

ENVIRONMENTAL STUDY REPORT

COUNTY ROAD 43/ BANWELL ROAD FROM THE CPR TRACKS (CITY LIMITS) TO SOUTH OF COUNTY ROAD 42

CLASS ENVIRONMENTAL ASSESSMENT STUDY

County of Essex



July 2009



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EXECUTIVE SUMMARY

INTRODUCTION AND BACKGROUND

This report was prepared as part of the Schedule C Municipal Class Environmental Assessment (Class EA) Study for improvements to the County of Essex's County Road 43/Banwell Road immediately south of the CPR tracks to south of County Road 42. The purpose of this study is to address the County Road 43/Banwell Road capacity and operating deficiencies that were identified in the Essex Windsor Regional Transportation Master Plan (EWRTMP) resulting from anticipated growth within the Town of Tecumseh and the eastern section of the City of Windsor. A related study purpose is to establish the future need to acquire Ontario Realty Corporation property in the hydro corridor at the north study area boundary.

PLANNING PROCESS AND CONSULTATION

The County Road 43/Banwell Road Class EA Study preceded the start of the City of Windsor's Class EA Study of Banwell Road from Tecumseh Road East to the CPR tracks south of Intersection Road. A decision was made by the County in late 2006 to place the County Road 43/Banwell Road Class EA Study on hold until the City's Banwell Road Class EA Study reached Phase 3 where the "Technically Recommended Design" for the entire Banwell Road corridor was determined. The overall integrated technically recommended design for the Banwell Road corridor from Tecumseh Road East to south of County Road 42 was presented to the public at combined second and third Public Information Centres, with representation from both the County and City. In this manner, the interested stakeholders would have the opportunity of understanding the recommended improvements for Banwell Road between the City and the County.

Various federal and provincial government agencies as well as other public agencies were contacted by mail. The majority responded to the request for input into the study indicating limited concern with the proposed undertaking but wanting to be kept informed. Refer to the main Environmental Study Report (ESR) *Appendix A – Public Consultation and Related Correspondence, A.5 – External Contacts*. All external representatives that expressed an interest in the study were invited to attend the Public Information Centres and/or were contacted during the course of the study to ensure that any issues were adequately addressed.

Formal contact with the public took place at five key points of contact; 1) Notice of Study Commencement, 2) Notice of Public Information Centre No. 1 (September 14, 2006), 3) Notice of Combined Public Information Centre No. 2 (September 18, 2007), 4) Notice of Combined Public Information Centre No. 3 (June 2, 2009) and 5) Notice of Study Completion and Submission of the Environmental Study Report issued in July 2009.

Throughout the course of the study, the Project Team dealt with numerous requests of information regarding the study process and progress and these requests were followed up by a letter, telephone conversation, meeting, or mailing of project related material.

PROBLEM STATEMENT

The section of County Road 43/Banwell Road between the City of Windsor boundary immediately south of the CPR tracks and County Road 42 is a two lane rural north/south County Road with narrow gravel shoulders and open ditch drainage within a 12 metre right-of-way. This section of road is currently posted at 60 km/h with stop sign control at County Road 42. The CPR tracks are controlled with train approach signals and gates. County Road 43/11th Concession south of County Road 42 is also a two lane north/south rural road with narrow gravel shoulders and open ditch drainage within a 20 metre right-of-way. The posted speed limit is 60 km/h with stop sign control at County Road 42.

County Road 43 is a key corridor within the County's transportation network and connects directly into the City of Windsor's arterial road system. Growth in population and employment in the immediate area will result in increased traffic congestion over the next 20 years. As well, with increasing urbanization, the needs of pedestrians and cyclists need to be addressed in any future road improvement program. The Essex Windsor Regional Transportation Master Plan identified the need for 4 basic lanes on County Road 43/Banwell Road. This has been reconfirmed through further traffic growth forecasting conducted for this EA (see ESR *Appendix 2: Traffic Report*). This traffic analysis has not been updated to reflect the Tecumseh Hamlet Traffic Study completed in August 2008, or revised Banwell Road Transportation Study forecasts prepared in March 2009 (Paradigm Transportation Solutions) for the City's Banwell Road EA because these updates do not significantly change County Road 43 forecasts, and so the following road problems and needs remain:

- Maintaining operational and capacity status quo would cause County Road 43 (Banwell Road/11th Concession) to lose its ability to handle traffic flow demands within a reasonable level of service as prescribed by its function;
- The need for pedestrian and cyclist facilities within the Banwell Road corridor will evolve with the significant growth in population and employment in this area and will complement the anticipated road improvements; and
- The need for a basic 4 lane cross section on Banwell Road can be supported between the City limits and County road 42. Further, a jog elimination at County Road 42 between Banwell Road and the 11th Concession is required to resolve excessive delay, congestion and safety issues in the future.

EXISTING CONDITIONS

Road Condition - County Road 43/Banwell Road and 11th Concession are tangent facilities between the south limit, approximately 800 metres south of County Road 42, and the north limit at the CPR tracks. Minor alignment deflections along the roadways are well within the accepted geometric design standards. The existing profile along County Road 43/Banwell Road/11th Concession is extremely flat within the project limits, with grades of less than 0.1%. The one exception is at the north end, where the grade for a short section, is approximately 3% as the road rises to meet the railway bed at the CPR crossing, resulting in a localized bump in the road. The pavement width along County Road 43/Banwell Road/11th Concession varies in the range of 6 metres to 7 metres. The gravel shoulders on either

side of the road are quite narrow and almost non-existent at some locations. Based on the borehole data, the depth of the existing asphalt varies from 20 mm to 65 mm and the depth of fill ranges from 165 mm to 305 mm. Refer to ESR Appendix C – Preliminary Geotechnical Review for more details.

The existing right-of-way along County Road 43/Banwell Road is approximately 12 metres. On the 11th Concession, the existing right-of-way is approximately 20 metres. The right-of-way on County Road 42 through the study area is approximately 26 metres.

There are currently no traffic signals along County Road 43/Banwell Road/ 11th Concession. However, the County proceeded with plans in late 2006 to add a left-turn lane from County Road 42 onto 11th Concession and install traffic control signals at the intersection of County Road 42 and County Road 43/Banwell Road. Illumination is currently provided at the intersection of County Road 42 and County Road 43/Banwell Road. There are also several luminaries mounted on hydro poles along County Road 43/Banwell Road. There is no illumination provided along 11th Concession.

Within the study area, County Road 43/Banwell Road and County Road 42 cross or parallel a number of municipal drains. Under existing conditions, runoff from County Road 43/Banwell Road is conveyed to six separate municipal drains identified on the site, including 11th Concession Drain, St. Louis Drain, Klondyke Drain, Soulliere Drain, Banwell Road Drain and Desjardins Drain.

The utility companies were contacted for information on the existing and proposed utility plant within the study area. Copies of utility record drawings or marked-up prints for reference were provided by the utility companies.

Natural Environment - The study area is dominated by active agricultural land use, with a few sparse deciduous hedgerows separating individual cultivation fields. Natural heritage features are limited to ephemeral drainage tributaries of the Little River, a warm water tributary of Lake St. Clair, and a small deciduous woodlot measuring 300 metres by approximately 50 metres. The natural environment investigations focused on these features.

Socio-Economic Environment - As part of this project, a land use assessment was undertaken and included a windshield survey, review of secondary source information, and discussions with the Town's Planning Department. The Official Plan (OP) of Essex County adopted on July 19, 2005 establishes the broader policy framework and guidance for future development and growth for both the County as well as its lower tier municipalities. In addition, the Town is governed by three separate Official Plans representing the three municipalities (Tecumseh, St. Clair Beach, and Sandwich South) that existed prior to their amalgamation in January 1999. Each Official Plan sets out the general policies and direction for future development (planning period of 1999-2011) within each of the respective lands: Tecumseh Hamlet, Oldcastle & Baseline Road Hamlet, and Maidstone Hamlet. The three separate Official Plans have not yet been amalgamated into one Official Plan.

The study area lies within Tecumseh Hamlet and is therefore governed by the Tecumseh Hamlet Secondary Plan. The entire County Road 43/Banwell Road project limits are within

the existing urban boundary of this Secondary Plan south to CR 42.. Most of the lands on either side of Banwell Road are designated as vacant or agricultural.

The Town of Tecumseh approved the Tecumseh Hamlet Secondary Plan in September 2006. The study area encompassed CR 43/Banwell Road from the CPR track/City boundary south to CR 42. Planned land use along this road includes some 1,800 new dwelling units for approximately 6,000 residents, plus some 12,500 square feet of new commercial space. A traffic study dated December 2007 was prepared by Dillon Consulting to identify the impacts and associated roadway network needs resulting the planned growth on the Hamlet Secondary Plan, and these projections and conclusions have been reflected in this EA study.

The majority of the lands adjacent to Banwell Road between County Road 42 and the CP Rail Line is zoned A (Agricultural), based on Schedule “A” of the Township of Sandwich South zoning information as provided by the Town of Tecumseh Planning Department.

Cultural Environment - As part of this study, any notable and existing archaeological resources, built heritage features and cultural landscape features were assessed. A Stage 1 archaeological assessment was conducted by Archaeological Services Inc. (ASI) in accordance with the Ontario Ministry of Culture’s archaeological assessment technical guidelines. Based on the presence of the Little River tributary within the study area, and the fact that the existing roads were part of the historic settlement network, the study area has the potential for the presence of pre-contact and historic archaeological sites depending on the intensity of more recent development and landscape alterations. Based on the review, there is no potential for archaeological sites within the typical disturbed right of way of County Road 43/Banwell Road/11th Concession and County Road 42. Further details of the archaeological assessment can be found in *ESR Appendix G– Stage 1 Archaeological Assessment*.

The Smith Black Cemetery is situated on the west side of Banwell Road, approximately 200 metres south of the CPR Line. For the purposes of the cultural heritage assessment, this and all other potentially affected cultural heritage resources within the study area were subject to inventory. There are no designated structures under Part IV of the Ontario Heritage Act within the study area although a historic plaque was erected in the Smith Black Cemetery in 1978 by the Township of Sandwich South. Descriptions of the identified built heritage and cultural landscape features and further details of the built heritage and cultural landscape assessment can be found in *ESR Appendix H– Built Heritage and Cultural Landscape Assessment*.

ALTERNATIVE SOLUTIONS AND EVALUATION

A number of alternative solutions were investigated to address the identified problems and needs along County Road 43/Banwell Road/11th Concession, including; 1) Do Nothing, 2) New/Improved County Road 43/Banwell Road/11th Concession (operational and infrastructure improvements and additions, 3) New/Improved Alternatives Modes, and 4) Manage Transportation Demand. The “Do Nothing Alternative” cannot support the anticipated growth in traffic projected for the Banwell Road corridor , and although alternatives modes and Transportation Demand Management are supported at the strategic County level, they are not expected to eliminate the capacity and safety enhancement needs on the road. Therefore, these three alternative solutions cannot be considered reasonable

alternatives for further consideration. Alternative 2: Operational Improvements and Infrastructure Improvements were carried forward for evaluation.

ALTERNATIVE DESIGNS AND EVALUATION

As operational improvements, left turn lanes are added to County Road 42 on the approach to County Road 43/Banwell Road and traffic signal control installed at the intersection of County Road 42 and County Road 43/Banwell Road. In general, these improvements will accommodate the short term growth in traffic over the next 5 to 7 year period. At the same time, the level of safety for all road users in this area will be significantly improved. These minor operational improvements will not impact on the existing environment, and as such, a rigorous environmental audit was not considered as necessary for this alternative solution. During the course of this study, the County implemented this operation improvement in late 2006 to resolve ongoing operational and safety concerns.

For infrastructure improvements, seven jog elimination alternative designs were developed to connect County Road 43/Banwell Road into the 11th Concession. The design requires four lanes on County Road 43/Banwell Road between the CPR tracks and County Road 42 with additional widening for turning lanes at intersections; two lanes on the 11th Concession south of County Road 42 with additional widening for turning lanes at intersections; and the widening to five lanes on County Road 42 from immediately west of the 11th Concession to immediately east of the existing County Road 43/Banwell Road. In addition, a 1.5 metre sidewalk was provided on the west side and a 4.0 metre multi-use trail on the east side of County Road 43/Banwell Road.

Alternative E was selected as the preferred alternative for preliminary design and presentation to the public at the second and third Public Information Centre. Banwell Road/County Road 43 is shifted westerly, with a new full intersection proposed at the approximate location of the former Danilo's property. During the course of this Class EA study, the Town of Tecumseh staff presented a report to their July 25, 2007 Planning and Building Services Committee (see ESR Appendix A:3) supporting Alternative "E, including closure of the existing Banwell Road/County Road 43 intersections at County Road 42. These remnant road sections are proposed to cul-de-sac at County Road 42 and will be connected to the realigned Banwell Road/County Road 43. The result will be reduced traffic flows for the existing homes that front these roads and improved traffic flow along County Road 42.

In presenting this and other technically supported refinements to the preferred solution, almost all Town staff comments have been incorporated into the recommended design. The road design details for County Road 43 include a sidewalk on the west side and a 4 metre wide trail on the East side. County staff believes there is no rationale that supports the need for on-road bike lanes, and further the City of Windsor has not incorporated this feature in their Banwell Road EA Recommended Design. Therefore, there would be no connectivity between the County and City bike lanes along the corridor.

As well, it is recognized that the addition of an on road bike lane would necessitate a further expansion to the proposed 30 metre right-of-way by some 3 metres. Also, the planned provision of a multi-use trail along the east side of County Road 43/Banwell Road,

extending into the City and with a very low number of intersecting roads and driveways, will serve off-road cycling demands in the corridor.

A further decision was made to defer any consideration of additional intersection improvements at this time to satisfy the potential traffic 2027 demands at the County Road 43/Banwell Road and County Road 42 intersection.

DETAILED DESCRIPTION OF THE TECHNICALLY RECOMMENDED DESIGN

The preferred alternative design was based on the following principles:

- Road widening south of the CPR tracks was kept to the east side of County Road 43/Banwell Road in order to reduce impacts on the west side properties.
- A 1.5 metre sidewalk and 4.0 metre multi-use trail is proposed from 11th Concession to the CPR tracks. Wider lanes of 3.65 metres in combination with a center median can better support mixed use vehicles in a safe operating environment. Figure E-1 illustrates the proposed cross section elements.
- Design speed sets the parameters such as minimum radii for horizontal and vertical curves, length of vertical curves, taper ratio etc. to be used for merging and diverging lanes and sight distances. Posted speed is also a function of design speed, such that posted speeds are usually 10 km/h to 20 km/h less than design speed (to provide a factor of safety). For County Road 43/Banwell Road a design speed of 80 km/h was selected based on the planned speed limit of 60 km/hr for Banwell Road.

In general terms, it is recommended that the following improvements to County Road 43/Banwell Road/11th Concession be undertaken:

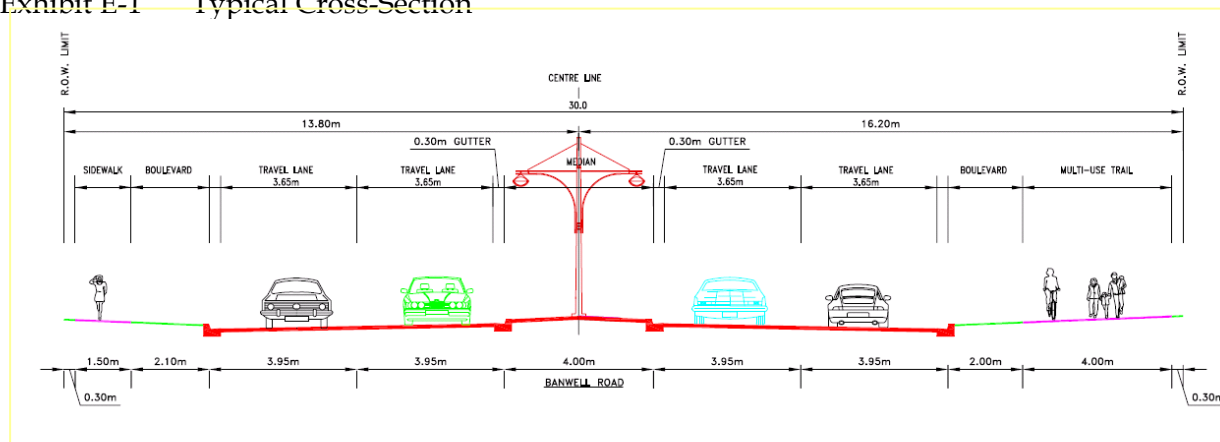
- Eliminate the offset intersections of County Road 43/Banwell Road/County Road 42 and 11th Concession by realigning both roads to the west. In the recommended design, realigned County Road 43/Banwell Road and 11th Concession will form the north and south legs, respectively at County Road 42, approximately 100 metres west of the existing 11th Concession/County Road 42 intersection.
- Construct the realigned County Road 43/Banwell Road, from County Road 42 to the CPR tracks approximately 1,470 metres to the north, as an urban four-lane section with a raised median. Incorporate at least two intersections to allow for future development access, with locations to be confirmed during detailed design based on future development plans. At selected intersections, the median area will be utilized as left-turn lanes, eliminating the opportunity for raised medians at these locations. The recommended design along County Road 43/Banwell Road includes a 1.5 metre sidewalk on the west side and a 4.0 metre multi-use trail on the east side.
- Construct/upgrade 11th Concession from the south limit of the project to approximately 155 metres south of County Road 42 (approximately Station 1+000 to Station 1+560), as a two-lane rural section with 2.5 metre partially paved shoulders. Include at least one intersection along this section for access to future development, with location to be

confirmed during detailed design based on future development plans. Northbound and southbound left-turn lanes will be provided at this intersection.

- From Station 1+560 on the 11th Concession to County Road 42, introduce northbound taper, resulting in one entry lane and two exit lanes for the south leg of 11th Concession.
- Construct turning basins on the existing County Road 43/Banwell Road, approximately 300 metre north of County Road 42, and on the existing 11th Concession, approximately 160 metres south of County Road 42 to terminate the connections to the realigned County Road 43/Banwell Road and realigned 11th Concession.
- Drainage improvements with new storm sewer systems for the realigned County Road 43/Banwell Road will be undertaken as part of the technically recommended design.

The roadway will be designed in accordance with the Geometric Design Standards established by the Ministry of Transportation, Ontario (MTO). Property will need to be acquired along the majority of the County Road 43/Banwell Road / 11th Concession. The typical cross-section for County Road 43/Banwell Road is shown in Figure E-1:

Exhibit E-1 Typical Cross-Section



It is expected that the quantity of runoff from the improved sections of the roadway will result in only a very minor increase in runoff, and therefore, no quantity controls are proposed. Grassed swales and/or existing grassed municipal drains will be used to provide water quality treatment for roadway runoff along most of the remainder of the County Road 43/Banwell Road study area. Water quality measures will be designed in accordance with the "Stormwater Management Planning and Design Manual" (2003) of the Ministry of the Environment. Water quality and quantity criteria provided by the Essex Region Conservation Authority will be considered as part of the detailed design.

A basic right-of-way width of 30 metres is proposed along County Road 43/Banwell Road/ 11th Concession from the CPR tracks at the north end to approximately 730 metres south of County Road 42 at the south limit of the project. Additional right-of-way requirements are needed to accommodate sight triangles.

Street lighting will be provided along the reconstructed County Road 43/Banwell Road/11th Concession within the median area with spacing of approximately 50 metres apart. Traffic

signals will be provided, as necessary, at the intermediate intersections along 11th Concession and County Road 43/Banwell Road, depending on technical warrants. Relocation of an existing utility may be desirable if it is in direct conflict with construction or if it encroaches on the recommended clear zone width. All utilities will be contacted early in the detailed design phase to confirm locates and establish relocation strategies.

With the CP rail crossing across County Road 43/Banwell Road currently being controlled with flashers and automatic gates, a rail grade separation is not considered warranted at this time even though the Exposure Index for grade separation is met. The only factors which may influence this conclusion are increased delay to Banwell Road traffic during times of train activity becomes significant, and/or if safety concerns are raised.

Should a grade separation of the CPR line be considered in the future, it is important that it be designed in association with the grade separation planned by the City of Windsor on the north side of the rail line/ municipal boundary. Also, access to and from Banwell Road to abutting lands within the area of the grade separation would have to be protected. From the County's perspective, the only driveway that should be impacted is the Hydro One access.

A preliminary construction cost estimate has been prepared for the reconstruction of County Road 43/Banwell Road/11th Concession and is \$7,835,000 based on present day costs and excludes all engineering, utility relocation and property costs.

ENVIRONMENTAL CONCERNS & MITIGATION MEASURES

Identified concerns and proposed mitigation measures associated with the project are summarized in the ESR document dealing with; 1) terrestrial habitat loss, 2) aquatic habitat, 3) construction noise, 4) archaeological resources and 5) built heritage and cultural landscapes. A monitoring program will be established to ensure that the mitigation measures specified in the ESR are undertaken. The key impacts to the environment are the short-term impacts that require monitoring during construction. The long-term impacts are expected to be taken into consideration during the detailed design of the project.

The construction of this project will be monitored on site by the County of Essex to ensure that the Contractor is implementing standard construction practices. This will include erosion and sedimentation control, dust and noise control, protection of existing vegetation, assurance of traffic safety and maintenance of traffic flow without causing unnecessary delays, etc. The overall performance and effectiveness of the environmental mitigating measures specified will be monitored and assessed during and subsequent to the construction of the project.

As the environmental impacts outlined in this section are the normal impacts associated with the construction of roads, the established standard construction practices outlined as the mitigating measures will be incorporated in the contract documents. The Contract Administrator will ensure that these mitigating measures are undertaken during construction. Should unforeseen environmental concerns and/or issues arise during the construction period, the appropriate ministry and agencies will be contacted and appropriate measures will be taken to mitigate the environmental concerns/issues.

1.0 INTRODUCTION AND BACKGROUND

This report was prepared as part of the Municipal Class Environmental Assessment (Class EA) Study for improvements to the County of Essex's County Road 43/Banwell Road immediately south of the CPR tracks to south of County Road 42. This report provides a detailed summary of the existing and predicted future traffic operating conditions, existing environmental conditions, area sensitivities and constraints, and outlines the work that was carried out to assess and develop the preferred solution.

1.1 PURPOSE OF THE STUDY

The purpose of this study is to address the County Road 43/Banwell Road capacity and operating deficiencies that were identified in the Essex Windsor Regional Transportation Master Plan (EWRTMP). A related study purpose is to establish the future need to acquire Ontario Realty Corporation property in the hydro corridor at the north study area boundary.

Growth within the Town of Tecumseh and the eastern section of the City of Windsor will result in increased traffic in the County Road 43 (Banwell Road and 11th Concession) corridor. In addition, the existing frontage properties and future developments abutting this corridor will require safe and reasonable accessibility. This study will ensure that the future travel demands on County Road 43/Banwell Road and 11th Concession are identified and accommodated such that this facility operates in an efficient manner. Improvements of this nature fall under the Ontario Environmental Assessment Act (EA Act) and as such this involves the undertaking of a Municipal Class Environmental Assessment Schedule C for this project.

1.2 DESCRIPTION OF THE STUDY AREA

The study limits, as illustrated in Figure 1-1, extends from the CPR Line on the north, Lesperance Road on the east, Lauzon Parkway on the west to approximately 800 metres south of County Road 42 and includes both Banwell Road and 11th Concession.

