

Agenda Item #	Page #

TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON MAY 29, 2012
FROM:	JOHN BRAAM, P.ENG. ACTING EXECUTIVE DIRECTOR, PLANNING, ENVIRONMENTAL & ENGINEERING SERVICES DEPARTMENT & CITY ENGINEER
SUBJECT:	SUNNINGDALE ROAD IMPROVEMENTS ENVIRONMENTAL STUDY REPORT PROJECT NUMBER: TS1496

RECOMMENDATION

That, on the recommendation of the Acting Executive Director, Planning, Environmental and Engineering Services Department & City Engineer, the following actions **BE TAKEN** with respect to the Sunningdale Road Improvements Environmental Study Report:

- (a) The Sunningdale Road Improvements Environmental Study Report **BE ACCEPTED**;
- (b) A Notice of Completion **BE FILED** with the Municipal Clerk; and
- (c) The Environmental Study Report **BE PLACED** on public record for a 30-day review period.

PREVIOUS REPORTS PERTINENT TO THIS MATTER
--

- Environment and Transportation Committee – June 22, 2009 – Appointment of Consulting Engineers; Class Environmental Assessments for Hyde Park Road, Sarnia Road, Sunningdale Road
- Built and Natural Environment Committee – October 17, 2011 – Sunningdale Road – Interim Maintenance Strategy

BACKGROUND

Purpose:

This report seeks approval to finalize a Schedule 'C' Class Environmental Assessment for improvements to Sunningdale Road from Wonderland Road North to Adelaide Street North.

Discussion:

AECOM was hired by the City of London to conduct the Environmental Assessment (EA) for Sunningdale Road. This EA considered many factors during evaluation of the design alternatives, including:

- impact on the social and natural environments;
- technical considerations;
- future traffic patterns;
- existing and future land uses;
- project phasing; and
- estimated costs.

Recommended Alternative

The recommended design for the widening of Sunningdale Road incorporates a number of features to improve traffic flow, minimize impacts, and maximize social benefits. They include:

Agenda Item #	Page #

- four through lanes with turn lanes;
- intersection improvements, including roundabouts at Wonderland Road and Adelaide Street;
- bicycle lanes and sidewalks in both directions;
- New bridge crossing of the Medway Creek with a new multi-use pathway link and crossing;
- upgrades to storm drainage, sanitary sewers and watermains.

Public Consultation

Public input to this project has been thoroughly solicited in both conventional and unconventional methods.

Project signboards were placed in the Sunningdale Road right-of-way at the outset of the project. The signs provided basic information including contact information for the project. These signs resulted in numerous inquiries about the project. All project information was also posted on the City's Transportation Planning website.

The first of two Public Information Centres (PIC) was held on October 29th, 2009 to introduce the project and to receive input and concerns. Display boards explained background information on the project along with the EA process.

A second PIC was held on June 28th, 2011. This PIC included alternatives and the preferred design layout of Sunningdale Road for input and comment.

Members of the project team met with individual property owners as interest in the project rose. There were also several meetings with homeowners fronting Sunningdale Road east of Richmond Street. Their specific interests are discussed further below.

Consistent with all consultation points during the study, the public, agencies and First Nations were informed of the date of this public participation meeting through a mail-out and advertisements in the Living in the City section of the London Free Press.

EA Issues

The ESR Executive Summary is contained in Appendix A. The EA study identifies and mitigates impacts associated with the project. The following issues are noted:

Homes Fronting Sunningdale Road East of Richmond Street

There are currently nine existing single family homes fronting Sunningdale Road on the south side between Richmond Street and Skyline Boulevard. Many of these homes are relatively close to the existing road and therefore had special concerns regarding the widening of Sunningdale Road. A standard, symmetrical widening of Sunningdale Road from two to four through lanes would have caused significant property impacts to some of these homes and may have made a few of the homes unviable.

These concerns were expressed at both PICs and due to this potential impact, the project team engaged these landowners on several occasions to discuss possible ways to reduce the property impact. The owners presented the project team with an alternative initiated by them for consideration which included rerouting the Sunningdale Road and Richmond Street intersection approximately 50m to the north and turning Sunningdale Road in front of their homes into a cul-de-sac. The alternative was evaluated with the same criteria applied to all of the alternatives. This alternative was evaluated but not chosen as the preferred alternative due to significant increased economic and environmental impacts as well as significantly increased impacts to the property owners on the north side of Sunningdale Road, including changing the approved area plan.

