



Hamilton Rapid Transit Preliminary Design and Feasibility Study

A-LINE

UTILITIES ASSESSMENT REPORT

Version: 1.0



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1.0 Introduction

The following elaborates on the envisaged impacts to surface and sub-surface utilities along the corridor. This assessment aims to inform the next design/study effort of considerations that shall be made when reviewing the bus rapid transit (BRT) and light rail transit (LRT) options further.

2.0 Surface and Sub-Surface Utilities

Impacts on the utilities for the Hamilton A-Line alignment depend on which technology (BRT or LRT) is ultimately chosen, as well as the running way configurations used along each section of the alignment. Both surface and sub-surface utilities, owned by both public and private agencies, have the potential to be impacted. The underground utility infrastructure includes duct banks, sewer lines, water mains and gas mains, while the surface infrastructure includes street lighting poles, hydrants and access covers for maintenance holes.

At this point, no detailed corridor mapping is available; therefore, it is currently not possible to assess specific utility relocation strategies along the route. Instead, a general discussion regarding the types of utility impacts to be expected for each type of running way for both the BRT and LRT options are discussed below. The proposed alignment for both the BRT and LRT alternatives can be found in below in Figure 2.1

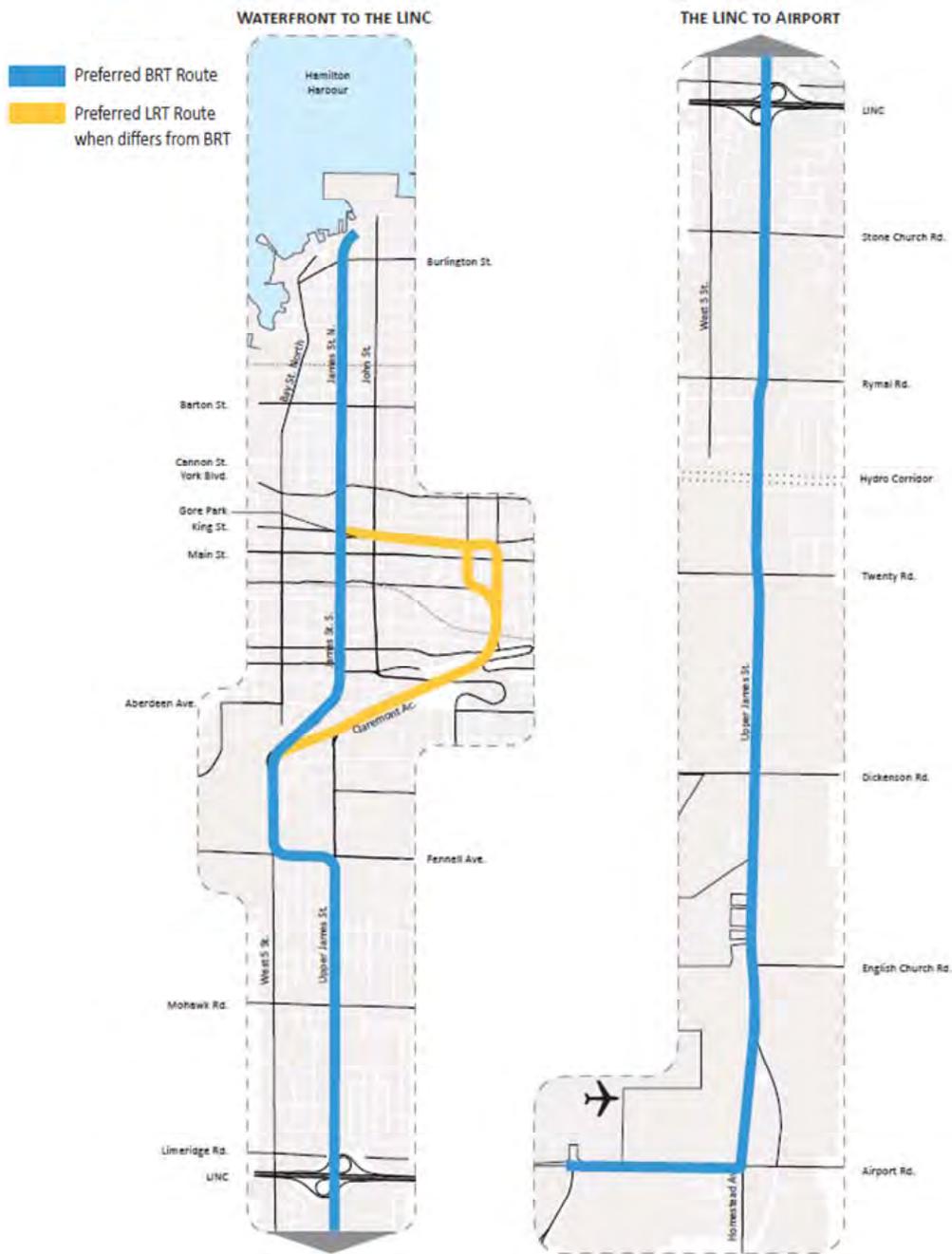


Figure 2.1: Proposed A-Line Corridor – Preferred Routes

2.1 Bus Rapid Transit Option

From a technological perspective, BRT systems do not inherently require any utility relocation as they are not fundamentally different than regular bus services running along a city street. However, as with all utilities under municipal streets, periodic maintenance and replacement is expected, which will result in a disruption of regular and continuous BRT operations. It is recommended that during the preliminary engineering phase, a more detailed assessment of the costs of these “discretionary” utility relocations be assessed against the long term maintenance and service impacts of leaving them in place, taking into account factors such as expected remaining life, ease with which service can be diverted etc. and comparing that cost to the loss of revenue caused by BRT disruption.

The main cause of utility relocation work associated with the BRT would be due to modifications/expansions to the existing road geometry in order to increase the amount of dedicated right-of-way (segregation) the route will have. This would generally impact utilities that are located on or under sidewalks that would need to be relocated or abandoned in case of street widening to accommodate the bus lane. Subsurface utilities (such as pipes and utility cables) may need to be buried deeper to allow for the higher loads placed on them by vehicles, while surface-level infrastructure such as hydro poles and junction boxes would need to be relocated to the new sidewalk. The expected utility impacts for each individual running way type are as follows:

