

AECOM

The City of Calgary

Macleod Trail Corridor Study
From 25 Avenue S to 67 Avenue S (North Segment)

Executive Summary

The Municipal Development Plan (*MDP*) and the Calgary Transportation Plan (*CTP*), adopted by Council in September 2009, outline the direction for Calgary's future growth and associated transportation system. The Macleod Trail corridor is designated as an Urban Corridor in the *MDP* and as an Urban Boulevard in the *CTP*. This report documents a study undertaken on the North Segment of Macleod Trail between 25 Avenue S and 67 Avenue S.

The Macleod Trail Corridor Study is required to strategize the way forward in transforming Macleod Trail into a complete street. Calgary's *Interim Complete Street Guides* categorize the Urban Boulevard as a 'Liveable Street' that is a destination as well as a travel facility. A liveable street emphasizes modes of travel that enable social interaction. The Urban Boulevard prioritizes walking, cycling, and transit while accommodating high volumes of vehicular traffic. There should be an emphasis on high quality urban design and sustainability of corridor infrastructure. Public realm must be designed to minimize visual and physical clutter. The corridor will be fully integrated with a variety of adjacent land uses including Transit Oriented Development (TOD) nodes around stations on the South LRT line that shares the corridor with Macleod Trail.

The Urban Corridor is expected to provide a high level of residential and employment intensification with a minimum intensity threshold of 200 jobs and population per gross developable hectare. Local Area Plans for the Macleod Trail Corridor will provide the land use framework for the adjacent area, with the highest development densities on lands directly fronting onto Macleod Trail. In addition to the Urban Corridor designation, Macleod Trail North Segment serves a Major Activity Centre around the Chinook LRT station. Development around Erlton and 39 Avenue S LRT stations will be guided by The City's Transit Oriented Development Policy Guidelines, which promote transit supportive land uses with increased density around stations. **Figure ES.1** illustrates the Urban Corridor Concept.

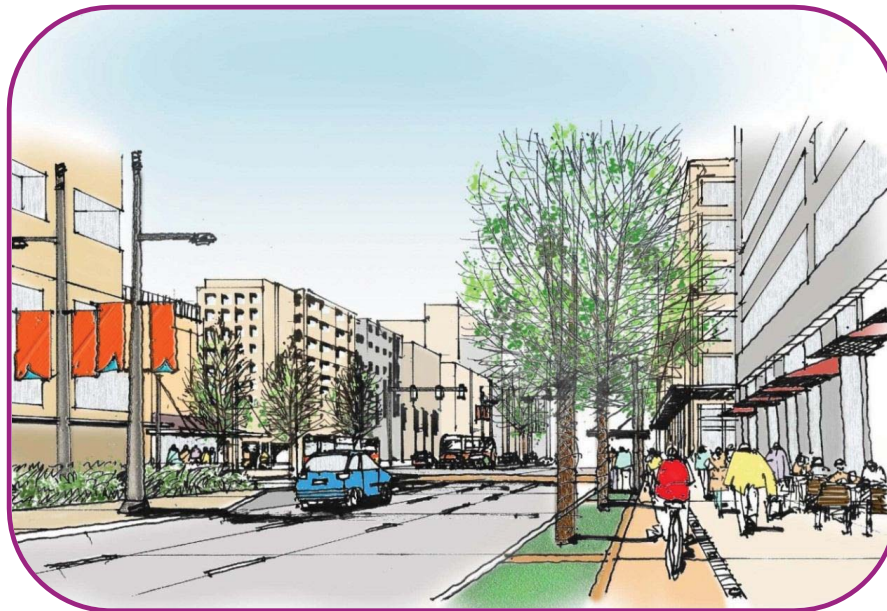


Figure ES.1: Macleod Trail Urban Corridor Concept

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The *MDP* and *CTP* place an emphasis on improving transportation choice, and on the development of sustainable infrastructure. The *CTP* outlines a new Road and Street Palette advocating the creation of complete streets that interact directly with adjacent land uses and serve a broad range of transportation modes. These streets would facilitate mobility and also contribute to place-making. Macleod Trail is identified in the *CTP* as part of the Primary Transit network and part of the HOV Network.

Roadway Sections

The total length of roadway study area is 4.3 km. There are three distinct sections of the North Segment corridor, Cemetery Hill, Central and Chinook, as shown in **Figure ES.2: Macleod Trail North Segment**.

