4. COLTA / HUGA CONNECTIONS – FUNCTIONAL DESIGN

4.1 KEATING ROAD

Keating Road is a 2 lane residential roadway ending in a cul du sac just east of the COLTA trail. The distance between the trail and the cul du sac is approximately 20 metres and as shown in Figure 3-5 previously, there is an existing worn trail at this location. It is recommended that HRM consider upgrading the existing pathway between the cul du sac and COLTA trail as a minimum 3 metre wide, asphalt multiuse trail. This upgrade would include appropriate radii on the connections and curb cuts at the connection to Keating Road.

With respect to upgrades on Keating Road and Crown Drive, it is assumed that Section 3.6 – Retrofitting Municipal Roads for AT Facilities - of HRM's Active Transportation Plans Facility Planning and Design Guidelines would apply in this situation given the low traffic volumes and constrained right-of-way on these roadways.

Functional design details for the Keating Road Connection are provided in Appendix B to this Report.

4.2 SPRINGVALE ROAD – COLTA TRAIL TO HUGA TRAIL AND WEST END MALL

Functional design drawings for this section are provided in Appendix C and described in the following sections.

4.2.1 Springvale Road - COLTA Trail to Joseph Howe Drive

Existing Conditions

Springvale Road is a 2 lane urban roadway approximately 9 metres in width oriented in an east-west direction. The COLTA trail crosses Springvale Road approximately 200 metres west of Joseph Howe Drive at a formalized crossing point installed during the construction of the COLTA trail. Immediately to the west of the trail crossing is the intersection of Springvale Road with Arlington Avenue. The separation between the intersection and the trail crossing is approximately 25 meters and as a result, additional advanced warning signs have been installed on Arlington Avenue.

Concrete sidewalk is present on the south side of the roadway. Boulevard width and type of material vary, though grass is used predominantly and there are some areas where the

boulevard is eliminated. Utility poles are also present along the south side of the roadway and are generally located behind the sidewalk. The roadside on the north side of Springvale varies and includes driveways, a transit stop, building accesses and residential pickup/drop off areas. Parking is currently permitted along Springvale.

Proposed Configuration

The roadway cross section does not allow consideration of a multiuse trail off road facility, therefore the preferred arrangements is as follows:

Pedestrians: *Accommodate pedestrians on the existing sidewalks as a minimum, with the consideration of widening the standard sidewalk width in consideration of it being a primary AT connection route. Minor pedestrian upgrades would be required at the Joseph Howe Drive intersection with pedestrians crossing two legs of the intersection. Widened concrete pads and improved directional curb cuts are required in each quadrant of the intersection.*

Cyclists: *Accommodate cyclists using a wide curb lane cross section with appropriate signage and pavement markings. The use of sharrows should be considered.*

