heritage Resources and

Cultural Heritage Landscapes and Criteria for Evaluating Archaeological Potential were completed and are provided in **Appendix D**. Based on these checklists, it was determined that the study area has low potential for built heritage/cultural heritage landscape and archaeological resources, and further study is not required.

#### 4.6 Drainage and Stormwater Management

The existing Study Area drains to catch basins connected to storm sewers located under Elm Street, Elm Line and Centennial Avenue. **Figure 4** depicts the direction of flow at the intersection. A summary of existing conditions is provided in the Drainage and Stormwater Management Study provided in **Appendix E**.



**Figure 4: Existing Drainage and Stormwater Management Conditions**

#### 4.7 Groundwater and Source Water Protection

The Study Area is within the Catfish Creek Source Protection Area (i.e. watershed); however, it is not within an area where Source Protection Policies apply (i.e. no wellhead protection area, issue contributing areas or intake protection zone).

Industry best practices will be used to prevent spills and / or the release of contaminated material during construction.

## 5.0 TRANSPORTATION

Peak hour traffic volumes (representing 2016 background traffic) were obtained from the Harvest Run Residential Development Phase 2A Traffic Impact Assessment (F.R. Berry & Associates, Revised 2018). These volumes were projected to 2020 assuming an annual traffic growth rate of 2.0% and are presented in **Figure 5**. These background traffic volumes do not include traffic generated from of the initial phases of the Harvest Run development (Phases 1 and 2A)

			N↑		
(173)	(124)	(21)	↑	15	(17)
91	57	15	←	148	(176)
↙	↓	↘	↘	5	(11)
<b>Centennial Road</b>					
(87)	163	↑	↙	↑	↘
(150)	104	→	27	105	6
(35)	14	↓	(38)	(67)	(8)
<b>Elm Line</b>			AM Peak (PM Peak)		

**Figure 5: 2020 Background Peak Hour Traffic Volumes**

### 5.1 Traffic Demands

Future Development adjacent to the Study Area includes:

**Harvest Run Subdivision:** This planned 150-acre subdivision is located in the southwest quadrant of the Centennial Road/Elm Line intersection and includes 1150 dwelling units and a 1.3 hectare commercial/retail block. The proposed land uses for this development are included in **Table 1**. Phase 1 of the development has been fully built out, and Phase 2A is planned to be built out by the end of 2023.

**Dunning Farm:** The Dunning Farm is located south of the Harvest Run subdivision and is 16.8 hectares. For the purposes of this report it was assumed that this property would be developed by the 2030 horizon year as low density residential. The proposed land uses for this development is included in **Table 1**.

	<b>Phase</b>	<b>Area</b>	<b>Density</b>
<b>Harvest Run Development</b>	Phase 1	7.29 ha	110 Single family units
	Phase 2A	25.5 ha	255 Single family Units 150 Townhouse units 35,000 Commercial space
	Phase 2B	2.95 ha <sup>2</sup>	Medium Density
	Phase 3	14.9 ha <sup>1</sup>	Low Density
<b>Dunning Farm</b>	n/a	16.8 ha <sup>1</sup>	Low Density

The ITE Trip Generation Manual was used to estimate the traffic volumes generated by full buildout of the Harvest Run Development and the Dunning Farm Property. The projected AM and PM peak hour site-generated traffic volumes are presented in **Table 2**.

	ITE Land Use (Code)		AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
<b>Phase 1</b>	<b>Single Family Detached (210)</b>	<i>ITE Trip Rate</i>	0.77			1.02		
110		<i>Distribution</i>	100%	26%	74%	100%	64%	36%
du		<i>Number of Trips</i>	85	22	63	112	72	40
<b>Phase 2A</b>	<b>Single Family Detached (210)</b>	<i>ITE Trip Rate</i>	0.77			1.02		
255		<i>Distribution</i>	100%	26%	74%	100%	64%	36%
du		<i>Number of Trips</i>	196	51	145	260	166	94
<b>Phase 2A</b>	<b>Medium Density (230)</b>	<i>ITE Trip Rate</i>	0.44			0.52		
150		<i>Distribution</i>	100%	19%	81%	100%	64%	36%
du		<i>Number of Trips</i>	66	13	53	78	50	28

<sup>2</sup> Area and density for Phase 2B and Phase 3 of the Harvest Run development and the Dunning Farm were based on the Harvest Run Subdivision Phase 1 Sanitary Drainage System Area.

**Table 2: Trip Generation of the Harvest Run Subdivision and Dunning Farm**

	ITE Land Use (Code)		AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
<b>Phase 2A</b>	<b>Commercial (820)</b>	<i>ITE Trip Rate</i>	0.96			3.71		
35 (x1000) sf		<i>Distribution</i>	100%	62%	38%	100%	48%	52%
		<i>Number of Trips</i>	34	21	13	130	62	68
<b>Phase 2B*</b>	<b>Medium Density (230)</b>	<i>ITE Trip Rate</i>	0.19			0.24		
192 persons		<i>Distribution</i>	100%	16%	84%	100%	67%	33%
		<i>Number of Trips</i>	36	6	31	46	31	15
<b>Phase 3*</b>	<b>Single Family Detached (210)</b>	<i>ITE Trip Rate</i>	0.21			0.27		
656 persons		<i>Distribution</i>	100%	30%	70%	100%	66%	34%
		<i>Number of Trips</i>	138	41	96	177	117	60
<b>Dunning Farm</b>	<b>Single Family Detached (210)</b>	<i>ITE Trip Rate</i>	0.21			0.27		
739 persons		<i>Distribution</i>	100%	30%	70%	100%	66%	34%
		<i>Number of Trips</i>	155	47	109	200	132	68
<b>TOTAL</b>		<i>Distribution</i>	100%	30%	70%	100%	63%	37%
		<i>Number of Trips</i>	710	201	510	1003	630	373

\* Based on Harvest Run Subdivision Phase 1 Sanitary Drainage System Area

## 5.2 Trip Distribution and Assignment

Trip distribution and assignment of site generated traffic (see **Figure 6**) for Phases 1 and 2A was based on the distribution identified in the Harvest Run Residential Development Phase 2A Traffic Impact Assessment (F.R. Berry & Associates, Revised 2018). This distribution was prepared in consultation with City of St. Thomas staff.

						N↑
(70)	(70)	(0)	↑	0	(0)	
21	21	0	←	7	(25)	
←	↓	↘	↘	3	(11)	<b>Centennial Road</b>
(46)	55	↑	←	↑	↘	
(12)	14	→	0	55	14	
(0)	0	↓	(0)	(46)	(12)	
			Elm Line			AM Peak (PM Peak)

**Figure 6: Traffic Volumes generated by the Harvest Run Subdivision (Phases 1 and 2A)**

Trip distribution and assignment of site generated traffic for Phases 2B and 3 of the Harvest Run Development and the Dunning Farm property were developed based on existing traffic patterns through the study area. The distribution assumes 5% of traffic will be destined to/from Southdale Line as a worst-case scenario (see **Figure 7**).

						N↑
(0)	(95)	(0)	↑	0	(0)	
0	34	0	←	0	(0)	
←	↓	↘	↘	3	(8)	<b>Centennial Road</b>
(0)	0	↑	←	↑	↘	
(0)	0	→	21	76	7	
(22)	8	↓	(27)	(100)	(9)	
			Elm Line			AM Peak (PM Peak)

**Figure 7: Traffic Volumes generated by the Harvest Run Subdivision (Phases 2B and 3) and the Dunning Farm Development**

### 5.3 Total Traffic

It was assumed that area peak hour traffic growth over the next 20 years will be dominated by the Harvest Run and Dunning Farm Developments. A conservative estimate of the total traffic for the 2040 planning horizon is the sum of the 2020 background traffic and the traffic generated from the Harvest Run and Dunning Farm development. The resulting 2040 total peak hour traffic projections are presented in **Figure 8**. The current intersection will be unable to accommodate this traffic growth and safety concerns resulting from the intersection geometry are already becoming more evident with the existing traffic demands.

			N↑		
(327)	(350)	(31)	↑	23	(26)
156	140	23	←	227	(287)
←	↓	↳	↘	14	(35)
			<b>Centennial Road</b>		
(175)	298	↑	↖	↑	↗
(236)	168	→	61	287	31
(73)	29	↓	(83)	(246)	(32)
Elm Line			AM Peak (PM Peak)		

**Figure 8: 2040 Total Traffic Volumes**

### 5.4 Signal Warrant Analysis

A signal warrant analysis was completed at the Centennial Road / Elm Line intersection following the methodology described in OTM Book 12. The peak hour volumes were adjusted to reflect an average hourly volume and were increased by 20% to reflect the uncertainties associated with the projection of background and development traffic.

The analysis shows that traffic signals are warranted for the 2040 projected total traffic volumes.

## 6.0 GENERATION OF ALTERNATIVES

The analysis and evaluation of alternatives involves a 2-step process for decision-making. The initial assessment is the analysis and evaluation of Planning Solutions, which considers different approaches to address the problem. This was documented in the Study Design. The second step is the assessment of preliminary design alternatives which considers alternative intersection improvements. These two steps in the evaluation are described in the following sections.

### 6.1 Assessment of Alternative Planning Solutions

The Class Environmental Assessment Act requires that all reasonable and feasible Planning Solutions be identified and evaluated at the start of the Study. These alternatives consider the overall needs of the study area and identify alternative approaches of addressing the need for improvements. Four (4) Alternative Planning Solutions were considered for Centennial Road / Elm Line:

1. Do Nothing – The Do Nothing Alternative must be considered as mandated by the Class EA. It represents a baseline from which other approaches can be compared. This alternative would maintain the existing offset intersection.
2. Transportation Demand Management (TDM) – This strategy would reduce vehicular demand and encourage alternative work hours, work at home, more active modes of transportation (cycling and walking) and the use of transit.
3. Limit Development – This strategy would limit any new residential, commercial or industrial development and therefore reduce the generation of new trips.
4. Intersection Improvements – Intersection improvements to improve geometry and capacity of the intersection.

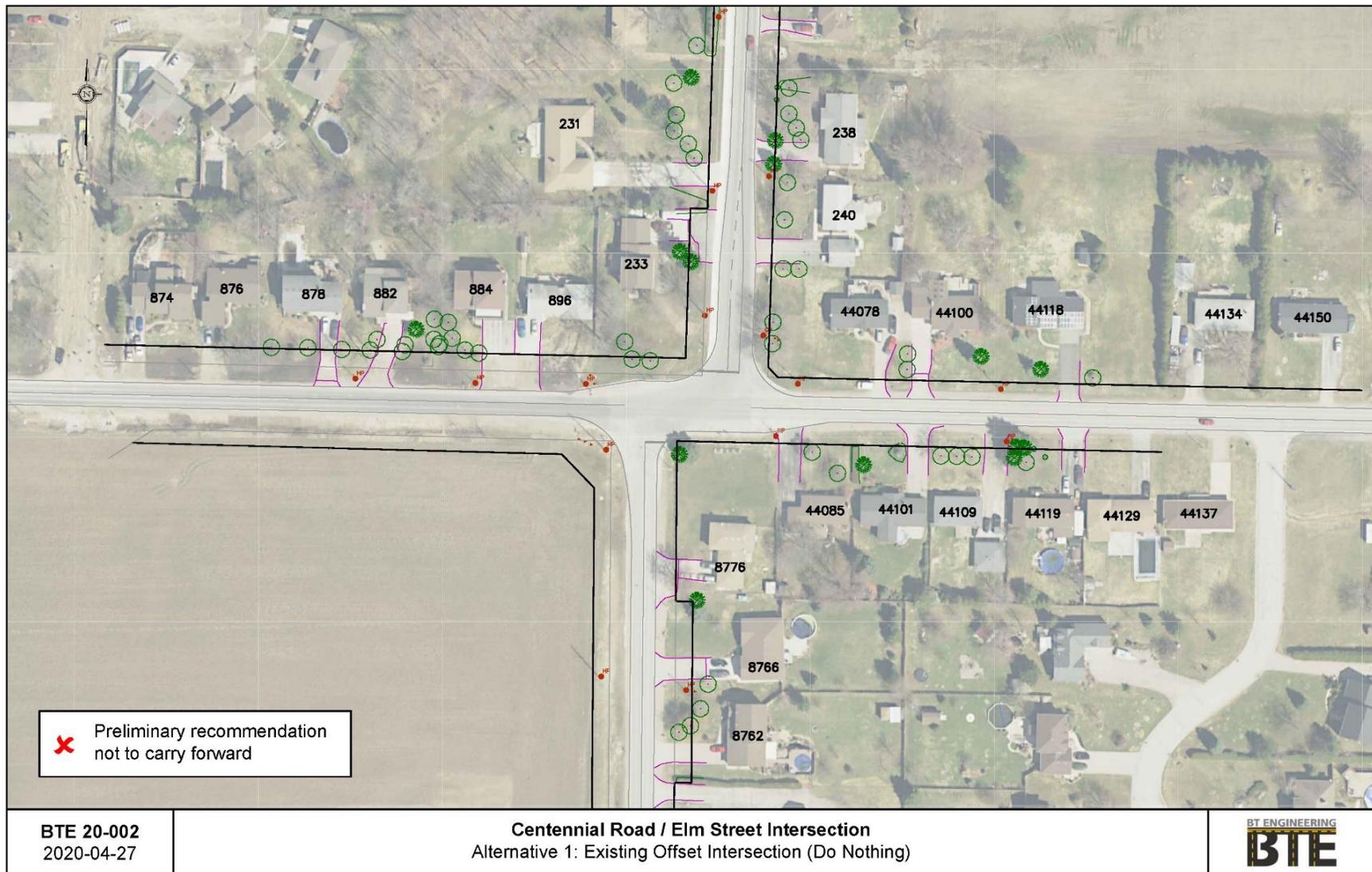
Based on the preliminary review of Alternative Planning Solutions, “Intersection Improvements at Centennial Road/Elm Line” was recommended. This Planning Solution addresses the transportation problem by improving safety and addressing future capacity constraints. This recommendation was presented at PIC No. 1 and no objections were received.

### 6.2 Generation and Assessment of Preliminary Design Alternatives

The analysis and evaluation process is a central requirement of the EA process. Preliminary Design Alternatives were generated for improvements to the Centennial Road and Elm Line intersection. Alternatives that were not viable, had significant impacts, or had substantially poorer safety or traffic performance compared with other alternatives, were coarse screened, as described below:

- ✘ Alternative 1: Existing Offset Intersection (Do Nothing) – An unsignalized intersection is not considered to be a viable alternative. This alternative does not address the warrant for traffic signals. Not carried forward for evaluation. See **Figure 9**.

- ✘ Alternative 2a: Skewed Unsignalized intersection – An unsignalized intersection is not considered to be a viable alternative. This alternative does not address the warrant for traffic signals. Not carried forward for evaluation. See **Figure 10**.
- ✘ Alternative 2b: Unsignalized Intersection with Realignment and Right-Turn Lane – An unsignalized intersection is not considered to be a viable alternative. This alternative does not address the warrant for traffic signals. Not carried forward for evaluation. See **Figure 11**.
- ✘ Alternative 2c: Unsignalized Intersection with Realignment and Right-Turn Lane – An unsignalized intersection is not considered to be a viable alternative. This alternative does not address the warrant for traffic signals. Not carried forward for evaluation. See **Figure 12**.
- ✘ Alternative 3a: Signalized Offset Intersection – Does not improve existing safety concerns with the offset intersection. Not carried forward for evaluation. See **Figure 13**.
- ✓ Alternative 3b: Signalized Skewed Intersection – Carried forward for evaluation. See **Figure 14**.
- ✘ Alternative 3c: Signalized Intersection with Realignment of Centennial Avenue – Significant property impacts as a result of the realignment of the north approach. Not carried forward for evaluation. See **Figure 15**.
- ✘ Alternative 3d: Signalized Intersection with Realignment of Centennial Road – Significant property impacts as a result of the realignment of the south approach. Not carried forward for evaluation. See **Figure 16**.
- ✘ Alternative 3e: Signalized Skewed Intersection with Channelization – Significant property impacts as a result of the channelization of right-turn movements and does not accommodate large trucks/farm equipment. Not carried forward for evaluation. See **Figure 17**.
- ✓ Alternative 4a: 40 m Roundabout – Carried forward for evaluation. See **Figure 18**.
- ✓ Alternative 4b: 45 m Roundabout (southwest offset) – Carried forward for evaluation. See **Figure 19**.
- ✓ Alternative 4c: 45 m Roundabout (centred) – Carried forward for evaluation. See **Figure 20**.
- ✓ Alternative 4d: 48 m Roundabout – Carried forward for evaluation. See **Figure 21**.



**Figure 9: Alternative 1: Existing Offset Intersection (Do Nothing)**

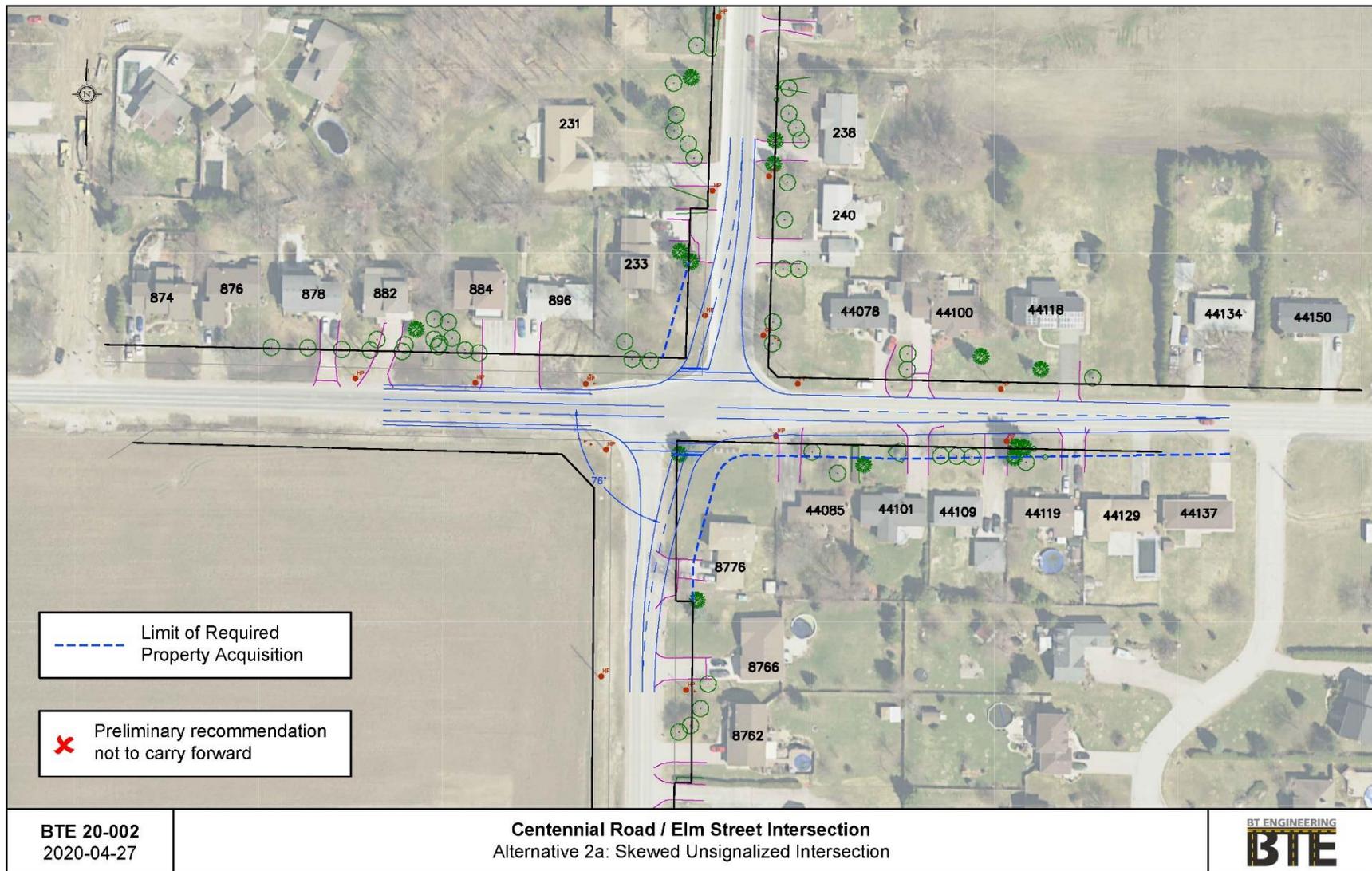
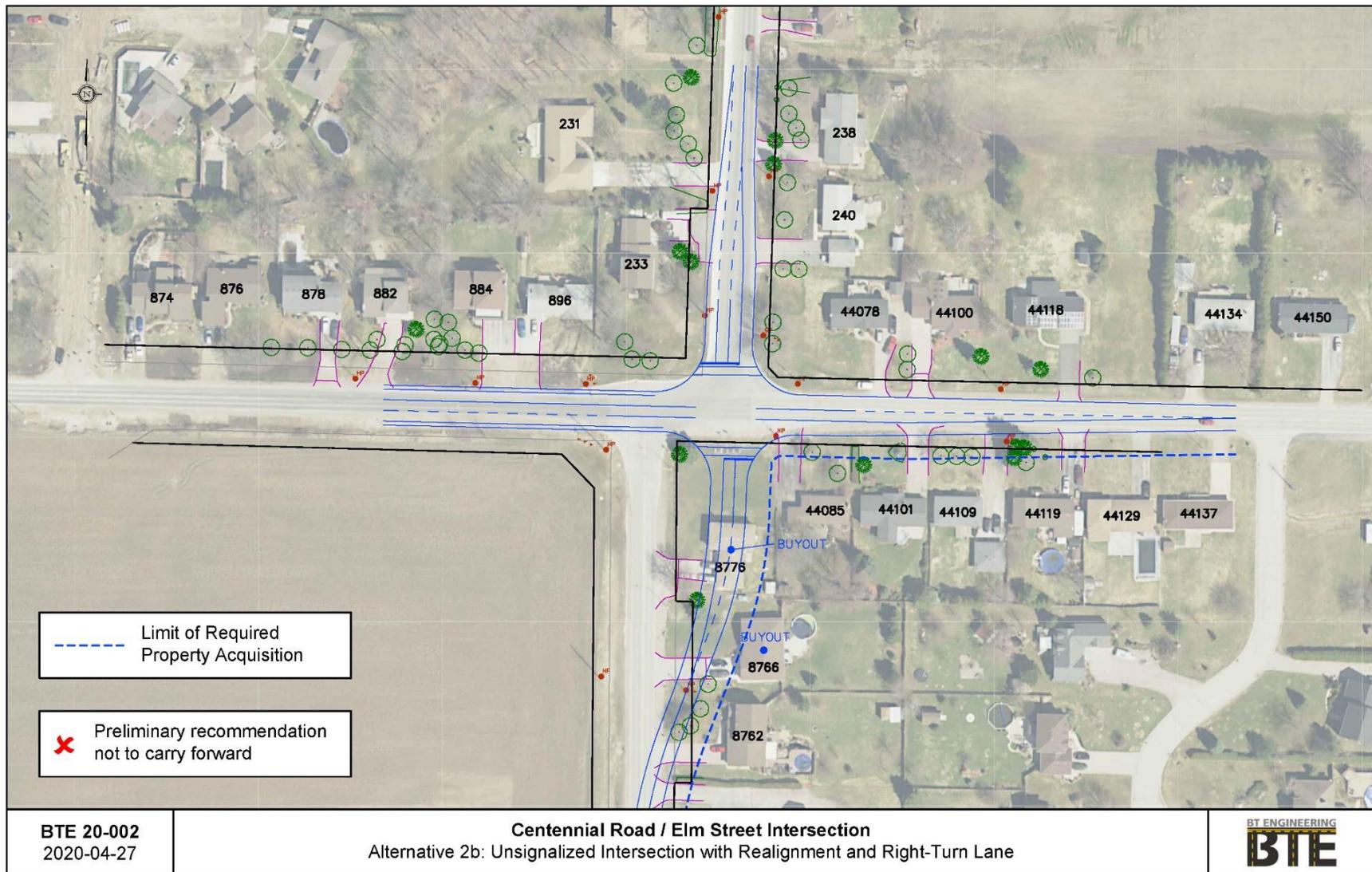


Figure 10: Alternative 2a: Skewed Unsignalized intersection



**Figure 11: Alternative 2b: Unsignalized Intersection with Realignment and Right-Turn Lane**

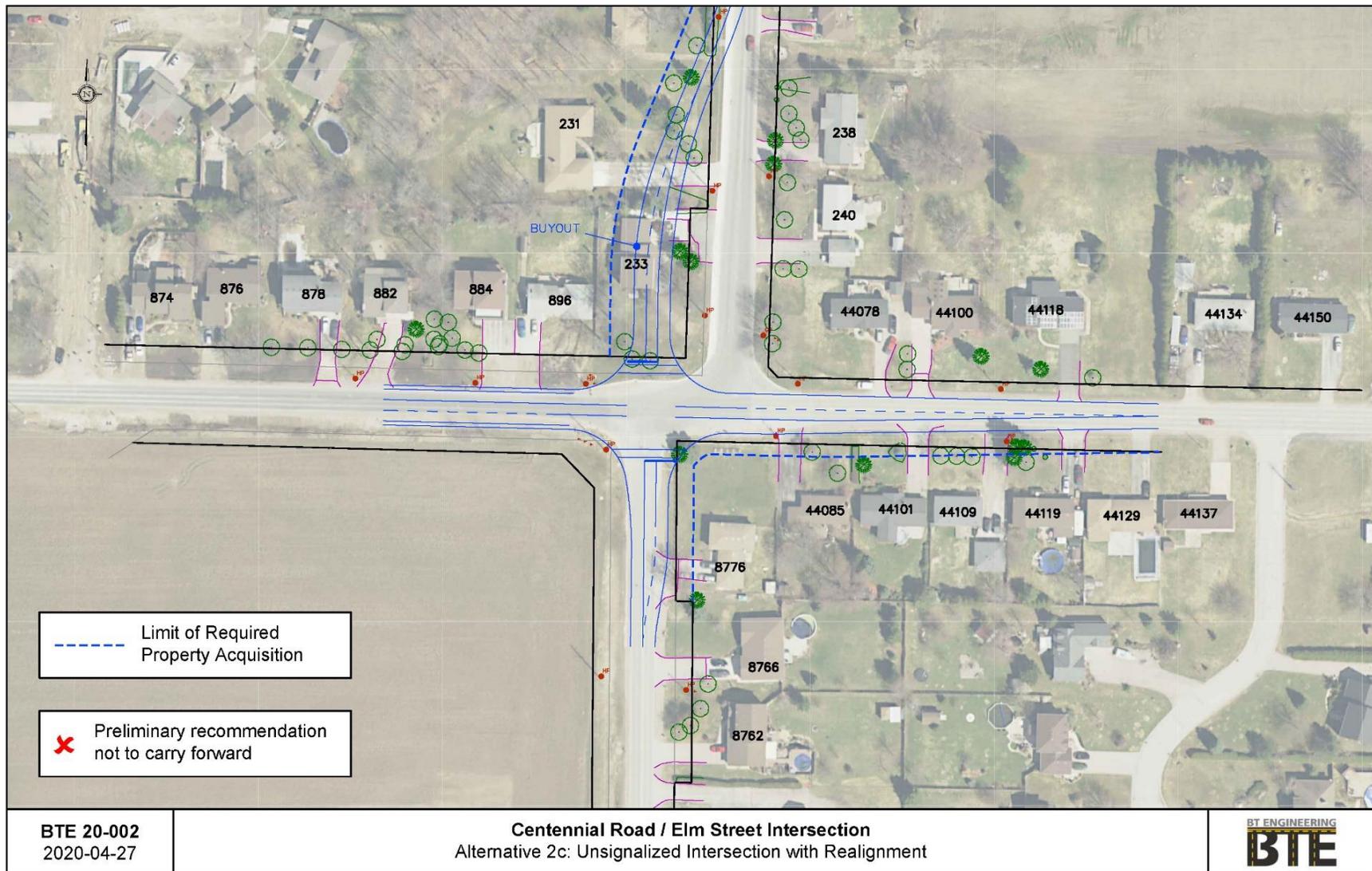


Figure 12: Alternative 2c: Unsignalized Intersection with Realignment and Right-Turn Lane

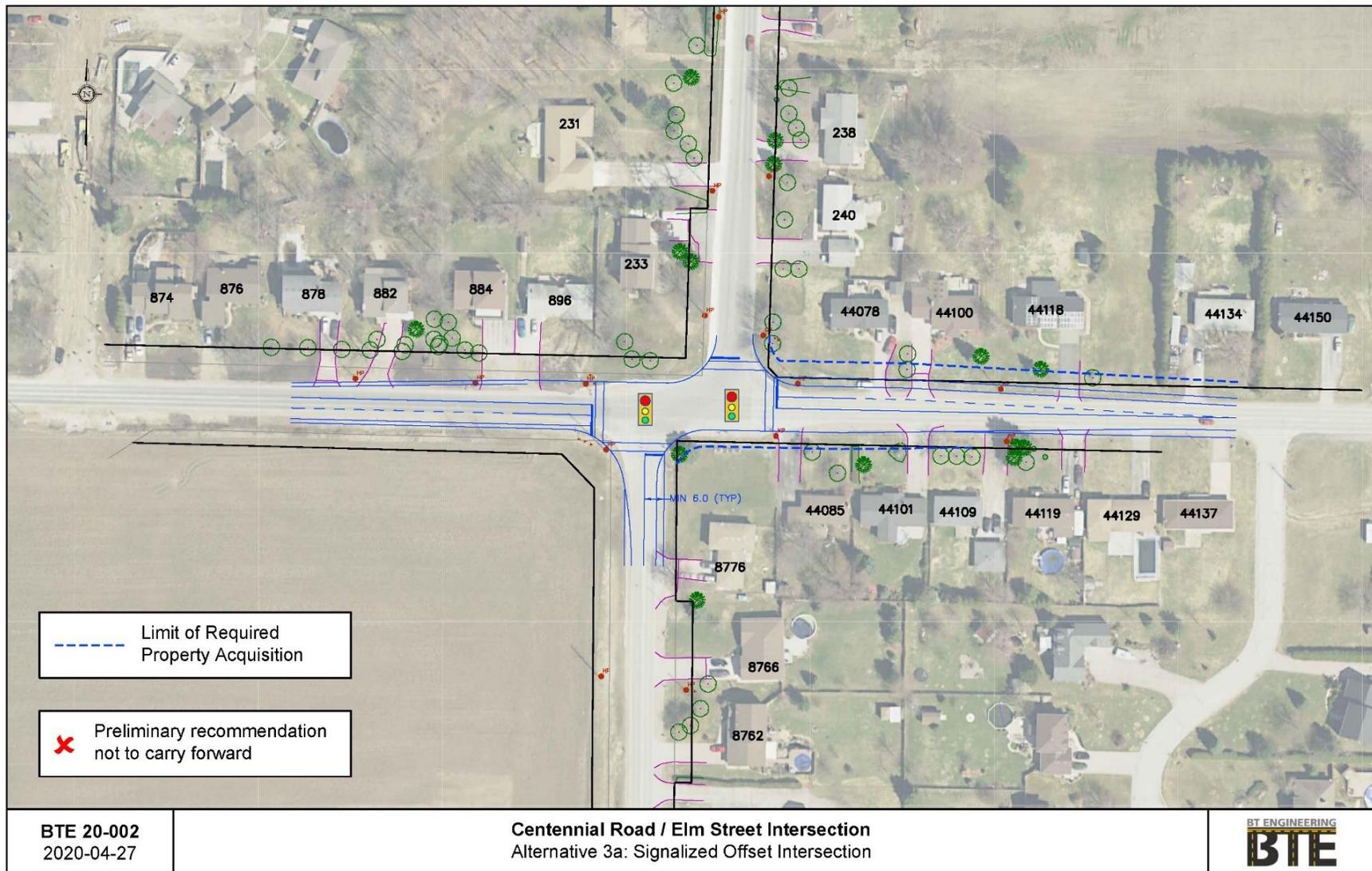
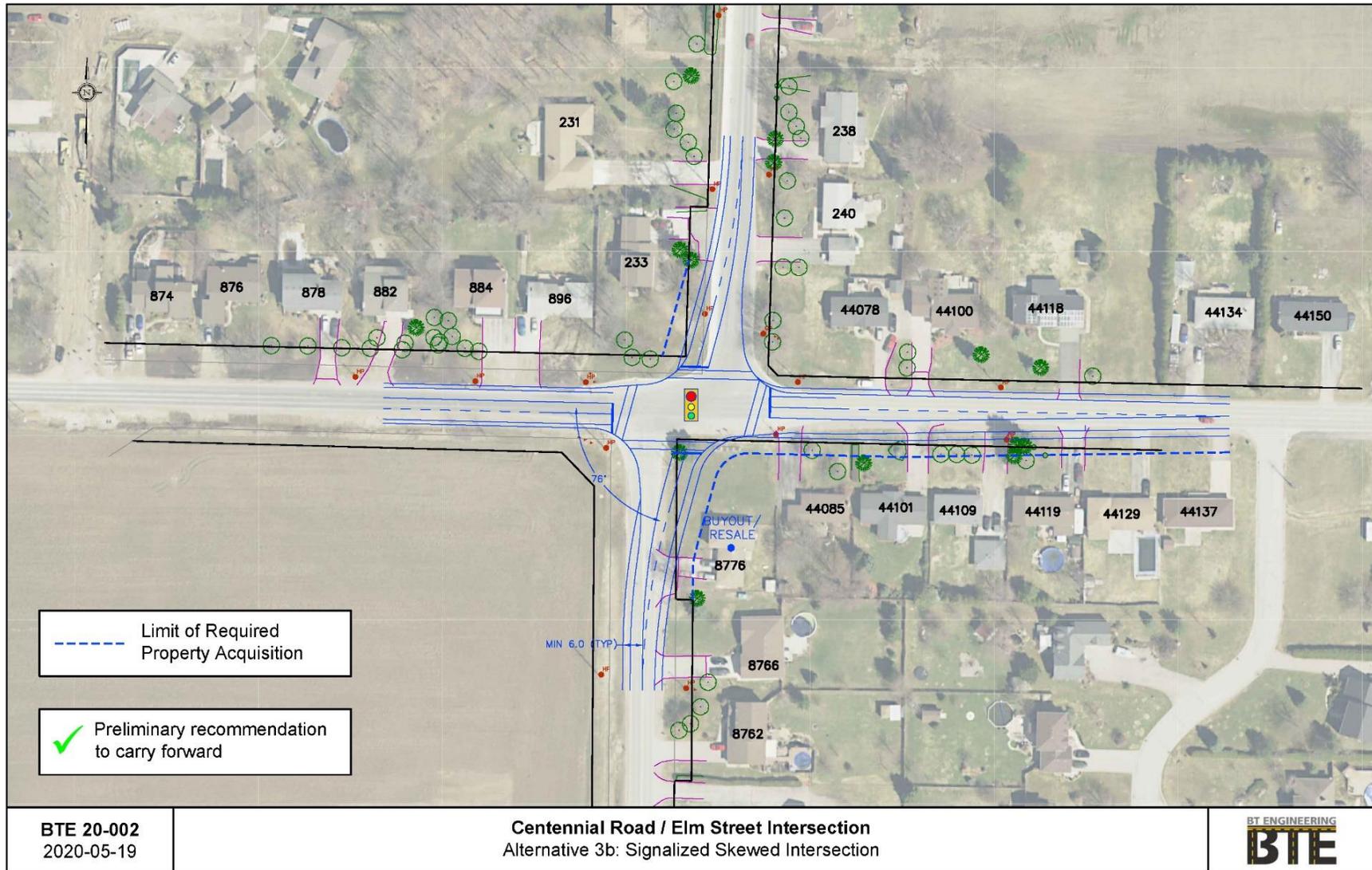
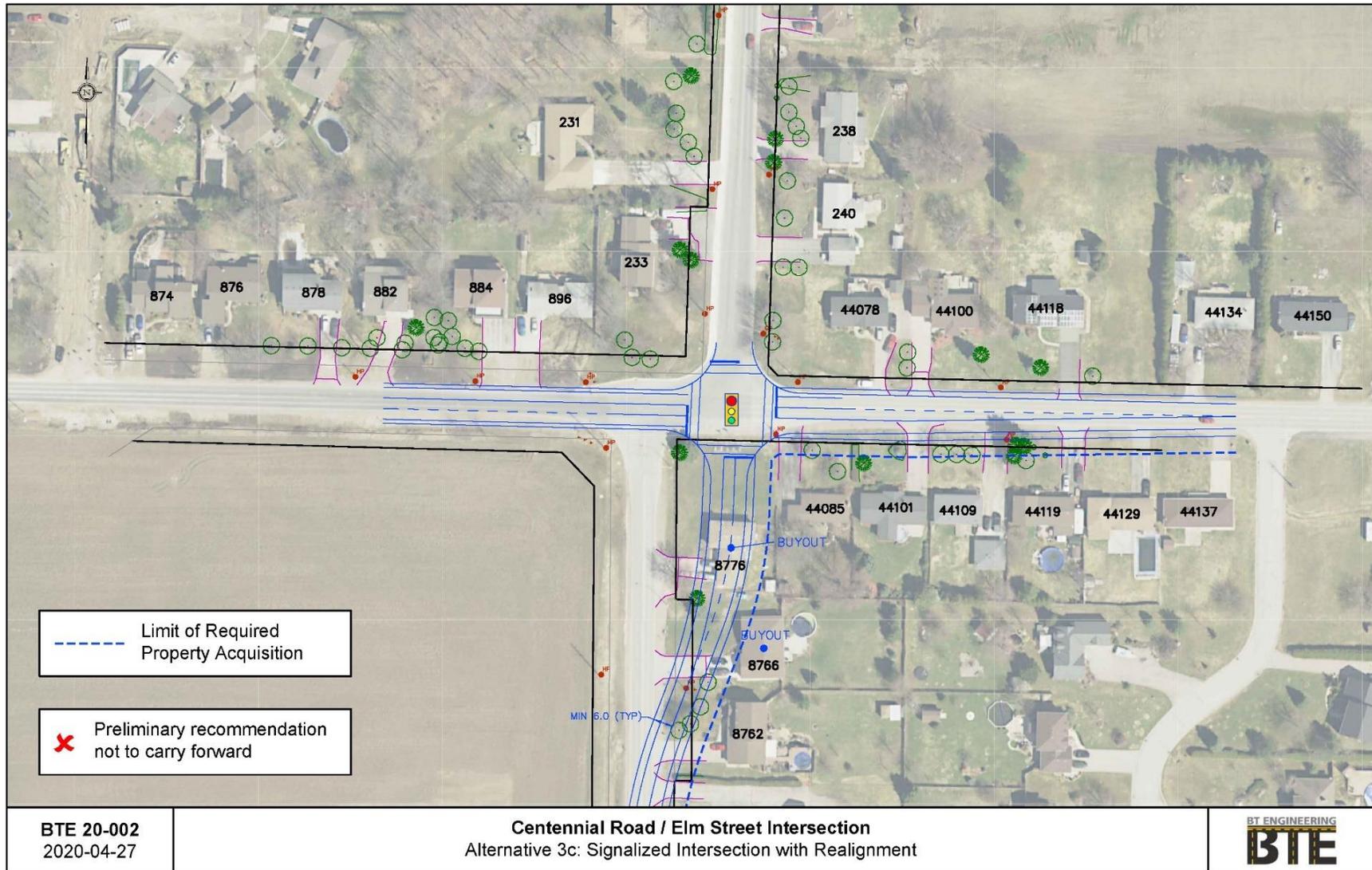


Figure 13: Alternative 3a: Signalized Offset Intersection



**Figure 14: Alternative 3b: Signalized Skewed Intersection**



**Figure 15: Alternative 3c: Signalized Intersection with Realignment of Centennial Avenue**

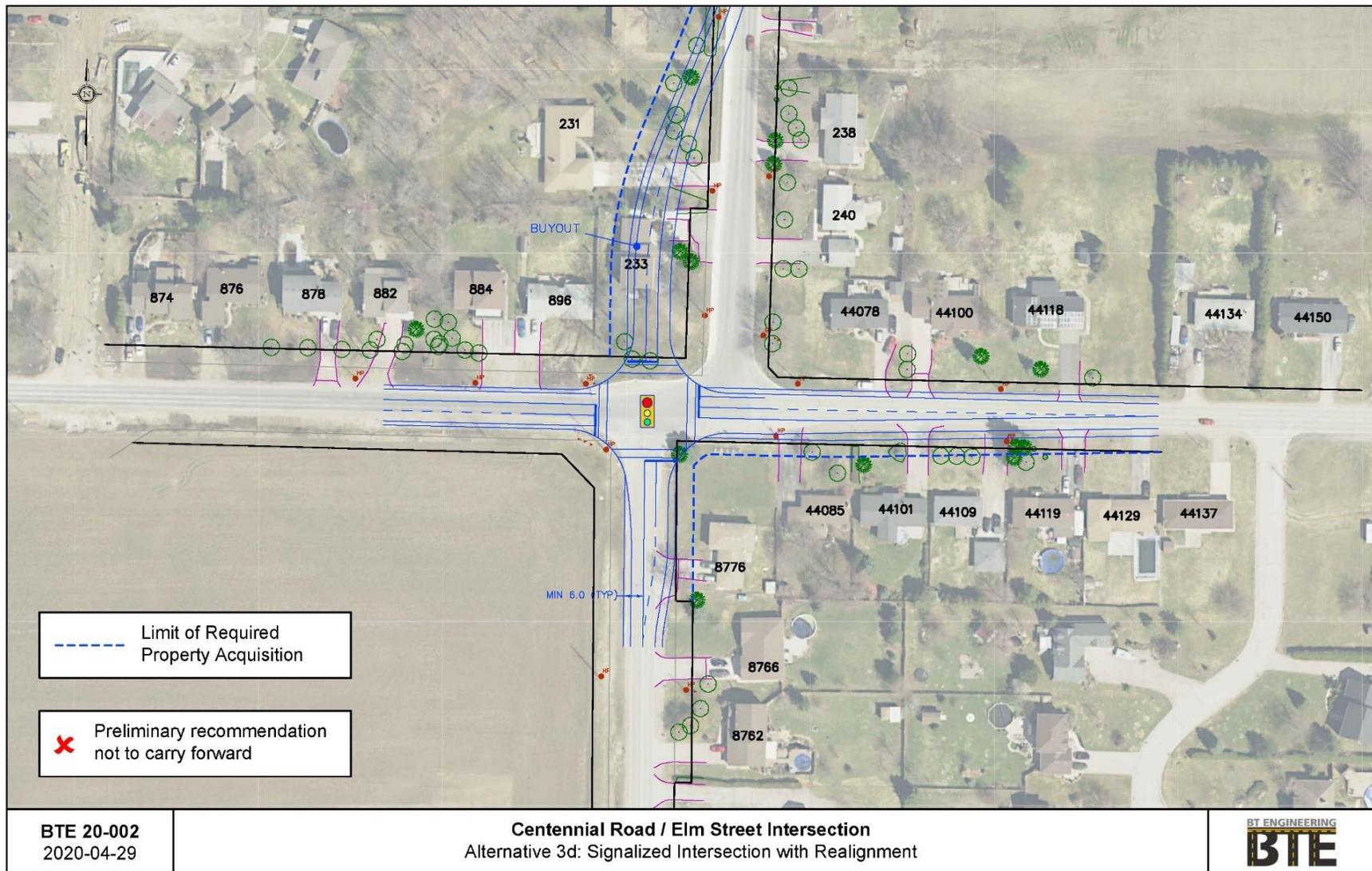


Figure 16: Alternative 3d: Signalized Intersection with Realignment of Centennial Road

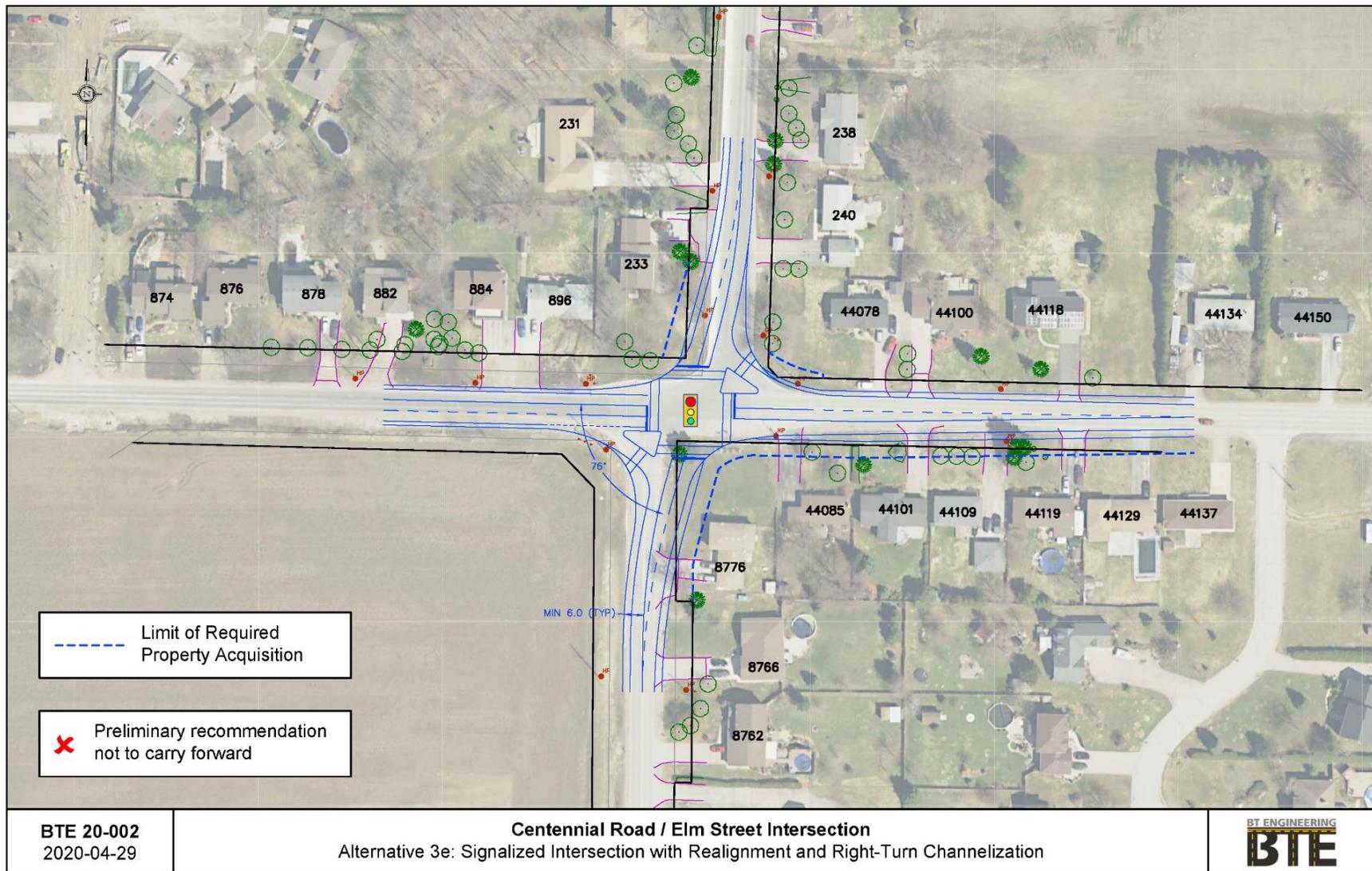


Figure 17: Alternative 3e: Signalized Skewed Intersection with Channelization

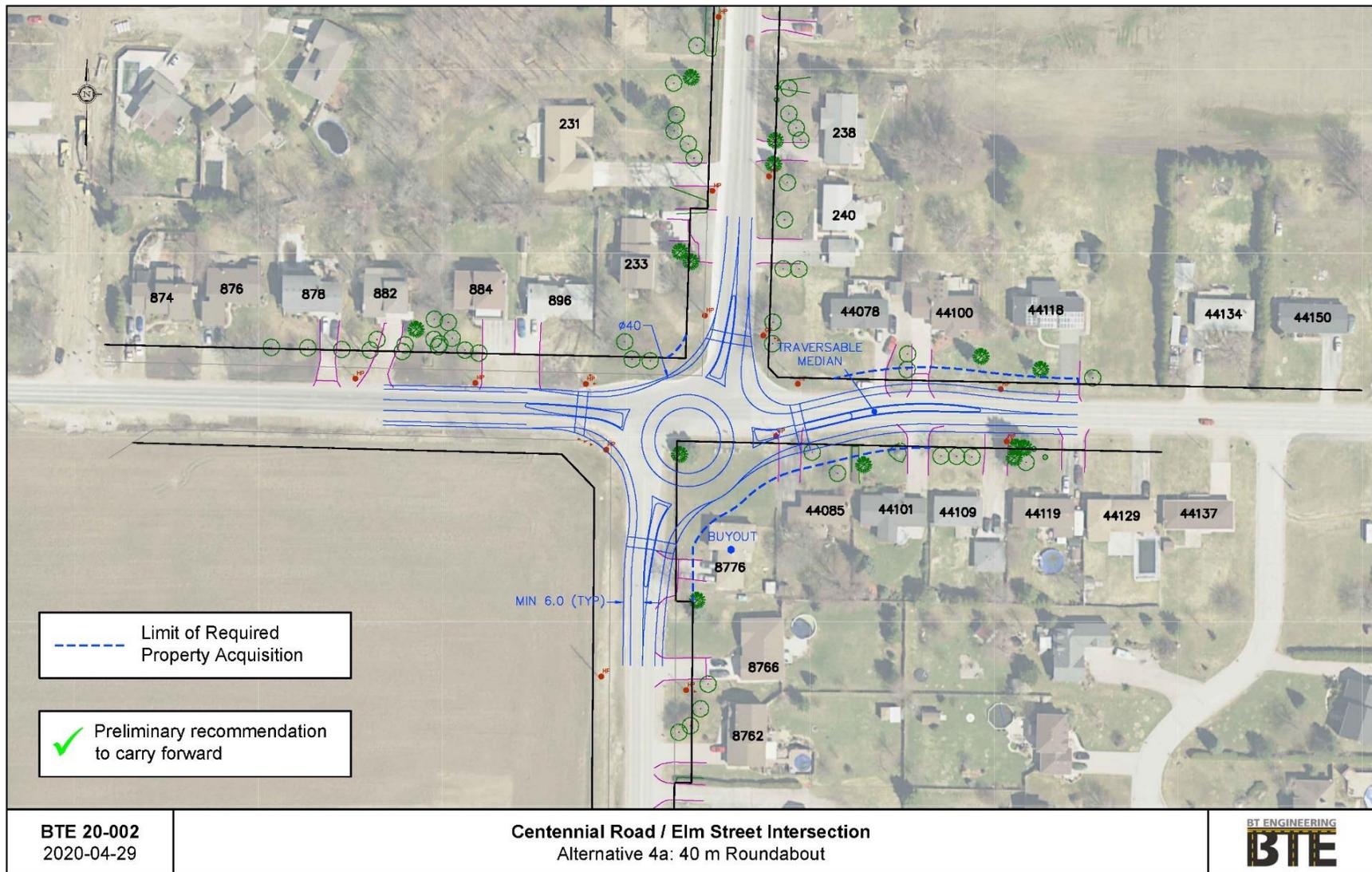


Figure 18: Alternative 4a: 40 m Roundabout

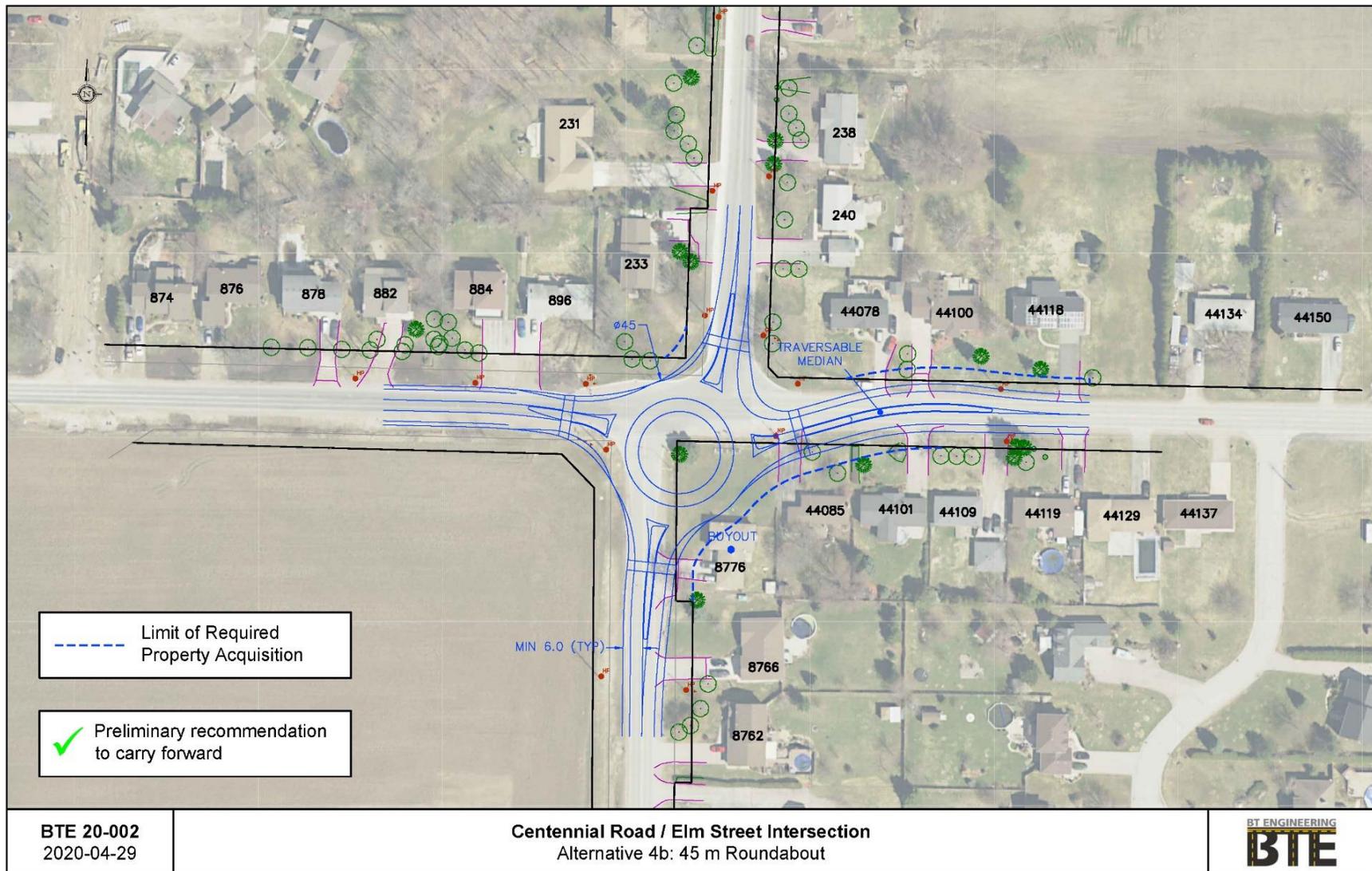
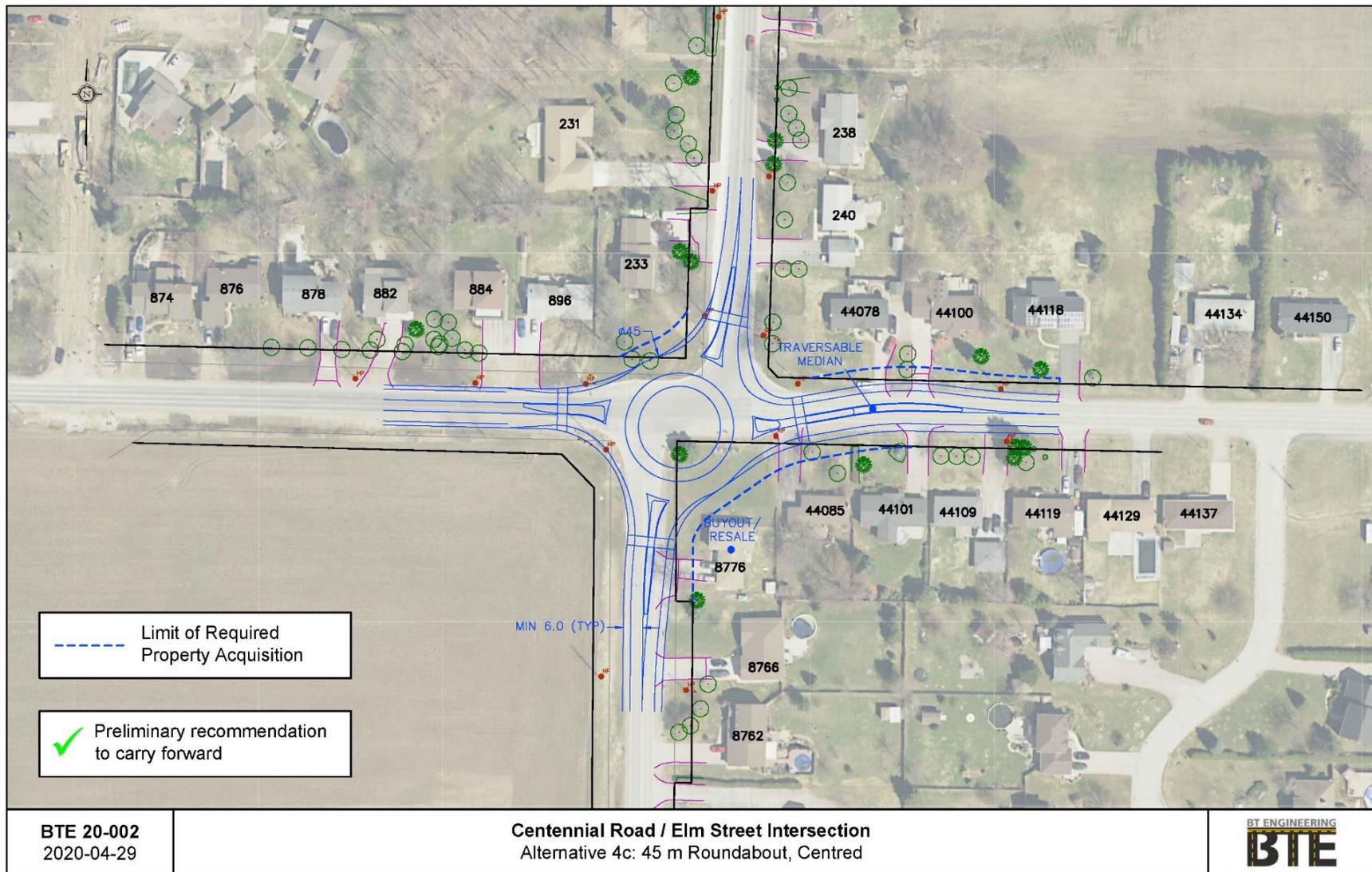
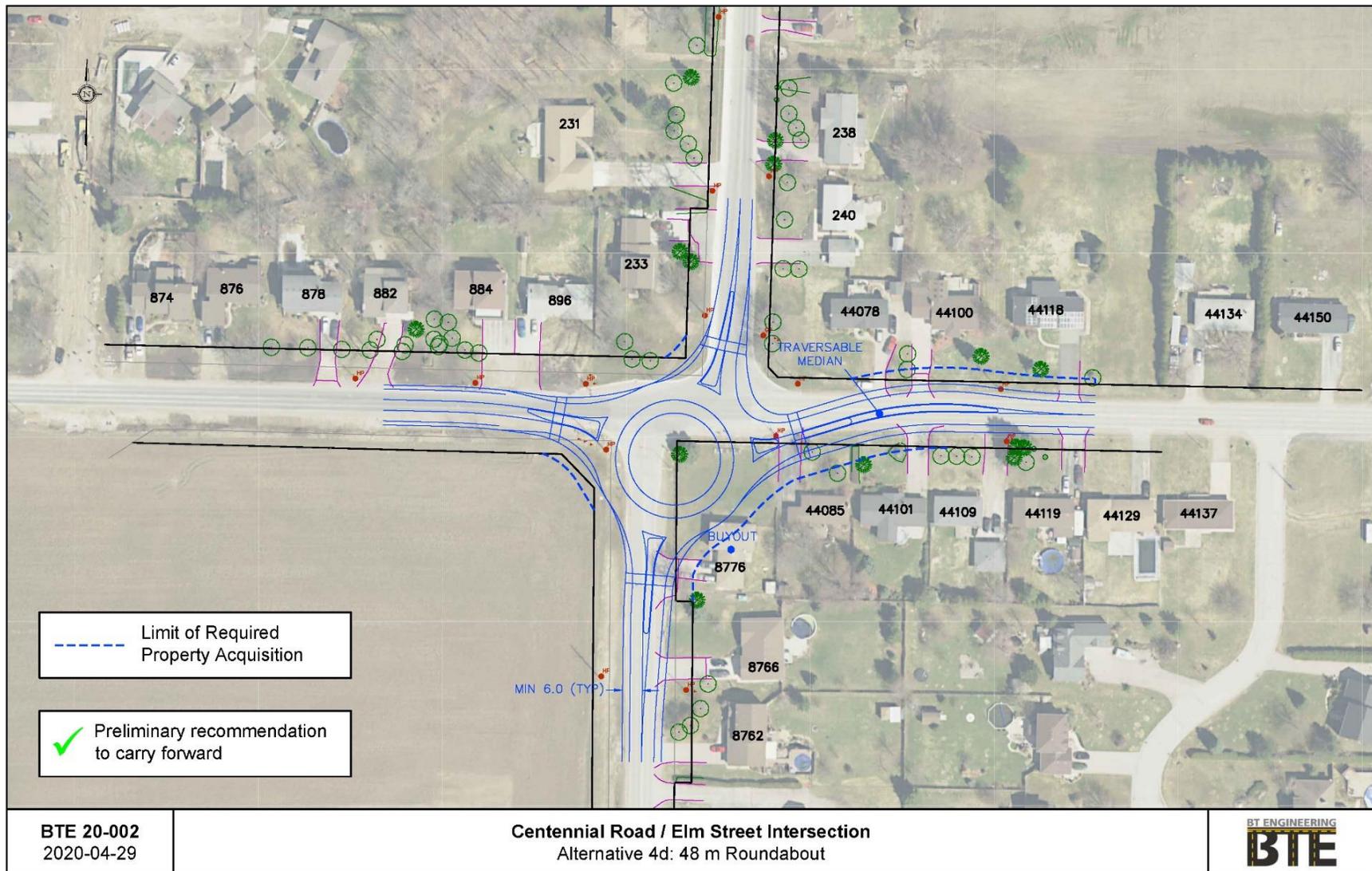


Figure 19: Alternative 4b: 45 m Roundabout (Southwest Offset)



**Figure 20: Alternative 4c: 45 m Roundabout (Centred)**



**Figure 21: Alternative 4d: 48 m Roundabout**

## 7.0 EVALUATION OF ALTERNATIVES

The quantitative assessment used a weighted additive score method to mathematically evaluate the alternatives being considered using various global factors. The methodology is referred to as the Multi Attribute Trade-off System (MATS). This process is described briefly in this section and in detail in **Appendix F**.

