

TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON JULY 20, 2015
FROM:	JOHN BRAAM, P.ENG. MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER
SUBJECT:	WONDERLAND ROAD SOUTH ENVIRONMENTAL STUDY REPORT

RECOMMENDATION

That, on the recommendation of the Managing Director, Environmental & Engineering Services and City Engineer, the following actions **BE TAKEN** with respect to the Wonderland Road South Environmental Assessment:

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

PREVIOUS REPORTS PERTINENT TO THIS MATTER
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- Civic Works Committee – June 17, 2013 – Appointment of MMM Group Limited (former: McCormick Rankin Corporation), Wonderland Road South, Schedule ‘C’ Environmental Assessment.

BACKGROUND

Purpose

This report provides Committee and Council with an overview of the Wonderland Road South Municipal Class Environmental Assessment (EA) and seeks approval to finalize the study. The completed Environmental Study Report (ESR) documents the EA process undertaken for the Wonderland Road South Improvements. One of the Areas of Focus in the Strategic Plan is “Building a Sustainable City”. The Strategic Plan identifies the implementation and enhancement of safe mobility choices for cyclists, pedestrians, transit users and drivers. Improvements to Wonderland Road South as identified in this EA will help achieve this goal by serving as an improved gateway to London and as the primary north/south connection between the provincial 400 series highways and north/central London through the southwest part of the City.

Improvements to Wonderland Road South are necessary for the corridor to fulfill its necessary function in the transportation network and to support growth in the southwest part of London. The provincial Environmental Assessment Act requires the completion



of an EA to determine the most appropriate implementation method for these improvements.

Background

The need to widen Wonderland Road South is identified in the City's Smart Moves 2030 Transportation Master Plan (TMP). The TMP recommended Wonderland Road South be widened from 2 to 4 lanes between Exeter Road and Highway 402 (Phase 1) and then further south to Highway 401 (Phase 2). Between Southdale Road West and Exeter Road, the TMP proposed widening Wonderland Road from 4 to 6 lanes in Phase 3 of the network improvements.

The EA study recommendations will set the directions for the implementation strategy of the Southwest Area Plan (SWAP) based on the identified transportation infrastructure needs for the Wonderland Road South corridor including improvements for pedestrians, cyclists and transit users. MMM Group Limited was retained by the City to conduct the Wonderland Road South EA. The EA extends from Southdale Road West to Highway 401, a distance of 7.3 km. The study area is shown in Figure 1.

As noted above, Wonderland Road South within the Southwest Area Plan (SWAP) is envisioned as a significant gateway to London, with a design that introduces a high quality visual character for the corridor, provides flexibility to support a wide range of adjacent land uses and creates opportunities for redevelopment over the life of the Secondary Plan. A high level of design for the adjacent built form and enhanced landscaping, tree planting and boulevard treatment is intended to create a high quality visual presence for this vital gateway.

The completion of the Wonderland Road South interchange with Highway 401 is one of key objectives of London's Economic Strategy in establishing the City as the trade and transportation hub of Southwestern Ontario. The improvements along Wonderland Road South, in conjunction with the interchange, will allow for future industrial development and enable residential and commercial growth in the SWAP area.

DISCUSSION

Wonderland Road South is a major transportation corridor designed to carry high volumes of traffic in a safe and efficient manner. To that end, the transportation services of the Wonderland Road South corridor will need to provide for both longer-distance mobility to serve business, and local accessibility, to serve the surrounding community in their day to day activities and in a variety of modes.

The Municipal Class EA is required in order to identify the transportation infrastructure needs for the Wonderland Road South corridor as recommended in the London 2030 Smart Moves TMP. The EA Study has been undertaken in accordance with the existing City's Official Plan, and the environmental polices contained in Chapter 15, including the completion of a scoped Environmental Impact Study as a component of the EA.

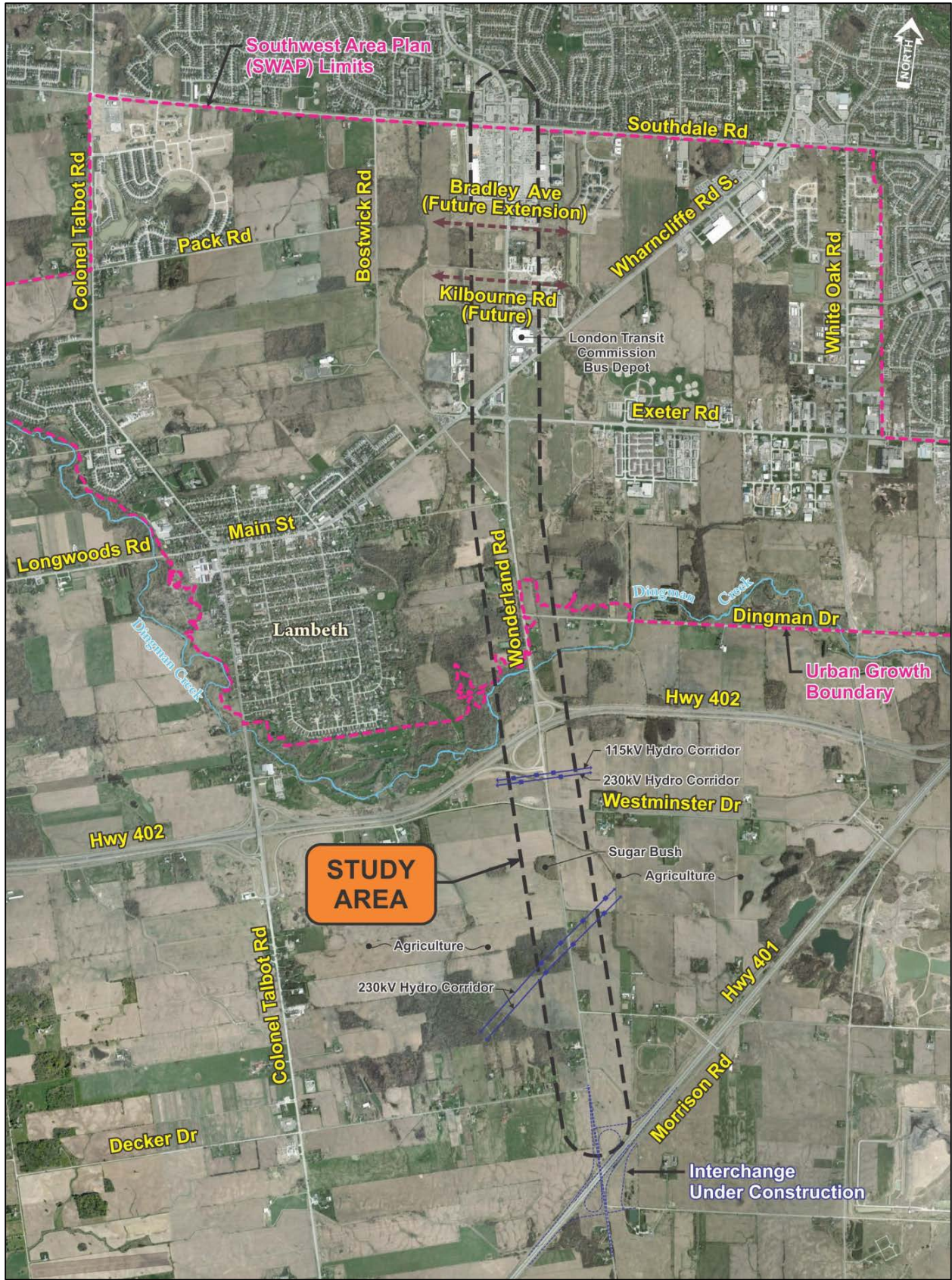
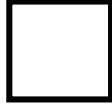


Figure 1: Wonderland Road South Study Area

The establishment of the right of way land requirements is a key outcome of the EA in order to deal with the short and long term anticipated development proposals along the subject corridor and for the protection of the future widening of Wonderland Road. The EA will identify the transportation infrastructure needs while balancing the requirements of the full range of potential users within the community including users of all ages and abilities, pedestrians, cyclists, goods movement, transit vehicles and motorists.