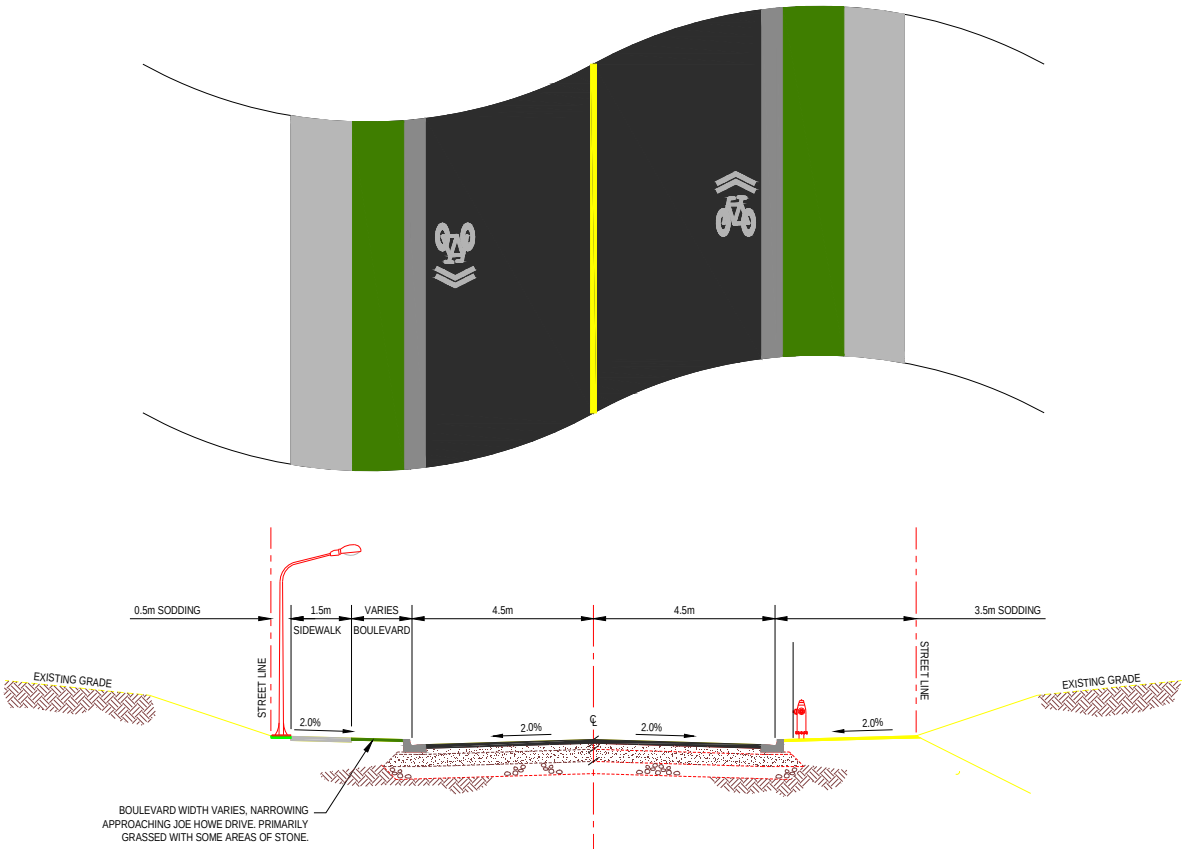

Figure 4-1: Typical Cross Section - Springvale

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Accommodation of cyclists in the existing cross section will require the elimination of parking along the street. These restrictions are only between the COLTA trail and Joseph Howe Drive, a distance of approximately 200 metres. In general, most households along this section of the street have relatively long driveways that can accommodate multiple vehicles; therefore the elimination of parking is not expected to have a significant impact on the residents.

Should there be a requirement to maintain on street parking, an option may be to provide a multiuse trail along the south side of Springvale Road, though upgrading in this manner would likely require the relocation of a number of power poles, construction of retaining walls, elimination of the boulevard, and likely some driveway reconstruction.

4.2.2 Murdoch Avenue - Joseph How Drive to Cemetery Entrance

Murdoch Avenue is a 2 lane urban roadway approximately 9 metres in width oriented in an east-west direction similar to Springvale Road. The distance from Joseph Howe Drive to the entrance at the Cemetery is approximately 100 metres.

Concrete sidewalk is present on both sides of the roadway complete with consistent grassed and treed boulevard. Utility poles are also present along the north side of the roadway. Currently there are no parking restrictions along Murdoch Avenue.

Proposed Configuration
Similar to the section on Springvale, this section of roadway does not allow consideration of a multiuse trail off road facility without the remove of a significant number of medium growth trees and relocation of utility poles. For consistency, recommendations are similar to Springvale, which include:

Pedestrians: *Accommodate pedestrians on the existing sidewalks. Sidewalks are present on both sides of the roadway, through preference should be given to use of the sidewalk on the north side of the road as it permits a direct connection the entrance to the cemetery and the continuation of the AT route.*

Cyclists: *Accommodate cyclists using a wide curb lane cross section with appropriate signage and pavement markings. The use of sharrows should be considered. Transition of cyclists from the south side of the street (eastbound) to the cemetery entrance should be carefully considered to minimize any potential conflicts with vehicles.*

Similar to Springvale, the accommodation of cyclists on the existing cross section will require the elimination of parking along the street. While driveways are present along this section of roadway, many have limited length, though most also have garages which typically allow the accommodation of at least two vehicles total.

