

Wye Road Functional Planning Study



Wye Road, Sherwood Park
Ordze Road to Highway 21

Functional Planning Study – 2014 Update

January 2015

Prepared for:



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Letter of Transmittal

Executive Summary

Corporate Authorization

Acknowledgement

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February 19, 2015

File: 1169-03

Strathcona County

2001 Sherwood Drive
Sherwood Park, AB T8A 3W7

Attention: Mr. Ross Etches, M.Eng., P.Eng., PTOE

**Re: Wye Road Functional Planning Study – 2014 Update
Wye Road, Sherwood Park
Ordze Road to Highway 21**

Please find enclosed five (5) hard copies and one (1) digital copy of our Functional Planning Study Update for your records. Thank you for the opportunity to have worked on this project with the County.

Should you have any questions, please contact the undersigned.

Regards,
Al-Terra Engineering Ltd.

A handwritten signature in black ink that reads 'Dana Leithead'.

Dana Leithead, P.Eng.

/jl

Enclosures

cc. Mr. Dan Schilbe, Strathcona County

EXECUTIVE SUMMARY

The Functional Planning Study for Wye Road between Highway 216 and Highway 21 was initiated by Strathcona County to develop plans to meet the long-term traffic demand for this important transportation corridor, including intersection requirements and access management for both existing and proposed developments. The primary objective was to determine a configuration for the roadway and intersections that will maintain an acceptable level of operating service for the foreseeable future.

Secondary Objectives Included

Address the needs of pedestrians in the corridor, including trails, sidewalks, benches, lighting and crosswalks (addressed in detail in a separate report entitled “Wye Road Urban Design Guidelines”).

Condition assessment and capacity analysis of storm sewers (Ordze Road to east of Brentwood Boulevard).

Noise assessment to determine additional noise attenuation requirements along Wye Road.

Develop an access management plan that balances business viability and corridor integrity

Recommendations

The recommended plans are illustrated on **Exhibits ES-1** through **ES-3**, and generally include widening Wye Road to a six (6) lane divided arterial roadway, plus auxiliary lanes and double left turn lanes, where required, to meet traffic demand. Additional findings and recommendations of the study include:

Sherwood Drive / Wye Road Intersection: To accommodate traffic (as projected for the 20 year horizon), double left turn movements are recommended in all quadrants except northbound to westbound. In conjunction with the dual lefts, modifications at the Petro Canada access and the Wal-Mart access are required. The recommendations for the Sherwood Drive intersection and corridor improvements between Ordze Road and Ash Street were developed in collaboration with the business owners adjacent to the corridor through an extensive public engagement process.

Brentwood Boulevard / Wye Road Intersection: Traffic analysis at the intersection indicates that the implementation of double left turns in all quadrants except northbound to westbound will result in acceptable function in the long term. Six (6) through lanes on Brentwood Boulevard / Range Road 232 cannot be provided in conjunction with southbound double left turn lanes, unless right-of-way is acquired from the residential lots that back onto Brentwood Boulevard. As the acquisition of the additional right-of-way would be very difficult, Range Road 232 is recommended to be a four lane roadway with auxiliary lanes adjacent to Salisbury Village East.

Clover Bar Road / Wye Road Intersection: Conventional intersection treatment, with double left turn lanes eastbound and northbound appears to meet the long-term traffic demand for this intersection.

Access Management for the new development south of Wye Road between Ash Street and Range Road 232 was completed as part of this Functional Planning Study, and the fixed access locations are shown on the Exhibits. It should be noted that the study assumed future development of the acreage parcels west of Range Road 231 would be low density residential, and as such the only access provided is at Nottingham

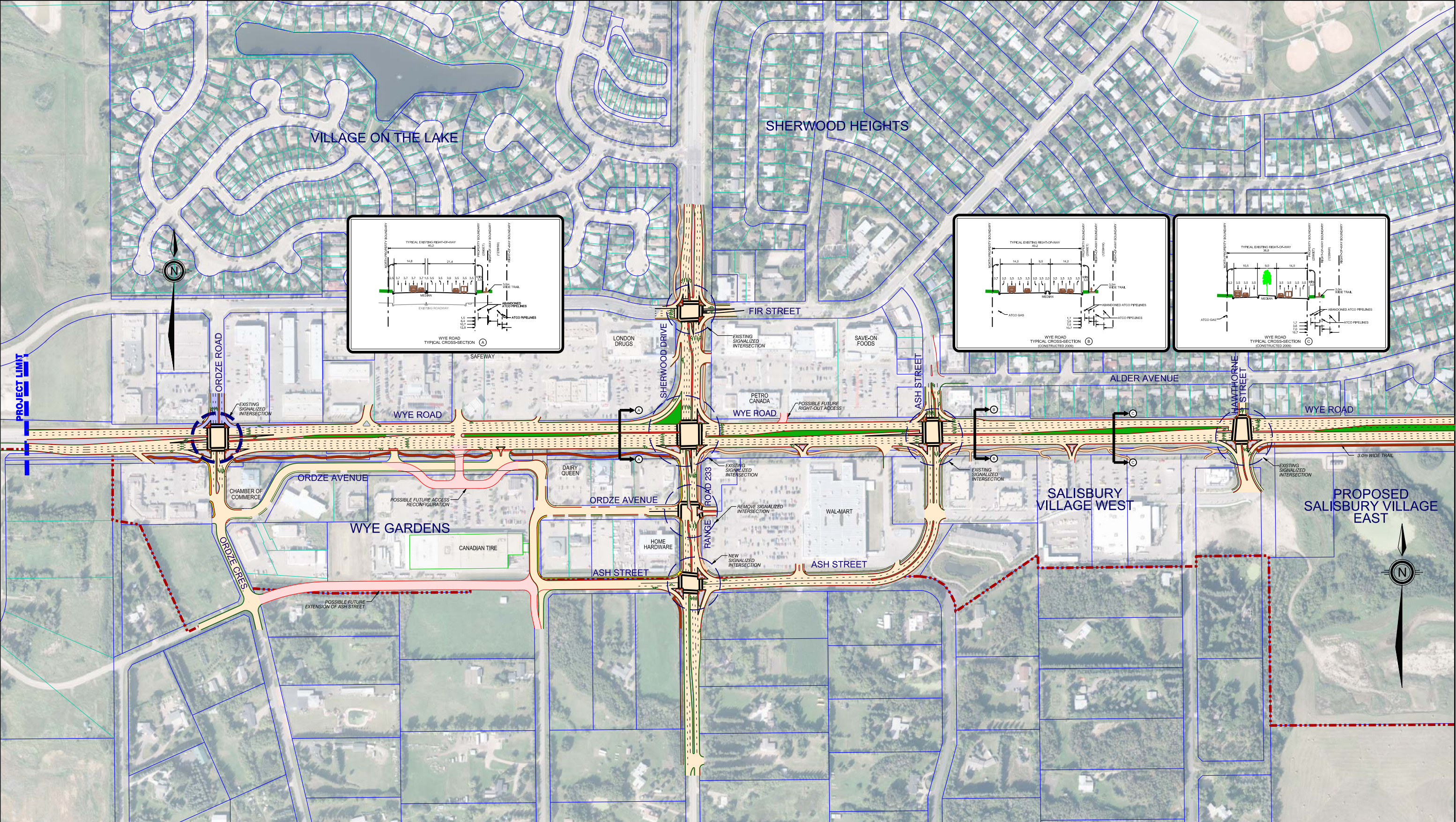
Way. Development of this area into high density residential or commercial property would require further review, but it should be noted that any additional accesses along Wye Road will detrimentally affect network performance. It is strongly recommended that additional accesses are not permitted along this corridor.

Storm Sewer Review of the existing storm infrastructure should be undertaken in advance of roadway improvements so that any capacity or condition concerns can be addressed in advance of the roadway construction.

Cost Estimate and Implementation Strategy

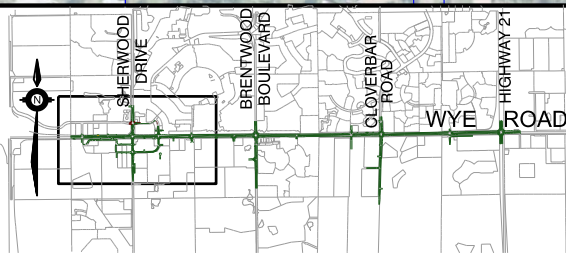
The estimated total cost of this project, based on 2013 typical construction costs, is **\$63 Million**, which does not include right-of-way acquisition, but does include pipeline and power relocations, extensive trail and landscape construction, minor storm sewer infrastructure and appurtenances in support of the roadway widening, new street lights and signals.

It is anticipated that the project will be staged over a number of years, and it would be prudent to use this study as the guiding document for staged implementation of the project. Feedback from the public communication sessions already held has indicated that there is a general desire to see the corridor improved, especially the construction of additional pedestrian facilities.



FUNCTIONAL PLAN ONLY
SUBJECT TO REVISIONS

- LEGEND:
- | | |
|--|-------------------------|
| SHORT TERM IMPROVED ROADWAY (1-10 YEARS) | PROPOSED TRAIL |
| MEDIUM TERM ROADWAY (11-20 YEARS) | EXISTING TRAIL |
| LONG TERM ROADWAY (20+ YEARS) | PROPOSED SIDEWALK |
| CONCRETE MEDIAN | EXISTING SIDEWALK |
| LANDSCAPED AND PLANTED MEDIAN | URBAN SERVICES BOUNDARY |

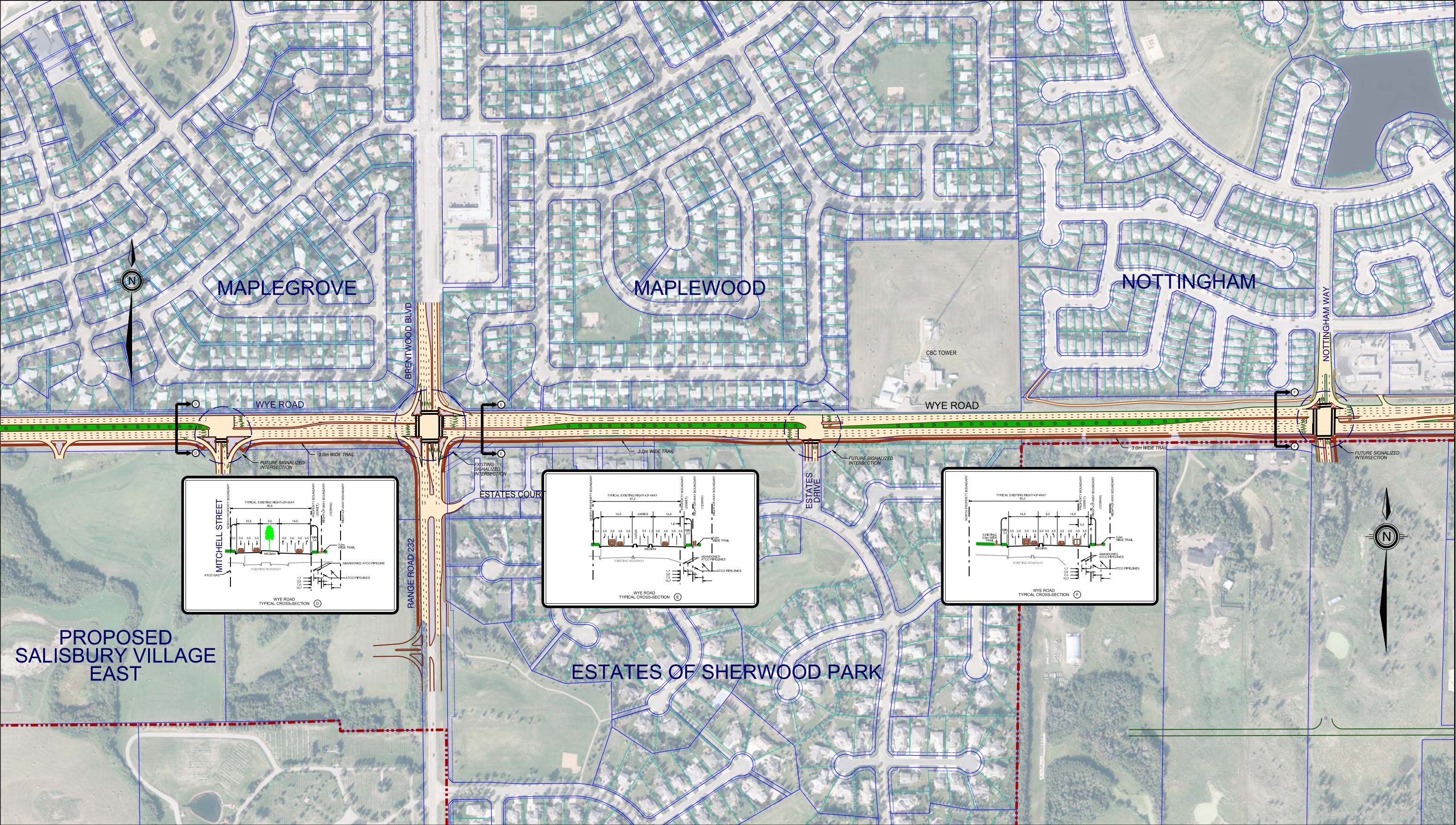


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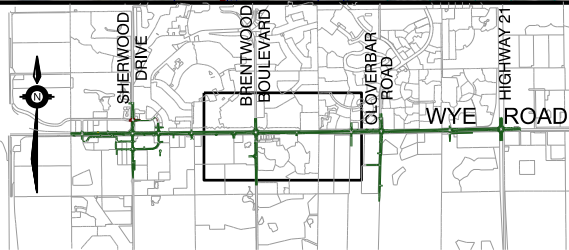
HORIZONTAL

WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY
RECOMMENDED LONG TERM IMPROVEMENT PLAN
Date: JANUARY, 2015
EXHIBIT ES-1



**FUNCTIONAL PLAN ONLY
SUBJECT TO REVISIONS**

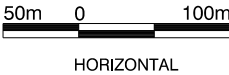
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| SHORT TERM IMPROVED ROADWAY (1-10 YEARS) | PROPOSED TRAIL |
| MEDIUM TERM ROADWAY (11-20 YEARS) | EXISTING TRAIL |
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| LANDSCAPED AND PLANTED MEDIAN | URBAN SERVICES BOUNDARY |



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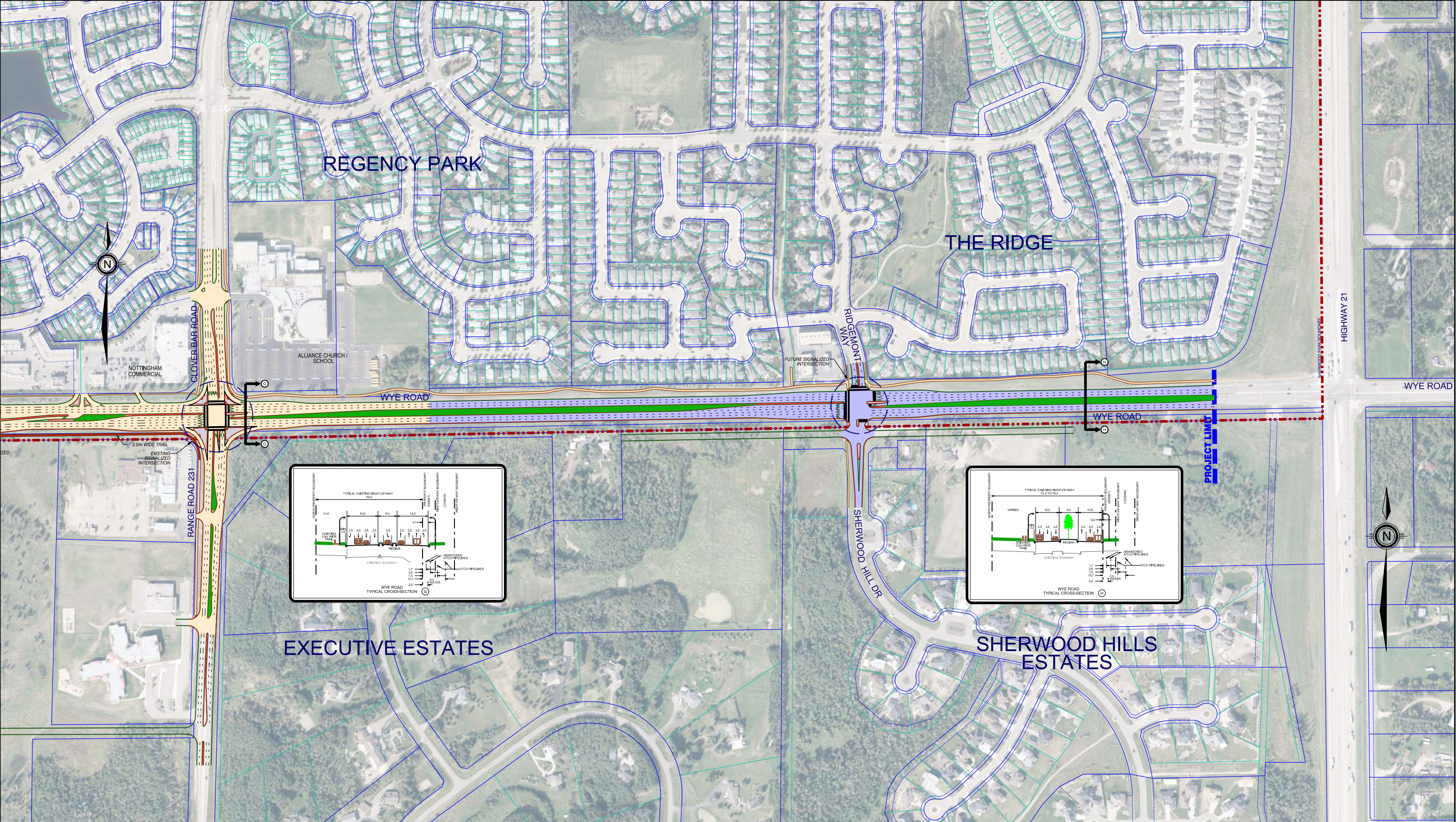


WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY

RECOMMENDED LONG TERM IMPROVEMENT PLAN

Date: JANUARY, 2015

EXHIBIT ES-2



**FUNCTIONAL PLAN ONLY
SUBJECT TO REVISIONS**

- LEGEND:**
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| SHORT TERM IMPROVED ROADWAY (1-10 YEARS) | PROPOSED TRAIL |
| MEDIUM TERM ROADWAY (11-20 YEARS) | EXISTING TRAIL |
| LONG TERM ROADWAY (20+ YEARS) | PROPOSED SIDEWALK |
| CONCRETE MEDIAN | EXISTING SIDEWALK |
| LANDSCAPED AND PLANTED MEDIAN | URBAN SERVICES BOUNDARY |



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HORIZONTAL

WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY

RECOMMENDED LONG TERM IMPROVEMENT PLAN

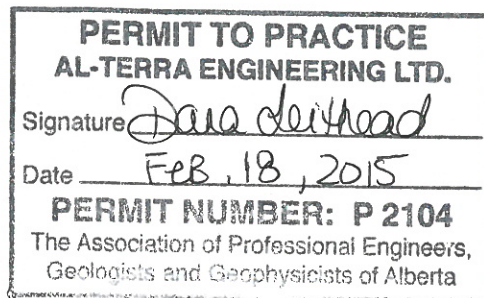
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EXHIBIT ES-3

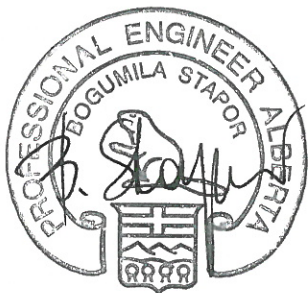
CORPORATE AUTHORIZATION

This report entitled **Wye Road, Sherwood Park – Ordze Road to Highway 21 Functional Planning Study – 2014 Update** was prepared by Al-Terra Engineering Ltd., under authorization and exclusive use of Strathcona County.

The designs and recommendations put forward reflect Al-Terra's best judgment with the information available. Any use of this information in a manner not intended or with the knowledge that situations have changed shall not be the responsibility of Al-Terra Engineering Ltd.

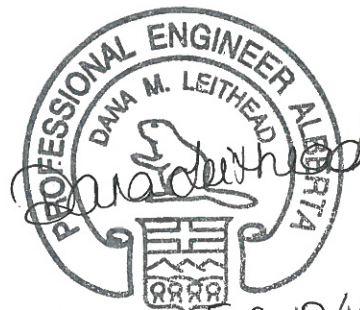


Corporate Permit



Feb 18, 2015

Bogusia Stapor, M.Eng., P.Eng., PTOE



Feb. 18/15

Dana Leithead, P.Eng.

ACKNOWLEDGEMENT

Al-Terra Engineering Ltd. was fortunate to have worked with a highly qualified and dedicated Project Team to complete the **Wye Road, Sherwood Park – Ordze Road to Highway 21 Functional Planning Study – 2014 Update**. In-house experience in the areas of functional planning and traffic engineering was supplemented by the services of a number of sub-consultants. We would like to acknowledge the high quality of assistance that they brought to the project in meeting the expectations of the Client.

Sub-consultants associated with the project were:

- ♦ **ACI Acoustical Consultants Ltd.** – Noise Assessment / Modeling
Mr. S. Bilwachuk, M.Sc., P.Eng.
- ♦ **Stantec Consulting** – Public Engagement
Shawn Bravender, B.SC., RPP, MCIP, CET, IAP2-certified
- ♦ **J.R. Paine & Associates Ltd.** – Pavement Evaluation and Design
Mr. John Rakievich, P.Eng.
- ♦ **BPTEC-DNW Engineering Ltd.** – Noise Wall Condition Assessment
Mr. Stuart Smith, P.Eng., M.Eng.

In addition, we would like to acknowledge, with gratitude and appreciation, the assistance of the Strathcona County staff for their input, technical review, assistance and cooperation during the study.

Strathcona County team members include:

- ♦ Mr. Ross Etches, M.Eng., P.Eng., PTOE
- ♦ Mr. Dan Schilbe, P.L. (Eng)
- ♦ Ms. Dawn Green, Public Engagement

1.0 Introduction

1.1 Background

The Wye Road Functional Planning Study was initiated by Strathcona County in 2006 due to increasing congestion and operational concerns at major intersections along the corridor, impending development south of Wye Road between Range Road 232 and 233 (Salisbury Village) and the potential for urbanization of the eastbound lanes of Wye Road between Brentwood Boulevard and Highway 21. The main objective of the project was to undertake a study and develop plans for Wye Road to meet the traffic demand (pedestrian and vehicular) between Highway 216 and Highway 21 as illustrated on **Exhibit 1.1**, Study Area.

Wye Road is a major gateway to Sherwood Park, a main commuter route to Edmonton, and an important arterial road within Strathcona County's arterial road network. A study entitled "Wye Road Urban Design Guidelines" was completed concurrently with the original Wye Road Functional Planning Study to address pedestrian needs such as trails, sidewalks, benches, lighting, and crosswalks. Guidelines for urban design and general landscape design principles were developed and are intended to be implemented in conjunction with Wye Road improvements. This study is included in **Appendix A** of this report.

Wye Road currently exists as a six lane divided urban roadway, plus auxiliary lanes between Highway 216 (interchange) and Sherwood Drive; a four lane divided urban roadway, plus auxiliary lanes between Sherwood Drive and Brentwood Boulevard; and a four lane divided semi-urban roadway (rural eastbound) between Brentwood Boulevard and Highway 21. The roadway functions at a good level of service during off peak hours, but experiences congestion, particularly during the PM Peak, when eastbound (commuter) and left turn volumes are very high.

Long terms plans for Wye Road have envisioned a six lane urban cross-section with auxiliary lanes as required, since the early 1980's. It was considered prudent to confirm the validity of this requirement based on more recent traffic modelling. The Strathcona County Integrated Transportation Master Plan model provided background traffic for the analysis required for this Functional Planning Study.

1.2 History

In 2006, Al-Terra Engineering Ltd. (Al-Terra) undertook the Functional Planning Study for Wye Road between Highway 216 (Anthony Henday Drive) and Highway 21. A draft report summarizing our technical work, analysis and functional plans showing recommended improvements, were submitted to the County in December 2008. The original report was not finalized due to concerns raised by stakeholders within the Wye Road Business area regarding the proposed roadway changes and ongoing land use planning changes for the Salisbury Village East (south of Wye Road between Range Roads 232 and 233).

In 2011, Salisbury Village East submitted a revised land use plan. Al-Terra was requested to evaluate the traffic impacts of this revised land use on the Wye Road corridor. This supplemental study and report focused on the intersections most directly impacted by Salisbury Village:

- ♦ Wye Road and Brentwood Boulevard
- ♦ Wye Road and Mitchell Street
- ♦ Range Road 232 and Salisbury Village East Parkway

The conclusion of this supplemental study, based on the traffic projections from the amended Salisbury Village ASP (Bylaw 63-2013, December 10, 2013), was that conventional intersection widening (three lanes

each direction on Wye Road) and double left turn lanes for all movements except northbound on Range Road 232, which required only a single left turn lane, provided the most desirable operations and Level of Service (LOS).

In 2012, Al-Terra was requested to initiate an independent Stakeholder Consultation Program to engage the Wye Road business owners regarding their concerns with the proposed Wye Road / Sherwood Drive intersection improvements proposed in the Draft (2008) Wye Road Functional Planning Study. The program intent was to engage and empower the local area business community to develop solutions for the corridor which could accommodate future traffic growth while addressing concerns as related to any access modifications. The solutions developed through stakeholder engagement would be subject to engineering review of technical feasibility, safety, and traffic impacts on the vicinity road network. The engagement process was conducted by Stantec Consulting in collaboration with Al-Terra through 2012 and 2013, and the recommended plans of the stakeholder developed improvements were presented to Council March 11, 2014.