Section 1 (Cemetery Hill) – 25 Avenue S to 34 Avenue S

Section 1, the Cemetery Hill section, between 25 Avenue S and 34 Avenue S is 0.8 km long. Here the roadway traverses Cemetery Hill and is bounded by the Erlton residential community and the various cemeteries that give the hill its name. Through this area Macleod Trail comprises a six-lane roadway within a right-of-way which varies between 25 m and 40 m in width. The roadway occupies almost all of the right-of-way. A monolithic sidewalk is provided on the west side. **Photo ES.1 Existing Cemetery Hill Section** illustrates the general situation. **Figure ES.3** shows a typical existing cross-section. There is a pedestrian overpass that connects with cemetery pathways and provides access between the Erlton community on the west and a bus stop on Macleod Trail. The South LRT line tunnel is beneath the roadway as it crests over the hill.

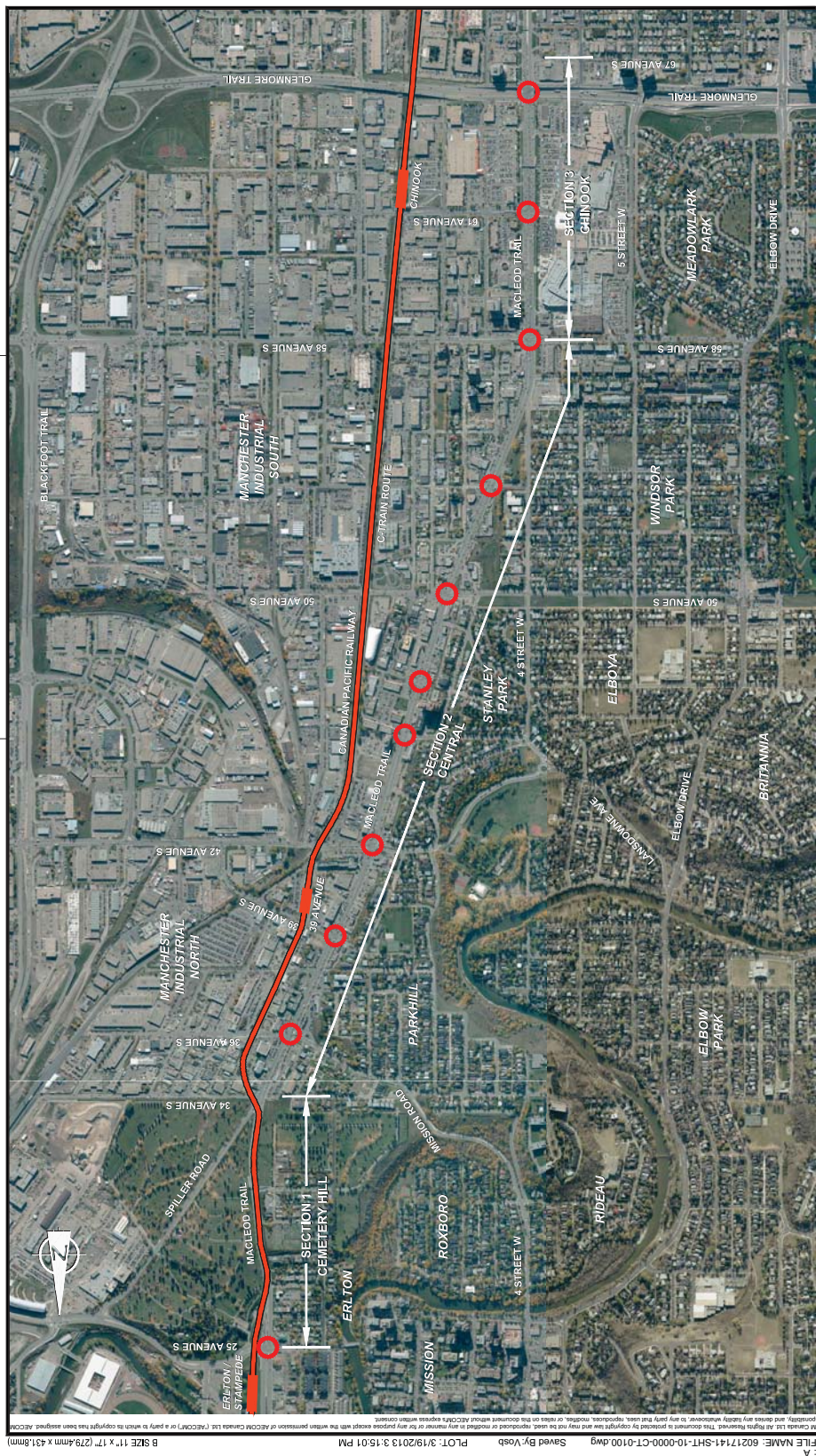