### 7.1 Multi-Attribute Trade-off System

The quantitative approach is based on the “Weighted Additive Method” which focuses on the differences between the alternatives, addressing the complexity of the base data collected and providing a traceable decision-making process. Sensitivity tests are also performed to determine the impact of the alternatives and the trade-offs between each alternative.

Overall scores are assigned to each alternative and the alternative with the highest score is selected as the preferred alternative to complete the evaluation. The initial task in the evaluation is to develop criteria from which alternatives will be evaluated and assessed. This process includes the identification of “global” groups of factors followed by the selection of a number of “local” sub-factors, or sub-factors under these global groups.

The evaluation criteria are grouped into broad categories (global factors) to describe the study specific engineering and environmental concerns. The global factors for the evaluation of the alignment alternatives included:

- Transportation
- Natural Environment
- Social and Cultural Environment
- Land Use and Property
- Cost

Under each of the global factors, a number of sub-factors were selected under which measurements could be made. Each sub-factor must adequately describe the issue or aspect of the environment to be evaluated and the unique features of each alternative. Then each sub-factor is reviewed, and those sub-factors considered equal or not applicable among the alternatives are screened.

To evaluate the alternatives using the short-listed criteria, the Evaluation Team rate each global factor and sub-factor based on their opinion. It is noted that every person assigning weights has a personal bias and understanding of the scope of the project, with various life experiences. Hence, the Evaluation Team consists of a diversified team of professionals with varied backgrounds including planners, architects, and structural and transportation engineers.

Each member of the Evaluation Team assigns percentage weights to each global factor and sub-factor based on their opinion of the relative importance of each following a presentation by

each specialist to TAC members. Their individual weights are then averaged to determine the Evaluation Team weight for each global factor and sub-factor.

## **Sensitivity Testing**

Sensitivity testing is essential in the analysis to determine if the nature of the evaluation is sensitive to the weights assigned to each criterion. Since each specialist assigns weights based on their professional opinion, there is a spread of values for the selection of weights. The range is dependent on the value judgements of individuals and specialists. Using the average of the group does not necessarily capture what the standard deviation was among individual scores. Therefore, sensitivity testing is conducted to test a range of weights either higher or lower than the group's average.

### **7.2 Analysis and Evaluation Results**

Five intersection alternatives were evaluated for Centennial Road / Elm Line improvements. These included:

- Alternative 3b: Signalized Skewed Intersection
- Alternative 4a: 40 m Roundabout
- Alternative 4b: 45 m Roundabout (southwest offset)
- Alternative 4c: 45 m Roundabout (centred)
- Alternative 4d: 48 m Roundabout

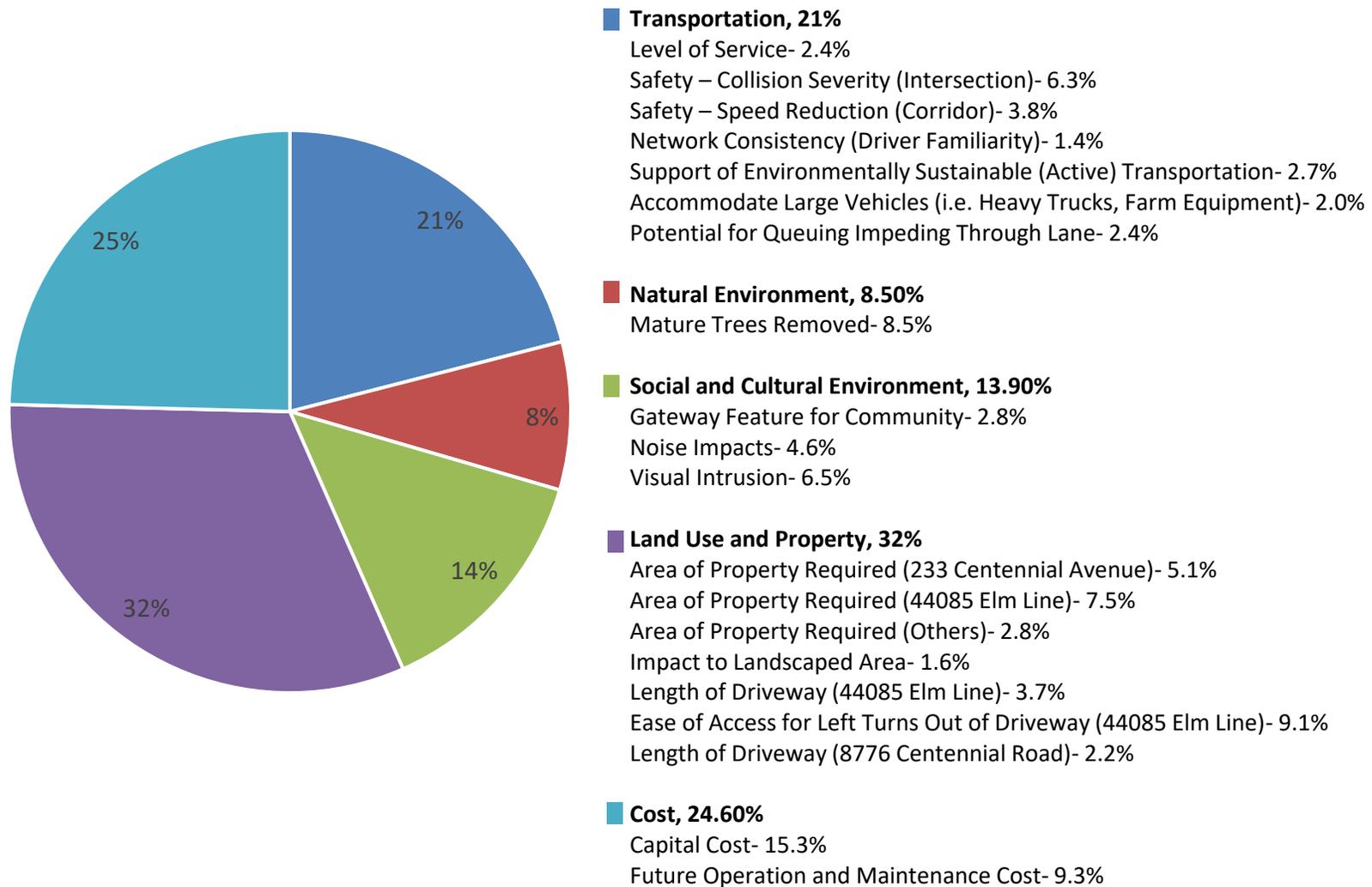
The results of the weighting exercise for each alternative are provided in detail in **Figure 22**. The results of the weights and rankings of the alignment evaluation are illustrated on **Figure 23**.

A series of tests were completed varying the weight for each global factor. The three tests included:

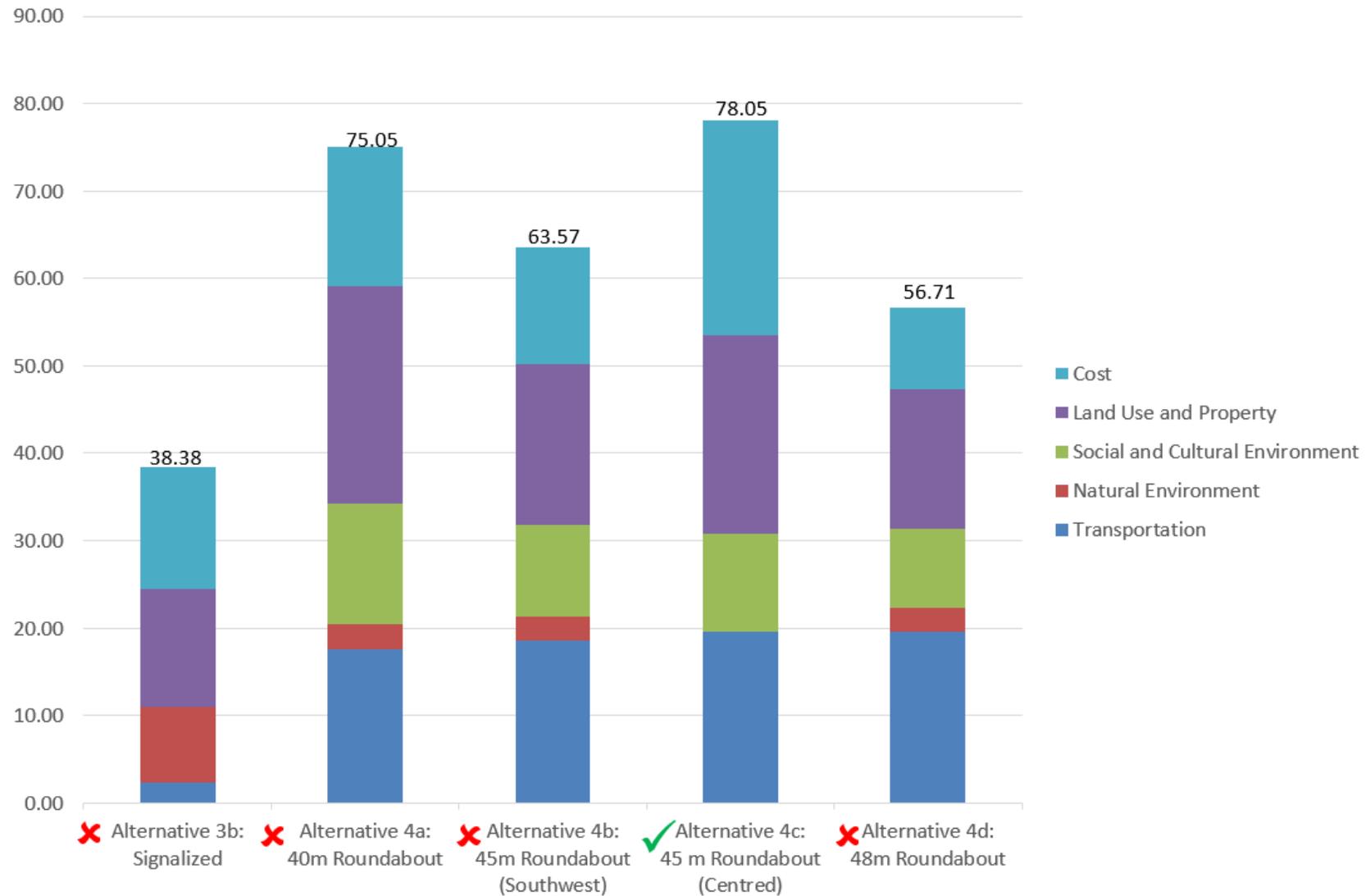
- Average Evaluation Team Weight
- Highest weight in a factor group by any Evaluation Team member
- Lowest weight in a factor group by any Evaluation Team member

The results of these tests are shown in **Table 3**.

The sensitivity test results showed that there were no trade-offs between the alternatives. The first rated alternative is shown as a green box in **Table 3**. Alternative 4c was determined to be the preferred alternative.



**Figure 22: Global Factors**



**Figure 23: MATS Evaluation Ranking Results**

**Table 3: Sensitivity Testing Results**

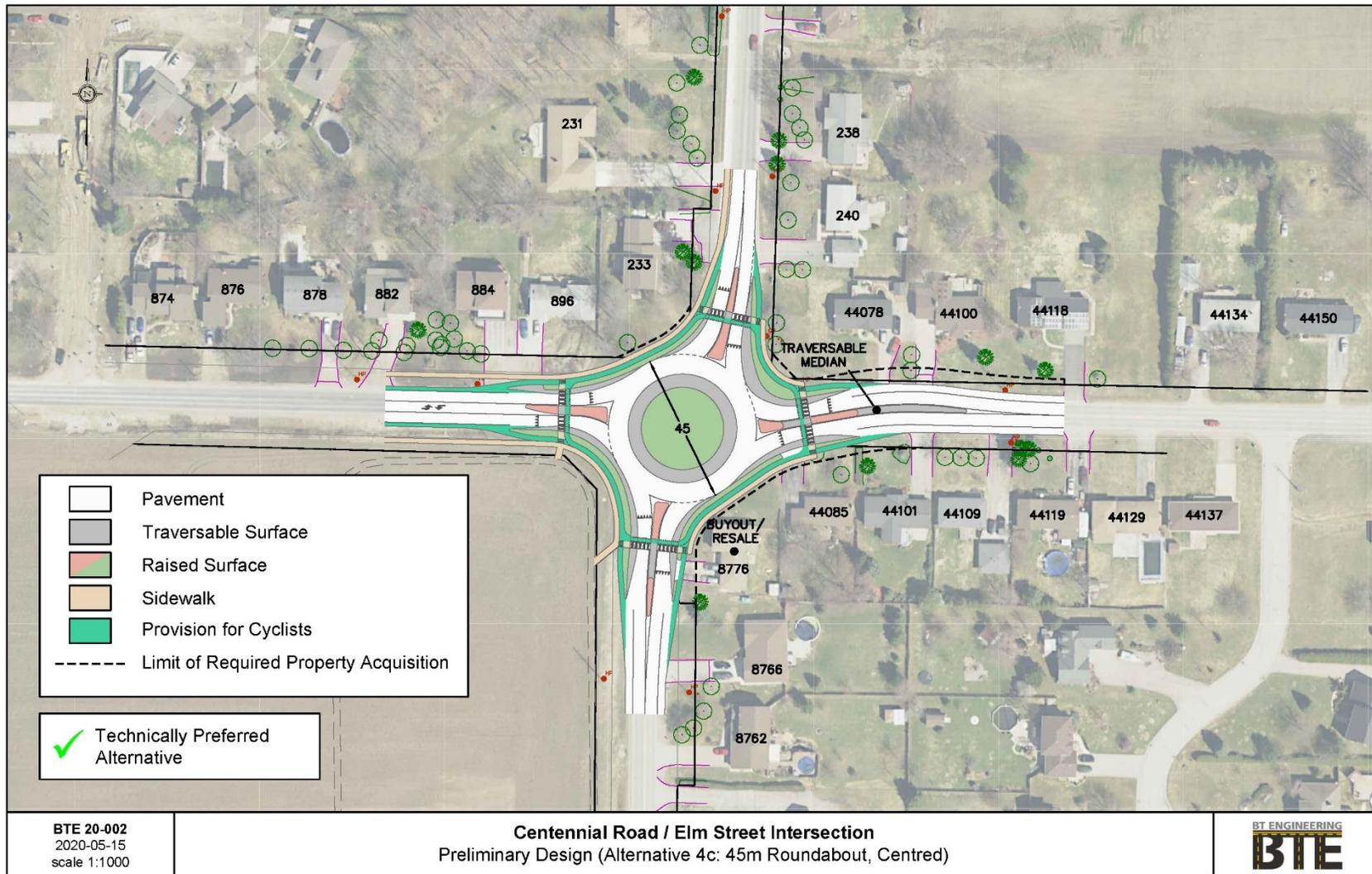
		<b>Alternative 3b: Signalized</b>	<b>Alternative 4a: 40m Roundabout</b>	<b>Alternative 4b: 45m Roundabout (Southwest)</b>	<b>Alternative 4c: 45 m Roundabout (Centred)</b>	<b>Alternative 4d: 48m Roundabout</b>
<b>Average Score</b>		38.38	75.05	63.57	78.05	56.71
<b>Average Rank</b>		5	2	3	1	4
<b>Transportation</b>	High	5	2	3	1	4
	Low	5	2	3	1	4
<b>Natural Environment</b>	High	5	2	3	1	4
	Low	5	2	3	1	4
<b>Social and Cultural Environment</b>	High	5	2	3	1	4
	Low	5	2	3	1	4
<b>Land Use and Property</b>	High	5	2	3	1	4
	Low	5	2	3	1	4
<b>Cost</b>	High	5	2	3	1	4
	Low	5	2	3	1	4

### 7.3 Technically Preferred Alternative (TPA)

The Technically Preferred Alternative for the Centennial Road / Elm Line intersection is illustrated in **Figure 24**. This plan includes:

- 45 m inscribed circle diameter roundabout
  - Chicane on the high speed approach on Elm Line (east leg)
- Sidewalk along the perimeter of the roundabout connecting to existing sidewalks on Centennial Avenue (north leg), Elm Street (west leg) and the walking path around the Harvest Run subdivision stormwater management pond
- Protected cycling lane along the perimeter of the roundabout connecting to cycling lanes on Elm Street (west leg)

The Technically Preferred Alternative was presented to the public at the online Public Information Centre.



**Figure 24: Technically Preferred Alternative**

## 8.0 RECOMMENDED PLAN

The Recommended Plan is the final recommended design reflecting public, agency and stakeholder comments on the plan (this is distinguished from the Technically Preferred Alternative (TPA) which was the recommendation from the Technical Team prior to the PIC). Based on public and agency comments, the TPA design was modified in the Recommended Plan to include changes to minimize property impacts to the entrance and driveway storage at number 44085. These changes reflect feedback from discussions with the property owner. The Recommended Plan includes:

- Intersection Improvements: 45 m Roundabout (inscribed circle diameter) centered between the Elm Line and Elm Street approaches.
- Drainage and Stormwater Management: The roundabout will drain into the existing 600 mm diameter Elm Line storm sewer and the existing 975 mm diameter Elm/Centennial storm sewer. Both storm sewers serve as outlets to the existing intersection drainage. Because the changes to the impervious area are small, it is not necessary to provide stormwater quantity control and the roundabout drainage can be connected directly to the existing storm sewers. Details on the proposed drainage/stormwater management is provided in the Drainage and Stormwater Management Study provided in **Appendix E**.
- Promotion of Active Transportation: Addition of sidewalks and a protected cycling lane are incorporated into the roundabout design to encourage the use of various modes of active transportation.
- Mitigation to individual property owners for compensation for land acquisition, landscaping and driveway reconstruction. These commitments are recorded in individual meeting notes with each owner.

The Recommended Plan may include an extension of a sanitary sewer into Central Elgin. Property owners identified the issue that if this utility work is to be completed it should be planned to be part of the project. As such the County has contacted the municipality to request confirmation if these works are to be planned and included into the intersection design.

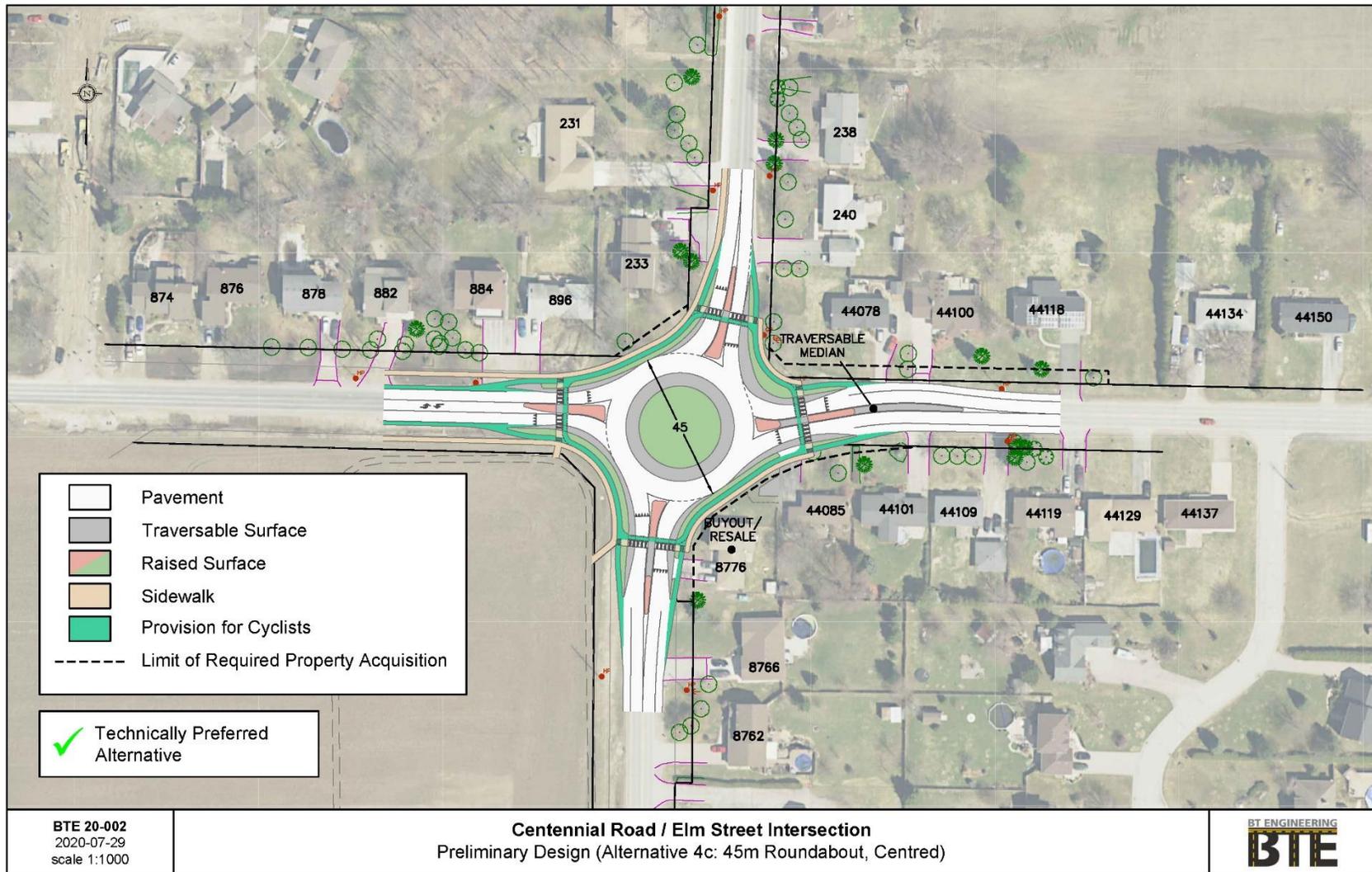
The Recommended Plan is illustrated on **Figure 25**.

### 8.1 Statement of Flexibility

The Recommended Plan for intersection improvements at Centennial Road / Elm Line contains key features with flexibility for refinements during detailed design including:

- Extension of the sanitary sewer to the east on Elm Line to service properties immediately east of the intersection. This will be based on input from the Municipality of Central Elgin and City of St. Thomas.
- Inclusion or exclusion of the protected cycling lane based on: desirability from stakeholders (i.e. cycling groups) and road users; impacts to adjacent property owners; and maintenance/operation requirements.

- Minor modifications to the sidewalk, protected cycling lane, lane and shoulder widths during detail design to accommodate existing infrastructure (i.e. utilities) and minimize impacts to adjacent property owners.



**Figure 25: Recommended Plan**

## 8.2 Preliminary Cost Estimate

The preliminary cost estimate in **Table 4** is in 2020 dollars and does not include HST or property acquisition costs. This is a preliminary estimate and will be refined during detailed design. Property acquisitions will be determined during detail design. Actual requirements will be based on legal surveys that will be completed during the detail design phase of the project.

**Table 4: Preliminary Cost Estimate**

Item No.	Description	Total
	<b>Section A - General</b>	
A1	General Construction Items	\$25,000.00
A2	Traffic Control	\$50,000.00
	<b>Total Section A (Carried to Summary)</b>	<b>\$75,000.00</b>
	<b>Section B - Roadworks</b>	
B1	Roundabout Construction	\$400,000.00
B2	Road Reconstruction	\$300,000.00
B3	1.5 m Wide Sidewalk	\$74,250.00
B4	Storm Sewer	\$50,000.00
B5	Cycle Track Facility (Provisional)	\$33,750.00
	<b>Total Section B (Carried to Summary)</b>	<b>\$858,000.00</b>
	<b>Section C - Lighting</b>	
C1	General Street Lighting	\$75,000.00
	<b>Total Section C (Carried to Summary)</b>	<b>\$75,000.00</b>
	<b>Section D - Landscaping</b>	
D1	General Landscaping	\$40,000.00
	<b>Total Section D (Carried to Summary)</b>	<b>\$40,000.00</b>
	<b>Section E - Utility Relocation</b>	
E1	General Utility Relocations	\$60,000.00
	<b>Total Section E (Carried to Summary)</b>	<b>\$60,000.00</b>
	<b>TOTAL All Sections</b>	<b>\$1,108,000.00</b>
	<b>20% Contingency</b>	<b>\$221,600.00</b>
	<b>TOTAL CONSTRUCTION</b>	<b>\$1,329,600.00</b>

### **8.3 Construction Phasing**

The scope of work will be phased with advanced utility relocations and municipal servicing (as required). The construction will be a single season. This construction phasing may include short term road closures (local access to properties only) if required to implement the works.

The timing of implementation will be subject to the availability of funding, other competing priorities of the County, and coordination with other area projects in the City of St. Thomas or Central Elgin.

## 9.0 MITIGATION MEASURES AND COMMITMENTS TO FUTURE WORK

Stakeholders, agencies and the public in the Study Area submitted questions and concerns throughout the study.

Key issues and commitments to future work are summarized in **Table 5**. Property municipal addresses are indexed/ illustrated on **Figure 25**.

Identified mitigation measures reflect commitments by Elgin County to mitigate environmental effects. Effects on the environment were considered in accordance with the Municipal Class EA process.

<b>Table 5: Summary of Issues, Proposed Mitigation and Commitments to Future Work</b>			
<b>No.</b>	<b>Issue</b>	<b>Project Effect</b>	<b>Commitments</b>
<b>1.0</b>	<b>Property Impacts</b>		
1.1	233 Centennial Avenue	A portion of property and landscaped garden is required to accommodate intersection improvements.	Purchase of the land is required at fair market value. Existing mature trees will be protected (if possible) or replaced.  Mitigation will be provided by: replacement of landscaping located at the south lot line; and visual screening (i.e. fencing) or landscaping to reduce headlight glare and provide additional privacy.
1.2	8776 Centennial Road	Complete acquisition of the property is required to accommodate intersection improvements.	Purchase of the entire property is required at fair market value. The property may be resold by the County following acquisition and construction of the roundabout.
1.3	44078 Elm Line	A portion of property is required to accommodate intersection improvements.	Purchase of the land is required at fair market value. Existing mature trees will be protected (if possible) or replaced.
1.4	44085 Elm Line	A portion of property is required to accommodate intersection improvements.	Purchase of the land is required at fair market value. Existing mature trees will be protected (if possible) or replaced.  Mitigation will be provided by: addition of a hammerhead to the west of their driveway

			to allow vehicles to make a 3-point turn; replacement of the landscaped area and lamppost on the front lawn; improved drainage across the front lawn/driveway; and landscaping along the side of the lot to mitigate headlight glare.
1.5	44100 Elm Line	A portion of property is required to accommodate intersection improvements.	Purchase of the land is required at fair market value. Existing mature trees will be protected (if possible) or replaced.  Mitigation will be provided by: removal of the maple tree west of the driveway (tree located closest to property line); reinstating concrete driveway to curb line; addition of a culvert across the driveway; and landscaping to minimize headlight glare.
1.6	44101 Elm Line	A portion of property is required to accommodate intersection improvements.	Purchase of the land is required at fair market value. Existing mature trees will be protected (if possible) or replaced.
1.7	44118 Elm Line	A portion of property is required to accommodate intersection improvements.	Purchase of the land is required at fair market value. Existing mature trees will be protected (if possible) or replaced.
<b>2.0</b>	<b>Natural, Social and Cultural Environment</b>		
2.1	Landscaping and Mature Trees	Removal of landscaping/mature tree to accommodate improvements.	Landscaping/mature trees will be replaced. A mitigation strategy (where required) will be established during detail design.
2.2	Headlight Glare	Headlight glare from the realigned road approaches and roundabout.	A Landscape Plan will be developed during detail design to identify strategic planting/landscaping to minimize headlight glare for adjacent property owners.
<b>3.0</b>	<b>Engineering</b>		
3.1	Drainage	Increase in impervious areas and increased stormwater runoff.	Stormwater management will be in accordance with Elgin County Regulations, Catfish Creek Conservation Authority Regulations, and the MECP

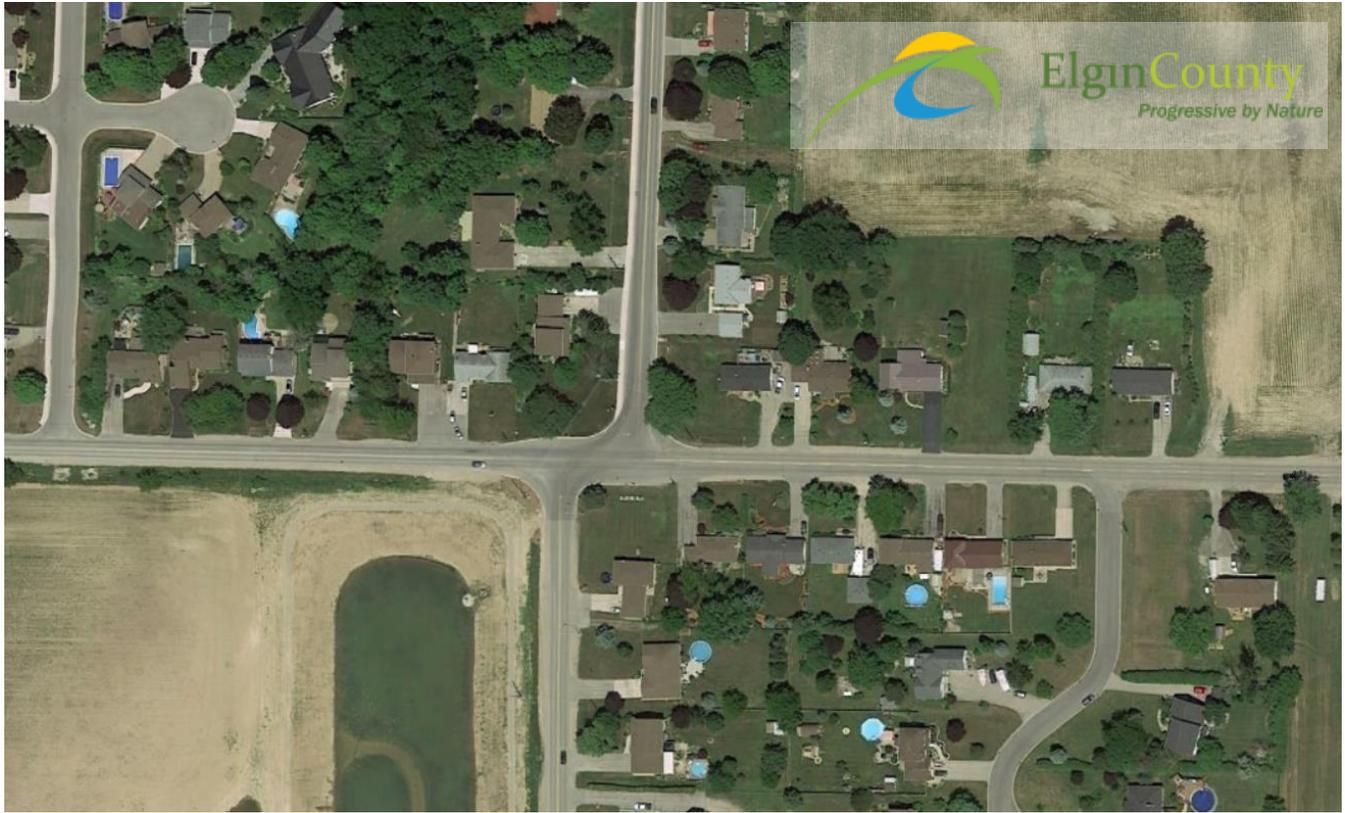
			Stormwater Management Planning and Design Manual, and all stormwater infrastructure will be approved in accordance with Section 53 of the <i>Ontario Water Resources Act</i> .
3.2	Utilities	Relocation of existing Bell, Rogers, Hydro One, Entegrus and Enbridge infrastructure.	Relocation of existing utilities will be required to accommodate the roundabout and municipal servicing. Relocations will be discussed with the utility owners during detail design to determine the new alignments.
3.3	Sanitary Sewer	Extension of the sanitary sewer.	A Statement of Flexibility has been included for the potential extension of the sanitary sewer to service houses immediately east of the Study Area. This will be investigated during detail design with input from the City of St. Thomas and Municipality of Central Elgin.
3.4	Source water Protection	Protection of the Study Area.	The Study Area is not located within a Source Water Protection Area. Industry best practices and Catfish Creek Conservation Authority regulations will be used to prevent spills and / or the release of contaminated material during construction.

## **10.0 FUTURE ACTIVITIES**

Following a 30-day public review period of the Project File Report (with no objections) and obtaining Class EA clearance, this project, or any individual element of this project, may proceed to detail design and construction by the County, after obtaining the necessary environmental permits and approvals, and subject to availability of funding and construction priorities. Mitigation measures listed in **Section 9.0** are to be incorporated during detailed design and construction, as appropriate.

**Appendix A**  
Study Design Report





## Study Design Report

# Centennial Road (CR 28) / Elm Line (CR 56) Intersection Improvements Municipal Class Environmental Assessment

February 2020

Submitted by: BT Engineering Inc.  
509 Talbot Street  
London, ON N6A 2S5



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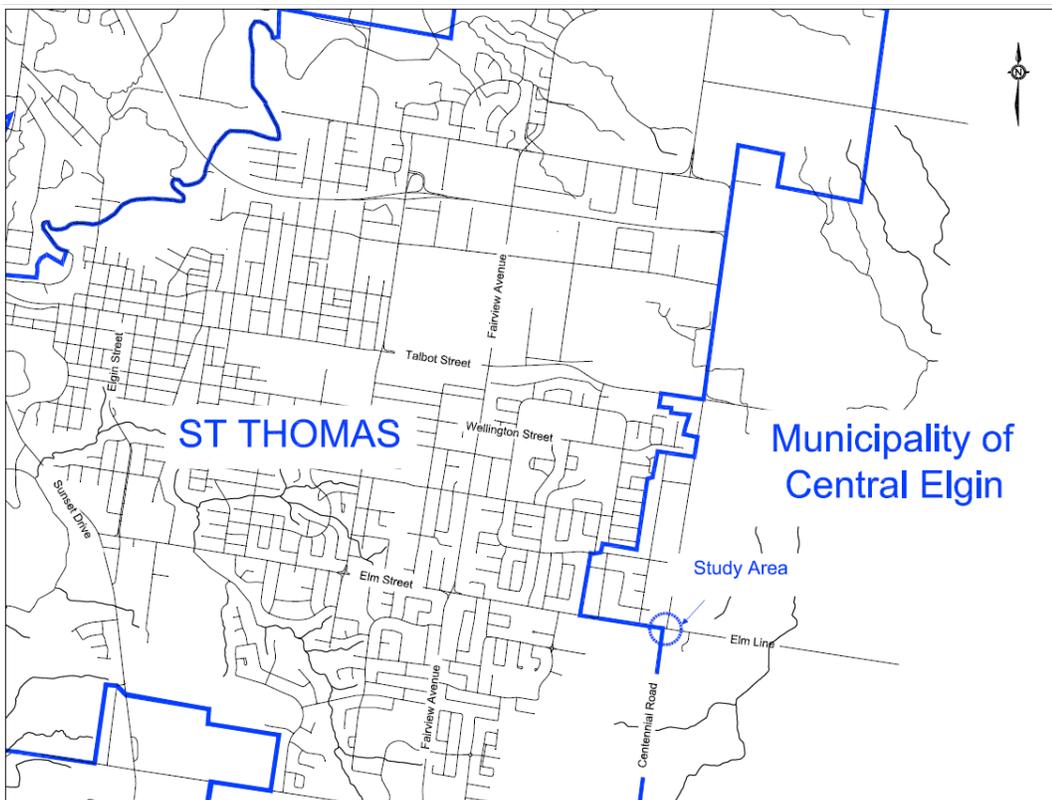
## 1.0 Introduction

The County of Elgin (County) has initiated a Class Environmental Assessment (EA) Study to develop a transportation plan for intersection improvements at Centennial Road (County Road 28) and Elm Line (County Road 56) in the Municipality of Central Elgin. Intersection improvements are required to improve the operation, safety and capacity of the existing intersection configuration. The Study will consider alternatives for intersection improvements which may include but is not limited to road realignment, the installation of traffic signals, or a roundabout as described in this report.

This report, the initial public document for the Municipal Class Environmental Assessment, presents a description of the work plan, preliminary alternatives, consultation plan and overall study process. It will outline the EA planning process and describe the key activities required to complete the Study. The Draft Study Design will be circulated to various agencies and the Study's Technical Advisory Committee (TAC) and is available to the general public on the County's website.

### 1.1 Study Area

The Study Area is located in the County of Elgin and is illustrated on **Figure 1**. The Study Area includes the Centennial Road / Centennial Avenue (CR 28) and Elm Street / Elm Line (CR 56) intersection. For the purposes of this report Centennial Road and Elm Line will be used to describe the roadways. This intersection is located within the Municipality of Central Elgin at the eastern boundary limits of the City of St. Thomas.



**Figure 1: Project Location**

## 1.2 Study Background

Intersection improvements at Centennial Road / Elm Line are required to accommodate planned and future development within the Municipality of Central Elgin and the City of St. Thomas. Centennial Road / Elm Line currently operates as a 4-legged intersection with the north and south approaches offset by approximately 25 m. The north and south approaches are Stop controlled, and all legs of the intersection have single-lane approaches with exception of the north leg which has a dedicated southbound left-turn lane.

Centennial Road and Elm Line are 2-lane rural roadways providing access to residential, agricultural and commercial properties as well as connecting the County to the City of St. Thomas and the wider transportation network. The roadway serves all modes of travel including vehicular traffic, goods movement, cycling and pedestrians. A sidewalk is provided on the west side of Centennial Avenue (north leg of the intersection). All road approaches have a posted speed of 50 km/h with exception of Centennial Road (south approach) which has a posted speed of 60 km/h.

### 1.2.1 Background Studies

Background studies have been completed within the Study Area to document the proposed land uses and transportation networks. These reports are summarized in the following sections.

#### 1.2.1.1 Official Plan and Land Use

The County of Elgin Official Plan (2015) provides “a policy framework for managing growth and land use decisions”. The County of Elgin provides guidance to the lower tier municipalities through the Official Plan, Official Plan Amendments and Zoning By-laws for the establishment of strategies, policies and land use designations. The County of Elgin Official Plan describes the Study Area as follows:

- Tier 1 Settlement Area (see Schedule A of the County’s Official Plan): These settlement areas have the largest populations and are fully serviced.
- Elm Line is identified as a County Collector road and Centennial Avenue is identified as a suburban link. This intersection is identified for “County Future Intersection Improvements” in the Official Plan (see Schedule B of the County’s Official Plan).

The Municipality of Central Elgin Official Plan (2013) describes policies to promote sustainable development and to ensure transparency in the decision-making process. The Municipality of Central Elgin Official Plan describes the Study Area as follows:

- Eastwood Urban Settlement Area (see Schedule 1 of the Municipality’s Official Plan). This area is a focus of urban growth in Central Elgin.
- Residential Land Use (see Schedule D of the Municipality’s Official Plan). These are the main locations for housing in Central Elgin and are fully serviced.

Section 2.8.5.1.1 of the Municipality’s Official Plan indicates that vehicular transportation will continue to be the dominant mode of transportation in the Municipality; however, alternative modes of transportation are encouraged in Urban Settlement Areas.

### 1.2.1.1.1 Development

Several traffic impact assessments were prepared in support of development of the lands adjacent to the Study Area. These reports and the planned development are summarized in this Section.

**Harvest Run Subdivision:** This planned 150 acre subdivision is located in the southwest quadrant of the Centennial Road/Elm Line intersection and includes 1150 dwelling units and a 1.3 hectare commercial/retail block. A Traffic Impact Assessment (TIA) was completed in 2016 and identified several alternatives for intersection control including:

- All-way stop with realigned north/south approaches and a channelized southbound right-turn lane
- Signalization with left-turn lanes on all approaches and a southbound right-turn lane
- Single-lane roundabout

Based on a preliminary review, the TIA recommended signalization of the intersection; however, signals were not warranted based on the volumes used in the 2016 report.

### 1.2.1.2 Active Transportation

The Elgin-St. Thomas Cycling Master Plan (2014) identifies Elm Line and Centennial Road as Active Transportation Routes. These recommendations include:

- A proposed signed route along Elm Line connecting the City of St. Thomas to Oxford County and Tillsonburg. Elm Line is also identified as part of the Trans Canada Trail.
- A proposed multi-use path along the southern leg of Centennial Road connecting the Southwest St. Thomas Area to Elm Line and the proposed network of trails.

## 2.0 Need and Justification

### 2.1 Problem and Opportunity Statement

Improvements are required to the Centennial Road and Elm Line Intersection as a result of development within Central Elgin and the City of St. Thomas. A transportation management plan is required to identify alternatives that will consider the operation and safety of all modes of transportation including vehicular traffic, pedestrians, cyclists and equipment.

The Study will provide the opportunity to: improve the approach geometry and operational capacity of the intersection to provide a safe link for all road users; define a transportation management plan to support travel within the County; and implement active transportation facilities that meet AODA consideration and compliance.

#### 2.1.1 Alternative Planning Solutions

The Class Environmental Assessment Act requires that all reasonable and feasible Planning Solutions be identified and evaluated at the start of the Study. These alternatives consider the overall needs of the study area and identify alternative approaches of addressing the need for improvements. The analysis and evaluation of Alternative Planning Solutions for this Study are summarized as follows:

1. Do Nothing – The Do Nothing Alternative must be considered as mandated by the Class EA. It represents a baseline from which other approaches can be compared. This alternative would maintain the existing offset intersection.
  - ✓ No cost
  - ✓ No property or environmental impacts
  - ✗ Does not address existing safety concerns (i.e. sight lines, operating speeds, turning radii and offset)
  - ✗ Does not provide a permanent long-term solution for intersection control (level of service and capacity will deteriorate as the adjacent subdivisions are developed)
  - ✗ Does not provide improved active transportation facilities
  
2. Transportation Demand Management (TDM) – This strategy would reduce vehicular demand and encourage alternative work hours, work at home, more active modes of transportation (cycling and walking) and the use of transit.
  - ✓ No cost
  - ✓ No property or environmental impacts
  - ✓ Reduces vehicular traffic demand
  - ✗ Limited active transportation facilities and no transit is provided through the study area
  - ✗ Does not address existing safety concerns (i.e. sight lines, operating speeds, turning radii and offset)
  - ✗ Does not provide a permanent long-term solution for intersection control (level of

service and capacity will deteriorate as the adjacent subdivisions are developed)

3. Limit Development – This strategy would limit any new residential, commercial or industrial development and therefore reduce the generation of new trips.

- ✓ No cost
- ✓ No property or environmental impacts
- ✓ Reduces generation of new trips

- ✗ Does not align with the Official Plan or the Provincial Policy Statement for land use planning
- ✗ Does not account for growth in background traffic or previously approved developments
- ✗ Does not address existing safety concerns (i.e. sight lines, operating speeds, turning radii and offset)
- ✗ Does not provide a permanent long-term solution for intersection control (level of service and capacity will deteriorate as the adjacent subdivisions are developed)
- ✗ Does not provide improved active transportation facilities

4. Intersection Improvements – Intersection improvements to improve geometry and capacity of the intersection.

- ✓ Improves safety for road users
- ✓ Provides long-term solution for improved capacity and operations
- ✓ Provides opportunity for improved active transportation facilities
- ✓ Aligns with the County’s plan for growth and development

- ✗ Medium to high cost
- ✗ Requires property acquisition
- ✗ Minor impacts to the natural environment

The Alternative Planning Solutions have been evaluated to select the most reasonable alternatives that address the Problem and Opportunity Statement. Based on the preliminary review of Alternative Planning Solutions, “Intersection Improvements at Centennial Road/Elm Line” is recommended. This Planning Solution adequately addresses the transportation problem by improving safety and addressing future capacity constraints. Property acquisition will be required to accommodate the realignment of the offset north and south legs of the intersection.

The Preliminary Recommendation for Alternative Planning Solutions is referred to in this Draft Study Design as “Improvement of the Existing Intersection” and will be presented at the Public Information Centre (PIC) for public and stakeholder feedback. This recommendation is consistent with the County’s Official Plan.

### **3.0 Study Process**

This Study will be conducted as a Municipal Schedule B or C Class Environmental Assessment Study meeting the requirements of the Municipal Class Environmental Assessment. The study will culminate in the filing of a Project File or Environmental Study Report (ESR).

The Schedule will be confirmed based on the requirements of the Class Environmental Assessment document. This project will be considered either “reconstruction or widening where the reconstructed road or other linear paved facilities will not be for the same purpose, use, capacity or at the same location” or “construction of new roads or other linear paved facilities”. Both of these projects will be considered as Schedule B if the cost is less than \$2.4 million, and as Schedule C if the cost is greater than \$2.4 million.

This Study will complete all requirements under the Municipal Class EA by establishing the need and justification for the project, considering all reasonable alternatives with acceptable effects on the natural, social and cultural environments, and proactively involving the public in defining a preferred design.

#### **3.1 Guiding Principles**

The study approach reflects the following Ministry of the Environment, Conservation and Parks (MECP) 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 a clear and concise documentation of the decision-making process and the public consultation program.

#### **3.2 Environmental Assessment Act Requirements**

The Environmental Assessment will follow the Class EA process, thereby meeting the requirements of the Municipal Engineer Association’s Municipal Class Environmental Assessment (2000 as amended in 2007, 2011 and 2015). The Study is being initiated as a Municipal Schedule B or C project based on the range on anticipated effects and capital cost of the project.

The Schedule B or C project will include a public meeting and conclude with the preparation of a Project File or Environmental Study Report (ESR). The public will be provided with a 30-day review period at the Study conclusion.

As the initial step in the Class EA process this Study Design Report is being made available to the public. This satisfies discretionary Step 1.2 of the Municipal Class EA process, as illustrated in **Figure 2**. The public and agencies will have this initial opportunity to comment on the proposed approach.

### **3.3 EA Phases**

The Municipal Class EA Process is illustrated in **Figure 2**. The following is the breakdown of tasks, by phase, for a Municipal Schedule B project:

#### **Phase 1: Identify the Problem**

- Step 1: Identification and description of the problem or opportunity.
- Step 2: Discretionary public consultation (Study Design available on the County's website).

#### **Phase 2: Alternative Solutions**

- 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.
- Step 5: Identification of reasonable design alternatives for the preferred solution.
- Step 6: Public consultation at PIC No. 1.
- Step 7: Confirmation of design alternatives and refinements to or addition of design alternatives.
- Step 8: Selection of the preferred solution, following the public and agency review.
- Step 9: Completion of the Project File and 30-day public review period.

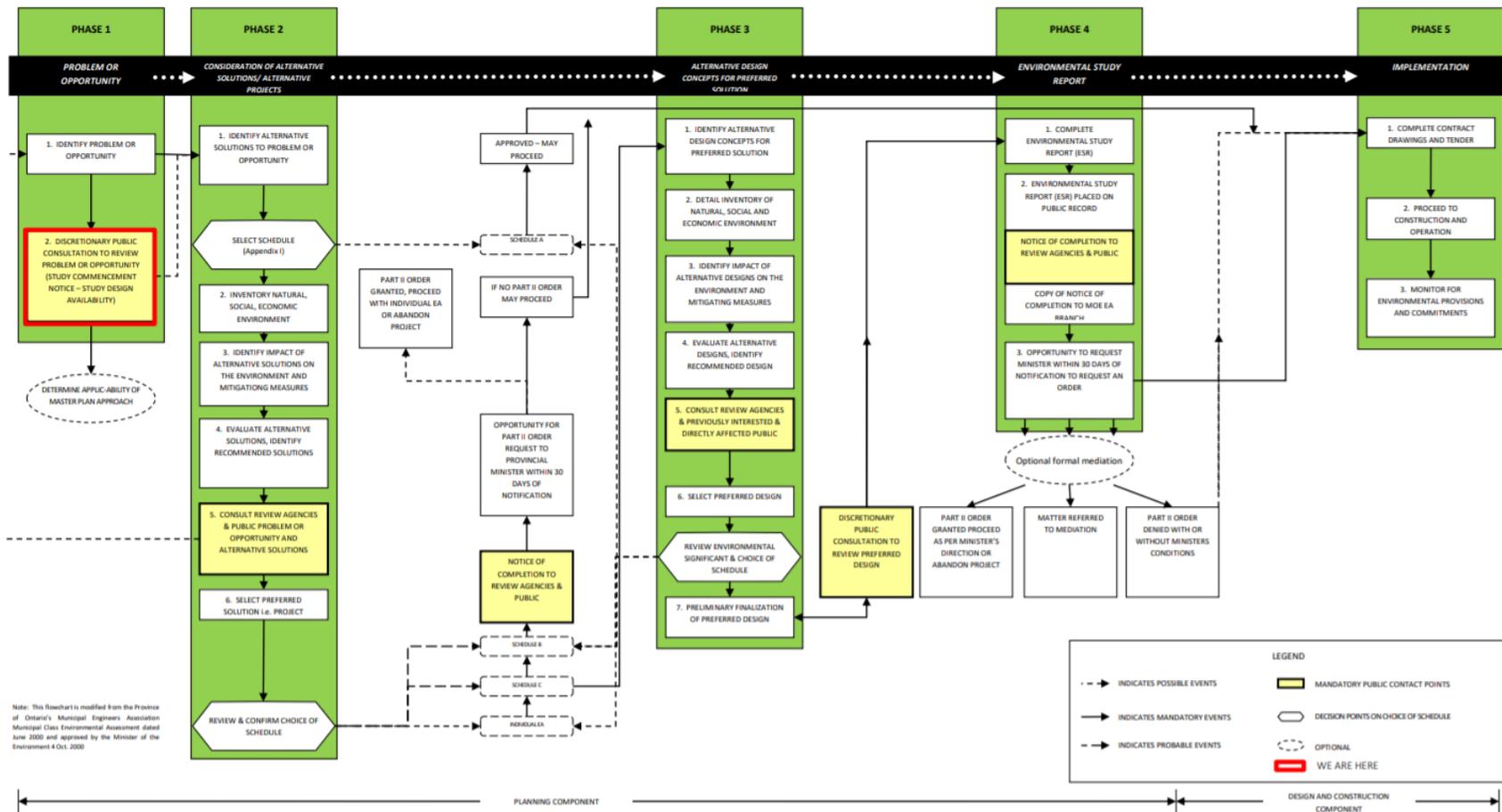


Figure 2: Municipal Class EA Process

## 4.0 Study Approach

Over the course of the study, input will be solicited from the public, stakeholders, agencies and Indigenous Communities. Input will be gathered through meetings, the project website, and discussions/communication with interested parties. The Study approach is to work collaboratively with interested parties to address issues and reach a consensus on the preferred design.

### 4.1 Consultation Program

The Consultation Program provides opportunities for the TAC to discuss the Study with the public/stakeholders, agencies and Indigenous Communities. This Study will use several processes to engage with interested parties and provide an opportunity for input. The Consultation Program will include:

- Notices published in local newspapers and directly mailed/emailed to the study mailing list at key points over the course of the study including:
  - Notice of Study Commencement at the Study start-up
  - Public Information Centre No. 1 (during the EA process)
  - Notice of Study Completion to account the start of the 30-day public review period
  - Public Information Centre No. 2 (during detail design)
- Communication and coordination with agencies/consultants to obtain background information for input into the Study and to obtain required approvals/permits
- Study updates on the project webpage located on the County's website
- Project Team Meetings
- Meetings with regulatory agencies, affected parties and stakeholders (as required)

#### 4.1.1 Public Consultation

The study will use several techniques to proactively involve the public including this Study Design Report, Public Information Centres (PIC) and meetings with external stakeholders. Meetings will be organized with the stakeholders and may include affected agencies. These meetings will include representatives from the County and the consultant team.

One Public Information Centres (PIC) will be held as part of the EA process. This PIC will present the problem and opportunity statement, Study Design (Work Plan), environmental inventories, traffic analysis, evaluation of design alternatives and the preferred solution for the Study Area. The PIC will provide an opportunity to receive public/agency input before the preferred solution is finalized and documented in the Project File.

The public meeting will be an integral component of the study - seeking input and comments from the public and stakeholders. There will be an opportunity for the public to comment on the study at any time. All information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act* (2009). Anyone interested in the study will be added to the study mailing list upon request.

### **4.1.2 Agency Consultation**

Agencies/Ministries will be contacted at the start of the study to inform them of Study Commencement and to circulate this Draft Study Design. As the study progresses, meetings will be held with select agencies (as required) to review the study and obtain approvals in accordance with the Municipal Class EA. Agencies will include:

- Ministry of the Environment, Conservation and Parks
- Ministry of Natural Resources and Forestry
- Ministry of Indigenous Affairs
- Ministry of Heritage, Sport, Tourism and Culture Industries
- Kettle Creek Conservation Authority
- City of St. Thomas
- Municipality of Central Elgin
- Infrastructure Ontario
- Transport Canada
- Emergency Services
- School Boards/Bus Services
- Other Stakeholders (as identified)

### **4.1.3 Indigenous Consultation**

The County of Elgin has a constitutional duty to consult with Indigenous Communities with traditional land use or interests within the Study Area. Clear, effective and timely consultation with Indigenous Communities is essential to ensure the success of the project. This will include:

- Identification of interested/affected Indigenous Communities early in the decision-making process;
- Distribution and notification of relevant project-related information, including the Class EA process, environmental inventories and potential alternatives/impacts;
- Early identification of concerns/issues;
- Understanding of potential risk and impacts of the Study on Indigenous Peoples interests;
- Development of mutually acceptable solutions involving Indigenous Communities; and
- Ensuring regulatory compliance throughout the Class EA process.