Subsequently, Al-Terra provided engineering analysis of the stakeholder developed improvements to evaluate technical feasibility, identify constraints and opportunities, and generate cost estimates. The stakeholder suggested improvements were evaluated to determine whether the improvements would accommodate the projected traffic demand for the twenty (20) year horizon. This evaluation criterion was a change from the original objectives of the 2006 report which required improvements to accommodate projected traffic at the full development of Sherwood Park with 10% spare capacity. The evaluation determined that the projected traffic demand for the twenty year horizon would be met with the proposed stakeholder suggested improvements.

The recommended functional plans were revised to include the stakeholder recommended improvements and were presented to the public on June 16, 2014 at an Open House. The presented functional plans for from the Open House are included in **Appendix D** of this report as part of the Wye Road Functional Planning Study 2014 Public Open House Summary.

1.3 Objective and Scope of Study

The primary objective of the Functional Planning Study was to develop plans for Wye Road which would meet the long-term traffic demand for the roadway, including intersection requirements and access management for both existing and proposed developments. The plans developed would include a trail linkage between Highway 21 and Sherwood Drive to also address pedestrian / cyclist uses in the corridor.

This report provides a consolidation of the previous studies and reports completed for the Wye Road Functional Planning Study since 2006. Copies of the Draft “Wye Road – Sherwood Park, Ordze Road to Highway 21, Function Planning Study”, December 2008, and the “Wye Road and Brentwood Boulevard, Supplementary Intersection Analysis”, May 2011, are included in **Appendix A** of this report.

1.4 Methodology and Study Approach

The following provides a brief outline of the methodology and study approach.

- ♦ Assemble and review available background data, including plans and profiles, intersection plans, legal base, development access, etc. to develop comprehensive base plans for the study area.
- ♦ Review available traffic data, TIA's, County Transportation Model, Regional Transportation Model, and traffic counts required to develop base year traffic and future traffic plans for all intersections and potential accesses, including on Sherwood Drive (R.R. 233) between Fir Street and Ash Street.

- ♦ Develop a base year traffic model / simulation using Synchro / Sim Traffic and complete analysis to identify (reconfirm) operational issues and / or deficiencies in the existing infrastructure. Quantify the issues and deficiencies in order that a “targeted approach” can be used to develop options and alternatives.
- ♦ Prepare alternatives to address operational and safety concerns, which were further evaluated.
- ♦ Complete traffic analysis on Wye Road between Ordze Crescent and Brentwood Boulevard to provide guidance for appropriate access locations for both existing and proposed developments.
- ♦ Review projected traffic volumes on each segment of Wye Road to confirm long-term lane requirements and lane balance.
- ♦ Review requirements for six laning and analyze how the widening and improvements could be accommodated within the right-of-way, particularly between the CBC Tower and Sherwood Drive.

Traffic projections and analysis for the Wye Road / Sherwood Drive intersection and vicinity roadways were updated to include analysis of the stakeholder developed improvements. Other traffic projections, analysis, and results remain unchanged from the original 2008 study, except that existing traffic exhibits were updated to reflect recent traffic count information.

1.5 Issues

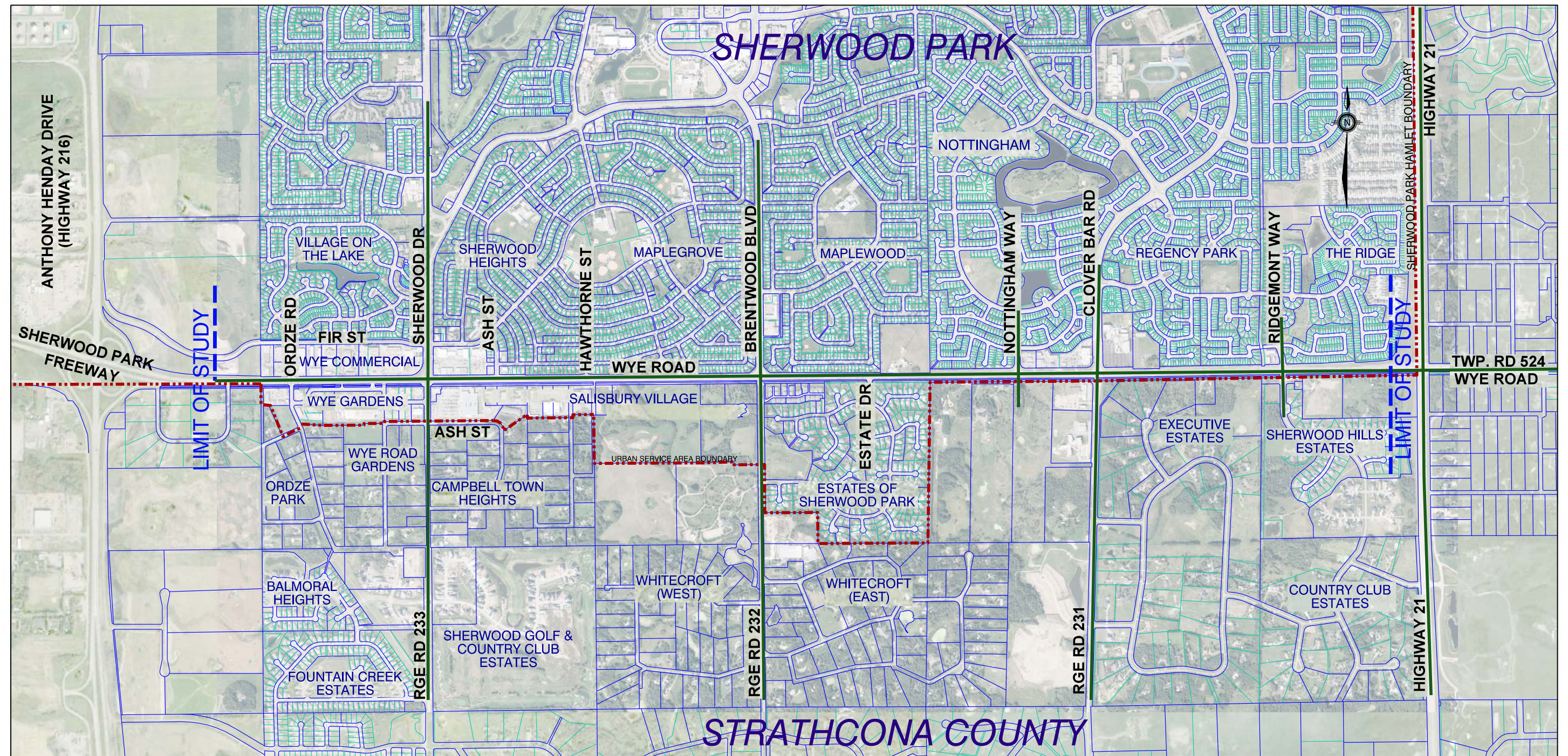
Other issues addressed in the study included:

- ♦ Identification of issues such as right-of-way requirements and pipeline constraints.
- ♦ Condition assessment and capacity analysis of storm sewers (Ordze Road to east of Brentwood Boulevard).
- ♦ Pavement design for widening, and structural overlay.
- ♦ Noise assessment.

Some Wye Road improvements between Sherwood Drive and Brentwood Boulevard were implemented in 2009 and in 2014 in conjunction with the development of Salisbury Village. It was considered prudent and cost effective to widen Wye Road to six (6) lanes while these adjacent areas were developed as concurrent construction eliminates “throw away” costs and duplication of construction.

The construction completed includes:

- ♦ Widening of Wye Road to six lanes between Sherwood Drive and Mitchell Street, including double left turn lanes at Mitchell Street, Hawthorne Street, and Ash Street.
- ♦ Construction of Ash Street between Wye Road and Range Road 233, behind the Walmart store to provide an alternate route for
 - left turns at Wye Road / Range Road 233 westbound to southbound
 - right turns at Wye Road / Range Road 233 northbound to eastbound
- ♦ All related pipeline and utility relocation work.



2.0 Existing Conditions

2.1 Land Use and Access Management

Existing and proposed land use within the study area is shown on **Exhibit 2.1**.

Lands north of Wye Road are essentially fully developed and consist primarily of commercial uses from Ordze Road to Ash Street (west portion) and low density residential uses throughout the remaining area from Ash Street to Highway 21 (east portion).

South of Wye Road, adjacent lands are only partially developed with a number of new developments along the roadway currently in the planning or development stage. It has been assumed that these developments will be completed to coincide with build out of Sherwood Park, generally expected within the 10 year horizon.

The Salisbury Village area between Ash Street and Brentwood Boulevard is envisioned as a mixed use development with approximately 8.44 ha (20.4 acres) of commercial, 4.81 ha (11.9 acres) of business office, 0.69 ha (1.70 acres) mixed business park, and 10.29 ha (25.4 acres) of residential, which provides 694 residential units. The Traffic Impact Assessment completed by Bunt & Associates (September 2009) suggests the development will generate approximately 33,000 new vehicle trips/day (3,378 trips/hour in PM Peak hour), and, therefore will have a significant impact on the vicinity road network, particularly on Wye Road. As a result of the potential impact, it was necessary to develop an access management strategy to ensure the integrity of Wye Road was protected, while providing reasonable opportunity for access. This initial access management plan was subjected to significant discussion and debate, and the collaborative final version is felt to provide a reasonable balance between providing access and maintaining the integrity of the arterial roadway.

An underdeveloped area of approximately 56 hectares (140 acres) south of Wye Road and west of Clover Bar Road has been assumed as future low density residential based on current zoning. An alternate, more intense type of development has been proposed, but not yet approved, and, could generate significantly higher traffic volumes on Wye Road.

The Long Term Access Management Plan developed is shown on **Exhibit 2.2**.

2.2 Exiting Features (Constraints)

As noted on **Exhibit 2.3**, the ability to upgrade (widen) Wye Road is limited by two very significant constraints; the concrete noise attenuation wall and existing residential developments on the north side of Wye Road and the ATCO right-of-way containing high pressure pipelines on the south side.

2.2.1 Concrete Noise Attenuation Wall

The noise attenuation structure built in 1983 along the north side of Wye Road, between Ash Street and Estates Drive, is a 3.0m high concrete wall located 6.8m north of the north through curb line. W-beam guard rail is located approximately 1.5m from the wall, and was determined to be largely ineffective in protecting the wall from vehicle collisions as the guard rail will deflect up to 2.5m (full analysis is included in Appendix E of the original report). The analysis concluded that the existing guard rail could be removed, but relocation of the noise wall would not be practical due to property and other constraints. To accommodate a six lane configuration next to the concrete noise wall, it was determined that the north curb line of a widened Wye Road could be located along the current alignment of the existing acceleration / deceleration lanes; approximately 3.2m from the noise wall. This alignment solution precludes the development of acceleration

and deceleration lanes at intersections westbound from Ash Street to Estates Drive within the limits of the noise wall.

2.2.2 ATCO Right-of-Way

The width of the existing Wye Road right-of-way between Ordze Avenue and Estates Drive varies somewhat, but is generally less than 40m wide and not sufficient for a six (6) lane roadway with double left turn lanes. Available right-of-way is constrained on the south side by two (2) ATCO Pipeline right-of-ways (6.0m and 9.0m), both of which are owned (fee simple) by ATCO. As the ability to widen Wye Road to the north was not considered feasible, investigation for encroachment into the ATCO right-of-way was required.

Investigation into the current right-of-way status indicates there are two (2) 323mm (12 inch) diameter pipelines located in the northerly 6.0m ATCO right-of-way, immediately south of Wye Road that have been abandoned, and therefore, no active pipelines exist within the right-of-way. However, between Hawthorne Street and Range Road 232, one of the 323mm diameter pipelines (nearest Wye Road) has been converted to a gas distribution main.

The current active pipelines (406mm and 508mm diameter high pressure) are located in the 9.0m right-of-way, further removed from Wye Road, and would therefore be minimally impacted by any Wye Road widening to the south.

In addition to the pipeline right-of-way, ATCO Group operates gate stations in the southeast quadrant of Sherwood Drive / Wye Road intersection and in the southwest quadrant of Brentwood Boulevard / Wye Road. The Gate Station (#2) at the Sherwood Drive intersection could be accommodated by roadway design, but would require collision protection, whereas the Brentwood Gate Station (#1) requires relocation for the Wye Road / Brentwood Boulevard intersection improvements. In discussions with ATCO Group, it was determined that relocation of both gate stations, with appropriate cost sharing, would be in the best interests of both ATCO Group and Strathcona County.

ATCO (CU Water) also operates a 350mm diameter water main within the 6.0m right-of-way south of Wye Road between Clover Bar Road and Highway 21. Widening of Wye Road will result in portions of this water main being within the carriageway of the roadway (auxiliary lanes). However, this configuration is typical, and construction would be considered conventional. Appropriate cover for frost protection should be considered at detail design.

Discussions and negotiations with ATCO Group have resulted in a Memorandum of Understanding (MOU) between ATCO and Strathcona County dealing with cost share for pipeline and gate station relocation. Generally the following consensus has been achieved:

- ♦ ATCO will transfer (sell or other appropriate mechanism) 5.1m of the northerly 6.0m ATCO right-of-way to the County to facilitate the Wye Road improvements. The transfer for each stage of Wye Road is to be negotiated, but generally the preferred approach will be for ATCO to receive right-of-way in kind adjacent to the southerly 9.0m ATCO right-of-way. Strathcona County will, where lands adjacent to Wye Road are currently undeveloped, require right-of-way in kind to be dedicated, as a condition of development.
- ♦ The County will provide a site (≈ 30m x 30m) between Hawthorne Street and Brentwood Boulevard to relocated Gate Station (Gate #1). Cost share for Gate Station relocation to be negotiated.
- ♦ ATCO will relocate the Sherwood Drive Gate Station (Gate #2) to a site south of Wye Road and near the Transportation and Utility Corridor (TUC).

- ♦ Strathcona County will work with ATCO for removal of abandoned pipelines from within the right-of-way transferred from ATCO to Strathcona.
- ♦ ATCO Gas will provide an alignment within the Wye Road right-of-way, or other right-of-way, to install a gas distribution main between the new Gate Stations 1 and 2.
- ♦ ATCO will consider on a case-by-case basis for Strathcona County to construct landscaping, trails, etc. on ATCO right-of-way to enhance the function and aesthetics of the Wye Road corridor.

In conjunction with the Wye Road widening completed in 2009, the two (2) 323mm (12 inch) diameter (abandoned) pipelines located in the northerly 6.0m ATCO right-of-way have been removed between Sherwood Drive and Brentwood Boulevard. Additionally, Gate Station #1 (at Brentwood Boulevard) was relocated west, to approximately 130m east of Hawthorne Street.

2.2.3 Existing Utilities

Various other underground and overhead utilities are located within the Wye Road right-of-way. Existing overhead power is located along the south boundary of the existing Wye Road, and will require relocation to facilitate road widening. The overhead power should be relocated underground where feasible and where budget permits.

The overhead power between Brentwood Boulevard and Sherwood Drive has been relocated underground to the north side.

Other utilities, including Telus duct lines, gas distribution, and deep utilities, exist within the right-of-way but are not expected to be a major constraint to the Wye Road improvements. Utilities should be researched and modification and/or relocation determined during design of each stage. **Exhibit 2.3** shows in plan view and **Exhibit 2.4** through **2.11** show in cross-section the existing utility features along the Wye Road corridor.

2.3 Existing Traffic Operations

Operations of the existing Wye Road traffic were modeled using Synchro / Sim V7 software for modelling, optimizing, and simulating traffic operations. Traffic counts collected by Strathcona County were used and estimated (balanced) for the purpose of the analysis. Typical heavy vehicle percentage within traffic stream ranges between 1.8 to 3.4% depending on time of day, which includes SU – single unit vehicles and TT - truck/trailer combination units. The input for the analysis included pcu units, representing traffic volumes as passenger vehicles equivalences.

Based on the counts, pedestrian traffic is low and ranges from 0 to 3 pedestrians at any pedestrian crossing location within the analyzed system. For the purpose of the analysis, it was assumed that 5 pedestrians will be present at all approaches, which will result in 5 pedestrian calls (actuators) during analyzed period.

Operations of the existing AM and PM Peak traffic analysis indicate that AM Peak traffic operates at good level of service with 30-40% spare capacity. The majority of traffic during AM Peak is directed westbound toward the City of Edmonton. However, the PM Peak show higher than AM Peak traffic demand (commuter and commercial traffic), with some Wye Road major intersections reaching near capacity condition with congestion, high delays and long queues.

The existing PM Peak traffic analysis show significant congestion at Wye and Sherwood Drive intersection, with LOS D (intersection average delay 50s) some movements operate at LOS E and F. The queues at all approaches affect operations of adjacent intersections on Wye Road and Sherwood Drive.

Although not modeled, observation of the Saturday peak hour traffic at Sherwood Drive / Wye Road intersection indicates regular congestion and operational concerns during this period.

Based on the above it was determined that PM Peak would represent the design hour for which the proposed improvements would be modeled and tested.

2.4 Existing Collision Statistics

Collision statistics were obtained from Strathcona County for the five year period from 2009-2013 to determine the collision rate at intersections along the Wye Road corridor. Collision rate is expressed as a ratio of the number of collisions per million entering vehicles, and is shown on **Exhibit 2.12** for intersections along Wye Road. Collision rates generally increase as congestion and operational problems increase, and this is the case on Wye Road.

To provide a comparison of collision rates on Wye Road, collision statistics were also obtained for major intersections on Baseline Road as shown in **Exhibit 2.13**. The higher collision rates at Broadmoor Boulevard and Sherwood Drive intersections on Baseline Road can be attributed to the amount of congestion and the expanse of pavement at these intersections.

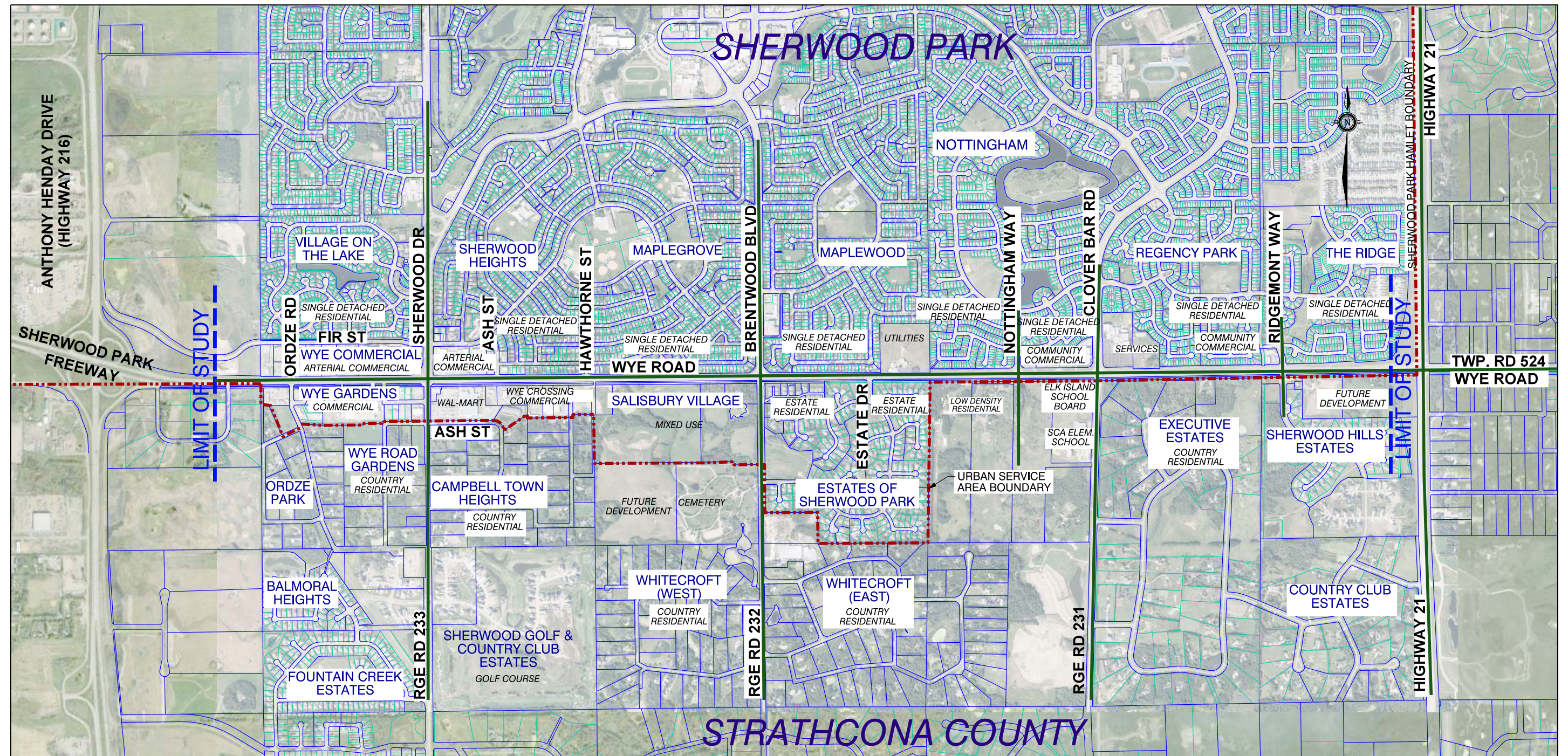
Three Baseline Road intersections are the highest collision locations in Sherwood Park with number of collisions ranging from 172 to 247 collisions over 5 year period. The fourth highest collision location intersection in Sherwood Park is Wye Road and Sherwood Drive intersection with 153 crashes over the same period.

The majority of collisions along the Wye Road corridor are typical for the congested signal controlled intersections and include rear end collisions where the vehicles follow too close and left turn across path, which occurs when drivers make left turns without appropriate gaps or on red. The congestion, and therefore collisions may be mitigated by increasing capacity and adding lanes for critical movements.

The left turn collisions may be further mitigated by implementation of protected phasing for the movements but this also affects capacity of the intersection. Dual left movements are recommended to always be protected phasing.

The third highest collision type at the four major intersections along Wye Road are right angle collisions, which are likely the result of red light violations, which may be mitigated by enforcement.

Overall the safety of the corridor is expected to be improved by providing sufficient capacity and implementing designs that provide positive guidance and are inclusive and friendly for all users - motorized and vulnerable.



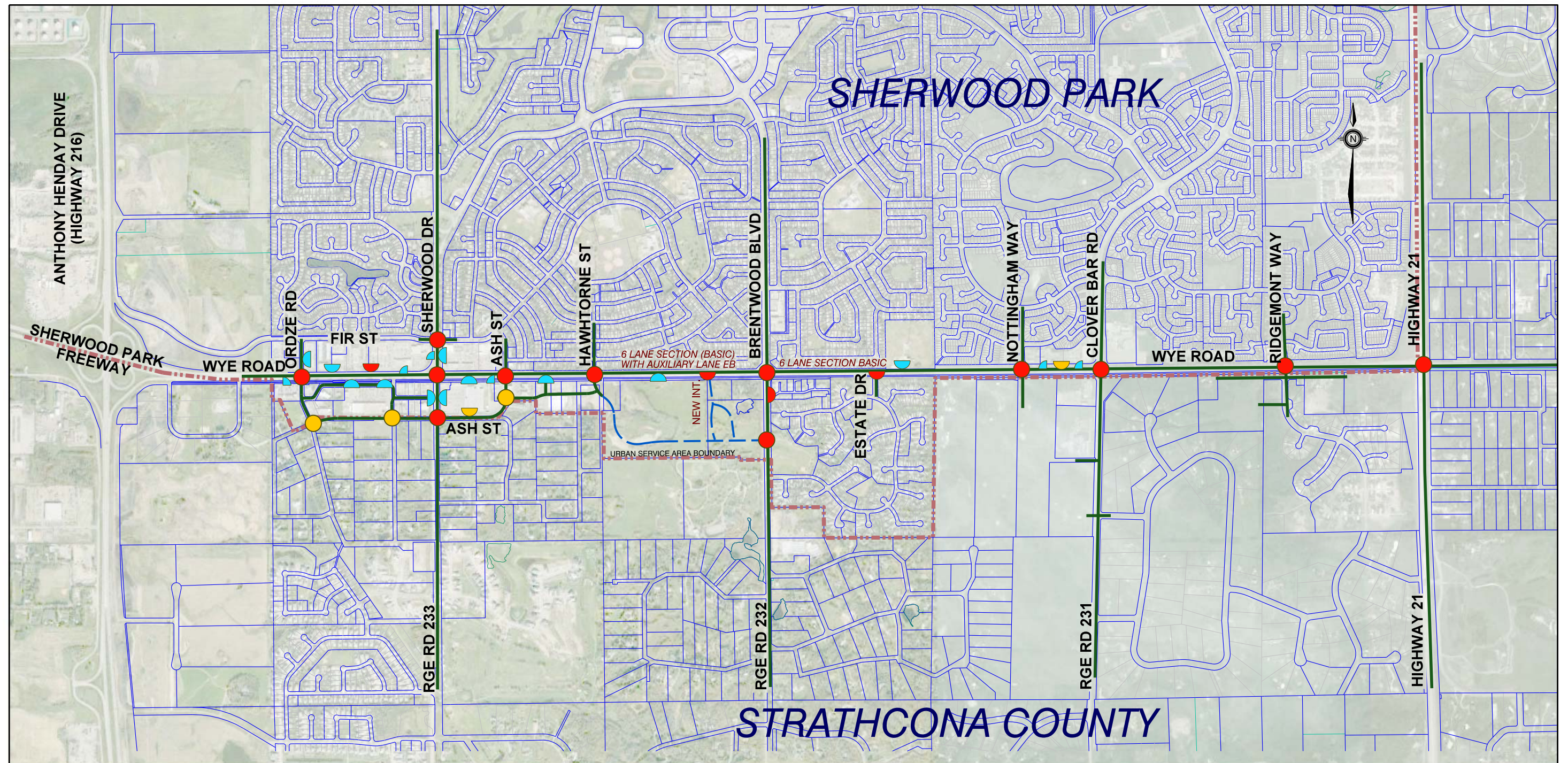


IMAGE 2014 DIGITALGLOBE GOOGLE EARTH

LEGEND:

- ALL DIRECTIONAL INTERSECTION SIGNALIZED
- ◐ T-INTERSECTION SIGNALIZED (MAY BE PARTIAL)
- ALL DIRECTIONAL INTERSECTION NOT SIGNALIZED
- ◐ T-INTERSECTION NOT SIGNALIZED (MAY BE PARTIAL)
- ◐ RIGHT-IN/RIGHT-OUT ◐ RIGHT-IN ◐ RIGHT-OUT
- PROPOSED DEVELOPMENT ROADS



WYE ROAD - SHERWOOD PARK FUNCTIONAL PLANNING STUDY LONG TERM ACCESS MANAGEMENT MAJOR INTERSECTIONS

Date: FEBRUARY, 2015

EXHIBIT 2.2

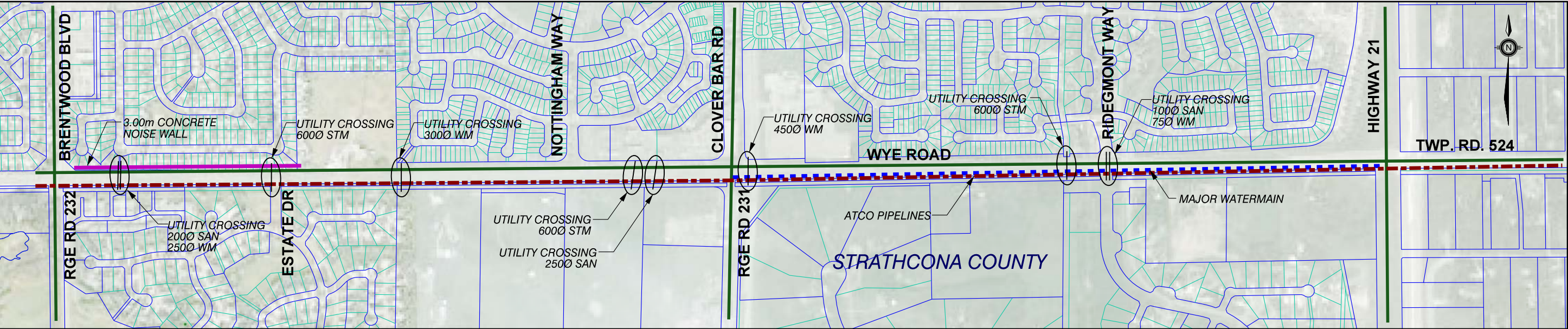
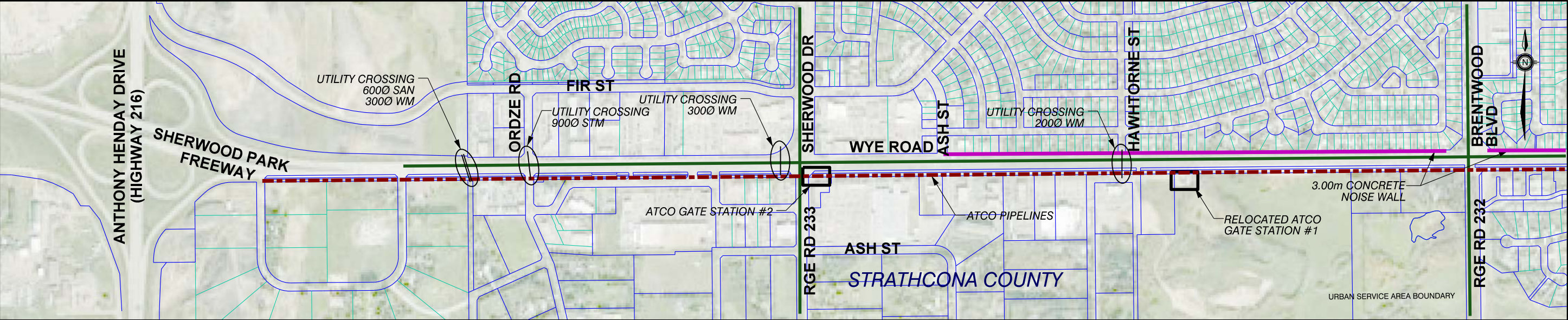
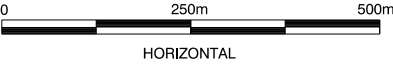


IMAGE 2014 DIGITALGLOBE GOOGLE EARTH

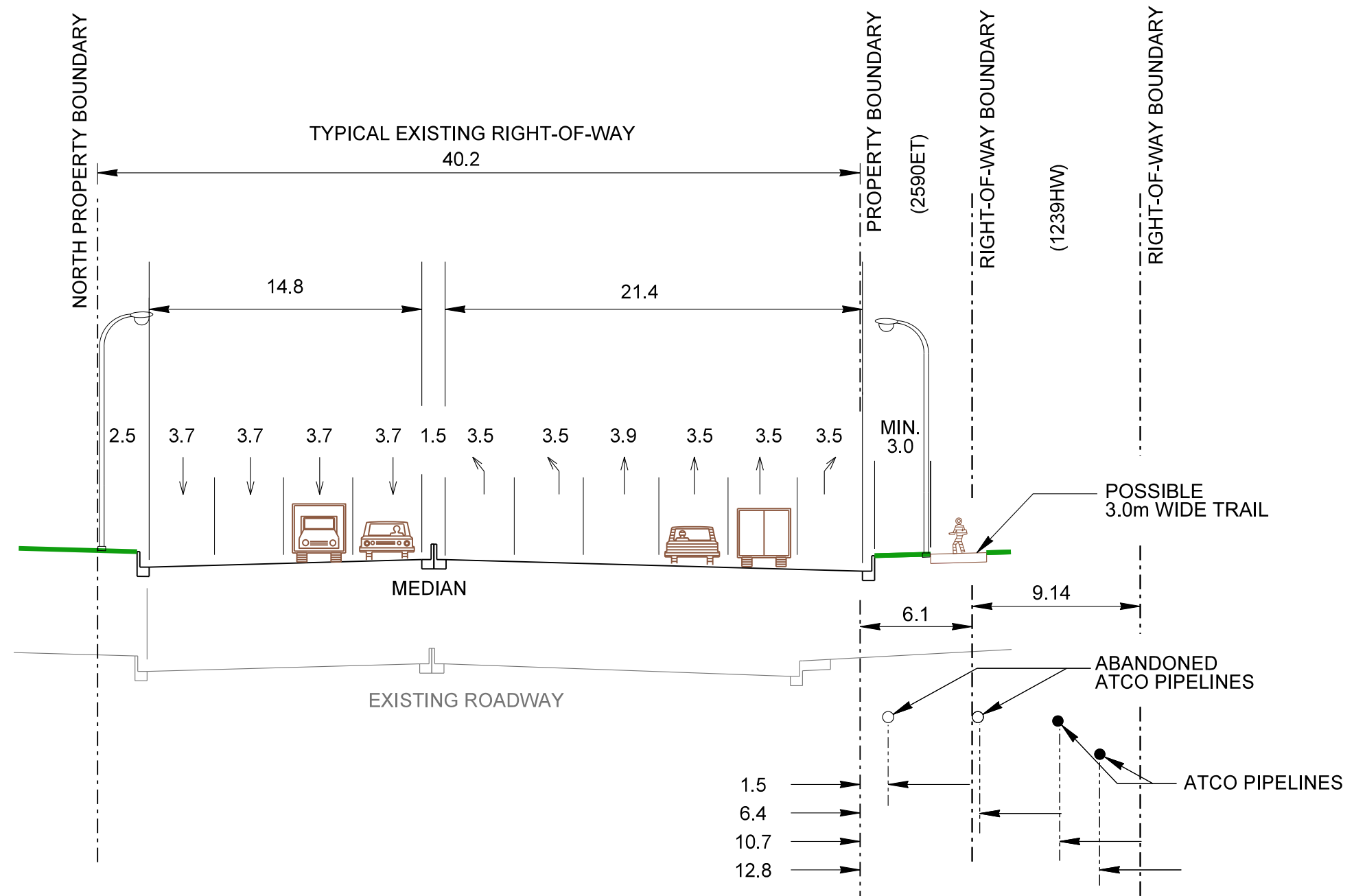
LEGEND:

- - - - - ATCO PIPELINES
- MAJOR WATERMAIN
- — — — — NOISE WALL
- — — — — ARTERIAL ROADS



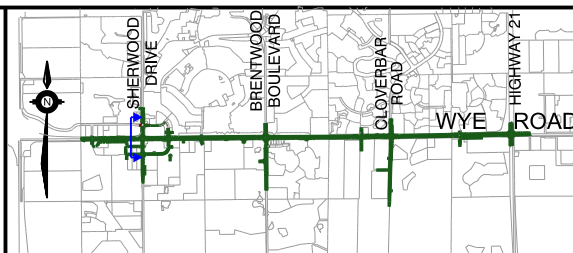
WYE ROAD - SHERWOOD PARK
 FUNCTIONAL PLANNING STUDY
EXISTING FEATURES

Date: JANUARY, 2015



WYE ROAD
CROSS-SECTION - WEST OF SHERWOOD DRIVE

FUNCTIONAL PLAN ONLY
SUBJECT TO REVISIONS

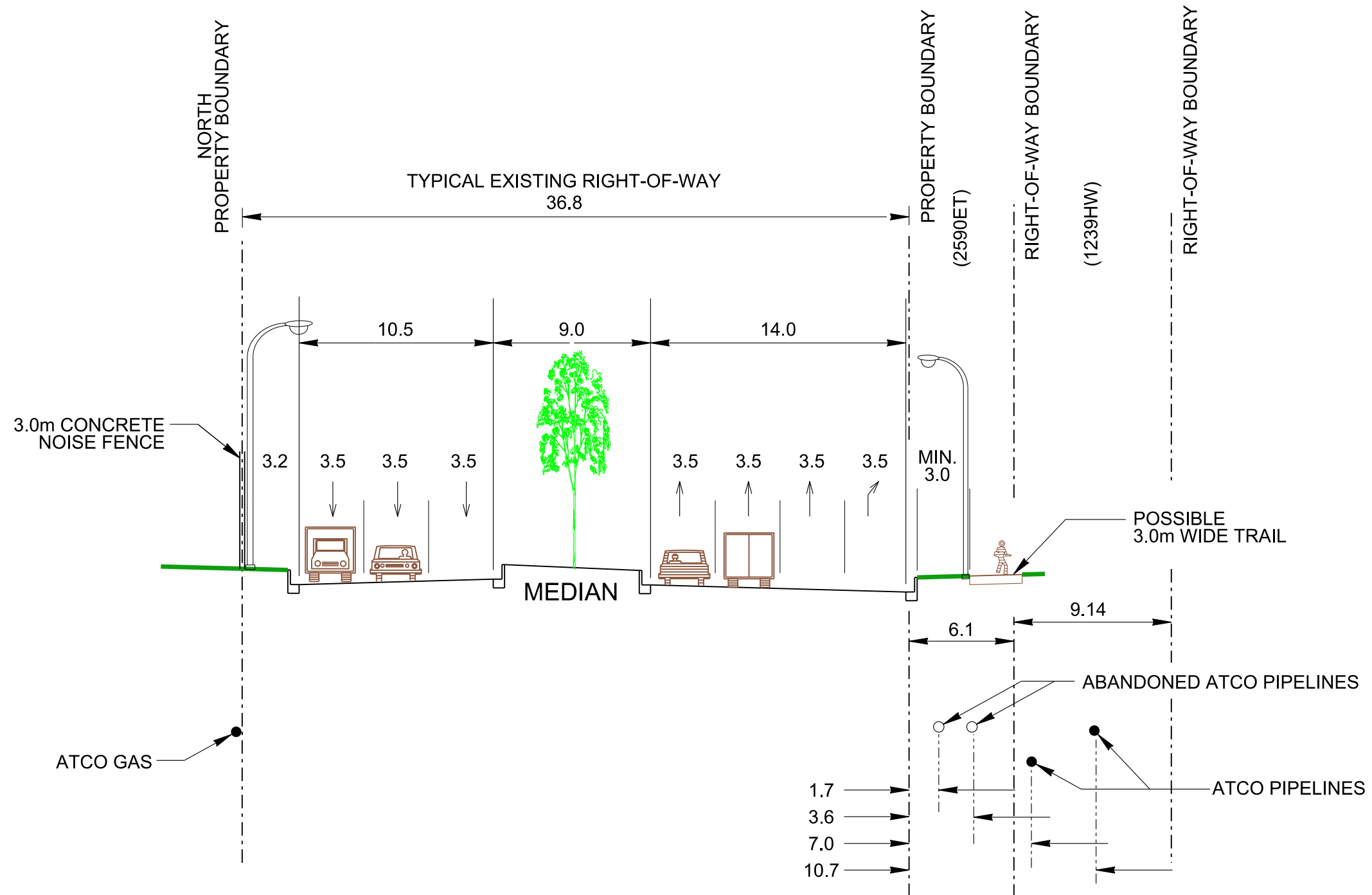


Scale: N.T.S.

WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY
TYPICAL CROSS - SECTION

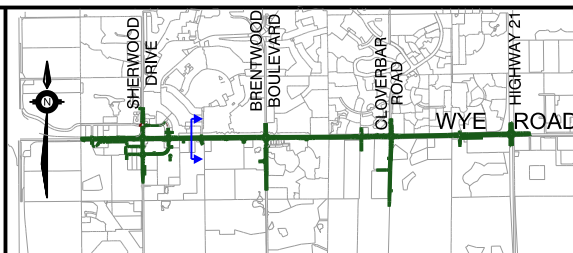
Date: JANUARY, 2015

EXHIBIT 2.4



WYE ROAD
CROSS-SECTION - WEST OF HAWTHORNE STREET
(CONSTRUCTED 2009)

FUNCTIONAL PLAN ONLY
SUBJECT TO REVISIONS



STRATHCONA
COUNTY

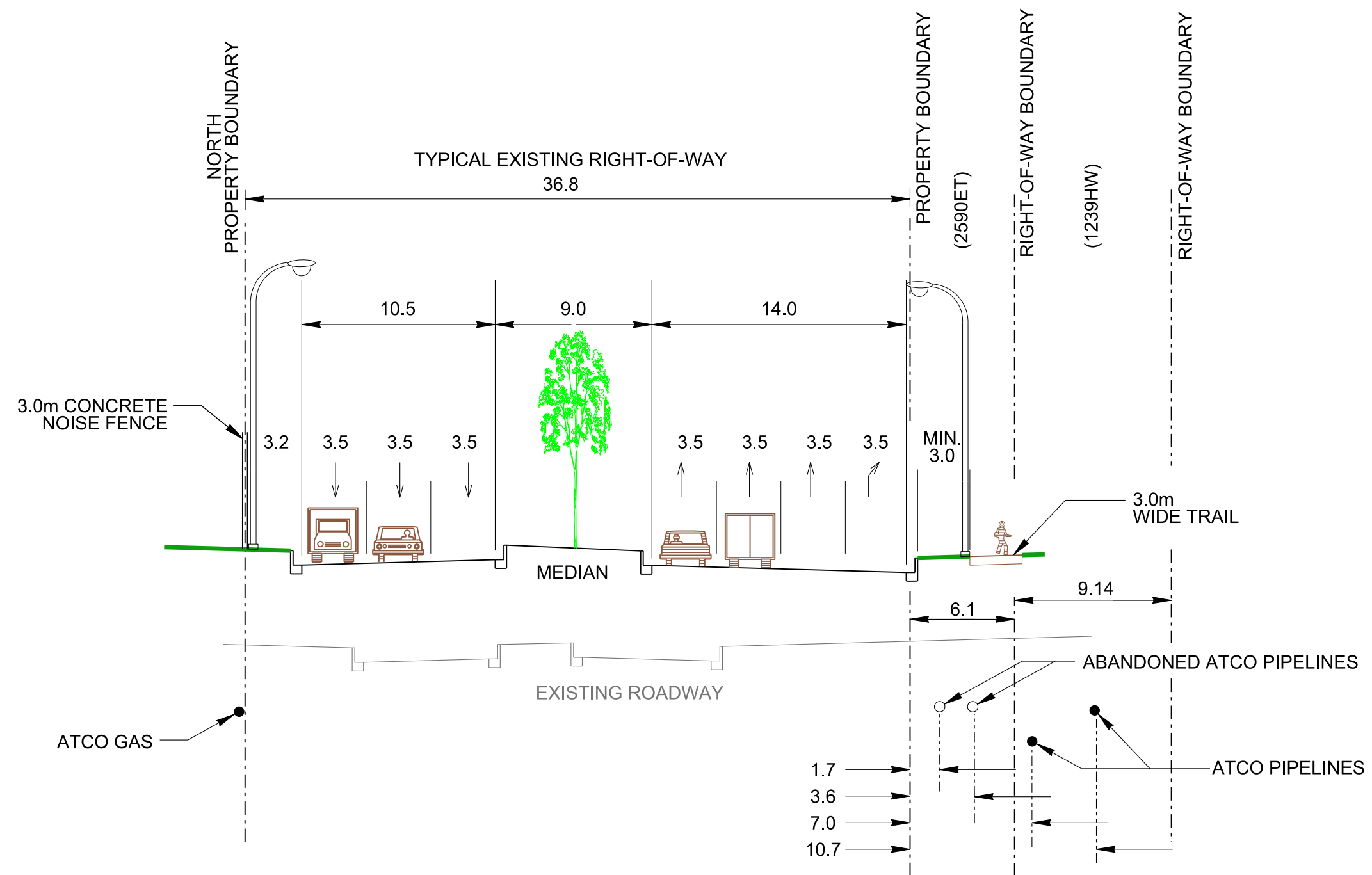


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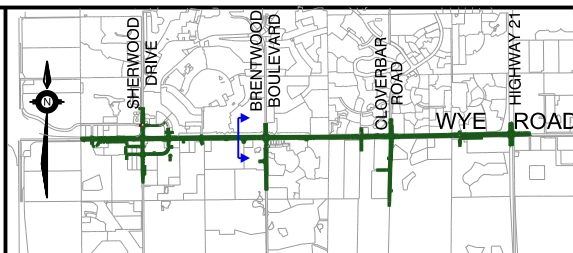
WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY
TYPICAL CROSS - SECTION

Date: JANUARY, 2015

EXHIBIT 2.6



**FUNCTIONAL PLAN ONLY
SUBJECT TO REVISIONS**

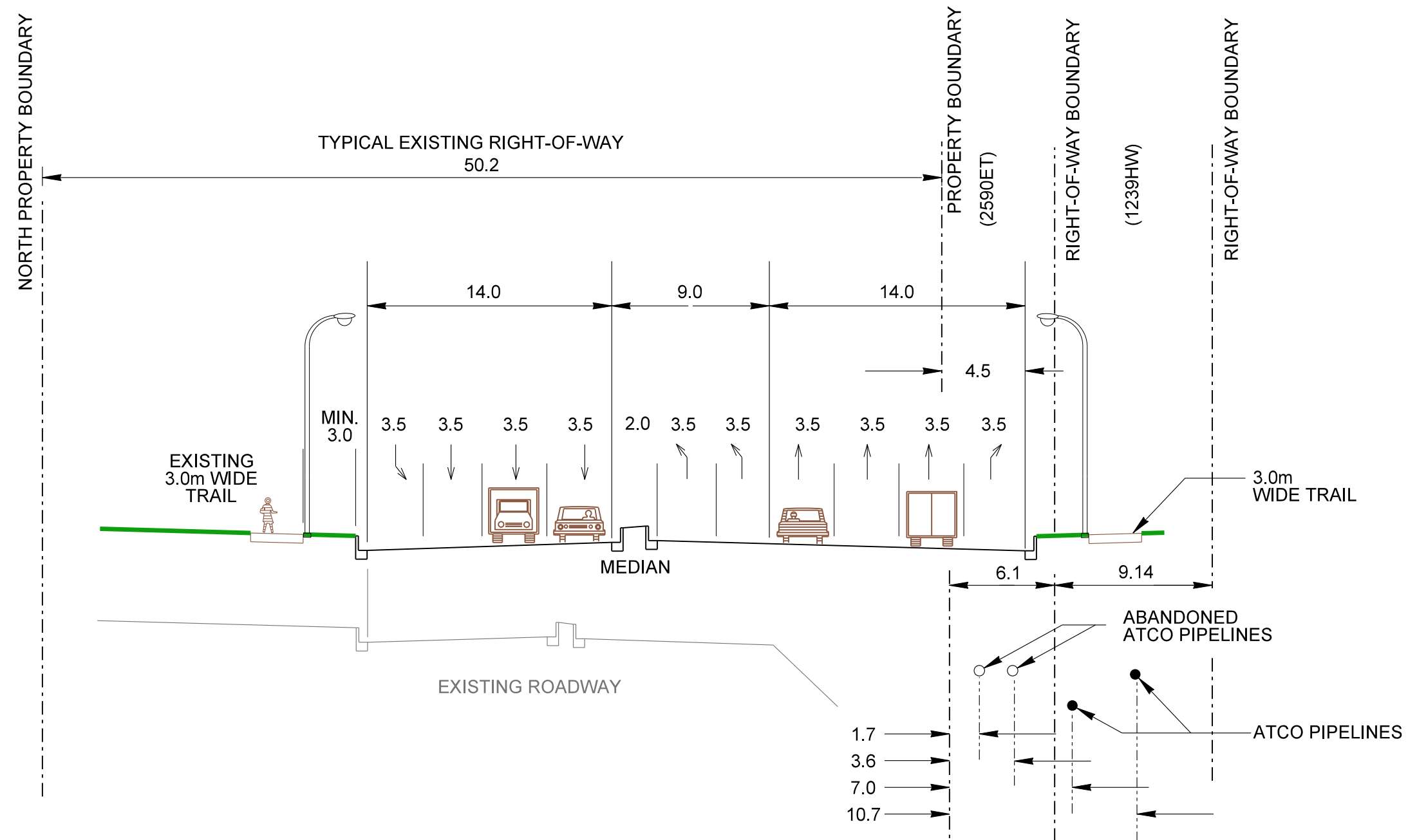


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WYE ROAD - SHERWOOD PARK FUNCTIONAL PLANNING STUDY TYPICAL CROSS - SECTION

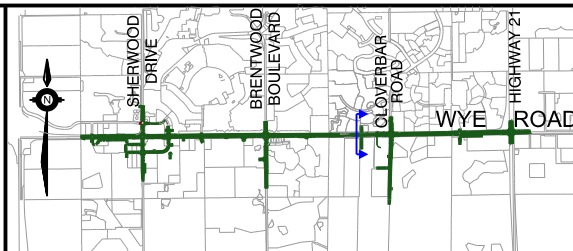
Date: JANUARY, 2015

EXHIBIT 2.7



WYE ROAD
CROSS-SECTION - WEST OF NOTTINGHAM WAY

FUNCTIONAL PLAN ONLY
SUBJECT TO REVISIONS

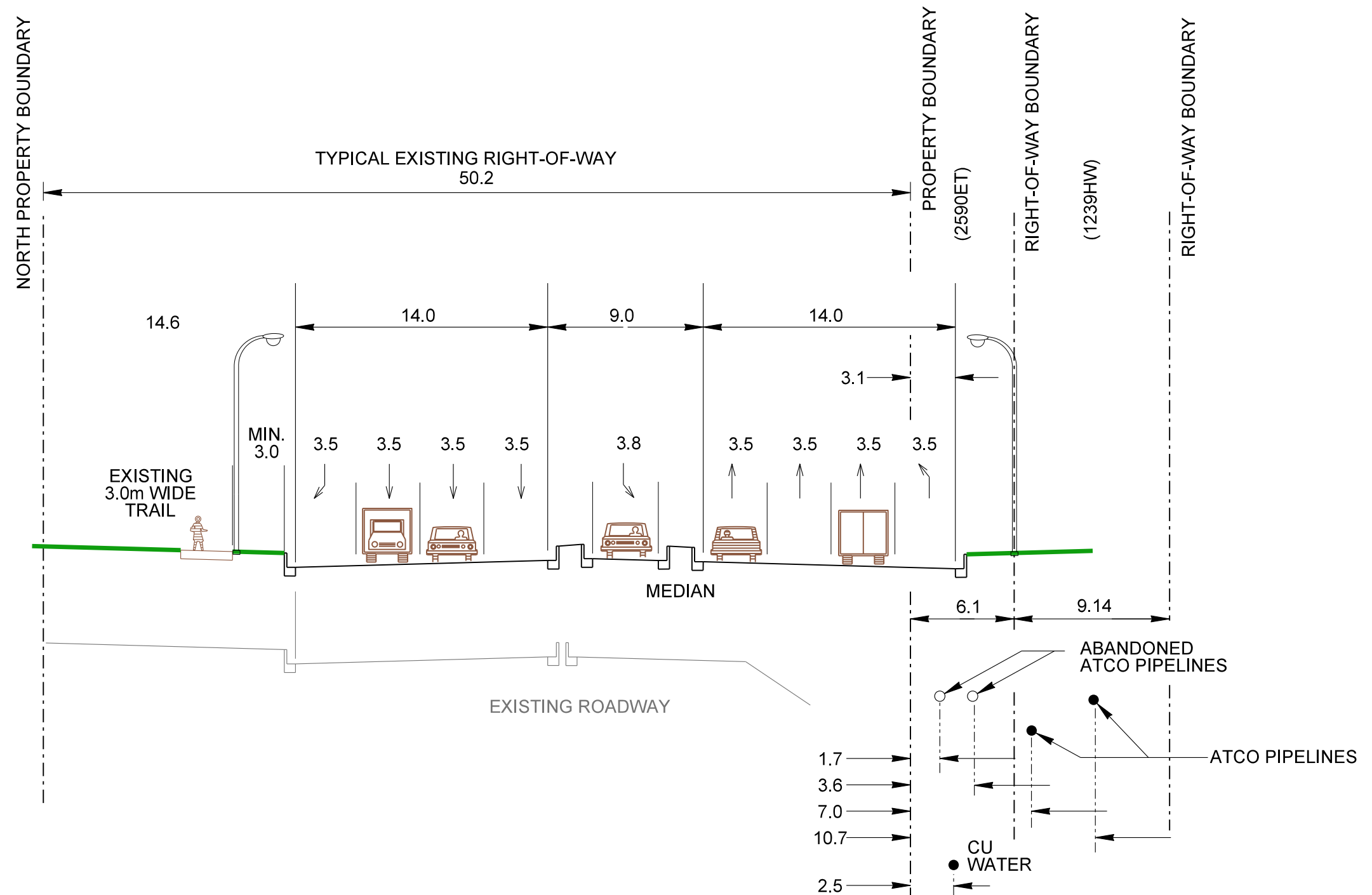


Scale: N.T.S.

WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY
TYPICAL CROSS - SECTION

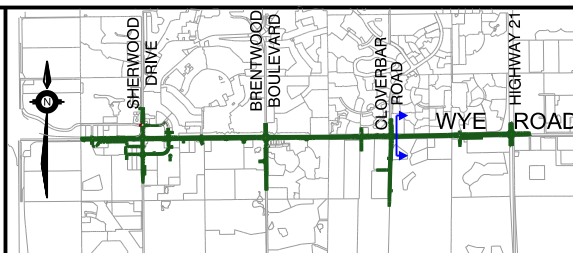
Date: JANUARY, 2015

EXHIBIT 2.9



WYE ROAD
CROSS-SECTION - EAST OF CLOVERBAR ROAD

FUNCTIONAL PLAN ONLY
SUBJECT TO REVISIONS

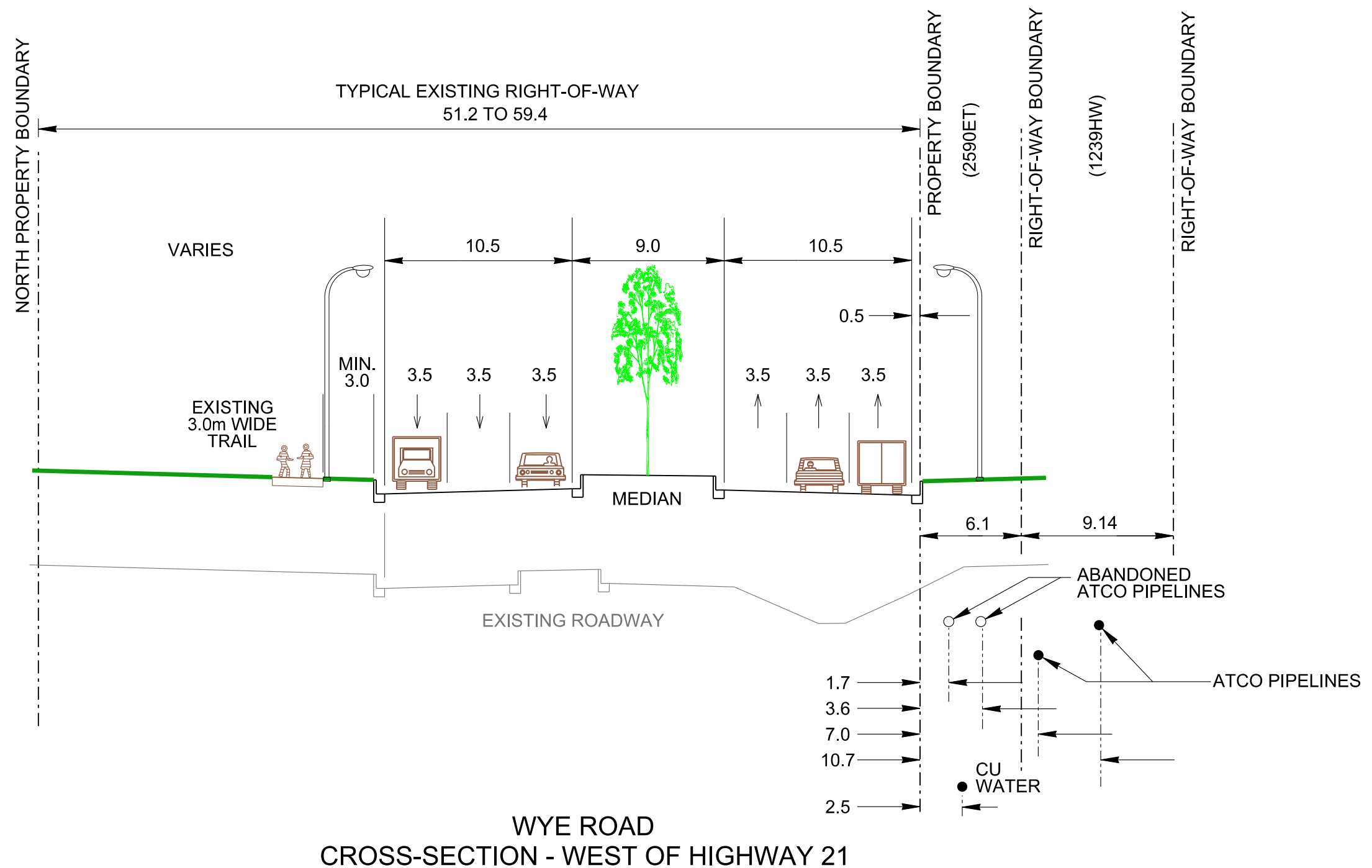


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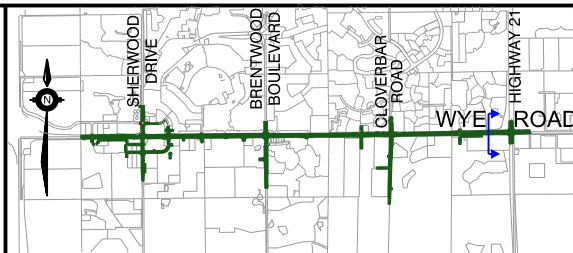
WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY
TYPICAL CROSS - SECTION

Date: JANUARY, 2015

EXHIBIT 2.10



FUNCTIONAL PLAN ONLY
SUBJECT TO REVISIONS

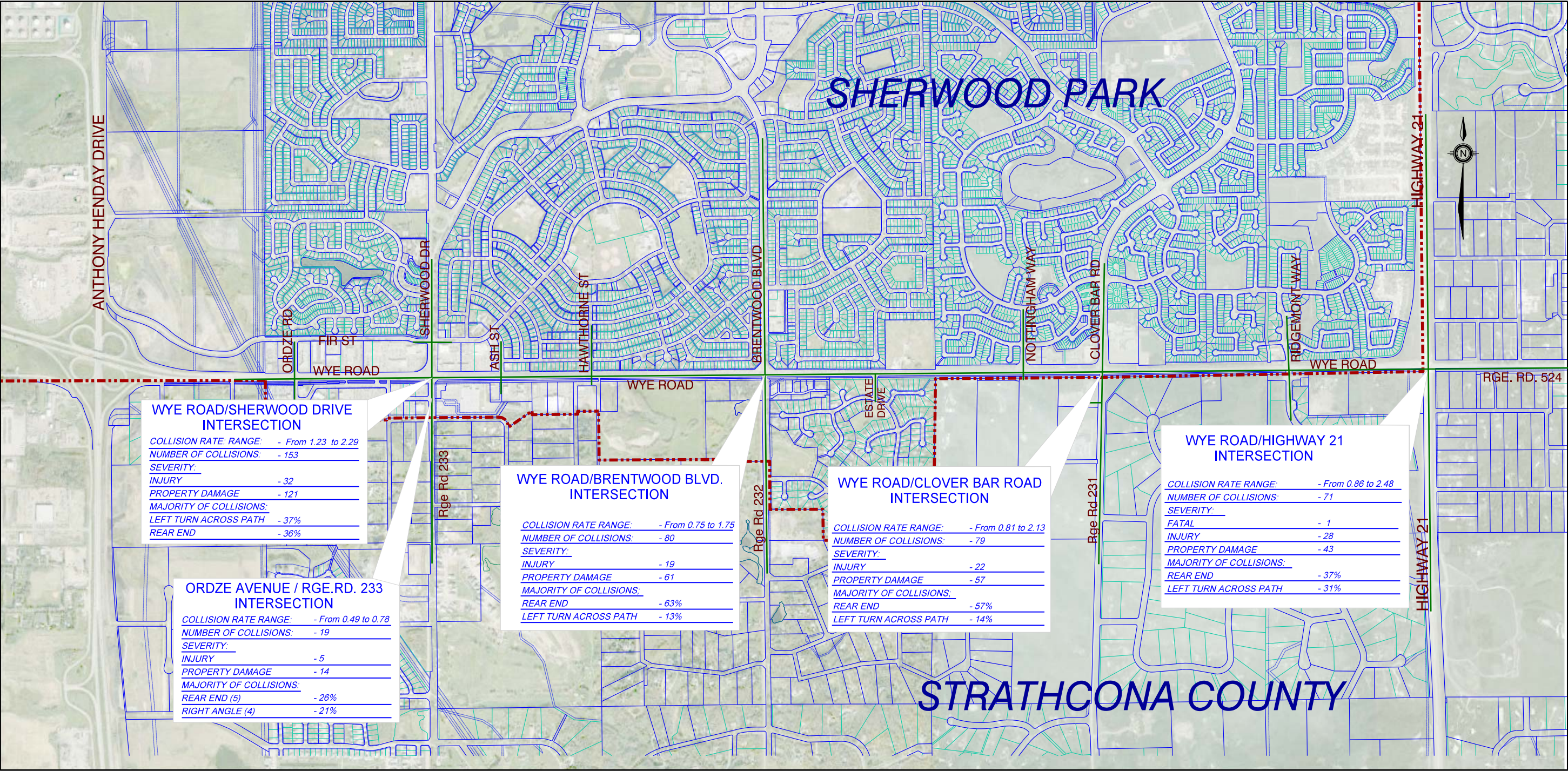


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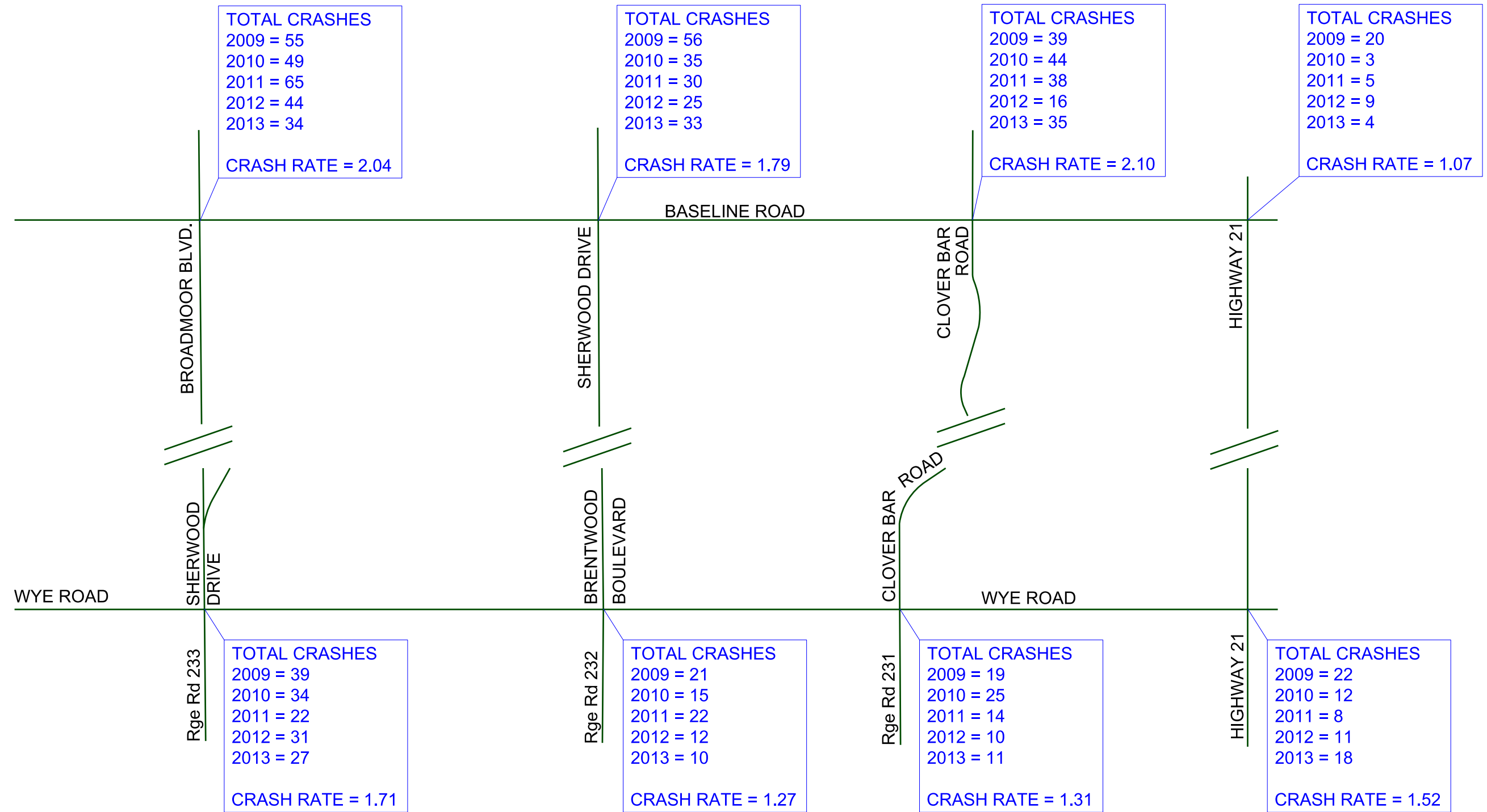
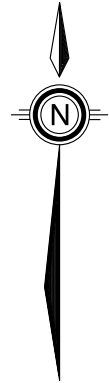
WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY
TYPICAL CROSS - SECTION

Date: JANUARY, 2015

EXHIBIT 2.11



NOTE:
COLLISION RATE = NUMBER OF CRASHES AT INTERSECTION
PER MILLION ENTERING VEHICLES PER YEAR
COLLISION RATES REPRESENT RANGE OVER 5 YEAR PERIOD (2009 TO 2013)



NOTES:

- COLLISION STATISTICS 2009 - 2013
- TOTAL CRASHES INCLUDE INJURY AND PROPERTY COLLISIONS
- CRASH RATE IS 5 YEAR AVERAGE PER MILLION VEHICLES ENTERING AN INTERSECTION

3.0 Design Criteria

The general approach to the study was to develop a long-term plan which maintains the integrity and function of Wye Road as a major arterial roadway in Sherwood Park and Strathcona County.

As noted, in the original study the desired (targeted) LOS at the time of full build out of Sherwood Park, which was previously expected to be achieved in about year 2015, was established at LOS D, with 10% spare capacity, and volume to capacity ratio v/c less than 0.8 for all movements. This study update has set the target to meet the traffic demand for the 20 year horizon, with LOS E or better and v/c less than 1.0.

Traffic projections and analysis in this study included redevelopment and development intensification for the Salisbury Village lands between Ash Street and Brentwood Boulevard as well as for the 140 acres west of Clover Bar Road, but did not include redevelopment or development traffic from the possible Colchester Urban Growth Node.

The design criteria used for preparation of the Wye Road Functional Plans, as shown in **Table 3.1**, was developed by the design team in consultation with County staff. These design criteria are considered appropriate for the standard and classification of this roadway.

Table 3.1 – Design Criteria

Criteria	Wye Road
Road Classification	UAD (Urban Arterial Divided)
Design Speed	80 km/h
No. of Lanes	Six (6) Lanes, and Auxiliary Lanes as Required ¹
Design Vehicle	WB 21
Min. Radius	R 250m (80 km/h)
Min. K Factor	Crest 35, Sag 35 (80 km/h)
Min. Grade	Desired > 0.6%
Superelevation	Typical Cross-slope 2.5%, Max Superelevation 6%
Min. S.S.S. (Stopping Sight Distance)	140m (80 km/h)
Min. D.S.D. (Decision Sight Distance)	230m – 310m (80 km/h)
Lane Width	3.5m min (Basic and Auxiliary Lanes)
C/G Width	0.25m Gutter (min)
Median Width	9.0m – Allowance for Double Left Turn Lane

¹ Right-of-way constraints may dictate preclusion of auxiliary lanes at some locations

4.0 Intersection Evaluation / Traffic Modelling & Analysis

Extensive traffic analysis for the Wye Road corridor, between Highway 216 (Anthony Henday Drive) and Highway 21 was conducted as part of the original 2008 Wye Road Functional Planning Study. The analysis was only updated for the section of Wye Road from west of Ordze Road to west of Hawthorne Street, and is described further in the Traffic Review Working Paper (2014) included in **Appendix B**.

4.1 Traffic Estimates

Traffic projections in the original Wye Road Functional Planning Study were generated from the following sources:

- ♦ Strathcona County 2015 Traffic Model, prepared in conjunction with the 2008 Transportation Model Update.
- ♦ Traffic Impact Assessment (TIA) for the South of Wye (Salisbury Village) development, based on land use plans available in 2008. The proposed land use for Salisbury Village has changed significantly since 2008, and the current plan, which includes a lower density residential component, generates somewhat less traffic than the 2008 TIA.
- ♦ Additional traffic generation work based on approved developments, which were not included in the Traffic Model Update.
- ♦ Background Traffic Growth was estimated at 2% per year for the first 5 years and at 3% per year subsequently.

The time horizon for the original study was 2015, which was expected to coincide with build-out of Sherwood Park, full development of Salisbury Village, and the residential areas adjacent to Range Road 233 between Wye Road and Township Road 522. As the 2015 horizon year was considered reasonably short term, an operational objective of LOS D (v/c <0.8) was established for the original (2008) Wye Road Functional Planning Study, as these targets were felt to provide approximately 10% spare capacity for background traffic growth on the road network.

For this study update, it was agreed that the operational objectives would be based on a twenty (20) year horizon and more current traffic projections, specifically for Wye Road between Ordze Road and Hawthorne Street. A target LOS E, and v/c approaching 1 would be considered acceptable for intersections within the study area. Traffic estimates were prepared based on the development progression shown in **Table 4.1**.

Table 4.1 – Development Assumptions Related to Time Horizons

Development Area	5 Year Horizon	10 Year Horizon	15 Year Horizon	20 Year Horizon
Salisbury Village West	100% Completed	100% Completed	100% Completed	100% Completed
Salisbury Village East	20% Completed	100% Completed	100% Completed	100% Completed
Developments Along Range Road 233	90% Completed	100% Completed	100% Completed	100% Completed
Background Traffic Growth	10%	25%	40%	55%

Exhibits 4.1 and 4.2 illustrate existing PM Peak hour and daily traffic volumes along the Wye Road corridor, and in the immediate vicinity. These estimates are based on recent counts completed by Strathcona County along the corridor, and have been adjusted to reflect 2013 volumes, where the counts were completed earlier.

Exhibits 4.3 and 4.4 illustrate estimated future PM Peak and daily traffic volumes for the approximate twenty (20) year horizon (2035). As noted, estimated future traffic shown on **Exhibits 4.3 and 4.4** has been revised for the westerly portion of Wye Road (west of Brentwood Boulevard), but is unchanged east of Brentwood Boulevard. The original traffic projections for the east area were felt to reasonably reflect the longer term horizon, as original projections were based on build-out of the urban services area of Sherwood Park, including the Salisbury Village development, which is a significant contributor to Wye Road traffic.

4.2 Traffic Analysis

Traffic analyses were conducted using Synchro and SimTraffic modelling software, and the results of these analyses are included in the original 2008 Wye Road Functional Planning Study, the Wye Road and Brentwood Boulevard Supplementary Intersection Analysis (2011), and the Traffic Review Working Paper (March 2014).

The traffic analysis completed in the original 2008 study confirmed that six (6) through lanes (3 in each direction) with a 9.0m wide median to accommodate double left turn lanes at the intersections, would be required to meet the long term traffic demand on Wye Road.

The 2008 Wye Road study also developed and analyzed numerous intersection configurations for the major intersections along Wye Road (Sherwood Drive, Brentwood Boulevard, and Clover Bar Road) to identify the configuration for each that provided the best operations. It was found that by removing some of the left turn movements, particularly at Sherwood Drive and Brentwood Boulevard, improved operations could be achieved. However, the proposal to relocate the removed left turns from the intersections was not well received by some members of the public, and particularly by some businesses.

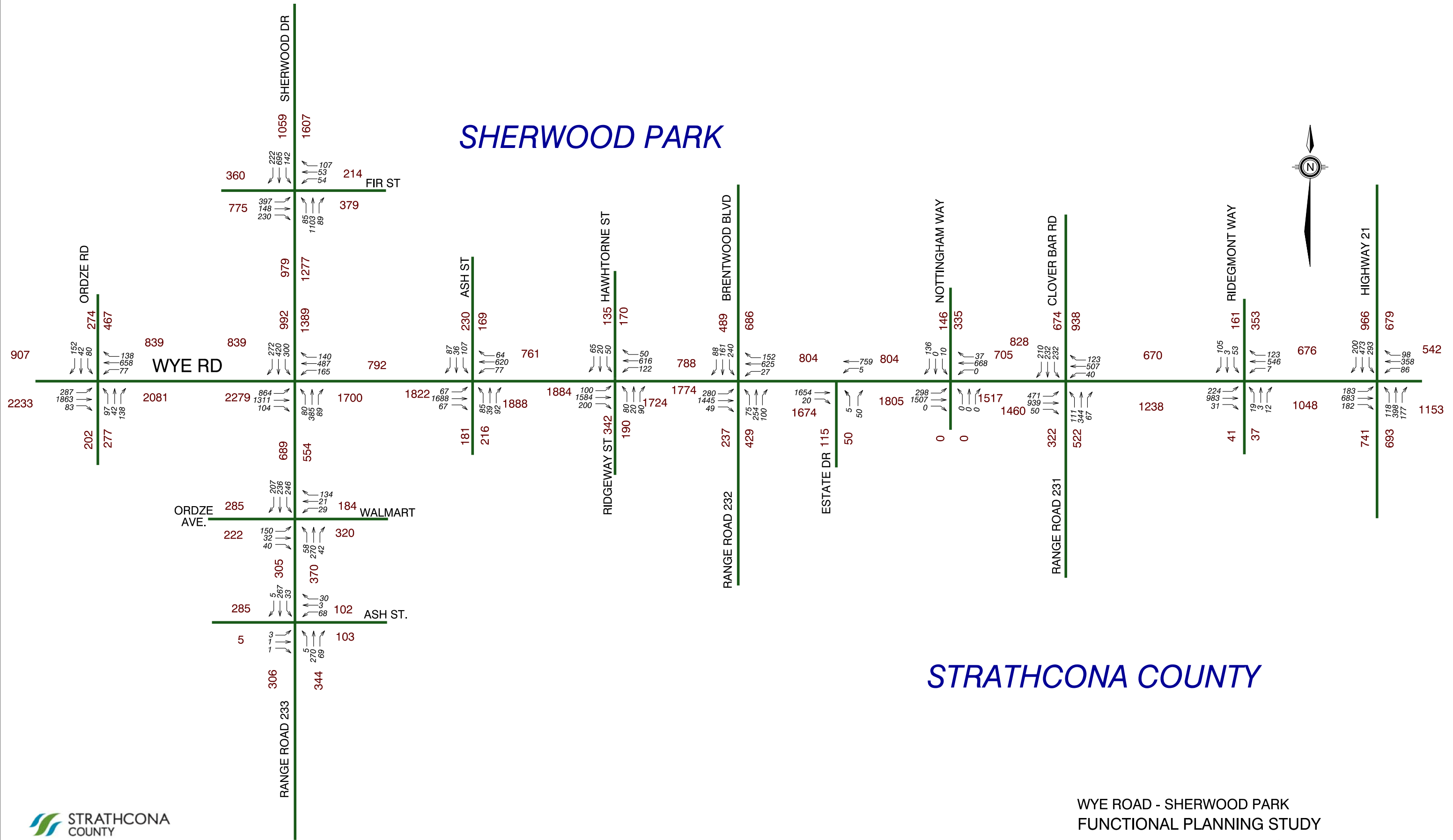
The 2012 Council directive to engage the business owners within the west portion of the corridor (from Ordze Road to Ash Street) to develop corridor improvements that would meet the projected traffic demand and not compromise business access necessitated an update to the 2008 study. The current traffic analysis work includes a review of the safety and effectiveness of the proposed stakeholder improvements for the corridor.