Photo ES.1: Existing Cemetery Hill Section

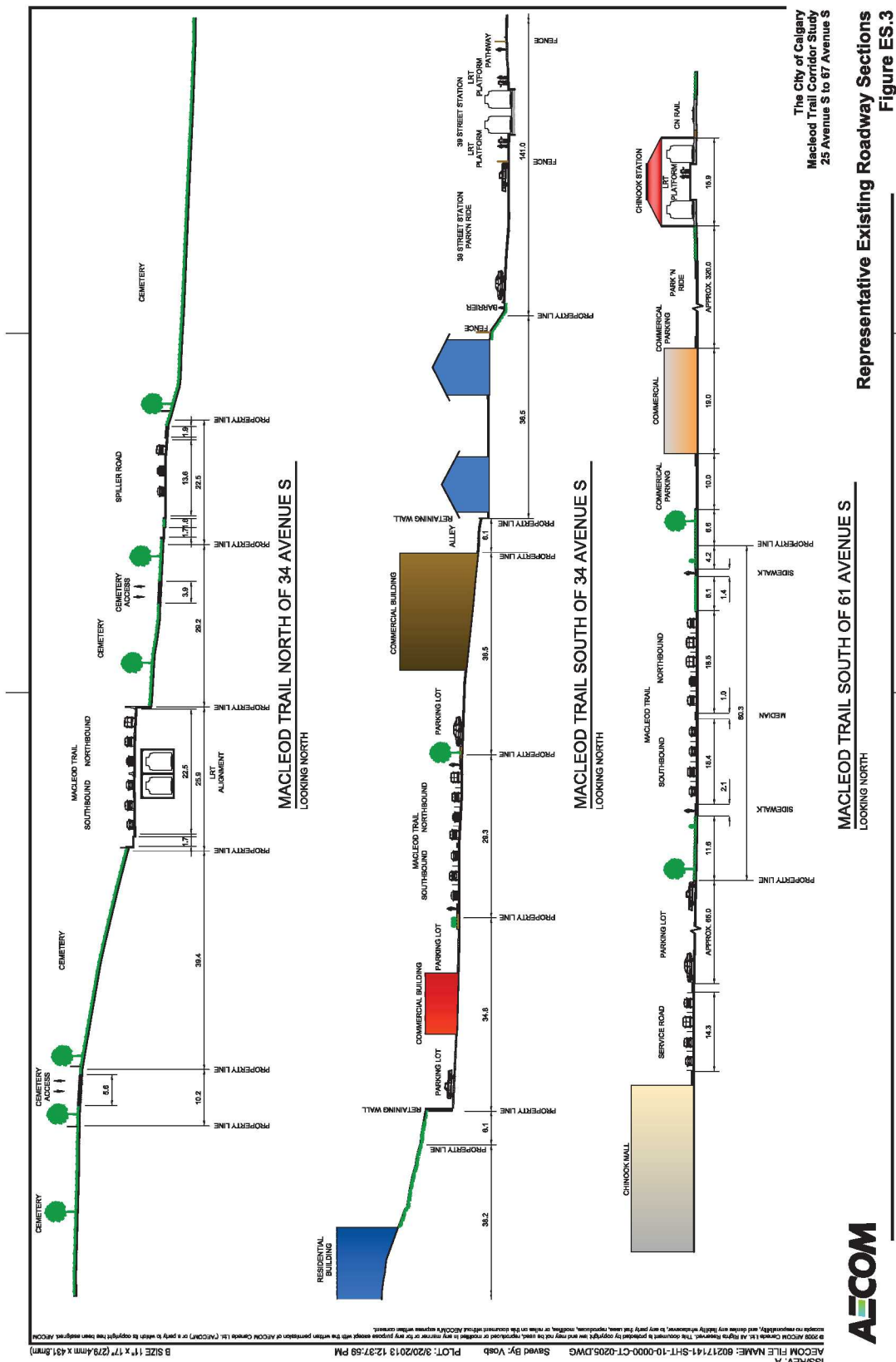
Section 2 (Central) – 34 Avenue S to 58 Avenue S

Section 2, the Central section, between 34 Avenue S and 58 Avenue S is 2.6 km long. This section is bounded predominantly by auto-oriented businesses (car dealerships, rental, and service), hotels and restaurants, and a variety of other uses as shown on **Photo ES.2 Existing Central Section**. **Figure ES.3** shows a typical existing cross-section. The land rises to the west of Macleod Trail and in some areas the developments on the west side of the roadway have cut into the slope. On the higher ground, behind the commercial developments fronting on Macleod Trail, are the residential communities of Parkhill, Stanley Park, and Windsor Park. On the east side of Macleod Trail the land falls away to the LRT and Canadian Pacific Railway tracks. These tracks create a development edge and have limited the presence of roadway crossings.