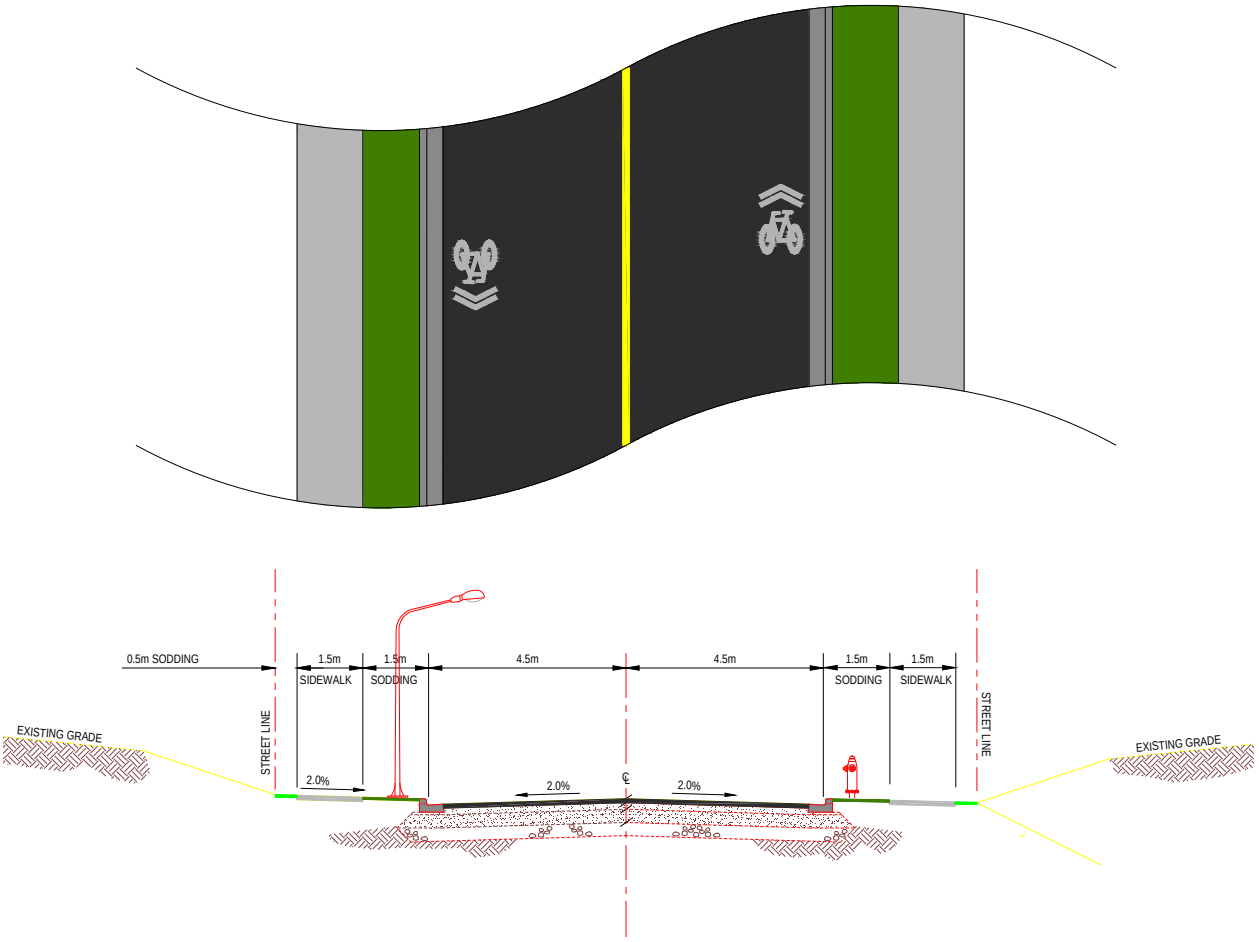

Figure 4-2: Typical Cross Section – Springvale

4.2.3 Olivet Cemetery

There are three specific trail sections within the boundaries of the Cemetery including:

- Transition from Murdoch Avenue to the cemetery's internal road network;
- Upgrading of the internal road network; and,
- Transition from the internal road network to Olivet Street.

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Transition from Murdoch Avenue to the Cemetery

The most logical location to transition is at the southeast corner of the cemetery where there are minimal grade differences from the existing sidewalks to the adjacent lands. This location is already serviced by an existing gate and would allow the trail to remain relatively close to the existing fence line. As the trail progresses northward, greater grade differences will need to be resolved and there will likely be the requirement for the construction of some small retaining walls. The biggest challenge in this area will be to remain as far as possible from existing grave sites while balancing the construction challenges associated with the grade differences. There are also a number of larger trees that will require consideration in routing the trail. It is also possible that a few short sections of the trail will require narrowing in order to minimize any impact on the trees.

Within the Cemetery

Once the main roadway within the cemetery is reached, the trail alignment follows the existing roadway and it is assumed that this roadway will be upgraded with a paved asphalt surface. It has also been assumed that the width of the paved surface will be similar to the existing paved width which approximately 4 metres. In the northeast corner of the cemetery, there is an option to use a northerly or southerly roadway. It has been assumed for the purposes of this study that the northerly route will be used as it is located further away from the houses adjacent to the cemetery and is more visible from a safety and security perspective.

Transition from Cemetery to Olivet Street

Use of the existing roadway ends along the east side of the cemetery where the trail will need to transition to the existing Olivet Street sidewalk on the west side of the road. This will require some earthwork due to the grade difference between the roadway and the cemetery lands, though the grade difference is relatively small (in the range of 1 metre). A profile of this area is provided in the Appendices of this report.