- **On-street mixed with traffic:** This only applies to three very short sections at the northern terminus of the line, near the Hunter Street GO station and just south of the Niagara Escarpment, and at a longer section near the airport. No major utility impacts are anticipated.
- **On-street using segregated lanes:** This applies to most of the line north of the Niagara Escarpment. Utility relocations are anticipated to only be necessary in locations where the roadway and sidewalk requires widening in order to accommodate the segregated right of way, largely impacting utilities that are on or below existing sidewalks.
- **Fully segregated in median:** This applies to the segment between Fennel Avenue and Alderlea Avenue. This section will require the existing median to be widened in order to accommodate the BRT, which may in turn require the widening of curbs and sidewalks, thereby impacting utilities both on and below the existing sidewalk.
- **Fully segregated off-street:** This applies to the segment from Alderlea Avenue to the intersection of Upper James and Homestead Drive. Depending on the exact road configuration of lanes, and where the BRT runs relative to the existing road ROW, the relocation of overhead power lines may be required in some sections.
- **Dedicated Transit Way:** The conceptual BRT alignment calls for James Mountain Road from St. James Place to the north until Claremont Drive to the south to be repurposed for exclusive use by transit service (including the BRT) and emergency vehicles. No major utility impacts are expected here.

2.2 Light Rail Transit Option

The LRT option is generally expected to have a higher level of impact on utilities in the corridor, as it requires utility relocation not only as a result of widening existing road geometry to accommodate the guideway, but also as a result of the technology required for the running of the fleet.

All sub-surface utility accesses such as manholes and hydro vaults from the path of the guideway will require relocation so as not to interfere with the construction of the track structure and the operation of the LRT. Light Rail Vehicles are also significantly heavier than buses, and as such, transfer a much higher level of load and vibration to the ground beneath the guideway than buses do. This additional stress on nearby underground utilities has the potential to greatly shorten their life span and cause sudden rupture. Therefore, a load impact analysis should be done to assess the potential impacts to the adjacent utilities and potential solutions include either relocating the utilities or lining them so they can sustain the extra load in-situ.

Furthermore, light rail vehicles are powered by electricity obtained from the overhead catenary system and have embedded running rails which are used to lead current back to the traction power substations as a current return mechanism. However, there is the potential for a small amount of current to stray from the rail into the surrounding soil, where it could come into contact with subsurface utilities and gradually cause them to corrode.