1.3 RELATED STUDIES

The following is a list of related studies within the immediate Banwell Road and 11th Concession corridor which provide a context to the need for improvements:

County of Essex Official Plan

The Official Plan (adopted July 19, 2005) offers fundamental broad based guidance and direction to the County and its municipalities on land use and planning and is intended to provide the necessary framework to implement Provincial Policy at the County level.

Within the context of the Official Plan, the Town of Tecumseh's population is expected to grow to between 30,106 to 35,259 persons by 2016 compared to its 1996 population of 23,151 which in turn will place pressure for area infrastructure improvements.

Figure 1-1 Study Area



Master Water Servicing Plan Addendum, Town of Tecumseh

In 2002, the Town initiated the preparation of a master water servicing plan to consolidate and update previous water and master water servicing studies and to develop optimum strategies for providing water and wastewater servicing for existing settlement areas and new growth areas in the Town.

The plan was based upon the anticipation that the Town will reach a population of 38,103 persons by the Year 2025. Approximately 68 percent of the projected growth is expected to be accommodated within the existing urban settlement areas of the former Township of Sandwich South. The Banwell Road corridor will be the main north/south arterial road servicing the anticipated residential growth.

Windsor Area Long Range Transportation Study (WALTS)

WALTS was conducted in 1997 and 1998 to provide a master plan to guide future development of transportation services in the Windsor area. WALTS relied on existing Official Plans and available growth studies to establish the expected transportation needs by the year 2016.

The following area roads that may impact on the County Road 43/Banwell Road/11th Concession corridor formed part of the recommended roadway system improvements within WALTS:

- Widening Lauzon Road from Wyandotte Street East to Trandy Avenue;
- Widening Tecumseh Road East from Jefferson Boulevard to Banwell Road;
- Operational/Capacity Improvements to Tecumseh Road East from Banwell Road to Lesperance Road;
- Operational/Capacity Improvements to Lauzon Parkway (County Road 17) from EC Row Expressway to Division Road; and
- Operational/Capacity Improvements to County Road 22 from EC Row Expressway to Manning Road.

As well, the WALTS study addressed the need to protect additional roadway corridors for future transportation flexibility in the Windsor area. One such corridor was the Highway 401 East Connector. This connector was seen as the future phase of the Lauzon Parkway by upgrading County Road 17 (10th Concession Road) to connect Highway 401 with the EC Row Expressway. Other candidate connection alternatives included Banwell Road/11th Concession and Manning Road (County Road 19).

Essex – Windsor Regional Transportation Master Plan (EWRTMP)

The goal of the 2005 EWRTMP was to develop a comprehensive regional transportation master plan for the Essex – Windsor region with recommended policies and an implementation strategy that will serve the needs of the region to the year 2021. The following principles were established to develop a transportation plan:

- Optimize arterial road network capacity;
- Select appropriate levels of service and standards;
- Ensure transportation improvement affordability;
- Ensure transportation system sustainability; and
- Ensure roadway network enhancement achievability.

Of note is the fact the EWRTMP study identified that Banwell Road from County Road 22 to County Road 42 will experience a significant capacity deficiency by the year 2021 if no improvements were undertaken, and further that four through lanes are required to satisfy Banwell Road's future transportation demands.

2.0 PLANNING PROCESS AND CONSULTATION

2.1 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PROCESS

The Municipal Class Environmental Assessment (Class EA) is an approved planning document, which describes the process that the proponent must follow to meet the requirements of the *Environmental Assessment Act*. Municipal projects, that are similar in nature and frequently undertaken by a municipality, may follow the planning process set out in the Municipal Class Environmental Assessment (MEA, June 2000, as amended in 2007) document, providing the projects are limited in scale, have generally predictable range of effects, have relatively minor environmental significance, and are responsive to mitigation measures.

Road projects conducted under the Class EA planning process vary in their environmental impact and are classified as Schedules A, B or C. **This project is identified as a Schedule C project under the Municipal Class EA.** Schedule 'C' projects have the potential for significant environmental effects and must proceed through the full planning process of the Class EA which requires an Environmental Study Report (ESR) to be prepared and submitted for public review.

The planning process covered by the Class EA for this project incorporated the following phases that are considered essential for compliance with the EA Act:

- Phase 1: Define Problem and Initial Public Notification
- Phase 2: Identify and Evaluate Alternative Solutions to the Problem
- Phase 3: Identify and Evaluate Alternative Designs
- Phase 4: Environmental Study Report
- Phase 5: Implementation

Phase 1 – Define Problem and Initial Public Notification

After reviewing background information a problem statement was identified. To scope the study, the County of Essex, City of Windsor and Town of Tecumseh staff representatives were contacted to engage their participation, identify issues and build upon existing information.

Government agencies and ministries, interest groups, and property owners in the immediate area were also contacted. Contact lists were created and updated as required throughout the study.

Phase 2 – Identify and Evaluate Alternative Solutions to the Problem

This phase involved conducting an inventory of the environment within the study area, generating, analyzing and evaluating alternative solutions to the problem. The evaluation of alternative solutions and the details of the recommended alternative solutions were presented

to the Project Team prior to being presented to the public at the first open house Public Information Centre (PIC).

Phase 3 – Identify and Evaluate Alternative Designs

Alternatives were generated and assessed based on technical considerations and impacts to the natural, social, economic, and cultural environments. The evaluation of alternative designs and the details of the recommended alternative design were presented to the Project Team prior to being presented at the second open house Public Information Centre (PIC). Subsequent to the second PIC and after all stakeholder's concerns were addressed, the details of the recommended design were finalized.

Phase 4 – Environmental Study Report

The Environmental Study Report (ESR) represents the documentation that is required in accordance with the Municipal Class EA for municipal road projects. The ESR documents the need and justification for the project, the alternatives considered, potential impacts, preferred alternative, proposed mitigation, and the consultation undertaken.

Upon study completion, a public Notice of Study Completion and Submission of the ESR is issued and the ESR is placed on the public record (for review) with the Clerk of the County of Essex for 30 calendar days. Following a 30 calendar day review period for filing any objections, the requirements of the Environmental Assessment Act (EA Act) will be deemed to have been satisfied subject to the appropriate resolution of any objections received from the public and/or review agencies.

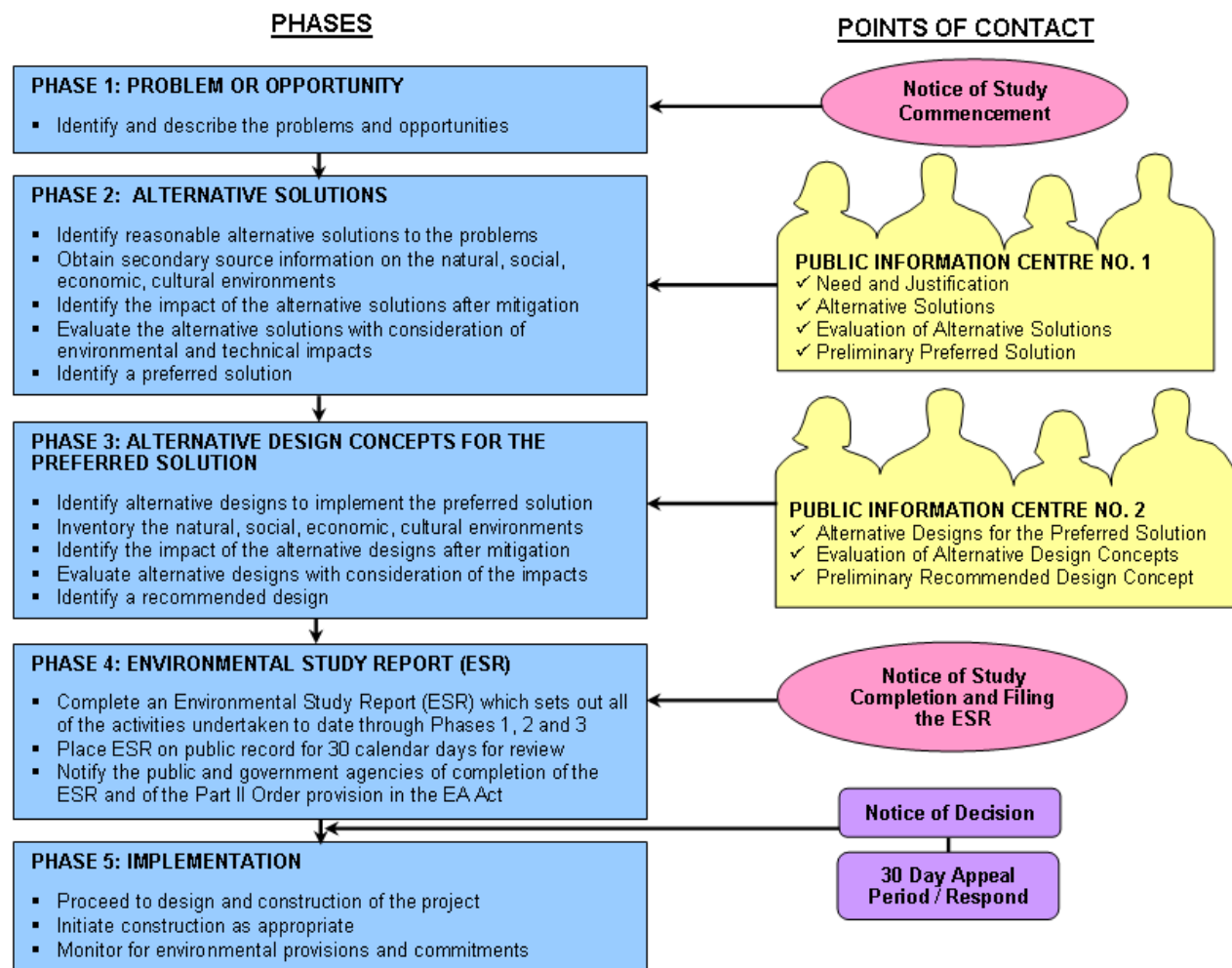
If concerns cannot be resolved through discussions with the County's representatives, then a person or party may request that the Minister of Environment place an order for the project to comply with Part II of the EA Act (referred as Part II Order), which addresses Individual Environmental Assessments. A written submission may be made to the Minister of the Environment within the 30 calendar day review period requesting an Individual Environmental Assessment in accordance with the EA Act. The Minister will consider such requests and notice of the Minister's decision respecting requests for an Individual Environmental Assessment will be given within 45 days of the request. If the request is granted, the project will be subject to formal government review and approval under the EA Act and may result in a formal public hearing. In all Part II Order requests, the Minister's decision is final.

Phase 5 – Implementation

If the Minister receives no request for an Order within the review period, then the project can proceed to the implementation phase of the project. To implement the project, contract drawings are prepared, and the project then proceeds to construction, operation and monitoring. All environmental provisions and commitments made in the ESR must be fulfilled.

The Class EA planning and design process is shown schematically in Figure 2-1.

Figure 2-1 Municipal Class Environmental Assessment Process



It should be noted that the County Road 43/Banwell Road Class EA Study preceded the start of the City of Windsor's Class EA Study of Banwell Road from Tecumseh Road East to the CPR tracks south of Intersection Road. A decision was made by the County in late 2006 to place the County Road 43/Banwell Road Class EA Study on hold until the City's Banwell Road Class EA Study reached Phase 3 where the "Technically Recommended Design" for the entire Banwell Road corridor was determined. The overall integrated technically recommended design for the Banwell Road corridor from Tecumseh Road East to south of County Road 42 was presented to the public at a combined second Public Information Centre held on September 18, 2007, plus a third Public Information Centre held on June 2, 2009, with representation from both the County and City. In this manner, the interested stakeholders would have the opportunity of understanding the recommended improvements for Banwell Road between the City and the County.

2.2 PROJECT TEAM ORGANIZATION

A key feature of successful planning and approval under the EA Act involves early consultation with the affected parties. Consequently, the study was conducted such that the affected parties were:

- Involved throughout the study at appropriate times;
- Provided with access to information;
- Provided with sufficient time to respond to questions and data requests; and
- Encouraged to participate in an issue identification/resolution process.

To achieve the above-mentioned objectives, consultation activities with government ministries/agencies, utility companies, interest groups, and the public were carried out.

2.2.1 Project Team Organization

At the outset of the study, a Project Team was established and included representatives from the County of Essex, City of Windsor, Town of Tecumseh, and Giffels Associates Limited / IBI Group (GAL/IBI Group) who provided consulting services for this project.

Meetings were held at key decision points during the course of the study to review and resolve project specific concerns. Prior to presenting the study findings to the public, the information was reviewed by the Project Team members.

The Project Team members are as follows:

County of Essex	Tom Bateman, County Engineer Jane Mustac, Environmental Assessment Co-ordinator Victor Mata, Project Engineer
City of Windsor	Wesley Hicks, Manager of Transportation Planning Josette Eugeni, Project Manager (Banwell Road Class EA) Steve Kapusta, Policy Analyst Jim Abbs, Policy Planner, Research and Analysis Anna Godo, Engineer
Town of Tecumseh	Brian Hillman, Director of Planning and Building Services George DeGroot, Director of Public Works and Environmental Services
Giffels Associates Limited / IBI Group	Len Rach, Consultant Project Manager (2006-07) Don Drackley, Consultant Project Manager (2008-09) Susan Smyth, Environmental Planner Musha Foradi , Design Engineer Chandi Ganguly, Traffic Engineer

2.2.2 External Agency Consultation

Various federal and provincial government agencies, ministries/authorities, as well as other public agencies were contacted by mail and asked to respond to the following questions:

- Does your Ministry/Agency have an interest in this study?
- Does your Ministry/Agency have any comments or concerns?

The external agencies contacted were as follows:

Federal and Provincial Ministries, Agencies, Groups

- Environment Canada
- Ministry of Natural Resources
- Ministry of Environment
- Ministry of Culture Heritage and Libraries Branch
- Ministry of Municipal Affairs and Housing
- Ministry of Agriculture and Food Resources Management Branch
- Ontario Native Affairs Secretariat
- Windsor/Essex Métes Council
- Southern First Nations Secretariat

Agencies, Municipalities, Utilities, Interested Stakeholders

- Ontario Realty Corporation
- Essex Region Conservation Authority
- Windsor Essex County Health Unit
- Town of Tecumseh
- City of Windsor
- County of Essex
- Ontario Provincial Police
- Town of Tecumseh Fire Department
- Sun Parlour Emergencies Incorporated
- Windsor – Essex Roman Catholic District School Board
- Greater Essex County District School Board
- Conseil Scolaire de District Des Ecoles
- Bell Canada
- Hydro One Networks Inc.
- Cogeco Cable Systems

- Union Gas Limited
- Canadian Pacific Railways
- Citizens Environmental Alliance

The majority of the external agencies responding to the request for input into the study indicated limited concern with the proposed undertaking. However, most respondents requested to be kept informed of the study progress. Refer to *Appendix A – Public Consultation and Related Correspondence, A.5 – External Contacts*.

All external representatives that expressed an interest regarding the study were invited to attend the Public Information Centres and/or were contacted during the course of the study to ensure that any issues were adequately addressed.

2.2.3 Public Consultation

The consultation program for the study included contact with the public at the following key points in the study:

- Notice of Study Commencement
- Notice of Public Information Centre No. 1
- Notice of Combined Public Information Centre No. 2
- Notice of Combined Public Information Centre No. 3
- Notice of Study Completion and Submission of the Environmental Study Report

To inform the general public of the study, a Notice of Study Commencement was placed in the July 20 and July 29, 2006 edition of the Windsor Star and Tecumseh Tribune. This notice provided a brief introduction to the study and encouraged interested individuals to contact the Project Team directly for more information. A hand delivered letter was delivered on July 18, 2006 to all residences and businesses along County Road 43/Banwell Road/11th Concession and County Road 42. Refer to *Appendix A – Public Consultation and Related Correspondence, A.1 – Study Commencement*.

In addition to the external agency contact list, a separate contact list was established consisting of adjacent property owners, interest groups, and individuals requesting more information on the project. The contact list was established at the commencement of the study and continuously updated throughout the study. The purpose of the contact lists was to ensure that individuals who stated an interest in the study were kept informed of upcoming events and the project progress.

Throughout the course of the study, the Project Team dealt with numerous requests of information regarding the study process and progress and these requests were followed up by a letter, telephone conversation, meeting, or mailing of project related material.

Public Information Centre No. 1

The first open house Public Information Centre (PIC No. 1) was held on Thursday September 14, 2006 at the Essex County Highways' West Pike Creek Depot between 2:30 PM and 7:00 PM. The public was notified of the PIC through advertisements placed in the Windsor Star and Tecumseh Tribune newspaper (August 31 and September 9, 2006) and through the distribution of notification letters to adjacent property owners. External agencies and utility companies on the project mailing list were also notified of the PIC.

Visual display boards providing a brief background of the study, depicting existing conditions and improvement considerations were set up for review in an informal walk-through format for public review and discussion. The PIC was staffed by members from the County and GAL/IBI Group to assist attendees in their review of material.

The purpose of the first PIC was to present the following information to the public:

- Study Area;
- Class Environmental Assessment Process;
- Background;
- Need and Justification for Improvements;
- Alternative Solutions Under consideration;
- Jog Elimination Alternatives and Screening of Alternative Jog Alignments;
- Evaluation Methodology; and
- Next steps in the process.

A "sign-in" sheet was maintained at the PIC to record visitors' names and addresses. Comment sheets were provided for attendees to be completed either at the PIC or to be returned by mail. A total of 33 people attended the PIC from which two individuals attended on behalf of the City of Windsor and one representative from the Town of Tecumseh. In total, 13 comment sheets were received.

In general there appeared to be support for improvements to the intersection of Banwell Road and County Road 42 and support for an elimination of the jog between Banwell Road and 11th Concession at County Road 42. There was, however, mixed opinion on the form of improvements. *Appendix A – Public Consultation and Related Correspondence, A.2 – Public Information Centre No. 1* provides the details of the PIC material, completed comment sheets and summary of responses.

Public Information Centre No. 2

It was decided by the County of Essex and the City of Windsor to hold a combined second PIC and to present the technically recommended design for the entire Banwell Road corridor.

The second PIC was held between 3:00 PM and 8:00 PM on Tuesday September 18, 2007 at the Banwell Community Church located at 2400 Banwell Road in the City of Windsor. The public was notified of the Combined Public Information Centre No. 2 by newspaper advertisements in Windsor Star and Tecumseh Tribune on Thursday September 13 and Saturday September 15, 2007. A hand delivered invitation was provided to adjacent property owners along the corridor. In addition, review agencies and all other members on the project mailing list, including utility companies and interest groups, were invited to attend the second PIC via Canada Post direct mail.

Various text displays and a plan illustrating the technically recommended design were presented.

The purpose of the second PIC was to present the following information to the public:

- Alternative designs concepts;
- Evaluation of alternative designs and proposed mitigation measures;
- Consultation activities undertaken to date; and
- Preliminary preferred design for both the County and the City sections of Banwell Road.

The technically recommended design showed two options for closing the existing County Road 43/Banwell portion of the road at County Road 42. Option "A" as shown on the technically recommended design roll plan (refer to *Appendix A – Public Consultation and Related Correspondence, Appendix A.3 – Public Information Centre No. 2* for the display boards) was designed by the Town of Tecumseh which had a cul-de-sac at County Road 42 with the road dissecting a currently operating farm complex to connect to the new County Road 43/Banwell Road. Option "B" which was designed by GAL/IBI Group had a cul-de-sac at County Road 42 but relocated the road to connect to the new County Road 43/Banwell Road east of the farm complex to avoid impacts to the operation.

A total of 52 people registered their names at the PIC. In total, 4 comment sheets were submitted at the PIC. According to the written and verbal comments received at the PIC there is a consensus that County Road 43/Banwell Road should be realigned to remove the jog elimination at County Road 43 and County Road 42 intersection. Also, the new County Road 43/Banwell Road should have breaks in the median for the residents located on the "old" Banwell Road to turn right and left and to provide access to the lane way to continue farming operations. *Appendix A – Public Consultation and Related Correspondence, A.3 – Public Information Centre No. 2* provides the details of the PIC material, completed comment sheets and summary of responses.

Public Information Centre No. 3

It was again decided by the County of Essex and the City of Windsor to hold a combined third PIC and to present the final technically recommended design for the entire Banwell

Road corridor. Following the second PIC in September 2007, in early 2008 the City of Windsor and Town of Tecumseh introduced new land use plans along Banwell Road in the City of Windsor. This required a reassessment of road improvement needs and alternatives along Banwell Road in the City, resulting in associated changes being made to the City's preferred design which were presented to a third PIC.

Although these land use changes did not affect the preferred improvements presented by the County at PIC #2 in September 2007, the County decided to wait while the City revised its Banwell Road design, and to then continue with a combined presentation of the County and City projects at the third PIC held on June 2, 2009 from 3:00 to 8:00 PM at the Banwell Community Church at 2400 Banwell Road.

The purpose of the third PIC as advertised in the public notice (see Appendix A) was to present the final evaluation of alternative designs and proposed mitigation measures for improvements to the Banwell Road/CR 43 corridor, report on consultation activities conducted to date and present the final preferred design for the County and City projects for public response. A total of 36 people signed in to the PIC, with three (3) comment sheets submitted at the PIC, and ten (10) subsequent comments submitted to the project team by the closing date of June 23, 2009. Only one of these comments, namely from the Ontario Realty Corporation, involved this County Road 43/Banwell Road study (see Appendix A.4).

3.0 PROBLEM STATEMENT

3.1 EXISTING TRAFFIC OPERATIONS

The section of County Road 43/Banwell Road between the City of Windsor boundary immediately south of the CPR tracks and County Road 42 is a two lane rural north/south County Road with narrow gravel shoulders and open ditch drainage within a 12 metre right-of-way. This section of road is currently posted at 60 km/h with stop sign control at County Road 42. The CPR tracks are controlled with train approach signals and gates.

County Road 43/11th Concession south of County Road 42 is also a two lane north/south rural road with narrow gravel shoulders and open ditch drainage within a 20 metre right-of-way. The posted speed limit is 60 km/h with stop sign control at County Road 42.

County Road 42 is an east/west two lane rural through roadway with gravel shoulders within a 26 metre right-of-way. The posted speed is 60 km/h. Currently an offset jog of approximately 178 metres exists between County Road 43/Banwell Road and the County Road 43/11th Concession on County Road 42 which creates some degree of friction between the various turning movements.

3.1.1 Traffic Safety

Between January 1, 2000 and December 31, 2005 a total of 26 reported accidents occurred within the study area. Table 3-1 summarizes the location and frequency of the resultant collisions.

Table 3-1 Road Section Collision Frequency

Road	From	To	No. Collisions
County Road 43/Banwell Road	County Road 42	CPR Tracks	2
County Road 43/11 th Concession	County Road 42	Southerly approximately 1 km	1
County Road 42	County Road 43/Banwell Road	County Road 19	8
County Road 42	County Road 43/11 th Concession	Westerly approximately 1 km	1
Intersection	Banwell Road	County Road 42	13
Intersection	11 th Concession	County Road 42	1

Of note are the higher frequency of motor vehicle accidents on County Road 42 east of County Road 43/Banwell Road and within the intersection of County Road 43/Banwell Road and County Road 42. Of the 13 collisions that occurred at the intersection, 5

appeared to be related to movements in or out of nearby private driveways while the remaining 8 were related to turning movements (5) or rear end accidents (3). Most of the motor vehicle accidents on County Road 42 east of the County Road 43/Banwell Road intersection are associated with movements into and out of private driveways. Of the two collisions on County Road 43/Banwell Road within the study area, one involved excessive speed crossing the railway tracks while the other was a single vehicle collision in a driveway. The motor vehicle accident on the County Road 43/11th Concession involved a motorist losing control under winter conditions while the accident at the County Road 43/11th Concession and County Road 42 intersection was a rear end collision.