Indigenous Communities will be consulted throughout the duration of the Study.

## **4.2 Work Program**

The major elements of the work program are described in the following sections.

### **4.2.1 Phase 1: Identify the Problem**

This phase of the Study will include: establishing the Study scope, schedule and approach with the Project Team and agencies; issuing the Notice of Study Commencement; the collection and

organization of background information; reviewing and documenting existing conditions; and the transportation analysis to identify operational, safety and traffic concerns.

In addition, this draft Study Design has been prepared to present: the Problem/Opportunity Statement; the consultation plan; project schedule; and the scope of the Study's technical requirements, design standards and proposed evaluation criteria. This document is available for public/agency review and will help establish the foundation for all remaining environmental planning and public consultation processes.

#### **4.2.2 Phase 2: Alternatives**

##### **Alternative Planning Solutions**

The list of Alternative Planning Solutions is provided in **Section 2.1.1**. Based on this evaluation, a context sensitive design approach that reflects the surrounding area will be used in the development and evaluation of alternative intersection improvements.

The consideration of all reasonable alternatives is a guiding principle for EA studies. Intersection alternatives will be generated through discussions with the County, agencies/stakeholders and the general public.

##### **Preliminary Design Alternatives**

This Section describes Preliminary Design Alternatives for the recommended Planning Solution for Intersection Improvements (see **Section 2.1.1**). The Environmental Assessment will identify the preferred alignment and intersection control at the Centennial Road/Elm Line intersection.

As an initial step in the generation of alternatives this Study has identified alternative intersection improvements. These include:

- Alternative 1: Unsignalized Conventional Control
  - All-way Stop Control
  - Speed Control (traffic calming)
  - Realignment (70-degree skew angle)
  - Realignment (gooseneck sideroads to achieve 90-degree skew angle)
- Alternative 2: Signalization
  - Realignment (70-degree skew angle)
  - Realignment (gooseneck sideroads to achieve 90-degree skew angle)
  - Pedestrian Signals
- Alternative 3: Roundabout Control

These alternatives will be evaluated, and the preferred solution will be presented at the Public Information Centre.

#### **4.2.3 Environmental Inventories and Technical Investigations**

Environmental inventories and technical investigations will be completed to assess the impacts of alternative design concepts. These investigations are described in **Sections 4.2.3.1 to Section 4.2.3.5**.

#### **4.2.3.1 Transportation Analysis**

The transportation analysis will build upon the previous work that has been completed. An analysis will be undertaken of the operational implications of existing and projected traffic demands and the distribution of traffic resulting from the planned developments. The transportation analysis will involve the following key tasks:

- Documentation of the existing profile of road users including all modes of travel (vehicular, bicycles, pedestrians, equipment, transit and emergency services);
- Analysis of forecast traffic demands and future projections, and identification of level of service for roadway links and intersections (building and documenting on previous forecasts) for any planned transportation network changes;
- Examination of area collision histories to identify areas of concern and possible improvement opportunities. This will be documented in the Safety Performance Report;
- Identification of existing /future operational problems and timelines for the need for additional capacity in the transportation network;
- Provide input describing the performance of each alternative (traffic operation and safety); and
- Confirmation of the need and justification for roadway improvements and timing.

#### **4.2.3.2 Natural Environment**

An assessment of the trees in the Study Area will be completed to determine if any trees will be impacted by the proposed improvements. This will include preparation of a Tree Inventory and Tree Preservation Report.

#### **4.2.3.3 Socio-Economic Environment**

An inventory of existing land uses within the Study Area will be undertaken. This will include documentation of recreational/residential development (access, emergency services, trails, etc.), commercial, institutional and utility corridor land uses. The inventory will also include consideration and identification of future land uses such as developments, right-of-way requirements, future transit and transportation facilities and development that could be implemented complying with existing planning documents. Any land use changes that have occurred will be documented.

#### **4.2.3.4 Stormwater Drainage**

The drainage and stormwater management design criteria will be confirmed with the County. Drainage analysis will be performed to determine the flows for the 5 to 100 year return period rainfall events and to establish the capacities of the existing and required system for the preferred solution.

#### **4.2.3.5 Geotechnical**

A geotechnical site investigation will be completed including: 8 boreholes taken on the roads approaching the intersection; physical soil testing (natural moisture content, sieve analysis and Sieve/Hydrometer); and a summary of the results of the site investigation and laboratory testing program in a geotechnical report.

#### **4.2.4 Evaluation of Alternatives**

Preliminary Design Alternatives will be generated based on the inventory of the natural, social and cultural environment and results of the technical investigations.

Preliminary Design Alternatives will be evaluated using a qualitative or quantitative evaluation process based on the range of alternatives and associated impacts. Through this process evaluation criteria will be identified including potential factors such as roadway level of service, traffic safety, accessibility, property impacts, socio-economic environment, natural environment, cultural heritage, technical aspects/construction complexity and implementation. The evaluation process will assign a “weight” to each criteria and an iterative process will be used for the evaluation of individual competing alternatives. The iterative process will involve one, or possible two levels of evaluation and sensitivity testing.

The evaluation and analysis will identify all improvement alternatives and associated cost estimates including life cycle costs, alternative construction/ material options, proposed timeline and innovative solutions.

Based on the results of an evaluation, a preferred solution will be selected. A technical memorandum outlining the results of the evaluation will be completed and will include: the assessment of alternatives to the undertaking; generation and assessment of preliminary design alternatives; evaluation criteria (i.e. environmental inventories and technical investigations); and selection of the preferred solution.

This document will be presented to the public for input at PIC No. 1. Following the PIC, refinements will be made to the preferred solution (if applicable) and the refined alternative will become the preferred design.

#### **4.3 Phase 4: Environmental Study Report (ESR) or Project File**

The preparation of the draft and final EA report will follow the format and content for an ESR or Project File accepted by the Ministry of Environment Parks and Conservation (MECP). The ESR or Project File will document the study methodology, findings, public involvement and recommendations. The public will be notified of the availability of the ESR or Project File for a 30-day public review period.

#### **4.4 Study Schedule**

A draft schedule for this Study is shown below in **Table 1**.

**Table 1: Draft Study Schedule**

<b>Task</b>	<b>Date</b>
Project Start-Up Meeting	January 2020
Study Commencement Notice and Study Design	February 2020
Information Gathering	Winter 2020
Environmental Review and Transportation Analysis	Winter/Spring 2020
Analysis and Evaluation of Alternatives	Spring 2020
Public Information Centre No. 1	Spring 2020
Finalize Preferred Design	May/June 2020
Preparation of ESR or Project File	June 2020
30-day Public Review Period	Summer 2020

**Appendix B**  
Record of Consultation



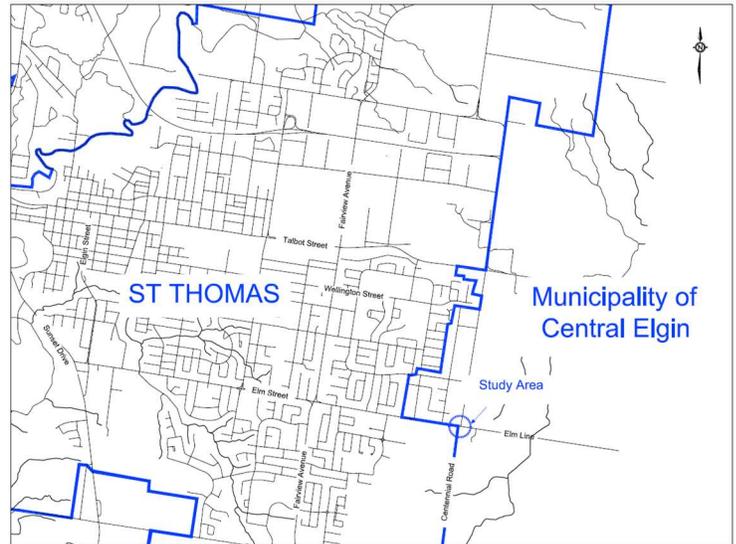
## Notice of Study Commencement Centennial Road / Elm Line Intersection Improvements Municipal Class Environmental Assessment Study

### INTRODUCTION

The County of Elgin has initiated an Environmental Assessment (EA) Study to develop a transportation plan for intersection improvements at Centennial Road and Elm Line in the Municipality of Central Elgin. The Study will evaluate alternatives to improve the operation, safety and capacity of the existing intersection.

### STUDY PROCESS

The Centennial Road / Elm Line EA Study is being conducted as a Schedule C or Schedule B project under the *Municipal Class Environmental Assessment (MCEA) (2015)*. The Study will follow the Municipal Class EA process by establishing the need and justification for the project, considering all reasonable alternatives with acceptable effects on the natural, social and cultural environments, and proactively involving the public.



### PUBLIC CONSULTATION

A draft Study Design Report is available on the County's website at: <https://www.elgincounty.ca/centennial-elm/>. The draft Study Design Report describes the study background, approach, preliminary alternatives and public consultation program. The public consultation process is vital to this Study and the County wants to ensure that anyone with interest in the project has the opportunity to provide input. A Public Information Centre (PIC) will be held during the Study. Notice of the PIC will be advertised and mailed to residents within the local community. Notices and updates will also be placed on the County's website.

There is an opportunity at any time during the Class EA process for interested persons to provide comments. Early identification of individual and group concerns greatly aids in addressing these concerns. All information will be collected in accordance with the Freedom of Information and Protection of Privacy Act (2009). With the exception of personal information, all comments will become part of the public record. Persons will be advised of future communication opportunities by electronic notice in addition to newspaper public notices.

For more information or if you wish to be placed on the study's mailing list, contact either:

**Steve Taylor, P.Eng.**  
**EA Project Manager**  
**BT Engineering Inc.**  
509 Talbot Street  
London, Ontario N6A 2S5  
Tel: 519-672-2222  
Email: [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca)

**Brian Lima, P.Eng.**  
**County Engineer**  
**County of Elgin**  
450 Sunset Drive  
St. Thomas, Ontario N5R 5V1  
Tel: 519-631-1460 ext. 117  
Email: [blima@elgin.ca](mailto:blima@elgin.ca)

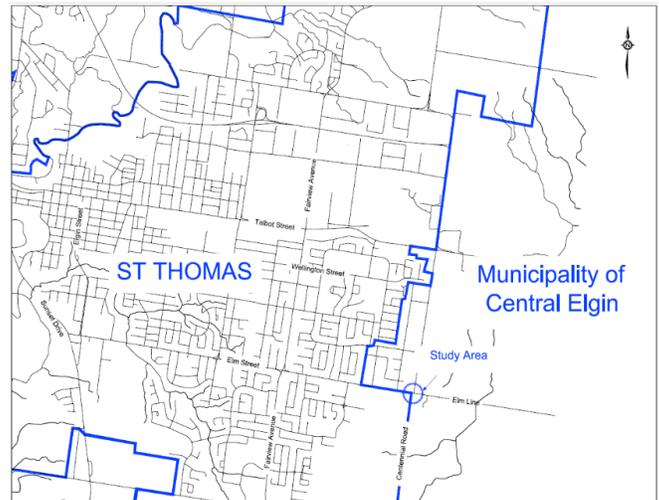
**Notice of Online Public Information Centre  
Centennial Road / Elm Line Intersection Improvements  
Municipal Class Environmental Assessment Study**

**INTRODUCTION**

The County of Elgin has initiated an Environmental Assessment (EA) Study to develop a transportation plan for intersection improvements at Centennial Road and Elm Line in the Municipality of Central Elgin. The Study has evaluated alternatives to improve the operation, safety and capacity of the existing intersection.

**STUDY PROCESS**

The Centennial Road / Elm Line EA Study is being conducted as a Schedule B project under the *Municipal Class Environmental Assessment (MCEA)* (2015). The Study will follow the Municipal Class EA process by establishing the need and justification for the project, considering all reasonable alternatives with acceptable effects on the natural, social and cultural environments, and proactively involving the public.



**PUBLIC CONSULTATION**

The County wishes to ensure that anyone interested in this study has the opportunity to be involved and provide input. At the present time, the Province of Ontario has implemented a State of Emergency requiring measures to deal with the COVID-19 pandemic, and public gatherings have been prohibited. As a result, **this Public Information Centre is relying on web-based communications**. The online PIC will include a series of exhibits that present background information, the evaluation of alternatives and the Technically Preferred Alternative for intersection improvements. Comments on the information presented can be provided on the online comment form or by contacting the County or consultant project manager's email addresses listed below.

**The Online Public Information Centre is scheduled for:**

**Date:** May 19, 2020 to June 5, 2020 (exhibits will remain on project website until study completion)

**Website:** <https://www.elgincounty.ca/centennial-elm/>

There is an opportunity at any time during the Class EA process for interested persons to provide comments. Early identification of individual and group concerns greatly aids in addressing these concerns. All information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act* (2009). With the exception of personal information, all comments will become part of the public record. Persons will be advised of future communication opportunities by newspaper public notice, email notice and posting on the County website.

For more information or if you wish to be placed on the study's email mailing list, contact either:

**Steve Taylor, P.Eng.**  
EA Project Manager  
BT Engineering Inc.  
509 Talbot Street  
London, Ontario N6A 2S5  
Tel: 519-672-2222  
Email: [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca)

**Brian Lima, P.Eng.**  
County Engineer  
County of Elgin  
450 Sunset Drive  
St. Thomas, Ontario N5R 5V1  
Tel: 519-631-1460 ext. 117  
Email: [blima@elgin.ca](mailto:blima@elgin.ca)

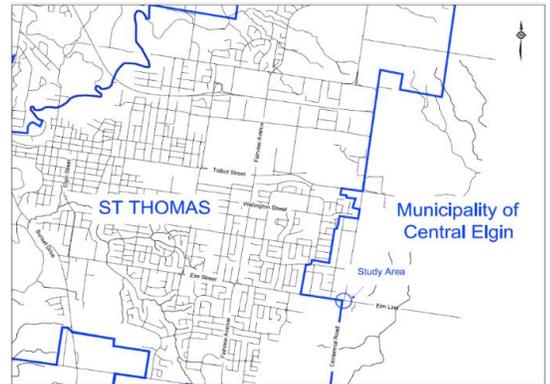
**Notice of Study Completion  
Centennial Road / Elm Line Intersection Improvements  
Municipal Class Environmental Assessment Study**

**INTRODUCTION**

The County of Elgin has completed an Environmental Assessment (EA) Study for intersection improvements at Centennial Road and Elm Line in the Municipality of Central Elgin. The Study has evaluated alternatives to improve the operation, safety, and capacity of the existing intersection.

**STUDY PROCESS**

The Centennial Road / Elm Line EA Study was completed as a Schedule B project under the *Municipal Class Environmental Assessment (MCEA)* (2015). The Study has completed all necessary phases of the Municipal Class EA and is documented in a Project File Report. Following the public review period, if there are no objections, the project will receive environmental clearance for construction.



**PROJECT FILE REPORT REVIEW**

The Project File Report will be available on public record for a 30-day public and agency review period from August 19, 2020 to September 18, 2020. The Project File Report will be available for viewing on the project website at:

<https://www.elgincounty.ca/centennial-elm/>

**NOTICE OF COMPLETION**

If there are any concerns regarding the project that cannot be resolved in discussion with the County, a person or party may request, in writing, that the Minister of the Environment, Conservation and Parks (MECP) make an order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses Individual Environmental Assessments. Requests, with reasons, may be received by the Minister and Director of the Environmental Assessment and Permissions Branch of the MECP (at the addresses noted below) within 30 days of this notice, prior to September 18, 2020. The request must also be copied to the County's Project Manager identified below.

As of July 1, 2018, a Part II Order Request Form must be used to request a Part II Order in accordance with O. Reg. 152/18. The Part II Order Request Form is available online on the Forms Repository website (<http://www.forms.ssb.gov.on.ca/>) by searching "Part II Order" or "012-2206E" (the form ID number). If there are no requests received within the 30-day review period, the project will receive environmental clearance.

<p><b>Ministry of Environment, Conservation and Parks</b> Minister Rod Phillips 777 Bay Street, 5<sup>th</sup> Floor Toronto, ON M7A 2J3 <a href="mailto:minister.mecp@ontario.ca">minister.mecp@ontario.ca</a></p>	<p><b>Director, Environmental Assessment and Permissions Branch</b> 135 St. Clair Avenue West, 1<sup>st</sup> Floor Toronto, ON M4V 1P5 <a href="mailto:enviropemissions@ontario.ca">enviropemissions@ontario.ca</a></p>	<p><b>Brian Lima, P.Eng.</b> <b>County of Elgin</b> 450 Sunset Drive St. Thomas, Ontario N5R 5V1 Tel: 519-631-1460 ext. 117 <a href="mailto:blima@elgin.ca">blima@elgin.ca</a></p>
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For more information, or if you require assistance accessing the report, contact either:

**Steve Taylor, P.Eng.**  
**EA Project Manager**  
**BT Engineering Inc.**  
509 Talbot Street  
London, Ontario N6A 2S5  
Tel: 519-672-2222  
Email: [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca)

**Brian Lima, P.Eng.**  
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Tel: 519-631-1460 ext. 117  
Email: [blima@elgin.ca](mailto:blima@elgin.ca)



## **Public Information Centre (PIC) No. 1, Summary Report**

### **Centennial Road (CR 28) / Elm Line (CR 56) Intersection Improvements Municipal Class Environmental Assessment**

June 2020

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**Prepared by:**  
BT Engineering Inc.  
509 Talbot Street  
London, ON N6A 2S5



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Appendix B	PIC Exhibits
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## 1.0 Introduction

The County of Elgin (County) is conducting a Class Environmental Assessment (EA) Study to develop a transportation plan for intersection improvements at Centennial Road (County Road 28) and Elm Line (County Road 56) in the Municipality of Central Elgin. Intersection improvements are required to improve the operation, safety and capacity of the existing intersection configuration.

The Class EA Study will complete all required phases of the Municipal Class Environmental Assessment. The study will: establish the need and justification for the improvements; complete environmental inventories; establish a baseline to compare alternatives; consider all reasonable alternatives; and proactively involve the public in defining a recommended plan for improvements.

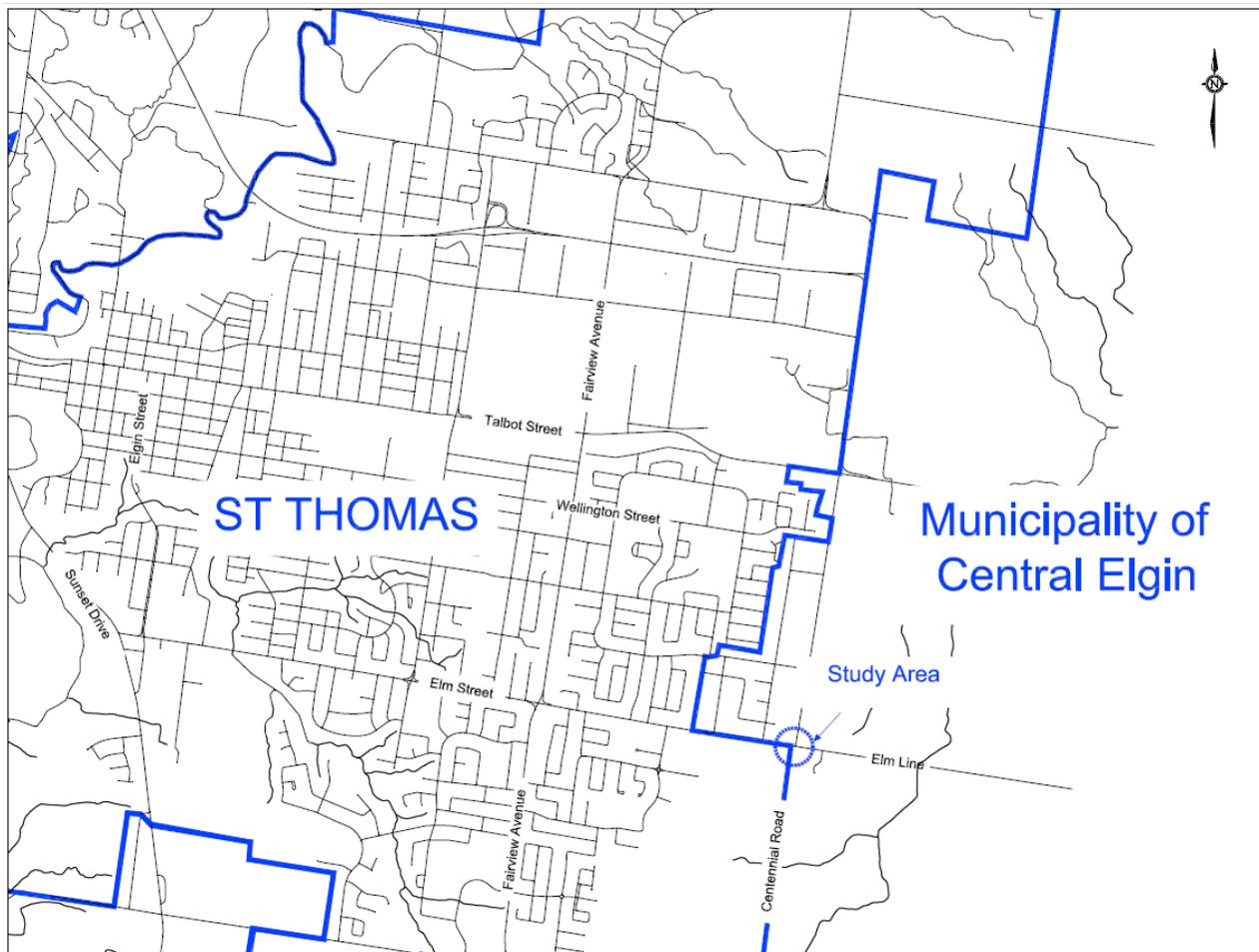
Based on the range of anticipated effects and capital cost of the project, the study is being conducted as a Municipal Schedule B project. At the completion of the project, a Project File will be prepared for a 30-day public review period.

Public Information Centre (PIC) No. 1 for this Study was held online from May 19 to June 5, 2020. At the time of the PIC, the Province of Ontario had implemented a State of Emergency requiring measures to deal with the COVID-19 pandemic, and public gatherings have been prohibited. As a result, the Public Information Centre relied on web-based communications. The Public Information Centre presented information on background information, the evaluation of alternatives and the Technically Preferred Alternative for intersection improvements

All members of the public and interest groups were invited to view the Online Public Information Centre material and were encouraged to provide a written response to any issues or concerns.

### 1.1 Study Area

The Study Area is located in the County of Elgin and is illustrated on **Figure 1**. The Study Area includes the Centennial Road / Centennial Avenue (CR 28) and Elm Street / Elm Line (CR 56) intersection. For the purposes of this report, Centennial Road and Elm Line will be used to describe the roadways. This intersection is located within the Municipality of Central Elgin at the eastern boundary limits of the City of St. Thomas.



**Figure 1: Project Location**

## 2.0 Public and Agency Consultation

One of the key aspects of the study is to provide the public, interested parties, affected agencies and municipalities with the opportunity for input. In order to ensure this objective is met, a public and agency notification program was undertaken. The program includes a number of communication mechanisms, discussed in the following sections.

### 2.1 Individual Property Owner Contacts

Notices were mailed to property owners within the study area, inviting them to attend the online Public Information Centre. The notice was also distributed electronically to members of the public/stakeholders that had identified an interest in the study or requested to be on the mailing list.

#### 2.1.1 Property Owner Meetings

Individual virtual meetings were also offered to property owners where property impacts and/or acquisition are involved. Meetings were held for the following properties:

- 233 Centennial Road
- 8776 Centennial Avenue
- 44085 Elm Line
- 44100 Elm Line

### 2.2 Newspaper Notice

Notices of the Public Information Centre were published in the St. Thomas Times Journal on May 15 and May 20, 2020.

The newspaper notice is found in **Appendix A**.

### 2.3 Agency and Stakeholder Contacts

The following ministries, agencies and stakeholders were invited to attend the online PIC:

- Municipality of Central Elgin
- City of St. Thomas
- Ministry of the Environment, Conservation and Parks
- Ministry of Natural Resources and Forestry
- Ministry of Heritage, Sport, Tourism and Culture Industries
- Infrastructure Ontario
- Ministry of Municipal Affairs and Housing
- Ministry of Agriculture, Food and Rural Affairs
- Ministry of Indigenous Affairs
- Elgin Federation of Agriculture (Chapter of OFA)
- Catfish Creek Conservation Authority
- Kettle Creek Conservation Authority
- Emergency Medical Services
- OPP Elgin County
- Thames Valley District School Board (TVDSB)
- London District Catholic School Board

Notices were sent to the Indigenous Peoples in the vicinity of the Study Area, inviting them to attend the online PIC. Notices were sent to the following:

- Munsee-Delaware Nation
- Walpole Island First Nation

- Chippewas of Kettle & Stony Point First Nation
- Oneida Nation of the Thames
- Aamjiwnaang First Nation (Chippewas of Sarnia)
- Chippewas of the Thames First Nation
- Caldwell First Nation
- Delaware Nation
- Metis Nation of Ontario
- Southern First Nations Secretariat

### 3.0 PIC Comments

PIC Exhibits were provided online for public/agencies to view at their convenience. A copy of the PIC exhibits is provided in **Appendix B**.

Eleven (11) comment sheets and emails were received during and beyond the comment period. Copies of the comments, excluding personal information, are provided in **Appendix C**.

#### 3.1 Summary of Comments

The comments received, and verbal discussions held at the Public Information Centre are summarized below in **Table 1**.

<b>Comment</b>	<b>Number of Respondents</b>	<b>Comment Sheet No.</b>
Concern for the increase in traffic and general support for improvements.	5	1, 5, 6, 7, 8
Concern for vehicles speeding through the intersection and support for traffic calming measures (i.e. speed bumps, improved signage).	6	1, 2, 5, 6, 7, 8
Support for a roundabout.	8	1, 3, 4, 5, 6, 8, 9, 10
Opposition to traffic signals or a stop-controlled intersection.	1	1
Support for traffic signals.	1	2
Opposition to a roundabout.	1	2
Concern for sightlines within a roundabout (consider plantings do not block sightlines).	2	2, 8
Consider constructing sewers along Elm Line at the same time the road is being reconstructed.	3	2, 7, 9
Concern for the loss of property/property impacts required to implement a roundabout.	4	2, 5, 7, 11
Support for a Road Needs Study of the entire County of Elgin.	1	3
Need for the roundabout to accommodate large trucks and farm equipment.	1	3
Support for expanding the County road system to the east. This would provide a north-south arterial road to the City of London/Highway 401 and would accommodate heavy trucks, farm equipment and emergency services.	1	3
Support for a cost effective solution.	1	5
Question over the need for cycling facilities – they are discontinuous and not provided on any other leg of the intersection.	1	8

Support for extending a sidewalk along Centennial Road from Elm Street to Auburn Drive.	1	9
Site specific concerns related to property impacts including: access to laneway; impacts to landscaping; snow plowing; sewer connections; and garbage removal.	1	7
Site specific concerns related to property impacts including: impacts to driveway; improved drainage; landscaping to reduce headlight glare; sewer connections; and improved sidewalk connections.	1	9

## 4.0 Conclusions and Recommendations

### Conclusions

The main comments, both verbal (i.e. phone calls, virtual meetings) and written, from the public information centre include:

- Support for intersection improvements and reducing speeding along Centennial Road.
- General support for the implementation of a roundabout at this location.
- Concern for property impacts and the loss of property.
- Need for the roundabout to accommodate large trucks/farm equipment.
- Consideration for the construction of sanitary sewers along Centennial Road. Support for this work to be completed at the same time to avoid future disruption.

### Recommendations for Future Actions

Actions for future review and consideration in the design include:

- Request for expanded driveway at 44085 Elm line to accommodate vehicle storage and movements onto the street (no backing onto the street in close proximity to the roundabout)
- Need to liaise with the Municipality of Central Elgin on coordination of future sanitary servicing (if planned)
- Assess drainage design to improve drainage on the west leg of the intersection
- Design landscaping to provide screening to private landowners and limit obstructing lines of sight from driveways

# Appendix A

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## Newspaper Notice

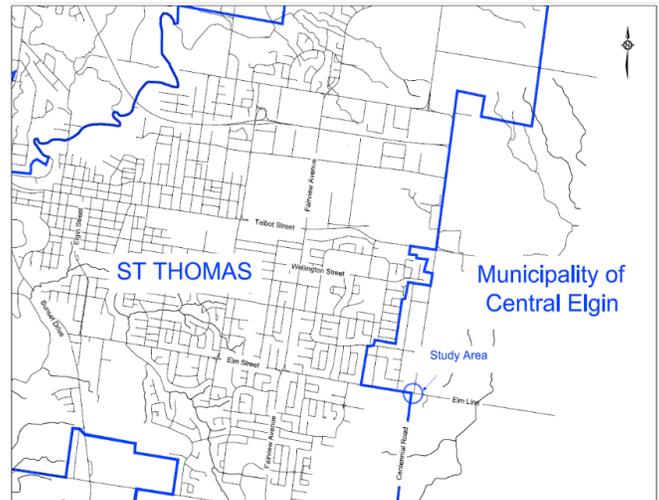
**Notice of Online Public Information Centre  
Centennial Road / Elm Line Intersection Improvements  
Municipal Class Environmental Assessment Study**

**INTRODUCTION**

The County of Elgin has initiated an Environmental Assessment (EA) Study to develop a transportation plan for intersection improvements at Centennial Road and Elm Line in the Municipality of Central Elgin. The Study has evaluated alternatives to improve the operation, safety and capacity of the existing intersection.

**STUDY PROCESS**

The Centennial Road / Elm Line EA Study is being conducted as a Schedule B project under the *Municipal Class Environmental Assessment (MCEA)* (2015). The Study will follow the Municipal Class EA process by establishing the need and justification for the project, considering all reasonable alternatives with acceptable effects on the natural, social and cultural environments, and proactively involving the public.



**PUBLIC CONSULTATION**

The County wishes to ensure that anyone interested in this study has the opportunity to be involved and provide input. At the present time, the Province of Ontario has implemented a State of Emergency requiring measures to deal with the COVID-19 pandemic, and public gatherings have been prohibited. As a result, **this Public Information Centre is relying on web-based communications**. The online PIC will include a series of exhibits that present background information, the evaluation of alternatives and the Technically Preferred Alternative for intersection improvements. Comments on the information presented can be provided on the online comment form or by contacting the County or consultant project manager's email addresses listed below.

**The Online Public Information Centre is scheduled for:**

**Date:** May 19, 2020 to June 5, 2020 (exhibits will remain on project website until study completion)

**Website:** <https://www.elgincounty.ca/centennial-elm/>

There is an opportunity at any time during the Class EA process for interested persons to provide comments. Early identification of individual and group concerns greatly aids in addressing these concerns. All information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act* (2009). With the exception of personal information, all comments will become part of the public record. Persons will be advised of future communication opportunities by newspaper public notice, email notice and posting on the County website.

For more information or if you wish to be placed on the study's email mailing list, contact either:

**Steve Taylor, P.Eng.**  
EA Project Manager  
BT Engineering Inc.  
509 Talbot Street  
London, Ontario N6A 2S5  
Tel: 519-672-2222  
Email: [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca)

**Brian Lima, P.Eng.**  
County Engineer  
County of Elgin  
450 Sunset Drive  
St. Thomas, Ontario N5R 5V1  
Tel: 519-631-1460 ext. 117  
Email: [blima@elgin.ca](mailto:blima@elgin.ca)

# Appendix B

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PIC Exhibits

# Welcome to the Centennial Road / Elm Line Class Environmental Assessment Study

Thank you for participating in the Online Public Information Centre (PIC) for Elgin County's Class Environmental Assessment (EA) for intersection improvements at Centennial Road / Elm Line.

At the present time, the Province of Ontario has implemented a State of Emergency requiring measures to deal with the COVID-19 pandemic, and have prohibited public gatherings. As a result, this Public Information Centre is relying on web-based communications. Should you have any questions regarding the study, please contact the County or Consultant Project Managers listed on the last exhibit.

There is an opportunity at any time during the Class EA process for interested persons to provide written input. Any comments received will be collected under the Environmental Assessment Act and, with the exception of personal information, will become part of the public record.

Comments can be submitted by emailing [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca) by  
**June 5, 2020.**

**Comments can also be submitted by emailing the County Project Manager or by  
completing the Comment Form provided on the project website.**

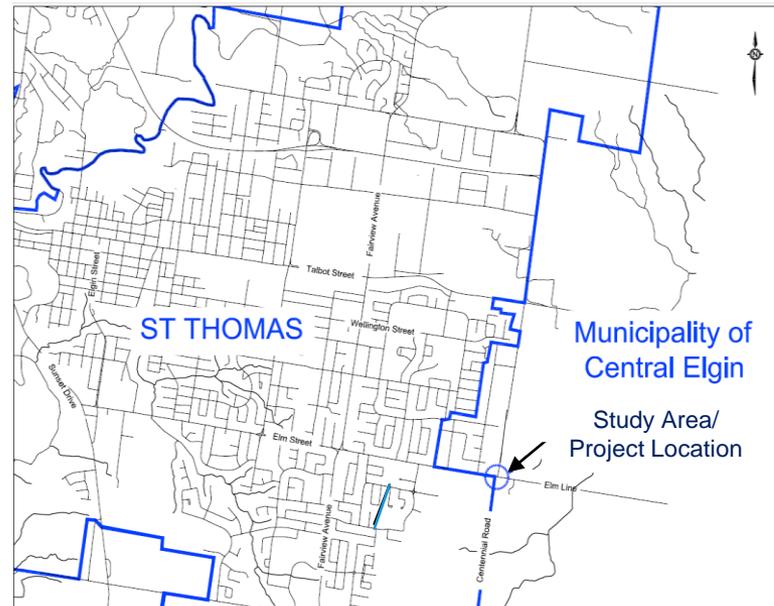
# Introduction

The County of Elgin (County) has initiated a Class Environmental Assessment (EA) Study to develop a transportation plan for intersection improvements at Centennial Road (County Road 28) and Elm Line (County Road 56) in the Municipality of Central Elgin. This Study will complete all phases of the Class EA by establishing the need and justification for the project, considering all alternatives and proactively involving the public in defining a Recommended Plan for improvements.

A draft Study Design describing the study process has been prepared for agency and public review. It has been posted on the County's website (<https://www.elgincounty.ca/wp-content/uploads/2020/02/20-002-Draft-Centennial-Elm-Study-Design-Feb-21-20-QC-v2.pdf>) for public review and comments.

The guiding principles of the Class Environmental Assessment include:

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



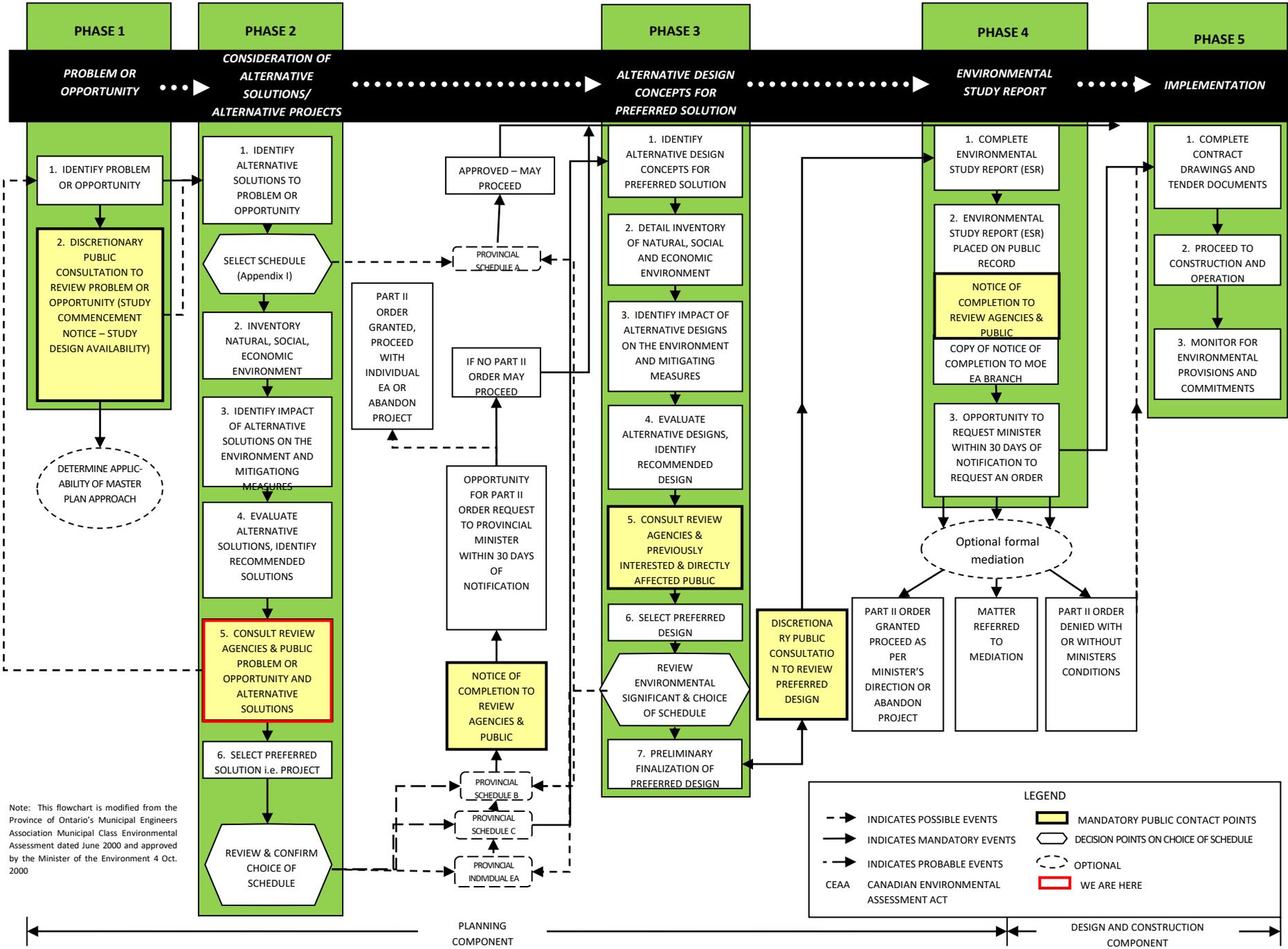
# Municipal Class Environmental Assessment (Class EA) Process

At the initiation of the EA, the Study was described as being either a Municipal Schedule B or C Class Environmental Assessment. Following selection of the Technically Preferred Alternative (TPA) the **Schedule was confirmed to be a Schedule B Class EA** based on the range of anticipated effects and capital cost of the project.

The TPA meets the EA Schedule B definition as “reconstruction or widening where the reconstructed road or other linear paved facilities will be for the same purpose, use, capacity or at the same location” at a cost of less than \$2.4 million.

The study will culminate in the submission of a Project File which is a detailed compilation of all data and reports produced for the project. The Class EA Schedule will be confirmed based on the preliminary recommendations for improvements.

If after viewing the exhibits and otherwise participating in this project, and at the conclusion of the process you still have concerns, you have the right to request the Minister of the Environment, Conservation and Parks (MECP) to reclassify the project through a Part II Order (or “bump-up”) to an Individual Environmental Assessment.



# Background

Intersection improvements at Centennial Road / Elm Line are required to accommodate planned and future development within the Municipality of Central Elgin and the City of St. Thomas. Centennial Road / Elm Line currently operates as a 4-legged intersection with the north and south approaches offset by approximately 25 m. The north and south approaches are stop controlled, and all legs of the intersection have single-lane approaches, with exception of the north leg which has a dedicated southbound left-turn lane.

Centennial Road and Elm Line are 2-lane rural roadways providing access to residential, agricultural and commercial properties as well as connecting the County to the City of St. Thomas and the wider transportation network. The roadway serves all modes of travel including vehicular traffic, goods movement, cycling and pedestrians. A sidewalk is provided on the west side of Centennial Avenue (north leg of the intersection). All road approaches have a posted speed of 50 km/h with exception of Centennial Road (south approach) which has a posted speed of 60 km/h.

The existing intersection will be unable to accommodate the projected traffic growth and as development continues, traffic demands will ultimately warrant the provision of traffic signals.



*Elm Street looking east.*



*Centennial Road looking north.*

# Study Area Issues

Issues in the study area include:

- ▶ Accommodating traffic generated by planned/ proposed area developments (Harvest Run subdivision);
- ▶ Integrating with the City of St. Thomas Elm Street improvements (currently under construction);
- ▶ Improved safety for road users and intersection design consistency (i.e. removal of the offset intersection)
- ▶ Need to suitably accommodate all modes of transportation (i.e. pedestrians, cyclists, heavy trucks, farm equipment); and
- ▶ Consideration of the property requirements and impacts (i.e. property acquisition, driveway realignments, tree removal).



# Assessment of Alternative Planning Solutions

The Class Environmental Assessment Act requires that all reasonable Planning Solutions be identified and evaluated at the start of the Study. These alternatives consider the overall needs of the study area and identify alternative approaches of addressing the need for improvements. The Alternative Planning Solutions have been evaluated to select the most reasonable alternatives that address the Problem and Opportunity Statement. The evaluation is documented in the Study Design Report and described below:

- ✘ Do Nothing: No cost, however, does not address operational or safety concerns.
- ✘ Transportation Demand Management: Reduces vehicular traffic demand (encourages alternative work hours, work at home, active modes of transportation and transit); however, there are limited active transportation facilities and no transit in the Study Area.
- ✘ Limit Development: Does not align with the Official Plan for land use. Does not address existing traffic capacity issues.
- ✔ Intersection Improvements: Provides a long-term solution for improved traffic capacity, operations and safety.

Based on the preliminary review of Alternative Planning Solutions, “**Intersection Improvements at Centennial Road/Elm Line**” is recommended. This Planning Solution addresses the transportation problem by addressing future capacity constraints and improving safety.

Should no comments be received that object to this recommendation, then the Class EA Study will continue with the evaluation of Providing New or Improved Transportation Infrastructure as described on the following exhibits.

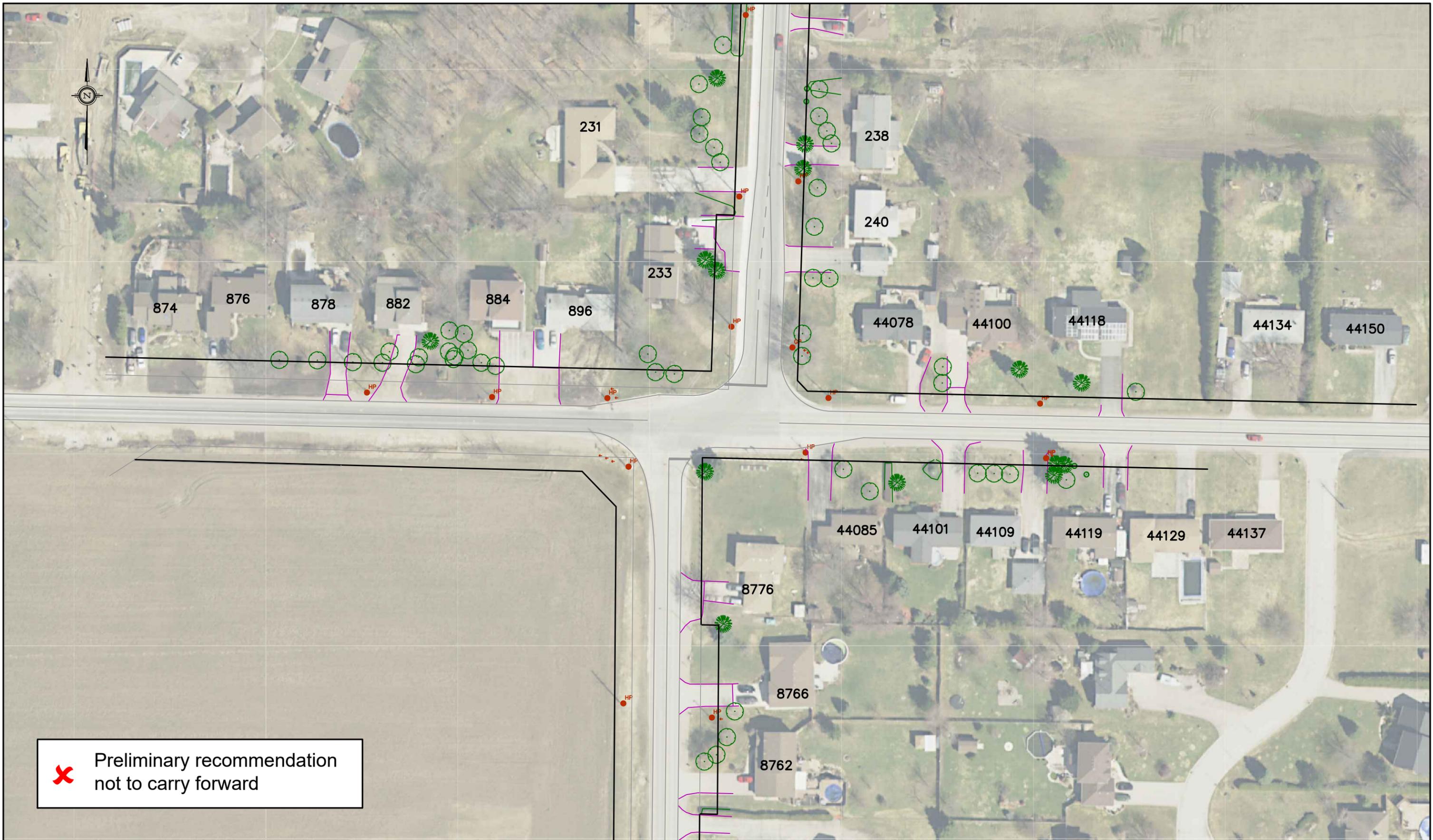
# Preliminary Design Alternatives - Coarse Screening

Preliminary Design Alternatives were generated for improvements to the Centennial Road (County Road 28) and Elm Line (County Road 56) intersection. Alternatives that were not viable, had significant impacts, or had substantially poorer safety or traffic performance compared with other alternatives were coarse screened. Preliminary Design Alternatives are illustrated on the following exhibits.

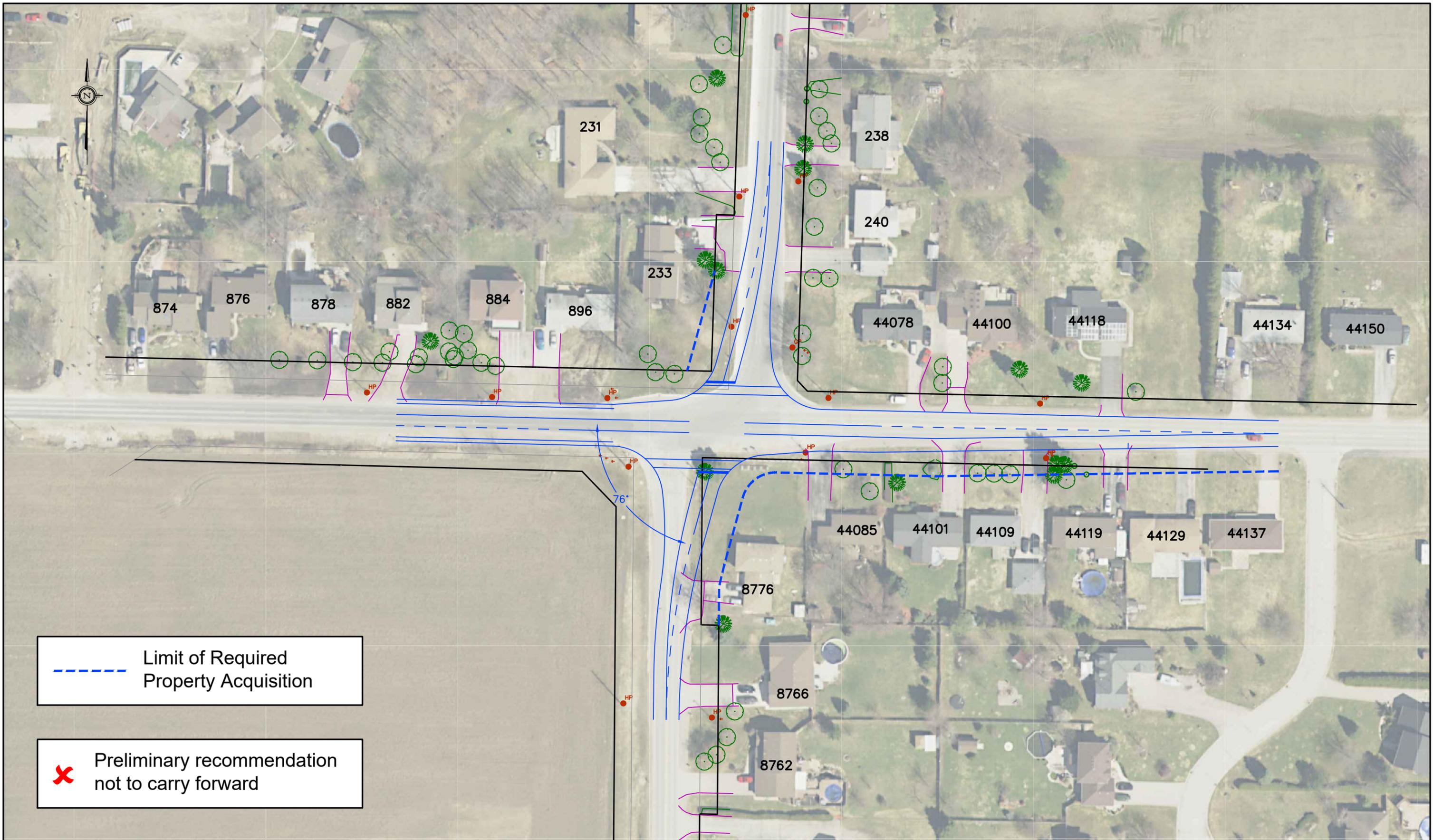
- ✘ Alternative 1: Existing Offset Intersection (Do Nothing) – unsignalized intersection is not considered a viable alternative. This alternative does not address the warrant for traffic signals.
- ✘ Alternative 2a: Skewed Unsignalized intersection – unsignalized intersection is not considered a viable alternative. This alternative does not address the warrant for traffic signals.
- ✘ Alternative 2b: Unsignalized Intersection with Realignment and Right-Turn Lane – unsignalized intersection is not considered a viable alternative. This alternative does not address the warrant for traffic signals.
- ✘ Alternative 2c: Unsignalized Intersection with Realignment and Right-Turn Lane – unsignalized intersection is not considered a viable alternative. This alternative does not address the warrant for traffic signals.
- ✘ Alternative 3a: Signalized Offset Intersection – Does not improve existing safety concerns with offset intersection.
- ✔ Alternative 3b: Signalized Skewed Intersection – Carried forward for evaluation.

# Preliminary Design Alternatives - Coarse Screening

- ✘ Alternative 3c: Signalized Intersection with Realignment of Centennial Avenue – Significant property impacts as a result of the realignment of the north approach.
- ✘ Alternative 3d: Signalized Intersection with Realignment of Centennial Road – Significant property impacts as a result of the realignment of the south approach.
- ✘ Alternative 3e: Signalized Skewed Intersection with Channelization – Significant property impacts as a result of the channelization of right-turn movements and does not accommodate large trucks/farm equipment.
- ✓ Alternative 4a: 40 m Roundabout – Carried forward for evaluation.
- ✓ Alternative 4b: 45 m Roundabout (southwest offset) – Carried forward for evaluation.
- ✓ Alternative 4c: 45 m Roundabout (centred) – Carried forward for evaluation.
- ✓ Alternative 4d: 48 m Roundabout – Carried forward for evaluation.