The preferred design alternative mitigates the impact to these homes by widening the road to the north and using a more compact road cross-section. This alternative eliminates the need to

Agenda Item #	Page #

acquire any property from these homeowners, with the exception of a small daylight corner required at Richmond Street. Some localized grading easements and retaining walls may be required to match these existing properties to the new road profile and cross-section. The details of these requirements will be confirmed during detailed design. While some of the homeowners accepted this plan, others were unhappy about the effects and tree loss within the City right-of-way and indicated that the homeowner proposal was still their preferred plan.

Imperial Oil Petro Carbon Transmission Main

A 300mm diameter Imperial Oil transmission pipeline is located along a portion of the north side of Sunningdale Road between approximately 800m west of Richmond Street to 1.7km east of Richmond Street (typically placed at an average depth of 1.0m). This pipeline can convey oil between Sarnia and Waterdown and is one of the main feed lines for the Toronto area. The pipeline easement changes in location and configuration along its route. Presently the pipeline is not active but is treated as a live pipe as it is charged with nitrogen and may be required by Imperial Oil at any time.

The preferred alternative near the Richmond Street intersection overlays the pipeline for 80m. As part of this study AECOM confirmed the depth and horizontal offset of the pipeline and determined that this section of pipe (80m) needs to be relocated to a location that is at least 1m north of the current location. The cost to relocate this section would be \$525,000, including construction, engineering costs, permit fees, construction administration, inspection and easement or land cost will be additional. The actual new pipe location, the cost of relocation, and the effects on the current easement and setback are subject to future negotiations between the City of London and Imperial Oil.

Natural Environment Features:

Medway Creek

The section of Medway Creek within the Study Area, runs primarily through rural residential and agricultural land uses as well as a golf course. The downstream reach of the Study Area is naturalized and part of the Medway Valley Forest ESA, while the banks of the upstream side are naturalized and surrounded by a golf course. The creek follows a gradual meandering course before flowing in to the Thames River. Medway Creek is a permanent warmwater fishery.

A total of 38 fish species have been captured within the Medway Creek watershed (UTRCA 2001). The black redhorse (*Moxostoma duquesnei*) and silver shiner (*Notropis photogenius*) are federally and provincially listed by the Species at Risk Act, as Threatened (Schedule 2) and Special Concern (Schedule 3), respectively. The province also lists the greenside darter (*Etheostoma blennioides*) as Special Concern.

Based on the data provided by the UTRCA, the wavy-rayed lampmussel (*Lampsilis fasciola*) has been found in the lower end of Medway Creek and is currently protected by Schedule 1 of the federal Species at Risk Act. The rainbow mussel (*Villosa iris*) is present throughout the Medway Creek Watershed and currently has no protection under the Species at Risk Act, however; this mollusc species is expected to be ranked as Endangered and placed on Schedule 1 of the Species at Risk Act in the near future.

Powell Drain

The Powell Drain is described as an intermittent channelized watercourse. The drain follows a south-easterly direction before flowing into Stoney Creek. During the field investigation both the upstream and downstream sections of the drain were dry. There was standing water in the culvert on the south side of Sunningdale Road.

The upstream reach of the drain flows through two channelized reaches that run parallel to Sunningdale Road before merging into a south flowing channel. The upstream side of Sunningdale Road is built up with rock check dams and flows underneath a rock berm into an underground channel as there is no open culvert. The downstream reach of the creek appears to flow through a channelized meadow marsh.

Agenda Item #	Page #

There is no direct fish habitat use within the study reach of Powell Drain.

Axford/McCallum Drain

The Axford Drain is described as an intermittent watercourse. The drain follows a south easterly direction before flowing into Medway Creek. The section of the drain in the Study Area runs primarily through rural and agricultural land uses including a golf course. Upstream of Sunningdale Road, the drain runs through an intermittent underground and channel system before arriving at Sunningdale Road. The drain flows underneath Sunningdale Road through a culvert into a second plunge pool located at the perched outlet, which represents a barrier to upstream fish movement. There is also a rock berm which purposefully prohibits fish movement upstream. There is little or no direct fish habitat noted upstream or downstream of Sunningdale Road.

Arva Moraine Provincially Significant Wetland Complex

This wetland is approximately 63.6 ha in Arva and comprised of two wetland types; 70% swamp and 30% marsh. Wetland communities along Powell Drain are part of this complex. This wetland also contains wild germander (*Teucrium canadense*), a locally significant plant species.