Since the repair of utilities located under the track is lengthy and costly and causes a disruption in service, such an occurrence is considered to be highly undesirable. As a result, the LRT guideway should have a “utility-free” or impact zone, in which all existing utilities that run along this area should be relocated. Note that it is still possible to have utilities cross this impact zone in special reinforced, non-corrosive casings. Figure 2.2 shows a typical impact zone (as per what was prescribed for the B-Line LRT preliminary design):

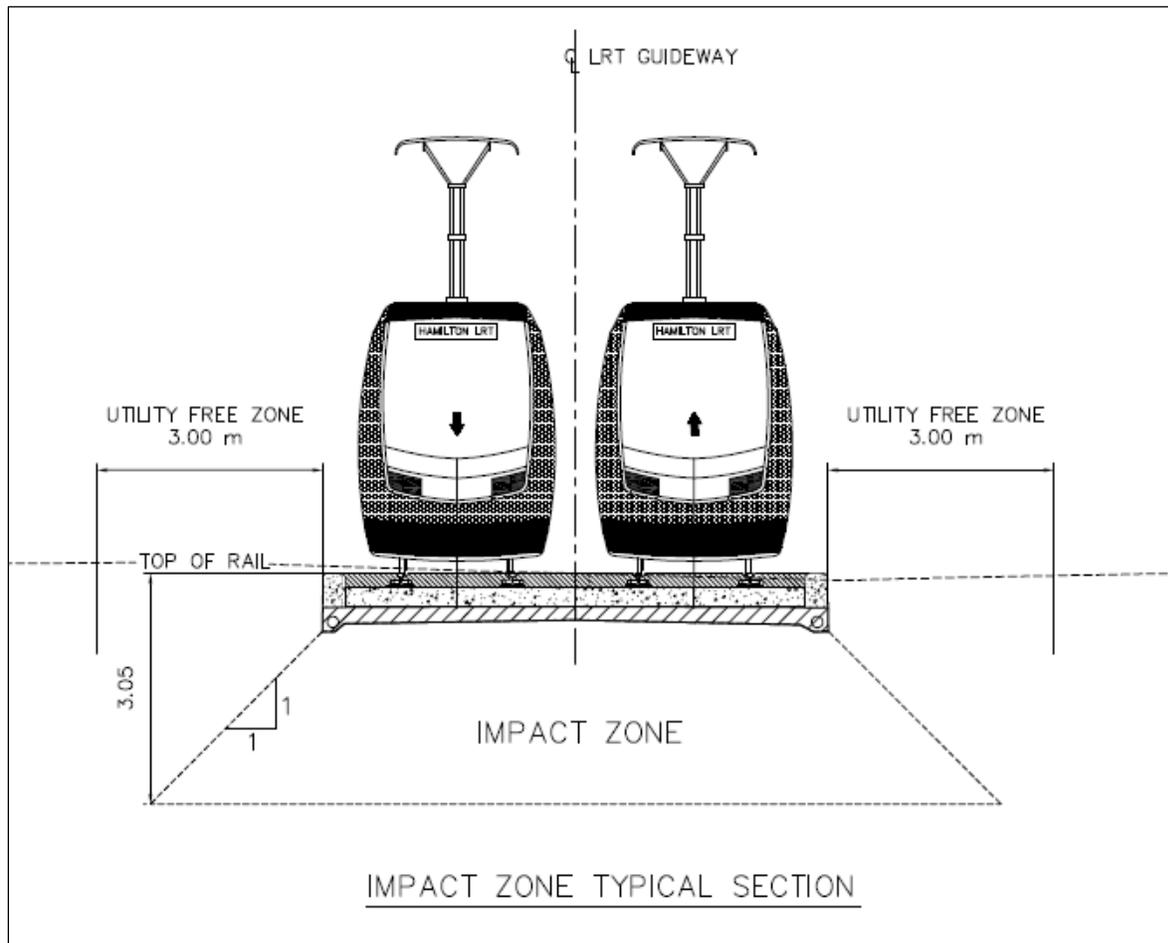


Figure 2.2: LRT Utility Free Zone

The expected utility impacts for each individual running way type are as follows:

- **On-street mixed with traffic:** This only applies to a small section of the line which will be shared with the B-Line, and therefore has already been assessed in more detail as part of the B-Line LRT preliminary design.
- **On-street in segregated lanes:** This applies to the section of James Street north of King Street, and Victoria/Wellington Street and the Claremont Access south of King Street. With the exception of the Claremont Access, much of this section is in highly urbanized sections of the City, which most likely feature a wide range of subsurface utilities; many of which would be within the guideway impact zone, and would require relocation. Street sections that require curb relocation due to lane widening would also require the relocation of utilities beneath the existing sidewalk, and relocation of street poles and other above-grade infrastructure.
- **Fully segregated in median:** This applies to the segment between Fennel Avenue and Alderlea Avenue. It is likely that there are several subterranean utilities in what will ultimately become the LRT guideway that will require relocation to be underneath the general traffic lanes.
- **Fully segregated off-street:** This applies to the segment from Fennel Avenue to the intersection of Upper James and Homestead Drive, and a short segment at the Airport. Depending on the exact road configuration of lanes, and where the LRT runs relative to the existing road ROW, the relocation of overhead power lines may be required in some sections. It is unlikely that there are a large number of subterranean utilities in an off-street corridor that would require relocation.

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