

Final Report

# Transit Windsor Garage Feasibility Study

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Future Facility Strategy



Prepared for the City of Windsor  
by IBI Group

October 28, 2021

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# 1 Introduction

The City of Windsor's transit operations and maintenance facility is located at 3700 North Service Road East and was opened in 1979. It was designed to accommodate a bus fleet and associated administration, operations, and vehicle maintenance functions for a fleet of 96 buses and some 230 employees. The facility is approximately 12,200 square metres (131,000 square feet) in size and sits on a site of approximately 4.5 hectares (10 acres). It is now operating beyond its design capacity with 117 buses and over 288 employees with the result that is deficient with regards to administration and operations space, staff amenities, accessibility, vehicle maintenance and vehicle servicing area capacity. There is also insufficient employee parking.

The City recently completed the *Transit Windsor More Than Transit 2019* master plan which forecasts a significant expansion of transit service and fleet growth to 165 buses by 2028. This growth will require additional facility capacity to accommodate the fleet and related employee increases. In response, the City has undertaken this transit garage feasibility study to determine its future transit facility needs not only in the short term but also over the longer term, and to identify and evaluate facility strategy options to meet those needs. This includes examining the feasibility of expanding the existing building or other options to meet its future needs and recommend the most feasible and cost-effective facility strategy option.

The steps involved in determining future transit facility needs and a recommended option are:

1. Define future needs in terms of fleet size, number of employees and related employee vehicle parking requirements.
2. Develop a preliminary facility space estimate and site size based on the identified future needs.
3. Determine the ability to accommodate the future needs on the existing site and the ability to expand the existing facility.
4. Identify facility strategy options to meet the defined future needs.

5. Develop cost estimates for each option and determine the most cost-effective option.
6. Prepare a recommended facility strategy option and implementation plan.

And, separately, identify a preferred site location, as applicable for the recommended facility strategy, based on defined site criteria and transit operating cost (deadhead) and site selection analysis. This analysis is presented under separate cover.

As the basis for defining the City's future transit facility needs and options, a Technical Memorandum (TM), *Future Facility Needs*, was prepared and is attached as Appendix A. This TM provides a projection of future transit fleet growth, future employee increases and related employee parking needs for the city and surrounding area (region) to 2051.

## 2 Future Facility Needs

### 2.1 Technical Memorandum Conclusions

The facility needs Technical Memorandum, provided in Appendix A, provided the following conclusions with regard to the city and area's future requirements.

- The existing Transit Windsor facility is over 40 years of age and is operating over capacity based on a 2021 fleet of 117 buses and 288 employees (293 FTEs) and a design capacity for 96 buses and 230 employees.
- There is a current employee parking capacity shortfall of 31 to 46 spaces over the current parking supply of 149 spaces.
- Based on the transit master plan, Transit Windsor is projected to have a fleet of 165 buses by 2028, an employee complement of 425 full-time employees (FTEs) and a need for 277 employee parking spaces. This reflects a fleet growth of 51 buses, the addition of 132 FTEs and 128 employee parking spaces.
- Between 2028 and 2051, limited population growth is expected within the city resulting in modest fleet growth of 6 buses for an overall estimated total fleet size of 171 buses.
- In contrast, significant population growth is projected to occur outside the city and, with it, the likely requirement for new and expanded transit services. If the transit needs of the Windsor Census Metropolitan Area (CMA), which includes the city of Windsor and towns of Amherstburg, LaSalle, Tecumseh, and Lakeshore, are considered this could result in an additional 53 buses along with associated employees and employee parking spaces.

- If transit service needs in the Essex Municipalities are considered, this could result in an additional 18 buses along with associated employees and employee parking spaces.

Together, the future transit needs could require a facility capacity of up to 171 buses for city-only purposes, or up to 242 buses to meet future regional transit needs by 2051. It should be noted that although the Transit Windsor Master Plan states that inter-regional transit service will be provided from Windsor to neighbouring communities, additional routes beyond the three (3) routes currently provided will be evaluated on an as-needed basis.

## 2.2 Facility Space and Site Estimate

Based on the defined future facility of 171 buses and ultimately 242 buses, a preliminary space program for these facilities was prepared. This step provides an estimate of the size and footprint of the building by functional area as well as, and importantly, the site requirements for the facility. In this regard, a transit facility consists of two key elements: the building, and, external areas for various operational and maintenance functions.

The functions within the transit building are grouped into five categories:

- Administration
- Operations
- Vehicle servicing
- Vehicle maintenance; and
- Vehicle storage

The external functions include:

- Employee and visitor vehicle parking (a function of the number of employees)
- Circulation driveways and exterior movement and staging areas for buses and other vehicles around the building to connect the various functional areas of the building



- Space for fuel tanks (diesel, gasoline, oil, and waste oil) commonly referred to as the “tank farm”
- A hydro substation (required for electric buses)
- Landscaping including any setback requirements dictated by local development by-laws
- Storm water retention ponds; and
- Security fencing and lighting.

To develop the space program, meetings were held with Transit Windsor and other City staff to review existing space deficiencies and needs within the existing building and to define the future facility needs by functional area. The space estimates were then developed based upon industry standards and guidelines and, together, determined the future facility size. Examples of industry standards and guidelines include:

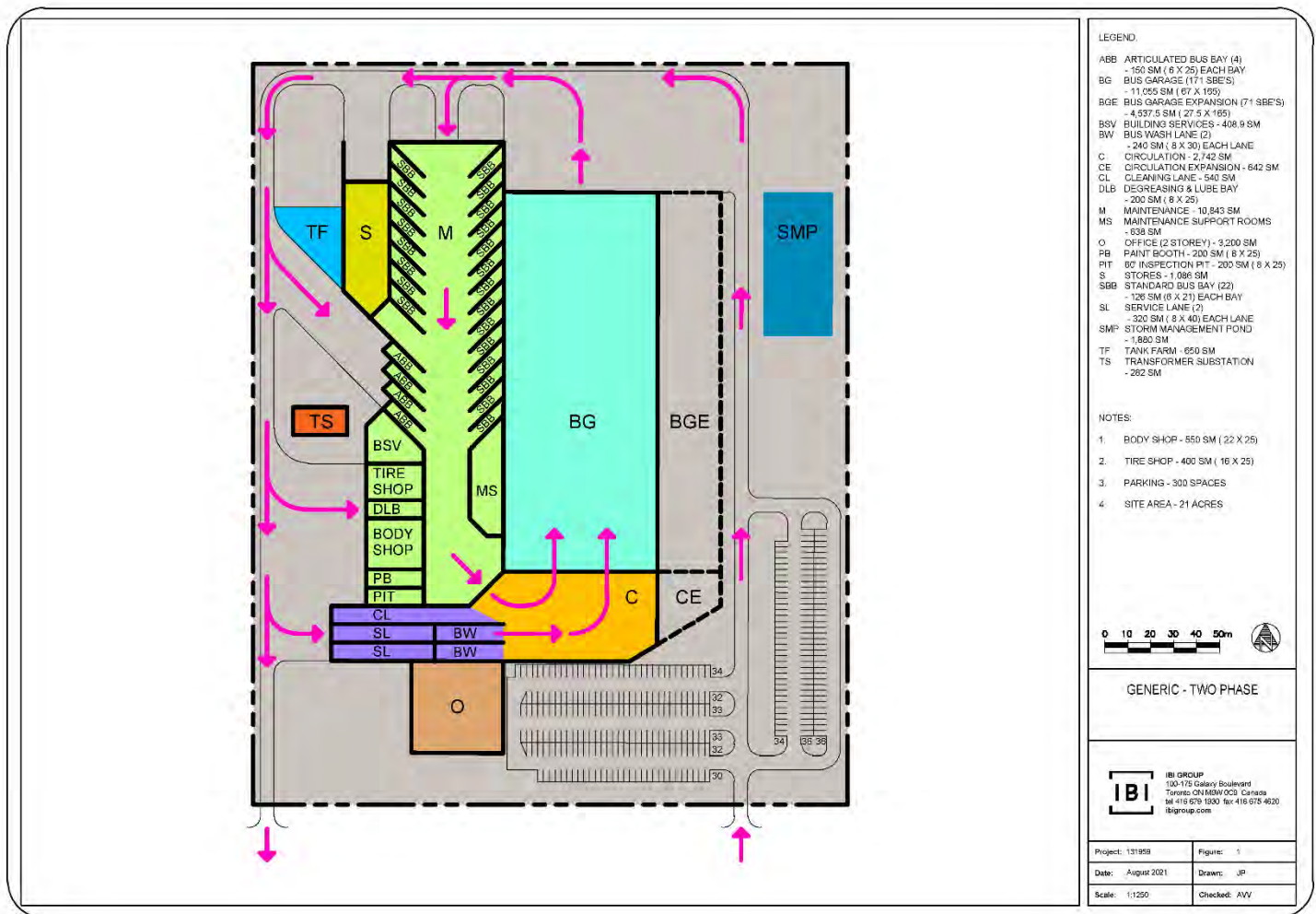
- Indoor bus storage including manoeuvring space with connectivity between the service lanes and the maintenance area.
- Provision to accommodate articulated and electric buses.
- Two service (fuel, wash, clean) lanes for up to 250 buses together with a by-pass lane.
- One repair bay for every 10 standard (12.2 metre) or smaller buses; one repair bay for every seven articulated (18 metre) buses.
- Specific dimensions for each maintenance bay and for each bus parking space in the storage area.
- Left-hand turning movements throughout the site (for safe operation).

The resulting space program is included in Appendix B and indicates that the 242-bus facility would be approximately **35,850 square metres** (385,888 square feet) in size. A 171-bus facility would be approximately

**30,670 m<sup>2</sup> (330,130 sf).** These estimates are preliminary and subject to further refinement during the detailed design phase.

A concept plan was prepared for these facilities including the exterior areas for the purpose of determining the required site size and indicated a need for a site of approximately 8.5 hectares (21 acres).

**Exhibit 2.1: Concept Plan for a 171 to 242-Bus Facility**



## 3 Existing Building Assessment

The next step toward identifying potential facility strategy options to meet Windsor and the surrounding area's transit needs was to assess the existing facility to understand the implications of continuing to use the facility and, in particular, the ability to expand it. The assessment was based on the following activities and resources:

1. The Building Condition Assessment report (BCA) completed by Bold Engineering in 2017 (Appendix C)
2. The Building Asbestos Survey completed by RWDI Air Inc, undated, but appears to have been completed in May 2017 (Appendix D)
3. Reference to the video overview of the building prepared by City staff and presented during the Request for Proposal (RFP) period; and
4. Site visits to view the building and understand its condition and site context.

### 3.1 Observed Building Condition and Deficiencies

As indicated previously, the facility is approximately 43 years old having been constructed in 1978. While the layout of the building represents excellent transit design practice and the exterior generally appears in good condition, the site visits and review of the background resources identified a wide range of deficiencies in both the building condition and its design, which will need to be addressed if the building continues in use beyond the immediate term (5 years). The recorded and observed deficiencies include:

- Inadequate bus storage. Currently a deficiency of 21 buses
- Inadequate employee parking. Currently a deficiency of 31 to 46 spaces
- Inadequate and constrained administrative and operations office spaces

- Insufficient parts stockroom space (currently supplemented with shipping containers located outside the building)
- Limited accessibility features particularly for washrooms in the administration and operations work areas, and no access to the second floor for people unable to use stairs
- Deteriorated internal concrete walls and floor in the service lane damaged by water and moisture
- Limited fireproofing on the second-floor slab and structural framing
- Inadequate heating, ventilation, and air conditioning (HVAC) systems throughout the building
- Limited dedicated space for the mechanical room, electrical room, intelligent technology (IT) room; and
- Inadequate office, training room, tool crib, battery room, and other spaces required for typical standard functions in the bus maintenance area.

It is to be noted that the design of the building superstructure consists of a concrete block wall, beam, and girder system. This design would present challenges to expanding the building where alterations would be required to the wall and roof system potentially resulting in the need for replacement of structural support systems.

### 3.2 BCA Report

The BCA, completed in 2017, identified a range of building structure, and mechanical, electrical, water, heating/cooling and security systems conditions within the building that require either upgrading or repair. The 2017 estimated cost for this work was **\$10.1 million**. Since that date, a limited number of the identified deficiencies have been addressed due to budget constraints as well as pending the outcome of this garage feasibility study. In view of the time lapse, the 2017 cost estimate was reviewed and updated to reflect 2021 construction costs resulting in a revised cost estimate of **\$14.8** (Appendix E).

The BCA report also noted that the exterior paved areas and other exterior items (signage, lighting and controls) were at the end of their economic life and require replacement. The estimated cost for this work would be **\$1.8 million** including a demolition allowance of \$0.5 million (Appendix E).

This review also indicated that the 2017 estimates may have been understated and did not include estimated costs for either contingencies or design and engineering fees that may be required for the work. With these costs included, totalling approximately \$10.2 million, the estimate could increase to approximately **\$26.8 million** (Appendix E).

The Building Asbestos Survey (Appendix D) did not identify any issues related to asbestos containing materials (ACM) or lead-based paints (LBP).

Apart from the building repair and upgrade items noted in the BCA and the costs to repave the exterior asphalt surfaces and replace the process equipment, the other areas of deficiency (bus parking, employee parking, office spaces, accessibility upgrades, parts room) would need to be addressed if the building was to continue in use for an extended period of time. The estimate to complete this work is **\$5.75 million, based** on recent examples of similar work, comprised of costs to increase bus storage capacity by 16 buses,<sup>1</sup> increase employee parking<sup>2</sup>, accessibility upgrades to the offices<sup>3</sup> and office expansion<sup>4,5</sup>.

### 3.3 Process Equipment

The BCA did not address the condition of the process equipment within the maintenance area which represent a significant investment. This equipment primarily includes:

- the vehicle fuelling systems (gasoline and diesel)

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<sup>1</sup> 2 rows of 8 buses each; area of 45ft x 12.5 ft x 16 buses + 10% x \$296/sf = \$3.0. IBI estimate

<sup>2</sup> 3,600m<sup>2</sup> x \$665/m<sup>2</sup> = \$0.25M. IBI estimate

<sup>3</sup> \$1.0M. IBI estimate

<sup>4</sup> 500m<sup>2</sup> x \$3,000/m<sup>2</sup> = \$1.5M. IBI estimate

<sup>5</sup> \$3.0M + \$0.25M + \$1.0M + \$1.5M = \$5.75M. IBI estimates

- exhaust air systems (service lane, maintenance area, storage area)
- bus washer
- hoists (14)
- air compressors
- paint booth and body repair equipment; and
- overhead oil and fluid dispensing equipment.

If the building was to be retained for a lengthy period of time, that is, beyond five years, an estimate of the cost to replace this equipment is important to document the potential risk and cost liability involved. A review of this equipment with Transit Windsor staff indicates that most of it would have to be replaced within the next few years, and all of it beyond that timeline. A preliminary estimate to replace this equipment is **\$10.7 million** including contingencies and fees (Appendix F). A detailed assessment of the equipment would be required to refine this estimate further and could be higher.

### 3.4 Electric Buses

The adoption of electric buses to the transit fleet require electrical infrastructure for recharging which includes a hydro substation on site, recharging units within the maintenance and vehicle storage areas, underground conduit between the substation and the recharging units and other miscellaneous building modifications. In the regard, the design of the existing building presents challenges and potential limitations to the use of electric buses in the future. Of particular consideration is that the recharging infrastructure in the bus storage area requires additional space between the rows of buses resulting in the need to widen the lanes by 0.5 metres with a corresponding reduction in the bus storage capacity by approximately 15% (16 buses, two rows). This would then increase the current vehicle storage capacity shortfall to some 37 buses. Confirmation of the impact of the recharging infrastructure on bus storage capacity as

well as the ability to adapt the building for electric buses would be subject to an electric bus implementation study.

### 3.5 Accessibility Compliance

The building serves as the administrative headquarters for the transit system and, as such, is regularly visited by members of the public to obtain transit information, visitors attending meetings with Transit Windsor staff and job applicants attending interviews among other purposes. While most public interface with transit staff, such as to purchase fare media, retrieve lost and found items or obtain transit information, occurs on the ground floor and in the main reception area, the one meeting room as well as the offices of senior staff are located on the second floor. On this basis, there may be a requirement to make the administrative and operation sections of the building accessible for people with disabilities in compliance with the Accessibility for Ontarians with Disabilities Act (AODA). Doorways and particularly washrooms would need to comply with established accessibility standards. Although there is an accessible washroom, all washrooms should be upgraded to meet AODA standards. As well, there may be a requirement for a lift to access the second floor.

The requirement for accessibility upgrades should be reviewed by City staff with the Windsor Accessibility Advisory Committee. Subject to any decisions in this regard, an allowance of **\$1.0 million** is included in the facility upgrade cost estimate of \$5.75M noted in section 3.2 for this purpose.

### 3.6 Summary of Existing Building Assessment

In summary, continued use of the existing facility will require significant expenditures over the next few years in the total amount of approximately **\$43.3 million**<sup>6</sup> to extend its useful life. As well, expansion of the building to address current space deficiencies and add vehicle storage capacity could be challenging given the structural design of the building. Any construction and expansion activities would not only disrupt transit operations but

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<sup>6</sup> \$26.8M + \$5.8M + \$10.7M = \$43.3M

require relocation of some functions off-site in order to provide the necessary logistical space for construction.

Overall, the site cannot accommodate current bus and employee vehicle parking requirements nor those resulting from service expansion under the transit master plan. Finally, the building and site limitations would restrict the ability of the City to adopt electric buses.



## 4 Future Facility Strategy Options

Based on the city and region's future transit needs and the assessment of the existing building, three facility strategy options are identified and evaluated to determine a preferred and recommended facility strategy option. The evaluation includes preliminary construction costs.

The Future Facility Needs analysis determined that Windsor's 30-year transit facility needs would be for a minimum of 171 buses, based on city-only transit services, or up to 242 buses to accommodate regional transit needs.

The size of a transit facility is based on its bus parking (storage) capacity. The fleet size and storage capacity, in turn, determines the size of the supporting functional areas for vehicle servicing, vehicle maintenance and repair, and administration and operations office spaces associated with the activities and personnel required to deliver the future transit services.

Facility capacities are expressed as standard 12.2 metre (40 foot) transit buses. It is projected that Windsor's future transit fleet may include longer, articulated 18 metre (60 foot) transit buses required to serve high ridership routes as well as smaller buses for lower ridership routes. As the future fleet mix has not been defined at this time, the standard bus measure is used for space planning purposes and allows for any future variations in fleet mix. For example, in terms of facility storage capacity, smaller buses could offset the space requirements of the larger articulated buses which are approximately 1.5 times a standard transit bus.

Although the facility capacity values referenced (171 and 242) appear specific, they are approximate and subject to future conditions as determined by transit service levels. As such, the final vehicle capacity of the facility would be subject to detailed design and the layout of the vehicle storage area, for example, and the final capacity could vary from these specific numbers.

## 4.1 Facility Concept Plan

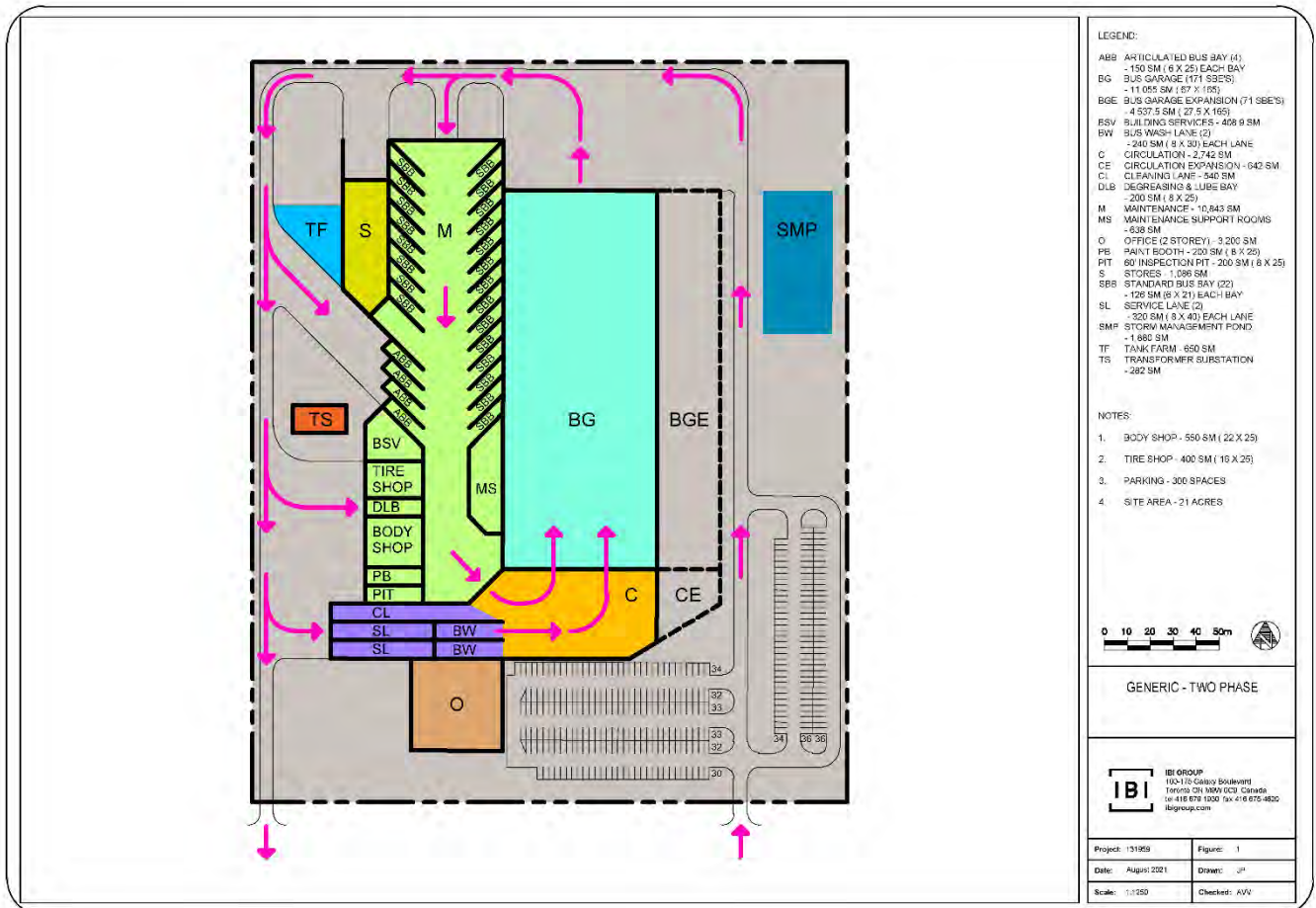
For the purpose of developing transit facility strategy options, a concept plan for the 171-bus and 242-bus facility was prepared to understand and visualize its size and, particularly, to determine the associated land (site) requirement. This concept plan is illustrated in Exhibit 4.1 and is based on four primary inputs:

- Preliminary facility space programming needs as identified from discussions with City staff
- Video prepared for the Request for Proposal describing the building's features and deficiencies
- Site visits, and
- Application of transit industry facility design guidelines.

The key facility design elements which influenced the 242-bus concept plan are:

- Administrative and operations office spaces for the future estimated staff complement of 624
- 26 maintenance bays
- Indoor storage for 242 buses
- Two service lanes and a by-pass lane
- Ability to service and maintain articulated buses
- Ability to accommodate electric buses including provision for a hydro substation on site
- Employee parking for up to 407 vehicles
- A storm water management pond
- A body shop and paint booth; and
- Exterior circulation roadways.

**Exhibit 4.1: Concept Plan for 171/242 Bus Facility**



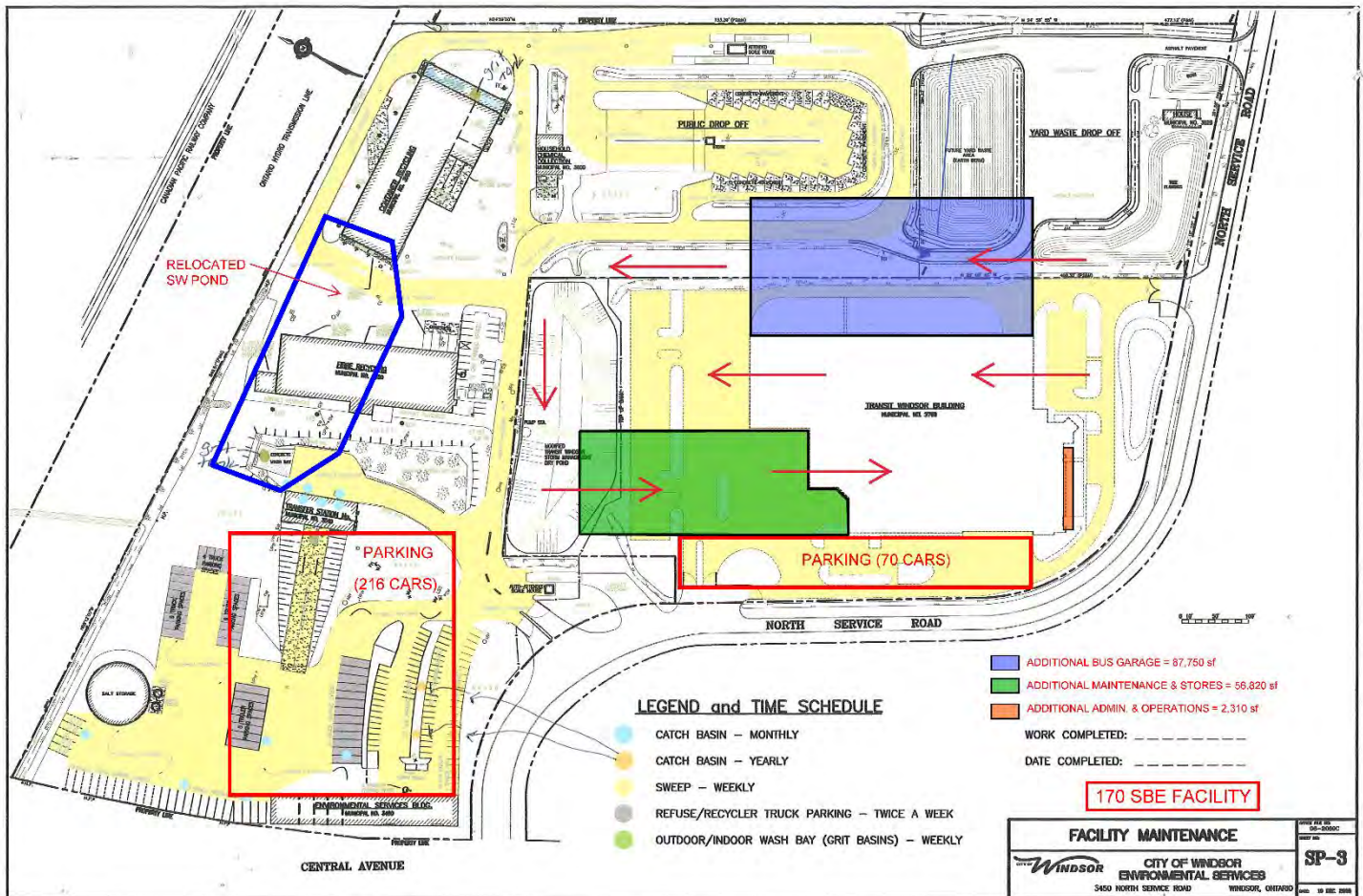
If constructed first, the 171-bus facility would incorporate several important design elements necessary for the full 242-bus facility size such as an additional vehicle service lane and maintenance area in order to facilitate its efficient expansion in future while minimizing disruption to on-going transit operations. As a result, the 171-bus building would be disproportionately larger on a m<sup>2</sup>/bus basis than the full 242-bus facility.

The next step is to consider the ability and feasibility of accommodating the future transit facility needs on the existing site, a key issue in this study.

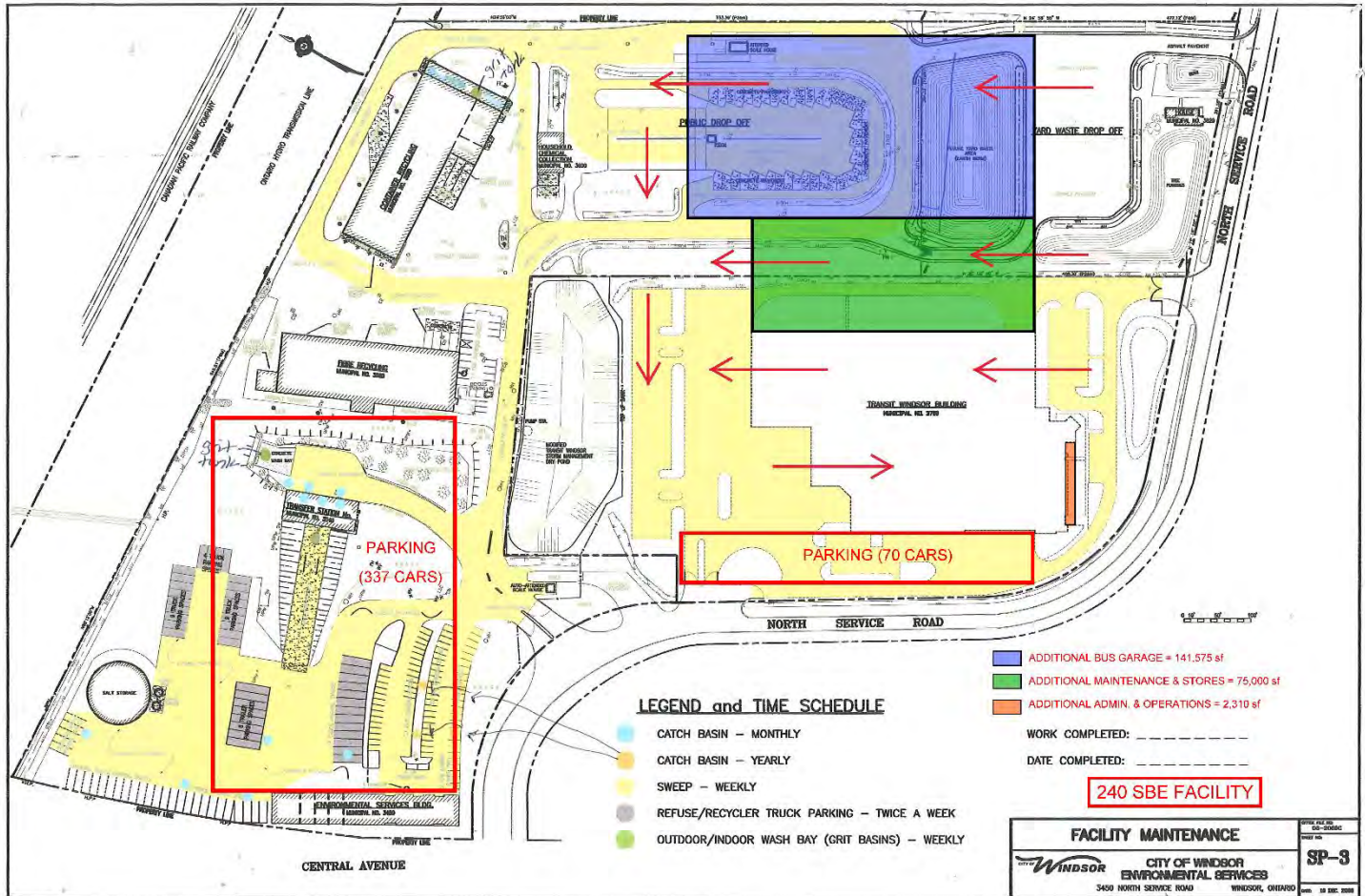
## 4.2 Existing Facility and Site

As noted earlier, the existing facility was designed for 96 buses and some 230 employees, is approximately 12,200 m<sup>2</sup> in size, and is situated on approximately 10 acres (4.1 hectares). The facility illustrated in Exhibits 2.1 and 4.1, would be approximately 35,850 m<sup>2</sup> in size and require a site of 21 acres (8.5 hectares). Based on these parameters, the city's future transit facility needs cannot be accommodated on the existing site. An additional 11 acres is required. To illustrate and confirm this conclusion, the concept plans for a 171-bus and 242-bus facility were over-laid on the existing building and site. Exhibits 4.2 and 4.3 demonstrate that the future facility requirements cannot be accommodated on the existing site.

**Exhibit 4.2: 171-Bus Facility Overlaid on Existing Site**



**Exhibit 4.3: 242-Bus Facility Overlaid on Existing Site**



Over-laying the future facility requirements on the existing facility also illustrates the challenges associated with attempting to expand the existing building specifically with regard to the vehicle maintenance area, the service lanes (the need to add an additional lane) and the vehicle storage area. Further, as may be visualized from the diagram, it would be difficult to restructure and expand the building while maintaining operations, especially vehicle maintenance activities since many parts of the building structure would need to be altered. Additionally, as noted earlier, the building structure would be difficult to modify to expand the building given its concrete block rather than steel frame design.

With regard to the requirement for additional land to accommodate the future facility size, consideration was given to City-owned (Waste Management) land to the east which could potentially be used to expand the transit facility. However, it was determined that this land may not become available to meet the project timeline. At the same time, the challenges associated with expanding the building both structurally as well as maintaining transit operations during construction precludes consideration of this option regardless of whether the land would be available to meet the project timeline.

#### **4.2.1 Conclusion**

Based on the land constraint and challenges associated with expanding the building while maintaining transit operations it is neither possible nor feasible to expand the existing building to meet the city and region's future transit needs. However, consideration can be given to retaining the existing facility for a period of time as part of a facility strategy option.

### **4.3 Double Deck Design**

In view of the site limitations, the concept of double-decking the existing facility was considered with the objective of determining if the City's future transit facility needs could be accommodated on the existing site.

Based on the preliminary space program for the 171-bus and 242-bus facilities, the existing building size would need to be increased by the amounts indicated in Exhibit 4.4.

The facility expansion for the 171-bus scenario represents a **112%** increase in overall size or 71 buses more than the existing storage capacity; more than a doubling in size compared to the existing building. The 242-bus scenario represents a **167%** increase in size.

In addition to the increase in the building size, the number of employee parking spaces would increase. There are currently 149 spaces with a shortfall of 31 to 46 for a total requirement of 180 to 195. For a 171-bus facility, 286 parking spaces would be required, an increase of 137. For a 242-bus facility, 407 spaces would be required, an increase of 258 spaces.

**Exhibit 4.4: Functional Area Increase**

Functional Area	171-Bus Scenario	242-Bus Scenario
<b>Bus Storage</b>	8,152 m <sup>2</sup>	13,153 m <sup>2</sup>
	87,750 ft <sup>2</sup>	141,575 ft <sup>2</sup>
<b>Maintenance &amp; Stores</b>	5,279 m <sup>2</sup>	6,968 m <sup>2</sup>
	56,820 ft <sup>2</sup>	75,000 ft <sup>2</sup>
<b>Administration &amp; Operations</b>	215 m <sup>2</sup>	215 m <sup>2</sup>
	2,310 ft <sup>2</sup>	2,310 ft <sup>2</sup>
<b>Total Increase</b>	<b>13,646 m<sup>2</sup></b>	<b>20,335 m<sup>2</sup></b>
	<b>146,880 ft<sup>2</sup></b>	<b>218,885 ft<sup>2</sup></b>

Based on the concept plans for either the 171-bus or 242-bus facilities, and visualizing the positioning of the required added building space on top of the existing building, it is clear that neither of the capacity requirements could be accommodated on the existing site. Further, a multi-level parking garage with ramps would be required to accommodate the future employee parking needs which is expensive to construct.

**4.3.1 Implications of Double-Decking the Existing Building**

While there are some examples of double-deck transit operations and maintenance facilities in Montreal, Edmonton, and New York City, each of these have been designed and built from new. There are no known examples of existing transit operations and maintenance buildings being double-decked afterwards.

In this regard, there are significant challenges associated with attempting to double-deck an existing facility. These are:

- Existing building foundations and structure are unlikely to have been designed to accommodate vertical expansion and the added load of buses on the second level. The building drawings and foundations would need to be reviewed by a structural engineer to confirm the structural condition of the building.

- Subject to the capacity of the foundation and structure, the existing building roof would need to be replaced and all roof-top systems relocated/reinstalled or replaced (subject to ability to re-deployed).
- Subject to a review and assessment for capacity and design, all existing building systems (electrical, mechanical, HVAC, water, sewer) may need to be replaced.
- A second level would need to be approximately 8 metres (20 feet) high to allow for clearances and flooring with drainage.
- It is uncertain whether the soil conditions could accommodate the additional loads. This would need to be confirmed.
- The municipal sewers in the right-of-way would have to be assessed to ensure they have the capacity to handle the additional flows from the expansion.
- The Stormwater Management of the site would need to be reviewed, and since the paved area would be increased (additional parking, additional building footprint, etc.), the SWM pond would have to be modified. This might not be practical given space constraints.
- If feasible, the existing building structure would likely need to be reinforced or a new structure provided to accommodate second level loads.
- Existing roof top solar panels will need to be removed and reinstalled on a new roof.
- Ramps for buses to access the second level will be required and will add additional area requirements.
- Potential height restrictions due to proximity to airport. Will need to confirm zoning.
- 171 SBE facility:



- Second level bus storage area will occupy a large percentage of the existing roof area leaving limited space for other second level functions.
- Maintenance expansion will need to be at ground level and will likely encroach upon the existing SWM pond.
- 242 SBE facility:
  - The second level bus storage area appears to be larger than the total of the existing building roof area.
  - Maintenance expansion will still need to be at ground level given height and other challenges associated with maintenance systems and activities which would not fit on the existing site.
  - To accommodate the added employee parking needs associated with the future fleet and transit service expansion, a large multi-level parking garage would be required which may not be able to be accommodated on the site given the overall site and space limitations.

#### **4.3.2 Impact on Transit Operations**

Aside from the foregoing design issues associated with double-decking the existing building, there would be significant disruption to on-going transit operations during construction. Moreover, and subject to a review of Provincial Health and Safety Regulations, it may not be possible to continue operations on site during construction. As such, all transit operations including vehicle servicing, maintenance and bus storage would need to be relocated off-site for a period of up to two years. Locating a suitable temporary site and building to accommodate Transit Windsor operations is highly unlikely. A preliminary review of potential temporary locations was completed; however, an ideal location could not be identified.

#### **4.3.3 Cost Estimation**

With regard to construction costs, IBI Group has recently prepared a double-deck transit operations and maintenance facility design for another

municipality. The estimated cost was approximately 50% higher than a single-level design and was subsequently eliminated from consideration.

#### **4.3.4 Conclusion**

While the space requirements for either a 171-bus or a 242-bus facility alone indicate that it could not be accommodated on the existing site, the design issues, construction cost premium (compared to a single-level facility) and operational logistics conclude that a double-deck transit operations and maintenance facility would be neither cost-effective nor feasible on the existing site.

Overall, double-decking would not only be physically impractical but would require the transit operation as a whole to vacate the property during reconstruction with the need to relocate to a temporary location and building for several years.

## **4.4 Re-Purposing Another Building**

Consideration was given to the alternative of re-purposing an existing industrial building either as a replacement for, or in addition to, the existing facility instead of the construction of a new building on the basis of reducing the capital cost. Re-purposing an existing building, which may appear suitable in terms of its size, involves adapting a building built for a different purpose to suit the specific operations and vehicle maintenance and servicing needs of a public transit service. Experience with similar projects in other jurisdictions indicates that this strategy may not, in fact, result in lower building costs due to the need to undertake extensive modifications to the building and site, and can result in a compromised building layout that does not meet the specific needs of the transit operation.

The following are some of the issues and constraints associated with considering the re-use of an existing building:

- Site size, access to main roads, deadhead distance for buses

- Positioning of existing building on the site - is it suited to transit needs for vehicle movement and access between functional areas?
- Building condition – is it in good condition or are extensive upgrades required?
- Building layout – can it be adapted to meet transit needs – bus servicing, storage, maintenance, and movement between functional areas
- Electrical system – does it have sufficient power, availability, and distribution within the building. New system likely required
- Heating/Ventilation – system unlikely suited to transit. Would need to be either augmented, re-designed or replaced
- Floors – would likely need to be replaced to provide for drainage and to carry weight of buses
- Building structure – column spacing, ability to modify for bus storage, maintenance, and internal bus movements
- Interior height – sufficient to accommodate bus heights and buses on hoists in maintenance area
- Roof – may need to be replaced and strengthened to accommodate ventilation equipment
- Doors – extensive number of new doors required may result in almost complete replacement of walls
- Lighting – new lighting may be required
- Windows – may require additional windows and/or replacement of existing

The over-riding challenge with attempting to re-purpose an existing building is that trying to modify it to suit the needs of transit can result in substantial rebuilding, depending on the design and layout of the candidate building being considered for conversion, and ultimately a building that may not be suited to the specific needs of transit. A preliminary review of

available buildings in Windsor was undertaken but did not identify any potential sites.

To properly assess the ability to re-purpose an existing building and site and determine any potential cost savings compared to constructing a new building on a new site, the following steps would be required:

1. Identify a candidate building on a transit-acceptable site (one that meets transit operational requirements)
2. Complete a detailed assessment of the building (structure, systems, layout) and site to determine its condition
3. Prepare a concept design to test the practicality of converting the building and site,
4. Prepare a more detailed design, if it appears practical to convert the building and site, and
5. Prepare a cost estimate.

This work is not within the scope of the present study.

## 4.5 Facility Strategy Options

Based on the foregoing assessments and conclusions, three transit facility strategy options are available to the City:

1. Status Quo.
2. Construct a new facility of 171 to 242 buses on a new site; and
3. Construct a second facility while retaining the existing building for a period of time.

### 4.5.1 Option 1 – Status Quo

Under this option, the existing facility would remain as is except for minor additions to the bus storage area and administration/operations spaces, and the upgrades necessary to maintain the building in a state of good repair and to resolve the operational deficiencies. This would include a minor extension of the bus storage area to accommodate an estimated 16

buses beyond the current building capacity. As well, additional parking space for employee vehicles would need to be found.

However, this option would effectively prevent the City from being able to implement the recommendations of the recently completed transit master plan or meet future city or regional transit needs. It would also limit the City's ability to implement new technologies, for example, to adopt electric buses.

Retention of the building would require an estimated \$43.3 million (2021 dollars) in building upgrades to address identified deficiencies, as discussed in Section 3. At the same time, it should be noted that as the building continues to age, there would be additional and increasing maintenance costs associated with the building structure and systems. At some point in time, the building will need to be replaced.

For these reasons, this option is not recommended.

#### **4.5.2 Option 2 – New Building on a New Site**

This option involves constructing a new facility for 242 buses on a new site fully replacing the existing facility. The 242-bus facility could be constructed in one build from the outset or could be constructed in two phases – Phase 1 for 171-buses; Phase 2, a 71-bus expansion to bring the facility to its full capacity of 242 buses. The timing of the Phase 2 expansion could coincide with evolving regional transit service needs. For this study and costing purposes, Phase 2 is projected to occur 10 years after the opening of Phase 1 in Year 15. Phase 1 is projected to take 4 to 5 years to complete. A concept plan for this option is illustrated in Exhibits 2.1 and 4.1.

If construction of the 242-bus building is phased, the initial 171-bus building would need to incorporate several design features required for the 242-bus facility in order to facilitate the efficient expansion of the building in future as well as minimize disruption to transit operations during construction. These features are a second service (fuel, clean, wash) lane and additional maintenance bays. For the latter, the additional maintenance bays would not be outfitted with hoists and other related equipment until full expansion of the building is completed later thereby minimizing the capital cost outlay initially.

The new building would be designed to replace all functions at the current facility and be suitable for articulated and electric buses.

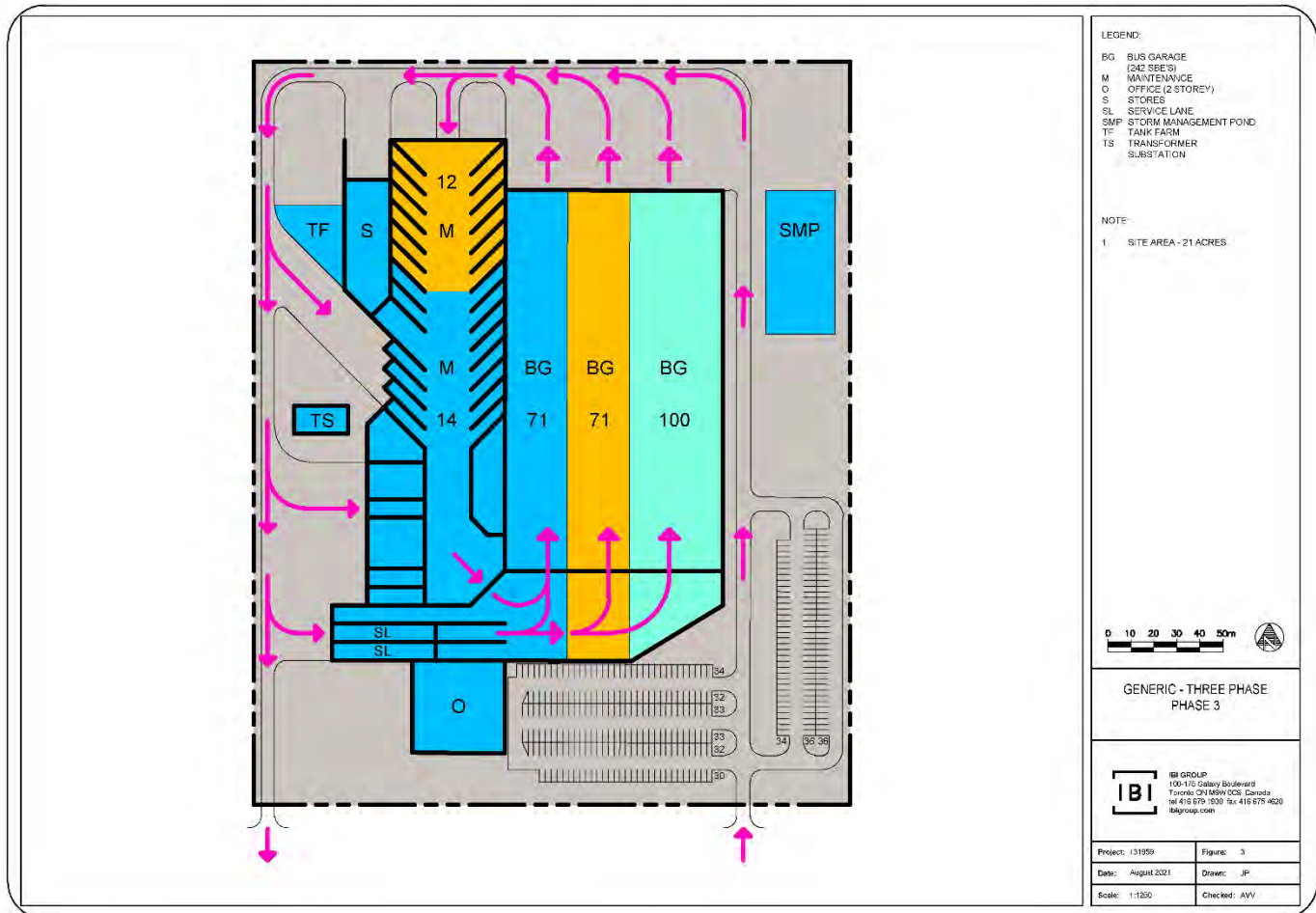
#### **4.5.3 Option 3 – Second Facility**

This option retains the existing facility at a nominal capacity of 100 buses for a specified period of time supplemented by the phased construction of a new facility on a new site. Retention of the existing building is planned to be 20 years to reflect the projected life cycle of the process equipment needing to be replaced and other building upgrades, at which time the existing facility would then be de-commissioned, sold or re-purposed. With this option, the required future facility capacity requirement of 242 buses would be achieved progressively by a combination of the existing facility (100 buses) and a new second facility of 71 buses ultimately expanded to 242 buses.

Construction phasing for this strategy option would be in three steps:

- Phase 1 – New building of 71 buses.
- Phase 2 – 71-bus expansion; and,
- Phase 2 – 100-bus expansion to replace the existing facility.

**Exhibit 4.5: Facility Concept Plan for a 3-Phase Building**



For this option, it is important to note that, from a design standpoint to allow for the cost-effective and efficient expansion of the new building while minimizing the impact on transit operations, a number of the core design principles required for the ultimate 242-bus facility would need to be designed into the initial building construction. These are: a second vehicle service lane; and additional vehicle maintenance area although the latter would not need to be fully outfitted until required at a future date.

A further design consideration could be to incorporate all future administrative and operational office space requirements in the new building from the outset and relocate them to the new building upon opening. This approach would minimize any required changes and

upgrades to the existing building while also minimizing the cost and impact on on-going operations at the existing building. These decisions would be made at the detailed design phase along with decisions regarding positioning of the building on the selected final site.

The hours of operation for the new building could also be limited to peak hours Monday to Friday and focus on vehicle cleaning, washing, fuelling and minor “running” repairs only to minimize maintenance and staffing costs. It would also be designed for electric and articulated buses thereby allowing the City to begin to incorporate these buses into its fleet.

Because the existing facility cannot meet the future fleet and employee growth needs of the transit system particularly with regard to vehicle maintenance, the second facility would have to incorporate vehicle maintenance functions along with more office space. As such, the facility becomes its own stand-alone building with similar attributes to the existing building.

#### **4.5.4 Temporary Storage Yard**

For Facility Strategy Options 2 and 3, in view of the current bus and employee parking deficiencies, the planned expansion of the bus fleet, and the increase in employees associated with implementation of the transit master plan over the next 8 years, a temporary site will need to be found for these vehicles until a new building is completed, estimated to be up to 4 years. The projected capacity of this site would be up to 45 buses (21 plus 24 for service expansion) and up to 80 employee vehicles (34 plus 46 for service expansion). Two potential sites are adjacent to the existing transit facility depending on the selected site for a new facility:

- The City-owned site east of the Waste Management property; or
- Use of the southern portion of the Waste Management property abutting the North Service Road (existing waste management operations would need to be re-located, potentially on the adjacent parcel of land to the east depending on the selected site for a new facility).

Exhibits 4.5 and 4.6 illustrate these two options. The site would need to be graded, have drainage, paved, fenced, and illuminated for security



purposes. A high-level estimate to prepare either of these sites is **\$1.3 million**.

**Exhibit 4.6: Temporary Yard - Existing City Land**



**Exhibit 4.7: Temporary Yard – Waste Management Site**



**4.5.5 Vehicle Maintenance Capacity**

Additional vehicle maintenance capacity will be required for an interim period to augment the vehicle maintenance capacity of the existing facility to handle the additional 24 buses being added to the fleet over the next five years. For this purpose, alternative approaches and sources for maintaining the increased size of the bus fleet could consist of contracting out certain maintenance work to a local company or utilize a vacant industrial building, suitably equipped, to service transit buses and staffed by City/Transit Windsor employees. This would involve additional capital and operating costs which have not been included in this report as the most appropriate solution would need to be developed by the City.

#### **4.5.6 Building Operating and Maintenance Costs – New vs. Old**

With an increase in the size of a transit facility, either an expanded existing building or a new building, there will be added annual costs to operate and maintain the building (O&M). These are typically consistent with the increased building size although for a new building there is the expectation for greater energy efficiency and a reduction in utilities costs. Any potential reduction is highly dependent on a variety of influences such as temperature settings, operating practices within the building (doors closed versus open), number of doors, the design of the heating and ventilation (HVAC) and vehicle exhaust systems as well as other factors. Because of these variables, it is difficult to provide precise comparative costs between an old and a new building. As well, it is difficult to compare the costs of a new building to an existing building, independent of the size difference, due to the age and design of the various systems in the existing building. For these reasons, a reliable cost estimate beyond a pro-rata cost increase based on the increased size of the building cannot be provided although it is reasonable to expect some reduction in utilities on a per m<sup>2</sup> basis using Windsor's current building O&M costs as a baseline. For the two facility options (2 and 3) that would meet the city's future transit needs, the O&M costs can be expected to be similar for the ultimate 242-bus facility with Option 2 (A or B) potentially having lower utility and maintenance costs from the outset because it is a completely new building.

In view of the variables, the O&M/utility costs for both Options 2 and 3 are considered the same and are not costed.

However, for Option 2A where the full building size is constructed from the outset and where the full building size, specifically the 71-bus addition for regional purposes, would not be required for the estimated 10 years, a cost factor to operate and maintain the additional (unnecessary) incremental building size (difference between the 171-bus and 242-bus facility – 5,180 m<sup>2</sup>) will be included in the cost analysis.

#### **4.5.7 Staffing**

With regard to staffing resources, additional staff would be required to maintain the larger building and additional fleet either for Option 2 or 3. However, under Option 3 with two buildings, additional staff compared to

Option 2 (one building) can be expected to be required due to the duplication of activities between the two buildings and loss of efficiency. This will apply to transit operations, vehicle maintenance including provision for the shuttling of buses between the two buildings for maintenance and other purposes, vehicle servicing and building maintenance. A second building would require additional staff not just to maintain the building but to monitor it. There would also be additional security requirements for a second building. This cost is not able to be estimated as it is dependent on the level and method of providing security.

From a transit operations and vehicle maintenance cost standpoint, a second building can be expected to result in a disproportionately higher number of employees for these functions compared to a one-building scenario due to lower efficiency and productivity and the need to provide supervision at the second building. On a comparative basis to Option 2, Option 3 can be expected to require three to four additional staff in the following categories on the basis that the second building initially functions for limited hours and weekdays only:

- One supervisor, responsible for all staff and functions occurring at the building including transit operations and vehicle maintenance (one person may be able to handle both functions)
- One person for the dispatch/bus operator reporting functions although this may be avoided with remote report and sign-in technology for dispatch and virtual sign-in)
- One person for vehicle servicing, bus shuttling and building maintenance functions.

The estimated annual added staff cost under Option 3 is **\$300,000** including benefits (1 supervisor - \$117,000, 1 ops/dispatch person - \$104,000, 1 service person - \$78,000).

Apart from this specific staff requirement, additional staff will generally be required in future as the fleet size and service levels increase irrespective of whether this occurs with one building or two.

For the interim period until a new facility is built under Options 2 and 3, the use of the temporary yard can be expected to require an additional

employee to shuttle buses between the yard and the main building for vehicle servicing purposes. This would represent an approximate **\$78,000** cost per year for up to five years.

## 5 Facility Strategy Cost Estimates

Cost estimates for the facility strategy options have been prepared by cost consultant RLB and are of Class D level. They include construction, related design, and professional fees (“soft costs”) as well as site development costs. The soft costs vary by construction phasing and timing and range between 21% and 24%. All estimates include a pricing and design contingency of 20%.

These costs are summarized in Exhibit 5.2 and have been distributed by year. The actual year of expenditure will depend on the internal City approval process. However, for the purposes of the cost analysis, all costs have been based on 2021 dollars with Year 1 costs representing 2022 with an inflation factor of 3%. Subsequent year costs also incorporate a 3% inflation factor. The supporting Class D cost estimates are attached as Appendices G (Options 2A and 2B) and H (Option 3). All of the cost estimates including the estimated size of the facilities, are preliminary and subject to refinement during the subsequent detailed design phase of the project.

### 5.1 Strategy Options

#### **Option 1 - Status Quo**

Although Option 1 is not viable for meeting the city and region’s future transit needs, it is included in the cost comparison to record the costs associated with not expanding transit services and retaining the existing building. Most of these costs also apply to Option 3.

#### **Option 2 – New 171-bus/242-Bus Facility**

Two sub-options and cost estimates have been prepared for Option 2:

- 2A – construction of a 242-bus facility in one build
- 2B – Phased construction of an initial 171-bus facility followed by a 71-bus addition 10 years after commissioning of the initial building (Year 15)

The estimated costs include construction, on-going operations, and maintenance costs for the new large building in Option 2A, staffing, the temporary yard, upgrade of the existing facility (Options 1 and 3), and land preparation.

### **Option 3 – Second Building + Retain Existing Building**

For Option 3, costs to replace the process equipment as well as other upgrades to the building are included as noted previously based on an estimated 20-year life for the existing facility until replacement. This timeline corresponds to the estimated life cycle for the process equipment and other building upgrades noted in the BCA report. Most of these costs are presumed not to be required should Option 2 be adopted with immediate implementation and completion of the new building within five years of the date of this report (Fall 2021).

## **5.2 Facility Size Comparison**

The three options, 2A, 2B and 3, include different building sizes for each phase although they appear to be equivalent based on the number of buses. The facility sizes for each of the facility options are summarized in Exhibit 5.1. The summary illustrates the difference in size for the initial 71-bus facility under Option 3 compared to the 71-bus addition under Option 2B and the second 71-bus addition under Option 3, which are less complex additions.

**Exhibit 5.1: Summary of Facility Sizes for Each Option**

Option	Facility Phase	Area (m <sup>2</sup> )	Area (ft <sup>2</sup> )
<b>Option 2A</b>	<b>Single (242 buses)</b>	<b>35,845.9</b>	<b>385,842.1</b>
<b>Option 2B</b>	Phase 1 (171 buses)	30,666.4	330,090.4
	Phase 2 (71 buses)	5,179.5	55,751.7
	<b>Total (242 buses)</b>	<b>35,845.9</b>	<b>385,842.1</b>
<b>Option 3</b>	Phase 1 (71 buses)	20,019.9	215,492.5
	Phase 2 (71 buses)	8,038.0	86,520.3
	Phase 3 (100 buses)	7,788.0	83,829.3
	<b>Total (242 buses)</b>	<b>35,845.9</b>	<b>385,842.1</b>

### 5.3 Cost Summary

The costs for each facility strategy option are summarized in Exhibit 5.2 showing the total project values in 2020 dollars and the Net Present Value estimates by year as explained further below. The timeline for expenditures is based on the construction of a new facility under Options 2A, 2B (Phase 1) and 3 (Phase 1) anticipated to take up to five years to complete from the time of Council approval to proceed (fall 2021). The projected timeline and steps for construction of a new facility would be:

- Year 1 – purchase of land, land preparation, detailed building design and preparation of tender documents
- Year 2 – issuance and award of tender, commence construction
- Year 3 – construction
- Year 4 – completion of construction
- Year 5 – commission the new building

This timeline may be reduced by one year for the smaller 71-bus facility under Option 3. Any significant environmental issues with the selected site and requirement for remediation could delay this timeline and would have to be confirmed once the preferred site is selected and environmental and remediation analysis is completed.



Timelines for provincial or federal (ICIP) funding approvals and completion of necessary legislated documents and reports may lengthen the overall project timeline. For simplicity of presentation, the construction timing and expenses for Option 2B Phase 2 and Option 3 Phases 2 and 3 are assigned to one year although it is possible that construction and expenditures may be spread over more than one year.

The construction cost estimates for Options 2 and 3 include detailed design and tender preparation. These costs are identified separately in Year 1 while the construction costs have been distributed by year based on the foregoing timeline with an approximate expenditure of 25% of the construction cost in Year 2, 50% in Year 3 and 25% in Year 4.

Based on various cost elements and estimates, the estimated total project costs for the three facility options in 2021 dollars, adjusted to 2022 dollars for Year 1, excluding land and related costs are:

- Option 1 – \$43.3 million
- Option 2A – \$152.5 million (building - \$146.9 million)
- Option 2B – \$151.7 million (building - \$127.7 million + \$22.4 million)
- Option 3 – \$196.6 million (building - \$90.5 million + \$32.0 million + \$30.4 million)

On this basis, Option 2B has the lowest cost. However, as the expenditures for each of the three options, particularly options 2B and 3, would occur over an extended time period of up to 20 years, the expenditures are presented on a Net Present Value (Cost Escalation) basis to demonstrate the total costs associated with each option compared to 2021 dollars (increased by 3% to 2022 - Year 1). This provides a more accurate estimate of the relative costs associated with each option.