Alternatives to the Olivet Cemetery

Two alternatives to using the Olivet Cemetery were considered through this study. The use of Mumford Road was evaluated and eliminated in discussions with HRM due to the high traffic volumes and restricted right-of-way. The second option was the use of Fielding Avenue to the eastern extent of the road and subsequently through the cemetery to Olivet Street in a location similar to that being proposed in the previous options. The restriction on this option is the existing residential properties that back on to the cemetery. Presently, there are no known right-of-way or easements present that would permit the passage of a public facility through these properties. Should such an opportunity present itself through the purchase of a property or the establishment of an easement, this option may warrant further consideration.

4.2.4 Olivet Street to COLTA Trail

A midblock cross walk will be required to allow AT uses to cross Olivet Street. There is currently parking permitted in this area which will have to be eliminated and it is also noted that the roadway in this area is in the range of 11 metres wide. It is recommended that a narrowed roadway cross section be created using "bulb-outs" which will serve to eliminate parking in the vicinity of the cross walk and to provide a clear and relatively short crossing distance.

The proposed trail location runs between the existing parking lot of the Fort Knox apartments and the exit driveway of the Brentwood Park apartment building. This will require some reconstruction of the parking lot south of the Fort Knox apartment building, though it appears that there is adequate space to accommodate the trail width, a narrowed circulation aisle and regular parking stalls. Some additional reconfiguration of parking stalls along the north side of the Brentwood Park parking area will be required, though it is likely only a small number of existing spaces will be impacted. Of particular note in this area is the presence of a large concrete manhole structure in one of the islands between the two buildings. It is likely that this structure will have to be modified or at least incorporated into the design of the trail in order to minimize the impacts on parking if the structure were to be avoided. The extension of the trail through these parking areas will allow the trail to connect directly to the HUGA trail extension along the CN rail cut.

It should also be noted that the presence of the HUGA trail parallel to multiple apartment buildings suggests that multiple connections between the buildings and the HUGA could be considered. Once on the HUGA trail, users can travel northbound or southbound along the trail, or access the single at grade crossing of the CN rail right-of-way as discussed below.

4.2.5 Crossing of CN Tracks

The grades along the edge of the rail right-of-way vary considerably in this area. It appears that there is a suitable location for an at-grade crossing at approximately the midpoint of the Brentwood Park building. The existing crossing location has been defined by pedestrians and occurs near the low point of the fence and results in a relatively flat grade between the mall and the apartments.

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4.2.6 Access to Commercial Businesses

While it is not directly part of the scope of work for this project, SLI considered the potential connections from the crossing of the CN tracks to the various commercial properties that are part of the West End Mall. Along the west side of the parking lot, there appears to be potential to widen sections of existing concrete islands internal to the parking lot which would extend a pathway south towards the existing Wal-Mart. This connection could subsequently connect to the stairway at the east end of Wal-Mart providing access to the other commercial properties within the West End Mall.

Extending connection to the north towards the existing Tim Horton's would provide access to other commercial areas in the northwest part of the development as well as to the existing transit terminal on Mumford Road. In either case, consideration should be given to a paved island receiving area within the parking lot immediately adjacent to the rail right-of-way to provide AT users refuge before entering the main parking lots areas.

4.3 SCOT STREET – COLTA TRAIL TO HUGA TRAIL

Functional design drawings for this section are provided in Appendix D and described in the following sections.

4.3.1 Scot Street – COLTA Trail to Desmond Avenue

This connection starts at the COLTA multiuse trail on the west side of Joseph Howe Drive. Trail users are required to utilize the existing signalized crossings at the Joseph Howe Drive and Scot Street intersection to access Scot Street. Scot Street is a two lane curbed roadway approximately 9 metres in width. This section has concrete sidewalks on both sides of the roadway complete with grassed boulevards, mature trees on both sides, and utility poles along the north side of the roadway.

With restricted right-of-way, there are limited opportunities to widen the existing sidewalks therefore a multiuse trail section has not been considered between Joseph Howe Drive and the first mall entrance. Between the mall entrance and Desmond Avenue, adequate space is available to transition to a full multiuse trail width.

Pedestrians: *Accommodate pedestrians on the existing sidewalks between Joseph Howe Drive and the first Mall entrance. East of this entrance, construct a full width multiuse trail extending through the parking areas to the CN rail cut. Minor upgrades would be required at*

the Joseph Howe Drive intersection to connect with the COLTA trail and upgrades to the pedestrian crossings and associated curb cuts should be considered.