**X** Preliminary recommendation  
not to carry forward



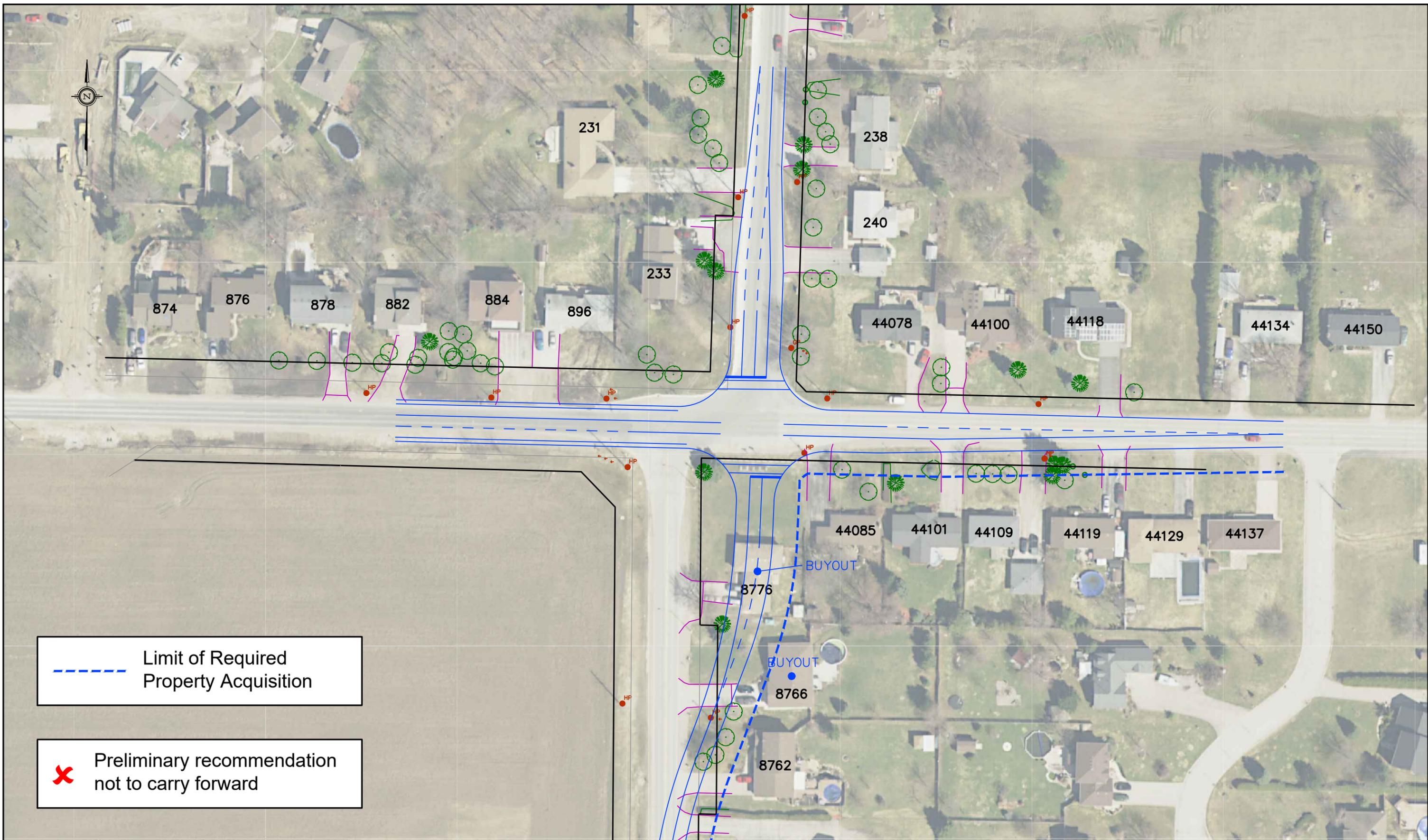
 Limit of Required Property Acquisition

 Preliminary recommendation not to carry forward

**BTE 20-002**  
 2020-04-27

**Centennial Road / Elm Street Intersection**  
 Alternative 2a: Skewed Unsignalized Intersection

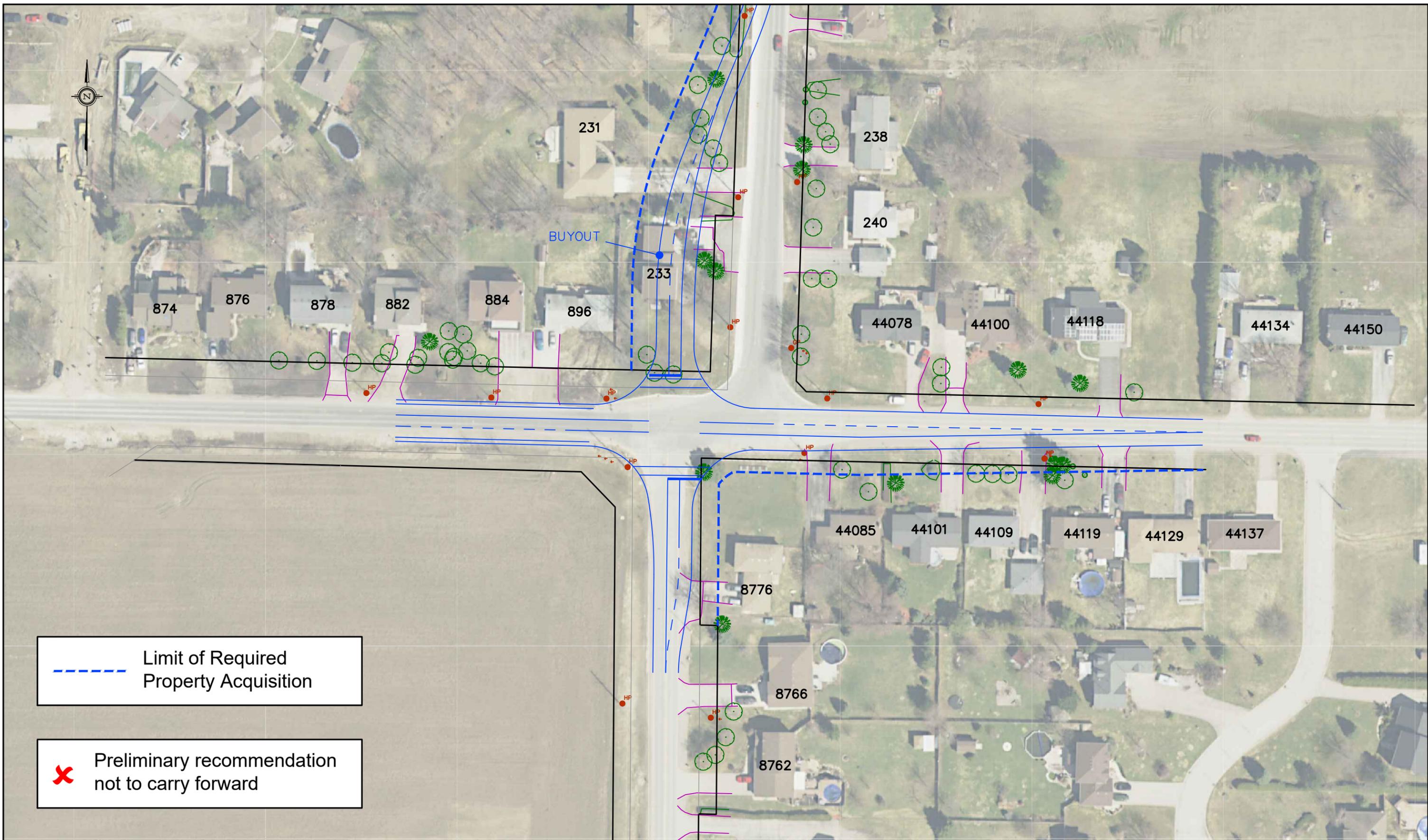




**BTE 20-002**  
2020-04-27

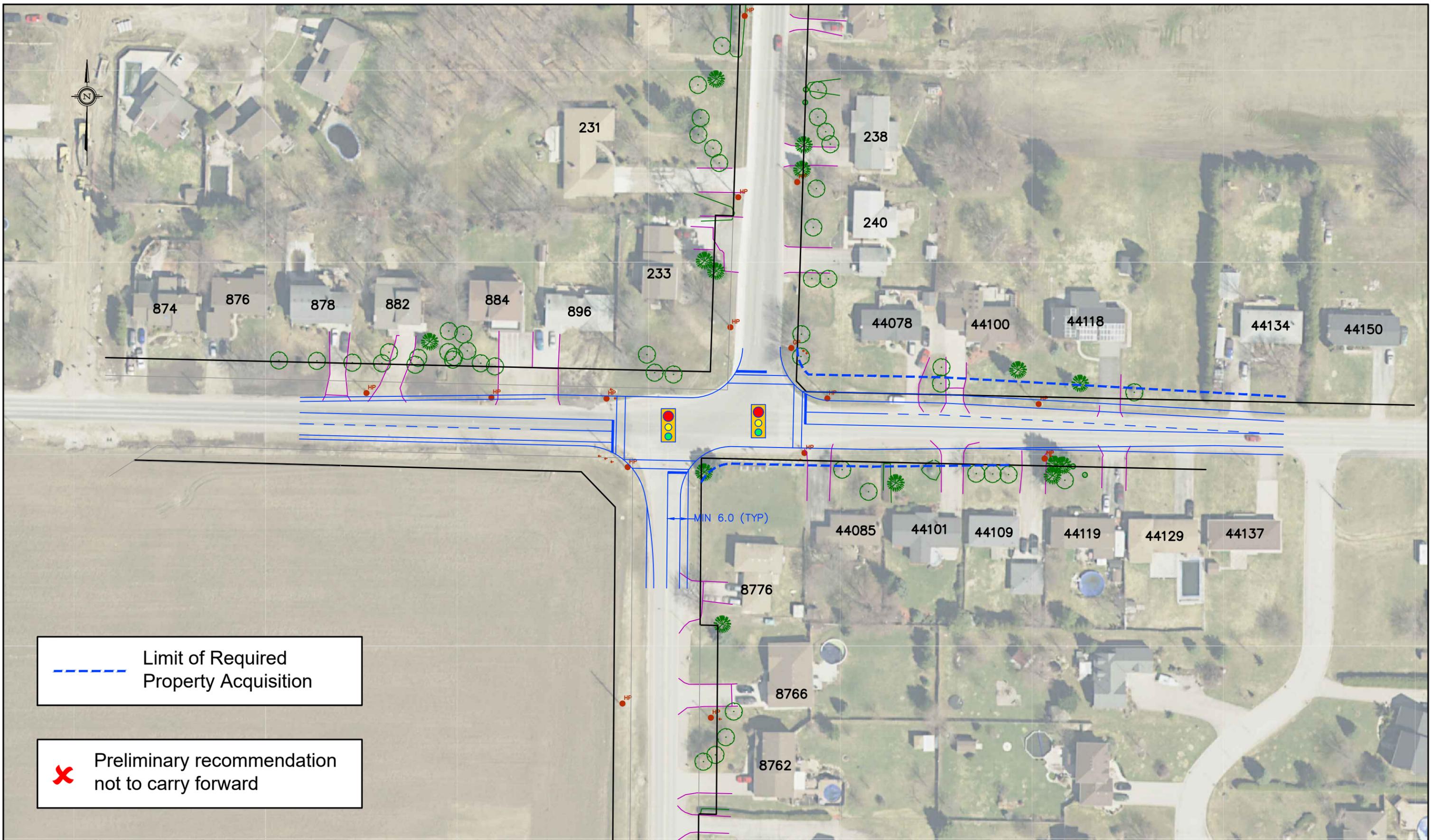
**Centennial Road / Elm Street Intersection**  
Alternative 2b: Unsignalized Intersection with Realignment and Right-Turn Lane





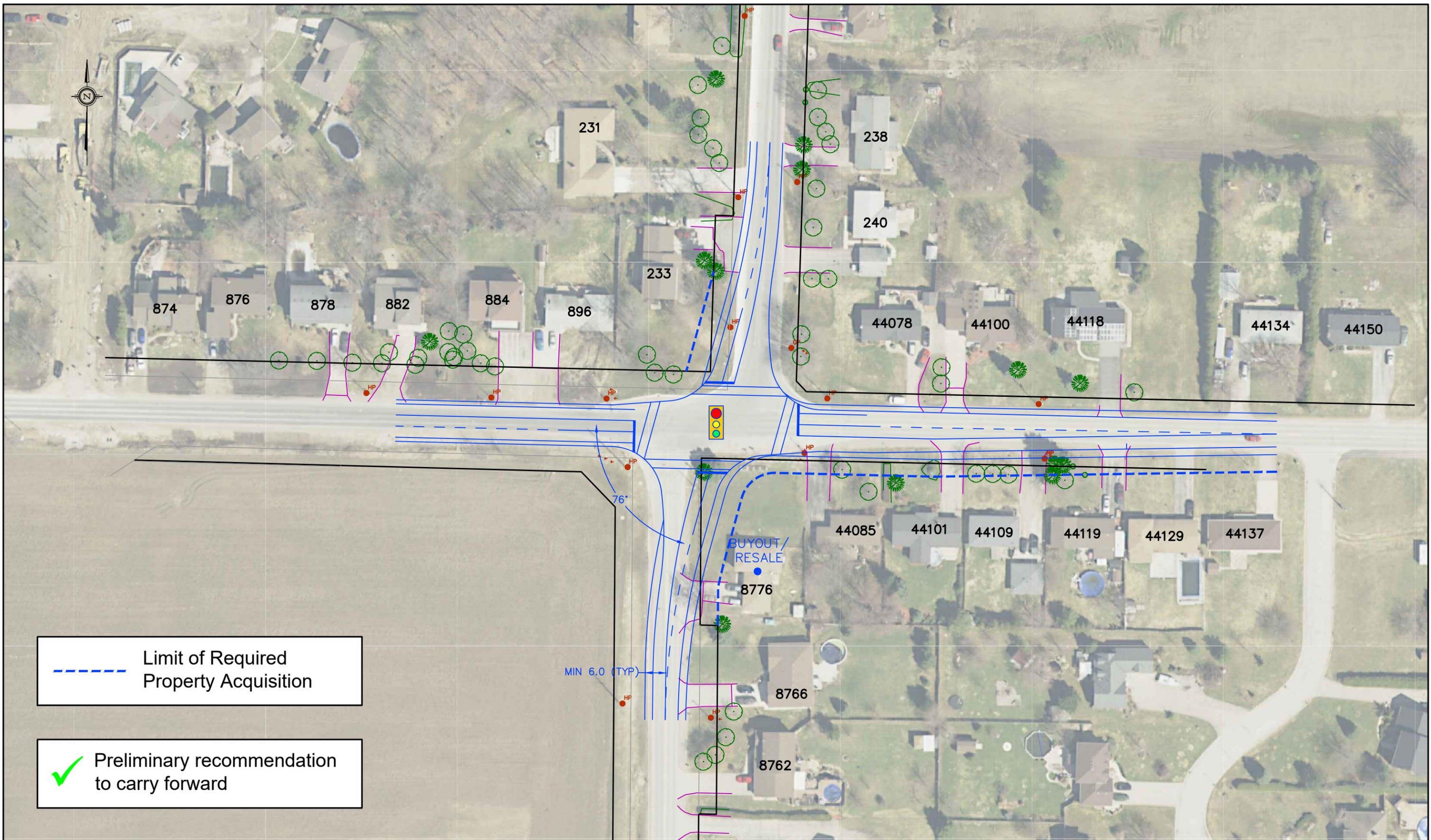
 Limit of Required Property Acquisition

 Preliminary recommendation not to carry forward



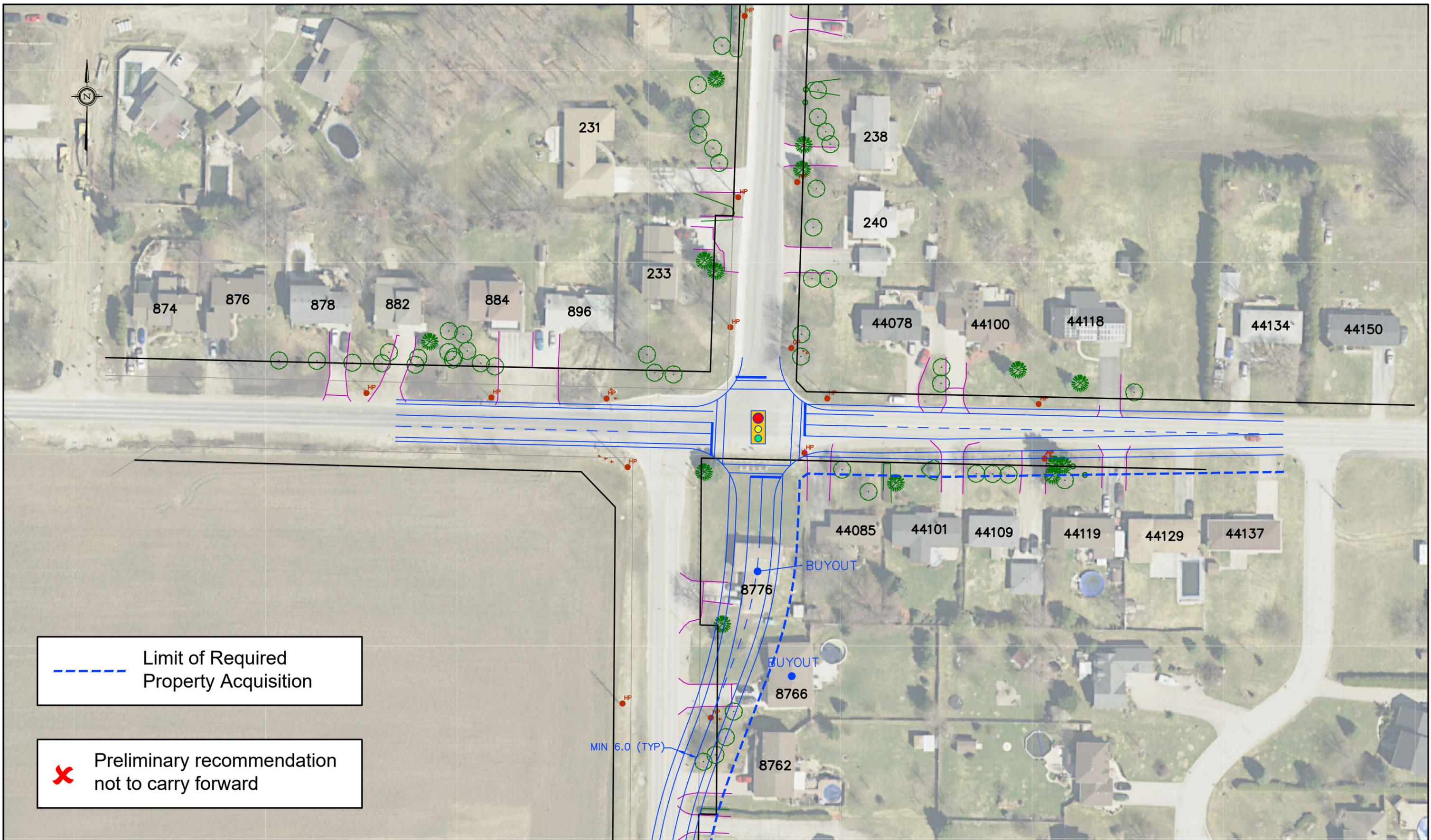

 Limit of Required  
 Property Acquisition


 Preliminary recommendation  
 not to carry forward



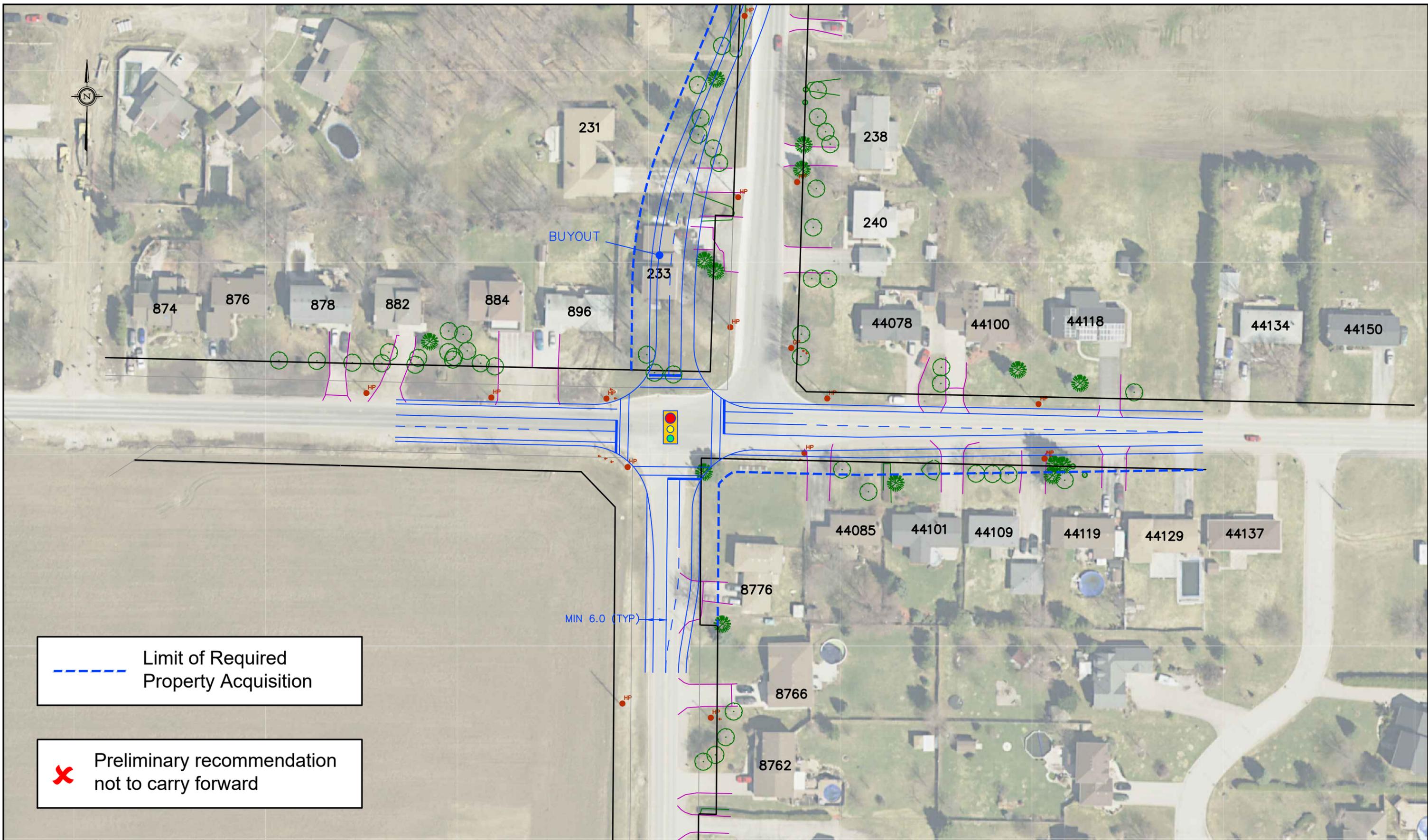

 Limit of Required Property Acquisition


 Preliminary recommendation to carry forward



--- Limit of Required Property Acquisition

X Preliminary recommendation not to carry forward



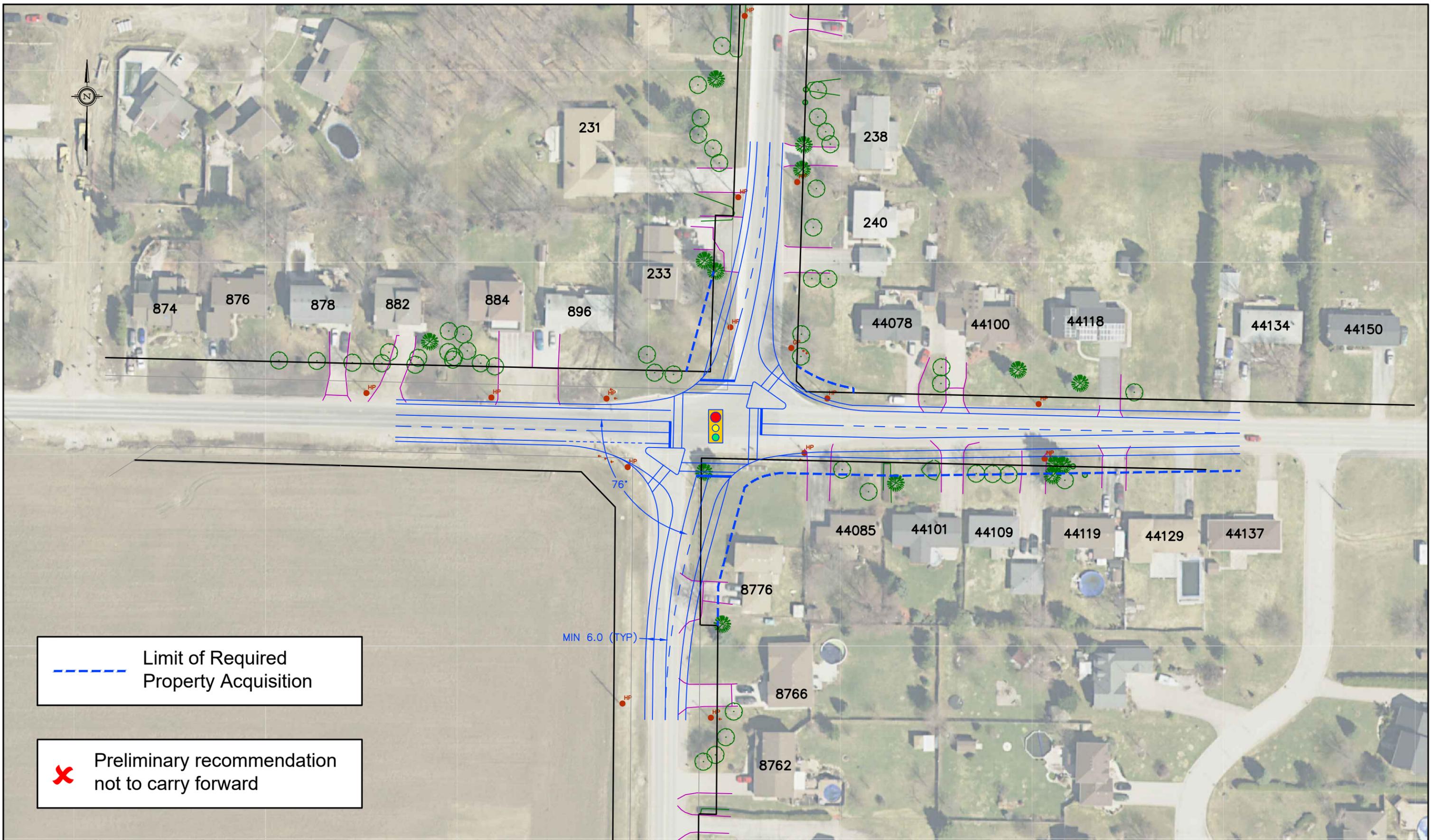

 Limit of Required  
 Property Acquisition

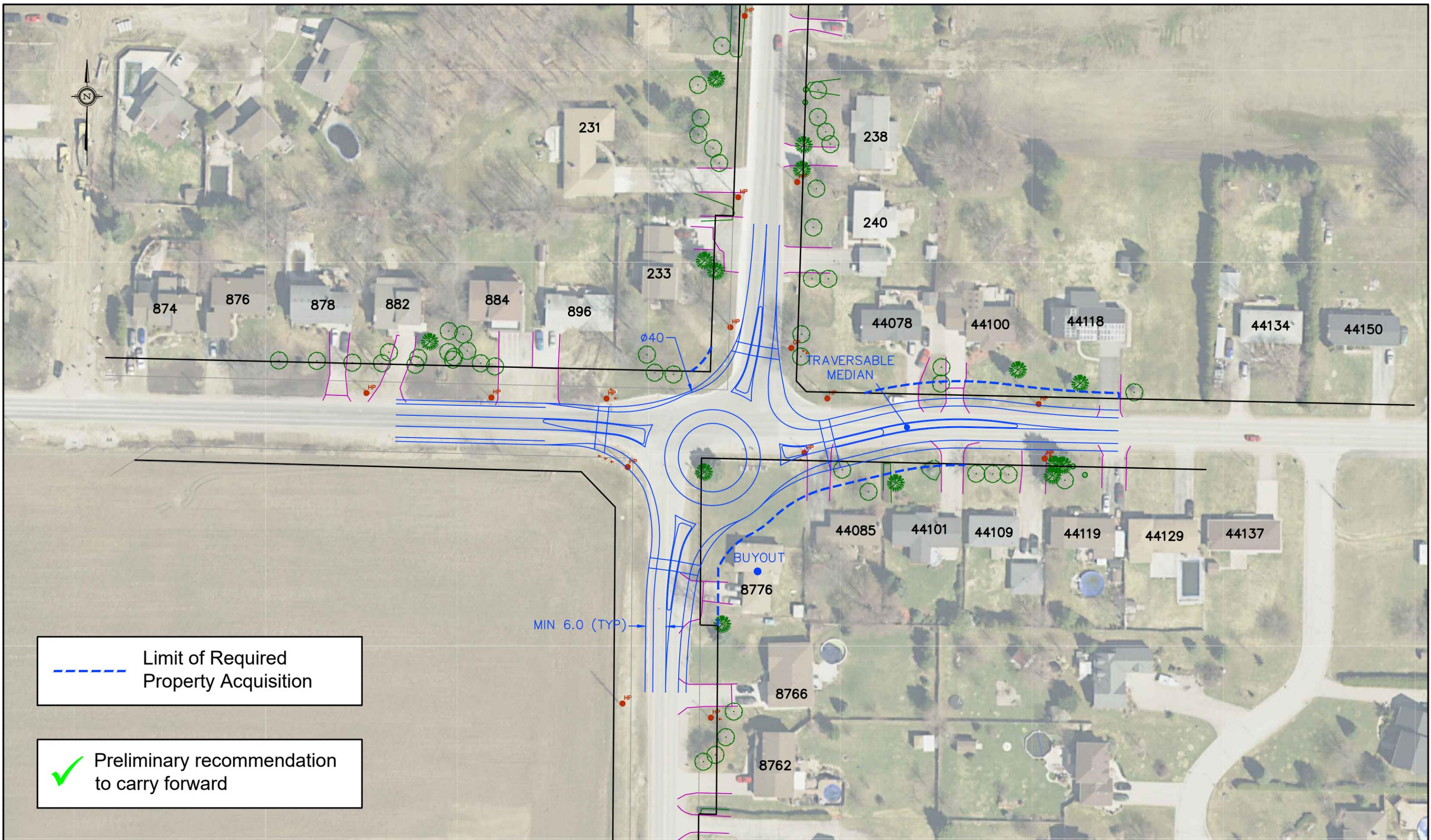

 Preliminary recommendation  
 not to carry forward

**BTE 20-002**  
 2020-04-29

**Centennial Road / Elm Street Intersection**  
 Alternative 3d: Signalized Intersection with Realignment



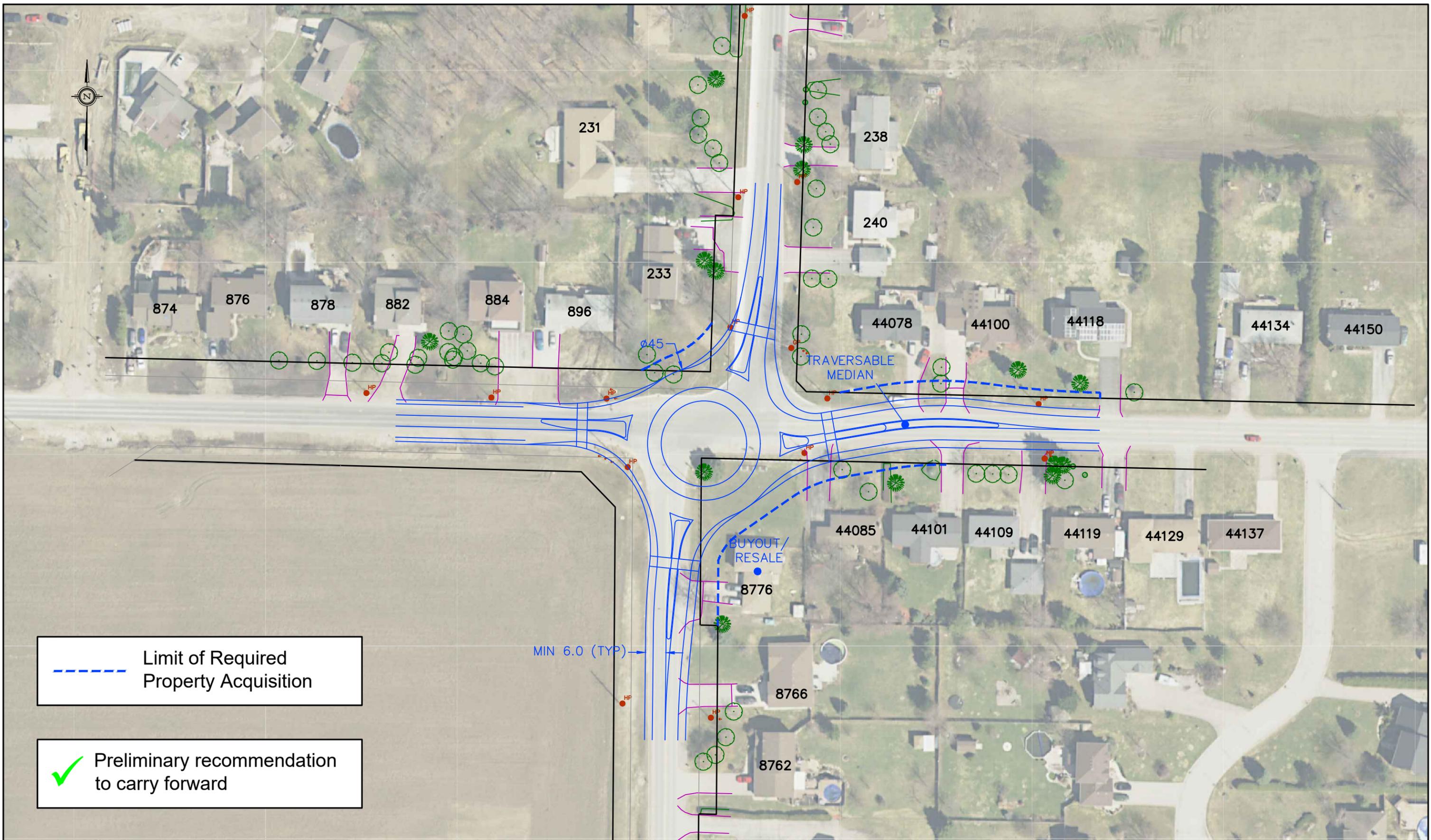




 Limit of Required Property Acquisition

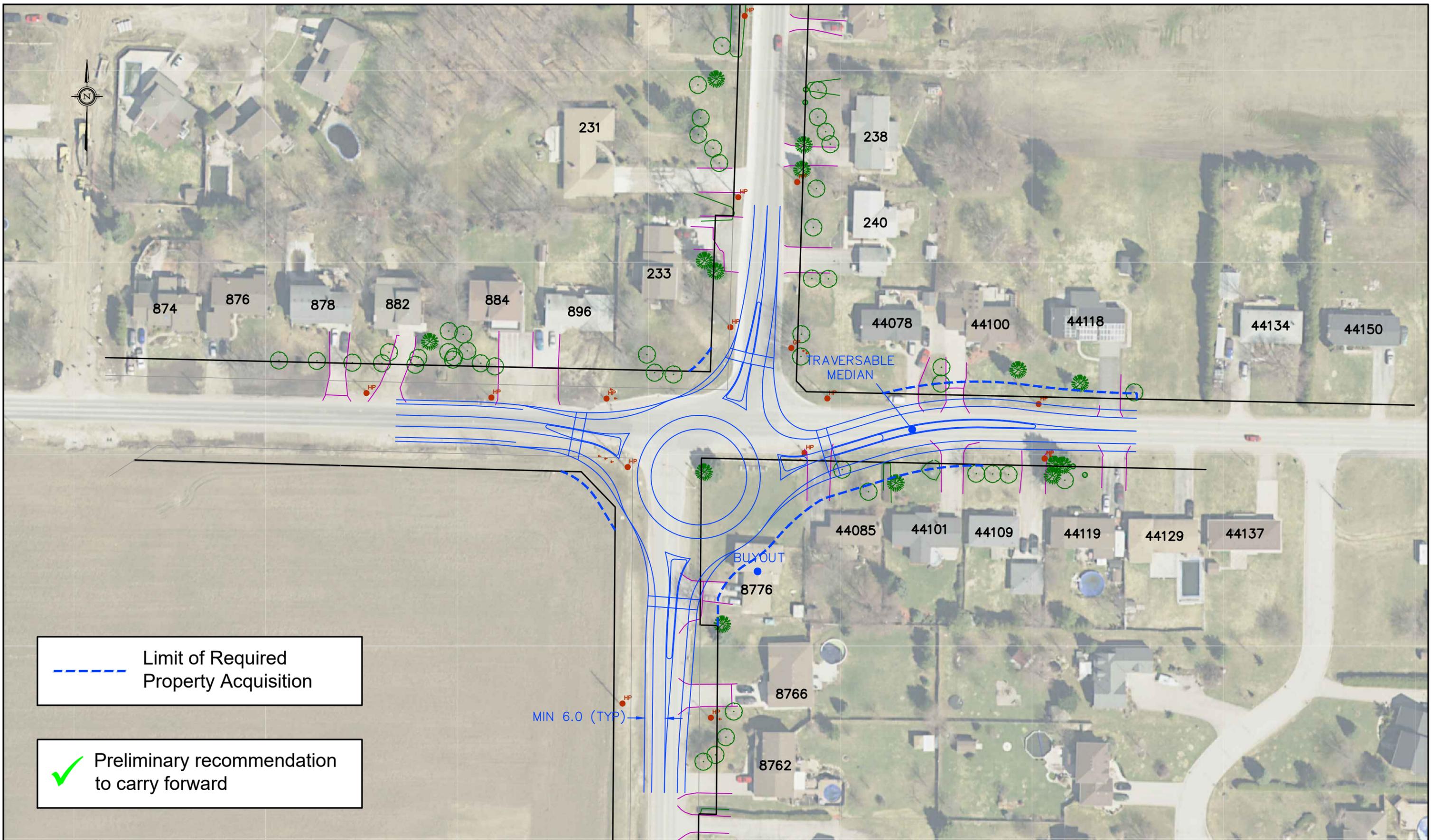
 Preliminary recommendation to carry forward





--- Limit of Required Property Acquisition

✓ Preliminary recommendation to carry forward




 Limit of Required Property Acquisition


 Preliminary recommendation to carry forward

**BTE 20-002**  
 2020-04-29

**Centennial Road / Elm Street Intersection**  
 Alternative 4d: 48 m Roundabout



# Detailed Quantitative Evaluation Methodology - MATS Process

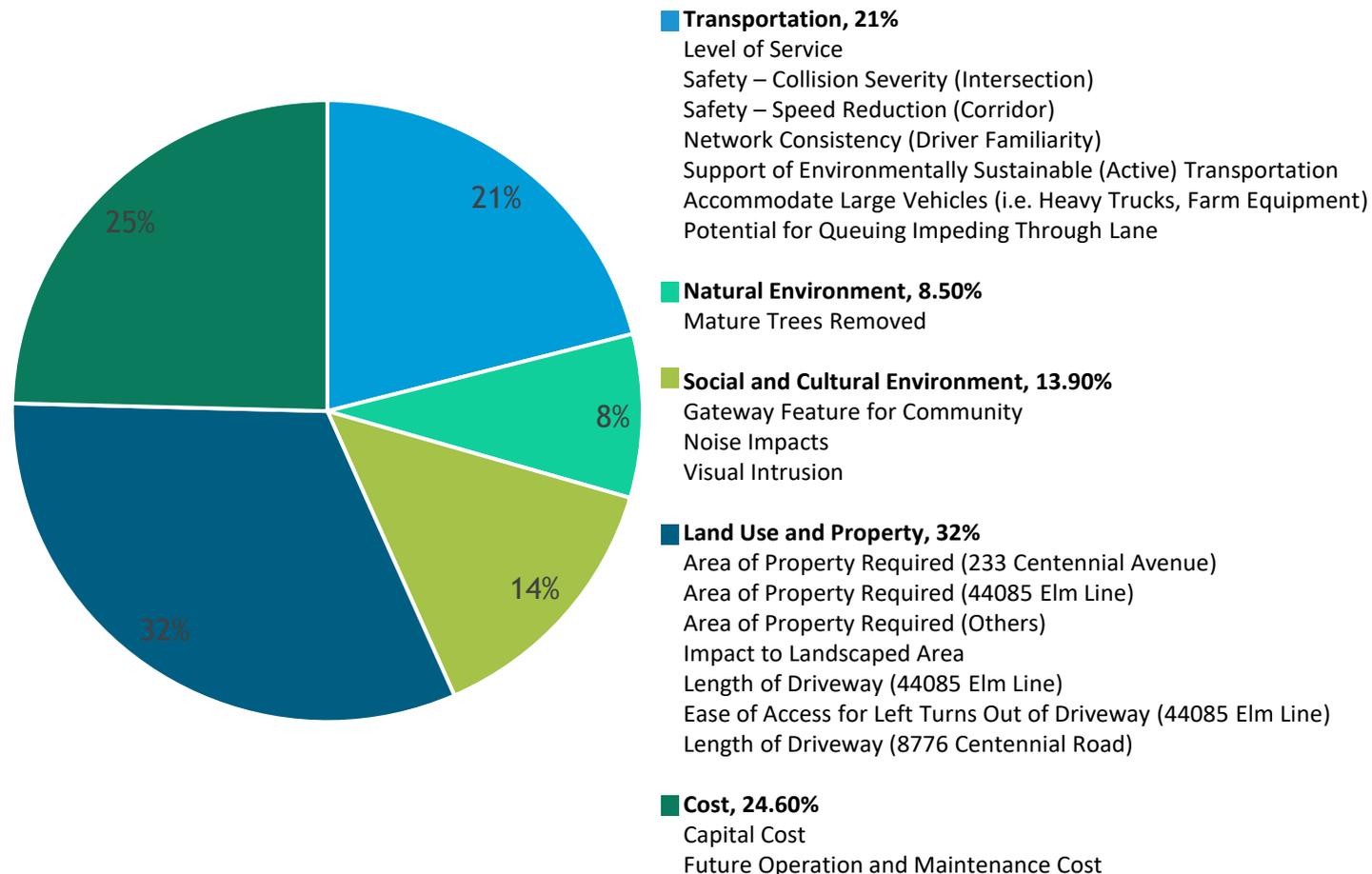
The evaluation approach to compare preliminary design alternatives, described as the Multi Attribute Trade-off System (MATS), is based on the “Weighted Additive Method” which focuses on the differences between the alternatives, addressing the complexity of the base data collected, and providing a traceable decision-making process. In addition, the method allows sensitivity tests to be performed because of the matrix configuration of the assessment and the use of numerical scores to measure the impact of the alternatives.

The initial task in the evaluation is to develop evaluation criteria from which alternatives will be assessed. This process includes the identification of “global” groups of factors followed by the selection of a number of “local” sub-factors under the global groups.

For this study an independent sensitivity test has been undertaken which places greater or less emphasis on a global factor and redistributing the weight to the other factors using the average values of the evaluation committee. Sensitivity testing will show the trade-offs between alternatives.

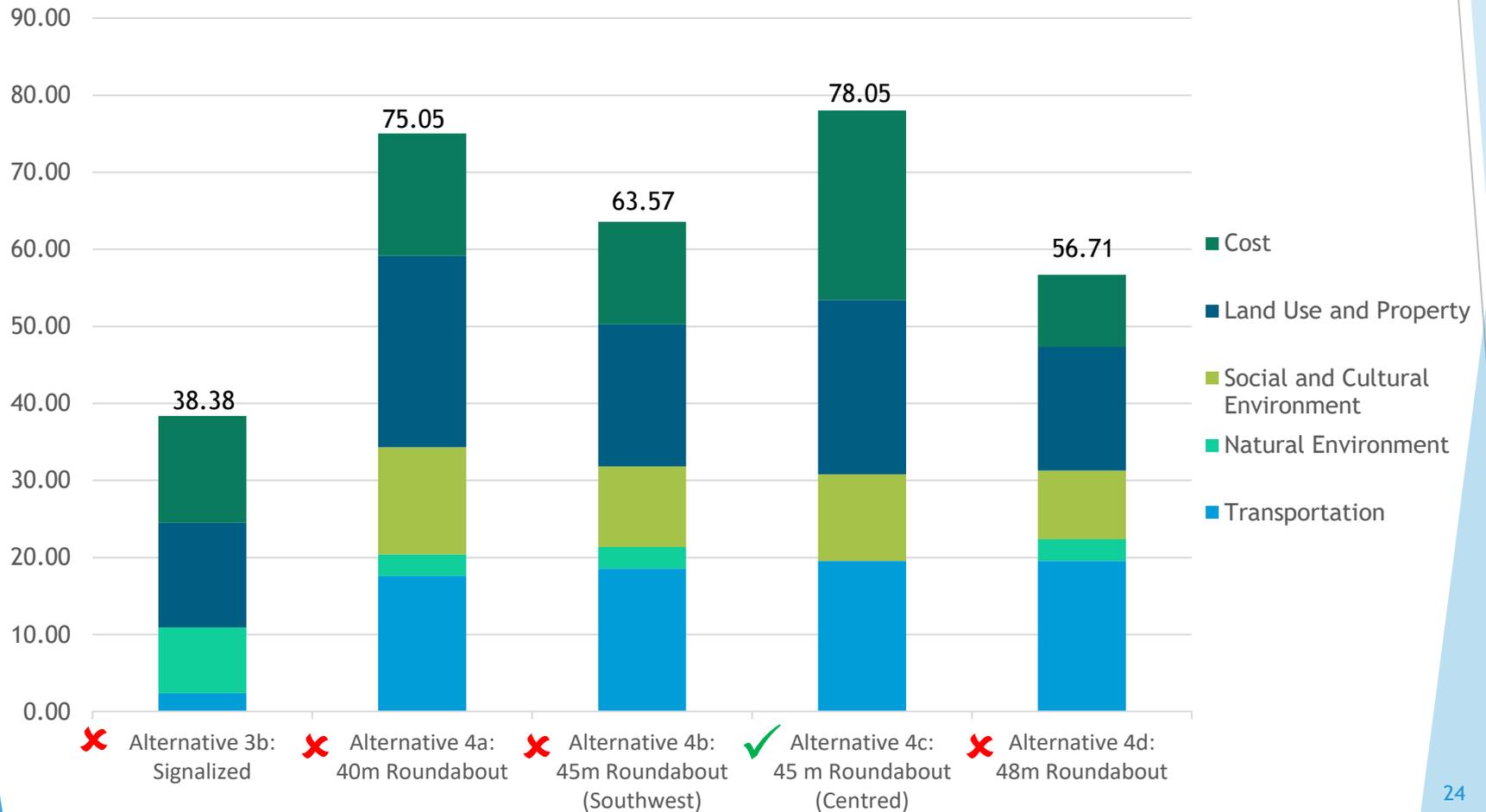
# Detailed Quantitative Evaluation Methodology - MATS Process

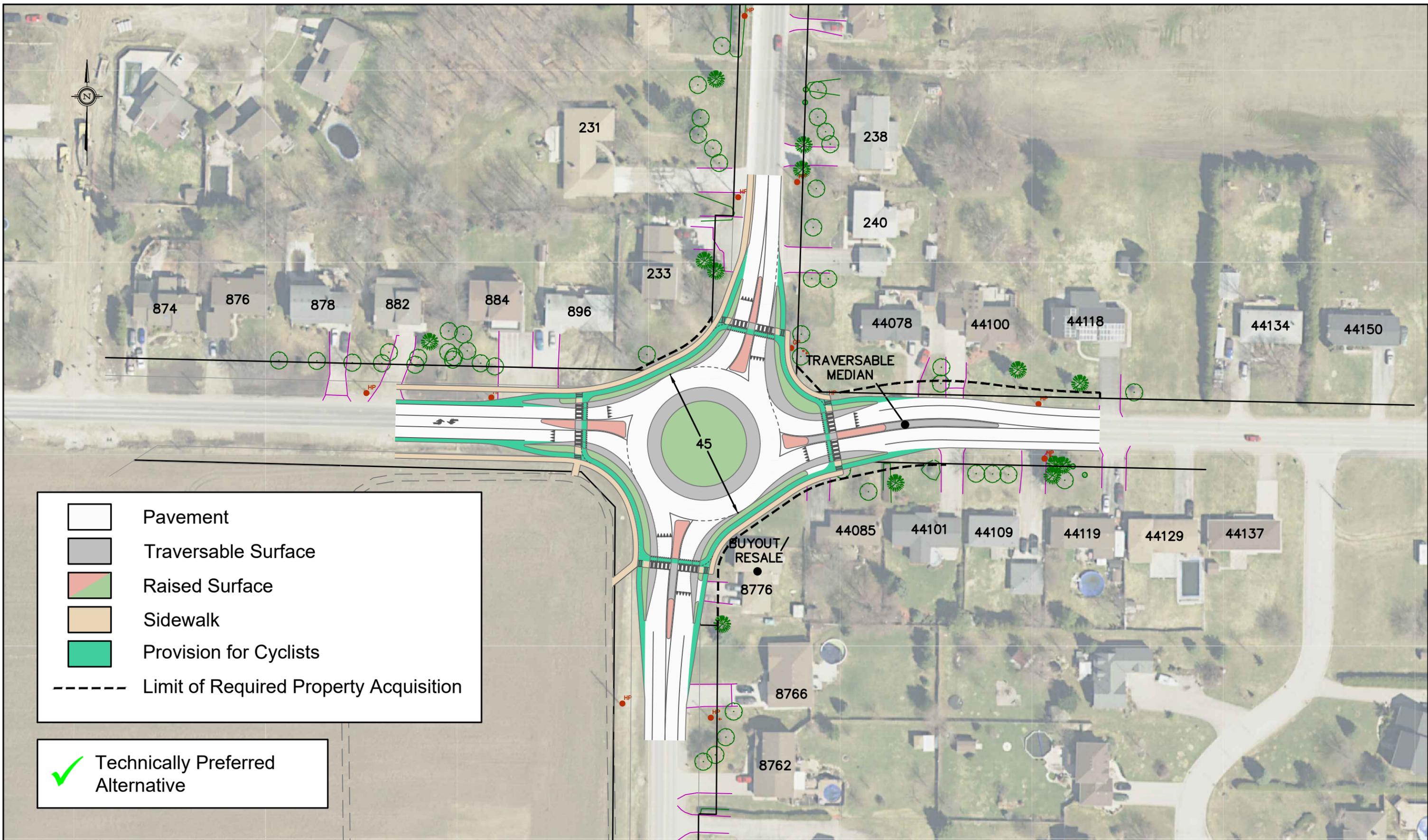
The ranking of alternatives was determined based on the evaluation and weights of various factors and subfactors that were established by the evaluation committee. This is the breakdown percentage of how each factor was valued. This measures the importance of each factor.



# Detailed Quantitative Evaluation Methodology - MATS Process

The ranking of alternatives carried forward (as illustrated below) indicates the score for each alternative based on the performance of the listed factors and subfactors shown on the previous exhibit.





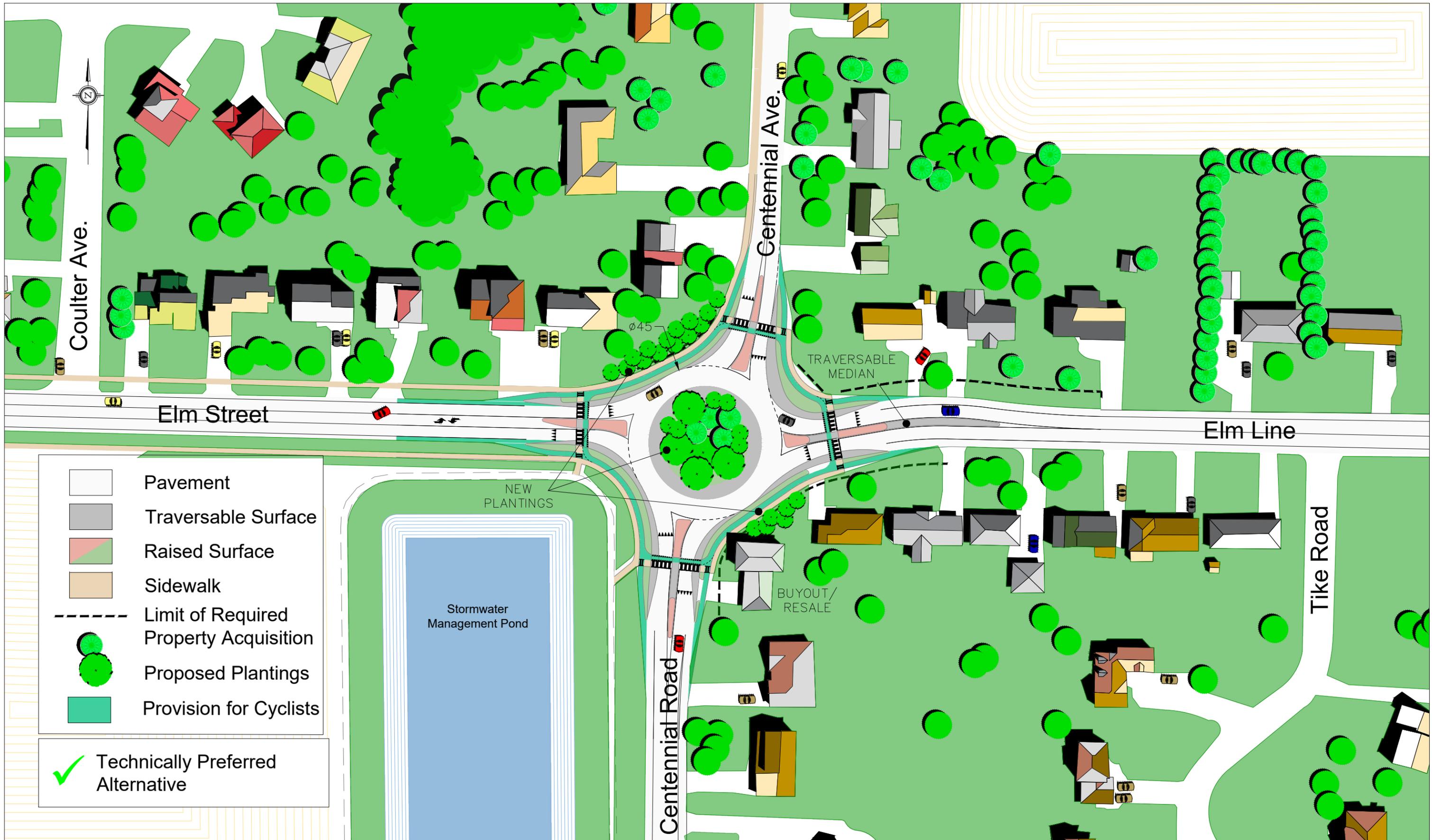
	Pavement
	Traversable Surface
	Raised Surface
	Sidewalk
	Provision for Cyclists
	Limit of Required Property Acquisition

 Technically Preferred Alternative

**BTE 20-002**  
2020-05-15  
scale 1:1000

**Centennial Road / Elm Street Intersection**  
Preliminary Design (Alternative 4c: 45m Roundabout, Centred)





# Effects and Mitigation

The following table identifies mitigation measures that reflect the results of individual meetings with property owners and commitments by Elgin County to mitigate property impacts:

Issue/Impact	Mitigation Plan
Property Impacts to 233 Centennial Avenue	Partial property acquisition is proposed to accommodate the roundabout. This will include removal of the landscaped area/mature trees at the southern property line. Property owners will be compensated at fair market value. Landscaping/vegetation will be protected (where possible) or replaced.
Property Impacts to 8776 Centennial Road	Complete property acquisition is proposed to accommodate the roundabout. Property owners will be compensated at fair market value.
Property Impacts to 44085 Elm Line	Partial property acquisition is proposed to accommodate the roundabout. This will include a triangle of land across their front yard/ driveway. Property owners will be compensated at fair market value. Landscaping/vegetation will be protected (where possible) or replaced. The driveway may be realigned to the east to increase the offset from the roundabout. Vehicles will be able to make a left turn into/out of the driveway across a traversable median.
Property Impacts to Others	Partial property acquisitions (minor widenings) are proposed from several owners on Elm Street to accommodate the roundabout. Property owners will be compensated at fair market value. Landscaping/vegetation will be protected (where possible) or replaced.

# Effects and Mitigation

The following table identifies mitigation measures that reflect commitments by Elgin County to mitigate environmental effects:

Issue/Impact	Mitigation Plan
Natural Environment	<p>The Study Area has been transformed from its natural state to accommodate residential land uses. An Environmental Protection Plan will be prepared during construction.</p> <p>Mature trees will be protected (where possible) or removed in compliance with the <i>Migratory Bird Convention Act</i>. Existing vegetation that is removed will be replaced in accordance with a landscaping/streetscaping plan.</p>
Noise	<p>Sound levels are projected to remain below 55 dBA (decibels). As a result sound barrier protection is not required.</p>
Visual Intrusion	<p>Construction of the roundabout will result in the roadway moving closer to some property owners with potential for headlight glare. Trees/vegetation will be planted to offset these impacts.</p>
Cultural Heritage / Archaeology	<p>The Study Area has been significantly disturbed and does not retain archaeological potential or cultural heritage significance.</p>
Utility Relocation	<p>Utilities will be relocated as required to accommodate the intersection improvements.</p>

# Next Steps

## Following this meeting we will:

- Review all comments
- Define mitigation plan and property requirements
- Prepare the Project File
- Proceed to Detail Design and construction

## We want to hear from you!

- Please provide comments by filling out the comment form or by contacting the County's representative or the consultant below:

### **Steve Taylor, P.Eng.**

EA Project Manager,  
BT Engineering Inc.  
509 Talbot Street  
London, Ontario N6A 2S5  
Tel: 519-672-2222  
Email: stevenj.taylor@bteng.ca

### **Brian Lima, P.Eng.**

County Engineer,  
County of Elgin  
450 Sunset Drive  
St. Thomas, Ontario N5R 5V1  
Tel: 519-631-1460 ext. 117  
Email: blima@elgin.ca

Please provide your comments on or before **June 5, 2020.**

## Thank you for your participation in the study.

- To receive updates on the project, request that your name/e-mail be added to the mailing list.
- Your input into this study is valuable and appreciated.

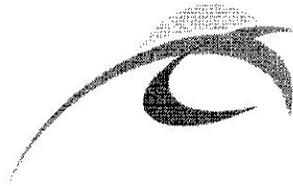
All information is collected in accordance with the *Freedom of Information and Privacy Act*.

# Appendix C

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Comment Sheets





**Online Public Information Centre (PIC)**

Tuesday, May 19, 2020

**Centennial Road / Elm Line Intersection Improvements  
Municipal Class Environmental Assessment Study**

Thank you for viewing this public meeting. Please provide your comments on any of the material presented.

since there has been no advertised meeting on centennial and elm street and elmline i would appreciate all information on what is planned .

i feel a round about is not acceptable police cannot control the speeders in this corridor as it is with a round about will b no different the only solution is a set of lights with delays or advance green lights its hard enough getting out of our drive know with all the speeders now your talking round about probably with something in the middle which will block our view of on coming i feel if a round about is put in it will traffic the safety of the families in this area and the devaluation of properties . we bought here to be away from the city i would like to say look after the township and don't worry about the city people who don't care about us .

they should considered this 4 years ago when the subdivision went in'

why do we have to lose our life style to serve people moving into town from Toronto Kitchener and Cambridge

I guess it all about the city and not the township.

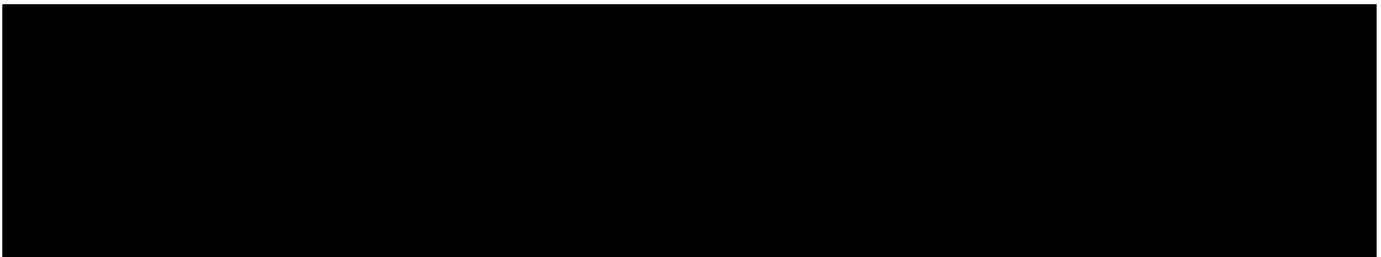
The people in the area on Elmline work hard to maintain there homes and keep the value of our property up know your talking of cutting our properties back the other question is -are they goin to tear everything up in 2 years for sewers hopefully some thought given to that.

E-mail [REDACTED]

(Use next page if required.)

Please complete your comment sheet and forward by email or mail by **June 5, 2020** to:

Steve Taylor, P.Eng.  
BT Engineering Inc.  
509 Talbot Street  
London, Ontario N6A 2S5  
Tel: (519) 672-2222 Fax: 1 (519) 488-0775  
[stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca)



Please check a box if you would like to be added to our mailing list to be informed of the publication of the EA.      mailing address       email

From: [REDACTED]  
Sent: June 5, 2020 7:11 PM  
To: [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca); [blima@elgin.ca](mailto:blima@elgin.ca)  
Subject: Centennial-Elm Environmental Assessment

Thank you for the opportunity to comment on the Centennial-Elm intersection redevelopment.

Let me first begin by suggesting that the Assessment needs to be part of a bigger comprehensive Elgin County roads needs study.

Centennial Road is the only County road that directly connects the south part of Central Elgin and the county of Elgin to roads and connections directly to the North including the city of London and Hwy 401. The closest direct route roads are Imperial Road to the east and Union Road to the west. Sunset is a connecting link road but transverse through the City of St Thomas and also has had slope stability issues in recent years north of elm street.

While there are roads such as Yarmouth Centre Road and Quaker Road, neither of those roads have any control mechanisms to allow timely and safe navigation to make adequate turns with large and heavy loads. Several trucks depending on the time of day either travel north on Centennial from John Wise Line, or come west from Quaker Road on Elm Line in order to utilize the traffic lights at Centennial and Hwy 3.

While I am not a fan and supporter of roundabouts I would not be opposed to one if designed large enough and were not offset with the entrances and egresses of the streets.

The offset roundabout on Southdale Line is almost impossible to navigate with tractor trailers and large farm equipment. I would be more than happy to provide an actual demonstration.

It is most unfortunate that the County did not have the foresight before both houses were built on two of the corners at Centennial and Elm to have purchased the properties for future road realignment.

I fully support a redevelopment of the intersection but a large picture look for future county roads networks needs to be considered when making a final decision on this project. Although there would appear to be very little agricultural land that need to transverse this intersection, let me assure you there are at least four properties that have no other frontages other than on Centennial Ave. There is also a considerable amount of large farm equipment that use Elm Line and Centennial because the large number of farms but also because both roads have wide shoulders the neither Yarmouth Centre Road or Southdale line have.

As part of a big picture and knowing that future growth will only increase traffic volumes, it would make sense for the County of Elgin to engage in expanding a new road system to the east. I would suggest that Yarmouth Centre Road should become a county road. Land acquisition would be easier for road realignments. It is the only road that runs fully from the south end at the lake to almost Glanworth Line. It is also a main fire road. With proper control measures at Hwy 3 it would the future for accommodating large and heavy trucks and equipment away from built up residential areas.