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**TRANSIT WINDSOR GARAGE FEASIBILITY STUDY**  
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**Exhibit 5.2: Cost Summary for Facility Strategy Options**

Option	Year									NPV
	Total (2021 dollars)	1	2	3	4	5	10	15	20	
<b>1 - Status Quo</b>										
<b>Building upgrades – per BCA</b>	<b>\$14.8</b>	\$5.4	\$5.6	\$4.7						<b>\$15.7</b>
<b>Replacement of asphalt paving</b>	<b>\$1.8</b>		\$1.9							<b>\$1.9</b>
<b>Contingencies and Fees</b>	<b>\$10.2</b>	\$3.4	\$3.7	\$3.7						<b>\$10.8</b>
<b>Sub-total BCA</b>	<b>\$26.8</b>	<b>\$8.8</b>	<b>\$11.2</b>	<b>\$8.4</b>						<b>\$28.4</b>
<b>Construction – 16 bus addition</b>	<b>\$3.0</b>		\$3.2							<b>\$3.2</b>
<b>Added employee parking</b>	<b>\$0.3</b>		\$0.3							<b>\$0.3</b>
<b>Office upgrades/addition</b>	<b>\$1.5</b>		\$1.6							<b>\$1.6</b>
<b>Accessibility upgrade</b>	<b>\$1.0</b>		\$1.1							<b>\$1.1</b>
<b>Sub-total Non-BCA</b>	<b>\$5.8</b>		<b>\$6.1</b>							<b>\$6.1</b>
<b>Process equipment</b>	<b>\$10.7</b>	\$3.7	\$3.8	\$3.8						<b>\$11.4</b>
<b>Total (\$M)</b>	<b>\$43.3</b>	<b>\$12.5</b>	<b>\$21.2</b>	<b>\$12.2</b>						<b>\$45.9</b>

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Option	Year									NPV
	Total (2021 dollars)	1	2	3	4	5	10	15	20	
<b>2A - New Facility</b>										
<b>Design + Consultant Fees</b>	<b>\$12.9</b>	\$13.3								<b>\$13.3</b>
<b>Construction 242-buses</b>	<b>\$134.0</b>		\$35.5	\$73.2	\$37.7					<b>\$146.5</b>
<b>Interim yard</b>	<b>\$1.3</b>	\$1.3								<b>\$1.3</b>
<b>O&amp;M and Utilities</b>	<b>\$4.0</b>						\$2.7	\$3.1		<b>\$5.8</b>
<b>Staffing</b>	<b>\$0.3</b>		\$0.1	\$0.1	\$0.1	\$0.1				<b>\$0.4</b>
<b>Total</b>	<b>\$152.5</b>	<b>\$14.6</b>	<b>\$35.6</b>	<b>\$73.3</b>	<b>\$37.8</b>	<b>\$0.1</b>	<b>\$2.7</b>	<b>\$3.1</b>		<b>\$167.2</b>

Option	Year									NPV
	Total (2021 dollars)	1	2	3	4	5	10	15	20	
<b>2B - New Facility – Phased</b>										
<b>Phase 1 - Design + Consultant Fees</b>	<b>\$11.0</b>	\$11.3								<b>\$11.3</b>
<b>Construction - 171-buses</b>	<b>\$116.7</b>		\$31.0	\$63.7	\$32.9					<b>\$127.5</b>
<b>Interim Yard</b>	<b>\$1.3</b>	\$1.3								<b>\$1.3</b>
<b>Staffing</b>	<b>\$0.3</b>		\$0.1	\$0.1	\$0.1	\$0.1				<b>\$0.4</b>
<b>Total Phase 1</b>	<b>\$129.3</b>	<b>\$12.6</b>	<b>\$31.1</b>	<b>\$63.8</b>	<b>\$33.0</b>	<b>\$0.1</b>				<b>\$140.5</b>
<b>Phase 2 - Design + Consultant Fees</b>	<b>\$2.8</b>							\$4.4		<b>\$4.4</b>
<b>Construction - 71 buses</b>	<b>\$19.6</b>							\$30.5		<b>\$30.5</b>
<b>Total Phase 2</b>	<b>\$22.4</b>							<b>\$34.9</b>		<b>\$34.9</b>
<b>Total Phases 1 &amp; 2 (\$M)</b>	<b>\$151.7</b>	<b>\$12.6</b>	<b>\$31.1</b>	<b>\$63.8</b>	<b>\$33.0</b>	<b>\$0.1</b>		<b>\$34.9</b>		<b>\$175.4</b>

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Option	Year									NPV
	Total (2021 dollars)	1	2	3	4	5	10	15	20	
<b>3 - Second Facility</b>										
<b>Phase 1 - Design + Consultant Fees</b>	<b>\$7.9</b>	\$8.1								<b>\$8.1</b>
<b>Construction - 71 buses</b>	<b>\$82.6</b>		\$22.0	\$45.1	\$23.2					<b>\$90.3</b>
<b>Existing upgrade - per BCA</b>	<b>\$26.8</b>	\$8.8	\$11.2	\$8.4						<b>\$28.4</b>
<b>Accessibility upgrade</b>	<b>\$1.0</b>		\$1.1							<b>\$1.1</b>
<b>Asphalt paving</b>	<b>\$1.3</b>		\$1.4							<b>\$1.4</b>
<b>Existing process equipment</b>	<b>\$10.7</b>	\$3.4	\$4.3	\$3.6						<b>\$11.4</b>
<b>Interim Yard</b>	<b>\$1.3</b>	\$1.3								<b>\$1.3</b>
<b>Staffing</b>	<b>\$2.6</b>	\$0.0	\$0.1	\$0.1	\$0.1	\$0.3	\$0.4	\$0.5	\$2.7	<b>\$4.2</b>
<b>Total Phase 1</b>	<b>\$134.2</b>	<b>\$21.6</b>	<b>\$40.1</b>	<b>\$57.2</b>	<b>\$23.3</b>	<b>\$0.3</b>	<b>\$0.4</b>	<b>\$0.5</b>	<b>\$2.7</b>	<b>\$146.1</b>
<b>Phase 2 - Design + Consultant Fees</b>	<b>\$3.7</b>							\$5.8		<b>\$5.8</b>
<b>Construction - 71 buses</b>	<b>\$28.3</b>							\$44.1		<b>\$44.1</b>
<b>Phase 3 - Design + Consultant Fees</b>	<b>\$3.6</b>								\$6.5	<b>\$6.5</b>
<b>Construction - 100 buses</b>	<b>\$26.8</b>								\$48.4	<b>\$48.4</b>
<b>Total (\$M)</b>	<b>\$196.6</b>	<b>\$21.6</b>	<b>\$40.1</b>	<b>\$57.2</b>	<b>\$23.3</b>	<b>\$0.3</b>	<b>\$0.4</b>	<b>\$50.3</b>	<b>\$57.6</b>	<b>\$250.9</b>

The NPV for each option is:

- Option 1 – \$45.9 million
- Option 2A – \$167.2 million
- Option 2B:
  - Phase 1 - \$140.5million
  - Phase 2 – \$34.9 million
  - Total - \$175.4 million
- Option 3:
  - Phase 1 – \$146.1 million
  - Phase 2 - \$50.3 million
  - Phase 3 - \$57.6 million
  - Total - \$250.9 million

It is to be noted that Option 1, Status Quo, does not meet the City’s future public transit and facility needs and is therefore not being considered. However, the costs for this option, \$43.3 million (NPV of \$45.9 million), are included to emphasize that there is a cost associated with the Status Quo option. Some of these costs would be **avoided** under Options 2 and 3 with the result that the net incremental cost to proceed with either Options 2 or 3 would be **reduced** by those amounts.

On the basis of the NPV, Option 2A represents the most cost-effective investment by the City at \$167.2 million with Option 2B marginally higher than Option 2A by \$8.2 million. However, Phase 1 of Option 2B has a lower initial cost at \$140.5 million. This phase meets the city-only projected needs to 2051.

Option 3, by retaining the existing building and constructing a new 242-bus facility in 3 phases over 20 years, has a significantly higher total NPV. Phase 1, which would permit the City to accommodate its future needs for 20 years, has the lowest initial NPV at \$146.1 million but results in the City retaining the existing building with its related deficiencies, risks and upgrade requirements. Including the construction of Phase 3 (100-bus facility to replace the existing building in 20 years), that is, excluding

expansion to meet regional needs, the total NPV for Phases 1 and 3 would be \$194.5 million.

The following table summarizes the NPV values by Option to illustrate the cost comparisons for City Only and Regional needs.

**Exhibit 5.3 Cost Comparison of Options by City and Regional Needs**

<b>City Only</b>	<b>Description</b>	<b>NPV</b>
Option 2B	Phase 1	\$140.5 million
Option 3	Phases 1 and 3	\$194.5 million
<b>Regional</b>		
Option 2A		\$167.2 million
Option 2B	Phases 1 and 2	\$175.4 million
Option 3	Phases 1, 2 and 3	\$250.9 million

Land costs are additional to the above facility-related cost estimates.

**Overall, constructing a new facility early, whether for city-only or regional needs, results in lower overall project costs.**

## 6 Conclusions

Based on the city and region's future transit facility needs and analysis of facility strategy options, the following are the key conclusions leading to the recommended facility strategy option.

- The transit fleet is currently 117 buses; the number of employees is 293 (FTE).
- The number of employees and fleet size exceed the capacity of the existing building. The transit fleet and number of employees are projected to increase to 165 buses and 425 employees by 2028. Therefore, additional transit facility capacity is urgently required.
- The existing building has deficiencies regarding office space, general accessibility, vehicle maintenance, vehicle storage, employee parking, and would require extensive modification to accommodate electric buses and articulated buses,
- The city's future transit needs to 2051 indicate a facility capacity requirement for 171 buses and approximately 31,000 m<sup>2</sup> (330,000 sf) in size. To accommodate potential regional transit needs, a facility capacity for 242 buses and a facility of 36,000 m<sup>2</sup> would be required. A site size of 8.5 hectares (21 acres) would be required.
- The city and region's future transit needs cannot be accommodated on the existing site. Further, the existing facility could not be efficiently expanded without major structural changes, could be structurally difficult to expand. Expansion would be difficult to undertake while maintaining transit operations. On this basis, expansion of the existing building is neither practical nor feasible.
- The existing building requires an estimated \$28.4 million in structural and systems upgrades as well as a further \$17.5 million in building upgrades (total of **\$45.9 million**) if it is to continue in use beyond the short term (5 years). Construction of a new building as soon as possible would largely avoid these costs.

- A new building on a new site is the most practical, feasible and cost-effective option.
- The timeline to construct and commission a new building is estimated to be five years. Work should commence as soon as possible.
- Three facility strategy options were identified and costed:
  - Option 2A – Construct a 242-bus facility in one build.
  - Option 2B – Phased construction of a 242-bus facility with an initial 171-bus facility (approx. 31,000 m<sup>2</sup>) followed by a 71-bus (5,200 m<sup>2</sup>) expansion in Year 15.
  - Option 3 – Construction of 242-bus facility in three phases and retain existing building for 20 years. Construct an initial 71-bus facility and undertake required upgrades to the existing building; construct a 71-bus extension to the new building in Year 15; construct a 100-bus expansion in Year 20 and decommission the existing building.
- Option 1, Status Quo, was not considered as it would not permit the City to achieve its transit goals.
- The estimated costs (2022 dollars) for the options excluding land, site remediation and development costs are:
  - Option 2A - \$152.5 million
  - Option 2B:
    - Phase 1 - \$129.3 million
    - Phase 2 – \$22.4 million
    - Total - \$151.7 million
  - Option 3:
    - Phase 1 - \$134.2 million
    - Phase 2 – \$32.0 million



- Phase 3 – \$30.4 million
- Total - \$196.6 million
- To quantify the effect of the phased construction over time for each of the options, a Net Present Value (NPV) analysis indicated the following for each of the options:
  - Option 2A - \$167.2 million
  - Option 2B - \$175.4 million (\$140.5 million + \$34.9 million)
  - Option 3 - \$250.9 million (\$146.1 million + \$44.1 million + \$48.4 million)
- In options 2B and 3, the new building should be designed to protect for future regional transit needs.
- A confidential site selection process was undertaken separately to identify a preferred site for the new facility. The estimated land and related site remediation and development costs are **\$TBD**.
- Option 2A has the lowest NPV and represents the most cost-effective investment for meeting the city and region’s future transit facility needs at an estimated NPV of **\$167.2 million**.
- Option 2B represents the most cost-effective investment for meeting the city’s transit needs with a 171-bus facility at an initial estimated NPV of **\$175.4 million** while protecting for future regional transit needs.

## 7 Recommendations

It is recommended that:

1. This report be received as the basis for constructing a new transit facility to meet the city and regions' future transit needs on a new site.
2. Approve, in principle, subject to necessary funding and legislated approvals, the construction of a new 171-bus transit operations and maintenance facility of approximate size of 31,000 m<sup>2</sup> while protecting for potential future regional needs to replace the existing facility on a new site.
3. The site identified in the confidential site selection Technical Memorandum be approved for purchase subject to necessary funding and legislated approvals.
4. Approve the commencement of the necessary applications and approval processes for funding, site acquisition including the application for ICIP funding approval process, the Provincial Business Case; and that,
5. The City proceed as soon as possible with the project.

### 7.1 Implementation Plan

Subject to funding and legislative approvals and related processes, the following is the tentative implementation plan of action steps and timeline:

Fall 2021:

- Approval of project by City Council
- Commence the required Investing in Canada Infrastructure Plan (ICIP) funding and MTO legislative approvals process
- Decision on recommended site
- Commence MTO Business Case study
- Identify site for Interim storage yard

2022:

- Acquire land
- Retain architectural/engineering consultant to design the building
- Develop tender documents, tender for construction, award tender
- Site preparation including any remediation
- Outfit (grade, drainage, pave, light, fencing, security) Interim Storage Yard

2023 - 2024:

- Construct new building

2025

- Complete construction and commission new building
- Decommission existing building; decommission Interim Storage Yard

# Appendix A - Technical Memorandum – Future Facility Needs

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Technical Memorandum

# Transit Windsor Garage Feasibility Study

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Future Facility Needs



Prepared for the City of Windsor  
by IBI Group

February 18, 2021

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# 1 Introduction

The City of Windsor's transit bus facility located on North Service Road East was built in 1978 and is 131,000 square feet (approximately 12,200 square metres) in size. It is currently over-capacity with 117 buses operating out of the facility which was designed for 96 buses. Similarly, the complex is over-capacity from an employee and vehicle parking standpoint and is deficient with regards to administration and operations employee space and related working conditions, and with regards to vehicle maintenance and vehicle servicing areas.

The City recently completed a transit master plan study which forecasts a significant expansion of transit service and fleet growth to 165 buses over the next 8 years. This growth will require additional facility capacity. As a result of these factors, the City has undertaken a study to determine its future transit facility needs both in the short term as well as over the longer term and, particularly, to consider the feasibility of expanding the existing building to meet those future needs and options to meet its future needs. At the same time, the feasibility analysis recognizes that the building is now over 40 years of age.

This Technical Memorandum provides a projection of future transit fleet growth, employee staffing increases and employee parking needs for a 30-year time horizon, 2021 to 2051, as the basis for determining the City's future transit facility capacity needs.

## 2 Needs Assessment

Determining a municipality's long-term transit operations and maintenance facility needs is based on future population growth, associated transit service increases, and related fleet growth projections. For areas with limited population growth, fleet growth may be modest unless there are strong policy initiatives to increase transit use or expand the transit service area. For areas such as Windsor, the *More Than Transit: 2019 Transit Master Plan* suggests a significant increase in transit service levels together with a gradual extension of Transit Windsor services to neighbouring municipalities. Growth of the Transit Windsor fleet can be expected due to both factors.

For facility planning purposes and given that a facility may last 50 years or more, it is important to take a long-term view of a transit system's facility needs so that the right investment decisions are made from the outset. An implementation plan then accompanies the long-term needs to guide decisions over the ensuing years. The planning horizon for this facility needs planning study is 2051. In this study, all vehicle estimates are expressed in terms of 12.2 metre (40-foot) standard bus equivalent (SBE) units. No distinction is made for larger or smaller buses that may be purchased in future since those details are unknown at this time. The effect of larger or smaller buses on facility requirements would be factored in at the time a facility design is developed.

With respect to projecting future fleet growth, in the short term (typically less than 10 years) it may be possible to pre-plan transit services (routes, frequencies, and running times) to project future fleet requirements. However, pre-planning transit services beyond 10 years becomes highly conjectural and therefore uncertain as future development plans and general transportation conditions (road, traffic) are much less defined. Accordingly, a surrogate method for projecting future fleet size is required.

As a result, there are two methods for determining future fleet growth that rely on transit operating statistics: population per transit vehicle, and revenue vehicle hours per transit vehicle. This analysis relies on the



population per transit vehicle method, where the current or historical ratio of population to transit vehicles in Windsor is applied to future population estimates, yielding an estimate of the number of transit vehicles that may be required to provide transit service.

To estimate Transit Windsor's fleet growth in addition to other factors needed for estimating future transit facility space needs, five steps are taken:

- Existing conditions for the City of Windsor and Transit Windsor are reviewed;
- The transit service area's population is projected to 2051;
- Transit Windsor's operating statistics are compared against its peers;
- Future fleet needs for Transit Windsor are identified; and
- Future employee and employee parking space needs are calculated.

## 2.1 Existing Conditions

### **The City of Windsor and Essex County**

As of 2016, the City of Windsor had a Census population of 217,188 individuals.<sup>1</sup> The Windsor Census Metropolitan Area (CMA), which includes the City of Windsor and Towns of Amherstburg, LaSalle, Tecumseh, and Lakeshore, had a population of 329,144,<sup>1</sup> reflecting a population of 111,956 in the towns outside the City of Windsor. The Essex County Census Division, which includes the Windsor CMA and other municipalities in the County, had a population of 398,953,<sup>1</sup> reflecting a population of 69,809 in the towns and municipalities outside the Windsor CMA. More details about these geographies and their impact on Transit Windsor's facility needs are provided in Section 2.2.

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<sup>1</sup> Statistics Canada, "2016 Census of Population," 2017.

## **Transit Windsor**

Transit Windsor provides fixed-route conventional transit service within the City of Windsor seven days a week, using a network of 13 routes. In addition to transit services within the city, service is provided in the Town of LaSalle under contract as well as an inter-community service to Essex, Leamington, and Kingsville under contract with the County of Essex. Transit Windsor also operates an international cross-border bus service, Windsor Tunnel Bus, connecting Windsor with Detroit across the Detroit River. Transit Windsor's operations are currently based out of a single facility, located at 3700 North Service Road East. The facility was constructed in 1978 and has an indoor storage capacity for 96 standard buses. The facility also includes maintenance and administration areas sized to serve a fleet of up to 96 buses.

In 2019<sup>2</sup>, Transit Windsor served over 8.43 million trips and provided 283,556 revenue hours of service. Transit Windsor's bus fleet consisted of 114 standard buses with a maximum of 95 buses required for peak service, resulting in a spare ratio of 23%. The 2021 fleet total is 117 buses which exceeds the existing facility storage capacity by 21 buses.

The 2019 staff complement included 288 full-time employees and 9 part-time employees. The numbers of employees are also expressed as full-time equivalents (FTEs), providing a fuller recognition of the employee resources required to deliver transit service, with 293 staff on an FTE basis. The number of Transit Windsor transit operators, maintenance staff, and general/administrative staff is summarized in Exhibit 2.1.

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<sup>2</sup> Canadian Urban Transit Association, "Canadian Conventional Transit Statistics: 2019 Operating Data," Toronto, Ontario, Canada, RTS-20-02E, 2020.

**Exhibit 2.1: Transit Windsor 2019 Employees**

Employee Role	Full-Time Employees	Part-Time Employees	FTEs*
<b>Bus Operations</b>			
Operators	203	–	203
Other Transportation Operations	14	1	15
<b>Maintenance</b>			
Vehicle Mechanics	20	–	20
Other Vehicle Maintenance	27	–	27
Plant and Other Maintenance	5	–	5
<b>General and Administration</b>			
General and Administration	19	8	23
<b>TOTAL</b>	<b>288</b>	<b>9</b>	<b>293</b>

**Note:** \*Each part-time employee is calculated as 0.5 FTE.

**Source:** Canadian Urban Transit Association, “Canadian Conventional Transit Statistics: 2019 Operating Data,” Toronto, Ontario, Canada, RTS-20-02E, 2020.

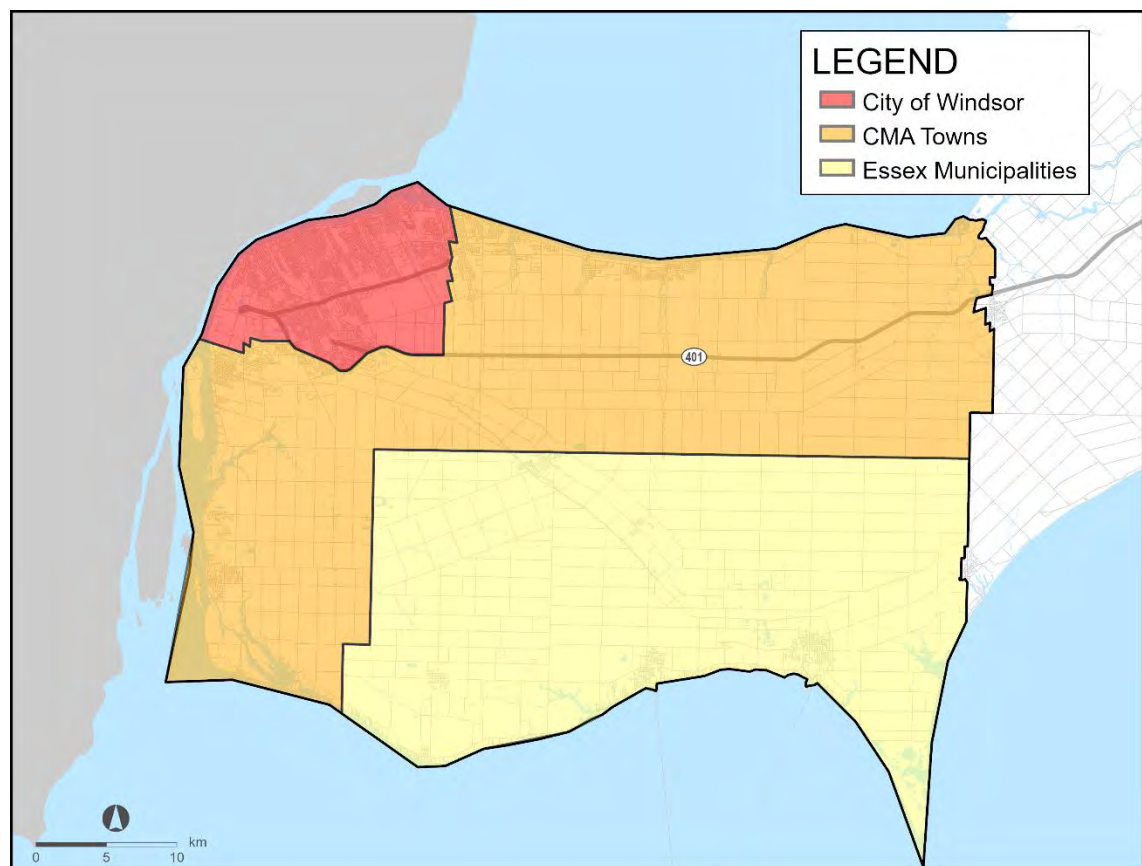
As of 2021, there are 149 parking spaces provided at the City’s existing transit facility for employee vehicles. Additionally, 9 spaces are provided for visitor parking (2 are accessible), and 13 spaces are provided for parking supervisor vans and driver shuttle vans. However, current employee and shuttle van parking needs exceed the available capacity, particularly at shift change times. Transit Windsor predicts an existing need for an additional 31 to 46 employee parking spaces and approximately 4 additional driver shuttle van spaces, in addition to any needs driven by future growth.

## 2.2 Population Projections

Given that Transit Windsor primarily serves the City of Windsor but also provides service to adjacent municipalities and other parts of Essex County under contract, it is important to look at multiple levels of geography when identifying Transit Windsor’s future needs. This section presents population projections for the City of Windsor and two groups of municipalities outside the city – the “CMA Towns” and “Essex Municipalities.”

The CMA Towns include the Towns of Amherstburg, Lakeshore, LaSalle, and Tecumseh, the four towns within the Windsor Census Metropolitan Area (CMA) but exclude the City of Windsor itself. The Essex Municipalities include the Towns of Essex and Kingsville, the Township of Pelee, and the Municipality of Leamington, all within the Essex County Census Division (CD) but exclude towns within the Windsor CMA and the City of Windsor. The geographic locations of these areas are shown in Exhibit 2.2.

**Exhibit 2.2: Map of the City of Windsor, CMA Towns, and Essex Municipalities**



### **City of Windsor**

The City of Windsor is a predominantly urban municipality located across the Detroit River from Detroit, Michigan. Windsor is approximately 146 square kilometres in size and is roughly bounded by the Detroit River to the north and west, Highway 401 and the Town of LaSalle to the south, and the Town of Tecumseh to the east.

Historically, Windsor’s census population has grown from just over 193,000 individuals in 1986 to just over 217,000 individuals in 2016, with average growth rates ranging from –0.5% to 1.1% per year. Over the coming years, Windsor’s population is expected to grow, but the rate of growth is forecast to slow significantly by 2031. These population figures are presented in Exhibit 2.3.

For this analysis, Windsor’s population growth between 2036 and 2051 has been projected based on the average growth rate between 2016 and 2036; approximately 0.2% per year. This yields a 2051 population for Windsor of just under 232,000 individuals as presented in Exhibit 2.3.

**Exhibit 2.3: City of Windsor Population and Projections, 1986–2051**

Year	City of Windsor Population	Average Year-over-Year Growth
1986	193,111	–
1991	191,435	–0.2%
1996	197,694	0.6%
2001	209,218	1.1%
2006	216,473	0.7%
2011	210,891	–0.5%
2016	217,188	0.6%
2021	221,955	0.4%
2026	224,677	0.2%
2031	225,466	0.1%
2036	225,466	–
2041	227,600	0.2%
2046	229,700	0.2%
2051	231,900	0.2%

**1986–2016 Source:** Statistics Canada, “2016 Census of Population,” 2017.

**2021–2036 Source:** MHBC Ltd., “County Road 42 Secondary Plan,” 2018.

**CMA Towns**

The Windsor Census Metropolitan Area extends beyond the City of Windsor, consisting of the City of Windsor as well as the Towns of

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Prepared for the City of Windsor

Amherstburg, Lakeshore, LaSalle, and Tecumseh. The Windsor CMA is a partly urban area and is approximately 1,020 square kilometres in size. It is bounded by Lake St. Clair to the north, the Detroit River to the west, Lake Erie and Essex Townline Road (County Road 8) to the south, and Walker Road (County Road 11) and Essex-Kent Boundary Road (County Road 1) to the east.

Historically, the Windsor CMA census population has grown from over 260,000 individuals in 1986 to just over 329,000 individuals in 2016. Excluding the City of Windsor, the CMA Towns have grown from over 67,000 individuals to nearly 112,000 individuals over the same period, with average growth rates ranging from 0.3% to 2.9% per year. Compared to the City of Windsor, the CMA Towns have grown more quickly over the past 30 years. As of 2016, the census populations of the individual towns within the Windsor CMA were:

- Town of Amherstburg: 21,936
- Town of Lakeshore: 36,611
- Town of LaSalle: 30,180
- Town of Tecumseh: 23,229
- **Total: 111,956**

For this analysis, the population for the CMA Towns was forecast to 2051 based on the projected Essex Census Division population and growth trends between the CMA Towns and Essex CD municipalities (excluding the City of Windsor). Between 1986 and 2016, the population of the CMA Towns grew from 55% to 62% of the population of Essex CD (excluding Windsor). This trend has been projected through 2051 to forecast the population of the CMA Towns, building on population projections for the Essex CD prepared by the Ontario Ministry of Finance. The population of the Essex CD is described further in the following section.

The populations of the Windsor CMA (including the City of Windsor) and the CMA Towns (excluding the City of Windsor) are shown in Exhibit 2.4. As shown, a 2051 population of 210,700 is forecast for the CMA Towns.

Together with the City of Windsor 2051 population, this yields an overall Windsor CMA population of 442,600 in 2051.

**Exhibit 2.4: CMA Towns and Windsor CMA Population, 1986–2051**

Year	Windsor CMA Population	CMA Towns (excl. City)	Average Year-over-Year Growth (Towns)
1986	260,693	67,582	0.8%
1991	268,688	77,253	2.7%
1996	286,811	89,117	2.9%
2001	307,877	98,659	2.1%
2006	323,342	106,869	1.6%
2011	319,246	108,355	0.3%
2016	329,144	111,956	0.7%
2021	356,500	134,600	3.7%
2026	371,800	147,100	1.8%
2031	384,500	159,000	1.6%
2036	397,500	172,000	1.6%
2041	411,900	184,300	1.4%
2046	426,900	197,200	1.4%
2051	442,600	210,700	1.3%

**1986–2016 Source:** Statistics Canada, “2016 Census of Population,” 2017.

### **Essex Municipalities**

The Essex County Census Division consists of the City of Windsor as well as the Towns of Amherstburg, Essex, Kingsville, Lakeshore, LaSalle, and Tecumseh, the Township of Pelee, and the Municipality of Leamington. The Essex CD is a predominantly rural area and is approximately 1,850 square kilometres in size. It is bounded by Lake St. Clair to the north, the Detroit River to the west, Lake Erie to the south, and the Essex-Kent Boundary Road (County Road 1) to the east.

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Historically, the Essex CD census population has grown from just over 316,000 individuals in 1986 to nearly 399,000 individuals in 2016. Excluding the City of Windsor and CMA Towns, the Essex Municipalities have grown from over 55,000 individuals to nearly 70,000 individuals over the same period, with average growth rates ranging from -0.2% to 1.6% per year.

Over the coming years, the Provincial government forecasts that the population of Essex CD will grow more rapidly and continue to grow through 2046. These population figures are presented in Exhibit 2.5.

For this analysis, the overall Essex CD population growth between 2046 and 2051 has been projected to continue at the same growth rate as forecast between 2026 and 2046; approximately 0.7% per year. This yields a 2051 population for Essex CD of just over 549,000 individuals. Subtracting the population of the Windsor CMA, including the City of Windsor, yields a 2051 Essex Municipalities population of 106,500 individuals.



**Exhibit 2.5: Essex CD Population and Projections, 1986–2046**

Year	Essex CD	Essex Municipalities (excl. CMA and City)	Average Year-over-Year Growth (Municipalities)
1986	316,362	55,669	–
1991	327,365	58,677	1.1%
1996	350,329	63,518	1.6%
2001	374,975	67,098	1.1%
2006	393,402	70,060	0.9%
2011	388,782	69,536	–0.2%
2016	398,953	69,809	0.1%
2021	438,001	81,500	3.1%
2026	458,312	86,500	1.2%
2031	475,215	90,700	1.0%
2036	492,781	95,300	1.0%
2041	510,971	99,000	0.8%
2046	529,714	102,800	0.7%
2051	549,100	106,500	0.7%

**1986 – 2016 Essex CD Source:** Statistics Canada, “2016 Census of Population,” 2017.

**2021 – 2046 Essex CD Source:** Ontario Ministry of Finance, “Ontario Population Projections Update, 2019–2046: Essex,” 2020.

### **Area Populations for Fleet Forecasting**

Exhibit 2.6 presents a summary of the City of Windsor, CMA Towns, and Essex Municipalities populations in 2016 and projections from 2021 through 2051. These population projections form the basis for projecting a range of future fleet and facility needs for Transit Windsor.

**Exhibit 2.6: City of Windsor, CMA Towns, and Essex Municipalities  
 Population Projections, 2016–2051**

<b>Year</b>	<b>City of Windsor</b>	<b>CMA Towns (excl. City)</b>	<b>Essex Municipalities (excl. CMA and City)</b>
2016	217,188	111,956	69,809
2021	221,955	134,600	81,500
2026	224,677	147,100	86,500
2031	225,466	159,000	90,700
2036	225,466	172,000	95,300
2041	227,600	184,300	99,000
2046	229,700	197,200	102,800
2051	231,900	210,700	106,500

## 2.3 Peer Review

Looking at similar municipal transit operators and their operational statistics can provide a guide to the number of buses needed by Transit Windsor in the future. As bus operations vary between larger and smaller operators, statistics from two groups of peers are reviewed. The first group compares municipalities similar in size to the City of Windsor (population of 100,000 to 400,000), while the second group compares municipalities similar in size to the towns and municipalities in the CMA Towns and Essex Municipalities (population of 10,000 to 50,000). Statistics compared for both groups include population, bus fleet size, annual ridership, and annual revenue vehicle hours (RVH).

### City of Windsor Peers

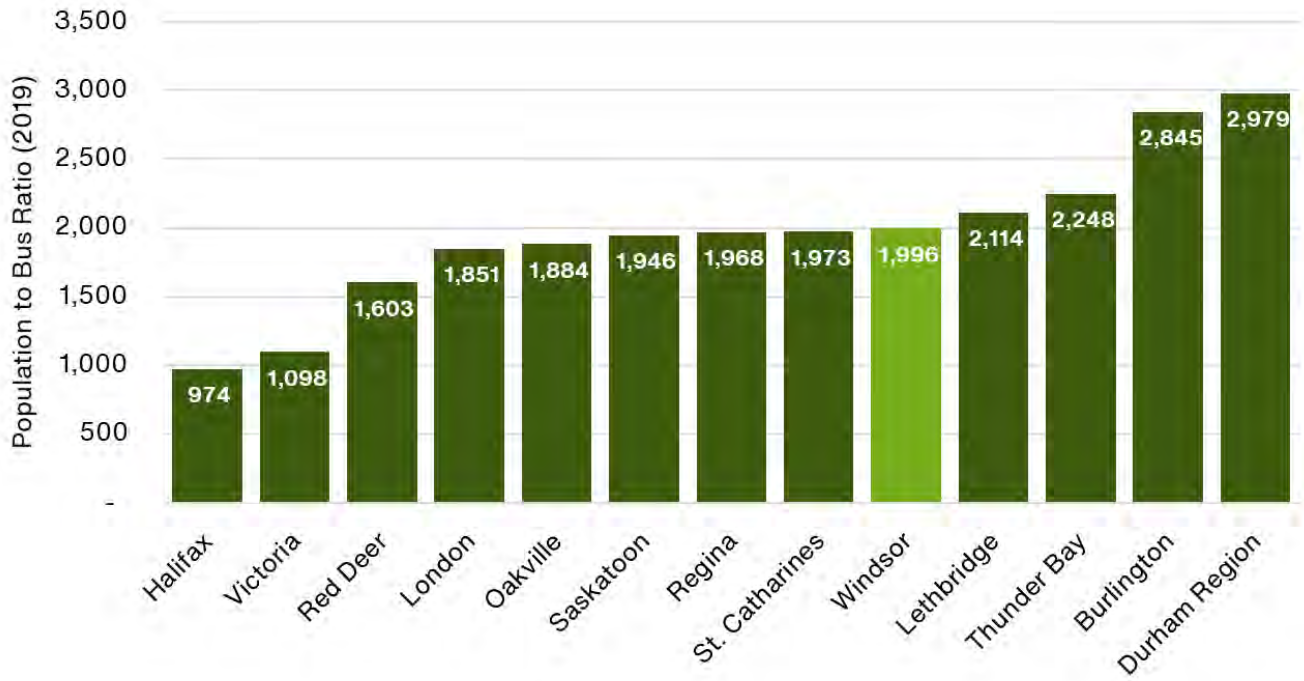
Exhibit 2.8 compares Transit Windsor with similar municipal transit service providers in Ontario and across Canada. Overall, Transit Windsor achieves similar operating ratios to its peer municipalities:

- A population-to-bus ratio of nearly 2,000, similar to St. Catharines, Regina, and Saskatoon;

- A productivity of nearly 30 riders per RVH, similar to St. Catharines, Thunder Bay, and Victoria; and
- A ridership-to-bus ratio of approximately 2,500, similar to Durham Region, Victoria, and Saskatoon.

As the City of Windsor’s population grows and as Transit Windsor provides higher levels of service, it is reasonable to expect that some operating ratios will shift. For example, providing greater levels of transit service within the city may result in a lower population-to-bus ratio of approximately 1,850, in line with peers such as London. Transit Windsor’s 2019 population-to-bus ratio is compared against those from peer municipalities in Exhibit 2.7.

**Exhibit 2.7: Population-to-Bus Ratios for Transit Windsor and Peers, 2019**



**Source:** Canadian Urban Transit Association, “Canadian Conventional Transit Statistics: 2019 Operating Data,” Toronto, Ontario, Canada, RTS-20-02E, 2020.

**Exhibit 2.8: Comparison of Transit Windsor and Peers, 2019**

Transit Operator	Service Area Population	Buses	Annual Ridership	Annual RVH	Population per Bus	Ridership per RVH	RVH per Bus
<b>Windsor</b>	<b>227,555</b>	<b>114</b>	<b>8,430,749</b>	<b>283,556</b>	<b>1,996</b>	<b>29.7</b>	<b>2,487</b>
<b>Ontario</b>							
St. Catharines	151,914	77	5,078,779	175,361	1,973	29.0	2,277
Durham Region	610,789	205	11,083,538	533,205	2,979	20.8	2,601
Burlington	179,236	63	2,452,867	177,555	2,845	13.8	2,818
Oakville	211,000	112	3,376,070	208,569	1,884	16.2	1,862
London	409,000	221	24,599,655	651,075	1,851	37.8	2,946
Thunder Bay	107,909	48	4,246,290	146,817	2,248	28.9	3,059
<b>Canada</b>							
Victoria	313,745	302	27,162,903	847,864	1,098	32.0	2,807
Red Deer	101,002	63	2,644,412	140,413	1,603	18.8	2,229
Lethbridge	101,482	48	1,485,889	113,190	2,114	13.1	2,358
Regina	238,132	121	6,142,858	279,271	1,968	22.0	2,308
Saskatoon	272,500	140	13,196,854	363,050	1,946	36.3	2,593
Halifax	342,768	352	20,398,146	840,471	974	24.3	2,388

**Source:** Canadian Urban Transit Association, "Canadian Conventional Transit Statistics: 2019 Operating Data," Toronto, Ontario, Canada, RTS-20-02E, 2020.

### **CMA Town and Essex Municipality Peers**

Most towns and municipalities in the Windsor CMA and Essex County, excluding the City of Windsor itself, have populations of approximately 20,000 to 30,000 individuals. Since smaller towns have a lower proportion of the population taking public transit, expanding Windsor Transit into nearby communities should take into account the transit operating statistics of services operating in similarly sized municipalities.

Exhibit 2.9 shows transit operating statistics for municipal operators in Ontario and across Canada serving areas similar in size to Amherstburg, Lakeshore, LaSalle, and Tecumseh. Some transit operators, such as Cornwall and Stratford, are more established and have grown their ridership over many years, while other operators are still in the process of expanding their services. Generally, the operating statistics for these smaller operators are:

- A population-to-bus ratio in the range of 2,500 to 4,000;
- A productivity in the range of 5 to 20 riders per RVH; and
- A ridership-to-bus ratio in the range of 1,700 to 3,000.

When estimating a mature (i.e. 2051) level of transit service to the CMA Towns or Essex Municipalities, ratios of 6,000 to 3,000 people per bus will be used, reflecting a moderate level of service in-line with smaller municipal peers.

**Exhibit 2.9: Small Canadian Transit Operator Statistics, 2019**

Transit Operator	Service Area Population	Buses	Annual Ridership	Annual RVH	Population per Bus	Ridership per RVH	RVH per Bus
<b>Ontario</b>							
Cornwall	46,340	14	861,127	38,159	3,310	22.6	2,726
Deseronto	48,725	4	10,799	6,930	12,181	1.6	1,733
Leamington	27,595	2	20,800	4,320	13,798	4.8	2,160
Welland	52,293	28	649,702	46,012	1,868	14.1	1,643
Belleville	50,716	16	1,207,077	56,942	3,170	21.2	3,559
Cobourg	10,741	5	98,795	8,691	2,148	11.4	1,738
Niagara-On-The-Lake	19,482	5	29,734	6,545	3,896	4.5	1,309
Collingwood	19,000	4	236,661	28,978	4,750	8.2	7,245
Stratford	33,000	13	587,416	39,444	2,538	14.9	3,034
<b>Canada</b>							
Prince Rupert	12,235	5	277,298	9,931	2,447	27.9	1,986
Yellowknife	19,569	6	200,279	12,812	3,262	15.6	2,135
Penticton	31,379	9	491,246	23,246	3,487	21.1	2,585
Kootenay Boundary	32,699	8	430,246	19,670	4,087	21.9	2,459

**Source:** Canadian Urban Transit Association, "Canadian Conventional Transit Statistics: 2019 Operating Data," Toronto, Ontario, Canada, RTS-20-02E, 2020.

## 2.4 Fleet Estimate to 2051

Fleet estimates for the City of Windsor, as well as the CMA Towns and Essex Municipalities, have been prepared to the year 2051 in five-year increments. These estimates draw on the population projections for each geography, Transit Windsor’s 2019 Transit Master Plan, and population-to-bus ratios from peer municipalities.

### City of Windsor Needs

Based on projected population growth for the City of Windsor alone, a small number of additional buses would be needed by Transit Windsor over the coming years. However, the *More Than Transit: 2019 Transit Master Plan* identifies significant fleet growth within the next ten years, with a total fleet of 165 buses (a mix of community, standard, and articulated vehicles) by 2028. These fleet projections are shown in Exhibit 2.10.

**Exhibit 2.10: Transit Windsor Fleet Projections, 2019–2028**

Year	Peak Buses	Spare Buses	Total Buses
2019	82	32	114
2020	82	32	114
2021	83	33	117
2022	86	34	120
2023	89	38	127
2024	94	40	134
2025	103	38	141
2026*	108	40	148
2027*	114	42	156
2028	120	45	165

**Note:** \* Fleet sizes interpolated from 2025 and 2028 values.

**Source:** Transit Windsor, “More Than Transit: 2019 Transit Master Plan,” 2019.

Based on a 2028 city population of approximately 225,000 individuals, this fleet size results in a population-to-bus ratio of 1,364, reflecting a large improvement in transit service levels.

Assuming Transit Windsor’s 2028 population-to-bus ratio of 1,364 is maintained, this would indicate a 2051 fleet total of 171 buses would be expected to serve the City of Windsor. This reflects a growth of 53 buses from 2016 to 2028 and a further growth of 6 buses from 2028 to 2051. This projection is shown in Exhibit 2.11 and is carried forward for facility size estimating purposes.

**Exhibit 2.11: City of Windsor Projected Bus Fleet, 2016-2051**

<b>Year</b>	<b>City of Windsor Population</b>	<b>Fleet @ 1,364 pop/bus (2028 onwards)</b>
2016	217,188	112
2019 <sup>a</sup>	227,555	114
2021	221,955	117 <sup>b</sup>
2026	224,677	148 <sup>b</sup>
2028	224,992	165 <sup>b</sup>
2031	225,466	166
2036	225,466	166
2041	227,600	167
2046	229,700	169
<b>2051</b>	<b>231,900</b>	<b>171</b>

**Sources:** <sup>a</sup> Canadian Urban Transit Association, “Canadian Conventional Transit Statistics: 2019 Operating Data,” Toronto, Ontario, Canada, RTS-20-02E, 2020.  
<sup>b</sup> Transit Windsor, “More Than Transit: 2019 Transit Master Plan,” 2019.

**CMA Town Needs**

Beyond the City of Windsor, there is a potential need for additional buses to serve the CMA Towns (Amherstburg, Lakeshore, LaSalle, and Tecumseh). These needs are forecast based on achieving population-to-bus ratios in the range of peer operators by 2051, with the fleet size gradually growing to those levels following the completion of the Transit



Master Plan in 2028. Achieving a population-to-bus ratio of 4,000 by 2051, in line with Niagara-on-the-Lake or Kootenay Boundary, requires 53 additional buses to serve the CMA Towns. This projection will be carried forward to estimate overall Transit Windsor facility needs. Achieving a lower ratio of 3,000 people per bus by 2051, in line with Belleville or Yellowknife, requires 71 additional buses. Both projections are shown in Exhibit 2.12.

**Exhibit 2.12: CMA Towns Projected Bus Needs, 2016–2051**

<b>Year</b>	<b>CMA Towns Population</b>	<b>Bus Fleet growing to 4,000 pop/bus</b>	<b>Bus Fleet growing to 3,000 pop/bus</b>
2016	111,956	-	-
2019	125,000	-	-
2021	134,600	-	-
2026	147,100	-	-
2028	151,800	-	-
2031	159,000	7	10
2036	172,000	19	25
2041	184,300	30	41
2046	197,200	42	56
<b>2051</b>	<b>210,700</b>	<b>53</b>	<b>71</b>

**Essex Municipality Needs**

Beyond the City and the CMA Towns, there is another potential need for additional buses to serve the Essex Municipalities (Essex, Kingsville, Leamington). These needs are forecast based on achieving population-to-bus ratios in the range of peer operators by 2051, with the fleet size gradually growing to those levels following the completion of the Transit Master Plan in 2028. Achieving a population-to-bus ratio of 6,000 by 2051, between Deseronto or Leamington and Collingwood, requires 18 additional buses to serve the Essex Municipalities. This projection will be carried forward to estimate overall Transit Windsor facility needs. Achieving a lower ratio of 4,000 people per bus by 2051, in line with Niagara-on-the-

Lake or Kootenay Boundary, requires 27 additional buses. Both projections are shown in Exhibit 2.13.

**Exhibit 2.13: Essex Municipalities Projected Bus Needs, 2016–2051**

<b>Year</b>	<b>Essex Municipalities Population</b>	<b>Bus Fleet growing to 6,000 pop/bus</b>	<b>Bus Fleet growing to 4,000 pop/bus</b>
2016	69,809	-	-
2019	76,595	-	-
2021	81,500	-	-
2026	86,500	-	-
2028*	88,200	-	-
2031	90,700	3	4
2036	95,300	7	10
2041	99,000	11	16
2046	102,800	15	22
<b>2051</b>	<b>106,500</b>	<b>18</b>	<b>27</b>

**Overall Fleet Needs**

A range of Transit Windsor fleet needs have been projected from 2021 through 2051 based on the potential areas being served, ranging from the City to the broader Essex County area. To serve the City of Windsor alone, it is expected that a fleet of 171 buses would be needed, including a mix of smaller community buses or shuttles, standard buses, and articulated buses. To serve the CMA Towns, 53 additional buses may be needed (based on a ratio of 4,000 people per bus), and an additional 18 buses may be needed to serve the Essex Municipalities (based on a ratio of 6,000 people per bus). Together, this leads to a 2051 fleet of up to 242 buses, depending on the area covered by the transit service. As the exact fleet breakdown has yet to be determined, it is assumed that the number of buses is equal to the number of SBEs. The overall Transit Windsor fleet projections are shown in Exhibit 2.14.

**Exhibit 2.14: Overall Transit Windsor Fleet Needs, 2016–2051**

Year	City Fleet	CMA Towns Fleet	Essex Municipalities Fleet	Total Fleet
2016	112	-	-	112
2019	114	-	-	114
2021	117	-	-	117
2026	148	-	-	148
2028	165	-	-	165
2031	166	7	3	176
2036	166	19	7	192
2041	167	30	11	208
2046	169	42	15	226
<b>2051</b>	<b>171</b>	<b>53</b>	<b>18</b>	<b>242</b>

## 2.5 Employee and Employee Parking Estimates

The next step in determining the space and area requirements for a new transit facility is to estimate the number of employees and associated employee vehicle parking requirements. These estimates are based on Transit Windsor’s 2019 ratios of employees to transit vehicles and the current (2021) number of parking spaces on a per-employee basis.

Exhibit 2.1 in Section 2.1 summarizes the number of full-time and part-time employees currently working in Transit Windsor’s facility in the functional areas of Bus Operations, Maintenance, and General and Administration. As indicated, there are a total of 297 full-time and part-time staff, or 293 staff on an FTE basis. Exhibit 2.15 shows the ratios of employees in each functional area to Transit Windsor’s fleet size, including an overall employee-to-bus ratio of 2.57.

**Exhibit 2.15: Transit Windsor Employee-to-Bus Ratios**

Functional Area	Fleet (Buses)	Employees (FTEs)	Employees per Bus
Bus Operations	114	218	1.91
Maintenance		52	0.46
General and Administration		23	0.20
<b>TOTAL</b>	<b>114</b>	<b>293</b>	<b>2.57</b>

**Source:** Canadian Urban Transit Association, “Canadian Conventional Transit Statistics: 2019 Operating Data,” Toronto, Ontario, Canada, RTS-20-02E, 2020.

To estimate future employee vehicle parking requirements, Transit Windsor’s current numbers of employee and visitor parking spaces have been documented. However, Transit Windsor has identified existing shortfalls in employee parking provided at its facility. As of 2021, Transit Windsor provides 9 parking spaces for visitors (2 are accessible) and 149 parking spaces for employees, but there is a need for between 31 and 46 additional employee parking spaces as shown in Exhibit 2.16. Based on the total number of parking spaces needed, there is an overall ratio of 0.61 to 0.67 employees per parking space which is in line with other transit facilities. For the purposes of facility need forecasting, a ratio of 0.65 will be used.

**Exhibit 2.16: Parking Spaces for Employee Vehicles**

Parking Type	Employee	Visitor	Visitor (accessible)
Current Parking Spaces	149	7	2
Shortfall	31 – 46	–	–
<b>Current Needed Parking Spaces</b>	<b>180 – 195</b>	<b>7</b>	<b>2</b>
Employees (FTEs)	293	–	–
<b>Ratio</b>	<b>0.61 – 0.67</b>	–	–

**IBI GROUP** TECHNICAL MEMORANDUM  
 TRANSIT WINDSOR GARAGE FEASIBILITY STUDY  
 Prepared for the City of Windsor

Using the foregoing employee per transit vehicle and employee ratios, Exhibit 2.17 presents the number of Transit Windsor employees and parking spaces required to meet the City of Windsor’s needs to 2051. Similarly, Exhibit 2.18 presents the number of employees and parking spaces to meet the transit needs of the CMA Towns, and Exhibit 2.19 presents the number of employees and parking spaces to meet the transit needs of the Essex Municipalities. Overall, there is a need for up to 242 buses, 624 employees and 407 employee parking spaces to serve Transit Windsor’s needs in 2051, depending on the area covered by the transit service.

**Exhibit 2.17: Fleet, Employee, and Employee Parking Needs, 2016–2051  
 (City of Windsor)**

<b>Year</b>	<b>Bus Fleet</b>	<b>Employees (@2.57/bus)</b>	<b>Parking Spaces (@0.65/employee)</b>
2016	112	288	188
2019	114	293	191
2021	117	301	196
2026	148	381	248
2028	165	425	277
2031	166	427	278
2036	166	427	278
2041	167	430	280
2046	169	435	283
<b>2051</b>	<b>171</b>	<b>440</b>	<b>286</b>

**Exhibit 2.18: Fleet, Employee, and Employee Parking Needs, 2016–2051  
 (CMA Towns)**

Year	Bus Fleet	Employees (@2.57/bus)	Parking Spaces (@0.65/employee)
2016	-	-	-
2019	-	-	-
2021	-	-	-
2026	-	-	-
2028	-	-	-
2031	7	18	12
2036	19	49	32
2041	30	78	51
2046	42	108	71
<b>2051</b>	<b>53</b>	<b>137</b>	<b>90</b>

**Exhibit 2.19: Fleet, Employee, and Employee Parking Needs, 2016–2051  
 (Essex Municipalities)**

Year	Bus Fleet	Employees (@2.57/bus)	Parking Spaces (@0.65/employee)
2016	-	-	-
2019	-	-	-
2021	-	-	-
2026	-	-	-
2028	-	-	-
2031	3	8	6
2036	7	18	12
2041	11	29	19
2046	15	39	26
<b>2051</b>	<b>18</b>	<b>47</b>	<b>31</b>

## 2.6 Conclusions

- The existing Transit Windsor facility is now over 40 years of age and is operating over capacity based on a 2021 fleet of 117 buses and design capacity for 96 buses.
- Based on the recent transit master plan, Transit Windsor is projected to have a fleet of 165 buses by 2028, along with an employee complement of 425 FTEs and a need for 277 employee parking spaces. This reflects a fleet growth of 51 buses, the addition of 132 FTE employees and 128 employee parking spaces.
- Between 2028 and 2051, limited population growth is expected within the City of Windsor, resulting in modest fleet growth of 6 buses for an overall total estimated fleet size of 171 buses.
- In contrast, significant population growth outside the City of Windsor is projected, and with it, the likely requirement for new and expanded transit services. If the transit needs of the CMA Towns outside the City of Windsor are considered, this could result in the need for an additional 53 buses along with associated employees and employee parking spaces.
- If transit service needs in the Essex Municipalities are considered, this could result in an additional 18 buses along with associated employees and employee parking spaces.
- Together, the future transit needs could require a transit facility capacity of up to 242 buses by 2051.
- Based on these projections, the following facility options have been identified:
  - Expand the existing Transit Windsor facility to meet the City's 30-year requirement of 171 buses. Determine the feasibility, practicality, and cost of this expansion.

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TRANSIT WINDSOR GARAGE FEASIBILITY STUDY  
Prepared for the City of Windsor

- Expand the existing Transit Windsor facility to meet the City’s needs plus those of the CMA Towns and Essex Municipalities (up to 242 buses). Determine the feasibility, practicality, and cost of this expansion.
- Meet the fleet expansion requirements (city or broader area) in another building.
- Construct a new Transit Windsor facility to meet the fleet expansion requirements (city or broader area) on a new site.

These options will be developed and evaluated in subsequent memoranda.



# Appendix B - Facility Space Programme – 171-bus and 242- bus

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City of Windsor  
Bus Maintenance & Storage Facility

SPACE PROGRAM - Version 1  
170 SBE

IBI Group  
Project No. 131959  
11-Feb-21

## Document Control Page

<b>Client:</b>	Transit Windsor
<b>Project Name:</b>	Bus Maintenance & Storage Facility
<b>Report Title:</b>	Space Program - Version 1
<b>IBI Reference:</b>	131959
<b>Version:</b>	For Approval
<b>Originator:</b>	Anthony van Veen
<b>Reviewer:</b>	Chris Prentice
<b>Client Approvals:</b>	
<b>Circulation List:</b>	



Prepared for Transit Windsor

by IBI Group

11-Feb-21

<b>Area Summaries for:</b> City of Windsor - Bus Maintenance & Storage Facility	<b>Area Requirements</b> Issue Date: February 11, 2021
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Code	Functional Unit or Area (Interior Spaces)	Total Staff	Total Net Work Area Allocation (Square Metres) <small>incl. internal circulation</small>	Net to Gross Ratio	Gross Building Area (Square Metres) <small>including avg 30% net to gross ratio</small>	Gross Building Area (Square Feet) <small>including avg 30% net to gross ratio</small>
COM	Common Areas	0	158.0	1.2	189.6	2,041
AO	Administration & Operations	344	1,284.3	1.2	1,541.2	16,590
BG	Bus Garage	0	14,578.0	1.0	14,578.0	156,921
FM	Fleet Maintenance	80	7,406.9	1.1	8,147.6	87,703
ST	Stores	6	1,019.4	1.1	1,121.3	12,070
ITS	Information Technology Systems	9	290.5	1.2	348.6	3,753
FA	Facilities	6	373.6	1.2	448.3	4,826
BS	Building Services	0	566.5	1.1	623.2	6,708
<b>Interior Area Totals</b>		445.0	25,677.2 Net Square Metres		26,997.8 Gross Square Metres	290,611.4 Gross Square Feet

Code	Functional Unit or Area (Exterior Spaces)	Total Staff	Total Net Work Area Allocation (Square Metres) <small>incl. internal circulation</small>	Net to Gross Ratio	Gross Area (Square Metres) <small>including avg 30% net to gross ratio</small>	Gross Area (Square Feet) <small>including avg 30% net to gross ratio</small>
EX	Exterior Functions	0	1,061.0	1.0	1,061.0	11,421
<b>Exterior Area Totals</b>		0.0	1,061.0 Net Square Metres		1,061.0 Gross Square Metres	11,421 Gross Square Feet

Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
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GROUP: [REDACTED]

<b>Spatial Programming Sheet Explanation</b>											
	Staff or function number										
	Staff title or space function								Latest Revision made to the Program		
	A generic description of the nature of the space - see key below.									Comments/Remarks/Explanations	
	The current staff count i.e. the number around which an all new facility would be built if constructed today.								The area assigned to each member of staff or support function		
	New Requirements								Required area is the product of the number of staff or spaces times the area allocation		
	New Requirements								The ratio between the assigned and the usable area.		
	Area (in Net Square Meters), to be confirmed, (area depends on configuration)								Usable area requirement when totaled		
	The number of unoccupied spaces i.e. those that are shared and not occupied by a particular member of staff										
<b>Subtotal</b>				0					0.0		

<b>Key to Symbols Used</b> OA - Open Area Workstation PO - Private Office (full height walls)	ES - Enclosed Space C - Circulation Areas	EX - Exterior Space
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Functional Program for: City of Windsor Bus Maintenance & Storage Facility	Accommodation Summary	Space Requirements Summary Issue Date: February 11, 2021
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Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
<b>GROUP: Common Areas</b>										
COM-100	Vestibule	ES			1	10.0	10.0	1.3	13.0	Lobby to incorporate space for 6 person waiting  Equipment layout TBD Refer to EX-104
COM-101	Lobby / Reception	OA			1	8.0	8.0	1.5	12.0	
COM-102	First Aid Room	ES			1	10.0	10.0	1.3	13.0	
COM-103	Gym (Fitness Room)	ES			1	100.0	100.0	1.2	120.0	
COM-104	Staff Bicycle Storage	EX								
<b>Total Common Area</b>				<b>0</b>			<b>128.0</b>		<b>158.0</b>	<b>1,701 Square Feet</b>

<b>GROUP: Administration &amp; Operations</b>										
<b>Administration</b>										
AO-100	Executive Director	PO		1	1	15.6	15.6	1.3	20.3	12' x 14' PO.
AO-101	Executive Admin Assistant	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO adjacent Executive Director
AO-102	Manager Administration & Operations	PO		1	1	11.1	11.1	1.3	14.4	10' x 12' PO
AO-103	Sr. Mgr Fleet & Support Services	PO		1	1	11.1	11.1	1.3	14.4	10' x 12' PO
AO-104	Project Manager	PO		1	1	11.1	11.1	1.3	14.4	10' x 12' PO
AO-105	City Payroll Accountant	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-106	City Payroll Clerk	OA		1	1	5.2	5.2	1.5	7.8	7' x 8' workstation
AO-107	Customer Service Agent (receptionist)	OA		1	1	5.2	5.2	1.5	7.8	7' x 8' workstation adjacent Lobby Reception Area
AO-108	Payroll Coordinator	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-109	Accounts Payable Clerk	OA		1	1	5.2	5.2	1.5	7.8	7' x 8' workstation
AO-110	Support Staff	OA		3	3	5.2	15.6	1.5	23.4	7' x 8' workstation
AO-111	Hotelling Stations	OA		6	6	5.2	31.2	1.5	46.8	7' x 8' workstation
FA-100	Manager Facilities	PO		1	1	11.1	11.1	1.3	14.4	10' x 12' PO
AO-112	Revenue Room	ES		1	1	50	50.0	1.2	60.0	Adjacent Service Lanes
AO-113	10 to 12 Person Boardroom	ES			1	35	35.0	1.3	45.5	
AO-114	Office Staff Lunch Room (Admin & Ops)	ES			1	70	70.0	1.2	84.0	To accommodate 40 staff c/w kitchette and access to exterior patio
AO-115	Coffee/Break Area	ES			1	27	27.0	1.3	35.1	On floor without lunchroom; space for up to 6 persons at tables.
AO-116	Printer/Copier Area	ES			1	11.1	11.1	1.3	14.4	
AO-117	Storage Room	ES			1	14	14.0	1.3	18.2	
AO-118	Male Office Staff Washroom (Admin & Ops)	ES			1	18.0	18.0	1.3	23.4	1 urinal, 1 BF toilet & 2 lavatories to accommodate 20 male office staff
AO-119	Female Office Staff Washroom (Admin & Ops)	ES			1	18.0	18.0	1.3	23.4	1 toilet, 1 BF toilet & 3 lavatories to accommodate 20 female office staff
<b>Operations</b>										
AO-120	Planning Supervisor	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-121	Planning Analyst	PO		3	3	9.3	27.9	1.5	41.9	10' x 10' PO
AO-122	Transportation Scheduler	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-123	Transportation Clerk	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-124	Operations Coordinator	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-125	Supervisors Office	ES		16	1	65	65.0	1.2	78.0	Eight 7' x 8' supervisors workstations within one room: 16 half lockers; pass through window & counter accessible to Operators
AO-126	Bookout Person	PO		1	1	9.3	9.3	1.5	14.0	Adjacent Dispatch
AO-127	Bus Operators			300						Maximum 100 drivers in building at any time: 60/40 male female split
AO-128	Dispatch / Control Room	ES		3	1	35	35.0	1.3	45.5	Space for three console workstations and filing
AO-129	Training Office	ES		2	1	16	16.0	1.3	20.8	Two 7' x 8' workstations in one room to accommodate 2 Trainers / Supervisors
AO-130	Training Room	ES			1	80	80.0	1.2	96.0	To accommodate 1 Trainer & 12 trainees in classroom format
AO-131	Breakout Room	ES			2	21	42.0	1.3	54.6	To accommodate 6 persons
AO-132	Printer/Copier Area	ES			1	11.1	11.1	1.3	14.4	
AO-133	Drivers Lounge / Lunch Room	ES			1	85.0	85.0	1.2	102.0	To accommodate 50 persons c/w servery area
AO-134	Quiet Room	ES			1	25	25.0	1.3	32.5	To accommodate 6 easy chairs
AO-135	Drivers Sign-up Room	ES			1	17	17.0	1.3	22.1	
AO-136	Uniform Storage Closet	ES			1	3	3.0	1.5	4.5	
AO-137	Male Operator Washroom/Showers/Lockers	ES			1	86	86.0	1.2	103.2	To accommodate 60 men: 2 urinals, 1 toilet, 1 BF toilet, 4 lavs, 2 standard showers, 1 BF shower, 180 half lockers
AO-138	Female Operator Washroom/Showers/Lockers	ES			1	68	68.0	1.2	81.6	To accommodate 40 women: 2 toilets, 1 BF toilet, 3 lavs, 1 standard shower, 1 BF shower, 120 half lockers
<b>Total Administration &amp; Operations</b>				<b>344</b>			<b>1000.9</b>		<b>1,284.3</b>	<b>13,825 Square Feet</b>

<b>Key to Symbols Used</b>	OA = Open Area Workstation PO = Private Office (full height walls)	ES = Enclosed Space C = Circulation Areas	EX = Exterior Space
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Functional Program for: City of Windsor Bus Maintenance & Storage Facility	Accommodation Summary	Space Requirements Summary Issue Date: February 11, 2021
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Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
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GROUP: Bus Storage Garage										
BG-100	Storage Garage for 170 SBE's 0 - 30' Buses 0 - 40' Buses 0 - Articulated 60' Buses				1	10300.0	10300.0	1.0	10300.0	
BG-101	Maneuvering / Turning Space				1	1500.0	1500.0	1.0	1500.0	
BG-102	Advertising Storage Room				1	20.0	20.0	1.3	26.0	Accessible from Storage Garage
BG-103	Service Lanes				2	360.0	720.0	1.2	864.0	Each Service Lane to accommodate 2 articulated buses in line.
BG-104	Bus Wash Lanes				2	240.0	480.0	1.2	576.0	Bus Washes at end of Service Lanes
BG-105	Wash Equipment Room				1	10.0	10.0	1.3	13.0	
BG-106	Cleaning Lane				1	525.0	525.0	1.2	630.0	6 vacuum stations
BG-107	Bypass Lane				1	525.0	525.0	1.2	630.0	
BG-108	Cleaning Supply Room				1	20.0	20.0	1.3	26.0	
BG-109	Vacuum Equipment Room				1	10.0	10.0	1.3	13.0	
BG-110	Lost & Found Bicycle Storage Room									
<b>Total Bus Storage Garage</b>					<b>0</b>		<b>14,110.0</b>		<b>14,578.0</b>	<b>156,921 Square Feet</b>