The objective of the current traffic analysis work is to:

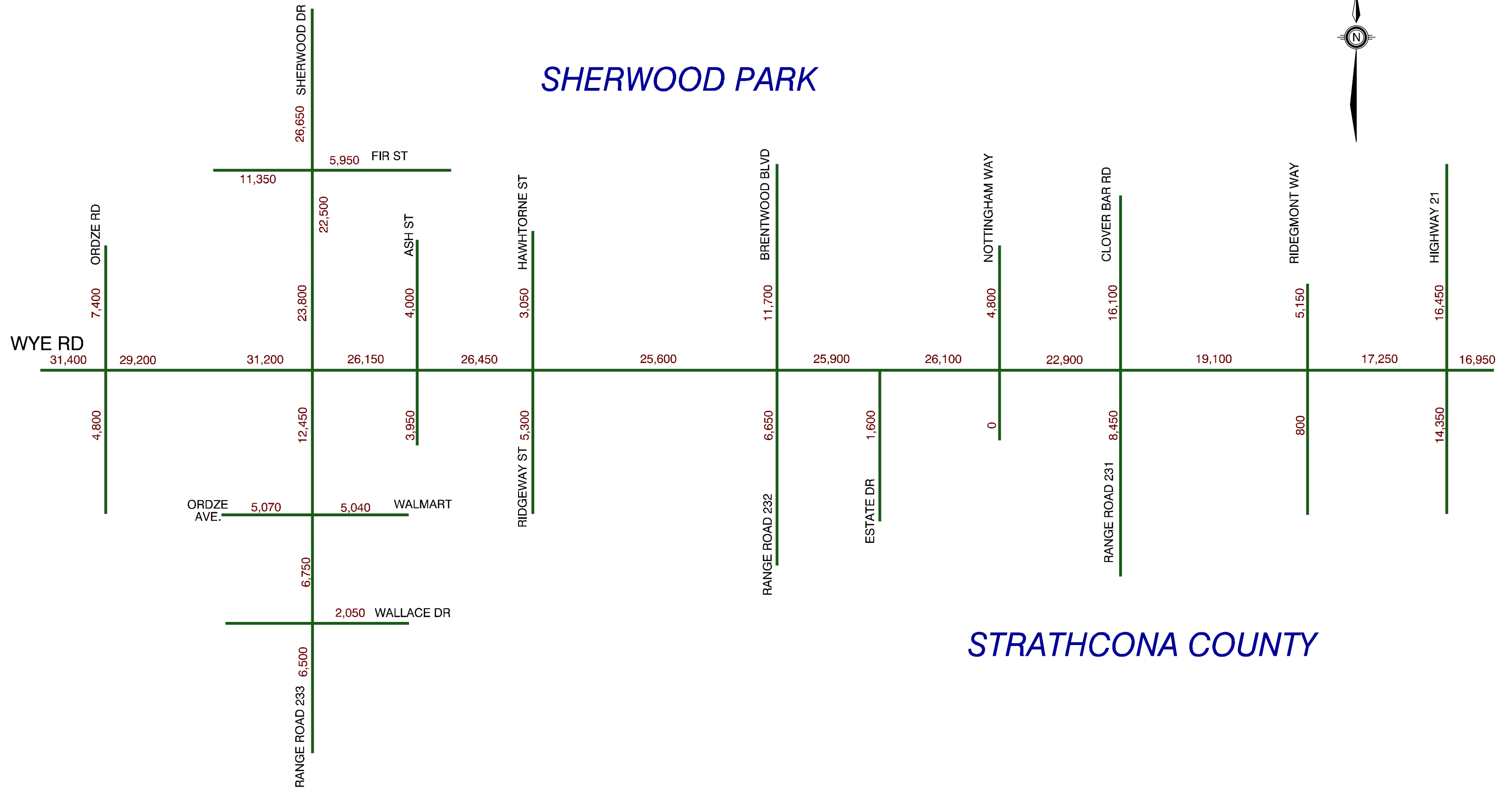
- ♦ Evaluate the impact of the projected 20 year horizon traffic on the existing Wye Road configuration, particularly at intersections. Intersection operations worse than LOS E and v/c >1 would be considered unacceptable, and would require improvements.
- ♦ Development and evaluate intersection improvements based on the stakeholder input to achieve operational objectives for the twenty year horizon traffic.

Additional traffic projections and analyses completed for the Wye Road corridor since the original study have shown that conventional intersections using double left turn lanes in the high traffic demand quadrants will meet the traffic demand for the 20 year horizon at the Sherwood Drive and Brentwood Boulevard intersections. Functional plans illustrating the recommended configuration of Wye Road and intersecting roads have been prepared on that basis, and are described in greater detail in **Section 5.0**.

SHERWOOD PARK



SHERWOOD PARK



LEGEND:

25,600 - ESTIMATED DAILY TRAFFIC VOLUME

NOTE:

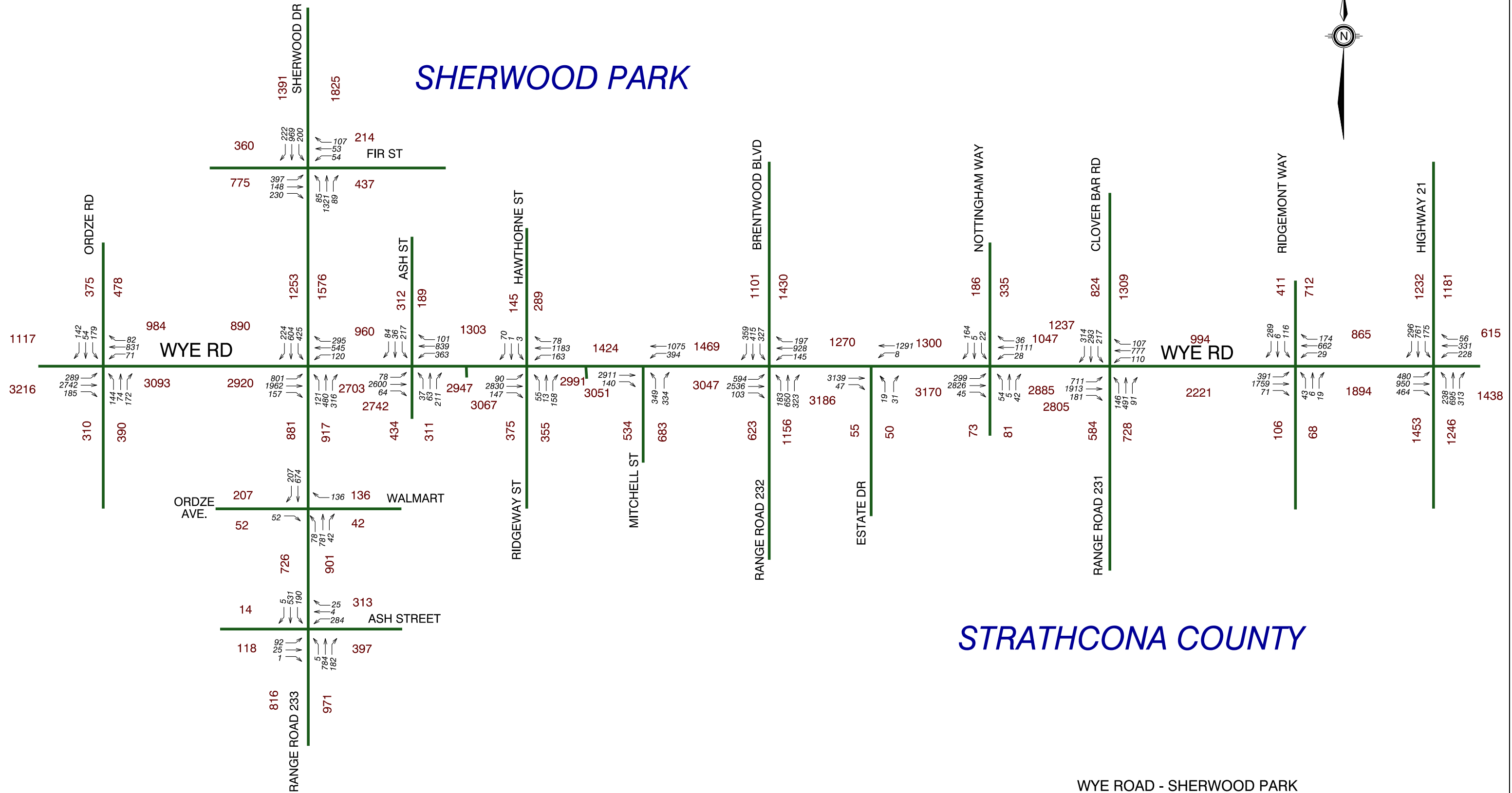
TRAFFIC ESTIMATE IS BASED ON PM PEAK
REPRESENTING 10% OF DAILY VOLUME
(EXISTING PROPORTION)

WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY
ESTIMATED EXISTING (YEAR 2013)
TRAFFIC DAILY VOLUME

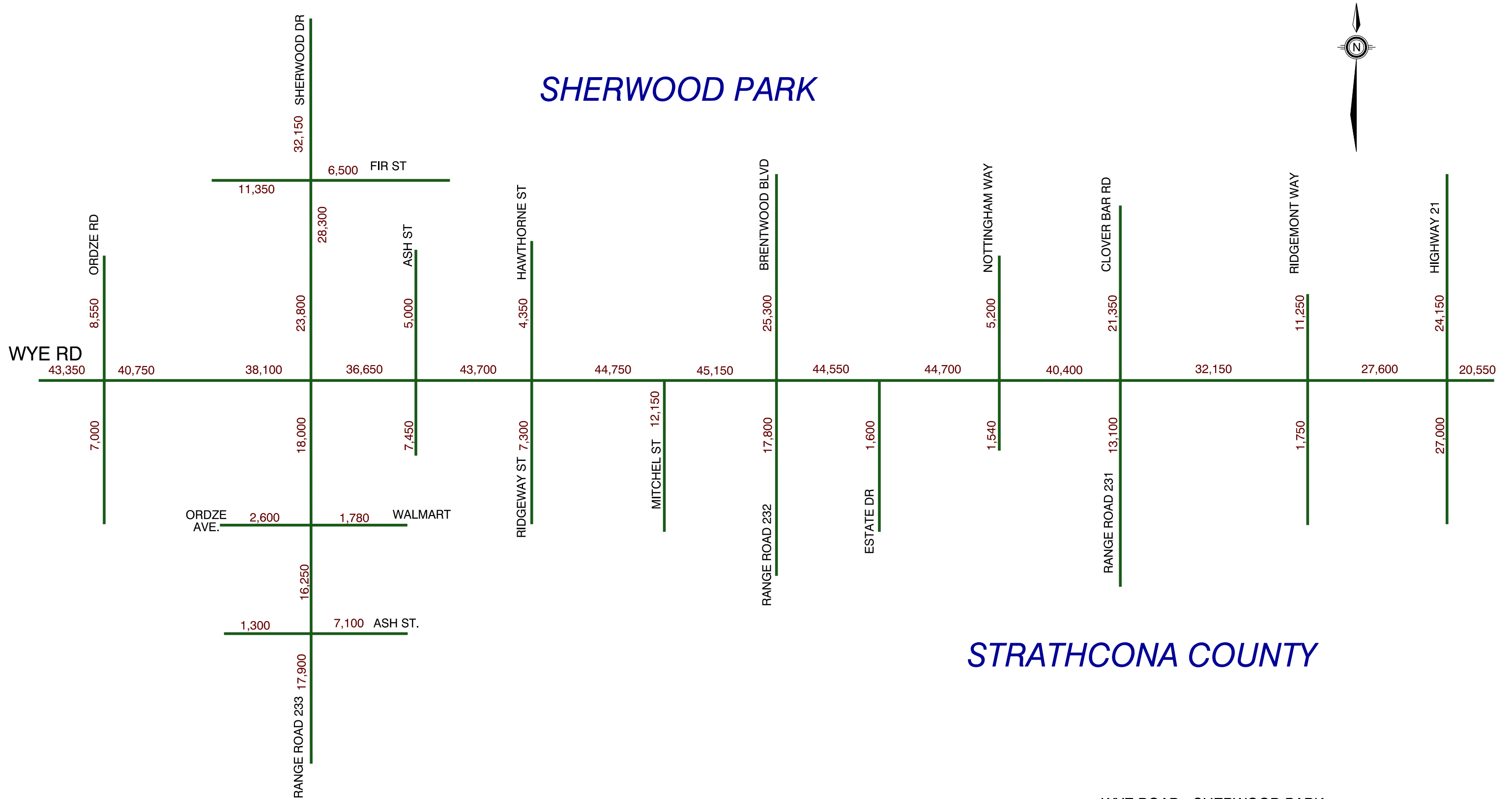
Date: AUGUST 2014

EXHIBIT 4.2

SHERWOOD PARK



STRATHCONA COUNTY



LEGEND:

25,600 - ESTIMATED DAILY TRAFFIC VOLUME

NOTE:

TRAFFIC ESTIMATE IS BASED ON PM PEAK
REPRESENTING 10% OF DAILY VOLUME
(EXISTING PROPORTION)

WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY

**ESTIMATED (YEAR 2035) DAILY TRAFFIC
(TOTAL DEVELOPMENT OF AREA)**

Date: FEBRUARY, 2015

EXHIBIT 4.4



5.0 Functional Plan Development

Functional plans were developed for Wye Road and the adjacent road network based on conclusions of the intersection / traffic analysis. Plans were developed to provide six basic lanes plus auxiliary lanes, as required for Wye Road, shown on **Exhibits 5.1 through 5.10**. Through lanes and auxiliary lanes have been designed at a minimum width of 3.5m where reconstruction is required. Typically the north side edge of Wye Road is preserved and the roadway is widened on the south side. Additional lanes are proposed to provide additional capacity and auxiliary lanes for safer access to developments on the south side. Channelized “Aussi” style designs are used at arterial road intersections to provide safer operations of the right turns. Where necessary, double left turn lanes are proposed with opposing slotted single left turn to provide improved sight lines, hence improving safety.

A brief description of the functional plans is provided as follows:

5.1 Wye Road – Highway 216 to Sherwood Drive

Existing Wye Road provides three (3) lanes eastbound with the right outside lane developed at the northbound to eastbound interchange ramp from Highway 216. The right lane currently functions as an auxiliary and through lane, and carries through the Ordze Road and Sherwood Drive intersections. Lane capacity is reduced on this through/auxiliary lane by the right in/out accesses to the commercial area south of Wye Road. Widening of Wye Road eastbound is proposed to provide three (3) through lanes plus auxiliary lanes. Widening between Ordze Road and Sherwood Drive will be approximately 7.0m to allow much of the south median curb to remain in its current location and configuration. The resulting design will develop the outside eastbound left turn lane for Sherwood Drive immediately east of the Ordze Road intersection. An alternative would require moving south, the entire median south curb, and result in loss of an eastbound lane. We believe a cost effective and prudent approach is demonstrated by the design shown, but this should be further evaluated during design.

Long term improvements (+20 years) between Ordze Road and Sherwood Drive were included on the functional plans and may be considered, if and when operations at the Sherwood Drive / Wye Road intersection deteriorate and become an operational or safety concern. It is suggested that the westerly extension of Ash Street from Sherwood Drive to Ordze Crescent could alleviate some of the turning movement pressure at the Sherwood Drive intersection, and could also provide access to the lands south, should redevelopment occur. Accordingly, it is suggested that a new access from Wye Road to the Wye Gardens commercial area, opposite the Safeway access, only be considered after the west extension of Ash Street to Ordze Crescent has been constructed.

Minimal change to Wye Road westbound between Highway 216 and Sherwood Drive is proposed, as the current roadway functions with three (3) through westbound lanes, plus auxiliary lanes. West of Ordze Road, Wye Road reduces to two (2) lanes westbound, as the outside westbound lane is dropped prior to Highway 216. Transition from six (6) lanes to four (4) lanes in the vicinity of Highway 216 is expected to be resolved in conjunction with the current interchange design by Alberta Transportation in conjunction with the Northeast Anthony Henday project.

5.1.1 Ordze Road / Wye Road Intersection

Changes proposed at the Ordze Road intersection are expected to improve operational and capacity issues, which currently exist at the intersection. Closing the access to the Chamber of Commerce in the southeast quadrant of the intersection will facilitate a longer left turn lane northbound (currently room for a maximum of

two vehicles). A narrow raised median (1.0m) is proposed to separate the southbound left turn lane from the northbound lane on Ordze Road, north of Wye Road. The median would limit the vehicular traffic at the first entrance into the Boston Pizza complex (located in the northeast quadrant of the intersection). This should be acceptable as the property has two (2) additional all direction accesses.

Slotted left turn lanes eastbound and westbound on Wye Road at Ordze Road are proposed to further enhance operations and safety.

5.1.2 Sherwood Drive / Wye Road Intersection

Proposed improvements for this intersection, including improvements on Sherwood Drive, north to Fir Street, and south to Ash Street, should be considered within the five (5) year horizon to mitigate safety and operational concerns. Traffic analysis suggests that some movements are currently functioning at less than desirable LOS, and the close spacing of intersections on Sherwood Drive on each side of Wye Road are creating significant operational and safety concerns.

Intersection improvements at Sherwood Drive / Wye Road include the following works, which cannot be effectively staged, without significant throw-away costs:

1. Add double left turn lanes southbound and westbound, such that double left lanes exist for all movements except northbound. The westbound double left can be achieved by removal of the existing slotted island. The double left southbound requires widening and reconfiguration on Sherwood Drive, both north and south of Wye Road.
2. To accommodate the southbound double left, modification to the large island in the northwest quadrant of Wye / Sherwood is required, and the southbound right turn lane on Sherwood Drive would be converted to a southbound through / right. There is the potential that the conversion of this lane to a through/right may compromise some right turn capacity at the intersection.
3. South of the Wye / Sherwood intersection the widening required to accommodate the southbound double left may require some retaining walls or other measures adjacent to the Wendy's restaurant.
4. Convert the all-directional access at Wal-Mart to a right in/out, with the northbound left turn movement onto Ordze Avenue retained. Relocate the existing traffic signal to the Ash Street / Range Road 233 intersection.
5. Convert all-directional access from Sherwood Drive to Sherwood Centre (Petro Canada) to a right in/out, by extending the narrow raised median from Wye Road to Fir Street.
6. Extend Ash Street west of Range Road 233 as indicated, with a north connection to Ordze Avenue. Improve the Ash Street / Range Road 233 intersection as shown, and install a traffic signal.
7. Modify the Sherwood Drive / Fir Street intersection to include slotted left turns for the northbound and southbound directions as well as lengthening the northbound to westbound left turn bay.

As noted, our analysis indicates that the improvements will meet the traffic demand for the 20 year horizon.

5.2 Wye Road – Sherwood Drive to Brentwood Boulevard

Wye Road between Sherwood Drive and Hawthorne Street was widened in 2009 to a six lane roadway with a 9.0m wide median and eastbound auxiliary lane. East of Hawthorne existing Wye Road is a four (4) lane divided urban roadway, with acceleration/deceleration lanes at the Brentwood Boulevard intersection. To convert to a six (6) lane roadway, with a 9.0m wide median (to accommodate double left turn lanes), widening to the south is required. The existing westbound acceleration lane at Brentwood and deceleration lane at Hawthorne Street will be converted to a through lane; no westbound auxiliary lane will be provided due to the

concrete noise wall constraint along the north side. A westbound deceleration lane at the approach to Ash Street, beyond the west end of the concrete wall is included in the design.

An auxiliary right turn lane eastbound, which is discontinuous at major intersections is required between Sherwood Drive and Brentwood Boulevard to support the access management plan developed for the Salisbury Village development concept. As noted, the access management plan is considered a reasonable compromise to maintain the integrity and function of Wye Road, while providing reasonable development access. The auxiliary lane between Sherwood and Hawthorne was constructed in 2009, the auxiliary lane will continue to Brentwood with the next stage of widening.

5.2.1 Ash Street / Wye Road Intersection

Ash Street, south of Wye Road, is one of the main accesses to the proposed Salisbury Village commercial area. Double left turn lanes westbound to southbound on Wye Road are required to handle the high volume of left turn traffic.

The Green Street intersection location on Ash Street is a compromise reached between the developer and Strathcona County, as a longer throat length between Wye Road and Green Street would be desirable. The TIA completed by the Developer's Consultant, and reviewed in conjunction with the study, confirmed appropriate operations at the Green Street and Wye Road intersections on Ash Street, based on projected traffic for the development. Analysis suggests that signals will not be required at the Ash Street / Green Street intersection.

5.2.2 Hawthorne Street / Wye Road Intersection

Hawthorne Street north provides one of the main accesses to Wye Road from the Sherwood Heights and Maple Grove residential areas of Sherwood Park. The south leg of this intersection was also identified as a major access to the Salisbury Village development. A double left turn lane westbound is required on Wye Road, and a single left and a through/left lane northbound are required to meet the traffic demand. The intersection requires signals (which were installed in 2009).

5.2.3 Mitchell Street / Wye Road Intersection

Mitchell Street, located approximately 280m west of Brentwood Boulevard, is a new access from Wye Road into the proposed Salisbury Village development. Westbound left turn volumes are projected to be quite high, and will require a double left turn lane to meet the high traffic demand. The resulting back-to-back eastbound double left turns for the Brentwood Boulevard intersection restricts the median width, and will preclude landscaping through the area.

5.2.4 Wye Road / Brentwood Boulevard Intersection

The long term plan for Brentwood Boulevard reflects the traffic demand for a four (4) lane north-south roadway through the intersection. Limited right-of-way north of Wye Road restricts the ability to implement a six (6) lane cross-section with southbound double left turn lanes. Accordingly, a four (4) lane roadway, with double left turn lanes southbound is proposed for Brentwood Boulevard north of Wye Road.

Right-of-way for widening Range Road 232 on the west side, which is currently undeveloped, is required and should be protected as a condition of development. The four (4) lane configuration plus auxiliary lanes on Range Road 232 should be constructed as part of the Wye Road / Brentwood Boulevard intersection improvements, at least to the Salisbury East Parkway / Range Road 232 intersection.

Construction of Wye Road improvements, including pipeline removals, overhead power relocation, and other miscellaneous works, in accordance with these functional plans commenced in 2009 for the section from Sherwood Drive to Hawthorne Street. Construction of Wye Road between Hawthorne Street and Mitchel Street is expected to be completed in the fall of 2014 or early 2015.

5.3 Wye Road – Brentwood Boulevard to Clover Bar Road

Similar to west of Brentwood Boulevard, widening of Wye Road east will be to the south, as the north side noise wall constraint exists for an additional 550m east of Brentwood Boulevard. The functional plans are based on maintaining the north curb in its current location and developing the required six (6) lanes, plus a 9.0m median from the existing north curb alignment. Acceleration and deceleration lanes would be developed for intersections. The functional plans indicate that the westbound right turn deceleration lane at Brentwood Boulevard could be shortened from the current 300m to 130m, but this could be further evaluated at detailed design, as it may be appropriate to maintain the longer deceleration lane.

East of the CBC Tower Site (Nottingham), additional right-of-way is available on the north side of the existing road; however, since the north boulevard has recently been landscaped, and a new trail constructed, it was considered desirable to retain the north curb line in its current alignment, and not disturb the north boulevard. The south side of the existing Wye Road is a rural section, and therefore, urbanization will require storm drainage, and the profile should be reviewed to determine if adjustments are required (current standard is 0.6% minimum gradient whereas 0.5% was the acceptable minimum when westbound Wye Road urbanization was completed). It will be prudent to construct the ultimate south curb line in conjunction with the urbanization of Wye Road.

5.3.1 Estate Drive / Wye Road Intersection

The existing T-intersection will remain essentially as it currently exists, but will require signalization as traffic volumes increase on Wye Road. A slotted left turn lane westbound has been suggested. Retention of a westbound acceleration lane is recommended.

5.3.2 Nottingham Way / Wye Road Intersection

Functional plans indicate a double left turn lane eastbound on Wye Road at the Nottingham Way intersection; however, our current 2015 traffic analysis suggests a single left turn will meet the traffic demand. An evaluation of the intersection should be completed in conjunction with design of Wye Road widening, intersection improvements, and/or implementation of development to the south.

The commercial accesses north of Wye Road between Clover Bar Road and Nottingham Way are expected to remain in their current configuration, although the eastbound left into the area may be enhanced.

5.3.3 Clover Bar Road / Wye Road Intersection

A four lane roadway is indicated for Clover Bar Road through the Wye Road intersection, with southbound double left turn lanes. Traffic demand also indicates a requirement for double left turn lanes eastbound to northbound. Traffic analysis confirmed that a conventional intersection as shown will meet the long term traffic demand with approximately 10% spare capacity.

5.4 Wye Road – Clover Bar Road to Highway 21

The six (6) lane cross-section, with 9.0m wide median, for Wye Road is proposed to continue to Highway 21 and connect to the at-grade intersection in the interim and to the interchange in the long term. The north curb

alignment will be retained and all widening is proposed to the south to avoid disturbing the north boulevard, which has been recently landscaped and a new trail constructed. The south side of existing Wye Road is a rural section, and therefore, urbanization will require storm drainage, and the profile should be reviewed to determine if profile adjustments are required. As-built plans indicate that a minimum gradient of 0.5% was used for the previous construction, and it may be prudent to apply this standard to avoid re-profiling the road during subsequent construction. It would be prudent to construct the ultimate six (6) lane south curb line in conjunction with the urbanization of Wye Road.