Thank you for the opportunity to comment in writing. I would be more than happy to discuss further in person and provide large equipment or trucks for demonstration purposes.

[REDACTED]

**From:** [REDACTED]  
**Sent:** May 25, 2020 12:44 PM  
**To:** [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca)  
**Subject:** Centennial/elm st

Just wondering if a turnabout would work at that intersection? We use that intersection often and think a turnabout would help move traffic.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**From:** [REDACTED]  
**Sent:** May 25, 2020 2:35 PM  
**To:** [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca)  
**Subject:** Centennial-elm intersection improvements

Steve,

As a motorist who uses this intersection frequently (pre-construction) I agree that even with the current traffic pattern there is a great need for improvement. I have thought in recent years that this intersection needed to have an all way stop in place. Usually my driving path was unobstructed but that was only because I seldom made a left hand turn (except from Elm to Centennial). I imagine that those turning left from Centennial going in either direction would have a different comment.

After viewing the powerpoint presentation, I think the roundabout is the best. I believe that they work very well in moving traffic efficiently. I have several in my neighbourhood and also usually visit the Cambridge/Kitchener area.

As to which version, I hope that the one chosen would be the least intrusive to the property owners and hopefully the most cost effective. While I am not looking forward to the construction, the increase in traffic as a result of the Harvest Run housing development will only get worse.

Thank you for the opportunity to have a say.

[REDACTED]

**From:** [REDACTED]  
**Sent:** May 21, 2020 2:37 PM  
**To:** [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca)  
**Cc:** [blima@elgin.ca](mailto:blima@elgin.ca)  
**Subject:** CENTENNIAL/ELM LINE INTERSECTION IMPROVEMENTS

Gentlemen:

We live on [REDACTED] and the traffic on Elm Street is very much a part of our daily driving experience. In the last 10 years, the volume of traffic on Elm and Centennial has grown at an incredible rate. Of concern at this end is not only the volume of traffic on Elm, but the speed. The new stop light @ Peach Tree is a blessing in this regard.

The intersection of Elm and Centennial is a hazard at best particularly for Centennial traffic north or south bound wanting to cross or access Elm Street.

My sense is that a round-about at the Elm/Centennial intersection would make the traffic exchange much safer and additionally would help reduce the speeding at our end of Elm Street.

Take Care

[REDACTED]

**From:** [REDACTED]  
**Sent:** May 20, 2020 10:28 AM  
**To:** Steve Taylor <stevenj.taylor@bteng.ca>  
**Cc:** katherine.scott@bteng.ca; Brian Lima <blima@elgin.ca>  
**Subject:** Centennial/Elm Intercection

After viewing the Centennial/Elm Intersection Improvements website we had concerns pertaining to our home/property. Unless we have interpreted the information incorrectly, it appears to us that our property will be affected in a very negative way with any of the sizes of the roundabouts you have projected.

We have lived in this house for 34 years as of next month and this intersection has progressively worsened over the years with not only regular traffic but now with the new subdivision in progress all of the construction traffic as well.

Here are just a few of our concerns

- 1)How much property do we stand to lose? By the images it appears to be most of our front yard and laneway.
- 2)How are going to exit our laneway into a very high traffic roundabout?
- 3)This will definitely affect our property value! By how much?

We are wondering if there will be a private meeting 1 on 1 with each homeowner to discuss our options and concerns as each homeowner will have different views on this?

Looking forward to hearing from you.

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

**From:** [REDACTED]  
**Sent:** May 26, 2020 3:34 PM  
**To:** Steve Taylor  
**Subject:** Centennial Road/Elm Intersection

Our zoom meeting was Monday May 25, 2020. Our comments and suggestions we took from our meeting are as follows. We were told our home would not be purchased for this project but we were offered suggestions as to what could be done to help this situation.. We did question as to why it wouldn't be purchased like they have offered to neighbours.

Here are our concerns and suggestions that were given yesterday in our meeting with more added as we thought about them after the meeting.

- 1) Our laneway still proves to be a huge issue for us with the projected plan of the roundabout. Right now our laneway is large enough for 6-8 vehicles and we are able to pull in and turn around so we can pull out of it and not back out of it onto the road. Or we do pull in backwards but with the roundabout we will not be able to back in or turn around with the shortening of the laneway. Also with losing most of our laneway we also lose parking there and on the road. for quests. Steve suggested maybe adding a hammerhead part to our laneway so that we could turn around. This would go onto our neighbours property so we would need this to be incorporated into our property line with no cost to us. Also we would need a 2 car hammerhead size. Also with this our whole laneway would need to be repaved.
- 2) Our front yard is landscaped, and has been for years, with mature landscaping and a pole light. We would want everything replaced with mature trees and plants. Professionally done.
- 3) Snow plowing was actually a plus with having a roundabout because over the years we have had issues with the County piling the snow beside our laneway and blocking our view to pull out of our laneway. Since this corner is plowed by both City of St. Thomas and Central Elgin then they both should be going around the roundabout each time.
- 4) The topic of sewers was brought up because a few years ago we received a letter stating that we would be able to hook up to sewers and that our area would be the final phase of that project. So we asked yesterday if and when this is to happen will the roundabout be ripped up to put sewers in? So Steve did make a suggestion that possibly with our neighbours house gone we would be able to hook up to sewers coming in from the west of house from Centennial Rd. We would be interested in this and also have Central Elgin pay for this.
- 5) Garbage pick up. As of right now we have to take our garbage and recycling across to our neighbours yard in the mornings of for pick up. With the roundabout we don't see this as a safe practise.
- 6) We did question if we would be now part of The City of St. Thomas or remain Central Elgin. We were told that nothing was changing for us in the area.
- 7) Hydro pole will be moved
- 8) We would like a wooden fence and bushes or landscaping added between our property and the house that you will be buying out and assuming tearing down. This we feel would help with the noise and our visual sights while we are in our backyard

As buying us out was not an option we are asking that you make this right for us. We do stand to lose a lot of our laneway and front yard. We have lived here for 34 years this year and it's not just a house it's our home. We chose this home because we were outside the city with large lot and large driveway. We do agree that this intersection has become a huge issue over the years with high traffic, accidents and vehicles driving fast and more now with this subdivision more traffic by vehicle and on foot. We do hope that your plan is to make this intersection safe and to beautify all of our property's. [REDACTED]

[REDACTED] and we have lived here for 34 years and raised our family here. This proves that we are very committed to our life. So yes this is very upsetting that our home and property is even involved with this plan and how this will disrupt our lives. Thank you our meeting yesterday.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**From:** [REDACTED]  
**Sent:** June 4, 2020 9:49 AM  
**To:** [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca)  
**Subject:** Centennial Road/Elm Line proposal

After review of the Centennial Road/Elm Line study, it would be greatly appreciated if the following comments/concerns could be considered.

The report indicated that Preliminary Design Alternative 4c-45m Roundabout, centered is the technically preferred option. This is great news! A round about is a wonderful way to control the rapidly increasing traffic while keeping it flowing. This intersection is a zoo most of the time.

After living here for 5+years now, we have noticed the traffic increase. We also notice the extreme carelessness with which people access this intersection, and also the extreme speeds that they leave and enter the City on Elm street east of this location, even though the speed limit here is 50km/hr.

1. Could it be considered to eliminate the proposed plantings in the middle? Maybe rocks and a small art piece instead. Reason being that when these planting grow a year or more they make it very difficult to see what's approaching and what's ahead as you enter the roundabout. I understand the theory is that a driver approaching the roundabout doesn't see across it however, there are MANY people who have difficulties with roundabouts as it is, if they can at least see, it will run more smoothly. The roundabout at Wellington Street/Highview Ave in St.Thomas is a great example where people can see currently, however the one at Wellington and Manor Road, the plantings are larger and it is difficult to see. Another location where planting cause issues is the exit for the Tim Hortons on the West end of Talbot Street. The City's planting get so tall there that a car cannot see to exit the drive. This issue does not likely affect trucks or SUV's but it does affect cars.
2. Are the provisions for cyclists necessary at this location? The speed limit through out a round about is usually 15-20 kms per hour, which should easily permit a cyclist to get around. The North branch of Centennial Ave does not have provisions for cyclists, nor does the East branch of Elm Line. It seems like a extra use of the physical space as well as funding.
3. Could there be some sort of traffic calming measure put in place at the East branch of Elm Line. Traffic speeds are very heugh in this location. Perhaps one of those digital "you are going this fast" signs

Thank you for the opportunity to comment.

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

**From:** [REDACTED]  
**Sent:** June 3, 2020 3:47 PM  
**To:** [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca)  
**Subject:** Centennial Road/Elm Line Assessment Study- St Thomas

June 3, 2020  
SteveTaylor, P. Eng.  
EA Project Manager  
BT Engineering Inc.

Good Afternoon Steve,

Re: Property at [REDACTED]  
[REDACTED]  
[REDACTED]

First of all, I wish to thank you for the Zoom meeting on May 21st. You explained the project well, and answered our questions and concerns.

After much consideration, we feel that probably Alternative 4c: 45 m Roundabout, Centred is the best option for traffic calming and reducing dangerous traffic conditions at the Elm/Centennial intersection.

Even as we agree that this is probably the most viable option, it does require that you acquire property from the front of our home. Who decides what is fair market value for this property? Do we, as property owners, have any negotiating powers in this process?

To make this option more palatable for us, we make the following requests:

1. When we installed our concrete driveway about 40 years ago, there was a hydro pole right beside the driveway, so we had to curve the driveway to avoid the pole. In a subsequent road renewal, the hydro pole was removed, but we were left with that curve at the end of the driveway. In doing this project, the end of our driveway will need to be renewed and we ask that at this time the driveway be straightened out, using concrete, and that the end of the driveway be renewed by using concrete to the road line.
2. At the present time, there is a catch basin beside the roadway between property numbers [REDACTED] [REDACTED]. This catch basin is higher than the ground around it, and as a result, after a rainfall, the water does not flow into it and we end up with a huge water puddle on our driveway at that location. We request that this situation be rectified by putting a culvert under the driveway which drains into the catch basin, so that we can prevent "Lake Lane" after each rainfall.
3. There are 2 trees on the grassy area between property numbers [REDACTED] [REDACTED]. We request that the most southern tree (maple) and stump, closest to the roadway, be removed.
4. Once the project is nearing completion, and we can see the effects that lights of cars coming around the roundabout will have on our home, we may request some plantings in our front yard to mitigate these effects.

5. Is it possible to include a sidewalk going south along Centennial Road from Elm Street to Auburn Drive, the first entrance into the Harvest Run subdivision? This would allow for a safe walking and biking area.

6. Sewers- east of Centennial along Elm Line. At the present time, the sewers are installed along Centennial Ave to Elm Line. Number 44078 Elm Line was connected to the sewer line when it was installed a few years ago. Does it not seem reasonable to include the sewers for the rest of this stretch of road while the road is under construction? Is there a timeline for when this project is being considered? If that timeline is short, would this not be the ideal time to include it, rather than have to demolish the roundabout a few years down the road to do this ?

Thank you for considering our requests and proposals.

Please do keep us informed of any developments in this project

Sincerely,

[Redacted signature block]

**From:** [REDACTED]  
**Sent:** June 14, 2020 6:58 PM  
**To:** [stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca); [blima@elgin.ca](mailto:blima@elgin.ca)  
**Subject:** Centennial/ Elm intersection plans

Hello,

I love the idea of a roundabout going in at this intersection. I live close down elm and would like to receive updates about the project.

I'm just wondering if we will be able to get our farm equipment around the planned roundabout.

Thank you for your time,

[REDACTED]  
[REDACTED]

Sent from my Samsung Galaxy smartphone.

**From:** [REDACTED]  
**Sent:** June 10, 2020 12:15 PM  
**To:** Elgin county Brian Lima,P.Eng; Elgin county Steve Tylor,P.Eng.  
**Cc:** [REDACTED]  
**Subject:** Centennial Rd./Elm Line

County of Elgin Council,  
 Central Elgin Council,

Hello Brian and Steve,

I apologise for my late reply.

As I do not reside in Elgin County (St Thomas) yet am a shareholder of Port Stanley Terminal Rail Inc..  
 I consider myself as a property owner in Elgin county.

Since Intersection improvements are long over due ;could I offer my suggestions.

Before any intersection improvements / realignment occur the planning must happen  
 PLUS HOW TO DEAL WITH THE AFFECTED PROPERTY OWNERS!  
 In St Thomas in the past the city required land from private property owners for the Grand Central  
 complex  
 and they used STRONG ARM METHODS.  
 At the end of the day the private owners won the court cases and only the law firms profited.  
 Long delays also occurred.

On the other hand the Township of Yarmouth,  
 USED "IF THEY ARE ON PRIVATE PROPERTY ; IT IS LEFT IN BETTER SHAPE THAN BEFORE THEY  
 ARRIVED!"  
 When completing necessary repairs / upgrades.

When dealing with properties that have dwelling that need to be removed or moved.  
 Using the Yarmouth Township approach.  
 The county obtains a relocated dwelling / shop property.  
 Ask the property owner if the county obtains title of THEIR property,the existing property owner has  
 the first right of refusal.  
 I believe this occurred in St Thomas at Elm St./Fairview Ave?  
 Or in the undertaking it could also be worded that the house has EVERY CURRENT coded updates;  
 Electrical,water,sewer,grading,roof,crack /paint repairs,landscape,etc.

Realignment in (corn fields);  
 Again work with the property owner and possibility offer a 2 for 1 acreage swap.  
 That is ;if the property owner loses 10 acres and the county replaces it with 20 acres.  
 Since first nations value land unlike we European Immigrants .

The County COULD BE A GOOD STEWARD and after the intersections are realigned the old road material

Are trucked to sites where they can be reused (or recycled)

Then TOP SOIL PLACED on the old road easement for future crop use!

There was one municipality that planned a realignment and had their work trucks fill the grade (with haz mat approved soil) .

Then commencing with the project.

IT MIGHT BE WISE TO PLAN ONE INTERSECTION REALIGNMENT A YEAR (OR EVERY OTHER YEAR) WHEN DEALING WITH CORN CROP FIELDS.

Look at St Thomas ,Talbot St where it took 60 years FOR THE realignment of Ross St/Flora St and Princess Ave / St.Catherine St.

With Queens St / St Geroge St in the WAIT ZONE.

Sincerely,

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

**Appendix C**  
Select Correspondence

**katherine.scott@bteng.ca**

---

**From:** Telus Utility Markups <telusutilitymarkups@Telecon.ca>  
**Sent:** February 26, 2020 6:37 AM  
**To:** Katherine Scott  
**Subject:** RE: Centennial Road/Elm Line Intersection | Notice of Study Commencement Telus 2020-1126

TELUS has no infrastructure in the area of your proposed work. Permit expires six(6) months from approval date.

Indira Sharma  
**Project Support**  
289-657-8256  
7777 Weston Road  
Vaughan, ON L4L 0G9



[www.telecon.ca](http://www.telecon.ca)

**From:** Katherine Scott <katherine.scott@bteng.ca>  
**Sent:** Friday, February 21, 2020 6:25 PM  
**Cc:** Steve Taylor <stevenj.taylor@bteng.ca>; Brian Lima <blima@elgin.ca>  
**Subject:** Centennial Road/Elm Line Intersection | Notice of Study Commencement

Good afternoon,

The County of Elgin has initiated a Municipal Class Environmental Assessment (EA) Study to develop a transportation plan for intersection improvements at Centennial Road and Elm Line in the Municipality of Central Elgin.

The Notice of Study Commencement is attached for additional information. Please do not hesitate to contact me if you have any additional questions or concerns.

Thank you,

Katherine Scott



509 Talbot Street

London, Ontario. N6A 2S5

**From:** MNRF Ayl Planners (MNRF) <MNRF.Ayl.Planners@ontario.ca>  
**Sent:** March 3, 2020 9:19 AM  
**To:** Katherine Scott  
**Cc:** Steve Taylor; Brian Lima  
**Subject:** RE: Centennial Road/Elm Line Intersection | Notice of Study Commencement  
**Attachments:** NHGuide\_MNRF\_2019-04-01.pdf; Notice of Study Commencemen FINAL\_21February2020.pdf



**Ministry of Natural  
Resources and Forestry**

615 John Street North  
Aylmer, ON N5H 2S8  
Tel: 519-773-9241  
Fax: 519-773-9014

**Ministère des Richesses  
naturelles et des Forêts**

615, rue John Nord  
Aylmer ON N5H 2S8  
Tél: 519-773-9241  
Télé: 519-773-9014

March 3, 2020

Katherine Scott  
BT Engineering  
509 Talbot Street  
London, Ontario. N6A 2S5  
[katherine.scott@bteng.ca](mailto:katherine.scott@bteng.ca)  
(519) 672-2222

**Subject: Centennial Road/Elm Line Intersection | Notice of Study Commencement**

Dear Katherine Scott,

The Ministry of Natural Resources and Forestry (MNRF) Aylmer District received the below and attached Notice for the proposed Centennial Road/Elm Line Intersection project on February 21<sup>st</sup>, 2020. Thank you for circulating this notice to our office, however, please note that we have not completed a screening of natural heritage or other resource values for the project at this time. Please also note that it is your responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals.

This response provides information to guide you in identifying and assessing natural features and resources as required by applicable policies and legislation, and engaging with MNRF Aylmer District for advice as needed.

**Natural Heritage & Endangered Species Act**

In order to provide the most efficient service possible, the attached Natural Heritage Information Request Guide has been developed to assist you with accessing natural heritage data and values from convenient online sources.

It remains the proponent's responsibility to complete a preliminary screening for each project, to obtain available information from multiple sources, to conduct any necessary field studies, and to consider any potential environmental impacts that may result from an activity. We wish to emphasize the need for the proponents of development activities to complete screenings prior to contacting the Ministry or other agencies for more detailed technical information and advice.

The Ministry continues to work on updating data housed by Land Information Ontario and the Natural Heritage Information Centre, and ensuring this information is accessible through online resources. Species at risk data is regularly being updated. To ensure access to reliable and up to date information, please contact the Ministry of Environment, Conservation and Parks at [SAROntario@ontario.ca](mailto:SAROntario@ontario.ca).

### **Petroleum Wells & Oil, Gas and Salt Resource Act**

There may be petroleum wells within the proposed project area. Please consult the Ontario Oil, Gas and Salt Resources Library website ([www.ogsrlibrary.com](http://www.ogsrlibrary.com)) for the best known data on any wells recorded by MNR. Please reference the 'Definitions and Terminology Guide' listed in the publications on the Library website in order to better understand the well information available. Any oil and gas wells in your project area are regulated by the *Oil, Gas and Salt Resource Act*, and the supporting regulations and operating standards. If any unanticipated wells are encountered during development of the project, or if the proponent has questions regarding petroleum operations, the proponent should contact the Petroleum Operations Section at 519-873-4634.

### **Public Lands Act & Lakes and Rivers Improvement Act**

Some Municipal projects may be subject to the provisions of the *Public Lands Act* or *Lakes and Rivers Improvement Act*. Please review the information on MNR's web pages provided below regarding when an approval is required or not. Please note that many of the authorizations issued under the *Lakes and Rivers Improvement Act* are administered by the local Conservation Authority.

- For more information about the *Public Lands Act*: <https://www.ontario.ca/page/crown-land-work-permits>
- For more information about the *Lakes and Rivers Improvement Act*: <https://www.ontario.ca/document/lakes-and-rivers-improvement-act-administrative-guide>

After reviewing the information provided, if you have not identified any of MNR's interests stated above, there is no need to circulate any subsequent notices to our office. If you have any questions or concerns, please feel free to contact me.

Sincerely,  
Karina

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#### **Karina Černiavskaja, District Planner**

Ministry of Natural Resources and Forestry, Aylmer District  
615 John St. N. Aylmer, ON N5H 2S8  
Tel: 519-773-4757 | Fax: 519-773-9014 | Email: [karina.cerniavskaja@ontario.ca](mailto:karina.cerniavskaja@ontario.ca)

*As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.*

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**From:** Katherine Scott <katherine.scott@bteng.ca>  
**Sent:** February-21-20 6:25 PM  
**Cc:** Steve Taylor <stevenj.taylor@bteng.ca>; Brian Lima <blima@elgin.ca>  
**Subject:** Centennial Road/Elm Line Intersection | Notice of Study Commencement

**CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.**

Good afternoon,

The County of Elgin has initiated a Municipal Class Environmental Assessment (EA) Study to develop a transportation plan for intersection improvements at Centennial Road and Elm Line in the Municipality of Central Elgin.

The Notice of Study Commencement is attached for additional information. Please do not hesitate to contact me if you have any additional questions or concerns.

Thank you,

Katherine Scott



509 Talbot Street

London, Ontario. N6A 2S5

[katherine.scott@bteng.ca](mailto:katherine.scott@bteng.ca)

(519) 672-2222

March 12, 2020

Mr. S. Taylor P.Eng.  
BT Engineering Inc.

Mr. B. Lima P.Eng.  
County of Elgin

Dear Messrs. Lima and Taylor:

**RE: Response to Notice of Commencement  
Centennial Road/Elm Line Intersection Improvements  
MEA Class EA Study**

This letter is in response to the Notice of Commencement for the above noted project. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that the County of Elgin has indicated that this study is following the Schedule "C" process as provided by the MEA Class EA to determine the optimal means of increasing road safety and capacity at this intersection.

Our database indicates that a water well does exist approximately 150m to the southwest of the intersection. Proper steps should be taken to determine whether this is a working well and if so, whether there is potential for impacts associated with any intersection modifications and if so, what measures will be taken to address those impacts.

Climate change should also be addressed in the context of mitigation and adaptation. The ministry has released a guidance document to support proponents in including climate change in environmental assessments. The guide can be accessed from this link: <https://www.ontario.ca/page/considering-climate-change-environmental-assessment-process> The 2015 amended MEA Class EA also speaks to this in Appendix 2, page 2-7.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of consultation to project proponents while retaining oversight of the process.

Your proposed project may have the potential to affect Aboriginal or treaty rights protected under section 35 of Canada's *Constitution Act 1982*. Where the Crown's duty to consult is triggered in relation to your proposed project, **the MECP is delegating the**

**procedural aspects of rights-based consultation to you through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information you have provided to date and the Crown's preliminary assessment you are required to consult with the following communities who have been identified as potentially affected by your proposed project:

- Kettle and Stoney Point First Nation
- Aamjiwnaang First Nation
- Bkejwanong (Walpole Island First Nation)
- Chippewas of the Thames First nation
- Caldwell First Nation
- Oneida Nation of the Thames

Steps that you may need to take in relation to Aboriginal consultation for your proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link:

<https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process>

Additional information related to Ontario's *Environmental Assessment Act* is available online at: [www.ontario.ca/environmentalassessments](http://www.ontario.ca/environmentalassessments)

You must contact the Director of Environmental Assessment and Permissions Branch (Director) under the following circumstances:

- Aboriginal or treaty rights impacts are identified to you by the communities;
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right;
- Consultation has reached an impasse; and
- A Part II Order request or elevation request is expected.

The Director can be notified either by email, fax or mail using the information provided below:

<b>Email:</b>	<a href="mailto:enviropemissions@ontario.ca">enviropemissions@ontario.ca</a> Subject: Potential Duty to Consult
<b>Fax:</b>	416-314-8452
<b>Address:</b>	Environmental Assessment and Permissions Branch 135 St. Clair Avenue West, 1 <sup>st</sup> Floor Toronto, ON, M4V 1P5

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role the County of Elgin will be asked to play should additional steps and activities be required.

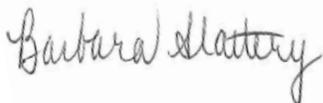
As of July 1<sup>st</sup> 2018, a standardized form is to be used by anyone who believes that the environmental assessment process was incomplete or incorrect in that it failed to follow the required process. The required form can be found on the Forms Repository website (<http://www.forms.ssb.gov.on.ca/>) by searching “Part II Order” or “012-2206E (the form ID number). Once completed, the form is then to be sent to both the Minister and Director of the Environmental Assessment and Permissions Branch. Their addresses are:

Minister  
Ministry of the Environment, Conservation and Parks  
777 Bay Street, 5<sup>th</sup> floor  
Toronto, ON M7A 2J3  
[Minister.mecp@ontario.ca](mailto:Minister.mecp@ontario.ca)

Director, Environmental Assessment and Permissions Branch  
Ministry of the Environment, Conservation and Parks  
135 St. Clair Ave. West, 1<sup>st</sup> Floor  
Toronto, ON M4V 1P5  
[enviopermissions@ontario.ca](mailto:enviopermissions@ontario.ca)

In keeping with the new process for notification of the ministry of all EA activity, please direct the final Notice of Completion to the notification email address:  
[eanotification.swregion@ontario.ca](mailto:eanotification.swregion@ontario.ca)

Current ministry protocol is that all Schedule “C” ESRs are to be reviewed by MECP prior to finalization. Should the EA process determine that this EA will in fact be completed as a Schedule “C” EA, please provide the draft ESR to me (electronic format is fine) and allow for a 30-day review period. Should you have any questions or issues arise during the process, please do not hesitate to contact me at (905) 521-7864 or via email at [Barbara.slattery@ontario.ca](mailto:Barbara.slattery@ontario.ca)



Barbara Slattery  
EA/Planning Coordinator



Hydro One Networks Inc  
483 Bay St  
Toronto, ON

May 22, 2020

Re: Centennial Road / Elm Line Intersection Improvements

Attention:  
Steve Taylor, P.Eng.  
EA Project Manager  
BT Engineering Inc.

Following our preliminary assessment, we confirm there are no existing Hydro One Transmission assets in the subject area. Please be advised that this is only a preliminary assessment based on current information.

However, if plans for the undertaking change or the study area expands beyond that shown, please contact Hydro One to assess impacts of existing or future planned electricity infrastructure.

Any future communications are sent to [Secondarylanduse@hydroone.com](mailto:Secondarylanduse@hydroone.com).

Be advised that any changes to lot grading and/or drainage within or in proximity to Hydro One transmission corridor lands must be controlled and directed away from the transmission corridor.

Sent on behalf of,

***Secondary Land Use  
Asset Optimization  
Strategy & Integrated Planning  
Hydro One Networks Inc.***

Ministry of Heritage, Sport,  
Tourism, and Culture Industries

Programs and Services Branch  
401 Bay Street, Suite 1700  
Toronto, ON M7A 0A7  
Tel: 416-314-7643

Ministère des Industries du Patrimoine,  
du Sport, du Tourisme et de la Culture

Direction des programmes et des services  
401, rue Bay, Bureau 1700  
Toronto, ON M7A 0A7  
Tél: 416-314-7643



March 12, 2020

EMAIL ONLY

Steve Taylor, P.Eng.  
EA Project Manager  
BT Engineering  
509 Talbot Street  
London, ON N6A 2S5  
[stevenj.taylor@bteng.ca](mailto:stevenj.taylor@bteng.ca)

**MHSTCI File :** 0012065  
**Proponent :** The County of Elgin  
**Subject :** Notice of Study Commencement – Municipal Class EA  
**Project :** Centennial Road / Elm Line Intersection Improvements  
**Location :** Intersection of Centennial Road and Elm Lin in the Municipality of Central Elgin, County of Elgin

---

Dear Steve Taylor:

Thank you for providing the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) with the Notice of Study Commencement for the above-referenced project. MHSTCI's interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- Archaeological resources, including land and marine;
- Built heritage resources, including bridges and monuments; and,
- Cultural heritage landscapes.

Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources.

### **Project Summary**

The County of Elgin has initiated an Environmental Assessment (EA) study to develop a transportation plan for intersection improvements at Centennial Road and Elm Line in the Municipality of Central Elgin. This EA study is being conducted as a Schedule C or Schedule B project under the Municipal Class Environmental Assessment (MCEA) (2015).

### **Identifying Cultural Heritage Resources**

While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

### **Archaeological Resources**

This EA project may impact archaeological resources and should be screened using the MHSTCI [Criteria for Evaluating Archaeological Potential](#) to determine if an archaeological assessment is needed. MHSTCI archaeological sites data are available at [archaeology@ontario.ca](mailto:archaeology@ontario.ca). If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licenced under the *OHA*, who is responsible for submitting the report directly to MHSTCI for review.

### **Built Heritage and Cultural Heritage Landscapes**

The MHSTCI [Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes](#) should be completed to help determine whether this EA project may impact cultural heritage resources. If potential or known heritage resources exist, MHSTCI recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to assess potential project impacts. Our Ministry's [Info Sheet #5: Heritage Impact Assessments and Conservation Plans](#) outlines the scope of HIAs. Please send the HIA to MHSTCI for review, and make it available to local organizations or individuals who have expressed interest in review.

### **Environmental Assessment Reporting**

All technical cultural heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MHSTCI whether any technical cultural heritage studies will be completed for this EA project, and provide them to MHSTCI before issuing a Notice of Completion or commencing any work on the site. If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Thank you for consulting MHSTCI on this project and please continue to do so throughout the EA process. If you have any questions or require clarification, do not hesitate to contact me.

Sincerely,

Joseph Harvey

*On behalf of*

Katherine Kirzati

Heritage Planner

Heritage Planning Unit

Katherine.Kirzati@Ontario.ca

Copied to: Brian Lima, County Engineer, County of Elgin  
Katherine Scott, BT Engineering

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. MHSTCI makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MHSTCI be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

Please notify MHSTCI if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out an archaeological assessment in accordance with the *Ontario Heritage Act* and the *Standards and Guidelines for Consultant Archaeologists*.

If human remains are encountered, all activities must cease immediately and the local police as well as the Registrar, Burials of the Ministry of Government and Consumer Services (416-326-8800) must be contacted. In situations where human remains are associated with archaeological resources, MHSTCI should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.

**Appendix D**  
Cultural Heritage / Archaeology Screening

The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
  - is a recognized heritage property
  - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

**Processes covered** under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

### **Cultural Heritage Evaluation Report (CHER)**

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

### **Other checklists**

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – [separate checklist](#)
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

Project or Property Name

Centennial Road / Elm Line Intersection Class Environmental Assessment

Project or Property Location (upper and lower or single tier municipality)

Central Elgin, Ontario

Proponent Name

Elgin County

Proponent Contact Information

Brian Lima, County Engineer, 450 Sunset Drive, St. Thomas, ON, N5R 5V1, blima@elgin.ca

### Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

### Part A: Screening for known (or recognized) Cultural Heritage Value

	Yes	No
2. Has the property (or project area) been evaluated before and found <b>not</b> to be of cultural heritage value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the <i>Ontario Heritage Act</i> as being of cultural heritage value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. a National Historic Site (or part of)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. designated under the <i>Heritage Railway Stations Protection Act</i> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. designated under the <i>Heritage Lighthouse Protection Act</i> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

## Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. has or is adjacent to a known burial site and/or cemetery?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. is in a Canadian Heritage River watershed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. contains buildings or structures that are 40 or more years old?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. has a special association with a community, person or historical event?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. contains or is part of a cultural heritage landscape?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**If Yes** to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

**If No** to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act*, *Planning Act* processes
- maintained by the property owner, proponent or approval authority

The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

**Processes covered** under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

### Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

- identify, evaluate and protect archaeological resources on your property or project area
- reduce potential delays and risks to your project

**Note:** By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

### What to do if you:

- **find an archaeological resource**

If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act*.

### Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – [separate checklist](#)
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name

Centennial Road / Elm Line Intersection Class Environmental Assessment

Project or Property Location (upper and lower or single tier municipality)

Central Elgin, Ontario

Proponent Name

Elgin County

Proponent Contact Information

Brian Lima, County Engineer, 450 Sunset Drive, St. Thomas, ON, N5R 5V1, blima@elgin.ca

### Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**If Yes**, please follow the pre-approved screening checklist, methodology or process.

**If No**, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**If Yes**, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

**If No**, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Yes	No
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Yes	No
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Yes	No
6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Yes	No
7. Has the property (or project area) been recognized for its cultural heritage value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**If Yes** to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

**If No**, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**If Yes** to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

**If No**, continue to question 9.

9. Are there present or past water sources within 300 metres of the property (or project area)? Yes  No

**If Yes**, an archaeological assessment is required.

**If No**, continue to question 10.

10. Is there evidence of two or more of the following on the property (or project area)? Yes  No

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

**If Yes**, an archaeological assessment is required.

**If No**, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act*, *Planning Act* processes
- maintained by the property owner, proponent or approval authority

**Appendix E**  
Drainage and Stormwater Management Study

---

# TECHNICAL MEMORANDUM

**TO:** Steve Taylor, P.Eng.                      **OUR REF.:** SN0423  
**FROM:** Leonardo Sanchez, P.Eng.           **DATE:** August 12, 2020  
**COPY:** Katherine Scott  
**RE:**        **Centennial Road / Elm Line Intersection Improvements  
              Drainage and Stormwater Management Study**

The purpose of the drainage and stormwater management study was to evaluate the effect of changes to runoff volumes and peak flowrates resulting from the proposed improvements to the intersection of Centennial Road / Elm Line, and to review and evaluate drainage and stormwater management measures to mitigate those effects.

The EA study investigated several intersection improvement alternatives. The Technically Preferred Alternative (TPA) for the Centennial Road / Elm Line intersection improvements is a 45 m diameter roundabout. The drainage and stormwater management alternatives were evaluated based on the TPA.

## 1 Design Standards and Criteria

The Study was based on the following standards:

- MTO Highway Drainage Design Standards, 2008.
- MOECC Stormwater Management Practices, Planning and Design Manual, 2003.
- City of St. Thomas Design Guidelines Manual.

Table 1 summarizes the hydrologic design criteria.

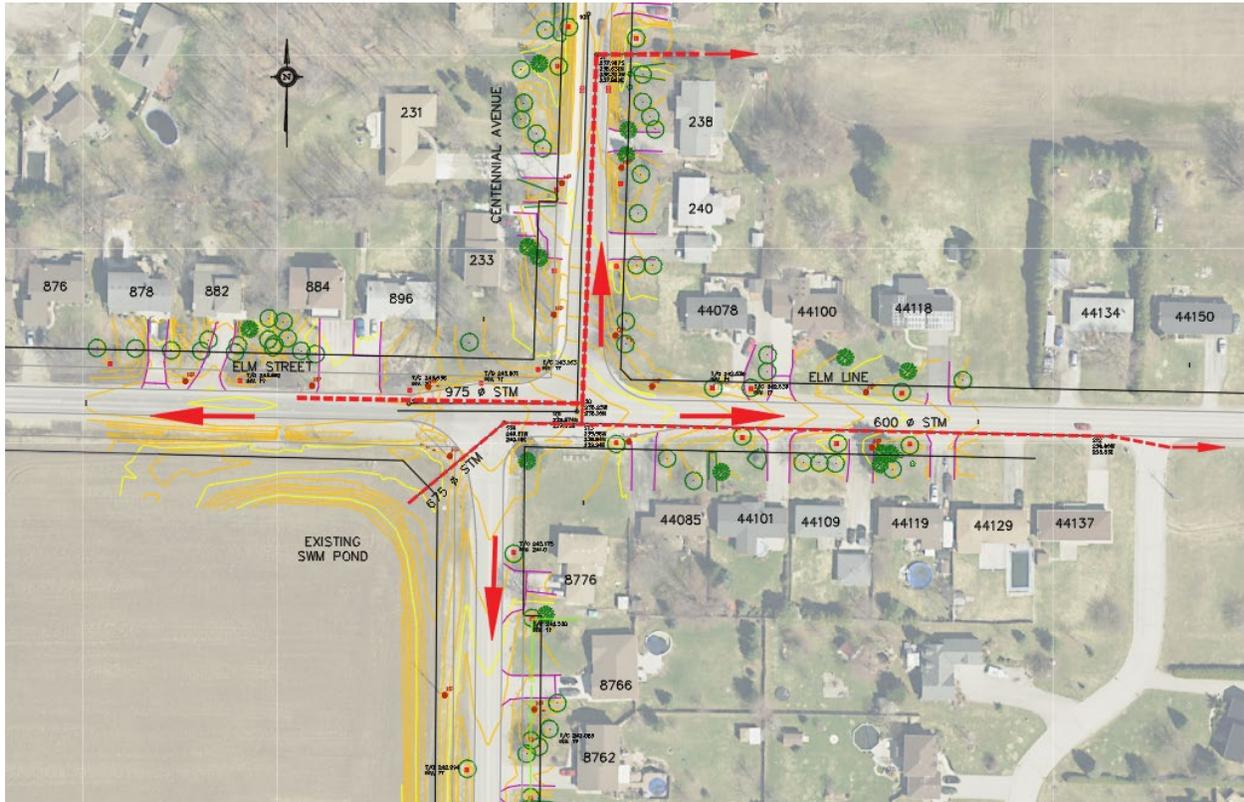
Table 1 - Design Criteria	
Criteria	Values
Design Storm Return Period	5-year storm for the minor system design 100-year storm for the major system design
Rainfall	IDF Curve determined by the MTO IDF tool website
Design Storm Distribution	3-hour Chicago storm distribution
Stormwater Quantity	Limit the change in runoff peaks and volumes, ensure no adverse impacts downstream
	Use Low Impact Development measures if feasible
Stormwater Quality	No adverse effects to receiving watercourses

## 2 Existing Conditions

### 2.1 Calculated Flowrates

In the existing conditions, Centennial Avenue, north of Elm Street, has a 2-lane urban cross section, with a left-turn lane, and a concrete sidewalk on the west side. Centennial Road, south of Elm Street, has a 2-lane rural section. Elm Street, west of Centennial Road, has a 2-lane urban cross section with sidewalk on the south side (this road was reconstructed in 2020). Elm Line, east of Centennial Avenue, has a 2-lane rural cross section.

Elm Street has a high point at the intersection with Centennial Road, and it drains to the west. Elm Line slopes to the east from the intersection at about 1%. Similarly, Centennial Road slopes to the south and Centennial Avenue slopes to the north. The arrows in **Figure 1** depict the direction of flow from the intersection.



**Figure 1 - Existing Conditions**

Elm Street drains to catch basins that connect to a 975 mm diameter storm sewer located under Elm Street, and which flows from west to east. At the intersection with Centennial Avenue, the storm sewer turns north to an outlet located about 100 m north of the intersection, where it turns 90 degrees east through an easement to connect to the Small Municipal Drain open channel.

Elm Line west of the intersection drains to catch basins (although a rural cross-section road) on both sides of the road that connect to a 600 mm diameter storm sewer constructed as part of the SWM system of the Harvest Run Subdivision.

Centennial Avenue drains to the 975 mm storm sewer heading north from the intersection with Elm Street.

Centennial Road drains south and runoff is collected by catch basins on both sides of the road that are connected to a storm sewer located behind the houses south of Elm Line, heading east to the intersection with Tike Road.

The Harvest Run Subdivision is located on the southwest quadrant of the intersection. Part of the subdivision drains to a quality/quantity stormwater management wet detention pond located on the southwest quadrant of the intersection. The stormwater management pond controls flows

up to the 100 year storm and discharges it to match the 5-year pre-development peak flowrate, as required by the City’s design standards. The pond’s outlet is a 675 mm diameter pipe that flows diagonally (at about N45W heading) to the intersection, where it turns east to continue along Elm Line. Because part of the drainage area that was tributary to the 975 mm diameter storm sewer on Elm Street was diverted to the stormwater management pond, the outlet sewer from the subdivision splits into two 600 mm diameter pipes. One section connects to the 975 mm diameter storm sewer on Centennial Avenue, and the other section continues along Elm Line and connects with the Elm Line storm sewer. By the split, the flow that used to be tributary to Centennial Avenue is returned to the system.

**Table 2** summarizes the calculated peak flowrates and pipe capacities for the two storm sewer systems that drain the intersection. The peak flowrates listed include the distribution of flows from the Harvest Run subdivision outlet sewer flow split structure at the intersection.

<b>Table 2 - Existing Conditions</b>			
<b>Location of Storm Sewer</b>	<b>Direction of Flow</b>	<b>Pipe Capacity (l/s)</b>	<b>5-year Peak Flowrate (l/s)</b>
Centennial Avenue	North	1584	1397
Elm Line	East	514	437

## 2.2 Drainage Issues

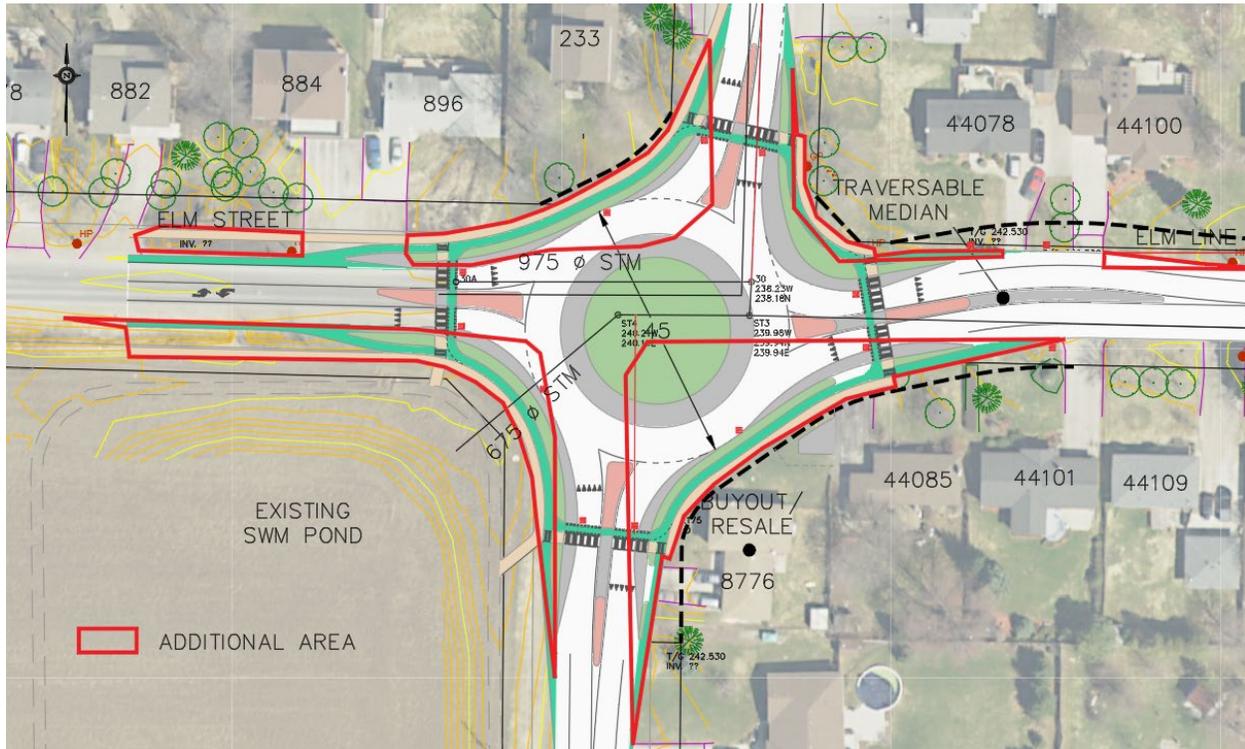
The owners of properties located on Elm Line between Centennial Avenue/Road and Tike Road have stated that water ponds in their yards during storms. Review of the locations and the survey information disclosed that the ponding is caused by the lack of gradient between the adjacent front yards and the catch basins. It is proposed to address this issue as part of the intersection improvements.

## 3 Proposed Conditions

### 3.1 Description

The Technically Preferred Alternative (TPA) is a 45 metre diameter roundabout. The roundabout will have a centre island, a truck apron, curb and gutter, a bike path, and sidewalks; it will be provided with an extra wide shoulder to accommodate combines.

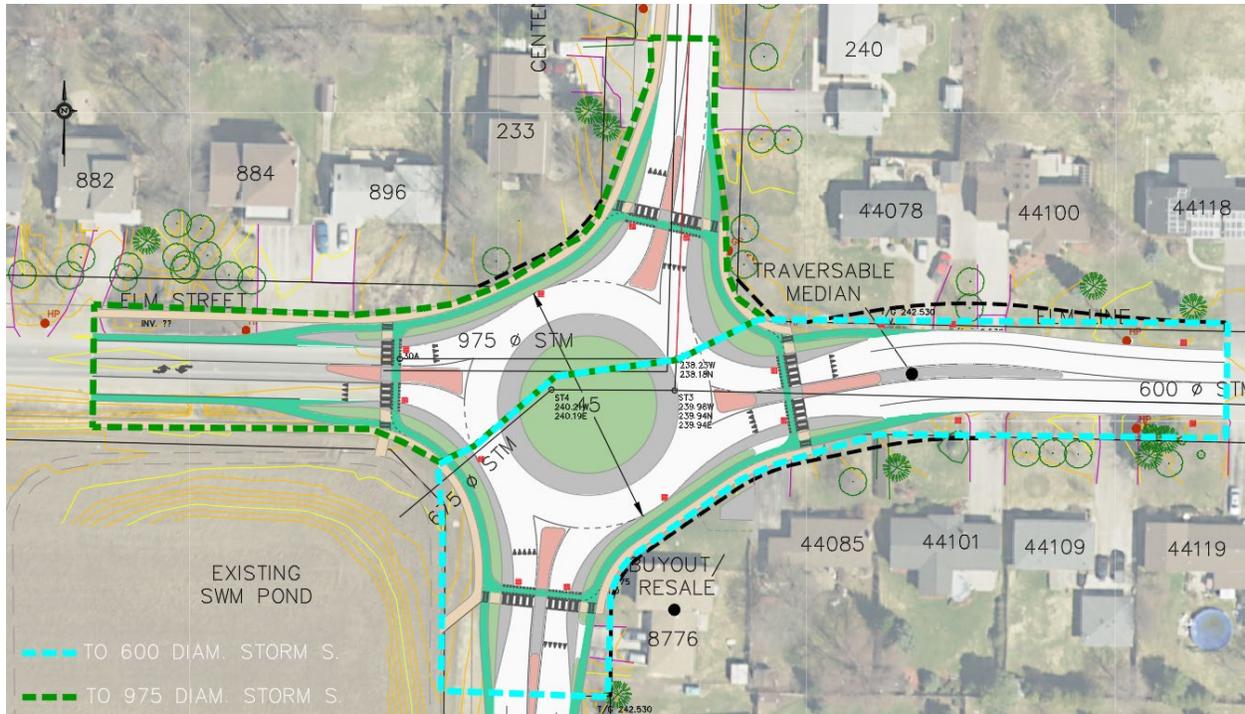
**Figure 2** shows the increase in area that will be occupied by the roundabout, in comparison with the existing conditions.



**Figure 2 - Technically Proposed Alternative - Additional Area**

The proposed drainage design for the roundabout conveys the runoff waters generated by the new intersection into two outlets, the 600 mm diameter Elm Line storm sewer and the existing 975 mm diameter Elm/Centennial storm sewer. As discussed in Section 2, both storm sewers serve as outlets to the existing intersection drainage. A small section of the south leg of the roundabout will drain to the existing storm sewer parallel to Elm Line.

It is proposed to drain the roundabout into the two existing storm sewers as shown on **Figure 3**. On Centennial Road, part of the drainage will continue to drain as in the existing conditions, to the drainage system south of 8776 Centennial Road.



**Figure 3 - Proposed Drainage Areas**

Because the changes to the intersection are small, it is not necessary to provide stormwater quantity control and the roundabout drainage can be connected directly to the existing storm sewers, as discussed in Subsection 3.2.

Stormwater quality control measures could be achieved by providing catch basin inserts to provide a minimum level of water quality control.

### **3.2 Effect on Flow Conditions**

The existing 975 mm diameter storm sewer to the intersection with Centennial Avenue has a capacity of 1282 l/s, and from the intersection to the outlet 100 m north it has a capacity of 1584 l/s. When the Harvest Run subdivision was built, an area of 12.13 ha was diverted to the stormwater management pond. The stormwater management pond was designed to control the 100-year storm flows from the subdivision to the 5-year pre-development levels. The design of the subdivision outlet sewer allows for a controlled 100-year storm outflow of 789 l/s, which is split into the 600 mm storm sewer on Elm Line and the 975 mm diameter storm sewer on Centennial Avenue.

As a result of the changes noted, the 5-year peak flowrate from the tributary area west of Centennial Avenue is 1397 l/s in the segment north of Elm Line. With the additional flow generated by the roundabout, the peak flowrate increases to 1422 l/s, which is less than the capacity of the sewer (1584 l/s). The change in peak flowrate is a very small proportion of the overall peak flowrate and is well within the capacity of the storm sewer.

In the case of the 600 mm storm sewer along Elm Line, the peak flowrate from the stormwater management pond is 404 l/s for the 100-year storm outflow controlled to the 5-year pre-development level. The additional 5-year peak flowrate generated by the additional roundabout area (0.26 ha) is 72 l/s, which will drain out of the intersection before the peak from the pond arrives, due to the difference in time to peak. The time of concentration of the roundabout drainage area is 15 minutes or less, while the time to peak of the stormwater management pond outflow is 11 hours. A conservative estimate is that the peaks coincide, in which case the 5-year peak flowrate with the roundabout will be 482 l/s, which is less than the capacity of the storm sewer.

**Table 3** summarizes the calculated peak flowrates and pipe capacities for the two storm sewer systems that drain the intersection for the proposed conditions. The peak flowrates listed include the distribution of flows from the Harvest Run subdivision outlet sewer flow split structure at the intersection.

<b>Table 3 - Proposed Conditions</b>			
<b>Location of Storm Sewer</b>	<b>Direction of Flow</b>	<b>Pipe Capacity (l/s)</b>	<b>5-year Peak Flowrate (l/s)</b>
Centennial Avenue	North	1584	1422
Elm Line	East	514	482

### 3.3 Stormwater Management

The impervious area of the intersection is approximately 0.84 ha. With the roundabout, the impervious area will be 1.10 ha, an increase of 0.26 ha. In terms of the total area tributary to the outlets of the Centennial Avenue and Elm Line storm sewers, this additional impervious area constitutes approximately 0.4% of the overall 68.77 ha tributary area, which includes 43.45 ha from the Harvest Run subdivision and 25.32 ha from the Eastwood Subdivision.

The very small change in imperviousness will have an insignificant effect on the stormwater quality of the tributary area. It is reasonable to conclude that any improvements that could be achieved by providing stormwater quality controls will be very small and unmeasurable. Therefore, it is recommended that no stormwater quality controls be provided.

The potential for using LIDs was investigated, and it was concluded that none should be provided. The reasons for this conclusion are that the change in imperviousness is very small in relation to the overall drainage area, and that the site is not favourable for any measures that would require infiltration. The very low infiltration capability of the native soils, mainly composed of Gobles Soil - Loamy Phase, which is a silty clay loam and clay loam soil, with imperfect natural drainage and medium compaction, make infiltration unfeasible.

This conclusion is reinforced by the "*Stormwater Management Report SWMF No. 2 (North Pond), Axford Farm Subdivision (Harvest Run) Phases 1 and 2, City of St. Thomas*", CJDLC Consulting Engineers, October 2016, which indicates that "Confirmed by recommendations contained within "Axford Farm Subdivision Geotechnical Engineering Report" (LVM, December 2014) and discussion in the Subwatershed Study, existing material onsite was found to be predominantly silty clay, considered to have low permeability and therefore low groundwater

recharge/infiltration potential. Groundwater recharge measures for this site are not recommended as they will be ineffective.” [sic]

## 4 Conclusions and Recommendations

### 4.1 Conclusions

On the basis of the analysis completed for this project, it can be concluded as follows:

- a. The changes to the intersection paved and impervious areas will be small (0.26 ha) and constitute a tiny proportion of the overall drainage area to the site.
- b. The anticipated changes to stormwater quality due to the additional impervious area are expected to also be, for practical purposes, undetectable.
- c. The site soils would make any measures that rely on infiltration ineffective.
- d. The intersection area is drained by two storm sewers systems, both with adequate hydraulic capacity to accommodate the existing and proposed drainage from the intersection.
- e. The proposed roundabout can be drained to the existing storm sewers within the hydraulic capacity of the existing sewer system.

### 4.2 Recommendations

It is recommended that the catch basins in the new roundabout be connected to the existing sewers in accordance with the drainage boundaries shown in Figure 3. The details of the new catch basins, including locations, grate elevations, outlet pipe invert elevations and sizes will be developed in the detail design.

Given that the road will be reconstructed as part of the work, it is recommended that the catch basins on the front yards of the properties that front on Elm Line be set lower, and the ground be graded to provide positive drainage for the yards. This will require that the connecting pipes to the existing storm sewer pipes be replaced.

Prepared by:

  
Leonardo Sanchez, P.Eng.



**Appendix F**  
Analysis and Evaluation Report



## Analysis and Evaluation Report

### Centennial Road (CR 28) / Elm Line (CR 56) Intersection Improvements Municipal Class Environmental Assessment

May 2020

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**Prepared by:**  
BT Engineering Inc.  
509 Talbot Street  
London, ON N6A 2S5  
519-672-2222



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## 1.0 INTRODUCTION

The County of Elgin (County) has retained BT Engineering Inc. (BTE) to undertake an Environmental Assessment (EA) study to develop a transportation plan for intersection improvements at Centennial Road (County Road 28) and Elm Line (County Road 56) in the Municipality of Central Elgin. This study is being carried out as a Schedule B project in accordance with the Municipal Class Environmental Assessment (EA).

The purpose of this report is to summarize the analysis and evaluation of the alternatives for intersection improvements. The EA process requires that all alternatives be evaluated in a manner that is systematic, traceable and transparent. This includes a commitment to open and meaningful public consultation. The analysis and evaluation process must recognize public and agency input as well as Municipal standards and requirements. This report documents the decision-making process used to select the Technically Preferred Alternative (TPA), including the following activities:

- Assessment of Alternative Planning Solutions;
- Development of a long list of alternatives;
- Identification of the long list of assessment factors and sub-factors and screening out those where there were no meaningful and measurable differences among the alternatives as well as those that do not apply to the study area, based on the site inventories carried out;
- Screening out of alternatives which do not achieve the basic project requirements and/or do not comply with standards/requirements;
- Identification of the benefits and potential impacts for the short-listed alternatives;
- Evaluation of short-listed alternatives using a recognized evaluation technique including weighting the relative importance of criteria;
- Ranking alternatives;
- Sensitivity testing to assess the robustness of the evaluation and alternative scores; and
- Selection of the TPA based on the evaluation results.

At the conclusion of the evaluation exercise, the TPA along with minor refinements will be presented as the Recommended Plan of improvements.

**This report reflects the technical evaluation process up to the preliminary identification of the Technically Preferred Alternative (TPA). The preliminary TPA will be presented to the public at the Online Public Information Centre (PIC) and may be modified following the PIC.**

## 2.0 STUDY PURPOSE

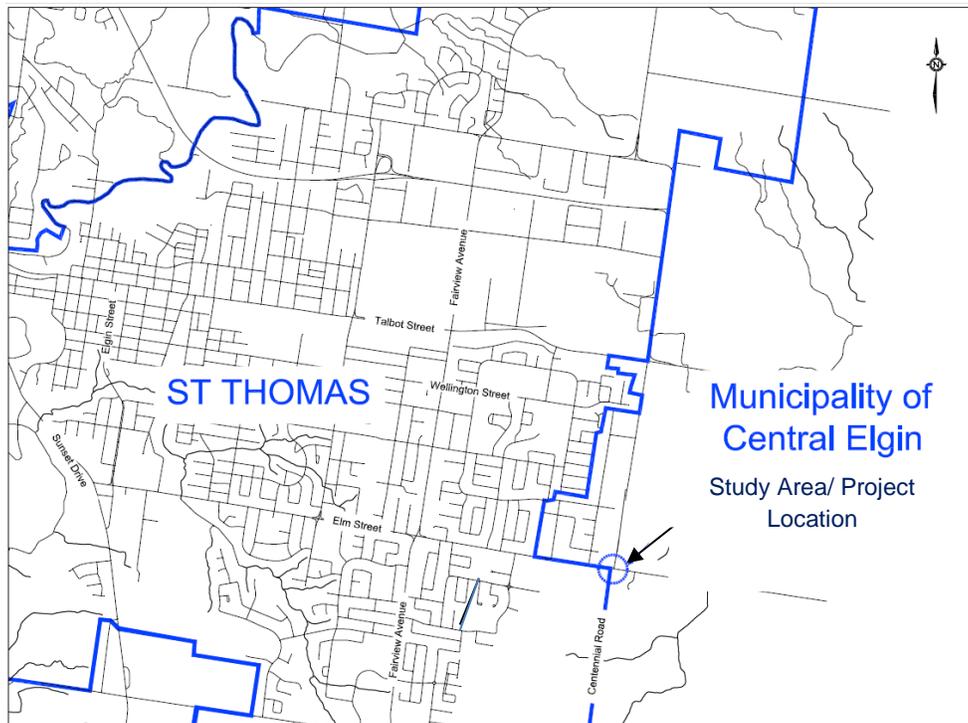
Improvements are required to the Centennial Road and Elm Line Intersection as a result of development within Central Elgin and the City of St. Thomas. A transportation management plan is required to identify alternatives that will consider the operation and safety of all modes of transportation including vehicular traffic, pedestrians, cyclists and equipment.

This study is following the Class EA process for a Schedule B project under the Municipal Class Environmental Assessment (EA). At the completion of this study, a Project File will be prepared and published for public review.

This report describes the evaluation of alternative intersection improvements. Engineering, environmental, and property requirements will be established, along with the identification of mitigation measures to reduce or negate short term (construction related) and long term residual effects.

### 2.1 Study Area

The Study Area is illustrated in **Figure 1**. The Study Area includes the Centennial Road / Centennial Avenue (CR 28) and Elm Street / Elm Line (CR 56) intersection. This intersection is located within the Municipality of Central Elgin at the eastern boundary limits of the City of St. Thomas.



**Figure 1: Study Area/Project Location**

### 3.0 ASSESSMENT OF ALTERNATIVE PLANNING SOLUTIONS

The analysis and evaluation process involves a 2-step decision-making process. Initially the study documents the analysis and evaluation of Alternative Planning Solutions (alternative project types or alternative strategies to address the problem) followed by the subsequent assessment of preliminary design alternatives.