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There is an LRT station at 39 Avenue S. The Manchester area east of Macleod Trail is generally light industrial land containing a small residential pocket.



Photo ES.2: Existing Central Section

Through this area Macleod Trail comprises a six-lane roadway with monolithic sidewalks. The roadway and sidewalks occupy the right-of-way width of about 30 m. There is no exclusive provision for cycling, nor any provision for green infrastructure.

Section 3 (Chinook) – 58 Avenue S to 67 Avenue S

Section 3, the Chinook section, between 58 Avenue S and 67 Avenue S is 0.9 km long. The roadway is bounded by the Chinook Regional Shopping Centre on the west side and the Chinook Station Area Plan area on the east. Between 58 Avenue S and the Glenmore Trail roadway interchange, the right-of-way is approximately 60 m and contains an eight-lane roadway with separate sidewalks within grassed boulevards (for the most part) on both sides.

Photo ES.3 Existing Chinook Section shows the general situation. Figure ES.3 shows a typical existing cross-section. There is a pedestrian overpass at about 62 Avenue S, and a pedestrian underpass at the north side of Glenmore Trail.



Photo ES.3: Existing Chinook Section

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Urban Boulevard Concept

The concept plan for Macleod Trail comprises three components: Macleod Trail, cross-street connecting roadways, and a parallel cycle route proposal.

Macleod Trail

The concept plan for Macleod Trail reflects the three distinct sections, Cemetery Hill, Central, and Chinook, described above and shown on Figure ES.2.

Cemetery Hill Section -25 Avenue S to 34 Avenue S

At 25 Avenue S the traffic signal operation is linked to the adjacent gate-controlled LRT level crossing. The LRT signalling system detects approaching trains and activates the traffic signals on Macleod Trail to clear vehicles off the LRT track. This arrangement disrupts the optimal operation of the signals on Macleod Trail. As LRT train frequency increases to proposed three minute headways, the trains will be passing at an average of 1.5 minutes in either direction. At this train frequency the traffic signal cycle will be being constantly disrupted and become dysfunctional. Consequently, the City of Calgary has developed a plan to grade separate 25 Avenue S above the LRT line and Macleod Trail. This plan is contained in the 25/26 Avenue SE Blackfoot Trail Connector, Final Report (Draft), March 2009, prepared for the City of Calgary by Morrison Hershfield. The plan maintains pedestrian pathways along the west side of Macleod Trail and on both sides of 25 Avenue S. The City plan for 25 Avenue S would connect Blackfoot Trail to Macleod Trail via 25 Avenue S, providing an alternative route to Macleod Trail between downtown and industrial south-central Calgary.

The proposed interchange at 25 Avenue S dominates this section of Macleod Trail and in combination with the cemeteries on the hill would create an unfavourable context for development of an Urban Corridor/Boulevard. The appearance of the existing roadway boundary walls could be improved to provide a better transition into the Urban Corridor/Boulevard to the south and suggestions are provided in this regard.

The proposed concept for the Cemetery Hill section is shown on **Figure ES.4**.

