Appendix K

Analysis and Evaluation

BT ENGINEERING

Analysis and Evaluation Report

County of Essex County Road 46 from Highway 401 to County Road 19, Town of Tecumseh Concession Roads 8 and 9 from County Road 46 northerly to the Town Boundary

Environmental Assessment Study

July 2025

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1.0 INTRODUCTION

The County of Essex has initiated an Environmental Assessment (EA) Study to develop an operational plan for County Road 46 from the City of Windsor boundary southeasterly to County Road 19. Part of the EA Study involves improvements to the Town of Tecumseh Concession Roads 8 and 9. The EA for County Road 46 and Concession Roads 8 and 9 are being undertaken concurrently as one EA Study by BT Engineering Inc. (BTE) on behalf of the County of Essex and the Town of Tecumseh due to the proximity of the roads and the interconnected operational improvements required. The "EA Study" in this document refers to all three roads under study. The County of Essex is the Proponent for the overall study.

The EA documents County Road 46 as a Schedule C undertaking of an arterial road under the jurisdiction of the County of Essex and Schedule B for collector roads under the jurisdiction of the Town of Tecumseh. Each component will be documented in a combined report.

1.1 Study Area

The Study Area is located in the County of Essex and Town of Tecumseh and is illustrated on **Figure 1**.

It includes the Town of Tecumseh's Concession Roads 8 and 9 from County Road 46 northerly to Highway 401, approximately 0.5 km and 1.0 km respectively.

County of Essex County Road 46 from Highway 401 to County Road 19,
Town of Tecumseh Concession Roads 8 and 9 from County Road 46 northerly to the Town Boundary
Analysis and Evaluation Report, July 2025

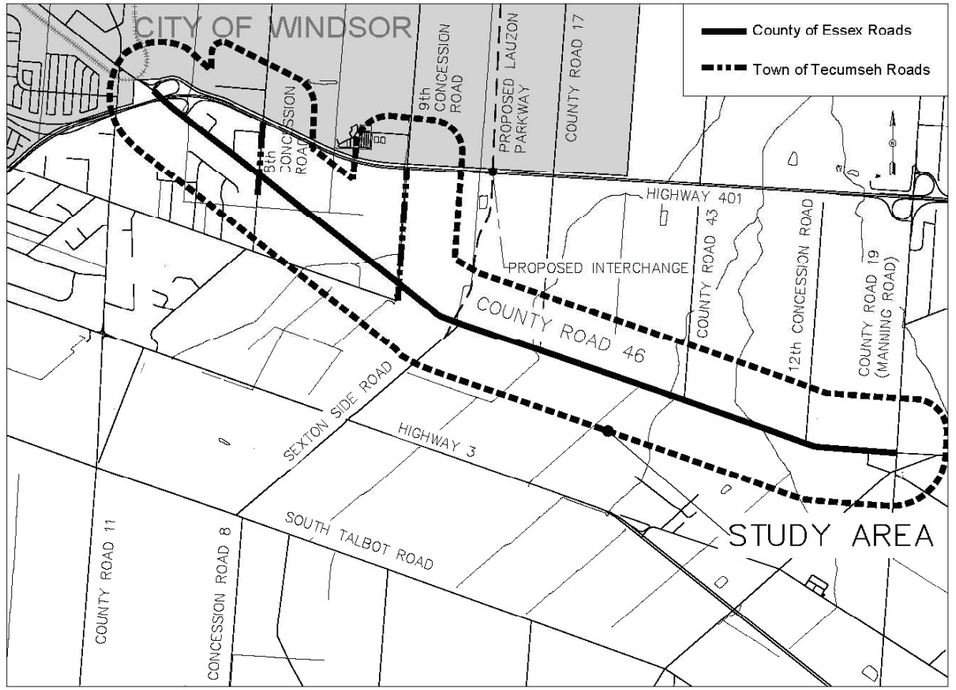


Figure 1: Study Area

1.2 Study Background

County Road 46 is an east-west arterial roadway with a rural 2-lane cross section. This roadway is considered a key route in the Essex-Windsor roadway network. County Road 46 has been projected to have significant future capacity deficiencies due to forecasted population and employment growth and traffic distribution between the Highway 401/Country Road 46 interchange and County Road 19 (Manning Road). County Road 46 is described as a Secondary Regional Road from County Road 19 to County Road 17 and a Class II Arterial Road from County Road 17 to the City of Windsor boundary/ Highway 401.[1].

8th Concession Road is a north-south rural road with a two-lane cross section and a posted speed limit of 50 km/h. It runs perpendicular to Highway 401 from County Road 46 where it ends at North Talbot Road to the south.

[1] Essex-Windsor Regional Transportation Master Plan (EWRTMP), IBI Group with Paradigm Transportation Solutions October 2005.

9th Concession Road is a north-south rural road with a two-lane cross section and a posted speed limit of 50 km/h. The 9th Concession Road runs perpendicular to Highway 401 from County Road 46 where it becomes North Talbot Road to the south.

8th Concession Road and 9th Concession Road have at-grade intersections with County Road 46 with grade separated crossings over Highway 401

1.3 Study Introduction

This Study is a Schedule C EA Study for County Road 46 and a Schedule B EA for Concession Roads 8 and 9, meeting the requirements of the MCEA (Amended 2023). The mandatory requirements vary between Schedule B and Schedule C. A final report will be filed report that will meet the requirements of both schedules. The Study involves evaluating alternative intersection configurations, alignments and cross sections as part of the operational improvement plan.

2.0 ALTERNATIVES TO THE UNDERTAKING – PLANNING ALTERNATIVES

2.1 Problem and Opportunity Statement

Road network improvements are required within the western sectors of the County of Essex to accommodate planned/proposed development south of Highway 401 and bordering the City of Windsor. This planning is required now to facilitate land use development by defining the future road right-of-way and intersection locations to provide certainty for land development adjacent to these roads.

Undertaking the EA provides the opportunity to: improve efficiency of the road network; improve access and reduce traffic delays; and define a long-term transportation plan to support travel within the County of Essex. The results of this Study support future growth within Town of Tecumseh and improve transportation for all road users.

2.1.1 Alternative Planning Solutions

The *Environmental Assessment Act* requires that all reasonable and feasible Planning Solutions (Alternatives to the Undertaking) be identified and evaluated at the start of the Study. Planning Solutions represent alternative ways or methods of addressing the Problem or Opportunity Statement specific to this 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 for this Study are summarized as follows:

1. Do Nothing - The Do Nothing Alterative 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 road network and would not construct a new arterial road or interchange.
2. Transportation Demand Management (TDM) and Transportation Systems Management (TSM) - TDM 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. TSM provides a more

efficient use of existing infrastructure such as traffic signal optimization to limit or avoid the need for expansion.

3. Active Transportation - This alternative would maintain the existing road network with the addition of bicycle lanes and multi use pathways within the right-of-way.
4. Roadway Improvements - including:
   a. County Road 46 improvements, including widening, turning lanes and intersection improvements, with connection to the future Lauzon Parkway Extension.
   b. Widen 8th and 9th Concession Roads from County Road 46 to the City of Windsor boundary.

The evaluation of Alternative Planning Solutions selects the most reasonable alternatives that address the Problem and Opportunity Statement. A preliminary assessment of each Alternative Planning Solution is presented in **Table 1.** This assessment is provided for public review and comment.

Based on the preliminary review of Alternative Planning Solutions, Roadway Improvements is recommended to be carried forward, consistent with the Essex-Windsor Regional Transportation Master Plan (EWRTMP). In addition, Transportation Demand Management and Active Transportation will be considered as a complimentary solution. This does not constitute a reasonable standalone solution; however, it may form part of the overall Recommended Plan for transportation improvements.

Table 1: Planning Alternative Evaluation

Screening Criteria	Alternative 1: Do Nothing	Alternative 2: TDM/TSM	Alternative 3: Active Transportation	Alternative 7: Roadway Improvements
Transportation				
Does the approach satisfy forecast traffic demand?	Does not address forecast demand.	May reduce vehicular demand by mode shift or work at home but will not eliminate need for new or improved infrastructure.	Improves local road access but does not eliminate the need for new or improved infrastructure.	Meets forecast demand.
Does the approach improve safety?	Collisions frequency is expected to increase with increasing congestion.	It would mitigate some of the concerns resulting from the Do Nothing alternative. Will not address vehicular safety concerns but may improve pedestrian and cyclist safety.	It would mitigate some of the concerns.	Reduces collision potential within the overall Study Area by improving intersection control, reducing traffic congestion, and managing speeds.
Does the approach address all modes?	No change.	Addresses active modes of transportation.	Addresses active modes of transportation.	Accommodates all modes of transportation.

Screening Criteria	Alternative 1: Do Nothing	Alternative 2: TDM/TSM	Alternative 3: Active Transportation	Alternative 7: Roadway Improvements
Environmental				
What is the magnitude of environmental impacts (natural, social and cultural environment)?	No impacts.	No or low impacts. Low impacts may be associated with active transportation projects/ improvements (i.e. sidewalks, bike lanes).	No or low impacts. Low impacts may be associated with active transportation projects/ improvements (i.e. sidewalks, bike lanes).	Low to medium environmental effect possible with new corridor. Magnitude of effects may be mitigated. .
Land Use/Property				
Does the approach support the Official Plan and EWRTMP?	No.	Supports objectives of Official Plan to encourage the development of active transportation facilities within the Municipality.	No. Does not address access issues of the Official Plan or the recommendations of the EWRTMP.	Supports the objectives of the Official Plan and the recommendations of the EWRTMP.
Preliminary Recommendation to Carry Forward?	Not recommended to be carried forward.	✓ Carried forward as a complimentary strategy (not a standalone solution).	✓ Carried forward as a complimentary strategy (not a standalone solution).	✓ Carried forward.

✓ **Recommended Planning Solutions**

3.0 EVALUATION METHODOLOGY

This section documents the evaluation approach used in this study for selecting the alignment, cross sections, and intersections for further study.

3.1 Qualitative Evaluation

The qualitative evaluation methodology is used where there are few alternatives and a low number of competing criteria among the alternatives being compared. The qualitative evaluation method involves comparing impacts in narrative terms, without the explicit weighting of criteria or producing numerical ratings. This method uses "professional judgment" to compare alternatives. A qualitative approach was used for the evaluation of the Cross-Section Alternatives and Intersection Alternatives.

Six categories or factor groups were considered for each evaluation when applicable. Within each of these factor groups are sub-criteria, described narratively and ranked with symbols, which define the measure and the relative differences of magnitude of impact or benefit. The factor groups are:

- Transportation
- Natural Environment
- Cultural Environment
- Socio-Economic Environment
- Land Use and Property
- Cost

Where there were no differences between the alternatives in a factor group, then the group was not used to evaluate the alternatives.

4.0 COUNTY ROAD 46 EVALUATION SECTIONS

In order to accommodate the changing site-specific right-of-way constraints throughout the length of the Study Area, the corridor was divided into three (3) different sections; the advantages of dividing the Study Area include:

- Allows the unique transportation and environmental constraints within each section to influence the evaluation; and
- Permits the evaluation to be divided into mutually exclusive areas.

Each section is described as follows:

Section 1 (Highway 401 to 8th Concession Road). Beginning at the Highway 401 Interchange (western end of the Study Area), this section extends easterly from the Town of Tecumseh limits to 8th Concession Road. This area is characterized by commercial and industrial land uses.

Section 2 (8th Concession Road to east of the future Lauzon Parkway Intersection). This section is characterized by both commercial and industrial land uses and agricultural / rural land uses with scattered residences along County Road 46.

Section 3 (Future Lauzon Parkway Intersection to County Road 19 (Manning Road)). This section is characterized by agricultural land uses with scattered residences and farms along County Road 46.

The evaluation sections are illustrated in **Figure 2.**

5.0 COUNTY ROAD 46 ALIGNMENT EVALUATION

The following section describes the alignment alternatives for each of the Evaluation Sections. All the alternatives carried forward to the detailed evaluation were considered by the Study Team to be reasonable alternatives to the Planning Solution and are described in **Table 2,** these include the alignment alternatives 1 to 3 that were presented to the public at Public Consultation Centre (PCC) No. 2. The fourth alternative in each evaluation section was developed as a meandering alignment to avoid existing constraints where possible.

Table 2: County Road 46 Alignment Alternatives

Alternative	Description
Section 1	
Alternative 1 - 1	40 m ROW Widen on-centre
Alternative 1 - 2	40 m ROW Widen to the South
Alternative 1 - 3	40 m ROW Widen to the North
Section 2	
Alternative 2 - 1	40 m ROW Widen on-centre
Alternative 2 - 2	40 m ROW Widen to the South
Alternative 2 - 3	40 m ROW Widen to the North
Alternative 2 - 4	40 m ROW Meandering
Section 3	
Alternative 3 - 1	40 m ROW Widen on-centre
Alternative 3 - 2	40 m ROW Widen to the South
Alternative 3 - 3	40 m ROW Widen to the North
Alternative 3 - 4	40 m ROW Meandering

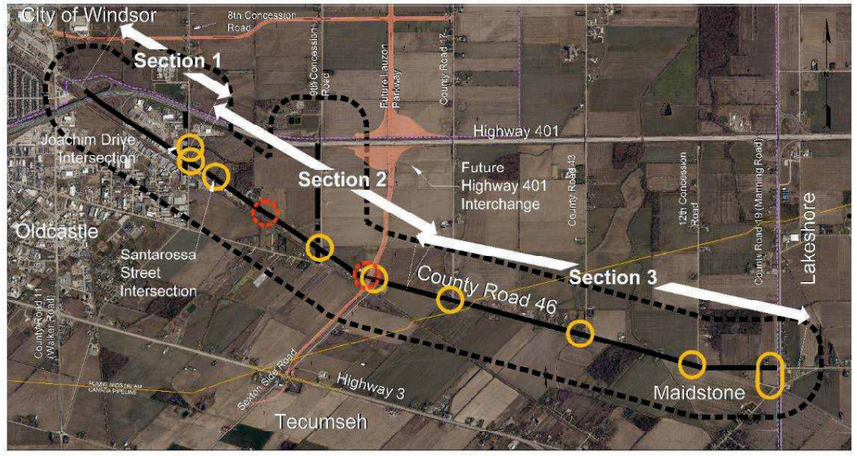


Figure 2: Evaluation Sections

5.1 County Road 46 Section 1 (Highway 401 to 8th Concession Road) Alignment Evaluation

County Road 46 within Section 1 is approximately 670 m long. The topography is flat throughout. This section has industrial development on both sides of the roadway and primarily services large transport vehicles.

5.1.1 Section 1 Alternatives

Three (3) alignment alternatives were carried forward for evaluation, each alternative has a 40-metre right-of-way.

Alternative 1-1

This alternative widens County Road 46 on the existing centre line, resulting in an additional seven (7) metres of land required on both sides of the existing right-of-way for the road widening. This results in impacts to both sides of the roadway. Moderate impacts include loss of frontage with modifications to existing driveways and parking lots and visual intrusion to existing residence. Refer to **Figure 3.**

Alternative 1-2

Alternative 1-2 widens the roadway to the south, resulting in an additional 14 metres on the south side to accommodate the 40-metre right-of-way. This results in the greatest level of impact because most of the existing development on the south side is closer to the roadway than on the north side. Examples of major impacts include the buyout of seven (7) industrial buildings and buyout of one (1) resident. Refer to **Figure 4.**

Alternative 1-3

Alternative 1-3 widens the roadway to the north, resulting in an additional 14 metres on the north side to accommodate the 40-metre right-of-way. This results in a moderate level of impact because most of the existing development on the north side is further away from the roadway than on the south side. Parking and entrances will be impacted along the north side. Refer to **Figure 5**.

5.1.2 Section 1 Alignment Evaluation

The evaluation of the County Road 46 alignment alternatives is shown in **Table 3**. Alternatives 1-has the least number of “Poor” criteria and the greatest number of ‘Good’ criteria when compared to the other alternatives.

5.1.3 Section 1 Preliminary Alignment Recommendation

The preliminary recommendation is Alternative 1-1 since this is a relatively short section of roadway and it avoids all the major constraints. The County Road 46 Technically Preferred Alignment is shown on **Figure 6.**

Figure 3: County Road 46 Section 1 Alignment Alternative 1-1

Figure 4: County Road 46 Section 1 Alignment Alternative 1-2

Figure 5: County Road 46 Section 1 Alignment Alternative 1-3

Table 3: County Road 46 Section 1 Preliminary Alignment Evaluation

Evaluation Criteria	Alternative 1-1 - Widen On-Centre	Alternative 1-2 - Widen to the South	Alternative 1-3 Widen to the North
Active Transportation	All equal. –	All equal. –	All equal. –
Property Impacts: Loss of access due to entrance changes	Minor reduction in turning movement ability. –	No change. ✓	Major reduction in turning movement ability. ×
Employment Area Lands Required	All equal. –	All equal. –	All equal. –
Residential Visual Intrusion (widening within 100 m)	1 ×	0 ✓	0 ✓
Residencial Buyout	0 ✓	1 ×	0 ✓
Industrial Buildings Buyouts	0 ✓	7 ×	0 ✓
Utility Corridor Relocation	Relocation. –	✓	Major relocation. ×
Cost	All equal. –	All equal. –	All equal. –
Recommendation:	**Recommended to be Carried Forward** ✓	Not recommended to be Carried Forward due to impact to industrial buildings. ×	Not recommended to be Carried Forward due to property impacts. ×

Legend

Good ✓ Fair – Poor ×

Figure 6: Section 1 Technically Preferred Alternative

5.2 County Road 46 Section 2 (8th Concession Road to east of the future Lauzon Parkway Intersection) Alignment Evaluation

County Road 46 within the Section 2 is approximately 2.1 km long. The topography is flat throughout. This section of County Road 46 has a mix of land uses, including residential, industrial, commercial and agricultural. Lands to the north are planned as future Business Park/Employment Area in the Town of Tecumseh Official Plan.

5.2.1 Section 2 Alignment Alternatives

This section provides a brief description of the County Road 46 alignment alternatives. Four (4) alignment alternatives were carried forward for evaluation, each alternative has a 40-metre right-of-way.