Urban Design

The urban design policies of SWAP further emphasize the importance of integrating the private and public realms where vibrant and dynamic urban and infrastructure design serves to encourage social interaction. Within the public realm, four street types are defined with urban design policies to set the general intent of each type. Wonderland Road South is an arterial road and its intent is captured in the following SWAP urban design policy:

Arterial/Transit Corridors are high capacity roads which serve as both a major entry way into the Planning Area and the city as a whole, along with being a route through the Planning Area to other parts of the City. A balance must be achieved between their transportation function, including accommodation for transit, and their ability to provide access to adjacent land uses, and act as a socially vibrant public space. To assist in achieving this balance, these streets will have the highest form of design treatment, including wide sidewalks, special tree and feature planting, paving, lighting and signage design.

The London Plan

The Wonderland Road South Class EA has been undertaken in the context of both the existing Official Plan policies and the emerging policies of the London Plan. A key aspect of the London Plan is creating the urban structure to support modal shifts to transit and active transportation (cycling and walking). The draft London Plan identifies Wonderland Road South from Southdale Road West to the Urban Growth Boundary just north of Highway 402 as Urban Thoroughfare and Wonderland Road South outside of the Urban Growth Boundary as Rural Thoroughfare.

The draft London Plan definition of an Urban Thoroughfare has a planned right-of-way width of 36 to 45 m with an emphasis on through movement of vehicles and freight, a high quality pedestrian realm and a high standard of urban design. The Rural Thoroughfare has a planned right-of-way width of 20 to 36 m with an emphasis on through movement of vehicles, farm equipment and freight/goods.

ENVIRONMENTAL ASSESSMENT SUMMARY

The Wonderland Road South EA has been carried out in accordance with the Schedule “C” process of the Municipal Engineers Association (MEA) Municipal Class Environment Assessment document (October 2000, as amended in 2007 and 2011).

The ESR documents the process followed to determine the recommended undertaking and the environmentally significant aspects of the planning, design and construction of the proposed Wonderland Road South improvements. It describes: the problem being addressed, the existing social, natural and cultural environmental considerations, planning and design alternatives that were considered and a description of the recommended alternative. The ESR also identifies environmental effects and proposed mitigation measures, commitments to further work, consultation, and monitoring associated with the implementation of the project. A copy of the Executive Summary for the ESR is contained in Appendix A.



Planning and Analysis of Alternatives

Phase 1 of the Municipal Class EA process involves the identification of the problem and/or opportunity being addressed by the study. It was determined that improvements are needed along the Wonderland Road South corridor to address existing and future road/traffic operational deficiencies, future transit system, long-term vision of a street design that supports active transportation, road safety, and drainage deficiencies.

Phase 2 of the Municipal Class EA process involves identifying alternative solutions (planning alternatives) to the problem/opportunity. The following six alternatives were assessed against their ability to reasonably address the problems and opportunities, and in consideration of the constraints identified in the early stages of the study, to identify the preferred solutions:

- Alternative 1 - Do Nothing
- Alternative 2 - Limit Community Growth
- Alternative 3 - Manage Transportation Demand
- Alternative 4 - Improve Intersections
- Alternative 5 - Widen Other Roadways in Proximity to the Study Area
- Alternative 6 - Widen Wonderland Road South

Recommended Planning Solution

The preferred planning solution is a hybrid combination of the preferred solutions to improve existing operational deficiencies, accommodate future travel demand and transit system expansion, address future pedestrian and cyclist movements, accommodate safe movement of slow moving farm equipment, address drainage deficiencies, and minimize social impacts and maximize social benefits:

- Widen Wonderland Road from Southdale Road to Highway 401 (Alternative 6);
- Manage travel demand including TDM (Alternative 3);
- Improve infrastructure to support active transportation and support for expanded transit service; and,
- Provide a street that has a high form of urban design treatment.

The preferred Planning Solution addresses the problems and opportunities by:

- Implementing the recommendations of the TMP;
- Creating a transportation network that supports the planned population and employment growth and the vision for Wonderland Road identified in the Southwest Area Plan and Official Plan; and,
- Supporting the function of Wonderland Road South as a significant gateway by providing the infrastructure necessary to strengthen connectivity to Highways 401 and 402.

Design Alternatives

Phase 3 of the Municipal Class EA process involves the development and review of alternative design concepts. The main outcome in this phase of the study was developing road cross-section concepts for the recommended Planning Solution to establish road right-of-way requirements.



Road cross-section concepts were developed for two distinct segments of the study area; Southdale Road W to Highway 402; and Highway 402 to Highway 401. Several road cross-section concept alternatives were developed to explore how transportation needs and urban design components could be integrated for the support of the numerous plans and policies related to future population and employment growth within the urban growth boundary.

Southdale Road West to Highway 402

It should be noted that the short section of Wonderland Road South between Dingman Drive and Highway 402 is a transitional area from the ultimate 6-lane cross section to the north, through the interchange, to the proposed 4-lane cross-section south of Highway 402. The road cross-section through this area will be determined by the preferred road cross-section to the north, the intersection design at Dingman Drive, and the speed change lane requirements for the Highway 402 Interchange ramps.

Five alternative road cross-sections were developed:

- Alternative A: 6-Lane with Frontage Street + Bike Lanes (ROW Width = 54.6 m)
- Alternative B: 6-Lane + Bike Lanes (42.0 m)
- Alternative C: 6-Lane + Off-Peak Parking + Bike Lanes (42.0 m)
- Alternative D: 6-Lane + Off-Peak Parking + Bike Lanes + Multi-Use Pathway (43.5 m)
- Alternative E: 6-Lane + Off-Peak Parking + 2-Way Bike Path (42.0 m)

An evaluation was undertaken for the above road cross-section alternatives following two basic steps:

- *Assessment of Alternatives:* The potential benefits and impacts of each alternative are assessed against a comprehensive set of criteria for socio-economic, land use and urban design, cultural, natural and technical factor groups.
- *Evaluation of Alternatives:* A comparative evaluation of the alternatives to identify a preliminary preferred design alternative.

Based on the evaluation, the preferred alternative was identified as Alternative C: 6-lane + off-peak on-street parking (long term future HOV lane to support transit) + bike lanes and a right-of-way 42.0 m. This design alternative accommodates future peak traffic volumes, has the least amount of property impact, and has boulevards on both sides of the road, providing the good opportunities for landscaping, and related community character, and gateway treatments. Figure 2 below shows the preferred road cross section of Wonderland Road South between Southdale Road West and Dingman Drive.

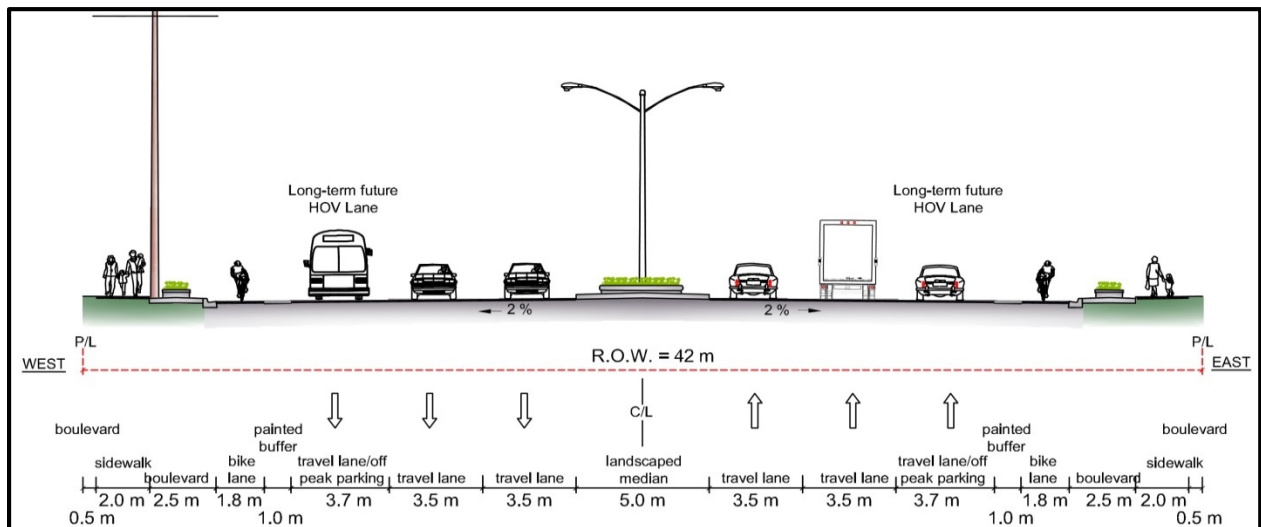
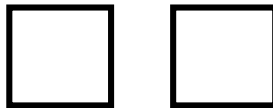