Based upon a field review of the roads within the study area to identify specific safety issues or concerns with the existing road configuration, signage, visibility, access and traffic control features, the following issues were identified:

- Narrow/no gravel shoulders on County Road 43/Banwell Road/11th Concession;
- Restricted visibility on the northeast and northwest corners of the County Road 42 and County Road 43/Banwell Road intersection due to mailboxes and vegetation;
- Proximity of local accesses on County Road 42 to the 11th Concession intersections and the number of potential traffic conflicts in this section;
- No provision for pedestrians or cyclists;
- Jogged (offset) intersection configuration of County Road 43/Banwell Road/11th Concession and the potential for increased slowing and stopping to make turns from County Road 42. The offset intersections also have increased traffic conflicts;
- Lack of turning lanes on County Road 42 at County Road 43/Banwell Road/11th Concession. This contributes to queuing, and potential for turning movement and rear-end collisions;
- A small “hump” in the vertical alignment of County Road 43/Banwell Road immediately south of the CPR tracks may have contributed to out of control vehicle accident.

3.1.2 Existing Traffic Volumes

The existing 24 hour traffic volumes on the area roads within the study area are as follows:

- County Road 43/Banwell Road – 3500 vehicles/day
- County Road 43/11th Concession Road – 1900 vehicles/day
- County Road 42 – 13600 vehicles/day

Based upon a September, 2006 traffic count, Figure 3-1 portrays the existing PM peak hour traffic hours for the County Road 43/Banwell Road/11th Concession and County Road 42 intersection. Between 6:30 AM and 6:30 PM, some 149 motorists wished to

travel from the 11th Concession to County Road 43/Banwell Road while 170 motorists traveled from County Road 43/Banwell Road to the 11th Concession.

A Level of Service (LOS) analysis undertaken for the County Road 43/Banwell Road and 11th Concession and County Road 42 intersections based upon the existing traffic demands and the existing lane configuration indicated that:

- The warrants for traffic control signals at the County Road 43/Banwell Road and County Road 42 intersection are almost met and traffic signals are expected to be warranted in a relatively short period of time if traffic continues to grow or increased collision frequency is experienced;
- The intersection of the 11th Concession and County Road 42 is operating at a Level of Service (LOS) D in the morning and afternoon peak hours; and
- The intersection of County Road 43/Banwell Road and County Road 42 is operating at a LOS F in the afternoon peak hour and LOS D in the morning peak hour.

The poor operation can be attributed to the lack of adequate gaps in the County Road 42 traffic flow to accommodate traffic from the 11th Concession and Banwell Road. As well, the lack of separate left turn lanes on County Road 42 adds to the level of congestion. It should also be noted that this analysis does not account for the additional interference caused by traffic turning into and out of driveways near the intersections. Therefore, the actual LOS may be lower (worse) than presented herein.

3.2 FUTURE TRAFFIC DEMANDS

Based upon the Essex-Windsor Regional Transportation Master Plan (EWRTMP) model forecasts, traffic growth annually within the Banwell corridor over the course of the next 20 years is projected to be approximately 6.5 percent per annum which is considered to be very high.

Based upon a comparison of 2005/2006 traffic counts on Banwell Road between the CPR Line and County Road 42, the increase in traffic was approximately 13 per cent over the one year period. Much of the future growth in traffic will be associated with the development of lands adjacent to Banwell Road and the 11th Concession. The pace of this development will, to a large degree, determine the timing for roadway improvements.

Figure 3-1 portrays the comparison between the 2006 and the EWRTMP model traffic forecasts for the PM peak hour period for 2021 and 2027.

Figure 3-1 County Road 43/Banwell Road/11th Concession and County Road 42 Intersection - PM Peak Hour Traffic Volumes

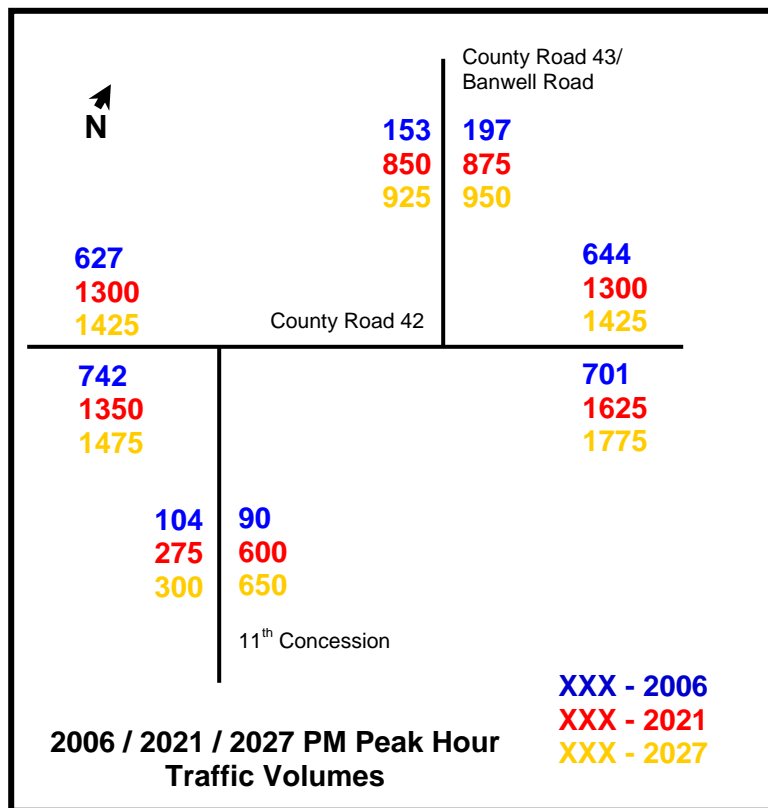


Table 3-2 presents an operational analysis of the Banwell Road/11th Concession/County Road 42 intersection based on existing conditions as compared with conditions in 2011, in 2021 and in 2027. Details of this analysis are contained in *Appendix B – Traffic Report*.

Over the 5 year horizon, the interim improvements (i.e. traffic control signals at Banwell/County Road 42 and left turn lanes on County Road 42) are expected to satisfy the projected growth. In fact, the County took the initiative in late 2006 to widen County Road 42 to permit left turn lanes into County Road 43 and installed traffic signal controls at County Road 42 and County Road 43/Banwell Road.

Table 3-2 Intersection Analysis – Year 2006, 2011, 2021 – PM Peak Hour

Year	Improvement	County Road 43/ Banwell Road and County Road 42		County Road 43/ 11 th Concession and County Road 42		Jog Elimination County Road 43/ Banwell Road/ 11 th Concession and County Road 42	
		LOS	V/C	LOS	V/C	LOS	V/C
2006	Existing Conditions	F	0.95	D	0.80	-	-
2006	Install Traffic Signals at County Road 43/Banwell Road and County Road 42	F	0.95	D	0.80	-	-
2006	Install Traffic Signals and Left Turn Lane on County Road 42	B	0.43	A	0.54	-	-
2011	Install Traffic Signals and Left Turn Lane on County Road 42	D	0.81	C	0.66	-	-
2027	Install Traffic Signals and Left Turn Lane on County Road 42	F	2.00	F	1.56	-	-
2021	Widen County Road 43/ Banwell Road/ Improve 11 th Concession approach to County Road 42/Eliminate Jog between Banwell Road and 11 th Concession	-	-	-	-	D	0.96
2027	Widen County Road 43/ Banwell Road/ Improve 11 th Concession approach to County Road 42/Eliminate Jog between Banwell Road and 11 th Concession/ Add separate westbound right turn lane at County Road 43/Banwell Road and County Road 42	-	-	-	-	D	0.93

Note:

LOS A – motorists experience low delay

LOS B – motorists experience delays of up to 15 sec per vehicle

LOS C – motorists experience delays of up to 25 sec per vehicle

LOS D – motorists experience delays of up to 40 sec per vehicle

LOS E – motorists experience delays of up to 60 sec per vehicle

(This level is considered to be the point at which improvements are considered)

LOS F – delays are excessive and unacceptable to most drivers

V/C – represents the volume to capacity ratio

As indicated in Table 3-2, without further improvements to County Road 43/Banwell Road/11th concession and County Road 42, this section of the county's arterial road network will experience severe congestion and delays well before the design year of 2027.

By 2021, to accommodate the anticipated growth in traffic in this area and to provide a reasonable level of service, the following road improvements are required:

- Widening County Road 43/Banwell Road to a basic four lane arterial standard;
- Improving the approach on the County Road 43/11th Concession at County Road 42;
- Widening County Road 42 to a basic five lane cross section between the existing Banwell Road and the realigned jog of the County Road 42/43 intersection;
- Eliminating the jog between County Road 43/Banwell Road and the County Road 43/11th Concession.

By 2027, if traffic growth continues as anticipated, the realigned intersection of County Road 43/Banwell Road/11th Concession and County Road 42 will require a separate westbound right turn lane to maintain a level of service 'D'. However, at this time it is recommended to only proceed with the improvements which can satisfy the 2021 traffic demands. It is anticipated that the County will be proceeding in the near future with a Class EA Study for County Road 42 and with anticipated improvements to the Manning Road/County Road 22 corridor, traffic patterns may change to reduce or eliminate the need for the separate westbound right turn lane at the County Road 43/Banwell Road/11th Concession and County Road 42 intersection.

3.3 OTHER ISSUES

With the future urbanization of this area, one other issue has surfaced in this study, namely facilities for pedestrians and cyclists. To accommodate the future anticipated needs of Tecumseh residents, it has been proposed to incorporate a 1.5 metre sidewalk on the west side and a 4.0 metre multi-use trail facility on the east side of the realigned Banwell Road down to County Road 42. These facilities will interconnect with the anticipated improvements to Banwell Road within the City of Windsor portion between Tecumseh Road East and the CPR tracks as well as serve to provide alternatives to private automobile use.

3.4 PROBLEM STATEMENT

County Road 43 is a key corridor within the County's transportation network and connects directly into the City of Windsor's arterial road system. Growth in population and employment in the immediate area will result in increased traffic congestion over the next 20 - 25 years. As well with increasing urbanization, the needs of pedestrians and cyclists need to be addressed in any future improvement program. The recent Essex Windsor Regional Transportation Master Plan identified the need for 4 basic lanes on Banwell Road which has now been confirmed based on recent growth projections. Furthermore, based on projections to 2027, it has been determined that:

- Maintaining operational and capacity status quo would cause County Road 43 (Banwell Road/11th Concession) to lose its ability to handle traffic flow demands within a reasonable level of service as prescribed by its function;

- The need for pedestrian and cyclist facilities to accommodate walking and to encourage cycling within the Banwell Road corridor will evolve with the significant growth in population and employment in this area and will compliment the anticipated road improvements; and
- The need for a basic 4 lane cross section on Banwell Road can be supported between the City limits and County road 42. Further, a jog elimination at County Road 42 between Banwell Road and the 11th Concession is required to resolve excessive delay, congestion and safety issues in the future.

4.0 EXISTING CONDITIONS

4.1 ROAD NETWORK

Information of existing conditions in the study area was assembled through various sources:

- Surveys and field investigations by the Project Team's specialist consultants;
- Secondary source material such as existing plans and reports from the County of Essex, Town of Tecumseh, and the City of Windsor (i.e. Official Plan, Essex-Windsor Regional Transportation Master Plan, Windsor Area Long Range Transportation Study, etc.); and,
- Comments received from the public, adjacent residences, and contact with relevant government ministries and agencies.

Under the jurisdiction of the County of Essex, County Road 43/Banwell Road and 11th Concession are two-lane rural roadways within the area transportation network. The County of Essex Official Plan has not given a specific designation to either County Road 43/Banwell Road or 11th Concession although the Essex-Windsor Regional Transportation Master Plan has recommended that County Road 43/Banwell Road be designated a Class II Arterial and 11th Concession be designated a Tertiary roadway.

The posted speed limit along County Road 43/Banwell Road/11th Concession is 60 km/h throughout the project limits. The 11th Concession originates at County Road 46 at its southerly limit and terminates at County Road 42 at its north limit. County Road 43/Banwell Road starts at County Road 42 and continues northerly into the City of Windsor, terminating just south of Riverside Drive East.

4.2 ROAD GEOMETRY

4.2.1 Horizontal and Vertical Alignment

County Road 43/Banwell Road and 11th Concession are tangent facilities between the south limit, approximately 800 metres south of County Road 42, and the north limit at the CPR tracks. Minor alignment deflections along the roadways are well within the accepted geometric design standards.

The existing profile along County Road 43/Banwell Road/11th Concession is extremely flat within the project limits, with grades of less than 0.1%. The one exception is at the north end, where the grade for a short section, is approximately 3% as the road rises to meet the railway bed at the CPR crossing, resulting in a localized bump in the road.

4.2.2 Cross Section and Pavement Structure

The pavement width along County Road 43/Banwell Road/ 11th Concession varies in the range of 6 metres to 7 metres. The gravel shoulders on either side of the road are quite narrow and almost non-existent at some locations.

Based on the borehole data, the depth of the existing asphalt varies from 20 mm to 65 mm and the depth of fill ranges from 165 mm to 305 mm. Refer to *Appendix C – Preliminary Geotechnical Review* for more details.

4.2.3 Right of Way

The existing right-of-way along County Road 43/Banwell Road is approximately 12 metres. On the 11th Concession, the existing right-of-way is approximately 20 metres. The right-of-way on County Road 42 through the study area is approximately 26 metres.

4.2.4 Traffic Signals and Illumination

There are currently no traffic signals along County Road 43/Banwell Road/ 11th Concession. However, the County proceeded with plans in late 2006 to add a left-turn lane from County Road 42 onto 11th Concession and install traffic control signals at the intersection of County Road 42 and County Road 43/Banwell Road.

Illumination is currently provided at the intersection of County Road 42 and County Road 43/Banwell Road. There are also several luminaries mounted on hydro poles along County Road 43/Banwell Road. There is no illumination provided along 11th Concession.

4.2.5 Drainage

Within the study area, County Road 43/Banwell Road and County Road 42 cross or parallel a number of municipal drains. Under existing conditions, runoff from County Road 43/Banwell Road is conveyed to six separate municipal drains identified on the site, including 11th Concession Drain, St. Louis Drain, Klondyke Drain, Soulliere Drain, Banwell Road Drain and Desjardins Drain.

Banwell Road Drain is located on the west side of County Road 43 and drains in a northerly direction to Desjardins Drain. The Soulliere and Desjardins Drains convey drainage from east to west, and discharge to Little River. Little River is located approximately 1.5 kilometers west of County Road 43 and drains northerly eventually discharging to Lake St. Clair. The St. Louis Drain parallels County Road 43 before turning westerly along County Road 42. It conveys runoff from the above noted roadways to the Concession Drain, which eventually discharges to Little River.

The 11th Concession Drain initially runs along the east side of County Road 43 in a northerly direction, turning easterly at County Road 42. From this point the 11th Concession Drain discharges easterly to the Pike Creek Drain. The Klondyke Drain

conveys runoff along the west side of County Road 42 easterly, eventually joining with the 11th Concession Drain.

The location of each of these municipal drains is illustrated in Figure 7-2 Proposed Drainage Concept.

4.2.6 Utilities and Infrastructure

The following utility companies were contacted for information on the existing and proposed utility plant within the study area. Copies of utility record drawings or marked-up prints for reference were provided by the utility companies.

Bell Canada

There is an underground Bell plant on the west side of County Road 43/Banwell Road, approximately 0.5 metres inside the edge of pavement, which extends from the CPR tracks to County Road 42. About 110 metres north of County Road 42, a Bell duct runs from the west side to the east side of County Road 43/Banwell Road. Along County Road 42, there are underground Bell cables on either side of the road. On 11th Concession, the underground Bell plant is installed on the east side of the road.

Bell also has underground fibre optic cables on the south side of and running parallel to the CPR tracks at the north limit of the study.

Based on drawings received from the Town of Tecumseh, an abandoned Bell cable runs along the centreline of County Road 43/Banwell Road, from the CPR tracks to approximately 400 metres south of the tracks. At this point, the cable jogs to the east side of County Road 43/Banwell Road and continues running parallel to and approximately 4 metres from the centreline of the roadway until it terminates approximately 590 metres south of the tracks.

Cogeco Cable Solutions

There are no Cogeco cable plants that exist within the study area.

Hydro One Networks Inc.

Hydro poles within the project limits are owned by Hydro One Networks Inc. and are located on the west side of County Road 43/Banwell Road and 11th Concession. However, there is at least one hydro pole on the east side on 11th Concession, just south of County Road 42. On County Road 42, hydro poles are situated on both sides of the road.

There are four hydro corridors, approximately 30 metres, 50 metres, 80 metres, and 150 metres respectively, south of the CPR tracks. The three corridors closest to the railway

tracks utilize steel towers to carry the hydro lines, whereas the corridor furthest from the railway tracks utilizes wooden poles.

Union Gas

There is a gas line on the west side of County Road 43/Banwell Road, approximately 5.9 metres from the existing centreline. The line extends from County Road 42 northerly for about 300 metres, with perpendicular service connections to the residences along that section of County Road 43/Banwell Road. On County Road 42, the gas line runs along the north side of the road, with service connections to the buildings on both sides of the road.

Sanitary Sewer

A 200 mm sanitary sewer is installed on the west side of County Road 43/Banwell Road from County Road 42 northerly to approximately 120 metres. The sanitary sewer along County Road 43/Banwell Road connects to a manhole at the northeast quadrant of the intersection of County Road 43/Banwell Road and County Road 42. This manhole forms part of an east-west sewer line installed on the north side of County Road 42. West of the manhole, the sewer is 200 mm and east of the manhole, the sewer is 250 mm.

Watermain

A 200 mm watermain is located on the east side of County Road 43/Banwell Road from County Road 42 to approximately 240 metres south of the CPR tracks which connects to another watermain on the north side of County Road 42.

4.3 NATURAL ENVIRONMENT

The study area is dominated by active agricultural land use, with a few sparse deciduous hedgerows separating individual cultivation fields. Natural heritage features are limited to ephemeral drainage tributaries of the Little River, a warm water tributary of Lake St. Clair, and a small deciduous woodlot, measuring 300 metres by approximately 50 metres. These features were the focus of the natural environment investigations.

4.3.1 Terrestrial Habitat

County Road 43/Banwell Road

A small woodlot located on the west side of County Road 43/Banwell Road, approximately 200 metres south of the CPR tracks was investigated. The woodlot is separated from Banwell Road by a small cemetery (Smith Black Cemetery) measuring approximately 50 metres wide. Dominant species recorded include red ash (*Fraxinus pensylvanica*), Manitoba maple (*Acer negundo*), white elm (*Ulmus americana*), thicket creeper (*Parthenocissus inserta*) and riverbank grape (*Vitis riparia*). The woodlot is young with good structural diversity, represented by clear regeneration, subcanopy and

canopy layers. All plant species recorded are considered common and widespread throughout southern Ontario.

Due to the small size of the woodlot, wildlife using the woodlot is likely to be common, disturbance-tolerant species such as American Robin and Red-eyed Vireo. There are no area sensitive breeding birds likely to occur in the woodlot. Connectivity to other forested habitats for the purposes of wildlife movement is very limited as the surrounding lands are mainly agricultural or residential.

County Road 42/11th Concession

The terrestrial features located along County Road 42 were investigated including a vacant property opposite 11th Concession, on the north side of County Road 42, and residential properties on either side on 11th Concession, immediately south of County Road 42. Samples from woody vegetation were collected and submitted for identification. Two species were identified; Carolina Poplar (*Populus x canadensis*) and Manitoba Maple (*Acer negundo*). Carolina Poplar is a non-native hybrid taxa commonly cultivated and planted in landscaping practices. According to Farrar (1995), the northern limit Manitoba Maple's native range occurs in the County of Essex however, this species is common and widespread throughout southern Ontario. Manitoba Maple is classified by the Society of Ecological Restoration (Urban Forest Associates 2002) as a Category 1 invasive exotic (i.e. it is an aggressive species that can dominate a site and displace other native species indefinitely). Mature representatives of both species were located on the vacant property to the north of County Road 42 (five mature trees in total), and along 11th Concession to the south (four mature trees in total). Smaller shrub and size class representatives were also located on the vacant lot to the north, and in a deciduous hedgerow on the east side of 11th Concession south of County Road 42. This investigation was not a complete species inventory of the above noted deciduous hedgerow.

The vegetation characteristics described above are not expected to support any ecological functions beyond support of common, disturbance-tolerant species.

4.3.2 Fisheries and Aquatic Habitat

A desktop analysis was completed for the study area using aerial photography and topographic maps. Existing fisheries and aquatic information was obtained from the Ontario Ministry of Natural Resources (MNR) Chatham District Office and Essex Region Conservation Authority (ERCA). An aquatic biologist from Gartner Lee Limited (GLL) completed a field visit on August 29, 2006. Photographs of the study area are presented in *Appendix D – Environmental Conditions Report*.

ERCA has recently completed mapping of the drainage features within the study area. The study area encompasses the Banwell Road Drain and the Desjardin Drain, which eventually discharge into Little River. Little River is a warmwater tributary of Lake St. Clair. Although the Desjardin Drain is designated as a permanent tributary by the

MNR NRVIS (Natural Resource Value Inventory System) mapping, more recent work by the ERCA has determined both the Banwell Road and the Desjardin drains to be ephemeral.

The Banwell Drain is a ditch that flows parallel to Banwell Road, discharging into the Desjardin Drain, approximately 300 m south of the railway tracks. The Desjardin Drain flows perpendicular to Banwell Road. There is no defined channel (i.e. no scour) but the area of flow is visible among the crops. Both drains are likely dry for most of the summer, except after significant rainfall events. During the site visit, approximately 0.01 to 0.05 m of standing water was present in both drains. The Windsor area had received a significant amount of rainfall (27.4 mm) the previous day. These drains, in particular the Desjardin Drain, would seasonally contribute to fish habitat during times of high flow (i.e. spring freshet) but are otherwise for drainage purposes only. The drain contributes to flow but does not provide direct fish habitat.

ERCA and MNR provided historical fisheries information for Little River, upstream and downstream of where Desjardin Drain discharges into Little River. These data are provided in *Appendix D – Environmental Conditions Report (Table 1)*. The fish community is diverse although most of the species are common warmwater species that are tolerant to environmental disturbance.

Of particular interest is the round goby (*Neogobius melanostomus*), which is an aggressive, invasive species. It was first introduced to Ontario in ballast water and reported in the St. Clair River in 1990. The round goby is rapidly expanding its range. It is tolerant of low dissolved oxygen and a wide range of water temperatures.

4.3.3 Wildlife Habitat

Most of the wildlife habitat in the study area is located within roadside ditches, agricultural lands with wildlife species that are habituated to human activity. Consequently, habitat in or adjacent to the right-of-way has limited wildlife capability.