Alternative 2-1

This alternative widens County Road 46 on the existing centre line, requiring an additional seven (7) metres of land on both sides of the existing right-of-way for the road widening. This results in impacts to both sides of the roadway. Moderate impacts include loss of frontage with modifications to existing driveways and parking lots and visual intrusion to existing residences. Eleven (11) residents will experience increased visual intrusion and lose of frontage. Refer to **Figure 7.**

Alternative 2-2

Alternative 2-2 widens the roadway to the south, resulting in an additional 14 metres on the south side to accommodate the 40-metre right-of-way. This results in the greatest level of impact due to having most of the existing development on the south side closer to the roadway than on the north side. Examples of major impacts include the buyout of four (4) industrial buildings and buyout of one (1) resident. In addition, there will be the need to relocate the overhead utilities to the new edge of right-of-way. Refer to **Figure 8.**

Alternative 2-3

Alternative 2-3 widens the roadway to the north, resulting in an additional 14 metres on the north side to accommodate the 40-metre right-of-way. This results in a high level of impact to the existing residences, requiring five (5) buyouts and two (2) with increased visual intrusion. Parking and entrances will be impacted along the north side. No relocation requirements for the overhead utilities along the south side. Refer to **Figure 9**.

Alternative 2-4

The County Road 46 Alignment Alternative 2-4 Meandering is widened on-centre or to the north due to the constraints and to the south approaching the future Lauzon Parkway intersection, refer to **Figure 10**. This alternative requires the least amount of Employment Lands and no residential or industrial buyouts. There will be seven (7) residences impacted by greater visual intrusion due to the right-of-way widening and a minor relocation of the overhead utilities.

5.2.2 Section 2 Alignment Evaluation

The evaluation of the County Road 46 alignment alternatives is shown in **Table 4**. Alternative 2-4 Meandering alignment is the technically preferred alternative and recommended to be carried

forward. Alternative 2-4 has the least number of "Poor" criteria and the greatest number of 'Good' criteria when compared to the other alternatives.

5.2.3 Section 2 Preliminary Alignment Recommendation

The County Road 46 Technically Preferred Alignment is shown on **Figure 11.** The Technically Preferred Alignment contains roadway sections where the right-of-way transitions between widening on-centre and to the north of the existing right-of-way. The subtle shifts in the alignment avoid most constraints. There is one (1) residential buyout and ten (10) residences with greater visual intrusion. The overhead utilities will require some relocation along the south side of the right-of-way.

Figure 7: County Road 46 Section 2 Alignment Alternative 2-1

Figure 8: County Road 46 Section 2 Alignment Alternative 2-2

Figure 9: County Road 46 Section 2 Alignment Alternative 2-3

Figure 10: County Road 46 Section 2 Alignment Alternative 2-4

Table 4: County Road 46 Section 2 Preliminary Alignment Evaluation

Evaluation Criteria	Alternative 2-1 - Widen On-Centre	Alternative 2-2 - Widen to the South	Alternative 2-3 Widen to the North	Alternative 2-4 - Meandering
Active Transportation	All equal. –	All equal. –	All equal. –	All equal. –
Future Development Lands Required.	0.03 ha –	0 ha ✓	0.3 ha –	0.03 ha –
Employment Area Lands Required	2 ha –	2.6 ha ×	1.5 ha –	1.2 ha ✓
Agricultural Land Required	0.7 ha –	0.8 ha ×	0.5 ha ✓	0.6 ha –
Residential Visual Intrusion (widening within 100 m)	11 ×	3 –	2 ✓	7 –
Residencial Buyout	0 ✓	1 –	5 ×	0 ✓
Industrial Buildings Buyouts	0 ✓	4 ×	0 ✓	0 ✓
Utility Corridor Relocation	Relocation. –	Major relocation. ×	No relocation. ✓	Relocation. –
Cost	All equal. –	All equal. –	All equal. –	All equal. –
Recommendation:	Not Carried Forward. ×	Not Carried Forward. ×	Not Carried Forward. ×	**Carried Forward**. ✓

Legend

Good ✓ Fair – Poor ×

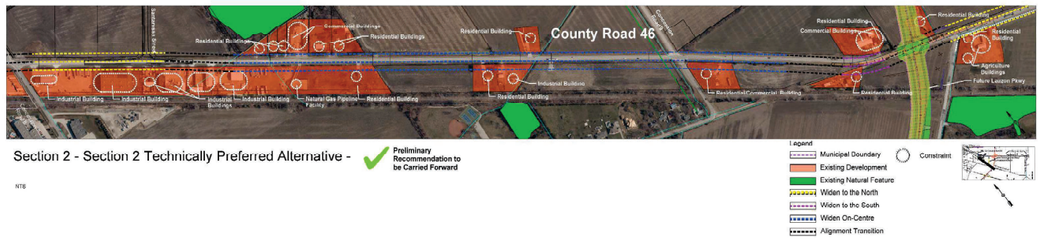


Figure 11: Section 2 Technically Preferred Alternative

5.3 County Road 46 Section 3 (Future Lauzon Parkway Intersection to County Road 19 (Manning Road)) Alignment Evaluation

County Road 46 within the Section 3 is approximately 4.3 km long. The topography is flat throughout. This section of County Road 46 is primarily agricultural with residential and commercial buildings located along both sides. There is one woodlot located midway on the south side and a municipal drain also on the south side in the western half.

5.3.1 Section 3 Alignment Alternatives

This section provides a brief description of the County Road 46 alignment alternatives. Four (4) alignment alternatives were carried forward for evaluation, each alternative has a 40-metre right-of-way.

Alternative 3-1

This alternative widens County Road 46 on the existing centre line, requiring an additional seven (7) metres of land on both sides of the existing right-of-way for the road widening. This results in impacts to both sides of the roadway. Moderate impacts include loss of frontage with modifications to existing driveways and buyouts of two (2) existing residences. Twenty-six (26) residents will experience increased visual intrusion and lose of frontage. This alternative takes the least amount of agricultural land. Refer to **Figure 12.**

Alternative 3-2

Alternative 3-2 widens the roadway to the south, resulting in an additional 14 metres on the south side to accommodate the 40-metre right-of-way. Examples of moderate impacts include the buyout of three (3) residential buildings and three (3) residences with increased visual intrusion. In addition, there will be the need to relocate a municipal drain southerly to the new edge of right-of-way. There is no requirement to relocate the overhead utility along the north edge of the right-of way. Refer to **Figure 13.**

Alternative 3-3

Alternative 3-3 widens the roadway to the north, resulting in an additional 14 metres on the north side to accommodate the 40-metre right-of-way. This results in a high level of impact to the existing residences, requiring eleven (11) buyouts and eight (8) with increased visual intrusion. Entrances will be impacted along the north side. No relocation requirements for the municipal along the south side. This alternative impacts the greatest amount of agricultural land. Refer to **Figure 14.**

Alternative 3-4

The County Road 46 Alignment Alternative 3-4 Meandering avoids constraints on both sides of the roadway, refer to **Figure 15**. This alternative requires no residential buyouts. There will be seven (7) residences impacted by greater visual intrusion due to the right-of-way widening and a minor relocation of the overhead utilities and the municipal drain.

5.3.2 Section 3 Alignment Evaluation

The evaluation of the County Road 46 alignment alternatives is shown in **Table 5**. Alternative 3-4 has the least number of "Poor" criteria and the greatest number of 'Fair' criteria when compared to the other alternatives.

5.3.3 Section 3 Preliminary Alignment Recommendation

The County Road 46 Technically Preferred Alignment is Alternative 3-4 and is shown on **Figure 16**. The Technically Preferred Alignment contains roadway sections where the right-of-way transitions between widening on-centre, north or south of the existing right-of-way and has used subtle shifts in the alignment to avoid short curve radii and has reduced the number of curves required to avoid all constraints. The preferred alignment has two (2) residential buyouts. Other impacts include eight (8) residents with increased visual intrusion and relocation of the municipal drain to the south and minor relocation of the overhead utility lines to the north.

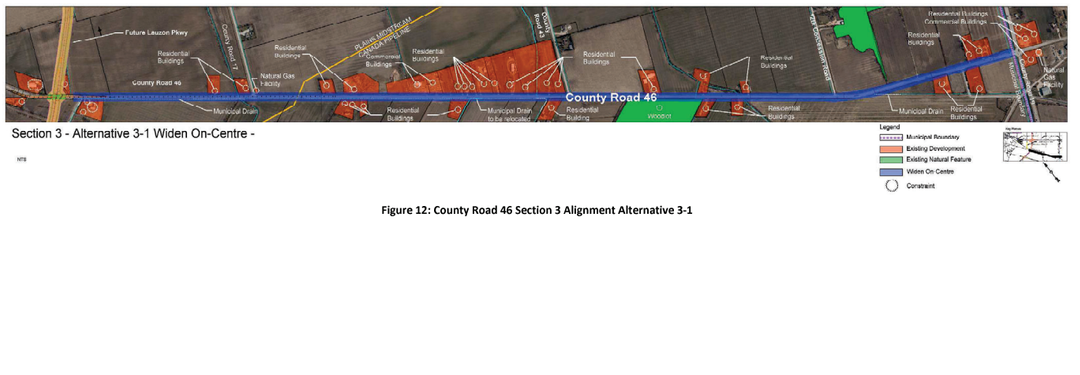


Figure 12: County Road 46 Section 3 Alignment Alternative 3-1

Figure 13: County Road 46 Section 3 Alignment Alternative 3-2

Figure 14: County Road 46 Section 3 Alignment Alternative 3-3

Section 3 - Alternative 3-4 Meandering -

NTS

Figure 15: County Road 46 Section 3 Alignment Alternative 3-4

Table 5: County Road 46 Section 3 Preliminary Alignment Evaluation

Evaluation Criteria	Alternative 3-1 - Widen On-Centre	Alternative 3-2 - Widen to the South	Alternative 3-3 Widen to the North	Alternative 3-4 - Meandering
Active Transportation	All equal. –	All equal. –	All equal. –	All equal. –
Agricultural Land Required	1.7 ha ✓	3.9 ha –	5.5 ha ×	4.4 ha –
Woodlot Impacted	0.3 ha –	0.5 ha ×	0 ha ✓	0.3 ha –
Residential Visual Intrusion (widening within 100 m)	26 ×	3 ✓	8 –	7 –
Residencial Buyout	2 –	3 –	11 ×	0 ✓
Municipal Drain Relocation	Relocation. ×	Relocation. ×	No relocation. ✓	Partial Relocation. –
Overhead Utility Relocation	Relocation. ×	No relocation . ✓	Major relocation. ×	Partial Relocation. –
Cost	All equal. –	All equal. –	All equal. –	All equal. –
Recommendation:	Not Carried Forward. ×	Not Carried Forward. ×	Not Carried Forward. ×	**Carried Forward**. ✓

Legend

Good ✓ Fair – Poor ×

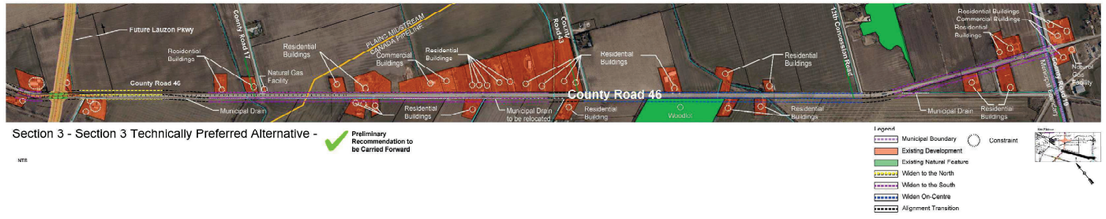


Figure 16: Section 3 Technically Preferred Alternative

6.0 CONCESSION ROADS 8 AND 9 ALIGNMENT EVALUATION

6.1 Concession Road 8 Alignment Alternatives

Concession Road 8 within the Study Area is approximately 436 m long, topography is flat throughout. This section provides a brief description of the Concession Road 8 alignment alternatives.

6.1.1 Concession Road 8 Alignment Alternatives

Four (4) alignment alternatives were carried forward for evaluation, each alternative has a 36-metre right-of-way.

Alternative 1

This alternative widens Concession Road 8 on the existing centre line, requiring an additional eight (8) metres of land on both sides of the existing right-of-way for the road widening. This results in impacts to both sides of the roadway. Moderate impacts include loss of frontage with modifications to existing driveways and relocation of an existing municipal drain. Refer to **Figure 17.**

Alternative 2

Alternative 2 widens the roadway to the west, resulting in an additional 16 metres on the west side to accommodate the 36-metre right-of-way. Examples of major impacts include the buyout of one (1) commercial building and one (1) industrial building. In addition, there will be the need to relocate a municipal drain westerly to the new edge of right-of-way. This alternative impacts the greatest amount of existing Employment lands on the west side. Refer to **Figure 18.**

Alternative 3

Alternative 3 widens the roadway to the east, resulting in an additional 16 metres on the east side to accommodate the 36-metre right-of-way. This results in a minor level of impact to the existing parking on the east side. No relocation requirements for the municipal drains along the east side. This alternative impacts the greatest amount of future Employment lands on the east side. Refer to **Figure 19.**

Alternative 4

The Concession Road 8 Alignment Alternative 4 Meandering avoids some constraints on both sides of the roadway, refer to **Figure 20**. The south half of the roadway is widened to the east to avoid the municipal drain along the west half and the north half is widened on centre to align with the MTO overpass. This alternative does not require any buyouts. There will be a section of the municipal drain in the north half that will need to be relocated.

6.1.2 Concession Road 8 Preliminary Alignment Evaluation

The evaluation of the Concession Road 8 alignment alternatives is shown in **Table 6**. Alternative 4 Meandering alignment is the technically preferred alternative and recommended to be carried forward. Alternative 4 has no “Poor” scores and the greatest number of ‘Fair’ scores when compared to the other alternatives. The Technically Preferred Alignment aligns with the existing MTO overpass which is required. The Concession Road 8 Technically Preferred Alignment is shown on **Figure 21**.