Figure 2: Preferred Road Cross Section (Southdale Road – Dingman Drive)

Highway 402 to Highway 401

The road cross-sections developed for Wonderland Road South between Highways 401 and 402 reflect the transportation needs identified for this segment of the corridor considering that it lies outside of the urban growth boundary and accommodates lower traffic volumes.

It should be noted that Wonderland Road is currently a 24-hour truck route from Westminster Drive to the north end of the City and south of Highway 401 from Morrison Dr to the south end of the City. Expanding the truck route limits to include the remaining 2.5 km missing truck route link of Wonderland Road South between Morrison Drive and Westminster Drive is necessary given the pending opening of the Highway 401 Interchange and connection to the provincial 400 series highway network. The previous Highway 401 Interchange EA and this current EA have regard for the remaining section of Wonderland Road becoming a 24-hour truck route upon opening of the Highway 401 interchange.

There is one Interim and one Ultimate road cross-section proposed as described below:

- An Interim 2-lane rural cross-section which incorporates increased travel lane widths and shoulder widths for improved safety and operations. This improved 2-lane cross-section will include turning lanes where necessary and will improve road widths where currently narrow at culvert crossings. This improved 2-lane cross-section will operate well until the future traffic volumes require widening to 4-lanes.
- The Ultimate 4-lane rural cross-section which reflects Wonderland Road South widening to 4-lanes to accommodate future traffic volumes. The proposed road right-of-way is 36.0 m.

The Interim 2-lane upgrades will enable the removal of reduced spring load limits which exist on Wonderland Road S south of Highway 402 upon completion of construction.

Consultation

External agencies, utilities, emergency service providers, property owners in proximity to the study area and First Nations were contacted during the study and requested to provide input and to comment on the study findings. The Agricultural, Transportation, Cycling, Heritage and Environmental and Ecological Planning Advisory Committees



were also contacted. Members of the general public were notified of the study through notifications in local newspapers, and invited to contact the project team and join the project mailing list. All notices were mailed to agencies, interest groups, property owners and utilities beginning with the Notice of Study Commencement on July 15, 2013. The Commencement Notice was also placed in 'The Londoner' on July 18 and July 25, 2013. Direct correspondence and meetings were held with interest groups and affected landowners as needed.

Two Public Information Centers (PICs) were held during the EA process. The first PIC was held on January 23, 2014 to notify and to invite interested parties to review information and provide input regarding: the problem being addressed, the collection of background information and the alternatives being considered.

A second PIC was held on November 11, 2014. This PIC presented a summary of the feedback received at the first PIC and the Preliminary Preferred Alternative which included elements such as recommended number of through lanes, cycle lanes and cycling facilities, main street boulevards, off-peak on-street parking, pedestrian and cycling connections to future planned recreational pathways; stormwater management, and localized realignment of municipal drains.

Very few comments were related to the need for widening i.e., there were no questions or concerns raised regarding the need for the project. Many of the comments confirmed operational deficiencies. Most comments were related to design alternatives such as the road cross-section alternatives, right-of-way requirements and associated impacts.

First Nations Consultation

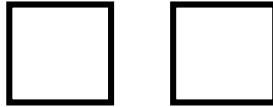
Communication with First Nation communities, with potential interest in the project, involved numerous contact points and follow-up throughout the study. City staff met with the Caldwell First Nation to discuss a range of topics pertaining to City growth and infrastructure projects.

Environmental Impact Study

The project follows the existing road corridor and encroachments into natural heritage areas are minimal. A scoped Environmental Impact Study has been completed as a component of the EA, in accordance with Official Plan Policies 15.5.1 items vii and viii. The City of London Environmental and Ecological Planning Advisory Committee (EEPAC) was provided an opportunity to review and provide comment on the EIS prior to the Class EA study being finalized. The EIS was prepared and presented to EEPAC for review/comments on May 21, 2015. Comments were received from the EEPAC on June 5, 2015 and subsequently responded to and addressed as appropriate.

Property Requirements

The road widening will predominantly take place within the right-of-way. However, the acquisition of strip widenings is required sporadically throughout the corridor where the right-of-way is constrained. The property impacts are illustrated in the ESR. The project design was configured to maximize the use of the existing right-of-way and minimize property impacts. The Recommended Plan will require portions of 46 properties. No private buildings will be directly impacted. It is envisioned that these properties will be acquired through a combination of purchase, road widening dedications at the time of development and possible expropriation if necessary.



Construction Phasing and Preliminary Cost Estimates

Based on the anticipated growth rates and forecasted traffic volumes, the ultimate 6-lane cross-section for Wonderland Road South between Southdale Road West and Highway 402 will be required by 2033. The interim widening of Wonderland Road South between Exeter Road and Highway 402 is planned for 2024. The 4-lane widening between Highway 402 and 401 is planned for 2028.

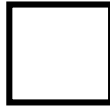
Since it is estimated that the need for four lanes south of Highway 402 is longer-term (planned for 2028), some improvements to the existing 2-lane Wonderland Road South will be required in the shorter term. Therefore, the City is planning improvements that will reconstruct the 2-lane road between Highway 402 and 401 to current road design standards, including provision of a partially paved shoulder in 2017. Traffic capacity needs will be monitored after the Highway 401 interchange opens, and the timing of future road improvements will be assessed accordingly.

A preliminary construction cost estimate summary for Wonderland Road is presented in Table 1 below. The costs include roadway construction, traffic signals, street lighting structures, stormwater management, utility relocation, landscaping, traffic control and temporary staging. The construction costs do not include new or replacement municipal services (i.e., sanitary sewers, watermains), major landscaping or gateway features, and property acquisition costs.

Table 1: Preliminary Construction Cost Estimate

Wonderland Road South Limits	Proposed Improvements	Schedule	Length (km)	Construction Cost (Million)
North of Southdale Road West to South of Bradley Avenue	Road Widening from 4-lane urban to 6-lane urban	2033	1.1	\$3.5
South of Bradley Avenue to South of Exeter Road	Road Reconstruction 4-lane rural to 6-lane urban	2033	1.3	\$10.0
South of Exeter Road to South of Highway 402	Road Reconstruction 2-lane rural to 4-lane urban including Dingman Creek Culvert Widening and Highway 402 Underpass Twin Structure	2024	2.6	\$19.6
South of Exeter Road to North of Dingman Drive	Road Widening from 4-lane urban to 5/6-lane urban ¹	2033	1.3	\$1.4
South of Highway 402 to Highway 401 (Decker Drive)	Road Reconstruction - 2-lane rural	2017	2.1	\$10.9
	Road Widening from 2-lane rural to 4-lane rural	2028	2.1	\$4.8
	TOTAL		7.1	\$50.2

1. 2033 South of Exeter Road to South of Hamlyn Street to road widening from 4 to 6 lanes; south of Hamlyn Street to Dingman Drive road widening from 4 to 5 lanes . The short section of Wonderland Road South between Dingman Drive and Highway 402 is a transitional area from the 6-lane cross section to the north, through the interchange, to the proposed 4-lane cross-section south of Highway 402.