Key to Symbols Used	OA = Open Area Workstation PO = Private Office (full height walls)	ES = Enclosed Space C = Circulation Areas	EX = Exterior Space
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Functional Program for: City of Windsor Bus Maintenance & Storage Facility	Accommodation Summary	Space Requirements Summary Issue Date: February 11, 2021
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Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
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GROUP: Fleet Maintenance										
Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
FM-100	Fleet Manager		PO	1	1	11.1	11.1	1.3	14.4	10' x 12' PO
FM-101	Fleet Supervisors	ES		8	1	70	70.0	1.2	84.0	Eight 7' x 8' workstations within one room c/w 8 lockers
FM-102	Garage Clerk		PO	1	1	9.3	9.3	1.5	14.0	10' x 10' PO
FM-103	Mechanics			40						26 mechanics on day shift work within Maintenance Area (all male)
FM-104	Service Lane Staff			20						8 staff on largest shift work within Service Lane Area (50/50 male female split)
FM-105	Body Men			10						8 staff on day shift work within Body Shop (all male)
FM-106	Maintenance Training Room	ES			1	35	35.0	1.3	45.5	To accommodate 15 persons
FM-107	Male Washroom/Showers/Lockers (ITS, FM Stores & Facilities)				1	78	78.0	1.2	93.6	2 urinals, 1 standard toilet, 1 BF toilet, 4 lavatories, 2 showers & 1 BF shower to accommodate 50 men plus 75 full size lockers.
FM-108	Female Washroom/Showers/Lockers (ITS, FM Stores & Facilities)				1	35	35.0	1.3	45.5	1 standard toilet, 1 BF toilet, 2 lavatories plus 1 BF shower to accommodate 10 women plus 20 full size lockers.
FM-109	Union Staff Lunchroom (42 FM, 3 Stores & 6 Facilities)	ES			1	82.0	82.0	1.2	98.4	To accommodate 51 persons c/w Kitchenette & vending machines
	Non-Union Staff Lunchroom (9 ITS & 10 FM)				1	37.0	37.0	1.3	48.1	To accommodate 19 persons c/w Kitchenette & vending machines
	First Aid Room	ES			1	10.0	10.0	1.3	13.0	
FM-110	Articulated Bus Repair Bays				2	150.0	300.0	1.2	360.0	6m x 25m drive-thru bays
FM-111	Regular Bus Repair Bays				16	125.0	2000.0	1.2	2400.0	6m x 21m bays; may be back-in & drive-off type for 30' and 40' buses
FM-112	Internal Driveway				1	2000.0	2000.0	1.0	2000.0	20m wide x 100m long (TBC), c/w 2 bus doors at each end
FM-113	60' Inspection Pit				2	118.0	236.0	1.2	283.2	
FM-114	Degrease & Lube Bay				1	200.0	200.0	1.2	240.0	To accommodate 60' articulated buses
FM-115	Tire Repair Bay				1	100.0	100.0	1.2	120.0	
FM-116	New Tire & Rim Storage Area				1	145.0	145.0	1.2	174.0	Adjacent to Tire Repair Bay; to accommodate storage of 120 new tires
FM-117	Used Tire & Rim Storage Area				1	80.0	80.0	1.2	96.0	remote to Tire Repair Bay and New Tire Storage Area. To have tractor-trailer access.
FM-118	Tool Crib				1	20	20	1.3	26.0	
FM-119	Re-build & Sandblast Room				1	60	60.0	1.2	72.0	
FM-120	Tool Box Storage Area				1	140	140.0	1.2	168.0	Multiple open areas distributed throughout Maintenance Shop
FM-121	Compressor Room				1	40	40.0	1.3	52.0	
FM-122	Maintenance Library				1	15	15.0	1.3	19.5	c/w 2 computer workstations
FM-123	Electronics Shop				1	90	90.0	1.2	108.0	
FM-124	Body Shop				1	450	450.0	1.2	540.0	3 - 6m x 25m drive thru bays for articulated buses
FM-125	Paint Booth				1	175	175.0	1.2	210.0	Prefabricated Paint Booth to accommodate articulated bus
FM-126	Lube Pump Room				1	49	49.0	1.3	63.7	
FM-127	Unisex Satellite Washrooms				2	6	12.0	1.5	18.0	
<b>Total Fleet Maintenance</b>					<b>80</b>		<b>6,479.4</b>		<b>7,406.9</b>	<b>79,730</b> Square Feet

<b>Key to Symbols Used</b>	OA = Open Area Workstation PO = Private Office (full height walls)	ES = Enclosed Space C = Circulation Areas	EX = Exterior Space
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Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
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GROUP: Stores										
ST-100	Storekeepers	OA		6	3	5.2	15.6	1.5	23.4	Storekeepers work on day shift; three 7 x 8' workstations in proximity to Stores Counter
ST-101	Stores				1	750	750.0	1.1	825.0	Secure space
ST-102	Stores Counter Vestibule				1	10	10.0	1.5	15.0	Sliding glass door between Vestibule & Maintenance shop area. 12' long counter c/w roll down security shutter.
ST-103	Printer Copy Area				1	9	9.0	1.5	13.5	
ST-104	Shipping Receiving Area				1	70	70.0	1.2	84.0	1 recessed loading dock with dock leveler, 1 at grade / drive-in dock and one 7 x 8' workstation
ST-105	Large Item Storage Area									Included in Stores
ST-106	Acid Battery Storage Room				1	25.0	25.0	1.3	32.5	
ST-107	Chemical Storage Room				1	20.0	20.0	1.3	26.0	
ST-107	Caged Gas Cylinder Storage				1					Exterior 20' x 20' space
<b>Total Stores</b>				<b>6</b>			<b>899.6</b>		<b>1,019.4</b>	<b>10,973 Square Feet</b>

GROUP: Information Technology Systems (ITS)										
ITS to be adjacent Fleet Maintenance and accessible to Bus Garage										
ITS-100	ITS Manager		PO	1	1	11.1	11.1	1.3	14.4	10' x 12' PO
ITS-101	ITS Coordinators		PO	3	3	9.3	27.9	1.5	41.9	10' x 10' PO
ITS-102	Support Specialists Office		ES	5	1	40	40.0	1.3	52.0	Five 7 x 8' workstations within one room
ITS-103	IT Lab / Work Area		ES		1	12	12.0	1.3	15.6	Adjacent Support Specialists c/w 2 work/test benches
ITS-104	ITS Parts Storage Room		ES		1	10	10.0	1.3	13.0	
ITS-105	Meeting Room		ES		1	35	35.0	1.3	45.5	To accommodate 10 to 12 persons
ITS-106	Staff Lockers									Use full size lockers for 3 Support Specialists within Fleet Maintenance Locker Room
ITS-107	Fare Box Maintenance Room		ES		1	30	30.0	1.3	39.0	
ITS-108	UPS Room		ES		1	40	40.0	1.3	52.0	
ITS-109	Satellite Network Closet		ES		4	3.3	13.2	1.3	17.2	Air conditioned space with room for 2 racks
Note: Entire facility to have UPS and Generator power backup										
<b>Total Information Technology Systems</b>				<b>9</b>			<b>219.2</b>		<b>290.5</b>	<b>3,127 Square Feet</b>

GROUP: Facilities										
FA-100	Manager Facilities									Private office within Administration Area
FA-101	Maintenance Staff			6						2 female and 4 male Maintenance Staff work throughout facility; 4 days, 1 afternoon & 1 night shift. Full size lockers can be with Fleet Maintenance Staff lockers.
FA-102	Work Shop		ES		1	180	180.0	1.2	216.0	Secure area with double door access, two workbenches and one 7 x 8' workstation. Secure caged area within workshop for storage of tools & equipment.
FA-103	Janitorial Supply Room		ES		1	12.0	12.0	1.3	15.6	
FA-104	Satellite Janitor's Room		ES		2	8	16.0	1.5	24.0	Minimum of one per floor
FA-105	HVAC Storage Room		ES		1	20	20.0	1.3	26.0	
FA-106	General Storage Room		ES		1	20	20.0	1.3	26.0	
FA-107	Equipment Storage Area		OA		1	55	55.0	1.2	66.0	Space for fork lift, floor cleaner, snow plow & salt hopper and riding lawnmower
<b>Total Facilities</b>				<b>6</b>			<b>303.0</b>		<b>373.6</b>	<b>4,022 Square Feet</b>

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Functional Program for: City of Windsor Bus Maintenance & Storage Facility	Accommodation Summary	Space Requirements Summary Issue Date: February 11, 2021
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Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
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GROUP: Building Services										
BS-100	Mech Room	ES			1	10.0	10.0	1.3	13.0	Area TBC
BS-101	Electrical Room	ES			1	125.0	125.0	1.2	150.0	Area TBC
BS-102	Sprinkler / Water Meter Room	ES			1	70.0	70.0	1.2	84.0	Area TBC
BS-103	Garage Electrical Room	ES			2	30.0	60.0	1.3	78.0	Area TBC
BS-104	Office Electrical Room	ES			1	15.0	15.0	1.3	19.5	Area TBC
BS-105	Gargage Boiler Room	ES			1	130.0	130.0	1.2	156.0	Area TBC, adjacent exterior walls for ventilation and roof for vents
BS-106	Office Boiler Room	ES			1	55.0	55.0	1.2	66.0	Area TBC, adjacent exterior walls for ventilation and roof for vents
Total Building Services				0			465.0		566.5	6,098 Square Feet

GROUP: Exterior Functions										
EX-100	Car Parking Lot	EX				18.0	0.0	1.7	0.0	Number of spaces TBC; to meet minimum zoning requirements. Electric vehicle charging stations???
EX-101	Visitor Parking Spots	EX				18.0	0.0	1.7	0.0	Number of spaces TBC
EX-102	Disability Parking Spots	EX				30.0	0.0	1.7	0.0	Number of spaces TBC; to meet City of Windsor zoning requirements.
EX-103	Motorcycle Parking	EX				9.0	0.0	1.7	0.0	Number of spaces TBC
EX-104	Covered Bicycle Storage/Parking	EX			1	20.0	20.0	1.5	30.0	Number of spaces TBC
EX-105	Roadways	EX			1		0.0	1.0	0.0	Area TBC
EX-106	Patio Area	EX			1	200.0	200.0	1.0	200.0	Exterior to Office Staff Lunchroom
EX-107	Exterior Garbage / Recycling	EX			1	167.0	167.0	1.5	250.5	Separate bins for cardboard, garbage, scrap metal, blue & green bins. Covered area, secure, shed, 1800 sf.: not heated
EX-108	Exterior Storage	EX			1	37	37.0	1.5	55.5	20'x20'
EX-109	Full Backup Generators	EX			1	250.0	250.0	1.5	375.0	32mx9m footprint, 2 x 900 kW
EX-110	Underground Diesel Fuel Tank	EX			1	0	0.0	0.0	0.0	2 - 100,000 lt underground tanks (TBC)
EX-111	Tank Farm including:	EX			1	100.0	100.0	1.5	150.0	Area and size of tanks TBC
	10,000 Litre Engine Oil Tank	EX			1					
	10,000 Litre Synthetic Trans. Fluid	EX			1					
	10,000 Litre Waste Engine Oil Tank	EX			1					
	2,500 Litre Auto Transmission Fluid	EX			1					
	4,500 Litre Windshield Washer Fluid	EX			1					
	2,200 Litre Anti-freeze Tank	EX			1					
	2,200 Litre Waste Anti-freeze Tank	EX			1					
EX-116	Switchgear Building	EX			1		0.0	1.0	0.0	Area TBC
EX-115	Transformer Yard	EX			1		0.0	1.0	0.0	Area TBC
Total Exterior Functions				0			774.0		1,061.0	11,421 Square Feet

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City of Windsor  
Bus Maintenance & Storage Facility

SPACE PROGRAM - Version 1  
240 SBE

IBI Group  
Project No. 131959  
11-Feb-21

# Document Control Page

<b>Client:</b>	Transit Windsor
<b>Project Name:</b>	Bus Maintenance & Storage Facility
<b>Report Title:</b>	Space Program - Version 1
<b>IBI Reference:</b>	131959
<b>Version:</b>	For Approval
<b>Originator:</b>	Anthony van Veen
<b>Reviewer:</b>	Chris Prentice
<b>Client Approvals:</b>	
<b>Circulation List:</b>	



Prepared for Transit Windsor  
 by IBI Group  
 11-Feb-21

<b>Area Summaries for:</b> City of Windsor - Bus Maintenance & Storage Facility	<b>Area Requirements</b> Issue Date: February 11, 2021
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Code	Functional Unit or Area (Interior Spaces)	Total Staff	Total Net Work Area Allocation (Square Metres) incl. internal circulation	Net to Gross Ratio	Gross Building Area (Square Metres) including avg 30% net to gross ratio	Gross Building Area (Square Feet) including avg 30% net to gross ratio
COM	Common Areas	0	158.0	1.2	189.6	2,041
AO	Administration & Operations	344	1,284.3	1.2	1,541.2	16,590
BG	Bus Garage	0	19,578.0	1.0	19,578.0	210,743
FM	Fleet Maintenance	80	8,666.9	1.1	9,533.6	102,622
ST	Stores	6	1,294.4	1.1	1,423.8	15,327
ITS	Information Technology Systems	9	290.5	1.2	348.6	3,753
FA	Facilities	6	373.6	1.2	448.3	4,826
BS	Building Services	0	566.5	1.1	623.2	6,708
<b>Interior Area Totals</b>		445.0	32,212.2 Net Square Metres		33,686.3 Gross Square Metres	362,608.1 Gross Square Feet

Code	Functional Unit or Area (Exterior Spaces)	Total Staff	Total Net Work Area Allocation (Square Metres) incl. internal circulation	Net to Gross Ratio	Gross Area (Square Metres) including avg 30% net to gross ratio	Gross Area (Square Feet) including avg 30% net to gross ratio
EX	Exterior Functions	0	1,061.0	1.0	1,061.0	11,421
<b>Exterior Area Totals</b>		0.0	1,061.0 Net Square Metres		1,061.0 Gross Square Metres	11,421 Gross Square Feet

Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
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GROUP: [REDACTED]

Spatial Programming Sheet Explanation										
<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Staff or function number</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Staff title or space function</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">A generic description of the nature of the space - see key below.</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">The current staff count i.e. the number around which an all new facility would be built if constructed today.</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px; background-color: #e0e0ff;">New Requirements</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">New Requirements</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Area (in Net Square Meters), to be confirmed, (area depends on configuration)</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">The number of unoccupied spaces i.e. those that are shared and not occupied by a particular member of staff</div>										<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px; background-color: #add8e6;">Latest Revision made to the Program</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Comments/Remarks/Explanations</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">The area assigned to each member of staff or support function</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Required area is the product of the number of staff or spaces times the area allocation</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">The ratio between the assigned and the usable area.</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px; background-color: #90ee90;">Usable area requirement when totaled</div>
<b>Subtotal</b>				0					0.0	

Key to Symbols Used	OA - Open Area Workstation PO - Private Office (full height walls)	ES - Enclosed Space C - Circulation Areas	EX - Exterior Space
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Functional Program for: City of Windsor Bus Maintenance & Storage Facility	Accommodation Summary	Space Requirements Summary Issue Date: February 11, 2021
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Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
<b>GROUP: Common Areas</b>										
COM-100	Vestibule	ES			1	10.0	10.0	1.3	13.0	Lobby to incorporate space for 6 person waiting
COM-101	Lobby / Reception	OA			1	8.0	8.0	1.5	12.0	
COM-102	First Aid Room	ES			1	10.0	10.0	1.3	13.0	
COM-103	Gym (Fitness Room)	ES			1	100.0	100.0	1.2	120.0	
COM-104	Staff Bicycle Storage	EX							Equipment layout TBD Refer to EX-104	
<b>Total Common Area</b>					<b>0</b>		<b>128.0</b>		<b>158.0</b>	<b>1,701 Square Feet</b>

<b>GROUP: Administration &amp; Operations</b>										
<b>Administration</b>										
AO-100	Executive Director	PO		1	1	15.6	15.6	1.3	20.3	12' x 14' PO.
AO-101	Executive Admin Assistant	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO adjacent Executive Director
AO-102	Manager Administration & Operations	PO		1	1	11.1	11.1	1.3	14.4	10' x 12' PO
AO-103	Sr. Mgr Fleet & Support Services	PO		1	1	11.1	11.1	1.3	14.4	10' x 12' PO
AO-104	Project Manager	PO		1	1	11.1	11.1	1.3	14.4	10' x 12' PO
AO-105	City Payroll Accountant	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-106	City Payroll Clerk	OA		1	1	5.2	5.2	1.5	7.8	7' x 8' workstation
AO-107	Customer Service Agent (receptionist)	OA		1	1	5.2	5.2	1.5	7.8	7' x 8' workstation adjacent Lobby Reception Area
AO-108	Payroll Coordinator	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-109	Accounts Payable Clerk	OA		1	1	5.2	5.2	1.5	7.8	7' x 8' workstation
AO-110	Support Staff	OA		3	3	5.2	15.6	1.5	23.4	7' x 8' workstation
AO-111	Hotelling Stations	OA		6	6	5.2	31.2	1.5	46.8	7' x 8' workstation
FA-100	Manager Facilities	PO		1	1	11.1	11.1	1.3	14.4	10' x 12' PO
AO-112	Revenue Room	ES		1	1	50	50.0	1.2	60.0	Adjacent Service Lanes
AO-113	10 to 12 Person Boardroom	ES		1	1	35	35.0	1.3	45.5	
AO-114	Office Staff Lunch Room (Admin & Ops)	ES		1	1	70	70.0	1.2	84.0	To accommodate 40 staff c/w kitchette and access to exterior patio
AO-115	Coffee/Break Area	ES		1	1	27	27.0	1.3	35.1	On floor without lunchroom; space for up to 6 persons at tables.
AO-116	Printer/Copier Area	ES		1	1	11.1	11.1	1.3	14.4	
AO-117	Storage Room	ES		1	1	14	14.0	1.3	18.2	
AO-118	Male Office Staff Washroom (Admin & Ops)	ES		1	1	18.0	18.0	1.3	23.4	1 urinal, 1 BF toilet & 2 lavatories to accommodate 20 male office staff
AO-119	Female Office Staff Washroom (Admin & Ops)	ES		1	1	18.0	18.0	1.3	23.4	1 toilet, 1 BF toilet & 3 lavatories to accommodate 20 female office staff
<b>Operations</b>										
AO-120	Planning Supervisor	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-121	Planning Analyst	PO		3	3	9.3	27.9	1.5	41.9	10' x 10' PO
AO-122	Transportation Scheduler	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-123	Transportation Clerk	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-124	Operations Coordinator	PO		1	1	9.3	9.3	1.5	14.0	10' x 10' PO
AO-125	Supervisors Office	ES		16	1	65	65.0	1.2	78.0	Eight 7' x 8' supervisors workstations within one room: 16 half lockers; pass through window & counter accessible to Operators
AO-126	Bookout Person	PO		1	1	9.3	9.3	1.5	14.0	Adjacent Dispatch
AO-127	Bus Operators			300						Maximum 100 drivers in building at any time: 60/40 male female split
AO-128	Dispatch / Control Room	ES		3	1	35	35.0	1.3	45.5	Space for three console workstations and filing
AO-129	Training Office	ES		2	1	16	16.0	1.3	20.8	Two 7' x 8' workstations in one room to accommodate 2 Trainers / Supervisors
AO-130	Training Room	ES		1	1	80	80.0	1.2	96.0	To accommodate 1 Trainer & 12 trainees in classroom format
AO-131	Breakout Room	ES		2	1	21	42.0	1.3	54.6	To accommodate 6 persons
AO-132	Printer/Copier Area	ES		1	1	11.1	11.1	1.3	14.4	
AO-133	Drivers Lounge / Lunch Room	ES		1	1	85.0	85.0	1.2	102.0	To accommodate 50 persons c/w servery area
AO-134	Quiet Room	ES		1	1	25	25.0	1.3	32.5	To accommodate 6 easy chairs
AO-135	Drivers Sign-up Room	ES		1	1	17	17.0	1.3	22.1	
AO-136	Uniform Storage Closet	ES		1	1	3	3.0	1.5	4.5	
AO-137	Male Operator Washroom/Showers/Lockers	ES		1	1	86	86.0	1.2	103.2	To accommodate 60 men: 2 urinals, 1 toilet, 1 BF toilet, 4 lavs, 2 standard showers, 1 BF shower, 180 half lockers
AO-138	Female Operator Washroom/Showers/Lockers	ES		1	1	68	68.0	1.2	81.6	To accommodate 40 women: 2 toilets, 1 BF toilet, 3 lavs, 1 standard shower, 1 BF shower, 120 half lockers
<b>Total Administration &amp; Operations</b>					<b>344</b>		<b>1000.9</b>		<b>1,284.3</b>	<b>13,825 Square Feet</b>

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Functional Program for: City of Windsor Bus Maintenance & Storage Facility	Accommodation Summary	Space Requirements Summary Issue Date: February 11, 2021
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Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
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GROUP: Bus Storage Garage										
BG-100	Storage Garage for 240 SBE's 0 - 30' Buses 0 - 40' Buses 0 - Articulated 60' Buses				1	14700.0	14700.0	1.0	14700.0	
BG-101	Maneuvering / Turning Space				1	2100.0	2100.0	1.0	2100.0	
BG-102	Advertising Storage Room				1	20.0	20.0	1.3	26.0	Accessible from Storage Garage
BG-103	Service Lanes				2	360.0	720.0	1.2	864.0	Each Service Lane to accommodate 2 articulated buses in line.
BG-104	Bus Wash Lanes				2	240.0	480.0	1.2	576.0	Bus Washes at end of Service Lanes
BG-105	Wash Equipment Room				1	10.0	10.0	1.3	13.0	
BG-106	Cleaning Lane				1	525.0	525.0	1.2	630.0	6 vacuum stations
BG-107	Bypass Lane				1	525.0	525.0	1.2	630.0	
BG-108	Cleaning Supply Room				1	20.0	20.0	1.3	26.0	
BG-109	Vacuum Equipment Room				1	10.0	10.0	1.3	13.0	
BG-110	Lost & Found Bicycle Storage Room									
<b>Total Bus Storage Garage</b>					<b>0</b>		<b>19,110.0</b>		<b>19,578.0</b>	<b>210,743 Square Feet</b>

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Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
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GROUP: Fleet Maintenance										
Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
FM-100	Fleet Manager		PO	1	1	11.1	11.1	1.3	14.4	10' x 12' PO
FM-101	Fleet Supervisors	ES		8	1	70	70.0	1.2	84.0	Eight 7' x 8' workstations within one room c/w 8 lockers
FM-102	Garage Clerk		PO	1	1	9.3	9.3	1.5	14.0	10' x 10' PO
FM-103	Mechanics			40						26 mechanics on day shift work within Maintenance Area (all male)
FM-104	Service Lane Staff			20						8 staff on largest shift work within Service Lane Area (50/50 male female split)
FM-105	Body Men			10						8 staff on day shift work within Body Shop (all male)
FM-106	Maintenance Training Room	ES			1	35	35.0	1.3	45.5	To accommodate 15 persons
FM-107	Male Washroom/Showers/Lockers (ITS, FM Stores & Facilities)				1	78	78.0	1.2	93.6	2 urinals, 1 standard toilet, 1 BF toilet, 4 lavatories, 2 showers & 1 BF shower to accommodate 50 men plus 75 full size lockers.
FM-108	Female Washroom/Showers/Lockers (ITS, FM Stores & Facilities)				1	35	35.0	1.3	45.5	1 standard toilet, 1 BF toilet, 2 lavatories plus 1 BF shower to accommodate 10 women plus 20 full size lockers.
FM-109	Union Staff Lunchroom (42 FM, 3 Stores & 6 Facilities)	ES			1	82.0	82.0	1.2	98.4	To accommodate 51 persons c/w Kitchenette & vending machines
	Non-Union Staff Lunchroom (9 ITS & 10 FM)				1	37.0	37.0	1.3	48.1	To accommodate 19 persons c/w Kitchenette & vending machines
	First Aid Room	ES			1	10.0	10.0	1.3	13.0	
FM-110	Articulated Bus Repair Bays			4		150.0	600.0	1.2	720.0	6m x 25m drive-thru bays
FM-111	Regular Bus Repair Bays			22		125.0	2750.0	1.2	3300.0	6m x 21m bays; may be back-in & drive-off type for 30' and 40' buses
FM-112	Internal Driveway			1		2000.0	2000.0	1.0	2000.0	20m wide x 100m long (TBC), c/w 2 bus doors at each end
FM-113	60' Inspection Pit			2		118.0	236.0	1.2	283.2	
FM-114	Degrease & Lube Bay			1		200.0	200.0	1.2	240.0	To accommodate 60' articulated buses
FM-115	Tire Repair Bay			1		100.0	100.0	1.2	120.0	
FM-116	New Tire & Rim Storage Area			1		145.0	145.0	1.2	174.0	Adjacent to Tire Repair Bay; to accommodate storage of 120 new tires
FM-117	Used Tire & Rim Storage Area			1		80.0	80.0	1.2	96.0	remote to Tire Repair Bay and New Tire Storage Area. To have tractor-trailer access.
FM-118	Tool Crib			1		20	20	1.3	26.0	
FM-119	Re-build & Sandblast Room			1		60	60	1.2	72.0	
FM-120	Tool Box Storage Area			1		140	140	1.2	168.0	Multiple open areas distributed throughout Maintenance Shop
FM-121	Compressor Room			1		40	40	1.3	52.0	
FM-122	Maintenance Library			1		15	15	1.3	19.5	c/w 2 computer workstations
FM-123	Electronics Shop			1		90	90	1.2	108.0	
FM-124	Body Shop			1		450	450	1.2	540.0	3 - 6m x 25m drive thru bays for articulated buses
FM-125	Paint Booth			1		175	175	1.2	210.0	Prefabricated Paint Booth to accommodate articulated bus
FM-126	Lube Pump Room			1		49	49	1.3	63.7	
FM-127	Unisex Satellite Washrooms			2		6	12	1.5	18.0	
<b>Total Fleet Maintenance</b>					<b>80</b>		<b>7,529.4</b>		<b>8,666.9</b>	<b>93,293 Square Feet</b>

<b>Key to Symbols Used</b>	OA = Open Area Workstation PO = Private Office (full height walls)	ES = Enclosed Space C = Circulation Areas	EX = Exterior Space
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Functional Program for: City of Windsor Bus Maintenance & Storage Facility	Accommodation Summary	Space Requirements Summary Issue Date: February 11, 2021
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Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
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GROUP: Stores										
ST-100	Storekeepers	OA		6	3	5.2	15.6	1.5	23.4	Storekeepers work on day shift; three 7 x 8' workstations in proximity to Stores Counter
ST-101	Stores				1	1000	1000.0	1.1	1100.0	Secure space
ST-102	Stores Counter Vestibule				1	10	10.0	1.5	15.0	Sliding glass door between Vestibule & Maintenance shop area. 12' long counter c/w roll down security shutter.
ST-103	Printer Copy Area				1	9	9.0	1.5	13.5	
ST-104	Shipping Receiving Area				1	70	70.0	1.2	84.0	1 recessed loading dock with dock leveler, 1 at grade / drive-in dock and one 7 x 8' workstation Included in Stores
ST-105	Large Item Storage Area									
ST-106	Acid Battery Storage Room				1	25.0	25.0	1.3	32.5	
ST-107	Chemical Storage Room				1	20.0	20.0	1.3	26.0	
ST-107	Caged Gas Cylinder Storage				1					Exterior 20' x 20' space
<b>Total Stores</b>				<b>6</b>			<b>1,149.6</b>		<b>1,294.4</b>	<b>13,933 Square Feet</b>

GROUP: Information Technology Systems (ITS)										
<b>ITS to be adjacent Fleet Maintenance and accessible to Bus Garage</b>										
ITS-100	ITS Manager		PO	1	1	11.1	11.1	1.3	14.4	10' x 12' PO
ITS-101	ITS Coordinators		PO	3	3	9.3	27.9	1.5	41.9	10' x 10' PO
ITS-102	Support Specialists Office		ES	5	1	40	40.0	1.3	52.0	Five 7 x 8' workstations within one room
ITS-103	IT Lab / Work Area		ES		1	12	12.0	1.3	15.6	Adjacent Support Specialists c/w 2 work/test benches
ITS-104	ITS Parts Storage Room		ES		1	10	10.0	1.3	13.0	
ITS-105	Meeting Room		ES		1	35	35.0	1.3	45.5	To accommodate 10 to 12 persons
ITS-106	Staff Lockers									Use full size lockers for 3 Support Specialists within Fleet Maintenance Locker Room
ITS-107	Fare Box Maintenance Room		ES		1	30	30.0	1.3	39.0	
ITS-108	UPS Room		ES		1	40	40.0	1.3	52.0	
ITS-109	Satellite Network Closet		ES		4	3.3	13.2	1.3	17.2	Air conditioned space with room for 2 racks
<b>Note: Entire facility to have UPS and Generator power backup</b>										
<b>Total Information Technology Systems</b>				<b>9</b>			<b>219.2</b>		<b>290.5</b>	<b>3,127 Square Feet</b>

GROUP: Facilities										
FA-100	Manager Facilities									Private office within Administration Area
FA-101	Maintenance Staff			6						2 female and 4 male Maintenance Staff work throughout facility; 4 days, 1 afternoon & 1 night shift. Full size lockers can be with Fleet Maintenance Staff lockers.
FA-102	Work Shop		ES		1	180	180.0	1.2	216.0	Secure area with double door access, two workbenches and one 7 x 8' workstation. Secure caged area within workshop for storage of tools & equipment.
FA-103	Janitorial Supply Room		ES		1	12.0	12.0	1.3	15.6	
FA-104	Satellite Janitor's Room		ES		2	8	16.0	1.5	24.0	Minimum of one per floor
FA-105	HVAC Storage Room		ES		1	20	20.0	1.3	26.0	
FA-106	General Storage Room		ES		1	20	20.0	1.3	26.0	
FA-107	Equipment Storage Area		OA		1	55	55.0	1.2	66.0	Space for fork lift, floor cleaner, snow plow & salt hopper and riding lawnmower
<b>Total Facilities</b>				<b>6</b>			<b>303.0</b>		<b>373.6</b>	<b>4,022 Square Feet</b>

<b>Key to Symbols Used</b>	OA = Open Area Workstation PO = Private Office (full height walls)	ES = Enclosed Space C = Circulation Areas	EX = Exterior Space
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Functional Program for: City of Windsor Bus Maintenance & Storage Facility	Accommodation Summary	Space Requirements Summary Issue Date: February 11, 2021
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Function Number	Activity or Space Name	Area Type	Office Type	Staff	No of Spaces	Unit Area in SM	Required Usable Area in SM	Internal Circ. Ratio	Required Floor Usable Area in SM	Comments and/or Remarks
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GROUP: Building Services										
BS-100	Mech Room	ES			1	10.0	10.0	1.3	13.0	Area TBC
BS-101	Electrical Room	ES			1	125.0	125.0	1.2	150.0	Area TBC
BS-102	Sprinkler / Water Meter Room	ES			1	70.0	70.0	1.2	84.0	Area TBC
BS-103	Garage Electrical Room	ES			2	30.0	60.0	1.3	78.0	Area TBC
BS-104	Office Electrical Room	ES			1	15.0	15.0	1.3	19.5	Area TBC
BS-105	Gargage Boiler Room	ES			1	130.0	130.0	1.2	156.0	Area TBC, adjacent exterior walls for ventilation and roof for vents
BS-106	Office Boiler Room	ES			1	55.0	55.0	1.2	66.0	Area TBC, adjacent exterior walls for ventilation and roof for vents
Total Building Services				0			465.0		566.5	6,098 Square Feet

GROUP: Exterior Functions										
EX-100	Car Parking Lot	EX				18.0	0.0	1.7	0.0	Number of spaces TBC; to meet minimum zoning requirements. Electric vehicle charging stations???
EX-101	Visitor Parking Spots	EX				18.0	0.0	1.7	0.0	Number of spaces TBC
EX-102	Disability Parking Spots	EX				30.0	0.0	1.7	0.0	Number of spaces TBC; to meet City of Windsor zoning requirements.
EX-103	Motorcycle Parking	EX				9.0	0.0	1.7	0.0	Number of spaces TBC
EX-104	Covered Bicycle Storage/Parking	EX			1	20.0	20.0	1.5	30.0	Number of spaces TBC
EX-105	Roadways	EX			1		0.0	1.0	0.0	Area TBC
EX-106	Patio Area	EX			1	200.0	200.0	1.0	200.0	Exterior to Office Staff Lunchroom
EX-107	Exterior Garbage / Recycling	EX			1	167.0	167.0	1.5	250.5	Separate bins for cardboard, garbage, scrap metal, blue & green bins. Covered area, secure, shed, 1800 sf.: not heated
EX-108	Exterior Storage	EX			1	37	37.0	1.5	55.5	20'x20'
EX-109	Full Backup Generators	EX			1	250.0	250.0	1.5	375.0	32mx9m footprint, 2 x 900 kW
EX-110	Underground Diesel Fuel Tank	EX			1	0	0.0	0.0	0.0	2 - 100,000 lt underground tanks (TBC)
EX-111	Tank Farm Including:	EX			1	100.0	100.0	1.5	150.0	Area and size of tanks TBC
	10,000 Litre Engine Oil Tank	EX			1					
	10,000 Litre Synthetic Trans. Fluid	EX			1					
	10,000 Litre Waste Engine Oil Tank	EX			1					
	2,500 Litre Auto Transmission Fluid	EX			1					
	4,500 Litre Windshield Washer Fluid	EX			1					
	2,200 Litre Anti-freeze Tank	EX			1					
	2,200 Litre Waste Anti-freeze Tank	EX			1					
EX-116	Switchgear Building	EX			1		0.0	1.0	0.0	Area TBC
EX-115	Transformer Yard	EX			1		0.0	1.0	0.0	Area TBC
Total Exterior Functions				0			774.0		1,061.0	11,421 Square Feet

Key to Symbols Used	OA = Open Area Workstation	ES = Enclosed Space	EX = Exterior Space
	PO = Private Office (full height walls)	C = Circulation Areas	

# Appendix C - Building Condition Assessment Report

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**BUILDING CONDITION ASSESSMENT  
TRANSIT WINDSOR  
3700 NORTH SERVICE ROAD EAST, WINDSOR, ONTARIO**

Prepared for:  
**THE CITY OF WINDSOR**

Prepared by:  
**BOLD ENGINEERING INC.**

Issued: **November 2, 2017**





November 2, 2017

Gabriel Taba  
Corporate Asset Planning  
The City of Windsor  
400 City Hall Square East, Suite 402  
Windsor, Ontario  
N9A 7K6

Dear Mr. Taba,

**Re: 3700 North Service Road East, Windsor, Ontario  
Building Condition Assessment**

Pursuant to your instructions, we enclose our Building Condition Assessment for the above noted property. This report provides a general overview of the building components and systems, including a commentary on the mechanical, electrical, structural and architectural components. In addition, we have identified conditions observed which may result in future capital expenditures above those associated with routine maintenance.

Exclusions and assumptions are detailed in Section 3, and all limiting conditions and qualifications are identified in Section 6.

This report is for the exclusive use and benefit of **The City of Windsor**. BOLD Engineering does not hold reporting responsibility to any other party and does not assume any liability whatsoever to any other party.

We trust this report meets your requirements and we would be pleased to meet and discuss this in detail at your convenience.

Yours truly,

**BOLD ENGINEERING INC.**

Per: Chris Politis, P.Eng.  
Bold Engineering Inc.

Per: Alex Mahavongthapanya, Arch Tech.  
Bold Engineering Inc.

Per: Dimitri Politis, B.Arch.  
Bold Engineering Inc.



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# 1. Executive Summary

This executive summary has been prepared as a quick reference of pertinent facts and estimates of this Building Condition Assessment. Readers are advised to refer to the Report in its entirety.

## 1.1 General Description

The subject property is located at 3700 North Service Road East, Windsor, Ontario. The property is a two storey transit building which consists of bus maintenance & storage area and administrative areas on the second floor. The facility is generally used by Transit Windsor and provides the City of Windsor with the most of its bus transportation services. The exterior walls predominately consist of a brick veneer and a window wall system. The building superstructure is constructed of a concrete block wall, beam and girder system with an open web steel joist and metal roof decking system. The roof is constructed of a built up roof system complete with stone ballast. The building is equipped with various types of heating systems and domestic water service is provided by a gas-fired domestic hot water system. There is a single-stage fire alarm system and partial sprinkler system installed within the building. The building was constructed in 1979.

## 1.2 General Physical Condition

The subject property has a current overall Facility Condition Index and Condition Rating of 0.0% with an Overall Building Condition “Good” classification.

## 1.3 Immediate Issues & Deficiencies

None.

## 1.4 Outstanding Information & Follow Up

- a) Skylights and Other Roof Openings – The single skylight above the reception desk appeared to be original to the building. Replacement within 1 year is recommended as the component significantly passed its typical life expectancy.
- b) Paving, Curbing and Parking – Asphalt paved areas observed in high traffic areas were in poor condition. Replacement within 1 year is recommended as the component significantly passed its typical life expectancy.

## 1.5 Contingency & Escalation

Our cost summaries include a specific contingency allowance of 10% and are priced in current dollars with no provision for escalation.

## 1.6 Planning & Zoning Issues

Planning and zoning issues are excluded from this report.

## 1.7 Environmental Issues

Environmental issues including mould contamination are excluded from this report.





## 2. SITE AND BUILDING PROFILE

### 2.1 Building Profile

Asset Name	Transit Windsor
Asset Address	3700 North Service Road East
Postal Code	N8W 1Y3
Segment	Transit
Construction Year	1979
Gross Floor Area (square feet)	131,696
Elevator(s)	0
# of Floors Above Grade	2
# of Floor Below Grade	0
Sprinklered	Yes
Specialty Equipment Within	No
Required Accessibility	No
Is this a multi-use facility?	No
Floor Plans provided by the Owner	No

### 2.2 Financials

#### 2.2.1 Estimate Replacement Value of the Building

Using the description of the building including type of exterior walls, heating system and sprinkler system provided by the City of Windsor, with associated basic building information such as number of storeys and gross floor area taken from non-as built drawings and high-level general overall measurements, we prepared using the programme “Marshall and Swift”, and Hanscomb Yardsticks for Costing, a high level order of magnitude square foot cost assessment for the likely replacement construction cost estimates for the building. The estimated costs exclude demolition of existing facility, development soft costs of the buildings and land value. The component breakdown provided below is not a replacement cost / repair cost for the current component, but rather a percentage value of the overall building cost as derived using costing tools. Project replacement costs have been provided in other sections of the report.

Components	Component Costs	Percentage
Roof	\$1,299,000	12.90%
Heating Systems	\$574,000	5.70%
Cooling Systems	\$574,000	5.70%
Air Handling Systems	\$393,000	3.90%
Conveying Systems	\$0	0.00%
Building Envelope	\$4,028,000	40.00%
Plumbing	\$574,000	5.70%
Main Electrical Service & Distribution	\$886,000	8.80%
Security/Access Systems	\$483,000	4.80%
Fire Suppression Systems	\$665,000	6.60%
Interior Finishes	\$594,000	5.90%
<b>Total Component Replacement Cost</b>	<b>\$10,070,000</b>	<b>100%</b>

### **3. Purpose & Scope**

The mandate of this project is to provide a general overview of the building systems, including a commentary on the mechanical, electrical, structural and architectural components. In addition, we have identified conditions observed which may result in future capital expenditures above those associated with routine maintenance.

Our Building Condition assessment procedures and documentation are conducted in general accordance with ASTM E 2018 – 08 Standard Guide for Building Condition Assessments: Baseline Building Condition Assessment Process.

#### **3.1 Terms of Reference**

We understand our terms of reference to be as follows:

- a) Co-ordinate the submissions from all consultants and review all documentation provided with a view to integrating the findings, conclusions and recommendations into one due diligence review report.
- b) Visually review the buildings.
- c) Identify any major issues of note and provide resolutions along with any costs involved.
- d) Prepare a report on our findings including the identifications of all the issues and our estimate of the individual capital expenditures required over a 20 year period specifically identifying any immediate action, with a threshold of \$5,000. Items below \$5,000 are considered on-going routine maintenance.
- e) Year 1 is defined at the 12 month period subsequently following the date this report is issued.
- f) Components highlighted in the “Immediate Repairs” Section 1.3 may or may not be deemed a life safety concern and should be prioritized over capital projects outlined in year 1.

#### **3.2 Basis of Analysis**

The assessment of Capital Expenditures required is based on the following:

- a) Building systems failing to meet their performance level.
- b) Building systems that have reached or are projected to reach the end of their productive life cycle within a 20 year period.

##### **3.2.1 Facility Condition Rating (FCR)**

The Facility Condition Ratings are as follows: good (under 5%), fair (5-10%), and poor (over 10%).

##### **3.2.2 Facility Condition Index (FCI)**

The FCI = value of immediate capital needs (Year 0) / total component replacement cost. The FCI is a relative indicator of condition, and should be tracked over time to maximize its benefit.

### 3.3 Component Condition Rating

The following component condition rating definitions are provided by the City of Windsor and are identified on a component by component basis in the Component Summary Table.

Rating	Descriptor	Data Standard
1	Very Good	The component is in very good overall condition with some early stages of deterioration evident, where the deterioration is minor in nature and causing no serviceability problems.
2	Good	The component is in good overall condition, where some deterioration is evident and serviceability is impaired very slightly.
3	Fair	The component is in fair to good overall condition, where deterioration is obvious and serviceability is impaired materially.
4	Poor	The component is in poor overall condition, where deterioration and serviceability impairment are considerable and maintenance costs and risk are relatively high.
5	Very Poor	The component is in very poor overall condition, where deterioration and serviceability impairment are severe. Maintenance costs and risk, including the risk of failure, are substantial and maintenance ineffective to the point such that rehabilitation is the only cost-effective means of restoring serviceability.

### 3.4 Conclusions Methodology

Our conclusions are based on the following:

- a) On-site identification and measurement (where possible) of a specific deficiency item priced accordingly.
- b) Measurement of areas from drawings where available (e.g. roofing) and priced at current replacement cost prevailing unit rates. It should be noted that floor areas and parking counts reported are taken directly from documents provided and detailed quantities will need to be assessed for any tendering purposes. **BOLD Engineering has carried out no independent verification or measurement.**
- c) Information available from maintenance logs relating to mechanical equipment, etc., priced at prevailing replacement costs for similar or equivalent equipment.

We inspected the building on **February 22, 2017** and were accompanied by **Gabriel Taba** and **Tim O'Neil**.

### 3.5 Exclusions

- a) Environmental issues including mould contamination.
- b) Tenant improvement allowances.
- c) Cost estimates are based on the assumption that phenolic foam insulation does not exist in the roof assembly as roof cuts were not performed as part of this review to determine the type of insulation existing.
- d) Expenditure for capital items which are categorized as maintenance or operational in nature.
- e) We have excluded the Americans with Disabilities Act (ADA) accessibility survey as it is not applicable in Canada.
- f) A code review of the property in accordance with the Ontarians with Disabilities Act or any other code review or audit.

- g) Review or comment on tenant leases or tenant lease requirements is not included as part of this Building Condition assessment.
- h) No testing has been performed at any mechanical, electrical or life safety equipment.
- i) This report is not a “Structural Adequacy Report” as defined by the PEO. This report comments only on the existing condition of structural elements based on a random sampling, visually reviewed on the inspection date by the reviewer and makes recommendation for the repair / replacement of these elements based on the current age and visible condition for financial planning purposes only.
- j) The assessment of the mechanical and electrical systems was strictly visual to determine the type of system, age and aesthetic condition. No physical testing or intrusive investigative techniques were used.
- k) Determining the extent of infestation or remedy for treatment, pertaining to any type of pests such as wood damaging organisms, rodents, or insects.

## **4. Immediate Repairs & Capital Reserve Analysis**

Our detailed summaries are enclosed, identifying the following:

- a) Immediate repairs and capital expenditures required.
- b) Capital expenditures, including the major building components/systems requiring replacement/repair to maintain the facility in fully satisfactory operating condition.



**3700 North Service Road**

<b>Security/Access Systems</b>	2.0																						
Building Entry Systems	N/A																						
Surveillance Systems	2							\$40,000															\$40,000
<b>Fire Suppresion Systems</b>	2.0																						
Sprinkler & Standpipe System	2					\$60,000																	\$60,000
Fire Pumps etc.	N/A																						
Fire Alarm System and Voice Communications	2												\$25,000										\$25,000
Heat, Smoke and Carbon Monoxide Detection Devices	2																						
Fire Extinguishers	2																						
Fire Separations and Emergency Evacuation Plans	2																						
<b>Interior Elements</b>	2.1																						
Common Area Interior Walls Finishes	2					\$10,000																	\$10,000
Common Area Interior Floor Finishes	2										\$98,000												\$98,000
Common Area Interior Ceiling Finishes	2					\$14,000																	\$14,000
Common Area Interior Doors	2					\$45,000																	\$45,000
Common Area Specialty Rooms	N/A																						
Common Area Kitchens	N/A																						
Common Area Washrooms	1																						
Private Spaces	2			\$82,000		\$75,000		\$100,000															\$257,000
Private Kitchens	3			\$20,000																			\$20,000
Private washrooms	3			\$10,000																			\$10,000
<b>Accessibility and Other Issues</b>	2.4																						
Building Accessibility	2																						
Platforms and Loading Docks	N/A																						
Topography	2																						
Storm Water Drainage	3																						
Access and Egress	2																						
Paving, Curbing and Parking	4	\$613,000																					\$613,000
Walkways, Sidewalks and Exterior Stairs	2					\$10,000																	\$10,000
Landscaping and Appurtenances	2																						
Site Signage	1																						
Site Lighting	3			\$15,000																			\$15,000
Fencing	3			\$55,000																			\$55,000
Retaining Wall	N/A																						
<b>Pools</b>	N/A																						
Pool Area Finishes	N/A																						
Change Rooms	N/A																						
Pool Equipment	N/A																						
<b>Specialized Equipment &amp; Electrical</b>	N/A																						
Specialy Equipment	N/A																						
Specialty Electrical	N/A																						
<b>Subtotal</b>		\$0	\$613,000	\$225,000	\$1,344,000	\$0	\$709,000	\$0	\$140,000	\$0	\$0	\$98,000	\$0	\$25,000	\$0	\$0	\$1,048,000	\$370,000	\$0	\$0	\$0	\$0	\$4,572,000
Contingency (10%)		\$0	\$61,300	\$22,500	\$134,400	\$0	\$70,900	\$0	\$14,000	\$0	\$0	\$9,800	\$0	\$2,500	\$0	\$0	\$104,800	\$37,000	\$0	\$0	\$0	\$0	\$457,200
<b>Subtotal Including Contingency</b>		\$0	\$674,300	\$247,500	\$1,478,400	\$0	\$779,900	\$0	\$154,000	\$0	\$0	\$107,800	\$0	\$27,500	\$0	\$0	\$1,152,800	\$407,000	\$0	\$0	\$0	\$0	\$5,029,200
<b>Escalation Allowance</b>		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	\$0
Escalation Total		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$0
<b>Total Estimated Financial Projections</b>		\$0	\$674,300	\$247,500	\$1,478,400	\$0	\$779,900	\$0	\$154,000	\$0	\$0	\$107,800	\$0	\$27,500	\$0	\$0	\$1,152,800	\$407,000	\$0	\$0	\$0	\$0	\$5,029,200
\$/Area/Year		0.00	5.12	1.88	11.23	0.00	5.92	0.00	1.17	0.00	0.00	0.82	0.00	0.21	0.00	0.00	8.75	3.09	0.00	0.00	0.00	0.00	\$7.64

Total Net Sq. Ft.	131,696
Total # Suites/Units	-
Facility Condition Index & Condition Rating - Overall Building Condition # of Buildings	0.00%

Year Built	1979
Age (yrs)	38

Uninflated (Year 1-20)	
\$ 251,460	Avg. /Yr.
\$ 1.91	Avg./sf/Yr

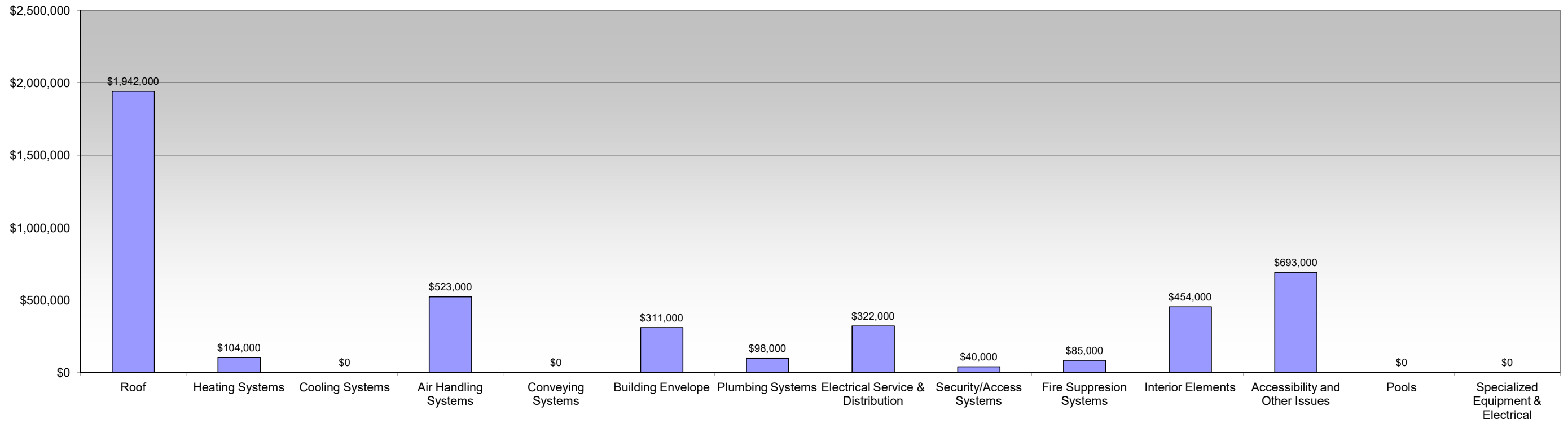
Reserve Term	20
<b>NOTES:</b>	
1) Contingency of 10% has been carried to cover unforeseen items & cost increases.	
2) Costs in 2016 dollars with no provision for escalation.	
3) HST is excluded.	
Expenditures should be reviewed regularly due to the current volatile market conditions, firstly to ensure adequacy and secondly to take advantage of competitive pricing in situations where the replacement item may have a two/three year time window.	



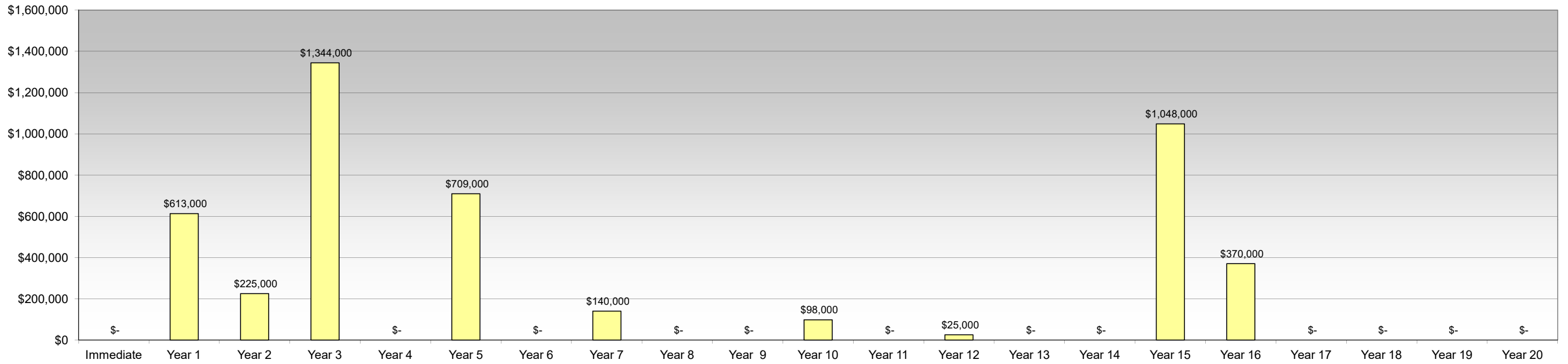
3700 North Service Road

Category	Immediate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Total
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
Roof	-	-	-	977,000	-	-	-	-	-	-	-	-	-	-	-	965,000	-	-	-	-	-	\$1,942,000
Heating Systems	-	-	20,000	30,000	-	54,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$104,000
Cooling Systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$0
Air Handling Systems	-	-	-	55,000	-	15,000	-	-	-	-	-	-	-	-	-	83,000	370,000	-	-	-	-	\$523,000
Conveying Systems	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$0
Building Envelope	-	-	15,000	90,000	-	206,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$311,000
Plumbing Systems	-	-	-	-	-	98,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$98,000
Electrical Service & Distribution	-	-	190,000	10,000	-	122,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$322,000
Security/Access Systems	-	-	-	-	-	-	-	40,000	-	-	-	-	-	-	-	-	-	-	-	-	-	\$40,000
Fire Suppression Systems	-	-	-	-	-	60,000	-	-	-	-	-	-	25,000	-	-	-	-	-	-	-	-	\$85,000
Interior Elements	-	-	-	112,000	-	144,000	-	100,000	-	-	98,000	-	-	-	-	-	-	-	-	-	-	\$454,000
Accessibility and Other Issues	-	613,000	-	70,000	-	10,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$693,000
Pools	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$0
Specialized Equipment & Electrical	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\$0
<b>Total</b>	-	613,000	225,000	1,344,000	-	709,000	-	140,000	-	-	98,000	-	25,000	-	-	1,048,000	370,000	-	-	-	-	\$4,572,000
<b>Total Including Contingency (10%)</b>	-	674,300	247,500	1,478,400	-	779,900	-	154,000	-	-	107,800	-	27,500	-	-	1,152,800	407,000	-	-	-	-	\$5,029,200

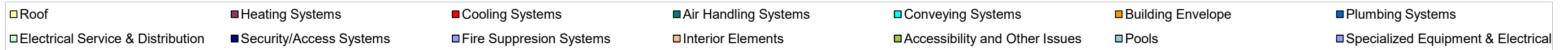
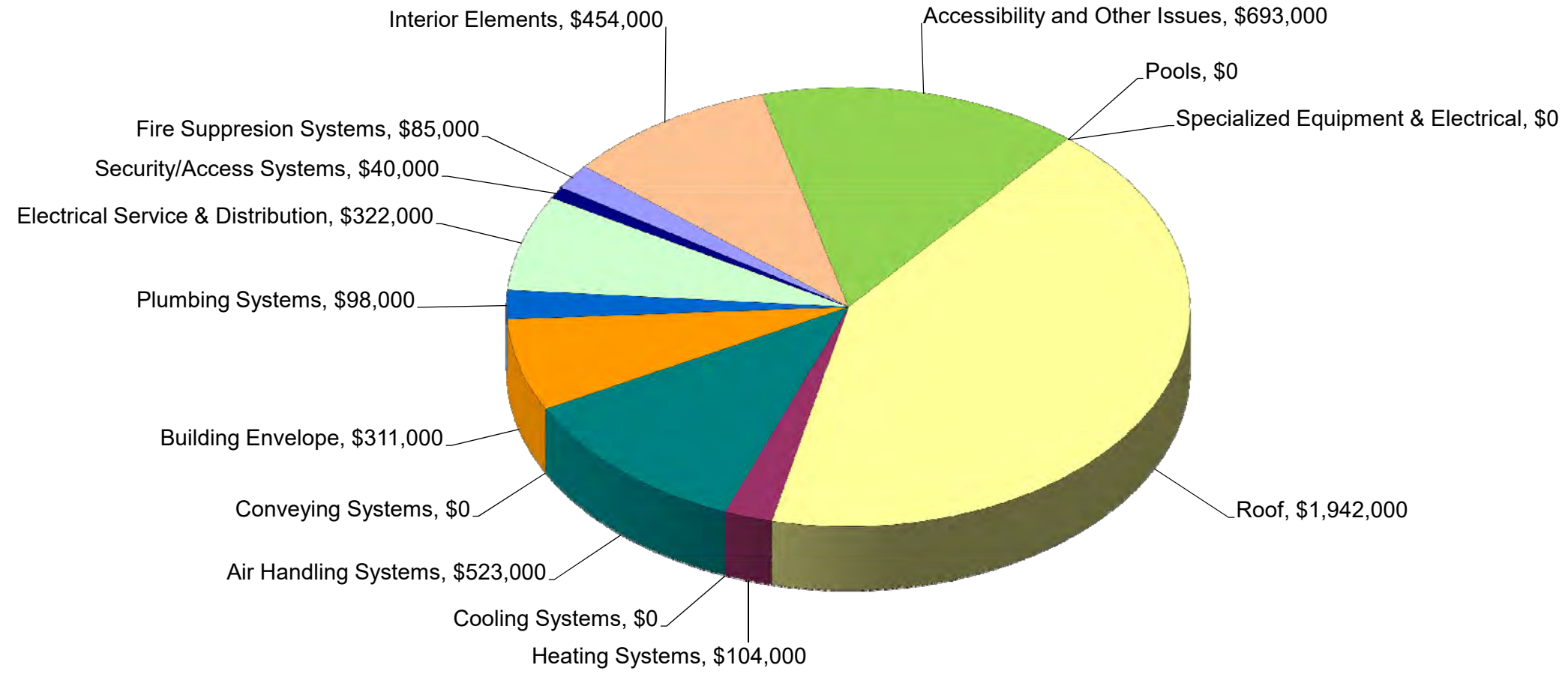
Cost Breakdown by Category



Cost Breakdown by Year



Cost Breakdown by Category



## 5. Component Description and Condition

This section of the report describes the building and site components that were visually surveyed during our site inspection and that are included in the study. Where required, we have elaborated on particular components that deviate from a standards remove-and-replace scenario or are of major impact as expenditure in the Building Condition Assessment. Unless otherwise noted below, the building components are wearing as anticipated, in fair condition and are based on normal life expectancy and actual ages.

### 5.1 Roof

Fair (3.3)

#### 5.1.1 Main Roofs

<p><b>Description</b></p> <p>The main roof is divided into a high roof and lower roof. Both roofs are constructed of a modified bitumen system with stone ballast. The main roof was damaged by a recent tornado. Damage was noticeable particularly at the southwest corner of the building. Isolated repairs have been observed in this area of the roof and was reported that additional repairs will be done in the future. Such areas were outlined with spray paint with a number beside the area.</p> <p>The east lower roof is of similar construction to the high roof and consists of a modified bitumen system with stone ballast. It has been reported that the roof was replaced in 2012.</p> <p>The perimeter parapet wall cladding is constructed with a prefinished metal capping. Damaged capping was found on the lower roof at the front of the building. Deficiencies within the system include a non-continuous water tight seal constructed with the flashing system. Water ingress around the damage was not reported however, it is recommended to repair immediately to prevent building superstructure damage. Overall, the metal capping appeared to be in fair condition.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979, 2012</p>
<p><b>Typical Life Span:</b> 20</p>	<p><b>Remaining Life:</b> 3, 15</p>	<p><b>Current Effective Age:</b> 17, 5</p>
<p><b>Recommendations</b></p> <p>This item has been deferred, where possible, to extend its normal life span. Isolated repairs can continue on an as-needed basis where damage has occurred from the tornado however, full replacement is recommended based on the life span. \$977,000 has been allocated for the replacement of the high roof which is recommended to be replaced in year 3. A budget of \$965,000 has been allocated for replacement of the lower roof in year 15. Appropriate costs are carried for all flat roofs.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 126,696sf</p>	<p><b>Capital Cost:</b> \$1,942,000</p>



	
<p>Access point to main roof</p>	<p>Overview of main roof</p>
	
<p>Overview of lower roof</p>	<p>Damaged flashing at lower roof</p>





### **5.1.2 Canopy Roofs**

Not Applicable.