Central Section – 34 Avenue S to 58 Avenue S

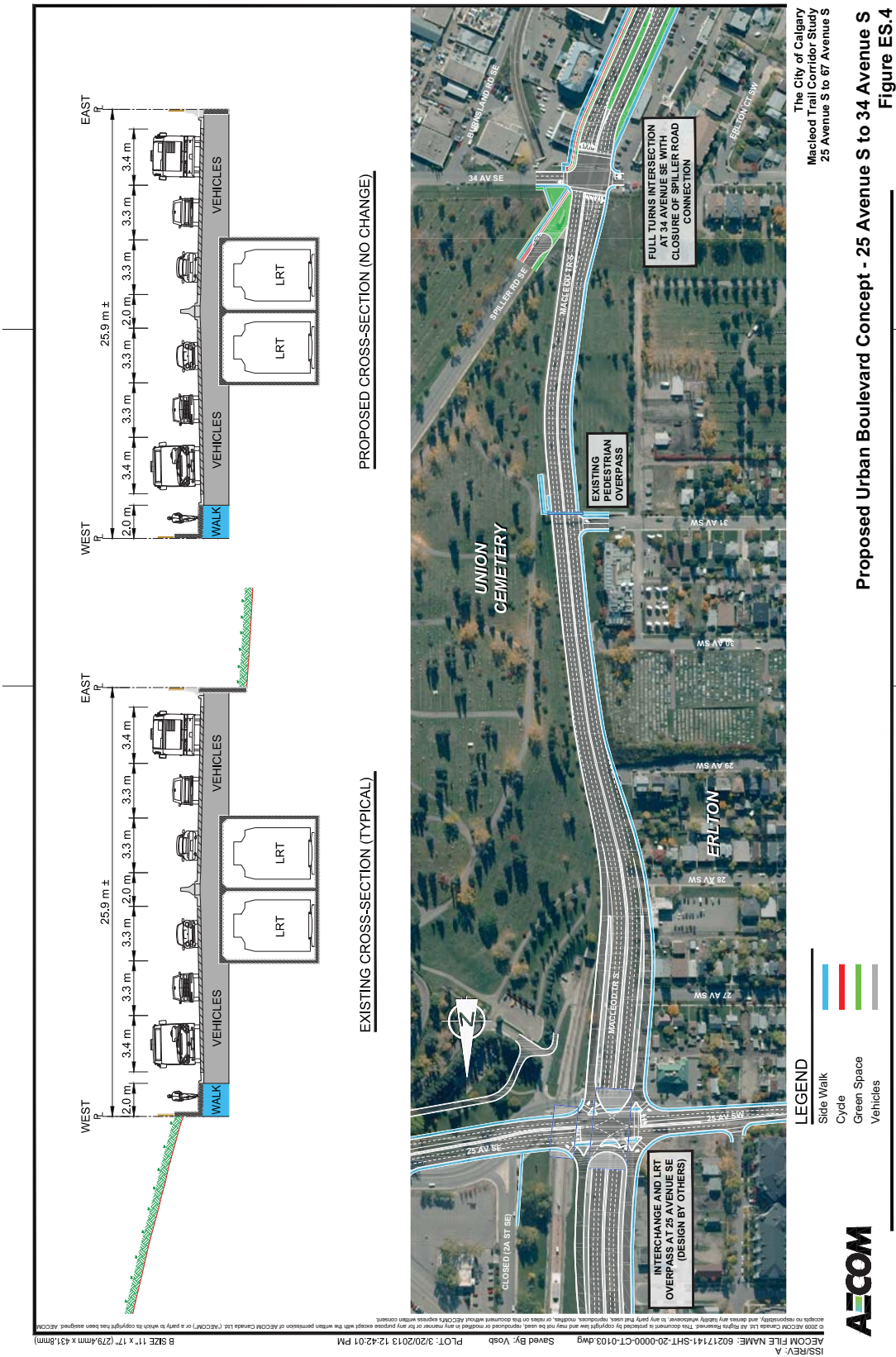
The central section between 34 Avenue S and 58 Avenue S is pivotal to the development of the Macleod Trail Urban Corridor and Urban Boulevard. This 2.6 km long section has the greatest potential for change in land use and change in the characteristics of Macleod Trail. Consequently the study focused initially on the central section.

The creation of a boulevard environment conducive to pedestrian and cycling activity involves the public realm component (pedestrian/cyclist space and green infrastructure) of the roadway and the abutting private space. The proposed 3.0 m wide pedestrian area is located next to the property line to be farthest removed from roadway traffic, and buffered by the planted green infrastructure area and the cycle facility. A 2.0 m wide uni-directional cycle track on each side of Macleod Trail is proposed.

Tree planting in the green infrastructure area provides visual interest and potential shade. Pedestrian amenities such as street furniture, public art, wayfinding signage, and lighting are located in the 2.4 m wide green infrastructure area. Pedestrian/vehicle conflict points should be designed to provide cues to the hearing and visually impaired. Driveway crossings should be minimized as redevelopment of abutting property occurs.

Land use guidelines for development of abutting property could make provision for pedestrian-friendly amenities including passive or planted open space, arcaded building frontage, patio development, etc.

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The roadway would comprise three travel lanes in each direction with a 4.5 m raised median. The median would accommodate single left-turn lanes and would also contain plantings. The curb lane would be 3.5 m wide to accommodate buses. It is proposed that buses would stop in the curb lane to serve passengers. The other traffic lanes would be 3.3 m wide.

Urban Boulevard Widening

The boulevard cross-section resulting from the combination of public realm and traffic lanes outlined above results in a right-of-way width of 42.1 m. The existing right-of-way between 34 Avenue S and 58 Avenue S is generally about 30.2 m wide. Accommodating the proposed cross-section thus requires about 12 m of land from abutting property.