The costs identified above are construction costs which include engineering and utility relocation, but do not include property acquisition costs. These costs are generally close to the estimates contained in the 2014 Development Charges Background Study. However, the requirement to widen the Highway 402 interchange structure in the Exeter Road to Highway 402 stage shifts some costs from the 2028 to the 2024 phase. This will be reflected in the next DC Background Study. With the exception of the ultimate 6-lane widening, budget for the design, land acquisition and utility relocation for the Wonderland Road South widening have been identified in the 2014 DC Background Study at the schedules identified in the EA.

CONCLUSION

Phased improvements to Wonderland Road South are necessary for the corridor to fulfill its necessary function in the transportation network and to support growth in the southwest part of London. The provincial Environmental Assessment Act requires the completion of an EA for projects of this scope. The improvements identified in this EA will help fulfill the Strategic Plan Area of Focus of Building a Sustainable City by providing convenient and connected mobility choices for all Londoners.

A Municipal Class Environmental Assessment (EA) was undertaken for the Wonderland Road South Improvements between Southdale Road West and Highway 401. An ESR has been completed and is ready for final public review.

The EA was prepared with input from external agencies, utilities, emergency service providers, agricultural community and other stakeholders, as well as First Nations and property owners in proximity to the study.

Based on the evaluation of five road cross-section alternatives, the preferred alternative for the ultimate improvements to Wonderland Road South between Southdale Road West and just north of Highway 402 was identified and included a 6-lane urban road cross section, off-peak on-street parking (long term future HOV lane to support transit), bike lanes and a 42 m right-of-way. The preferred alternative for the remaining section of Wonderland Road South between Highway 402 and Highway 401 identifies an ultimate 4-lane rural road cross section and a 36 m right-of-way.

Pending Council approval, a Notice of Completion will be filed, and the ESR will be placed on public record for a 30 day review period.

- Stakeholders and the public are encouraged to provide input and comments regarding the study during this time period.
- Should the public and stakeholders feel that issues have not been adequately addressed, they may provide written notification within the 30-day review period to the Minister of the Environment requesting further consideration.
- Implementation of the projects identified in this report requires approval of the EA.

Acknowledgements

This report was prepared with assistance from Maged Elmadhoon, Transportation Planning Engineer in the Transportation Planning & Design Division.

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Attach: Appendix "A" – Environmental Study Report Executive Summary

c: Michael Chiu, P.Eng.; MMM Group Limited



APPENDIX A

Environmental Study Report Executive Summary

Wonderland Road South is the primary gateway from Highways 401 and 402 and is the ‘spine’ of southwest London and the Southwest Area Secondary Plan (SWAP). The City of London is undertaking a ‘Schedule C’ Municipal Class Environmental Assessment (EA) Study for improvements to Wonderland Road South, from Southdale Road West to the new interchange at Highway 401. The existing Wonderland Road South is an urban 4-lane roadway between Southdale Road West and Exeter Road and a 2-lane rural road from south of Exeter Road to Highway 401. The purpose of improvements to the Wonderland Road South corridor is to create a transportation network that provides the north-south arterial road capacity and active transportation infrastructure necessary to support the future population and employment growth planned in the SWAP as well as support regional and local transportation needs by improving connectivity to provincial Highways 401 and 402. The future corridor will perform high levels of both mobility and access, as well as a gateway to west London.

It should be noted that Wonderland Road South is currently a 24-hour truck route from Westminster Drive to the north end of the City, and from Morrison Drive to the south end of the City. Expanding the truck route limits to include the remaining 2.5 km link of Wonderland Road South between Morrison Drive and Westminster Drive is necessary given the pending opening of the new Highway 401 Interchange and connection to the provincial 400 series highway network. This EA study has had regard for proposed change to the truck route.

Upon completion, Wonderland Road South will be a 6-lane urban road between Southdale Road West and Highway 402, and a 4-lane rural road between Highways 402 and 401.

A scoped Environmental Impact Study has been completed as a component of the Class EA Study, in accordance with Official Plan Policies 15.5.1 items vii and viii. The City of London Environmental and Ecological Planning Advisory Committee (EEPAC) was provided an opportunity to review and comment on the EIS prior to the Class EA study being finalized.

Planning Context

Southwest Area Secondary Plan (SWAP)

The SWAP was the product of a City-led planning process to guide growth in one of the City’s last and largest reserves of land. The purpose of the SWAP (April 29, 2014 as amended by OMB PL 130020) is to establish a vision, planning principles and policies for the development of the Southwest Planning Area, an area generally bounded by Southdale Road West, White Oak Road, Exeter Road, Wellington Road South, Green Valley Road and the Urban Growth Boundary. The SWAP was prepared on the premise that growth will occur over the next 50+ years. The Plan has factored significantly into the Wonderland Road South Class EA study, as elaborated upon in the specific policies including: Vision, Community Structure Plan, Trail Network, Transportation and Urban Design. The future character and function of the Wonderland Road South corridor,



within the City's urban growth boundary, is envisioned in the SWAP. The section of Wonderland Road South from Southdale Road West to Hamlyn Street is designated 'Enterprise Corridor', a designation applied to accommodate a broad range of commercial, residential, office and institutional uses. The Enterprise Corridor envisions a lively mixed use corridor, an animated streetscape 'framed' by tree canopy and 'punctuated' by strong gateway features; and a 'complete street' that supports a variety of uses and users. The vision for Wonderland Road South is one that provides facilities for cyclists, pedestrians, transit users with strong relationships to surrounding land use. As the area grows and redevelops, Wonderland Road South will be transformed from the current roadway to a multi-modal corridor in the heart of southwest London.

London 2030 Smart Moves - Transportation Master Plan (TMP)

The TMP was centered on five strategies, or "Smart Moves":

- ▶ Rethinking Growth to Support the TMP
- ▶ Taking Transit to the Next Level
- ▶ Actively Managing Transportation Demand
- ▶ Greater Investment in Cycling and Walking Infrastructure
- ▶ More Strategic Program of Road Network Improvements

In the context of the 'more strategic program of road network improvements', and recognizing the growth objectives within the SWAP, the TMP identified the following improvements for Wonderland Road South as part of the 2030 baseline road network:

- ▶ Widen Wonderland Road South to 6 lanes between from Southdale Road West to Exeter Road;
- ▶ Widen Wonderland Road South to and 4 lanes from Exeter Road to Scotland Drive;
- ▶ Improve the intersection of Wonderland Road South / Wharncliffe Road South / Exeter Road by constructing a raised concrete median and northbound and southbound left turn lanes on Wonderland Road South at Wharncliffe Road South.

Other key elements of the planning context for the Wonderland Road South corridor are:

- ▶ The London Plan (Draft)
- ▶ Wonderland Road / Wharncliffe Road / Exeter Road Triangle Technical Study Review
- ▶ Bicycle Master plan (2005), Implementation Plan (2007) and London ON Bikes (2015)
- ▶ SHIFT (2015)

Needs and Opportunities

Improvements are needed along the Wonderland Road South corridor to address/accommodate:

- ▶ Existing operational deficiencies in both urban and rural parts of the corridor;
- ▶ Future travel demand associated with planned population and employment growth;



- ▶ An enhanced north-south transportation corridor to facilitate both local and regional movement of people and goods;
- ▶ Future transit system expansion along the corridor;
- ▶ Pedestrian and commuter cyclist movements through the corridor and connectivity to existing and planned recreational pathways;
- ▶ Long-term vision of a street design that supports a pedestrian and mixed-use built environment within the Urban Growth Boundary;
- ▶ Safe movement of slow moving farm equipment in areas of the corridor that will remain rural/agricultural;
- ▶ Drainage deficiencies and opportunities for Stormwater Management, particularly in the section south of Highway 402.