### 5.1.3 Rain Water Drainage

<p><b>Description</b></p> <p>The building's main water drainage system consists of roof drains strategically placed to allow water and melted snow to drain into the building's leader lines which were mostly hidden behind interior finishes. Various types of roof drains were observed throughout the main roof which suggests that the roof drains have been replaced on an as-needed basis. Minor deficiencies include exposed roof drains and damaged drain caps. There were no reported problems with the actual drainage system. Overall, the roof drains appeared to be in fair condition with normal signs of wear. No significant signs of deterioration were present.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 2</p>	<p><b>Current Effective Age:</b> 33</p>
<p><b>Recommendations</b></p> <p>This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Exposed roof drains are recommended to be replaced immediately to prevent drainage problems. This is considered under on-going routine maintenance.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Exposed roof drain on flat roof</p>	<p>Roof drain on flat roof</p>	

### 5.1.4 Skylights and Other Roof Openings


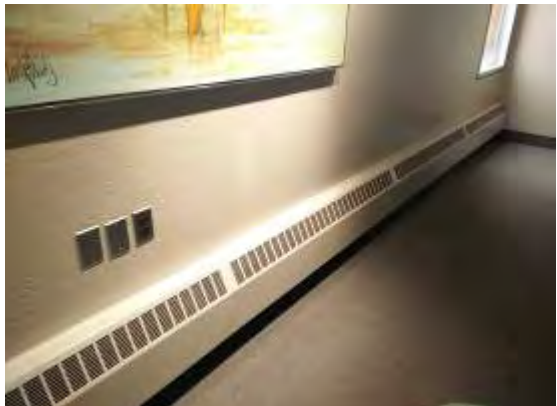
<p><b>Description</b>          There is one (1) skylight located above the main reception desk. The skylight is made up of a translucent plexiglass dome with a metal frame and is mounted on an 8” curb. The skylight appeared to be original to the building and was in poor condition with extensive wear from the exterior elements. There are no issues with the skylight however, it has well passed its typical life span and is recommended to be replaced.</p>		
<p><b>Component Rating:</b> Poor (4)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 20</p>	<p><b>Remaining Life:</b> 1</p>	<p><b>Current Effective Age:</b> 19</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. This is considered under on-going routine maintenance.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Single skylight above reception desk</p>	<p>Skylight seen from interior</p>	




## 5.2 Heating Systems





Good (2.6)

### 5.2.1 Primary Heating



<p><b>Description</b></p> <p>The primary heating source for the facility is a hot water heating (hydronic) system which provides heat to only the administrative areas of the building. The system consists of one (1) "A.O. Smith" hot water boiler located in the mechanical room of the building and distributes hot water to heat emitting units in the form of fin tube radiators. Other components include hot water flow pumps, insulated heating piping and exhaust fan system.</p> <p>Fin tube radiators were observed within the administrative areas and were typically floor mounted. No major deficiencies were found with the heat emitting units. The radiators were in good condition.</p> <p>The primary heating system appeared to be in good and working condition during the assessment. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 25</p>	<p><b>Remaining Life:</b> 2</p>	<p><b>Current Effective Age:</b> 23</p>
<p><b>Recommendations</b></p> <p>Its typical lifespan is 25 years however it has already passed its typical life expectancy as is still observed to be in fair and working condition. Replacement of the boiler can be deferred to year 2. Other primary heating components can be replaced on an as-needed basis.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 1</p>	<p><b>Capital Cost:</b> \$20,000</p>
		
<p>Hot water boiler</p>	<p>Fin tube radiators in boardroom</p>	

	
<p>Fin tube radiators in office</p>	



### 5.2.2 Supplementary Heating

<p><b>Description</b>          Several gas-fired unit heaters were found within the bus storage. Suspended gas-fired tube heaters were found within the bus maintenance areas which ran the length of the space. The units were observed from ground level and specifications could not be determined however, appeared to be in good and working condition. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 20</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 15</p>
<p><b>Recommendations</b>          Its typical lifespan is 25 years however it has already passed its typical life expectancy as is still observed to be in good condition. Replacement can be deferred to year 5. All unit/tube heaters can be replaced on an as-needed basis.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$30,000</p>
		
<p>Unit heater</p>	<p>Unit heater</p>	
		
<p>Gas-fired tube heaters</p>	<p>Gas-fired tube heaters</p>	



### 5.2.3 Pumps

<p><b>Description</b>          A “Bell &amp; Gossett” circulating pump was found within the mechanical room. The pump was found pushing the heated water supply to other mechanical components. The pump was rated 1/6HP and appeared to be in good and working condition. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1999</p>
<p><b>Typical Life Span:</b> 20</p>	<p><b>Remaining Life:</b> 2</p>	<p><b>Current Effective Age:</b> 18</p>
<p><b>Recommendations</b>          Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. This is considered under on-going routine maintenance.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Circulating pump</p>		<p>Pump specification label</p>

### 5.2.4 Building Automation & Controls

<p><b>Description</b>          The building HVAC system is controlled by wall mounted programmable thermostats. All hydronic heating is controlled by BAS, while all packaged heating/cooling rooftop units &amp; interior make up air units are individually controlled by wall mounted thermostats. A unitary controller was found in the mechanical room which is a programmable unit to adjust HVAC settings. Overall, the systems appeared to be in good and working condition. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 30</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 25</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. An allowance is carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 13,000sf</p>	<p><b>Capital Cost:</b> \$24,000</p>
		
<p>Protected thermostat</p>	<p>Unitary controller</p>	

**5.2.5 Distribution System**

<p><b>Description</b></p> <p>The building is equipped with galvanized ductwork for supply and return exhaust distribution systems typically found within the administrative and maintenance areas. The majority of the galvanized ductwork was visible within the bus maintenance areas.</p> <p>Supply air diffusers were found throughout the building and were found in various sizes as shown in the pictures below. Typical diffusers include and silhouette type found on the second floor administrative area. The distribution system where visible, appeared to be in good condition. No significant signs of deterioration were present.</p> <p>The majority of the hydronic distribution system was hidden behind interior finishes and could not be evaluated. Where visible, the distribution lines were insulated. With no issues reported, it is assumed that the system is working as intended. It has been noted that excessive residue was observed above the fin tube radiator located in the sprinkler room. Further investigation is recommended.</p>		
<b>Component Rating:</b> Fair (3)		<b>Installation Date:</b> 1979
<b>Typical Life Span:</b> 35	<b>Remaining Life:</b> 3	<b>Current Effective Age:</b> 32
<p><b>Recommendations</b></p> <p>Replacement of ductwork does not truly occur unless damages have been observed or the sizing is insufficient for the air handling unit provided. This item is anticipated for repairs and/or replacement during the study period. An allowance is carried for general repairs and/or replacements to the hydronic distribution system over the study period.</p>		
<b>Project Breakdown</b>	<b>QTY:</b> Allowance	<b>Capital Cost:</b> \$30,000
		
Excessive residue above heat emitting radiator	Fin tube radiators	

	
<p>Galvanized steel ductwork distribution</p>	<p>Ductwork distribution</p>

### **5.3 Cooling Systems**

N/A

#### **5.3.1 Air Conditioning**

Refer to section 5.4.1 – *Air Handling Units* for Air Conditioning.

#### **5.3.2 Terminal Self-Contained Units**

Not applicable.

#### **5.3.3 Chillers, Towers, Exchangers etc.**



Not applicable.




**5.4 Air Handling Systems**



Good (2.0)

**5.4.1 Air Handling Units**

<p><b><u>Description</u></b>          There are two several gas-fired “EngA” make up air units located on the high roof of the facility which provides fresh tempered air to the maintenance areas of the building. Several “Reznor” make up air units were observed integrated within the ductwork distribution system. The interior units were typically suspended and were observed from ground level. The interior units appear to be original to the building and were in fair condition with normal wear. The components appear to be in good and working condition. No significant signs of deterioration were present. No issues were reported by the site representative.           All HVAC equipment is connected to the building automation system (BAS).</p>		
<p><b><u>Component Rating:</u></b> Good (2)</p>		<p><b><u>Installation Date:</u></b> 1979, 2008</p>
<p><b><u>Typical Life Span:</u></b> 25</p>	<p><b><u>Remaining Life:</u></b> 3, 16</p>	<p><b><u>Current Effective Age:</u></b> 22, 9</p>
<p><b><u>Recommendations</u></b>          The interior make up air units have been deferred, where possible, to extend its normal life span. A budget of \$55,000 has been allocated for the replacement of these units and is recommended to be replaced in year 3. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried. Regular maintenance such as air filter replacement can be done on an as-needed basis.</p>		
<p><b><u>Project Breakdown</u></b></p>	<p><b><u>QTY:</u></b> Allowance</p>	<p><b><u>Capital Cost:</u></b> \$100,000</p>
		
<p>Make up air unit</p>	<p>Interior make up air unit</p>	

	
Interior make up air unit	




### 5.4.2 Rooftop Units

<p><b>Description</b>          There are two (2) gas-fired “Trane” rooftop units located on the high rooftop of the facility. The units have a maximum output of 324MBH. The components appear to be in good and working condition with normal signs of wear from exterior elements. Minor surface corrosion was observed between the mounting curb and bottom of RTU flashing. No significant signs of deterioration were present. No issues were reported by the site representative.          All HVAC equipment is connected to the building automation system (BAS).</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 2009</p>
<p><b>Typical Life Span:</b> 25</p>	<p><b>Remaining Life:</b> 15</p>	<p><b>Current Effective Age:</b> 8</p>
<p><b>Recommendations</b>          Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried. Regular maintenance such as air filter replacement can be done on an as-needed basis.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 2</p>	<p><b>Capital Cost:</b> \$83,000</p>
		
<p>Rooftop unit</p>	<p>Rooftop unit</p>	




### 5.4.3 Exhaust Systems

<p><b>Description</b></p> <p>There are approximately 25 exhaust fan systems located on both the high and low rooftops of the building to move vehicle exhaust fumes to the exterior as well as from various mechanical components such as the make up air units. Each exhaust fan was found to be manufactured by “Greenheck” and was noted to be indicated with a number. The exhaust fans ranged from 1/4HP to 3/4HP.</p> <p>Other various exhaust vents are installed throughout the building to exhaust air from the washrooms and common areas. The fans were reported to be in working condition with some minor visible denting noted on several exhaust fans and exterior vents. Original rooftop exhaust vents exhibit extensive surface corrosion and wear.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 2008</p>
<p><b>Typical Life Span:</b> 25</p>	<p><b>Remaining Life:</b> 16</p>	<p><b>Current Effective Age:</b> 9</p>
<p><b>Recommendations</b></p> <p>Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried. Original exhaust systems and vents are recommended to be replaced within 3 years.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$75,000</p>
		
<p>Washroom exhaust fan</p>	<p>Various exhaust fans on rooftop</p>	
		
<p>Centrifugal exhaust fan on rooftop</p>	<p>Large exhaust vent</p>	

**5.4.4 Fans, blowers, dampers etc.**

<p><b>Description</b>          Several fans were found within the facility. A ceiling fan was located above the main reception desk to circulate air within the area. Other fans typically exhaust stale air from the mechanical rooms to the exterior of the building. The component condition is in good working order. No significant signs of deterioration were present. No issues were reported by the site representative.</p> <p>Exterior louvers were constructed of a pre-manufactured metal system and generally appeared to be in good condition.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 25</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 20</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. An allowance is carried for components to be replaced.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$15,000</p>
		
<p>Fan above reception desk</p>	<p>Exhaust fan to exterior</p>	
		
<p>Louver</p>		

### 5.4.5 Other Mechanical Components

<p><b>Description</b></p> <p>There are two commercial size heat recovery ventilators (HRV) located on the east side of the facility. The units appear to be in good and working condition.</p> <p>A rotary screw air compressor system was found above the oil room and provides the facility with compressed air for pneumatic tools within the bus maintenance area. The system consists of a control panel, compressor tank, pressure check and release valves. The system appeared to be in good and working condition.</p> <p>Facility fuel storage tanks were found in the oil room and consist of 8 tanks with a total capacity of 90,000L. The tanks appeared to be in good condition with normal wear.</p>		
<b>Component Rating:</b> Good (2)		<b>Installation Date:</b> 2008
<b>Typical Life Span:</b> 25	<b>Remaining Life:</b> 16	<b>Current Effective Age:</b> 9
<p><b>Recommendations</b></p> <p>The life spans for this component vary due to the various mechanical components, repairs and/or replacements are anticipated during the study period. A general allowance is carried for replacement of the other mechanical components. The components can be replaced on an as-needed basis.</p>		
<b>Project Breakdown</b>	<b>QTY:</b> Allowance	<b>Capital Cost:</b> \$250,000
		
Commercial size HRV		Compressor system
		
Compressor system		Fuel storage tanks



## **5.5 Conveying Systems**

N/A


### **5.5.1 Elevators & Lifts**

Not applicable.

**5.6 Building Envelope**



Good (2.2)



**5.6.1 Building Substructures**

<p><b>Description</b>          The building's substructure could not be assessed throughout the facility due to interior flooring finishes. No visible foundation walls were observed on the exterior of the building. The building's footings are not visible as they are concealed below grade level. While the condition of the footings and foundation walls could not be confirmed, it is assumed that the substructure is functioning as intended.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 75</p>	<p><b>Remaining Life:</b> 37</p>	<p><b>Current Effective Age:</b> 38</p>
<p><b>Recommendations</b>          This item is not anticipated for repairs or replacement during the study period. Minor repairs (if any) are considered under on-going routine maintenance.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Covered concrete slab on grade</p>		



### 5.6.2 Building Superstructure



<p><b>Description</b></p> <p>The building's superstructure where visible consists of a concrete block wall system around the exterior and a structural steel column system within the interior of the building. The concrete block superstructure wherever observed was found to be in good condition. No major step cracking or deficiencies were observed.</p> <p>Large steel columns mounted on painted concrete bases were observed in the bus storage area. These steel columns are in good condition with no major signs of deficiencies. No deficiencies were noted in the metal deck system, so the superstructure is believed to be in stable condition.</p> <p>Other superstructure components found on site include concrete floor slabs that are seen within the bus maintenance and storage areas. The concrete floor slab within the storage area appears to be exposed with bus guidelines and the floor slab within the maintenance area was noted to be coated with waterproofing. The concrete elements were in good condition. Overall, no anomalies were observed or reported that would suggest the structural components are not functioning as intended.</p> <p>The roof superstructure where visible consisted of an open web steel joist (OWSJ) complete with a metal decking system. No issues were reported with the roof. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<b>Component Rating:</b> Good (2)		<b>Installation Date:</b> 1979
<b>Typical Life Span:</b> 75	<b>Remaining Life:</b> 37	<b>Current Effective Age:</b> 38
<p><b>Recommendations</b></p> <p>This item is not anticipated for repairs or replacement during the study period. Minor repairs (if any) are considered under on-going routine maintenance.</p>		
<b>Project Breakdown</b>	<b>QTY:</b> N/A	<b>Capital Cost:</b> N/A
		
Open web steel joist and metal decking system		Close up of OWSJ in mechanical mezzanine

	
<p>Structural concrete block wall</p>	<p>Highlighted steel columns in garage bay</p>


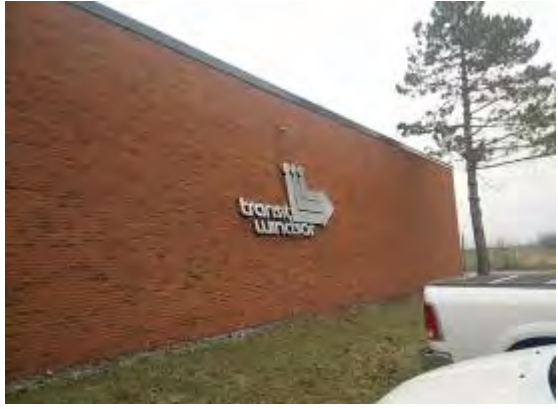


### 5.6.3 Canopies & Overhangs

Not applicable.



#### 5.6.4 Interior Stairs and Railing Systems

<p><b>Description</b></p> <p>There are two staircases provided for the facility. The staircase structures are constructed of a prefinished metal stringer system. The main staircase was finished with ceramic tile treads. The secondary staircase was finished with vinyl tile treads and abrasive stripping to provide additional traction. The handrail system was constructed of prefinished metal handrails installed on both sides of the staircase. Both staircases provided access from the first floor to roof level. There were no visible signs of deficiencies noted during the site visit. Overall, no anomalies exist that would suggest the staircase structure is not functioning as intended.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 75</p>	<p><b>Remaining Life:</b> 37</p>	<p><b>Current Effective Age:</b> 38</p>
<p><b>Recommendations</b></p> <p>This item is not anticipated for repairs or replacement during the study period. Minor repairs and replacement (if any) are considered under on-going routine maintenance.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Interior stairs</p>	<p>Interior stairs</p>	

### 5.6.5 Cladding System

<p><b>Description</b></p> <p>The exterior cladding system predominately consists of a masonry brick veneer. Control joints were installed at appropriate intervals to allow building envelope movement. The brick veneer overall was in good condition. Minor mortar deterioration was noted at the lower brick courses at the east employee entrance.</p> <p>Masonry ties within the wall assembly are not visible for review. However, intrusive testing would be required to conform if there are latent defects that were not visible during our site review.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 30</p>
<p><b>Recommendations</b></p> <p>This item has been deferred, where possible, to extend its normal life span. Brick repointing can be done on an as-needed basis. An allowance is carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$30,000</p>
		
<p>Deteriorating mortar joints</p>	<p>Brick veneer at front of building</p>	
		
<p>Brick veneer at front of building with control joints</p>	<p>Brick veneer on side of building</p>	

### 5.6.6 Exterior Doors

<p><b>Description</b></p> <p>The majority of the exterior doors consist of large overhead garage doors to accommodate the transit buses. A public entrance was found on the southwest side of the building and typically consists of an aluminum framed insulated storefront style unit with a dual leaf vestibule configuration. The employee entrance located on the southeast side of the building was of similar construction and appeared to be in good condition. Other exterior doors include hollow metal doors in a metal frame which provide access to various mechanical rooms and means of egress.</p> <p>Overall, the exterior doors are generally original to the building and were in fair condition where reviewed. All sensors and door opening mechanisms appear to be functional wherever tested and normal signs of wear and tear were observed on the public entrance doors. No anomalies existed that would suggest immediate replacement. No significant signs of deterioration or damage were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 3</p>	<p><b>Current Effective Age:</b> 32</p>
<p><b>Recommendations</b></p> <p>This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 25</p>	<p><b>Capital Cost:</b> \$90,000</p>
		
<p>Main entrance</p>	<p>Exterior door on rooftop</p>	





Large overhead garage doors for buses on west perimeter






Large overhead garage doors on east perimeter

### 5.6.7 Exterior Windows

<p><b>Description</b></p> <p>The exterior windows consist of mixture of a window wall system predominately installed on the south and west perimeters of the building. The windows are aluminum framed with insulated glazing units. The majority of the windows are fixed and non-operational. Overall, the windows appeared to be in good condition.</p> <p>No wide-spread window pane failure was observed for the sampling of windows that were observed on site. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1997</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 30</p>
<p><b>Recommendations</b></p> <p>This item has been deferred, where possible, to extend its normal life span. The exterior windows are anticipated for replacement during the study period. An allowance is carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$86,000</p>
		
<p>Overview of windows at front of building</p>		<p>West perimeter window wall system</p>
		
<p>Second floor window wall looking out to roof</p>		<p>Window wall system at front entrance</p>

### 5.6.8 Exterior Sealants and Caulking

<p><b>Description</b></p> <p>The sealants at the building joints and around the perimeter of the windows, doors and louvers were observed to in fair condition with normal wear observed. All exterior sealants observed on the window wall system from grade level that were significantly higher than eye level were not evaluated. With no issues reported, it is assumed that the exterior sealants are functioning as intended. No significant signs of deterioration were present. No other issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1994</p>
<p><b>Typical Life Span:</b> 15</p>	<p><b>Remaining Life:</b> 2</p>	<p><b>Current Effective Age:</b> 13</p>
<p><b>Recommendations</b></p> <p>This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$15,000</p>
		
<p>Sealant at brick veneer and flashing</p>		<p>Sealant at exterior cladding control joint</p>
		
<p>Sealant window frame and flashing</p>		





### **5.6.9 Recreational Facilities & Amenities**

Not applicable.



### 5.6.10 Incoming Water Services

<p><b>Description</b>          Domestic cold water is provided from the local municipality from the cold water connection to the building. The condition of the buried and concealed piping cannot be evaluated visually. No significant signs of deterioration were observed on the water piping. No issues were reported by the site representative. The incoming water service components were in good condition.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 40</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 35</p>
<p><b>Recommendations</b>          Its typical lifespan is 40 years however it has already passed its typical life expectancy as is still observed to be in good condition. Replacement can be deferred to year 5. Appropriate costs are carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$25,000</p>


### 5.6.11 Incoming Electrical Services

<p><b><u>Description</u></b>          The incoming electrical service enters the building below grade from the local utility's provider. Underground cables run through the site to distribute power to the electrical room. These cables are owned and maintained by the city. No anomalous conditions were observed that would indicate that the system is not functioning as intended.</p>		
<p><b><u>Component Rating:</u></b> Good (2)</p>		<p><b><u>Installation Date:</u></b> 1979</p>
<p><b><u>Typical Life Span:</u></b> 40</p>	<p><b><u>Remaining Life:</u></b> 5</p>	<p><b><u>Current Effective Age:</u></b> 35</p>
<p><b><u>Recommendations</u></b>          Incoming electricity services to the building are maintained by the local utility. No capital costs by the city are anticipated.</p>		
<p><b><u>Project Breakdown</u></b></p>	<p><b><u>QTY:</u></b> N/A</p>	<p><b><u>Capital Cost:</u></b> N/A</p>


**5.6.12 Natural Gas**

<p><b>Description</b></p> <p>The gas utility supply enters the building below grade. The gas piping is concealed below grade and is not accessible for visual evaluation. No significant signs of deterioration were observed on the visible portions.</p> <p>The incoming gas service complete with gas meter is located on the south side of the building and is painted light blue and white. Several portions of the gas piping that lead to the rooftop units were observed to have surface corrosion. Some gas piping was observed to be flexible.</p> <p>Gas service for the building is provided by the local service provider.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 40</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 35</p>
<p><b>Recommendations</b></p> <p>Gas piping downstream of the gas meter is recommended to be painted yellow. This can be done at a cost below the threshold limit of this report. Repairs to the gas piping in the building and up to the gas meter can be performed on an as-needed basis under operations and maintenance. No costs are included for repairs or replacements.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Gas piping at rooftop unit</p>	<p>Surface corrosion on incoming gas lines</p>	
		
<p>Incoming natural gas</p>	<p>Gas meter</p>	

**5.6.13 Sanitary Sewer**

<b>Description</b>		
The sanitary piping exits the building below grade. The pipes are concealed below grade and not accessible for visual evaluation. No anomalous conditions were observed or reported that would suggest this systems is not functioning as intended.		
<b>Component Rating:</b> Good (2)	<b>Installation Date:</b> 1997	
<b>Typical Life Span:</b> 40	<b>Remaining Life:</b> 5	<b>Current Effective Age:</b> 35
<b>Recommendations</b>		
This item has been deferred, where possible, to extend its normal life span. We recommend that the drains be flushed and scoped routinely. This maximizes the service life of the piping and also helps identify repair needs. A budget for repairs has been included in year 5.		
<b>Project Breakdown</b>	<b>QTY:</b> Allowance	<b>Capital Cost:</b> \$30,000
		
Sanitary sewer		



**5.6.14 Storm Sewer**

<p><b>Description</b>          The storm sewer connects to the main municipal connection below grade. The condition of the buried and concealed piping cannot be evaluated visually. Catch basins were observed within the employee and public parking areas of the property. No significant signs of deterioration were observed. No anomalous conditions were observed or reported that would suggest this systems is not functioning as intended.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 40</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 35</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. We recommend that the drains be flushed and scoped routinely. This maximizes the service life of the piping and also helps identify repair needs. A budget for repairs has been included in year 5.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$35,000</p>
		
<p>Sanitary sewer</p>		



## 5.7 Plumbing Systems

Good (2.0)

### 5.7.1 Main Incoming Domestic Water



<p><b>Description</b>          The incoming domestic water main service enters the building below grade in storage room located in the southwest corner of the building. The water main then feeds to the main shut-off and meter assembly and then is distributed throughout the building. The domestic water service has a backflow preventer (BFP) assembly installed. No signs of deterioration were observed on the water piping or main shut off.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 40</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 35</p>
<p><b>Recommendations</b>          Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$8,000</p>
		
<p>Incoming domestic water shut off</p>		<p>Immediate water distribution</p>

### 5.7.2 Domestic Hot Water Heating System

<p><b>Description</b>          The domestic hot water (DHW) is supplied by a gas-fired “John Wood” hot water tank located in the utility room. The tank has a capacity of 151L. All immediate piping, valves and fittings appear to be in good condition. The immediate piping was noted to not be insulated. No anomalous conditions were observed or reported that would suggest this system is not functioning as intended.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 2010</p>
<p><b>Typical Life Span:</b> 15</p>	<p><b>Remaining Life:</b> 8</p>	<p><b>Current Effective Age:</b> 7</p>
<p><b>Recommendations</b>          It is recommended to insulate all immediate hot water distribution lines from the hot water tank in the immediate year to increase efficiency. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. This is considered under on-going routine maintenance.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Domestic water heater</p>		<p>Exhaust vent from HWT</p>







### 5.7.3 Water Distribution System

<b>Description</b>		
The plumbing piping system consists of copper piping to distribute hot and cold water throughout the building's plumbing fixtures. The majority of the lines were hidden behind interior finishes or insulated throughout and were not readily available for review. All plumbing piping where visible typically within the washrooms, valves and fittings appear to be in good condition. No anomalous conditions were observed or reported that would suggest this system is not functioning as intended.		
<b>Component Rating:</b> Good (2)		<b>Installation Date:</b> 1979
<b>Typical Life Span:</b> 35	<b>Remaining Life:</b> 5	<b>Current Effective Age:</b> 30
<b>Recommendations</b>		
This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. A general allowance has been carried for isolated repairs and/or replacements over the study period.		
<b>Project Breakdown</b>	<b>QTY:</b> 131,696sf	<b>Capital Cost:</b> \$33,000
		
Immediate distribution lines	Flexible piping under sink	
		
Flexible piping under sink		

### 5.7.4 Domestic Water Pumps

Not applicable.

### 5.7.5 Building Sanitary Waste Management System



<p><b>Description</b>          The building's sanitary waste management system consists of ABS plastic and copper piping where visible underneath washroom sinks. The majority of the sanitary lines not visible as they are hidden below grade.          Specialty sanitary drains were located within the bus maintenance area. The waste collection from these drains is collected in a buried oil interceptor and is then merged with the sanitary drain system leaving the building.          No significant signs of deterioration were present. No issues were reported by the site representative therefore it is assumed that the system is draining appropriately.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 30</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. A general allowance has been carried for isolated repairs and/or replacements over the study period.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$45,000</p>
		
<p>Sanitary lines</p>	<p>Sanitary lines</p>	
		
<p>Sanitary lines</p>	<p>Specialty drainage system in bus maintenance area</p>	



### 5.7.6 Building Storm Water Management System

<p><b>Description</b>          Storm water is collected on the flat roof by strategically placed roof drains on the canopy roof system. The majority of the vertical leaders was hidden behind interior finishes and could not be assessed for deficiencies. Overall, the storm water management system appeared to be in good and working condition. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 30</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. A general allowance has been carried for isolated repairs and/or replacements over the study period.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$12,000</p>

### 5.7.7 Plumbing Fixtures

<p><b>Description</b></p> <p>The domestic water system is distributed to a variety of fixtures which typically include countertop mounted sinks, toilets, urinals water fountains and a bus wash bay. All lavatories were noted to be manual faucets.</p> <p>All plumbing fixtures were in good condition and working condition with minimal signs of wear and tear. Plumbing fixtures were noted to be replaced on an as-needed basis. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979, 2009</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 5, 27</p>	<p><b>Current Effective Age:</b> 35, 8</p>
<p><b>Recommendations</b></p> <p>Original plumbing fixtures have been deferred, where possible, to extend its normal life span. Appropriate costs have been carried. Costs have been carried in section 5.11.7 – <i>Common Area Washrooms</i> and 5.11.10 – <i>Private Washrooms</i>. New plumbing fixtures are not anticipated for repairs or replacement during the study period. Minor repairs (if any) are considered under on-going routine maintenance.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Lavatories</p>	<p>Urinal in men's washroom</p>	
		
<p>Bus wash</p>	<p>Commercial sink and water fountain</p>	





### **5.7.8 Specialty Domestic Water Systems**

Not applicable.





**5.8 Electrical Service & Distribution**

Good (2.8)



**5.8.1 Main Incoming Electrical Services**

<b>Description</b> The main incoming electrical service enters the building from below grade and into a closed electrical room. The main mechanical room includes an 800A main switchgear that provides power to the building. The power is then distributed to other multiple electrical panels installed within the mechanical room and throughout the facility. No significant signs of deterioration were present. No issues were reported by the site representative.		
<b>Component Rating:</b> Fair (3)		<b>Installation Date:</b> 1979
<b>Typical Life Span:</b> 40	<b>Remaining Life:</b> 2	<b>Current Effective Age:</b> 38
<b>Recommendations</b> We recommend infrared thermograph scanning of all electrical equipment (i.e. main, distribution etc.) to find “hot spots”. In additional, general housekeeping of equipment (i.e. tagging and removal of miscellaneous items too close to equipment). This is considered under normal operations and maintenance as below the threshold limit. All electrical equipment should be checked regularly under operations and maintenance to ensure good working operation. Replacement and installation should be carried out in accordance with the manufacturer’s recommendations. This item is anticipated for repairs or replacement during the study period. An allowance is carried.		
<b>Project Breakdown</b>	<b>QTY:</b> 800Amps	<b>Capital Cost:</b> \$44,000
		
Main switchgear	Distribution lines	

### 5.8.2 Intermediate Electrical Distribution Systems

<p><b>Description</b>          There are several secondary panel boards located in the mechanical room, administrative areas and bus storage &amp; maintenance areas that were rated between 100A and 225A. Overall, the majority of panels appeared to be original to the building and in good and working condition. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 40</p>	<p><b>Remaining Life:</b> 2</p>	<p><b>Current Effective Age:</b> 38</p>
<p><b>Recommendations</b>          Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried. Newer panel boards are not anticipated for replacement during the study period.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 131,696sf</p>	<p><b>Capital Cost:</b> \$121,000</p>
		
<p>Intermediate panels</p>	<p>Various intermediate panels and breakers</p>	
		
<p>Intermediate panel</p>	<p>Intermediate panel</p>	

### 5.8.3 Transformers and Supplementary Electrical Components

<p><b>Description</b></p> <p>There are two (2) “Rex Manufacturing” dry-type transformers found in room 115 of the building. The transformers are rated 45kVA. Several other transformers were found within the building which includes a 10kVA “Westinghouse” transformer adjacent to the bus repair booth and 75kVA “Westinghouse” transformer found within the main electrical room. A transformer was found on the west perimeter of the building which was enclosed in a chain link fence. Overall, the transformers appeared to be in good and working condition. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979, 2007</p>
<p><b>Typical Life Span:</b> 30</p>	<p><b>Remaining Life:</b> 2, 20</p>	<p><b>Current Effective Age:</b> 28, 10</p>
<p><b>Recommendations</b></p> <p>Original transformers have been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried. Transformers that have been replaced in 2007 are anticipated for replacement in year 20. The exterior transformer is owned by the city and is not included in capital costs.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$25,000</p>
		
<p>Westinghouse transformer</p>		<p>Information label</p>
		
<p>Westinghouse transformer</p>		<p>Exterior transformer</p>

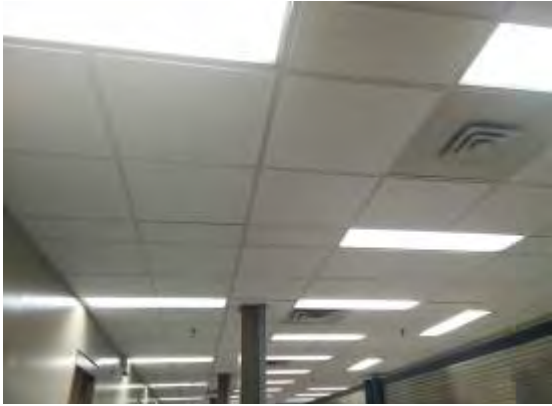









#### **5.8.4 Emergency Power Generation Systems**

Not applicable.

### 5.8.5 Interior Lighting Systems

<p><b>Description</b>          Interior lighting within the facility was comprised of mostly suspended fluorescent light fixtures. The fixtures were generally in good and working condition wherever reviewed with normal wear observed. We did not find any major issues with the lighting system during the site visit that would warrant immediate replacement. Although light level measurements were not taken, lighting levels are adequate.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 25</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 20</p>
<p><b>Recommendations</b>          The interior lighting has been deferred, where possible, to extend its normal life span. A major interior lighting retrofit is recommended in year 5 of this report. An allowance is carried. Expended light bulbs can be replaced on an as-needed basis. All existing incandescent and T12 fluorescent lights should be upgraded to more energy-efficiency bulbs such as compact fluorescents and T8s. Energy efficiencies items are considered upgrades and not included.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 131,696sf</p>	<p><b>Capital Cost:</b> \$122,000</p>
		
<p>Fluorescent lighting in administrative area</p>		<p>Fluorescent lighting in bus maintenance area</p>
		
<p>Fluorescent lighting in administrative area</p>		<p>Fluorescent lighting in bus maintenance area</p>

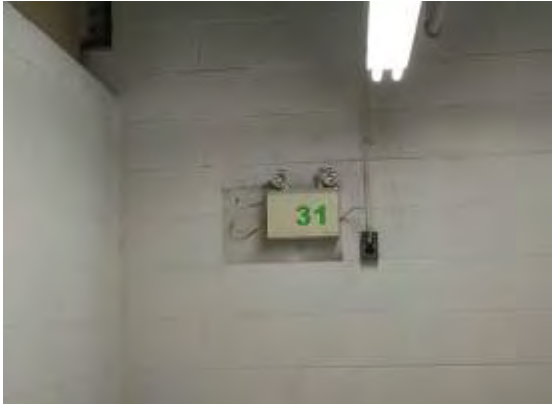



### 5.8.6 Exterior Lighting Systems

<p><b>Description</b>          The exterior lighting system consists of recessed pot lights found on the underside of the soffit at the public and employee entrances. Other lights include single and dual head high-pressure sodium (HPS) wall mounted light fixtures typically found above garage doors or private entrances. The majority of lights were not on during the site visit and only recessed lights were observed to be on. Overall, the fixtures were in good condition with normal wear and tear observed. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 25</p>	<p><b>Remaining Life:</b> 3</p>	<p><b>Current Effective Age:</b> 22</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. A major exterior lighting retrofit is recommended in year 3 of this report. An allowance is carried. Expended light bulbs can be replaced on an as-needed basis. Energy efficiencies items are considered upgrades and not included.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$10,000</p>
		
<p>Recessed pot lights</p>	<p>Dual head exterior light fixture</p>	

### 5.8.7 Automated Lighting Control Systems

Not applicable.

### 5.8.8 Emergency Lighting Systems

<p><b>Description</b>          Emergency lighting systems installed within the facility include emergency exit signs, dual head emergency lights and battery packs or a combination of. The exit signs are typically installed above egress doors and are illuminated with incandescent fixtures. Battery packs were observed to have numbers indicated on them. Various types of emergency exit signs were found throughout the facility indicating that the several signs have been replaced on an as-needed basis. The systems were in good and working order. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 20</p>	<p><b>Remaining Life:</b> 2</p>	<p><b>Current Effective Age:</b> 18</p>
<p><b>Recommendations</b>          It is recommended to replace non-operational emergency lighting systems immediately as it is a life safety system. This can be done at a cost below the threshold limit of this report.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Battery Pack</p>	<p>Emergency exit sign</p>	
		
<p>Battery pack and emergency exit sign</p>	<p>Emergency exit sign at staircase</p>	



### **5.8.9 Other Electrical Systems**

Not applicable.



**5.9 Security/Access System**

Good (2.0)

**5.9.1 Building Entry Systems**

Not applicable.



**5.9.2 Surveillance Systems**



<b>Description</b> The building surveillance system is provided by strategically placed closed circuit system and consists of small dome cameras found throughout the interior and exterior of the facility. The information is then transferred to a video monitoring system. Overall, the cameras were in good and working condition. Monitoring and network equipment were reported to be in good condition. No significant signs of deterioration were present. No issues were reported by the site representative.		
<b>Component Rating:</b> Good (2)		<b>Installation Date:</b> 2009
<b>Typical Life Span:</b> 15	<b>Remaining Life:</b> 7	<b>Current Effective Age:</b> 8
<b>Recommendations</b> Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried.		
<b>Project Breakdown</b>	<b>QTY:</b> Allowance	<b>Capital Cost:</b> \$40,000
		
Dome camera on exterior wall	Dome camera beside door 13	

**5.10 Fire Suppression Systems**

Good (2.0)

**5.10.1 Sprinkler and Standpipe System**

<b>Description</b>		
<p>A partial “Grinnell” sprinkler system is installed in the sprinkler room. The sprinkler system was observed to be installed within the administrative areas only. A standpipe system and connection was also found on the south perimeter of the building. All T-bar ceiling panel sprinkler heads are pendant-type and all exposed ceiling has upright sprinkler heads. Where randomly observed, tags around the sprinkler system were found to be recently signed-off for inspection. Overall, the sprinkler system appeared to be in good and working condition. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<b>Component Rating:</b> Good (2)		<b>Installation Date:</b> 1979
<b>Typical Life Span:</b> 35	<b>Remaining Life:</b> 5	<b>Current Effective Age:</b> 30
<b>Recommendations</b>		
<p>All fire protection devices should be checked regularly under operations and maintenance to ensure good working operation. Replacement and installation should be carried out in accordance with manufacturer’s recommendations. Based on the typical life span of this component, repairs and/or replacements are anticipated within the study period. Appropriate costs are carried.</p>		
<b>Project Breakdown</b>	<b>QTY:</b> Allowance	<b>Capital Cost:</b> \$60,000
		
Main sprinkler system	Main sprinkler system	



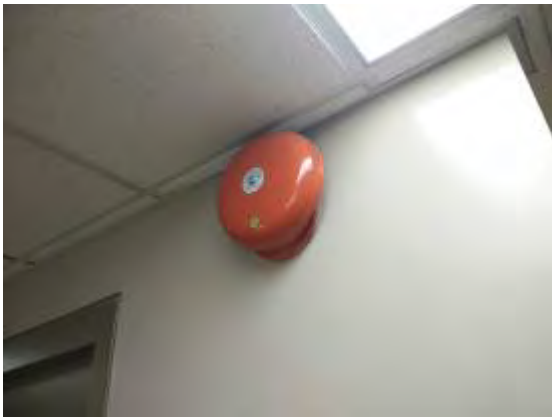

	
<p>Typical sprinkler head</p>	<p>Standpipe connection</p>

**5.10.2 Fire Pumps etc.**


Not applicable.





### 5.10.3 Fire Alarm System and Voice Communications

<p><b>Description</b>          A “Simplex” fire alarm system is installed in the mechanical room of the facility and consists of the main fire alarm control panel, junction boxes, pull stations and bells. An annunciator panel was found at the south entrance vestibule. The smoke and heat detectors are connected to the fire alarm system as well. The system is reported to be tested on a monthly basis and is monitored by “Access Fire” and “Fire Monitoring of Canada Inc.”. Overall, the fire alarm system appears to be in good and working condition.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 2009</p>
<p><b>Typical Life Span:</b> 20</p>	<p><b>Remaining Life:</b> 12</p>	<p><b>Current Effective Age:</b> 8</p>
<p><b>Recommendations</b>          All fire protection devices should be checked regularly under operations and maintenance to ensure good working operation. Replacement and installation should be carried out in accordance with manufacturer’s recommendations. Based on the typical life span of this component, repairs and/or replacements are anticipated within the study period. Appropriate costs are carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$25,000</p>
		
<p>Fire alarm junction box</p>		<p>Fire alarm control panel</p>
		
<p>Fire bell</p>		<p>Annunciator panel</p>




#### 5.10.4 Heat, Smoke and Carbon Monoxide Detection Devices

<p><b>Description</b>          There are heat and smoke detectors installed at appropriate locations throughout the building. The majority of the devices were heat and smoke combination detectors. The detectors were in good and working condition. No significant signs of deterioration were present. No issues were reported by the site representative. The system along forming part of the fire alarm system is reported to be tested on a monthly basis.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 2009</p>
<p><b>Typical Life Span:</b> 15</p>	<p><b>Remaining Life:</b> 7</p>	<p><b>Current Effective Age:</b> 8</p>
<p><b>Recommendations</b>          All fire protection devices should be checked regularly under operations and maintenance to ensure good working operation. Replacement and installation should be carried out in accordance with manufacturer's recommendations. Based on the typical life span of this component, repairs and/or replacements are anticipated within the study period. This is considered under on-going routine maintenance.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Heat smoke detector</p>		

### 5.10.5 Fire Extinguishers

<p><b>Description</b>          There are fire extinguishers located in strategic locations throughout the facility. Where randomly checked, tagging was present at fire extinguishers and had been signed-off recently. Annual inspections are done by “Access Fire” and associated repairs are expected to continue to be completed as part of ongoing maintenance. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 2014</p>
<p><b>Typical Life Span:</b> 5</p>	<p><b>Remaining Life:</b> 2</p>	<p><b>Current Effective Age:</b> 3</p>
<p><b>Recommendations</b>          All fire protection devices should be checked regularly under operations and maintenance to ensure good working operation. Replacement and installation should be carried out in accordance with manufacturer’s recommendations. Replacement of the fire extinguishers can be done at a cost below the threshold limit of this report. It was reported that fire protection devices are checked regularly under operations and maintenance.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Typical fire extinguisher</p>	<p>Fire extinguisher</p>	



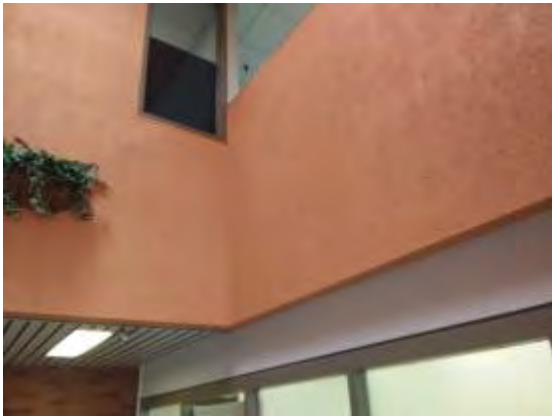
### 5.10.6 Fire Separations and Emergency Evacuation Plans

<p><b>Description</b></p> <p>No analysis has been carried out to determine the adequacy of the fire containment with respect to Code requirements. We did not note any major degradation of components forming fire separations. The verification of the fire-resistance ratings of fire-separations was not conducted. A further investigation would be required to verify the full extent of the wall materials and the continuity of the separations.</p> <p>A fire safety plan was found posted in the common and private spaces indicating emergency exit and fire extinguisher locations.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 2007</p>
<p><b>Typical Life Span:</b> 20</p>	<p><b>Remaining Life:</b> 10</p>	<p><b>Current Effective Age:</b> 10</p>
<p><b>Recommendations</b></p> <p>All FSP should be approved by the local fire department in the immediate term. This is considered under on-going routine maintenance. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Fire safety plan</p>	<p>Fire safety plan</p>	
		
<p>Fire safety box</p>		



**5.11 Interior Elements**

Good (2.1)


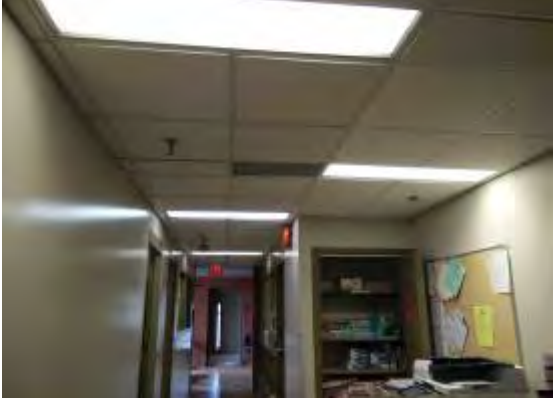
**5.11.1 Common Area Interior Walls Finishes**

<p><b>Description</b>          The common area interior wall finishes predominately painted gypsum wallboard found on the first floor. A brick veneer accent wall and coloured stucco walls were observed in the main reception area. Storefront style window walls were found separating offices from the common area corridor. The finishes generally appeared to be in good condition. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 20</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 15</p>
<p><b>Recommendations</b>          Repainting/replacement of the gypsum wallboard is anticipated during the study period. This can be carried out on an ongoing basis, as needed. Minor repairs such as repointing can be done at a cost below the threshold limit of this report. An allowance is carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$10,000</p>
		
<p>Interior finishes at main visitor entrance</p>	<p>Combination storefront and painted gypsum wallboard</p>	
		
<p>Interior finishes at main visitor entrance</p>		

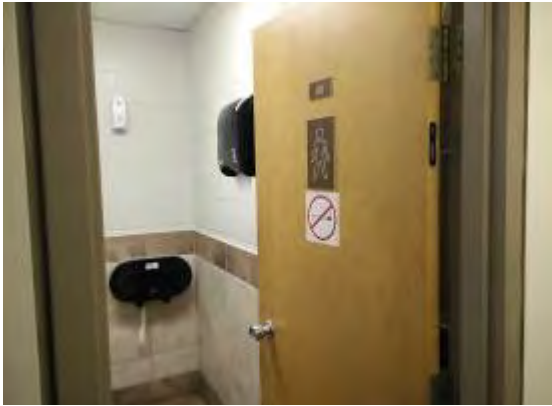



### 5.11.2 Common Area Interior Floor Finishes

<p><b>Description</b>          The common area finishes consists of ceramic tiles laid out in random colours found throughout the whole common area. Overall, the ceramic tiles appeared to be in good condition with normal wear. No significant signs of deterioration were present.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 10</p>	<p><b>Current Effective Age:</b> 25</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. This item is anticipated for repairs or replacement during the study period. An allowance is carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 7,544sf</p>	<p><b>Capital Cost:</b> \$98,000</p>
		
<p>Ceramic tiling in main foyer</p>	<p>Ceramic tiling in public corridor</p>	

**5.11.3 Common Area Interior Ceiling Finishes**

<p><b>Description</b>          The common area interior ceiling finishes are typically consist of a 2'x2' acoustic ceiling tile system with fluorescent tube light fixtures. An accent ceiling finish was found at the public entrance of the facility. Overall, the finishes appear to be in good condition. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 20</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 15</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. An allowance is carried for general repairs over the study period.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 7,544sf</p>	<p><b>Capital Cost:</b> \$14,000</p>
		
<p>Main foyer ceiling finishes</p>	<p>Acoustic ceiling panel in public corridor</p>	

#### 5.11.4 Common Area Interior Doors

<p><b>Description</b></p> <p>The interior doors consist of hollow wood doors in metal frames found throughout the first floor and hollow metal doors with small glass inserts in metal frames separating the common area to the bus maintenance area. Door features include door signs on office doors and automatic door closers at fire separations.</p> <p>Hollow metal doors in metal frames were observed on the second floor maintenance area and generally appeared to be in good condition.</p> <p>Overall, the interior doors appeared to be in good condition and working condition. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<b>Component Rating:</b> Good (2)		<b>Installation Date:</b> 1979
<b>Typical Life Span:</b> 40	<b>Remaining Life:</b> 5	<b>Current Effective Age:</b> 35
<p><b>Recommendations</b></p> <p>This item has been deferred, where possible, to extend its normal life span. This item is anticipated for repairs or replacement during the study period. An allowance is carried.</p>		
<b>Project Breakdown</b>	<b>QTY:</b> Allowance	<b>Capital Cost:</b> \$45,000
		
Men's washroom interior door		Various interior doors
		
Maintenance area interior doors		Administrative area office door



**5.11.5 Common Area Specialty Rooms**

Not applicable.

**5.11.6 Common Area Kitchens**



Not applicable.

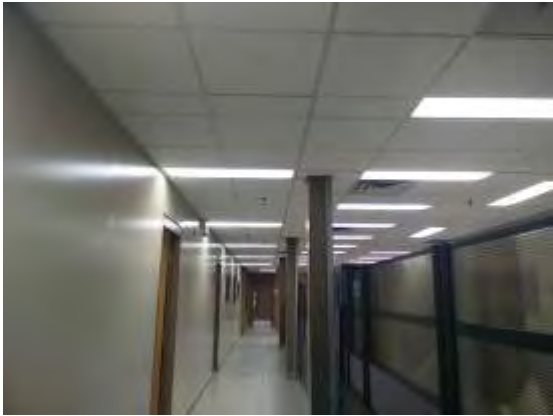


**5.11.7 Common Area Washrooms**

<p><b>Description</b>          The common area washrooms are located at the center of the common area and consist of both men’s and a unisex washroom. Common area washroom finishes consist of ceramic tile flooring &amp; half walls and painted gypsum wallboard and acoustic ceiling panels. The washrooms were recently renovated. Typical fixtures include urinals, toilets and counter mounted sinks. The unisex washroom was noted to be accessible with several barrier-free features such as a large turning radius and grab bars. Overall, the washroom appeared to be in good condition with normal wear observed. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Very Good (1)</p>		<p><b>Installation Date:</b> 2009</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 27</p>	<p><b>Current Effective Age:</b> 8</p>
<p><b>Recommendations</b>          The component is not anticipated for major repairs or replacement during the study period. Minor repairs (if any) are considered under on-going routine maintenance. No costs are carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Men’s washroom</p>	<p>Unisex washroom</p>	




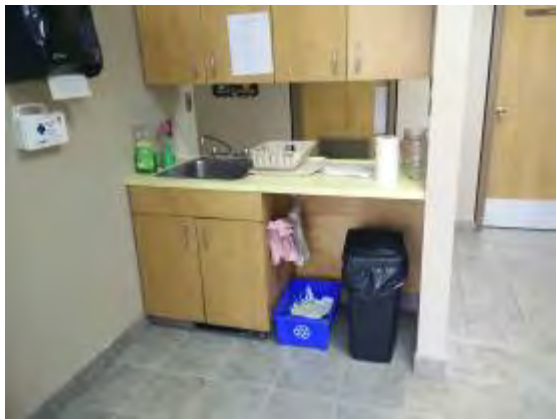
### 5.11.8 Private Spaces

#### Wall, Ceiling & Floor Finishes

<p><b>Description</b></p> <p>Private spaces make up the majority of the building area and consist of the bus storage &amp; maintenance areas, mechanical rooms, utility &amp; administrative area on the second floor. Typical finishes include ceramic tile floor finishes within the private corridors, carpet in offices, painted gypsum walls and acoustic ceiling panels throughout the administrative area.</p> <p>Finishes within the bus storage &amp; maintenance areas were generally minimal, consisting of polished concrete floor slabs (bus maintenance area only), painted concrete block walls and ceiling suspended soundproof acoustic panels.</p> <p>Overall, the finishes appeared to be in good condition with normal wear observed. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<b>Component Rating:</b> Good (2)		<b>Installation Date:</b> 1979
<b>Typical Life Span:</b> 20	<b>Remaining Life:</b> 5	<b>Current Effective Age:</b> 15
<p><b>Recommendations</b></p> <p>Based on a normal life span for the finishes, repairs and/or replacements are anticipated during the study period. A cost breakdown of the capital expenditures is included below. Waterproof coatings and polishing within the bus maintenance &amp; storage areas are included in the pricing.</p> <p>Concrete polishing in bus maintenance area - \$100,000 (Year 7)</p> <p>Floor finishes in administrative area - \$82,000 (Year 3)</p> <p>A budget of \$75,000 has been allocated for general maintenance of wall and ceiling finishes within the private area. This can be done on an as-needed basis.</p>		
<b>Project Breakdown</b>	<b>QTY:</b> Allowance	<b>Capital Cost:</b> \$257,000
		
Bus storage area		Waterproofed concrete slab on grade

	
<p>Typical administrative area interior finishes</p>	<p>Mechanical area</p>
	
<p>Soundproof acoustic panels in bus maintenance area</p>	

**5.11.9 Private Kitchens**

<p><b>Description</b>          Two kitchenettes are provided for the facility. One is located on the first floor shared with the IT room. The second kitchenette is found on the second floor administrative area. The kitchens consist of a stainless steel sink, vinyl laminated countertops and upper &amp; lower cabinetry. Other small appliances include a microwave, toaster oven and coffee machines. Kitchen finishes include sheet vinyl (first floor) and ceramic tile (second floor) flooring and 2'x2' acoustic ceiling tile. Overall, kitchen finishes appeared to be in fair condition and somewhat dated however, cabinetry doors were in fully functional state. Kitchen appliances appear to be in working condition.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 3</p>	<p><b>Current Effective Age:</b> 32</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. This item is anticipated for repairs or replacement during the study period. An allowance is carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 2</p>	<p><b>Capital Cost:</b> \$20,000</p>
		
<p>Kitchenette on first floor</p>	<p>Kitchenette on first floor</p>	
		
<p>Kitchenette on second floor</p>	<p>Kitchenette on second floor</p>	

**5.11.10 Private Washrooms**

<p><b>Description</b></p> <p>The private washrooms are located in the administrative area and consist of a men's and women's washroom. A unisex washroom was also noted behind the board room. Washroom finishes were similar to the public washrooms and include ceramic tile flooring and upturns &amp; half-walls and painted gypsum wallboard ceilings. Washroom fixtures include counter-mounted sinks, toilets and urinals. Some private washrooms were noted to be recently renovated. The washroom appeared to be dated and in fair condition with minimal signs of wear and tear observed.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979, 2009</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 3, 27</p>	<p><b>Current Effective Age:</b> 32, 8</p>
<p><b>Recommendations</b></p> <p>Original washrooms are anticipated for repairs and/or replacement during the study period. An allowance is carried. No costs are carried for recently renovated washrooms as they are not anticipated for replacement during the study period.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 2</p>	<p><b>Capital Cost:</b> \$10,000</p>
		
<p>Men's washroom in administrative area</p>		<p>Toilet</p>
		
<p>Boardroom washroom</p>		<p>Lavatory</p>

**5.12 Accessibility and Other Issues**

Good (2.4)




**5.12.1 Building Accessibility**

<p><b>Description</b></p> <p>Although no measurements were taken or an in-depth analysis completed, the facility generally does comply with accessibility requirements despite the age of building. We are not aware of any compliance orders for the facility with regards to barrier-free requirements. General compliance with the “Accessible Design for the built Environment” – CAN/CSA-B651-04 and industry best guidelines is considered a secondary desirable upgrade and only recommended after Ontario Building Code requirements are fully met.</p> <p>The intent behind developing and implementing additional guidelines is to eliminate or at least minimize safety risks to the occupants and improve operational performance. Overall, the building can continue to function as a municipal facility as long as fire and life safety recommendations and non-compliance issues are addressed.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> N/A</p>	<p><b>Remaining Life:</b> 8</p>	<p><b>Current Effective Age:</b> 38</p>
<p><b>Recommendations</b></p> <p>We recommend that an accessibility audit be performance and the facility be renovated to bring it to current barrier-free design and the compliance with the requirements for a fully accessible facility in accordance with the Accessibility for Ontarians with Disabilities Act (AODA) coming into force in 2025.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Accessible washroom sign</p>	<p>Accessible features in washroom including grab bar</p>	

**5.12.2 Platforms and Loading Docks**





Not applicable.

### 5.12.3 Topography



<p><b>Description</b>          The facility is situated on the north side of North Service Road. The site is generally flat and concrete paved throughout. No major deficiencies with the topography or ponding were found.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> N/A</p>	<p><b>Remaining Life:</b> N/A</p>	<p><b>Current Effective Age:</b> 38</p>
<p><b>Recommendations</b>          The site is maintained under normal operations and maintenance. No allowances are carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Typical flat topography</p>	<p>Asphalt paved area</p>	
		
<p>Flat asphalt area</p>		



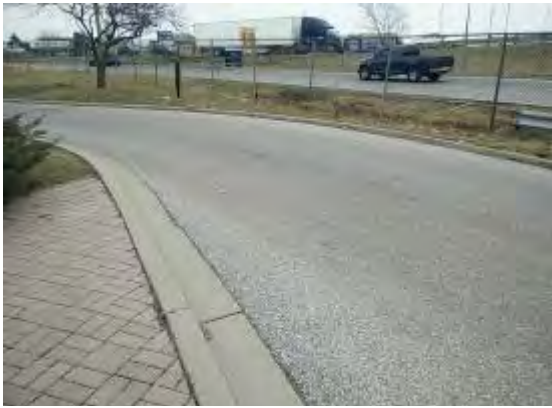

### 5.12.4 Storm Water Drainage

<p><b>Description</b>          The storm sewer system is located below grade from the municipal hookup to the building. The condition of the buried and concealed piping cannot be evaluated visually. Rain water collected on paved areas sloped towards catch basins installed within the employee &amp; public parking lots. Catch basins were also observed within the bus storage area. The catch basins are appeared to be in good condition. The adequacy of the drainage system could not be confirmed as there was no precipitation during the site visit however, with no reported issues it is assumed to be in good working order. No significant signs of deterioration were present.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 40</p>	<p><b>Remaining Life:</b> 2</p>	<p><b>Current Effective Age:</b> 38</p>
<p><b>Recommendations</b>          We recommend that drains be flushed and scoped routinely. This maximizes the service life of the piping and also helps identify repair needs. We assume this will be done as part of ongoing maintenance. Minor repairs (if any) are considered under on-going routine maintenance.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Catch basin in visitor's parking lot</p>	<p>Catch basin in visitor's parking lot</p>	
		
<p>Catch basin in bus storage area</p>	<p>Catch basin in visitor's parking lot</p>	

### 5.12.5 Access and Egress

<p><b>Description</b>          There are two vehicular entrances provided for the facility. The south entrance is mainly used for public entry as the public parking lot is situated on the south side of the building. Designated egress signs/zones were found also displaying direction of street and bus directions. Egress exits were found throughout the perimeter of the building. No issues pertaining to access and egress to the site were reported by the site representative.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> N/A</p>	<p><b>Remaining Life:</b> N/A</p>	<p><b>Current Effective Age:</b> 38</p>
<p><b>Recommendations</b>          No major capital expenditures are expected during the study period to address access and egress.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Vehicular entrance seen in distance</p>	<p>Bus access to facility</p>	

### 5.12.6 Paving, Curbing and Parking

<p><b>Description</b></p> <p>There majority of the property is paved in asphalt. Concrete pads were typically found at the base of the garage door to provide additional toughness between the exterior and interior. A dedicated driveway ran parallel to North Service Road and provided internal north to south traffic. Heavy traffic areas including bus routes were observed to be in poor condition. The asphalt in these areas exhibit major cracking however, no significant potholes were found. The asphalt paving has passed its typical life expectancy. Buses were observed to be parked on gravel areas which may suggest that there is insufficient parking space provided for the facility.</p> <p>Concrete curbs are provided around the north and south parking lots. The concrete curbs were in good condition for the majority of its length, some minor deterioration and cracking were found.</p> <p>The top surface of asphalt paving materials was reviewed and assessed for condition. The adequacy and condition of underlying soils could not be assessed. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Poor (4)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 20</p>	<p><b>Remaining Life:</b> 1</p>	<p><b>Current Effective Age:</b> 19</p>
<p><b>Recommendations</b></p> <p>Paving of the asphalt driveways and parking areas is recommended to be done within 1 year due to its condition. An allowance is carried. Replacement of the concrete curbing should coincide with the asphalt repaving. General maintenance such as cleaning engine fluids off the asphalt paved areas is considered under operations and maintenance.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 150,000sf</p>	<p><b>Capital Cost:</b> \$613,000</p>
		
<p>Asphalt paved driveway</p>	<p>Rear parking lot area</p>	



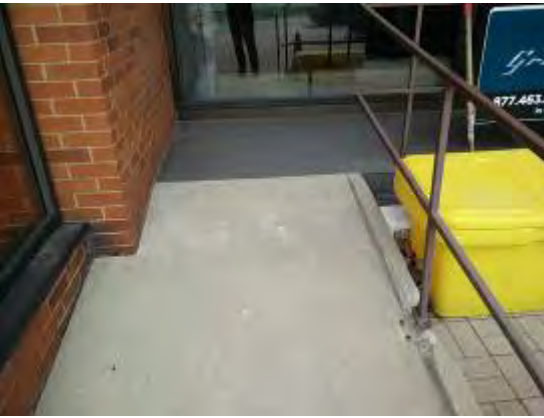



Concrete slab on grade before garage entrance



Visitor's parking lot





**5.12.7 Walkways, Sidewalks and Exterior Stairs**

<p><b>Description</b>          Pedestrian walkways are constructed of poured concrete around the south parking lot. Brick interlocking was found from the parking lot to the main public entrance. A small ramp and exterior stairs located at the main public entrance matched the exterior average grade to the first floor level and was finished with ceramic tile. Overall, the component is in good condition with no major cracks observed. No significant signs of deterioration were present. No issues were reported.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 35</p>	<p><b>Remaining Life:</b> 5</p>	<p><b>Current Effective Age:</b> 30</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$10,000</p>
		
<p>Concrete walkway from parking lot to visitor's entrance</p>	<p>Brick walkway to visitor's entrance</p>	
		
<p>Small ramp at visitor's entrance</p>	<p>Exterior stairs at visitor's entrance</p>	

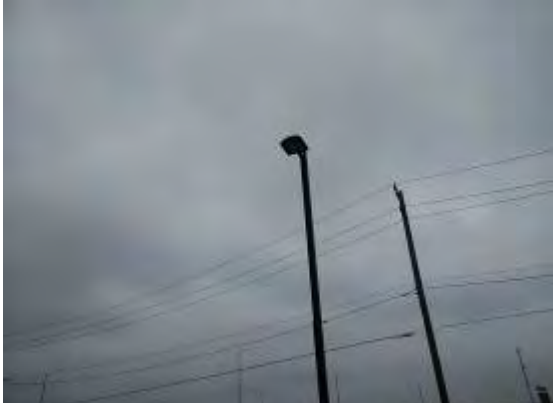
**5.12.8 Landscaping and Appurtenances**

<p><b>Description</b>          The site is generally paved with concrete throughout and only small areas of grass were found on the south side of the property. The landscaping included small shrubs, trees and grass. The landscaping is in good condition.          Appurtenances include a metal clad shed on the north side of the property. Only the exterior of the shed was evaluated. The shed appeared to be in good condition. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Good (2)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> N/A</p>	<p><b>Remaining Life:</b> N/A</p>	<p><b>Current Effective Age:</b> 38</p>
<p><b>Recommendations</b>          Landscaping is part of the parks and recreation’s scope of work. No costing for landscaping has been included here.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Landscaping features at visitor’s entrance</p>		<p>Sodded area at front of building</p>
		
<p>Landscaping features at visitor’s entrance</p>		<p>Exterior shed</p>

### 5.12.9 Site Signage



<p><b>Description</b>          Various signs and logos were installed around the perimeter of the building. A brushed metal logo was found on the south side of the building. A ground mounted sign displayed the main entrance and parking area for the public. The signs were reviewed from ground level and appeared to be in good condition with minor stains observed. Other signs installed throughout the site consist of vehicular &amp; pedestrian directional signs and bus designations. The signs appear to be replaced on an as-needed basis. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Very Good (1)</p>	<p><b>Installation Date:</b> 2009</p>	
<p><b>Typical Life Span:</b> 40</p>	<p><b>Remaining Life:</b> 32</p>	<p><b>Current Effective Age:</b> 8</p>
<p><b>Recommendations</b>          The component is not anticipated for major repairs or replacement during the study period. No costs are carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> N/A</p>	<p><b>Capital Cost:</b> N/A</p>
		
<p>Transit Windsor logo at front of building</p>	<p>Building date stamp</p>	
		
<p>Various signage around garage doors</p>	<p>Main entrance signage</p>	

### 5.12.10 Site Lighting

<p><b>Description</b>          Site lighting consists of pole-mounted high intensity discharge fixtures installed throughout the site. The light fixtures are mounted on a concrete bases that were in good condition. The fixtures were not on during the time of inspection however, with no issues reported it is assumed to be in working condition. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 25</p>	<p><b>Remaining Life:</b> 3</p>	<p><b>Current Effective Age:</b> 22</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> Allowance</p>	<p><b>Capital Cost:</b> \$15,000</p>
		
<p>Typical light standards on property</p>		



### 5.12.11 Fencing

<p><b>Description</b>          The site is fitted with a chain link fence around the entire perimeter of the property. The chain link fence generally appeared to be in fair condition with surface wear from exterior elements. No major leaning was found for the length of the fence. Additional chain link fencing was found enclosing a city-owned transformer. No significant signs of deterioration were present. No issues were reported by the site representative.</p>		
<p><b>Component Rating:</b> Fair (3)</p>		<p><b>Installation Date:</b> 1979</p>
<p><b>Typical Life Span:</b> 25</p>	<p><b>Remaining Life:</b> 3</p>	<p><b>Current Effective Age:</b> 22</p>
<p><b>Recommendations</b>          This item has been deferred, where possible, to extend its normal life span. Based on a normal life span for this component, repairs and/or replacements are anticipated during the study period. Appropriate costs are carried.</p>		
<p><b>Project Breakdown</b></p>	<p><b>QTY:</b> 2400 lf</p>	<p><b>Capital Cost:</b> \$55,000</p>
		
<p>Fencing around transformer</p>		<p>Chain link fence in background</p>

### 5.12.12 Retaining Wall

Not applicable.