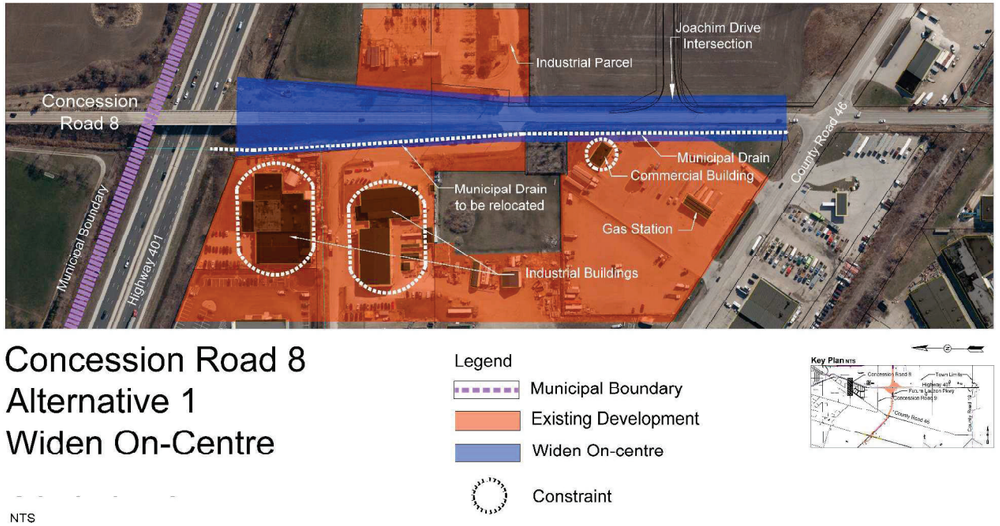


Figure 17: Concession Road 8 Alignment Alternative 1

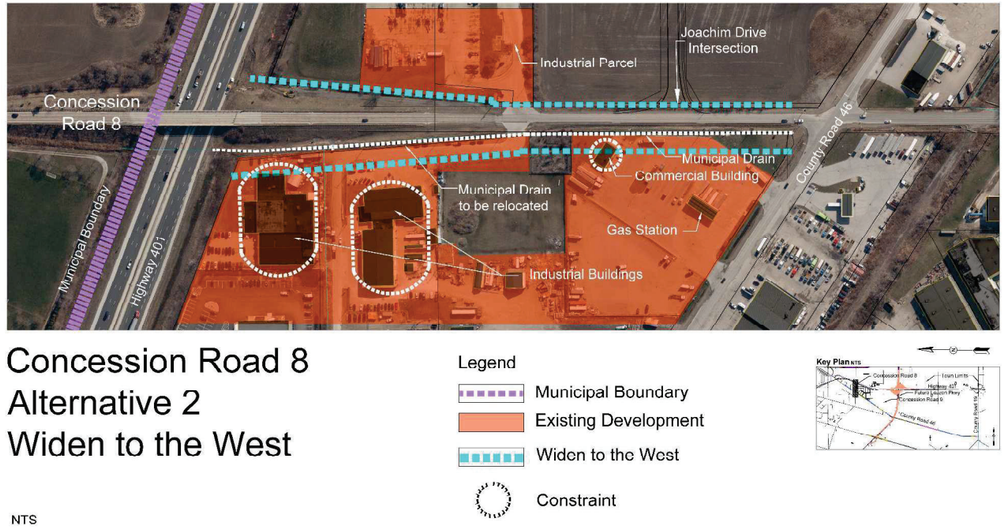


Figure 18: Concession Road 8 Alignment Alternative 2

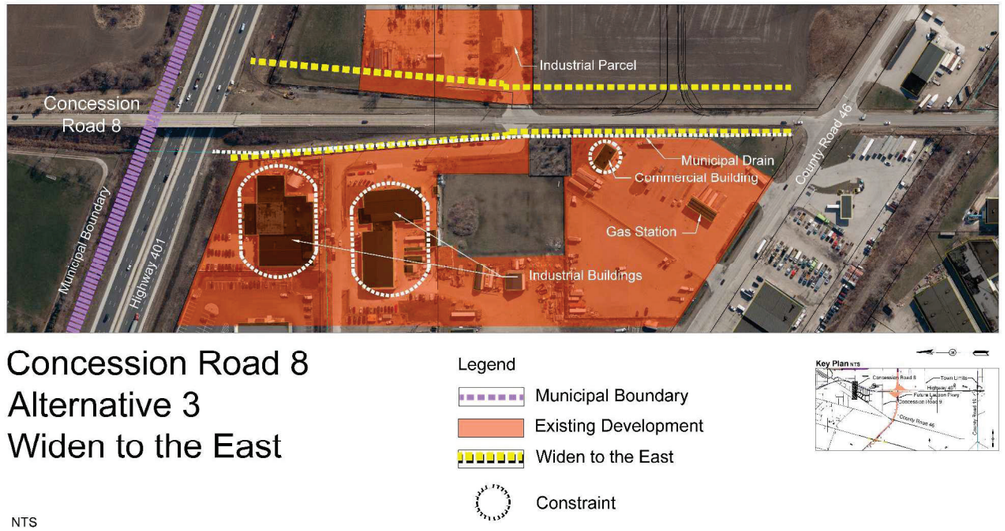


Figure 19: Concession Road 8 Alignment Alternative 3

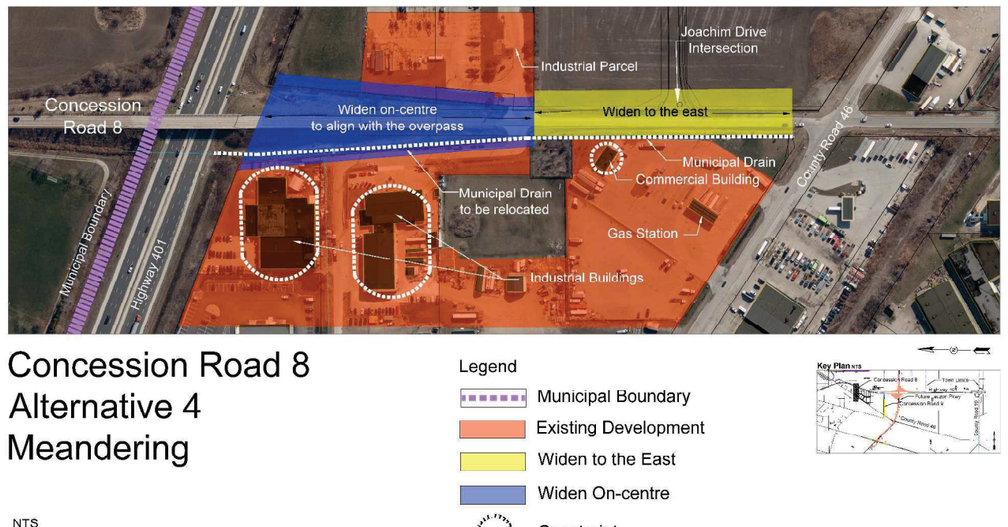


Figure 20: Concession Road 8 Alignment Alternative 4

Table 6: Concession Road 8 Preliminary Alignment Evaluation

Evaluation Criteria	Alternative 1 - Widen On-Centre	Alternative 2 - Widen to the West	Alternative 3 Widen to the East	Alternative 4 - Meandering
Active Transportation	All equal. –	All equal. –	All equal. –	All equal. –
Aligns with the MTO Overpass	Yes ✓	No ×	No ×	Yes ✓
Employment Land Required	0.5 ha ✓	0.7 ha ×	0.5 ha ✓	0.5 ha ✓
Municipal Drain Impacted	460 m ×	460 m ×	0 m ✓	230 m –
Commercial Building Buyout	1 ×	1 ×	0 ✓	0 ✓
Overhead Utility Relocation	Relocation. –	Major relocation . ×	No relocation. ✓	Relocation. –
Cost	All equal. –	All equal. –	All equal. –	All equal. –
Recommendation:	Not Carried Forward. ×	Not Carried Forward. ×	Not Carried Forward. ×	**Carried Forward**. ✓

Legend

Good ✓ Fair – Poor ×

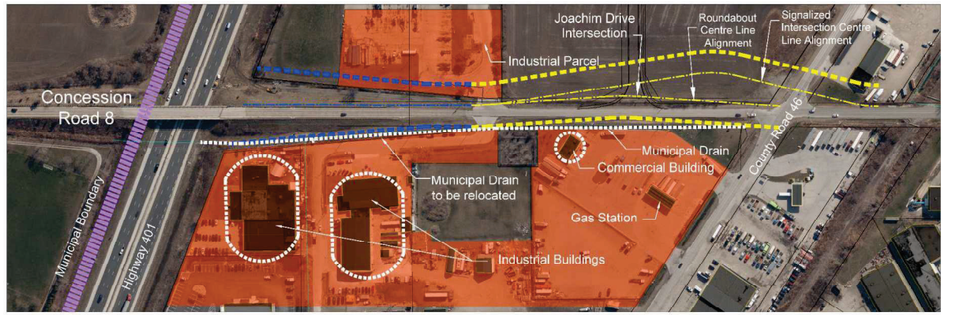


Figure 21: Concession Road 8 Technically Preferred Alternative

6.2 Concession Road 9 Alignment Alternatives

Concession Road 9 within the Study Area is approximately 1 km long, right-of-way width is approximately 31 m and topography is flat throughout. This section provides a brief description of the Concession Road 9 alignment alternatives.

6.2.1 Concession Road 9 Alignment Alternatives

Four (4) alignment alternatives were carried forward for evaluation, each alternative has a 36-metre right-of-way.

Alternative 1

This alternative widens Concession Road 9 on the existing centre line, requiring an additional two and half (2.5) metres of land on both sides of the existing right-of-way for the road widening. This results in impacts to both sides of the roadway. Minor impacts include loss of frontage with modifications to existing driveways and relocation of an existing municipal drain. Refer to **Figure 22.**

Alternative 2

Alternative 2 widens the roadway to the west, resulting in an additional five (5) metres on the west side to accommodate the 36-metre right-of-way. Examples of major impacts include the buyout of one (1) residential building. In addition, there will be the need to relocate a municipal drain westerly to the new edge of right-of-way. This alternative does not align with the MTO overpass. Refer to **Figure 23.**

Alternative 3

Alternative 3 widens the roadway to the east, resulting in an additional five (5) metres on the east side to accommodate the 36-metre right-of-way. This results in a minor level of impact to the existing driveway on the east side. No relocation requirements for the municipal along the west side. This alternative does not align with the MTO overpass. Refer to **Figure 24.**

Alternative 4

The Concession Road 9 Alignment Alternative 4 Meandering avoids constraints on both sides of the roadway, refer to **Figure 25**. The south three-quarters of the roadway is widened to the east to avoid the municipal drain along the west half and the north quarter is widened on-centre to align with the MTO overpass. This alternative does not require any buyouts. There will be a section of the municipal drain in the north half that will need to be relocated and minor modifications to the driveways.

6.2.2 Concession Road 9 Preliminary Alignment Evaluation

The evaluation of the Concession Road 9 alignment alternatives is shown in **Table 7**. Alternative 4 Meandering alignment is tied with Alternative 3 with the same number of good criteria and poor criteria. However Alternative 4 aligns with the MTO overpass. Subsequently Alternative 4 is the technically preferred alternative and recommended to be carried forward. The Concession Road 9 Technically Preferred Alignment is shown on **Figure 26**.

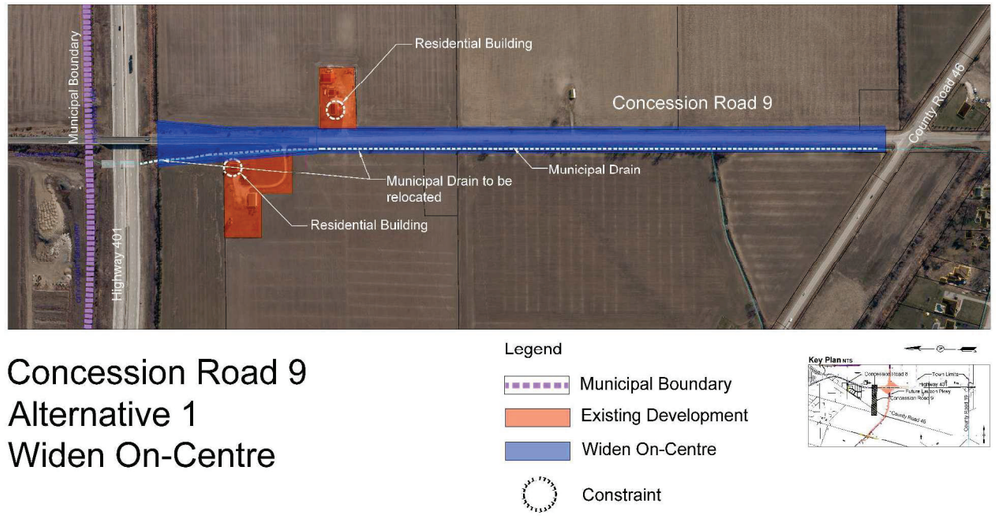


Figure 22: Concession Road 9 Alignment Alternative 1

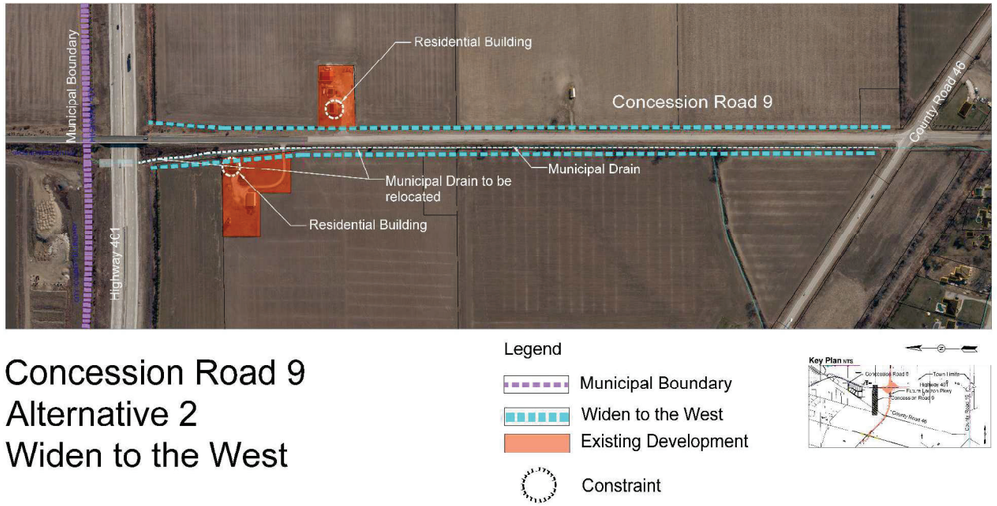


Figure 23: Concession Road 9 Alignment Alternative 2

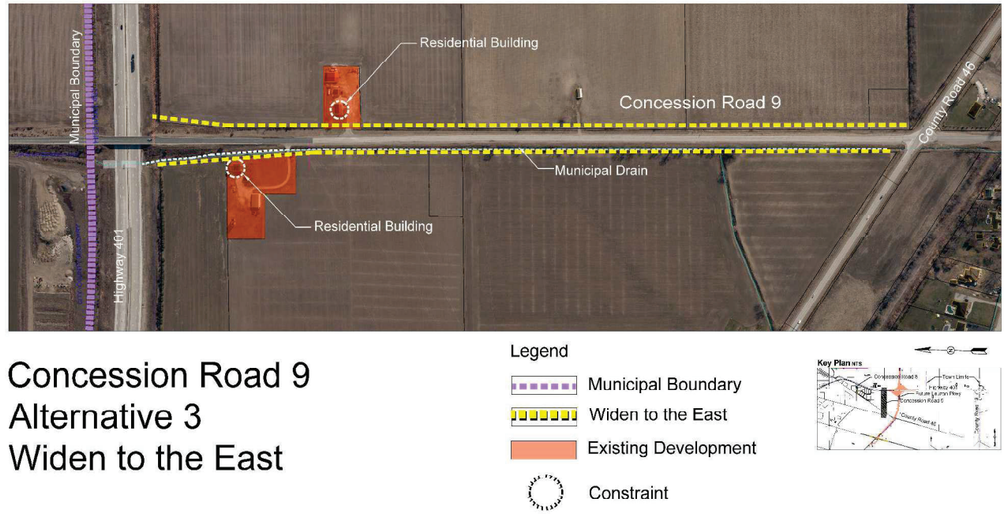


Figure 24: Concession Road 9 Alignment Alternative 3

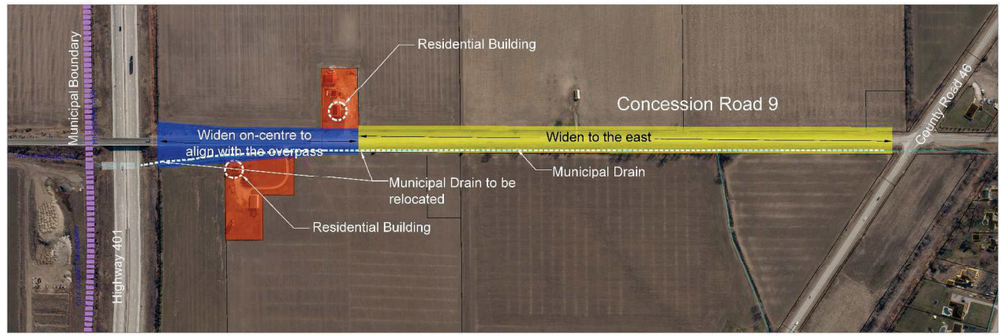


Figure 25: Concession Road 9 Alignment Alternative 4

Table 7: Concession Road 9 Preliminary Alignment Evaluation

Evaluation Criteria	Alternative 1 - Widen On-Centre	Alternative 2 - Widen to the West	Alternative 3 Widen to the East	Alternative 4 - Meandering
Active Transportation	All equal. –	All equal. –	All equal. –	All equal. –
Aligns with the MTO Overpass	Yes ✓	No ×	No ×	Yes ✓
Agricultural Land Required	0.6 ha –	0.6 ha –	0.6 ha –	0.6 ha –
Municipal Drain Impacted	1 km ×	1 km ×	0 m ✓	270 m –
Residential Building Buyout	0 ✓	1 ×	0 ✓	0 ✓
Visual Intrusion	2 ×	0 ✓	1 –	2 ×
Overhead Utility Relocation	Relocation –	No relocation . ✓	Relocation. –	Relocation. –
Cost	All equal. –	All equal. –	All equal. –	All equal. –
Recommendation:	Not Carried Forward. ×	Not Carried Forward. ×	Not Carried Forward. ×	**Carried Forward**. This alternative aligns with the MTO overpass. ✓

Legend

Good ✓ Fair – Poor ×

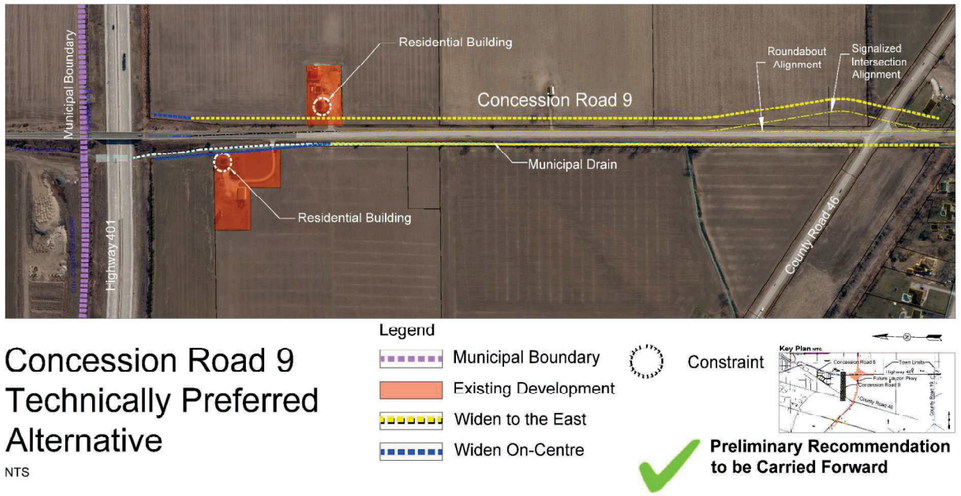


Figure 26: Concession Road 9 Technically Preferred Alternative

7.0 COUNTY ROAD 46 CROSS SECTION EVALUATION

This section documents the coarse screening of the County Road 46 cross section alternatives. The cross sections that have the greatest desirable characteristics will be carried forward for further assessment and review.

7.1 Section 1 Cross Section Evaluation

Section 1 is located in an urban area with commercial and industrial development on both sides of County Road 46.

7.1.1 Section 1 Alternatives

Four (4) urban cross section alternatives were considered for the arterial roadway and are shown in **Figure 27** to **Figure 30**. The TPA for the alignment in Section 1 widens on-centre, refer to **Section 5.1.2.** All cross sections have a 40 m ROW and include bike lanes, a Multi-Use Path (MUP) and/or sidewalk and stormwater services:

1. Alternative 1 –2-Lane Urban Cross Section;
2. Alternative 2 - 3-Lane Urban Cross Section;
3. Alternative 3 - 4-Lane Urban Cross Section; and
4. Alternative 4 - 5-Lane Urban Cross Section.

All alternatives provide active transportation; however, the implementation of the MUP may be a feature that can be phased in with the Essex Region Conservation Authority proposed Multi-use Trail along the south side of the ROW.

The coarse screening of the Section 1 cross section alternatives is shown in **Table 8** The recommended cross sections for further study are:

- Alternative 3 –4-Lane Urban Cross Section; and
- Alternative 4 –5-Lane Urban Cross Section**.**

7.1.2 Section 1 Recommended Cross Section

Alternative 4 – 5-Lane Urban Cross Section provides the greatest flexibility for future growth and includes active transportation for pedestrians and cyclists in addition to the future multi-use trail located to the south of County Road 46. The 5-Lane Urban Cross Section is the technically preferred cross section and is shown on **Figure 30.**

7.1.3 Section 1 Cross Section Refinements

Refinements to the Section 1 Cross Section, shown at PCC 3, included a larger ditch on the northside to accommodate stormwater runoff, space for existing utilities and a 1.8 m sidewalk on the northside and utilize the future abandoned rail line trail to the south for pedestrians and cyclists, as shown on **Figure 31**.