5.4.1 Ridgmont Way / Wye Road Intersection

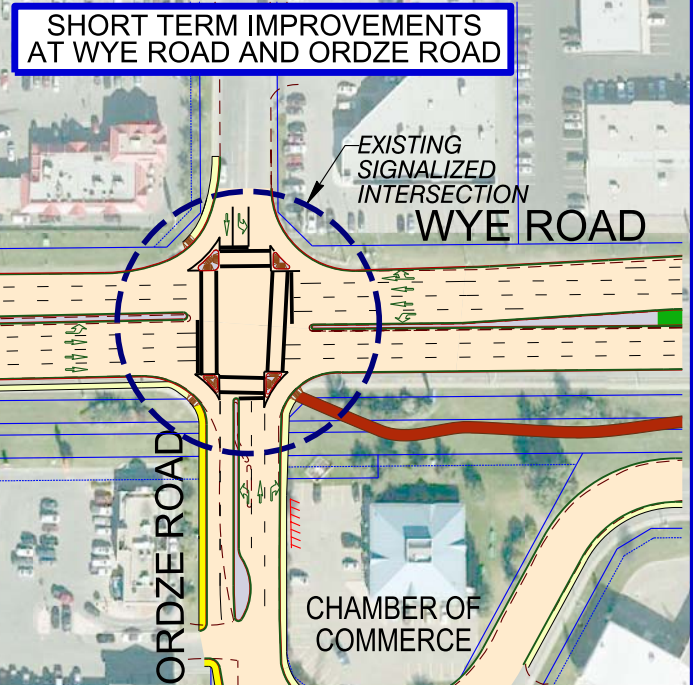
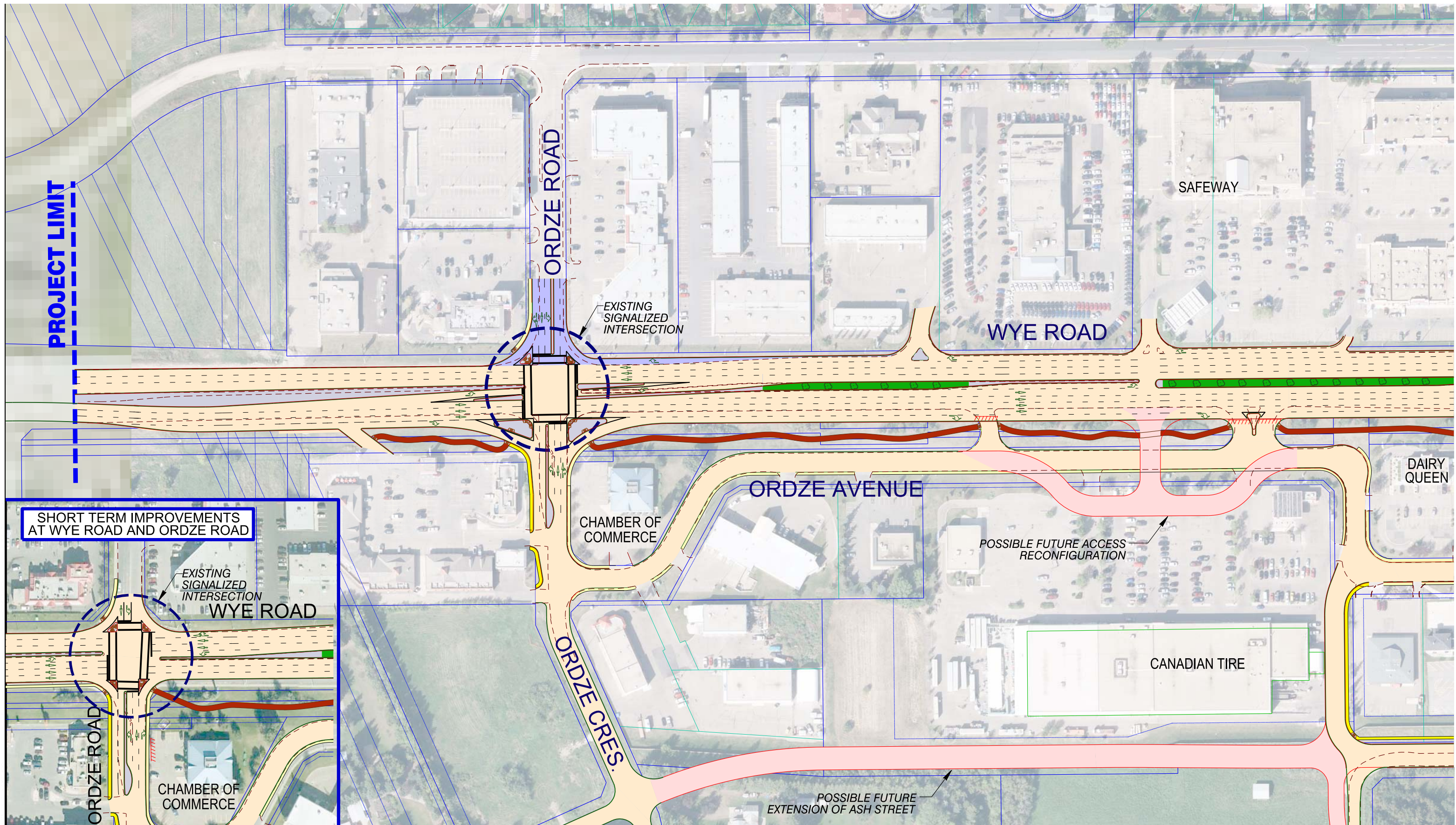
One intersection exists between Clover Bar Road and Highway 21 (\approx 900m east of Clover Bar Road). The intersection requires a double left turn lane eastbound into The Ridge / Regency Park residential area, and single left turn lane westbound into the Sherwood Hills Estates area.

5.5 Multi-Use Trails

A multi-use trail system along the south side of the Wye Road corridor, between Ordze Road and Highway 21 will provide desirable pedestrian / cyclist connectivity for the area. Although the trail is indicated as a linear trail, the intent is to create a meandering facility utilizing the adjacent Atco right-of-way, subject to negotiations, for each section of road. The “Wye Road Urban Design Guidelines” are intended to be the governing document for design of the trail and south boulevard landscaping, with the expectation that an attractive, pedestrian friendly environment can be created along this gateway to Sherwood Park.

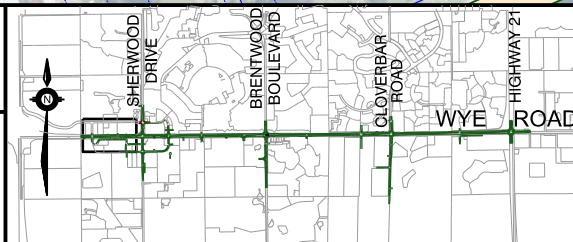
No additional multi-use trail is proposed on the north side of Wye Road due to the lack of available right-of-way between the north curb line and the concrete noise wall. A multi-use trail along the north side of Wye Road, between the CBC Tower (Nottingham Area) and Highway 21 was recently installed, as adequate right-of-way is available through this area. Pedestrian / cyclist crossings of Wye Road between the north and south sides to access trails should only be permitted at signalized intersections.

It is expected that pedestrian facilities along Wye Road will be constructed concurrently with the widening of Wye Road and adjacent future developments.



**FUNCTIONAL PLAN ONLY
SUBJECT TO REVISION**

LEGEND:	
	SHORT TERM IMPROVED ROADWAY (1-10 YEARS)
	MEDIUM TERM ROADWAY (11-20 YEARS)
	LONG TERM ROADWAY (20+ YEARS)
	CONCRETE MEDIAN
	LANDSCAPED AND PLANTED MEDIAN
	PROPOSED TRAIL
	EXISTING TRAIL
	PROPOSED SIDEWALK
	EXISTING SIDEWALK
	URBAN SERVICES BOUNDARY ACCESS CLOSED



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COUNTY



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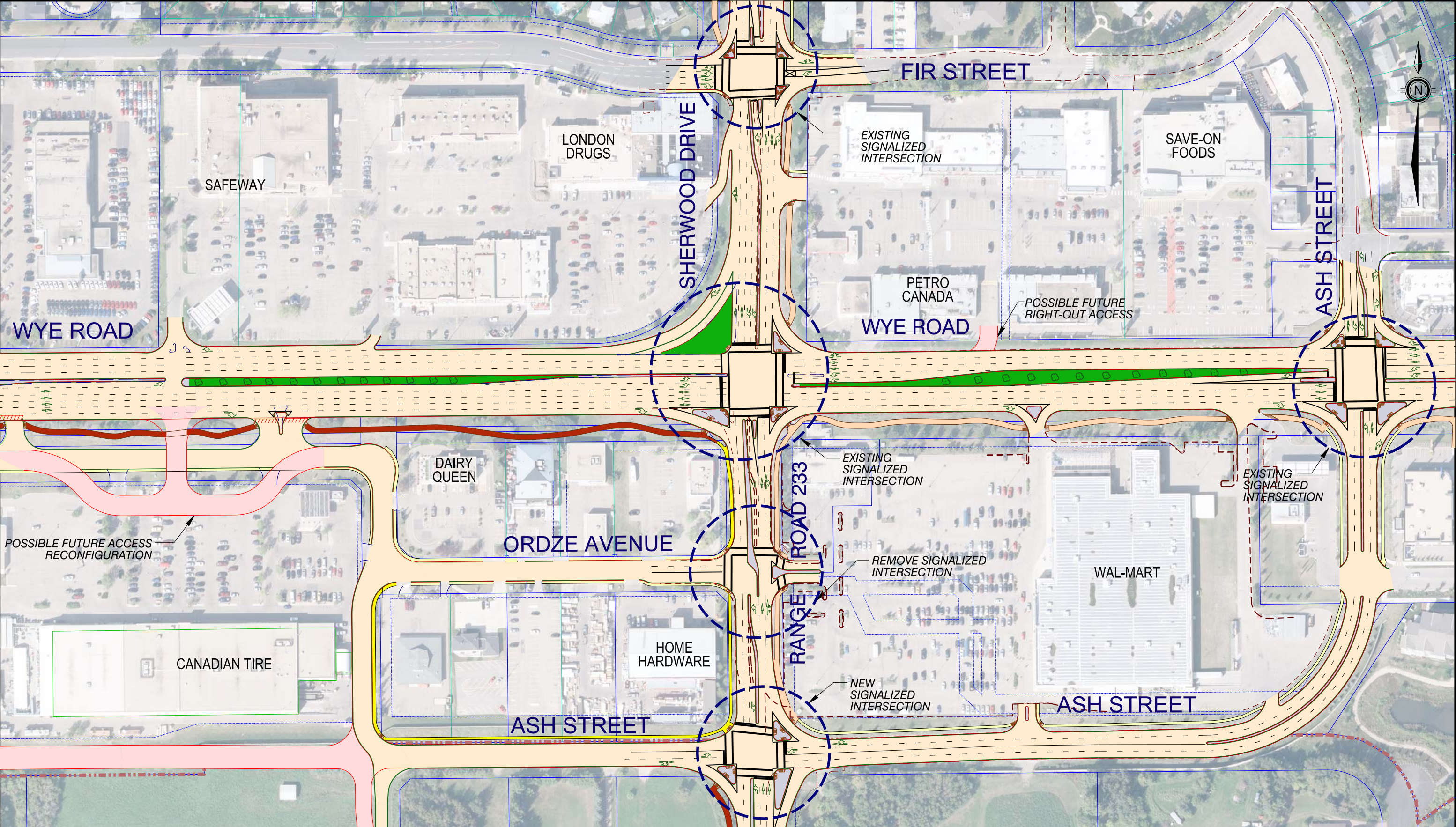


WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY

RECOMMENDED LONG TERM IMPROVEMENT PLAN

Date: FEBRUARY, 2015

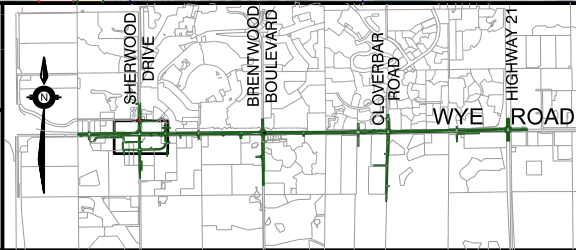
EXHIBIT 5.1



**FUNCTIONAL PLAN ONLY
SUBJECT TO REVISION**

LEGEND:

SHORT TERM IMPROVED ROADWAY (1-10 YEARS)	PROPOSED TRAIL
MEDIUM TERM ROADWAY (11-20 YEARS)	EXISTING TRAIL
LONG TERM ROADWAY (20+ YEARS)	PROPOSED SIDEWALK
CONCRETE MEDIAN	EXISTING SIDEWALK
LANDSCAPED AND PLANTED MEDIAN	URBAN SERVICES BOUNDARY ACCESS CLOSED



STRATHCONA COUNTY

Al-Terra

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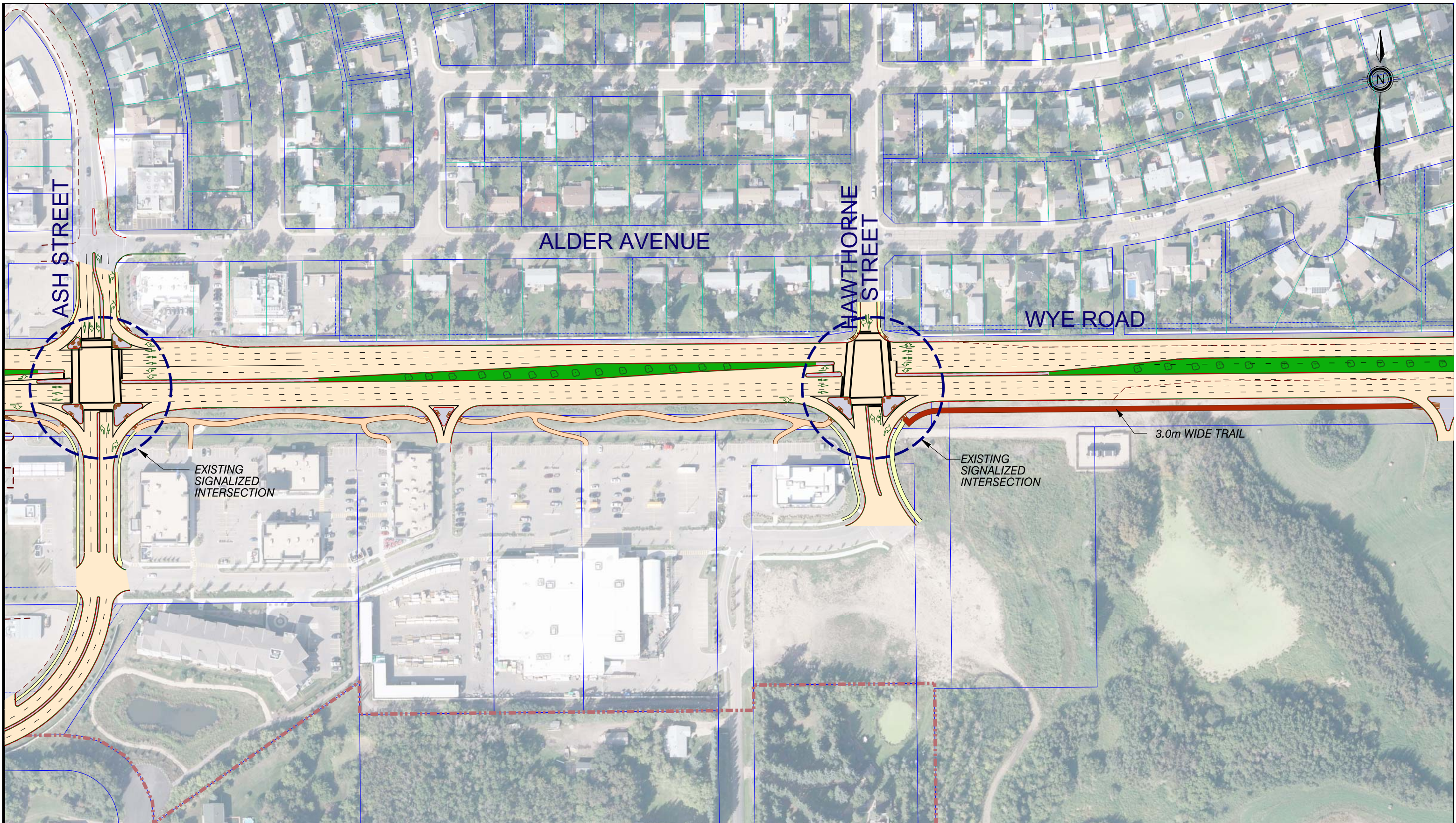
HORIZONTAL

WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY

RECOMMENDED LONG TERM IMPROVEMENT PLAN

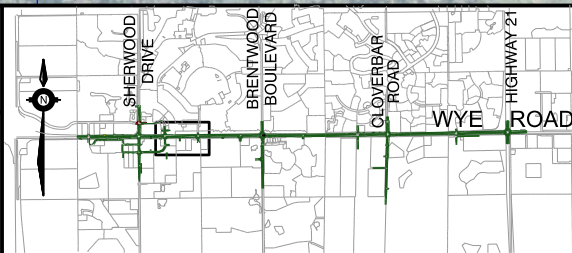
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EXHIBIT 5.2

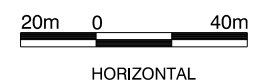


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	PROPOSED TRAIL
	EXISTING TRAIL
	PROPOSED SIDEWALK
	EXISTING SIDEWALK
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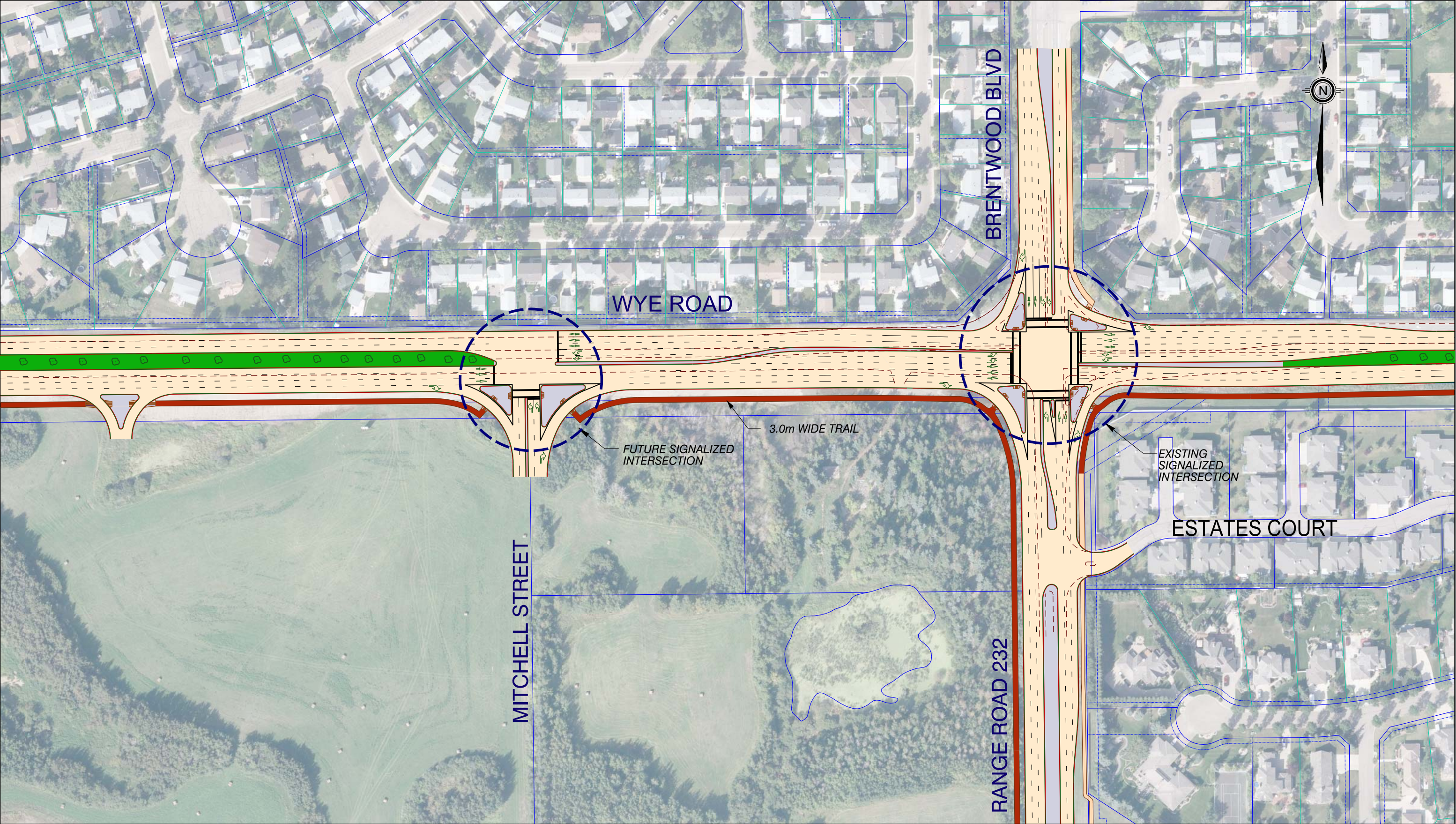


WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY

RECOMMENDED LONG TERM IMPROVEMENT PLAN

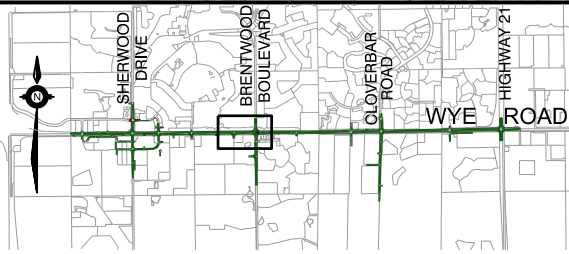
Date: JANUARY, 2015

EXHIBIT 5.3



**FUNCTIONAL PLAN ONLY
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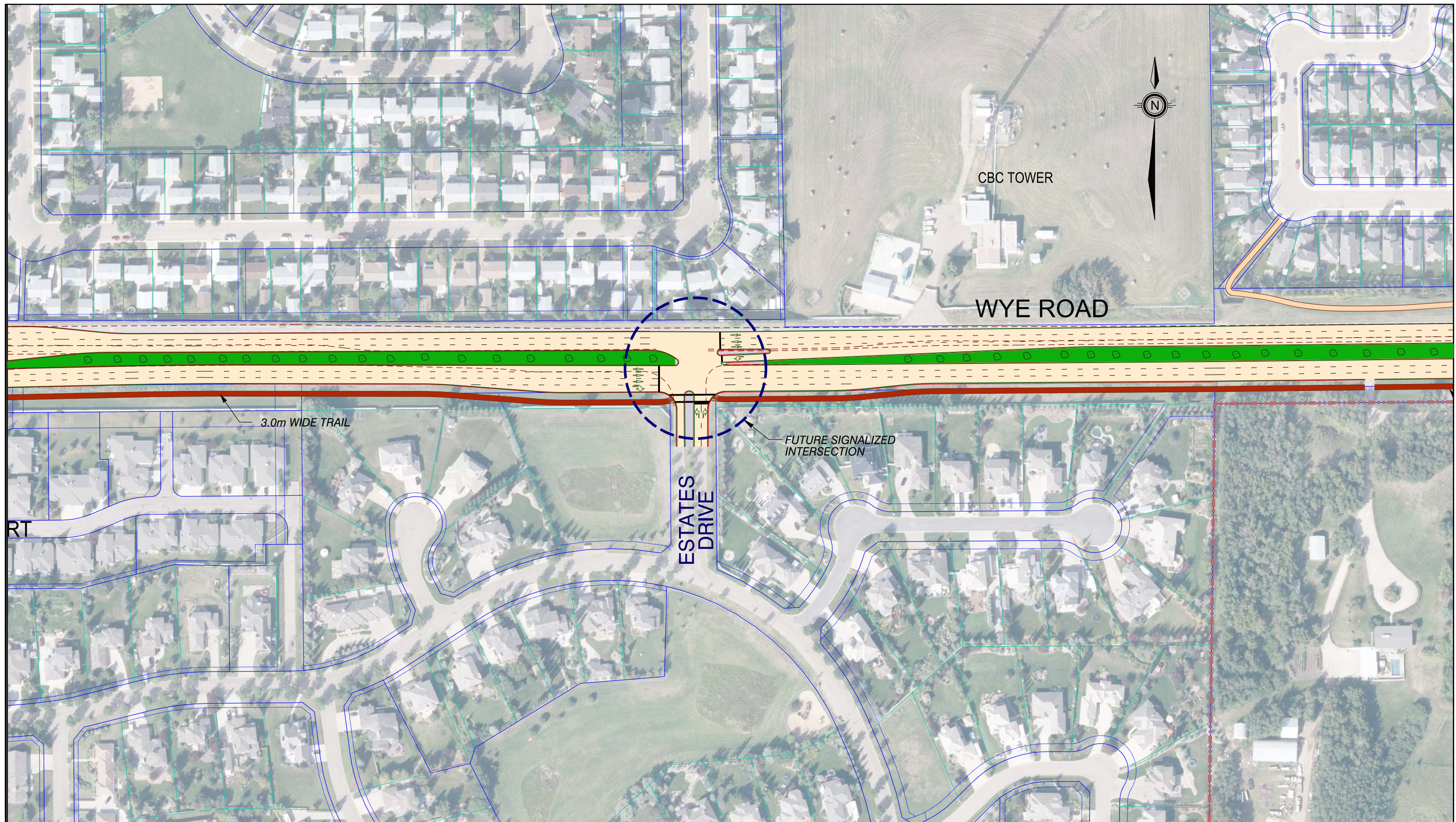
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	MEDIUM TERM ROADWAY (11-20 YEARS)		EXISTING TRAIL
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	CONCRETE MEDIAN		EXISTING SIDEWALK
	LANDSCAPED AND PLANTED MEDIAN		URBAN SERVICES BOUNDARY ACCESS CLOSED



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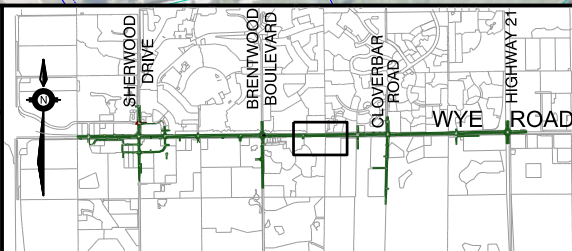
HORIZONTAL

WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY
RECOMMENDED LONG TERM IMPROVEMENT PLAN
Date: FEBRUARY, 2015
EXHIBIT 5.4

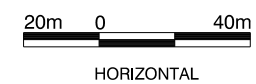


**FUNCTIONAL PLAN ONLY
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	MEDIUM TERM ROADWAY (11-20 YEARS)		EXISTING TRAIL
	LONG TERM ROADWAY (20+ YEARS)		PROPOSED SIDEWALK
	CONCRETE MEDIAN		EXISTING SIDEWALK
	LANDSCAPED AND PLANTED MEDIAN		URBAN SERVICES BOUNDARY ACCESS CLOSED