Between 34 Avenue S and 50 Avenue S, the typical lot depth on the west side of Macleod Trail is about 35 m deep. This depth of lot is considered to be sub-optimal for the type of intense development contemplated for an Urban Corridor along Macleod Trail. To facilitate intense development along Macleod Trail consideration could be given to accommodating sub-surface parking structures and aerial development within the boulevard right-of-way. It is proposed that the boundary of the Urban Boulevard be generally located on the west property line of Macleod Trail between 34 Avenue S and 50 Avenue S.

Between 34 Avenue S and 50 Avenue S the roadway widening would occur to the east. This implies some consolidation of property on the east side of Macleod Trail to create developable parcels between the new east edge of Macleod Trail and the one-way (southbound) roadway alongside the LRT track. It is proposed that the one-way roadway would be extended south to 42 Avenue S to provide rear access to the abutting properties and also to provide re-circulating opportunities for traffic on Macleod Trail.

Between 50 Avenue S and 58 Avenue S the City of Calgary owns the majority of the property on the west side of Macleod Trail and for this reason it is proposed that the widening would be generally to the west. This implies consolidation of the residual property on the west side and relocation of some of the existing land uses. These residual properties are triangular in shape and have a depth greater than the 40 m considered desirable for development intensification. Part of the lands are above the elevation of Macleod Trail and may need to be excavated for development.

The proposed concept for the central section is shown on **Figures ES.5, ES.6 and ES.7**. Widening of the roadway has implications on cross-connecting roads as outlined later in the report.

Chinook Section – 58 Avenue S to 67 Avenue S

The Chinook Station Area Plan, adopted by City Council in June 2008, encompasses Macleod Trail between 58 Avenue S and Glenmore Trail. The Plan envisions significant pedestrian improvements along Macleod Trail with wider sidewalks, future cycle track and street trees in a landscaped corridor announcing to the travelling public that 'something special' is happening in the area. The end result will be a revitalized urban boulevard serving as a 'front door' for new retail, hotel and office uses and a redeveloped large urban format retail precinct.

The Chinook Station Area Plan proposed a dramatic new pedestrian bridge at Macleod Trail and 61 Avenue S creating a notable connection between the second level of Chinook Centre and the proposed Retail Mixed-Use Precinct and LRT Station. The Chinook Station Area Plan proposed a new development levy to contribute to the cost of public improvements, such as the Macleod Trail Pedestrian Bridge, that serve the entire area.

The Chinook Station Area Plan also proposes a pedestrian bridge over Macleod Trail near Glenmore Trail to replace an existing pedestrian underpass that has a lack of natural surveillance.

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The pedestrian accommodation proposed in this Macleod Trail Corridor Study is a 4.0 m wide sidewalk along the property line.

Between 58 Avenue S and Glenmore Trail a 3.0 m wide, two-way bikeway on both sides of Macleod Trail is proposed.

Two new pedestrian/cyclist bridges are proposed to improve crossing conditions over Glenmore Trail. These bridges would create more separation between pedestrians/cyclists and vehicular traffic turning on Macleod Trail.

There are two options for the green infrastructure space. A 6.0 m wide green space could separate the cycle/pedestrian area from the vehicular traffic on the roadway and this area could accommodate ramps to the pedestrian overpass at 61 Avenue S. Alternatively, the green space could be divided into two 3.0 m wide strips – one between the curb and the cyclists and another between the cyclists and pedestrians, allowing a double row of trees. Both options can be combined longitudinally along this section of the roadway.

The traffic volumes on this section of Macleod Trail are characterized by higher turning volumes than those in the northern sections. This results in relatively higher levels of congestion and delay. Three laning configurations were considered for this section of Macleod Trail:

- Six through lanes with dual left-turn lanes
- Six through lanes with single left-turn lanes
- Eight through lanes with single left-turn lanes

The eight-lane cross-section with single left-turn lanes provides the lowest overall delay per vehicle for both the 58 Avenue S and 61 Avenue S intersections. The proposed concept for the Chinook Section is shown on **Figure ES.8**.

Cross Connecting Roadways

Roadways cross connecting with Macleod Trail will be affected in the future by the effect of shifting the curb lines on Macleod Trail to accommodate the proposed widening and the increased frequency of service on the LRT line. The increased frequency on the LRT will reduce the effective capacity of the roadways crossing at grade. The curb line shifts (to the east between 34 Avenue S and 50 Avenue S and to the west between 50 Avenue S and 58 Avenue S) will increase the approach gradients of the connecting roadways. There are several proposals to address issues arising from the changes.