4.4 SOCIO-ECONOMIC ENVIRONMENT

As part of this project, a land use assessment was undertaken and included a windshield survey, review of secondary source information, and discussions with the Town's Planning Department. The following sections document the findings of the land use assessment, including an overview of the land use planning context (Official Plan designations, zoning and development, etc.), a description of existing land uses within the study area, and a brief discussion of future/proposed land uses.

4.4.1 Land Use Planning Context

Official Plans

The Official Plan (OP) of Essex County adopted on July 19, 2005 establishes the broader policy framework and guidance for future development and growth for both the County as well as its lower tier municipalities. In addition, the Town is governed by three separate Official Plans representing the three municipalities (Tecumseh, St. Clair Beach, and Sandwich South) that existed prior to their amalgamation in January 1999. Each Official Plan sets out the general policies and direction for future development (planning period of 1999-2011) within each of the respective lands: Tecumseh Hamlet, Oldcastle & Baseline Road Hamlet, and Maidstone Hamlet. The three separate Official Plans have not yet been amalgamated into one Official Plan.

The study area lies within Tecumseh Hamlet and is therefore governed by the Tecumseh Hamlet Secondary Plan (September 2006). The entire County Road 43/Banwell Road project limits are within the existing urban boundary of this Secondary Plan south to CR 42.. Most of the lands on either side of Banwell Road are designated as vacant or agricultural except for:

- Adjacent to/south of the CPR is designated Ontario Hydro Right-of-Way (ROW).
- South of Ontario Hydro (ROW), west of Banwell Road is designated institutional.
- Adjacent to County Road 42 and to the northwest and southwest is residential.
- Adjacent to County Road 42 and to the northeast is industrial/commercial.
- Adjacent to County Road 42 and to the southeast is industrial.
- Small areas scattered along the west side of Banwell Road are designated residential.

Tecumseh Hamlet Secondary Plan

The Town of Tecumseh approved the Tecumseh Hamlet Secondary Plan in September 2006. The study area encompassed CR 43/Banwell Road from the CPR track/City boundary south to CR 42. Planned land use along this road includes some 1,800 new dwelling units for approximately 6,000 residents, plus some 12,500 square feet of new commercial space. A traffic study dated August 2008 was subsequently prepared by Dillon Consulting to identify the impacts and associated roadway network needs resulting from the planned growth in the Hamlet Secondary Plan.

Traffic analysis from the early draft traffic study dated December 2007 has been reflected in this EA study. However, because traffic growth forecasts from the final traffic study do not significantly change County Road 43 forecasts, they have not been incorporated into this ESR. Similarly, final editing of Banwell Road forecasts conducted by Paradigm Transportation Solutions in their March 2009 Transportation Study for the City's Banwell Road EA are not incorporated into this EA because they do not change the need for roadway improvements on County Road 43.

Zoning By-Laws

The majority of the lands adjacent to Banwell Road between County Road 42 and the CP Rail Line is zoned A (Agricultural), based on Schedule “A” of the Township of Sandwich South zoning information as provided by the Town of Tecumseh Planning Department. Exceptions to this include a number of smaller land parcels zoned as follows:

- The land parcel located to the northeast of the Banwell Road/County Road 42 intersection is zoned CM (Commercial/Industrial).
- The land parcel located to north of County Road 42 and west of Banwell Road contains mixed zoning. Along County Road 42, a portion of the property is zoned (H) C1-8 (Holding Zone) (General Commercial), another portion is C1-1 (General Commercial), and the largest portion of this parcel is zoned R1 (Residential Zone 1) along both County Road 42 and Banwell Road.
- The land parcel located in the northern part of the study area, along the west side of Banwell Road, is zoned as I-1 (Institutional).

Existing Land Uses

As part of this study, a “windshield survey” was undertaken to identify existing land uses within the study area. In general, land uses within the study area were found to be a mixture of rural/agricultural, residential, and industrial/commercial.

County Road 43/Banwell Road and County Road 42 Intersection

With respect to the southern portion of the study area, particularly the area surrounding the County Road 43/Banwell Road and County Road 42 intersection, land use is comprised of both industrial/commercial as well as residential. In the area east of Banwell Road and southeast of County Road 42, various types of businesses were observed including, manufacturing (i.e. aluminum, concrete), commercial (i.e. furniture store, printing/courier services), hospitality (i.e. restaurant), and warehousing.

The area west of Banwell Road and southwest of County Road 42 it was primarily residential. A small number of orchards and farms also exist along County Road 42 to the west of the County Road 43/Banwell Road intersection. Further west on County Road 42, there is a horse track and barn stables (it was not confirmed whether or not these facilities are currently in use).

County Road 43/Banwell Road northerly to the CPR Line

The portion of the study area from just north of the County Road 43/Banwell Road and County Road 42 intersection northerly to the CPR Line was observed to be a rural/agricultural area. The west side of County Road 43/Banwell Road contains a small number of residences that are relatively dispersed and are separated by crop areas

in between. A small cemetery (Smith Black Cemetery) was also observed adjacent to one of the residential properties along Banwell Road, just south of the CPR Line.

With respect to the northern portion of the study area, there is a utility corridor (i.e. Ontario Hydro Right of Way) that extends in an east-west direction, parallel to the CPR Line. The rail line represents the northern limit of the study area.

Proposed Land Uses

Based on discussions with the Town's Planning Department, there are currently no development applications affecting the study area. However, according to the Town's Planning Department, future urban development is expected to occur within the study area based on approval of the Tecumseh Hamlet Secondary Plan. Although the study area is currently designated as "Hamlet Development" under Schedule "A-1" of the Township of Sandwich South OP, it is anticipated this designation will be revised to plan for future urban growth in the area.

4.4.2 Agriculture Land Use

Existing background data sources were reviewed to provide a summary of the physical resource features and characteristics associated with the study area. These published data sources included, but are not necessarily limited to the following:

- Soil Survey of Essex County
- County of Essex Official Plan (July 19, 2005)
- Town of Tecumseh Secondary Plan - Tecumseh Hamlet Existing Land Use Schedule (2006)
- Township of Sandwich South Official Plan, Land Use Schedule A
- Canada Land Inventory (CLI) manuscript mapping of Soil Capability for Agriculture
- Aerial photography (Orthophotography) and land use mapping
- Assessment Mapping and Assessment Roll information (2006)

Based on a review of these data, a reasonable description of the distribution of agricultural lands within and adjacent to the study area was obtained. A reconnaissance-level field investigation of the study area was also completed on September 11, 2006. The purpose of this field survey was to identify and document the presence of agricultural operations within and adjacent to the study area and identify and document the presence of significant forms of capital investment related to agriculture within and adjacent to the study area.

Significance and Sensitivity

As per provincial policy, the following priority is given to agricultural lands within the study area:

- Specialty crop areas
- Canada Land Inventory (CLI) Class 1 soils
- CLI Class 2 soils
- CLI Class 3 soils
- Other agricultural soils, CLI Class 4, 5 and 6 soils in that order of priority

With respect to the significance and sensitivity of agricultural operations and other forms of capital investment related to agriculture, a determination was made on an individual basis. Criteria considered in determining significance and sensitivity included the following:

- Extent and type of operation
- Size of operation
- Accessibility
- The potential for impact

Findings

Planning Context

The study area includes lands designated “Agricultural” and “Hamlet”. The lands not considered to be “Agricultural” are mainly associated with the intersection of County Road 43/Banwell Road and County Road 42. North of this intersection and on both sides of County Road 43/Banwell Road, non-agricultural lands are also identified in the Township of Tecumseh Official Plan.

The southern portion of the study area, approximately 200 m south of County Road 42 and County Road 43/Banwell Road intersection, is designated as “Agricultural” (County of Essex Official Plan). Given these designations, it is important to recognize that not all of the lands that are currently cultivated for agricultural purposes are considered to be part of a Prime Agricultural Area. Also, most lands on either side of County Road 43/Banwell Road that is the subject of this EA are planned for long term urban development in the Tecumseh Hamlet Secondary Plan.

Soils

The County of Essex is predominantly a smooth clay plain with scattered sandy and gravelly knolls and ridges. Owing to the flat topography and heavy texture of most of the soils, artificial drainage is used extensively to improve the productivity of the land. The natural drainage system has been supplemented with open ditches and dredge cuts to serve as outlets for the tile drains which have been installed on many of the farms in this area.

The Soil Map of Essex County (Soil Survey Report No. 11) was consulted to determine the distribution of soil series in proximity to the proposed undertaking. The study area

is comprised of Brookston clay soils. The Brookston series is a poorly drained soil developed on heavy calcareous clay till. The topography associated with the Brookston series is nearly level. The Brookston clay series is the most extensive soil type in Essex County, with a large block covering most of the lands south and east of Windsor.

The greatest limitation to crop production on the Brookston soils is the poor internal drainage. With proper management practices, such as the installation of artificial drainage systems, these soils are capable of producing common field crops. Depending on the type of crops to be grown, both potassic and phosphatic fertilizers may be necessary for satisfactory yields. Brookston soils are considered Prime Agricultural Lands.

Agricultural Land Uses

There are two noteworthy agricultural operations in proximity to the study area. Both of these operations are located south of the intersection of County Roads 42 and County Road 43/Banwell Road. In the southwest portion of the study area, a horse farm was observed. This horse farm has a training track, associated outbuildings (in fair condition but requiring repair) and fenced (wooden) pasture areas.

Southeast of the study area is an active livestock (beef) operation. This farmstead has several outbuildings in good condition. West of the County Road 42 and County Road 43/Banwell Road intersection, several small hobby horse farms were observed. Much of the study area that is not devoted to residential buildings and manicured lawns is held in active agricultural systems. Fields in proximity to the study area were cultivated mainly for common field crops, namely soy beans and corn, during the 2006 growing season. Small fields adjacent to the study area were held in pasture. This type of agricultural land use system is what would be anticipated given the soil capability, (i.e. C.L.I. Class 1-3 soils, for the local area). There is no specialty crop land uses located in proximity to the study area. Refer to *Appendix E – Preliminary Agricultural Assessment* for more details.

4.4.3 Noise

Noise is a form of energy. Noise is measured in terms of sound pressure, using "Decibels" (dBA) to best represent the way in which the human ear perceives noise. The following lists examples of sound levels from various sources:

Decibel Level Sounds Like

- 130dBA Jet Take Off
- 100dBA Jack Hammer
- 90dBA Busy Street
- 65dBA Business Office
- 40dBA Living Room
- 25dBA Bedroom
- 0dBA Threshold of Hearing

The following identifies general thresholds for how people perceive changes in noise levels. These guidelines can be used for either increases or decreases in the decibel levels to which people are exposed.

Change in Decibel Level

- | | |
|--------------------------|---|
| • Less than 3dBA | Change considered insignificant due to imperceptibility |
| • Between 3dBA and 5dBA | Change considered a just-noticeable difference |
| • Between 5dBA and 10dBA | Change considered marginally significant |
| • Over 10dBA | Change considered significant (perceived as doubling of sound exposure) |

Roadway noise, like most noise, varies throughout the day. Therefore, the noise descriptor used in Ontario to assess noise is the equivalent sound level, Leq. Leq is identified as the continuous sound level which has the same energy as a time varying noise level over a specified time period. Roadway noise levels generally depend on vehicle type (truck, car), road profile, distance from receiver, type of ground between the road and the receiver.

MOE/MTO Protocol

The Ministry of the Environment (MOE) uses the 16-hour period between 7 AM and 11 PM for the assessment of municipal roadway noise. The noise at any one instant may be higher or lower than the 16 hour average. MOE requires that the predicted future noise level without the proposed road improvement be compared to the future noise level with the proposed road improvement adjacent to a Noise Sensitive Area (NSA). If a future increase in noise of greater than 5dB is predicted, the MOE/Ministry of Transportation (MTO) Noise Protocol requires that noise mitigation be investigated within the right-of-way.

For purposes of assessing noise as part of road expansion project, MTO defines a NSA as a noise sensitive land use with an outdoor living area, which includes private homes/single family units and townhouses; multiple unit buildings such as apartments with outdoor living areas for use by all occupants; hospitals and nursing homes where an outdoor living area is provided for the patients.

The following land uses are generally not considered by either the MTO or MOE to qualify as NSAs, including apartment balconies; cemeteries; parks and picnic areas; all commercial and industrial uses.

Lands that have been zoned for future noise sensitive uses but where NSAs do not currently exist must also be considered under MTO/MOE policies (lands with a plan of subdivision in place). A review of the land use zoning within the project area has been conducted. The land use zoning review indicates no zoned-for-future-use NSAs. Any future noise sensitive land use should be developed with regard to the planned road configuration.

4.5 CULTURAL ENVIRONMENT

As part of this study, any notable and existing archaeological resources, built heritage features and cultural landscape features were assessed. The following sections highlight the findings in the study area.

4.5.1 Archaeological Resources

A Stage 1 archaeological assessment was conducted by Archaeological Services Inc. (ASI) in accordance with the Ontario Ministry of Culture's archaeological assessment technical guidelines. The Stage 1 archaeological assessment involved research of background material to describe the known and potential archaeological resources within a study area. Such an assessment incorporated a review of previous archaeological research, physiography, and land use history for the property. Background research was completed to identify any archaeological sites in the study area and to assess the area's archaeological potential. Based on the presence of the Little River tributary within the study area, and the fact that the existing roads were part of the historic settlement network, the study area has the potential for the presence of pre-contact and historic archaeological sites depending on the intensity of more recent development and landscape alterations.

A field review of the study corridor was carried out by ASI on September 18, 2006, in order to confirm the assessment of archaeological site potential and to determine the degree to which development and landscape alteration may have affected that potential. Based on the review, there is no potential for archaeological sites within the typical disturbed right of way (ROW) of County Road 43/Banwell Road/11th Concession and County Road 42.

The Smith Black Cemetery is situated on the west side of Banwell Road, approximately 200 metres south of the CPR Line. The small cemetery was plaqued in 1978, and the grave markers have been consolidated. The locations of the named as well as any additional unnamed graves are unknown, and graves may be present on the west side of Banwell Road in the general vicinity of the marked cemetery.

Further details of the archaeological assessment can be found in *Appendix G- Stage 1 Archaeological Assessment*.

4.5.2 Built Heritage and Cultural Landscape

For the purposes of the cultural heritage assessment of the proposed road improvements, all potentially affected cultural heritage resources within the study area were subject to inventory. A short form name was applied to each resource type, (i.e. barn, residence) and the locations were plotted on area maps. Building interiors were not subject to survey. Historical research was also conducted for the purposes of identifying broad agents or themes of historical change in the area while historic mapping was consulted to reveal cultural landscape development in the area.

Built heritage features and cultural landscapes were inventoried according to a consistent typology of units based upon Ministry of Culture guidelines and past experience. The following definitions of typical cultural landscape units were used:

- Farm complexes: comprise two or more buildings, one of which must be a farmhouse or barn, and may include a tree-lined drive, tree windbreaks, fences, domestic gardens and small orchards.
- Roadscape: generally two-lanes in width with absence of shoulders or narrow shoulders only, ditches, tree lines, bridges, culverts and other associated features.
- Waterscapes: waterway features that contribute to the overall character of the cultural heritage landscape, usually in relation to their influence on historic development and settlement patterns.
- RAILSAPES: active or inactive railway lines or railway rights of way and associated features.
- Historical Settlements: groupings of two or more structures with a commonly applied name.
- Historical Agricultural Landscapes: generally comprises a historically rooted settlement and farming pattern that reflects a recognizable arrangement of fields within a lot and may have associated agricultural outbuildings and structures.

Historic research revealed that the study area has origins in eighteenth and nineteenth-century survey and settlement and it has remained largely rural in character until recently.

A field survey conducted in August 2006 confirmed an altered agricultural landscape that maintains much of its rural heritage character. A small number of cultural heritage resources were identified. These include:

- one early roadscape
- historic agricultural field patterns associated with the French seigniorial system
- one early twentieth century farm complex
- one late nineteenth century barn
- one late nineteenth century house with a barn at the rear
- one historic cemetery associated with the George Washington and Amanda Smith family
- one railscape

There are no designated structures under Part IV of the Ontario Heritage Act within the study area although a historic plaque was erected in the Smith Black Cemetery in 1978 by the Township of Sandwich South.

Descriptions of the identified built heritage and cultural landscape features and further details of the built heritage and cultural landscape assessment can be found in *Appendix H- Built Heritage and Cultural Landscape Assessment*.

5.0 ALTERNATIVE SOLUTIONS AND EVALUATION

5.1 OVERVIEW OF ALTERNATIVE SOLUTIONS

A number of alternative solutions were investigated to address the identified problems and needs along County Road 43/Banwell Road/11th Concession. The alternative solutions that were considered included:

- Do nothing
- New/Improved County Road 43/Banwell Road/11th Concession (localized construction, intersection improvements, road widening, jog elimination)
- New/Improved Alternative Modes (air, water, rail, transportation systems)
- Manage Transportation Demands (develop and promote transportation demand management strategies to encourage reduced automobile usage including carpooling, local transit initiatives, divert traffic to parallel facilities, etc.)

5.1.1 Do Nothing Alternative

This alternative is defined as the continued maintenance of the existing roadway corridor within the project limits. In summary, this does not solve the identified capacity and safety deficiencies, and as such, was not considered as a reasonable solution.

This alternative was not carried forward for further investigation.

5.1.2 New/Improved County Road 43/Banwell Road/11th Concession

(i) Operation Improvements – Minor Localized Reconstruction and Resurfacing

This alternative does not address the projected 2021 deficiencies, by installing traffic control signals at the County Road 43/Banwell Road/County Road 42 intersection in conjunction with back to back left turn lanes on County Road 42 between County Road 43/Banwell Road and the 11th Concession. However, these operational improvements do satisfy a number of existing capacity and safety deficiencies and may present a reasonable interim solution.

This alternative was carried forward for further investigation as an interim solution.

(ii) Infrastructure Improvements – Widen and Reconstruct Banwell Road to Meet Forecast Traffic Demands

This alternative provided for the widening of Banwell Road from a rural 2 lane cross section to a basic four lane urban roadway between the CPR tracks and County Road 42. This alternative would leave the existing jog between Banwell Road and the 11th

Concession in place and result in projected capacity and safety deficiencies at the intersections of County Road 42 and Banwell Road and the 11th Concession in order to process the projected 2021 traffic demands. As well, this alternative would further aggravate congestion and public safety at the existing fronting driveways on Banwell Road, the 11th Concession and County Road 42.

This alternative was not carried forward for further investigation.

- (iii) *Infrastructure Addition – Realign Banwell Road to Connect Directly into the 11th Concession (i.e. Jog Elimination)*

This alternative provided for the widening of Banwell Road between the CPR tracks and County Road 42 as a basic four lane urban roadway, and realigning Banwell Road to directly connect into the 11th Concession. This alternative provides the highest benefit to motorists along the Banwell Road/11th Concession corridor, and results in improved safety and traffic operations.

This alternative was carried forward for further investigation.

5.1.3 New/Improved Alternative Modes

On balance, there is little opportunity to reduce traffic volumes within the study limits through the implementation of local/regional air, water or rail services.

This alternative was not carried forward for further consideration.

5.1.4 Manage Transportation Demand

- (i) *Spread the Peak Period*

This alternative attempts to encourage road users to spread their travel demands outside the traditional peak hour periods in order to avoid designing the road facilities to meet the “peak” need. This alternative is realistic to consider as a future demand management strategy. However, this alternative when considered in combination with other alternatives does not provide a significant contribution towards satisfying the problem statement.

- (ii) *Shift Travel Elsewhere*

This alternative examines the effect of shifting travel from the Banwell Road/11th Concession corridor to other corridors where capacity is available or operational problems do not exist.

Banwell Road/11th Concession is a designated north/south arterial road under the jurisdiction of the County. Unless improvements are implemented along this corridor, other planned north/south facilities will need to be further widened (beyond the ultimate number of lanes planned for these facilities) to accommodate vehicular

volumes diverted from the Banwell/11th Concession corridor. Upgrading parallel facilities would not eliminate the need to widen Banwell Road to four lanes since the majority of traffic is associated with adjacent development.

This alternative was not carried forward for further consideration.

(iii) Eliminate Growth

This alternative is designed to control development and growth in the Town of Tecumseh, which in turn, may restrict traffic growth both within and external to the corridor.

The Banwell Road corridor abuts a major growth area in the Town of Tecumseh. It is anticipated that the total population of the Town of Tecumseh will reach 38,103 persons by the Year 2025. Approximately 68 percent of the projected growth is expected to be accommodated within the existing settlement areas of the former Township of Sandwich South. In anticipation of this growth, the Town has recently completed a master water servicing plan for the area. This alternative is inconsistent with the Town's plan to encourage growth and development within its existing settlement areas.

This alternative was not considered to be realistic and therefore was not carried forward for further consideration.

(iv) Reduce Demand

This alternative is designed to develop and promote transportation demand, management strategies to encourage reduced automobile use (carpooling, local transit initiatives, cycling etc.)

Projected traffic volumes used in this study incorporated the Essex Windsor Regional Transportation Master Plan's target modal split and vehicle occupancy values, and also reflected the benefits from transportation demand strategies. It should be recognized that the road improvements and the widened right of way will play a key role in enhancing the provision of future transit service (if required) and allow for the provision of a multiuse trail within Banwell corridor.

Overall it is not realistic to assume that these factors could reduce demands enough to eliminate the need to widen County Road 43/Banwell Road. Therefore, this alternative was not carried forward but elements of transportation demand management will be incorporated into the recommended solution.

A summary assessment of the alternative solutions considered is included in Table 5-1.

Table 5-1 Assessment of Alternate Solutions

PLANNING ALTERNATIVES	SELECTION CRITERIA	DOES THE ALTERNATIVE REALISTICALLY ADDRESS ALL OF THE PROBLEM/OPPORTUNITY STATEMENTS	DOES THE ALTERNATIVE, WHEN USED IN COMBINATION WITH OTHER ALTERNATIVES, MAKE A SIGNIFICANT CONTRIBUTION TOWARDS REALISTICALLY ADDRESSING ALL OF THE PROBLEM/OPPORTUNITY STATEMENTS	RECOMMENDATION
	DO NOTHING Maintain the status quo. No improvements are planned or made.	Not Realistic	Not Realistic	Not Carried Forward
NEW/IMPROVED COUNTY ROAD 43/ BANWELL ROAD Add a new or improve the existing road transportation facilities in the corridor.	OPERATIONAL IMPROVEMENTS Introduce traffic signal controls, intersection improvements, alignment improvements.	Realistic	Significant Contribution	Carried Forward
	INFRASTRUCTURE IMPROVEMENTS Road widening and access control.	Realistic	Not Realistic	Not Carried Forward
	INFRASTRUCTURE ADDITION Road widening and eliminate the County Road/Banwell Road/11 th Concession Jog.	Realistic	Significant Contribution	Carried Forward
NEW/IMPROVED ALTERNATIVE MODES Add a new or improve the existing modes of travel within the corridor.	AIR TRANSPORTATION Provide local/regional air connections.	Not Realistic	Not Realistic	Not Carried Forward
	WATER TRANSPORTATION SYSTEM Provide local/regional ferry or water taxi service.	Not Realistic	Not Realistic	Not Carried Forward
	RAIL TRANSPORTATION SYSTEM Provide local/regional rail connection.	Not Realistic	Not Realistic	Not Carried Forward
MANAGE TRANSPORTATION DEMAND Reduce, shift or eliminate the transportation demand to avoid the need for facility improvements.	SPREAD THE PEAK PERIOD Spread the travel over a longer period of time to avoid designing the facility to meet the "peak" need.	Realistic	No Significant Contribution	Not Carried Forward
	SHIFT THE TRAVEL ELSEWHERE Shift travel from County Road 43/Banwell Road to another corridor where capacity is available or operational problems do not exist.	Realistic	No Significant Contribution	Not Carried Forward
	ELIMINATE GROWTH Control development and growth to restrict traffic both within and external to the corridor.	Not Realistic	Not Realistic	Not Carried Forward
	REDUCE DEMAND Reduce demand by using fewer vehicles to move people and goods – requires larger trucks and higher auto occupancy.	Realistic	No Significant Contribution	Not Carried Forward

6.0 ALTERNATIVE DESIGNS AND EVALUATION

As outlined in Section 5.1.1 the “Do Nothing Alternative” cannot support the anticipated growth in traffic projected for the Banwell Road corridor and therefore, cannot be considered as a reasonable alternative for further consideration. The two alternatives identified in Table 5-1, i.e. “Operational Improvements” and “Infrastructure Improvements” have been carried forward for evaluation and are discussed in further detail in the following sections.