Natural Environment Mitigation

As noted above, Sunningdale Road crosses several significant natural environment features. Any impact to these features would need to be studied and mitigated appropriately. Typically an Environmental Impact Study (EIS) would recommend mitigation measures in these circumstances. All of the construction proposed in the study area near these natural environment features is almost 10 years in the future. In this time changes could potentially occur to the features or to the status of the species they contain, rendering the EIS out of date. As such EIS's to determine specific mitigation strategies will be carried out prior to the detailed design of road sections that impact environmentally sensitive features. This approach was reviewed and accepted by the City's Ecologist Planner.

Medway Creek Crossing

A concrete girder bridge is the recommended structural design for the Medway Creek crossing. This alternative has the lowest risk of potential cost escalation and provides a balance between durability and cost. Also, the preliminary bridge design contains no piers or other restrictions in the creek, which will enhance the natural environment compared to the existing culvert. A pathway under the bridge structure has been included in the preliminary design to align with future plans for the area. Allowing for this pathway under the bridge is projected to have a minimal cost impact to the construction of the bridge. With the large road profile raise and change in structure type from a culvert to a bridge, it is considered unlikely that it would be cost effective to keep Sunningdale Road open during the construction of the Medway Creek crossing.

Property Acquisition

Most of Sunningdale Road corridor within the study area will have a standard future right-of-way (ROW) of 36m centred on the existing road centreline. The exceptions to this will be near Richmond Street as noted previously in this report, and a section of Sunningdale Road near Medway Creek which will be widened entirely to the south to comply with the Official Plan. The road alignment in the vicinity of the Sunningdale Golf Club was previously changed to reduce future impacts on the course and to integrate future road needs with developing lands on the south side of Sunningdale Road. Also additional slivers of land will be required to accommodate the roundabouts at Wonderland Road and Adelaide Street.

Grading easements are also required near large vertical profile corrections, along the Sunningdale Golf Course property, adjacent to Medway Creek, Powell Drain, Blackwater Road,

Agenda Item #	Page #

and along the frontage of existing residential, non-redeveloping properties near Richmond Street and Skyline Avenue. Grading easements have been identified and will be subject to confirmation in detailed design. It has been the City’s preference in similar projects to negotiate an amicable solution with individual property owners before considering expropriation.

Intersection Improvements

There are two roundabouts proposed in this project, one at Wonderland Road and the other at Adelaide Street. Roundabouts at these intersections fit the future traffic patterns projected and were also selected because of well documented roundabout advantages including benefits to safety, the environment, and operational costs. Roundabouts would also improve the aesthetics of these gateway intersections to the City. Due to the widening of Sunningdale Road from two to four lanes, these roundabouts will need to be multilane roundabouts in the future.

The Richmond Street intersection was found not to be suitable for a roundabout since the future traffic flows at this intersection are projected to exceed the capacity of a two lane roundabout. Instead, it is recommended that the Richmond Street intersection remain a signalized intersection with improvements and widening.

Noise Mitigation

Municipally owned noise barriers are not recommended adjacent to Sunningdale Road. However, some noise walls and window streets at certain locations are a condition of current approved subdivision plans and are to be constructed by the developer.

Other Municipal Servicing

The future road improvements will include the provision of a storm sewer systems along Sunningdale Road and potential culvert extensions where required for the wider road. The future storm sewers will need to discharge into a downstream storm sewer, existing watercourse, or temporary outlet that may ultimately be received by a planned or existing storm water management facility. Many of these outlets have been previously determined from storm water management area studies and environmental assessments; all required are laid out and summarized in the Environmental Study Report for this project.

Within the Sunningdale Road corridor local sanitary sewer collection systems are largely not required with the exception of between Richmond Street and Skyline Boulevard. During detailed design, it will be determined if a local sewer will be installed that will allow those residents fronting onto Sunningdale Road to connect to the municipal system as part of a Local Improvement.

The supply pipelines which provide water from the Lake Huron Water Supply System to the City of London cross Sunningdale Road within the Study Area just east of Richmond Street. Also, transmission mains are located along Sunningdale Road both east and west of this location. These transmission mains also supply the Uplands High Level Pumping Station located at 221 Sunningdale Road E which is the source of water supply for the surrounding land area. The requirement that Sunningdale Road be widened to the south near Medway Creek means that the future bridge would be constructed over the existing location of a large transmission watermain. This would create an operations and maintenance difficulty for this main and as such it is proposed that the main be reconstructed and fixed to the new bridge.