The alternative solutions presented for analysis include:

1. Do Nothing – The Do Nothing Alternative must be considered as mandated by the Class EA. It represents a baseline from which other approaches can be compared. This alternative would maintain the existing offset intersection.

- ✓ No cost
- ✓ No property or environmental impacts
- ✗ Does not address existing safety concerns (i.e. sight lines, operating speeds, turning radii and offset)
- ✗ Does not provide a permanent long-term solution for intersection control (level of service and capacity will deteriorate as the adjacent subdivisions are developed)
- ✗ Does not provide improved active transportation facilities

2. Transportation Demand Management (TDM) – This strategy would reduce vehicular demand and encourage alternative work hours, work at home, more active modes of transportation (cycling and walking) and the use of transit.

- ✓ No cost
- ✓ No property or environmental impacts
- ✓ Reduces vehicular traffic demand
- ✗ Limited active transportation facilities and no transit is provided through the study area
- ✗ Does not address existing safety concerns (i.e. sight lines, operating speeds, turning radii and offset)
- ✗ Does not provide a permanent long-term solution for intersection control (level of service and capacity will deteriorate as the adjacent subdivisions are developed)

3. Limit Development – This strategy would limit any new residential, commercial or industrial development and therefore reduce the generation of new trips.

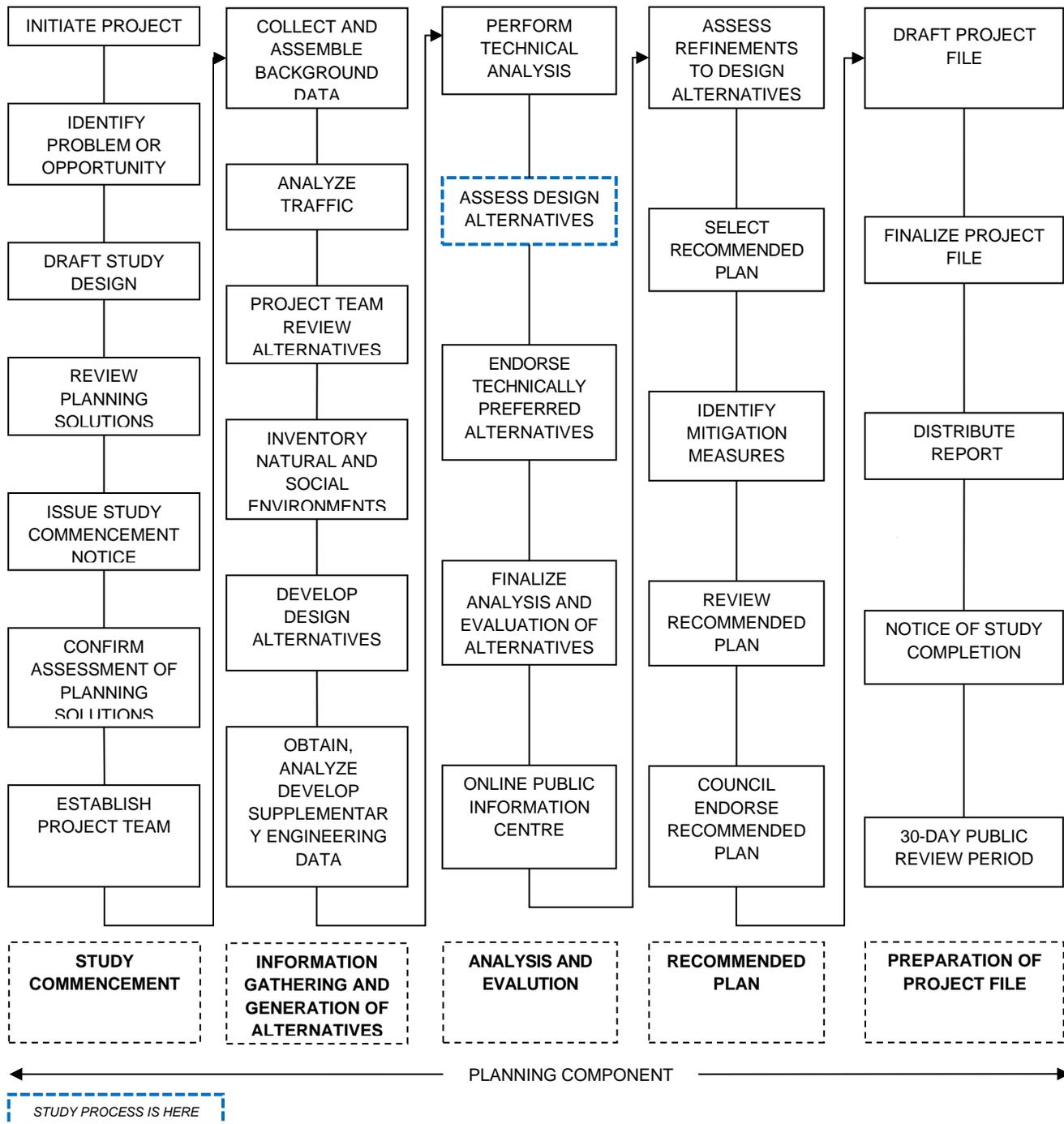
- ✓ No cost
- ✓ No property or environmental impacts
- ✓ Reduces generation of new trips
- ✗ Does not align with the Official Plan or the Provincial Policy Statement for land use planning
- ✗ Does not account for growth in background traffic or previously approved developments
- ✗ Does not address existing safety concerns (i.e. sight lines, operating speeds, turning radii and offset)
- ✗ Does not provide a permanent long-term solution for intersection control (level of service and capacity will deteriorate as the adjacent subdivisions are developed)
- ✗ Does not provide improved active transportation facilities

4. Intersection Improvements – Intersection improvements to improve geometry and capacity of the intersection.

- ✓ Improves safety for road users
- ✓ Provides long-term solution for improved capacity and operations
- ✓ Provides opportunity for improved active transportation facilities
- ✓ Aligns with the County’s plan for growth and development
- ✗ Medium to high cost
- ✗ Requires property acquisition
- ✗ Minor impacts to the natural environment

Based on the preliminary review of Alternative Planning Solutions, “Intersection Improvements at Centennial Road/Elm Line” is recommended. This Planning Solution adequately addresses the transportation problem by improving safety and addressing future capacity constraints.

The generalized planning process is presented in **Figure 2** illustrating the step where the Assessment of Alternative Planning Solutions is undertaken. This recommendation was presented in the Draft Study Design Report and at the Online Public Information Centre for public and agency review.



**Figure 2: Simplified Generalized Preliminary Design Planning Process**

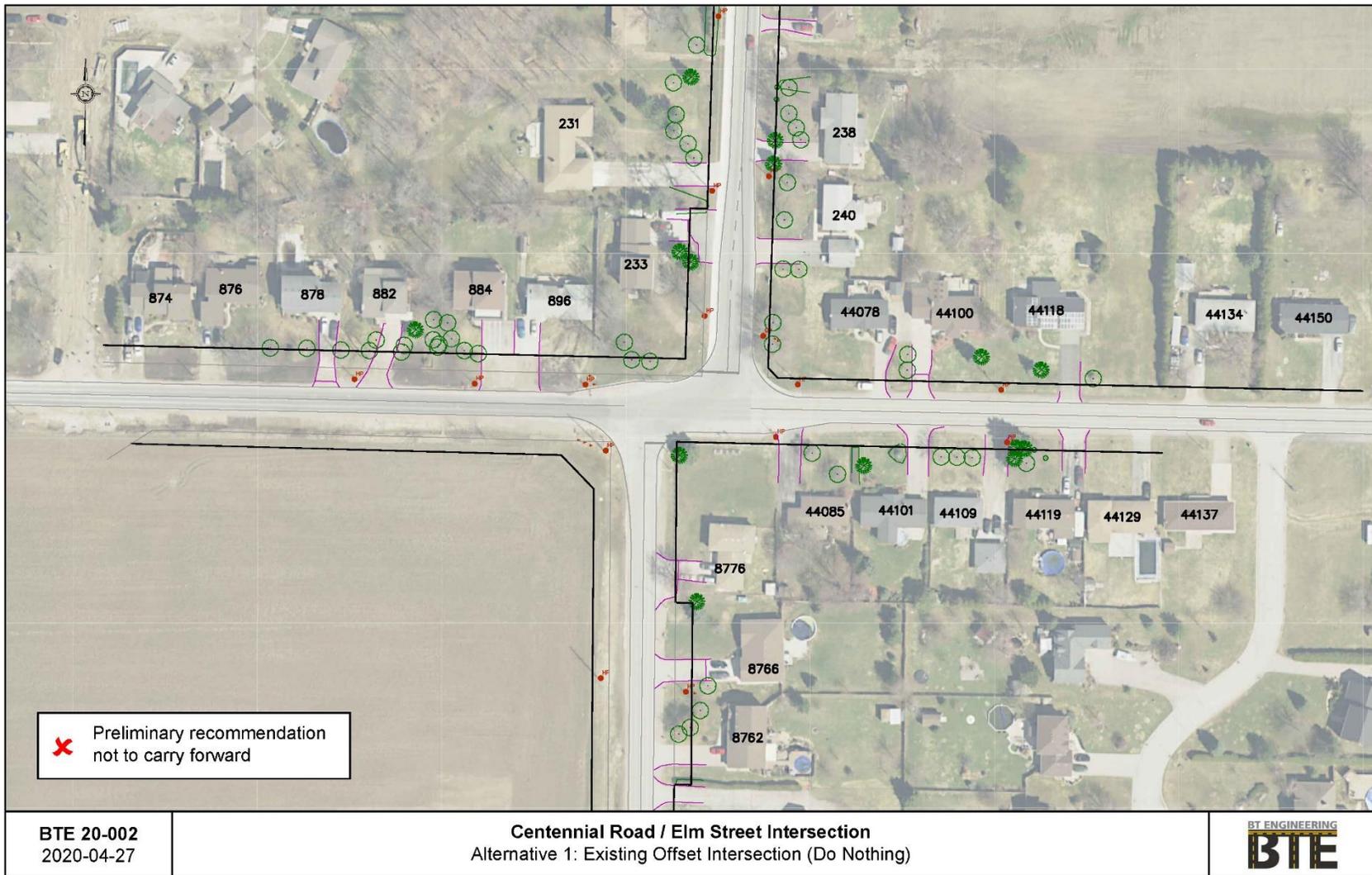
#### 4.0 GENERATION AND ASSESSMENT OF PRELIMINARY DESIGN ALTERNATIVES

The analysis and evaluation process is a central requirement of the EA process and has been the subject of review by the Ministry of the Environment, Conservation and Parks (MECP). MECP's review of *Evaluation Methods in Environmental Assessment* provided the framework for the detailed evaluation processes to be followed for this study.

Preliminary Design Alternatives were generated for improvements to the Centennial Road (County Road 28) and Elm Line (County Road 56) intersection. Alternatives that were not viable, had significant impacts, or had substantially poorer safety or traffic performance compared with other alternatives, were coarse screened, as described below:

- ✘ Alternative 1: Existing Offset Intersection (Do Nothing) – An unsignalized intersection is not considered a viable alternative. This alternative does not address the warrant for traffic signals. Not carried forward for evaluation. See **Figure 3**.
- ✘ Alternative 2a: Skewed Unsignalized intersection – An unsignalized intersection is not considered a viable alternative. This alternative does not address the warrant for traffic signals. Not carried forward for evaluation. See **Figure 4**.
- ✘ Alternative 2b: Unsignalized Intersection with Realignment and Right-Turn Lane – An unsignalized intersection is not considered a viable alternative. This alternative does not address the warrant for traffic signals. Not carried forward for evaluation. See **Figure 5**.
- ✘ Alternative 2c: Unsignalized Intersection with Realignment and Right-Turn Lane – An unsignalized intersection is not considered a viable alternative. This alternative does not address the warrant for traffic signals. Not carried forward for evaluation. See **Figure 6**.
- ✘ Alternative 3a: Signalized Offset Intersection – Does not improve existing safety concerns with offset intersection. Not carried forward for evaluation. See **Figure 7**.
- ✓ Alternative 3b: Signalized Skewed Intersection – Carried forward for evaluation. See **Figure 8**.
- ✘ Alternative 3c: Signalized Intersection with Realignment of Centennial Avenue – Significant property impacts as a result of the realignment of the north approach. Not carried forward for evaluation. See **Figure 9**.
- ✘ Alternative 3d: Signalized Intersection with Realignment of Centennial Road – Significant property impacts as a result of the realignment of the south approach. Not carried forward for evaluation. See **Figure 10**.
- ✘ Alternative 3e: Signalized Skewed Intersection with Channelization – Significant property impacts as a result of the channelization of right-turn movements and does not accommodate large trucks/farm equipment. Not carried forward for evaluation. See **Figure 11**.

- ✓ Alternative 4a: 40 m Roundabout – Carried forward for evaluation. See **Figure 12**.
- ✓ Alternative 4b: 45 m Roundabout (southwest offset) – Carried forward for evaluation. See **Figure 13**.
- ✓ Alternative 4c: 45 m Roundabout (centred) – Carried forward for evaluation. See Figure 14.
- ✓ Alternative 4d: 48 m Roundabout – Carried forward for evaluation. See **Figure 15**.



**Figure 3: Alternative 1: Existing Offset Intersection (Do Nothing)**

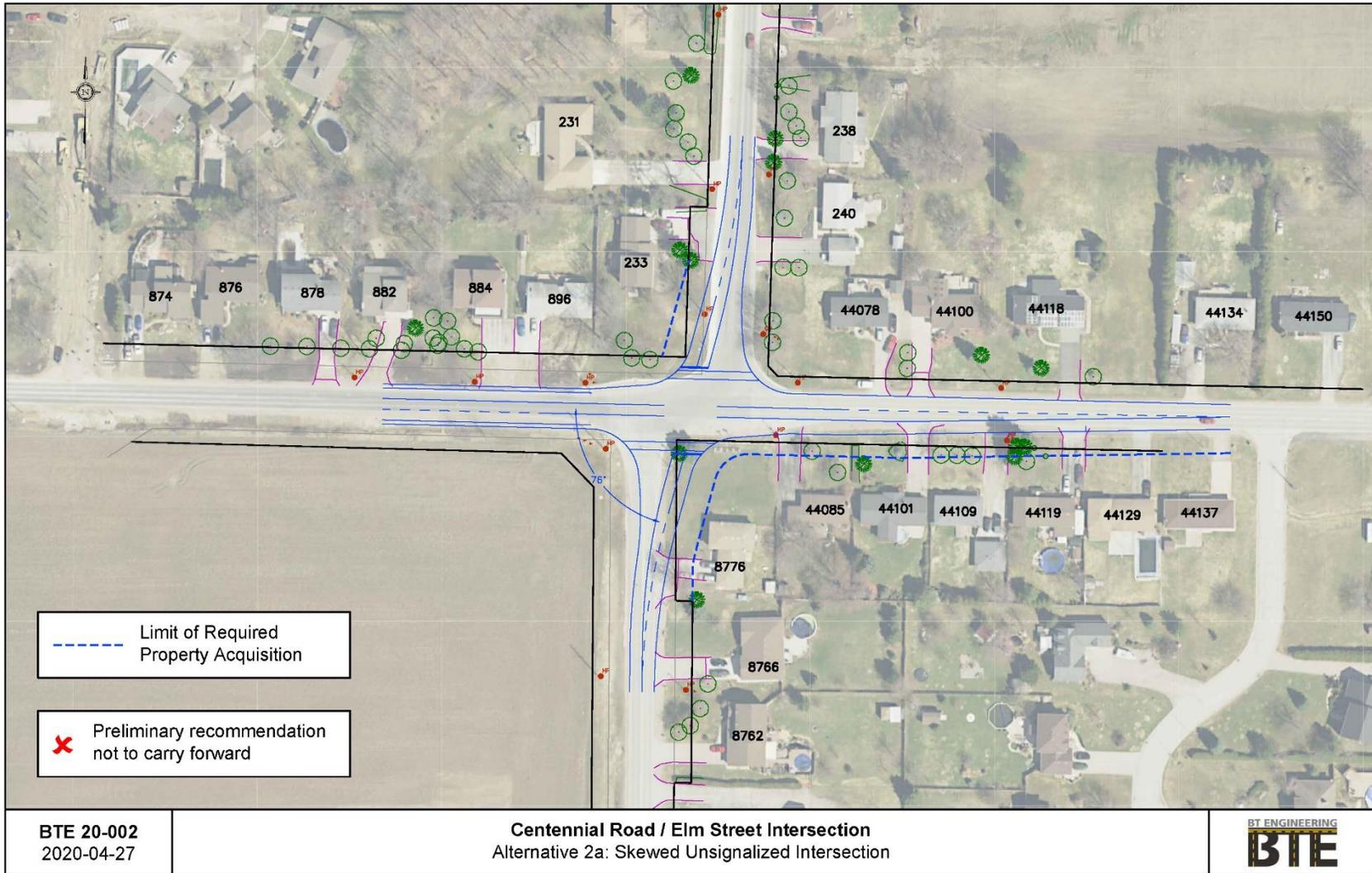
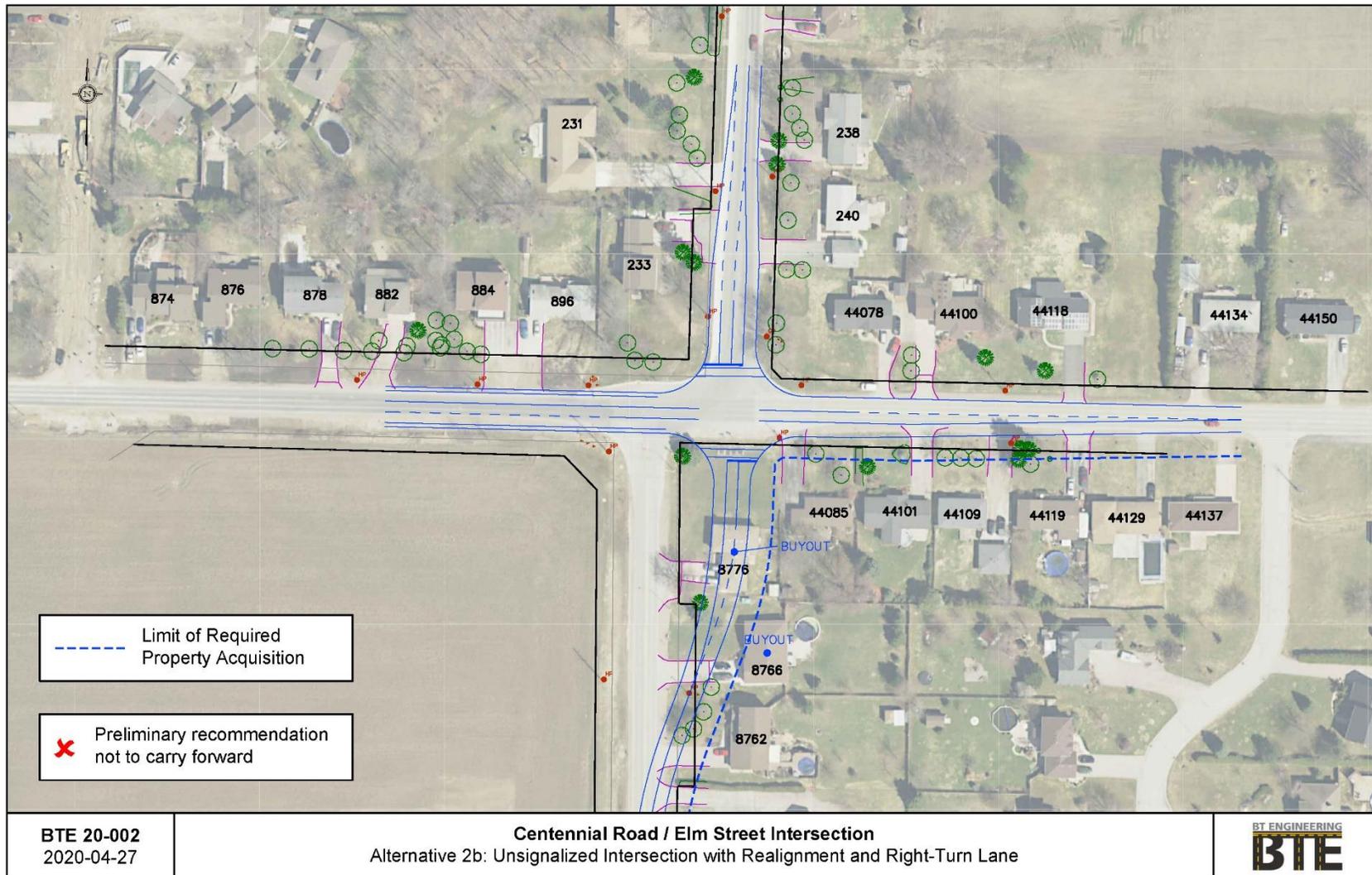


Figure 4: Alternative 2a: Skewed Unsignalized intersection



**Figure 5: Alternative 2b: Unsignalized Intersection with Realignment and Right-Turn Lane**

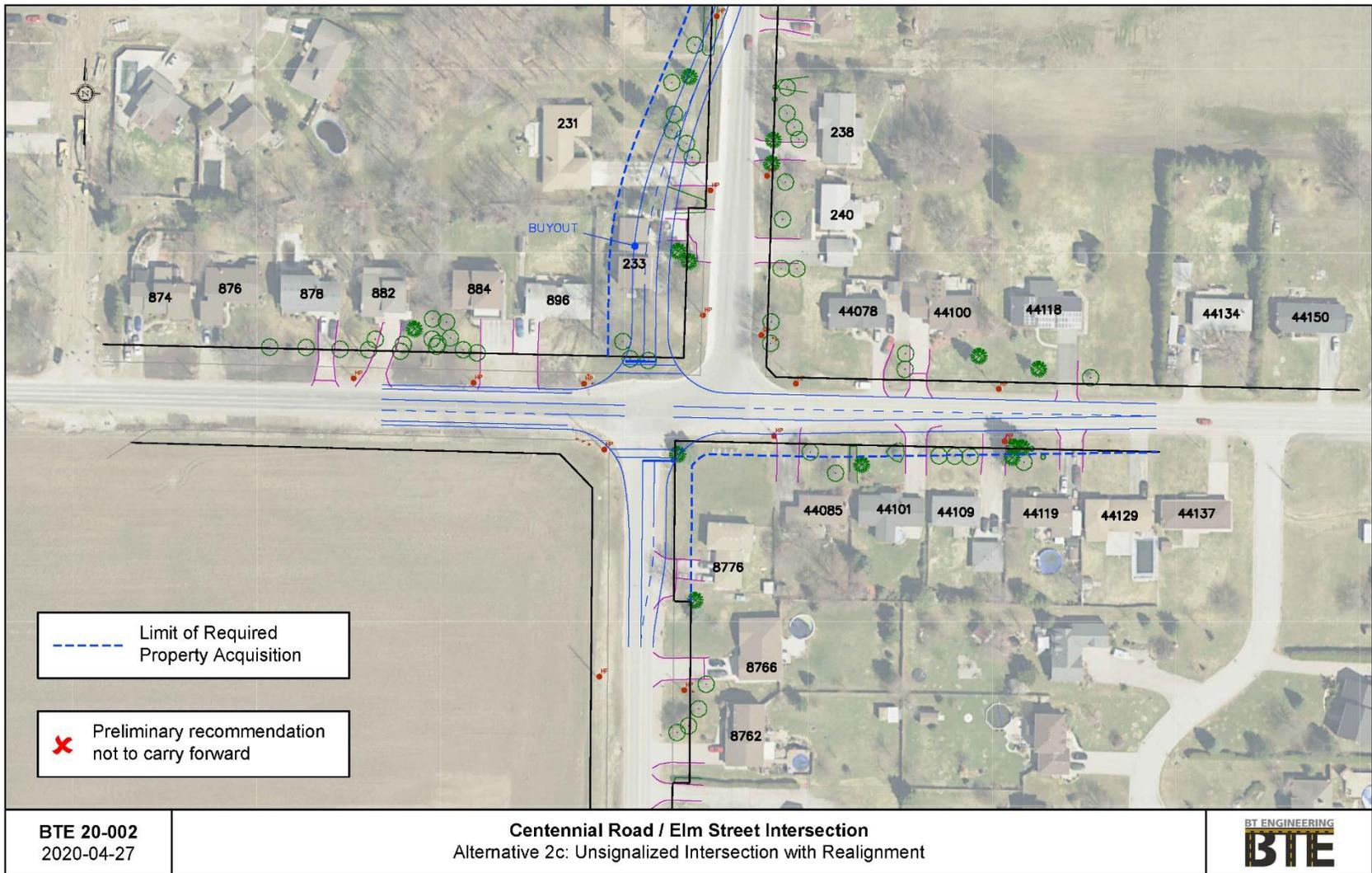


Figure 6: Alternative 2c: Unsignalized Intersection with Realignment and Right-Turn Lane

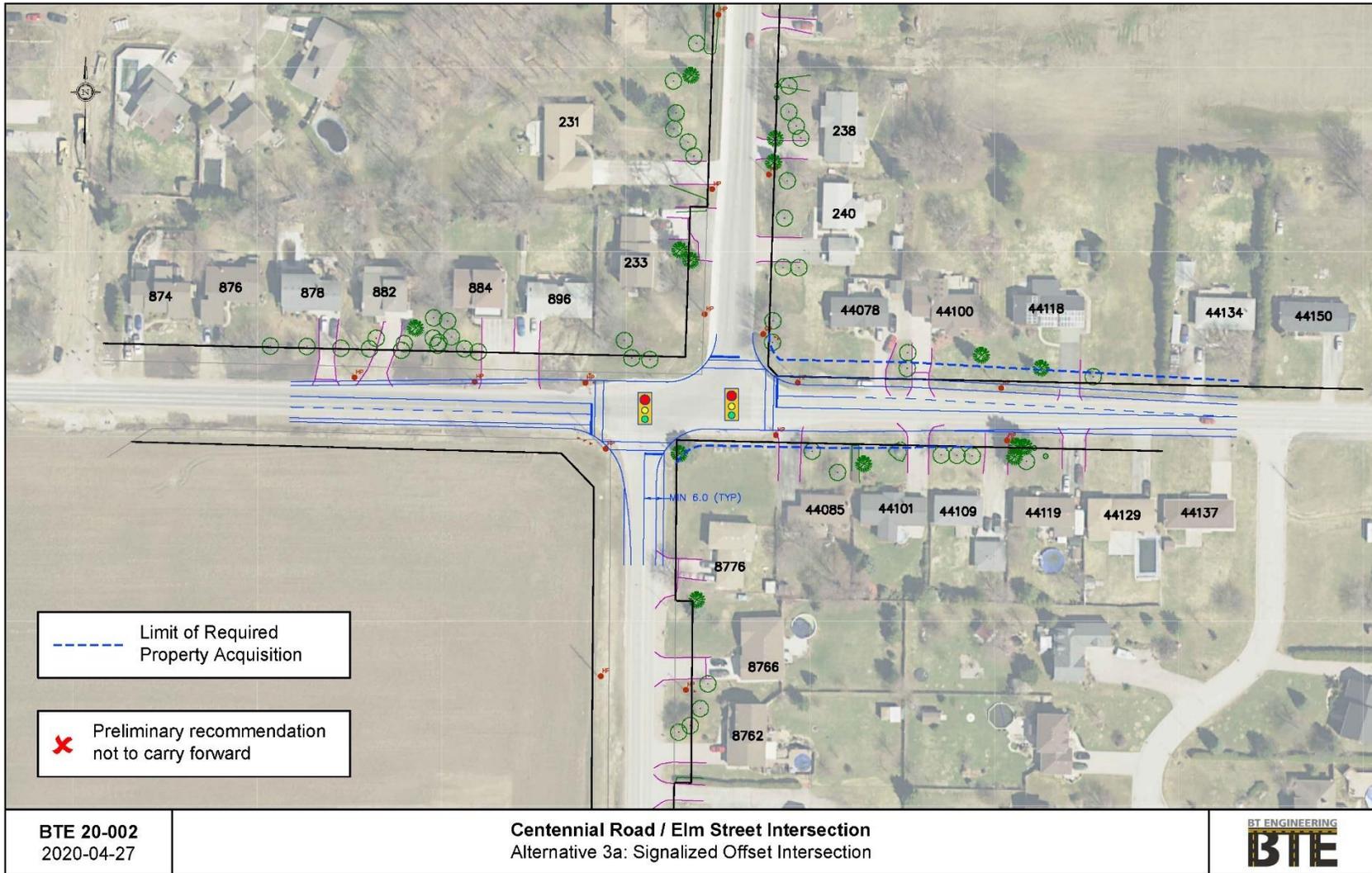
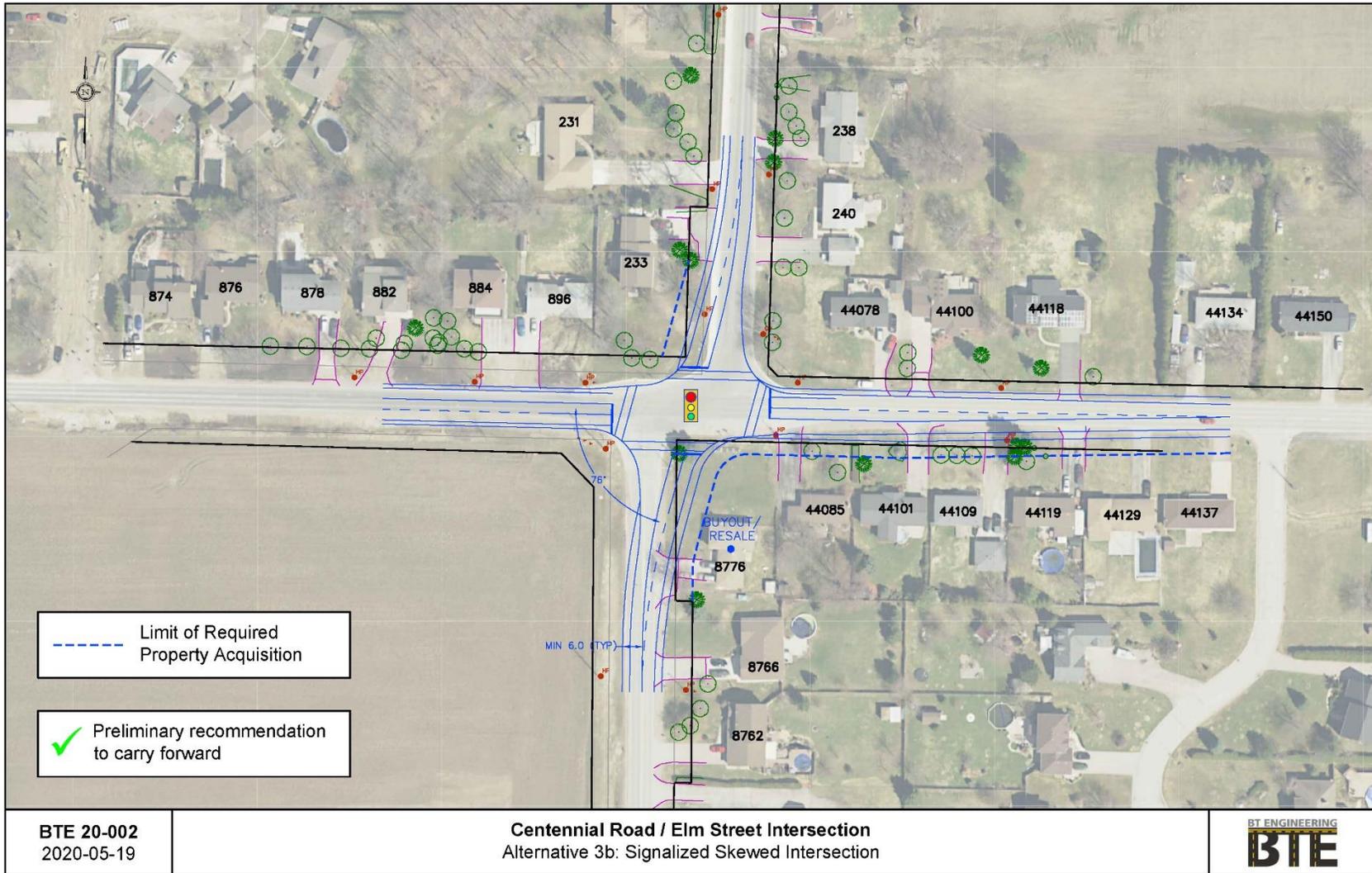
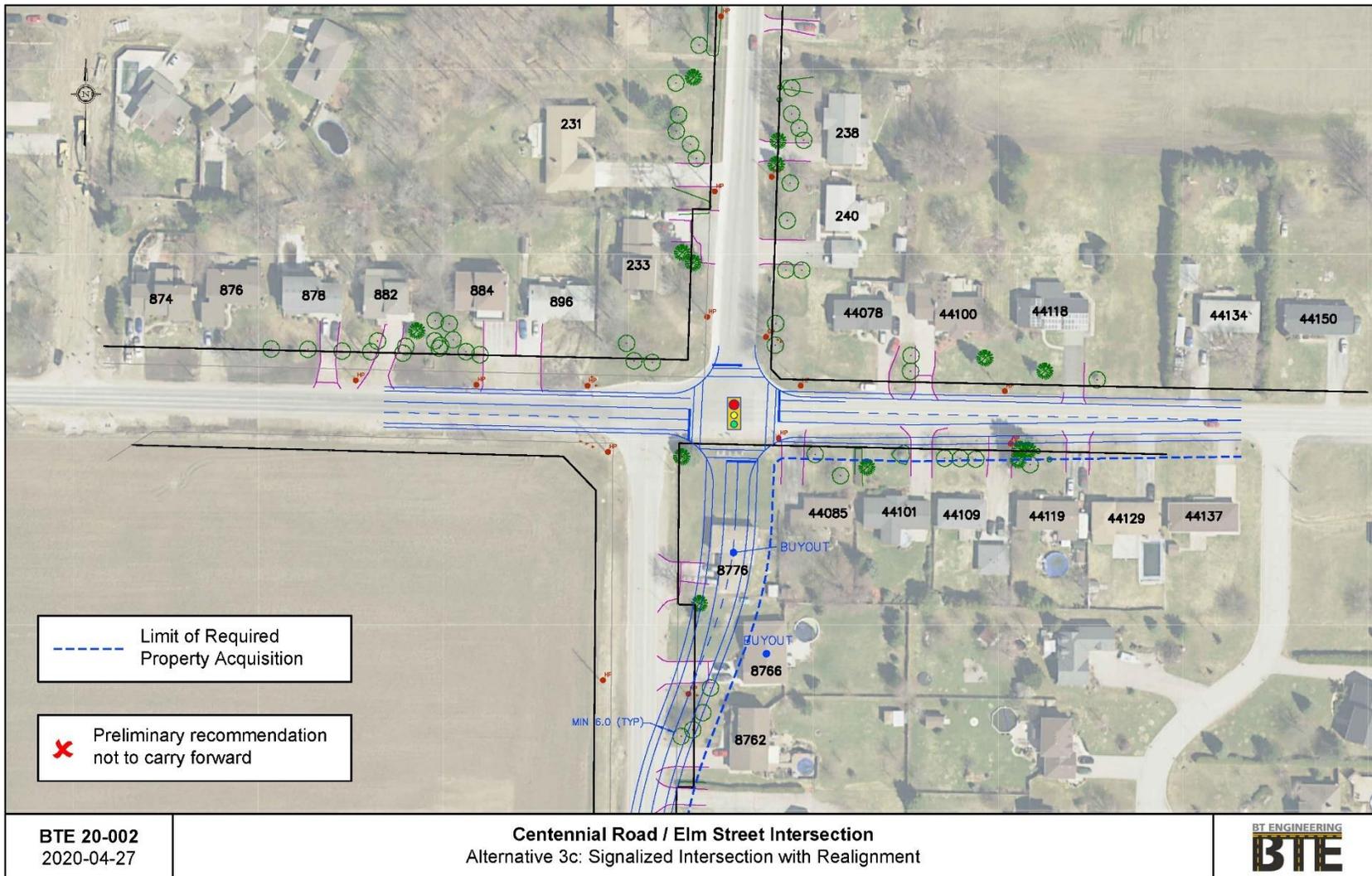


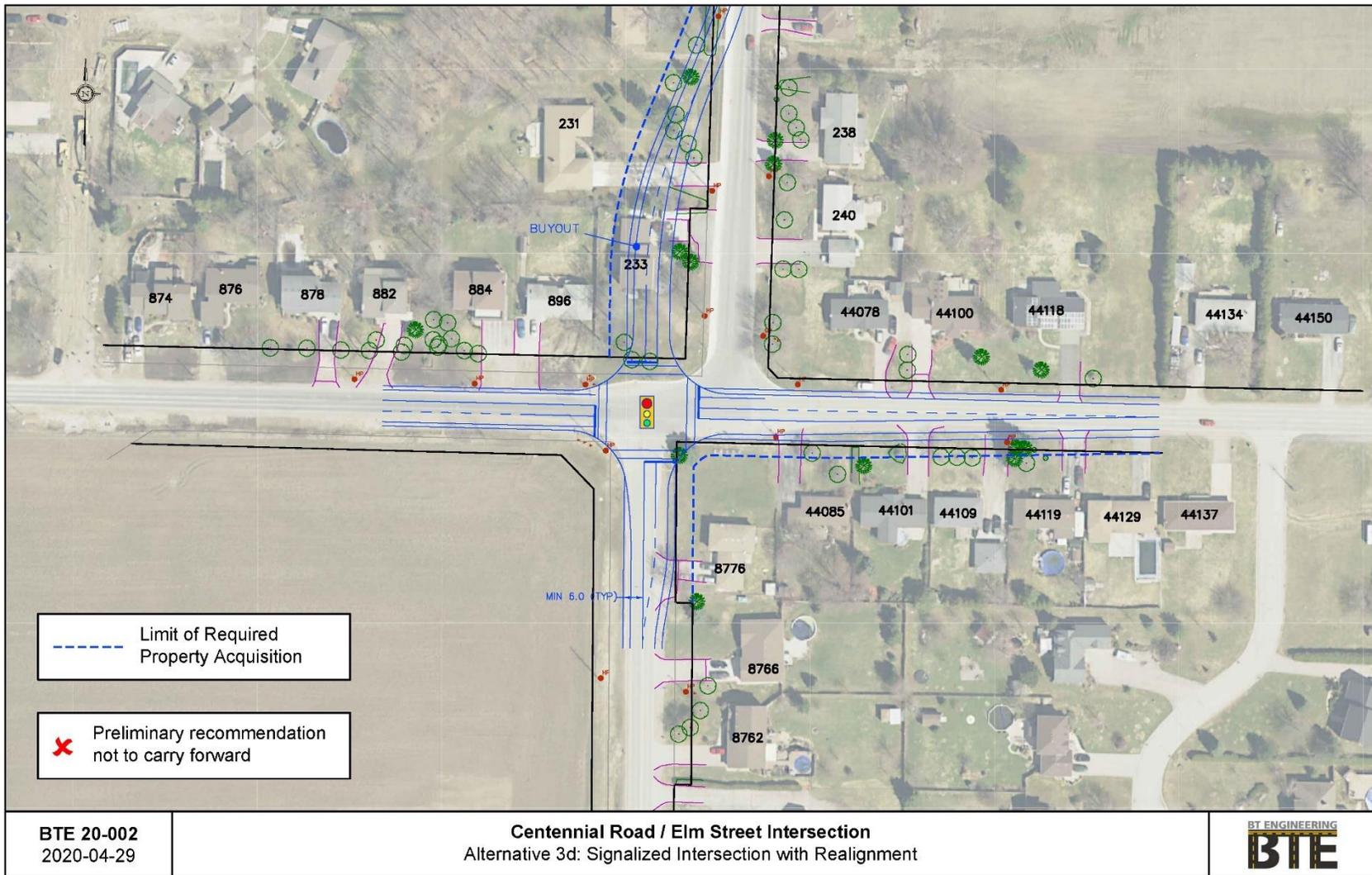
Figure 7: Alternative 3a: Signalized Offset Intersection



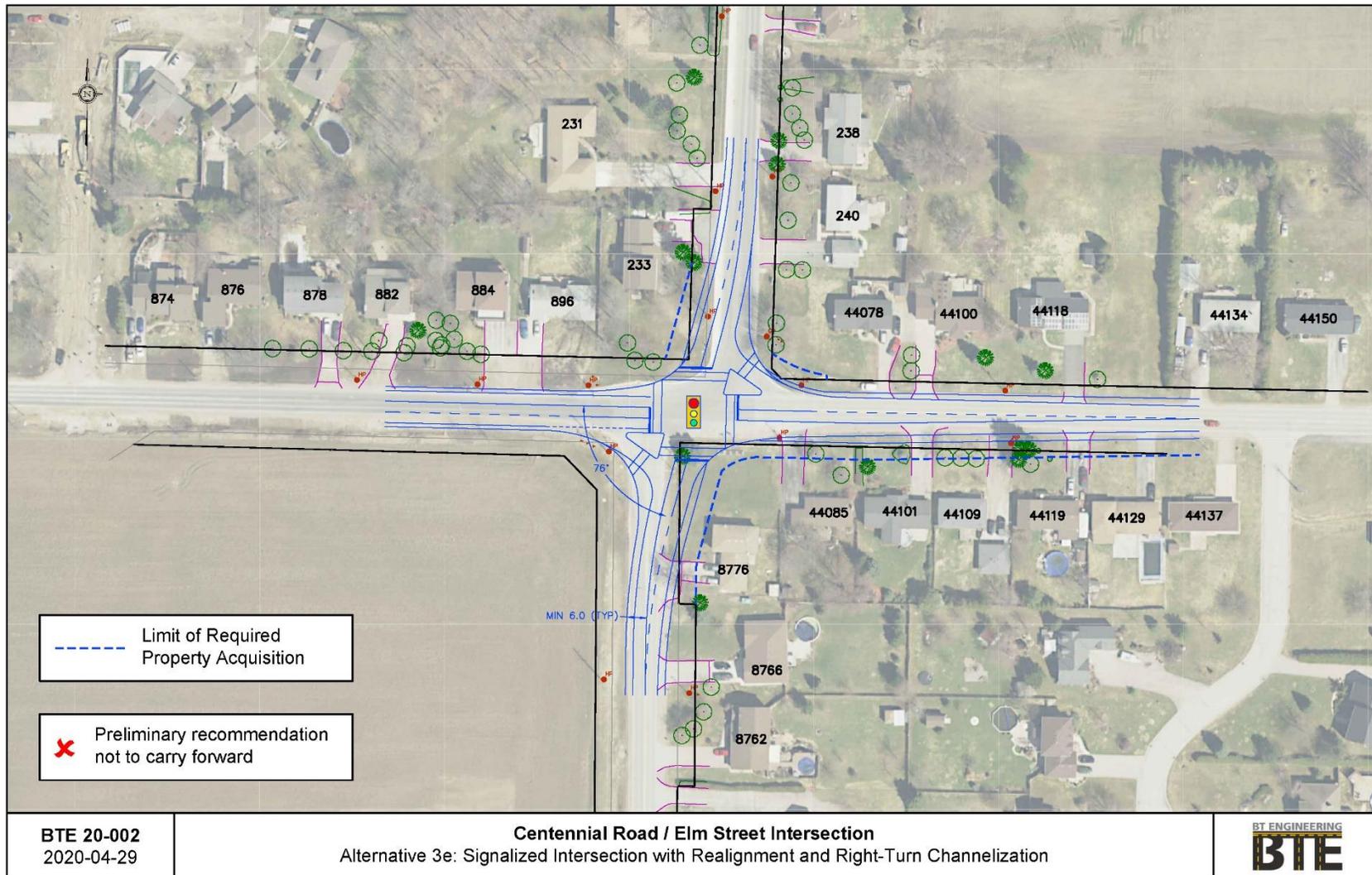
**Figure 8: Alternative 3b: Signalized Skewed Intersection**



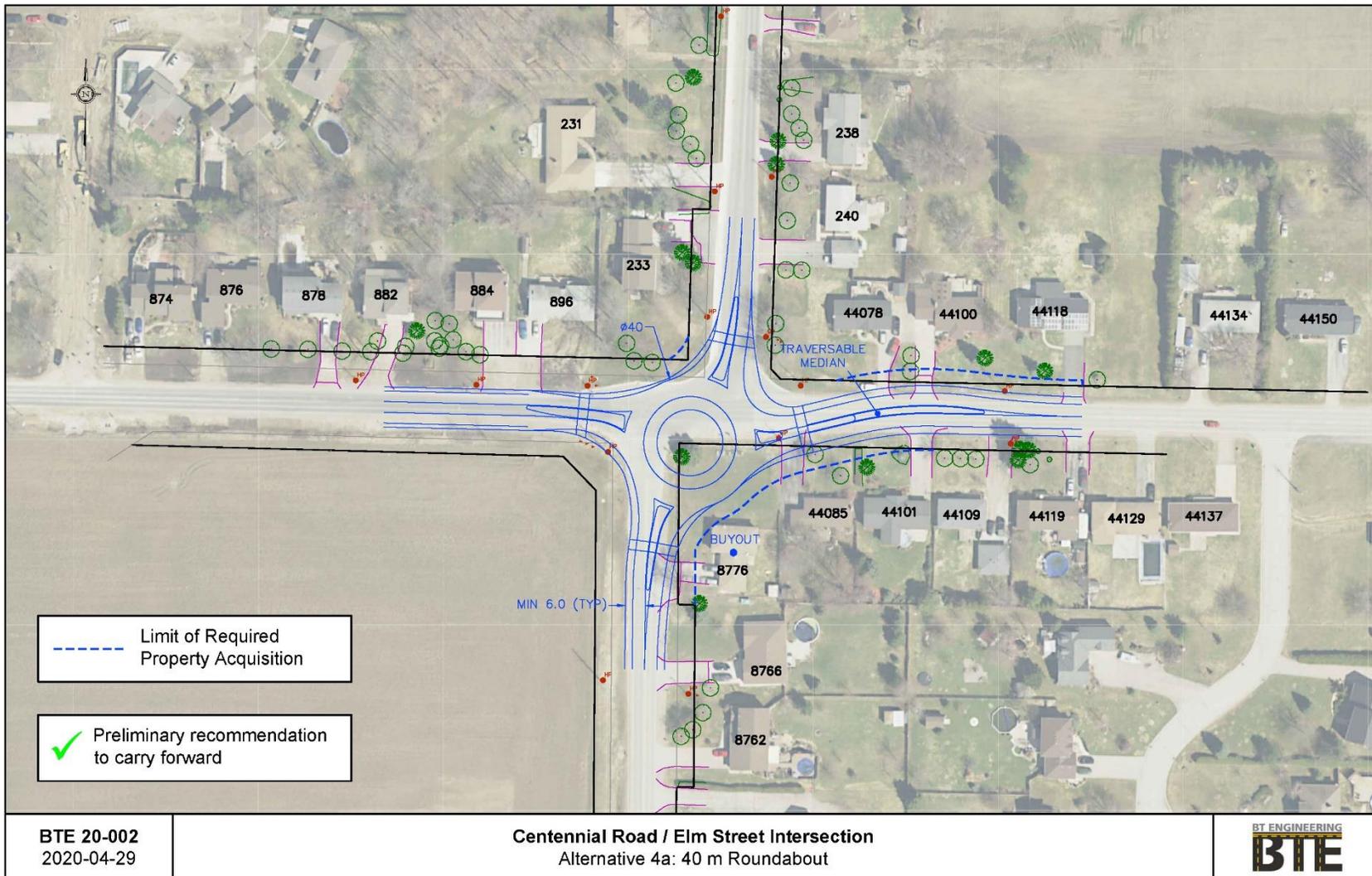
**Figure 9: Alternative 3c: Signalized Intersection with Realignment of Centennial Avenue**



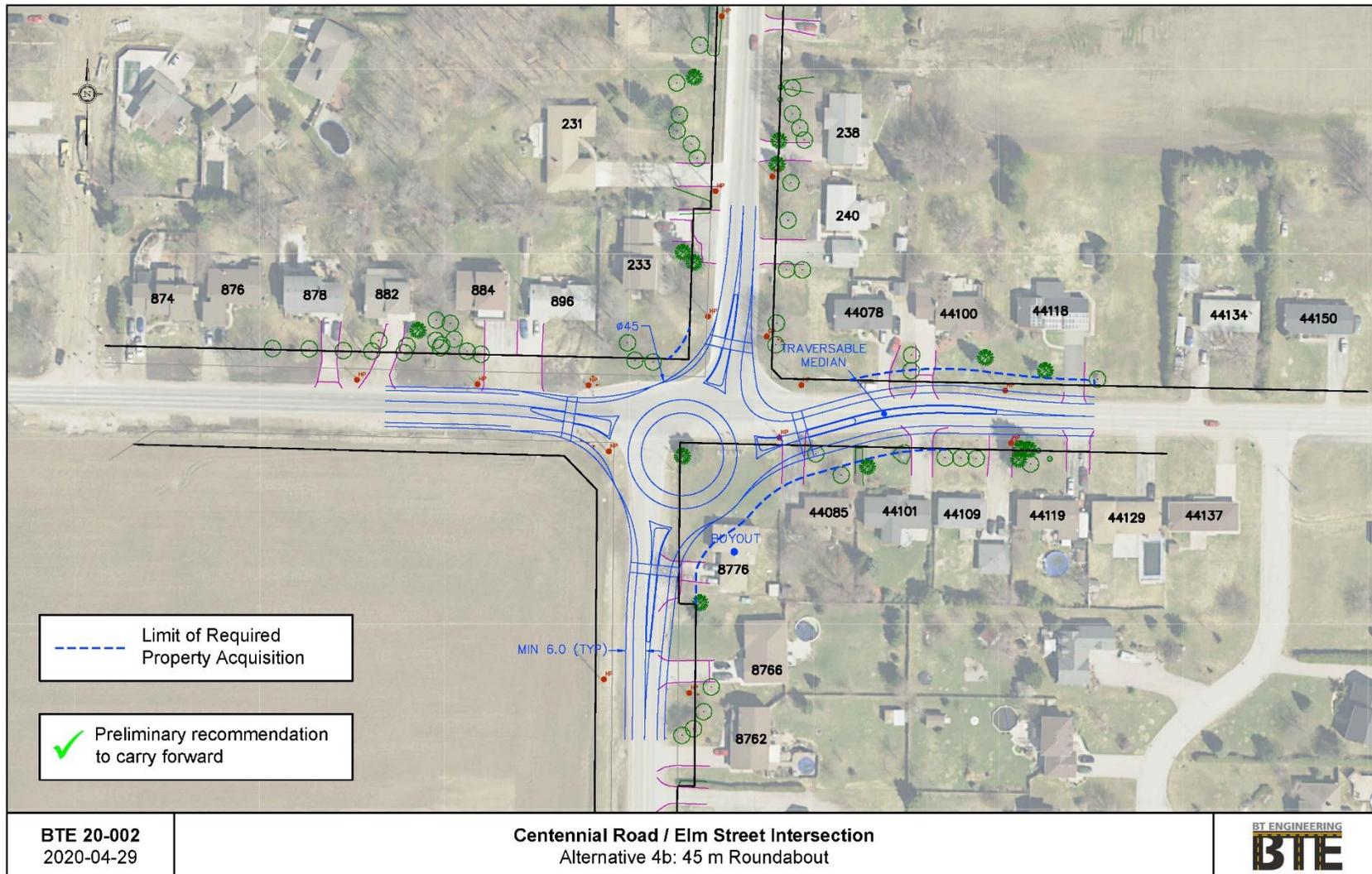
**Figure 10: Alternative 3d: Signalized Intersection with Realignment of Centennial Road**



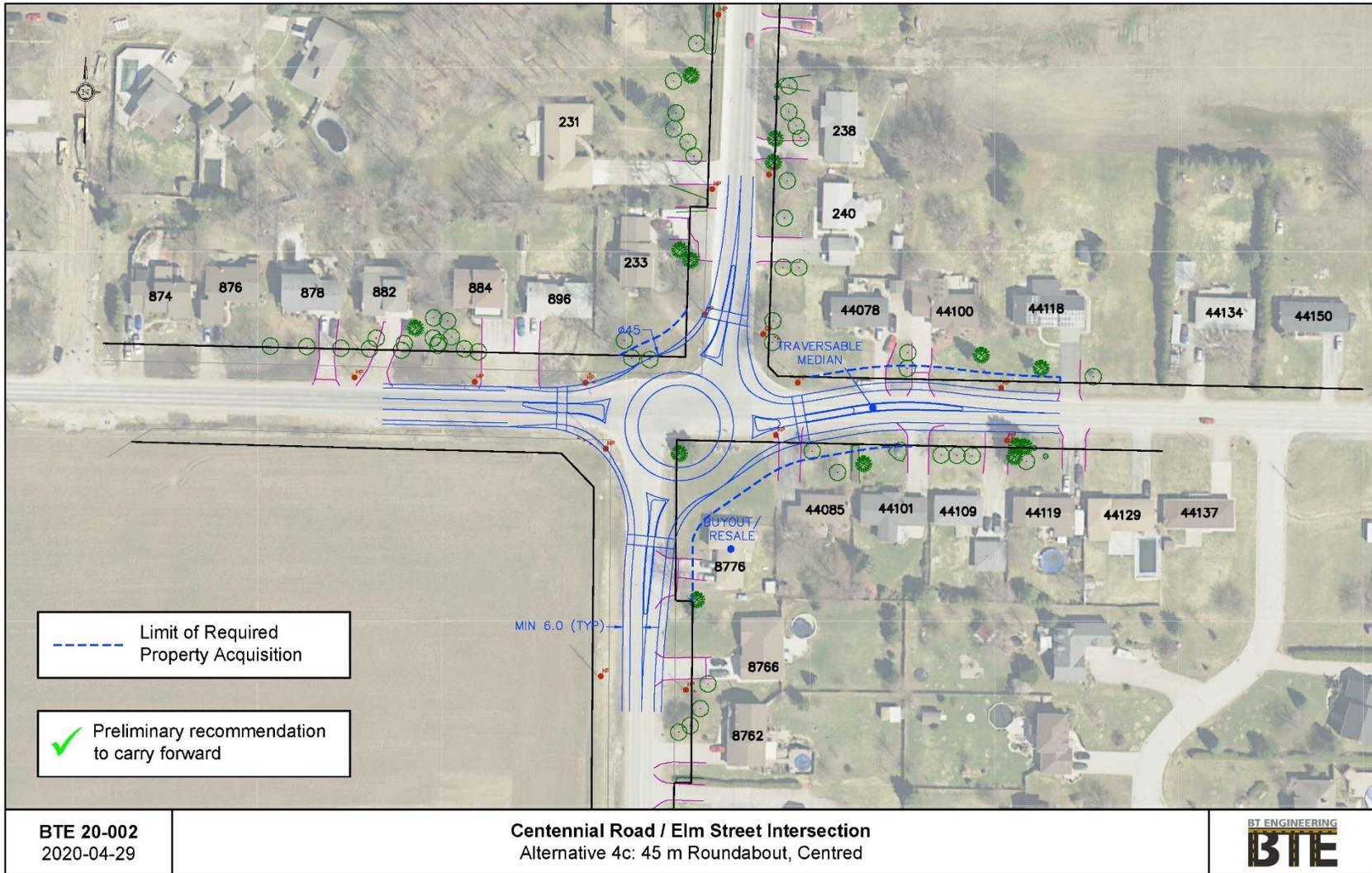
**Figure 11: Alternative 3e: Signalized Skewed Intersection with Channelization**



**Figure 12: Alternative 4a: 40 m Roundabout**



**Figure 13: Alternative 4b: 45 m Roundabout (southwest offset)**



**Figure 14: Alternative 4c: 45 m Roundabout (centred)**

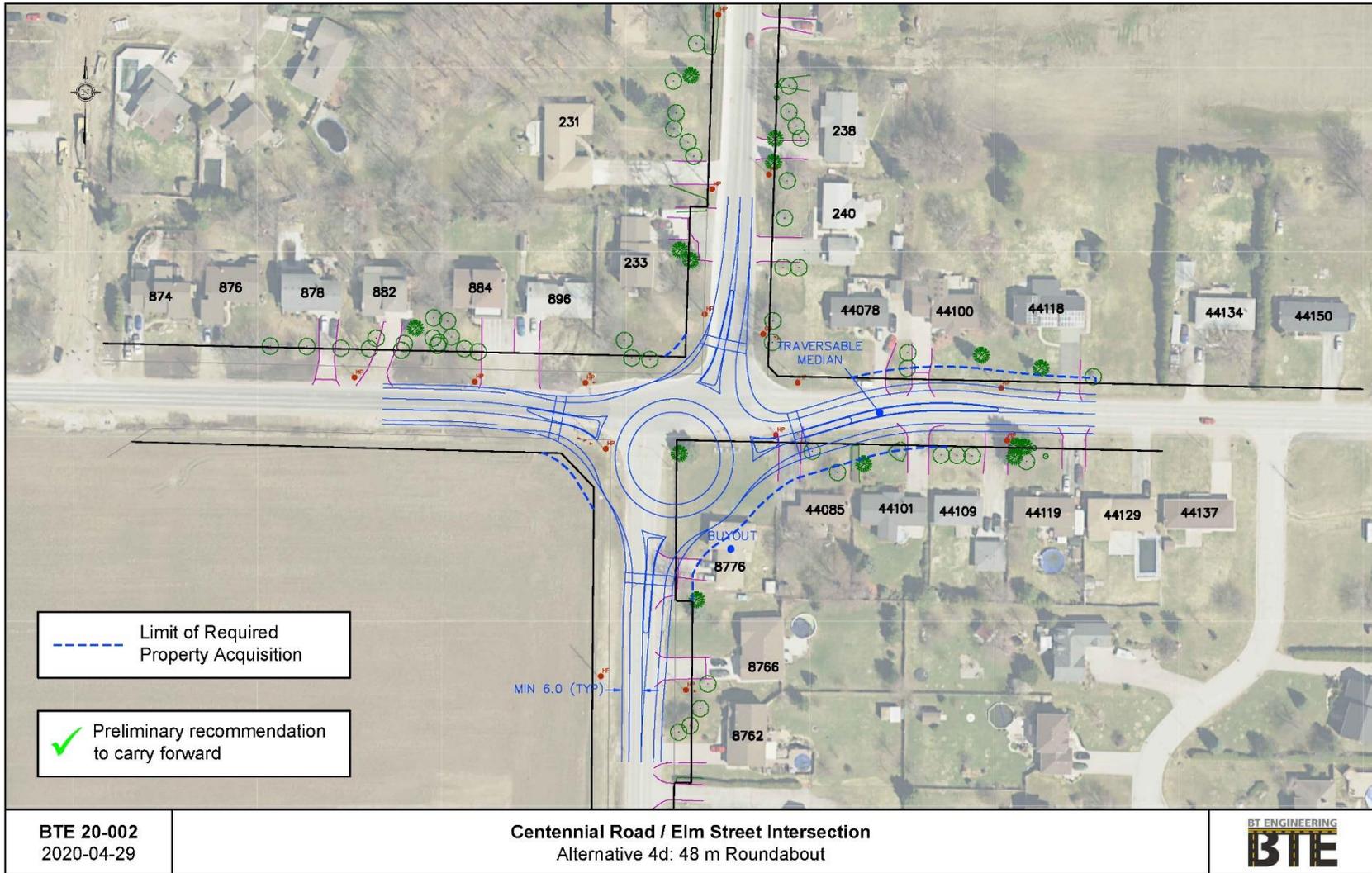


Figure 15: Alternative 4d: 48 m Roundabout

## 4.1 Quantitative Evaluation Methodology

The alternatives carried forward for evaluation were evaluated quantitatively using the Multi-Attribute Tradeoff System (MATS). This evaluation approach is based on the “Weighted Additive Method” which focuses on the differences between the alternatives, addresses the complexity of the base data collected, and provides a traceable decision-making process. In addition, the method allows quick sensitivity tests to be performed because of the matrix configuration of the assessment and the use of numerical scores to measure the impact of the alternatives. The sensitivity tests are also documented in this report. This approach is consistent with the MECP practices for the evaluation of numerous and complex alternatives. Using the “Weighted Additive Method”, overall scores are assigned to each alternative and the option with the highest score is selected as the preferred alternative to complete the evaluation.