6.1 OPERATIONAL IMPROVEMENT

For this option, left turn lanes are added to County Road 42 on the approach to County Road 43/Banwell Road and traffic signal control installed at the intersection of County Road 42 and County Road 43/Banwell Road.

In general, these improvements will accommodate the short term growth in traffic over the next 5 to 7 year period. At the same time, the level of safety for all road users in this area will be significantly improved (Table 3-2). These minor operational improvements will not impact on the existing environment, and as such, a rigorous environmental audit was not considered as necessary for this alternative solution.

During the course of this study, the County implemented this operation improvement in late 2006 to resolve ongoing operational and safety concerns.

6.2 INFRASTRUCTURE IMPROVEMENTS

For this alternative, seven jog elimination alternative designs were developed to connect County Road 43/Banwell Road into the 11th Concession as shown in Figure 5-1. The design requires four lanes on County Road 43/Banwell Road between the CPR tracks and County Road 42 with additional widening for turning lanes at intersections; two lanes on the 11th Concession south of County Road 42 with additional widening for turning lanes at intersections; and the widening to five lanes on County Road 42 from immediately west of the 11th Concession to immediately east of the existing County Road 43/Banwell Road. In addition, a 1.5 metre sidewalk was provided on the west side and a 4.0 metre multi-use trail on the east side of County Road 43/Banwell Road.

Table 5-2 outlines the evaluation results (preliminary and detailed screening) of the various alternatives. On balance, Alternative E was selected as the preferred alternative for preliminary design and presentation to the public at the second Public Information Centre.

Figure 6-1 Jog Elimination Alternatives



Table 6-1 Detailed Evaluation of Jog Alternatives

Criteria Group	Criteria	Alternative A1 Comments / Remarks	Rating	Alternative A2 Comments / Remarks	Rating	Alternative B Comments / Remarks	Rating	Alternative C1 Comments / Remarks	Rating	Alternative C2 Comments / Remarks	Rating	Alternative D Comments / Remarks	Rating	Alternative E Comments / Remarks	Rating
System Design	Quality of Horizontal and Vertical Alignments	South of County Road 42, the minimum radius reverse curves are not ideal and drivers may not be prepared for the "sharpness" of the turns. Superelevation transitions occur entirely on the curves since there are no spirals or tangent between them; this may affect driver comfort. North of County Road 42, the tangent between the curves provides adequate distance for superelevations	●	North of County Road 42, the absence of spirals in this alignment makes it less desirable compared to Alternative C2. However, the transition between curves is still relatively smooth since superelevation can be distributed between the tangent and curves. South of County Road 42, spirals provide smoother and more gradual transitions between curves, as opposed to the reverse curves in Alignment A1.	●	North of County Road 42, the reverse minimum radius curves, with no connecting spiral or tangent, are not ideal. However, the curves are more gradual than the reverse curves in Alignment A1. Superelevation transitions on the reverse curves occur entirely on the curves since there are no spirals or tangent between the curves; this may affect driver comfort.	●	North and south of County Road 42, the absence of spirals in this alignment makes it less desirable compared to Alternative C2. However, the transition between curves is still relatively smooth since superelevation can be distributed between the tangent and curves.	●	North and south of County Road 42, spirals provide smooth transitions between tangents and curves by following the path that drivers would naturally adopt. Superelevation is applied over spirals and the tangents are of sufficient lengths to accommodate tangent runouts.	●	Even though reverse curves are utilized to connect the two offset tangents north of County Road 42, the curves are extremely flat and have greater-than-minimum radii of 450 m. South of County Road 42, spirals provide smooth transitions between the tangents and curves. Superelevation is applied over the spirals and the tangent between the spirals provides adequate distance for tangent runouts.	●	North of County Road 42, spirals provide smooth transitions between tangents and curves. However, the tangent between the two 250 m curves is too short to accommodate tangent runouts. South of County Road 42, the reverse curves between the two tangents are quite flat and have greater-than-minimum radii of 400 m.	●
	Intersection with County Road 42	There is a "kink" between the north and south legs through the intersection. Ideally, the alignment should intersect County Road 42 at the same angle on both sides. The intersection angle between the north leg and County Road 42 is approximately 85°, the angle between the south leg and County Road 42 is approximately 86°. Adequate sight distance to the intersection is available but driver perception may be affected by the curves on both the northbound and southbound approaches.	●	The alignment is continuous through the intersection. The intersection angle between Alternative A2 and County Road 42 is approximately 85°. The northbound approach is more gradual than Alternative A1 and this should improve sight lines to the intersection. This alignment is less desirable than the other alternatives with continuous alignments through the intersection i.e. Alternatives C1, C2, D, and E, given the comparatively sharper curve after the short tangent just north of County Road 42. Adequate sight distance to the intersection is available.	●	There is a "link" between the north and south legs of the intersection. Ideally, the alignment should intersect County Road 42 at the same angle on both sides. The intersection angle between the north leg and County Road 42 is approximately 90°, the angle between the south leg and County Road 42 is approximately 80°. A short curve was introduced to existing Concession 11 as it approaches County Road 42, to improve the angle of the intersection and to provide a better transition to the north leg. Adequate sight distance to the intersection is available. Ability to incorporate the roundabout design is difficult to achieve than Alternatives A1, A2, C1, C2 and E due to the property restrictions.	●	The alignment is continuous through the intersection. The intersection angle between Alternative C1 and County Road 42 is approximately 79°, making this intersection more skewed compared to Alternative D (intersection angle of 87°) or Alternative E (intersection angle of 85°). Adequate sight distance to the intersection is available.	●	The alignment is continuous through the intersection. This alignment is superior to Alternative D since the approaches to the intersection with County Road 42 are straighter, due to the longer tangent length and presence of spirals. The intersection angle between Alternative C2 and County Road 42 is approximately 79°, making this intersection more skewed compared to Alternative D (intersection angle of 87°) or Alternative E (intersection angle of 85°). Adequate sight distance to the intersection is available.	●	The angle of intersection between Alternative D and County Road 42 is close to right angles, at approximately 67°. Adequate sight distance to the intersection is available. Ability to incorporate the roundabout design is difficult to achieve than Alternatives A1, A2, C1, C2 and E due to the property restrictions.	●	The alignment is continuous through the intersection. The angle of intersection between Alternative E and County Road 42, at 85°, is comparable to that of Alternative D. Adequate sight distance to the intersection is available. Cui-de-sacs at existing County Road 43/Banwell Road at the 11th Concession will remove conflicts on County Road 42.	●
	Traffic Service	The intersections of Alternative A1, Concession 11, and Banwell Road with County Road 42 are spaced far enough apart to avoid conflicts.	●	The intersections of Alternative A2, Concession 11, and Banwell Road with County Road 42 are spaced far enough apart to avoid conflicts.	●	The limited spacing of approximately 180 m between the intersection of Alternative B with County Road 42 and the intersection of existing Banwell Road and County Road 42 may result in conflicts between various turning movements, although the number of vehicles entering / exiting Banwell Road in the future will be limited.	●	The intersections of Alternative C1, Concession 11, and Banwell Road with County Road 42 are spaced far enough apart to avoid conflicts.	●	The intersections of Alternative C2, Concession 11, and Banwell Road with County Road 42 are spaced far enough apart to avoid conflicts.	●	The limited spacing of approximately 180 m between the intersection of Alternative D with County Road 42 and the intersection of Concession 11 and County Road 42 may result in conflicts between various turning movements, although the number of vehicles entering / exiting Concession 11 in the future will be limited.	●	The limited spacing of approximately 110 m between the intersection of Alternative E with County Road 42 and the intersection of existing Concession 11 and County Road 42 may result in conflicts between various turning movements, although the number of vehicles entering / exiting Concession 11 in the future will be limited.	●
OVERALL RATING FOR SYSTEM DESIGN			●		●		●		●		●		●		●
Natural Environment	Impact to Vegetation Community	No change to vegetation communities is expected. Loss of individual trees will be quantified during detail design and appropriately mitigated. Mitigation for individual tree loss should replace each tree identified for removal at a minimum ratio of 3:1.	●	No change to vegetation communities is expected. Loss of individual trees will be quantified during detail design and appropriately mitigated. Mitigation for individual tree loss should replace each tree identified for removal at a minimum ratio of 3:1.	●	No change to vegetation communities is expected. Loss of individual trees will be quantified during detail design and appropriately mitigated. Mitigation for individual tree loss should replace each tree identified for removal at a minimum ratio of 3:1.	●	No change to vegetation communities is expected. Loss of individual trees will be quantified during detail design and appropriately mitigated. Mitigation for individual tree loss should replace each tree identified for removal at a minimum ratio of 3:1.	●	No change to vegetation communities is expected. Loss of individual trees will be quantified during detail design and appropriately mitigated. Mitigation for individual tree loss should replace each tree identified for removal at a minimum ratio of 3:1.	●	No change to vegetation communities is expected. Loss of individual trees will be quantified during detail design and appropriately mitigated. Mitigation for individual tree loss should replace each tree identified for removal at a minimum ratio of 3:1.	●	No change to vegetation communities is expected. Loss of individual trees will be quantified during detail design and appropriately mitigated. Mitigation for individual tree loss should replace each tree identified for removal at a minimum ratio of 3:1.	●
	Impact to Fisheries	No significant change to fish habitat is expected because the drainage system is considered indirect fish habitat (contributes to flow rather than direct habitat). Proper mitigation techniques (i.e. silt fencing) should be implemented. Should a drain be required to be enclosed, permits from the appropriate agencies may be necessary.	●	No significant change to fish habitat is expected because the drainage system is considered indirect fish habitat (contributes to flow rather than direct habitat). Proper mitigation techniques (i.e. silt fencing) should be implemented. Should a drain be required to be enclosed, permits from the appropriate agencies may be necessary.	●	No significant change to fish habitat is expected because the drainage system is considered indirect fish habitat (contributes to flow rather than direct habitat). Proper mitigation techniques (i.e. silt fencing) should be implemented. Should a drain be required to be enclosed, permits from the appropriate agencies may be necessary.	●	No significant change to fish habitat is expected because the drainage system is considered indirect fish habitat (contributes to flow rather than direct habitat). Proper mitigation techniques (i.e. silt fencing) should be implemented. Should a drain be required to be enclosed, permits from the appropriate agencies may be necessary.	●	No significant change to fish habitat is expected because the drainage system is considered indirect fish habitat (contributes to flow rather than direct habitat). Proper mitigation techniques (i.e. silt fencing) should be implemented. Should a drain be required to be enclosed, permits from the appropriate agencies may be necessary.	●	No significant change to fish habitat is expected because the drainage system is considered indirect fish habitat (contributes to flow rather than direct habitat). Proper mitigation techniques (i.e. silt fencing) should be implemented. Should a drain be required to be enclosed, permits from the appropriate agencies may be necessary.	●	No significant change to fish habitat is expected because the drainage system is considered indirect fish habitat (contributes to flow rather than direct habitat). Proper mitigation techniques (i.e. silt fencing) should be implemented. Should a drain be required to be enclosed, permits from the appropriate agencies may be necessary.	●
OVERALL RATING FOR NATURAL ENVIRONMENT			●		●		●		●		●		●		●
Socio-Economic Environment	Property Impacts (m ²)	Property area impacted 53,162 m ² (approximate).	●	Property area impacted 53,967 m ² (approximate).	●	Property area impacted 40,485 m ² (approximate).	●	Property area impacted 68,013 m ² (approximate).	●	Property area impacted 69,935 m ² (approximate).	●	Property area impacted 47,294 m ² (approximate). Displacement of two existing houses.	●	Property area impacted 50,960 m ² (approximate). Displacement of one vacant commercial property currently for sale.	●
	Compatibility with Future Land Use Planning	Realignment / widening of Banwell Road supports anticipated future urban development within Tecumseh Hamlet.	●	Realignment / widening of Banwell Road supports anticipated future urban development within Tecumseh Hamlet.	●	Realignment / widening of Banwell Road supports anticipated future urban development within Tecumseh Hamlet.	●	Realignment / widening of Banwell Road supports anticipated future urban development within Tecumseh Hamlet.	●	Realignment / widening of Banwell Road supports anticipated future urban development within Tecumseh Hamlet.	●	Realignment / widening of Banwell Road supports anticipated future urban development within Tecumseh Hamlet.	●	Realignment / widening of Banwell Road supports anticipated future urban development within Tecumseh Hamlet.	●
	Agricultural Operations	Impacts approximately 1,965 ha of agricultural land.	●	Impacts approximately 1,965 ha of agricultural land.	●	Impacts approximately 1,010 ha of agricultural land. Farm fields are actively cultivated for common field crops.	●	Impacts approximately 5,010 ha of agricultural land. Farm fields are actively cultivated for common field crops.	●	Impacts approximately 5,529 ha of agricultural land. Farm fields are actively cultivated for common field crops and approaches existing active livestock facility.	●	Impacts approximately 1,515 ha of agricultural land. Farm fields are actively cultivated for common field crops.	●	Impacts approximately 2,5792 ha of agricultural land. Farm fields are actively cultivated for common field crops.	●
	Property Access	Impacts 14 entrances.	●	Impacts 14 entrances.	●	Impacts 22 entrances.	●	Impacts 14 entrances.	●	Impacts 14 entrances.	●	Impacts 23 entrances.	●	Impacts 11 entrances. Access to existing properties on County Road 43/Banwell Road and 11th Concession is improved with the cui-de-sac treatment at County Road 42.	●
	Noise	Receptor is in excess of the MOE guideline limits.	●	Receptor is in excess of the MOE noise guideline limits.	●	Receptor is in excess of the MOE noise guideline limits.	●	Receptor is in excess of the MOE guideline limits.	●	Receptor is in excess of the MOE guideline limits.	●	Receptor is in excess of the MOE noise guideline limits.	●	Receptor is in excess of the MOE noise guideline limits.	●
OVERALL RATING FOR SOCIO-ECONOMIC ENVIRONMENT			●		●		●		●		●		●		●
Cultural Environment	Impacts to Archaeological Resources	No direct impact because there are no registered archaeological sites identified within the study area. General physiography and local 19 th century land use suggests that there is potential for archaeological sites within 100 m of the road. Approximately 4.9 ha of land may have archaeological potential and a Stage 2 archaeological assessment should be conducted.	●	No direct impact because there are no registered archaeological sites identified within the study area. General physiography and local 19 th century land use suggests that there is potential for archaeological sites within 100 m of the road. Approximately 4.7 ha of land may have archaeological potential and a Stage 2 archaeological assessment should be conducted.	●	No direct impact because there are no registered archaeological sites identified within the study area. General physiography and local 19 th century land use suggests that there is potential for archaeological sites within 100 m of the road. Approximately 4.7 ha of land may have archaeological potential and a Stage 2 archaeological assessment should be conducted.	●	No direct impact because there are no registered archaeological sites identified within the study area. General physiography and local 19 th century land use suggests that there is potential for archaeological sites within 100 m of the road. Approximately 4.7 ha of land may have archaeological potential and a Stage 2 archaeological assessment should be conducted.	●	No direct impact because there are no registered archaeological sites identified within the study area. General physiography and local 19 th century land use suggests that there is potential for archaeological sites within 100 m of the road. Approximately 4.7 ha of land may have archaeological potential and a Stage 2 archaeological assessment should be conducted.	●	No direct impact because there are no registered archaeological sites identified within the study area. General physiography and local 19 th century land use suggests that there is potential for archaeological sites within 100 m of the road. Approximately 4.7 ha of land may have archaeological potential and a Stage 2 archaeological assessment should be conducted.	●	No direct impact because there are no registered archaeological sites identified within the study area. General physiography and local 19 th century land use suggests that there is potential for archaeological sites within 100 m of the road. Approximately 4.7 ha of land may have archaeological potential and a Stage 2 archaeological assessment should be conducted.	●
	Impacts to Built Heritage Features	Alignment of Banwell Road north of County Road 42 on the west side approaches a designated cultural landscape (CLU 3 - farm complex).	●	Alignment of Banwell Road north of County Road 42 on the west side approaches a designated cultural landscape (CLU 3 - farm complex).	●	Alignment of Banwell Road north of County Road 42 severs a small section of a designated cultural landscape (CLU 3 – farm complex) and is in close proximity to a built heritage feature (BHF 2- house 18th /19th century) located on the east side of Concession 11 just south of County Road 42.	●	Alignment of Banwell Road north of County Road 42 dissects a designated cultural landscape (CLU 2 – agricultural lands).	●	Alignment of Banwell Road north of County Road 42 dissects a designated cultural landscape (CLU 2 – agricultural lands).	●	Alignment of Banwell Road north of County Road 42 approaches two designated cultural landscapes (CLU 3 - farm complex) on the west side and (CLU 2 – agricultural lands) on the east side. At the bottom end of the alignment of Banwell Road it is in close proximity to a designated built heritage feature (BHF 1 – barn).	●	Alignment of Banwell Road north of County Road 42 approaches two designated cultural landscapes (CLU 3 - farm complex) on the west side and (CLU 2 – agricultural lands) on the east side. At the bottom end of the alignment of Banwell Road it is in close proximity to a designated built heritage feature (BHF 1 – barn).	●
OVERALL RATING FOR CULTURAL ENVIRONMENT			●		●		●		●		●		●		●
Cost	Capital Cost	Approximately \$4.42 Million.	●	Approximately \$4.41 Million.	●	Approximately \$3.91 Million.	●	Approximately \$4.60 Million.	●	Approximately \$4.58 Million.	●	Approximately \$3.82 Million.	●	Approximately \$4.13 Million.	●
OVERALL RATING			●		●		●		●		●		●		●
OVERALL RANKING			5		4		2		7		6		3		1

6.3 REFINEMENTS BASED ON STAKEHOLDER COMMENTS

During the course of this Class EA study, the Town of Tecumseh staff presented a report to their July 25, 2007 Planning and Building Services Committee (see *Appendix A:3*) and offered the following comments:

- i. Town Administration recommends that which is referred to as Alternative “E” in the EA documents as the preferred road alignment for Banwell Road/County Road 43. Under this proposal, Banwell Road/County Road 43 is shifted westerly, with a new full intersection proposed at the approximate location of the former Danilo’s property;
- ii. In order to achieve safe and efficient traffic flow, Town Administrations’ preferred design alternative involves the closure of the existing Banwell Road/County Road 43 intersections at County Road 42. These remnant road sections are proposed to cul-de-sac at County Road 42 and will be connected to the realigned Banwell Road/County Road 43. The result will be reduced traffic flows for the existing homes that front these roads and improved traffic flow along County Road 42;
- iii. Between CP Rail and County Road 42, there is sufficient spacing to support two new intersections for future east/west roads. Town Administration supports the location of what is referred as the Shields Extension at the intersection. This location best facilitates future development opportunities and road alignments to the east and west;
- iv. The northerly intersection is proposed to be shifted southerly so that it does not interfere with the open drain crossing Banwell Road and so that it better facilitates future opportunities and road alignments to the east and west;
- v. With regards to the cross section for the County Road 43 reconstruction, it is the County’s preference that the cross section has a centre median, consistent with that which is proposed for the portion of Banwell Road north of the CP Railway and in the City of Windsor. Town Administration supports such a cross section design, provided adequate urban design standards are applied that have the effect of “greening” and “softening” the corridor and optimize its use for alternative modes of transportation including walking and biking. It is therefore recommended that the corridor be designed with adequate tree and vegetative plantings and include a sidewalk on the west side and a 4 metre trail on the east side. This will facilitate the linkage of various future neighbourhoods and designations (including shopping areas, schools, and recreation areas);
- vi. There is a range of infrastructure either currently within or proposed within the Banwell Road/County Road 43 corridor. Prior to finalization of the road design details, additional discussions are required between the Town and the County regarding the possible need to relocate infrastructure, create adequate servicing corridors and so on.

In presenting the technically recommended design (Alternative E) at the second and third Public Information Centres, all the staff comments have been incorporated into the Recommended Design. The road design details in the Recommended Design for County Road 43 include a sidewalk on the west side and a 4 metre trail on the east side. At this point in the

time, the rationale does not support the need for on road bike lanes, and further, the City of Windsor has not incorporated this aspect into the Banwell Road EA Recommended Design. Therefore, there would be no connectivity between the County and City bike lanes along the corridor. As well, it is recognized that the addition of an on road bike lane would necessitate a further expansion to the proposed 30 metre right-of-way by some 3 metres. Also, the planned provision of a multi-use trail along the east side of County Road 43/Banwell Road, extending into the City and with a very low number of intersecting roads and driveways, will serve off-road cycling demands in the corridor.

A further decision was made to defer any consideration of additional intersection improvements, at this time, to satisfy the potential traffic 2027 demands at the County Road 43/Banwell Road and County Road 42 intersection as outlined in Section 3.2 of this report.

7.0 DETAILED DESCRIPTION OF THE TECHNICALLY RECOMMENDED DESIGN

This section summarizes the key elements of the technically recommended design. The preliminary design plan and profile drawings showing the recommended improvements are shown in Figure 7-2, Sheet 1 to 6.