Project Phasing & Cost Estimate

The Growth Management Implementation Strategy (GMIS) presently identifies the intersection improvements of Sunningdale Road at Richmond Street and Wonderland Road both in 2014. Sunningdale Road from Richmond Street to Adelaide Street is identified to be widened in 2024 and from Richmond Street to Wonderland Road in 2027. It should be noted that reconstruction

and capacity improvements from Richmond Street to Adelaide Street were previously scheduled for 2014, and from Wonderland Road to Richmond Street in 2017. These works were deferred for 10 years as part of a Development Charges By-Law OMB Appeal Settlement. This Environmental Study Report recommends a different schedule and phasing strategy based on forecasted capacity needs.

The Wonderland Road and Richmond Street intersections are the highest priority phase in the corridor and should be reconstructed in 2014. Wonderland Road will be reconstructed as a roundabout while Richmond Street will have interim improvements to improve traffic flow through the intersection ahead of the ultimate four-lane cross-section being constructed in 2019. The remainder of the recommended corridor work is scheduled in 2019. The construction years recommended will be considered in the next Development Charges Update.

The GMIS presently has \$45.7M designated for this section of road in various projects. This is within 5% of the \$47.1M identified in this study with the difference due to a more refined design. In the current capital budget, both the Wonderland Road and Richmond Street intersections improvements are allotted \$1.75M each in 2014. This study identifies \$2.2M for Wonderland Road in 2014 and \$1.1M for Richmond Street in 2014. This change will necessitate the reallocation of the total funds from one project to the other.

The table below and Figure 1 outline possible project stages and cost estimates for Sunningdale Road. This information will be used in the Development Charges Update Study to set timing for work beyond 2014, notwithstanding the year when this ESR identifies improvements are needed by.

Phase	Project – Sunningdale Rd	Required Year	Estimated Project Cost
1a	Wonderland Road roundabout including Wallingford Avenue	2014	\$2.2M
1b	Richmond Street intersection (Uplands to Village Walk)	2014	\$1.1M
2a	Adelaide Street roundabout and Roadworks westerly to Bluebell Road	2019	\$15.2M
2b	Uplands Road to Bluebell Road	2019	\$7.3M
2c	Medway Creek Bridge and approaches (Golf Course entrance to crest of hill 2+500) near SWM 4\	2019	\$5.7M
	Wallingford Road to Golf Course Entrance		\$15.6M
	Crest of hill at Station 2+500 to Villagewalk Road		
	Ultimate Richmond Street intersection (Uplands to Village Walk)		
	TOTAL		\$47.1M

Notes:

- All works timing is subject to Council approval through the annual budget process, and changing priorities of the individual budget year (Timing will be dependent on the TMP and DC Background Study).
- Advanced purchase and negotiation of property acquisitions should be initiated early in the project process
- Detailed utility relocations and staging is required to determine the best location within the ROW
- Additional cost for landscaping may be incurred if the center median island is prioritized for enhanced gateway aesthetics.
- Phase 1b goal to have very few utility relocates for surface hydro poles and no relocation of Imperial oil pipeline and include upgrades to typical curb and gutter cross section and right/left turn lanes.
- Watermain relocation at Medway Creek is estimated to cost \$1.1M included in cost.
- Installation of a water valve at Adelaide Street is estimated to cost \$750,000 included in cost.