The steps shown below, as described in the Evaluation Methodology report included in **Appendix A**, are being followed by the Project Team/ Evaluation Committee to arrive at an overall score for each alternative.

- Development of Evaluation Criteria (coarse screening a long list of criteria to develop a short list of criteria to carry forward for evaluation). These factors and sub-factors are used to measure the differences between the alternatives;
- Development of definitions and utility functions for each sub-factor carried forward. (Data must be collected for each alternative under each sub-factor. Measurements for each alternative, under each sub-factor, are conducted using topographic plans, field surveys, numerical modelling etc.);
- Weighting of Criteria (assigning weights to each Factor and Sub-factor based on their importance to each team member’s discipline or area of expertise);
- Rating Alternatives (based on Average TAC Weights);
- Selection of TPA – Highest Ranked Alternative;
- Sensitivity testing;
- Public review (Online Public Information Centre);
- Refinements to the TPA; and
- Recommendations and presentation of a Recommended Plan.

This systematic approach is consistent with MECP practices for the evaluation of numerous and complex alternatives. It avoids many of the pitfalls associated with qualitative assessments by using an analytical approach that measures scores based on a mathematical relationship, i.e. the degree of subjectivity by the Project Team is minimized. This traceable process allows the Project Team and the public an opportunity to assess trade-offs involved in the evaluation

and use of this information in the decision-making process. These steps are briefly described in the following sections.

#### **4.1.1 Evaluation Criteria**

The initial task in the evaluation is to develop evaluation criteria from which alternatives will be assessed. This process includes the identification of “global” groups of factors followed by the selection of a number of “local” sub-factors under the global groups.

#### **4.1.2 Global Evaluation Factors**

As an initial step, the evaluation criteria were grouped into broad categories, or factors, established to describe the study specific engineering and environmental concerns. Five factors were selected which were used for each evaluation.

The global factors for the alignment alternatives are:

- Transportation;
- Natural Environment;
- Social and Cultural Environment;
- Land Use and Property; and
- Cost.

#### **4.1.3 Evaluation Sub-Factors**

Under each of the five general global factors listed above, there were a number of sub-factors selected under which measurements could be made. These sub-factors were the individual descriptors for the evaluation. The selection of the sub-factors is very important to the decision-making process because they must adequately describe the issue or aspect of the environment to be evaluated and the unique features of each alternative. Any information regarding an alternative, where there are differences among alternatives, is incorporated into the decision-making process by including it as a sub-factor. Generally, the process begins by establishing a long list of potential sub-factors through discussions with the Project Team, Stakeholders and the Public. Then, for each group of alternatives being evaluated the sub-factors are reviewed and screened by eliminating those that were considered equal or not applicable among the alternatives. This was presented at the initial PIC for public review and comment. The long list is provided in **Appendix B**.

**Table 1** provides the Short List of Factors and Sub-Factors carried forward for alternatives to the analysis for each alternative.

**Table 1 : Short List of Factors and Sub-factors**

<b>Factors and Sub-Factors</b>	<b>Unit of Measurement</b>
<b>Transportation</b>	
Level of Service	High/Medium/Low
Safety – Collision Severity (Intersection)	High/Medium/Low
Safety – Speed Reduction (Corridor)	Yes/No
Network Consistency (Driver Familiarity)	Yes/No
Support of Environmentally Sustainable (Active) Transportation	Yes/No
Ease of Accommodating Large Vehicles (i.e. heavy trucks, farm equipment)	High/Medium/Low
Potential for Queuing Impeding Through Lane	Yes/No
<b>Natural Environment</b>	
Mature Trees Removed	No.
<b>Social and Cultural Environment</b>	
Gateway Feature for Community	Yes/No
Noise Impacts	High/Medium/Low
Visual Intrusion	m
<b>Land Use and Property</b>	
Area of Property Required (233 Centennial Avenue)	m <sup>2</sup>
Area of Property Required (44085 Elm Line)	m <sup>2</sup>
Area of Property Required (Others)	m <sup>2</sup>
Impact to Landscaped Area	Yes/No
Length of Driveway (44085 Elm Line)	m <sup>2</sup>
Ease of Access for Left Turns Out of Driveway (44085 Elm Line)	Yes/No
Length of Driveway (8776 Centennial Road)	m
<b>Cost</b>	
Capital Cost	\$
Future Maintenance and Operation Cost	High/Medium/Low

#### **4.2 Social Utility Function**

The evaluation method (Weighted Additive Method) used to evaluate alternatives related the performance or attractiveness of alternatives using a mathematical relationship. This included

two variables. The first was the raw, measured or modelled data, and the second was the utility score. The utility score is the measure of the attractiveness of the alternative under the particular sub-factor. For this study, the relationship between these two variables was described by either a linear, stepped or a dichotomous social utility function. These utility functions assigned a dimensionless score between 0 and 1 to an alternative for each sub-factor.

Examples of dichotomous, stepped and linear functions used in this study are explained in the following sections.

#### **4.2.1 Dichotomous Utility Function**

The dichotomous utility function, shown in **Figure 16**, permits the decision-makers to establish criteria that present an “either-or” situation (desirable or undesirable, negative or positive, present or absent, etc.). If a “no” answer is desirable then a utility score of ‘one’ would be assigned to this criterion, otherwise a value of ‘zero’ would be assigned; no other utility score being available.

#### **4.2.2 Stepped Utility Function**

The stepped utility function, shown in **Figure 16**, permits the decision-makers to assess criteria when the sub-factor presents more than one level of impact. An example of this situation is where the sub-factor can be categorized into “high, medium or low” degrees of impact. If a “high” answer is undesirable then a utility score of zero is assigned to this criterion, a “medium” answer would be 0.5 and “low” would have a value of 1.0 assigned to it. The stepped function may have more than three categories, with each category assigned a value between one and zero.

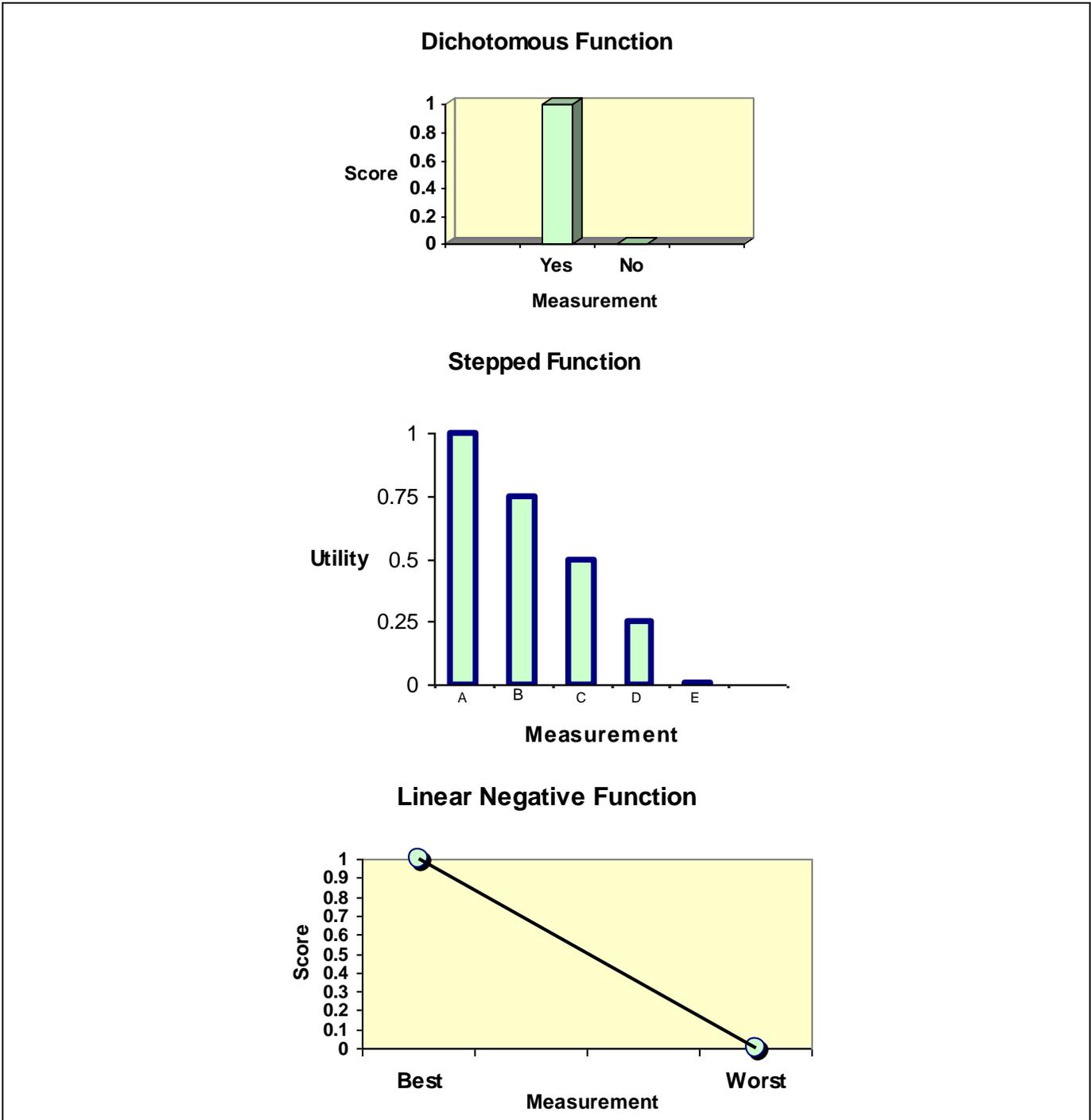
The value for each step is determined by the subject area specialist (expert). The maximum value found within the group is either the highest or lowest step. If the maximum value is undesirable it is given a value of zero and conversely the lowest value is desirable and is assigned a value of one.

#### **4.2.3 Linear Utility Function**

The linear function, shown in **Figure 16**, was used to convert scores for sub-factors that had varying measurements. Given a measurement, a unique score between zero and one could be assigned to a sub-factor.

The slope of the linear utility function is either negative or positive depending on the desirability of the impact. In the example below, the slope of the function is negative.

The short-listed criteria, including definitions and their respective social utility functions are included as **Appendix B**.



**Figure 16: Sample Utility Functions**

**4.3 Weighted Global Factors and Sub-Factors**

Factors were eliminated where they were not applicable (because there was no difference between alternatives, or they were considered equal). The selection of weights for the factors

and sub-factors was based on assessments by the Project Team. Within a group of factors, inevitably there was an ordering with some sub-factors having more importance than others. This is accounted for by each individual assigning weights to each factor and sub-factor, which is reflected in the “Global Factor Weight” and “Sub-factor Weight” columns in **Table 2**.

<b>Table 2: Sample Global Factor / Sub-Factor Weights (Sample)</b>		
<b>Global Factors/Sub-factors</b>	<b>Project Team Average Weights</b>	
	<b>Global Factor Weight</b>	<b>Sub-factor Weight</b>
Transportation	21.0%	
Level of Service		11.4%
Safety – Collision Severity (Intersection)		29.8%
Safety – Speed Reduction (Corridor)		18.2%
Network Consistency (Driver Familiarity)		6.8%
Support of Environmentally Sustainable (Active) Transportation		13.0%
Accommodate Large Vehicles (i.e. Heavy Trucks, Farm Equipment)		9.4%
Potential for Queuing Impeding Through Lane		11.4%
TOTAL		100%

The percentage weight for all global factors totalled (considered as global weights), is 100%. As well, the percentage weight for the sub-factors under each global factor, described as local weights, must total 100%. There is a degree of subjectivity in deciding on the most important and least important global factors. Every person assigning weights has a personal bias and understanding of the scope of the project and life experience. Hence, there is an advantage to having a diversified team of professionals with varied backgrounds performing the evaluation.

Each member assigns percentage weights to each global factor and sub-factor based on their opinion of the relative importance of each after a presentation by each specialist to the Project Team. Their individual weights were then averaged to determine the Project Team weight for each global factor and sub-factor.

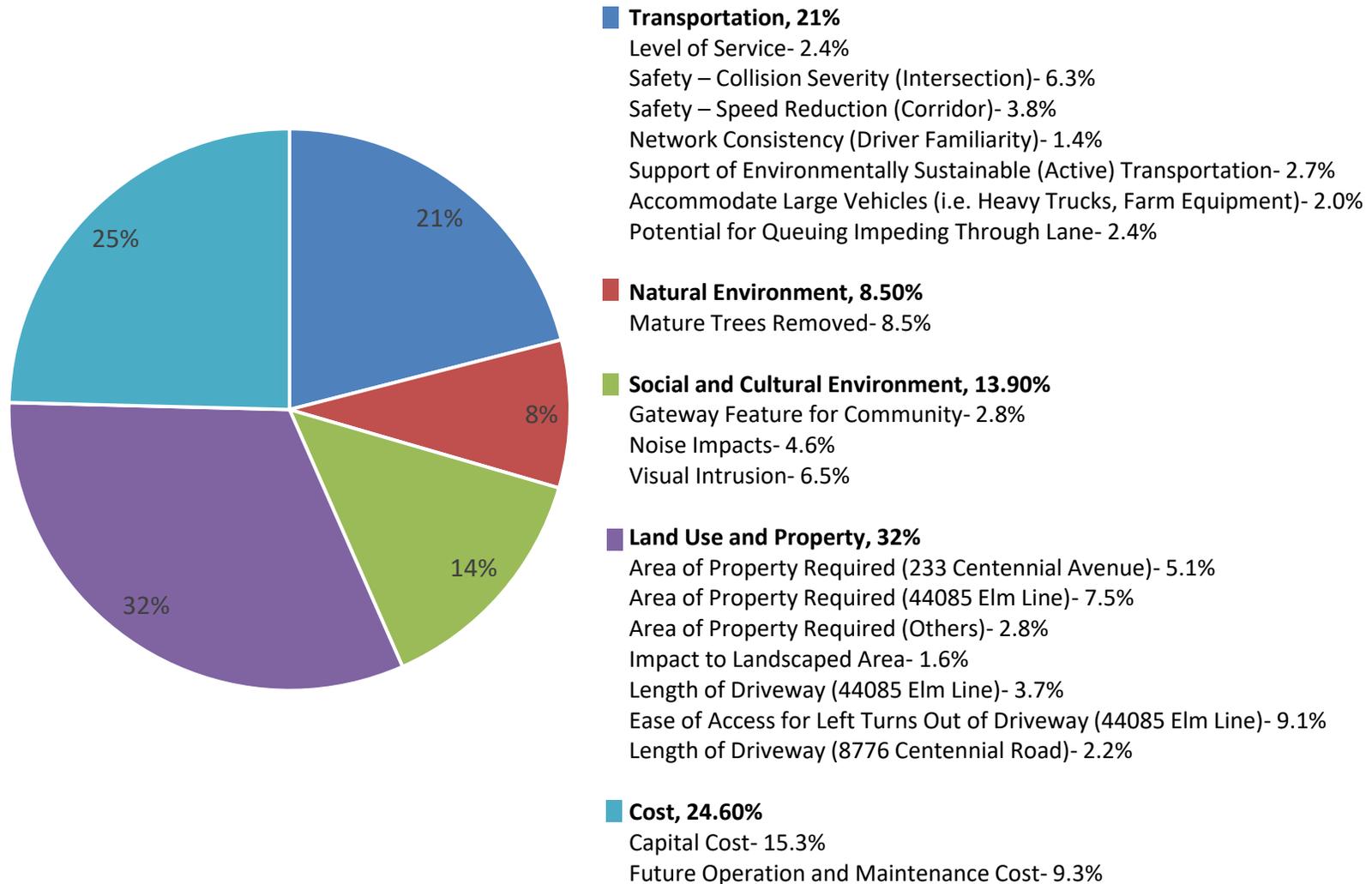
The results of the weighting exercise for each alternative are provided in the following sections.

### 4.3.1 Weighting Results

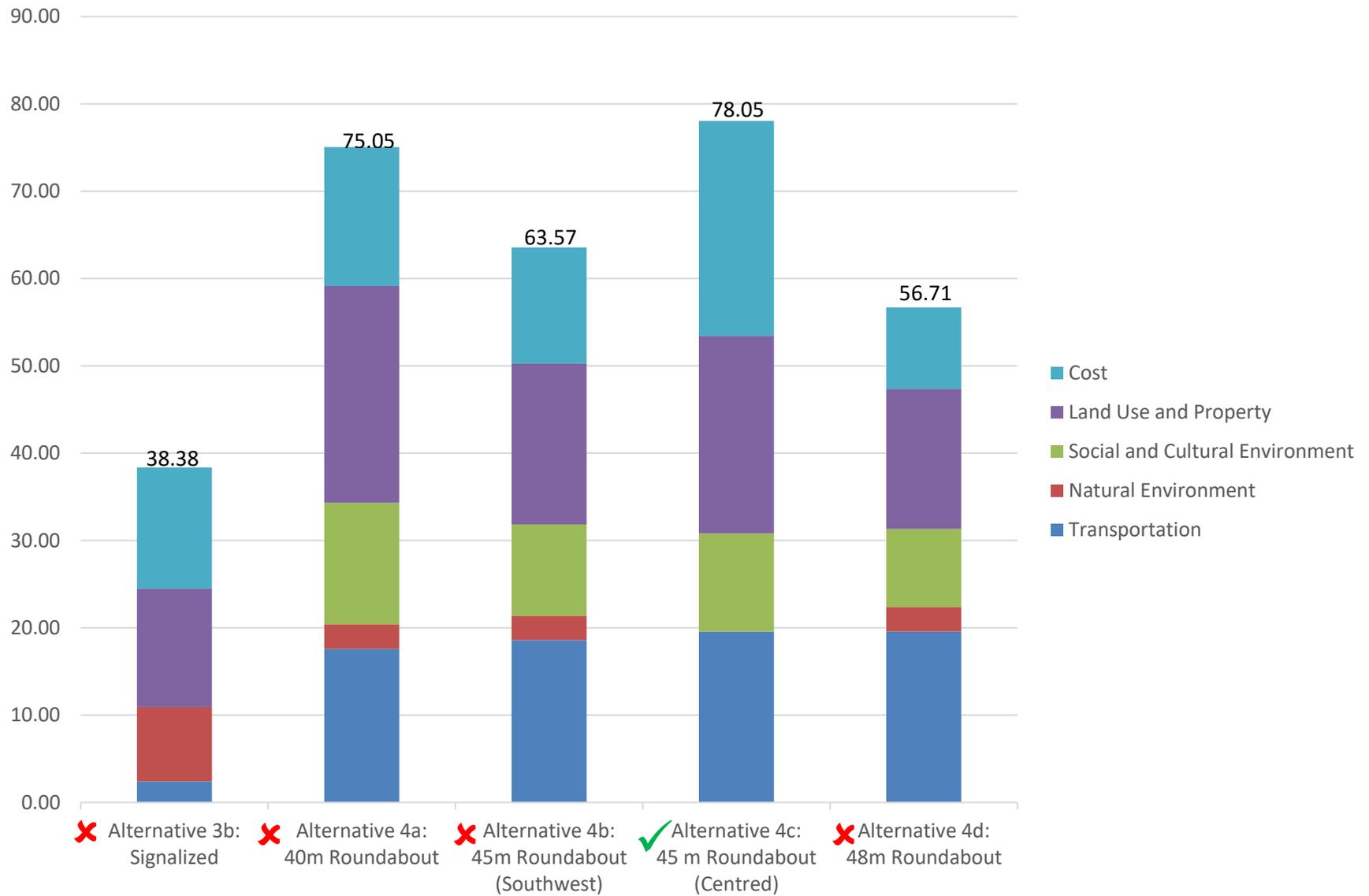
The weighting exercises were carried out by the Project Team. The results of the weighting exercises and the sensitivity tests have been included in the following sections. The sensitivity tests provided the Project Team with an indication of possible trade-offs between indicators.

The Multi Attribute Trade-off System (MATS) evaluation method is a numerical quantitative evaluation methodology based on the weighted additive method. For the purpose of this report, they can be treated as identical terms.

The results of the weights and rankings of the MATS evaluation for the alternatives are illustrated on **Figure 17** and **Figure 18**, respectively, with the results of the weights for each sub-factor shown in **Table 3**. The MATS evaluation ranked Alternative 4C: 45m Roundabout (Centred) as the Technically Preferred Alternative (TPA).



**Figure 17: MATS Weighting Results**



**Figure 18: MATS Evaluation Ranking Results**

**Table 3: MATS Evaluation Weighted Scores**

	<b>Alternative 3b: Signalized</b>	<b>Alternative 4a: 40m Roundabout</b>	<b>Alternative 4b: 45m Roundabout (Southwest)</b>	<b>Alternative 4c: 45 m Roundabout (Centred)</b>	<b>Alternative 4d: 48m Roundabout</b>
<b>Transportation</b>					
Level of Service	0.00	2.39	2.39	2.39	2.39
Safety – Collision Severity (Intersection)	0.00	6.26	6.26	6.26	6.26
Safety – Speed Reduction (Corridor)	0.00	3.82	3.82	3.82	3.82
Network Consistency (Driver Familiarity)	1.43	0.00	0.00	0.00	0.00
Support of Environmentally Sustainable (Active) Transportation	0.00	2.73	2.73	2.73	2.73
Accommodate Large Vehicles (i.e. Heavy Trucks, Farm Equipment)	0.99	0.00	0.99	1.97	1.97
Potential for Queuing Impeding Through Lane	0.00	2.39	2.39	2.39	2.39
<b>TOTAL</b>	<b>2.42</b>	<b>17.60</b>	<b>18.59</b>	<b>19.57</b>	<b>19.57</b>
<b>Natural Environment</b>					
Mature Trees Removed	8.50	2.81	2.81	0.00	2.81
<b>TOTAL</b>	<b>8.50</b>	<b>2.81</b>	<b>2.81</b>	<b>0.00</b>	<b>2.81</b>
<b>Social and Cultural Environment</b>					
Gateway Feature for Community	0.00	2.78	2.78	2.78	2.78
Noise Impacts	0.00	4.59	4.59	4.59	4.59
Visual Intrusion	0.00	6.53	3.07	3.85	1.57
<b>TOTAL</b>	<b>0.00</b>	<b>13.90</b>	<b>10.44</b>	<b>11.22</b>	<b>8.93</b>
<b>Land Use and Property</b>					
Area of Property Required (233 Centennial Avenue)	0.81	5.07	4.97	0.00	4.77

Area of Property Required (44085 Elm Line)	7.50	3.60	1.28	6.53	0.00
Area of Property Required (Others)	0.00	1.75	0.67	2.77	0.08
Impact to Landscaped Area	1.61	1.61	1.61	0.00	1.61
Length of Driveway (44085 Elm Line)	3.66	1.43	0.48	2.71	0.00
Ease of Access for Left Turns Out of Driveway (44085 Elm Line)	0.00	9.14	9.14	9.14	9.14
Length of Driveway (8776 Centennial Road)	0.00	2.24	0.29	1.50	0.45
<b>TOTAL</b>	<b>13.58</b>	<b>24.84</b>	<b>18.43</b>	<b>22.65</b>	<b>16.05</b>
<b>Cost</b>					
Capital Cost	13.88	6.56	3.97	15.25	0.00
Future Maintenance and Operation Cost	0.00	9.35	9.35	9.35	9.35
<b>TOTAL</b>	<b>13.88</b>	<b>15.91</b>	<b>13.31</b>	<b>24.60</b>	<b>9.35</b>
<b>FINAL SCORE</b>	<b>38.38</b>	<b>75.05</b>	<b>63.57</b>	<b>78.05</b>	<b>56.71</b>

#### 4.4 Sensitivity Testing

It should be recognized that the scope of the evaluation and determination of weights for the evaluation criteria are a matter of professional judgment. Accordingly, it is considered essential to conduct sensitivity testing to determine if the nature of the evaluation is sensitive to the weights assigned to each criterion.

There is a spread of values among the groups of evaluators for the selection of weights. The range is dependent on the value judgment of individuals and specialists. Using the average of the group does not necessarily capture what the standard deviation was among the individual scores. Therefore, sensitivity testing is conducted to test a range of weights either higher or lower than the group's average.

For this study, an independent test was undertaken which placed greater or less emphasis on a global factor, and then redistributed the weight to the other factors using the average values of the Project Team. In fact, a separate test was completed for each factor using the highest weight given by anyone in the Project Team as well as the lowest weight.

Following this methodology, a series of tests was completed varying the weight for each global factor. The three tests included:

- Average Project Team Weight
- Highest Weight in a factor group by any Project Team member
- Lowest Weight in a factor group by any Project Team member

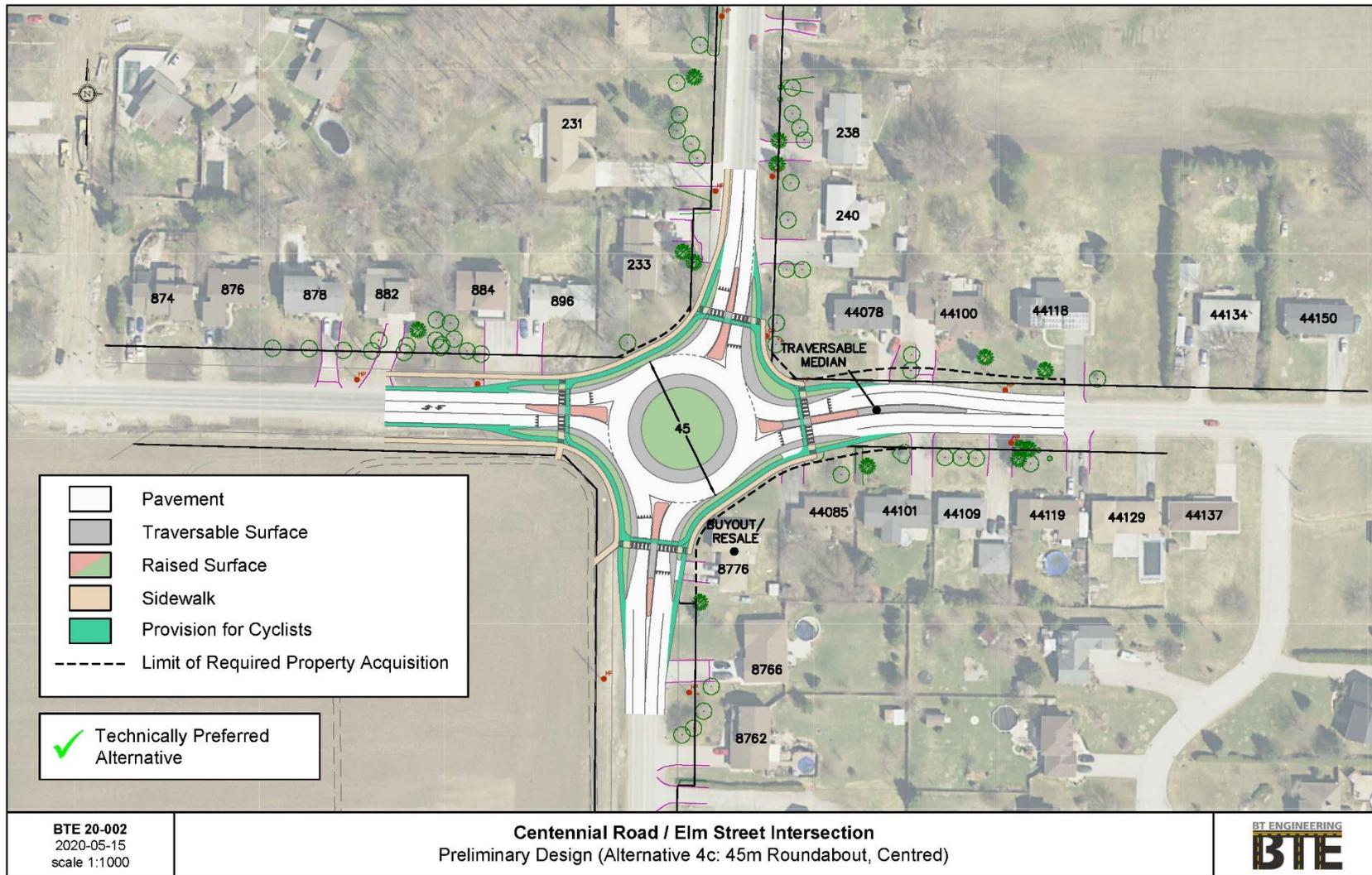
Following this series of tests, the results were reviewed to assess whether the preferred alternative changed when the weights were varied. Using this information alone is not the only justification for selecting a particular alternative, but it provides a level of confidence in the selection and the ability to assess trade-offs. This information is considered and used in the decision-making process before an alternative is recommended to be carried forward. The sensitivity testing is shown in **Table 4**. The sensitivity test results indicate that there were no trade-offs between alternatives.

#### 4.5 Technically Preferred Alternative

The Technically Preferred Alternative (TPA) is **Alternative 4C: 45m Roundabout (Centred)**. The TPA is shown in **Figure 19**.

**Table 4: Sensitivity Testing Results**

		<b>Alternative 3b: Signalized</b>	<b>Alternative 4a: 40m Roundabout</b>	<b>Alternative 4b: 45m Roundabout (Southwest)</b>	<b>Alternative 4c: 45 m Roundabout (Centred)</b>	<b>Alternative 4d: 48m Roundabout</b>
<b>Average Score</b>		38.38	75.05	63.57	78.05	56.71
<b>Average Rank</b>		5	2	3	1	4
<b>Transportation</b>	High	5	2	3	1	4
	Low	5	2	3	1	4
<b>Natural Environment</b>	High	5	2	3	1	4
	Low	5	2	3	1	4
<b>Social and Cultural Environment</b>	High	5	2	3	1	4
	Low	5	2	3	1	4
<b>Land Use and Property</b>	High	5	2	3	1	4
	Low	5	2	3	1	4
<b>Cost</b>	High	5	2	3	1	4
	Low	5	2	3	1	4



**Figure 19: Technically Preferred Alternative**

## 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 fulfills 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
BMP	Best Management Practice
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. This is described as a Part II Order. Also see Part II order.
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	A planning process established for a group of projects in

Assessment Process	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.
Coarse Screening	Initial screening of a group of alternatives. Also see Screening.
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 variable width between two locations. In transportation studies a corridor is a defined area where a new or improved transportation facility might be located.
Criterion(a)	Explicit feature or consideration used for comparison of alternatives.
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 sounds, and hence the predicted sound levels, measured in dBA, are a reasonable accurate approximation of sound levels heard by the human ear.
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.
DFO	Department of Fisheries and Oceans.
Dichotomous Utility Function	A utility function that represents a desirable or undesirable response from a criterion (yes/no, present/absent, true/false).

Dimensionless Number	A number that does not have a unit of measurement, such as length (m), time (s), mass (kg) associated with it. Examples include Utility Score and Overall Score.
Do Nothing Alternative	This alternative is a mandatory requirement of the Class EA. This option is the null or no action alternative and it becomes the baseline to which all alternatives are compared.
Double Counting	Unintentional accounting for a particular factor or attribute more than once in the evaluation.
EA	Environmental Assessment
EA Act	Ontario Environmental Assessment Act (as amended by S.O. 1996 C.27), RSO 1980.
Environment	<ul style="list-style-type: none"> <li>• Air, land or water,</li> <li>• Plant and animal life, including humans,</li> <li>• The social, economic and cultural conditions that influence the life of man or a community,</li> <li>• Any building structure, machine or other device or thing made by man,</li> <li>• Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities or man, or</li> <li>• Any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.</li> </ul>
Environmental Effect	A change in the existing conditions of the environment which may have either beneficial (positive) or detrimental (negative) effects.
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.
Equivalent Sound Level (Leq)	The level of 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.
ESR	Environmental Study Report.

Evaluation	The outcome of a process that appraises the advantages and disadvantages of alternatives.
Evaluation Process	The process involving the identification of criteria, rating of predicted impacts, assignment of weights to criteria, aggregation of weights, and rating to produce an ordering of preference of alternatives.
External Agencies	Include Federal departments and agencies, Provincial ministries and agencies, conservation authorities, municipalities, Crown corporations or other agencies other than the City of Cambridge.
Factor	See Global Factors.
Flyover	A grade separation with the side road over the freeway. Also described as an underpass.
Freeway	Freeway is defined as an existing completed, partially developed (staged) or proposed divided highway with full control of access and grade separated intersections. This definition may include some highways that are not officially designated as freeways.
Function Form	See Utility Function
Grade Separation	The separation of a cross road with a vertical grade difference from the freeway. Also see overpass, underpass or flyover.
Global Factors	The main categories of factors, (i.e. Transportation, Economic Environment, Natural Environment, Social and Cultural, Land Use and Property and Cost). All sub-factors are components or a subset of global factors.
HADD	Harmful Alteration, Disturbance or Destruction of fish habitat.
Harmonized EA Process	Harmonized planning process for this project that will meet both the Provincial and Federal EA requirements.
Individual Environmental Assessment	An Environmental Assessment for an undertaking to which the EA Act applies and which requires formal review and approval under the Act.
Interchange	The intersection between two roadways at different levels with connecting ramps for traffic turning between them.
Linear Utility Function	A function that can be defined using a linear equation of the

form:

$y = a + bx$ , where

y is the dependent variable (raw score)

x is the independent variable (measurement)

b is the slope of the function, and

a is the y intercept, normalized in this study to be equal to one or zero

Matrix	A rectangular array of criteria and values.
Mitigating Measure	A measure that is incorporated into a project to reduce, eliminate or ameliorate detrimental environmental effects.
Mitigation	Taking actions that either remove or alleviate to some degree the negative impacts associated with the implementation of alternatives.
MNRF	Ministry of Natural Resources and Forestry
MOECC	Ministry of the Environment and Climate Change
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.
Overall Score	The final value of an alternative's score derived by summing all of the weighted scores.
Part II Order	The Environmental Assessment Act (EAA) has provisions that allow an 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.
PIC	Public Information Centre
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.
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.
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.
Ranking	The ordering of alternatives from first to last for comparison purposes.
Raw Data	The measurement of the impact, or measured data, under each criterion.
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 measures; 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.
Risk	Probability that a given outcome will or will not materialize. Distinct from uncertainty in that the alternative outcomes are known or defined and that the probability of each is measureable.
Route Alternatives	Location alternatives within a corridor.
SADT	Summer Average Daily Traffic – the average 24-hour, two way traffic for the period from July 1st to August 31st

	including weekends.
Screening	Process of eliminating alternatives from further consideration, which do not meet minimum conditions or categorical requirements.
Step Function	<p>A utility function can be defined by several linear functions within separate ranges that have a slope equal to zero. For this study, two step functions are used:</p> <p>Case A: <math>y = 1</math>, for <math>x =</math> desirable and <math>y = 0</math>, for <math>x =</math> undesirable</p> <p>Case B: <math>y = 1</math> for <math>x =</math> desirable, <math>y = 0.5</math> for <math>x =</math> medium performance and <math>y = 0</math> for <math>x =</math> undesirable</p>
Study Team	The Study Team will include the City of Cambridge and Consultant Technical management team who will lead all technical elements of the study.
Sub-factor	A single criterion used for the evaluation. Each sub-factor is grouped under one of the factors.
TAC	Technical Advisory Committee
TPA	Technically Preferred Alternative
TPP	Technically Preferred Plan
Traceability	Characteristic of an evaluation process which enables its development and implementation to be followed with ease.
Undertaking	In keeping with the definition of the Environmental Assessment act, a project or activity subject to an Environmental Assessment.
Utility Function	A function (linear, step, dichotomous) that represents the Utility Score versus the criterion measurement or desirableness.
Utility Score	The “y” value derived from the Utility Function of the measurement of the impact induced by a particular alternative’s criterion. A measurement of the usefulness or attractiveness of an alternative with respect to an individual evaluation criterion based on its measured effect (a number between 0 and 1). The utility score is dimensionless.
Weight	The importance attributed to a criterion relative to other criterion. The value of the weight is expressed in a percentage and the sum of all criterion weights is equal to

100%.

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Weighted Additive Method

The method used in the quantitative evaluation of alternatives, which reduces the project's numerous criteria into a dimensionless number for each alternative suitable for comparison.

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Weighted Score

A raw score that has been multiplied by the criterion weights. The weighted scores reflect the social value or importance of the specific group providing weights.

# Appendix A

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## Evaluation Methodology Report



## Evaluation Methodology Report

Centennial Road (CR 28) / Elm Line (CR 56) Intersection  
Improvements Municipal Class Environmental Assessment

May 2020

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## 1.0 INTRODUCTION

The County of Elgin (County) has retained BT Engineering Inc. (BTE) to undertake an Environmental Assessment (EA) study to develop a transportation plan for intersection improvements at Centennial Road (County Road 28) and Elm Line (County Road 56) in the Municipality of Central Elgin. This study is being carried out as a Schedule B project in accordance with the Municipal Class Environmental Assessment process. The Analysis and Evaluation process is based on the Ministry of the Environment, Conservation and Parks' (MECP) Evaluation Methods in Environmental Assessment.<sup>1</sup>

This document describes the qualitative and quantitative methods of evaluation and which approaches will be utilized for different groups of alternatives for this study.

An evaluation method may be defined as a formal procedure for establishing an order of preference among alternatives. The use of a formal evaluation method has two main advantages: it provides a better basis for decision-making than would otherwise exist and it results in reasons for decisions that, on examination, can be traced.

The selection of an evaluation method should consider the following generic factors:

- Various evaluation methods have different capabilities which support different planning processes that may be better suited to a particular project or stage of the EA.
- With any particular planning process, all the steps (such as identifying alternatives, selecting criteria, consulting and involving interested parties, as well as evaluating) must be reasonable and provide a systematic assessment of the net effects of the project.

The selection of the appropriate evaluation methodology depends upon the:

- Complexity of the decision-making;
- Number of alternatives;
- Number of criteria; and
- Sensitivity of the decision.

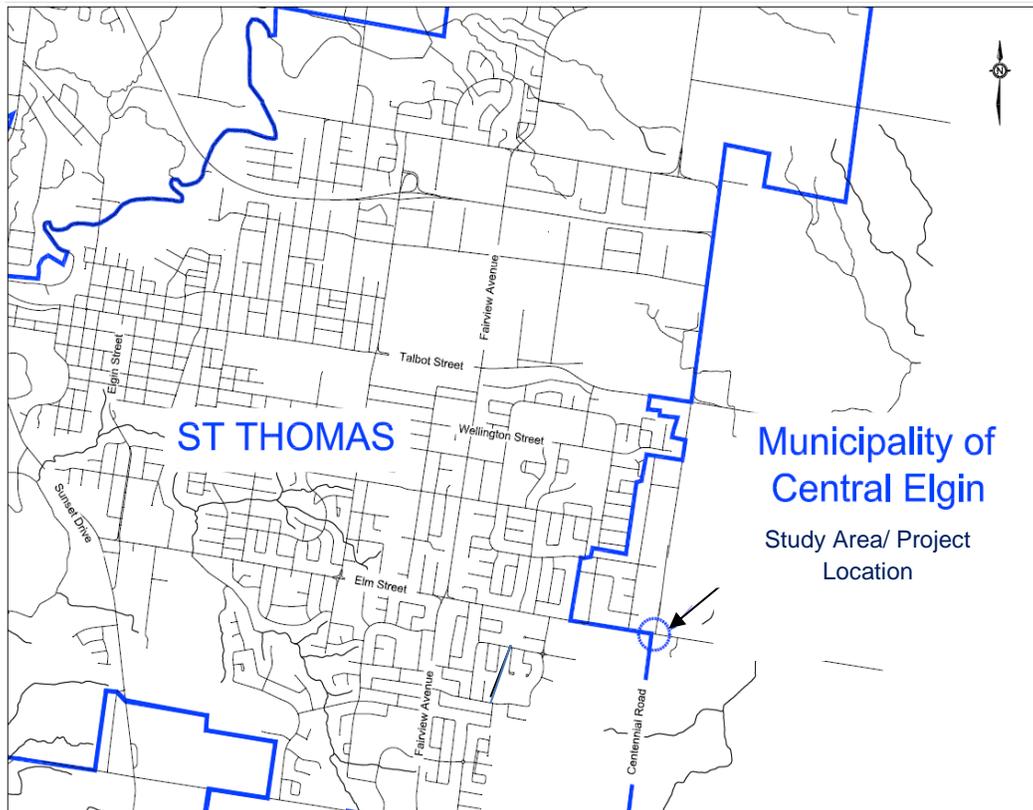
These issues are described in the following sections which explain the rationale for utilizing the most appropriate evaluation methodology in each stage of the EA study.

## 2.0 STUDY AREA

The Study Area is illustrated in **Figure 1**. The Study Area includes the Centennial Road / Centennial Avenue (CR 28) and Elm Street / Elm Line (CR 56) intersection. This intersection is located within the Municipality of Central Elgin at the eastern boundary limits of the City of St. Thomas.

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<sup>1</sup> Evaluation Methods in Environmental Assessment, Ministry of Environment, 1990.



**Figure 1: Study Area/Project Location**

### **3.0 PARTICIPATION**

Public participation is a key component to the success of this project. Early public involvement is encouraged to establish a sound understanding of the public's concerns and views, to identify areas of concern and major study issues, and to establish a working relationship with the public that is amicable and cooperative rather than adversarial.

The County of Elgin has a constitutional duty to consult with Indigenous Communities with traditional land use or interests within the Study Area. Clear, effective and timely consultation with Indigenous Communities is essential to ensure the success of the project.

#### **3.1 Public, Property Owner, and Stakeholder Consultation**

The public will be engaged through the use of an Online Public Information Centre (PIC) and one-on-one meetings with directly affected property owners. This includes meetings and consultation with utilities, businesses and stakeholders that have an interest in providing comments on the design.

### 3.2 Indigenous Peoples Consultation

MECP has identified the Indigenous Peoples communities to be consulted during this study. Indigenous Peoples will be sent invitations by way of a notice at major project milestones.

### 4.0 QUALITATIVE EVALUATION METHODOLOGY

A qualitative evaluation method involves describing impacts in narrative terms, or through qualitative measures, without the explicit specification of criteria, ratings or weights. This method, also known as “professional judgment” is widely used in EA’s to assess “Alternative Planning Solutions”. For example, an EA involving the selection of intersection alternatives might evaluate alternative intersection types in considerable detail using a formal quantitative evaluation, but the evaluation of “Alternatives To” might be done using a simpler qualitative approach. See **Table 1** for a sample qualitative evaluation.

A challenge of the qualitative approach is the difficulty in recognizing when a comparison will have intuitive choice or universal support (public), i.e. a simple decision easily accepted. A qualitative approach may also be less defensible and could be subject to criticism. Should the public or stakeholders question these early decisions, additional information may be required to substantiate or detail the rationale for the early decisions. When alternatives are not systematically compared against a specified set of criteria, it may be difficult to follow how the decision was made and what evidence supports it.

Some advantages of using a qualitative approach over a quantitative approach include: greater simplicity, reduced time and cost, and ease of presentation to the public. A qualitative approach is often used to evaluate alternatives where there is a straightforward conclusion and low public concern. The qualitative approach is also suitable where there are few alternatives and few criteria where there are measurable and meaningful differences between alternatives being considered.

**Table 1: Sample Qualitative Evaluation**

Factor Group	Intersection Alternatives		
	Alternative 1 Two Leg Stop Control	Alternative 2 Three Leg Stop Control	Alternative 3 Roundabout
<b>Transportation</b>			
Traffic Operations	-	-	✓
Safety	-	-	✓
<b>Property/Land Use</b>			
Property Impacts	✓	✓	x
<b>Natural Environment</b>			

Impacts to Natural Environment	-	-	-
<b>Social/Cultural</b>			
Social Environment	-	-	✓
<b>Cost</b>			
Cost	✓	✓	-
Evaluation Results	x	x	✓ Carried forward
✓ Good in Comparison	- Fair/Equal in Comparison	x Poor in Comparison	Preferred Alternative

Where there are few criteria, such as in **Table 1**, it is generally acceptable to use a qualitative analysis because the trade-offs are clear and understandable. The more rigorous definition of the attributes of each alternative, as would be possible using a quantitative approach, is not required because there are a limited number of evaluation factors.

For this study, the qualitative approach will be used to assess Alternative Planning Solutions.

The use of a more comprehensive evaluation technique becomes necessary as the complexity increases (i.e. number of alternatives and number of criteria). In these situations, as described in **Section 5.0**, this study will utilize a quantitative approach.

## 5.0 QUANTITATIVE EVALUATION METHODOLOGY

Key principles of the EA Act and MECP’s Guidelines on Environmental Assessment Planning and Approval are that there be accountability and traceability. A quantitative evaluation method allows both of these key principles to be addressed. A quantitative method based on the “Weighted Additive Method” will be used for this study and is also referred to as the “Multi-Attribute Trade-off System” (MATS).

The Weighted Additive Method has proven to be well suited for the evaluation of complex groups of alternatives. The methodology allows for sensitivity testing and the ability to answer “what if” questions. It is used on projects where the decision-making process is faced with either a large number of alternatives or a large number of competing criteria for the alternatives being evaluated.

The Weighted Additive Method is consistent with MECP practices for the evaluation of alternatives. It avoids many of the pitfalls associated with qualitative assessments by using an analytical approach that measures scores based on a mathematical relationship, i.e. the degree of subjectivity by the evaluators (i.e. the Technical Advisory Committee (TAC)) is minimized. A traceable process allows the TAC and public an opportunity to assess trade-offs involved in the evaluation and use this information in the decision-making process. In addition,

the quantitative method allows sensitivity tests to be performed to determine whether the highest ranked alternative is affected by changing the weights (perspective of importance) of the assessment factors.

For this study, preliminary design alternatives will be compared and scores assigned to each of the various assessment factors, and a sensitivity-testing program will be completed in consultation with the public and external agency interaction.

When using the Weighted Additive Method, each member of the TAC assigns a weight to the global factors and sub-factors. The Average TAC Weight is assigned to each of the alternatives. The alternative with the highest score is selected as the Technically Preferred Alternative (TPA).

This systematic approach includes the following steps:

- Collection of data/environmental inventories
- Development of a long list of reasonable alternatives (including coarse screening of alternatives that are not feasible or unreasonable in comparison to those being carried forward)
- Development of a long list of global evaluation criteria/performance sub-factors
- Short-listing of sub-factors to those where there are meaningful differences among the alternatives to be compared
- Establishing Social Utility Functions (Performance Factors or Function Forms) for the short-listed sub-factors
- Weighting of Evaluation Criteria (assigning importance based on the specific set of alternatives)
- Rating of Alternatives
- Sensitivity Testing
- Selection of the Technically Preferred Alternative (TPA)
- Public Information Centre (PIC)
- Refinements to the Technically Preferred Plan (TPA)
- Recommended Plan

These steps, as they relate to this project, are briefly described in the following sections.

## 5.1 Evaluation Criteria – Factors

The initial step in the evaluation is to develop evaluation criteria from which alternatives will be assessed. This is a two-step process that involves the selection of a “global” group of factors and a number of “local” sub-factors under the global groups.

The global factors groups will be presented to the public and, following this consultation, will be accepted as describing the broad definition of the environment to be evaluated. Global factors considered for this study include:

- Traffic and Transportation;
- Natural Environment;
- Social and Cultural Environment;
- Land Use and Property; and
- Cost.

While these factor groups are the starting point for the evaluation, one or more factors may be removed if it is determined that there is no sub-factor in this category i.e. there is not a meaningful and measurable difference between the alternatives being assessed in this category. When a particular factor is carried forward, then one or more sub-factors are considered under this group. These sub-factors are the individual descriptors for the evaluation. The selection of the sub-factors is very important to the decision-making process because they must adequately describe the issue to be evaluated and the alternatives being compared. See **Table 2** for a preliminary listing of sub-factors. Any information regarding an alternative, where there are differences among alternatives, is incorporated into the decision-making process by including it as a sub-factor. The benefit to incorporating two levels of evaluation criteria (global factors and local sub-factors) is the prevention of the unbalancing of the evaluation (that could occur by adding more criteria under one group). Weights are assigned to the global factors to eliminate any possibility of skewing the results by selecting a large number of sub-factors in one particular factor group.

<b>Table 2: Long List of Evaluation Criteria (Global Factors and Sub-factors)</b>	
<b>Transportation</b>	
1. Level of Service	✓
2. Safety – Collision Severity (Intersection)	✓
3. Safety – Speed Reduction (Corridor)	✓
4. Network Consistency (Driver Familiarity)	✓
5. Support of Environmentally Sustainable (Active) Transportation	✓
6. Accessibility Requirements	x
7. Ease of Accommodating Large Vehicles (i.e. heavy trucks, farm equipment)	✓
8. Potential for Queuing Impeding Through Lane	✓
<b>Natural Environment</b>	

<b>Table 2: Long List of Evaluation Criteria (Global Factors and Sub-factors)</b>	
1. Natural Area(s) Avoidance	x
2. Air Quality	x
3. Aquatic/Terrestrial SAR	x
4. Water Quality – Stormwater Runoff	x
5. Migratory Bird Nesting	x
6. Significant Wildlife Habitat	x
7. ESAs/ANSIs/PSWs	x
8. Mature Trees Removed	✓
9. Air Quality	x
10. Groundwater Source Protection	x
<b>Social and Cultural Environment</b>	
1. Community Cohesion	x
2. Gateway Feature for Community	✓
3. Cultural Heritage Potential	x
4. Archaeological Potential	x
5. Noise Impacts	✓
6. Green Spaces Impacted	x
7. Lighting and Visual Impacts	x
8. Visual Intrusion	✓
9. Excess Materials Management	x
<b>Land Use and Property</b>	
1. Area of Property Required (233 Centennial Avenue)	✓
2. Area of Property Required (8776 Centennial Road)	✓
3. Area of Property Required (44085 Elm Line)	✓
4. Area of Property Required (Others)	✓
5. Impact to Landscaped Area	✓
6. Buyout of 8776 Centennial Road	✓
7. Length of Driveway (44085 Elm Line)	✓
<b>Cost</b>	
1. Life Cycle Cost	✓
2. Future Maintenance and Operation Cost	✓
<b>Legend:</b>	✓ Carried Forward                      x Not Carried Forward

Generally, the process begins by establishing a long list of potential sub-factors through discussions with the public, community associations, the TAC and interest groups or from previous studies of the same nature. Then, for each group of alternatives being evaluated, the sub-factors are reviewed and screened by eliminating those that are considered equal among alternatives being considered as well as those that do not apply to the Study Area, based on the site inventories carried out.

**Table 3** provides a sample of a typical Global Factor, Sub-Factor, Unit and Utility Function Type from a Transportation Study. Similar Global Factor, Sub-factor and Utility functions will be developed for this study.

<b>Table 3: Typical Evaluation Factor and Sub-Factors</b>			
<b>Global Factor</b>	<b>Sub-Factor</b>	<b>Unit</b>	<b>Utility Function Type</b>
<b>Natural Environment</b>	• Natural Area(s) Avoidance	m <sup>2</sup>	Linear
	• Air Quality	High/Medium/Low	Stepped Function
	• Aquatic/Terrestrial SAR	No. of SAR	Linear
	• Water Quality – Stormwater Runoff	m <sup>2</sup>	Linear
	• Migratory Bird Nesting	m <sup>2</sup>	Linear
	• Significant Wildlife Habitat	m <sup>2</sup>	Linear
	• ESAs/ANSIs/PSWs	Yes/No	Dichotomous
	• Mature Trees Removed	No.	Linear
	• Air Quality	High/Medium/Low	Stepped Function

## 5.2 Factor and Sub-factor Weights

The selection of weights for the factors and the sub-factors is based on assessments by the TAC of their relative importance. Within a group of factors, inevitably there is an ordering, with some factors having more importance than others. This is accounted for by each individual assigning a weight to each factor, which is reflected in the “Factor Weight” and “Sub-Factor Weight” columns. An example of typical results is shown in **Table 4**.

<b>Table 4: Sample TAC Average Weights for a Factor Group and Sub-Factors in that Group</b>		
<b>Factors</b>	<b>TAC</b>	
	<b>Factor Weight</b>	<b>Sub-Factor Weight</b>
<b>Transportation</b>	40.9%	
• Level of Service		25.9%

**Table 4: Sample TAC Average Weights for a Factor Group and Sub-Factors in that Group**

Factors	TAC	
	Factor Weight	Sub-Factor Weight
• Safety – Collision Severity (Intersection)		32.4%
• Safety – Speed Reduction (Corridor)		12.4%
• Network Consistency (Driver Familiarity)		4.3%
• Support of Environmentally Sustainable (Active) Transportation		5.6%
• Ease of Accommodating Large Vehicles (i.e. heavy trucks, farm equipment)		14.7%
• Potential for Queuing Impeding Through Lane		4.7%
	<b>Total</b>	<b>100%</b>

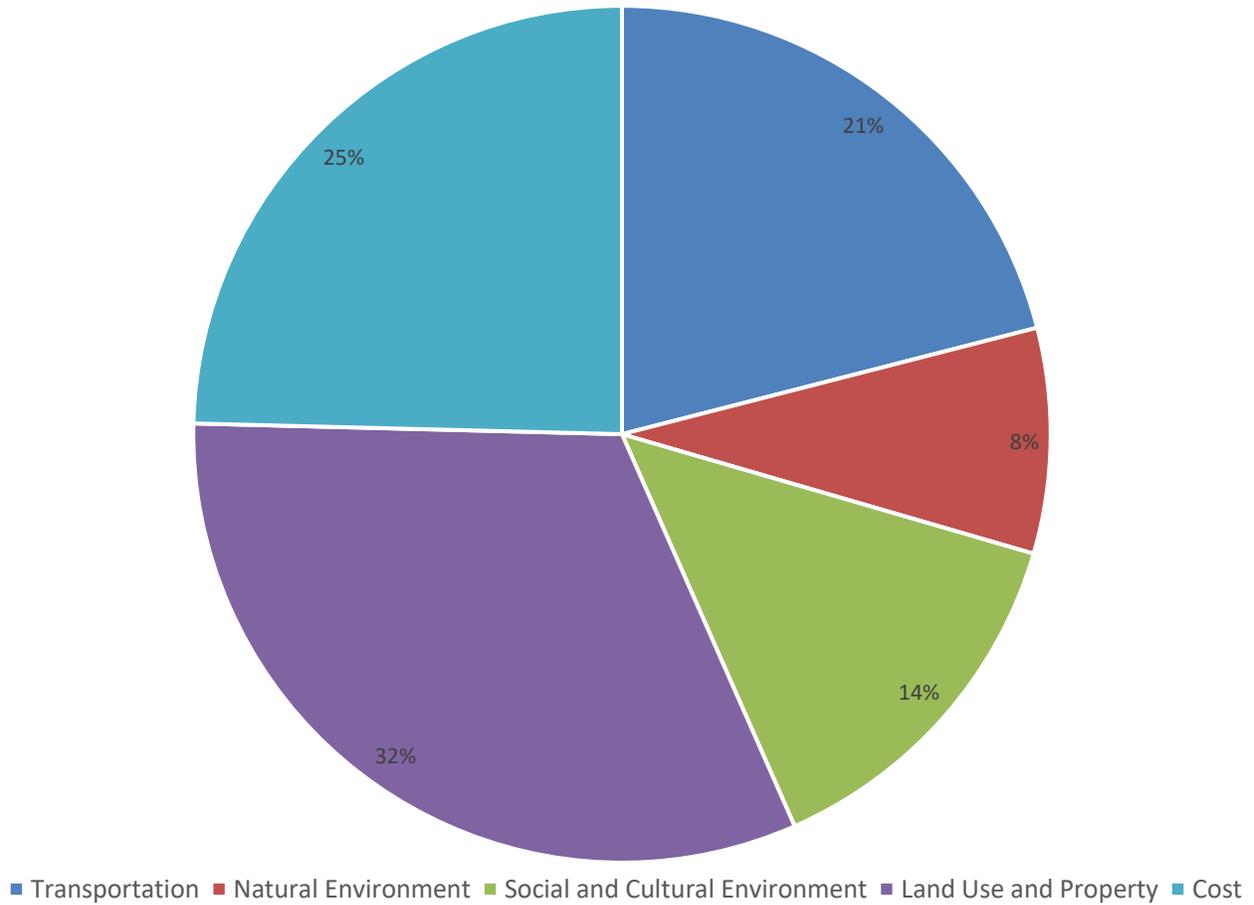
As shown in **Table 4** in this example, the group of evaluators judged the Traffic and Transportation Factor Group to be valued at 40.9% of the overall importance of the decision between the alternatives being considered.