34 Avenue S

At 34 Avenue S the LRT passes under the roadway as the LRT tunnel enters Cemetery Hill. This creates an opportunity to make greater use of 34 Avenue S as an access between Macleod Trail and the Manchester Industrial area where currently traffic turning movements are restricted. The proposed option allows for all turning movements between Macleod Trail and 34 Avenue S eastward. To accommodate these movements, the connection to Spiller Road would be closed to general traffic. Provision could be made to accommodate northbound funeral procession traffic from Macleod Trail to the Union or Burnsland Cemeteries with gated access and police control if required.

36 Avenue S, 38A Avenue S, and 39 Avenue S

On the east side of Macleod Trail the eastward shift of the east curb line increases the gradient between Macleod Trail and the LRT line. This affects 36 Avenue S, 38 'A' Avenue S, and 39 Avenue S. 36 Avenue S could continue to

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operate similarly to the existing situation, recognizing that the frequency of LRT trains at the level crossing will restrict roadway capacity. The down grade on 38 'A' Avenue S would be steeper than desirable and it is proposed that 38 'A' Avenue S be operated as a one-way roadway in the upward westbound direction to Macleod Trail. On 39 Avenue S the proposed solution is to construct an overpass over the LRT line. This will resolve the grade issue and create a superior connection between the Manchester Industrial area east of the LRT station and Macleod Trail. Pedestrian pathways could be provided on the overpass and also maintained at the original roadway level to provide access to the LRT station. Between 50 Avenue S and 58 Avenue S the connections to the east side are generally unaffected by the proposed changes.

53 Avenue S and 4 Street W

On the west side of Macleod Trail between 50 Avenue S and 58 Avenue S the widening is proposed to the west, affecting connections at 53 Avenue S and 4 Street W (56 Avenue S). The grade on 53 Avenue S will increase with the shift of the curb line to the west. The grade would be within acceptable parameters and it is therefore proposed that 53 Avenue S continue to operate as a two-way street with a signalized intersection at Macleod Trail. At the intersection of 4 Street W and 56 Avenue S with Macleod Trail the westward shift of Macleod Trail could create an undesirable intersection for pedestrian, cycle, and vehicular traffic. The proposed solution is to create a cul-de-sac on 4 Street W and revise the grade on 56 Avenue S to connect in to the new edge grade on Macleod Trail.

50 Avenue S Intersection

The existence of an overhead electrical transmission line along the north edge of 50 Avenue S, and the City-owned property acquired for an abandoned freeway plan, provides an opportunity to create a landmark feature at this location. Alternative concepts were examined to create an enhanced pedestrian located integrated with the roadway requirements. These included a traffic roundabout, traffic square and conventional intersection, each with related pedestrian and landscaped amenities. The proposed concept includes an enhanced pedestrian environment and generous landscaped areas with a conventional traffic intersection.