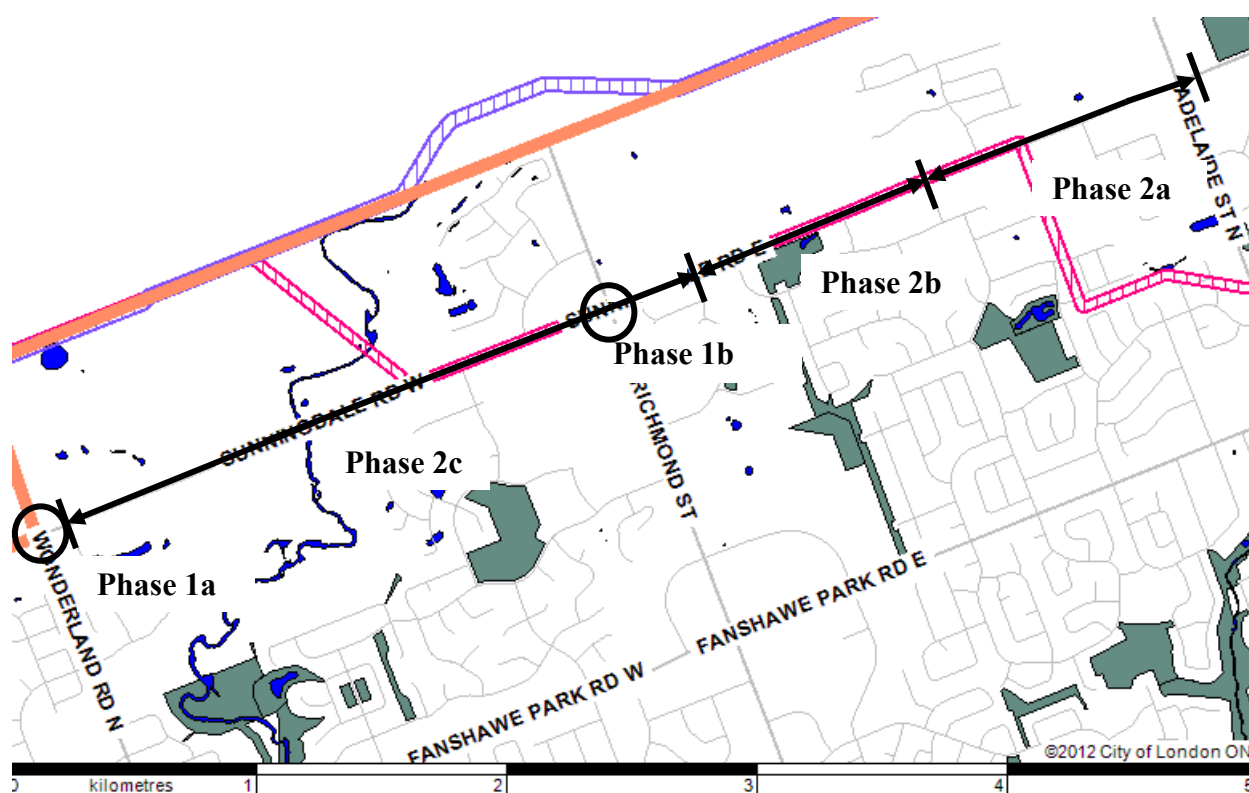


Figure 1 – Recommended Phasing of Sunningdale Road Improvements

Recommended Mitigation Measures

The ESR includes a number of mitigation commitments covering a broad range of topics:

- a requirement for an EIS at sensitive locations prior to design
- tree removal and retention
- wetland impacts
- watercourse impacts
- sediment and erosion control
- tree clearing impacts on wildlife
- construction noise impacts on wildlife
- species at risk protection
- construction impacts on aquatic / wetland habitat and wildlife
- construction noise at all Noise Sensitive Areas
- localized stage 2 archaeological assessments
- traffic staging and road closures

Summary and Next Steps:

1. A Schedule 'C' Class Environmental Assessment for improvements to Sunningdale Road from Wonderland Road North to Adelaide Street North has been undertaken.
2. An Environmental Study Report is ready for final public review. It was prepared with public and agency participation, and includes a preliminary design which provides mitigation measures for impacts associated with the widening.
3. Completion of this phase of the Municipal Class Environmental Assessment process requires that the ESR be placed on the public record for a 30-day review period.
4. Subject to no Part 2 Orders ("bump-up requests") being received within the 30-day review period, design activities and property acquisition related to the first phase of improvements can commence. The duration of the property acquisition process necessitates that negotiations for the Phase 1a acquisitions begin immediately to meet the project schedule.

Agenda Item #	Page #

5. A needs based schedule for future stages of the project has been identified in the ESR. The stages and costs are to be referred to the Development Charges Background Study Update to finalize an implementation schedule.

Acknowledgements:

This report was prepared with assistance from Aaron Rozentals, P.Eng. and Doug MacRae, P.Eng. in the Transportation Planning & Design Division.