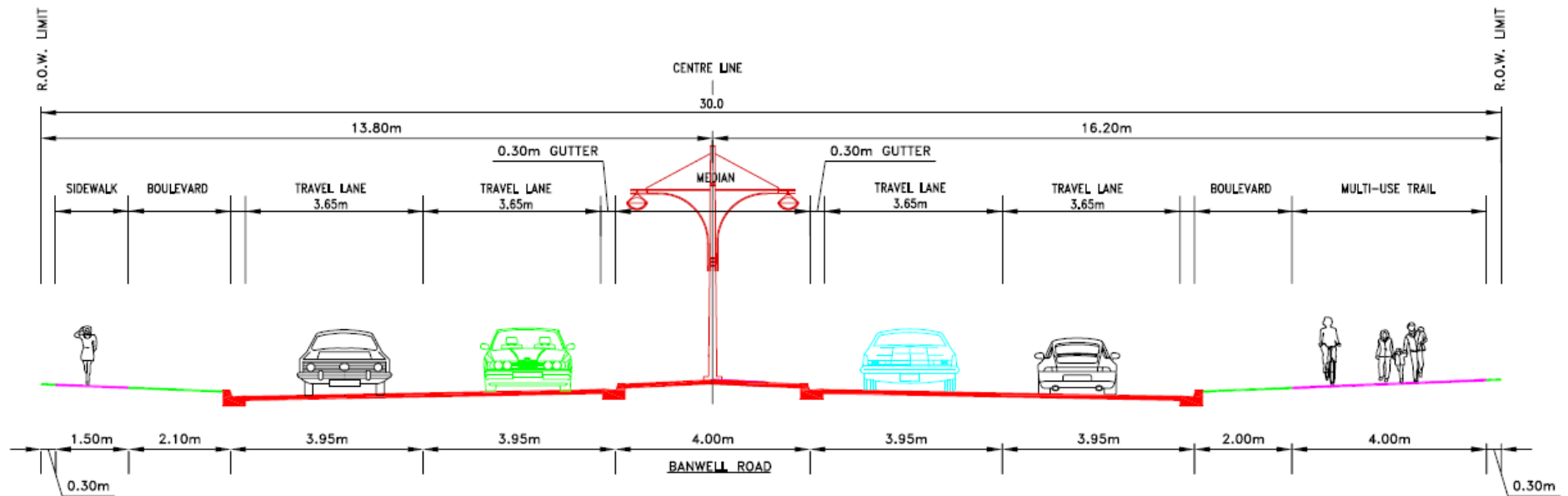
The preferred alternative was based on the following principles:

- i. The widening for the preferred alternative south of the CPR tracks was kept to the east side of County Road 43/Banwell Road in order to reduce impacts on the west side properties. After the detailed design stage, this will include future acquisition of some hydro corridor property immediately south of the CP rail line, owned by the Ministry of Energy and Infrastructure and managed by Ontario Realty Corporation.
- ii. A 1.5 metre sidewalk and 4.0 metre multi-use trail is proposed from 11th Concession to the CPR tracks. Wider lanes of 3.65 metres in combination of a center median can better support mix use vehicles in a safe operating environment. Figure 7-1 illustrates the proposed cross section elements.
- iii. Design speed sets the parameters such as minimum radii for horizontal and vertical curves, length of vertical curves, taper ratio etc. to be used for merging and diverging lanes and sight distances. Posted speed is also a function of design speed, such that posted speeds are usually 10 km/h to 20 km/h less than design speed (to provide a factor of safety). For County Road 43/Banwell Road a design speed of 80 km/h was selected based on the planned speed limit of 60 km/hr for Banwell Road.

In general terms, it is recommended that the following improvements to County Road 43/Banwell Road/11th Concession be undertaken:

- Eliminate the offset intersections of County Road 43/Banwell Road/County Road 42 and 11th Concession by realigning both County Road 43/Banwell Road and 11th Concession to the west. In the recommended design, realigned County Road 43/Banwell Road and 11th Concession will form the north and south legs, respectively at County Road 42, approximately 100 metres west of the existing 11th Concession/County Road 42 intersection.
- Construct the realigned County Road 43/Banwell Road, from County Road 42 to the CPR tracks approximately 1,470 metres to the north, as an urban four-lane section with a raised median. Incorporate at least two intersections to allow for future development along the roadway to access the future development. Note that the locations of these intersections will be confirmed during detailed design based on future development plans, and may differ slightly from the locations shown on the technically recommended design (Figure 7-2, Sheet 1 to 6). At selected intersections, the median area will be utilized as left-turn lanes. As well, raised medians may be discontinued, as necessary, to provide storage for and allow the movement of left-turning vehicles into existing driveways along the roadway. The recommended design along County Road 43/Banwell Road includes a 1.5 metre sidewalk on the west side and a 4.0 metre multi-use trail on the east side.

Figure 7-1 Proposed Cross Section Elements



- Construct/upgrade 11th Concession from the south limit of the project to approximately 155 metres south of County Road 42 (approximately Station 1+000 to Station 1+560), as a two-lane rural section with 2.5 metre partially paved shoulders. Include at least one intersection along this section for access to future development. Note that the location of this intersection will be confirmed during detailed design based on future development plans, and may differ slightly from the location shown on the technically recommended design (Figure 7-2, Sheet 1 to 6). Northbound and southbound left-turn lanes will be provided at this intersection.
- From Station 1+560 on the 11th Concession to County Road 42, introduce northbound taper, resulting in one entry lane and two exit lanes for the south leg of 11th Concession.
- Construct turning basins on the existing County Road 43/Banwell Road, approximately 300 metre north of County Road 42, and on the existing 11th Concession, approximately 160 metres south of County Road 42 to terminate the connections to the realigned County Road 43/Banwell Road and realigned 11th Concession.
- Drainage improvements, including new storm sewer systems for the realigned County Road 43/Banwell Road will also be undertaken as part of the technically recommended design.

7.1 DESIGN CRITERIA

The roadway will be designed in accordance with the Geometric Design Standards established by the Ministry of Transportation, Ontario (MTO). The design criteria for County Road 43/Banwell Road is summarized in Table 7-1:

Table 7-1 Design Criteria for Banwell Road

Design Element	Criteria
Design Speed	80 km/h
Posted Speed	60 km/h
Number of Through Lanes	4 along Banwell Road
Through Lane Width	3.65 m
Auxiliary Lane Width	3.65 m
Maximum/Minimum Grades	6% max; 0.3% min.
Maximum Grades	5%
Minimum Stopping Sight Distance	135 m
Sidewalks	1.5 m
Multi-use Trail	4.0 m
Basic Right-of-Way	30 m ⁽¹⁾

Notes:

- (1) Property will need to be acquired along the majority of the County Road 43/Banwell Road / 11th Concession.

7.2 ROAD GEOMETRY

7.2.1 Horizontal and Vertical Alignment

For the portion of proposed County Road 43/Banwell Road that coincides with existing County Road 43/Banwell Road, it is recommended that the road centreline be shifted approximately 8 metres to the east. This centreline shift will allow the west right-of-way to be maintained, thus avoiding impacting the cemetery property and several residential properties on the west side. However, the alignment should transition back to existing centreline prior to the CPR tracks to connect into the City's plan for improving Banwell Road north of the City limits. Reverse curve of radii 2000 and 500 m radii were used to transition the alignment to tie-in at CPR tracks.

Approximately 550 metres north of County Road 42, the proposed roadway diverges from the existing County Road 43/Banwell Road and curves westerly to intersect with County Road 42 at approximately 100 metres west of the existing intersection of 11th Concession and County Road 42. To achieve the realignment of County Road 43/Banwell Road to the west, minimum radius curves of 250 m, along with transition spirals, were utilized.

For the most part the existing vertical alignment will be maintained. High points at strategic locations have been incorporated to facilitate drainage.

7.2.2 Typical Cross-Section

Along County Road 43/Banwell Road, the basic roadway section consists of two 3.65 metre lanes in each direction, along with a 4.0 metre raised median, centered within a 30 metre right-of-way (refer to Figure 7-1). Curb and gutter is provided throughout. A 1.5 metre concrete sidewalk is proposed along the west side of the road while a 4.0 metre asphalt multi-use trail is proposed along the east side. Both the sidewalk and the multi-use trail are typically situated behind the splash pad.

The basic roadway section along 11th Concession comprises one 3.65 metre through lane in each direction with 2.5 metre partially paved shoulders, centred within a 30 metre right-of-way (refer to Figure 7-1). Northbound and southbound left-turn lanes will be provided at the intersection to future subdivisions on either side of 11th Concession.

7.3 DRAINAGE

7.3.1 Roadway Drainage System

It is expected that the quantity of runoff from the improved sections of the roadway will result in only a very minor increase in runoff, and therefore, no quantity controls are proposed. At the Desjardins Drain crossing, runoff from County Road 43/Banwell Road

should be treated through the use of oil-grit separator units sized to meet Ministry of the Environment's normal level of protection. A total of two oil-grit separators are proposed at this location.

Grassed swales and/or existing grassed municipal drains will be used to provide water quality treatment for roadway runoff along most of the remainder of the County Road 43/Banwell Road study area. These drainage systems will include Banwell Drain, Soulliere Drain, and part of 11th Concession Drain and St. Louis Drain at the southerly limit of the project prior to the enclosure of these two drains into the proposed trunk sewer.

Water quality measures will be designed in accordance with the "Stormwater Management Planning and Design Manual" (2003) of the Ministry of the Environment. The following criteria, as provided by the Essex Region Conservation Authority must be considered as part of the detailed design:

- Stormwater storage on roadways and other traveled surfaces should not exceed 0.3 meters in depth or less if required by the municipality; and
- Driveways, walkways and other roadways essential to ingress or egress should be 0.15 meters above the 1:100 year monthly mean water level, or 0.3 meters below the regulatory flood level, whichever is greater.

A conceptual layout of the proposed storm drainage system is shown on the technically recommended design Figure 7-2, Sheet 1 to 6. The sizing and final location of the drainage infrastructure will be determined during detailed design.

The proposed improvements to County Road 42 easterly and westerly from the intersection with County Road 43, and would likely involve widening of the road to a five lane urban cross-section. The proposed improvements would most likely not result in significant increase of surface runoff, and no water quantity controls would be required.

The proposed widening of County Road 42 would require enclosure of the Klondyke Drain and the 11th Concession Drain into a trunk sewer, which would parallel the north side of County Road 42 and convey runoff in an easterly direction to an open grassed segment of the Klondyke Drain. Runoff from the 11th Concession Drain will be collected by storm inlets and conveyed to the proposed trunk sewer. In order to ensure that the downstream capacity of the Klondyke Drain is not exceeded, a portion of the drainage from this trunk sewer would be conveyed across County Road 42 by a new storm sewer to the 11th Concession drain. The Klondyke Drain and the 11th Concession Drains will eventually discharge to the Pike Creek Drain.

The St. Louis drain along the proposed improvements to County Road 42 would also be enclosed into a trunk sewer, which would outlet into an open grassed segment of the St. Louis Drain further downstream.

Pavement drainage along the County Road 42 would be collected by a series of catchbasins, which would discharge directly to the trunk sewer. These catchbasins would have a minimum 600 mm deep sump and would be fitted with Goss Traps to collect sediment and debris from roadway runoff.

As an alternative to the use of oil-grit separator units and deep sump catchbasins, integration of roadway drainage with drainage systems associated with future plans of subdivision should be reviewed during detailed design. Currently, there are no development applications within the study limits. If development is initiated in the future, means to integrate the roadway drainage with the development's Stormwater management system should be explored.

Similar water quality and quantity criteria to those used in the design of County Road 43 will apply to the design of County Road 42.

In accordance with correspondence from the Essex Region Conservation Authority (November 16, 2006), any alterations to the municipal drains must be reviewed in accordance with requirements of the Fisheries Act and may require a Federal Authorization prior to them being enclosed.

7.3.2 Roadway Culvert

Modifications to the existing culvert (Culvert No. 1 – Figure 7-2, Sheet 5) as a result of the County Road 43 improvements will be required at Desjardins Drain, which will involve extension of the existing culvert on the upstream and downstream side. The Desjardins Drain is regulated under jurisdiction of the Essex Region Conservation Authority. A permit from the Conservation Authority will be required for the proposed works. Based on the Environmental Conditions Report prepared by Gartner Lee Limited (2006), Desjardins Drain seasonally contributes to fish habitat during high flow, as such an authorization from the Department of Fisheries and Oceans (DFO) will likely be required for any proposed works on this drain.

The proposed crossings (Culvert No. 2 and Culvert No. 3 – Figure 7-2, Sheet 4 and 5) are located within the Banwell Drain and Soulliere Drains, which do not contribute to fish habitat, and no permits are required for constriction of these culverts. The construction of crossings (Culvert No. 4, Culvert No. 5, Culvert No. 6 and Culvert No. 7 – Figure 7-2, Sheet 1 to 4), will be required to convey roadside runoff along the improved segment of the County Road 43. These crossings will convey only roadside runoff, and they do not contribute to fish habitat. However, adequate mitigation measures should be provided at each of these crossings during and after construction to protect downstream fisheries habitat.

7.4 RIGHT-OF-WAY REQUIREMENTS AND PROPERTY ACCESS

A basic right-of-way width of 30 metres is proposed along County Road 43/Banwell Road/ 11th Concession from the CPR tracks at the north end to approximately 730 metres south of County

Road 42 at the south limit of the project. The extent of property requirements is shown in Figure 7-2, Sheet 1 to 6 and is summarized in Table 7-2. Additional right-of-way requirements are shown where necessary to accommodate sight triangles.

Table 7-2 Property Requirements

Property Affected		Property Required	Comments
11th Concession to County Road 42			
West Side	1	0.060 ha	– Agricultural land with farm residence fronting onto 11 th Concession – Full access to property maintained
	2	0.021 ha	– Residential property fronting onto 11 th Concession – Full access to property maintained
	3	0.201 ha	– Agricultural land fronting onto 11 th Concession – Full access to property maintained
	4	0.061 ha	– Agricultural land fronting onto 11 th Concession – Access to property will be removed
	5	0.075 ha	– Cul-de-sac will impact the south east corner of existing County Road 43 and County Road 42 – Agricultural land with farm residence fronting onto 11 th Concession
East Side	6	0.102 ha	– Agricultural property with farm residence fronting onto 11 th Concession – Full access to property maintained
	7	0.019 ha	– Residential property fronting onto 11 th Concession – Full access to property maintained
	8	0.025 ha	– Industrial property fronting onto 11 th Concession – Full access to property maintained
	9	1.140 ha	– Agricultural land will be displaced
County Road 42			
North Side	10	0.030 ha	– Property currently available for redevelopment – Existing building currently not in use – Proposed design will require removal of the building and several mature trees at the back of the property
County Road 43/Banwell Road/County Road 42 northerly to CPR Tracks			
West Side	11	1.292 ha	– Agricultural property, including residence and farm buildings, fronting onto existing Banwell Road – Proposed realigned County Road 43/Banwell Road bisects the property – Access to residence will be maintained
	12	0.073 ha	– Agricultural property will be required to tie in the existing County Road 43/Banwell Road to the realigned

Property Affected	Property Required	Comments
		County Road 43/Banwell Road
	13	0.138 ha <ul style="list-style-type: none"> – Agricultural property fronting onto both Banwell Road and the CPR ROW – Hydro corridor runs through the north section of the property – There are no existing entrances to the property from Banwell Road
East Side	14	0.085 ha <ul style="list-style-type: none"> – Cul-de-sac will impact agricultural property, including residence and farm buildings, fronting onto County Road 43/Banwell Road – Full access to property will be maintained – Small section of property required at northeast corner for sight triangle and connection to proposed sideroad
	15	1.287 ha <ul style="list-style-type: none"> – Agricultural property fronting onto Banwell Road – There are no existing entrances to the property from Banwell Road
	16	0.214 ha <ul style="list-style-type: none"> – Agricultural property fronting onto both Banwell Road and the CPR ROW – Hydro corridor runs through the north section of the property, managed by Ontario Realty Corporation – Full access to the property will be maintained

7.5 ILLUMINATION AND TRAFFIC SIGNALS

Street lighting will be provided along the reconstructed County Road 43/Banwell Road/11th Concession within the median area with spacing of approximately 50 metres apart. At the detailed design stage, consideration will be given to the use of environmentally friendly lighting (i.e. full cut-off luminaires) to protect the nighttime environment.

Traffic signals will be provided, as necessary, at the intermediate intersections along 11th Concession and County Road 43/Banwell Road. The provision for traffic signals will depend on technical warrants based on several factors, including safety and turning volumes.

7.6 UTILITIES AND INFRASTRUCTURE

Utilities identified as part of this study are shown on the Technically Recommended Design plates provided at the end of this section. Relocation of a utility may be desirable if it is in direct conflict with construction or if it encroaches on the recommended clear zone width. It is recommended that all utilities be contacted early in the detailed design phase to confirm locates and establish relocation strategies.

Bell Canada

There are underground Bell cables running along the west side of the existing County Road 43/Banwell Road, along the east side of existing 11th Concession, and along both sides of County Road 42, and the actual plant locations and depths will need to be confirmed during detailed design to determine if relocation will be necessary.

Hydro One

North of Station 3+000 the centreline for County Road 43/Banwell Road curves back to match the existing centreline as the roadway approaches the CPR tracks at the north limit. For this section, the road will be widened on both the east and west sides; two poles will be affected by the widening on the west side.

South of Station 1+400, the proposed works, including the provision for proper shoulders and ditches, may require the hydro poles to be relocated, although this will have to be determined at the detailed design stage after discussions with Hydro One Networks Inc.

Some poles may also be impacted by the proposed intersections along 11th Concession and County Road 43/Banwell Road. The need for relocation will depend on the location of the intersection, which will be determined during detailed design.

The construction of turning basins at County Road 43/Banwell Road and 11th Concession will also require the relocation of one pole at each location, as the pavement is widened to accommodate the cul-de-sacs.

Sanitary Sewer

The 200 mm sanitary sewer running along the north side of County Road 42 may be impacted and may required relocation, depending on the depth of the sewer.

Watermain

The 200 mm watermain on the east side of County Road 43/Banwell Road, and associated valves, leads, and hydrants, will be impacted by the widening of County Road 43/Banwell Road on the east side. Even if the watermain is deep enough to avoid impacts from the construction of the roadway, it may still be advantageous to relocate the watermain to allow for easier access for future maintenance works.

Three hydrants, at approximately Station 11+389, 11+669, and 11+943, that are currently situated on the east side of County Road 43/Banwell Road will require relocations.

7.7 BANWELL ROAD/CPR RAIL AT GRADE CROSSING

Municipalities use an “Exposure Index” as a guide to determine an appropriate treatment for the at-grade crossing of a roadway with a rail line. The “Exposure Index” is calculated by

multiplying the number of vehicles per day times the number of trains per day. Grade separations are considered when the Exposure Index exceeds a threshold of 200,000.

At the present time, the average number of trains crossing Banwell Road at the Windsor City limits on a daily basis is 15 with an average of 66 cars and engines. While the average delay to Banwell Road traffic is in the neighbourhood of 3 to 4 minutes per occurrence, no significant queuing exists and there have been no recorded traffic accidents associated with this crossing over the last 7 years. Based upon the current average daily traffic, the Exposure Index was calculated to be approximately 45,000.

The estimated 2027 daily traffic on Banwell Road at the CPR crossing is 18,750 vehicles per day. At the same time, CPR management staff does not anticipate any increase in train usage over the 15 trains per day which currently use this crossing. This volume could ultimately be higher depending on the impacts of rail rationalization in the Windsor/Essex area as considered in the City's Community Based Strategic Rail Study (April 2008). The 15 trains/day would produce a 2027 Exposure Index of over 280,000 (18,750 x 15).

Given the fact that this crossing is currently controlled with flashers and automatic gates, a rail grade separation is not considered warranted at this time even though the Exposure Index for grade separation is met. The only factors which may influence this conclusion are:

- Delay to Banwell Road traffic during times of train activity becomes significant; and/or
- Safety concerns are raised.

However, should a grade separation of the CPR line be considered in the future, it is important that it be designed in association with the grade separation planned by the City of Windsor on the north side of the rail line/municipal boundary. Also, access to and from Banwell Road to abutting lands within the area of the grade separation would have to be protected. In this regard, Figure 7-2 illustrates a possible profile for a road underpass of the CPR rail line together with the location of existing driveways.

From the County's perspective, the only driveway that should be impacted is the Hydro One access, and this will be dealt with as part of related property acquisition arrangements with Ontario Realty Corporation based on the eventual detailed design.

7.8 COST ESTIMATE

A preliminary construction cost estimate has been prepared for the reconstruction of County Road 43/Banwell Road/11th Concession and is presented in Table 7-3. This estimate is based on present day costs and excludes all engineering, utility relocation and property costs.

7.9 PLAN/PROFILE PLATES OF TECHNICALLY RECOMMENDED DESIGN

Refer to Figure 7-3 (Sheet 1 to 6) which illustrates the proposed reconstruction plan for County Road 43/Banwell Road/11th Concession.