This study is an opportunity to contemplate both the function and the character of the future Wonderland Road South corridor in the context of:

- ▶ transportation needs identified in the TMP and confirmed during this study;
- ▶ the existing urban environment and the planned future urban environment associated with the implementation of the Southwest Area Secondary Plan;
- ▶ growth and transportation policies contained in The London Plan (Draft);
- ▶ continued agricultural operations outside of the Urban Growth Boundary.

The key transportation problems and needs can be summarized as follows:

Problems:

- ▶ The roadway capacity analysis (volume to planning level capacity ratio) indicated that a segment of Wonderland Road South between Exeter Road and Dingman Drive was operating at 'Very-Congested' (with a v/c ratio over 1.0) traffic conditions, that justified a need for additional capacity in the near future. The v/c between Southdale Road West and Wharncliffe Road South was between 0.8 and 0.9, which indicated 'Unstable' flow conditions.
- ▶ The future (2033) roadway capacity analysis for a 'Do-Nothing' scenario indicated that without any additional capacity, the study area corridor was expected to operate with significant congestions (very high v/c ratios) and unacceptable level of service with the future development.
- ▶ The Wonderland Road South intersections with Southdale Road West, Wharncliffe Road South and Exeter Road are already operating at an overall LOS 'D' during afternoon peak hour which indicated that these intersections do not have spare capacity available to accommodate future traffic demand.
- ▶ Collision data analysis indicated that the intersection at Wonderland Road South and Southdale Road West accounts for nearly half of all the collisions within the study area. This intersection has experienced 155 collisions in five years (2008-2012) with the collision rate of 1.77.
- ▶ The intersections on Wonderland Road South at Wharncliffe Road South and Exeter Road have experienced 71 and 56 collisions (during 2008-2012), respectively. These result in collision rates of 0.94 for Wharncliffe Road South intersection and 0.83 for Exeter Road intersection.
- ▶ The intersection at Wharncliffe Road South and Exeter Road has experienced 21 collisions during five year period, resulting in a collision rate of 0.57.



Needs:

- ▶ Wonderland Road South is envisioned to be a significant gateway to London and the primary north-south connection between 400 series Highways and Central London. The gateway is intended to provide a *stunning approach* to the City. A high level design for the adjacent build form and enhanced landscaping, tree planting and boulevard treatment along Wonderland Road South intended to create a high quality visual presence for this vital gateway.
- ▶ The City of London TMP – ‘Smart Moves’ identified Wonderland Road South for widening as part of the 2030 network improvements (six lanes from Southdale Road to Exeter Road, and four lanes from Exeter Road to Highway 402), as well as intersection improvements at the Wonderland Road South / Exeter Road / Wharncliffe Road South triangle.
- ▶ Considering various evaluation criteria (e.g. socio economic and land use, cultural environment, natural environment and technical considerations), six basic lanes between Southdale Road West and Highway 402 and four basic lanes south of Highway 402 were identified as being required within the planning horizon (2033).
- ▶ The signal warrant analysis for the future (2033) conditions indicated that the existing un-signalized intersections at Dingman Drive, Highway 402 ramp terminals, and Westminster Drive would require traffic signals. The new intersection at Kilbourne Road is also warranted for the traffic signals. With the proposed 6-lane widening with a central median, the intersection at Hamlyn Street is also recommended with traffic signals.

Alternatives and Evaluation

Preferred Planning Solution

The preferred planning solution includes a combination of the following solutions:

- ▶ Widen Wonderland Road South from Southdale Road West to Highway 401; and
- ▶ Manage travel demand including TDM, improve infrastructure to support active transportation and support for expanded transit service.

The preferred planning solution addresses the problems and opportunities by:

- ▶ Implementing the recommendations of the TMP by providing additional traffic capacity in the north-south arterial road network to meet future travel demand;
- ▶ Creating a transportation network that fully supports the planned population and employment growth and the intended vision for Wonderland Road South (land use, character, transit hub), as identified in the SWAP and Official Plan;
- ▶ Supporting the function of Wonderland Road South as a gateway to central and north London and the realization of City’s Economic Development Strategy, by providing the infrastructure necessary to strengthen connectivity to and from Highways 401 and 402;
- ▶ Providing an opportunity to improve deficiencies in the portion of the corridor that will remain rural (outside of the Urban Growth Boundary).



Preferred Road Cross-Sections

Road cross-section concepts were developed for two distinct segments of the study area:

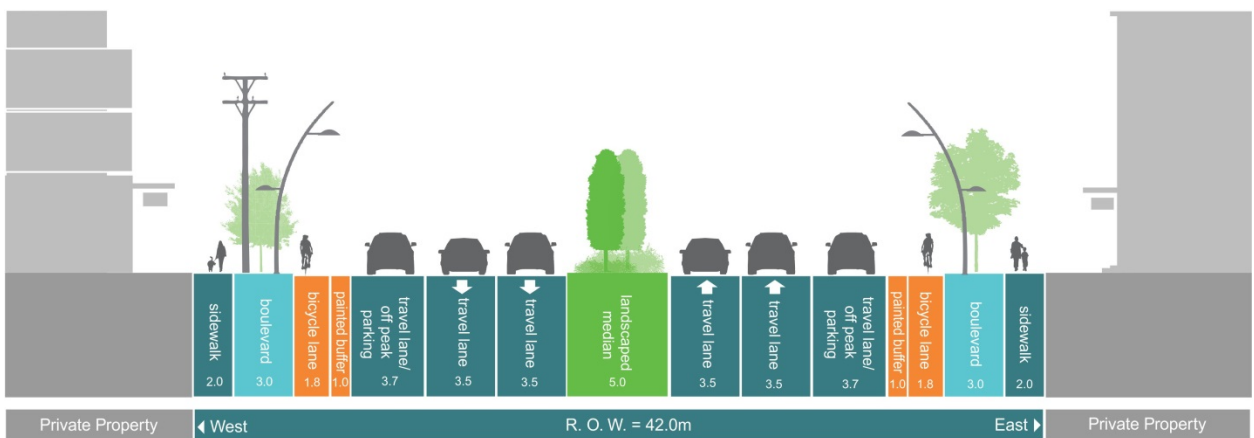
- ▶ Southdale Road West to Highway 402; and
- ▶ Highway 402 to Highway 401.

This approach reflects the results of the transportation needs assessment which determined different lane requirements within each segment to meet future travel demand.

Southdale Road West to Highway 402

Based on the evaluation, the preferred alternative for Wonderland Road South from Southdale Road West to Highway 402 was identified as **Alternative C: 6-Lane + Off-Peak Parking + Bicycle Lanes** for the following reasons:

- ▶ It accommodates future peak traffic volumes;
- ▶ It has the minimum right-of-way requirements and therefore the least amount of property required (and least footprint impact);
- ▶ It includes opportunities for on-street parking that is a critical aspect to street vibrancy and access to future ‘street-front’ businesses envisioned by the SWAP;
- ▶ It will not limit mid-block access to the extent that Alternative A (Frontage Street) would (although mid-block access opportunities are still subject to access policies and development-specific transportation impact assessment);
- ▶ It has boulevards on both sides of the road, providing the good opportunities for landscaping, and related community character, gateway treatments; and
- ▶ The location of the commuter bicycle lanes (on the road) has less potential to disrupt pedestrians than other alternatives.



Highway 402 to Highway 401

An Interim 2-lane rural cross-section incorporates standard travel lane widths and shoulder widths for improved safety and operations until the future traffic volumes require widening to 4-lanes.

The Ultimate 4-lane rural cross-section reflects Wonderland Road South widening to 4-lanes to accommodate future traffic volumes. The proposed road right-of-way is 36.0 m. In addition to addressing through-traffic needs, the Interim and Ultimate road cross-sections were developed considering:



- ▶ Use of this corridor by farm equipment and the benefit of providing additional shoulder width to accommodate farm vehicles;
- ▶ Use of this corridor by cyclists and the benefit of providing standard travel lanes and paved shoulders; and
- ▶ The intent for enhanced landscape plantings or other gateway features to announce the entrance into the City.