Cycle Routes

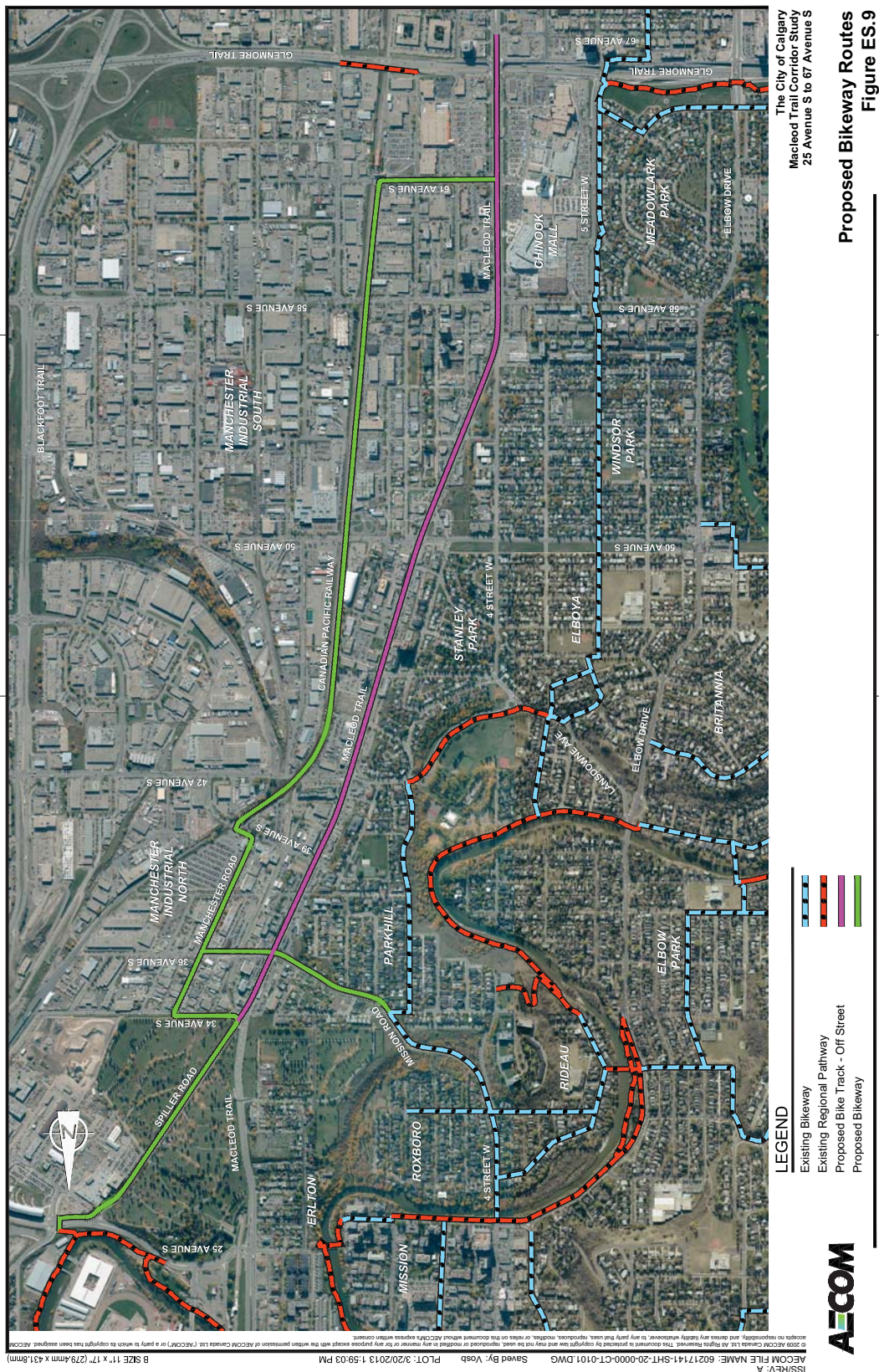
Since implementation of the proposed cycle facilities on Macleod Trail is expected to take a long time, a parallel route for cyclists is recommended along the LRT line. This route would connect to the Elbow River pathway at the north end and to Macleod Trail at Glenmore Trail as shown in **Figure ES.9**. A cross connection between the route alongside the LRT line and the 5 Street W route could be accomplished on Mission Road/36 Avenue S.

Next Steps

The process of transforming Macleod Trail into an Urban Corridor and Urban Boulevard will be a long one. This report provides a step forward by identifying issues that must be addressed in the course of providing enhanced boulevard elements within a constrained roadway corridor. Adoption of the urban boulevard concept recommended in this report would provide a framework for continued refinement of the urban boulevard plan, and for preparation of local land use plans along the Urban Corridor.

Preparation of local area plans would facilitate the development of a roadway right-of-way acquisition strategy. The roadway right-of-way acquisition strategy could consider a range of options from easements and sharing air rights or sub-surface rights to land purchase. The strategy needs to consider short-term protection of the right-of-way as well as acquisition over the long term.

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Also to be considered is a comprehensive review of utility requirements for the development of the Urban Corridor. This review would address the capacity and placement of utilities needed to serve the anticipated development.

While implementation of the recommended concept for the North Segment of Macleod Trail will require continuity of available right-of-way that will take time to achieve, there are elements of the concept that could be advanced in the shorter term. The proposal to develop a cycle route along the LRT line could be considered along with the new pedestrian/cyclist bridges across Glenmore Trail. The posted speed on the roadway could be reduced from 60 km/h to 50 km/h to make pedestrian use of the existing sidewalks less daunting. In the Chinook section, where ample right-of-way exists, a demonstration section of the Urban Boulevard could be initiated with enhanced landscaping, lighting, and amenities to showcase the attractiveness of the Urban Boulevard vision.

Conclusions and Recommendations

This study developed an Urban Corridor concept (**Figure ES.10**) that balances the co-existence of public realm and roadway components, integrated with intensified abutting land use. The study identifies the challenges to be faced in implementing the concept and the next steps in the long process that will be necessary to achieve the vision for Macleod Trail.

It is recommended that the findings of this study, outlined in the report, be accepted as a basis for continued development of the Macleod Trail Urban Boulevard concept.

Figure ES.10 illustrates the proposed Macleod Trail Concept.



Figure ES.10: Proposed Macleod Trail Concept Illustration