

170 STREET PLANNING STUDY

REPORT #3

Executive Summary

ISL Engineering and Land Services and Al-Terra Engineering were retained by the City of Edmonton (the City), in partnership with Alberta Transportation (AT), to conduct a Functional Planning Study for 170 Street, from Anthony Henday Drive to south of 41 Avenue SW. This report focuses on the section north of the realigned Ellerslie Road to 23 Avenue (north section).

In 1980, the City and AT developed the Highway Penetrator Agreement (Bylaw 9445). This agreement defines each party's commitment to plan, design, construct, maintain and operate Highway Penetrators (City roadways of major provincial significance beyond the City Limits) to a standard that is mutually agreed to by both parties. 170 Street (the Terwillegar Drive extension) was identified as a Highway Penetrator, and as such is subject to input from both the City and AT. Design criteria for the project have been developed to meet City and AT design standards, while meeting or exceeding Transportation Association of Canada Guidelines.

The *Windermere Area Structure Plan* (ASP), adopted by City Council in 2006, was developed for the area south of Anthony Henday Drive to 41 Avenue SW, from the North Saskatchewan River to Whitemud Creek. The document predicted approximately 63,000 residents at full build-out. The ASP identifies the transportation network needed to support growth in this area, including the 170 Street corridor (originally proposed as a 6-lane expressway), which represented the southerly extension of Terwillegar Drive through the western portion of the Windermere ASP area, south of Anthony Henday Drive.

Regional planning by the City, Leduc County, and AT, has since identified a need to upgrade 170 Street to a freeway to meet long-term projected traffic demand. As such, the existing service interchange at Anthony Henday Drive will no longer be sufficient and will need to be reconfigured to a systems interchange configuration.

This study was undertaken to refine the corridor alignment of the urban freeway; identify locations and configurations of interchanges at the cross-streets to meet long-term traffic demands (based on the Capital Region's 3.2 Million Population Model); develop an Access Management Strategy; reconfigure the 170 Street/Anthony Henday interchange, and identify long-term right-of-way requirements. To the extent possible, construction staging for the corridor has also been developed. As part of the study process, a Public Consultation plan was undertaken, and a Value Engineering session was conducted. A Safety Audit of the Stage 1 plan will be included in the final report.

Ten (10) systems interchange and two (2) service interchange concepts were developed and evaluated for the 170 Street/Anthony Henday Drive location. The location presents a significant challenge due to the close spacing of the Windermere Boulevard and Haddow Drive proposed interchanges along 170 Street (Terwillegar Drive) between which the Anthony Henday Drive systems interchange must be located. Previous planning work had been based on a service interchange at this location, which required a much smaller footprint. The recommended plan was originally developed during the Study, but modified based on the Value Engineering Workshop.

Recommended Plan:

The recommended plan for the Anthony Henday Drive/170 Street/Terwillegar Drive interchange will be a free-flow facility with directional ramps for the northbound to westbound and southbound to eastbound movements. The remaining movements are accommodated through loop and diagonal ramps. To ensure that this system becomes free-flow, several changes to the adjacent network are also required:

- Haddow Drive becomes a flyover, with access to Terwillegar Drive via the 23 Avenue interchange;
- A basket weave is required on Terwillegar Drive southbound from 23 Avenue to 170 Street and Anthony Henday Drive;
- A basket weave is required to Windermere Boulevard southbound from 170 Street and Anthony Henday Drive;
- Wates Link/Ambleside Link becomes discontinuous, with access to 170 Street via Windermere Boulevard interchange;
- Anderson Way becomes a flyover, with access to 170 Street from the realigned Ellerslie Road or Windermere Boulevard interchanges; and
- A Collector-Distributor Road is required on Anthony Henday Drive eastbound between 170 Street/Terwillegar Drive ramps and the ramps for Rabbit Hill Road.

Due to the proposed proximity of the adjacent interchanges, connections between Anthony Henday Drive and Windermere Boulevard were not possible (with the exception of Anthony Henday Drive westbound to Windermere Boulevard) without significantly compromising geometry. While it is a best practice to always provide the return movement; the City felt that a partial connection to the commercial area on Windermere Boulevard was better than no connection at all. The missing Windermere Boulevard connections to and from Anthony Henday Drive are accommodated at the Rabbit Hill Road interchange.

An Environmental Overview is currently underway for this project. Issues identified to date include the two natural areas and the need for regulatory approvals for the new stormwater management facilities and any new outfalls required for the North Saskatchewan River. No wetlands were found in this developed corridor.

The proposed plan impacts three power transmission towers, three pipelines, street lights, and several underground municipal service lines. Compensation and/or relocation strategies for each of these items are addressed in the main report.

Exhibits ES.1, ES.2 and ES.3 in the full report illustrate the long term, intermediate term and first stage recommended plans.

Staging of the Preferred Alternative:

The existing Anthony Henday Drive/170 Street/Terwillegar Drive simple diamond interchange is expected to reach capacity within the next few years. To increase the capacity, with minimal cost, a split diamond interchange with a northbound to westbound loop has been proposed for the next stage. All existing at-grade connections to adjacent roadways are maintained for this stage.

With the expansion of the main interchange, the constraint point within the network will become the intersection at Windermere Boulevard. When the population in the Windermere ASP reaches approximately 35,000 people the interchange at Windermere Boulevard will be required. Improvements to the south will be required when the population in the Windermere ASP reaches approximately 50,000 people.

Proposed Stormwater Drainage Concept:

The proposed ultimate stormwater drainage concept plan is for 25 Avenue to north of Windermere Boulevard to drain through a storm sewer draining north to the Transportation Utility Corridor (TUC) and to a new SWMF adjacent to the North Saskatchewan River. The storm sewer catchment area will include a portion of 170 Street within the TUC where the roadway gradeline is too low to drain into the TUC/AHD ditch system. The Terwillegar Drive sags at Haddow Drive and 23 Avenue/Riverbend Road will be drained south to the TUC and connect to the 170 Street outlet trunk, with shared outlet to the proposed SWMF adjacent to the North Saskatchewan River. The AHD/TUC SWMF in the northwest corner of the 170 Street/AHD interchange will have to be relocated, tentatively to the northeast corner of the interchange.

Noise:

To date a noise assessment has not been completed for this section of the project, but it is anticipated that noise mitigation will be required along residential boundaries due to their proximity. For the purpose of calculating right-of-way requirements and cost estimates, a 3 m high noise wall has been included at the property lines for these areas. A noise assessment for the Stage 1 plan will be included in the final report.

Right-of-way Requirements:

As the majority of the required right-of-way for this portion of the project is located within the TUC and other existing road rights-of-way, the right-of-way required to complete this project is limited to small parcels totalling approximately 8800 m².

Cost Estimate:

Estimated cost of the long term plan, including improvements on Terwillegar Drive to 23 Avenue, is \$415 M in 2011 Dollars. Stage 1 improvements are estimated at \$45 M, while intermediate stage improvements are estimated at \$71 M. These estimates are not additive, and accordingly the total estimated project cost is \$415 M (2011 Dollars).