Preferred Road Widening Alternative

Initially, conceptual plans were developed to widen the Wonderland Road South corridor:

- ▶ on existing centreline
- ▶ to the east only (holding westerly property line)
- ▶ to the west only (holding easterly property line)

For much of the study area, there are existing constraints located along both sides of Wonderland Road South. Therefore, it was not considered reasonable to develop alternatives that widen “strictly” to the east or west, or on the existing centreline.

Based on the preliminary screening of alternatives, it is proposed to widen along a “best fit” alignment, that is, widen the road in such a way that best accommodates the surrounding land uses and constraints. “Best fit” locations were evaluated and selected to improve the existing roadway alignment, avoid or minimize environmental impacts and significant physical and utility constraints. These included:

- ▶ Sugar Bush: The Project Team made efforts to avoid the Sugar Bush so as to avoid impacting current agri-business operations. It is proposed that road widening adjacent to the sugar bush be to the east.
- ▶ Westminster Drive: The effort to avoid the Sugar Bush also provides an opportunity to improve the Westminster Drive intersection by shifting it slightly east and realigning the CB Smith Municipal Drain to address intersection operational issues and localized drainage issues.
- ▶ Locally Significant Wetland: Opportunities to avoid impacts to the LSW are significantly constrained by the hydro tower immediately adjacent to the east side of the road and a residence on the east side of the road, just north of the hydro corridor. The Project Team considered options to avoid the wetland including: a slight easterly shift to hold the west edge of road; and a new road alignment further east. Both options were deemed to have significant socio-economic impacts. Widening to the east would result in impacts to the residence and require relocation of the hydro tower located immediately adjacent to the road, at significant cost and resulting in additional impacts to the property. Road realignment (i.e., shifting the road further east) is constrained by road geometric requirements such that the realignment would impact the farm to the south, severing it from the surrounding farm fields, and create a new intersection location at Scotland Drive. Therefore ‘best fit’ alignment in this location holds the existing east edge of the road to avoid relocating the hydro tower and property impacts, but results in edge encroachment into the LSW.
- ▶ Natural Areas located along the west side of Wonderland Road South near Dingman Drive: These areas include the unevaluated vegetation patches that are contiguous with the East Lambeth Forest ESA and Dingman Creek Significant Corridor, forming part of a very large natural heritage / habitat mosaic. The Project Team considered means of avoiding impacts to these natural areas.



However, opportunities to avoid the natural areas on the west side by widening to the east are constrained by road geometric design requirements and limited distance / flexibility for adjusting road alignment between Highway 402 and Dingman Drive. The resulting impact is deemed very minor in magnitude and of low significance (about 140 m² or ~ 0.01ha).

- ▶ Dingman Creek Corridor at the Dingman Creek crossing structure: The Dingman Creek crossing structure will require an extension on the east side of Wonderland Road by ~ 3 m. Extension of the structure can occur within the existing road right-of-way. The bridge had been built to accommodate additional lanes, however a slight widening will still be required to accommodate the proposed 4-lanes and the Highway 402 off-ramp. However, widening can be isolated to one side to minimize impacts to the Dingman Creek corridor. By widening to the east, impacts will be contained within the right-of-way and will be limited to vegetation communities and habitat that are more open/disturbed than on the west side.

Recommended Plan

Refer to the plan and profile Design Plates provided in **Section Error! Reference source not found.** for details of the Wonderland Road South Recommended Plan. The Recommended Plan for Wonderland Road South between Southdale Road West and Highway 402 includes the following key components:

- ▶ reconstruction of Wonderland Road South to an Interim 4-lane, and Ultimate 6-lane urban cross-section from Southdale Road West to Highway 402;
- ▶ minor alignment shift of the existing Wonderland Road South between Bradley Avenue and Wharncliffe Road South to maintain London Transit operations at the London Transit terminal;
- ▶ improvement of existing intersections with signalization and the addition of auxiliary turning lanes where appropriate;
- ▶ incorporation of active transportation facilities within the corridor to support pedestrian/cycling activity, including a 1.8 m on-road bicycle lane with 1.0 m buffer and 2.0 m sidewalk on each side of Wonderland Road South;
- ▶ flexibility to use the outside 3.7 m lane for off-peak on-road parking or as a long-term future designated HOV lane between Southdale Road West to Hamlyn Street; and
- ▶ provision of a wide median (5 m) where feasible in the corridor, for enhancement of the streetscape and attractiveness of corridor with street trees, lighting, signage and gateway features;
- ▶ a 2-lane roundabout at Dingman Drive;
- ▶ an opportunity for a gateway feature or public art display within the roundabout, announcing the entrance to the City;
- ▶ allowance of U-Turns at signalized intersections when widened to 6-lanes; and
- ▶ a review of entrances / driveways / accesses in the context of the City's Access Management Guideline.

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The Recommended Plan for Wonderland Road South between Highway 402 and Highway 401 includes the following:

- ▶ reconstruction of Wonderland Road South to a widened Interim 2-lane rural cross-section, and Ultimate 4-lane rural cross-section;
 - the Interim 2-lane road includes 3.5 m travel lanes, 1.5 m paved shoulder and 1.5 m gravel shoulder;
 - the Ultimate 4-lane road includes 3.5 m travel lanes, 1.5 m paved shoulder and 1.5 m gravel shoulder;
- ▶ minor shifts in the alignment of Wonderland Road South based on existing constraints along the corridor;
- ▶ improvement of intersection operations with signalization and the addition of auxiliary turning lanes, where appropriate;
- ▶ connection of Wonderland Road South, south of Decker Drive, to the new Highway 401 interchange;
- ▶ localized realignment of the CB Smith and Krasnicki Municipal Drains, within the road right-of-way to accommodate the road improvements.

Preliminary Cost Estimate

A preliminary construction cost estimate summary for Wonderland Road is presented below and the detailed breakdown is included in Error! Reference source not found..

The cost estimates are provided in 2015 dollars. The costs include the roadway construction, traffic signals, illumination, cut/fill, and structures where applicable. The minor items included are: stormwater management, utility relocation, landscaping, traffic control, temporary staging, pavement marking, signing and subdrains. The construction costs do not include new municipal services (i.e., sanitary sewers, watermains); gateway features, and property acquisition costs.

Wonderland Road South Limits	Proposed Improvements	Estimated Time of Construction	Length (km)	Construction Cost (M)
North of Southdale Road West to South of Bradley Avenue	Road Widening from 4-lane urban to 6-lane urban	by 2033	1.1	\$3.5
South of Bradley Avenue to South of Exeter Road	Road Reconstruction from 4-lane rural to 6-lane urban	by 2033	1.3	\$10.0
South of Exeter Road to South of Highway 402	Road Reconstruction from 2-lane rural to 4-lane urban including Dingman Creek Culvert Widening and Highway 402 Underpass Twin Structure	2024	2.6	\$19.6

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Wonderland Road South Limits	Proposed Improvements	Estimated Time of Construction	Length (km)	Construction Cost (M)
South of Exeter Road to North of Dingman Drive	Road Widening from 4-lane urban to 5/6-lane urban ¹	by 2033	1.3	\$1.4
South of Highway 402 to Highway 401 (Decker Drive)	Road Reconstruction - 2-lane rural	2017	2.1	\$10.9
	Road Widening from 2-lane rural to 4-lane rural	2028	2.1	\$4.8
TOTAL			7.1	\$50.2

¹ South of Exeter Road to South of Hamlyn Street to road widening from 4 to 6 lanes; south of Hamlyn Street to Dingman Drive road widening from 4 to 5 lanes (see Design Plates 5 and 6 in Section 6.8)

Property Requirements

The Recommended Plan will require portions of 46 properties. A property plan has been prepared under separate cover to guide the City in negotiations with property owners. No residences or business will be directly impacted (displaced).