### **5.13 Pools**

N/A

#### **5.13.1 Pool Area Finishes**

Not applicable.

#### **5.13.2 Change Rooms**

Not applicable.

#### **5.13.3 Pool Equipment**

Not applicable.



## **5.14 Specialized Equipment & Electrical**

N/A

### **5.14.1 Specialty Equipment**

Not applicable.

### **5.14.2 Specialty Electrical**

Not applicable.

## 6. Report Qualifications

The qualifications described below apply to this report:

- a) All review surveys were visual only. No removal or testing of materials or components was carried out. The review was made on a random basis with no attempt to review or inspect every element or portion of the building. The intent of the review was to determine areas of visually obvious deterioration and need for repair and to determine, in a general way, the overall quality and sufficiency of the existing building conditions but not to ascertain the quality or sufficiency of any particular aspect of the building.
- b) This report is intended to provide **The City of Windsor** with a general description of the systems employed in the building and to comment on their general condition, which may be apparent at the time of our review. No calculations were performed to confirm the adequacy of the elements. No findings contained in this report shall be construed as a guarantee or warranty of the quality or sufficiency of any particular aspect of the building or the adequacy of any particular element of any system employed in the building.
- c) The timing of site visits is critical to building performance reviews. To observe the actual extent of problem areas, it is necessary to monitor the building conditions throughout the year and under varying weather conditions (for example, contraction and expansion of all component joints occur at different times of the year) in each specific area. As a result, all problems may not be visible at the time of our review and we shall not be responsible for any problems not readily visible or apparent at the time of our inspection.
- d) Any timeframe given for repair or replacement work represents a judgement based on the apparent condition and theoretical life span of components. Failure of the item, or optimum repair/replacement time, may be earlier or later than the time estimate due to conditions unknown and beyond our control. The property manager should pro-actively assess the time lines identified going forward.
- e) Any and all previous opinions expressed by BOLD Engineering, either verbally or in writing, regarding the condition of the building or cost estimates for repair of the above elements of the building cannot be relied upon unless contained herein and are superseded by this report. No portion of this report may be used as a separate entity; it is written to be read in its entirety.
- f) An overall contingency allowance of **10%** has been carried to cover any unforeseen capital repairs arising during the ten years contemplated in this report.
- g) It should be noted that floor areas and parking counts reported and provided by building management and the planning consultant (as identified in our summaries) have been used. No independent verification, measurement or assessment has been carried out by BOLD Engineering.
- h) Environmental issues are excluded from this report. No environmental issues have been addressed nor renewal costs included in our summaries.
- i) We are not responsible for the effects of any actions taken as a result of this report unless we are specifically advised of and participate in such action in which case our responsibility will be agreed to at that time.
- j) BOLD Engineering shall have no liability either in contract or in tort for services or matters beyond the scope of the services as outlined and qualified in this report.
- k) This report is for the exclusive use and benefit of **The City of Windsor**. BOLD Engineering does not hold reporting responsibility to any other party and does not assume any liability whatsoever to any other party.



## 7. Exhibits & Attachments

Appendix A	Schedule of Information Reviewed
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**APPENDIX A**  
**INFORMATION REVIEWED**



**INFORMATION REVIEWED**

In the preparation of this report, the following drawings/documents were reviewed:

No documentation has been provided.

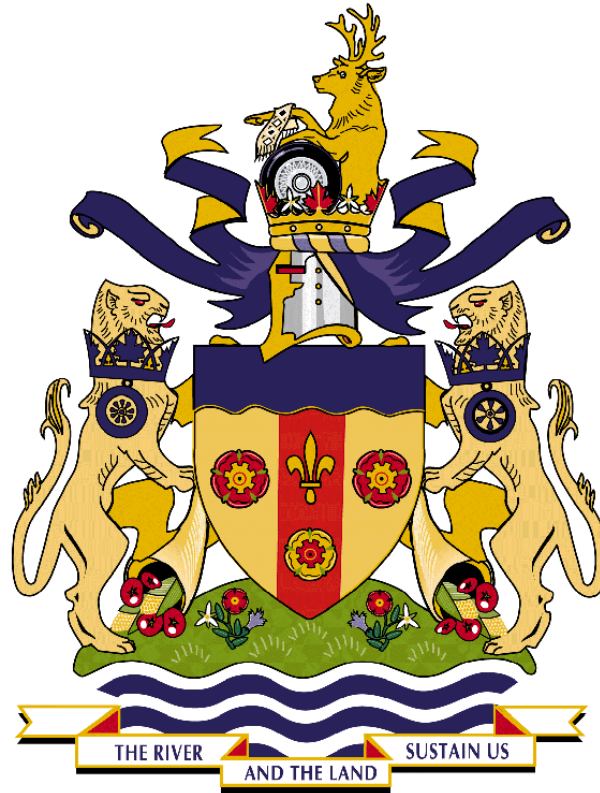
# Appendix D - Building Asbestos Report

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**\*\*\* BLUE BINDERS \*\*\***

**On site copies of Asbestos Reports are to be maintained in the blue binder as provided.**



**Corporation of the City of Windsor**

# **Asbestos Survey**

**3700 North Service Rd E**

**Windsor, Ontario**

**(Transit Windsor Administration Offices and  
Service Garage)**

# ASBESTOS SURVEY

## 1.0 Introduction

RWDI AIR Inc. [RWDI] was retained by the Corporation of the City of Windsor [City] to conduct a non-invasive indoor designated substance survey [DSS], focusing mostly on assessing for the presence of asbestos containing materials [ACMs] and lead-based paint [LBPs], with ancillary observations made as to the presence of mercury, silica, polychlorinated biphenyls [PCBs], and mold. The DSS was conducted at the above noted facility on April 24, 2017. The purpose of the survey was to determine the location(s) and condition(s) of ACMs and LBPs if present in the facility, as well as identifying the potential presence of mercury, silica, PCBs, and mold.

The DSS was conducted as an indoor non-destructive inspection and building material sampling for the presence of friable and non-friable ACMs as well as LBPs. Samples were collected, where required, in accordance with Ontario Regulation 278/05 *Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations* [O. Reg. 278] for asbestos, and paint scrapings where paint was noted to be flaking and/or peeling from building structures. Paint that was noted to be intact with no flaking and/or peeling was deemed to be in good condition with minimal risk to exposure as it relates to day-to-day operations of the facility.

The DSS included:

- A survey of accessible interior spaces
- Bulk sampling of suspected ACMs and LBPs
- Laboratory analysis of suspect ACM and LBP bulk samples
- Noting the potential presence of building materials containing mercury, silica, PCBs, as well as noting areas of mold
- Preparation of a report detailing the findings and locations of known and suspected ACMs and LBPs, as well as notes on the potential presence of mercury, silica, PCBs, and mold

## 2.0 Management Summary

### **Main Floor (On Grade) – Administration Area**

No confirmed ACMs or LBPs were identified on the main floor administration area.

### **Main Floor (On Grade) – Bus Storage/Repair Area**

No confirmed ACMs were identified on the main floor. LBP material was identified on the blue paint present on the boiler system on the main floor of the bus storage/repair area.

### **Second Floor – Executive Offices**

No confirmed ACMs or LBPs were identified on the second floor executive offices.

## **Second Floor – Employee Area**

No confirmed ACMs or LBPs were identified on the second floor in the employee area.

## **Building Envelope and/or Other Outdoor Structures**

No confirmed ACMs or LBPs were identified on the building envelope.

There were three (3) outdoor structures observed on the property. Two (2) of the three (3) structures were pole barn-style sheds that were finished with metal cladding veneer exterior walls. The inside structure was exposed wood framing. The flooring was poured concrete. No potential ACM's were observed in these sheds.

A third structure resembling a guard shack could not be accessed at the time of the inspection. Its construction was interpreted to consist of outside vinyl siding veneer walls with a shingled roof. The structure is assumed to be wooden framed. No potential ACM's were observed on the exterior of the guard shack. The interior of the guard shack could not be accessed, as such, potential ACM's or flaking painted surfaces could not be observed.

## **3.0 Scopes and Methodology**

RWDI personnel entered each accessible room, hallway or area within the extent of the assessed buildings/structures and inspected for the presence of potential ACMs and/or LBPs. Information relating to the location and condition of suspected ACMs and/or LBPs was recorded in the field. Where samples were collected, sample information and locations were also recorded in the field.

The DSS was limited to non-intrusive testing at the request of the City. Concealed locations such as void spaces above ceilings were accessed through existing access panels only, if present. Solid ceilings, walls, flooring, structural items, interior or exterior building finishes were not disturbed to confirm or deny the presence of ACMs or LBPs in line with maintaining a non-intrusive assessment methodology.

Asbestos containing materials are collected at a frequency consistent with the requirements of O. Reg. 278/05, which establishes the minimum number of samples to be collected and analyzed. One paint sample would be collected per colour based on its condition (i.e. peeling). That paint colour quality testing would represent any other painted surfaces of that same colour.

Bulk building material samples that were collected for the identification of asbestos and/or lead were submitted for laboratory analysis to Paracel Laboratories Ltd. [Paracel] in Ottawa and Mississauga, Ontario. Analysis was performed using the polarized light microscopy [PLM] method for determination of asbestos in building materials and the inductively coupled plasma method using an optical emission spectrometer [ICP-OES] for determination of lead in paint. Paracel is an accredited NVLAP [National Voluntary Laboratory Accreditation Program] laboratory for asbestos analysis and is a Canadian Association for Laboratory Accreditation [CALA] certified for lead analysis.

O. Reg. 278 stipulates that materials that contain greater than 0.5% by dry weight of asbestos are considered to be an ACM. The laboratory utilized testing method 600/R-93/116 of the US Environmental Protection Act [US EPA] with the use of PLM to determine the presence of asbestos minerals/fibres.

Until December 2010, lead concentrations in painted surface treatment were regulated at concentrations greater than 600 ppm (0.06%) in Canada. Abatement for lead painted surfaces is recommended for lead concentrations greater than 0.5% by weight according to the US EPA and the Office of Public and Indian Housing [PIH]. In August of 2009, a petition to lower the abatement lead concentration limit was accepted by the US EPA to decrease its pre-1978 lead concentration limit of 0.5% (5,000 ppm) to 0.06% (600 ppm). However, the US EPA has yet to revise its decision into regulatory law.

Of note, surface painted treatment is considered to be lead-containing at concentrations of lead greater than 90 ppm (0.009%) per the Canadian Hazardous Products Act (SOR/2005-109, revised June 2011) [CHPA]. However, the CHPA does not define concentrations of lead in products that would warrant abatement as it relates to construction projects. For the purposes of identifying LBPs in painted surfaces, a limit of 600 ppm is utilized as the criteria to warrant abatement prior to renovations/construction activities.

### 3.2 Exceptions

The following non-friable presumed ACMs, if present, were not included in the survey:

Materials	Reasons for exclusion from survey
Roofing felts and mastics Components or wiring within motors HVAC equipment or lights High voltage wiring Underground services or piping Fire doors and partitions Process pipe gaskets Mica	These materials are not typically accessible without demolition and therefore were not quantified or sampled
Window caulking Carpet Concrete levelling compound Ceramic tile Concrete Cinder block Brick Terrazzo	Asbestos was used in an inconsistent fashion in these materials.  Sampling of these materials is likely to prove inconclusive unless performed extensively prior to demolition.

### **3.3 Survey Limitations**

This report reflects the observations, findings and analysis of materials sampled at the time of the survey. Due to the nature of building construction, some inherent limitations exist as to the possible thoroughness of the survey. As an example, it was not possible to test all materials on a foot-by-foot basis. Visually similar materials were referenced to specific sample locations. The survey did not include demolition of floors, floor finishes, drywall, plaster ceilings or walls or other demolition to examine concealed conditions. Observations were made based on building knowledge and layout where possible, in areas, which are inaccessible. There is a possibility that materials may exist which could not be reasonably identified within the scope of the assessment or which were not apparent during the Site visit. Additional investigation and possible acquiring of bulk samples for laboratory analysis should be performed prior to building renovations or modifications.

As previously noted, the guard shack was locked and could not be accessed at the time of the survey.

Some areas in the main facility building could not be readily accessed. Some building components that could not be sampled inconspicuously (i.e. no hidden corners, behind baseboards, above ceiling tiles, etc.) without damaging the aesthetic and/or integrity of material conditions, such as the popcorn ceiling in the main administrative area, the wall soundproofing boards of the Cash Room (Cash Room has restricted access), the vinyl tile floor located in some of the main floor rooms, and presumed transite piping elbows and roof drain runs, were identified as suspect ACMs, until such time as laboratory testing can prove otherwise.

### **3.4 Survey Conditions**

This facility and its finishes are in good condition.

### **4.0 Results**

**Table 1** indicates the materials sampled and laboratory results.

**Table 2** indicates materials determined to be ACMs, their location(s), and condition(s).

**Table 3** indicates painted surfaces, their location(s), and condition(s).

**Laboratory Results** are at the end of this report.

### **5.0 Deficiencies to Asbestos Containing Materials**

No deficiencies to visible ACMs were noted during this survey, therefore no action, in the form of abatement or repair, are required at this time.

### **6.0 Deficiencies to Suspect Painted Surfaces and/or Lead-Based Paints**

No deficiencies to visible painted surfaces were noted during this survey, therefore no action, in the form of abatement or repair, are required at this time.

## 7.0 Conclusions

ACMs were not identified through laboratory testing at this facility. Given the nature of the operations of this facility, pipe gaskets could be ACM and these materials should be handled carefully during pipe refitting and/or pipe replacement work.

The blue paint present on the boiler system on the main floor of the bus storage/repair area was sampled (Sample Pb01) and determined to be lead containing (0.065%) by laboratory analysis.

In addition to the assessment for ACMs, RWDI was requested to note the presence of other materials included as part of this DSS. Mercury may be present within the thermostat noted on the main floor. If during demolition activities additional mercury thermostats are encountered, thermostats may be disposed as regular solid waste and should be transported intact and disposed off-site at licensed disposal or resource recovery facility.

Silica-containing dust may occur during demolition of cementitious material such as mortar, cement, bricks, and cinder blocks (foundation blocks). So long as these materials are left in place, the risk for silica exposure is minimal. Respiratory protection should be worn during demolition of concrete blocks/bricks and/or concrete floors during demolition activities.

Of note, fluorescent lighting could contain PCBs within the lamp ballast, especially if the lamp ballasts were installed prior to May 1987. Given the age of the building and/or some of the components of the building (>30 years), the potential exists for these materials to be present.

The buildup of mold was not observed at the facility.

Under O. Reg. 278/05, the development, implementation, and updating of the Asbestos Management Program is required where known or ACMs are present. ACMs are required to be inspected on a frequency as prescribed in the Regulation and inspections must be documented.

This report is a step towards compliance with the requirements of O. Reg. 278/05. A copy of this report will remain resident with the City's Corporate Health & Safety and also be attached to the Asbestos Management Program.

A 2nd copy of this report is to be maintained on-site at this facility and be made readily available for review by all workers and contractors who may make contact with or perform work on or in the vicinity where ACMs may be located.

**BLUE BINDERS** - For consistency and ready identification throughout the Corporation, on-site copy(ies) of asbestos report(s) are to be maintained in the blue binder provided for ease of reference

## 8.0 Attachments

<b>Tables:</b>	<b>Table 1</b> – Locations, materials sampled, laboratory results <b>Table 2</b> – Locations where suspected ACMs were noted <b>Table 3</b> – Locations where lead-containing paints were suspected and/or identified
<b>Figures:</b>	<b>Figure 1</b> – Site Location Map <b>Figure 2</b> – Floor Plan - Main Floor (Administration Offices) <b>Figure 3</b> – Floor Plan – Second Floor (Executive Offices) <b>Figure 4</b> – Floor Plan – Buss Storage Repair Area <b>Figure 5</b> – Floor Plan – Second Floor <b>Figure 6</b> – Floor Plan – Guard Shack <b>Figure 7</b> – Floor Plan Garage 1 <b>Figure 8</b> – Floor Plan Garage 2
<b>Appendix A:</b>	Laboratory Analytical Results
<b>Survey Conducted by:</b>	Hassan Fakh, RWDI
<b>Report Prepared by:</b>	Hassan Fakh, RWDI Phil Janisse, RWDI

# TABLES



**Table 1**

<b>Sample ID</b>	<b>Sample Location</b>	<b>Sample Material</b>	<b>Asbestos Type and Content</b>
As01	Main Floor (Administration Area) – Storage Room	Ceiling Tiles	None Detected
As02	Main Floor (Administration Area) – A.T.U.	Drywall Compound	None Detected
As03	Main Floor (Administration Area) – Locker Room	Black Baseboard Trim Adhesive	None Detected
As04	Main Floor (Bus Storage/Repair Area) – Boiler Room	6” Insulated Pipe Wrap	None Detected

## Table 2

Location	Materials Examined	Sample #	Quantity	Friable/ Non-Friable	Damage	Accessibility	Type	Comments
Roof	Roofing Materials	Presumed	NA	Non-friable	1-2	3	Presumed	Consider roofing materials to be asbestos-containing until sampled
Exterior	Exterior Caulking	Presumed	NA	Non-friable	1	4	Presumed	Consider all exterior caulking materials to be asbestos-containing until sampled
Exterior/ Interior Block Walls	Possible Vermiculite	Presumed	NA	Friable	1	1	Presumed	Consider all exterior/interior block walls as asbestos containing inside wall cavities until sampled/verified
Exterior/ Interior	Fire Doors, popcorn ceiling, vinyl tile flooring, soundproof wall boards, transite piping	Presumed	NA	Friable	1	3	Presumed	Consider these materials to contain asbestos until sampled
Piping, Pumps, Turbines	Gaskets	Presumed	NA	Non-friable	1	3	Presumed	Consider all gaskets to be asbestos containing until sampled

**Notes:**

Types                    CH – Chrysotile                    AM – Amosite                    C – Crocidolite  
 Damage                1. No damage                    2. Slight damage                3. Moderate damage            4. Severe damage  
 Accessibility        1. Not accessible                2. Above ceiling                3. Accessible to workers      4. Accessible to public

“**Friable**” - Friable ACM is any material that contains 0.5 % or more by weight or area, depending on whether it is a bulk or sheet material and can be crumbled, pulverized, or reduced to powder by the pressure of an ordinary human hand.

“**Non-friable**” - Non-friable ACM is any material that contains more than one percent asbestos, but cannot be pulverized under hand pressure.

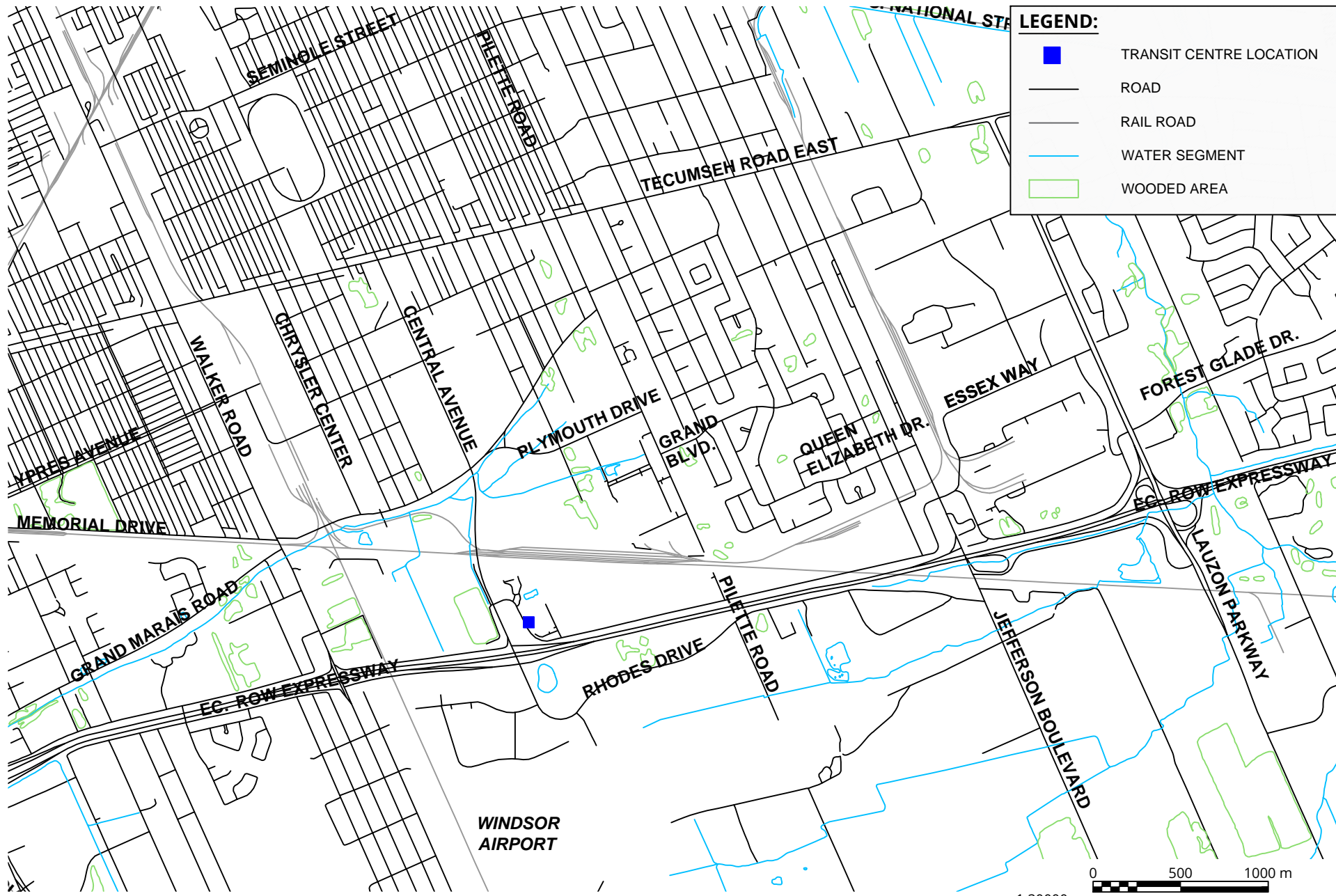
“**Assume**” – samples not taken due to inaccessibility or potential for damages to materials, therefore assumed to be ACM

**Comments** – observation of damaged materials including water damage, where located, other comments.

**Table 3**

<b>Sample ID</b>	<b>Sample Location</b>	<b>Sample Material</b>	<b>Lead Content (%)</b>
Pb01	Boiler Room – Blue Painted Boiler	Paint – Boiler	0.065
Pb02	Boiler Room – Beige Painted Surface	Paint – Block Walls	<0.05
Pb03	Service Lane – Beige Painted Surface	Paint – Block Walls	<0.05

# FIGURES



**Site Location Map**  
 Transit Centre - Windsor, ON.  
 DSS Report

Corporation of the City of Windsor

**Note:**  
 1. BASEMAP FROM ONTARIO BASE MAP (2016).



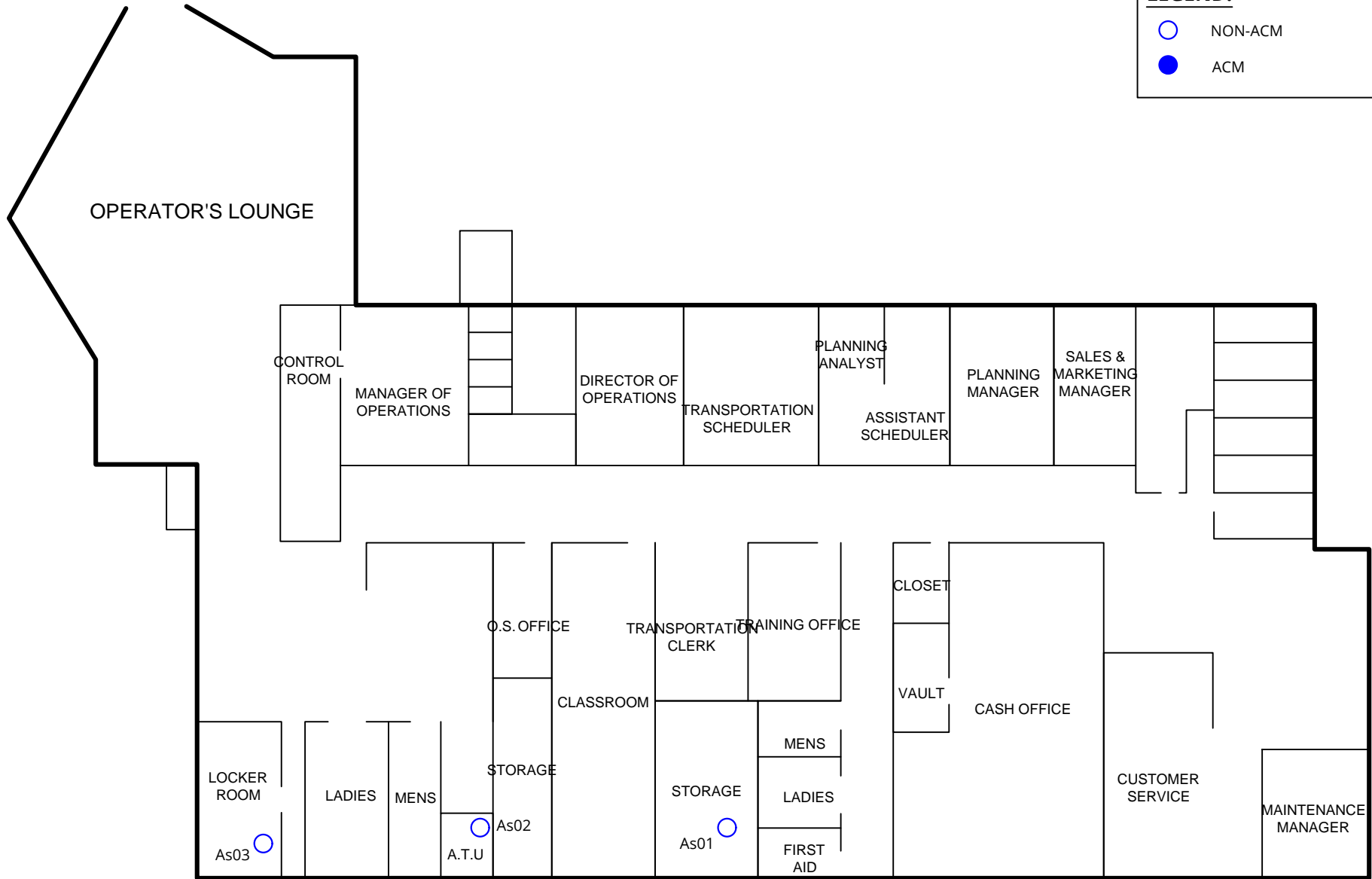
Project #1603382


Drawn by: SSL	Figure: 1
Approx. Scale: 1:30,000	
Date Revised: May 29, 2017	



**LEGEND:**

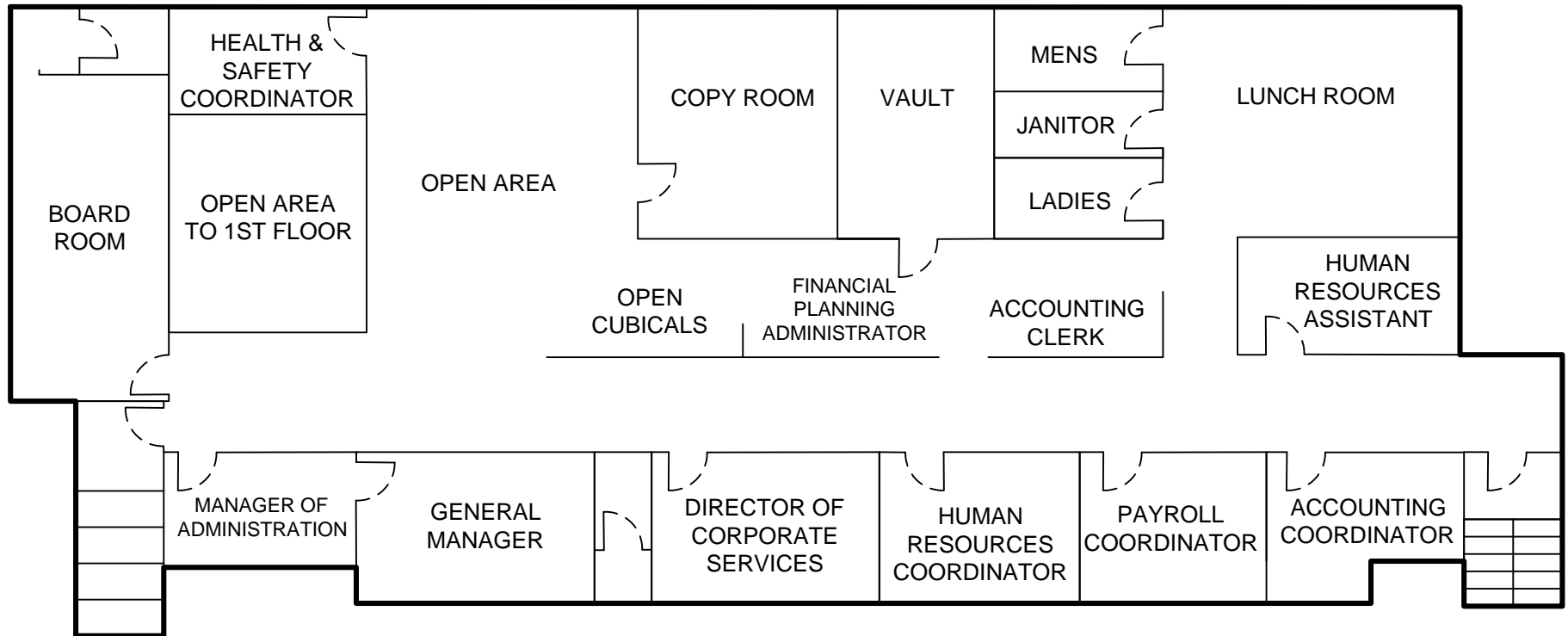
- NON-ACM
- ACM



<b>Floor Plan - Main Floor (Administration Offices)</b> Transit Centre - Windsor, ON. DSS Report  Corporation of the City of Windsor	Drawn by: SSL   Figure: 2	
	Approx. Scale: NTS	
	Date Revised: May 29, 2017	

**Note:**  
1. ARCHITECTURAL PLANS ARE APPROXIMATE.

Project #1603382



**Floor Plan - Second Floor (Executive Offices)**

Transit Centre - Windsor, ON.  
DSS Report

Corporation of the City of Windsor

**Note:**

1. ARCHITECTURAL PLANS ARE APPROXIMATE.

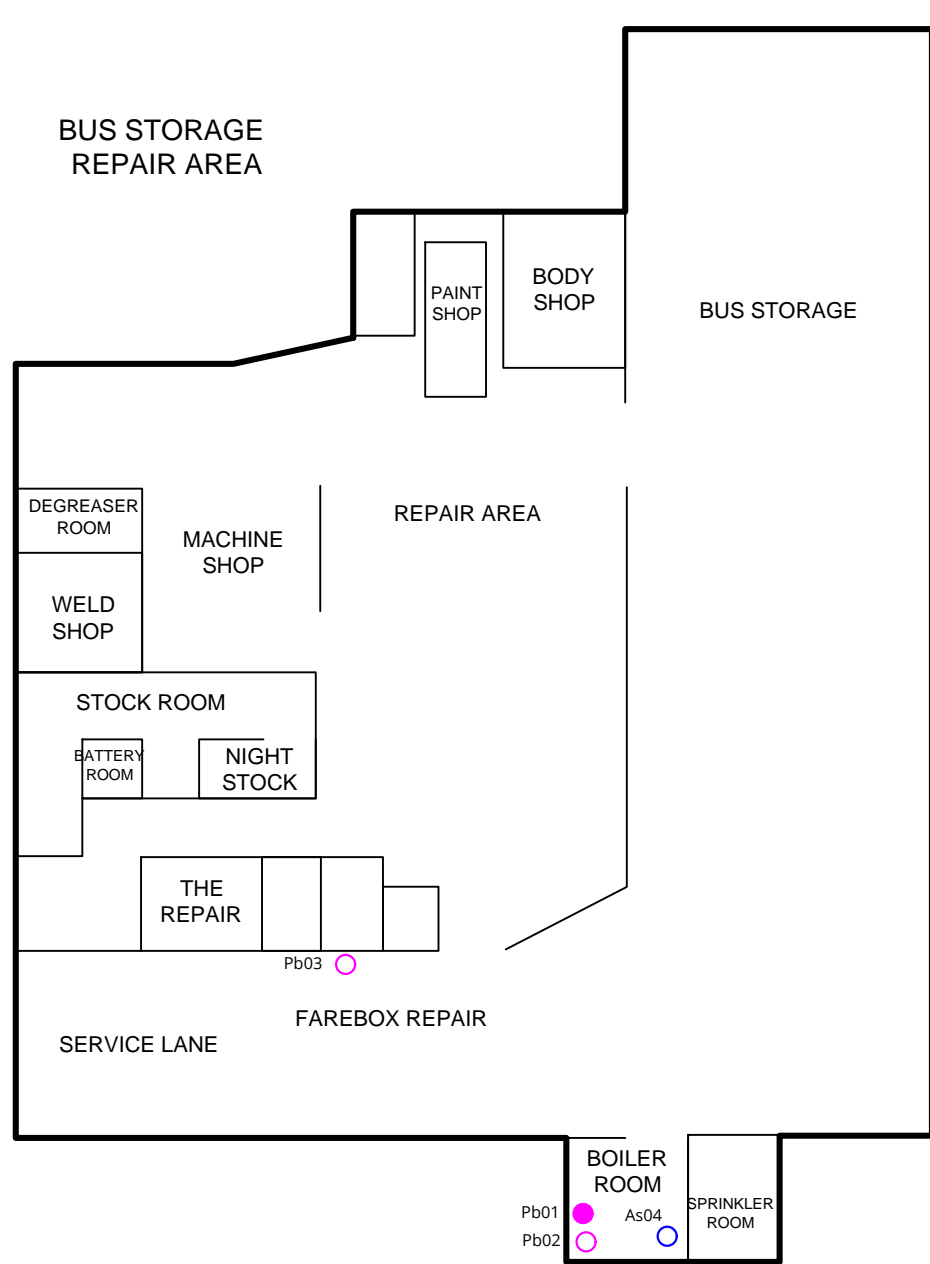
Project #1603382

Drawn by: SSL Figure: 3

Approx. Scale: NTS


Date Revised: May 29, 2017



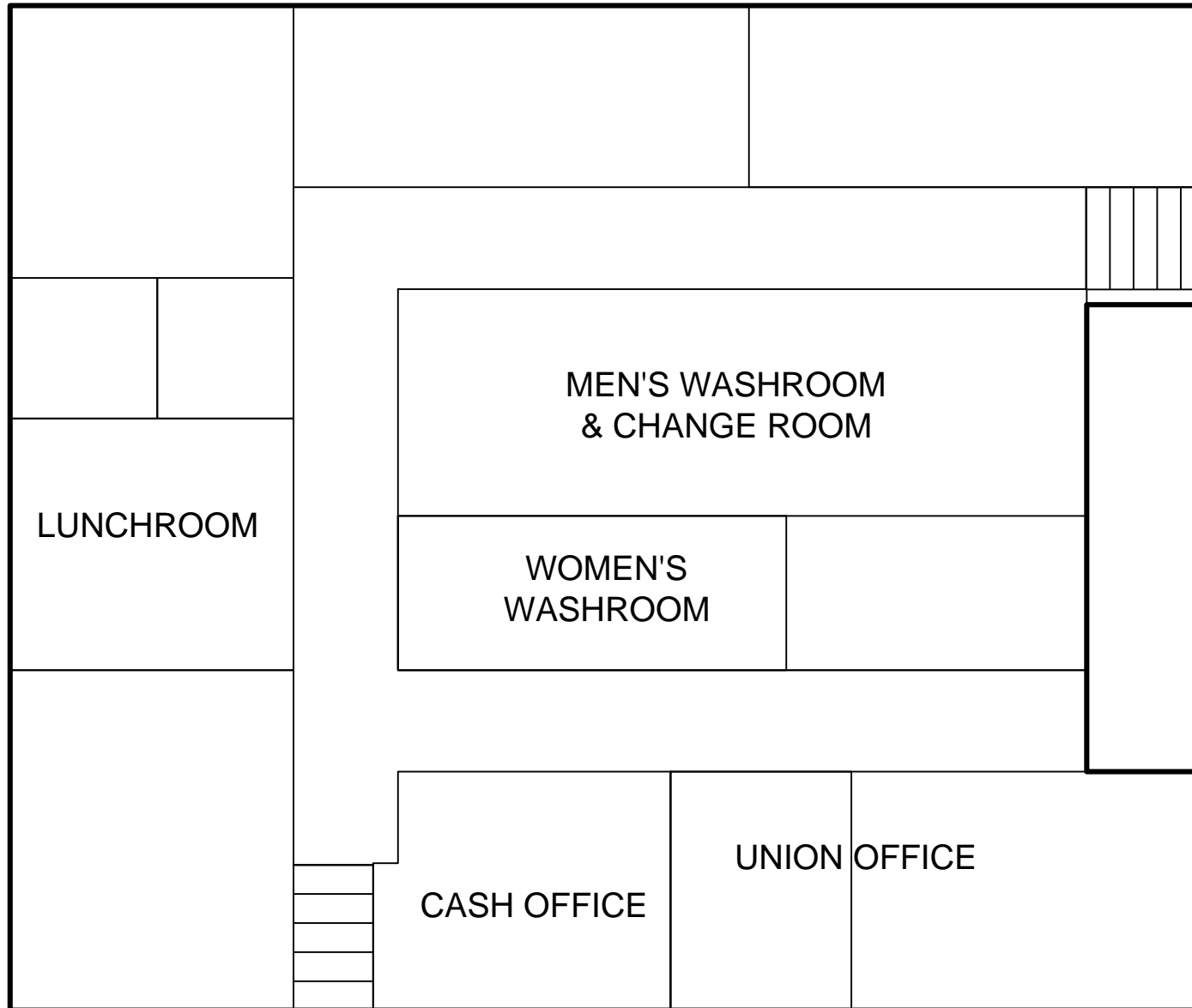


**LEGEND:**

- NON-LBP
- LBP
- NON-ACM
- ACM

<p><b>Floor Plan - Bus Storage Repair Area</b>          Transit Windsor Station - Windsor, ON.          DSS Report</p> <p>Corporation of the City of Windsor</p>	<p><b>Note:</b>          1. ARCHITECTURAL PLANS ARE APPROXIMATE.</p>	<p>Project #1603382</p>	Drawn by: SSL Figure: 4	
			Date Revised: May 29, 2017	
			Approx. Scale: NTS	





**Floor Plan - Second Floor**

Transit Centre - Windsor, ON.  
DSS Report

Corporation of the City of Windsor

**Note:**

1. ARCHITECTURAL PLANS ARE APPROXIMATE.

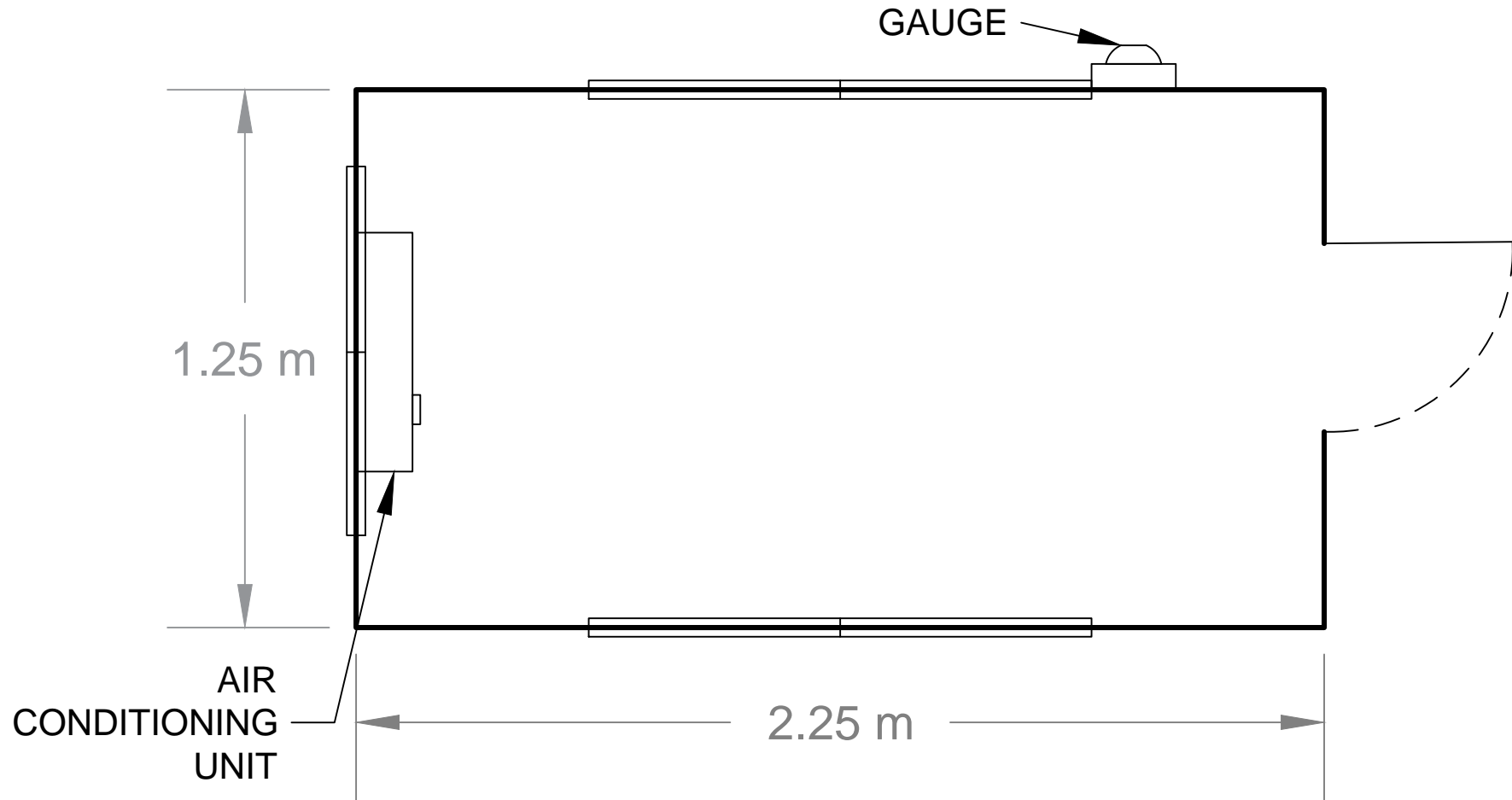
Project #1603382

Drawn by: SSL Figure: 5

Approx. Scale: NTS

Date Revised: May 20, 2017





**Floor Plan - Guard Shack**

Transit Centre - Windsor, ON.  
DSS Report

Corporation of the City of Windsor

**Note:**

1. ARCHITECTURAL PLANS ARE APPROXIMATE.

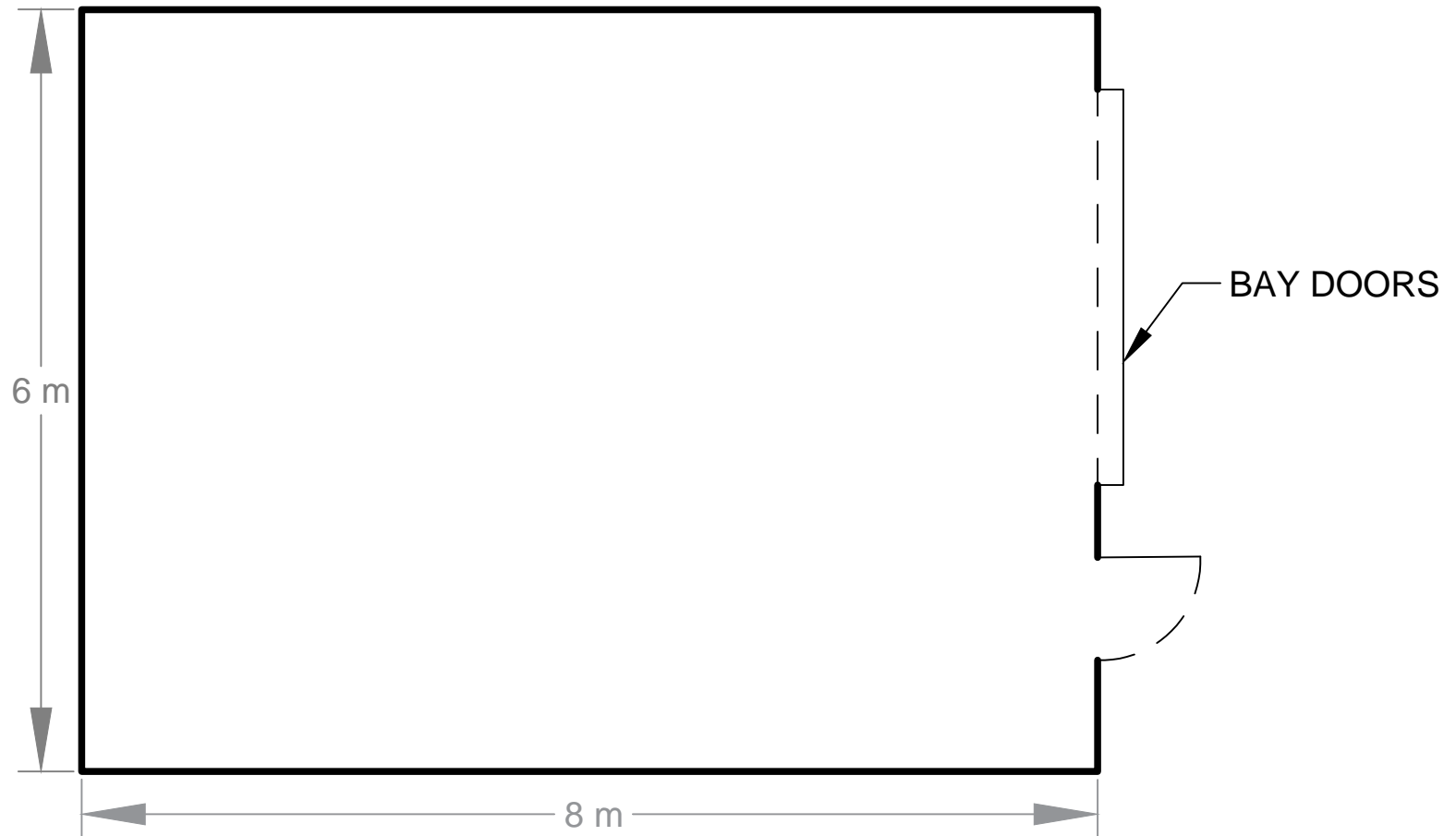
Project #1603382

Drawn by: SSL Figure: 6

Approx. Scale: NTS

Date Revised: Jun. 6, 2017





**Floor Plan - Garage 1**  
 Transit Centre - Windsor, ON.  
 DSS Report

Corporation of the City of Windsor

**Note:**  
 1. ARCHITECTURAL PLANS ARE APPROXIMATE.

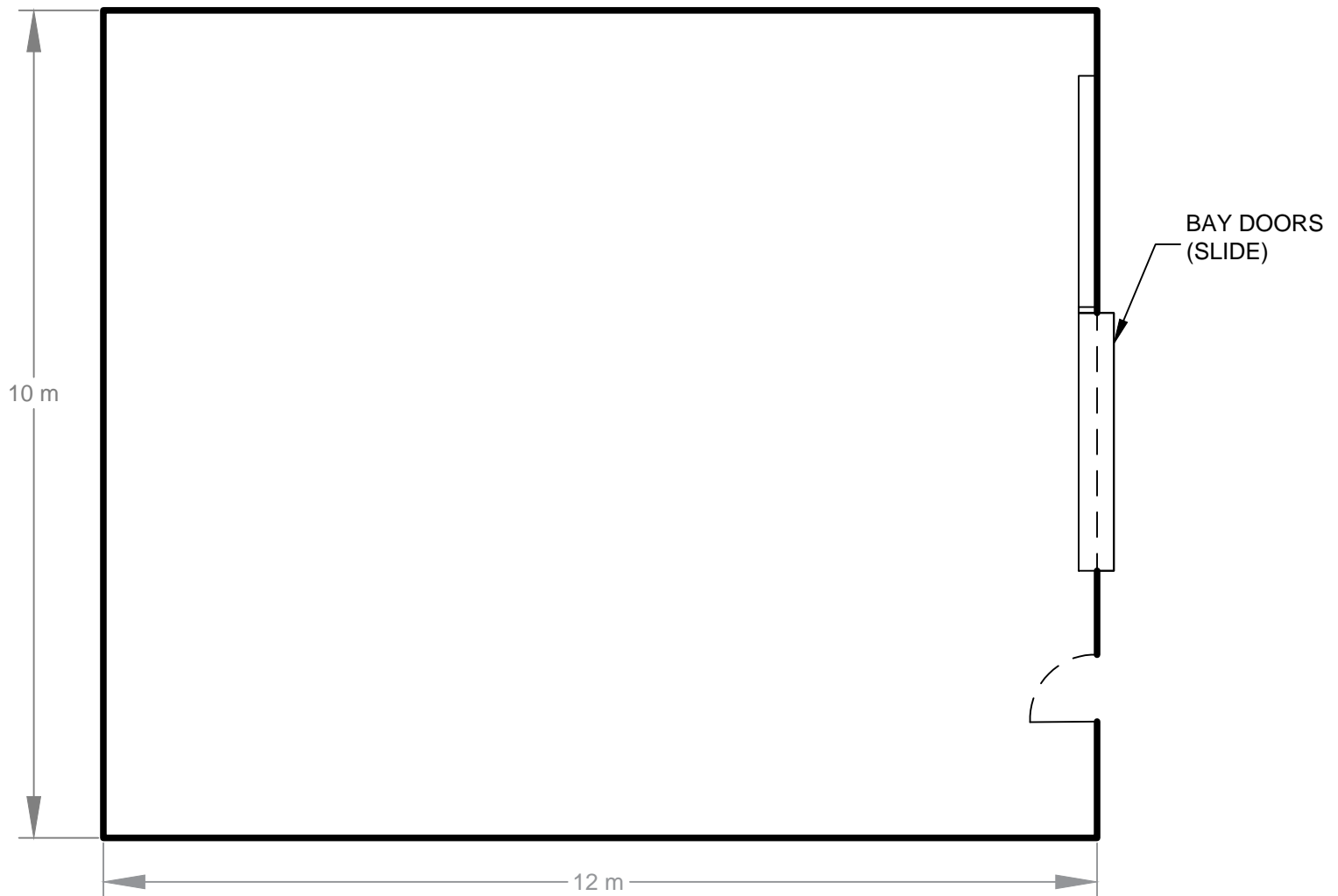
Project #1603382

Drawn by: SSL Figure: 7

Approx. Scale: NTS

Date Revised: Jun. 6, 2017





**Floor Plan - Garage 2**  
 Transit Centre - Windsor, ON.  
 DSS Report

Corporation of the City of Windsor

**Note:**  
 1. ARCHITECTURAL PLANS ARE APPROXIMATE.

Project #1603382

Drawn by: SSL	Figure: 8
Approx. Scale: NTS	
Date Revised: Jun. 6, 2017	



# APPENDIX A

## Certificate of Analysis

**RWDI Air Inc (Windsor)**

4510 Rhodes Drive, Unit 530  
Windsor, ON N8W 5K5  
Attn: Hassan Fakih

Client PO: 1603382-1000  
Project: 1603382-1000  
Custody: 17326

Report Date: 8-May-2017  
Order Date: 3-May-2017

**Order #: 1718245**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1718245-01	AS01-A
1718245-02	AS01-B
1718245-03	AS01-C
1718245-04	AS02-A (plaster)
1718245-05	AS02-B (plaster)
1718245-06	AS02-C (plaster)
1718245-07	AS03-A (adhesive)
1718245-08	AS03-B (adhesive)
1718245-09	AS03-C (adhesive)
1718245-10	AS04-A (fiberglass)
1718245-11	AS04-B (fiberglass)
1718245-12	AS04-C (fiberglass)

Approved By:



Heather S.H. McGregor, BSc  
Laboratory Director - Microbiology

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis  
 Client: **RWDI Air Inc (Windsor)**  
 Client PO: **1603382-1000**

Report Date: 08-May-2017  
 Order Date: 3-May-2017  
 Project Description: **1603382-1000**

**Asbestos, PLM Visual Estimation \*\*MDL - 0.5%\*\***

<i>Parcel I.D.</i>	<i>Sample Date</i>	<i>Layers Analyzed</i>	<i>Colour</i>	<i>Description</i>	<i>Asbestos Detected:</i>	<i>Material Identification</i>	<i>% Content</i>
1718245-01	24-Apr-17	sample homogenized	Grey	Ceiling Tile	No	<b>Client ID: AS01-A</b> [AS-PRE]	
						Cellulose	40
						MMVF	40
						Non-Fibers	20
1718245-02	24-Apr-17	sample homogenized	Grey	Ceiling Tile	No	<b>Client ID: AS01-B</b> [AS-PRE]	
						Cellulose	40
						MMVF	40
						Non-Fibers	20
1718245-03	24-Apr-17	sample homogenized	Grey	Ceiling Tile	No	<b>Client ID: AS01-C</b> [AS-PRE]	
						Cellulose	40
						MMVF	40
						Non-Fibers	20
1718245-04	24-Apr-17	sample homogenized	White	Plaster	No	<b>Client ID: AS02-A (plaster)</b>	
						Cellulose	1
						Non-Fibers	99
1718245-05	24-Apr-17	sample homogenized	White	Plaster	No	<b>Client ID: AS02-B (plaster)</b>	
						Cellulose	1
						Non-Fibers	99
1718245-06	24-Apr-17	sample homogenized	White	Plaster	No	<b>Client ID: AS02-C (plaster)</b>	
						Cellulose	1
						Non-Fibers	99
1718245-07	24-Apr-17	sample homogenized	Yellow	Adhesive	No	<b>Client ID: AS03-A (adhesive)</b> [AS-PRE]	
						Non-Fibers	100
1718245-08	24-Apr-17	sample homogenized	Yellow	Adhesive	No	<b>Client ID: AS03-B (adhesive)</b> [AS-PRE]	
						Non-Fibers	100
1718245-09	24-Apr-17	sample homogenized	Yellow	Adhesive	No	<b>Client ID: AS03-C (adhesive)</b> [AS-PRE]	
						Non-Fibers	100
1718245-10	24-Apr-17	sample homogenized	Yellow	Fiberglass	No	<b>Client ID: AS04-A (fiberglass)</b>	
						MMVF	99
						Non-Fibers	1
1718245-11	24-Apr-17	sample homogenized	Yellow	Fiberglass	No	<b>Client ID: AS04-B (fiberglass)</b>	
						MMVF	99
						Non-Fibers	1

Certificate of Analysis  
 Client: **RWDI Air Inc (Windsor)**  
 Client PO: **1603382-1000**

Report Date: 08-May-2017  
 Order Date: 3-May-2017  
 Project Description: **1603382-1000**

**Asbestos, PLM Visual Estimation    \*\*MDL - 0.5%\*\***

Parcel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1718245-12	24-Apr-17	sample homogenized	Yellow	Fiberglass	No	<b>Client ID: AS04-C (fiberglass)</b>	
						MMVF	99
						Non-Fibers	1

\* MMVF: Man Made Vitreous Fibers: Fiberglass, Mineral Wool, Rockwool, Glasswool

**Analysis Summary Table**

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	1 - Mississauga	200863-0	4-May-17

\* Reference to the NVLAP term does not permit the user of this report to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

**Qualifier Notes**

Sample Qualifiers :

AS-PRE: Due to the difficult nature of the bulk sample (interfering fibers/binders), additional NOB preparation was required prior to analysis

**Work Order Revisions / Comments**

None





Client Name: <b>RWDI</b>	Project Reference: <b>1603382-1000</b>	<b>Turnaround Time:</b> <input type="checkbox"/> Immediate <input type="checkbox"/> 1 Day <input type="checkbox"/> 4 Hour <input type="checkbox"/> 2 Day <input type="checkbox"/> 8 Hour <input type="checkbox"/> 3 Day <input checked="" type="checkbox"/> Regular
Contact Name: <b>Hassan.Fakih@RWDI.com</b>	Quote #: <b>17-013</b>	
Address: <b>4510 Rhodes Drive - Unit 530 Windsor, ON N9W5K5</b>	PO #: <b>1603382-1000</b>	
Telephone: <b>519-823-1311</b>	Email Address:	
		Date Required:

**ASBESTOS & MOLD ANALYSIS**

Matrix:  Air     Bulk     Tape Lift     Swab     Other    Regulatory Guideline:

Required Analyses:  Microscopic Mold     Culturable Mold     Bacteria GRAM     PCM     PLM     Chatfield     TEM

Parcel Order Number: <b>1718245</b>		Asbestos - Bulk					
Sample ID	Sampling Date	Air Volume (L)	Analysis Required	Matrix Description	Positive Stop? (Y/N)	Is the Sample Layered? (Y/N)	If layered, Describe Layer(s) to be analyzed Separately* or Homogenize all **
1 AS01	24 APR 17	-	PLM	Ceiling Tile	Y	Y	middle layer
2 AS02	"	-	"	Drywall	Y	Y	middle layer
3 AS03	"	-	"	Baseboard Trim	Y	Y	adhesive material
4 AS04	"	-	"	Insulation	Y	Y	Fiberglass/yellow paper
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

\*Each layer will be analyzed and charged separately    \*\*Homogenize - All layers are blended into a single uniform sample.

Comments:		Method of Delivery: <b>Pendata</b>	
Relinquished By (SPM): <b>HF</b>	Received at Depot:	Received at Lab: <b>[Signature]</b>	Verified By: <b>[Signature]</b>
Relinquished By (IPM): <b>Hassan Fakih</b>	Date/Time: <b>2-May-17 11AM</b>	Date/Time: <b>May 3-17 11:20</b>	Date/Time: <b>May 5-17 13:00</b>

## Certificate of Analysis

**RWDI Air Inc (Windsor)**

4510 Rhodes Drive, Unit 530  
Windsor, ON N8W 5K5  
Attn: Hassan Fakih

Client PO: 1603382-1000  
Project: 1603382-1000  
Custody:

Report Date: 5-May-2017  
Order Date: 3-May-2017

**Order #: 1718198**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

**Parcel ID    Client ID**

1718198-01    Pb01  
1718198-02    Pb02  
1718198-03    Pb03

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Any use of these results implies your agreement that our total liability in connection with this work, however arising shall be limited to the amount paid by you for this work, and that our employees or agents shall not under circumstances be liable to you in connection with this work

Certificate of Analysis  
Client: **RWDI Air Inc (Windsor)**  
Client PO: **1603382-1000**

Report Date: 05-May-2017  
Order Date: 3-May-2017  
Project Description: **1603382-1000**

**Analysis Summary Table**

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-OES	based on MOE E3470, ICP-OES	3-May-17	3-May-17

**Sample Data Revisions**

None

**Work Order Revisions/Comments:**

None

**Other Report Notes:**

- n/a: not applicable
- ND: Not Detected
- MDL: Method Detection Limit
- Source Result: Data used as source for matrix and duplicate samples
- %REC: Percent recovery.
- RPD: Relative percent difference.