Table 7-3 Preliminary Construction Cost Estimate

Component/ Category	Item Description	Units	Unit Price	Quantity	Sub Total	Total
Property Acquisition	Strip property purchase	ha		4.77		-N-A-
	Whole purchase (specify)	lump sum				
Utility Relocation	General	km	200000	2.2	\$440,000	
	Other (assumed)					
	Contingency (10%)				\$44,000	
	Sub Total					\$484,000
Construction	Clearing & Grubbing	m ²	4.0	50400	\$201,600	
	Asphalt removal full depth	m ²	3	15000	\$37,500	
	Excavation/Earthworks	m ³	12.0	73000	\$876,000	
	Install storm sewer	lump sum	550000	1	\$550,000	
	Granular 'A'	tonne	17.0	6200	\$105,400	
	Granular 'B'	tonne	17.0	16400	\$278,800	
	Asphalt Base course	tonne	55.0	6200	\$341,000	
	Asphalt surface course	tonne	65.0	2100	\$136,500	
	Install curb and gutter	m	40.0	4400	\$176,000	
	Install subdrains	m	18.0	4400	\$79,200	
	Install catch-basin leads	m	200.0	1100	\$220,000	
	Install catch-basin	each	2000	150	\$300,000	
	Install manhole	each	3000	20	\$60,000	
	Concrete Median	m ³	250	800	\$200,000	
	Sodding	m ²	4	11000	\$44,000	
	Pavement Marking	m ²	5	5000	\$25,000	
	Signage	lump sum	100000	1	\$100,000	
	Traffic Management	lump sum	200000	1	\$200,000	
	Site Office	lump sum	50000	1	\$50,000	
	Contingency (specify 25 %)				\$994,000	
	Sub Total					\$4,975,000
Streetlights	Median	km	200000	2.2	\$440,000	
	Contingency (10%)				\$44,000	
	Sub Total					\$484,000
Traffic Signals	Permanent 4 - way	each	100000	3	\$300,000	
	Contingency (10%)				\$30,000	
	Sub Total					\$330,000
Landscaping/ Sidewalks	Sidewalk/Trail	m ²	40	15000	\$600,000	
	Trees and shrubs					
	Contingency (10%)				\$60,000	
	Sub Total					\$660,000
TOTAL						\$6,933,000
Design/Contract Administration	Design (5%)	lump sum	410000	1	\$410,000	
	Contract Administration (5%)	lump sum	410000	1	\$410,000	
	Contingency (10%)				\$82,000	
	Sub Total					\$902,000
PROJECT TOTAL						\$7,835,000

Figure 7- 2 Possible Banwell Road/CPR Grade Separation Profile

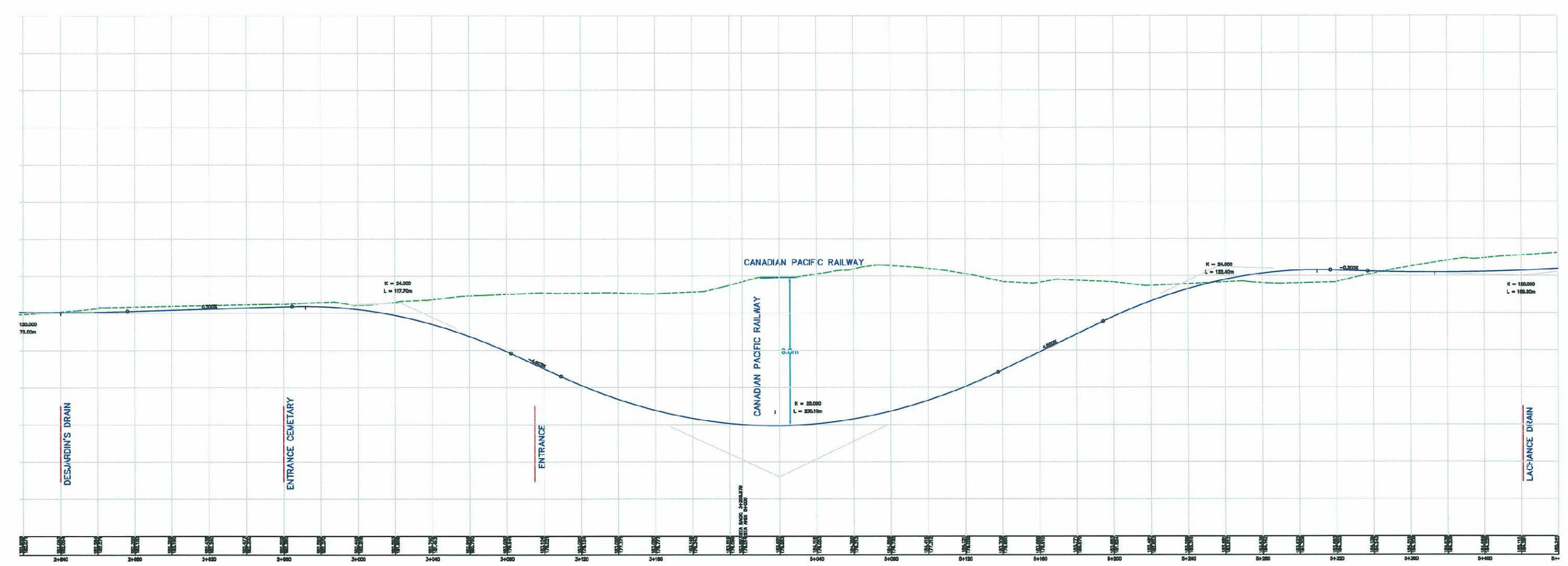
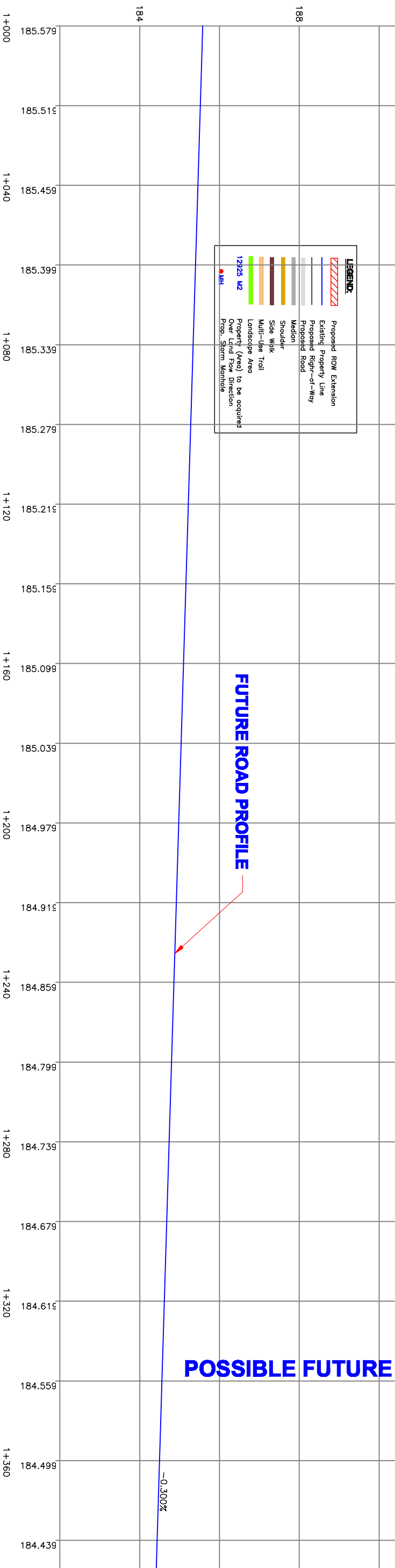
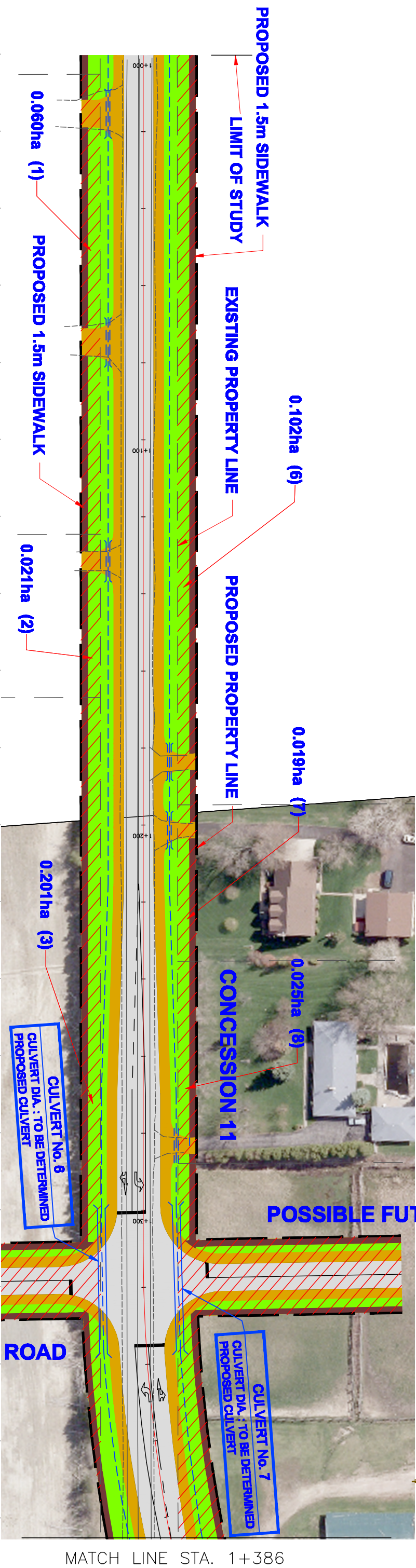
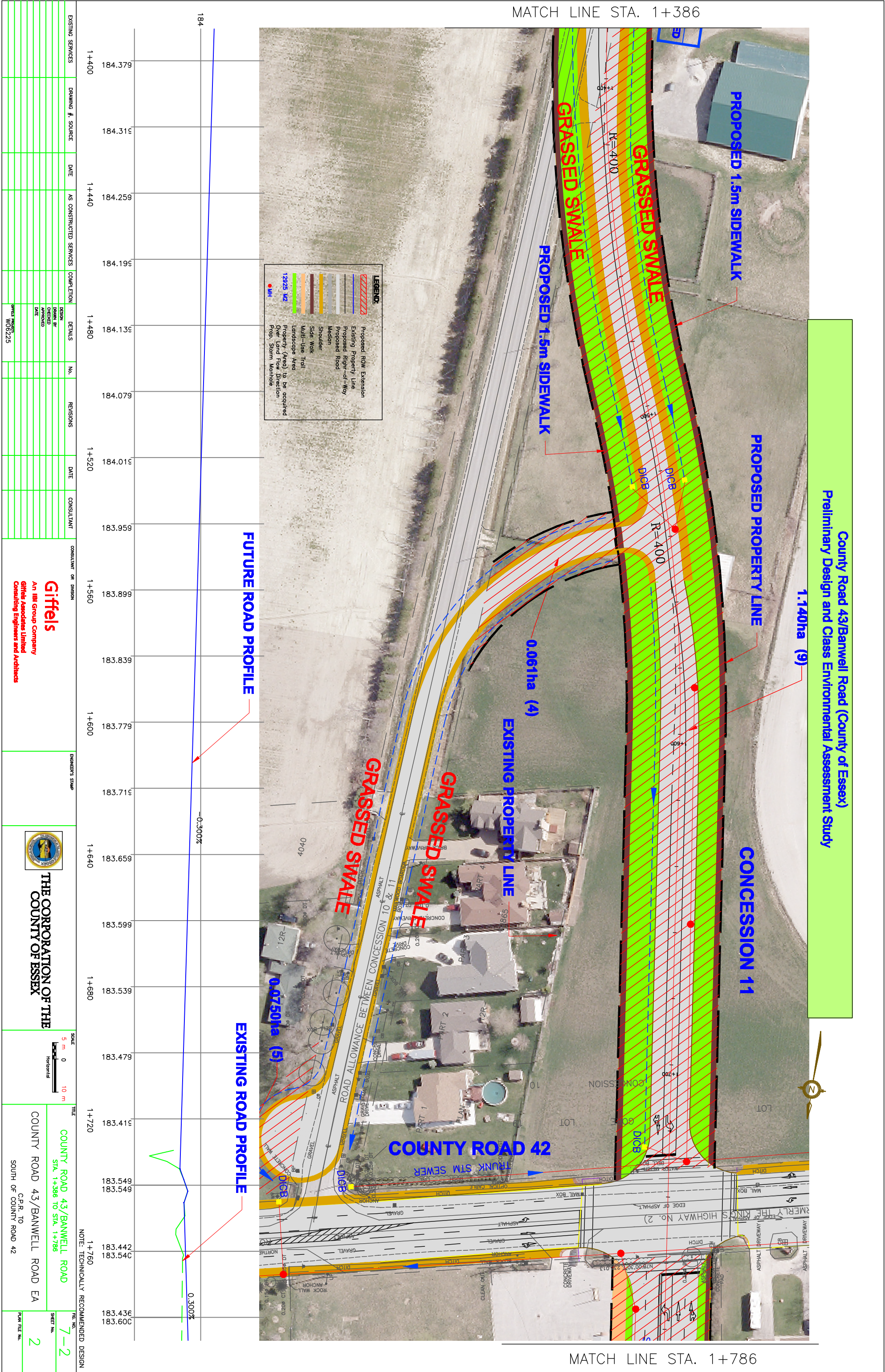


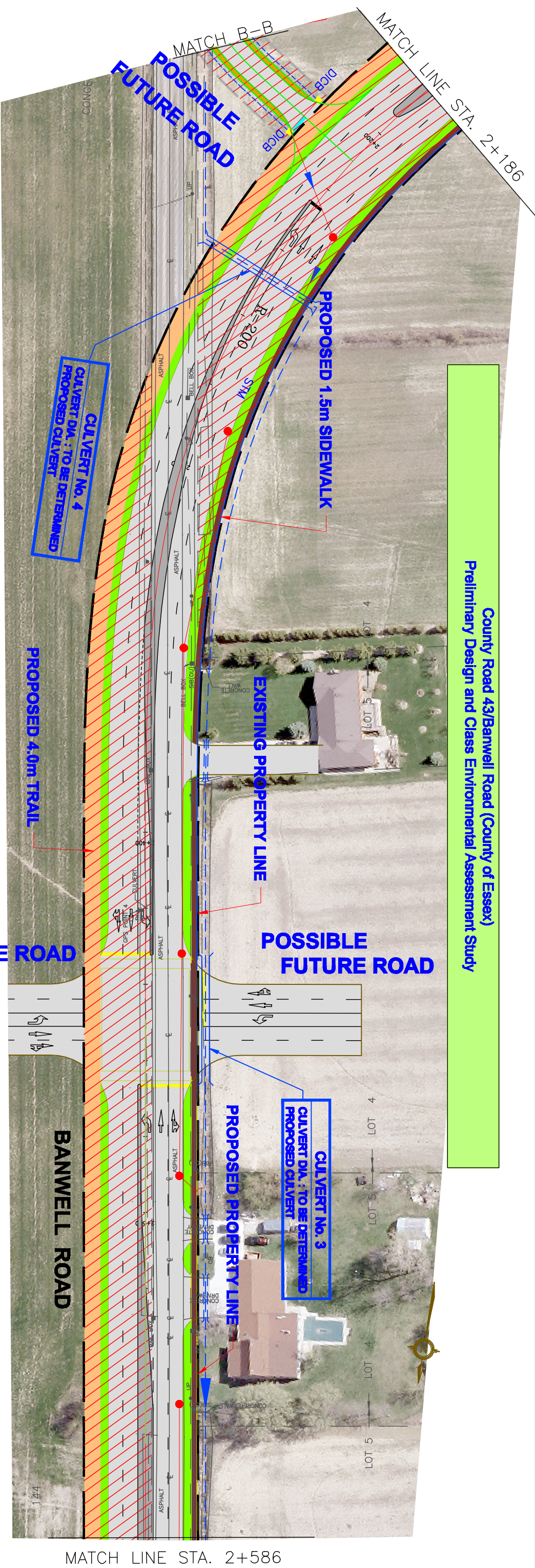
Figure 7-3 Technically Recommended Design

County Road 43/Banwell Road (County of Essex) Preliminary Design and Class Environmental Assessment Study

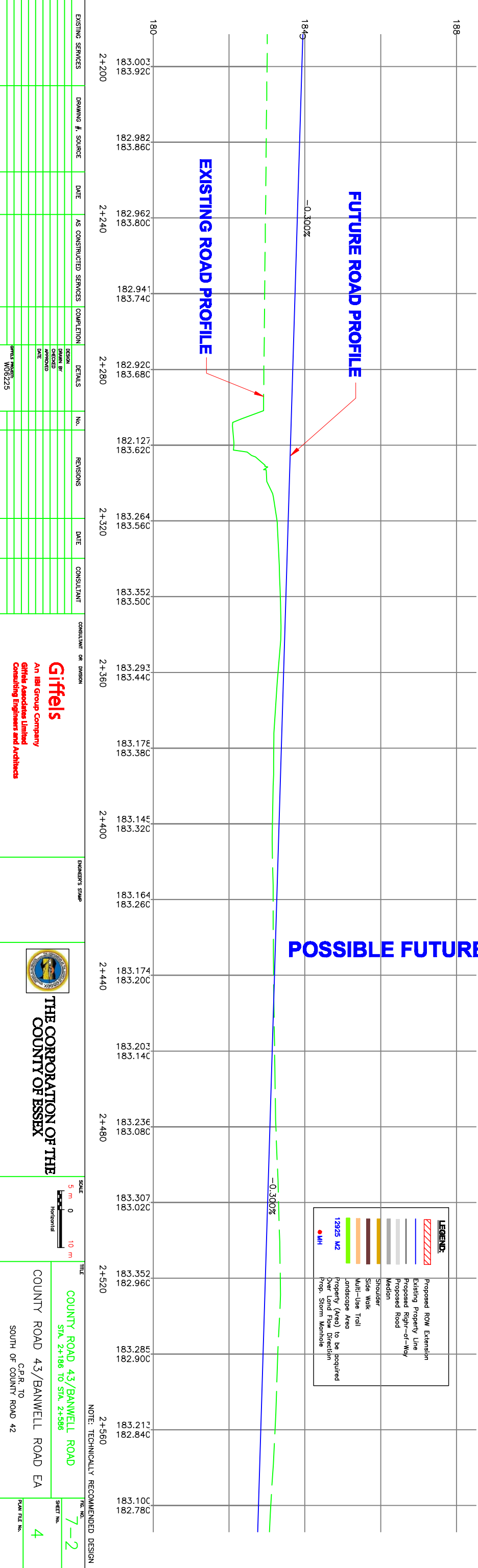
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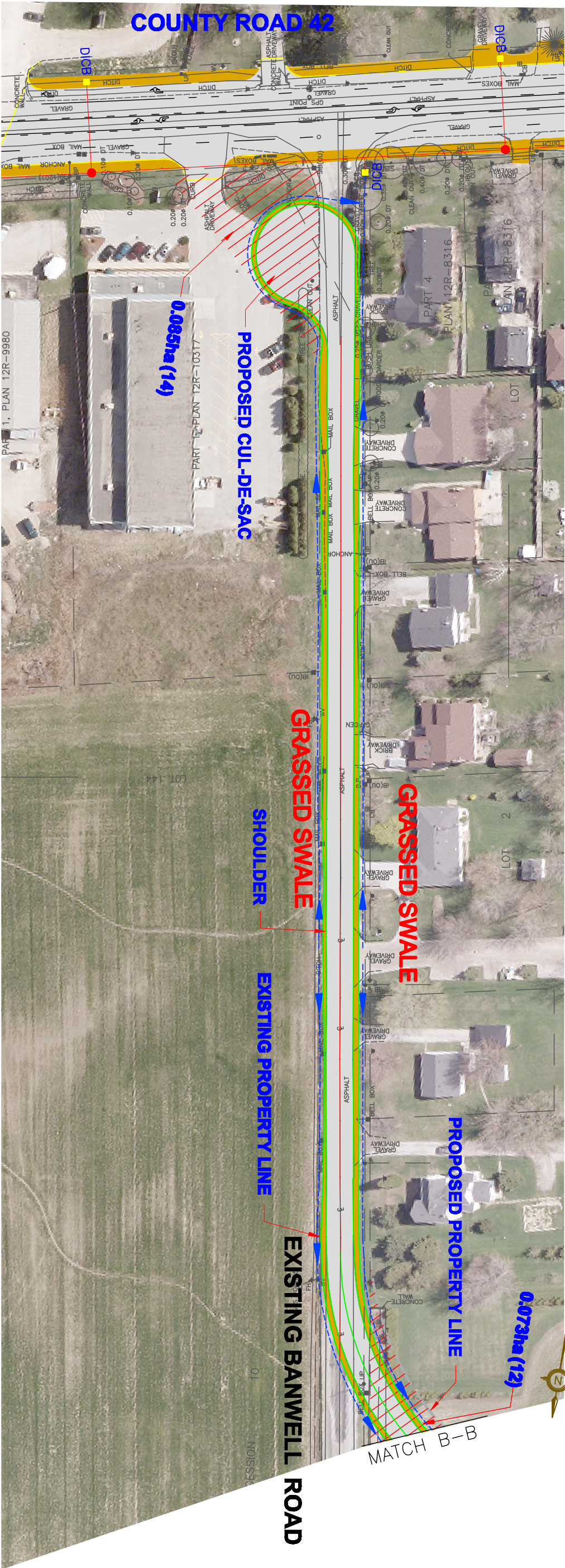
MATCH LINE STA. 1+786

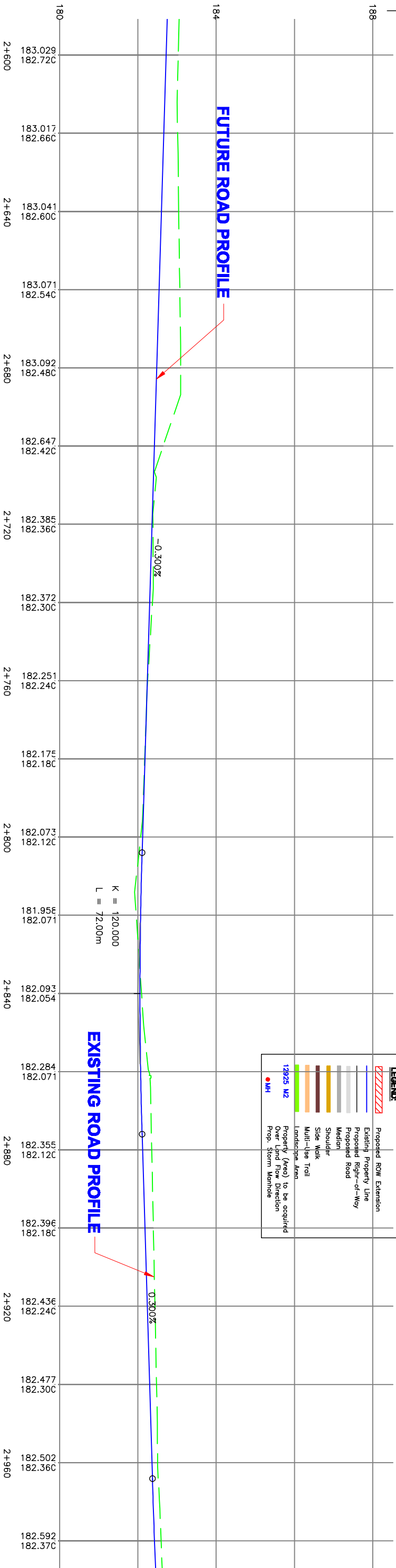
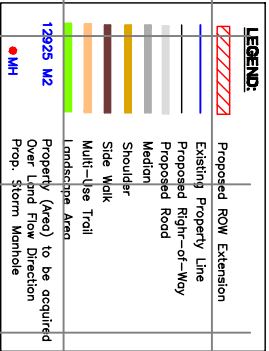
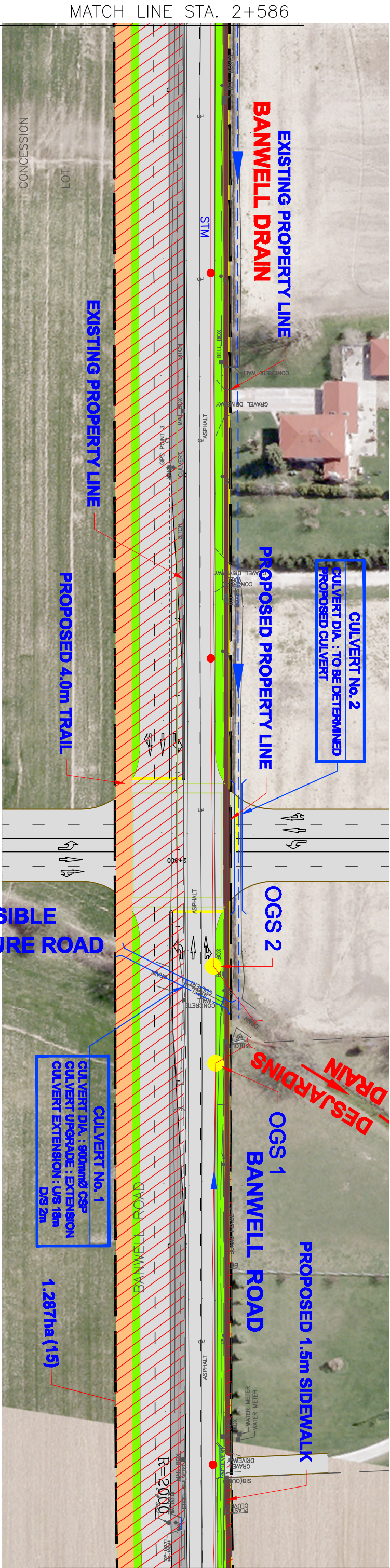


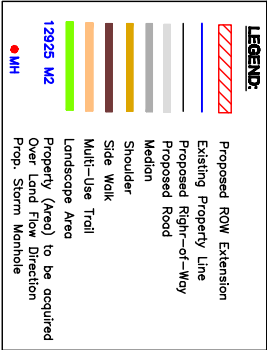
MATCH LINE STA. 2+586



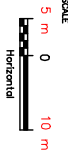
**County Road 43/Barwell Road (County of Essex)
Preliminary Design and Class Environmental Assessment Study**

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THE CORPORATION OF THE
COUNTY OF ESSEX



COUNTY ROAD 43/BANWELL ROAD
STA. 2+986 TO STA. 3+206.7

COUNTY ROAD 43/BANWELL ROAD EA
C.P.R. TO
SOUTH OF COUNTY ROAD 42

7-2	SHEET No.	6
	PLAN FILE No.	