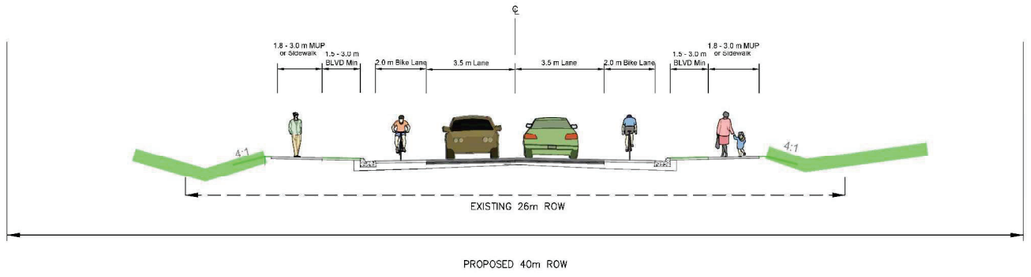


Figure 27: Section 1 Alternative 1 - 2-Lane Urban Cross Section

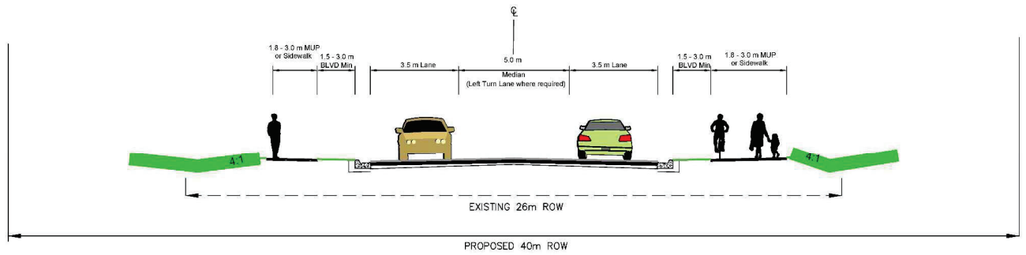


Figure 28: Section 1 Alternative 2 – 3-Lane Urban Cross Section

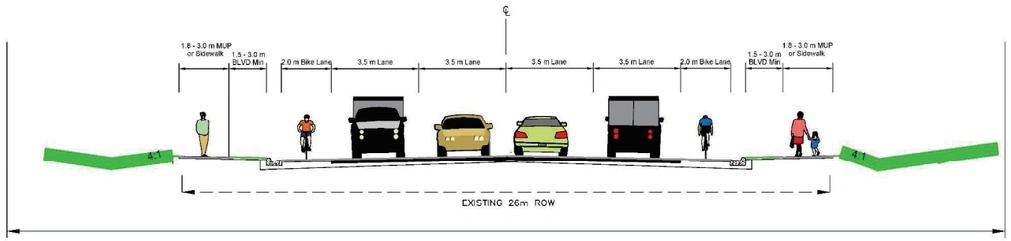


Figure 29: Section 1 Alternative 3 – 4-Lane Urban Cross Section

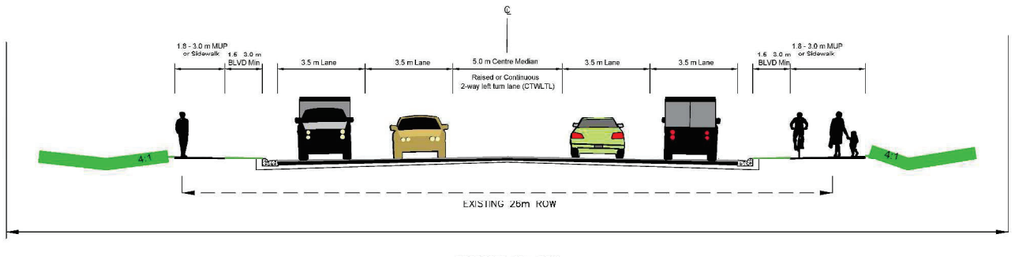


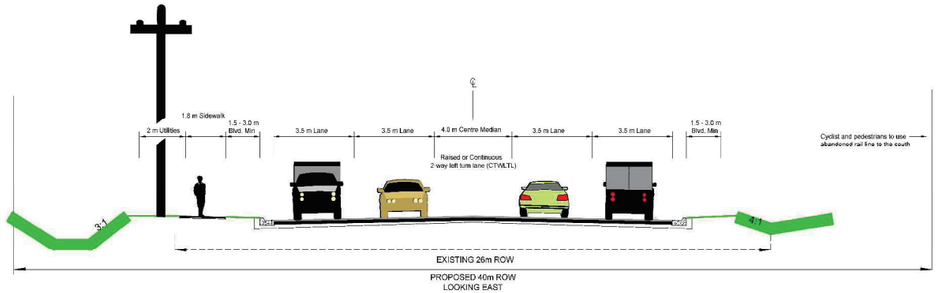
Figure 30: Section 1 Alternative 4 – 5-Lane Urban Cross Section

Table 8: Section 1 Cross Section Evaluation

Evaluation Criteria	Alternative 1 – 40 m ROW 2-Lane Urban Cross Section with MUP/Sidewalk	Alternative 2 – 40 m ROW 3-Lane Urban Cross Section with MUP/Sidewalk	Alternative 3 – 40 m ROW 4-Lane Urban Cross Section with MUP/Sidewalk	Alternative 4 – 40 m ROW 5-Lane Urban Cross Section with MUP/Sidewalk
Active Transportation	All equal. –	All equal. –	All equal. –	All equal. –
Meets Future Travel Demand	Does not meet future travel demand. ✗	Does not meet future travel demand. ✗	Meets future travel demand by providing 4-laning. ✓	Meets future travel demand by providing 4-laning. ✓
Provide a left-turn lane	No Left-turn Lane. ✗	Left-turn Lane provided. ✓	No Left-turn Lane. ✗	Left-turn Lane provided. ✓
Impacts to Business Park/Employment Area	All alternatives considered equal. –	All alternatives considered equal. –	All alternatives considered equal. –	All alternatives considered equal. –
Construction Cost	2-lane roadway width lowest cost. ✓	3-lane roadway width median cost. –	4-lane roadway width higher cost. ✗	5-lane roadway width highest cost. ✗
Recommendation:	Not Carried Forward. Does not meet travel demand. ✗	Not Carried Forward. Does not meet travel demand. ✗	Carry Forward for further study ✓	Carry Forward for further study ✓

Legend

Good ✓ Fair – Poor ✗



Preliminary Recommendation to be Carried Forward

Figure 31: Technically Preferred Section 1 Cross Section

7.2 Section 2 Cross Section Evaluation

Section 2 is located in an urban area with a mix commercial, industrial and residential development on the south side of County Road 46 and an approved industrial subdivision being developed to the north.

7.2.1 Section 2 Cross Section Alternatives

Rural and urban cross section alternatives were considered for this section of the arterial roadway. The eight (8) cross section alternatives are shown in **Figure 32** to **Figure 39**. Urban cross sections have a 40 m ROW and include bike lanes, MUP and/or sidewalk, stormwater service and/or ditching. Rural cross sections have a 40 m ROW with paved shoulders for bikes and ditching. Pedestrians may be accommodated by the future multi-use trail to the south. The TPA for the alignment in Section 2 meanders, refer to **Section 5.2.2**. The alternatives are listed as follows:

1. Alternative 1 – 2-Lane Rural Cross Section
2. Alternative 2 - 2-Lane Urban Cross Section;
3. Alternative 3 – 3-Lane Rural Cross Section;
4. Alternative 4 – 3-Lane Urban Cross Section;
5. Alternative 5 – 4-Lane Rural Cross Section;
6. Alternative 6 – 4-Lane Urban Cross Section;
7. Alternative 7 – 5-Lane Rural Cross Section; and
8. Alternative 8 – 5-Lane Urban Cross Section.

Implementation of the MUP may be a feature that can be phased in conjunction with the proposed Multi-Use Trail to the south of the ROW by the Essex Region Conservation Authority.

The coarse screening of the Central Section 2 cross section alternatives is shown in **Table 9**. The recommended cross sections for further study are:

- Alternative 5 –40 m ROW 4-Lane Rural Cross Section;
- Alternative 6 – 40 m ROW 4-Lane Urban Cross Section;
- Alternative 7 - 40 m ROW 5-Lane Rural Cross Section; and
- Alternative 8 – 40 m ROW 5-Lane Urban Cross Section.

7.2.2 Section 2 Recommended Cross Section

Alternative 7 – 5-Lane Rural Cross Section provides the greatest flexibility for future growth, accommodates farm vehicles and includes active transportation for cyclists in addition to the future multi-use trail located to the south of County Road 46. Alternative 7 is technically preferred cross section for Section 2 and is shown on **Figure 40.**

7.2.3 Section 2 Cross Section Refinement

A refinement for Section 2 includes providing an urban cross section within the commercial area to accommodate existing driveways and parking.

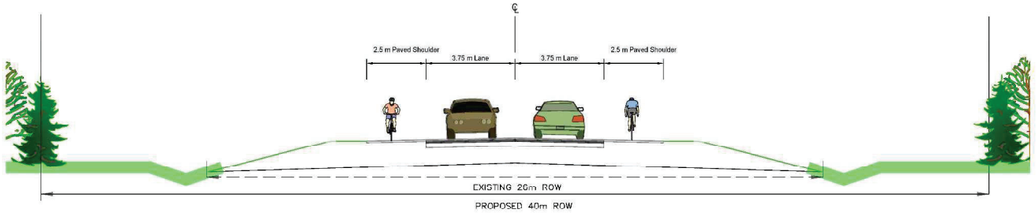


Figure 32: Section 2 Alternative 1 - 2-Lane Rural Cross Section

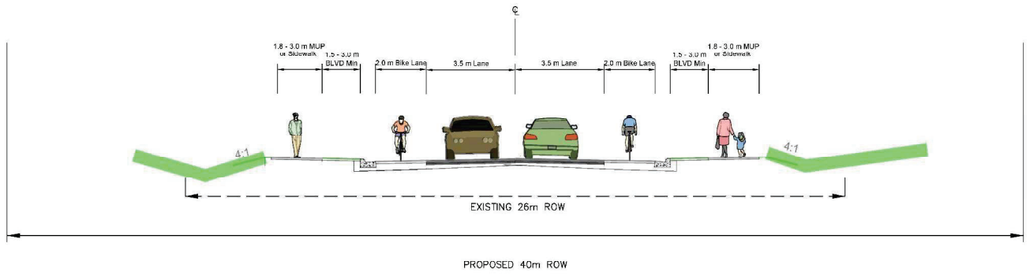


Figure 33: Section 2 Alternative 2 – 2-Lane Urban Cross Section

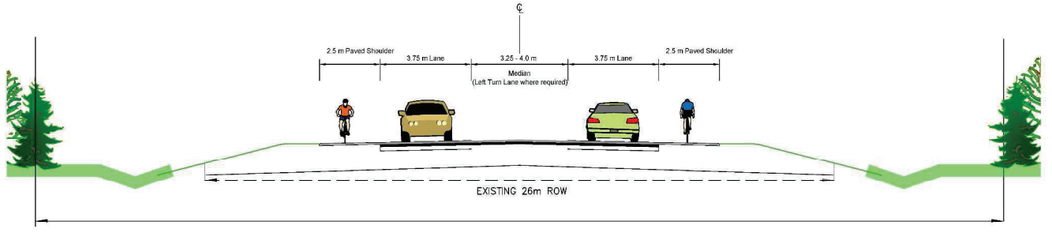


Figure 34: Section 2 Alternative 3 - 3-Lane Rural Cross Section

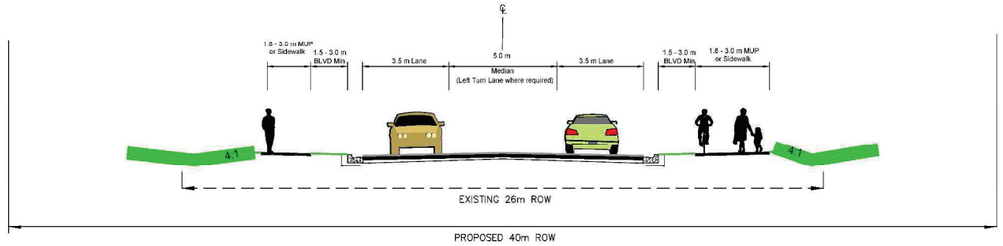


Figure 35: Section 2 Alternative 4 - 3-Lane Urban Cross Section

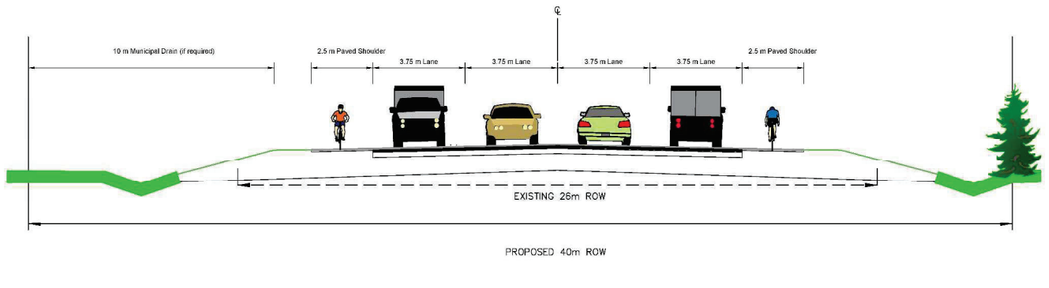


Figure 36: Section 2 Alternative 5 - 4-Lane Rural Cross Section

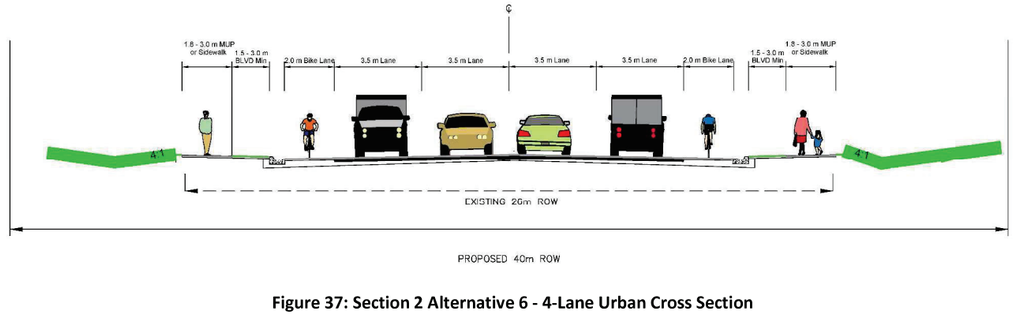


Figure 37: Section 2 Alternative 6 - 4-Lane Urban Cross Section

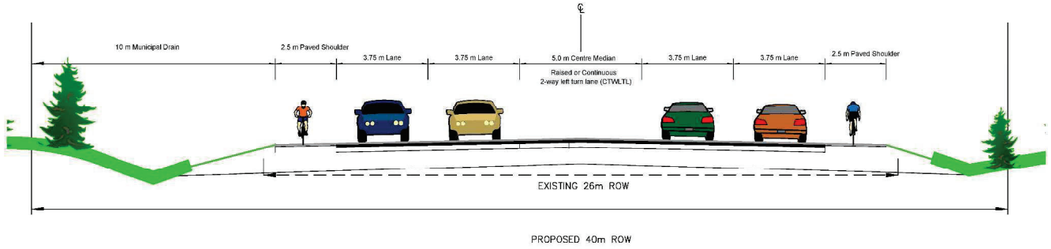


Figure 38: Section 2 Alternative 7 - 5-Lane Rural Cross Section

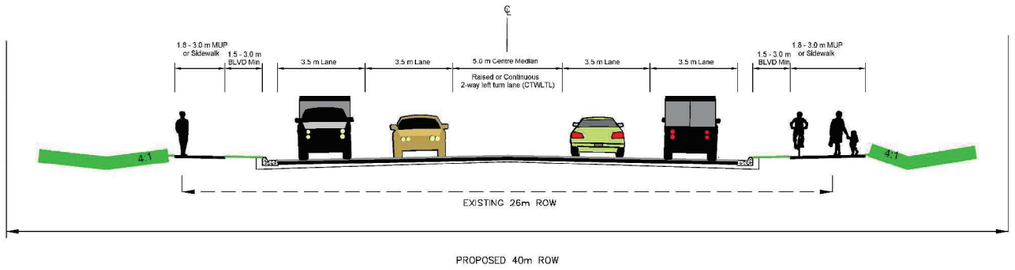


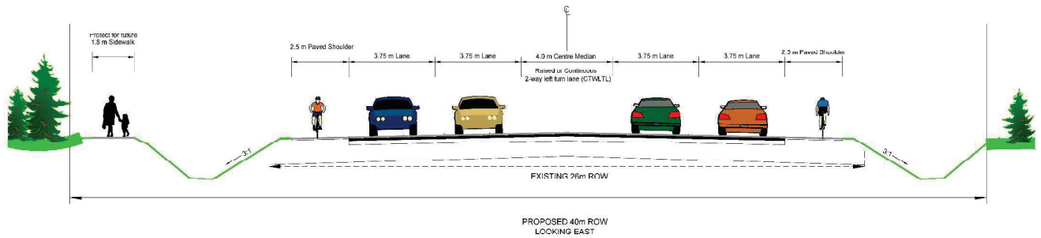
Figure 39: Section 2 Alternative 8 - 5-Lane Urban Cross Section

Table 9: Section 2 Cross Section Evaluation

Evaluation Criteria	Alternative 1 – 2-Lane Rural Cross Section	Alternative 2 – 2-Lane Urban Cross Section	Alternative 3 – 3-Lane Rural Cross Section	Alternative 4 – 3-Lane Urban Cross Section	Alternative 5 – 4-Lane Rural Cross Section	Alternative 6 – 4-Lane Urban Cross Section	Alternative 7– 5-Lane Rural Cross Section	Alternative 8 – 5-Lane Urban Cross Section
Meets Future Travel Demand	Does not meet future travel demand. ×	Does not meet future travel demand. ×	Does not meet future travel demand. ×	Does not meet future travel demand. ×	Meets future travel demand by providing 4-laning. ✓	Meets future travel demand by providing 4-laning. ✓	Meets future travel demand by providing 4-laning. ✓	Meets future travel demand by providing 4-laning. ✓
Provide a left-turn lane	No Left-turn Lane. ×	Left-turn Lane provided. ✓	Left-turn Lane provided. ✓	Left-turn Lane provided. ✓	No Left-turn Lane. ×	No Left-turn Lane. ×	Left-turn Lane provided ✓	Left-turn Lane provided. ✓
Accommodates pedestrians (Pedestrian may use the future multi-use trail.)	No ×	Yes ✓	No ×	Yes ✓	No ×	Yes ✓	No ×	Yes ✓
Accommodates municipal drain within the ROW.	Yes ✓	No ×	Yes ✓	No ×	Yes ✓	No ×	Yes ✓	No ×
Construction Cost	2-lane rural roadway width lowest cost. ✓	2-lane urban roadway width second lowest cost. ✓	3-lane rural roadway width third lowest cost. –	3-lane urban roadway width fourth lowest cost. –	4-lane rural roadway width 5th highest cost. –	4-lane urban roadway 6th highest cost. –	5-lane rural roadway second highest cost. ×	5-lane urban roadway highest cost. ×
Recommendation:	Not Carried Forward. Does not meet travel demand. ×	Not Carried Forward. Does not meet travel demand. ×	Not Carried Forward. Does not meet travel demand. ×	Not Carried Forward. Does not meet travel demand. ×	Carry Forward for further study ✓	Carry Forward for further study ✓	Carry Forward for further study ✓	Carry Forward for further study ✓

Legend

Good ✓ Fair – Poor ×



SECTION 2 PRELIMINARY CROSS SECTION

Preliminary Recommendation to be Carried Forward

Figure 40: Technically Preferred Section 2 Cross Section

7.3 Section 3 Cross Section Evaluation

Section 3 is located within a rural area, of primarily agricultural land uses to the north and south side with residences scattered along the roadway.