Within each Factor Group, the sum of the percentage weights of all sub-factors listed under each factor totals 100%. As shown in **Table 4**, several of the sub-factors were judged to be more important/less important when compared to each other for this specific evaluation of alternatives being considered.

The weights for each factor and sub-factor are determined by averaging the weights assigned by the TAC (Evaluation Committee). Each member gives a judgement of the importance of each global factor and local sub-factor (a percentage value) based on his or her personal assessment and professional judgement, considering the net effects and input of stakeholders and the public.

There is usually a range of perspectives in deciding the weights (importance) of factors and sub-factors. Every person assigning weights has a personal perspective and understanding of the scope of the project. Hence, there is an advantage to having a diversified team of professionals with varied backgrounds performing the evaluation.

An example of the weighting of each of the global factors is shown in **Figure 2**. The weighting of sub-factors within each factor group would be a similar distribution among the available sub-factors.



**Figure 2: Sample Weighting of Global Factors**

### 5.3 Social Utility Functions

The Weighted Additive Method used to evaluate alternatives relates the performance or attractiveness of alternatives using a mathematical relationship. This includes two variables: the first is the raw data or measured or modelled data, and the second is the utility or utility score, which is the measure of attractiveness of the alternative.

For this project, the relationship between these two variables is described, as shown in **Figure 3**, by either a dichotomous, stepped, or linear social utility function. A dimensionless utility score between zero (0) and 1 is assigned to an alternative for each sub-factor. The

shape of this function can vary from linear to stepped or exponential and is defined by a subject area specialist.

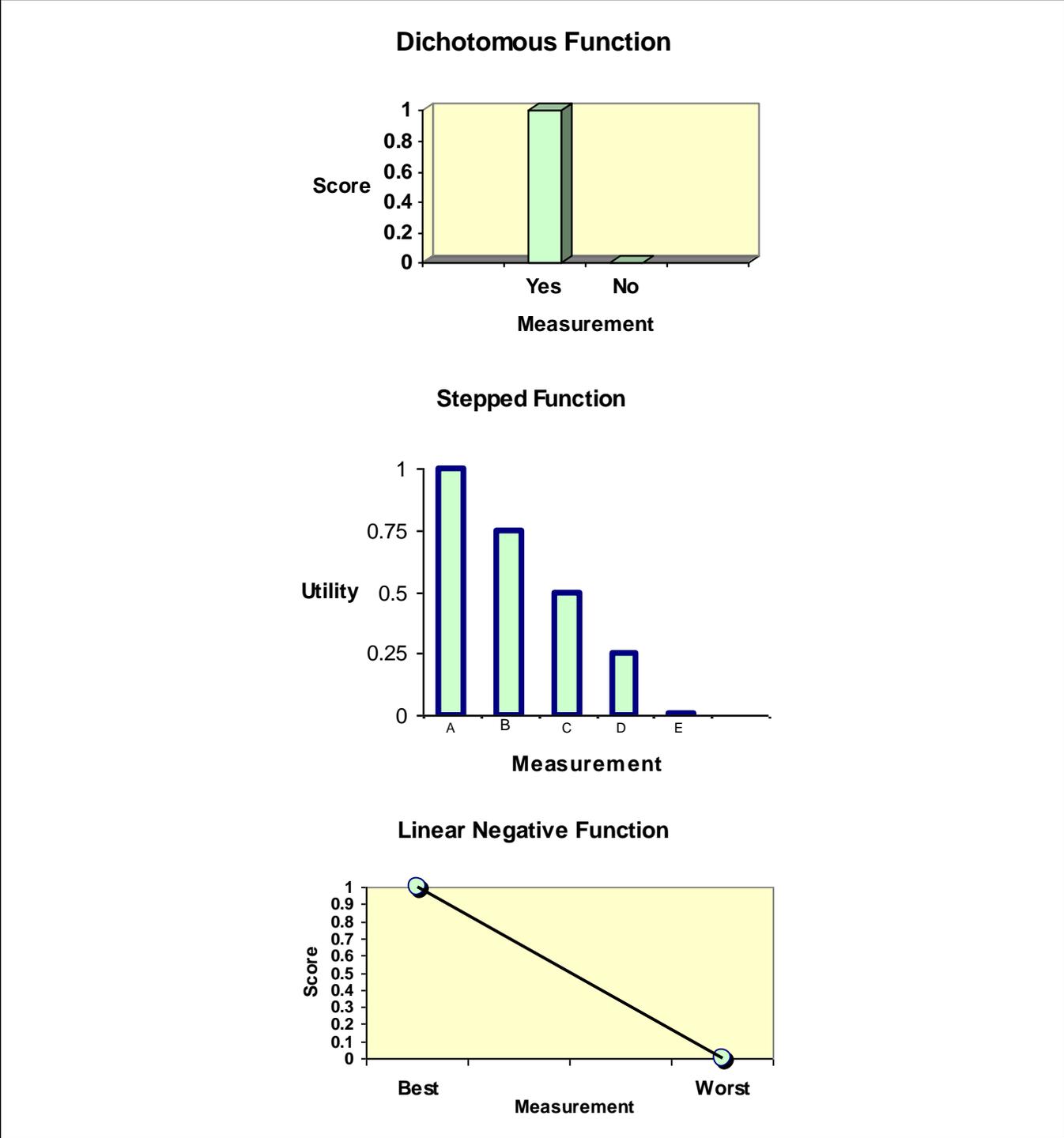
The use of utility curves or functions is a step that transforms each of the measured effects to a dimensionless number and measure of utility. This step is required because the effects of each sub-factor are measured in different units (length, area, time, volume, dollars etc.). To produce a mathematical measure of the performance, each effect is translated to a measure of utility. The combined effect or performance of each alternative is a measure of utility (attractiveness) which is a dimensionless measure. The utility function (also commonly described as performance factor or function form) defines the relationship of effect to the attractiveness (utility). These utility functions are defined by subject area specialists in their field of study.

Examples of Social Utility Functions for the “Ease of Maintenance” sub-factor definition are shown in **Figure 4**.

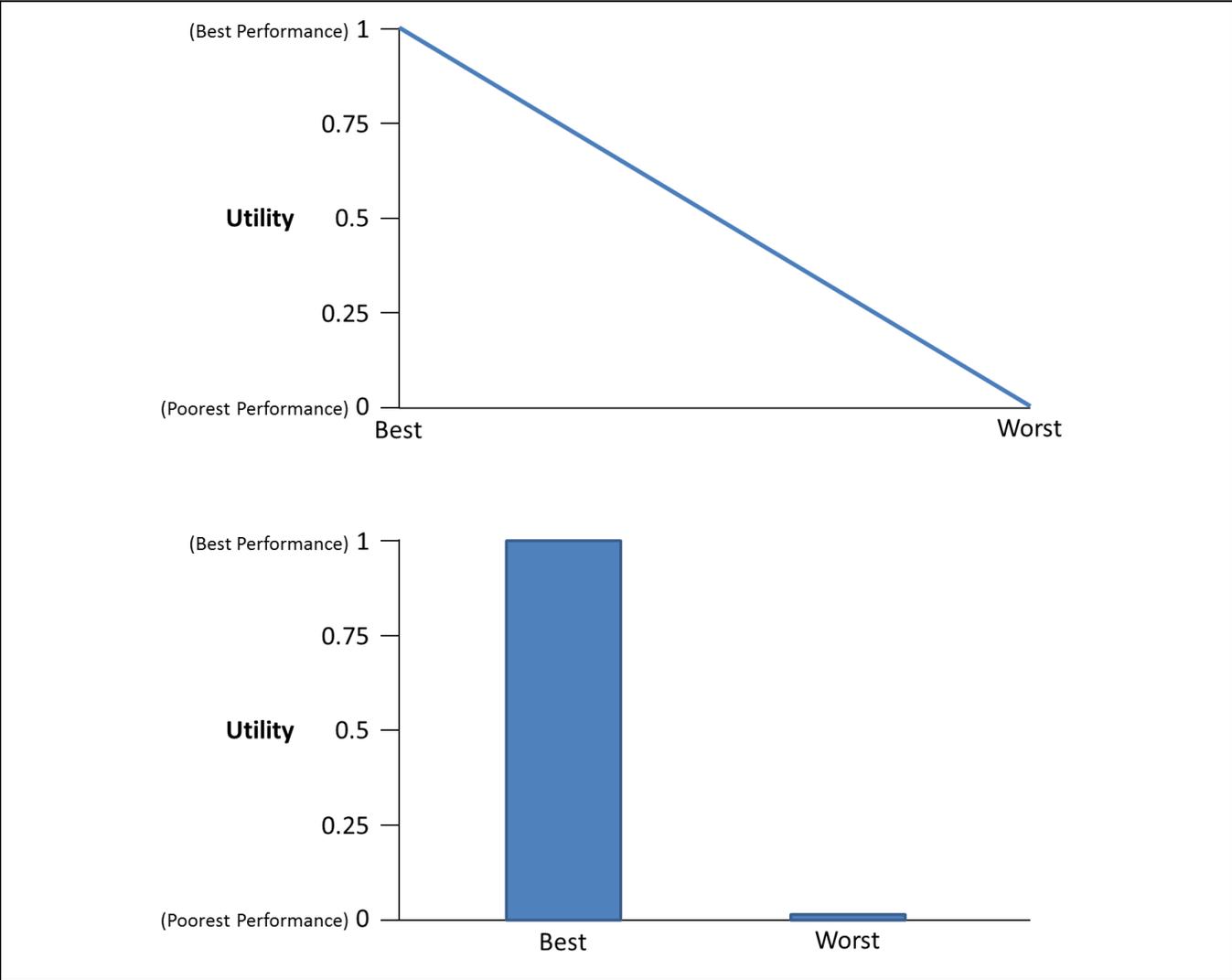
A dichotomous utility function enables the decision-maker to establish criteria that presents an “either–or” situation (desirable or undesirable, negative or positive, present or absent). If it is decided beforehand that a “yes” answer is desirable, then a utility score of one would be assigned to this criterion, otherwise zero would be assigned. One or zero are the available alternatives; no other utility score is available.

A linear function is used to convert scores for sub-factors that have varying measurements. Given a measurement, a unique utility score between zero and one can be assigned to a sub-factor. The slope of the linear utility function can be negative or positive depending on the desirability of the impact.

Figure 3: Sample Utility Functions



**Figure 4: Social Utility Function**



## 5.4 Weighted Score

The total un-weighted utility score of a given alternative can be expressed as:

$$U (\text{Alternative A}) = \emptyset_1 X_1 + \emptyset_2 X_2 \dots + \emptyset_n X_n, \text{ where}$$

**U (A) = Total un-weighted utility score for Alternative A**

**$\emptyset_1$  = attractiveness with respect to parameters**

**$X_1$  = measurement of parameter X**

Weighted scores are computed using the weights selected by the TAC. The weighted score for each alternative under a specific sub-factor is calculated as follows:

$$(\text{weighted score}) = (\text{utility score} \times [(\text{factor weight}) \times (\text{sub-factor weight})])$$

Using this approach, a generic weighted attractiveness function can be expressed as:

$$U_w (\text{Alternative A}) = U_1 W_1 + U_2 W_2 + \dots + U_n W_n$$

**OR**

$$U_w (\text{Alternative A}) = W_1 \emptyset_1 X_1 + W_2 \emptyset_2 X_2 \dots + W_n \emptyset_n X_n$$

Where:      U = Total un-weighted utility score for Alternative A  
               $U_w (A)$  = Total weighted utility score for Alternative A  
               $W_1$  = Weighted parameter (factor weight x sub-factor weight)  
               $\emptyset_1$  = Attractiveness with respect to parameter 1  
               $X_1$  = Measurement of parameter

The weighted scores of all the sub-factors are then added to give total score for each alternative.

$$U_w(A) = \sum_{X=1}^n W_n \emptyset_n X_n$$

## 5.5 Rating Alternatives

Following the selection of evaluation factors and sub-factors, measurements of the impacts are made using topographic plans, field surveys, and numerical modelling. These

measurements result in data being available under each of the evaluation criteria from which ratings are made for each alternative.

The Weighted Additive Method focuses on the differences of the alternative, addresses the complexity of the base data collected and provides a traceable and defensible decision-making process. This process is a numerical calculation where alternative scores are determined through the use of a mathematical relationship to equate impacts to scores. It eliminates any possible subjective opinions of scores for alternatives because the team does not estimate the score for an alternative.

The scores for each alternative under each of the respective sub-factors are normalized based on measured impacts. Social utility functions are defined to relate impacts to the attractiveness of an alternative. This means that under each sub-factor, the alternative receives an un-weighted rating of between zero and one based on these measurements. The mathematical relationships for calculating scores are developed in consultation with the TAC.

## **5.6 Sensitivity Testing Program**

It should be recognized that the scope of the evaluation and determination of weights for the evaluation criteria are a matter of personal and professional judgement. Accordingly, it is considered essential to conduct sensitivity testing to determine the effect of changing weights assigned to each criterion.

To test how sensitive the outcome of the evaluation is with respect to the assigned weights (i.e. would the result have changed if different weights were used), a sensitivity testing program is undertaken. This results in greater confidence in the selection process and reduces the potential that the average weights bias the outcome of the evaluation.

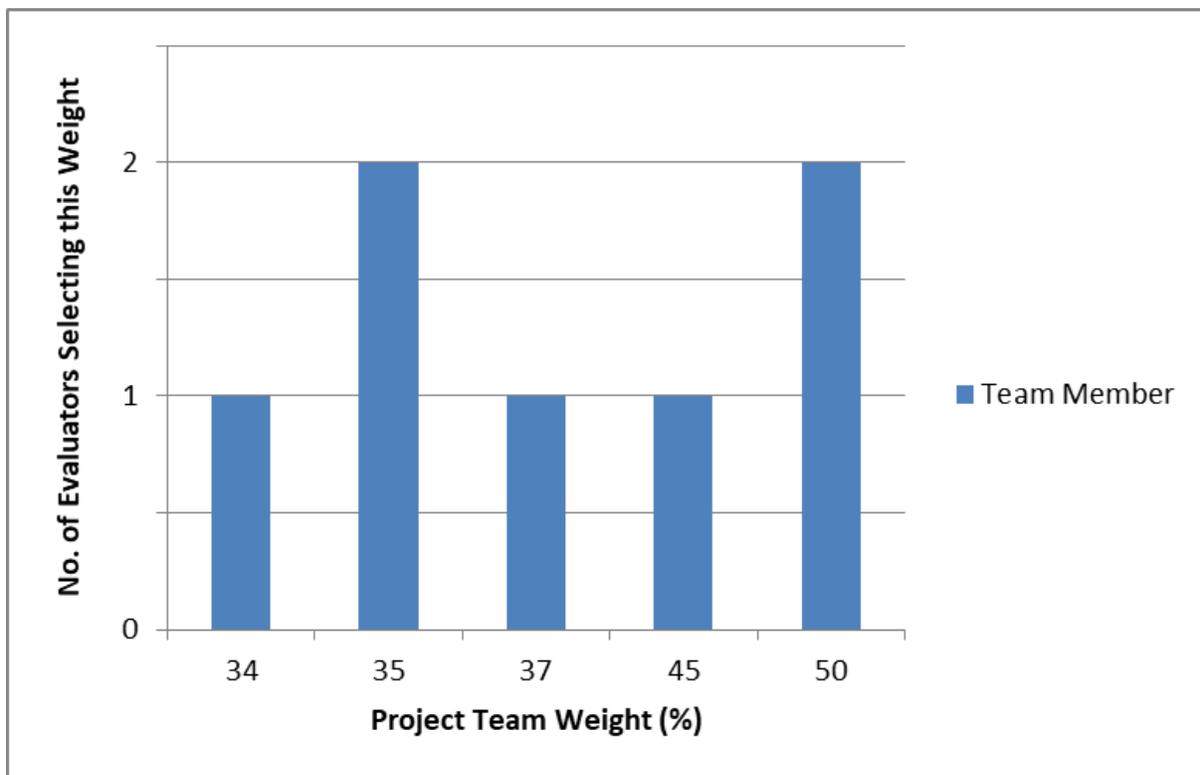
Often, there is a diversity of opinion in the group as to what weight is appropriate for a factor or sub-factor. When an average weight is used to capture the preferences of the group it loses valuable information on the range of values of the group. To test the range of perspective of the TAC, the highest and lowest weights suggested by anyone in the group are defined as a reasonable range of weights to test. A series of sensitivity tests are performed for the evaluation of alternatives. This allows the team an opportunity to assess the outcome of the evaluation if different weights (different perspectives of importance) are assigned to the factors and sub-factors from the average weights defined by the TAC members. In this way, trade-offs can be identified, credibility can be achieved with the public, and “what if” questions can be answered quickly. See **Figure 5** for an example of the typical range of project team weights and for a sample ranking of alternatives, refer to **Table 5**.

Following the above methodology, a series of tests can be performed varying the weights for each global factor. These tests include:

- Average TAC Team Weight
- Highest Weight by any Team Member
- Lowest Weight by any Team Member

Following this series of tests, the results can be reviewed to assess whether the preferred alternative changes when the weights are varied.

Using this information alone is not the only justification for selecting a particular alternative, but it does provide a level of confidence in the selection. This information is used in the decision-making process before the TPAs are recommended to be carried forward.



**Figure 5: Sample Range of Weights for Traffic and Transportation**

**Table 5: Sample Ranking of Alternatives**

Testing	Weight	Alt 1A	Alt 1A'	Alt 1B	Alt 1C
TAC Average Team Scores	N/A	2	1	3	4
High Traffic and Transportation	65%	2	1	3	4
Low Traffic and Transportation	30%	2	1	3	4
High Natural Environment	20%	2	1	3	4
Low Natural Environment	5%	1	2	3	4
High Economic Environment	30%	1	2	3	4
Low Economic Environment	5%	2	1	3	4

### 5.7 Selection of Technically Preferred Alternative(s)

The TPA is determined by considering the technical analysis, environmental considerations and comments of all study participants. The TPA is then presented to the public and external stakeholders. This allows for any comments or questions regarding the proposed design.

It should be recognized that the information and conclusions obtained using the evaluation method are only tools used to assist in the evaluation process and identifying trade-offs. In the end, it is the TAC (Evaluation Committee) which makes the final decision on the selection of the TPA(s), using both the information obtained throughout the evaluation process and their individual experience and expertise, and through additional input from senior management on funding availability or other program constraints.

The findings of the analysis and evaluation process will be included as a component of the EA Process and documented in the Transportation Environmental Study Report. The principles and methodology of the EA process assist the TAC in the analysis and evaluation of alternatives and the selection of the TPA. The public and government agencies have the opportunity to provide input throughout the course of the study.

## Glossary of Terms

<b>AASHTO</b>	American Association of State and Highway Transportation Officials
<b>Adjacent</b>	Adjacent indicates lying near MTO or Municipal roadway rights-of-way, although not necessarily contiguous to them.
<b>Aesthetics</b>	Methods of providing visual relief and appealing characteristics to planned noise barriers thorough the application of landscaping designs.
<b>Alternative</b>	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”.
<b>Coarse Screening</b>	Initial screening of a group of alternatives. Also see Screening.
<b>COH</b>	Community Open House
<b>Criterion (Criteria)</b>	Explicit feature or consideration used for comparison of alternatives.
<b>Dichotomous Utility Function</b>	A utility function that represents a desirable or undesirable response from a criterion (yes/no, present/absent, true/false).
<b>Dimensionless Number</b>	A number that does not have a unit of measurement, such as length (m), time (s), mass (kg) associated with it. Examples include Utility Score and Overall Score.
<b>Do Nothing Alternative</b>	This alternative is a mandatory requirement of the Class EA. This alternative is the null or no action alternative and it becomes the baseline to which all alternatives are compared.
<b>Double Counting</b>	Unintentional accounting for a particular factor or attribute more than once in the evaluation.
<b>EA</b>	Environmental Assessment
<b>Evaluation</b>	The outcome of a process that appraises the advantages and disadvantages of alternatives.
<b>Evaluation Criteria</b>	See Criteria.
<b>Evaluation Process</b>	The process involving the identification of criteria, rating of predicted impacts, assignment of weights to criteria, aggregation of weights, and rating to produce an ordering of preference of alternatives.

<b>Factor</b>	See Global Factors.
<b>Freeway</b>	Freeway is defined as an existing completed, partially developed (staged) or proposed divided highway with full control of access and grade separated intersections. This definition may include some highways that are not officially designated as freeways.
<b>Function Form</b>	See Utility Function
<b>Global Factors</b>	The main categories of factors, (i.e. Transportation, Economic Environment, Natural Environment, Social and Cultural, Land Use and Property and Cost). All sub-factors are components or a subset of global factors.
<b>Linear Utility Function</b>	<p>A function that can be defined using a linear equation of the form:</p> $y = a + bx, \text{ where}$ <p>y is the dependent variable (raw score)                      x is the independent variable (measurement)                      b is the slope of the function, and                      a is the y intercept, normalized in this study to be equal to one or zero</p>
<b>Matrix</b>	A rectangular array of criteria and values.
<b>MATS</b>	Multi-Attribute Trade-off System
<b>MECP</b>	Ministry of the Environment, Conservation and Parks
<b>Mitigation</b>	Taking actions that either remove or alleviate to some degree the negative impacts associated with the implementation of alternatives.
<b>MTO</b>	Ministry of Transportation of Ontario
<b>Overall Score</b>	The final value of an alternative's score derived by summing all of the weighted scores.
<b>Performance Factor</b>	See Utility Function
<b>Ranking</b>	The ordering of alternatives from first to last for comparison purposes.
<b>Raw Data</b>	The measurement of the impact, or measured data, under each criterion.

<b>Risk</b>	Probability that a given outcome will or will not materialize. Distinct from uncertainty in that the alternative outcomes are known or defined and that the probability of each is measurable.
<b>Screening</b>	Process of eliminating alternatives from further consideration, which do not meet minimum conditions or categorical requirements.
<b>Sensitivity Tests</b>	A series of tests to assess the robustness of the evaluation and alternative scores.
<b>Step Function</b>	<p>A utility function can be defined by several linear functions within separate ranges that have a slope equal to zero. For this study, two step functions are used:</p> <p>Case A: <math>y = 1</math>, for <math>x = \text{desirable}</math> and <math>y = 0</math>, for <math>x = \text{undesirable}</math></p> <p>Case B: <math>y = 1</math> for <math>x = \text{desirable}</math>, <math>y = 0.5</math> for <math>x = \text{medium performance}</math> and <math>y = 0</math> for <math>x = \text{undesirable}</math></p>
<b>Sub-factor</b>	A single criterion used for the evaluation. Each sub-factor is grouped under one of the factors.
<b>TAC</b>	Technical Advisory Committee
<b>TPA</b>	Technically Preferred Alternative
<b>Traceability</b>	Characteristic of an evaluation process which enables its development and implementation to be followed with ease.
<b>Transportation Environmental Study Report (TESR)</b>	This report is prepared in compliance with the EA Act requirements and the Ministry of the Environment and Climate Change for acceptance, approval, informational or monitoring purposes and the public record.
<b>Utility Function</b>	A function (linear, step, dichotomous) that represents the Utility Score versus the criterion measurement or desirableness.
<b>Utility Score</b>	The “y” value derived from the Utility Function of the measurement of the impact induced by a particular alternative’s criterion. A measurement of the usefulness or attractiveness of an alternative with respect to an individual evaluation criterion based on its measured effect (a number between 0 and 1). The utility score is dimensionless.
<b>Weight</b>	The importance attributed to a criterion relative to other criterion. The value of the weight is expressed in a percentage

and the sum of all criterion weights is equal to 100%.

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<b>Weighted Additive Method</b>	The method used in the quantitative evaluation of alternatives, which reduces the project's numerous criteria into a dimensionless number for each alternative suitable for comparison.
<b>Weighted Score</b>	A raw score that has been multiplied by the criterion weights. The weighted scores reflect the social value or importance of the specific group providing weights.

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## Appendix B

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### Evaluation Criteria



## Evaluation Criteria

# Centennial Road (CR 28) / Elm Line (CR 56) Intersection Improvements Municipal Class Environmental Assessment

April 2020

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**Prepared by:**  
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# **Evaluation Criteria**

## **Long-List of Evaluation Criteria**

Factors and Sub-Factors	Unit of Measure	Carried Forward Y - Yes N - No	Remarks
<b>Transportation</b>			
Level of Service	High/Medium/Low	Y	
Safety – Collision Severity (Intersection)	High/Medium/Low	Y	
Safety – Speed Reduction (Corridor)	Yes/No	Y	
Network Consistency (Driver Familiarity)	Yes/No	Y	
Support of Environmentally Sustainable (Active) Transportation	Yes/No	Y	
Accessibility Requirements	Yes/No	N	All considered equal
Ease of Accommodating Large Vehicles (i.e. heavy trucks, farm equipment)	High/Medium/Low	Y	
Potential for Queuing Impeding Through Lane	Yes/No	Y	
<b>Natural Environment</b>			
Natural Area(s) Avoidance	m <sup>2</sup>	N	
Air Quality	High/Medium/Low	N	All considered equal
Aquatic/Terrestrial SAR	No. SAR	N	None identified
Water Quality – Stormwater Runoff	m <sup>2</sup>	N	All considered equal
Migratory Bird Nesting	m <sup>2</sup>	N	All considered equal
Significant Wildlife Habitat	m <sup>2</sup>	N	None identified
ESAs/ANSIs/PSWs	Yes/No	N	None identified
Mature Trees Removed	No.	Y	
Air Quality	High/Medium/Low	N	Carbon emissions (negligible change)
Groundwater Source Protection	Yes/No	N	All considered equal
<b>Social and Cultural Environment</b>			
Community Cohesion	High/Medium/Low	N	All considered equal
Gateway Feature for Community	Yes/No	Y	
Cultural Heritage Potential	m <sup>2</sup>	N	All considered equal
Archaeological Potential	m <sup>2</sup>	N	All considered equal
Noise Impacts	High/Medium/Low	Y	
Green Spaces Impacted	Yes/No	N	See Land Use and Property
Lighting and Visual Impacts	High/Medium/Low	N	All considered equal
Visual Intrusion	m	Y	
Excess Materials Management	Yes/No	N	All considered equal

Factors and Sub-Factors	Unit of Measure	Carried Forward Y - Yes N - No	Remarks
<b>Land Use and Property</b>			
Area of Property Required (233 Centennial Avenue)	m <sup>2</sup>	Y	
Area of Property Required (8776 Centennial Road)	m <sup>2</sup>	N	
Area of Property Required (44085 Elm Line)	m <sup>2</sup>	Y	
Area of Property Required (Others)	m <sup>2</sup>	Y	
Impact to Landscaped Area	Yes/No	Y	
Buyout of 8776 Centennial Road	Yes/No	N	
Length of Driveway (44085 Elm Line)	m <sup>2</sup>	Y	
Ease of Access for Left Turns Out of Driveway (44085 Elm Line)	Yes/No	Y	
Length of Driveway (8776 Centennial Road)	m	Y	
<b>Cost</b>			
Capital Cost	\$	Y	
Future Maintenance and Operation Cost	High/Medium/Low	Y	

# **Evaluation Criteria**

## **Short-List of Evaluation Criteria**

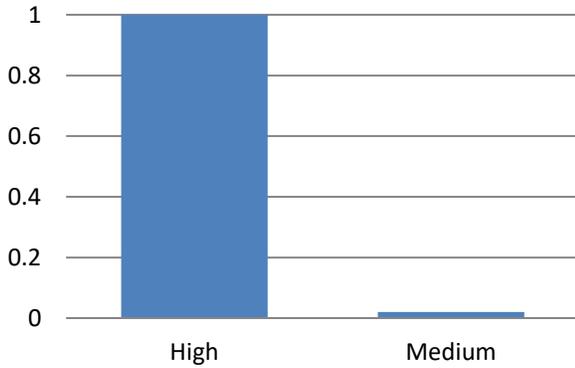
Factors and Sub-Factors	Unit of Measure	Carried Forward Y - Yes N - No	Remarks
<b>Transportation</b>			
Level of Service	High/Medium/Low	Y	
Safety – Collision Severity (Intersection)	High/Medium/Low	Y	
Safety – Speed Reduction (Corridor)	Yes/No	Y	
Network Consistency (Driver Familiarity)	Yes/No	Y	
Support of Environmentally Sustainable (Active) Transportation	Yes/No	Y	
Ease of Accommodating Large Vehicles (i.e. heavy trucks, farm equipment)	High/Medium/Low	Y	
Potential for Queuing Impeding Through Lane	Yes/No	Y	
<b>Natural Environment</b>			
Mature Trees Removed	No.	Y	
<b>Social and Cultural Environment</b>			
Gateway Feature for Community	Yes/No	Y	
Noise Impacts	High/Medium/Low	Y	
Visual Intrusion	m	Y	
<b>Land Use and Property</b>			
Area of Property Required (233 Centennial Avenue)	m <sup>2</sup>	Y	
Area of Property Required (8776 Centennial Road)	m <sup>2</sup>	Y	
Area of Property Required (44085 Elm Line)	m <sup>2</sup>	Y	
Area of Property Required (Others)	m <sup>2</sup>	Y	
Impact to Landscaped Area	Yes/No	Y	
Buyout of 8776 Centennial Road	Yes/No	Y	
Length of Driveway (44085 Elm Line)	m <sup>2</sup>	Y	
Ease of Access for Left Turns Out of Driveway (44085 Elm Line)	Yes/No	Y	
Length of Driveway (8776 Centennial Road)	m	Y	
<b>Cost</b>			
Capital Cost	\$	Y	
Future Maintenance and Operation Cost	High/Medium/Low	Y	

# **Evaluation Criteria**

## **Subfactor Definitions**

## Transportation

### Level of Service



**Definition:** This subfactor measures the operational performance (level of service) for each intersection alternative taking into consideration congestion, delays, etc.

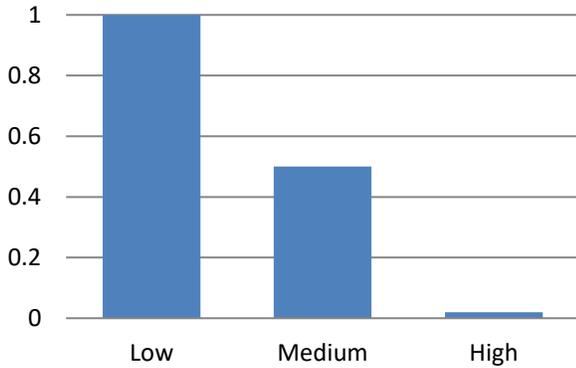
**Mitigation:** None.

### Alternatives:

Alternative	High/Medium	Utility Score
Alternative 3b: Signalized Skewed Intersection	Medium	0
Alternative 4a: 40m Roundabout	High	1
Alternative 4b: 45m Roundabout (Southwest)	High	1
Alternative 4c: 45m Roundabout (Centred)	High	1
Alternative 4d: 48m Roundabout	High	1

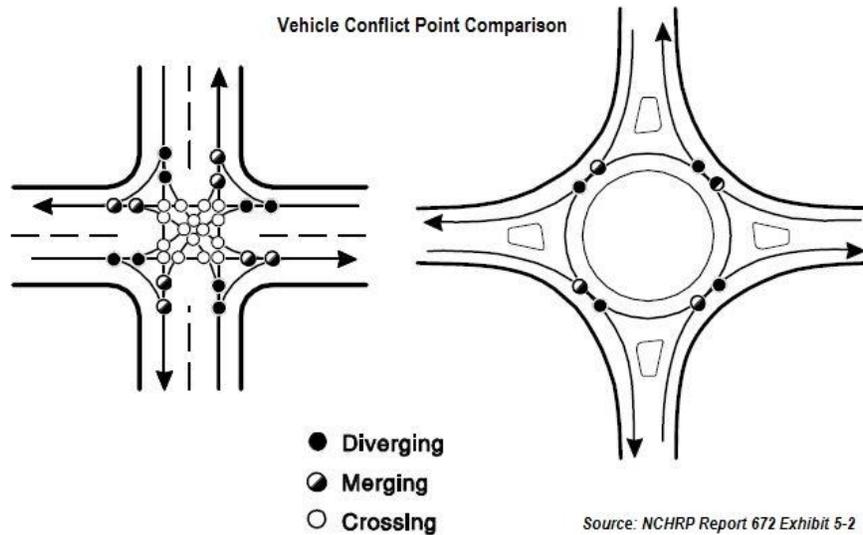
## Transportation

### Safety – Collision Severity (Intersection)



**Definition:** This criterion reflects the potential collision severity. Those alternatives with roundabouts are judged to provide the greatest level of safety (fewer conflict points).

**Mitigation:** None.

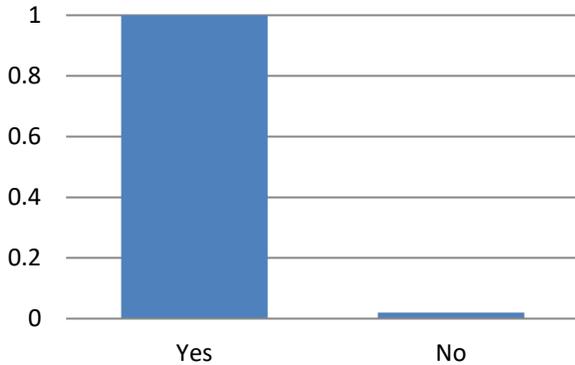


**Alternatives:**

Alternative	High/Medium/Low	Utility Score
Alternative 3b: Signalized Skewed Intersection	High	0
Alternative 4a: 40m Roundabout	Low	1
Alternative 4b: 45m Roundabout (Southwest)	Low	1
Alternative 4c: 45m Roundabout (Centred)	Low	1
Alternative 4d: 48m Roundabout	Low	1

## Transportation

### Safety – Speed Reduction (Corridor)



**Definition:** This subfactor measures the safety of the intersection approaches and the ability of the intersection to induce lower operation speeds on Elm Street west of the intersection. Low operating speeds improve safety in the urban area. Roundabouts are preferred as they require vehicles to travel at a lower speed.

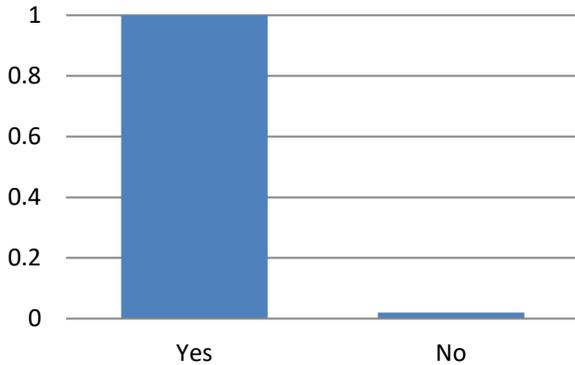
**Mitigation:** None.

#### Alternatives:

Alternative	Yes/No	Utility Score
Alternative 3b: Signalized Skewed Intersection	No	0
Alternative 4a: 40m Roundabout	Yes	1
Alternative 4b: 45m Roundabout (Southwest)	Yes	1
Alternative 4c: 45m Roundabout (Centred)	Yes	1
Alternative 4d: 48m Roundabout	Yes	1

## Transportation

### Network Consistency (Driver Familiarity)



**Definition:** This subfactor measures the consistency (driver familiarity) of the intersection type compared to what is expected in Elgin County. A signalized intersection is the most common intersection type in the area. St. Thomas now has two roundabouts on arterial roads.

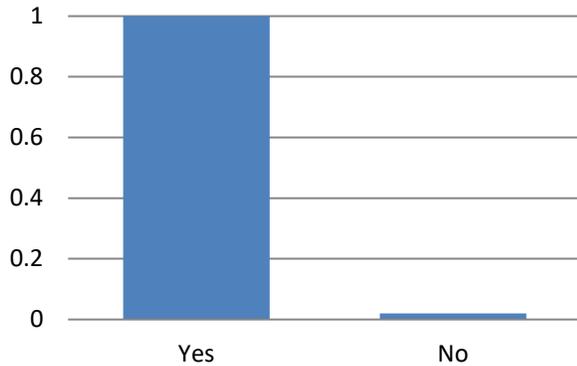
**Mitigation:** None.

#### Alternatives:

Alternative	Yes/No	Utility Score
Alternative 3b: Signalized Skewed Intersection	Yes	1
Alternative 4a: 40m Roundabout	No	0
Alternative 4b: 45m Roundabout (Southwest)	No	0
Alternative 4c: 45m Roundabout (Centred)	No	0
Alternative 4d: 48m Roundabout	No	0

## Transportation

### Support of Environmentally Sustainable (Active) Transportation



**Definition:** This subfactor measures the ability of the alternatives to accommodate pedestrians and cyclists. Roundabout alternatives are preferred as they have improved safety for pedestrians/cyclists (two-stage crossing with lower travel speeds and right-of-way over motorists). Data from the Region of Waterloo which has compared signalized and roundabout traffic control have identified roundabouts as having improved safety.

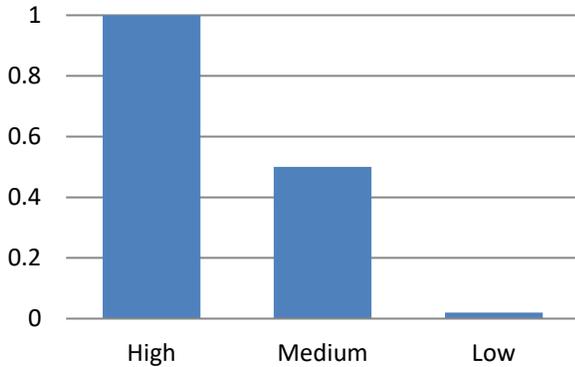
**Mitigation:** None.

#### Alternatives:

Alternative	Yes/No	Utility Score
Alternative 3b: Signalized Skewed Intersection	No	0
Alternative 4a: 40m Roundabout	Yes	1
Alternative 4b: 45m Roundabout (Southwest)	Yes	1
Alternative 4c: 45m Roundabout (Centred)	Yes	1
Alternative 4d: 48m Roundabout	Yes	1

## Transportation

### Ease of Accommodating Large Vehicles (i.e. heavy trucks, farm equipment)



**Definition:** This subfactor measures the ease with which heavy trucks (WB-20.5) and farm equipment (i.e. combines) are able to maneuver through the intersection.

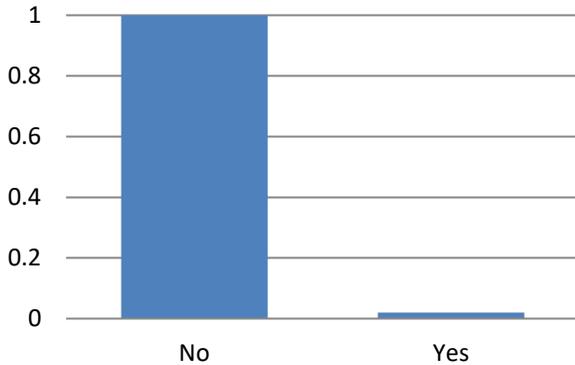
**Mitigation:** Widened shoulders.

#### Alternatives:

Alternative	High/Medium/Low	Utility Score
Alternative 3b: Signalized Skewed Intersection	Medium	0.5
Alternative 4a: 40m Roundabout	Low	0
Alternative 4b: 45m Roundabout (Southwest)	Medium	0.5
Alternative 4c: 45m Roundabout (Centred)	High	1
Alternative 4d: 48m Roundabout	High	1

## Transportation

### Potential for Queuing Impeding Through Lanes



**Definition:** This subfactor measures the potential for turning vehicles to queue into the through lanes. Roundabout alternatives are preferred as they allow continuous traffic movements.

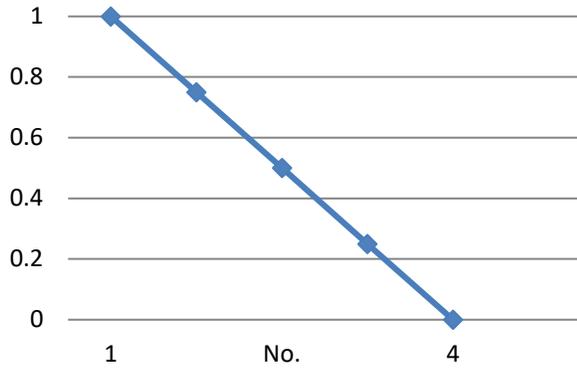
**Mitigation:** Additional storage length for turn lanes.

#### Alternatives:

Alternative	Yes/No	Utility Score
Alternative 3b: Signalized Skewed Intersection	Yes	0
Alternative 4a: 40m Roundabout	No	1
Alternative 4b: 45m Roundabout (Southwest)	No	1
Alternative 4c: 45m Roundabout (Centred)	No	1
Alternative 4d: 48m Roundabout	No	1

## Natural Environment

### Mature Trees Removed



**Definition:** This subfactor measures the number of mature trees removed to accommodate the intersection improvements.

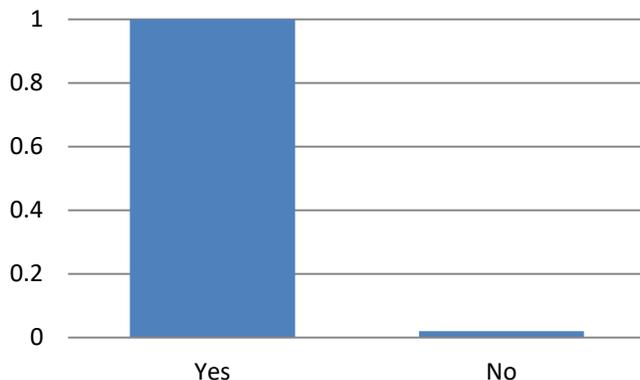
**Mitigation:** Replanting of trees removed.

#### Alternatives:

Alternative	No.	Utility Score
Alternative 3b: Signalized Skewed Intersection	1	1
Alternative 4a: 40m Roundabout	2	0.33
Alternative 4b: 45m Roundabout (Southwest)	2	0.33
Alternative 4c: 45m Roundabout (Centred)	4	0
Alternative 4d: 48m Roundabout	2	0.33

## Social and Cultural Environment

### Gateway Feature for Community



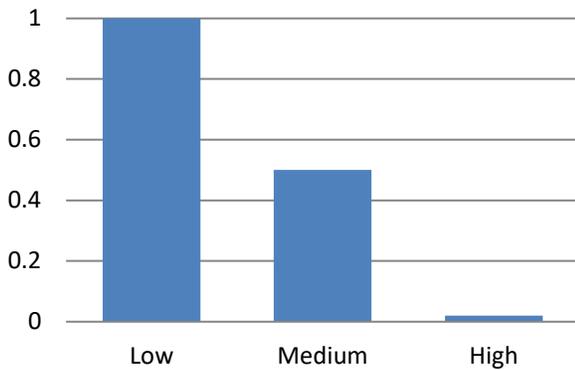
**Definition:** This subfactor measures the ability to construct a gateway feature into Elgin County and the City of St. Thomas. Roundabout alternatives that include greenspace and a centre island to accommodate a gateway feature are preferred.

#### Alternatives:

Alternative	Yes/No	Utility Score
Alternative 3b: Signalized Skewed Intersection	No	0
Alternative 4a: 40m Roundabout	Yes	1
Alternative 4b: 45m Roundabout (Southwest)	Yes	1
Alternative 4c: 45m Roundabout (Centred)	Yes	1
Alternative 4d: 48m Roundabout	Yes	1

## Social and Cultural Environment

### Noise Impacts



**Definition:** This subfactor measures whether an alternative may increase noise levels as a result of stop-and-go traffic through the intersection. Roundabout alternatives are preferred because they allow continuous traffic movements.

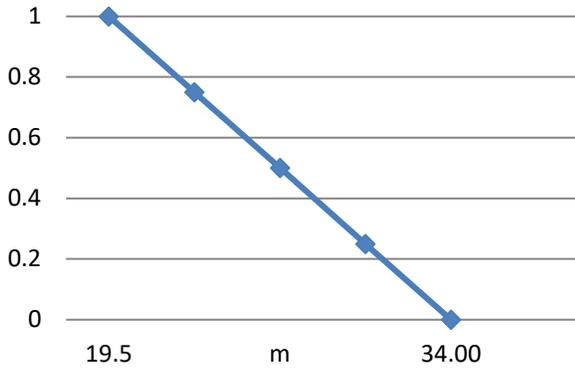
**Mitigation:** None.

#### Alternatives:

Alternative	High/Medium/Low	Utility Score
Alternative 3b: Signalized Skewed Intersection	High	0
Alternative 4a: 40m Roundabout	Low	1
Alternative 4b: 45m Roundabout (Southwest)	Low	1
Alternative 4c: 45m Roundabout (Centred)	Low	1
Alternative 4d: 48m Roundabout	Low	1

## Social and Cultural Environment

### Visual Intrusion



**Definition:** This subfactor measures the distance from the intersection improvements to the remaining houses where the travelled lane is moved closer to the residential houses.

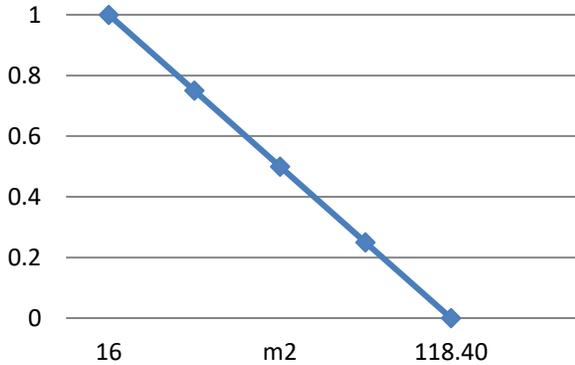
**Mitigation:** Landscaping.

#### Alternatives:

Alternative	m (approx.)	Utility Score
Alternative 3b: Signalized Skewed Intersection	28	0.00
Alternative 4a: 40m Roundabout	19.5	1.00
Alternative 4b: 45m Roundabout (Southwest)	24	0.47
Alternative 4c: 45m Roundabout (Centred)	23	0.59
Alternative 4d: 48m Roundabout	26	0.24

## Land Use and Property

### Area of Property Required (233 Centennial Avenue)



**Definition:** This subfactor measures the area of property at 233 Centennial Avenue to be acquired by the County to accommodate intersection improvements.

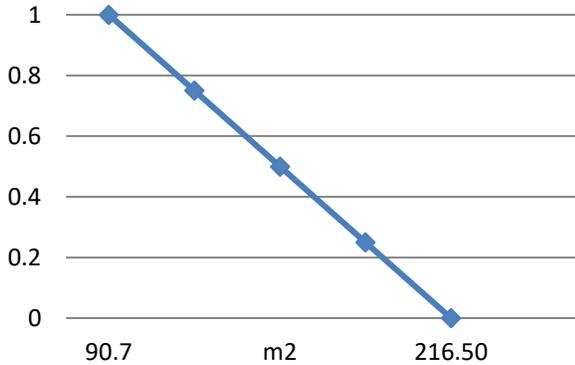
**Mitigation:** Payment at fair market value.

### Alternatives:

Alternative	m <sup>2</sup> (approx.)	Utility Score
Alternative 3b: Signalized Skewed Intersection	102.3	0.16
Alternative 4a: 40m Roundabout	16.0	1.00
Alternative 4b: 45m Roundabout (Southwest)	18.1	0.98
Alternative 4c: 45m Roundabout (Centred)	118.4	0.00
Alternative 4d: 48m Roundabout	22.4	0.94

## Land Use and Property

### Area of Property Required (44085 Elm Line)



**Definition:** This subfactor measures the area of property at 44085 Elm Line to be acquired by the County to accommodate intersection improvements.

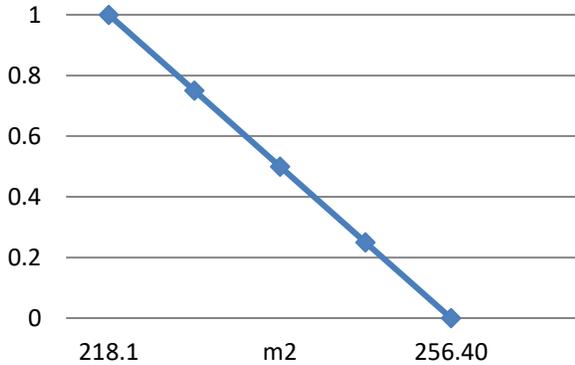
**Mitigation:** Payment at fair market value.

### Alternatives:

Alternative	m <sup>2</sup> (approx.)	Utility Score
Alternative 3b: Signalized Skewed Intersection	90.7	1.00
Alternative 4a: 40m Roundabout	156.5	0.48
Alternative 4b: 45m Roundabout (Southwest)	195.5	0.17
Alternative 4c: 45m Roundabout (Centred)	107.3	0.87
Alternative 4d: 48m Roundabout	216.5	0.00

## Land Use and Property

### Area of Property Required (Others)



**Definition:** This subfactor measures the area of property to be acquired by the County to accommodate intersection improvements. This does not include property required at 233 Centennial Avenue, 8776 Centennial Road or 44085 Elm Line.

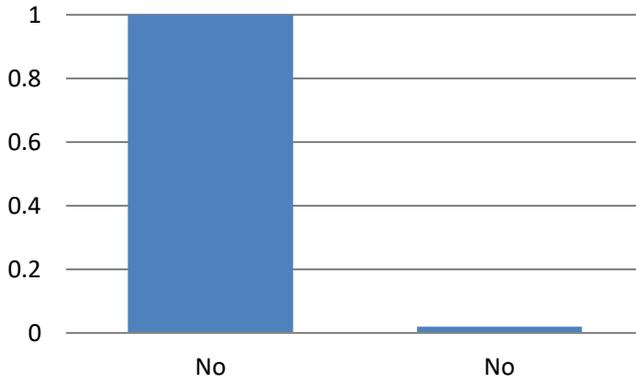
**Mitigation:** Payment at fair market value.

### Alternatives:

Alternative	m <sup>2</sup> (approx.)	Utility Score
Alternative 3b: Signalized Skewed Intersection	256.4	0.00
Alternative 4a: 40m Roundabout	232.4	0.63
Alternative 4b: 45m Roundabout (Southwest)	247.1	0.24
Alternative 4c: 45m Roundabout (Centred)	218.1	1.00
Alternative 4d: 48m Roundabout	255.3	0.03

## Land Use and Property

### Impact to Landscaped Area



**Definition:** This subfactor measures if the landscaped area on 233 Centennial Avenue that needs to be removed. Alternatives that do not require this land are preferred.

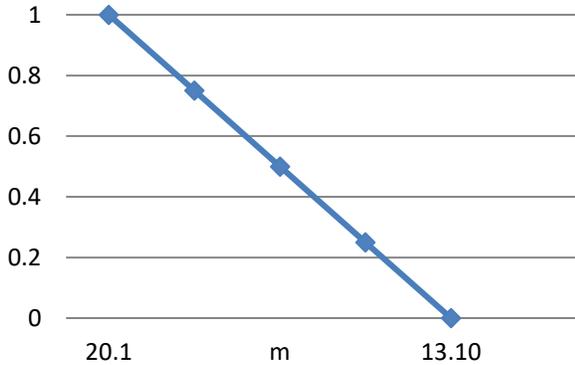
**Mitigation:** Replacement of landscaping.

#### Alternatives:

Alternative	Yes/No	Utility Score
Alternative 3b: Signalized Skewed Intersection	No	1
Alternative 4a: 40m Roundabout	No	1
Alternative 4b: 45m Roundabout (Southwest)	No	1
Alternative 4c: 45m Roundabout (Centred)	Yes	0
Alternative 4d: 48m Roundabout	No	1

## Land Use and Property

### Length of Driveway (44085 Elm Line)



**Definition:** This criterion measures the length of driveway provided to 44085 Elm Line. Some alternatives will result in a shortened driveway to accommodate intersection improvements. Alternatives with a longer driveway are preferred.

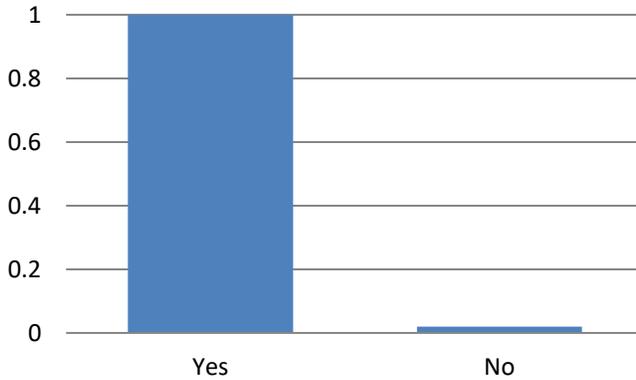
**Mitigation:** None.

#### Alternatives:

Alternative	m	Utility Score
Alternative 3b: Signalized Skewed Intersection	20.1	1.00
Alternative 4a: 40m Roundabout	15.8	0.39
Alternative 4b: 45m Roundabout (Southwest)	14.0	0.13
Alternative 4c: 45m Roundabout (Centred)	18.3	0.74
Alternative 4d: 48m Roundabout	13.1	0.00

## Land Use and Property

### Ease of Access for Left Turns out of Driveway (44085 Elm Line)



**Definition:** This criterion measures the ease of access for left turns out of 44085 Elm Line. Signalized alternatives do not allow vehicles to turn left out of the driveway if cars are queued at the intersection.

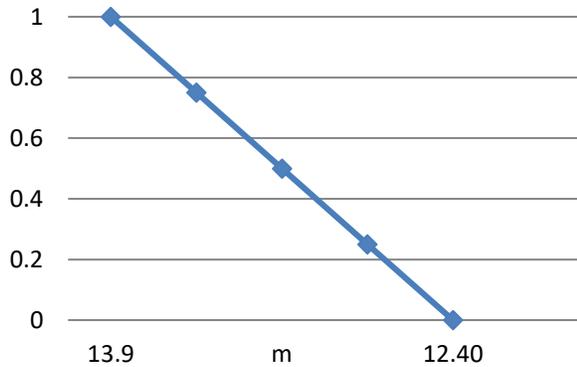
**Mitigation:** None.

#### Alternatives:

Alternative	Yes/No	Utility Score
Alternative 3b: Signalized Skewed Intersection	No	0
Alternative 4a: 40m Roundabout	Yes	1
Alternative 4b: 45m Roundabout (Southwest)	Yes	1
Alternative 4c: 45m Roundabout (Centred)	Yes	1
Alternative 4d: 48m Roundabout	Yes	1

## Land Use and Property

### Length of Driveway (8776 Centennial Road)



**Definition:** This criterion measures the length of driveway provided to 8776 Centennial Road (for resale). Some alternatives will result in a shortened driveway to accommodate intersection improvements. Alternatives with a longer driveway are preferred.

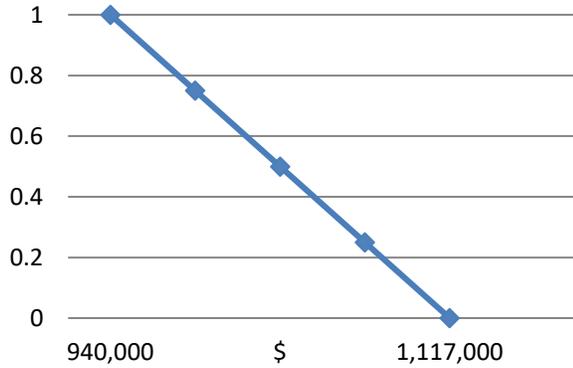
**Mitigation:** None.

#### Alternatives:

Alternative	m	Utility Score
Alternative 3b: Signalized Skewed Intersection	12.4	0.00
Alternative 4a: 40m Roundabout	13.9	1.00
Alternative 4b: 45m Roundabout (Southwest)	12.6	0.13
Alternative 4c: 45m Roundabout (Centred)	13.4	0.67
Alternative 4d: 48m Roundabout	12.7	0.20

## Cost

### Capital Cost



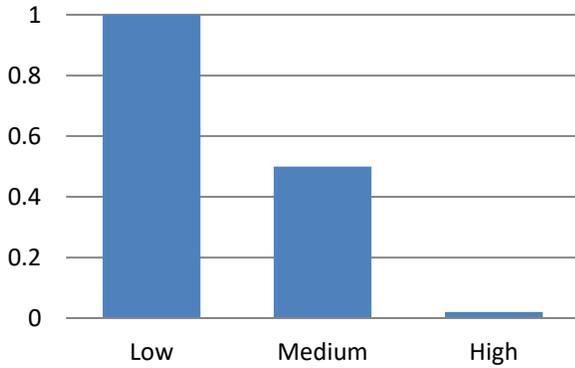
**Definition:** This subfactor measures the capital cost to construct the intersection improvements. This includes the cost of construction, property acquisition and utilities.

### Alternatives:

Alternative	\$	Utility Score
Alternative 3b: Signalized Skewed Intersection	960,000.00	0.91
Alternative 4a: 40m Roundabout	1,070,000.00	0.43
Alternative 4b: 45m Roundabout (Southwest)	1,110,000.00	0.26
Alternative 4c: 45m Roundabout (Centred)	940,000.00	1.00
Alternative 4d: 48m Roundabout	1,170,000.00	0.00

## Cost

### Future Maintenance and Operation Cost



**Definition:** This subfactor measures the cost to maintain and operate the intersection. Roundabout alternatives have lower equipment and electricity costs but require more maintenance. Roundabouts are preferred.

### Alternatives:

Alternative	High/Medium/Low	Utility Score
Alternative 3b: Signalized Skewed Intersection	High	0
Alternative 4a: 40m Roundabout	Low	1
Alternative 4b: 45m Roundabout (Southwest)	Low	1
Alternative 4c: 45m Roundabout (Centred)	Low	1
Alternative 4d: 48m Roundabout	Low	1