Certificate of Analysis  
 Client: RWDI Air Inc (Windsor)  
 Client PO: 1603382-1000

Report Date: 05-May-2017  
 Order Date: 3-May-2017  
 Project Description: 1603382-1000

### Sample Results

Lead				Matrix: Paint
				Sample Date: 24-Apr-17
Paracel ID	Client ID	Units	MDL	Result
1718198-01	Pb01	ug/g	20	647
1718198-02	Pb02	ug/g	20	68
1718198-03	Pb03	ug/g	20	54

### Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Matrix Blank</b>									
Lead	ND	20	ug/g						
<b>Matrix Duplicate</b>									
Lead	9300	200	ug/g	9300			0.0	30	
<b>Matrix Spike</b>									
Lead	224		ug/L		89.7	70-130			



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1-800-749-1947  
paracel@paracellabs.com

Chain of Custody  
(Lab Use Only)

Page 1 of 1

Client Name: <b>RWDI</b>	Project Reference: <b>1603382-1000</b>	<b>Turnaround Time:</b> <input type="checkbox"/> 1 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: <b>Hassan Fakhri RWDI.com</b>	Quote #: <b>17-013</b>	
Address: <b>4510 Rhodes Drive - Unit 530 Windsor, ON N9W 5K5</b>	PO #: <b>1603382-1000</b>	
Telephone: <b>519-433-1311</b>	Email Address: _____	

Criteria:  O. Reg. 153/04 (As Amended) Table     RSC Filing     O. Reg. 558/00     PWQO     CCME     SUB (Storm)     SUB (Sanitary)    Municipality: \_\_\_\_\_     Other: \_\_\_\_\_

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) **P (Paint)** A (Air) O (Other)

Parcel Order Number: <b>1718198</b>	Matrix	Air Volume	# of Containers	Sample Taken		Lead in paint	Required Analyses												
				Date	Time		1	2	3	4	5	6	7	8	9	10			
1	P	/	1	24-APR-17	AM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	P	/	1	"	AM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	P	/	1	"	AM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: \_\_\_\_\_  
 Method of Delivery: **Per Express**

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot:	Received at Lab: <b>Savage</b>	Verified By: <b>Rachel Subject</b>
Relinquished By (Print): <b>Hassan Fakhri</b>	Date/Time:	Date/Time: <b>May 31/17 9:00am</b>	Date/Time: <b>May 31/17</b>
Date/Time: <b>2-May-17 / AM</b>	Temperature: _____ °C	Temperature: _____ °C	pid Verified <input checked="" type="checkbox"/> By <b>N/A</b> <b>9:5</b>

## Appendix E - BCA Cost Update

---

**APPENDIX E - ESTIMATE SUMMARY**  
**WINDSOR TRANSIT GARAGE - BUILDING & SITE UPGRADES**  
ORDER OF MAGNITUDE CLASS D ESTIMATE REV. 2  
October 22, 2021



Gross Floor Area (SF) 131,696

No.	Item Description	BOLD Eng. BCA (SF)	Bldg of Site GFA (SF)	BOLD Unit Rate	RLB Unit Rate	Estimate Total
		(\$2017)		BOLD	RLB	(\$2021)
<b>1</b>	<b>Building Exteriors and Interiors</b>					
1.1	Roof Finish	\$1,299,000	126,696	\$10.25	\$30.00	\$3,800,880
1.2	Building Envelope	\$4,028,000	131,696	\$30.59	\$25.00	\$3,292,400
1.3	Interior Elements	\$594,000	131,696	\$4.51	\$5.00	\$658,480
1.4	Accessibility and Other Issues	\$0	131,696	\$0.00	\$5.50	\$724,328
1.5	Conveying Systems	\$0				
	<b>Subtotal - Building Exterior &amp; Interiors</b>	<b>\$5,921,000</b>			<b>\$64.36</b>	<b>\$8,476,088</b>
<b>2</b>	<b>Building Mechanical Systems</b>					
2.1	Plumbing Systems	\$574,000	131,696	\$4.36	\$4.50	\$592,632
2.2	Heating Systems	\$574,000	131,696	\$4.36	\$4.50	\$592,632
2.3	Cooling Systems	\$574,000	131,696	\$4.36	\$4.50	\$592,632
2.4	Air Handling Systems	\$393,000	131,696	\$2.98	\$5.00	\$658,480
2.5	Building Controls	N/A	131,696		\$2.50	\$329,240
2.6	Fire Suppression Systems	\$665,000	131,696	\$5.05	\$5.50	\$724,328
	<b>Subtotal - Building Mechanical</b>	<b>\$2,780,000</b>			<b>\$26.50</b>	<b>\$3,489,944</b>
<b>3</b>	<b>Electrical</b>					
3.1	Electrical Service & Distribution	\$886,000	131,696	\$6.73	\$6.75	\$888,948
3.2	Lighting and devices				\$8.00	\$1,053,568
3.3	Security/Access Systems	\$483,000	131,696	\$3.67	\$4.00	\$526,784
3.4	Systems and Ancillaries				\$2.50	\$329,240
	<b>Subtotal - Building Electrical</b>	<b>\$1,369,000</b>	<b>131,696</b>		<b>\$21.25</b>	<b>\$2,798,540</b>
	<b>SUBTOTAL - Scope 1 to 3 above</b>	<b>\$10,070,000</b>	<b>131,696</b>	<b>\$76.46</b>	<b>\$112.11</b>	<b>\$14,764,572</b>
<b>4</b>	<b>Site Work</b>					
4.1	Paving, sidewalks and curbs		150,000	\$0.00	\$5.00	\$750,000
4.2	Site Improvements		150,000		\$1.00	\$150,000
4.3	Site signage					\$30,000
4.5	Mechanical site services		150,000		\$0.75	\$112,500
4.6	Electrical site lighting and controls		150,000		\$1.25	\$187,500
	<b>Subtotal - Site Work</b>	<b>\$0</b>	<b>150,000</b>		<b>\$8.20</b>	<b>\$1,230,000</b>
	<b>SUBTOTAL - Scope 1 to 4 above</b>	<b>\$10,070,000</b>	<b>131,696</b>		<b>\$121.45</b>	<b>\$15,994,572</b>
5	Demolition (selective)	\$0	131,696		\$4.00	\$526,784
	<b>Combined Total - inc. Demolition</b>	<b>\$10,070,000</b>	<b>131,696</b>	<b>\$76.46</b>	<b>\$125.45</b>	<b>\$16,521,356</b>
6	Contractor's General Conditions	10%				\$1,652,136
7	Contractor's Fees	5%				\$826,068
	<b>Subtotal - Including Contractor's Mark Ups</b>					<b>\$18,999,559</b>
8	Insurance and Bonding	2%				\$379,991
9	Contingency including phasing	20%				\$3,875,910
	<b>TOTAL - HARD CONSTRUCTION</b>		<b>131,696</b>		<b>\$176.58</b>	<b>\$23,255,461</b>

**APPENDIX E - ESTIMATE SUMMARY**  
**WINDSOR TRANSIT GARAGE - BUILDING & SITE UPGRADES**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE REV. 2**  
**October 22, 2021**



Gross Floor Area (SF) 131,696

No.	Item Description	BOLD Eng. BCA (SF)	Bldg of Site GFA (SF)	BOLD Unit Rate	RLB Unit Rate	Estimate Total
	<b>Soft Costs &amp; Escalation Contingency</b>	(\$2017)		BOLD	RLB	(\$2021)
10	Design and Engineering Fees	15%				\$3,488,319
11	Escalation Contingency to mid point of construction 2023	8%	(2 years at 4.0% per annum)			Excluded
<b>Combined Total - (excluding HST)</b>		<b>\$10,070,000</b>	<b>131,696</b>	<b>\$76.46</b>	<b>\$203.07</b>	<b>\$26,743,780</b>

**Notes:**

- The estimates in the column titled "BOLD Eng. BCA" have been extracted from the Building Condition Assessment Report prepared by BOLD Engineering dated Nov 2, 2017. These estimates are out of date and the scope is incomplete.



# Appendix F - Process Equipment Replacement Cost Estimate

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**AAPENDIX F - ESTIMATE SUMMARY**  
**WINDSOR TRANSIT GARAGE - EQUIPMENT REPLACEMENT ESTIMATE**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE - Revision 3**  
**October 22, 2021**



No	Item Description	Net Estimate	Design & Engineering	
			Engineering	Combined Total
	<b>Building Process Equipment (fixed)</b>		15%	
1	Bus wash (touchless drive through)	\$265,000	\$39,750	\$304,750
2	Air Compressors	\$90,000	\$13,500	\$103,500
3	Lube and Compressed Air Hose Reels (14 sets x 6)	\$151,200	\$22,680	\$173,880
4	Fuel Tanks (1999)	\$240,000	\$36,000	\$276,000
5	Fuel Dispensers (1 internal diesel, 2 external Diesel and Gasoline) including removal of existing dispensers	\$30,000	\$4,500	\$34,500
6	DEF Dispensers	\$7,500	\$1,125	\$8,625
7	Garage Bus Exhaust System	\$200,000	\$30,000	\$230,000
8	Hertz Scissor Lift (2004)	\$165,000	\$24,750	\$189,750
9	Bus Hoists	\$3,640,000	\$546,000	\$4,186,000
10	Hydraulic Lifts (2016)	\$720,000	\$108,000	\$828,000
11	Paint Booth (1978)	\$938,000	\$140,700	\$1,078,700
12	Lube Tanks and Pumps Systems (1999)	\$80,000	\$12,000	\$92,000
13	Drive on Hoist	\$147,500	\$22,125	\$169,625
14	Portable Process Equipment (moveable)	\$368,250	\$55,238	\$423,488
	<b>SUBTOTAL (excluding HST)</b>	<b>\$7,042,450</b>	<b>\$1,056,368</b>	<b>\$8,099,000</b>
15	General Requirements	15%	\$1,056,368	\$1,056,368
16	Fees	5%	\$352,123	\$352,123
17	Equipment consultant	2.5%		\$176,061
	<b>SUBTOTAL (excluding HST)</b>	<b>\$8,450,940</b>	<b>\$1,232,429</b>	<b>\$9,683,600</b>
18	Project Contingency	10%	\$845,094	\$968,337
19	Escalation Contingency (to 2023, 2 years @ 4% per annum)	8%		Excluded
	<b>TOTAL - Equipment (excluding HST)</b>	<b>\$9,296,034</b>	<b>\$1,355,672</b>	<b>\$10,651,940</b>

**APPENDIX F - ESTIMATE SUMMARY**  
**WINDSOR TRANSIT GARAGE - EQUIPMENT REPLACEMENT ESTIMATE**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE - Revision 2**  
**October 22, 2021**



No.	Equipment Description	Date	Quantity	Unit	Unit Rate	Extension	Subtotal
<b>Building Process Equipment (fixed)</b>							
1	Bus wash (touchless drive through) including:		1	sum	\$175,000.00		\$265,000
1.1	- decommission and remove the existing bus wash		1	sum	\$35,000.00	\$35,000	
1.2	- equipment pads and anchoring for new bus wash		1	sum	\$10,000.00	\$10,000	
1.3	- supply and install new touchless bus wash		1	sum	\$175,000.00	\$175,000	
1.4	- replace existing HW pumps and valves for new bus wash		1	sum	\$30,000.00	\$30,000	
1.5	- miscellaneous options/add ons		1	sum	\$15,000.00	\$15,000	
2	Air Compressors (assumed 2 locations)		2	No	\$45,000.00		\$90,000
2.1	- decommission and remove the existing compressors		2	No	\$5,000.00	\$10,000	
2.2	- equipment pads and anchoring for new compressors		2	No	\$5,000.00	\$10,000	
2.3	- supply and install new air compressors		2	No	\$25,000.00	\$50,000	
2.4	- replace existing piping and valves		2	No	\$5,000.00	\$10,000	
2.5	- miscellaneous options/add ons		2	No	\$5,000.00	\$10,000	
3	Lube and Compressed Air Hose Reels (14 sets x 6)		84	No	\$1,800.00	\$151,200	
4	Fuel Tanks (1999)		4	No	\$60,000.00		\$240,000
4.1	- decommission the existing fuel tanks		4	No	\$5,000.00	\$20,000	
4.2	- remove the existing fuel tanks		4	No	\$7,500.00	\$30,000	
4.3	- modify existing housekeeping pads and containment areas		4	No	\$15,000.00	\$60,000	
4.4	- supply and install new fuel tanks and pumps		4	No	\$25,000.00	\$100,000	
4.5	- testing and commissioning new tanks and pumps		4	No	\$2,500.00	\$10,000	
4.6	- miscellaneous options/add ons (fuel monitoring and alarms and controls)		4	No	\$5,000.00	\$20,000	
5	Fuel Dispensers (1 internal diesel, 2 external Diesel and Gasoline) including removal of existing dispensers		3	No	\$10,000.00	\$30,000	
6	DEF Dispensers		1	No	\$7,500.00	\$7,500	
7	Garage Bus Exhaust System		1	sum	\$200,000.00		\$200,000
7.1	- decommission the existing bus exhaust system including fans, ductwork and controls		1	sum	\$25,000.00	\$25,000	
7.2	- modify existing roof openings for new exhaust fans		1	sum	\$10,000.00	\$10,000	
7.3	- supply and install new exhaust system, fans, ductwork and controls		1	sum	\$150,000.00	\$150,000	
7.4	- testing and commissioning new exhaust system		1	sum	\$5,000.00	\$5,000	
7.5	- miscellaneous alterations and making good		1	sum	\$10,000.00	\$10,000	
8	Hertz Scissor Lift (2004)		1	No	\$165,000.00		\$165,000
8.1	- decommission the existing scissor lift		1	sum	\$5,000.00	\$5,000	
8.2	- remove the existing scissor lift		1	sum	\$15,000.00	\$15,000	
8.3	- allowance to modify the housekeeping pads/foundations for the new lift		1	sum	\$10,000.00	\$10,000	
8.4	- supply and install new 50 ft scissor lift		1	sum	\$125,000.00	\$125,000	
8.5	- testing and commissioning new scissor lift		1	sum	\$5,000.00	\$5,000	
8.6	- miscellaneous alterations and making good		1	sum	\$5,000.00	\$5,000	

**APPENDIX F - ESTIMATE SUMMARY**  
**WINDSOR TRANSIT GARAGE - EQUIPMENT REPLACEMENT ESTIMATE**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE - Revision 2**  
**October 22, 2021**



No.	Equipment Description	Date	Quantity	Unit	Unit Rate	Extension	Subtotal
9	Bus Hoists		13	No	\$280,000.00		\$3,640,000
9.1	- decommission the existing bus hoists		13	No	\$2,500.00	\$32,500	
9.2	- remove the existing bus hoists (phased)		13	sum	\$15,000.00	\$195,000	
9.3	- allowance to modify the hoist pits/foundations for the new bus hoists		13	No	\$10,000.00	\$130,000	
9.4	- supply and install new bus hoists		13	No	\$245,000.00	\$3,185,000	
9.5	- testing and commissioning new hoists		13	No	\$2,500.00	\$32,500	
9.6	- miscellaneous alterations and making good		13	No	\$5,000.00	\$65,000	
10	Hydraulic Lifts (2016)		6	2016	\$120,000.00		\$720,000
10.1	- decommission the existing bus lifts		6	No	\$2,500.00	\$15,000	
10.2	- remove the existing bus lifts (phased)		6	sum	\$7,500.00	\$45,000	
10.3	- allowance to modify the hoist pits/foundations for the new bus lifts		6	No	\$5,000.00	\$30,000	
10.4	- supply and install new bus lifts		6	No	\$100,000.00	\$600,000	
10.5	- testing and commissioning new hoists		6	No	\$2,500.00	\$15,000	
10.6	- miscellaneous alterations and making good		6	No	\$2,500.00	\$15,000	
11	Paint Booth (1978) custom built booth 10 m wide x 25 m long		1	1978	\$938,000.00		\$938,000
11.1	- decommission the existing paint booth		1	sum	\$5,000.00	\$5,000	
11.2	- remove the existing paint booth		1	sum	\$15,000.00	\$15,000	
11.3	- allowance to modify the anchors for the new booth		1	No	\$3,000.00	\$3,000	
11.4	- supply and install new paint booth (custom built) assumed 10 m wide x 25 m long		250	m2	\$3,500.00	\$875,000	
11.5	- modify and reconnect existing M&E to new paint booth		1	sum	\$25,000.00	\$25,000	
11.6	- testing and commissioning new booth		1	No	\$5,000.00	\$5,000	
11.7	- miscellaneous alterations and making good		1	No	\$10,000.00	\$10,000	
12	Lube Tanks and Pumps Systems (1999)		1	sum	\$80,000.00		\$80,000
12.1	- decommission the existing lube tanks and pumps		1	sum	\$10,000.00	\$10,000	
12.2	- modify existing housekeeping pads/foundations for new lube tanks and pumps		1	sum	\$10,000.00	\$10,000	
12.3	- supply and install new lube tanks, pumps and controls		1	sum	\$50,000.00	\$50,000	
12.4	- testing and commissioning new tanks, pumps and controls		1	sum	\$5,000.00	\$5,000	
12.5	- miscellaneous alterations and making good		1	sum	\$5,000.00	\$5,000	
13	Drive on Hoist		1	No	\$147,500.00		\$147,500
13.1	- decommission the existing bus hoist		1	No	\$5,000.00	\$5,000	
13.2	- remove the existing bus hoist		1	sum	\$10,000.00	\$10,000	
13.3	- allowance to modify the hoist pits/foundations for the new bus hoist		1	No	\$10,000.00	\$10,000	
13.4	- supply and install new bus hoist		1	No	\$115,000.00	\$115,000	
13.5	- testing and commissioning new hoist		1	No	\$2,500.00	\$2,500	
13.6	- miscellaneous alterations and making good		1	No	\$5,000.00	\$5,000	
<b>SUBTOTAL</b>						<b>\$6,674,200</b>	

APPENDIX F - ESTIMATE SUMMARY  
WINDSOR TRANSIT GARAGE - EQUIPMENT REPLACEMENT ESTIMATE  
ORDER OF MAGNITUDE CLASS D ESTIMATE - Revision 2  
October 22, 2021



No.	Equipment Description	Date	Quantity	Unit	Unit Rate	Extension	Subtotal
<b>Portable Process Equipment (moveable)</b>							
14	Walk Behind Sweeper	2004	1	No	\$750	\$750	
15	John Deer Tractor	?	1	No	\$40,000	\$40,000	
16	Nissan Lift Truck	2012	1	No	\$65,000	\$65,000	
17	John Deer Tractor	2002	1	No	\$40,000	\$40,000	
18	Tennant Sweeper	2002	1	No	\$500	\$500	
19	Frame Machine Ram	1978	2	No	\$10,000	\$20,000	
20	Tire Machine	1998	1	No	\$12,000	\$12,000	
21	Tire Balancer	1998	1	No	\$15,000	\$15,000	
22	A/C Machine	2000 & 2018	2	No	\$5,000	\$10,000	
23	Lathe	1978	1	No	\$40,000	\$40,000	
24	Bridge Port Machine	1978	1	No	\$75,000	\$75,000	
25	Heavy Duty Battery Chargers	2014	5	No	\$10,000	\$50,000	
<b>SUBTOTAL</b>						<b>\$368,250</b>	

# Appendix G – Class D Cost Estimate – 171-bus and 242-bus Facility

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ORDER OF MAGNITUDE “CLASS D” ESTIMATE

## APPENDIX G - WINDSOR TRANSIT GARAGE OPTION 2A and 2B

3700 NORTH SERVICE ROAD  
WINDSOR, ONTARIO

**Prepared For:**

IBI Group  
100 – 175 Galaxy Blvd.  
Toronto ON M9W 0C9 Canada

**Prepared By**

Rider Levett Bucknall  
435 North Service Road West, Suite 203  
Oakville, ON LM6 4X8

**Revision:**

Rev. 6

**Project Number**

YYZ7940

**Submitted:**

October 28, 2021



October 28, 2021

IBI Group  
100 – 175 Galaxy Blvd.  
Toronto ON M9W 0C9 Canada  
Tel: 416 679 193  
Email: [chris.prentice@ibigroup.com](mailto:chris.prentice@ibigroup.com)

**Re: Windsor Transit Garage – Option 2A and 2B - Order of Magnitude “Class D” Estimates  
Revision 6**

**Attn: Chris Prentice,**

Dear Chris,

Please find enclosed our Order of Magnitude Estimate Revision 6 report for the Windsor Transit Garage project at 3700 North Service Road in Windsor, Ontario. The estimate is based on the functional program summary and the site plan drawing provided by the IBI Group. We understand the City is evaluating two options: Option 2A is a single phase option with all of the requirements built in one phase. Option 2B includes a phased approach to the expansion. Phase One includes the program requirements for 171 buses, and Phase Two includes the expansion for an additional 71 buses (total of 242 buses to meet 2035 requirements).

This Order of Magnitude “Class D” Estimate is intended to provide a realistic budget of the hard construction costs based on the level of design information available. The estimate reflects an opinion as to the fair market value for the hard construction of the proposed project and is not intended to predict the lowest bid in a competitive tendering scenario. The provisions for contingencies are based on the information provided and defined within the body of this cost report.

Project soft costs are included and based on percentages of the estimated hard construction and lump sum estimates based on assumed scopes of services. Project Ancillaries (Owner Supplied Fittings, Fixtures & Equipment) is included as well in the Project Soft Cost summary.

The estimate excludes any work related to disassembling, and relocating equipment, and fixtures from the existing transit facilities to the new facility.

Should you have questions related to this report please do not hesitate to contact the undersigned.

Respectfully submitted,

Mel Yungblut, PQS (F)  
Principal



**EXECUTIVE ESTIMATE SUMMARY**

**APPENDIX G - MULTIPLE ESTIMATE SUMMARY  
WINDSOR TRANSIT GARAGE - OPTION 2A - ALL IN ONE PHASE**

ORDER OF MAGNITUDE CLASS D ESTIMATE

October 28, 2021

			All In One Phase		
No.	Scope Description	GFA (m2)	Unit (Cost/m2)	Estimated Total	% of Total
<b>1.0 Hard Construction Costs inc. Contractor's Overheads and Profit</b>				<b>2021 Dollars</b>	
<b>Bus Garage &amp; Site Development</b>					
1.1	Transit Garage + Bus Storage (242 Buses)	35,766	\$2,482	\$88,753,500	71.2%
1.2	Site Development including M&E site services	85,490	\$147	\$12,554,600	10.1%
<b>Subtotal</b>		<b>35,766</b>	<b>\$2,833</b>	<b>\$101,308,100</b>	<b>81.3%</b>
<b>Contingencies</b>					
C1	Design & Pricing Contingency	20%	35,766	\$566	\$20,260,657 16.3%
C2	Construction Contingency	3%	35,766	\$85	\$3,039,243 2.4%
C3	Escalation Contingency	0%			Excluded
<b>Subtotal - Contingencies</b>		<b>35,766</b>	<b>\$651</b>	<b>\$23,299,900</b>	<b>18.7%</b>
<b>Total Estimated Hard Construction Cost</b>		<b>35,766</b>	<b>\$3,484</b>	<b>\$124,608,000</b>	<b>83.3%</b>
<b>4.0 Project Soft Costs</b>					
4.1	Land Acquisition Costs			\$0	0.0%
4.2	Municipal Charges			\$0	0.0%
4.3	Consulting Fees and Expenses			\$12,160,163	48.6%
4.4	Specialty Consultants			\$367,500	1.5%
4.5	Project Management Fees			\$0	0.0%
4.6	Owner Supplied Furnishings, Fixtures, and Equipment (FF&E)			\$6,620,400	26.4%
4.7	Financing and Loan Fees			\$50,000	0.2%
4.8	Operational Expenses (Construction Related)			\$1,015,569	4.1%
4.9	Taxes - Non Refundable GST/HST	1.76%		\$2,548,861	10.2%
4.10	Project Soft Cost Contingency	10.0%		\$2,276,199	9.1%
4.11	Escalation Contingency on Soft Costs	0.0%			Excluded
<b>Total Project Soft Costs</b>		<b>35,766</b>	<b>\$700.07</b>	<b>\$25,038,690</b>	<b>16.7%</b>
<b>Total Project Budget</b>		<b>35,766</b>	<b>\$4,184</b>	<b>\$149,646,690</b>	
<b>Average Estimated Cost per m2 - Combined Hard + Soft Costs</b>				<b>\$4,184</b>	

## EXECUTIVE ESTIMATE SUMMARY

### MULTIPLE ESTIMATE SUMMARY - OPTION 2B

#### WINDSOR TRANSIT GARAGE

ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)

October 22, 2021 (May 2021 Estimate Reconciliation)

No.	Scope Description	GFA (m2)	Unit (Cost/m2)	PHASE 1		PHASE 2	
				Estimated Total	% of Total	Estimated Total	% of Total
<b>1.0 Hard Construction Costs</b>							
<b>Phase 1 - Bus Garage &amp; Site Development</b>							
1.1	Phase 1 - Transit Garage + Bus Storage (171 Buses)	30,670	\$2,501	\$76,709,985	72.3%		
1.2	Phase 1 - Site Development including M&E site services	84,590	\$125	\$10,570,158	10.0%		
	Subtotal	30,670	\$2,846	\$87,280,143			
1.3	Design & Pricing Contingency	20%	30,670	\$511	\$15,669,700		
1.4	Construction Contingency	3%	30,670	\$101	\$3,088,500		
2.5	Phase 1 - Escalation Contingency	0.0%			Excluded		
<b>Total Estimated Hard Construction Cost</b>		<b>30,670</b>	<b>\$3,457</b>	<b>\$106,038,340</b>	<b>83.1%</b>		
<b>2.0 Phase 2 - Bus Garage Expansion &amp; Site Development</b>							
2.1	Phase 2 - Bus Garage Expansion (71 buses)	5,180	\$2,325			\$12,043,500	69.5%
2.2	Phase 2 - Site Development including M&E site services	14,700	\$135			\$1,984,500	11.4%
	Subtotal	5,180	\$2,708			\$14,028,000	
2.3	Design & Pricing Contingency	20%	5,180	\$542		\$2,805,600	
2.4	Construction Contingency	3%	5,180	\$97		\$505,008	
2.5	Phase 2 - Escalation Contingency (construction in 2035)	45.0%				Excluded	
<b>Total Estimated Hard Construction Cost</b>		<b>5,180</b>	<b>\$3,347</b>			<b>\$17,338,610</b>	<b>77.7%</b>
<b>3.0 Project Soft Costs</b>							
3.1	Land Acquisition Costs			\$0	0.0%	\$0	0.0%
3.2	Municipal Charges			\$0	0.0%	\$0	0.0%
3.3	Consulting Fees and Expenses			\$10,605,237	49.3%	\$2,583,720	51.8%
3.4	Specialty Consultants			\$367,500	1.7%	\$183,750	3.7%
3.5	Project Management Fees			\$0	0.0%	\$0	0.0%
3.6	Owner Supplied Furnishings, Fixtures, and Equipment (FF&E)			\$5,152,743	23.9%	\$670,268	13.4%
3.7	Financing and Loan Fees			\$50,000	0.2%	\$20,000	0.4%
3.8	Operational Expenses			\$1,217,124	5.7%	\$699,749	14.0%
3.9	Taxes - Non Refundable GST/HST	1.76%		\$2,172,385	10.1%	\$378,331	7.6%
3.10	Project Soft Cost Contingency	10.0%		\$1,956,499	9.1%	\$453,580	9.1%
3.11	Phase 1 - Escalation Contingency on Soft Costs	9.0%			Excluded		
3.12	Phase 2 - Escalation Contingency on Soft Costs	45.0%				Excluded	
<b>Total Project Soft Costs</b>		<b>30,670</b>	<b>\$701.71</b>	<b>\$21,521,490</b>	<b>16.9%</b>	<b>\$4,989,400</b>	<b>22.3%</b>
<b>Total Project Budget</b>		<b>30,670</b>	<b>\$4,159</b>	<b>\$127,559,830</b>		<b>\$22,328,010</b>	

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## **1 Introduction**

### **1.1 Scope of Work for the Project**

The scope of work for this project includes the proposed design and construction of a new transit bus facility for the City of Windsor. We understand the City is considering two options for the expansion. Option 2A is based on a single phase development, Option 2B is a phased (2 phases) development. The new facility for Option 2B is being planned in two phases: Phase One includes the bus maintenance and storage for 171 buses, and Phase Two includes an expansion of the bus storage for an additional 71 buses for a total capacity of 242 buses. The functional program for the facility includes the operations and administration areas, indoor bus storage, fleet maintenance and the support utility space.

## **2 Project Details**

### **2.1 General Information**

Based on the preliminary design information provided, we have measured quantities where possible and applied unit rates for the specific items based on the design drawings and outline project specifications provided. Where design information was limited, we made assumptions based on our experience with projects of a similar type, size, and standard of quality. The following two reference projects were used in the preparation of the estimate:

1. Grand River Northfield Bus Facility – 30,456 m<sup>2</sup> - Class A Estimate completed in Feb 2018
2. City of Brampton Transit Maintenance Facility – 55,700 m<sup>2</sup> – Class D Estimate completed in May 2020

We used unit rate cost data from the above two projects in developing the estimate for the Windsor Transit Facility.

### **2.2 Location Factors**

The location cost base for this estimate is Windsor Ontario. Construction in the Windsor and Essex County area does experience a regional factor attributable to its proximity to the Toronto and London Waterloo construction markets. Due to the size of this project, we expect larger contractors from the Toronto and London area would have interest in bidding the project. We would expect this increased level of interest would have a marginally impact on the regional cost factors in Windsor.

### **2.3 Measurement and Pricing**

The estimate has been derived using generally accepted principles on method of measurement as per the Canadian Institute of Quantity Surveyors (CIQS) Elemental Cost Analysis and/or Method of Measurement of Construction Works.

The unit rates used and developed for this estimate where applicable include labour and material, equipment, and subcontractor's overheads and profit. Pricing is based on experience with similar project types.

We have assumed that a mix of both non-union and unionized commercial contractors would perform the work. This estimate is not intended to be a prediction of the lowest bid and assumes competitive bidding for all aspects of the work.

## **2.4 Environmental Sustainability**

The estimate incorporates sustainable design elements consistent with Leadership in Energy and Environmental Design (LEED) principles as identified within the design information available. The costs associated with registering the project for LEED Certification including the additional consulting fees is excluded.

## **2.5 Taxes**

The estimates include the applicable Non-Refundable Harmonized Sales Tax (NRGST/HST) of 1.76%. Actual NRGST/HST to be confirmed by the City of Windsor.

## **2.6 Procurement Methodology**

We have assumed that the project would be procured with a General Contractor approach under a project specific CCDC2 stipulated lump sum form of contract. We have assumed a minimum of three bids would be received for all the major trade categories to establish competitive bidding and tender results. The estimate is a prediction based on fair market pricing and not a prediction of lowest bid in any trade category. Note that should the above minimum bidding conditions not occur on this project, construction bids received could vary significantly from the estimated costs included within this report.

## **2.7 General Requirements and Fees**

The fee for the General Contractor is included as a percentage of the hard construction cost. The general requirements are based on our assumptions of the anticipated construction approach and schedule.

The estimate includes allowances for the premiums associated with typical bonding and insurance for the contractors. The actual cost of bonding and insurance would be subject to the City of Windsor requirements and the project specifications.

## **2.8 Schedule / Phasing**

The scope of work has been estimated based on the work being executed in a single Phase for Option 2A and two phases for Option 2B as outlined above. We have assumed the majority of the work would be completed within regular daytime hours with limited after hours or weekend work for building system tie-ins if required. The estimates exclude any allowances for premium time for extended work hours or weekend work.

## **2.9 Area / Project Statistics**

The gross floor areas of the addition/renovation have been measured in accordance with the Canadian Institute of Quantity Surveyors Standard Method of Measurement. Areas are based on dimensions to the inside face of the exterior walls and exclude areas identified on the floor plan drawings in grey highlights as “not in scope.”

Detailed gross floor areas and project statistics are included in Section 6 of the report

## **3 Contingencies**

### **3.1 General Approach to Contingencies**

The effective use of contingencies in construction cost planning requires a clear understanding of estimating risks in both a project specific and general construction market sense. The appropriate level of contingency is dependent on the amount of design information available, knowledge of the design teams’ methods and philosophy, the timing of the estimate preparation relative to the project design and construction schedule, and the anticipated complexity of the construction work.

### **3.2 Design and Pricing Contingency**

A design and pricing contingency of **20.0%** is included in the estimate. This allowance where included is meant to cover pricing and design unknowns during the preparation of this estimate, and not meant to cover additional scope or functional program requirements. This allowance is also meant to cover the potential changes in scope of work during the completion of the design documentation and the preparation of the tender documents.

### **3.3 Escalation Contingency**

An escalation contingency has been excluded in the estimates for both phases of the project. This allowance is meant to address anticipated changes in construction costs due to market fluctuations between the date of this cost report and the anticipated midpoint of construction as outlined below.

***Note: We understand escalation is being handled outside of the current RLB estimates.***

### **3.4 Cost Considerations for the Current Health Pandemic & COVID-19**

We expect the project will be tendered in the near future and could experience the market influences of the current COVID-19 pandemic. The market influences are unquantifiable currently and are likely to change in the future. We also expect the contractors bidding the project would include in their bids, allowances for the COVID-19 risk unless that risk is mitigated in the bid documents. We forecast the inclusion of these risks in bids could impact normal competitive market conditions resulting in a bid price increase in the range of 3% to 10% or in extreme situations as much as 10% to 20%.

We encourage the owner and the consulting team to address this future risk by providing clear direction to the bidders in the bid documents on risk mitigation for COVID-19 issues.

The primary risks related to COVID-19 include impacts to the supply of materials to the site, the potential interruption of labour on the site and the productivity in executing the work.

Reduced site productivity could result from any of the following risks:

- lack of availability of labour for due illness related to COVID-19,
- delays related to recruiting replacement workers,
- social/physical distancing requirements on the site,
- site shutdowns due to the risk of workers testing positive for the COVID-19 virus,
- health authority mandated industry or project shutdowns,
- delays in delivery of materials and equipment to the site and the procurement supply chain,
- unavailability of materials due to factory closure or shipping interruptions in the supply chain,
- delays related to acquiring material and or equipment substitutions

**Note: The COVID 19 Contingency is excluded from the current estimates.**

### **3.5 Construction Contingency (Post Contract Stage)**

A post contract contingency of **3%** has been included. This contingency is meant to cover the potential changes (change orders/directives) in cost due to the discovery of unknowns during the execution of the construction work.

## **4 Project Scope Assumptions**

### **4.1 Project Scope Assumptions**

#### **Building Shell - Substructure**

- Standard spread footing and pad foundations founded on load bearing soil conditions.
- Scope excludes any allowance for special foundations such as caissons and pile foundations.
- Estimate excludes any allowances for the removal, treatment, and disposal of impacted or contaminated soils.

#### **Building Shell - Structure**

- Conventionally framed structure steel building structure with columns, beams, purlins, and open web steel joists, and metal roof deck.
- Structural steel framing to exterior overhead doors (headers and jambs)

### **Building Shell – Exterior Enclosure**

- Insulated precast concrete or metal siding to exterior of the garage
- Aluminum framed glazed curtainwall to the office area
- Prefinished metal roll up overhead doors or rapid roll fabric doors where applicable
- Prefinished aluminum doors and frames at main entrances
- Solid hollow metal doors and frames at fire exits and maintenance areas

### **Building Interiors - Partitions**

- Combination of light weight concrete block and metal stud and drywall partitions demising walls
- Metal blocking where required
- Caulking and sealing to interior partitions
- Interior glazed partitions and windows where required

### **Building Interiors - Doors**

- Prefinished aluminum doors and frames at entrance vestibules (inner doors)
- Hollow metal doors and frames to utility areas
- Solid core wood doors with metal frames at the office area
- Commercial grade door hardware
- Exterior weatherstripping

### **Building Interiors – Floors Finishes**

- Combination of porcelain tile, ceramic tile, rubber and epoxy floor finishes where applicable
- Concrete sealer
- Vinyl dissipative tile to IT areas
- Carpet tile to the office areas where applicable

### **Building Interiors – Ceiling Finishes**

- Painted exposed structure in the garage areas
- Suspended gypsum drywall ceilings in washrooms and select office areas
- Suspended acoustical ceilings where applicable

### **Building Interiors – Fittings & Equipment**

- Two fuel wash systems (ie. two fuel wash lanes)
- Two bus wash systems, one for each service lane
- A paint booth for 60 ft bus and body repair shop (one bay)

### **Building Mechanical – Plumbing & Drainage**

- Water meter and main connection
- DHW heaters and piping
- Water softener system



- Hose bibbs
- Pumps, pipe distribution, storage tanks, and fittings
- Commercial grade plumbing fixtures
- Sanitary waste
- Storm water drainage
- Other operational related plumbing including windshield washer fluid system, diesel storage and fueling systems, engine oil systems, antifreeze storage and fill systems, lube systems, transmission oil and hydraulic fluid systems, grease systems, waste engine oil disposal systems, gas meter and distribution, vacuum systems, compressed air, pneumatic tube systems, etc.

### **Building Mechanical – Fire Protection**

- Dry and wet sprinkler systems where required
- Sprinkler heads
- Fire pump (if required)
- Specialty fire suppression systems (if required)

### **Building Mechanical – Heating Ventilation & Air Conditioning**

- Humidification systems
- Heat Generating Systems
- Glycol heating
- Snow melting
- Chemical treatment
- Cooling Generating Systems
- HVAC distribution
- Terminal Package Units including exhaust extraction

### **Building Mechanical - Controls**

- Digital building controls and instrumentation
- Testing and commissioning

### **Building Electrical – Service & Distribution**

- Primary power system including incoming service, switchboard, and distribution board
- Surge protection
- Automatic transfer switch
- 347/600V distribution panels
- 120/208V distribution panels
- Mechanical control connections
- Conduit and wiring

### **Building Electrical - Lighting**

- Lighting and controls
- Low voltage lighting systems and controls

### **Building Electrical – Ancillary Systems**

- Communications and IT conduit and boxes
- Security system conduit and cabling
- Video intercom door station
- Master clock system
- Fire alarm system
- Maglocks and door strikes
- CCTV system
- Lighting protection system

### **Site Development – Hard & Soft Landscaping**

- Site preparation and earthworks
- Hard surfaces, HD paving to driveways, MD paving to parking
- Concrete sidewalks
- Precast concrete pavers
- Retaining walls, planters walls, concrete stairs
- Concrete equipment housekeeping pads (tank farm)
- Line painting and directional markings
- Soft landscaping, trees, shrubs, seeding and topsoil

### **Site Development – Mechanical Site Services**

- Incoming water supply
- Sanitary water piping and connection
- Storm water piping and connection
- Other site utilities

### **Site Development – Electrical Site Services**

- Emergency generators and associated work
- Primary transformer and connections
- Site lighting and controls
- Site communications
- Site security controls

## 4.2 Exclusions & Qualifications

The following items are excluded from the estimate:

1. Demolition and decommissioning of the existing site buildings and improvements (see separate estimates)
2. Special foundations such as caissons or pile foundations
3. The treatment and disposal of impacted or contaminated soils
4. Premium time for afterhours and weekend work
5. Phasing premium (assumed to be executed in two phases as outlined above)
6. Municipal off-site service connections (outside the property line)
7. Development charges and building permit fees (assumed not applicable)
8. Sole sourcing of materials, services, or equipment
9. Premiums for LEED certification
10. Onsite or offsite temporary storage facilities
11. Site work improvements to the North Service Road for additional turn lanes, traffic lights, etc.
12. Offsite mechanical and electrical site services (power, water, sanitary, storm) to support the new development.

## 5 Document List

The following documents were used for the preparation of this report:

Doc Ref.	Description	Date	Rev. No.
28 pages	Transit Windsor Garage Feasibility Study prepared by IBI Group	Feb 18, 2021	N/A
36 pages	RFP for Engineering Consulting Services for a Transit Windsor – Garage Feasibility Study	July 28, 2020	N/A
8 pages	Space Program Summary prepared by IBI Group	Feb 11, 2021	V1.
1 page	Site Plan prepared by IBI Group	April 2021	N/A
emails	Comments received May 16 and 17 from IBI Group	May 16, 2021	N/A

## 6 Gross Floor Area Summary & Graphics

FUNCTIONAL PROGRAM SUMMARY		GFA		% of
WINDSOR TRANSIT GARAGE - PHASE 1 & 2		GFA		Total
ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)		(m2)	(SF)	
October 22, 2021				
No.	Area Description	GFA (m2)	GFA (SF)	% of Total
<b>1.0</b>	<b>Transit Garage - Phase 1 (171 Buses)</b>			
1.1	Common Areas	158	1,701	0.5%
1.2	Administration	518	5,570	1.7%
1.3	Operations	767	8,254	2.5%
1.4	Indoor Bus Storage Garage	18036	194,136	58.8%
1.5	Fleet Maintenance	8,667	93,291	28.3%
1.6	Stores	1,294	13,933	4.2%
1.7	Information Technology (IT)	291	3,127	0.9%
1.8	Facilities	374	4,021	1.2%
1.9	Building Services (M&E space)	567	6,098	1.8%
	<b>Total - Phase 1 - Transit Garage</b>	<b>30,670</b>	<b>330,130</b>	
<b>2.0</b>	<b>Transit Garage - Phase 2 (Additional 71 Buses, Total of 242 Buses)</b>			
2.1	Indoor Bus Storage Garage	5,180	55,758	14.4%
	<b>Combined Total - Phase 1 &amp; 2</b>	<b>35,850</b>	<b>385,888</b>	
<b>3.0</b>	<b>Exterior Site Programs (partial list of program areas)</b>			
3.1	Parking	See Site Plan		
3.2	Patio Area	200	2,153	0.2%
3.3	Exterior Garage/Recycling	250.5	2,696	0.3%
3.4	Exterior Storage	55.5	597	0.1%
3.5	Emergency Generators	375	4,037	0.4%
3.6	Tank Farm	150	1,615	0.2%
3.7	Balance of the Site Area	47,709.1	513,541	
	<b>Total - Site Work (including the building footprint area)</b>	<b>84,590</b>	<b>524,639</b>	
	<b>Site Area</b>	8.5	12.0	
		Hectares	acres	

## **7 List of Appendices**

The following appendices are enclosed:

- A. Master Estimate Summary – Option 2A
- B. Project Soft Cost Summary – Option 2A
- C. Master Estimate Summary – Option 2B
- D. Project Soft Cost Summary – Option 2B Phase 1
- E. Project Soft Cost Summary – Option 2B Phase 2
- F. Estimate Summary – Option 2B Phase 1
- G. Elemental Estimate Summary – Option 2B Phase 1
- H. Detailed Elemental Estimate – Option 2B Phase 1

**APPENDIX G - MULTIPLE ESTIMATE SUMMARY**  
**WINDSOR TRANSIT GARAGE - OPTION 2A - ALL IN ONE PHASE**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE**

October 28, 2021



		All In One Phase				
No.	Scope Description	GFA (m2)	Unit (Cost/m2)	Estimated Total	% of Total	
<b>1.0 Hard Construction Costs inc. Contractor's Overheads and Profit</b>				<b>2021 Dollars</b>		
<b>Bus Garage &amp; Site Development</b>						
1.1	Transit Garage + Bus Storage (242 Buses)	35,766	\$2,482	\$88,753,500	71.2%	
1.2	Site Development including M&E site services	85,490	\$147	\$12,554,600	10.1%	
<b>Subtotal</b>		<b>35,766</b>	<b>\$2,833</b>	<b>\$101,308,100</b>	<b>81.3%</b>	
<b>Contingencies</b>						
C1	Design & Pricing Contingency	20%	35,766	\$566	\$20,260,657	16.3%
C2	Construction Contingency	3%	35,766	\$85	\$3,039,243	2.4%
C3	Escalation Contingency	0%			Excluded	
<b>Subtotal - Contingencies</b>		<b>35,766</b>	<b>\$651</b>	<b>\$23,299,900</b>	<b>18.7%</b>	
<b>Total Estimated Hard Construction Cost</b>		<b>35,766</b>	<b>\$3,484</b>	<b>\$124,608,000</b>	<b>83.3%</b>	
<b>4.0 Project Soft Costs</b>						
4.1	Land Acquisition Costs			\$0	0.0%	
4.2	Municipal Charges			\$0	0.0%	
4.3	Consulting Fees and Expenses			\$12,160,163	48.6%	
4.4	Specialty Consultants			\$367,500	1.5%	
4.5	Project Management Fees			\$0	0.0%	
4.6	Owner Supplied Furnishings, Fixtures, and Equipment (FF&E)			\$6,620,400	26.4%	
4.7	Financing and Loan Fees			\$50,000	0.2%	
4.8	Operational Expenses (Construction Related)			\$1,015,569	4.1%	
4.9	Taxes - Non Refundable GST/HST	1.76%		\$2,548,861	10.2%	
4.10	Project Soft Cost Contingency	10.0%		\$2,276,199	9.1%	
4.11	Escalation Contingency on Soft Costs	0.0%		Excluded		
<b>Total Project Soft Costs</b>		<b>35,766</b>	<b>\$700.07</b>	<b>\$25,038,690</b>	<b>16.7%</b>	
<b>Total Project Budget</b>		<b>35,766</b>	<b>\$4,184</b>	<b>\$149,646,690</b>		
<b>Average Estimated Cost per m2 - Combined Hard + Soft Costs</b>				<b>\$4,184</b>		

**PROJECT SOFT COST SUMMARY**  
**WINDSOR TRANSIT GARAGE - OPTION 2A - ALL IN ONE PHASE**

**ORDER OF MAGNITUDE CLASS D ESTIMATE**

October 28, 2021



Gross Floor Area **35,766** m<sup>2</sup>  
 Estimated Hard Construction Costs - Phase 1 **\$124,608,000**

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>1</b>	<b>Land Acquisition Costs</b>						<b>\$0</b>	
1.1	Land costs							
1.2	Land Transfer Taxes							
1.3	Zoning Approval - Planning							
1.4	Zoning Approval - Project Manager							
1.5	Legal Fees							
1.6	Environmental Assessments							
1.7	Permit application fees							
1.8	Other land charges							
<b>2</b>	<b>Municipal Charges</b>						<b>\$0</b>	
2.1	Development Charges/ Community Benefits Charges					Assumed Not Applicable		
2.2	Approvals, Inspections and Permits					Assumed Not Applicable		
2.3	Municipal Levies, Charges & Building Permits					Assumed Not Applicable		
2.4	Property Taxes During Construction							
2.5	Toronto Green Standards							
<b>3</b>	<b>Consulting Fees and Expenses</b>						<b>\$12,160,163</b>	
3.1	Architectural design services and expenses	3.25%	1		\$4,049,760	\$4,049,760		
3.2	Interior design and expenses					Assumed Not Applicable		
3.3	Planning consultant					Assumed Not Applicable		
3.4	Programming consultant					Assumed Not Applicable		
3.5	Structural Engineering	1.2%	1		\$1,495,296	\$1,495,296		
3.6	Mechanical Engineering	2.0%	1		\$2,492,160	\$2,492,160		
3.7	Electrical Engineering	2.0%	1		\$2,492,160	\$2,492,160		
3.8	Building Code Consultant	0.2%	1		\$249,216	\$249,216		
3.9	Cost Consultant	0.20%	1		\$249,216	\$249,216		
3.10	Geotechnical Consultant	0.20%	1		\$249,216	\$249,216		
3.11	Acoustical Consultant					Assumed Not Applicable		
3.12	Food Services Consultant					Assumed Not Applicable		
3.13	IT and Communications consultant	0.2%	1		\$249,216	\$249,216		
3.14	Sustainable Design Consultant (LEED)	0.2%	1		\$249,216	\$249,216		
3.15	IPAC Consultant					Assumed Not Applicable		
3.16	Environmental Consultant (designated substances)		1	sum	\$125,000	\$125,000		
3.17	Construction Management - pre-construction services					Assumed Not Applicable		
3.18	Land Surveying		1	sum	\$50,000	\$50,000		
3.19	Environmental scanning and locates		1	sum	\$30,000	\$30,000		
3.20	Disbursements and reimbursable expenses		1	sum	\$179,707	\$179,707		
		9.5%						
<b>4</b>	<b>Specialty Consultants</b>						<b>\$367,500</b>	
4.1	Independent Inspection and Testing		1	sum	\$150,000	\$150,000		
4.2	Furniture and Equipment consultant		1	sum	\$100,000	\$100,000		
4.3	Security/Risk Assessment consultants					Assumed Not Applicable		
4.4	Independent 3rd Party Commissioning		1	sum	\$100,000	\$100,000		
4.5	Disbursements and reimbursable expenses		1	sum	\$17,500	\$17,500		
<b>5</b>	<b>Project Management Fees</b>						<b>\$0</b>	
5.1	Independent PM Services					Assumed Not Applicable		
5.2	City of Windsor in-house PM services					Assumed Not Applicable		
<b>6</b>	<b>Owner Supplied Furnishings, Fixtures, and Equipment (FF&amp;E)</b>						<b>\$6,620,400</b>	
6.1	Loose furniture	1.5%	1	sum	\$1,869,120	\$1,869,120		
6.2	Maintenance Shop equipment (in addition to the included in the Hard Construction Estimate)	3.5%	1	sum	\$4,361,280	\$4,361,280		
6.3	Kitchen equipment, smallwares, appliances		1	sum	\$50,000	\$50,000		
6.4	Laundry and garbage handling equipment		1	sum	\$40,000	\$40,000		
6.5	Artwork, signature signage, interior landscaping, etc.		1	sum	\$30,000	\$30,000		
6.6	IT and Telecomm hardware and systems		1	sum	\$250,000	\$250,000		
6.7	AV Systems and cabling		1	sum	\$20,000	\$20,000		

**PROJECT SOFT COST SUMMARY**  
**WINDSOR TRANSIT GARAGE - OPTION 2A - ALL IN ONE PHASE**

ORDER OF MAGNITUDE CLASS D ESTIMATE

October 28, 2021



Gross Floor Area **35,766** m<sup>2</sup>  
 Estimated Hard Construction Costs - Phase 1 **\$124,608,000**

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>7</b>	<b>Financing and Loan Fees</b>						<b>\$50,000</b>	
7.1	Interest during construction							
7.2	Legal fees and expenses (lien searches, contract review)		1	sum	\$50,000	\$50,000		
<b>8</b>	<b>Operational Expenses (Construction Related)</b>						<b>\$1,015,569</b>	
8.1	Insurance	0.75%	1		\$535,569	\$535,569		
8.2	Marketing and sales							
8.3	Pre-opening expenses		1	sum	\$100,000	\$100,000		
8.4	Initial operating inventory		1	sum	\$50,000	\$50,000		
8.5	Temporary utilities							
8.6	Site security (assumed for the last 20 months of construction)		1	sum	\$300,000	\$300,000		
8.7	Site photographs, site camera		1	sum	\$30,000	\$30,000		
8.8	Legal Fees							
8.9	Internal Charges - Housekeeping							
8.10	Internal Charges - Facilities							
8.11	Internal Charges - Digital							
8.12	Internal Charges - IPAC							
8.13	Internal Charges - Other							
8.14	Internal - Loss of Parking Revenue Impact							
<b>9</b>	<b>Taxes - Non Refundable GST/HST</b>						<b>\$2,548,861</b>	<b>10.2%</b>
9.1	Property taxes during construction							
9.2	Non-refundable HST 1.76% on Project Soft Costs	1.76%				\$355,760		
9.3	Non-refundable HST 1.76% on Hard Construction Costs	1.76%				\$2,193,101		
<b>Project Soft Costs Sub Total</b>							<b>\$22,762,490</b>	
<b>10</b>	<b>Project Soft Cost Contingency</b>	<b>10.0%</b>					\$2,276,199	9.1%
<b>11</b>	<b>Escalation Contingency - Project Soft Costs</b>	<b>0.0%</b>					Excluded	
<b>Total Estimated Project Soft Costs</b>					<b>35,766</b>	<b>\$700.07</b>	<b>\$25,038,690</b>	



**MULTIPLE ESTIMATE SUMMARY - OPTION 2B**  
**WINDSOR TRANSIT GARAGE**

ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)  
 October 22, 2021 (May 2021 Estimate Reconciliation)



No.	Scope Description	GFA (m2)	Unit (Cost/m2)	PHASE 1		PHASE 2	
				Estimated Total	% of Total	Estimated Total	% of Total
<b>1.0 Hard Construction Costs</b>							
<b>Phase 1 - Bus Garage &amp; Site Development</b>							
1.1	Phase 1 - Transit Garage + Bus Storage (171 Buses)	30,670	\$2,501	\$76,709,985	72.3%		
1.2	Phase 1 - Site Development including M&E site services	84,590	\$125	\$10,570,158	10.0%		
	Subtotal	30,670	\$2,846	\$87,280,143			
1.3	Design & Pricing Contingency	20%	30,670	\$511	\$15,669,700		
1.4	Construction Contingency	3%	30,670	\$101	\$3,088,500		
2.5	Phase 1 - Escalation Contingency	0.0%			Excluded		
<b>Total Estimated Hard Construction Cost</b>		<b>30,670</b>	<b>\$3,457</b>	<b>\$106,038,340</b>	<b>83.1%</b>		
<b>2.0 Phase 2 - Bus Garage Expansion &amp; Site Development</b>							
2.1	Phase 2 - Bus Garage Expansion (71 buses)	5,180	\$2,325			\$12,043,500	69.5%
2.2	Phase 2 - Site Development including M&E site services	14,700	\$135			\$1,984,500	11.4%
	Subtotal	5,180	\$2,708			\$14,028,000	
2.3	Design & Pricing Contingency	20%	5,180	\$542		\$2,805,600	
2.4	Construction Contingency	3%	5,180	\$97		\$505,008	
2.5	Phase 2 - Escalation Contingency (construction in 2035)	45.0%				Excluded	
<b>Total Estimated Hard Construction Cost</b>		<b>5,180</b>	<b>\$3,347</b>			<b>\$17,338,610</b>	<b>77.7%</b>
<b>3.0 Project Soft Costs</b>							
3.1	Land Acquisition Costs			\$0	0.0%	\$0	0.0%
3.2	Municipal Charges			\$0	0.0%	\$0	0.0%
3.3	Consulting Fees and Expenses			\$10,605,237	49.3%	\$2,583,720	51.8%
3.4	Specialty Consultants			\$367,500	1.7%	\$183,750	3.7%
3.5	Project Management Fees			\$0	0.0%	\$0	0.0%
3.6	Owner Supplied Furnishings, Fixtures, and Equipment (FF&E)			\$5,152,743	23.9%	\$670,268	13.4%
3.7	Financing and Loan Fees			\$50,000	0.2%	\$20,000	0.4%
3.8	Operational Expenses			\$1,217,124	5.7%	\$699,749	14.0%
3.9	Taxes - Non Refundable GST/HST	1.76%		\$2,172,385	10.1%	\$378,331	7.6%
3.10	Project Soft Cost Contingency	10.0%		\$1,956,499	9.1%	\$453,580	9.1%
3.11	Phase 1 - Escalation Contingency on Soft Costs	9.0%			Excluded		
3.12	Phase 2 - Escalation Contingency on Soft Costs	45.0%				Excluded	
<b>Total Project Soft Costs</b>		<b>30,670</b>	<b>\$701.71</b>	<b>\$21,521,490</b>	<b>16.9%</b>	<b>\$4,989,400</b>	<b>22.3%</b>
<b>Total Project Budget</b>		<b>30,670</b>	<b>\$4,159</b>	<b>\$127,559,830</b>		<b>\$22,328,010</b>	

**PROJECT SOFT COST SUMMARY - PHASE 1**  
**WINDSOR TRANSIT GARAGE - OPTION 2B**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**  
 October 22, 2021 (May 2021 Estimate Reconciliation)



Gross Floor Area 30,670 m2

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>1</b>	<b>Land Acquisition Costs</b>						<b>\$0</b>	
1.1	Land costs							
1.2	Land Transfer Taxes							
1.3	Zoning Approval - Planning							
1.4	Zoning Approval - Project Manager							
1.5	Legal Fees							
1.6	Environmental Assessments							
1.7	Permit application fees							
1.8	Other land charges							
<b>2</b>	<b>Municipal Charges</b>						<b>\$0</b>	
2.1	Development Charges/ Community Benefits Charges					Assumed Not Applicable		
2.2	Approvals, Inspections and Permits					Assumed Not Applicable		
2.3	Municipal Levies, Charges & Building Permits					Assumed Not Applicable		
2.4	Property Taxes During Construction							
2.5	Toronto Green Standards							
<b>3</b>	<b>Consulting Fees and Expenses</b>						<b>\$10,605,237</b>	
3.1	Architectural design services and expenses	3.75%	1		\$3,860,619	\$3,860,619		
3.2	Interior design and expenses					Assumed Not Applicable		
3.3	Planning consultant					Assumed Not Applicable		
3.4	Programming consultant					Assumed Not Applicable		
3.5	Structural Engineering	1.2%	1		\$1,235,398	\$1,235,398		
3.6	Mechanical Engineering	2.0%	1		\$2,058,997	\$2,058,997		
3.7	Electrical Engineering	2.0%	1		\$2,058,997	\$2,058,997		
3.8	Building Code Consultant	0.2%	1		\$205,900	\$205,900		
3.9	Cost Consultant	0.20%	1		\$205,900	\$205,900		
3.10	Geotechnical Consultant	0.20%	1		\$205,900	\$205,900		
3.11	Acoustical Consultant					Assumed Not Applicable		
3.12	Food Services Consultant					Assumed Not Applicable		
3.13	IT and Communications consultant	0.2%	1		\$205,900	\$205,900		
3.14	Sustainable Design Consultant (LEED)	0.2%	1		\$205,900	\$205,900		
3.15	IPAC Consultant					Assumed Not Applicable		
3.16	Environmental Consultant (designated substances)		1	sum	\$125,000	\$125,000		
3.17	Construction Management - pre-construction services					Assumed Not Applicable		
3.18	Land Surveying		1	sum	\$50,000	\$50,000		
3.19	Environmental scanning and locates		1	sum	\$30,000	\$30,000		
3.20	Disbursements and reimbursable expenses		1	sum	\$156,728	\$156,728		
		10.0%						
<b>4</b>	<b>Specialty Consultants</b>						<b>\$367,500</b>	
4.1	Independent Inspection and Testing		1	sum	\$150,000	\$150,000		
4.2	Furniture and Equipment consultant		1	sum	\$100,000	\$100,000		
4.3	Security/Risk Assessment consultants					Assumed Not Applicable		
4.4	Independent 3rd Party Commissioning		1	sum	\$100,000	\$100,000		
4.5	Disbursements and reimbursable expenses		1	sum	\$17,500	\$17,500		
<b>5</b>	<b>Project Management Fees</b>						<b>\$0</b>	
5.1	Independent PM Services					Assumed Not Applicable		
5.2	City of Windsor in-house PM services					Assumed Not Applicable		
<b>6</b>	<b>Owner Supplied Furnishings, Fixtures, and Equipment (FF&amp;E)</b>						<b>\$5,152,743</b>	
6.1	Loose furniture	1.5%	1	sum	\$1,544,248	\$1,544,248		
6.2	Maintenance Shop equipment (in addition to the included in the Hard Construction Estimate)	3.0%	1	sum	\$3,088,495	\$3,088,495		
6.3	Kitchen equipment, smallwares, appliances		1	sum	\$50,000	\$50,000		
6.4	Laundry and garbage handling equipment		1	sum	\$40,000	\$40,000		
6.5	Artwork, signature signage, interior landscaping, etc.		1	sum	\$30,000	\$30,000		
6.6	IT and Telecomm hardware and systems		1	sum	\$250,000	\$250,000		
6.7	AV Systems and cabling		1	sum	\$150,000	\$150,000		

**PROJECT SOFT COST SUMMARY - PHASE 1**  
**WINDSOR TRANSIT GARAGE - OPTION 2B**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**  
 October 22, 2021 (May 2021 Estimate Reconciliation)



Gross Floor Area  m2

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>7</b>	<b>Financing and Loan Fees</b>						<b>\$50,000</b>	
7.1	Interest during construction							
7.2	Legal fees and expenses (lien searches, contract review)		1	sum	\$50,000	\$50,000		
<b>8</b>	<b>Operational Expenses</b>						<b>\$1,217,124</b>	
8.1	Insurance	0.75%	1		\$772,124	\$772,124		
8.2	Marketing and sales							
8.3	Pre-opening expenses		1	sum	\$75,000	\$75,000		
8.4	Initial operating inventory		1	sum	\$40,000	\$40,000		
8.5	Temporary utilities							
8.6	Site security (assumed for the last 20 months of construction)		1	sum	\$300,000	\$300,000		
8.7	Site photographs, site camera		1	sum	\$30,000	\$30,000		
8.8	Legal Fees							
8.9	Internal Charges - Housekeeping							
8.10	Internal Charges - Facilities							
8.11	Internal Charges - Digital							
8.12	Internal Charges - IPAC							
8.13	Internal Charges - Other							
8.14	Internal - Loss of Parking Revenue Impact							
<b>9</b>	<b>Taxes - Non Refundable GST/HST</b>						<b>\$2,172,385</b>	<b>10.1%</b>
9.1	Non-refundable HST 1.76% - Hard Construction Costs	1.76%				\$1,866,275		
9.2	Non-refundable HST 1.76% - Project Soft Costs	1.76%				\$306,110		
<b>Project Soft Costs Sub Total</b>							<b>\$19,564,990</b>	
<b>10</b>	<b>Project Soft Cost Contingency</b>	<input type="text" value="10.0%"/>					\$1,956,499	9.1%
<b>11</b>	<b>Escalation Contingency - Project Soft Costs</b>	<input type="text" value="9.0%"/>		(2 years @ 4.5% per annum)			Excluded	
<b>Total Estimated Project Soft Costs</b>					<b>30,670</b>	<b>\$701.71</b>	<b>\$21,521,490</b>	

**PROJECT SOFT COST SUMMARY - PHASE 2**  
**WINDSOR TRANSIT GARAGE - OPTION 2B**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**  
 October 22, 2021 (May 2021 Estimate Reconciliation)



Gross Floor Area 5,180 m2

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>1</b>	<b>Land Acquisition Costs</b>						<b>\$0</b>	
1.1	Land costs					Assumed Not Applicable		
1.2	Land Transfer Taxes					Assumed Not Applicable		
1.3	Zoning Approval - Planning					Assumed Not Applicable		
1.4	Zoning Approval - Project Manager					Assumed Not Applicable		
1.5	Legal Fees					Assumed Not Applicable		
1.6	Environmental Assessments					Assumed Not Applicable		
1.7	Permit application fees					Assumed Not Applicable		
1.8	Other land charges					Assumed Not Applicable		
<b>2</b>	<b>Municipal Charges</b>						<b>\$0</b>	
2.1	Development Charges/ Community Benefits Charges					Assumed Not Applicable		
2.2	Approvals, Inspections and Permits					Assumed Not Applicable		
2.3	Municipal Levies, Charges & Building Permits					Assumed Not Applicable		
2.4	Property Taxes During Construction					Assumed Not Applicable		
2.5	Toronto Green Standards					Assumed Not Applicable		
<b>3</b>	<b>Consulting Fees and Expenses</b>						<b>\$2,583,720</b>	
3.1	Architectural design services and expenses	4.5%	1		\$780,237	\$780,237		
3.2	Interior design and expenses					Assumed Not Applicable		
3.3	Planning consultant					Assumed Not Applicable		
3.4	Programming consultant					Assumed Not Applicable		
3.5	Structural Engineering	2.3%	1		\$390,119	\$390,119		
3.6	Mechanical Engineering	2.8%	1		\$476,812	\$476,812		
3.7	Electrical Engineering	2.8%	1		\$476,812	\$476,812		
3.8	Building Code Consultant	0.3%	1		\$52,016	\$52,016		
3.9	Cost Consultant	0.3%	1		\$52,016	\$52,016		
3.10	Geotechnical Consultant	0.3%	1		\$52,016	\$52,016		
3.11	Acoustical Consultant					Assumed Not Applicable		
3.12	Food Services Consultant					Assumed Not Applicable		
3.13	IT and Communications consultant	0.3%	1		\$52,016	\$52,016		
3.14	Sustainable Design Consultant (LEED)	0.3%	1		\$52,016	\$52,016		
3.15	IPAC Consultant					Assumed Not Applicable		
3.16	Environmental Consultant (designated substances)		1	sum	\$75,000	\$75,000		
3.17	Construction Management - pre-construction services					Assumed Not Applicable		
3.18	Land Surveying		1	sum	\$40,000	\$40,000		
3.19	Environmental scanning and locates		1	sum	\$34,000	\$34,000		
3.20	Disbursements and reimbursable expenses		1	sum	\$50,661	\$50,661		
<b>4</b>	<b>Specialty Consultants</b>						<b>\$183,750</b>	
4.1	Independent Inspection and Testing		1	sum	\$75,000	\$75,000		
4.2	Furniture and Equipment consultant		1	sum	\$50,000	\$50,000		
4.3	Security/Risk Assessment consultants							
4.4	Independent 3rd Party Commissioning		1	sum	\$50,000	\$50,000		
4.5	Disbursements and reimbursable expenses		1	sum	\$8,750	\$8,750		
<b>5</b>	<b>Project Management Fees</b>						<b>\$0</b>	
5.1	Independent PM Services							
5.2	City of Windsor in-house PM services							
<b>6</b>	<b>Owner Supplied Furnishings, Fixtures, and Equipment (FF&amp;E)</b>						<b>\$670,268</b>	
6.1	Loose furniture	1.0%	1	sum	\$173,386	\$173,386		
6.2	Maintenance Shop equipment (in addiiton to above)	2.5%	1	sum	\$431,882	\$431,882		
6.3	Kitchen equipment, smallwares, appliances							
6.4	Laundry and garbage handling equipment							
6.5	Artwork, signature signage, interior landscaping, etc.							
6.6	IT and Telecomm hardware and systems		1	sum	\$35,000	\$35,000		
6.7	AV Systems and cabling		1	sum	\$30,000	\$30,000		