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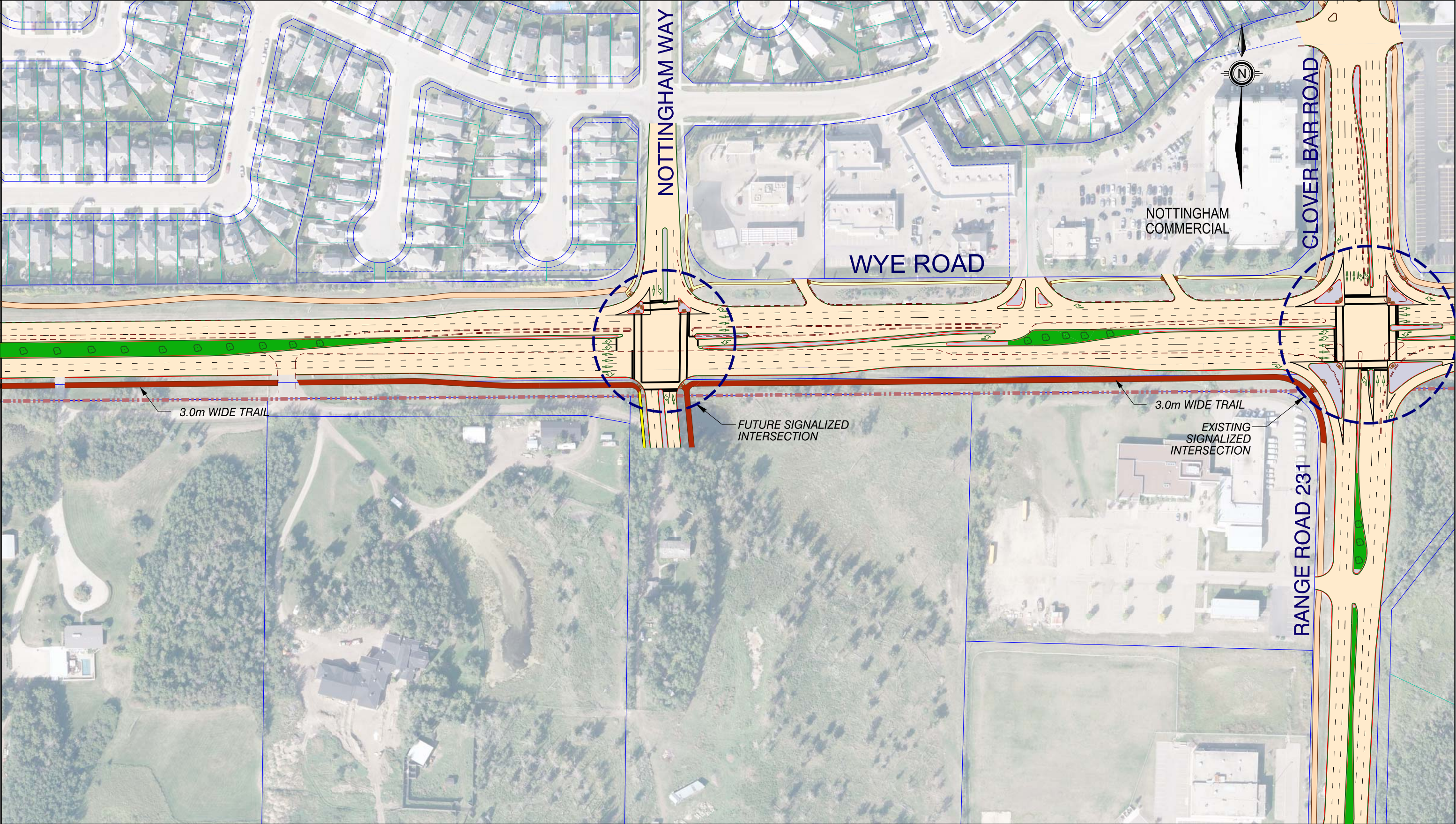


WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY

RECOMMENDED LONG TERM IMPROVEMENT PLAN

Date: FEBRUARY, 2015

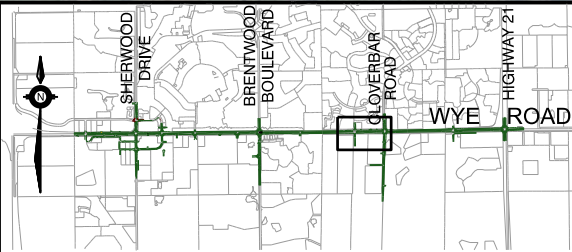
EXHIBIT 5.5



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LEGEND:

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	CONCRETE MEDIAN		EXISTING SIDEWALK
	LANDSCAPED AND PLANTED MEDIAN		URBAN SERVICES BOUNDARY ACCESS CLOSED



STRATHCONA
COUNTY



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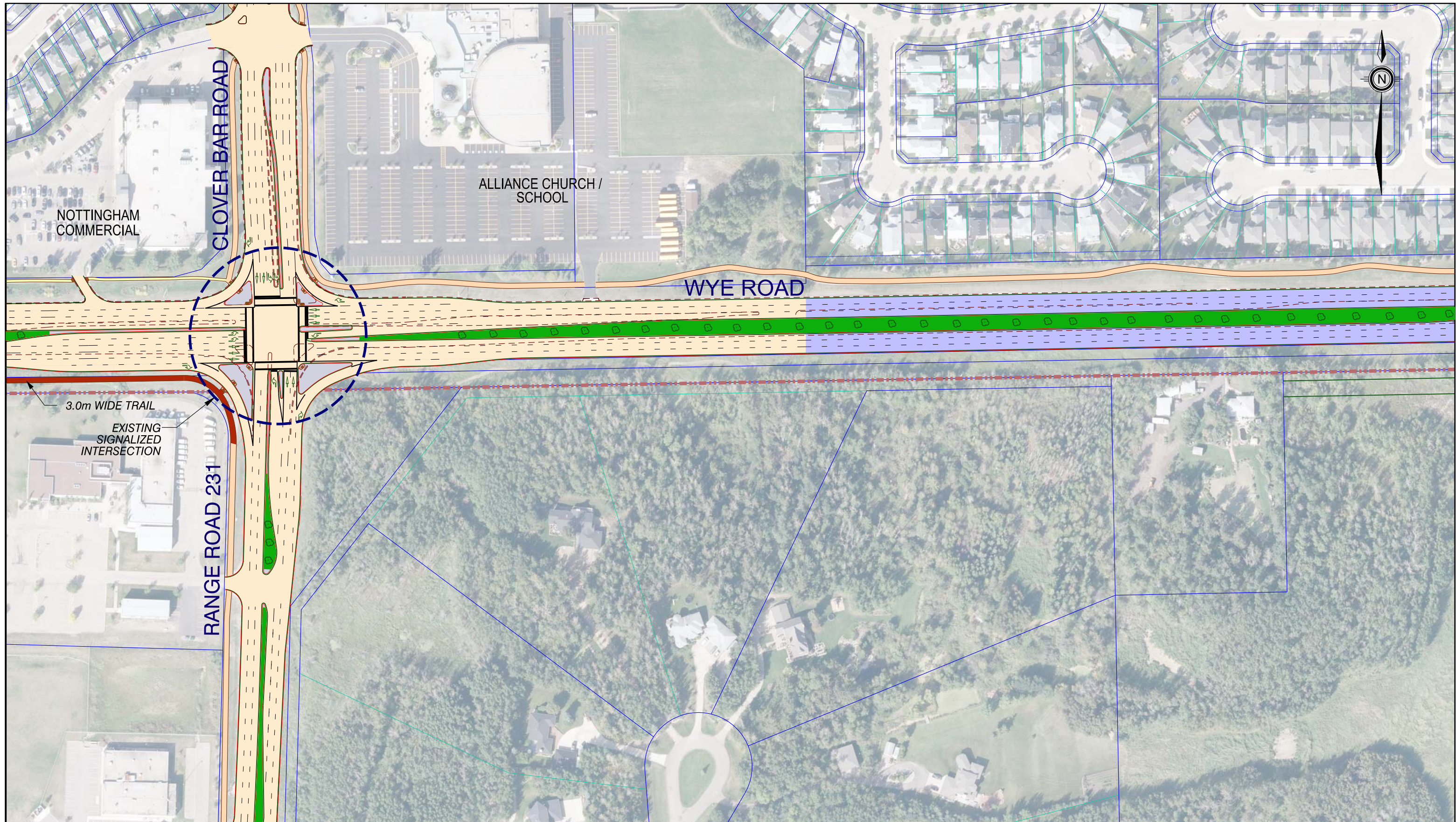


WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY

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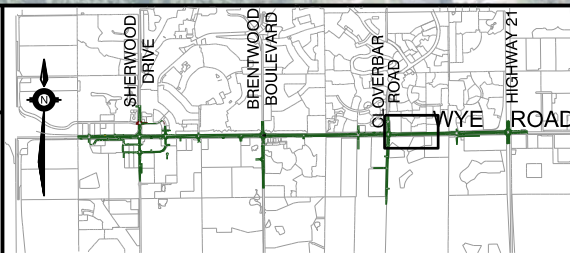
Date: FEBRUARY, 2015

EXHIBIT 5.6



**FUNCTIONAL PLAN ONLY
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LEGEND:	
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	PROPOSED TRAIL
	EXISTING TRAIL
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	EXISTING SIDEWALK
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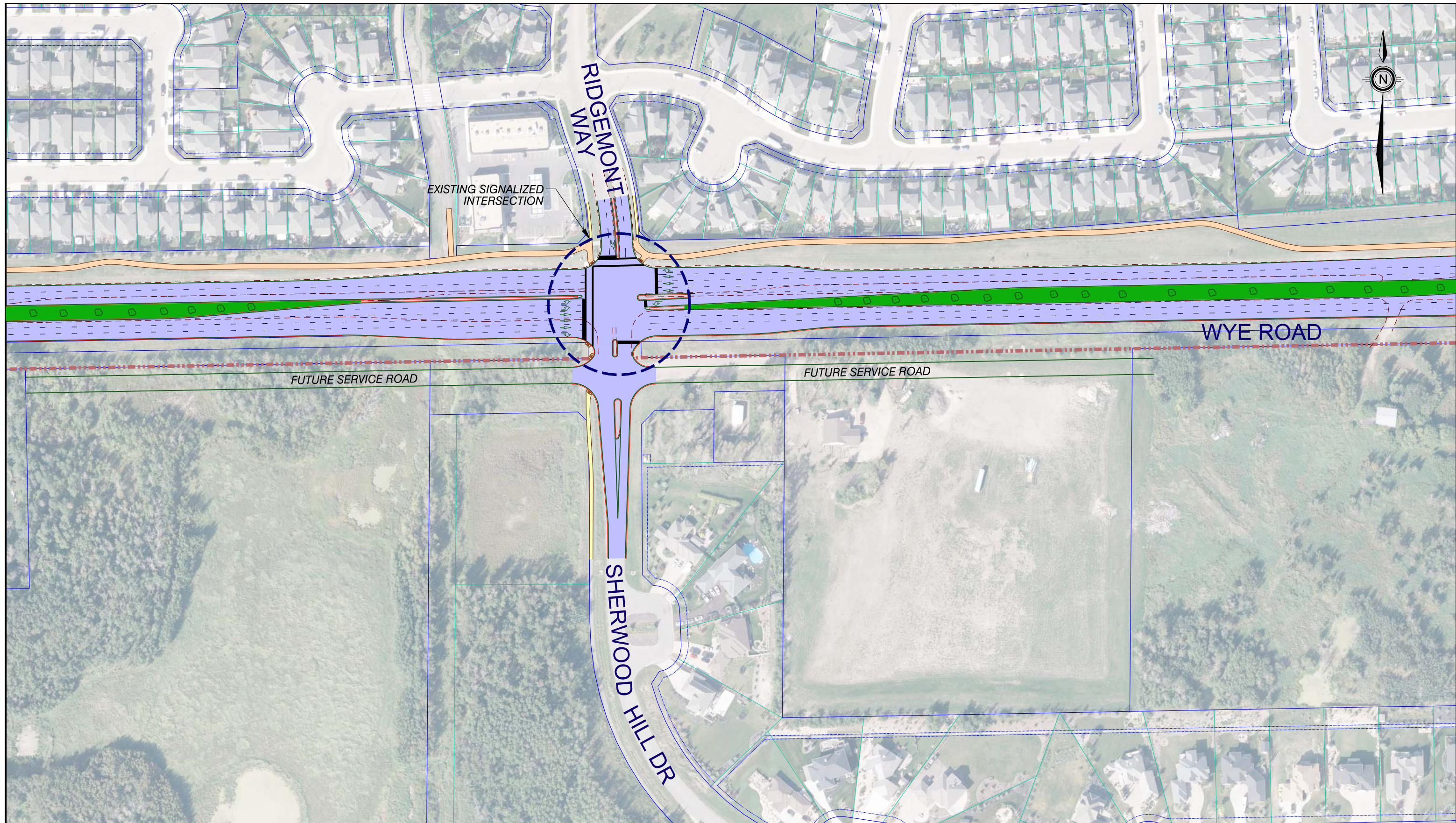


WYE ROAD - SHERWOOD PARK
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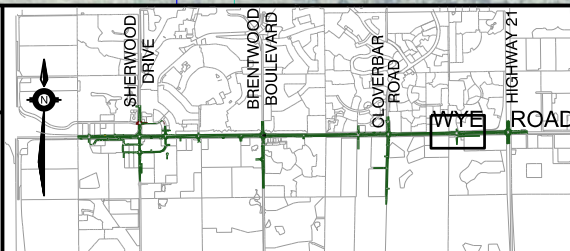
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EXHIBIT 5.7

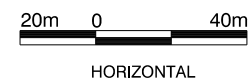


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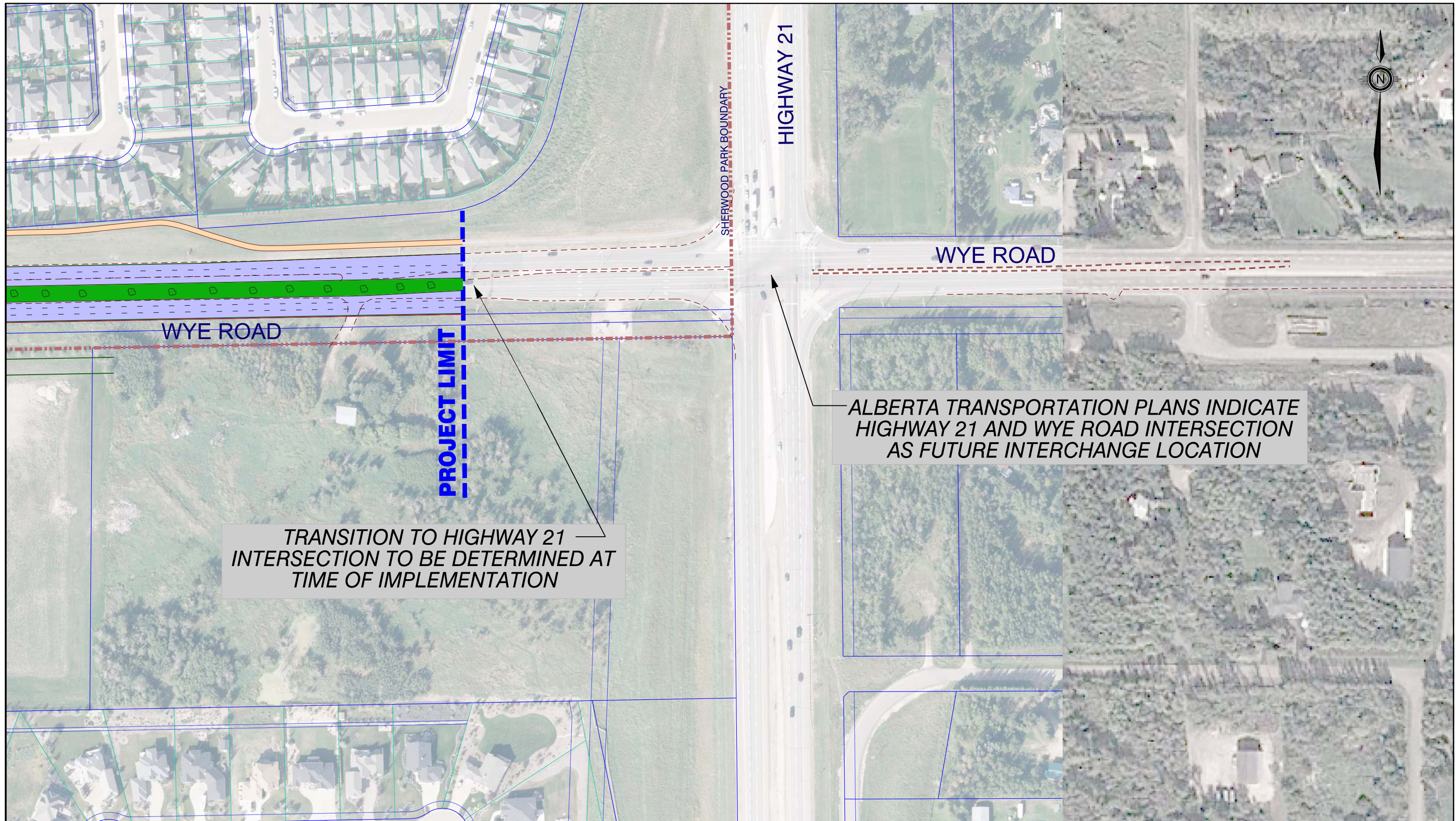


WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY

RECOMMENDED LONG TERM IMPROVEMENT PLAN

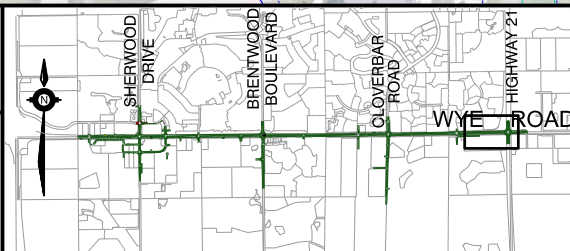
Date: FEBRUARY, 2015

EXHIBIT 5.8

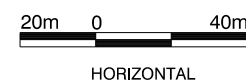


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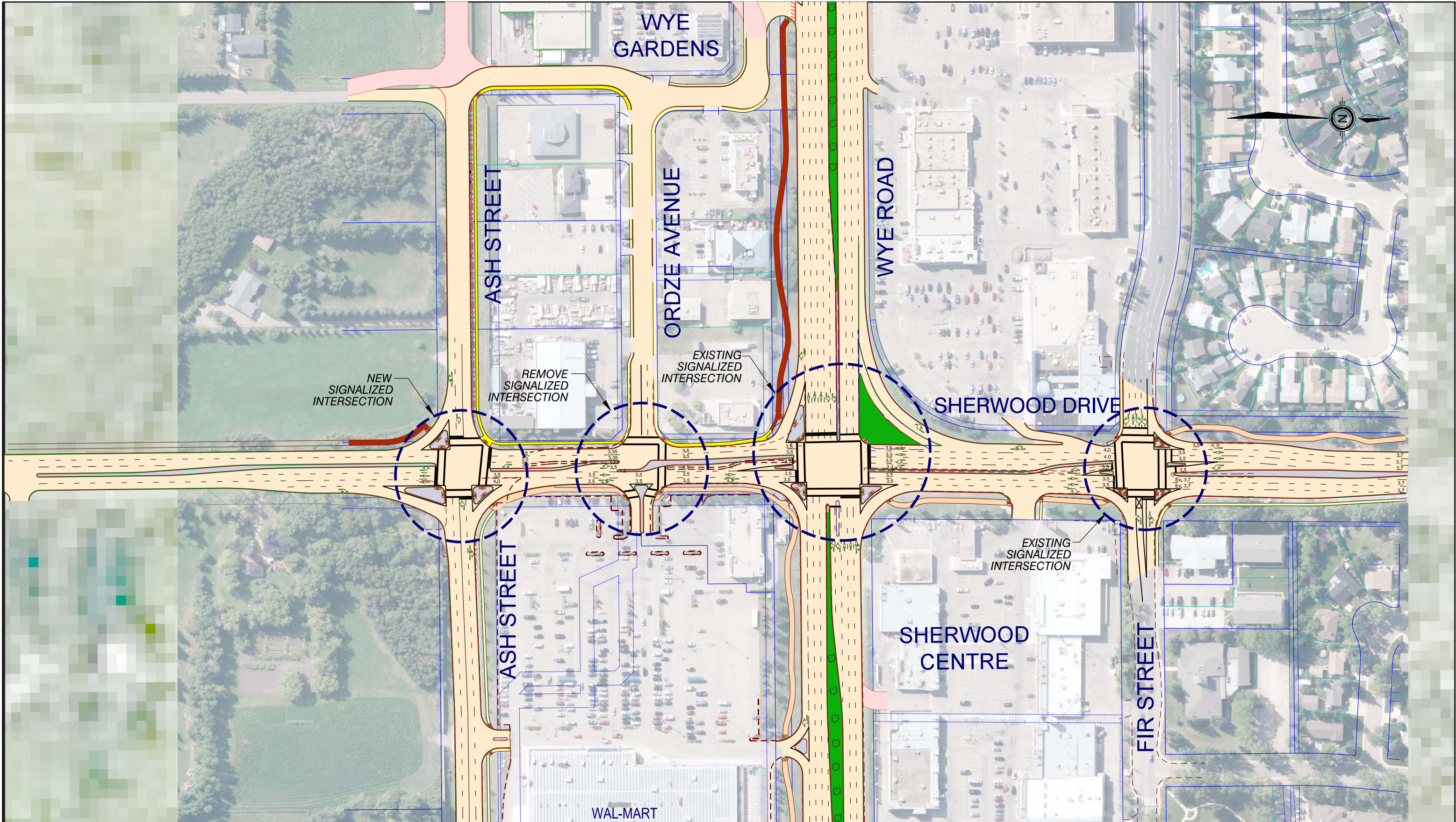


WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY

RECOMMENDED LONG TERM IMPROVEMENT PLAN

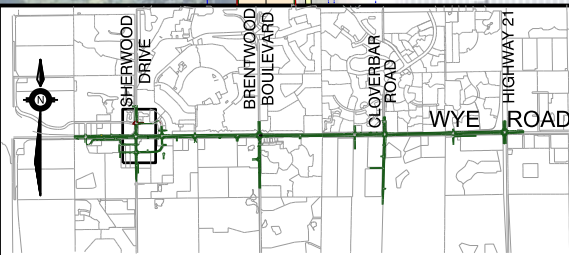
Date: FEBRUARY, 2015

EXHIBIT 5.9



FUNCTIONAL PLAN ONLY
SUBJECT TO REVISION

LEGEND:	
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	URBAN SERVICES BOUNDARY
	ACCESS CLOSED



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WYE ROAD - SHERWOOD PARK
FUNCTIONAL PLANNING STUDY
RECOMMENDED LONG TERM IMPROVEMENT PLAN
Date: JANUARY, 2015
EXHIBIT 5.10

6.0 Pavement Evaluation / Design / Surfacing Strategy

Investigation of existing pavement, pavement design for widening, and surfacing strategy for existing pavement were completed by J.R. Paine & Associates Ltd., and are documented in Appendix C of the original 2008 report. Field investigation included the drilling of 46 probe holes to determine pavement structure thickness, and the visual inspection of existing pavements. Detailed Deflection Report(s) for Wye Road were used as the basis for developing the surfacing strategy for each section of existing Wye Road.

Table 6.1 has been extracted from the Pavement Evaluation Report and provides recommendations for the asphalt overlay thickness required for each section of Wye Road.

Table 6.1 – Design and Recommended Overlay Thickness

Road Section	Station	Section #	Direction	RRD	Design Overlay Thickness (mm)	Recommended Overlay Thickness (mm)
HWY 21 to Clover Bar Road	All	01011	WB	38.2	40	40
Clover Bar Road to Brentwood Blvd	All	02011	WB	41.8	50	50
Brentwood Blvd to Hawthorne Street	All	03011	WB	56	75	80
Hawthorne Street to Ash Street	All	03013	WB	39.1	45	50
Ash Street to Sherwood Drive	All	03015	WB	38.9	45	50
Sherwood Drive to Transport Utility Corridor	All	4011	WB	55.2	80	80
HWY 21 to Clover Bar Road	All	01012	EB	51.1	65	70
Clover Bar Road to Brentwood Blvd	0-1050	02012	EB	93.7	135	140
Clover Bar Road to Brentwood Blvd	1050-1650	02012	EB	50.1	65	70
Brentwood Blvd to Hawthorne Street	All	03012	EB	44.4	60	60
Hawthorne Street to Ash Street	All	03014	EB	36.4	30	40
Ash Street to Sherwood Drive	All	03016	EB	31.6	10	40
Transport Utility Corridor to Sherwood Drive	All	4012	EB	50.4	70	70

Notes: RRD – Representative Rebound Deflection (mean plus 2 standard deviations)
Design thickness based on County July 2007 Dynaflect data

The recommended pavement structure for new construction and/or widening is shown in **Table 6.2**.

Table 6.2 – Surfacing Strategy, New Construction

Asphaltic Concrete Pavement	Granular Base Course
175mm <ul style="list-style-type: none"> ♦ 50mm ACO over ♦ 125mm ACB or staged ACO/ACB 	350mm <ul style="list-style-type: none"> ♦ 2 lifts (maximum of 200mm thickness per lift) ♦ 20mm crush

It should be noted that the ACP mix types and GBC are as per City of Edmonton specifications.

The recommended structure has a pavement thickness 15mm greater than recommended in the J.R. Paine report to comply with the minimum Strathcona County arterial road standard, and also to facilitate staged pavement construction.

The final 50mm lift of pavement on the widening and overlay of existing road should be deferred two or three years after widening construction has been completed.

Each section of Wye Road should be re-evaluated prior to detailed design to determine a feasible approach to balance pavement overlay of existing, and structural requirements for new construction and/or widening. Where required overlay of existing pavement is 80mm or less, a single lift overlay of existing and widened roadway is expected to be feasible. It is suggested that the section of Wye Road between Clover Bar Road and Brentwood Boulevard (eastbound), which requires 140mm overlay, be completed in two stages: an initial 90mm to 100mm overlay in conjunction with the widening, and subsequent (staged) 40mm or 30mm overlay of existing and widened area at some later date.

A pavement overlay was completed in 2011 on Wye Road from Sherwood Drive to Clover Bar Road subsequent to the J.R. Paine pavement evaluation and design. **Table 6.3** is a summary of the pavement thickness, by section, of the recent overlay. Future construction and overlay on Wye Road should account for these thicknesses.