SUBMITTED BY:	RECOMMENDED BY:
JOHN LUCAS, P. ENG. DIVISION MANAGER, TRANSPORTATION PLANNING AND DESIGN	JOHN BRAAM, P. ENG. ACTING EXECUTIVE DIRECTOR, PLANNING, ENVIRONMENTAL & ENGINEERING SERVICES DEPARTMENT & CITY ENGINEER

AR/DM

Attach: Appendix "A" – Executive Summary

- c. AECOM, 410-250 York Street, Citi Plaza, London, ON, N6A 6K2
Betty Mercier, Secretary, Transportation Advisory Committee

Agenda Item #	Page #

Appendix A

Executive Summary

BACKGROUND

Sunningdale Road is located near the northern boundary of the City of London and is aligned in an east-west direction between the westerly boundary of the City and Clarke Road. In the City of London's Official Plan, the road is classified as an Arterial Road within the Study Area, which extends between the intersection approaches of Wonderland Road and the intersection approaches of Adelaide Street.

The road serves as access to the Sunningdale Golf and Country Club, existing and emerging residential subdivisions, agricultural lands, planned commercial nodes, the City of London multi-use recreation pathway system and existing residents fronting on to the road.

At present, Sunningdale Road has a two lane cross-section within the project limits. In 1993 the road's jurisdiction was transferred from Middlesex County to the City of London.

Sunningdale Road crosses the Medway Valley Heritage Forest, Environmentally Significant Area (ESA) near the Sunningdale Golf and Country Club. This ESA is a regionally/locally significant feature. Vegetation communities are generally restricted to riparian areas of watercourses and designated wetlands. Significant terrestrial features include wetland communities associated with the Arva Moraine PSW and the Medway Creek. The Medway Creek is a permanent natural watercourse that supports a variety of residential fish and mollusc species.

Traffic volumes are steadily increasing, and roadway improvements are required in order to keep up with travel demands by London residents. Based on the "Level of Service" (LOS) criteria used by the transportation industry as a predictor of future conditions, Sunningdale Road in the vicinity of the Adelaide Street and Wonderland Road intersections is deteriorating to LOS "F" in the PM peak periods (See Table 2-6) ("A" being excellent or little delay and "F" being very poor or very long delay).

Based on planned growth in the Study Area and adjacent planning areas, Sunningdale Road traffic volumes are forecast to increase significantly by 2029. This study has also extrapolated this growth rate to the year 2032. Portions of the Study Area, to the east of Wonderland Road are forecast to exceed the capacity for a rural two lane cross section during the AM and PM peak hours in 2018. Prior to Sunningdale Road reaching capacity, the major intersections will begin to experience operational and safety problems due to increased traffic volumes and high turning movement volumes. Existing conditions at Wonderland Road warrant the improvement of the intersection within the next 5 years.

As a result, the City of London has initiated this Class EA study in accordance with the requirements for Class Environmental Assessment (Class EA) Schedule 'C' projects as described in the Municipal Engineers Association's "Municipal Class Environmental Assessment (EA)" document (October 2000 as amended in 2007). The intent was to identify a preferred design which provides an appropriate level of service to address safety, traffic congestion, comfort and convenience, speed and travel time, while ensuring a reliable transportation corridor with long term sustainability. The recommendations herein have addressed issues related to the protection and maintenance of natural heritage features, have had regard for the existing built environment and the future development potential adjacent to the Study Area.

Agenda Item #	Page #

CLASS EA PROCESS

Municipalities in Ontario, including the City of London, are subject to provisions of the Environmental Assessment (EA) Act and the requirement to prepare an Environmental Assessment for most public works projects. Based on the Class EA process, projects are classified as Schedule “A”, “A+”, “B” or “C”. The complexity of each project is based on the level of investigation, environmental effects, technical considerations and public/agency input, which may affect the selection of the project schedule. It is up to the proponent to determine and/or customize the planning process to meet the project’s consultation and technical needs based on the complexity of issues. AECOM has recommended that the Municipal Class EA process outlined for Schedule “C” projects be undertaken to adequately address the technical and environmental needs of this project. Therefore it is subject to Phases 1 through 5 of the Class EA process. The Municipal Class EA document requires that Schedule C projects proceed with full planning and documentation (Phases 1 to 4), and that an Environmental Study Report (ESR) be prepared and filed for review by the public and review agencies.