7.3.1 Section 3 Cross Section Alternatives

Only rural cross section alternatives were considered for this section of the arterial roadway. The Four (4) rural cross section alternatives are shown in **Figure 41** to **Figure 44**Error! Reference source not found. All cross sections have a 40 m ROW widening either on-centre, to the north or to the south of the existing ROW and include bike lanes, and ditches. The TPA for the alignment in Section 3 meanders to avoid constraints, refer to **Section 5.3.2**. The alternatives are listed as follows:

1. Alternative 1 - 2-Lane Rural Cross Section;
2. Alternative 2 - 3-Lane Rural Cross Section;
3. Alternative 3 - 4-Lane Rural Cross Section; and
4. Alternative 4 - 5-Lane Rural Cross Section;

The evaluation of the coarse screening for the Section 3 cross section alternatives is shown in **Table 10**. Two (2) alternatives cross sections are recommended for further study:

- Alternative 3 –4-Lane Rural Cross Section; and
- Alternative 4 –5-Lane Rural Cross Section.

7.3.2 Section 3 Recommended Cross Section

Alternative 4 – 5-Lane Rural Cross Section provides the greatest flexibility for future growth, accommodates farm vehicles and includes active transportation for cyclists. Alternative 4 is the technically preferred cross section for Section 3 and is shown on **Figure 45.**

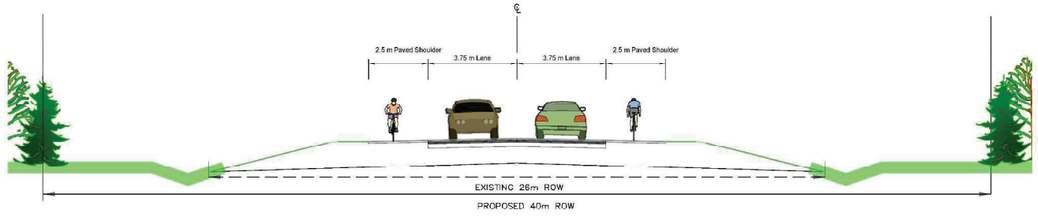


Figure 41: Section 3 Alternative 1 - 2-Lane Rural Cross Section

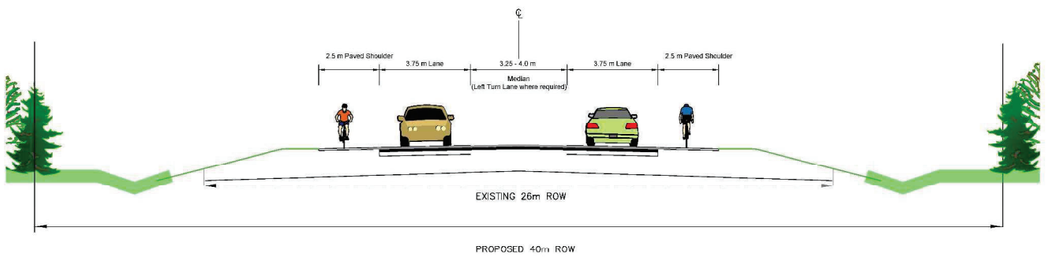


Figure 42: Section 3 Alternative 2 – 3-Lane Rural Cross Section

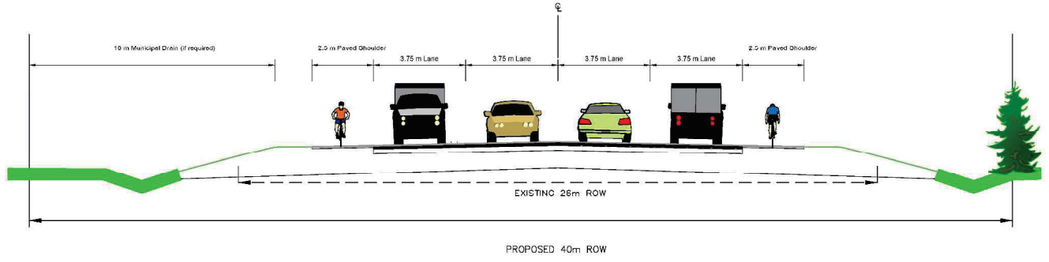


Figure 43: Section 3 Alternative 3 – 4-Lane Rural Cross Section

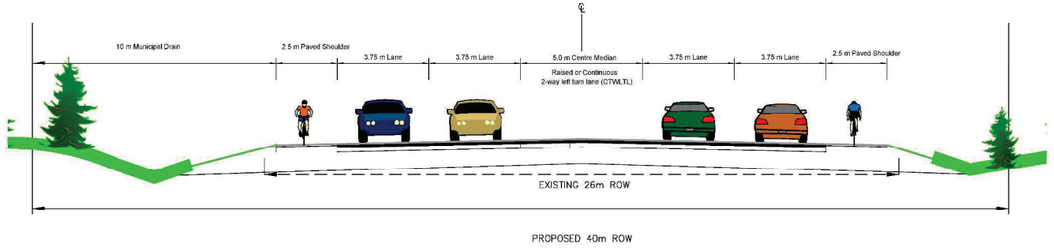


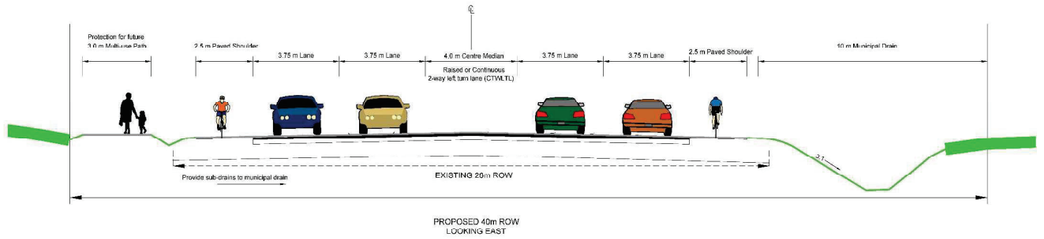
Figure 44: Section 3 Alternative 4 – 5-Lane Rural Cross Section

Table 10: Section 3 Cross Section Evaluation

Evaluation Criteria	Alternative 1 – 2-Lane Rural Cross Section	Alternative 2 – 3-Lane Rural Cross Section	Alternative 3 – 4-Lane Rural Cross Section	Alternative 4 – 5-Lane Rural Cross Section
Active Transportation	All equal. –	All equal. –	All equal. –	All equal. –
Meets Future Travel Demand	Does not meet future travel demand. ✗	Does not meet future travel demand. ✗	Meets future travel demand. ✓	Meets future travel demand. ✓
Provides a left-turn lane	No Left-turn Lane. ✗	Left-turn Lane. ✓	No Left-turn Lane. ✗	Left-turn Lane. ✓
Construction Cost	2-lane roadway width lowest cost. ✓	3-lane roadway width medium cost. –	4-lane rural roadway width higher cost. –	5-lane rural roadway width highest cost. ✗
Recommendation:	Not Carried Forward. Does not meet travel demand. ✗	Not Carried Forward. Does not meet travel demand. ✗	**Carry Forward for further study**. ✓	**Carry Forward for further study**. ✓

Legend

Good ✓ Fair – Poor ✗



SECTION 3 PRELIMINARY CROSS SECTION

✓ **Preliminary Recommendation to be Carried Forward**

Figure 45: Technically Preferred Section 3 Cross Section

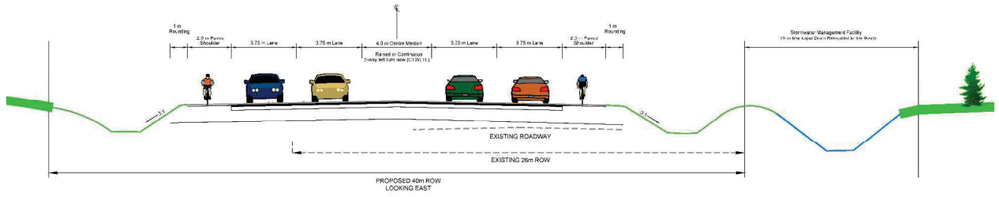
7.4 Section 3 Cross Section Refinements

Two refinements were considered for Section 3 Cross Section Alternative 4 – 5-Lane Rural Cross Section east of Lauzon Parkway.

Refinement 1: Keeps the municipal drain where it is and widens the right-of-way to the north, as shown on **Figure 45**.

Refinement 2: Widen the right-of-way to the north. The municipal drain remains as is, in a separate easement from the arterial road right-of-way, as shown on **Figure 46**.

The refinements were shown to the public at PCC 3. Refinement 1 was recommended to be carried forward to minimize property impacts to the north.



SECTION 3 PRELIMINARY CROSS SECTION - REFINEMENT 2
EAST OF LAUZON PARKWAY TO WEST OF COUNTY ROAD 43

Figure 46: Section 3 Cross Section Refinement 2

8.0 CONCESSION ROADS 8 AND 9 CROSS SECTION EVALUATION

8.1 Concession Road 8

Concession Roads 8 is located within the Town of Tecumseh and will be servicing the developing Business Park/Employment Areas north of County Road 46. This roadway continues northerly into the City of Windsor, north of Highway 401, where lands are also undergoing expansion for employment and residential areas. Urban and rural cross section alternatives were considered. A municipal drain is located along the west side.

8.1.1 Concession Road 8 Cross Section Alternatives

The four (4) cross section alternatives are shown in **Figure 47** to **Figure 50.** All cross sections have a 36 m ROW. Alternatives with cycle tracks are proposed to match the City of Windsor's planned roadway design for Concession Roads 8 north of Highway 401. The cross-section alternatives include:

1. Alternative 1 – 2-Lane Rural Cross Section with bike lanes and a MUP (one side);
2. Alternative 2 – 2-Lane Urban Cross Section with cycle tracks with a sidewalk and/or a MUP (one side);
3. Alternative 3 – 3- Lane Rural Cross Section with bike lanes and a MUP (one side) (utilized at intersections only); and
4. Alternative 4 – 3- Lane Urban Cross Section with cycle tracks with a sidewalk on one side and a MUP on the other (utilized at intersections only).

The coarse screening of the Concession Road 8 cross section alternatives is shown in **Table 11**. The recommended cross sections for further study are:

- Alternative 1 – 2-Lane Rural Cross Section with bike lanes and a MUP (one side);
- Alternative 2 –-2-Lane Urban Cross Section with cycle tracks and sidewalks and/or MUP; and
- Alternative 4 – 3- Lane Urban Cross Section with cycle tracks with a sidewalk on one side and a MUP on the other (utilized at intersections only).

8.1.2 Concession Road 8 Recommended Cross Section

The technically preferred cross section for Concession Road 8 is a 2-Lane Semi-Urban. This cross section provides the greatest flexibility for future growth in combination with a 3-lane cross section at the intersections. This recommendation will accommodate large vehicles and include active transportation for pedestrians and cyclists. Refer to **Figure 51**.

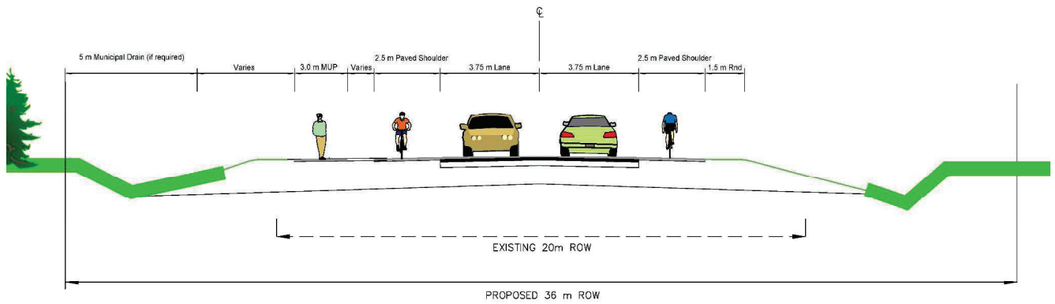


Figure 47: Concession Roads 8 and 9 – Alternative 1 - 2-Lane Rural Cross Section with Bike Lanes and a MUP

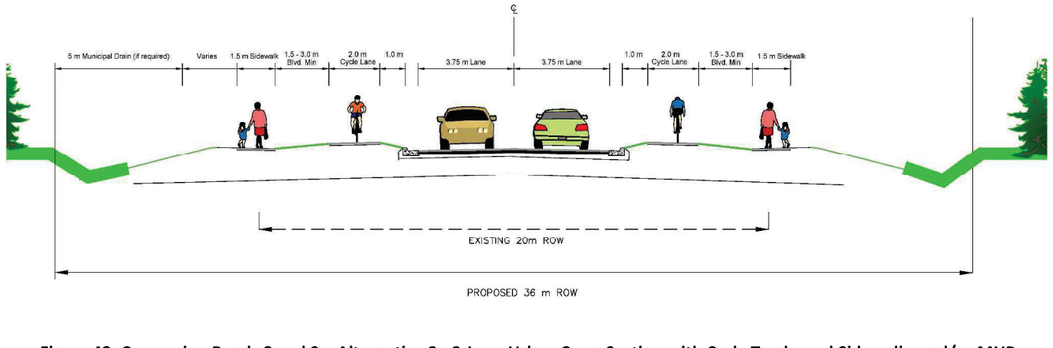


Figure 48: Concession Roads 8 and 9 – Alternative 2 - 2-Lane Urban Cross Section with Cycle Tracks and Sidewalks and/or MUP

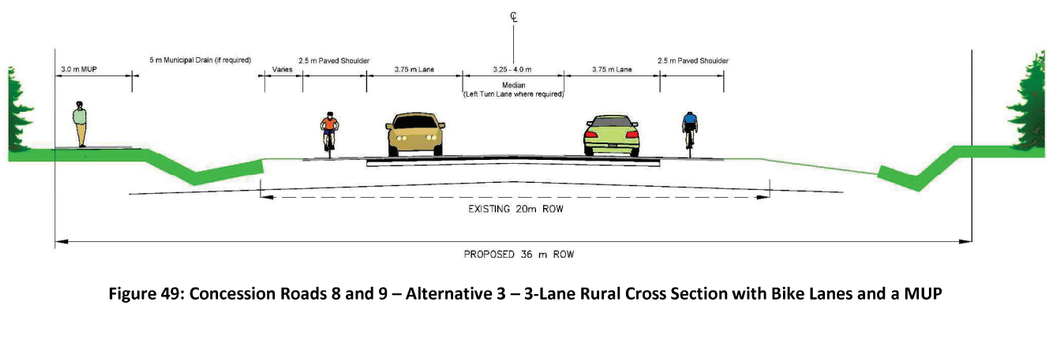


Figure 49: Concession Roads 8 and 9 – Alternative 3 – 3-Lane Rural Cross Section with Bike Lanes and a MUP

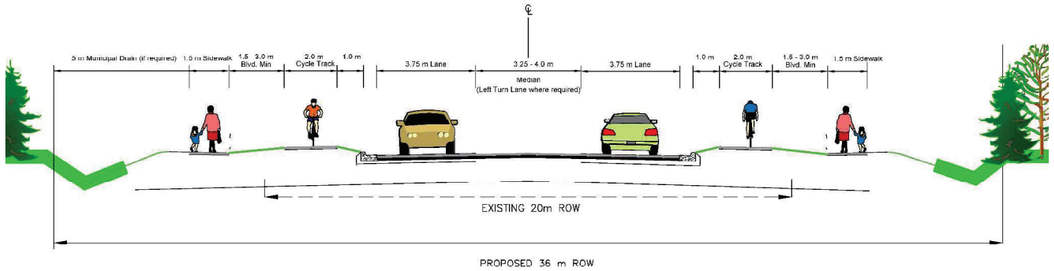


Figure 50: Concession Roads 8 and 9 – Alternative 4 – 3-Lane Urban Cross Section with Cycle Tracks and Sidewalks

Table 11: Concession Roads 8 – Coarse Screening of Cross Sections

Evaluation Criteria	Alternative 1 – 2-Lane Rural Cross Section	Alternative 2 – 2-Lane Urban Cross Section	Alternative 3 – 3-Lane Rural Cross Section	Alternative 4 – 3-Lane Urban Cross Section
Active Transportation	All equal. –	All equal. –	All equal. –	All equal. –
Meets Future Travel Demand	Meets future travel demand by providing 2-laning. ✓	Meets future travel demand by providing 2-laning. ✓	Exceeds future travel demand by providing 3-laning. ✗	Exceeds future travel demand by providing 3-laning. ✗
Matches the City of Windsor planning north of Highway 401.	No ✗	Yes ✓	No ✗	Yes ✓
Provide a left-turn lane	No Left-turn Lane. ✗	No Left-turn Lane. ✗	Left-turn Lane provided. ✓	Left-turn Lane provided. ✓
Accommodates farm vehicles	Yes ✓	No ✗	Yes ✓	No ✗
Impacts to Natural Environment / Storm Water Quality	All alternatives considered equal. –	All alternatives considered equal. –	All alternatives considered equal. –	All alternatives considered equal. –
Construction Cost	2-lane rural roadway lowest cost. ✓	2-lane urban roadway 2nd lowest cost. ✓	3-lane rural roadway higher cost. ✗	3-lane urban roadway highest cost. ✗
Recommendation	Carry Forward for further study. ✓	Carry Forward for further study. ✓	Not Carried Forward. Exceeds travel demand. ✗	Carry Forward for further study at intersections. ✓

Legend: Good ✓ Fair – Poor ✗

8.2 Concession Road 9

Concession Road 9 is located within the Town of Tecumseh and will be servicing the developing Business Park/Employment Areas north of County Road 46 and west of Concession Road 9. The lands to the east are agricultural and a municipal drain is located along the west side. This roadway continues northerly into the City of Windsor, north of Highway 401, where lands are also undergoing expansion for employment and residential areas. Urban and rural cross section alternatives were considered.