Cyclists: *Accommodate cyclists using a wide curb lane cross section with appropriate signage and pavement markings between Joseph Howe Drive and the first Mall entrance, transitioning to the multiuse trail east of the Mall entrance. The use of sharrows should be considered.*

4.3.2 Through the Mall Parking Lot

The section of trail between Desmond Road and the CN rail cut must navigate a number of distinct features include a truck access and parking areas and must also consider passage past a number of building fronts. The intention is to create a multiuse trail corridor through this area by minimizing AT user exposure to vehicle traffic. The creation of the corridor with the priority set to AT users would include minimizing driveway widths, maximizing guidance and direction for all users, and providing appropriate markings and signage.

The trail will also require the relocation or elimination of some parking stalls, though the number is expected to be minimal and can likely be relocated elsewhere in the existing lots. It should be noted that there is a significant grade difference between the parking lot located behind the Superstore and that in front of the offices of the Bayers Road Mall.

The current orientation of parking within the upper lot is not considered to be particularly efficient or conducive to permitting the crossing of an AT corridor. Given the preferred location of the bridge structure crossing the CN rail cut, the AT trail is best accommodated along the front of the existing office building on south side of the parking lot. Adequate space must be left in the front of the building for regular access plus the accommodation of the multiuse trail, both of which are expected to account for 6 – 7 metres of space in front of the building. Parking reconfiguration will also be required along the front of the building, and within the parking lot to accommodate the trail.

4.3.3 Crossing the CN Rail Cut

Both at-grade and grade separate crossings were considered at this location, though the preference for a grade separated crossing over the CN tracks was strongly expressed by all stakeholders. The proposed pedestrian bridge crossing location was selected with consideration of the surface geography and topography in the area.

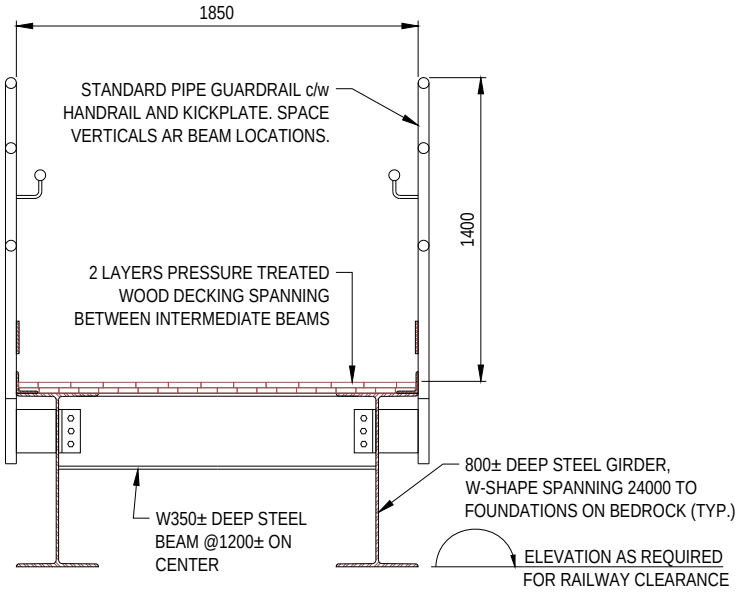
The approaches to the pedestrian bridge would be from the existing paved parking lots on either side of the tracks, which are roughly 7 metres above the existing railway tracks. The railway tracks run between two vertical rock faces at this location. The width between adjacent rock faces varies with the narrowest distance measuring approximately 24 m. This location is considered the most economical location for a proposed crossing with lesser material costs associated with a reduced bridge span. The bridge approaches would be ramped as required to

match existing grade to enable easy access for cyclists and to provide the minimum clearance requirements above the railway tracks.

Approximately Crossing Location	West Rock Face	East Rock Face

Figure 4-3: Crossing of CN Rail Cut

A number of different bridge construction types were considered, with the most cost effective arrangement likely to include:



- two W-shape steel girders, approximately 800 mm deep, spanning approximately 24 m to concrete foundations constructed on existing bedrock;
- intermediate W-Shape steel beams spanning between the girders;
- two layers of wood decking with one layer spanning between the intermediate beams and the top layer placed on a diagonal; and,
- horizontal bracing at the underside of the deck.

Alternatively, a concrete or composite deck could be provided on a similar girder and beam arrangement. Guardrail posts would be spaced at the intermediate beams to lessen torsion on

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the girders, and would be required to a height of approximately 1400 mm for bicycle traffic. Wider bridge cross sections could also be considered.

Given the location of the bridge, the landing area on the east side of the rail cut will impact a small number of parking spaces in the back of the West Point apartments. It is likely only 2-3 spaces would be impacted, though consideration will have to be made with respect to property ownership and easements.