PUBLIC CONSULTATION

As part of the Class EA process, an extensive agency/public consultation program has been undertaken seeking input from directly affected landowners and residents, the general public and review agencies and First Nations Communities. A series of project meetings were held with the City, Parks Planning, Ministry of the Environment (MOE), Upper Thames River Conservation Authority (UTRCA) and directly affected landowners. Public and agency input was received and incorporated into the planning and proposed design of the works required for this project where applicable. The primary recurring issues are summarized as follows:

- Existing traffic problems on Thistlewood Drive and Blackwater Road;
- Potential for increased noise;
- Timing of construction;
- Potential impact to properties and property values;
- Safety concerns;
- Potential for increased pollution;
- Clarification on project justification;
- Impacts on existing vegetation;
- Effects on Adelaide/Sunningdale intersection;
- Impacts on driveway access;
- The need for a ring road;
- Potential impacts on the existing oil pipeline;
- Increased speed of traffic;
- Impact to existing fire hydrants;
- Need for traffic lights at Skyline Drive;
- Requirements for noise walls, bike lanes and sidewalks;
- Lack of existing services, impact to existing access to Sunningdale Road and traffic cut-through;
- Need to extend the study boundary to include Adelaide Street;
- Clarification on descriptions of Provincially Significant Wetland Complex & Cattail Marsh;
- Costs to relocate oil pipeline;
- Profile changes, access, traffic management, preservation of treed area;
- Removal of the existing retaining wall on property;
- Extent of road widening required;
- How will the vertical alignment at Powell Drain be addressed; and
- Potential impacts to the Arva Moraine.

In accordance with Municipal Class EA requirements, a notice of completion has been circulated to those who previously expressed an interest in the project which outlines the completion of the project including the recommended alternatives, the thirty (30) day review period and the public’s right to request the Minister of the Environment to issue an order to comply with Part II of the EA Act.

RECOMMENDED PLANNING SOLUTION

All reasonable and feasible solutions that could be implemented to address the problem and or deficiency for the Study Area were identified as part of Phase 2 of the Class EA process. The following options were considered in the previous studies and reconfirmed as part of this study:

Agenda Item #	Page #

- Do nothing (as a base case);
- Opportunities for reduced auto usage Transportation Demand Management (TDM);
- Opportunities for enhanced transit;
- Improvements to parallel roads upgrade adjacent roads;
- Limit community growth;
- Structural alternatives involving urbanization, traffic signalization and widening.

Based on previous studies (2004 TMP, Transportation Development Charge Background Report) and the work undertaken as part of this study it was concluded that improvements to Sunningdale Road, in the form of urbanization, traffic signalization and widening from two to four lanes would be required to meet the projected transportation requirements in the study corridor of the City of London.

ALTERNATIVE DESIGN SOLUTIONS

As a result of this, planning solution, alternative design solutions were developed and comparatively evaluated and analyzed, based on existing constraints, public input and traffic studies, to ensure that each of the potential alternatives met the objectives to improve system operation, reduce congestion, improve the level of service, reduce potential impacts where feasible and appropriate, and address existing and future capacity deficiencies.

To develop alternative design solutions that met the objectives, four major design elements were considered including horizontal alignment; cross road node improvements; cross sectional improvements; and physical constraints, These elements formed the basis of solutions for Evaluation Refer to Figure EX-1 Design Alternatives.

The evaluation of alternative design solutions was based on qualitative and quantitative factors used to identify significant advantages and disadvantages with respect to the evaluation criteria identified for this study. This evaluation covered all environmental components (Natural Environment, Social, Cultural, Technical and Economic) representing a broad definition of the environment,. The goal was to meet as many of the criteria as possible.

After various evaluation criteria were developed, they were applied to each of the alternatives to identify potential effects on the environment. The evaluation of alternatives was then captured in a matrix format to allow for direct comparison between alternatives.

RECOMMENDED DESIGN ALTERNATIVE

The study has developed and evaluated all viable alternatives to address the deficiencies along the study corridor. The recommended design alternative consists of a four-lane section (two westbound and two eastbound through lanes) with auxiliary turn lanes at intersections where warranted. The recommended design alternative is illustrated in Figure 6-11A – 6-11C with specific details as follows:

- Roundabouts for traffic control at two major intersections (Wonderland Road and Adelaide Street);
- Richmond Street intersection will be improved by the addition of left/right turn lanes, tapers and storage on all four quadrants;
- Through lanes are 3.5 m wide, and left and right turn lanes are 3.0 m wide;
- On road bicycle lanes are recommended throughout the Study Area except at roundabouts where cyclists will integrate with traffic or pedestrians;
- A variable separated median (3.0 m typical) will be used to divide the westbound and eastbound lanes and may allow for tree plantings in selected areas;
- Improvements to intersection configurations and signal timing/interconnection;
- Sidewalks for both sides of Sunningdale Road;
- Storm sewers throughout the Study Area;