Consultation

External agencies, utilities, emergency service providers, municipalities and other stakeholders, as well as property owners in proximity to the study area were contacted during the study and requested to provide input and to comment on the study findings. Members of the general public were notified of the study through notifications in local newspapers, and invited contact the project team to join the project mailing list.

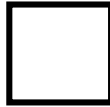
Communication with First Nation communities involved numerous contact points and follow-up throughout the study. City staff met with Chief Hillier of Caldwell First Nation to discuss a range of topics pertaining to City growth and infrastructure projects.

Stakeholder meetings were held with two property owners:

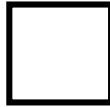
- ▶ St. Sava Serbian Church and Cultural Centre - regarding their concerns over increasing traffic from the new interchange at Highway 401 and access to their property on the west side of Wonderland Road South. The City has committed to implement a left-turn lane and a right-turn taper at the St. Sava entrance, as part of the interim improvements planned for 2017.
- ▶ Farmer / Agribusiness Operator / Property Owner - regarding a number of issues/considerations related to their operations, movement of farm equipment and access, knowledge of the corridor and specific deficiencies (e.g., drainage). The Project Team has carefully this considered this feedback in developing the Recommended Plan.

Commitments to Further Work

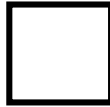
Mitigation measures as well as environmental protection and enhancement measures will be incorporated into the detailed design and employed during implementation of the Recommended Plan to reduce or avoid environmental impacts. The table below summarizes the key considerations and commitments to future work.



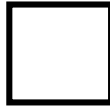
Factor	Considerations / Commitment to Further Work
Property	
<ul style="list-style-type: none"> The Recommended Plan will impact 46 properties through encroachment No residences or business will be directly impacted (i.e., removed) 	<ul style="list-style-type: none"> City of London will negotiate with individual property owners to provide fair market value for the required property. It is the City's intent to have the Municipal Drain realignments contained within the road right-of-way and complete any necessary Drainage Act requirements accordingly.
Access	
<ul style="list-style-type: none"> The highest rated issue among stakeholders at PIC 1 Access considerations include commercial/retail access in north portion of corridor and farm access in south portion of corridor 	<ul style="list-style-type: none"> Assess all corridor accesses in accordance with the City's Access Management Guidelines. Work with commercial property owner in SE quadrant of Southdale Road West/Wonderland Road South intersection to develop the plan for relocation of the commercial driveway access further south and a reconfigured parking area. Continue to consult with business owners in the 'triangle' regarding changes to their access as a result of the proposed raised medians. Two farm field accesses located south of Dingman Drive (on east and west sides of Wonderland Road South) will be maintained but will be provide right-in/right-out access. One access is located close to the Hwy 402 off-ramp/merge lane. No farm field accesses are proposed to change between Highway 402 and 401. Work with farm owners and operators to ensure access to fields is maintained as needed, during road construction. The City will continue to work with St. Sava Serbian Church to develop a design for the right and left turn lanes at the church entrance, as part of the detailed design for the 2 lane interim plan (2017). Hydro One Networks Inc. currently utilizes farm field entrances to access their corridor east and west of Wonderland Road South, just south of Highway 402. Hydro One had requested that they be provided with new access directly to their corridor from Wonderland Road South. However, given the proximity of the hydro corridor to the Highway 402 interchange, and given that the farm accesses will remain open, the Recommended Plan is to maintain status quo.
Agriculture	
<ul style="list-style-type: none"> Direct impacts to agricultural lands and related impacts to production Any indirect impacts to agricultural operations would be temporary in nature (construction 	<ul style="list-style-type: none"> Impacts to agricultural lands will be minimized where possible. Direct impacts to agricultural lands and related impacts to production will be mitigated / compensated through the property acquisition process. Contractors will be required to allow farm equipment movement. Access to farm properties will be maintained during and after construction.



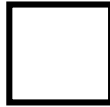
Factor	Considerations / Commitment to Further Work
<ul style="list-style-type: none"> vehicles on side roads) • Agricultural fields which may have tile drainage, whereby land acquisition may require removal and / or modifications to existing drainage works • Flooding issues 	<ul style="list-style-type: none"> • Tile drainage systems within and adjacent to the proposed new right-of-way will be identified in consultation with property owners, during detailed design. Tile drains will be avoided where possible and the tile drain network will be modified, as required, to ensure that impacted tiles are removed / closed and that remaining tiles continue to function. Given landowner concerns about drainage, it will be important to demonstrate to landowners that farm drainage will continue to function. • Drainage and flooding issues at the intersection of Westminster Drive and Wonderland Road South will be addressed, as feasible, during the detailed design phase. Consultation with the property owner in the NE quadrant will be required to discuss flooding history and impacts to agricultural lands.
Vegetation	
<ul style="list-style-type: none"> • Vegetation removal and edge encroachment impacts to significant natural heritage features • Removal of plant species of conservation concern 	<ul style="list-style-type: none"> • The extent of encroachment within the adjacent natural features and, in particular, significant natural features should be limited as much as possible to minimize impacts on the feature/natural vegetation. • Special design mitigation measures should be considered during detailed design to minimize encroachment into the significant features. These measures could include steeper grading slopes to minimize the road footprint. A retaining wall could be considered to reduce impacts adjacent to the Locally Significant Wetland, where edge encroachment is more substantial. • Implement edge management and buffer plantings to treat new vegetation edge and reduce indirect impacts in the remainder of the natural area that is retained. • Re-establish vegetation in the newly cleared/graded areas that are not to be paved. Select species based on the City and UTRCA guidelines. • Woodland trees are to be retained and protected, if feasible. • Tree and vegetation protection is recommended for all trees and vegetation being retained. Tree protection should be outlined in a Tree Protection Plan (TPP). Vegetation protection should be outlined on specification drawings in detailed design. Protection should be implemented to ensure encroachment within the adjacent natural features is restricted to the identify construction footprint. • Regionally rare plant species that have the potential to be removed may be considered for relocation prior to construction. • Develop a mitigation strategy in accordance with Official Plan Policies, to offset the removal of vegetation communities/habitat associated with Significant Natural Features and the Natural Heritage System. This will include replacement plantings at a ratio of 1:1, for the areas affected. Opportunities for compensation will be



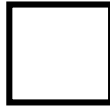
Factor	Considerations / Commitment to Further Work
	<p>identified and developed by the City, ideally within the Dingman Creek watershed, during detailed design. City staff will consider comments by EEPAC in developing implementing the compensation plan.</p>
Wildlife Habitat	
<ul style="list-style-type: none"> • Loss of wildlife during construction • Impacts to wildlife due to removal of vegetation/habitat • Localized potential for nesting by some species in adjacent vegetation that may be disturbed by the construction activities • Wildlife passage 	<ul style="list-style-type: none"> • No work is permitted to proceed that would result in the destruction of active nests (nests with eggs or young birds), or the wounding or killing of birds, of species protected under the Migratory Birds Convention Act, 1994 and/or Regulations under that Act. • Ensure that timing constraints are applied to avoid vegetation clearing (including grubbing) during the breeding bird season for tree nesting (approximately May 1 to Aug 8). It should be noted that occasionally bird species will precede or exceed the approximate breeding bird season window. Migratory bird species that use structures for nesting often commence nesting later, and may continue nesting beyond, the above period. • Any trees identified for removal as part of the detailed design should be surveyed for potential suitable bat habitat (i.e. cavity) prior to removal. • The City will consider comments made by EEPAC in identifying any additional targeted wildlife surveys to be undertaken during the detailed design phase. • Wildlife exclusion fencing may be considered to keep wildlife out of the construction zone, particularly in areas adjacent to natural habitat features e.g. fencing to prevent movement of amphibians and reptiles into the construction zone in areas adjacent to wetlands. • In the event that an animal encountered during construction does not move from the construction zone and construction activities are such that continuing construction in the area would result in harm to the animal, all activities will stop and the Contract Administrator will be notified. • In the event that a SAR or possible SAR is found in the construction area, all construction that could potentially harm the animal will cease immediately and the Contract Administrator will be notified. The Contract Administrator will then contact the MNR SAR Biologist for direction, as these animals are protected under the ESA (2007).
Fisheries & Aquatic Habitat	
<ul style="list-style-type: none"> • Impact on fish habitat due the proposed widening of Dingman Creek bridge, culvert replacements and realignment of CB Smith and Krasnicki Drains 	<ul style="list-style-type: none"> • Complete the DFO Self-Assessment process to determine if DFO review under the Fisheries Act is required and consult with DFO as necessary to complete the review and/or obtain Fisheries Act Authorization, as applicable. • Implement DFO's measures to 'avoid harm to fish' (use tools available on DFO's website). Measures to avoid harm include those outlined in Table 8-1 (Section 8.4). • Implement construction timing window for warmwater