8.2.1 Concession Road 9 Cross Section Alternatives

The four (4) cross section alternatives are shown in **Figure 47** to **Figure 50.** All cross sections have a 36 m ROW. Alternatives with cycle tracks are proposed to match the City of Windsor's planned roadway design for Concession Roads 9 north of Highway 401. The cross-section alternatives include:

5. Alternative 1 – 2-Lane Rural Cross Section with bike lanes and a MUP (one side);
6. Alternative 2 – 2-Lane Urban Cross Section with cycle tracks and sidewalks and/or a MUP (one side);
7. Alternative 3 – 3-Lane Rural Cross Section with bike lanes and a MUP (one side) (utilized at intersections only); and
8. Alternative 4 – 3-Lane Urban Cross Section with cycle tracks and sidewalks) (utilized at intersections only).

The coarse screening of the Concession Road 9 cross section alternatives is shown in **Table 12**. The recommended cross sections for further study are:

- Alternative 1 – 2-Lane Rural Cross Section with bike lanes and a MUP (one side);
- Alternative 2 –-2-Lane Urban Cross Section with cycle tracks and sidewalk and/or MUP (one side); and
- Alternative 4 – 3- Lane Urban Cross Section with cycle tracks with a sidewalk on one side and a MUP on the other (utilized at intersections only).

8.2.2 Concession Road 9 Recommended Cross Section

The technically preferred cross section for Concession Road 9 is a 2-Lane Semi-Urban. This cross section provides the greatest flexibility for future growth in combination with a 3-lane cross section at the intersections. This recommendation will accommodate large vehicles and include active transportation for pedestrians and cyclists. Refer to **Figure 51**.

Table 12: Concession Roads 9 – Coarse Screening of Cross Sections

Evaluation Criteria	Alternative 1 – 2-Lane Rural Cross Section	Alternative 2 – 2-Lane Urban Cross Section	Alternative 3 – 3-Lane Rural Cross Section	Alternative 4 – 3-Lane Urban Cross Section
Active Transportation	All equal. –	All equal. –	All equal. –	All equal. –
Meets Future Travel Demand	Meets future travel demand by providing 2-laning. ✓	Meets future travel demand by providing 2-laning. ✓	Exceeds future travel demand by providing 3-laning. ✗	Exceeds future travel demand by providing 3-laning. ✗
Matches the City of Windsor planning north of Highway 401.	No ✗	Yes ✓	No ✗	Yes ✓
Provide a left-turn lane	No Left-turn Lane. ✗	No Left-turn Lane. ✗	Left-turn Lane provided. ✓	Left-turn Lane provided. ✓
Accommodates farm vehicles	Yes ✓	No ✗	Yes ✓	No ✗
Impacts to Natural Environment / Storm Water Quality	All alternatives considered equal. –	All alternatives considered equal. –	All alternatives considered equal. –	All alternatives considered equal. –
Construction Cost	2-lane rural roadway lowest cost. ✓	2-lane urban roadway 2nd lowest cost. ✓	3-lane rural roadway higher cost. ✗	3-lane urban roadway highest cost. ✗
Recommendation	Carry Forward for further study. ✓	Carry Forward for further study. ✓	Not Carried Forward. Exceeds travel demand. ✗	Carry Forward for further study at intersections. ✓

Legend: Good ✓ Fair – Poor ✗

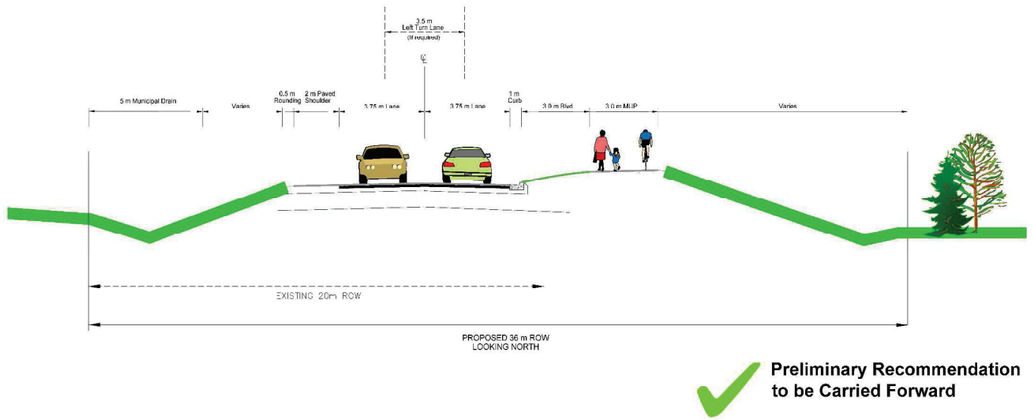


Figure 51: Concession Road 8 and 9 Technically Recommended Cross Section

9.0 COUNTY ROAD 46 INTERSECTION EVALUATION

The five (5) intersections under review are shown in **Figure 52**. They include Concession Road 8, Concession Road 9, County Road 17, County Road 43 and Concession Road 12. Future intersections, including the new Joachim Drive and Santarossa Street have not been included in this evaluation. Previously approved intersections designs for Lauzon Parkway and County Road 19 are carried forward unchanged. In addition, Sexton Sideroad will be closed when Lauzon Parkway is constructed and is not included in this evaluation.

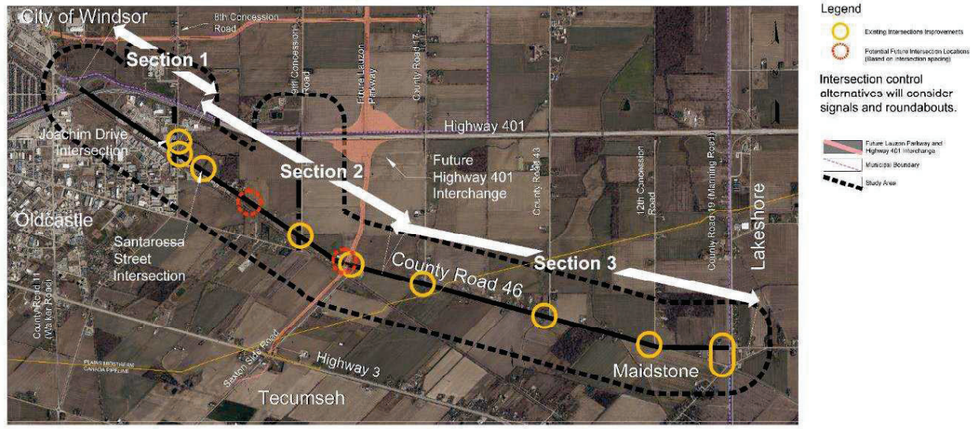


Figure 52: Intersection Locations

9.1 Assessment of Intersection Control Alternatives

The following section describes the trade-offs that were considered at the intersections on County Road 46 within the Study Area:

Traffic Operation (favours roundabout control): Traffic signals may provide a more conventional operation for drivers but result in longer delays than a roundabout.

Traffic signals may result in delays and driver frustration in off peak periods as a result of a single vehicle on the lower volume approach causing the signal phase to change to red for the higher volume or major approach.

Roundabout control is more efficient than a traffic signals.

Traffic Safety (favours roundabout control): Roundabouts feature channelized, curved approaches that reduce vehicle speed, entry yield control that gives right-of-way to circulating traffic, and counterclockwise flow around a central island that minimizes conflict points. The net result of lower speeds and reduced conflicts at roundabouts compared to a traffic signal is an environment where injury or fatality crashes are substantially reduced.

Pedestrian and Cyclist Safety (favours single lane roundabout control) The lower vehicular speeds and reduced conflict environment at a roundabout create a more suitable environment for walking and bicycling. The roundabout design can allow cyclists to operate in a traffic lane or outside the roundabout on a multi use path.

***Large Agricultural Equipment and Transport Trucks (equal*)**: A roundabout centre island can be designed to accommodate oversized vehicles. A recent roundabout project in southern Ontario was designed to accommodate trucks transporting wind turbine blades. Roundabout designs are based on accommodating large combines with an overall length of 24 metres.

Construction Cost (favours signalized intersections): From a cost perspective, a signalized intersection is typically 20%-50% lower cost than a roundabout control design. A roundabout may also require purchase of additional property. The higher cost is typically associated with traffic staging to construct the roundabout.

Future Longer Term Operational Costs (favours roundabout control): Future longer term operational costs typically favour roundabout control.

Property Impacts (favours signalization): A roundabout typically requires more property than a signalized intersection.

Intersection Spacing (favours roundabout control): The desirable spacing of arterial road intersections is 400 to 500 m. This distance allows for the coordination of adjacent traffic signals (if required), would normally accommodate the increased traffic queuing at a traffic signal while

allowing for the left-turn storage lanes, signage, driver recognition of the intersection and directional signage requirements.

9.2 Preliminary Design Alternatives

In developing Preliminary Design Alternatives, several general principles and objectives were considered for arterial road operation and safety. These include:

- Meeting the traffic demand forecast for the next 20 – 30 years.
- Intersection spacing.
- Satisfy design standards and corridor classification standards.
- Ensure the technical feasibility of construction, operation and maintenance.
- Improve the use of existing infrastructure.
- Promote sustainable growth and economic development.
- Provide for the efficient movement of people and goods during the staging of the project.
- Minimize the environmental impacts.
- Support emergency service response objectives.

The planning process includes the generation of all possible alternatives including the "Do Nothing" alternative as a baseline to compare other alternatives. Alternatives that were not considered viable, had significant impacts, or had substantially poorer safety or traffic performance compared with other alternatives, were coarse screened, as described in the following sections.

9.3 County Road 46 and Concession Road 8 Intersection

The following are the intersection alternatives carried forward for the County Road 46 and Concession Road 8 intersection.

Alternative A – Do Nothing. The existing intersection is signalized with a significant skew on the north and south legs. Disadvantages of this alternative include increased delays to accommodate turning movements; and higher occurrence/severity of collisions based on higher operating speeds and number of conflict points.
Alternative B - Signalized Intersection: Disadvantages of this alternative include increased delays to accommodate turning movements; and higher occurrence/severity of collisions based on higher operating speeds and number of conflict points. Refer to **Figure 53**.

Alternative C – 2 circulating lane Roundabout: Advantages of this alternative include greater level of service, lower long-term costs. Cyclists will be directed to ride outside the roundabout. In addition, For the future employment areas to the north, a roundabout typically results in better traffic operations during both high and low traffic demand periods and provides a gateway opportunity for the Business Park / Employment Area. Refer to **Figure 54**.

Table 13 summarizes the evaluation of the County Road 46 and Concession Road 8 preferred intersection alternatives.

9.3.1 County Road 46 and Concession Road 8 Preliminary Intersection Recommendation

Where property is available or where no buyouts are required impacting residences, then a single lane roundabout is preferred as they generally provide better traffic operations and lower collision risk.

The preliminary recommendation would be to choose roundabout control, accepting the increase in capital cost associated with this solution.

For the future employment areas to the north and northwest, a roundabout typically results in better traffic operations during both high and low traffic demand periods and provides a gateway opportunity for the Business Park / Employment Area.

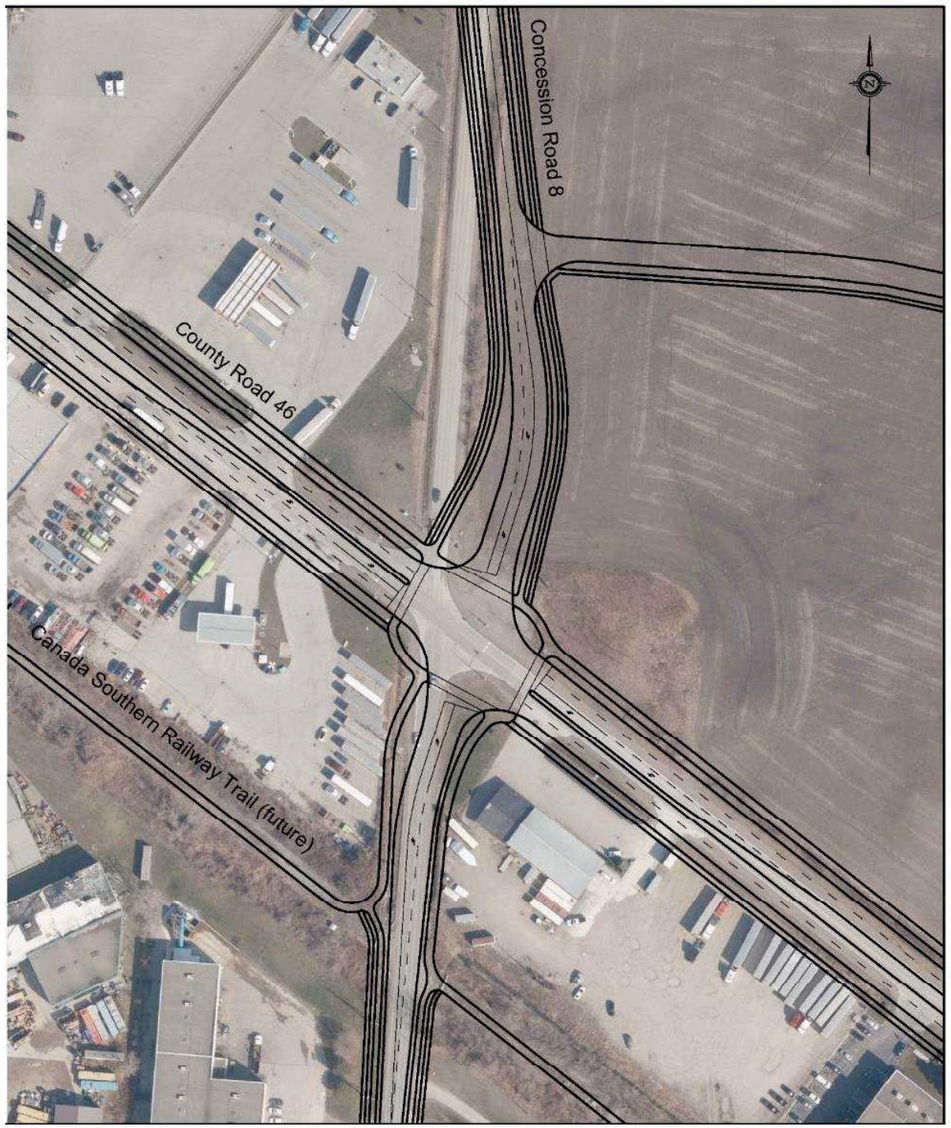


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Figure 53: County Road 46 and Concession Road 8 Intersection Alternative B

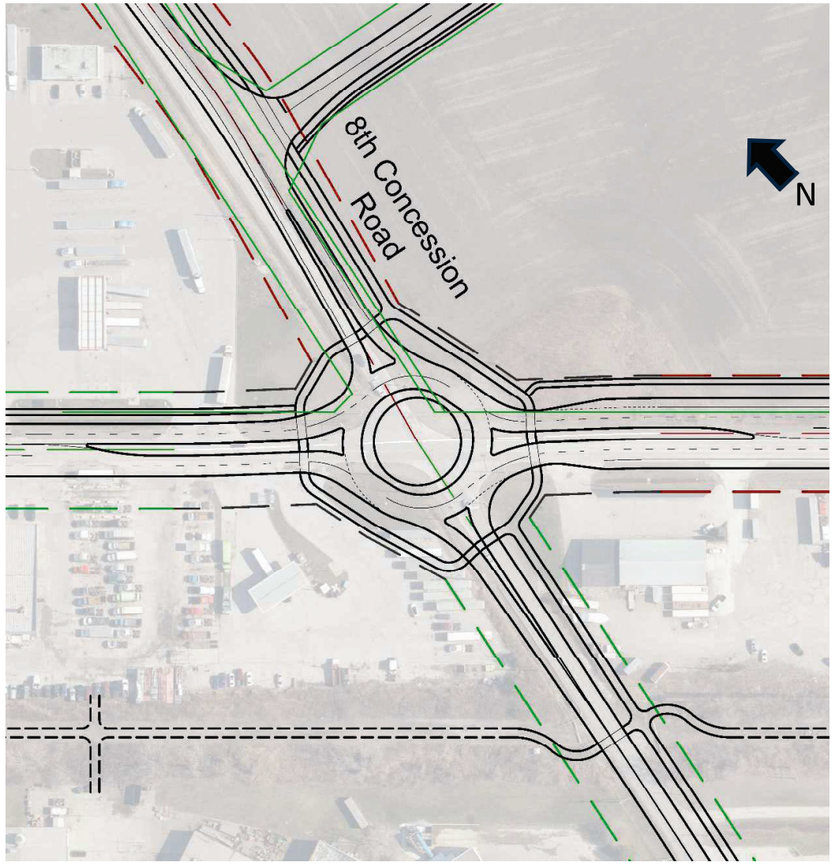

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Figure 54: County Road 46 and Concession Road 8 Intersection Alternative C

Table 13: Evaluation of County Road 46 and Concession Road 8 Intersection Evaluation

Criteria	Alternative A Do Nothing	Alternative B Signalized Intersection	Alternative C Roundabout
Future Development	✗ • Does not meet future traffic requirements.	✓ • Does meet future traffic requirements.	✓ • Does meet future traffic requirements.
Traffic Operations	✗ • Reduced level of service on County Road 46 and Concession Road 8 due to skew angle on Concession Road 8.	✗ • Reduced level of service on County Road 46 and Concession Road 8 due to traffic delays and signal timing.	✓ • Improves the level of service on County Road 46 and Concession Road 8.
Property Impacts	✓ • No property impacts.	✗ • Major property impacts due to reduced skew..	– • Moderate property impacts.
Construction Cost	✓ • Least cost.	– • Moderate cost.	✗ • Highest cost.
Overall Rating	✗ Not Recommended to be Carried Forward	✗ Not Recommended to be Carried Forward	✓ **Recommended to be Carried Forward**

Legend: ✓ Good – Neutral/Fair ✗ Poor

9.4 County Road 46 and Concession Road 9 Intersection

The following are the intersection alternatives carried forward for the County Road 46 and Concession Road 9 intersection.