**PROJECT SOFT COST SUMMARY - PHASE 2**  
**WINDSOR TRANSIT GARAGE - OPTION 2B**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**  
 October 22, 2021 (May 2021 Estimate Reconciliation)



Gross Floor Area  m2

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>7</b>	<b>Financing and Loan Fees</b>						<b>\$20,000</b>	
7.1	Interest during construction							
7.2	Legal fees and expenses		1	sum	\$20,000	\$20,000		
<b>8</b>	<b>Operational Expenses</b>						<b>\$699,749</b>	
8.1	Insurance (City of Windsor)	0.5%	1		\$514,749	\$514,749		
8.2	Marketing and sales							
8.3	Pre-opening expenses		1	sum	\$25,000	\$25,000		
8.4	Initial operating inventory		1	sum	\$15,000	\$15,000		
8.5	Temporary utilities							
8.6	Site security (assumed for the last 6 months of construction)		1	sum	\$120,000	\$120,000		
8.7	Site photographs, site camera		1	sum	\$25,000	\$25,000		
8.8	Legal Fees							
8.9	Internal Charges - Housekeeping							
8.10	Internal Charges - Facilities							
8.11	Internal Charges - Digital							
8.12	Internal Charges - IPAC							
8.13	Internal Charges - Other							
8.14	Internal - Loss of Parking Revenue Impact							
<b>9</b>	<b>Taxes - Non Refundable GST/HST</b>						<b>\$378,331</b>	<b>7.6%</b>
9.1	Non-refundable HST 1.76% - Hard Construction Costs	1.76%				\$305,160		
9.2	Non-refundable HST 1.76% - Project Soft Costs	1.76%				\$73,172		
<b>Project Soft Costs Sub Total</b>							<b>\$4,535,800</b>	
<b>10</b>	<b>Project Soft Cost Contingency</b>	<input type="text" value="10%"/>					\$453,580	9.1%
<b>11</b>	<b>Escalation on Soft Costs</b>	<input type="text" value="45%"/>					Excluded	
<b>Total Estimated Project Soft Costs</b>					<b>5,180</b>	<b>\$963</b>	<b>\$4,989,400</b>	

**MASTER ESTIMATE SUMMARY**  
**WINDSOR TRANSIT GARAGE - PHASE 1 (168 BUSES)**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**  
 October 12, 2021 (May 2021 Estimate Reconciliation)



Gross Floor Area 30,670 m2

Hard Construction Costs	GFA (m2)	Unit (Cost/m2)	Sub Total	Estimated Total	% of Total
<b>1 Building Shell</b>	30,670	\$1,038.75		\$31,858,470	30.0%
- Sub Structure		\$175.00	\$5,367,250		
- Structure		\$442.50	\$13,571,475		
- Exterior Enclosure		\$421.25	\$12,919,745		
<b>2 Building Interiors</b>	30,670	\$374.00		\$11,470,580	10.8%
- Partitions and Doors		\$72.50	\$2,223,575		
- Finishes		\$68.00	\$2,085,560		
- Fittings and Equipment		\$233.50	\$7,161,445		
<b>3 Mechanical</b>	30,670	\$651.50		\$19,981,505	18.8%
- Plumbing and Drainage		\$277.00	\$8,495,590		
- Fire Protection		\$45.00	\$1,380,150		
- Heating, Ventilation, Air Conditioning		\$289.50	\$8,878,965		
- Controls		\$40.00	\$1,226,800		
<b>4 Electrical</b>	30,670	\$177.00		\$5,428,590	5.1%
- Service and Distribution		\$85.00	\$2,606,950		
- Lighting, Devices, and Heating		\$50.00	\$1,533,500		
- Systems and Ancillaries		\$42.00	\$1,288,140		
<b>5 Site Work</b>	30,670	\$313.31		\$9,609,234	9.1%
- Site Development (prep, surfaces, landscaping)		\$183.47	\$5,626,940		
- Mechanical Site Services		\$40.93	\$1,255,433		
- Electrical Site Services		\$88.91	\$2,726,862		
<b>6 Ancillary Work</b>	30,670	\$0.00		\$0	0.0%
- Demolition		\$0.00	\$0		
- Alterations		\$0.00	\$0		
<b>7 Contractor's General Requirements</b>	30,670	\$214.58		\$6,581,264	6.2%
<b>8 Contractor's Fees (OH&amp;P)</b>	30,670	\$76.64		\$2,350,500	2.2%
<b>Subtotal - Hard Construction</b>	<b>30,670</b>	<b>\$2,845.78</b>		<b>\$87,280,143</b>	
<b>9 Design &amp; Pricing Contingency</b>	30,670	\$510.91		\$15,669,700	14.8%
<b>10 Escalation Contingency</b>		Excluded			0.0%
<b>11 IPAC Contingency</b>		Excluded			0.0%
<b>12 COVID-19 Contingency</b>		Excluded			0.0%
<b>Subtotal - Hard Const. inc. Contingencies</b>	<b>30,670</b>	<b>\$3,356.70</b>		<b>\$102,949,840</b>	
<b>13 Construction Contingency (post contract)</b>	30,670	\$100.70		\$3,088,500	2.9%
<b>Total Estimated Hard Construction Cost</b>	<b>30,670</b>	<b>\$3,457.40</b>		<b>\$106,038,340</b>	

**ELEMENTAL ESTIMATE SUMMARY**  
**WINDSOR TRANSIT GARAGE - OPTION 2B - PHASE 1 (168 BUSES)**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**  
 October 22, 2021 (May 2021 Estimate Reconciliation)



Gross Floor Area **30,670** m2

Description Element/Sub-Element	Ratio	Quantity	Unit	Unit Rate	Elemental Cost		\$ per m2 Sub Element	\$ per m2 Element	%
					Sub Element	Element Total			
<b>A. SHELL</b>									
<b>A1. Sub-Structure</b>									
							<b>\$5,367,250</b>	\$175.00	0.0%
A1.1 Foundations	1.00	30,670	m2	\$175.00	\$5,367,250		\$175.00		
A1.2 Basement Excavation	0.00	0	m2	\$0.00	\$0		\$0.00		
<b>A2. Structure</b>									
							<b>\$13,571,475</b>	\$442.50	0.0%
A2.1 Lowest Floor Construction	1.00	30,670	m2	\$117.50	\$3,603,725		\$117.50		
A2.2 Upper Floor Construction	0.00	0	m2	\$0.00	\$0		\$0.00		
A2.3 Roof Construction	1.00	30,670	m2	\$325.00	\$9,967,750		\$325.00		
<b>A3. Exterior Enclosure</b>									
							<b>\$12,919,745</b>	\$421.25	0.0%
A3.1 Walls Below Grade	0.00	0	m2	\$0.00	\$0		\$0.00		
A3.2 Walls Above Grade	1.00	30,670	m2	\$108.12	\$3,316,125		\$108.12		
A3.3 Windows & Entrances	1.00	30,670	m2	\$66.98	\$2,054,220		\$66.98		
A3.4 Roof Finish	1.00	30,670	m2	\$225.37	\$6,911,950		\$225.37		
A3.5 Projections	1.00	30,670	m2	\$20.78	\$637,450		\$20.78		
<b>B. INTERIORS</b>									
<b>B1 Partitions &amp; Doors</b>									
							<b>\$2,223,575</b>	\$72.50	0.0%
B1.1 Partitions	1.00	30,670	m2	\$57.50	\$1,763,525		\$57.50		
B1.2 Doors	1.00	30,670	m2	\$15.00	\$460,050		\$15.00		
<b>B2 Finishes</b>									
							<b>\$2,085,560</b>	\$68.00	0.0%
B2.1 Floor Finishes	1.00	30,670	m2	\$35.00	\$1,073,450		\$35.00		
B2.2 Ceiling Finishes	1.00	30,670	m2	\$15.00	\$460,050		\$15.00		
B2.3 Wall Finishes	1.00	30,670	m2	\$18.00	\$552,060		\$18.00		
<b>B3 Fittings &amp; Equipment</b>									
							<b>\$7,161,445</b>	\$233.50	0.0%
B3.1 Fittings & Fixtures	1.00	30,670	m2	\$23.50	\$720,745		\$23.50		
B3.2 Equipment	1.00	30,670	m2	\$210.00	\$6,440,700		\$210.00		
B3.3 Conveying Systems	0.00	0	m2	\$0.00	\$0		\$0.00		
<b>C. SERVICES</b>									
<b>C1 Mechanical</b>									
							<b>\$19,981,505</b>	\$651.50	0.0%
C1.1 Plumbing & Drainage	1.00	30,670	m2	\$277.00	\$8,495,590		\$277.00		
C1.2 Fire Protection	1.00	30,670	m2	\$45.00	\$1,380,150		\$45.00		
C1.3 HVAC	1.00	30,670	m2	\$289.50	\$8,878,965		\$289.50		
C1.4 Controls	1.00	30,670	m2	\$40.00	\$1,226,800		\$40.00		
<b>C2 Electrical</b>									
							<b>\$5,428,590</b>	\$177.00	0.0%
C2.1 Service & Distribution	1.00	30,670	m2	\$85.00	\$2,606,950		\$85.00		
C2.2 Lighting, Devices & Heating	1.00	30,670	m2	\$50.00	\$1,533,500		\$50.00		
C2.3 Systems & Ancillaries	1.00	30,670	m2	\$42.00	\$1,288,140		\$42.00		
<b>D. SITE &amp; ANCILLARY WORK</b>									
<b>D1 Site Work</b>									
							<b>\$9,609,234</b>	\$313.31	0.0%
D1.1 Site Development	2.76	84,590	m2	\$66.52	\$5,626,940		\$183.47		
D1.2 Mechanical Site Services	2.76	84,590	m2	\$14.84	\$1,255,433		\$40.93		
D1.3 Electrical Site Services	2.76	84,590	m2	\$32.24	\$2,726,862		\$88.91		
<b>D2 Ancillary Work</b>									
							<b>\$0</b>	\$0.00	0.0%
D2.1 Demolition	0.00	0	m2	\$0.00	\$0		\$0.00		
D2.2 Alterations	0.00	0	m2	\$0.00	\$0		\$0.00		
<b>Subtotal - Net Hard Construction</b>		<b>30,670 m2</b>		<b>\$2,555</b>		<b>\$78,348,379</b>			
<b>Z. GENERAL REQUIREMENTS &amp; CONTINGENCIES</b>									
<b>Z1 General Requirements &amp; Fees</b>									
							<b>\$8,931,764</b>	\$291.22	0.0%
Z1.1 General Requirements	1.00	30,670	m2	\$214.58	\$6,581,264		\$214.58		
Z1.2 Fees	1.00	30,670	m2	\$76.64	\$2,350,500		\$76.64		
<b>Subtotal - Hard Construction</b>		<b>30,670 m2</b>		<b>\$2,846</b>		<b>\$87,280,143</b>			
<b>Z2 Contingencies</b>									
							<b>\$15,669,700</b>	\$510.91	0.0%
Z2.1 Design & Pricing Contingency	1.00	30,670	m2	\$510.91	\$15,669,700		\$510.91		
Z2.2 Escalation Contingency	1.00	30,670	m2	Excluded	\$0		\$0.00		
Z2.3 IPAC Contingency	1.00	30,670	m2	Excluded	\$0				
Z2.4 COVID-19 Contingency	1.00	30,670	m2	Excluded	\$0				
<b>Subtotal - Hard Const. inc. Contingencies</b>		<b>30,670 m2</b>		<b>\$3,357</b>		<b>\$102,949,843</b>			
Z2.5 Construction Contingency	1.00	30,670	m2	\$100.70	\$3,088,500		\$100.70	\$100.70	0.0%
<b>TOTAL HARD CONSTRUCTION COST</b>		<b>30,670 SF</b>		<b>\$3,457</b>		<b>\$106,038,340</b>			<b>0.0%</b>

**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - OPTION 2B - PHASE 1 (168 BUSES)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**

October 22, 2021 (May 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b>A. SHELL</b>						
<b>A1.1 SUB-STRUCTURE - Foundations</b>						
<b>A1.11 - Standard Foundations</b>						
<i>Note: We have assumed normal soil conditions exist in the proposed building location and that load bearing soil is present at the levels shown on the architectural/structural drawings.</i>						
1	Allowance for standard foundations	30,670	m2	\$175.00	\$5,367,250	
<b>A1.12 - Special Foundations</b>						
2	The estimate excludes any allowance for special foundations such as caissons or piles				Excluded	
<b>TOTAL FOR SUB-STRUCTURE - Foundations</b>		1.00	30,670	m2	\$175.00	\$5,367,250
<b>A1.2 SUB-STRUCTURE - Basement Excavation</b>						
NIL						
<b>TOTAL FOR SUB-STRUCTURE - Basement Excavation</b>		0.00	0	m2	\$0.00	\$0
<b>A2.1 STRUCTURE - Lowest Floor Construction</b>						
3	Level and compact subgrade	30,670	m2	\$2.50	\$76,675	
4	Allowance for slab on grade	30,670	m2	\$115.00	\$3,527,050	
<b>TOTAL FOR STRUCTURE - Lowest Floor Construction</b>		1.00	30,670	m2	\$117.50	\$3,603,725
<b>A2.2 STRUCTURE - Upper Floor Construction</b>						
<b>A2.21 - Upper Floor Construction</b>						
NIL						
<b>A2.22 - Stair Construction</b>						
NIL						
<b>TOTAL FOR STRUCTURE - Upper Floor Construction</b>		0.00	0	m2	\$0.00	\$0
<b>A2.3 STRUCTURE - Roof Construction</b>						
<b>A2.31 - Roof Construction</b>						
5	Allowance for roof construction (conventional structural steel)	30,670	m2	\$325.00	\$9,967,750	
<b>TOTAL FOR STRUCTURE - Roof Construction</b>		1.00	30,670	m2	\$325.00	\$9,967,750



**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - OPTION 2B - PHASE 1 (168 BUSES)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**

October 22, 2021 (May 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b><u>A3.1 EXTERIOR ENCLOSURE - Walls Below Grade</u></b>						
<b><u>A3.11 - Walls Below Grade</u></b>						
	NIL					
<b><u>A3.12 - Structural Walls Below Grade</u></b>						
	NIL					
	<b>TOTAL FOR EXT. ENCLOSURE - Walls Below Grade</b>	0.00	0	m2	\$0.00	\$0
<b><u>A3.2 EXTERIOR ENCLOSURE - Walls Above Grade</u></b>						
<b><u>A3.21 - Walls Above Grade</u></b>						
6	Allowance for walls above grade (exterior cladding)					
7	Cladding area: Garage 763 m x 7.3 m H = 5,563 m2	5,563	m2	\$375.00	\$2,086,125	
<b><u>A3.22 - Structural Walls Above Grade</u></b>						
8	Structural framing to exterior doors (headers and jambs)	1	sum	\$150,000.00	\$150,000	
<b><u>A3.23 - Glazed Curtain Wall</u></b>						
9	Aluminum framed curtain wall system, assumed double glazed, low e coating, and argon filled	540	m2	\$2,000.00	\$1,080,000	
10	Cladding area: Office 120 m x 4.5 m H = 540 m2					
	<b>TOTAL FOR EXT. ENCLOSURE - Walls Above Grade</b>	1.00	30,670	m2	\$108.12	\$3,316,125
<b><u>A3.3 EXTERIOR ENCLOSURE - Windows &amp; Entrances</u></b>						
<b><u>A3.31 - Windows &amp; Louvers</u></b>						
11	Allowance for windows, clerestory windows, and louvers in the garage areas	30,670	m2	\$38.00	\$1,165,460	
<b><u>A3.32 - Entrance Glazed Screens</u></b>						
12	Aluminum framed glazed entrance screens	30	m2	\$1,000.00	\$30,000	
<b><u>A3.33 - Exterior Doors</u></b>						
13	Allowance for exterior doors	30,670	m2	\$28.00	\$858,760	
	<b>TOTAL FOR EXT. ENCLOSURE - Windows &amp; Entrances</b>	1.00	30,670	m2	\$66.98	\$2,054,220
<b><u>A3.4 EXTERIOR ENCLOSURE - Roof Covering</u></b>						
<b><u>A3.41 - Roofing</u></b>						
14	Allowance for roof coverings	30,670	m2	\$225.00	\$6,900,750	
<b><u>A3.42 - Skylights &amp; Roof Glazing</u></b>						
	Included above					

**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - OPTION 2B - PHASE 1 (168 BUSES)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**

October 22, 2021 (May 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b><u>A3.43 - Roof Hatches &amp; Doors</u></b>						
15	Prefabricated roof hatches	4	No	\$2,800.00	\$11,200	
<b>TOTAL FOR EXT. ENCLOSURE - Roof Covering</b>		1.00	30,670	m2	\$225.37	\$6,911,950
<b><u>A3.5 EXTERIOR ENCLOSURE - Projections</u></b>						
<b><u>A3.51 - Projections</u></b>						
16	Allowance for parapet projections	882	m	\$375.00	\$330,750	
17	Allowance for other building projections, canopies, etc.	30,670	m2	\$10.00	\$306,700	
<b>TOTAL FOR EXT. ENCLOSURE - Projections</b>		1.00	30,670	m2	\$20.78	\$637,450
<b>B. INTERIORS</b>						
<b><u>B1.1 PARTITIONS &amp; DOORS - Partitions</u></b>						
<b><u>B1.11 - Fixed Partitions</u></b>						
18	Allowance for interior partitions	30,670	m2	\$50.00	\$1,533,500	
19	Rough carpentry	30,670	m2	\$5.00	\$153,350	
20	Caulking, sealing, and firestopping	30,670	m2	\$2.50	\$76,675	
<b><u>B1.12 - Moveable Partitions</u></b>						
Included above						
<b><u>B1.13 - Structural Partitions &amp; Shear Walls</u></b>						
Included above						
<b>TOTAL FOR INTERIOR PARTITIONS &amp; DOORS - Partitions</b>		1.00	30,670	m2	\$57.50	\$1,763,525
<b><u>B1.2 PARTITIONS &amp; DOORS - Interior Doors</u></b>						
<b><u>B1.21 - Interior Doors &amp; Hardware</u></b>						
21	Allowance for interior doors and frames, hardware	30,670	m2	\$15.00	\$460,050	
<b>TOTAL FOR INTERIOR PARTITIONS &amp; DOORS - Doors</b>		1.00	30,670	m2	\$15.00	\$460,050
<b><u>B2.1 FINISHES - Floor Finishes</u></b>						
<b><u>B2.11 - Floor Finishes</u></b>						
22	Allowance for floor finishes	30,670	m2	\$35.00	\$1,073,450	
<b>TOTAL FOR FINISHES - Floor Finishes</b>		1.00	30,670	m2	\$35.00	\$1,073,450

**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - OPTION 2B - PHASE 1 (168 BUSES)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**

October 22, 2021 (May 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b><u>B2.2 FINISHES - Ceiling Finishes</u></b>						
<b><u>B2.21 - Ceiling Finishes</u></b>						
23	Allowance for ceiling finishes	30,670	m2	\$15.00	\$460,050	
<b>TOTAL FOR FINISHES - Ceiling Finishes</b>		1.00	30,670	m2	\$15.00	\$460,050
<b><u>B2.3 FINISHES - Wall Finishes</u></b>						
<b><u>B2.31 - Wall Finishes</u></b>						
24	Allowance for wall finishes	30,670	m2	\$18.00	\$552,060	
<b>TOTAL FOR FINISHES - Wall Finishes</b>		1.00	30,670	m2	\$18.00	\$552,060
<b><u>B3.1 FITTINGS &amp; EQUIPMENT - Fittings &amp; Fixtures</u></b>						
<b><u>B3.11 - Miscellaneous Metals</u></b>						
25	Miscellaneous metals including lintels, bracing, and so fourth	30,670	m2	\$7.50	\$230,025	\$230,025
<b><u>B3.12 - Millwork</u></b>						
26	Allowance for Fittings and Fixtures	30,670	m2	\$11.00	\$337,370	\$337,370
<b><u>B3.13 - Specialties</u></b>						
27	Allowance for Specialties	30,670	m2	\$5.00	\$153,350	\$153,350
<b><u>B3.14 - Furniture</u></b>						
28	The estimate excludes loose furniture, tables and chairs, etc.				Excluded	\$0
<b>TOTAL FOR FITTINGS &amp; EQUIP. - Fittings &amp; Fixtures</b>		1.00	30,670	m2	\$23.50	\$720,745
<b><u>B3.2 FITTINGS &amp; EQUIPMENT - Equipment</u></b>						
<b><u>B3.21 - Equipment</u></b>						
29	Allowance for Equipment supplied by Windsor Transit <i>(See also Owner Supplied Equipment in the Project Soft Cost Estimate)</i>	30,670	m2	\$210.00	\$6,440,700	
<b>TOTAL FOR FITTINGS &amp; EQUIP. - Equipment</b>		1.00	30,670	m2	\$210.00	\$6,440,700

**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - OPTION 2B - PHASE 1 (168 BUSES)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**

October 22, 2021 (May 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b><u>B3.3 FITTINGS &amp; EQUIPMENT - Conveying Systems</u></b>						
<b><u>B3.31 - Elevators</u></b>						
NIL						
<b><u>B3.32 - Escalators &amp; Moving Walks</u></b>						
NIL						
<b><u>B3.33 - Material Handling Systems</u></b>						
NIL						
<b>TOTAL FOR FITTINGS &amp; EQUIP. - Conveying Systems</b>		0.00	0	m2	\$0.00	\$0
 <b>C1. SERVICES - MECHANICAL</b>						
<b><u>C1.1 Plumbing &amp; Drainage</u></b>						
30	D2010 Plumbing Fixtures	30,670	m2	\$7.00	\$214,690	
31	D2020 Domestic Water Distribution	30,670	m2	\$20.00	\$613,400	
32	D2030 Sanitary Waste	30,670	m2	\$25.00	\$766,750	
33	D2040 Rain Water Drainage	30,670	m2	\$45.00	\$1,380,150	
34	D2090 Other Plumbing Systems	30,670	m2	\$180.00	\$5,520,600	
<b>TOTAL FOR MECHANICAL - Plumbing &amp; Drainage</b>		1.00	30,670	m2	\$277.00	\$8,495,590
 <b><u>C1.2 Fire Protection</u></b>						
35	Allowance for sprinkler system	30,670	m2	\$45.00	\$1,380,150	
<b>TOTAL FOR MECHANICAL - Fire Protection</b>		1.00	30,670	m2	\$45.00	\$1,380,150
 <b><u>C1.3 Heating, Ventilation &amp; Air Conditioning</u></b>						
36	D3010 Energy Supply	30,670	m2	\$2.00	\$61,340	
37	D3020 Heat Generating Systems	30,670	m2	\$45.00	\$1,380,150	
38	D3030 Cooling Generating Systems	30,670	m2	\$10.00	\$306,700	
39	D3040 Distribution Systems	30,670	m2	\$55.00	\$1,686,850	
40	D3050 Terminal & Package Units	30,670	m2	\$150.00	\$4,600,500	
41	D3090 Other HVAC Systems & Equipment	30,670	m2	\$24.00	\$736,080	
42	D3070 Systems Testing & Balancing	30,670	m2	\$3.50	\$107,345	
<b>TOTAL FOR MECHANICAL - HVAC</b>		1.00	30,670	m2	\$289.50	\$8,878,965
 <b><u>C1.4 MECHANICAL - Controls</u></b>						
43	D3060 Controls & Instrumentations	30,670	m2	\$40.00	\$1,226,800	
<b>TOTAL FOR MECHANICAL - Controls</b>		1.00	30,670	m2	\$40.00	\$1,226,800
				Total Mech Unit Rate	\$651.50	

**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - OPTION 2B - PHASE 1 (168 BUSES)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**

October 22, 2021 (May 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b>C2. SERVICES - ELECTRICAL</b>						
<b>C2.1 ELECTRICAL - Service &amp; Distribution</b>						
44	D5010 Electrical Service & Distribution	30,670	m2	\$85.00	\$2,606,950	
<b>TOTAL FOR ELECTRICAL - Service &amp; Distribution</b>		1.00	30,670 m2	\$85.00	\$2,606,950	
<b>C2.2 ELECTRICAL - Lighting, Devices &amp; Heating</b>						
45	D5020 Lighting and Branch Wiring	30,670	m2	\$50.00	\$1,533,500	
<b>TOTAL FOR ELECTRICAL - Lighting, Devices &amp; Heating</b>		1.00	30,670 m2	\$50.00	\$1,533,500	
<b>C2.3 ELECTRICAL - Systems &amp; Ancillaries</b>						
46	D5030 Communications & Security	30,670	m2	\$29.00	\$889,430	
47	D5090 Other Electrical Systems	30,670	m2	\$13.00	\$398,710	
<b>TOTAL FOR ELECTRICAL - Systems &amp; Ancillaries</b>		1.00	30,670 m2	\$42.00	\$1,288,140	
				Total Elec Unit Rate	\$177.00	
<b>D. SITE &amp; ANCILLARY WORK</b>						
<b>D1.1 SITEWORK - Site Development</b>		84,590	m2	Net Site Area		\$2,232,695
<b>D1.11 - Preparation</b>						
48	Clear and grub site (assumed limited scope post demolition of buildings and site improvements)	84,590	m2	\$5.00	\$422,950	
49	Strip topsoil and stockpile on site	20,158	m3	\$15.00	\$302,370	
50	Rough grading including cut and fill	84,590	m2	\$10.00	\$845,900	
51	Site protection and erosion control	84,590	m2	\$2.50	\$211,475	
52	Earthwork, swales, grading, SW Management Pond	1	sum	\$450,000.00	\$450,000	
<b>D1.12 - Hard Surfaces</b>						\$1,844,600
53	Asphalt paving to parking and laneways including:					
53.1	- heavy duty driveways	14,200	m2	\$87.00	\$1,235,400	
53.2	- medium duty to parking areas	4,811	m2	\$60.00	\$288,660	
54	Concrete curbs	550	m	\$125.00	\$68,750	
55	Concrete paving to walkways	1,100	m2	\$75.00	\$82,500	
56	Extra over for ramps	1	sum	\$10,000.00	\$10,000	
57	Extra over for stairs	1	sum	\$15,000.00	\$15,000	
58	Heavy duty concrete paving	700	m2	\$125.00	\$87,500	
59	Concrete equipment pads	1	sum	\$40,000.00	\$40,000	
60	Line painting to parking lot	194	No	\$35.00	\$6,790	
61	Line painting to driveways - directional	1	sum	\$10,000.00	\$10,000	

**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - OPTION 2B - PHASE 1 (168 BUSES)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**

October 22, 2021 (May 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b><u>D1.13 - Improvements</u></b>						<b>\$1,027,500</b>
62	Retaining walls	1	sum	\$350,000.00	\$350,000	
63	Railings	1	sum	\$30,000.00	\$30,000	
64	Chain link fence	1,500	m	\$250.00	\$375,000	
65	Gates including foundations	1	sum	\$120,000.00	\$120,000	
66	Bollards	30	No	\$1,500.00	\$45,000	
67	Parking signage	1	sum	\$5,000.00	\$5,000	
68	Bicycle racks, benches, garbage cans, etc.	1	sum	\$7,500.00	\$7,500	
69	Planter walls	1	sum	\$50,000.00	\$50,000	
70	Site signage	1	sum	\$45,000.00	\$45,000	
<b><u>D1.14 - Landscaping</u></b>						<b>\$522,145</b>
71	Seed and topsoil	7,576	m2	\$15.00	\$113,645	
72	Planting beds including topsoil and planting material	1	sum	\$150,000.00	\$150,000	
73	Large trees	80	No	\$950.00	\$76,000	
74	Small trees	150	NO	\$550.00	\$82,500	
75	Shrubs, plantings, and ground covers	1	sum	\$100,000.00	\$100,000	
<b>TOTAL FOR SITE WORK - Site Development</b>		<b>2.76</b>	<b>84,590</b>	<b>m2</b>	<b>\$66.52</b>	<b>\$5,626,940</b>
<b><u>D1.2 SITEWORK - Mechanical Site Services</u></b>						
76	G3010 Water Supply	30,670	m2	\$4.49	\$137,657	
77	G3020 Sanitary Water	30,670	m2	\$2.69	\$82,594	
78	G3030 Storm Sewer	30,670	m2	\$26.93	\$825,943	
79	G3090 Other Site Mechanical Utilities	30,670	m2	\$6.82	\$209,239	
<b>TOTAL FOR SITE WORK - Mechanical Site Services</b>		<b>2.76</b>	<b>84,590</b>	<b>m2</b>	<b>\$14.84</b>	<b>\$1,255,433</b>
<b><u>D1.3 SITEWORK - Electrical Site Services</u></b>						
80	G4010 Electrical Distribution	30,670	m2	\$62.39	\$1,913,371	
81	G4020 Site Lighting	30,670	m2	\$13.00	\$398,581	
82	G4030 Site Communications & Security	30,670	m2	\$4.37	\$134,103	
83	G4090 Other Site Electrical Utilities	30,670	m2	\$9.16	\$280,807	
<b>TOTAL FOR SITE WORK - Electrical Site Services</b>		<b>2.76</b>	<b>84,590</b>	<b>m2</b>	<b>\$32.24</b>	<b>\$2,726,862</b>

**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - OPTION 2B - PHASE 1 (168 BUSES)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**

October 22, 2021 (May 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
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**D2.1 ANCILLARY WORK - Demolition**

**D2.11 - Demolition**

See separate estimate for demolition of existing buildings and site improvements

See Separate Estimate

**D2.12 - Hazardous Materials**

84 This estimate excludes allowances for asbestos abatement and the handling of hazardous materials

**Excluded**

**TOTAL FOR ANCILLARY WORK - Demolition**

0.00	0	m2	\$0.00	\$0
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**D2.2 ANCILLARY WORK - Alterations**

**D2.21 - Alterations**

NIL

**TOTAL FOR ANCILLARY WORK - Alterations**

0.00	0	m2	\$0.00	\$0
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**Z. GENERAL REQUIREMENTS & CONTINGENCIES**

**Z1.1 GENERAL REQUIREMENTS & FEES - General Requirements**

**Z1.11 - Supervision & Labour Expenses**

1 Allowance for the General Contractor's supervision & labour expenses as follows:

1 sum \$5,484,387 \$5,484,387 7.0%

- supervision and coordination of subcontractors
- site superintendent and vehicle
- general labour expenses

Average per month based on a construction schedule of 30 months

\$182,813
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**Z1.12 - Temporary Conditions**

1 Allowance for the temporary conditions provided by the General Contractor including:

Included above

1 Allowance for the temporary conditions provided by the General Contractor including:

1.1 Access to site

- traffic control
- pedestrian safety
- removal of exterior cladding for access
- temporary closure panels

1.2 Site accommodations:

- temporary site office
- temporary signage
- telephone and fax
- stationary supplies and office equipment

1.3 Site protection:

- hoarding and gates
- safety guard rails
- fire extinguishers
- first aid kits
- temporary shoring
- temporary stairs and ladders
- protection for site elevators and flooring

**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - OPTION 2B - PHASE 1 (168 BUSES)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**

October 22, 2021 (May 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
1.4	Temporary utilities: - temporary construction power panels - temporary water source					
1.5	Site clean up: - daily clean up in addition to the trades - final cleaning - dump bins - dumping charges					
1.6	Equipment: - material hoisting equipment - cranes and operators - small tool rental - pumps and pumping equipment					
1.7	Miscellaneous - CPM scheduling - land surveying - testing and inspections - photography					
	<b>Cash Allowances</b>					<b>\$0</b>
1	Independent inspection and testing				See Project Soft Costs	
	<b>Z1.13 - Permits, Insurance &amp; Bonds</b>					<b>\$1,096,877</b>
1	Building permit fees <i>(input lump sum fee)</i>				See Project Soft Cost Estimate	
2	General Liability and Builder's Risk insurance <i>(enter \$/1000)</i>	\$6.50	1 LS	\$509,264	\$509,264	
3	Labour & Material and Performance bonding <i>(enter \$/1000)</i>	\$7.50	1 LS	\$587,613	\$587,613	
	<b>TOTAL FOR GEN. REQ'MENTS &amp; FEES - Gen. Req'ments</b>	1.00	30,670 m2	\$214.58	\$6,581,264	8.4%
	<b>Z1.2 GENERAL REQUIREMENTS &amp; FEES - Fees</b>					
	<b>Z1.21 - General Contractor's Fees</b>					
1	Allowance for the General Contractor's Fees (Overhead and Profit). (applied to measured works plus general requirements)		1 LS	\$2,350,451	\$2,350,500	3.0%
	<b>TOTAL FOR GEN. REQ'MENTS &amp; FEES - Fees</b>	1.00	30,670 m2	\$76.64	\$2,350,500	3.0%
	<b>Z2.1 CONTINGENCY - Design &amp; Pricing Contingency</b>					
1	Design & Pricing Contingency as a percentage of the above to cover increases in the overall scope of the design during the remaining stages of the design phase (applied to measured works plus general requirements and fees)					
1.1	- Architectural		1 sum	\$4,878,065	\$4,878,065	20.0%
1.2	- Structural		1 sum	\$3,787,745	\$3,787,745	20.0%
1.3	- Building Mechanical		1 sum	\$3,996,301	\$3,996,301	20.0%
1.4	- Building Electrical		1 sum	\$1,085,718	\$1,085,718	20.0%
1.5	- Civil Sitework		1 sum	\$1,125,388	\$1,125,388	20.0%
1.6	- Mechanical Site Services		1 sum	\$251,087	\$251,087	20.0%
1.7	- Electrical Site Services		1 sum	\$545,372	\$545,372	20.0%
1.8	- Ancillary Work		1 sum	\$0	\$0	20.0%
	<b>TOTAL CONTINGENCY - Design &amp; Pricing Contingency</b>	1.00	30,670 m2	\$510.91	\$15,669,700	20.0%



**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - OPTION 2B - PHASE 1 (168 BUSES)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.5)**

October 22, 2021 (May 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total														
<b>Z2.2 CONTINGENCY - Escalation Contingency</b>																				
2.1	Contingency for escalation that might occur between the date of the estimate and the anticipated midpoint of construction based on the following.  Anticipated start date of construction stage Estimated duration of the construction phase Estimated midpoint of construction Start date for escalation calculations Estimated timeframe for escalation (to midpoint of construction) Effective annual escalation factor Effective escalation calculation (non-compounded)				Excluded	0.0%														
						<table border="1"> <tr><td></td><td></td></tr> <tr><td></td><td>months</td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td>months</td></tr> <tr><td></td><td>per annum</td></tr> <tr><td></td><td>&lt;&lt;&lt; (to be calculated and input)</td></tr> </table>				months						months		per annum		<<< (to be calculated and input)
	months																			
	months																			
	per annum																			
	<<< (to be calculated and input)																			
	<b>TOTAL FOR ALLOWANCES - Escalation Contingency</b>	1.00	30,670	m2	\$0.00	\$0														
<b>Z2.3 CONTINGENCY - IPAC Contingency</b>																				
1	Contingency for Infection Prevention & Control (IPAC) compliance and requirements including personal protection equipment (PPE), temporary isolation ventilation, temporary protection, sanitization procedures, special cleaning and packaging requirements, and any other infection control procedures imposed on the project.				Excluded	0.0%														
	<b>TOTAL FOR ALLOWANCES - Escalation Contingency</b>	1.00	30,670	m2	\$0.00	\$0														
<b>Z2.4 CONTINGENCY - COVID-19 Contingency</b>																				
1	Contingency for the potential impact of the COVID-19 pandemic including:  - lack of availability of labour for due illness related to COVID-19, - delays related to recruiting replacement workers, - social/physical distancing requirements on the site, - site shutdowns due to the risk of workers testing positive for the COVID-19 virus, - health authority mandated industry or project shutdowns, - delays in delivery of materials and equipment to the site and the procurement supply chain, - unavailability of materials due to factory closure or shipping interruptions in the supply chain, - delays related to acquiring material and or equipment substitutions			1 LS	Excluded	0.0%														
	<b>TOTAL CONTINGENCY - COVID-19 Contingency</b>	1.00	30,670	m2	\$0.00	\$0														
<b>Z2.3 CONTINGENCY - Construction Contingency</b>																				
1	Construction Contingency for post contract changes (applied to measured works plus general requirements, fees, Design Contingency and Escalation Contingency)			1 LS	\$3,088,495	\$3,088,500 3.0%														
	<b>TOTAL FOR ALLOWANCES - Construction Contingency</b>	1.00	30,670	m2	\$100.70	\$3,088,500														

# Appendix H – Class D Cost Estimate – 71/71/100-Bus Facility

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**ORDER OF MAGNITUDE “CLASS D” ESTIMATE**

**APPENDIX H - WINDSOR TRANSIT GARAGE – OPTION 3**

**3700 NORTH SERVICE ROAD  
WINDSOR, ONTARIO**

**Prepared For:**

IBI Group  
100 – 175 Galaxy Blvd.  
Toronto ON M9W 0C9 Canada

**Prepared By**

Rider Levett Bucknall  
435 North Service Road West, Suite 203  
Oakville, ON LM6 4X8

**Revision:**

Rev 5

**Project Number**

YYZ7940

**Submitted:**

October 22, 2021

**WINDSOR TRANSIT GARAGE – APPENDIX H - OPTION 3**  
**ORDER OF MAGNITUDE “CLASS D” ESTIMATE**  
**OCTOBER 22, 2021**



IBI Group  
100 – 175 Galaxy Blvd.  
Toronto ON M9W 0C9 Canada  
Tel: 416 679 193  
Email: [chris.prentice@ibigroup.com](mailto:chris.prentice@ibigroup.com)

**Re: Windsor Transit Garage – Order of Magnitude “Class D” Estimate Revision 5**

**Attn: Chris Prentice,**

Dear Chris,

Please find enclosed our Order of Magnitude Estimate report for the Windsor Transit Garage project at 3700 North Service Road in Windsor, Ontario. The estimate is based on the functional program summary and the site plan drawings provided by the IBI Group. For estimating purposes, we understand the City plans to develop the new site in three phases. Phase One includes the program requirements for 71 buses, Phase Two includes the expansion for an additional 71 buses to be added in the next 10 years, and Phase Three includes an additional 100 buses (total of 242 buses to meet 2035 requirements) identified as Option 3 in the Feasibility Study.

This Order of Magnitude “Class D” Estimate is intended to provide a realistic budget of the hard construction costs based on the level of design information available. The estimate reflects an opinion as to the fair market value for the hard construction of the proposed project and is not intended to predict the lowest bid in a competitive tendering scenario. The provisions for contingencies are based on the information provided and defined within the body of this cost report.

Project soft costs are included and based on percentages of the estimated hard construction and lump sum estimates based on assumed scopes of services. Project Ancillaries (Owner supplied Fittings, Fixtures, & Equipment) are also included in the Project Soft Cost summary.

The estimate excludes any work related to disassembling, and relocating equipment, and fixtures from the existing transit facilities to the new facility.

Should you have questions related to this report please do not hesitate to contact the undersigned.

Respectfully submitted,

Mel Yungblut, PQS (F)  
Principal

**WINDSOR TRANSIT GARAGE – APPENDIX H - OPTION 3**  
**ORDER OF MAGNITUDE “CLASS D” ESTIMATE**  
**OCTOBER 22, 2021**



**EXECUTIVE ESTIMATE SUMMARY (page 1 of 2)**

**APPENDIX H - MULTIPLE ESTIMATE SUMMARY - OPTION 3**  
**WINDSOR TRANSIT GARAGE - PHASED EXPANSION**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)**  
 October 22, 2021 (August 2021 Estimate Reconciliation)



No.	Scope Description	GFA (m2)	Unit (Cost/m2)	PHASE 1		PHASE 2		PHASE 3	
				Estimated Total	% of Total	Estimated Total	% of Total	Estimated Total	% of Total
<b>1.0</b>	<b>Hard Construction Costs</b>								
	<b>Phase 1 - Bus Garage &amp; Site Development</b>								
1.1	Phase 1 - Transit Garage + Bus Storage (71 Buses)	19,940	\$2,607	\$51,974,394	69.5%				
1.2	Phase 1 - Site Development including M&E site services	64,554	\$133	\$8,565,765	11.5%				
	<b>Subtotal</b>	<b>19,940</b>	<b>\$3,036</b>	<b>\$60,540,158</b>	<b>81.0%</b>				
1.3	Design & Pricing Contingency	20%	19,940	\$605	\$12,064,600	16.1%			
1.4	Construction Contingency	3%	19,940	\$109	\$2,178,100	2.9%			
1.5	Escalation Contingency - Phase 1	0%			Excluded				
	<b>Subtotal - Contingencies</b>		<b>19,940</b>	<b>\$714</b>	<b>\$14,242,700</b>	<b>19.0%</b>			
	<b>Total Estimated Hard Construction Cost</b>	<b>19,940</b>	<b>\$3,750</b>	<b>\$74,782,860</b>	<b>82.7%</b>				
<b>2.0</b>	<b>Phase 2 - Bus Garage Expansion &amp; Site Development</b>								
2.1	Phase 2 - Bus Garage Expansion (71 buses)	8,038	\$2,365			\$19,009,870	73.3%		
2.2	Phase 2 - Site Development including M&E site services	56,516	\$35.00			\$1,978,060	7.6%		
	<b>Subtotal</b>	<b>8,038</b>	<b>\$2,611.09</b>			<b>\$20,987,930</b>	<b>80.9%</b>		
2.3	Design & Pricing Contingency	20%	8,038	\$522		\$4,197,586	16.2%		
2.4	Construction Contingency	3%	8,038	\$94		\$755,465	2.9%		
2.5	Phase 2 - Escalation Contingency (construction in 2028)	21.75%				Excluded			
	<b>Subtotal - Contingencies</b>		<b>8,038</b>	<b>\$616.20</b>		<b>\$4,953,051</b>			
	<b>Total Estimated Hard Construction Cost</b>	<b>8,038</b>	<b>\$3,227</b>			<b>\$25,941,000</b>	<b>81.0%</b>		
<b>3.0</b>	<b>Phase 3 - Bus Garage Expansion &amp; Site Development</b>								
3.1	Phase 3 - Bus Garage Expansion (100 buses)	7,788	\$2,365					\$18,423,850	74.1%
3.2	Phase 3 - Site Development including M&E site services	48,728	\$35.00					\$1,696,697	6.8%
	<b>Subtotal</b>	<b>7,788</b>	<b>\$2,584</b>					<b>\$20,120,547</b>	
3.3	Design & Pricing Contingency	20%						\$4,024,109	
3.4	Construction Contingency	3%						\$724,340	
3.5	Phase 3 - Escalation Contingency (construction in 2033)	36.5%						Excluded	
	<b>Subtotal - Contingencies</b>		<b>7,788</b>	<b>\$610</b>				<b>\$4,748,449</b>	
	<b>Total Estimated Hard Construction Cost</b>	<b>7,788</b>	<b>\$3,193</b>					<b>\$24,868,996</b>	

**WINDSOR TRANSIT GARAGE – APPENDIX H - OPTION 3**  
**ORDER OF MAGNITUDE “CLASS D” ESTIMATE**  
**OCTOBER 22, 2021**



**EXECUTIVE ESTIMATE SUMMARY (page 2 of 2)**

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No.	Scope Description	GFA (m2)	Unit (Cost/m2)	PHASE 1		PHASE 2		PHASE 3	
				Estimated Total	% of Total	Estimated Total	% of Total	Estimated Total	% of Total
<b>4.0</b>	<b>Project Soft Costs</b>								
4.1	Land Acquisition Costs			\$0	0.0%	\$0	0.0%	\$0	0.0%
4.2	Municipal Charges			\$0	0.0%	\$0	0.0%	\$0	0.0%
4.3	Consulting Fees and Expenses			\$7,540,611	48.2%	\$3,445,425	56.7%	\$3,306,238	54.4%
4.4	Specialty Consultants			\$387,500	2.3%	\$262,500	4.3%	\$262,500	4.3%
4.5	Project Management Fees			\$0	0.0%	\$0	0.0%	\$0	0.0%
4.6	Owner Supplied Furnishings, Fixtures, and Equipment (FF&E)			\$3,787,214	24.2%	\$824,319	13.6%	\$480,338	7.9%
4.7	Financing and Loan Fees			\$50,000	0.3%	\$25,000	0.4%	\$25,000	0.4%
4.8	Operational Expenses			\$989,536	6.3%	\$444,410	7.3%	\$408,690	6.7%
4.9	Taxes - Non Refundable GST/HST	1.76%		\$1,501,978	9.6%	\$544,591	9.0%	\$516,609	8.5%
4.10	Project Soft Cost Contingency	10.0%		\$1,423,684	9.1%	\$530,047	8.7%	\$476,037	7.8%
4.11	Phase 1 - Escalation Contingency on Soft Costs	13.5%	to 2023	Excluded					
4.13	Phase 2 - Escalation Contingency on Soft Costs	21.75%	to 2028			Excluded			0.0%
4.14	Phase 3 - Escalation Contingency on Soft Costs	36.5%	to 2033					Excluded	
	<b>Total Project Soft Costs</b>	<b>19,940</b>	<b>\$785.40</b>	<b>\$15,660,520</b>	<b>17.3%</b>	<b>\$6,076,290</b>	<b>19.0%</b>	<b>\$5,475,410</b>	<b>18.0%</b>
	<b>Total Project Budget</b>	<b>19,940</b>	<b>\$4,536</b>	<b>\$90,443,380</b>		<b>\$32,017,290</b>		<b>\$30,344,406</b>	
	<b>Average Estimated Cost per m2</b>			<b>\$4,536</b>		<b>\$3,983</b>		<b>\$3,896</b>	

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  - 1.1 Scope of Work for the Project
- 2 Assignment Details
  - 2.1 General Information
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  - 2.3 Measurement and Pricing
  - 2.4 Environmental Sustainability
  - 2.5 Taxes
  - 2.6 Procurement Methodology
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- 4 Project Description and Scope Assumptions
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  - G. Elemental Summary – Phase 1
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## **1 Introduction**

### **1.1 Scope of Work for the Project**

The scope of work for this Option 3 of the project includes the proposed design and construction of a new transit bus facility for the City of Windsor. We understand the new facility is being planned in three phases: Phase One includes the bus maintenance and storage for 71 buses, and Phase Two includes an expansion of the bus storage for an additional 71 buses for a total capacity of 142 buses. The final phase includes an expansion of an additional 100 buses to bring the total capacity to 242 buses to meet the projected 2035 requirements. The functional program for the facility includes the operations and administration areas, indoor bus storage, fleet maintenance and the support utility spaces. The gross site area for the project is approximately 84,983 square meters (8.5 hectares) or 21 acres.

### **1.1 Gross Floor Area Summary**

Phase 1 – 71 Buses – Total Gross Floor Area = 19,939.50 m<sup>2</sup> (214,629 SF)

- 14 bus bay including 4 articulated bus repair bays and 10 standard bus bays
- 71 SBE bus garage
- Office ( 2 storey) = 3,200 sm;
- Service (service lanes, bus wash lanes, cleaning lane) = 1,660 sm;
- Maintenance = 8,313 sm;
- Stores = 1.086 sm;
- Circulation = 1,225.5 sm;
- 71 Bus Garage (27 X 165) = 4,455 sm;

○

Phase 2 – Additional 71 Buses – Total Gross Floor Area = 27,977.50 m<sup>2</sup> (301,150 SF)

- Maintenance expansion area including 12 standard bus repair bays (total of 26 bus repair bays)
- 71 bus garage expansion (total of 142)
- Remainder of Maintenance = 2,530 sm;
- Circulation addition = 1,053 sm;
- 71 Bus Garage addition (27 X 165) = 4,455 sm;

○

Phase 3 – Additional 100 buses – Total Gross Floor Area = 35,765.50 m<sup>2</sup> (384,980 SF)

- 100 bus garage expansion (total of 242)
- Additional 106 vehicle parking lot on lands to west of site.
- 100 Bus Garage addition (40.5 X 165) = 6,682.5 sm;
- Circulation addition = 1,105.5 sm;



## **2 Project Details**

### **2.1 General Information**

Based on the preliminary design information provided, we have measured quantities where possible and applied unit rates for the specific items based on the design drawings and outline project specifications provided. Where design information was limited, we made assumptions based on our experience with projects of a similar type, size, and standard of quality. The following two reference projects were used in the preparation of the estimate:

1. Grand River Northfield Bus Facility – 30,456 m<sup>2</sup> - Class A Estimate completed in Feb 2018
2. City of Brampton Transit Maintenance Facility – 55,700 m<sup>2</sup> – Class D Estimate completed in May 2020

We used unit rate cost data from the above two projects in developing the estimate for the Windsor Transit Facility.

### **2.2 Location Factors**

The location cost base for this estimate is Windsor Ontario. Construction in the Windsor and Essex County area does experience a regional factor attributable to its proximity to the Toronto and London Waterloo construction markets. Due to the size of this project, we expect larger contractors from the Toronto and London area would have interest in bidding the project. We would expect this increased level of interest would have a marginally impact on the regional cost factors in Windsor.

### **2.3 Measurement and Pricing**

The estimate has been derived using generally accepted principles on method of measurement as per the Canadian Institute of Quantity Surveyors (CIQS) Elemental Cost Analysis and/or Method of Measurement of Construction Works.

The unit rates used and developed for this estimate where applicable include labour and material, equipment, and subcontractor’s overheads and profit. Pricing is based on experience with similar project types.

We have assumed that a mix of both non-union and unionized commercial contractors would perform the work. This estimate is not intended to be a prediction of the lowest bid and assumes competitive bidding for all aspects of the work.

### **2.4 Environmental Sustainability**

The estimate incorporates sustainable design elements consistent with Leadership in Energy and Environmental Design (LEED) principles as identified within the design information available. The costs associated with registering the project for LEED Certification including the additional consulting fees is excluded.

### **2.5 Taxes**

The estimates include the applicable Non-Refundable Harmonized Sales Tax (NRGST/HST) of 1.76%. Actual NRGST/HST to be confirmed by the City of Windsor.

## **2.6 Procurement Methodology**

We have assumed that the project would be procured with a General Contractor approach under a project specific CCDC2 stipulated lump sum form of contract. We have assumed a minimum of three bids would be received for all the major trade categories to establish competitive bidding and tender results. The estimate is a prediction based on fair market pricing and not a prediction of lowest bid in any trade category. Note that should the above minimum bidding conditions not occur on this project, construction bids received could vary significantly from the estimated costs included within this report.

## **2.7 General Requirements and Fees**

The fee for the General Contractor is included as a percentage of the hard construction cost. The general requirements are based on our assumptions of the anticipated construction approach and schedule.

The estimate includes allowances for the premiums associated with typical bonding and insurance for the contractors. The actual cost of bonding and insurance would be subject to the City of Windsor requirements and the project specifications.

## **2.8 Schedule / Phasing**

The scope of work has been estimated based on the work being executed in three phases as outlined above. The escalation contingencies for each phase have been excluded. We understand the escalation contingency is being handling outside the RLB Estimates.

We have assumed the majority of the work would be completed within regular daytime hours with limited after hours or weekend work for building system tie-ins if required. The estimates exclude any allowances for premium time for extended work hours or extensive weekend work.

## **2.9 Area / Project Statistics**

The gross floor areas of the addition/renovation have been measured in accordance with the Canadian Institute of Quantity Surveyors Standard Method of Measurement. Areas are based on dimensions to the inside face of the exterior walls and exclude areas identified on the floor plan drawings in grey highlights as “not in scope.”

Detailed gross floor areas and project statistics are included in Section 6 of the report

## **3 Contingencies**

### **3.1 General Approach to Contingencies**

The effective use of contingencies in construction cost planning requires a clear understanding of estimating risks in both a project specific and general construction market sense. The appropriate level of contingency is dependent on the amount of design information available, knowledge of the design teams' methods and philosophy, the timing of the estimate preparation relative to the project design and construction schedule, and the anticipated complexity of the construction work.

### **3.2 Design and Pricing Contingency**

A design and pricing contingency of **20.0%** is included in the estimate. This allowance where included is meant to cover pricing and design unknowns during the preparation of this estimate, and not meant to cover additional scope or functional program requirements. This allowance is also meant to cover the potential changes in scope of work during the completion of the design documentation and the preparation of the tender documents.

### **3.3 Escalation Contingency**

An escalation contingency has been excluded in the estimates for all phases of the project. This allowance is meant to address anticipated changes in construction costs due to market fluctuations between the date of this cost report and the anticipated midpoint of construction as outlined below.

We understand the escalation contingency is being handled outside of the RLB estimates.

### **3.4 Cost Considerations for the Current Health Pandemic & COVID-19**

We expect the project will be tendered in the near future (within the next 4 to 6 months) and could experience the market influences of the current COVID-19 pandemic. The market influences are unquantifiable currently and are likely to change in the future. We also expect the contractors bidding the project would include in their bids, allowances for the COVID-19 risk unless that risk is mitigated in the bid documents. We forecast the inclusion of these risks in bids could impact normal competitive market conditions resulting in a bid price increase in the range of 3% to 10% or in extreme situations as much as 10% to 20%.

We encourage the owner and the consulting team to address this future risk by providing clear direction to the bidders in the bid documents on risk mitigation for COVID-19 issues.

The primary risks related to COVID-19 include impacts to the supply of materials to the site, the potential interruption of labour on the site and the productivity in executing the work.

Reduced site productivity could result from any of the following risks:

- lack of availability of labour for due illness related to COVID-19,
- delays related to recruiting replacement workers,

- social/physical distancing requirements on the site,
- site shutdowns due to the risk of workers testing positive for the COVID-19 virus,
- health authority mandated industry or project shutdowns,
- delays in delivery of materials and equipment to the site and the procurement supply chain,
- unavailability of materials due to factory closure or shipping interruptions in the supply chain,
- delays related to acquiring material and or equipment substitutions

**Note: The COVID 19 Contingency has been excluded from the RLB Estimates.**

### **3.5 Construction Contingency (Post Contract Stage)**

A post contract contingency of **3%** has been included. This contingency is meant to cover the potential changes (change orders/directives) in cost due to the discovery of unknowns during the execution of the construction work.

## **4 Project Scope Assumptions**

### **4.1 Project Scope Assumptions**

#### **Building Shell - Substructure**

- Standard spread footing and pad foundations founded on load bearing soil conditions.
- Scope excludes any allowance for special foundations such as caissons and pile foundations.
- Estimate excludes any allowances for the removal, treatment, and disposal of impacted or contaminated soils.

#### **Building Shell - Structure**

- Conventionally framed structure steel building structure with columns, beams, purlins, and open web steel joists, and metal roof deck.
- Structural steel framing to exterior overhead doors (headers and jambs)

#### **Building Shell – Exterior Enclosure**

- Insulated precast concrete or metal siding to exterior of the garage
- Aluminum framed glazed curtainwall to the office area
- Prefinished metal roll up overhead doors or rapid roll fabric doors where applicable
- Prefinished aluminum doors and frames at main entrances
- Solid hollow metal doors and frames at fire exits and maintenance areas

#### **Building Interiors - Partitions**

- Combination of light weight concrete block and metal stud and drywall partitions demising walls
- Metal blocking where required
- Caulking and sealing to interior partitions

- Interior glazed partitions and windows where required

#### **Building Interiors - Doors**

- Prefinished aluminum doors and frames at entrance vestibules (inner doors)
- Hollow metal doors and frames to utility areas
- Solid core wood doors with metal frames at the office area
- Commercial grade door hardware
- Exterior weatherstripping

#### **Building Interiors – Floors Finishes**

- Combination of porcelain tile, ceramic tile, rubber and epoxy floor finishes where applicable
- Concrete sealer
- Vinyl dissipative tile to IT areas
- Carpet tile to the office areas where applicable

#### **Building Interiors – Ceiling Finishes**

- Painted exposed structure in the garage areas
- Suspended gypsum drywall ceilings in washrooms and select office areas
- Suspended acoustical ceilings where applicable

#### **Building Interiors – Fittings & Equipment**

- Two fuel wash systems (ie. two fuel wash lanes)
- Two bus wash systems, one for each service lane
- A paint booth for 60 ft bus and body repair shop (one bay)

#### **Building Mechanical – Plumbing & Drainage**

- Water meter and main connection
- DHW heaters and piping
- Water softener system
- Hose bibbs
- Pumps, pipe distribution, storage tanks, and fittings
- Commercial grade plumbing fixtures
- Sanitary waste
- Storm water drainage
- Other operational related plumbing including windshield washer fluid system, diesel storage and fueling systems, engine oil systems, antifreeze storage and fill systems, lube systems, transmission oil and hydraulic fluid systems, grease systems, waste engine oil disposal systems, gas meter and distribution, vacuum systems, compressed air, pneumatic tube systems, etc.