Factor	Considerations / Commitment to Further Work
	<p>fish community at all watercourse crossings (and Municipal Drains) with no in-water work permitted between March 1 and June 30.</p> <ul style="list-style-type: none"> Implementation of erosion and sediment control measures will also protect fish habitat.
Erosion and Sediment Control	
<ul style="list-style-type: none"> Excavation and grading may result in erosion of exposed soils that can be carried via overland flow and drainage channels Dingman Creek during storm events Given the erosion issues and concerns within the Dingman Creek subwatershed generally, a high level of diligence with respect to managing erosion and sedimentation and maintaining fully functioning control systems 	<p>Relevant mitigation measures will include the following:</p> <ul style="list-style-type: none"> Vegetation removal will be limited to only what is required for grading and ditching operations, and will be clearly identified on the drawings. Erosion and sediment control BMPs will be implemented throughout construction to prevent migration of sediment to the watercourses/municipal drains within the study area and all other natural features. Any works in the watercourse or along the banks will be isolated from the main flow and conducted ‘in the dry’ using flow passage systems including cofferdams. Any dewatering operations will be directed onto a suitable vegetated area at least 30 m away from watercourses, or into a sediment settling basin or filter bag which will allow sediments to settle out prior to discharging to the watercourse. The discharge point for dewatering activities shall be suitable so as not to create additional erosion or sediment related impacts. New or re-constructed ditches will be properly stabilized using vegetation or rock protection depending on slope. Rip rap or other clean granular stabilizing materials free of fines, will be installed at outlets and spillways. Stabilization and re-vegetation of all disturbed surfaces will be established as soon as possible following excavation and construction to protect against erosion and sedimentation of local drainage.
Surface Water	
<ul style="list-style-type: none"> Road runoff could impact water quality if not properly handled Erosion and flood risk in the receiving watercourses Changes to the hydrologic characteristics of adjacent wetlands and woodlots 	<p>The proposed stormwater management strategy will provide stormwater quality and quantity control. The key elements are summarized below and elaborated upon in Section 6.3 and in the Drainage and Stormwater Management Report (Appendix E):</p> <ul style="list-style-type: none"> Southdale Road West to Bradley Avenue - road drainage will continue to be conveyed in existing storm sewers to the existing stormwater Pincombe Drain SWM Pond 1, located east of Wonderland Road South, behind the commercial development, for water quality treatment and quantity control. Bradley Avenue to Wharncliffe Road South - road drainage will be conveyed in a new storm sewer system to the southeast quadrant of the intersection of Wonderland Road South and Wharncliffe Road South, in the vicinity of the existing 1350 mm culvert. After outletting from the storm sewer system, flows from this section will be conveyed via the existing Pincombe Drain tributary to a future Pincombe Drain SWM Pond 4,



Factor	Considerations / Commitment to Further Work
	<p>to be located on the east side of Wonderland Road approximately 230 m south of Hamlyn Street, for water quality treatment and quantity control.</p> <ul style="list-style-type: none"> • Wharncliffe Road South to Hamlyn Street - road drainage will be conveyed in a new storm sewer system which will outlet to the future Pincombe Drain SWM Pond 4, as described above. • Hamlyn Street to Highway 402 - The northern portion this section, from the north limit to Dingman Creek, will have an urban cross-section, while the remaining portion extending to Highway 402 will have a rural cross-section. Road drainage in the urban section will be conveyed to Dingman Creek via a future storm sewer system. Road drainage in the rural section will be conveyed to Dingman Creek via grassed swales. Water quality treatment will be provided by an oil/grit separator prior to flows discharging to Dingman Creek. Compensation will be included in the design of Pincombe Drain SWM Pond 4 (or other suitable locations) for the lack of water quantity control provided directly for road drainage from this section. • Highway 402 to just north of Highway 401 - road drainage will continue to be conveyed to the municipal drains in the study area. Water quality treatment will be provided through linear grass-lined ditch systems within the road right-of-way. Drainage improvements to the municipal drains will be required, including relocations and/or realignments. • The Sugar Bush is to be maintained, and as such, no widening of the right-of-way will occur on the east side at this location. This will limit the ability to provide a formal ditch in this area; however, the catchment area to this location is small and therefore this is not anticipated to be problematic. If it is determined during detailed design that ditching is required for effective drainage, an additional cross culvert will be provided upstream of the Sugar Bush to convey drainage to the east ditch. • In addition to the above, the drainage design will be undertaken in a manner that minimizes any impact on the hydrologic characteristics of the adjacent wetlands and woodlots. To this end the drainage design will ensure no runoff from the Wonderland Road South discharges directly to the Locally Significant Wetland, Dingman Creek or the East Lambeth forest ESA, and ensure that the water table within the wetlands (Locally Significant Wetland and East Lambeth forest ESA) is not impacted by either construction or the permanent road works.
Groundwater Resources	
<ul style="list-style-type: none"> • Impacts to existing wells and groundwater resources 	<ul style="list-style-type: none"> • A Permit to Take Water (PTTW) will be obtained from MOECC if the amount of water taken exceeds 50,000 L/day as per the Ontario's Water Taking Regulation (O. Reg. 387/04 made under the Ontario Water Resources Act).



Factor	Considerations / Commitment to Further Work
	<ul style="list-style-type: none"> • Unused and unreported water wells may be encountered during construction, and any unused water wells within the construction footprint must be abandoned as per O. Reg. 903, as amended by O. Reg. 372/07, prior to any further work where they are located. • Complete a well survey and undertake a well monitoring program, as appropriate, to monitor the impacts to the wells that will be potentially affected by the Wonderland Road South improvements, prior to, during and after the construction activities. • The Stormwater Management Plan is intended to ensure that all road runoff from Wonderland Road South will be controlled for quantity and quality to mitigate potential impacts (i.e., interrupt contaminant pathways) to groundwater. • BMPs will be implemented by the Contractor to prevent impacts to groundwater. • No storage, maintenance or refuelling of equipment will be permitted near any sensitive areas including the drainage routes within the study area. • Appropriate dewatering measures will be implemented to manage any groundwater encountered during grading activities, and dewatering discharge water will be filtered as necessary to prevent transport of sediment to natural surface water receptors.
Utilities	
<ul style="list-style-type: none"> • Existing utilities and potential impacts / recommendations are discussed in Table 6-5 of the ESR 	<ul style="list-style-type: none"> • The utilities information noted is based on mark-ups / information received from the agencies. Therefore, the location of all plant and specific relocation strategies must be established during detailed design. • Relocation or mitigation of affected utilities will occur through consultation with the affected utility providers in the subsequent detailed design phase.
Technical	
<ul style="list-style-type: none"> • Surveys 	<ul style="list-style-type: none"> • Conduct foundations investigations at appropriate locations to facilitate structural design (e.g., Highway 402 and Dingman Creek structures). • Complete engineering survey prior to detailed design.