Agenda Item #	Page #

- Property acquisition is limited to large daylight triangles and sliver widenings at the main intersections (Wonderland Road, Richmond Street and Adelaide Street);
- A single span concrete structure is proposed at the Medway Creek crossing. This is the lowest cost and least environmental impact crossing;
- A 3.0 m pathway under the Medway Creek Bridge to allow future connections to the east path system;
- Municipally owned noise barriers are not recommended adjacent to Sunningdale Road. However, some noise walls and window streets at certain locations are a condition of current approved subdivision plans and are to be constructed by the developer;
- Utility relocations will be required, including Imperial Oil Pipeline, watermain and storm sewers. Sanitary sewers manholes may require adjustments as a result of profile changes.

COST AND SCHEDULE

The preliminary project cost was estimated to be \$47.1 million (2011 estimate) including construction and engineering costs, of which approximately \$42.0 million is attributable to the roadwork and structures and \$5.1 million attributable to utility relocations and engineering.

In order to prepare budgets to allow for the orderly construction of the phases to ensure maximum effectiveness of the work, the phasing of projects as shown in Figure ES1 is recommended.

INTERIM IMPROVEMENTS

The construction of intersections first is a standard methodology to phase large transportation project's cost over a timeline that is both financially responsible and technically preferable. This results in the construction of needed infrastructure in a time period when it is justified without incurring costs of temporary works or front ending construction costs before they are absolutely needed, prolonging service life and reducing operational costs. The Sunningdale Road project presents several challenges to following this concept as intricacies of other servicing needs and utility relocations have to be considered along with the construction of phased or interim road works. Specifically challenging for Sunningdale Road is stormwater management infrastructure required to accommodate road drainage. Specifically, the building of intersections on hills crests without the linear connection to storm sewers and stormwater management ponds.

AECOM has developed interim stormwater management (SWM) strategies at the Sunningdale Road and Richmond Street intersection. Improvement to this intersection has been identified as a priority from a traffic perspective (5-10 year) traffic demand at this intersection,

Richmond Street at Sunningdale Road slopes downwards to the north towards a tributary to the Medway Creek. The ultimate discharge location for the drainage area is SWM Facility 4 located near the Medway Creek. In the interim, this drainage is proposed to be directed to the Medway Creek via an oil-grit separator (OGS) routed in a northerly direction (300m). This is estimated to cost approximately \$750,000 and has potential to be recycled into the ultimate SWM strategy for the improvements to Richmond Street.

This interim SWM work would be approximately \$750,000 and the interim road works approximately \$360,000. These works would defer the ultimate project phase which would include building a large amount of the phase 4 storm sewer works outside of the road works for at least 5-12 years. This coincides with service life of the asphalt in the sliver widening required for the interim turn lanes, and the approximate timing of traffic warrants for the other lane needs.

Proposed project phasing is shown on **Figure ES1**.

--	--

Table ES1: Proposed Project Phasing

Phase	Project- Sunningdale Road	Year to begin Engineering	Recommended Year	Estimated Project Cost
1a	Wonderland Road roundabout including Wallingford Avenue	2012	2014	\$2.2M
1b	Richmond Street intersection	2013	2014	\$1.1M
2a	Adelaide Street roundabout and road works westerly to Bluebell Road	2015	2019	\$14.9M
2b	Uplands Road to Bluebell Road	2018	2019	\$7.3M
2c	Wallingford Road to Golf Course Entrance to Uplands & the Medway Creek Bridge and approaches	2018	2019	\$21.6M
	TOTAL			\$47.1M

Notes:

- All works timing is subject to Council approval through the annual budget process, and changing priorities of the individual budget year (Timing will be dependent on the TMP and DC Background Study).
- Advanced purchase and negotiation of property acquisitions should be initiated early in the project process
- Detailed utility relocations and staging is required to determine the best location within the ROW
- Additional cost for landscaping may be incurred if the center median island is prioritized for enhanced gateway aesthetics.
- Phase 1b goal to have very few utility relocates for surface hydro poles and no relocation of Imperial oil pipeline and include upgrades to typical curb and gutter cross section and right/left turn lanes.
- Watermain relocation at Medway Creek is estimated to cost \$1.1M included in cost.
- Installation of a water valve at Adelaide Street is estimated to cost \$750,000 included in cost.