Alternative A – Do Nothing. The existing intersection is signalized with a significant skew on the north and south legs. Disadvantages of this alternative include increased delays to accommodate turning movements; and higher occurrence/severity of collisions based on higher operating speeds and number of conflict points.

Alternative B - Signalized Intersection: Disadvantages of this alternative include increased delays to accommodate turning movements; and higher occurrence/severity of collisions based on higher operating speeds. Refer to **Figure 55**.

Alternative C - Roundabout: Advantages of this alternative include greater level of service, lower long-term costs. For the future employment areas to the north, a roundabout typically results in better traffic operations during both high and low traffic demand periods and provides a gateway opportunity for the Business Park / Employment Area. Refer to **Figure 56**.

Table 14 summarizes the evaluation of the County Road 46 and Concession Road 9 preferred intersection alternatives.

9.4.1 County Road 46 and Concession Road 9 Preliminary Intersection Recommendations

Where property is available or where no buyouts are required impacting residences, then a roundabout is preferred as they generally provide better traffic operations and lower collision risk.

The preliminary recommendation would be to choose roundabout control, accepting the increase in capital cost associated with this solution.

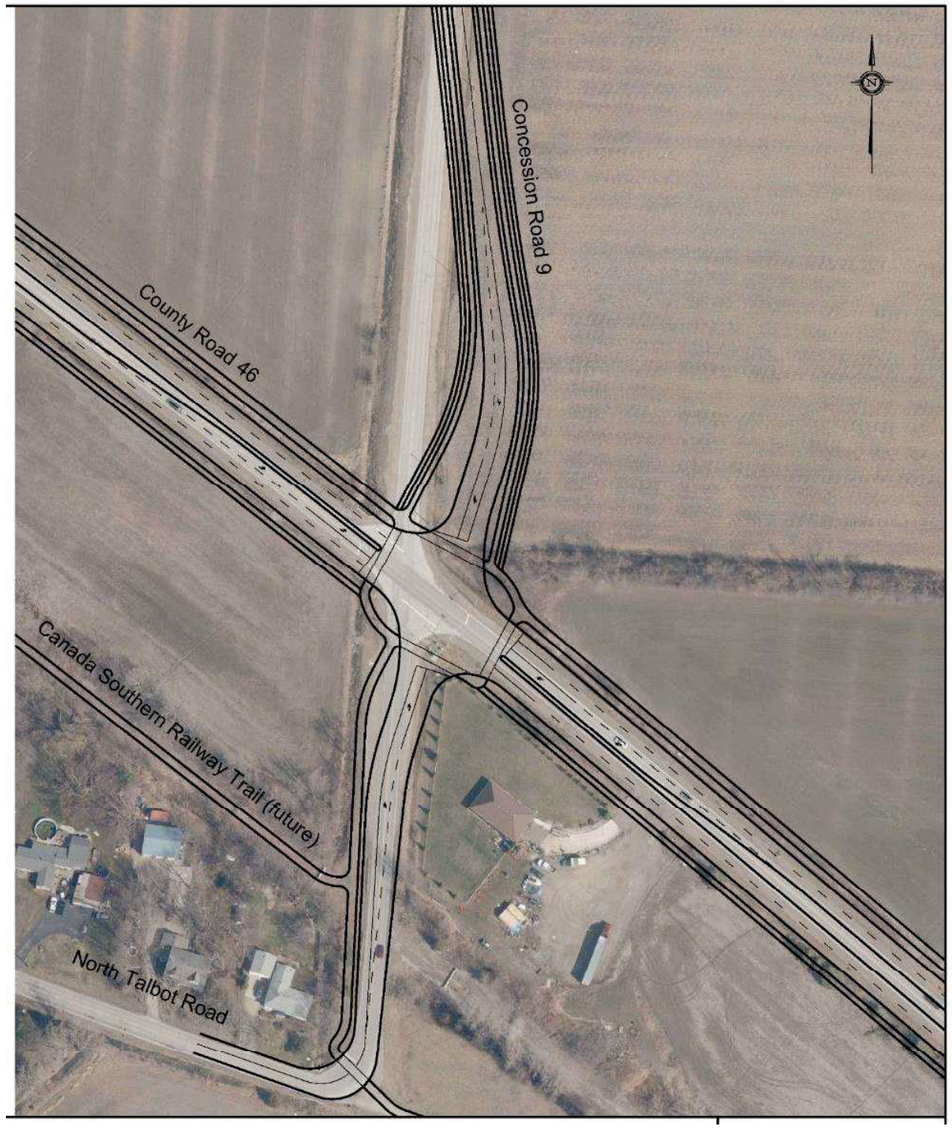

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Figure 55: County Road 46 and Concession Road 9 Intersection Alternative B

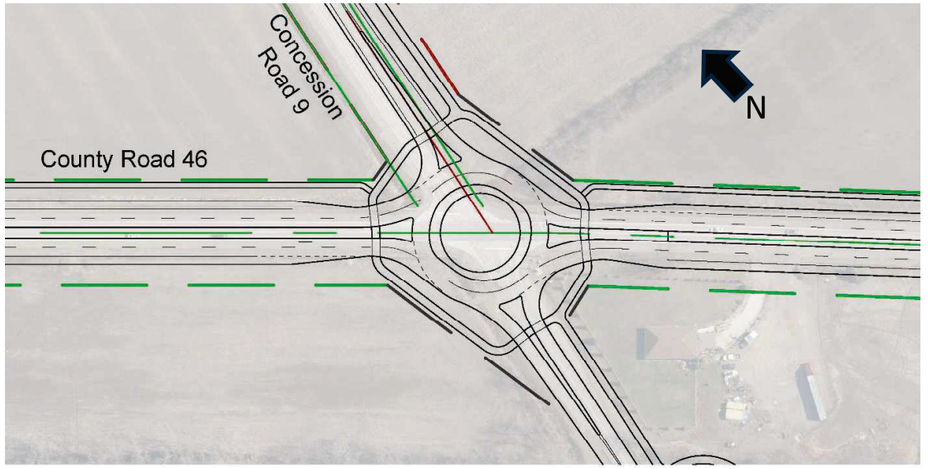

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Figure 56: County Road 46 and Concession Road 9 Intersection Alternative C

Table 14: Evaluation of County Road 46 and Concession Road 9 Intersection Evaluation

Criteria	Alternative A Do Nothing	Alternative B Signalized Intersection	Alternative C Roundabout
Future Development	× • Does not meet future traffic requirements.	✓ • Does meet future traffic requirements.	✓ • Does meet future traffic requirements.
Traffic Operations	× • Reduced level of service on County Road 46 and Concession Road 9 due to skew angle on Concession Road 9.	× • Reduced level of service on County Road 46 and Concession Road 8 due to traffic delays and signal timing.	✓ • Improves the level of service on County Road 46 and Concession Road 8.
Property Impacts	✓ • No property impacts.	× • Major property impacts due to reduced skew.	– • Moderate property impacts.
Construction Cost	✓ • Least cost.	– • Moderate cost.	× • Highest cost.
Overall Rating	× Not Recommended to be Carried Forward	× Not Recommended to be Carried Forward	✓ **Recommended to be Carried Forward**

Legend: ✓ Good – Neutral/Fair × Poor

9.5 County Road 46 and County Road 17 Intersection

The following are the intersection alternatives carried forward for the County Road 46 and County Road 17 intersection.

Alternative A – Stop Control Intersection. The existing intersection is a three-way, unsignalized intersection with a minor skew on the north leg. Refer to **Figure 57**.
Alternative B - Roundabout: Advantages of this alternative include consistency with other intersections in the corridor. lower level of service due to low traffic volume on County Road 17. Refer to **Figure 58**.

Table 15 summarizes the evaluation of the County Road 46 and County Road 17 preferred intersection alternatives.

9.5.1 County Road 46 and County Road 17 Preliminary Intersection Recommendations

The preliminary recommendation would be to choose conventional intersection control. MTO has confirmed County Road 17 will be closed at Highway 401 and will become a low volume roadway.

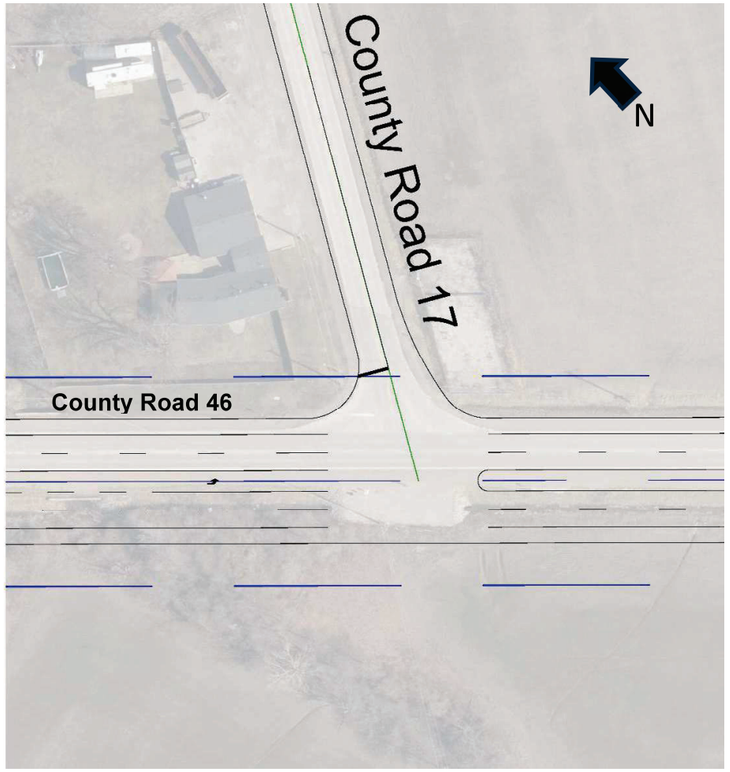

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Figure 57: County Road 46 and County Road 17 Intersection Alternative A

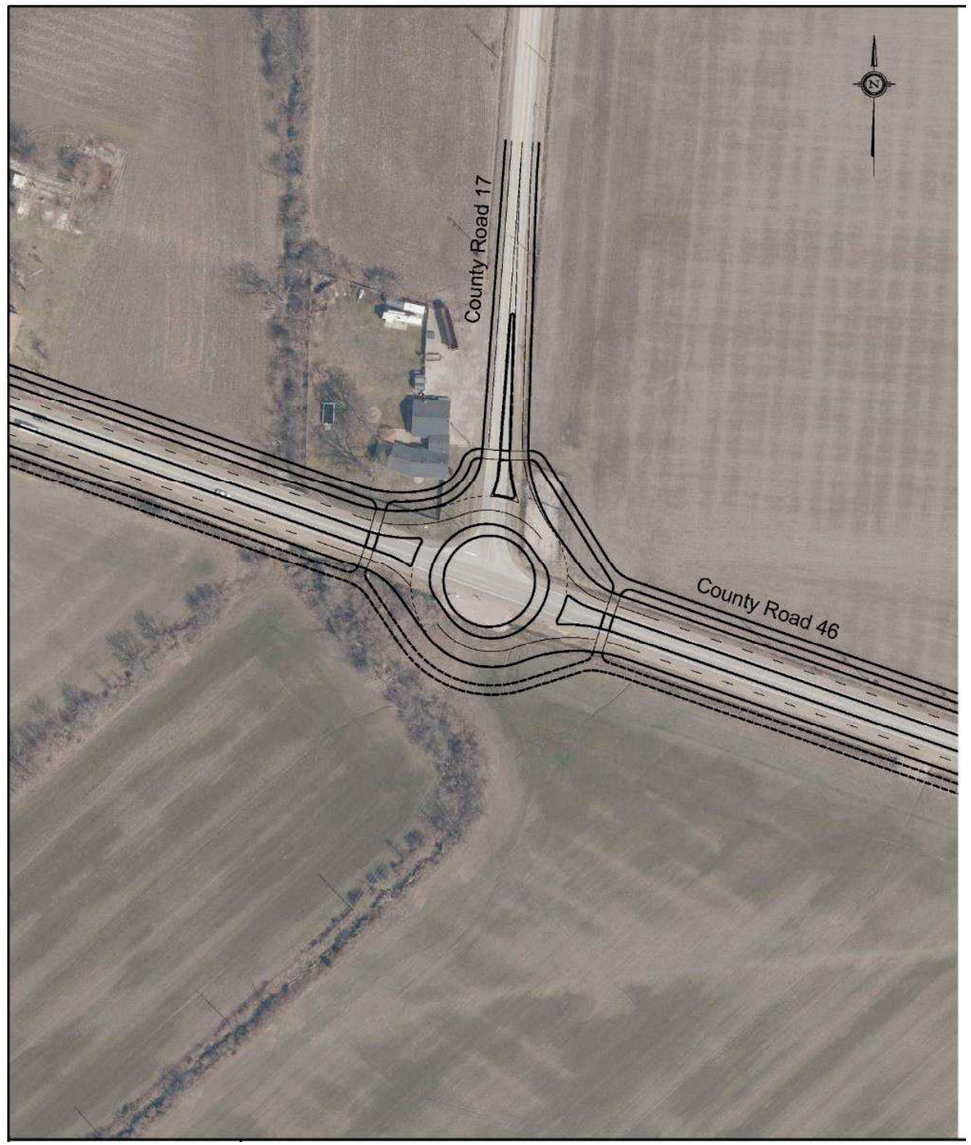

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Figure 58: County Road 46 and County Road 17 Intersection Alternative B

Table 15: Evaluation of County Road 46 and County Road 17 Intersection Evaluation

Criteria	Alternative A Stop Control Intersection	Alternative B Roundabout
Future Development	✓ • Meets future traffic requirements.	× • Exceeds future traffic requirements.
Traffic Operations	✓ • Meets required level of service on County Road 46 and County Road 17.	✓ • Exceeds required level of service on County Road 46 and County Road 17.
Property Impacts	✓ • Minor property impacts.	– • Moderate property impacts.
Utility Impacts	– • Minor natural gas facility impacts in the northeast quadrant.	× • Major natural gas facility impacts in the northeast quadrant.
Construction Cost	✓ • Least cost.	– • Highest cost.
Overall Rating	✓ **Recommended to be Carried Forward**	× Not recommended to be Carried Forward (County Road 17 will be closed at Highway 401)

Legend: ✓ Good – Neutral/Fair × Poor

9.6 County Road 46 and County Road 43

The following are the intersection alternatives carried forward for the County Road 46 and County Road 43 intersection.

Alternative A – Stop Control Intersection. The existing intersection is a three-way, unsignalized intersection with a minor skew on the north leg. Refer to **Figure 59**.
Alternative B - Roundabout: Advantages of this alternative is consistency with other intersections. Refer to **Figure 60**.

Table 16 summarizes the evaluation of the County Road 46 and County Road 43 preferred intersection alternatives.

9.6.1 County Road 46 and County Road 43 Preliminary Intersection Recommendations

The preliminary recommendation would be to choose Stop Control intersection control with protection for signals.