8.0 ENVIRONMENTAL CONCERNS AND MITIGATION MEASURES

8.1 NATURAL ENVIRONMENT

8.1.1 *Terrestrial Habitat*

The plant and vegetative species identified in the study area are considered common and widespread throughout southern Ontario, particularly in a rural and agricultural setting. Disturbance to vegetation as a result of improvements to County Road 43/Banwell Road is considered negligible since majority of the vegetation located adjacent to the right-of-way has been previously disturbed by agricultural practices.

The following environmental protection measures designed to reduce vegetation removals should be considered on a site-specific basis during detail design:

- Reduce the area of the footprint to the extent possible through the use of urban cross-sections and other road design elements;
- Identify and protect trees to be retained during construction using a temporary tree protection barrier; and,
- Plant new native vegetation to compensate for vegetation removals as a result of improvements to County Road 43/Banwell Road.

8.1.2 *Fisheries and Aquatic Habitat*

With regard to aquatic/fisheries, there are two agricultural drains within the study area, both of which are likely dry for most of the summer, except after significant rainfall events. These drains, in particular the Desjardin Drain, would seasonally contribute to fish habitat during times of high flow (i.e., spring freshet) but are otherwise for drainage purposes only. The drain contributes to flow but does not provide direct fish habitat although with reference to the Department of Fisheries (DFO) Drain Primer, the following mitigation strategies for municipal drains should be utilized:

- In-stream work will be restricted to the warmwater timing window from July 1 to March 31;
- Sediment control devices (i.e., sediment traps, rock checks, silt fences, etc) will be installed where appropriate prior to construction and will be maintained during and after construction until exposed areas have been re-vegetated.

8.2 SOCIO-ECONOMIC ENVIRONMENT

8.2.1 Property Impacts

Direct and indirect effects on existing land uses will result from the disruption of local traffic patterns during construction and additional right-of-way requirements. According to the technically recommended design approximately 5.096 ha of property will be required from 16 properties (refer to Table 7-2 for more details) for the proposed widening of County Road 43/Banwell Road, of which approximately 2.579 ha of the property required will be agricultural lands.

8.2.2 Property Access

It is anticipated that 11 entrances/accesses along existing County Road 43/Bawell Road will be affected by the proposed improvements.

8.2.3 Noise Impacts

As part of this study, an environmental noise assessment including noise calculations was conducted.

They are seven individual or groups of existing single family homes used for the noise calculations to determine the projected noise impacts for future “no build” compared to future “build”. The future “no build” considered the noise level contributions from the existing road configuration in the year 2006, while the future “build” considered noise level contribution from the proposed future road configuration for the year 2021. Refer to Table 8-1 for the description of the receptor locations.

Table 8-1 Representative Noise Sensitive Area Locations

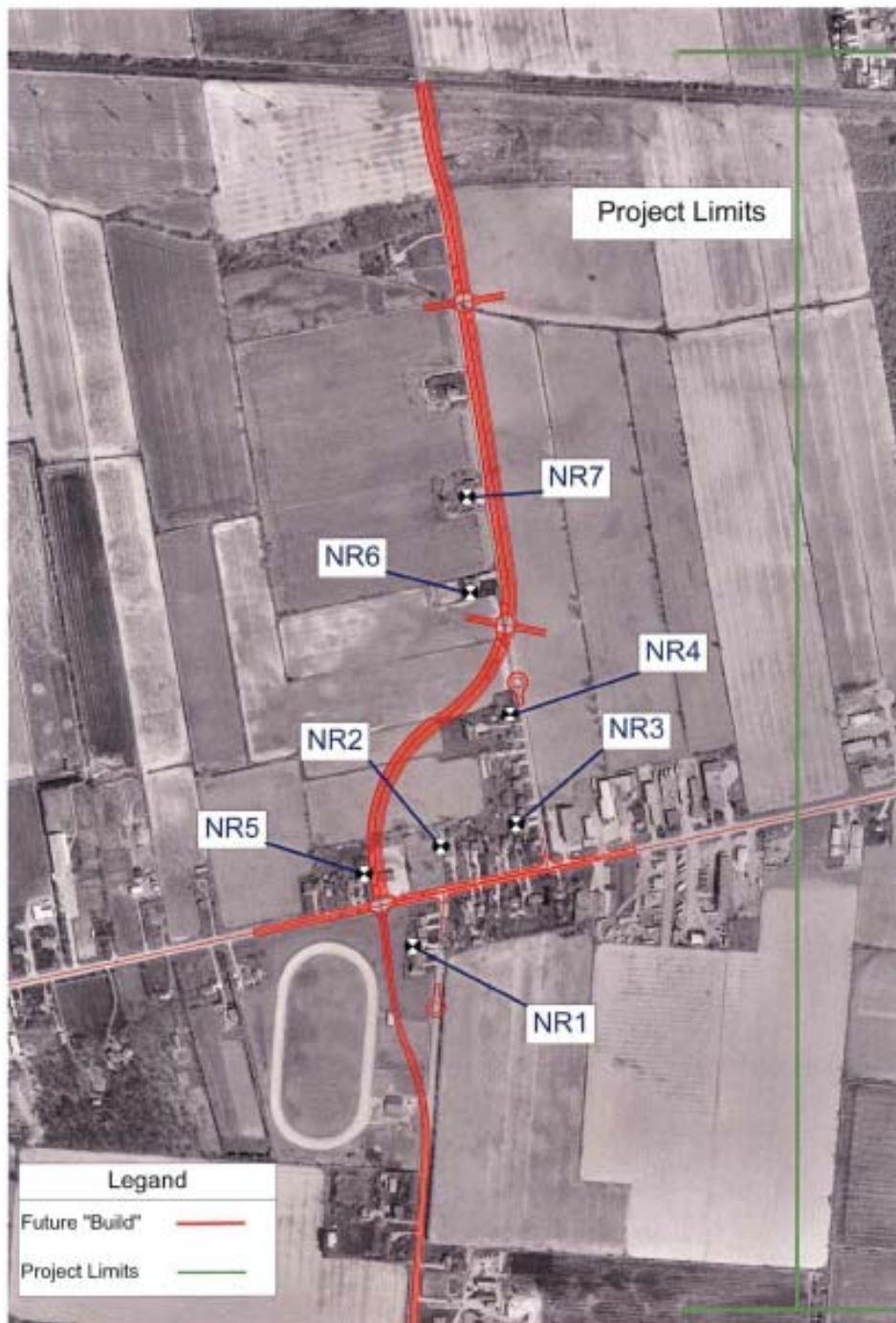
Receptor Location	Description	Distance to Edge of Pavement ^[1] (m)	Approx. No. of NSAs Represented ^[2]
NR1	Home on County Road 43 (Concession 11)	38	5
NR2	Home on County Road 42	97	5
NR3	Home on County Road 43 (Banwell Road)	212	4
NR4	Home on County Road 43 (Banwell Road)	61	3
NR5	Home on County Road 42	10	3
NR6	Home on County Road 43 (Banwell Road)	53	1
NR7	Home on County Road 43 (Banwell Road)	35	3

Notes: [1] Distance is with respect to the closest lane of the proposed County Road 43 to the receptor location.
[2] NSAs represented are houses in the area of the modelled receptor.

The point of reception for impact assessment is the Outdoor Living Area (OLA) of noise sensitive land uses. The OLA may be situated on any side of the receptor, but is

generally taken to be the back yard. For assessment purposes, it is taken as a point 3 metres from the façade of the receptor, and 1.5 metres (composite average height of a standing/sitting person) above the ground surface. Where the actual position of the OLA is unknown, the side closest to the proposed roadway has been assumed. The locations of the points of reception used in the analysis are shown in Figure 8-1.

Figure 8-1 Noise Sensitive Area Receptor Locations



Future build traffic data Annual Average Daily Traffic (AADT) ultimate volumes was considered to reflect capacity at full development within the study area and that 85% of the AADT occurs within the 16 daytime hours. Commercial truck AADTs were also considered in the form of light and heavy truck volumes. For this analysis it was assumed that the light trucks are equivalent to the definition of a medium truck and approximately 50% of the traffic will be traveling in either direction on each roadway.

Road traffic noise levels were modelled using the “Ontario Road Noise Analysis Method for Environmental Transportation (ORNAMENT)” algorithms (MOE 1989) and the STAMSON v5.03 computer program produced by the MOE (MOE 1996). Results from the ORNAMENT calculations and STAMSON are equivalent. Sound levels were predicted using the spreadsheet for both the future “no-build” and future “build” cases. The ORNAMENT model was selected as road receiver geometries and intervening terrain within the project are relatively “simple”, and the potential for impacts (sound level increases greater than 5 dBA) to result from the proposed undertaking is small.

The following factors were taken into account in the analysis:

- Horizontal and vertical road-receiver geometry;
- Road gradients;
- Intervening terrain types (ground absorption);
- Traffic volumes and percentage of trucks;
- Vehicle speeds; and
- Screening provided by terrain, and houses.

Distances, roadway heights, gradients and receptor locations were obtained from plan drawings and aerial photographs. Currently there are no existing noise barriers within the project study area.

Under the applicable MOE and MTO Protocols and Directives, the assessment of impact is conducted by comparing future “build” sound levels (with the project in place) with future “no-build” sound levels. Year 2006 traffic volumes have been conservatively used and it was identified that in the “no-build” situation, traffic volumes would be expected to grow beyond existing levels. Therefore using present year 2006 traffic volumes exaggerates the potential change due to the project and is extra conservative.

Table 8-2 Future Noise Levels With and Without Improvements – Unmitigated

Receptor Location	No. of NSAs Represented	Future “Build” L _{eq} (16h)	Future “No-Build” L _{eq} (16h)	Change (“Build” minus “No-Build”)
NR1	5	58	55 ^[1]	3
NR2	5	57	55 ^[1]	2
NR3	4	50	55 ^[1]	-5
NR4	3	54	56	-2
NR5	3	64	56	8
NR6	1	54	55 ^[1]	-1
NR7	3	57	55 ^[1]	2

Notes: – All sound levels are in dBA
[1] Outdoor objective level of 55 dBA was used per MOE/MTO Joint Protocol.

In keeping with MTO requirements, impacts are also ranked in terms of increasing future “build” sound level (Table 8-3) and increasing change in sound level (Table 8-4).

Table 8-3 Ranking Absolute Future “Build” Noise Levels – Unmitigated

Future Build Sound Level	Receptors in Category	Total No. of Affected NSAs
45 to < 50 dBA	-	-
50 to < 55 dBA	NR3, NR4, and NR6	8
55 to < 60 dBA	NR1, NR2, and NR7	13
60 to < 65 dBA	NR5	3
65 < 70 dBA	-	-
70 dBA or greater	-	-

Notes: – All sound levels are in dBA

Table 8-4 Ranking of Change in Sound Levels – Unmitigated

Future Build Sound Level		Receptors in Category	Total No. of Affected NSAs
Increase in Sound Level	> 15 dBA	-	-
	> 10 to 15 dBA	-	-
	> 5 to 10 dBA	NR5	3
	0 to 5 dBA	NR1, NR2, and NR7	13
Decrease in Sound Level	-5 to < 0 dBA	NR4 and NR6	4
	-10 to < -5 dBA	NR3	4
	-15 to < -10 dBA	-	-
	> -15 dBA	-	-

Notes: – All sound levels are in dBA

Future impacts and the change in sound levels are used to rank NSA's with respect to noise mitigation measures. The results show that the single NSA NR5 has a predicted future sound level above 55 dBA and an increase of sound level between 5 to 10 dBA. As a result, under the applicable MOE and MTO Protocols and Directives, investigation of noise mitigation is required in this area.

As indicated above, noise mitigation is warranted when increases in sound level over the no-build ambient are 5 dBA and greater. Mitigation measures can include noise barriers, noise reducing asphalts, and changes in vertical profiles and horizontal alignments. Noise mitigation, where applied, must be administratively, economically and technically feasible, and must provide at least 5 dBA of reduction averaged over the first row of noise-sensitive receivers. Mitigation measures are restricted to locations within the roadway right-of-way. Off right-of-way noise mitigation, such as window upgrades and air conditioning are not considered. Noise mitigation requirements are summarized in Table 8-5.

Table 8-5 Noise Mitigation Requirements

Existing and Future Sound Levels	Change in Noise Level Above Future "No-Build" Ambient (dBA)	Mitigation Effort Required
< 55 dBA	0 to 5	<ul style="list-style-type: none"> None
	> 5	<ul style="list-style-type: none"> None. Sound levels still below 55 dBA Objective
> 55 dBA	0 to 5	<ul style="list-style-type: none"> None
	> 5	<ul style="list-style-type: none"> Investigate noise control measures within right-of-way Noise control measures where used must provide a minimum of 5 dBA of attenuation, averaged over the first row of receivers Mitigated to as close to ambient as possible, where technically, economically and administratively feasible

Notes: Values are L_{eq} (16h) levels for municipal and Provincial Highways, and L_{eq} (24h) for Freeways

Based on the projected increase in sound levels resulting from the project, an investigation of noise mitigation measures is required for NR5. Noise barriers reduce noise levels at protected receptors through blocking the path of sound emanating from the source towards the receiver, and by absorbing or reflecting the incident sound energy away. Therefore, a noise barrier must at least break the line-of-sight between the source (the roadway) and the receptor (the ground-level OLA of the NSA under investigation). A 2 metre high barrier is recommended above the road centerline elevation.

Refer to Table 8-6 for the future noise levels with proposed 2 metre high noise barrier in place.

Table 8-6 Future Noise Levels With and Without Improvements – Mitigated

Receptor Location	No. of NSAs Represented	Future “Build” L _{eq} (24h)	Future “No-Build” L _{eq} (24h)	Change (“Build” minus “No-Build”)
NR1	5	58	55 ^[1]	3
NR2	5	57	55 ^[1]	2
NR3	4	50	55 ^[1]	-5
NR4	3	54	56	-2
NR5	3	59	56	3
NR6	1	54	55 ^[1]	-1
NR7	3	57	55 ^[1]	2

Notes: – All sound levels are in dBA

8.2.4 Construction Noise Impacts

The following construction activities are anticipated as part of this project:

- Removing existing surface pavements;
- Construction and rehabilitation of the base course;
- Addition of new lane(s); and
- Paving (and repaving) of the roadway surface.

Construction activities will vary temporally and spatially as the project progresses. Noise levels from construction at a given receptor location will also vary over time as different activities take place, and as those activities change location within the right-of-way. To minimize the potential for construction noise impacts, it is recommended that provisions be written into the detail design and contract documentation for the contractor, as outlined below.

- Construction should be limited to the time periods allowed by the locally applicable bylaws (7 AM to 8 PM Monday to Sunday). If construction activities are required outside of these hours, permits/exemptions must be sought from the County in advance.
- There should be explicit indication that Contractors are expected to comply with all applicable requirements of the contract and local noise by-laws. Enforcement of noise control by-laws is the responsibility of the County for all work done by Contractors.
- All equipment should be properly maintained to limit noise emissions. As such, all construction equipment should be operated with effective muffling devices that are in good working order.
- The contract documents should contain a provision that any initial noise complaint will trigger verification that the general noise control measures agreed to be in effect.

- In the presence of persistent noise complaints, all construction equipment should be verified to comply with MOE NPC-115 guidelines, as outlined in Section 3.
- In the presence of persistent complaints and subject to the results of a field investigation, alternative noise control measures may be required, where reasonably available. In selecting appropriate noise control and mitigation measures, consideration should be given to the technical, administrative and economic feasibility of the various alternatives.

8.3 CULTURAL ENVIRONMENT

8.3.1 Archaeological Resources

The Stage 1 archaeological assessment revealed that while no archaeological sites have previously been registered within the study corridor, one site has been registered within a one kilometre of its limit. Additionally, a review of the general physiography and local nineteenth century land use suggested that it exhibits archaeological site potential.

The study corridor is comprised of mixed use lands, and there is potential for archaeological sites within 100 metres of the roads, excluding lands that have been disturbed by existing ROW or by residential or commercial development.

In view of these results, the following recommendations are made:

- A Stage 2 archaeological assessment should be conducted in selected areas within the study corridor (*Appendix G: Stage 1 Archaeological Assessment, Figure 3: areas marked in green*) in accordance with the Ministry of Culture's Stage 1-3 Archaeological Assessment Technical Guidelines (1993, 2006), in order to identify any archaeological remains that may be present;
- Prior to any land-disturbing activities adjacent to the Smith Black Cemetery, investigations will be required to confirm the presence or absence of unmarked graves involving either the monitoring of the area by a licensed archaeologist during construction or the removal of the topsoil with a Gradall followed by the shovel-shining of the exposed surfaces and inspection for grave shafts.
- The above recommendations are subject to Ministry of Culture approval, and it is an offence to alter any archaeological site without Ministry of Culture concurrence. No grading or other activities that may result in the destruction or disturbance of an archaeological site are permitted until notice from the Ministry of Culture approval has been received.
- Should deeply buried archaeological remains be found during construction activities, the Heritage Operations Unit of the Ontario Ministry of Culture should be notified immediately.
- In the event that human remains are encountered during construction, the proponent should immediately contact both the Ontario Ministry of Culture and the

Registrar or Deputy Registrar of the Cemeteries Regulation Unit of the Ontario Ministry of Government Services, (416) 326-8392.

8.3.2 Built Heritage and Cultural Landscape Features

Road widening, jog eliminations and other improvements may have a variety of impacts upon built heritage resources and cultural landscapes. These include the loss or displacement of resources through removal or demolition and the disruption of resources by introducing physical, visual, audible or atmospheric elements that are not in keeping with the resources and/or their setting. The following recommendations should be considered during the proposed work on County Road 43/Banwell Road.

- Any proposed alignments through the study area should be suitably planned in a manner that avoids any identified, above ground, cultural heritage resource. Where any identified, above ground, cultural heritage resource is to be affected by loss or displacement further research should be undertaken to identify the specific heritage significance of the affected cultural heritage resource and appropriate mitigation measures adopted.
- Where features are to be disrupted by introducing physical, visual, audible or atmospheric elements that are not in keeping with the resources and/or their setting suitable measures such as landscaping, buffering or other forms of mitigation should be adopted. In this regard provincial guidelines should be consulted for advice. Where possible, existing trees and plantings should be retained.

8.4 SUMMARY OF IDENTIFIED CONCERNS AND MITIGATION MEASURES

The identified concerns associated with the project are summarized in Table 8-7. Mitigation measures are summarized where they have been recommended to minimize or eliminate changes to the environmental conditions described in this report.

Table 8-7 Summary of Identified Concerns and Mitigation Measures

ENVIRONMENTAL CONCERN		MITIGATION MEASURE
1.0	Terrestrial Habitat Loss	<ul style="list-style-type: none"> Minimize vegetation clearing and grubbing and maintain existing vegetation cover when possible. Establish clearing timing constraints outside critical nesting and denning periods, or confirm lack of localized nesting and denning activity prior to initiating construction activity (i.e. bird nesting constraint with construction restricted to July 16 to March 30). Use of Best Management Practices during construction.
2.0	Aquatic Habitat	<ul style="list-style-type: none"> In-stream work will be restricted to the warmwater timing window from July 1 to March 31. Sediment control devices (i.e., sediment traps, rock checks, silt fences, etc) will be installed where appropriate prior to construction and will be maintained during and after construction until exposed areas have been re-vegetated.
3.0	Construction Noise	<ul style="list-style-type: none"> Construction should be limited to the time periods allowed by the locally applicable bylaws (7 AM to 8 PM Monday to Sunday). If construction activities are required outside of these hours, permits/exemptions must be sought from the County in advance. There should be explicit indication that Contractors are expected to comply with all applicable requirements of the contract and local noise by-laws. Enforcement of noise control by-laws is the responsibility of the County for all work done by Contractors. All equipment should be properly maintained to limit noise emissions. As such, all construction equipment should be operated with effective muffling devices that are in good working order. The contract documents should contain a provision that any initial noise complaint will trigger verification that the general noise control measures agreed to are in effect. In the presence of persistent noise complaints, all construction equipment should be verified to comply with MOE NPC-115 guidelines, as outlined in Section 3. In the presence of persistent complaints and subject to the results of a field investigation, alternative noise control measures may be required, where reasonably available. In selecting appropriate noise control and mitigation measures, consideration should be given to the technical, administrative and economic feasibility of the various alternatives.

ENVIRONMENTAL CONCERN		MITIGATION MEASURE
4.0	Archaeological Resources	<ul style="list-style-type: none"> • A Stage 2 archaeological assessment should be conducted in selected areas within the study corridor (Figure 3: areas marked in green) in accordance with the Ministry of Culture's Stage 1-3 Archaeological Assessment Technical Guidelines (1993, 2006), in order to identify any archaeological remains that may be present. • Prior to any land-disturbing activities adjacent to the Smith Black Cemetery, investigations will be required to confirm the presence or absence of unmarked graves involving either the monitoring of the area by a licensed archaeologist during construction or the removal of the topsoil with a Gradall followed by the shovel-shining of the exposed surfaces and inspection for grave shafts. • The above recommendations are subject to Ministry of Culture approval, and it is an offence to alter any archaeological site without Ministry of Culture concurrence. No grading or other activities that may result in the destruction or disturbance of an archaeological site are permitted until notice from the Ministry of Culture approval has been received. • Should deeply buried archaeological remains be found during construction activities, the Heritage Operations Unit of the Ontario Ministry of Culture should be notified immediately. • In the event that human remains are encountered during construction, the proponent should immediately contact both the Ontario Ministry of Culture and the Registrar or Deputy Registrar of the Cemeteries Regulation Unit of the Ontario Ministry of Government Services, (416) 326-8392.
5.0	Built Heritage and Cultural Landscapes	<ul style="list-style-type: none"> • Any proposed alignments through the study area should be suitably planned in a manner that avoids any identified, above ground, cultural heritage resource. Where any identified, above ground, cultural heritage resource is to be affected by loss or displacement further research should be undertaken to identify the specific heritage significance of the affected cultural heritage resource and appropriate mitigation measures adopted. • Where features are to be disrupted by introducing physical, visual, audible or atmospheric elements that are not in keeping with the resources and/or their setting suitable measures such as landscaping, buffering or other forms of mitigation should be adopted. In this regard provincial guidelines should be consulted for advice. Where possible, existing trees and plantings should be retained.

8.5 MONITORING

A monitoring program will be established to ensure that the mitigation measures specified in Table 8-7 are undertaken. The key impacts to the environment are the short-term impacts that require monitoring during construction. The long-term impacts are expected to be taken into consideration during the detailed design of the project.

The construction of this project will be monitored on site by the County of Essex to ensure that the Contractor is implementing standard construction practices. This will include erosion and sedimentation control, dust and noise control, protection of existing vegetation, assurance of traffic safety and maintenance of traffic flow without causing unnecessary delays, etc. The overall performance and effectiveness of the environmental mitigating measures specified will be monitored and assessed during and subsequent to the construction of the project.

As the environmental impacts outlined in this section are the normal impacts associated with the construction of roads, the established standard construction practices outlined as the mitigating measures will be incorporated in the contract documents. The Contract Administrator will ensure that these mitigating measures are undertaken during construction. Should unforeseen environmental concerns and/or issues arise during the construction period, the appropriate ministry and agencies will be contacted and appropriate measures will be taken to mitigate the environmental concerns/issues.