Table 6.3 – 2011 Pavement Overlay Thicknesses

Road Section	Station	Direction	Average 2011 Overlay Thickness (mm)
Clover Bar Road to Brentwood Blvd	All	WB	58
Brentwood Blvd to Hawthorne Street	All	WB	53
Clover Bar Road to Brentwood Blvd	All	EB	54
Brentwood Blvd to Hawthorne Street	All	EB	53

7.0 Storm Sewer Condition and Capacity Assessment

7.1 General

The Functional Planning Study for Wye Road identified roadway improvements required along Wye Road from Ordze Avenue to Highway 21. As Wye Road has an existing storm sewer system, the roadway improvements will necessitate storm sewer modifications, primarily catchbasin relocation and catchbasin lead extension. Some sections of the storm sewer on Wye Road were constructed as early as 1977, and the original design did not consider the widening of Wye Road to six (6) lanes plus an auxiliary lane. Therefore, it is recommended that prior to any improvements along Wye Road, the storm sewer system be reviewed for condition and capacity. The timely review of the system will identify any deficiencies and allow the system to be repaired, replaced or upgraded (as required) in conjunction with the roadway widening, reducing construction costs and disruption to the travelling public.

The capacity analysis is intended to supplement the overall Sherwood Park Urban Area Drainage System Assessment completed by Sam-Eng in 2007. The 2007 Sam-Eng report analyzed storm sewer capacity and storm manhole surcharge for Sherwood Park. The study concluded that along Wye Road the storm sewer capacity (ratio of peak flow to pipefull capacity) was <1.0 , however Table 3-13 Basin Percent Run-off Values from the report indicates the % Run-off used for Basin A (which encompasses Wye Road) was 39%. The study also indicated the manholes along Wye Road would surcharge in the 1:5 Chicago event, some to $<0.5\text{m}$ below ground. As the Sam-Eng analysis of the Wye Road capacity did not consider the expansion of Wye Road, and at any rate was not intended to be specific enough to focus on the individual characteristics of small sections within the Basin, it is recommended that capacity analysis be completed specific to Wye Road as part of detailed design of the roadway improvements. As Wye Road is generally the upstream portion of the storm sewer system, capacity improvements must consider downstream impacts; increasing capacity of the Wye Road storm sewer system may exacerbate capacity issues downstream if the downstream system is not improved.

7.2 Initial Assessment – Ordze Avenue to east of Brentwood Boulevard

7.2.1 Condition Assessment

In preparation for the first phase of Wye Road widening and improvements between Sherwood Drive and Hawthorne Street, a video inspection of the storm sewer system (including catchbasin leads) was completed from Ordze Avenue to east of Brentwood Boulevard in March 2008.

In general, and as expected, the oldest sections reviewed showed the most deterioration; additionally there was some damage from third party shallow utility installations. The section from Sherwood Drive to east of Hawthorne was identified as requiring the most replacement and repair. Due to the poor condition of the Wye Road storm sewer system near Sherwood Drive, a video inspection of the storm sewer on Sherwood Drive downstream of Wye Road was completed to identify if any repairs and/or replacements should be coordinated with the Wye Road work.

A full review of the storm sewer tapes (completed by both Al-Terra Engineering and Strathcona County) are included in the report in Appendix D of the original report.

Recommendations are summarized in **Table 7.1** below.

Table 7.1 – Storm Sewer Recommendations

Location	No Action	Install Liner	Replacement	Notes
West of Brentwood				Some catchbasin leads are damaged and require replacement/repair. See full report for details.
MH 10 – MH 9		✓		Completed in 2014 as part of Wye Road Stage 2 project
MH 9 – MH 8	✓			
MH 8 – MH 7	✓			
Brentwood				
MH 7 – MH 6	✓			
MH 6 – MH 5	✓			
MH 5 – MH 4	✓			
East of Brentwood				
MH 4 – MH 1.1	✓			
East of Hawthorne				Some catchbasin leads are damaged and require replacement/repair. See full report for details
MH 12 – MH 11	✓			
MH 11 – MH 10			✓	Completed in 2009 as part of Wye Road Stage 1 project
Hawthorne				
MH 10 – MH 9		✓		Completed in 2009 as part of Wye Road Stage 1 project
MH 9 – MH 8		✓		Completed in 2009 as part of Wye Road Stage 1 project
MH 8 – MH 7		✓		Completed in 2009 as part of Wye Road Stage 1 project
MH 7 – MH 6		✓		Completed in 2009 as part of Wye Road Stage 1 project
MH 6 – MH 5			✓	Completed in 2009 as part of Wye Road Stage 1 project
MH 5 – MH 4		✓		
MH 4 – MH 3			✓	Replaced with 525mm in 2009 as part of Wye Road Stage 1 project
MH 3 – MH 2	✓		✓	No Action in 2008. Replace with 525mm when Sherwood Drive storm sewer repaired/replaced.

Location	No Action	Install Liner	Replacement	Notes
Sherwood Drive				
MH 2 – MH 1 *	✓		✓	No Action in 2008. Replace with 525mm when Sherwood Drive storm sewer repaired/replaced.
Sherwood Drive North				
MH 20 – MH 21	✓			
MH 21 – MH 22			✓	
MH 22 – MH 23			✓	Lining would be adequate, but recommend replacement as pipes on both sides are being replaced
MH 22 – MH 24			✓	
MH 24 – MH 25	✓			
West of Sherwood Drive				Some catchbasin leads are damaged and require replacement/repair. See full report for details
MH 5 – MH 4	✓			
MH 4 – MH 3	✓			
MH 3 – MH 2	✓			
Ordze Avenue				
MH 2 – MH 1	✓			Repair required due to third party shallow utility damage

7.2.2 Capacity Assessment

Using the Rational method, the functionality of the Wye Road storm sewer from Ordze Avenue to east of Brentwood Boulevard was evaluated for the 2-year and 5-year storm event. A time of concentration of 8 minutes and 15 minutes were used for both storm events, although given the largely impervious area of the Wye Road right-of-way, the 8 minute time of concentration is generally felt to provide a more accurate representation.

Based on the analysis, the Wye Road storm sewer between Ordze Avenue to east of Brentwood Boulevard has capacity for the 2-year and 5-year storms with some surcharge in the system which is consistent with the findings of the Sam-Eng report. The surcharge in the system was calculated for the 5-year storm using a time of concentration of 8 minutes. Generally, the surcharging does not rise above 0.50m below catchbasin rim elevation, with the exception being east of Hawthorne Street at a sag manhole collecting drainage from approximately 20m west of Hawthorne Street to 137m east of Hawthorne Street. Due to the increased impervious area draining to the low point, the analysis shows that surcharging of the system to over 1.0m could be expected. However, the low point has a historic major overland flow route south into a natural low area which is being retained within the Salisbury development. Therefore, surface ponding at the location if the system surcharges does not exceed 0.15m; the point at which the water overtops the curb and releases

across the boulevard to the south. Improvements to the capacity of the Wye Road storm sewer system were considered but not implemented as:

- ♦ The Wye Road storm sewer in this section is the upper end of the system. The Sam-Eng 2007 Urban Area Drainage System Assessment identified capacity and surcharge in the downstream system which capacity improvements along Wye Road would exacerbate. Downstream capacity improvements are not currently considered.
- ♦ Wye Road has a major overland flow route to the low point east of Hawthorne with an outlet to a natural area to the south so potential for roadway flooding is minimal.

Urbanization and widening of Wye Road eastbound, east of Brentwood Boulevard, will require additional catchbasins and catchbasin leads. It has been assumed that capacity is available in the storm drainage system installed previously for the westbound lanes; however this has not been confirmed. A storm sewer capacity verification and a condition assessment should be conducted for the storm sewer system in this area.

7.2.3 Costs

Costs for the additional storm infrastructure (catchbasins and catchbasin leads) as well as some rehabilitation (liner) of the existing storm sewer has been included in the cost estimate (**Section 11.0**).

8.0 Noise Assessment and Modelling

Residential areas adjacent to Wye Road all have some form of noise attenuation, including the concrete noise wall on the north side of Wye Road from Ash Street to east of Brentwood Boulevard. Other residential areas (Nottingham Estates, Regency, and The Ridge) have combinations of berm and double board wood fence for noise attenuation. The Estates of Sherwood Park, a residential area on the south side of Wye Road also has a double board noise attenuation fence.

Although all existing residential areas along Wye Road have noise attenuation, some concerns have been expressed regarding the level of attenuation provided. As a result, noise analysis was completed for three (3) locations, using the Stamson Version 3.10, Noise Prediction model. Analysis was completed in 2008 for three conditions at the three (3) locations as shown in **Table 8.1**.

Table 8.1 – Noise Prediction Model

Location	Site	Existing Road / Existing 2008 Traffic		Existing Road / Year 2015 Traffic		Future Road / Year 2015 Traffic	
		Noise Level (dBA)		Noise Level (dBA)		Noise Level (dBA)	
		PM Peak	24h Equivalent	PM Peak	24h Equivalent	PM Peak	24h Equivalent
Lot 117, Estates of Sherwood Park (S. of Wye Rd.)	A	57.6	55.0	62.9	59.5	65.5	61.7
Lot 111, Estates of Sherwood Park (S. of Wye Rd.)	B	54.6	52.4	60	57.0	62.4	59.0
Lot 109, Maplewood at Rosewood Drive (N. of Wye Rd.)	C	55.0	52.8	60.7	57.6	58.9	56.8

Notes: Site A and B – Existing 1.8m noise barrier (double boarded fence)
Site C – Existing 3.0m noise wall

The table illustrates that based on existing year traffic and existing road configuration, predicted noise levels behind the concrete wall on the north side (Maplewood) are at 52.8 dBA $L_{eq} 24$, and 52.4 dBA $L_{eq} 24$, and 55.0 dBA $L_{eq} 24$ behind berm and wooden fence on the south side in the Estates of Sherwood Park. The predicted noise levels for the 2015 traffic and the improved six (6) lane Wye Road are 56.8 dBA behind the concrete wall and 59.0 dBA and 61.7 dBA behind the berm/fence combination, all expressed as $L_{eq} 24$. These predicted noise levels are well below the noise policy trigger of 65 dBA $L_{eq} 24$, at which noise attenuation improvements are considered.

In addition to the noise prediction work completed during the study, ACI Acoustical Consultants Inc., of Edmonton AB, were retained to conduct an environmental noise survey for the Estates of Sherwood Park residential development. The purpose of the work was to determine the current noise climate in the area and generate a computer noise model to illustrate the noise contours under current and future conditions with the proposed modifications to Wye Road. Site work was conducted by ACI on November 4-5, 2008.

As part of the study, a total of three (3) baseline noise monitorings were conducted in residential backyards directly adjacent to Wye Road. The overnight monitoring resulted in adjusted $L_{eq} 24$ levels of 57.8 dBA, 58.2 dBA and 56.8 dBA, respectively. The results were adjusted to remove “non-typical” sounds near the monitors. It was found that the dominant noise source in this area was Wye Road.

The results of the noise monitoring compare well with the Stamson prediction model, and although monitoring shows noise levels 1 to 3 dBA higher than predicted, this seems reasonable as gaps between the fence and ground, and in the fence itself were noted at the monitoring locations.

The baseline noise modelling corresponded with the measured results, and as such, they were used to calibrate the model for future conditions. Modelling for future conditions indicated that the noise levels at all receptors within the study area would increase by approximately 3 dBA (related to the approximate proposed doubling of traffic) but would remain below the outdoor trigger criterion sound level L_{eq24} of 65 dBA.

A complete copy of the noise report is included in Appendix F of the original study.

Additional noise monitoring was conducted on June 11-12, 2014 at two (2) locations in Maple Grove, east of Brentwood Boulevard. Monitoring was completed in two (2) backyards backing onto Wye Road, and behind the concrete noise attenuation wall. The environmental noise survey report is included in **Appendix C**. The results of the noise monitoring indicated sound levels of 53.0 dBA and 56.1 dBA L_{eq24} , respectively, which are similar to the results measured behind the noise attenuation walls in the Estates of Sherwood Park and Maplewood in 2008. The results of the noise monitoring confirmed that the current noise levels are well below the outdoor criterion sound level of 65 L_{eq24} for existing residential developments.

The assessment and modelling indicates no further noise attenuation is required along Wye Road adjacent to existing residential development, provided that noise attenuation fencing (both concrete and double board) is maintained in good repair, free of gaps both under and along the fence.

9.0 Roadway Lighting

Existing roadway lighting along Wye Road is owned and operated by Fortis Canada and consists of a combination of centre median lighting and lights along each side of the arterial roadway. This lighting system has been in place for twenty-five (25) to thirty (30) years, depending on location, and the light standards would be described as fair to adequate condition.

A lighting assessment was not completed during the Functional Planning Study, as it was determined that widening would require removal and/or relocation of the south side lights. In addition, the median modifications resulting from the widening, will also require removal and/or relocation of any median lights. These factors and the decorative lighting recommended in the “Wye Road Urban Design Guidelines” suggested that a new lighting system would be required as part of any Wye Road widening and improvements. In accordance with Strathcona County’s current practice, the lighting system should be County owned, and a metered facility.

The new roadway lighting, including the decorative fixtures was implemented for the Wye Road improvements completed in 2009, and will be implemented with the current 2014 construction. Accordingly, with the construction currently underway, the new lighting system will be in place for Wye Road between Sherwood Drive and Brentwood Boulevard.

10.0 Public Consultation

Initial public engagement sessions for the project were held in 2008. The sessions were generally information sessions where the proposed functional plans were presented. Two separate sessions were held, one for the tenants, landowners and business owners (the stakeholders) adjacent to Wye Road, and one for the general public. Separate stand alone reports documenting the 2008 process and results were prepared by IMI Strategies and are included in **Appendix D** of this report.

The presented plan, particularly the proposed removal of the westbound to southbound left turn at Sherwood Drive was a significant concern to some landowner/business owners. Replacing the westbound to southbound left turn movements on Wye Road at Sherwood Drive to the Ash Street connection behind Wal-Mart was considered a detriment to “way finding” and convenient access. The finalization of the functional planning study was delayed, pending adequate resolution of the stakeholders concerns.

In 2012 Al-Terra hired Stantec Consulting to prepare and execute a stakeholder engagement process, focusing on empowering the stakeholders to suggest potential improvements for the Wye Road corridor that would enhance traffic movement while maintaining their business access and viability.

The engagement process started in September 2012 and involved the business communities of Wye Gardens, Wye Commercial, Wye Crossing and Sherwood Centre. Numerous opportunities were made available to the stakeholders to participate and contribute to the stakeholder’s process. The engagement process wrapped up in late June 2013 with a presentation of the stakeholder consensus recommendation. The Wye Road Stakeholder Engagement Summary Report prepared by Stantec Consulting summarizes the engagement process and outcomes and is included in **Appendix D**.

The stakeholder recommendations were reviewed for feasibility, cost and safety. Almost all of the stakeholder recommendations were incorporated into the final recommended functional plan for Wye Road. The updated proposed functional plans for the Wye Road Corridor were presented to the stakeholders on June 3, 2014. The business stakeholder open house was lightly attended. Seventeen people sign in, but only two comment forms were returned. In general, the attendees were pleased their recommendation had been adopted into the final plan. The majority of stakeholders who attended, and who also had concerns with the original functional plan expressed favorable opinions of the presented final plan.

A public open house presenting the Wye Road Functional Planning Study was held in the Agora of the Community Centre June 16, 2014. Generally the public was supportive of the addition of extra lanes and the pedestrian facilities and expressed a desire for the project to be completed in the short term. Concerns were expressed about increased traffic, additional lights, noise and timeline for the project. A summary of the event and feedback received is included in **Appendix D** of this report.

11.0 Implementation and Cost Estimates

Implementation of the plans for Wye Road improvements is expected to be staged over a period of years, subject to Strathcona County Council approval and available funding.

Staging for the project was developed based on numerous criteria and should be reviewed occasionally based on changing demand and/or development of adjacent land. The major consideration was to address those areas currently experiencing congestion and operational concerns. A secondary consideration related to coordinating Wye Road improvements with the development of adjacent areas, particularly between Range Roads 232 and 233, to achieve construction savings by combining Wye Road widening with auxiliary lane construction, which are a developer responsibility. Further consideration included required transitions between stages and logical project size.

Based on the study, and as illustrated on **Exhibit 11.1**, the following staging is expected:

- ♦ Stage 1 – Wye Road, Sherwood Drive to Hawthorne Street
 - Sherwood Drive to Hawthorne Street (constructed in 2009)
 - Ash Street from Wye Road to Range Road 233 (constructed in 2009)
- ♦ Stage 2 – Wye Road, Hawthorne Street to West of Brentwood Boulevard
 - Hawthorne Street to west of Brentwood Boulevard (tendered and construction in 2014)
- ♦ Stage 3 – Wye Road, Brentwood Boulevard to West of Estates Drive
 - Brentwood Boulevard intersection to west of Estates Drive, including 200m north and south of Wye Road
- ♦ Stage 4 – Wye Road, Estates Drive to East of Clover Bar Road
 - Wye Road and Range Road 231 / Clover Bar Road intersection (200m north and south of Wye Road)
- ♦ Stage 5 – Sherwood Drive and Ordze Road, Short Term Improvements
 - Sherwood Drive, 100m south of Ash Street to 100m north of Fir Street
 - Ash Street extension from Range Road 233 to behind Canadian Tire
 - Ordze Road, closure of the Chamber of Commerce Access
- ♦ Stage 6 – Wye Road, Ordze Road to Sherwood Drive
 - Ordze Road to Sherwood Drive
- ♦ Stage 7 – Wye Road, Clover Bar Road to West of Highway 21
 - Clover Bar Road to west of Highway 21
- ♦ Stage 8 – Sherwood Drive and Ordze Road Area, Intermediate and Long Term Improvements
 - Wye Road and Ordze Road intersection improvements (both sides of Wye Road)
 - Ash Street extension from behind Canadian Tire to Ordze Crescent
 - Wye Road Safeway / Canadian Tire access modification

Cost estimates, based on typical 2013 construction costs, were prepared for the staging identified and are shown in **Table 11.1**. Total estimated cost is **\$63,361,000**. A breakdown of the costs per Stage are included in **Appendix E**.

Stage 1 of the project was approved by Council in 2008, and was constructed in 2009. Stage 1 included Atco Pipeline removal along the south side of Wye Road between Range Roads 232 and 233, as well as removal and relocation of Gate Station #1. Overhead power was removed from the south side and relocated underground to the north side between Range Roads 232 and 233. Road construction included widening of Wye Road between Sherwood Drive and Hawthorne Street, and Ash Street construction from Wye Road to

Range Road 233. This project was completed concurrent with the first stage of the Salisbury Village (South of Wye) development to take advantage of construction synergies, which provided cost savings to both the County and Developer.

Stage 2, which includes widening of Wye Road from Hawthorne Street to west of Brentwood Boulevard is currently (2014) under construction with completion expected in late 2014 or 2015. This project was scheduled to coincide with servicing of the second stage of the Salisbury development to take advantage of construction synergies to reduce costs.

Negotiations (discussions) are underway with Atco Pipelines and Fortis for the removal of pipelines and relocation of overhead power on the south side of Wye Road between Brentwood Boulevard and Clover Bar Road. These works are tentatively scheduled for 2015 construction, subject to successful negotiations and funding approvals, and are required to be complete prior to proceeding with Stage 3 and Stage 4 of the Wye Road widening.

It will be desirable to complete the Stage 5 improvements, within the five (5) year horizon to alleviate peak hour congestion and mitigate safety and operational concerns. These improvements include:

- ♦ The addition of double left turn lanes southbound and westbound at the intersection of Wye Road / Sherwood Drive.
- ♦ Access modifications along Sherwood Drive between Fir Street and Ash Street.
- ♦ The Ash Street extension west of Range Road 233 to Canadian Tire.

This work could be completed as a “stand alone” project, but should include all the components identified to avoid throw-away construction and minimize disruption to traffic.

The timing of Stages 6 and 7 could be influenced by a number of factors, and we expect it could be deferred by up to ten (10) years.

Stage 8 construction would be expected to be beyond the twenty (20) year horizon.

Urbanization of the eastbound lanes of Wye Road east of Brentwood Boulevard will require storm drainage that has not been fully investigated in conjunction with this report. It has been assumed that the storm drainage system for the westbound lanes in this section, which was previously urbanized, has capacity for the eastbound lanes; however, this has not been confirmed. A storm sewer investigation, including a condition assessment should be conducted for the storm sewer system in this area.

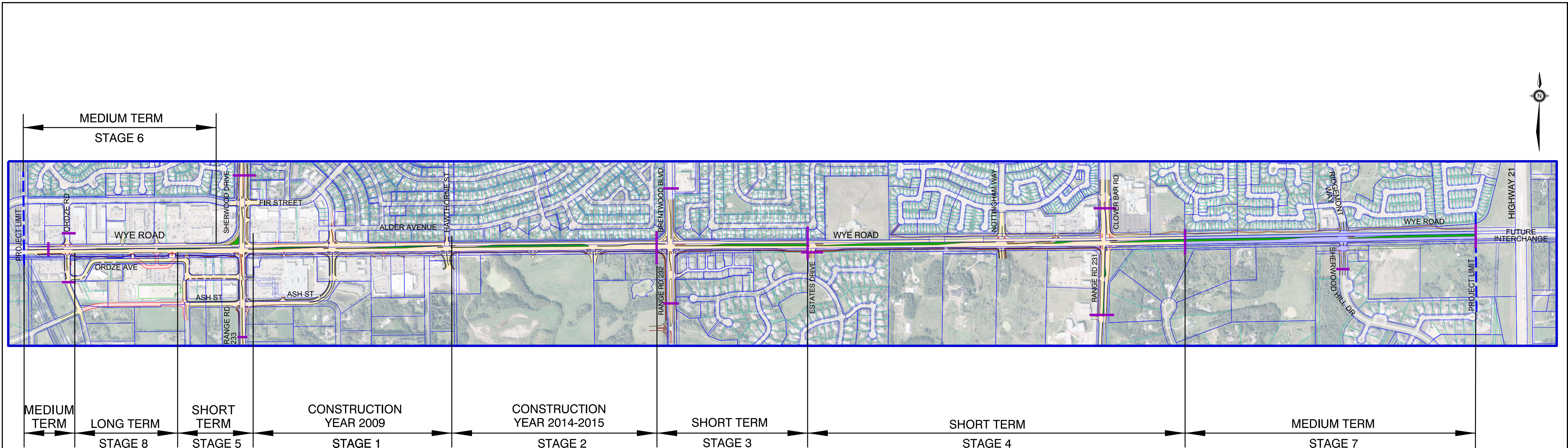




Table 11.1

Statement of Probable Costs for Improvements

Wye Road, Ordze Road to Highway 21

Road Segment	Approx. Length (m)	Estimated Construction Cost (2013)	Utility Costs				Landscaping (Medians and Boulevards)	Engineering & Testing (15%)	Total (Rounded)
			ATCO Pipelines (Abandoned Pipe Removal)	ATCO Gas (Gate Station Relocation)	Street lighting & Signals	Fortis (Overhead Power relocation)			
Stage 1: Wye Road - Sherwood Drive to Hawthorne Street									
Sherwood Drive to Hawthorne Street (Constructed in 2009)	820	\$ 4,300,000	\$ 245,000	\$ 1,138,000		\$ 606,777	\$ 395,500	\$ 1,002,792	\$ 7,688,100
Ash Street from Wye Road to RR 233 (Constructed in 2009)	500	\$ 2,706,000				\$ 65,500	\$ 55,125	\$ 423,994	\$ 3,250,600
Stage 2: Wye Road - Hawthorne Street to West of Brentwood Boulevard									
Hawthorne St. to W. of Brentwood (Tendered and Construction in 2014)	780	\$ 3,750,000	\$ 172,000			\$ 206,282	\$ 1,936,250	\$ 909,680	\$ 6,974,200
Stage 3: Wye Road - Brentwood Boulevard Intersection to West of Estates Drive									
Brentwood Intersection to West of Estates Dr. incl. 200 m North and South of Wye Road	575	\$ 3,000,000	\$ 235,074			\$ 458,342	\$ 700,000	\$ 659,012	\$ 5,052,428
Stage 4: Wye Road - Estates Drive to East of Clover Bar Road									
Wye Road, and Range Road 231/Clover Bar Road Intersection (200m North and South of Wye Road)	1440	\$ 9,320,000	\$ 588,706			\$ 1,147,848	\$ 2,880,000	\$ 2,090,483	\$ 16,027,037
Stage 5: Sherwood Drive and Ordze Road Area									
Sherwood Drive - 100m South of Ash Street to 100m North of Fir Street (First Stage) and Ordze Road (First Stage)	600	\$ 3,050,000					\$ 300,000	\$ 502,500	\$ 3,852,500
Stage 6: Wye Road - Ordze Road to Sherwood Drive									
Ordze Road to Sherwood Drive	750	\$ 2,220,000	\$ 306,618	\$ 1,707,000			\$ 375,000	\$ 691,293	\$ 5,299,910
Stage 7: Wye Road - Clover Bar Road to West of Highway 21									
Clover Bar Road to West of Highway 21	1100	\$ 5,410,000	\$ 449,706			\$ 876,828	\$ 2,200,000	\$ 1,340,480	\$ 10,277,014
Stage 8: Sherwood Drive and Ordze Road Area (Intermediate & Long Term)									
Wye Road and Ordze Road Intersection Improvements (Intermediate Stage) - both sides of Wye Road	260	\$ 620,000					\$ 130,000	\$ 112,500	\$ 862,500
Ash Street Extension and Wye Road Canadian Tire Access Modification (Long Term)	850	\$ 3,120,000					\$ 425,000	\$ 531,750	\$ 4,076,750
Total		\$ 37,496,000	\$ 1,997,103	\$ 2,845,000	\$ -	\$ 3,361,578	\$ 9,396,875	\$ 8,264,483	\$ 63,361,000

Notes:

Cost Estimate does not include land costs

Costs are represented as 2013 Construction costs

Fortis overhead power relocation includes costs for installation of north side streetlights and new primary power installation for adjacent development (which would be developer recoverable)

Estimated Construction Costs include grading, installation of new catchbasins and new leads, storm sewer rehabilitation through lining (portion of system), roadway and trail construction, south side streetlights, traffic signal modifications (or new installation), topsoil and seed

Landscape Costs estimated based on Unit Cost of Boulevard Landscape at 500\$/lm and Median at 1500\$/lm

ATCO Pipeline Removal Costs and ATCO Gas Gate Station Relocation Costs escalated 50% from (ATCO) provided 2009 estimates