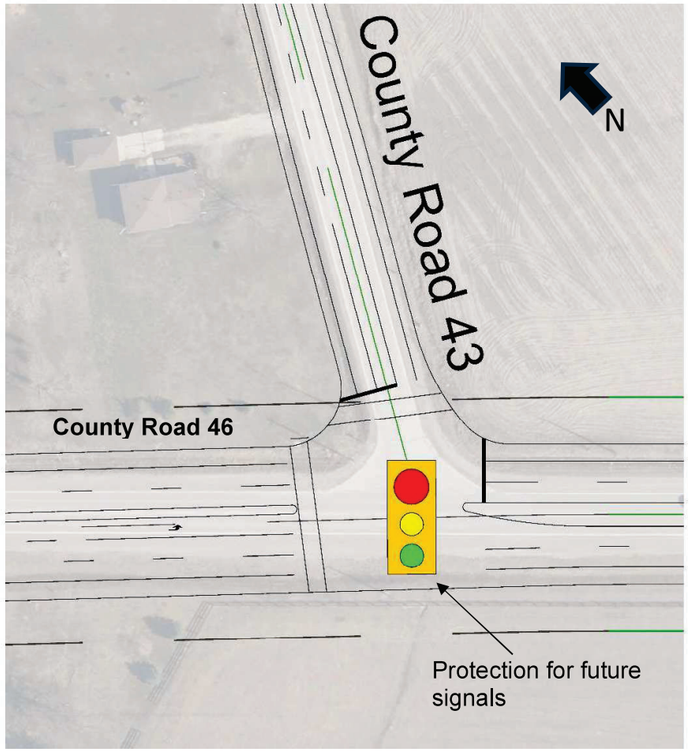

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Figure 59: County Road 46 and County Road 43 Intersection Alternative A

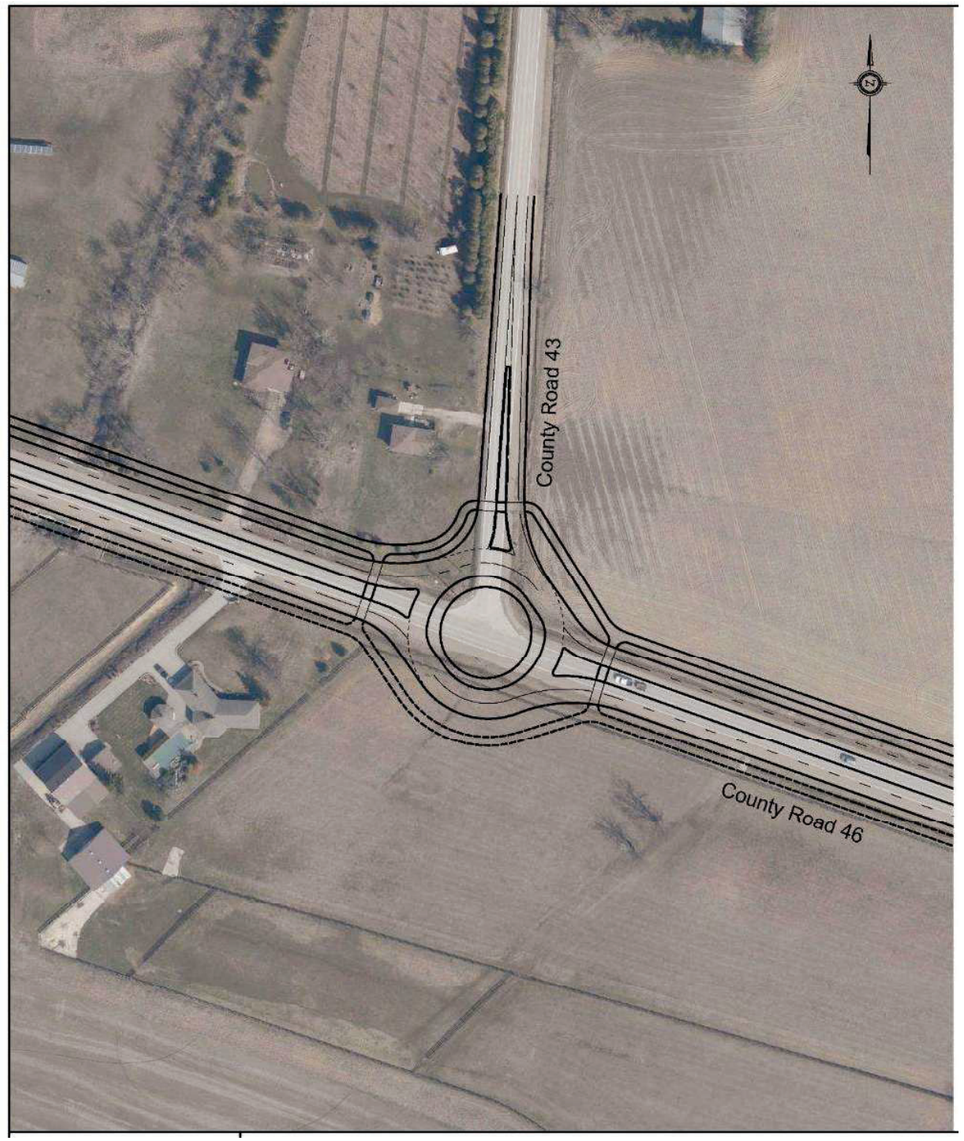

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Figure 60: County Road 46 and County Road 43 Intersection Alternative B

Table 16: Evaluation of County Road 46 and County Road 43 Intersection Evaluation

Criteria	Alternative A Stop Control Intersection	Alternative B Roundabout
Future Development	✓ • Meets future traffic require-ments.	× • Exceeds future traffic requirements.
Traffic Operations	✓ • Meets level of service required on County Road 46 and County Road 43.	✓ • Exceeds required level of service on County Road 46 and County Road 43.
Property Impacts	✓ • Minor property impacts.	— • Moderate property impacts.
Construction Cost	✓ • Least cost.	— • Highest cost.
Overall Rating	✓ **Recommended to be Carried Forward** With protection for signals	× Not recommended to be Carried Forward

Legend: ✓ Good — Neutral/Fair × Poor

9.7 County Road 46 and Concession Road 12

The following are the intersection alternatives carried forward for the County Road 46 and Concession Road 12 intersection.

Alternative A – Stop Control Intersection. The existing intersection is a three-way, unsignalized intersection with a minor skew on the north leg. Refer to **Figure 61**.
Alternative B - Roundabout: Advantages of this alternative include consistency with other roundabout controlled intersections. Refer to **Figure 62**.

Table 17 summarizes the evaluation of the County Road 46 and Concession Road 12 preferred intersection alternatives.

9.7.1 County Road 46 and Concession Road 12 Preliminary Intersection Recommendations

The preliminary recommendation would be to choose conventional intersection control.

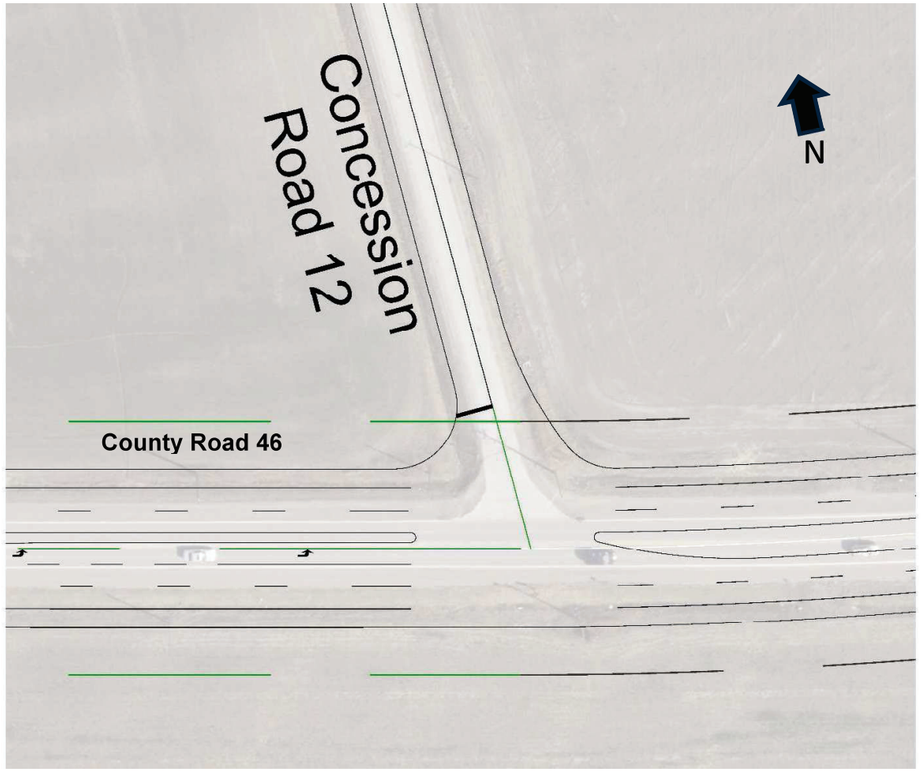

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Figure 61: County Road 46 and Concession Road 12 Intersection Alternative A

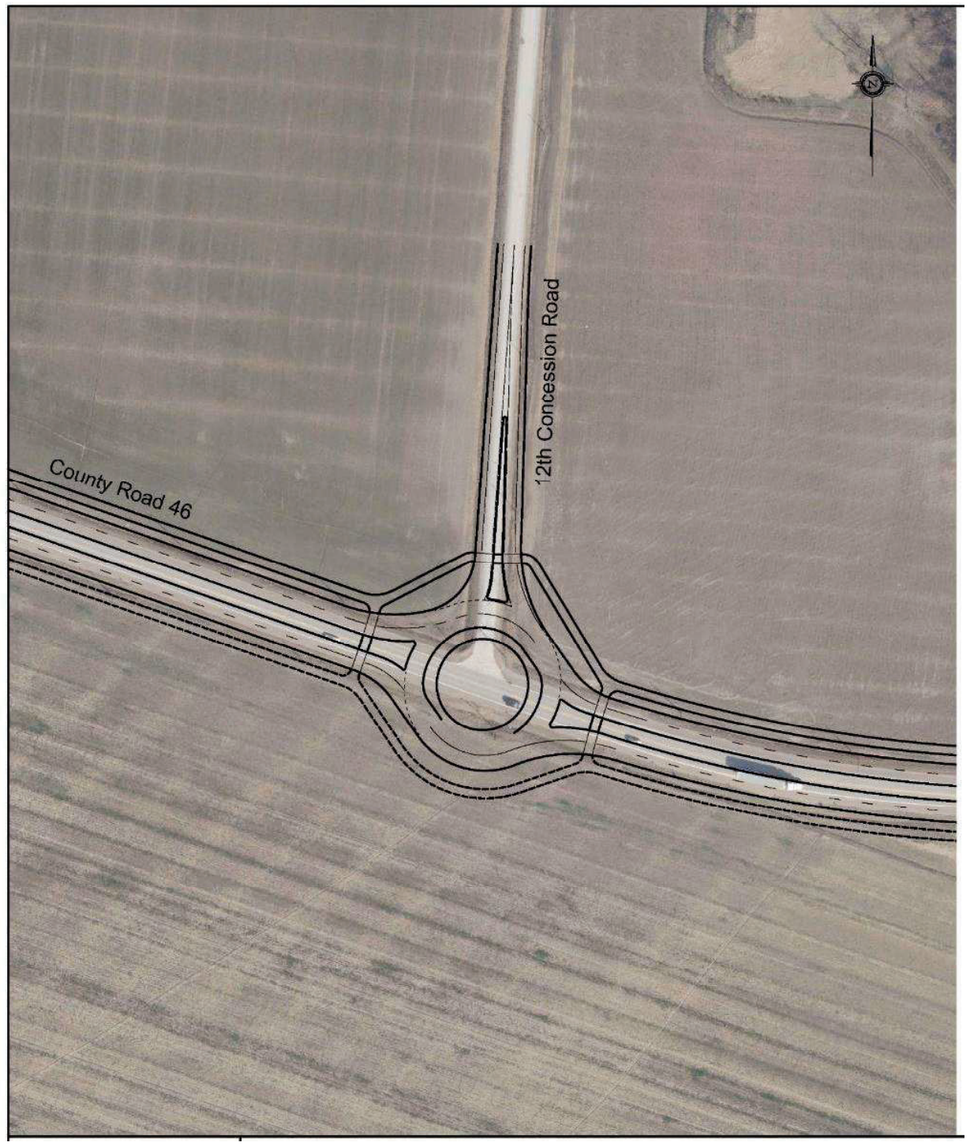

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Figure 62: County Road 46 and Concession Road 12 Intersection Alternative B

Table 17: Evaluation of County Road 46 and Concession Road 12 Intersection Evaluation

Criteria	Alternative A Stop Control Intersection	Alternative C Roundabout
Future Development	✓ • Meets future traffic require-ments.	× • Exceeds future traffic requirements.
Traffic Operations	✓ • Meets required level of service on County Road 46 and Conces-sion Road 12.	✓ • Exceeds the level of service on County Road 46 and Concession Road 12.
Property Impacts	✓ • Minor property impacts.	– • Moderate property impacts.
Construction Cost	✓ • Least cost.	– • Highest cost.
Overall Rating	✓ **Recommended to be Carried Forward**	× Not recommended to be Carried Forward

Legend: ✓ Good – Neutral/Fair × Poor

9.8 Summary of Preliminary Intersection Recommendations

The preliminary recommendation for Concession Roads 8 and 9 would be to choose roundabout control, accepting the minor increase in capital cost associated with this solution. For the future employment areas in the northwest quadrant of the Study Area, a roundabout typically has better operations during both high and low traffic demand periods and provides the opportunity for a gateway treatment.

Stop Control intersections are recommended for County Roads 17 and 43 and Concession Road 12.

9.9 Previous Intersection EA Recommendations

9.9.1 Lauzon Parkway Intersection

In January 2014 the Lauzon Parkway Improvement Class Environmental Study Report was filed for public review and documented the Recommended Plan for the Lauzon Parkway Extension. The goals of the EA were to develop a gateway and community transportation corridor from the existing Lauzon Parkway to Highway 3, with a new interchange at Highway 401 and access to new development in the Sandwich South Secondary Plan area. The project was undertaken as a Schedule 'C' under the Municipal Class EA (October 2000 as amended in 2007 and 2011) and was directed by a Project Team that included staff members from MTO, the City of Windsor, the County of Essex, and MRC.[2]

Within the County Road 46 Study Area the recommended alignment for Lauzon Parkway south of Highway 401 follows the mid-lot lines to County Road 46 and then follows the existing Sexton Side-road to Highway 3. Sexton Sideroad will be closed at County Road 46. The recommended intersection with County Road 46 is located to the west of the existing Sexton Sideroad and would be a signalized intersection. Refer to **Figure 63**.

[2] Lauzon Parkway Improvement Class Environmental Study Report, MRC, a member of the MMM Group, January 2014

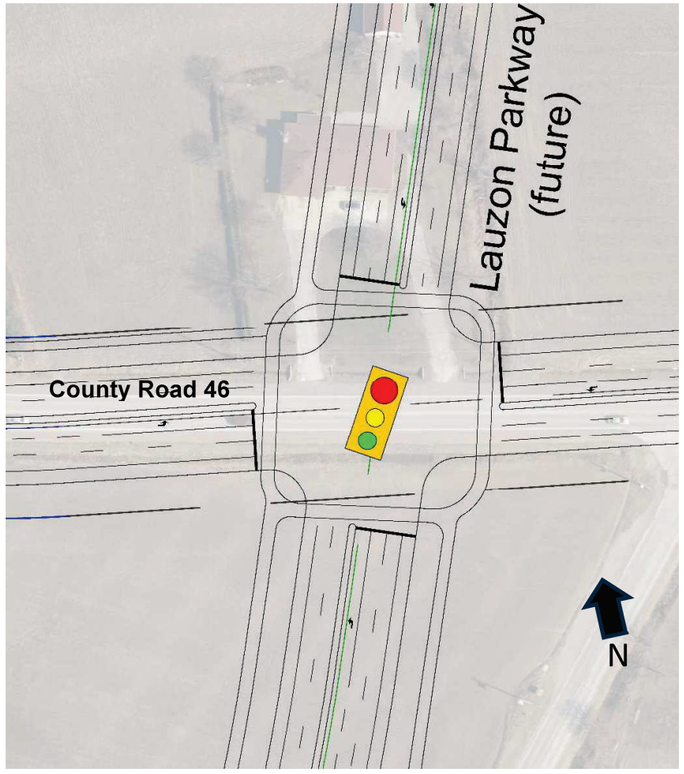

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Figure 63: Lauzon Parkway and County Road 46 Intersection

9.9.2 Sexton Road Intersection

As part of the Lauzon Parkway Improvement Class Environmental Study Report the Recommended Plan for the Lauzon Parkway Extension included closing Sexton Sideroad. The road allowance to the south will become part of the Lauzon Parkway with a short section at County Road 46 will be closed and a new signalized intersection to the west, refer to **Section 9.9.1**.

9.9.3 County Road 19 (Manning Road) and County Road 46 Intersection

The County Road 19 (Manning Road) and County Road 22 Improvements GWP 3031-06-00 Environmental Study/Preliminary Design Report was completed in November 2008. The Study Team for the

project consisted of representatives of MTO, County of Essex, Town of Lakeshore and Town of Tecumseh. [3]

The Environmental Study/Preliminary Design Report (ESR/PDR) was prepared in accordance with the requirements of the Municipal Class EA (October 2000, as amended in 2007) and MTO's Class EA for Provincial Transportation Facilities (2000). MTO's Class EA applies to the Highway 401 interchange. The Recommended Plan included widening County Road 19 from two to four lanes with a signalized intersection at County Road 46. Refer to **Figure 64**.

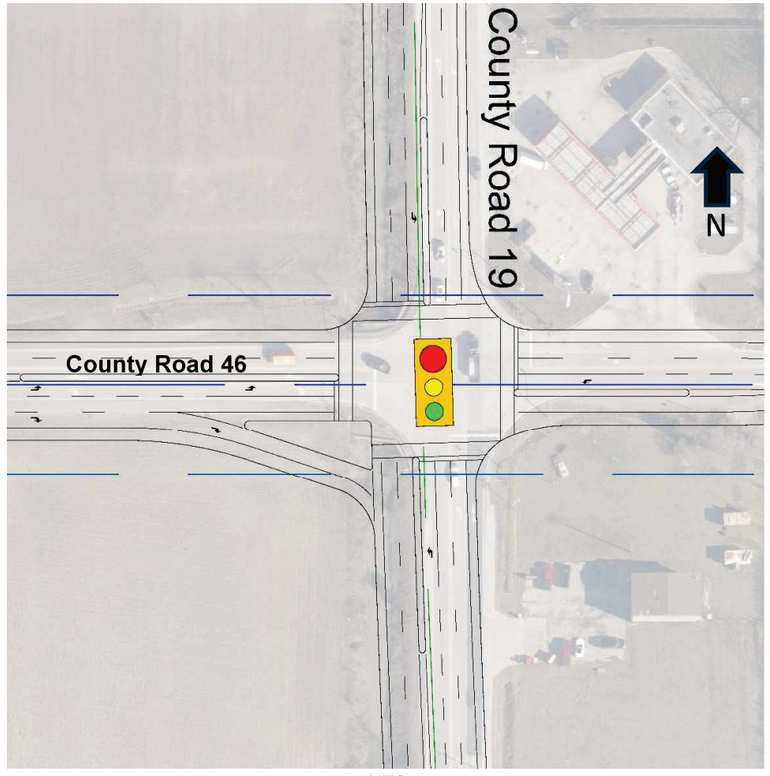

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Figure 64: County Road 19 and County Road 46 Intersection

[3] County Road 19 (Manning Road) & County Road 22 Improvements GWP 3031-06-00 Environmental Study/Preliminary Design Report by Dillion, November 2008