### **Building Mechanical – Fire Protection**

- Dry and wet sprinkler systems where required
- Sprinkler heads
- Fire pump (if required)
- Specialty fire suppression systems (if required)

### **Building Mechanical – Heating Ventilation & Air Conditioning**

- Humidification systems
- Heat Generating Systems
- Glycol heating
- Snow melting
- Chemical treatment
- Cooling Generating Systems
- HVAC distribution
- Terminal Package Units including exhaust extraction

### **Building Mechanical - Controls**

- Digital building controls and instrumentation
- Testing and commissioning

### **Building Electrical – Service & Distribution**

- Primary power system including incoming service, switchboard, and distribution board
- Surge protection
- Automatic transfer switch
- 347/600V distribution panels
- 120/208V distribution panels
- Mechanical control connections
- Conduit and wiring

### **Building Electrical - Lighting**

- Lighting and controls
- Low voltage lighting systems and controls

### **Building Electrical – Ancillary Systems**

- Communications and IT conduit and boxes
- Security system conduit and cabling
- Video intercom door station

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**ORDER OF MAGNITUDE “CLASS D” ESTIMATE**  
**OCTOBER 22, 2021**



- Master clock system
- Fire alarm system
- Maglocks and door strikes
- CCTV system
- Lighting protection system

**Site Development – Hard & Soft Landscaping**

- Site preparation and earthworks
- Hard surfaces, HD paving to driveways, MD paving to parking
- Concrete sidewalks
- Precast concrete pavers
- Retaining walls, planter walls, concrete stairs
- Concrete equipment housekeeping pads (tank farm)
- Line painting and directional markings
- Soft landscaping, trees, shrubs, seeding and topsoil

**Site Development – Mechanical Site Services**

- Incoming water supply
- Sanitary water piping and connection
- Storm water piping and connection
- Other site utilities

**Site Development – Electrical Site Services**

- Emergency generators and associated work
- Primary transformer and connections
- Site lighting and controls
- Site communications
- Site security controls

**4.2 Exclusions & Qualifications**

The following items are excluded from the estimate:

1. Demolition and decommissioning of the existing site buildings and improvements
2. Escalation Contingency
3. Special foundations such as caissons or pile foundations
4. The treatment and disposal of impacted or contaminated soils
5. Premium time for afterhours and weekend work
6. Phasing premium (assumed to be executed in three phases as outlined above)
7. Municipal off-site service connections (outside the property line)
8. Development charges and building permit fees (assumed not applicable)
9. Sole sourcing of materials, services, or equipment
10. Premiums for LEED certification
11. Onsite or offsite temporary storage facilities
12. Site work improvements to the North Service Road for additional turn lanes, traffic lights, etc.
13. Offsite mechanical and electrical site services (power, water, sanitary, storm) to support the new development.
14. Onerous winter working conditions
15. Mock ups (if required)

**4 Document List**

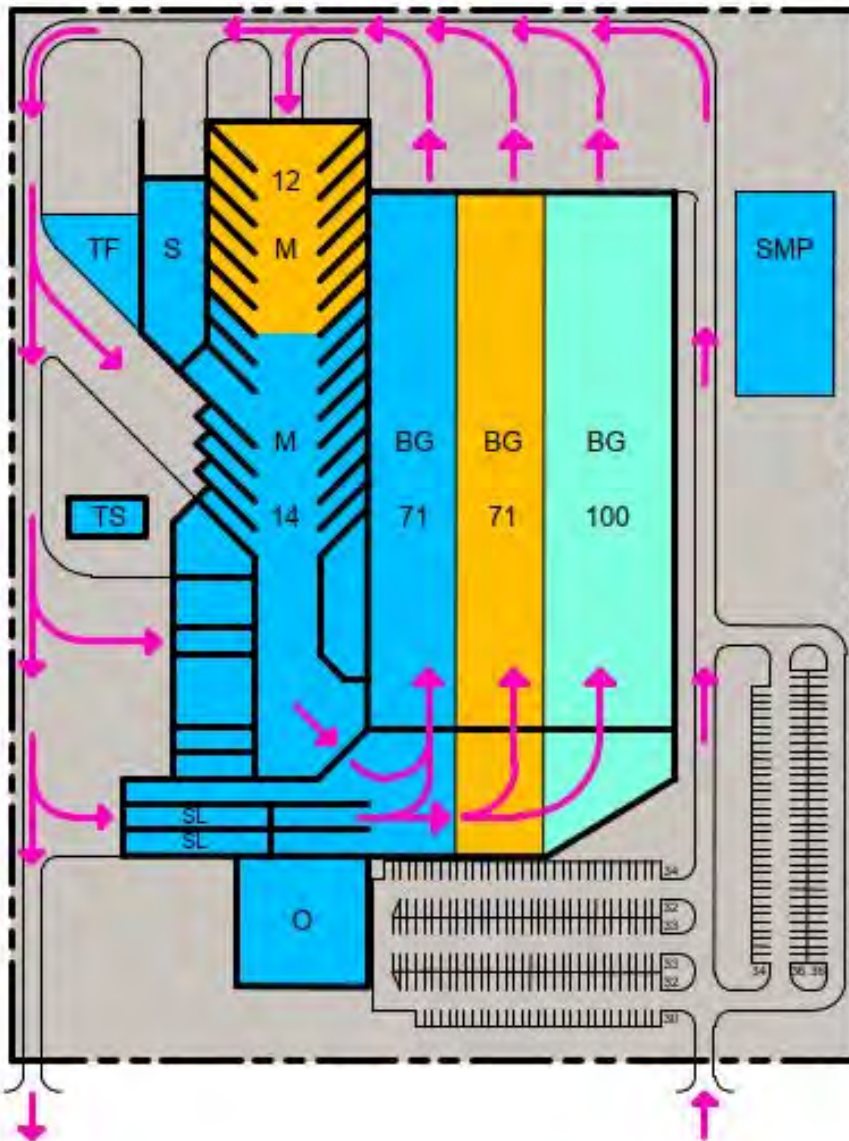
The following documents were used for the preparation of this report:

<b>Doc Ref.</b>	<b>Description</b>	<b>Date</b>	<b>Rev. No.</b>
28 pages	Transit Windsor Garage Feasibility Study prepared by IBI Group	Feb 18, 2021	N/A
36 pages	RFP for Engineering Consulting Services for a Transit Windsor – Garage Feasibility Study	July 28, 2020	N/A
8 pages	Space Program Summary prepared by IBI Group	Feb 11, 2021	V1.
1 page	Site Plan prepared by IBI Group	April 2021	N/A
emails	Comments received May 16 and 17 from IBI Group	May 16, 2021	N/A
3 drawings	Site Plans for Phase 1, 2, and 3 prepared by IBI Group dated July 2021	July 2021	N/A
140 pages	Building Condition Assessment for the existing Windsor Transit Facility at 3700 North Service Road East, Windsor, ON	Nov 2, 2017	N/A

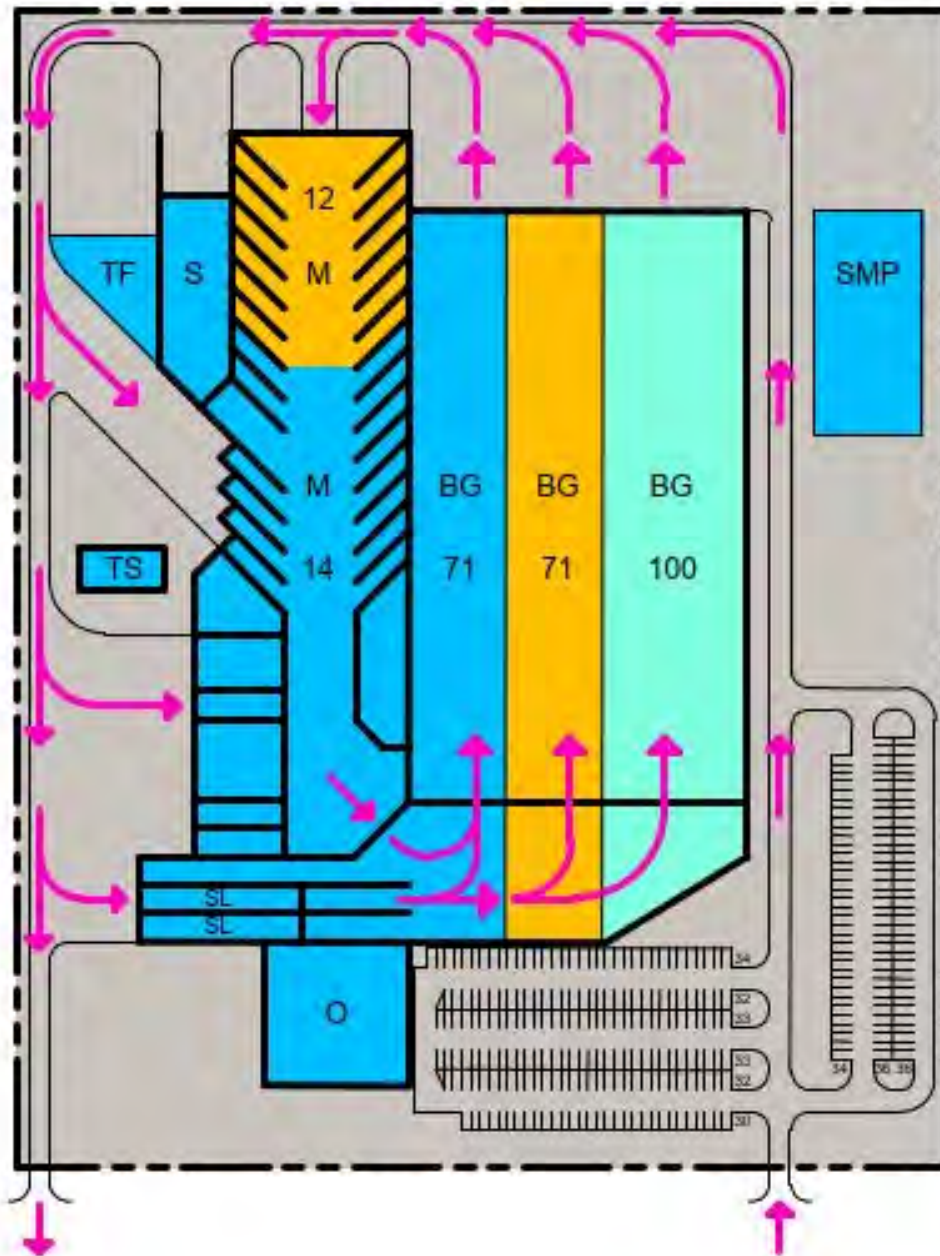


## 6 Gross Floor Area Summary & Graphics

Phase 1 – Site Plan = Building Area = 19,939.50 m<sup>2</sup> (214,629 SF) (blue coloured building below)

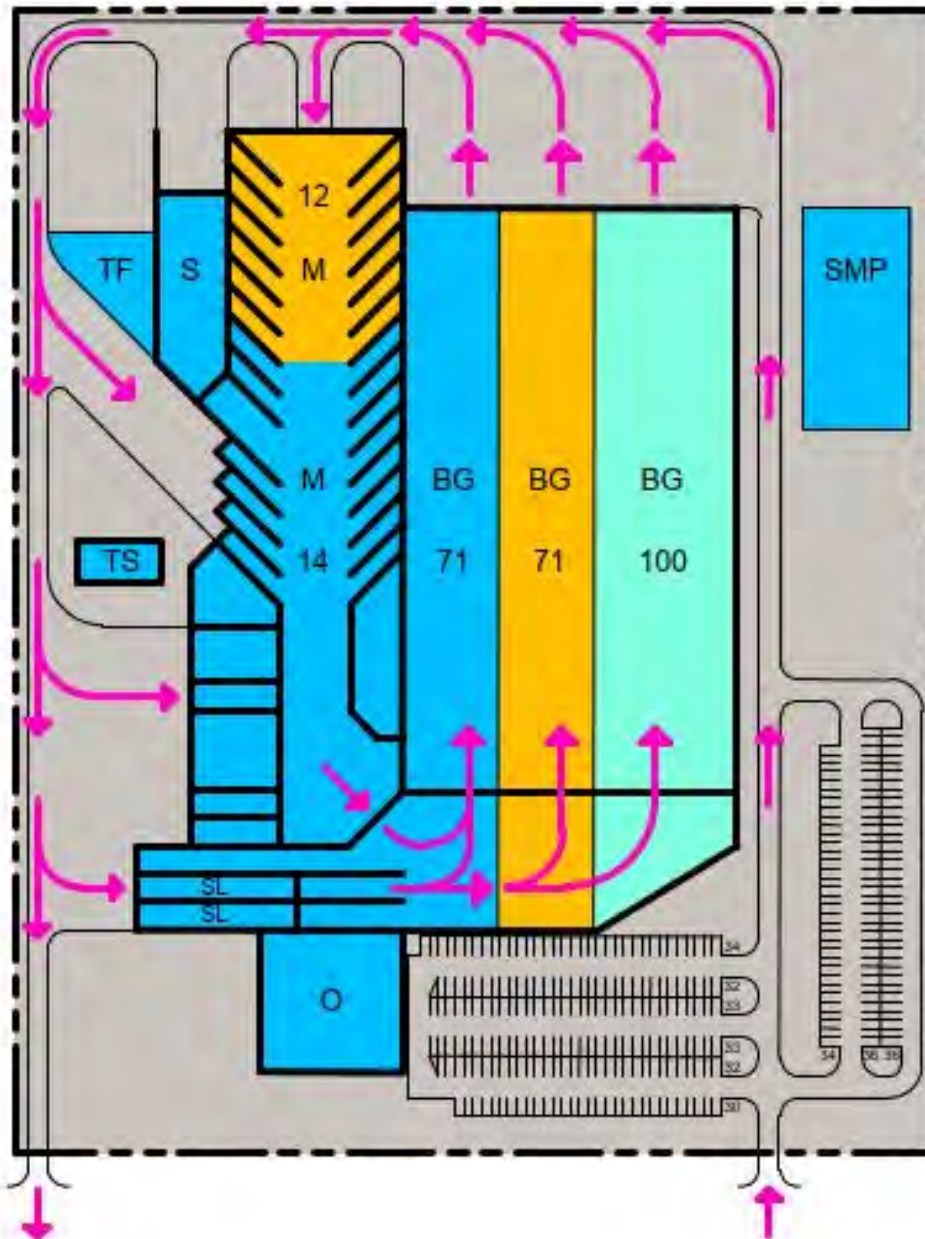


Phase 2 – Site Plan – Building Area Addition = 8038 m2 (86,521 SF) (orange coloured addition below)



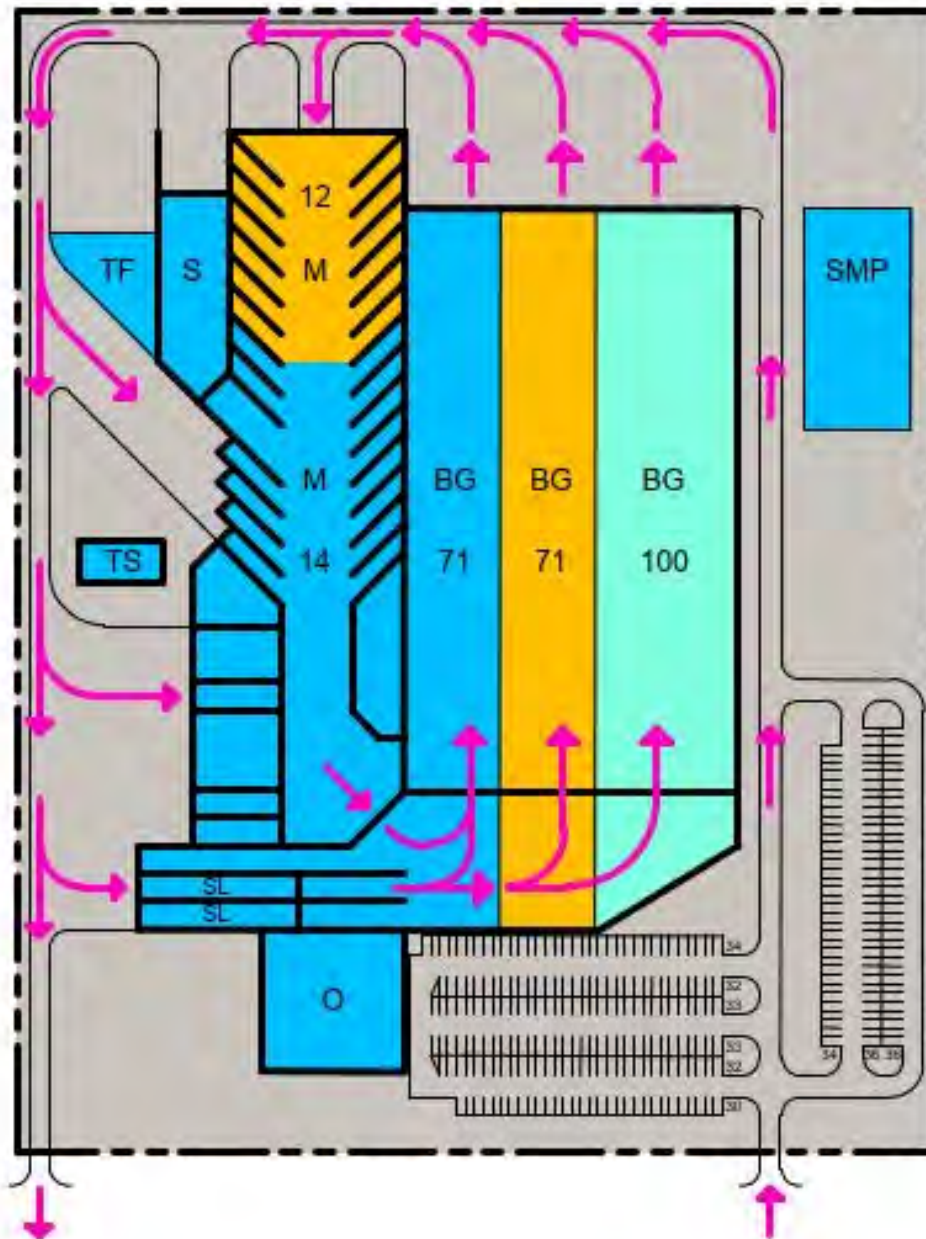
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**Phase 3 – Site Plan Building Area Addition = 7788 m2 (83,830 SF)**  
(light green coloured addition below)



## 6 Site Area Graphic

Proposed Site. Total gross site area required is approximately 84,983 square meters, 8.5 hectares (21 acres).



## **7 List of Appendices**

The following appendices are enclosed:

- A. Master Estimate Summary – All Phases
- B. Project Soft Cost Summary – Phase 1
- C. Project Soft Cost Summary – Phase 2
- D. Project Soft Cost Summary – Phase 3
- E. Estimate Summary – Phase 1
- F. Elemental Estimate Summary – Phase 1
- G. Elemental Estimate – Phase 1

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1.5	Escalation Contingency - Phase 1 0%			Excluded					
	<b>Subtotal - Contingencies</b>	<b>19,940</b>	<b>\$714</b>	<b>\$14,242,700</b>	<b>19.0%</b>				
	<b>Total Estimated Hard Construction Cost</b>	<b>19,940</b>	<b>\$3,750</b>	<b>\$74,782,860</b>	<b>82.7%</b>				
<b>2.0 Phase 2 - Bus Garage Expansion &amp; Site Development</b>									
2.1	Phase 2 - Bus Garage Expansion (71 buses)	8,038	\$2,365			\$19,009,870	73.3%		
2.2	Phase 2 - Site Development including M&E site services	56,516	\$35.00			\$1,978,060	7.6%		
	<b>Subtotal</b>	<b>8,038</b>	<b>\$2,611.09</b>			<b>\$20,987,930</b>	<b>80.9%</b>		
2.3	Design & Pricing Contingency 20%	8,038	\$522			\$4,197,586	16.2%		
2.4	Construction Contingency 3%	8,038	\$94			\$755,465	2.9%		
2.5	Phase 2 - Escalation Contingency (construction in 2028) 21.75%					Excluded			
	<b>Subtotal - Contingencies</b>	<b>8,038</b>	<b>\$616.20</b>			<b>\$4,953,051</b>			
	<b>Total Estimated Hard Construction Cost</b>	<b>8,038</b>	<b>\$3,227</b>			<b>\$25,941,000</b>	<b>81.0%</b>		
<b>3.0 Phase 3 - Bus Garage Expansion &amp; Site Development</b>									
3.1	Phase 3 - Bus Garage Expansion (100 buses)	7,788	\$2,365					\$18,423,850	74.1%
3.2	Phase 3 - Site Development including M&E site services	48,728	\$35.00					\$1,696,697	6.8%
	<b>Subtotal</b>	<b>7,788</b>	<b>\$2,584</b>					<b>\$20,120,547</b>	
3.3	Design & Pricing Contingency 20%							\$4,024,109	
3.4	Construction Contingency 3%							\$724,340	
3.5	Phase 3 - Escalation Contingency (construction in 2033) 36.5%							Excluded	
	<b>Subtotal - Contingencies</b>	<b>7,788</b>	<b>\$610</b>					<b>\$4,748,449</b>	
	<b>Total Estimated Hard Construction Cost</b>	<b>7,788</b>	<b>\$3,193</b>					<b>\$24,868,996</b>	
<b>4.0 Project Soft Costs</b>									
4.1	Land Acquisition Costs			\$0	0.0%	\$0	0.0%	\$0	0.0%
4.2	Municipal Charges			\$0	0.0%	\$0	0.0%	\$0	0.0%
4.3	Consulting Fees and Expenses			\$7,540,611	48.2%	\$3,445,425	56.7%	\$3,306,238	54.4%
4.4	Specialty Consultants			\$367,500	2.3%	\$262,500	4.3%	\$262,500	4.3%
4.5	Project Management Fees			\$0	0.0%	\$0	0.0%	\$0	0.0%
4.6	Owner Supplied Furnishings, Fixtures, and Equipment (FF&E)			\$3,787,214	24.2%	\$824,319	13.6%	\$480,338	7.9%
4.7	Financing and Loan Fees			\$50,000	0.3%	\$25,000	0.4%	\$25,000	0.4%
4.8	Operational Expenses			\$989,536	6.3%	\$444,410	7.3%	\$408,690	6.7%
4.9	Taxes - Non Refundable GST/HST 1.76%			\$1,501,978	9.6%	\$544,591	9.0%	\$516,609	8.5%
4.10	Project Soft Cost Contingency 10.0%			\$1,423,684	9.1%	\$530,047	8.7%	\$476,037	7.8%
4.11	Phase 1 - Escalation Contingency on Soft Costs 13.5% to 2023			Excluded					
4.13	Phase 2 - Escalation Contingency on Soft Costs 21.75% to 2028					Excluded			0.0%
4.14	Phase 3 - Escalation Contingency on Soft Costs 36.5% to 2033							Excluded	
	<b>Total Project Soft Costs</b>	<b>19,940</b>	<b>\$785.40</b>	<b>\$15,660,520</b>	<b>17.3%</b>	<b>\$6,076,290</b>	<b>19.0%</b>	<b>\$5,475,410</b>	<b>18.0%</b>
	<b>Total Project Budget</b>	<b>19,940</b>	<b>\$4,536</b>	<b>\$90,443,380</b>		<b>\$32,017,290</b>		<b>\$30,344,406</b>	
	<b>Average Estimated Cost per m2</b>			<b>\$4,536</b>		<b>\$3,983</b>		<b>\$3,896</b>	

**PROJECT SOFT COST SUMMARY - APPENDIX H - OPTION 3 - PHASE 1**  
**WINDSOR TRANSIT GARAGE**



**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)**  
 October 22, 2021 (August 2021 Estimate Reconciliation)

Gross Floor Area **19,940** m<sup>2</sup>  
 Estimated Hard Construction Costs - Phase 1 **\$72,604,800**

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>1</b>	<b>Land Acquisition Costs</b>						<b>\$0</b>	
1.1	Land costs							
1.2	Land Transfer Taxes							
1.3	Zoning Approval - Planning							
1.4	Zoning Approval - Project Manager							
1.5	Legal Fees							
1.6	Environmental Assessments							
1.7	Permit application fees							
1.8	Other land charges							
<b>2</b>	<b>Municipal Charges</b>						<b>\$0</b>	
2.1	Development Charges/ Community Benefits Charges					Assumed Not Applicable		
2.2	Approvals, Inspections and Permits					Assumed Not Applicable		
2.3	Municipal Levies, Charges & Building Permits					Assumed Not Applicable		
2.4	Property Taxes During Construction							
2.5	Toronto Green Standards							
<b>3</b>	<b>Consulting Fees and Expenses</b>						<b>\$7,540,611</b>	
3.1	Architectural design services and expenses	3.75%	1		\$2,722,679	\$2,722,679		
3.2	Interior design and expenses					Assumed Not Applicable		
3.3	Planning consultant					Assumed Not Applicable		
3.4	Programming consultant					Assumed Not Applicable		
3.5	Structural Engineering	1.2%	1		\$871,257	\$871,257		
3.6	Mechanical Engineering	2.0%	1		\$1,452,095	\$1,452,095		
3.7	Electrical Engineering	2.0%	1		\$1,452,095	\$1,452,095		
3.8	Building Code Consultant	0.2%	1		\$145,210	\$145,210		
3.9	Cost Consultant	0.20%	1		\$145,210	\$145,210		
3.10	Geotechnical Consultant	0.20%	1		\$145,210	\$145,210		
3.11	Acoustical Consultant					Assumed Not Applicable		
3.12	Food Services Consultant					Assumed Not Applicable		
3.13	IT and Communications consultant	0.2%	1		\$145,210	\$145,210		
3.14	Sustainable Design Consultant (LEED)	0.2%	1		\$145,210	\$145,210		
3.15	IPAC Consultant					Assumed Not Applicable		
3.16	Environmental Consultant (designated substances)		1	sum	\$125,000	\$125,000		
3.17	Construction Management - pre-construction services					Assumed Not Applicable		
3.18	Land Surveying		1	sum	\$50,000	\$50,000		
3.19	Environmental scanning and locates		1	sum	\$30,000	\$30,000		
3.20	Disbursements and reimbursable expenses		1	sum	\$111,438	\$111,438		
		10.0%						
<b>4</b>	<b>Specialty Consultants</b>						<b>\$367,500</b>	
4.1	Independent Inspection and Testing		1	sum	\$150,000	\$150,000		
4.2	Furniture and Equipment consultant		1	sum	\$100,000	\$100,000		
4.3	Security/Risk Assessment consultants					Assumed Not Applicable		
4.4	Independent 3rd Party Commissioning		1	sum	\$100,000	\$100,000		
4.5	Disbursements and reimbursable expenses		1	sum	\$17,500	\$17,500		
<b>5</b>	<b>Project Management Fees</b>						<b>\$0</b>	
5.1	Independent PM Services					Assumed Not Applicable		
5.2	City of Windsor in-house PM services					Assumed Not Applicable		
<b>6</b>	<b>Owner Supplied Furnishings, Fixtures, and Equipment (FF&amp;E)</b>						<b>\$3,787,214</b>	
6.1	Loose furniture	1.5%	1	sum	\$1,089,071	\$1,089,071		
6.2	Maintenance Shop equipment (in addition to the included in the Hard Construction Estimate)	3.0%	1	sum	\$2,178,143	\$2,178,143		
6.3	Kitchen equipment, smallwares, appliances		1	sum	\$50,000	\$50,000		
6.4	Laundry and garbage handling equipment		1	sum	\$40,000	\$40,000		
6.5	Artwork, signature signage, interior landscaping, etc.		1	sum	\$30,000	\$30,000		
6.6	IT and Telecomm hardware and systems		1	sum	\$250,000	\$250,000		
6.7	AV Systems and cabling		1	sum	\$150,000	\$150,000		

**PROJECT SOFT COST SUMMARY - APPENDIX H - OPTION 3 - PHASE 1  
WINDSOR TRANSIT GARAGE**



**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)**  
October 22, 2021 (August 2021 Estimate Reconciliation)

Gross Floor Area **19,940** m<sup>2</sup>  
Estimated Hard Construction Costs - Phase 1 **\$72,604,800**

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>7</b>	<b>Financing and Loan Fees</b>						<b>\$50,000</b>	
7.1	Interest during construction							
7.2	Legal fees and expenses (lien searches, contract review)		1	sum	\$50,000	\$50,000		
<b>8</b>	<b>Operational Expenses</b>						<b>\$989,536</b>	
8.1	Insurance	0.75%	1		\$544,536	\$544,536		
8.2	Marketing and sales							
8.3	Pre-opening expenses		1	sum	\$75,000	\$75,000		
8.4	Initial operating inventory		1	sum	\$40,000	\$40,000		
8.5	Temporary utilities							
8.6	Site security (assumed for the last 20 months of construction)		1	sum	\$300,000	\$300,000		
8.7	Site photographs, site camera		1	sum	\$30,000	\$30,000		
8.8	Legal Fees							
8.9	Internal Charges - Housekeeping							
8.10	Internal Charges - Facilities							
8.11	Internal Charges - Digital							
8.12	Internal Charges - IPAC							
8.13	Internal Charges - Other							
8.14	Internal - Loss of Parking Revenue Impact							
<b>9</b>	<b>Taxes - Non Refundable GST/HST</b>						<b>\$1,501,978</b>	<b>9.6%</b>
9.1	Property taxes during construction							
9.2	Non-refundable HST 1.76% on Project Soft Costs	1.76%				\$224,134		
9.3	Non-refundable HST 1.76% on Hard Construction Costs	1.76%				\$1,277,844		
<b>Project Soft Costs Sub Total</b>							<b>\$14,236,840</b>	
<b>10</b>	<b>Project Soft Cost Contingency</b>	<b>10.0%</b>					\$1,423,684	9.1%
<b>11</b>	<b>Escalation Contingency - Project Soft Costs</b>	<b>13.5%</b>					Excluded	
<b>Total Estimated Project Soft Costs</b>					<b>19,940</b>	<b>\$785.40</b>	<b>\$15,660,520</b>	



**PROJECT SOFT COST SUMMARY - APPENDIX H - OPTION 3 - PHASE 2**  
**WINDSOR TRANSIT GARAGE**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)**  
 October 13, 2021 (August 2021 Estimate Reconciliation)



Gross Floor Area **8,038** m2  
 Estimated Hard Construction Costs **\$25,941,000**

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>1</b>	<b>Land Acquisition Costs</b>						<b>\$0</b>	<b>0.0%</b>
1.1	Land costs				Assumed Not Applicable			
1.2	Land Transfer Taxes				Assumed Not Applicable			
1.3	Zoning Approval - Planning				Assumed Not Applicable			
1.4	Zoning Approval - Project Manager				Assumed Not Applicable			
1.5	Legal Fees				Assumed Not Applicable			
1.6	Environmental Assessments				Assumed Not Applicable			
1.7	Permit application fees				Assumed Not Applicable			
1.8	Other land charges				Assumed Not Applicable			
<b>2</b>	<b>Municipal Charges</b>						<b>\$0</b>	<b>0.0%</b>
2.1	Development Charges/ Community Benefits Charges				Assumed Not Applicable			
2.2	Approvals, Inspections and Permits				Assumed Not Applicable			
2.3	Municipal Levies, Charges & Building Permits				Assumed Not Applicable			
2.4	Property Taxes During Construction				Assumed Not Applicable			
2.5	Toronto Green Standards				Assumed Not Applicable			
<b>3</b>	<b>Consulting Fees and Expenses</b>						<b>\$3,445,425</b>	<b>56.7%</b>
3.1	Architectural design services and expenses	4.00%	1		\$1,037,640	\$1,037,640		
3.2	Interior design and expenses				Assumed Not Applicable			
3.3	Planning consultant				Assumed Not Applicable			
3.4	Programming consultant				Assumed Not Applicable			
3.5	Structural Engineering	2.0%	1		\$518,820	\$518,820		
3.6	Mechanical Engineering	2.5%	1		\$648,525	\$648,525		
3.7	Electrical Engineering	2.5%	1		\$648,525	\$648,525		
3.8	Building Code Consultant	0.3%	1		\$77,823	\$77,823		
3.9	Cost Consultant	0.3%	1		\$77,823	\$77,823		
3.10	Geotechnical Consultant	0.3%	1		\$77,823	\$77,823		
3.11	Acoustical Consultant				Assumed Not Applicable			
3.12	Food Services Consultant				Assumed Not Applicable			
3.13	IT and Communications consultant	0.5%	1		\$129,705	\$129,705		
3.14	Sustainable Design Consultant (LEED)	0.3%	1		\$77,823	\$77,823		
3.15	IPAC Consultant				Assumed Not Applicable			
3.16	Environmental Consultant (designated substances)		1	sum	\$50,000	\$50,000		
3.17	Construction Management - pre-construction services				Assumed Not Applicable			
3.18	Land Surveying		1	sum	\$25,000	\$25,000		
3.19	Environmental scanning and locates		1	sum	\$25,000	\$25,000		
3.20	Disbursements and reimbursable expenses		1	sum	\$50,918	\$50,918		
<b>4</b>	<b>Specialty Consultants</b>						<b>\$262,500</b>	<b>4.3%</b>
4.1	Independent Inspection and Testing		1	sum	\$100,000	\$100,000		
4.2	Furniture and Equipment consultant		1	sum	\$75,000	\$75,000		
4.3	Security/Risk Assessment consultants							
4.4	Independent 3rd Party Commissioning		1	sum	\$75,000	\$75,000		
4.5	Disbursements and reimbursable expenses		1	sum	\$12,500	\$12,500		
<b>5</b>	<b>Project Management Fees</b>						<b>\$0</b>	<b>0.0%</b>
5.1	Independent PM Services							
5.2	City of Windsor in-house PM services							
<b>6</b>	<b>Owner Supplied Furnishings, Fixtures, and Equipment (FF&amp;E)</b>						<b>\$824,319</b>	<b>13.6%</b>
6.1	Loose furniture	1.2%	1	sum	\$311,292	\$311,292		
6.2	Maintenance Shop equipment (in addiiton to above)	1.65%	1	sum	\$428,027	\$428,027		
6.3	Kitchen equipment, smallwares, appliances							
6.4	Laundry and garbage handling equipment							
6.5	Artwork, signature signage, interior landscaping, etc.							
6.6	IT and Telecomm hardware and systems		1	sum	\$45,000	\$45,000		
6.7	AV Systems and cabling		1	sum	\$40,000	\$40,000		

**PROJECT SOFT COST SUMMARY - APPENDIX H - OPTION 3 - PHASE 2  
WINDSOR TRANSIT GARAGE**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)**  
October 13, 2021 (August 2021 Estimate Reconciliation)



Gross Floor Area **8,038** m2  
Estimated Hard Construction Costs **\$25,941,000**

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>7</b>	<b>Financing and Loan Fees</b>						<b>\$25,000</b>	<b>0.4%</b>
7.1	Interest during construction							
7.2	Legal fees and expenses		1	sum	\$25,000	\$25,000		
<b>8</b>	<b>Operational Expenses</b>						<b>\$444,410</b>	<b>7.3%</b>
8.1	Insurance (City of Windsor)	1.0%	1		\$259,410	\$259,410		
8.2	Marketing and sales							
8.3	Pre-opening expenses		1	sum	\$25,000	\$25,000		
8.4	Initial operating inventory		1	sum	\$15,000	\$15,000		
8.5	Temporary utilities							
8.6	Site security (assumed for the last 6 months of construction)		1	sum	\$120,000	\$120,000		
8.7	Site photographs, site camera		1	sum	\$25,000	\$25,000		
8.8	Legal Fees							
8.9	Internal Charges - Housekeeping							
8.10	Internal Charges - Facilities							
8.11	Internal Charges - Digital							
8.12	Internal Charges - IPAC							
8.13	Internal Charges - Other							
8.14	Internal - Loss of Parking Revenue Impact							
<b>9</b>	<b>Taxes - Non Refundable GST/HST</b>						<b>\$544,591</b>	<b>9.0%</b>
9.1	Property taxes during construction							
9.2	Non-refundable HST 1.76% on Soft Costs	1.76%				\$88,029		
9.3	Non-refundable HST 1.76% on Hard Construction Costs	1.76%				\$456,562		
<b>Project Soft Costs Sub Total</b>							<b>\$5,546,240</b>	
<b>10</b>	<b>Project Soft Cost Contingency</b>		<b>10%</b>				\$530,047	8.7%
<b>11</b>	<b>Escalation on Soft Costs (to 2028)</b>		<b>21.75%</b>				Excluded	
<b>Total Estimated Project Soft Costs</b>					<b>8,038</b>	<b>\$756</b>	<b>\$6,076,290</b>	

**PROJECT SOFT COST SUMMARY - APPENDIX H - OPTION 3 - PHASE 3  
WINDSOR TRANSIT GARAGE**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)**  
October 13, 2021 (August 2021 Estimate Reconciliation)



Gross Floor Area **7,788** m2  
Estimated Hard Construction Costs **\$24,868,996**

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>1</b>	<b>Land Acquisition Costs</b>						<b>\$0</b>	<b>0.0%</b>
1.1	Land costs					Assumed Not Applicable		
1.2	Land Transfer Taxes					Assumed Not Applicable		
1.3	Zoning Approval - Planning					Assumed Not Applicable		
1.4	Zoning Approval - Project Manager					Assumed Not Applicable		
1.5	Legal Fees					Assumed Not Applicable		
1.6	Environmental Assessments					Assumed Not Applicable		
1.7	Permit application fees					Assumed Not Applicable		
1.8	Other land charges					Assumed Not Applicable		
<b>2</b>	<b>Municipal Charges</b>						<b>\$0</b>	<b>0.0%</b>
2.1	Development Charges/ Community Benefits Charges					Assumed Not Applicable		
2.2	Approvals, Inspections and Permits					Assumed Not Applicable		
2.3	Municipal Levies, Charges & Building Permits					Assumed Not Applicable		
2.4	Property Taxes During Construction					Assumed Not Applicable		
2.5	Toronto Green Standards					Assumed Not Applicable		
<b>3</b>	<b>Consulting Fees and Expenses</b>						<b>\$3,307,238</b>	<b>60.4%</b>
3.1	Architectural design services and expenses	4.00%	1		\$994,760	\$994,760		
3.2	Interior design and expenses					Assumed Not Applicable		
3.3	Planning consultant					Assumed Not Applicable		
3.4	Programming consultant					Assumed Not Applicable		
3.5	Structural Engineering	2.0%	1		\$497,380	\$497,380		
3.6	Mechanical Engineering	2.5%	1		\$621,725	\$621,725		
3.7	Electrical Engineering	2.5%	1		\$621,725	\$621,725		
3.8	Building Code Consultant	0.3%	1		\$74,607	\$74,607		
3.9	Cost Consultant	0.3%	1		\$74,607	\$74,607		
3.10	Geotechnical Consultant	0.3%	1		\$74,607	\$74,607		
3.11	Acoustical Consultant					Assumed Not Applicable		
3.12	Food Services Consultant					Assumed Not Applicable		
3.13	IT and Communications consultant	0.5%	1		\$124,345	\$124,345		
3.14	Sustainable Design Consultant (LEED)	0.3%	1		\$74,607	\$74,607		
3.15	IPAC Consultant					Assumed Not Applicable		
3.16	Environmental Consultant (designated substances)		1	sum	\$50,000	\$50,000		
3.17	Construction Management - pre-construction services					Assumed Not Applicable		
3.18	Land Surveying		1	sum	\$25,000	\$25,000		
3.19	Environmental scanning and locates		1	sum	\$25,000	\$25,000		
3.20	Disbursements and reimbursable expenses		1	sum	\$48,875	\$48,875		
<b>4</b>	<b>Specialty Consultants</b>						<b>\$262,500</b>	<b>4.8%</b>
4.1	Independent Inspection and Testing		1	sum	\$100,000	\$100,000		
4.2	Furniture and Equipment consultant		1	sum	\$75,000	\$75,000		
4.3	Security/Risk Assessment consultants							
4.4	Independent 3rd Party Commissioning		1	sum	\$75,000	\$75,000		
4.5	Disbursements and reimbursable expenses		1	sum	\$12,500	\$12,500		
<b>5</b>	<b>Project Management Fees</b>						<b>\$0</b>	<b>0.0%</b>
5.1	Independent PM Services							
5.2	City of Windsor in-house PM services							
<b>6</b>	<b>Owner Supplied Furnishings, Fixtures, and Equipment (FF&amp;E)</b>						<b>\$480,338</b>	<b>8.8%</b>
6.1	Loose furniture					Not required		
6.2	Maintenance Shop equipment (in additon to above)	1.7%	1	sum	\$410,338	\$410,338		
6.3	Kitchen equipment, smallwares, appliances							
6.4	Laundry and garbage handling equipment							
6.5	Artwork, signature signage, interior landscaping, etc.							
6.6	IT and Telecomm hardware and systems		1	sum	\$40,000	\$40,000		
6.7	AV Systems and cabling		1	sum	\$30,000	\$30,000		

**PROJECT SOFT COST SUMMARY - APPENDIX H - OPTION 3 - PHASE 3  
WINDSOR TRANSIT GARAGE**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)**  
October 13, 2021 (August 2021 Estimate Reconciliation)



Gross Floor Area **7,788** m2  
Estimated Hard Construction Costs **\$24,868,996**

No.	Line item description	%	Quant	Unit	Unit Rate	Extension	Estimate Subtotal	% of Total
<b>7</b>	<b>Financing and Loan Fees</b>						<b>\$25,000</b>	<b>0.5%</b>
7.1	Interest during construction							
7.2	Legal fees and expenses		1	sum	\$25,000	\$25,000		
<b>8</b>	<b>Operational Expenses</b>						<b>\$408,690</b>	<b>7.5%</b>
8.1	Insurance (City of Windsor)	1.0%	1		\$248,690	\$248,690		
8.2	Marketing and sales							
8.3	Pre-opening expenses							
8.4	Initial operating inventory		1	sum	\$15,000	\$15,000		
8.5	Temporary utilities							
8.6	Site security (assumed for the last 6 months of construction)		1	sum	\$120,000	\$120,000		
8.7	Site photographs, site camera		1	sum	\$25,000	\$25,000		
8.8	Legal Fees							
8.9	Internal Charges - Housekeeping							
8.10	Internal Charges - Facilities							
8.11	Internal Charges - Digital							
8.12	Internal Charges - IPAC							
8.13	Internal Charges - Other							
8.14	Internal - Loss of Parking Revenue Impact							
<b>9</b>	<b>Taxes - Non Refundable GST/HST</b>						<b>\$516,609</b>	<b>9.4%</b>
9.1	Property taxes during construction							
9.2	Non-refundable HST 1.76% on Soft Costs	1.76%				\$78,914		
9.3	Non-refundable HST 1.76% on Hard Construction Costs	1.76%				\$437,694		
<b>Project Soft Costs Sub Total</b>							<b>\$5,000,370</b>	
<b>10</b>	<b>Project Soft Cost Contingency</b>	<b>10%</b>					\$476,037	8.7%
<b>11</b>	<b>Escalation on Soft Costs (to 2028)</b>	<b>36.5%</b>					Excluded	
<b>Total Estimated Project Soft Costs</b>					<b>7,788</b>	<b>\$703</b>	<b>\$5,476,410</b>	

# MASTER ESTIMATE SUMMARY

## WINDSOR TRANSIT GARAGE - APPENDIX H - OPTION 3 - PHASE 1 (71 buses)

ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)

October 22, 2021 (August 2021 Estimate Reconciliation)



Gross Floor Area 19,940 m2

Hard Construction Costs	GFA (m2)	Unit (Cost/m2)	Sub Total	Estimated Total	% of Total
1 Building Shell	19,940	\$1,138.45		\$22,700,217	30.4%
- Sub Structure		\$185.00	\$3,688,808		
- Structure		\$452.50	\$9,022,624		
- Exterior Enclosure		\$500.95	\$9,988,786		
2 Building Interiors	19,940	\$379.50		\$7,567,040	10.1%
- Partitions and Doors		\$80.50	\$1,605,130		
- Finishes		\$68.00	\$1,355,886		
- Fittings and Equipment		\$231.00	\$4,606,025		
3 Mechanical	19,940	\$645.00		\$12,860,978	17.2%
- Plumbing and Drainage		\$247.50	\$4,935,026		
- Fire Protection		\$48.00	\$957,096		
- Heating, Ventilation, Air Conditioning		\$309.50	\$6,171,275		
- Controls		\$40.00	\$797,580		
4 Electrical	19,940	\$172.00		\$3,429,594	4.6%
- Service and Distribution		\$80.00	\$1,595,160		
- Lighting, Devices, and Heating		\$50.00	\$996,975		
- Systems and Ancillaries		\$42.00	\$837,459		
5 Site Work	19,940	\$390.53		\$7,787,059	10.4%
- Site Development (prep, surfaces, landscaping)		\$245.53	\$4,895,831		
- Mechanical Site Services		\$54.50	\$1,086,703		
- Electrical Site Services		\$90.50	\$1,804,525		
6 Ancillary Work	19,940	\$0.00		\$0	0.0%
- Demolition		\$0.00	\$0		
- Alterations		\$0.00	\$0		
7 Contractor's General Requirements	7.0%	19,940	\$228.94	\$4,564,971	6.1%
8 Contractor's Fees (OH&P)	3.0%	19,940	\$81.76	\$1,630,300	2.2%
<b>Subtotal - Hard Construction</b>	<b>19,940</b>	<b>\$3,036.19</b>		<b>\$60,540,158</b>	
9 Design & Pricing Contingency	19,940	\$605.06		\$12,064,600	16.1%
10 Escalation Contingency		Excluded			0.0%
11 IPAC Contingency		Excluded			0.0%
12 COVID-19 Contingency		Excluded			0.0%
<b>Subtotal - Hard Const. inc. Contingencies</b>	<b>19,940</b>	<b>\$3,641.25</b>		<b>\$72,604,760</b>	
13 Construction Contingency (post contract)	3.0%	19,940	\$109.24	\$2,178,100	2.9%
<b>Total Estimated Hard Construction Cost</b>	<b>19,940</b>	<b>\$3,750.49</b>		<b>\$74,782,860</b>	

**ELEMENTAL ESTIMATE SUMMARY**  
**WINDSOR TRANSIT GARAGE - APPENDIX H - OPTION 3 - PHASE 1 (71 buses)**

ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)

October 22, 2021 (August 2021 Estimate Reconciliation)



Gross Floor Area **19,940** m2

Description Element/Sub-Element	Ratio	Quantity	Unit	Unit Rate	Elemental Cost		\$ per m2 Sub Element	\$ per m2 Element	%
					Sub Element	Element Total			
<b>A. SHELL</b>									
<b>A1. Sub-Structure</b>									
						<b>\$3,688,808</b>		\$185.00	4.9%
A1.1 Foundations	1.00	19,940	m2	\$185.00	\$3,688,808		\$185.00		
A1.2 Basement Excavation	0.00	0	m2	\$0.00	\$0		\$0.00		
<b>A2. Structure</b>									
						<b>\$9,022,624</b>		\$452.50	12.1%
A2.1 Lowest Floor Construction	1.00	19,940	m2	\$117.50	\$2,342,891		\$117.50		
A2.2 Upper Floor Construction	0.00	0	m2	\$0.00	\$0		\$0.00		
A2.3 Roof Construction	1.00	19,940	m2	\$335.00	\$6,679,733		\$335.00		
<b>A3. Exterior Enclosure</b>									
						<b>\$9,988,786</b>		\$500.95	13.4%
A3.1 Walls Below Grade	0.00	0	m2	\$0.00	\$0		\$0.00		
A3.2 Walls Above Grade	1.00	19,940	m2	\$164.99	\$3,289,750		\$164.99		
A3.3 Windows & Entrances	1.00	19,940	m2	\$59.50	\$1,186,491		\$59.50		
A3.4 Roof Finish	1.00	19,940	m2	\$245.42	\$4,893,578		\$245.42		
A3.5 Projections	1.00	19,940	m2	\$31.04	\$618,968		\$31.04		
<b>B. INTERIORS</b>									
<b>B1 Partitions &amp; Doors</b>									
						<b>\$1,605,130</b>		\$80.50	2.1%
B1.1 Partitions	1.00	19,940	m2	\$62.50	\$1,246,219		\$62.50		
B1.2 Doors	1.00	19,940	m2	\$18.00	\$358,911		\$18.00		
<b>B2 Finishes</b>									
						<b>\$1,355,886</b>		\$68.00	1.8%
B2.1 Floor Finishes	1.00	19,940	m2	\$35.00	\$697,883		\$35.00		
B2.2 Ceiling Finishes	1.00	19,940	m2	\$15.00	\$299,093		\$15.00		
B2.3 Wall Finishes	1.00	19,940	m2	\$18.00	\$358,911		\$18.00		
<b>B3 Fittings &amp; Equipment</b>									
						<b>\$4,606,025</b>		\$231.00	6.2%
B3.1 Fittings & Fixtures	1.00	19,940	m2	\$31.00	\$618,125		\$31.00		
B3.2 Equipment	1.00	19,940	m2	\$200.00	\$3,987,900		\$200.00		
B3.3 Conveying Systems	0.00	0	m2	\$0.00	\$0		\$0.00		
<b>C. SERVICES</b>									
<b>C1 Mechanical</b>									
						<b>\$12,860,978</b>		\$645.00	17.2%
C1.1 Plumbing & Drainage	1.00	19,940	m2	\$247.50	\$4,935,026		\$247.50		
C1.2 Fire Protection	1.00	19,940	m2	\$48.00	\$957,096		\$48.00		
C1.3 HVAC	1.00	19,940	m2	\$309.50	\$6,171,275		\$309.50		
C1.4 Controls	1.00	19,940	m2	\$40.00	\$797,580		\$40.00		
<b>C2 Electrical</b>									
						<b>\$3,429,594</b>		\$172.00	4.6%
C2.1 Service & Distribution	1.00	19,940	m2	\$80.00	\$1,595,160		\$80.00		
C2.2 Lighting, Devices & Heating	1.00	19,940	m2	\$50.00	\$996,975		\$50.00		
C2.3 Systems & Ancillaries	1.00	19,940	m2	\$42.00	\$837,459		\$42.00		
<b>D. SITE &amp; ANCILLARY WORK</b>									
<b>D1 Site Work</b>									
						<b>\$7,787,059</b>		\$390.53	10.4%
D1.1 Site Development	3.24	64,554	m2	\$75.84	\$4,895,831		\$245.53		
D1.2 Mechanical Site Services	3.24	64,554	m2	\$16.83	\$1,086,703		\$54.50		
D1.3 Electrical Site Services	3.24	64,554	m2	\$27.95	\$1,804,525		\$90.50		
<b>D2 Ancillary Work</b>									
						<b>\$0</b>		\$0.00	0.0%
D2.1 Demolition	0.00	0	m2	\$0.00	\$0		\$0.00		
D2.2 Alterations	0.00	0	m2	\$0.00	\$0		\$0.00		
<b>Subtotal - Net Hard Construction</b>		<b>19,940 m2</b>		<b>\$2,725</b>	<b>\$54,344,888</b>				
<b>Z. GENERAL REQUIREMENTS &amp; CONTINGENCIES</b>									
<b>Z1 General Requirements &amp; Fees</b>									
						<b>\$6,195,271</b>		\$310.70	8.3%
Z1.1 General Requirements	1.00	19,940	m2	\$228.94	\$4,564,971		\$228.94		
Z1.2 Fees	1.00	19,940	m2	\$81.76	\$1,630,300		\$81.76		
<b>Subtotal - Hard Construction</b>		<b>19,940 m2</b>		<b>\$3,036</b>	<b>\$60,540,158</b>				
<b>Z2 Contingencies</b>									
						<b>\$12,064,600</b>		\$605.06	16.1%
Z2.1 Design & Pricing Contingency	1.00	19,940	m2	\$605.06	\$12,064,600		\$605.06		
Z2.2 Escalation Contingency	0.00	0	m2	Excluded	\$0		\$0.00		
Z2.3 IPAC Contingency	1.00	19,940	m2	Excluded	\$0				
Z2.4 COVID-19 Contingency	1.00	19,940	m2	Excluded	\$0				
<b>Subtotal - Hard Const. inc. Contingencies</b>		<b>19,940 m2</b>		<b>\$3,641</b>	<b>\$72,604,758</b>				
Z2.5 Construction Contingency	1.00	19,940	m2	\$109.24	\$2,178,100		\$109.24	\$109.24	2.9%
<b>TOTAL HARD CONSTRUCTION COST</b>		<b>19,940 SF</b>		<b>\$3,750</b>	<b>\$74,782,860</b>			<b>\$3,750.49</b>	<b>100.0%</b>

No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b>A. SHELL</b>						
<b><u>A1.1 SUB-STRUCTURE - Foundations</u></b>						
<b><u>A1.11 - Standard Foundations</u></b>						
<i>Note: We have assumed normal soil conditions exist in the proposed building location and that load bearing soil is present at the levels shown on the architectural/structural drawings.</i>						
1	Allowance for standard foundations	19,940	m2	\$185.00	\$3,688,808	
<b><u>A1.12 - Special Foundations</u></b>						
2	The estimate excludes any allowance for special foundations such as caissons or piles				Excluded	
<b>TOTAL FOR SUB-STRUCTURE - Foundations</b>		1.00	19,940	m2	\$185.00	\$3,688,808
<b><u>A1.2 SUB-STRUCTURE - Basement Excavation</u></b>						
NIL						
<b>TOTAL FOR SUB-STRUCTURE - Basement Excavation</b>		0.00	0	m2	\$0.00	\$0
<b><u>A2.1 STRUCTURE - Lowest Floor Construction</u></b>						
3	Level and compact subgrade	19,940	m2	\$2.50	\$49,849	
4	Allowance for slab on grade	19,940	m2	\$115.00	\$2,293,043	
<b>TOTAL FOR STRUCTURE - Lowest Floor Construction</b>		1.00	19,940	m2	\$117.50	\$2,342,891
<b><u>A2.2 STRUCTURE - Upper Floor Construction</u></b>						
<b><u>A2.21 - Upper Floor Construction</u></b>						
NIL						
<b><u>A2.22 - Stair Construction</u></b>						
NIL						
<b>TOTAL FOR STRUCTURE - Upper Floor Construction</b>		0.00	0	m2	\$0.00	\$0
<b><u>A2.3 STRUCTURE - Roof Construction</u></b>						
<b><u>A2.31 - Roof Construction</u></b>						
5	Allowance for roof construction (conventional structural steel)	19,940	m2	\$335.00	\$6,679,733	
<b>TOTAL FOR STRUCTURE - Roof Construction</b>		1.00	19,940	m2	\$335.00	\$6,679,733

**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - APPENDIX H - OPTION 3 PHASE 1 (71 buses)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)**

October 22, 2021 (August 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b><u>A3.1 EXTERIOR ENCLOSURE - Walls Below Grade</u></b>						
<b><u>A3.11 - Walls Below Grade</u></b>						
	NIL					
<b><u>A3.12 - Structural Walls Below Grade</u></b>						
	NIL					
	<b>TOTAL FOR EXT. ENCLOSURE - Walls Below Grade</b>	0.00	0	m2	\$0.00	\$0
<b><u>A3.2 EXTERIOR ENCLOSURE - Walls Above Grade</u></b>						
<b><u>A3.21 - Walls Above Grade</u></b>						
6	Allowance for walls above grade (exterior cladding)					
7	Cladding area: Garage 733 m x 7.3 m H = 5,350 m2	5,350	m2	\$385.00	\$2,059,750	
<b><u>A3.22 - Structural Walls Above Grade</u></b>						
8	Structural framing to exterior doors (headers and jambs)	1	sum	\$150,000.00	\$150,000	
<b><u>A3.23 - Glazed Curtain Wall</u></b>						
9	Aluminum framed curtain wall system, assumed double glazed, low e coating, and argon filled	540	m2	\$2,000.00	\$1,080,000	
10	Cladding area: Office 120 m x 4.5 m H = 540 m2					
	<b>TOTAL FOR EXT. ENCLOSURE - Walls Above Grade</b>	1.00	19,940	m2	\$164.99	\$3,289,750
<b><u>A3.3 EXTERIOR ENCLOSURE - Windows &amp; Entrances</u></b>						
<b><u>A3.31 - Windows &amp; Louvers</u></b>						
11	Allowance for windows, clerestory windows, and louvers in the garage areas	19,940	m2	\$30.00	\$598,185	
<b><u>A3.32 - Entrance Glazed Screens</u></b>						
12	Aluminum framed glazed entrance screens	30	m2	\$1,000.00	\$30,000	
<b><u>A3.33 - Exterior Doors</u></b>						
13	Allowance for exterior doors	19,940	m2	\$28.00	\$558,306	
	<b>TOTAL FOR EXT. ENCLOSURE - Windows &amp; Entrances</b>	1.00	19,940	m2	\$59.50	\$1,186,491
<b><u>A3.4 EXTERIOR ENCLOSURE - Roof Covering</u></b>						
<b><u>A3.41 - Roofing</u></b>						
14	Allowance for roof coverings	19,940	m2	\$245.00	\$4,885,178	
<b><u>A3.42 - Skylights &amp; Roof Glazing</u></b>						
	Included above					



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b><u>A3.43 - Roof Hatches &amp; Doors</u></b>						
15	Prefabricated roof hatches	3	No	\$2,800.00	\$8,400	
<b>TOTAL FOR EXT. ENCLOSURE - Roof Covering</b>		1.00	19,940	m2	\$245.42	\$4,893,578
<b><u>A3.5 EXTERIOR ENCLOSURE - Projections</u></b>						
<b><u>A3.51 - Projections</u></b>						
16	Allowance for parapet projections	853	m	\$375.00	\$319,875	
17	Allowance for other building projections, canopies, etc.	19,940	m2	\$15.00	\$299,093	
<b>TOTAL FOR EXT. ENCLOSURE - Projections</b>		1.00	19,940	m2	\$31.04	\$618,968
<b>B. INTERIORS</b>						
<b><u>B1.1 PARTITIONS &amp; DOORS - Partitions</u></b>						
<b><u>B1.11 - Fixed Partitions</u></b>						
18	Allowance for interior partitions	19,940	m2	\$55.00	\$1,096,673	
19	Rough carpentry	19,940	m2	\$5.00	\$99,698	
20	Caulking, sealing, and firestopping	19,940	m2	\$2.50	\$49,849	
<b><u>B1.12 - Moveable Partitions</u></b>						
Included above						
<b><u>B1.13 - Structural Partitions &amp; Shear Walls</u></b>						
Included above						
<b>TOTAL FOR INTERIOR PARTITIONS &amp; DOORS - Partitions</b>		1.00	19,940	m2	\$62.50	\$1,246,219
<b><u>B1.2 PARTITIONS &amp; DOORS - Interior Doors</u></b>						
<b><u>B1.21 - Interior Doors &amp; Hardware</u></b>						
21	Allowance for interior doors and frames, hardware	19,940	m2	\$18.00	\$358,911	
<b>TOTAL FOR INTERIOR PARTITIONS &amp; DOORS - Doors</b>		1.00	19,940	m2	\$18.00	\$358,911
<b><u>B2.1 FINISHES - Floor Finishes</u></b>						
<b><u>B2.11 - Floor Finishes</u></b>						
22	Allowance for floor finishes	19,940	m2	\$35.00	\$697,883	
<b>TOTAL FOR FINISHES - Floor Finishes</b>		1.00	19,940	m2	\$35.00	\$697,883

No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b><u>B2.2 FINISHES - Ceiling Finishes</u></b>						
<b><u>B2.21 - Ceiling Finishes</u></b>						
23	Allowance for ceiling finishes	19,940	m2	\$15.00	\$299,093	
	<b>TOTAL FOR FINISHES - Ceiling Finishes</b>	<b>1.00</b>	<b>19,940</b> m2	<b>\$15.00</b>	<b>\$299,093</b>	
<b><u>B2.3 FINISHES - Wall Finishes</u></b>						
<b><u>B2.31 - Wall Finishes</u></b>						
24	Allowance for wall finishes	19,940	m2	\$18.00	\$358,911	
	<b>TOTAL FOR FINISHES - Wall Finishes</b>	<b>1.00</b>	<b>19,940</b> m2	<b>\$18.00</b>	<b>\$358,911</b>	
<b><u>B3.1 FITTINGS &amp; EQUIPMENT - Fittings &amp; Fixtures</u></b>						
<b><u>B3.11 - Miscellaneous Metals</u></b>						
						<b>\$169,486</b>
25	Miscellaneous metals including lintels, bracing, and so fourth	19,940	m2	\$8.50	\$169,486	
<b><u>B3.12 - Millwork</u></b>						
						<b>\$299,093</b>
26	Allowance for Fittings and Fixtures	19,940	m2	\$15.00	\$299,093	
<b><u>B3.13 - Specialties</u></b>						
						<b>\$149,546</b>
27	Allowance for Specialties	19,940	m2	\$7.50	\$149,546	
<b><u>B3.14 - Furniture</u></b>						
						<b>\$0</b>
28	The estimate excludes loose furniture, tables and chairs, etc.				Excluded	
	<b>TOTAL FOR FITTINGS &amp; EQUIP. - Fittings &amp; Fixtures</b>	<b>1.00</b>	<b>19,940</b> m2	<b>\$31.00</b>	<b>\$618,125</b>	
<b><u>B3.2 FITTINGS &amp; EQUIPMENT - Equipment</u></b>						
<b><u>B3.21 - Equipment</u></b>						
29	Allowance for Equipment supplied by Windsor Transit	19,940	m2	\$200.00	\$3,987,900	
	<i>(See also Owner Supplied Equipment in the Project Soft Cost Estimate)</i>					
	<b>TOTAL FOR FITTINGS &amp; EQUIP. - Equipment</b>	<b>1.00</b>	<b>19,940</b> m2	<b>\$200.00</b>	<b>\$3,987,900</b>	

**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - APPENDIX H - OPTION 3 PHASE 1 (71 buses)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)**

October 22, 2021 (August 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b><u>B3.3 FITTINGS &amp; EQUIPMENT - Conveying Systems</u></b>						
<b><u>B3.31 - Elevators</u></b>						
NIL						
<b><u>B3.32 - Escalators &amp; Moving Walks</u></b>						
NIL						
<b><u>B3.33 - Material Handling Systems</u></b>						
NIL						
<b>TOTAL FOR FITTINGS &amp; EQUIP. - Conveying Systems</b>		0.00	0	m2	\$0.00	\$0
 <b>C1. SERVICES - MECHANICAL</b>						
<b><u>C1.1 Plumbing &amp; Drainage</u></b>						
30	D2010 Plumbing Fixtures	19,940	m2	\$7.50	\$149,546	
31	D2020 Domestic Water Distribution	19,940	m2	\$20.00	\$398,790	
32	D2030 Sanitary Waste	19,940	m2	\$25.00	\$498,488	
33	D2040 Rain Water Drainage	19,940	m2	\$45.00	\$897,278	
34	D2090 Other Plumbing Systems	19,940	m2	\$150.00	\$2,990,925	
<b>TOTAL FOR MECHANICAL - Plumbing &amp; Drainage</b>		1.00	19,940	m2	\$247.50	\$4,935,026
 <b><u>C1.2 Fire Protection</u></b>						
35	Allowance for sprinkler system	19,940	m2	\$48.00	\$957,096	
<b>TOTAL FOR MECHANICAL - Fire Protection</b>		1.00	19,940	m2	\$48.00	\$957,096
 <b><u>C1.3 Heating, Ventilation &amp; Air Conditioning</u></b>						
36	D3010 Energy Supply	19,940	m2	\$2.00	\$39,879	
37	D3020 Heat Generating Systems	19,940	m2	\$45.00	\$897,278	
38	D3030 Cooling Generating Systems	19,940	m2	\$10.00	\$199,395	
39	D3040 Distribution Systems	19,940	m2	\$60.00	\$1,196,370	
40	D3050 Terminal & Package Units	19,940	m2	\$165.00	\$3,290,018	
41	D3090 Other HVAC Systems & Equipment	19,940	m2	\$24.00	\$478,548	
42	D3070 Systems Testing & Balancing	19,940	m2	\$3.50	\$69,788	
<b>TOTAL FOR MECHANICAL - HVAC</b>		1.00	19,940	m2	\$309.50	\$6,171,275
 <b><u>C1.4 MECHANICAL - Controls</u></b>						
43	D3060 Controls & Instrumentations	19,940	m2	\$40.00	\$797,580	
<b>TOTAL FOR MECHANICAL - Controls</b>		1.00	19,940	m2	\$40.00	\$797,580
				Total Mech Unit Rate	\$645.00	

**ELEMENTAL ESTIMATE**

**WINDSOR TRANSIT GARAGE - APPENDIX H - OPTION 3 PHASE 1 (71 buses)**

**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)**

October 22, 2021 (August 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b>C2. SERVICES - ELECTRICAL</b>						
<b><u>C2.1 ELECTRICAL - Service &amp; Distribution</u></b>						
44	D5010 Electrical Service & Distribution	19,940	m2	\$80.00	\$1,595,160	
<b>TOTAL FOR ELECTRICAL - Service &amp; Distribution</b>		1.00	19,940	m2	\$80.00	\$1,595,160
<b><u>C2.2 ELECTRICAL - Lighting, Devices &amp; Heating</u></b>						
45	D5020 Lighting and Branch Wiring	19,940	m2	\$50.00	\$996,975	
<b>TOTAL FOR ELECTRICAL - Lighting, Devices &amp; Heating</b>		1.00	19,940	m2	\$50.00	\$996,975
<b><u>C2.3 ELECTRICAL - Systems &amp; Ancillaries</u></b>						
46	D5030 Communications & Security	19,940	m2	\$29.00	\$578,246	
47	D5090 Other Electrical Systems	19,940	m2	\$13.00	\$259,214	
<b>TOTAL FOR ELECTRICAL - Systems &amp; Ancillaries</b>		1.00	19,940	m2	\$42.00	\$837,459
				Total Elec Unit Rate	\$172.00	
<b>D. SITE &amp; ANCILLARY WORK</b>						
<b><u>D1.1 SITEWORK - Site Development</u></b>		64,554	m2	Net Site Area		\$1,333,351
<b><u>D1.11 - Preparation</u></b>						
48	Clear and grub site (assumed limited scope post demolition of buildings and site improvements)	64,554	m2	\$2.50	\$161,384	
49	Strip topsoil and stockpile on site	20,158	m3	\$15.00	\$302,370	
50	Rough grading including cut and fill	64,554	m2	\$5.00	\$322,768	
51	Site protection and erosion control	64,554	m2	\$1.50	\$96,830	
52	Earthwork, swales, grading, SW Management Pond	1	sum	\$450,000.00	\$450,000	
<b><u>D1.12 - Hard Surfaces</u></b>						\$2,114,480
53	Asphalt paving to parking and laneways including:					
53.1	- heavy duty driveways	14,800	m2	\$87.00	\$1,287,600	
53.2	- medium duty to parking areas	7,500	m2	\$60.00	\$450,000	
54	Concrete curbs	900	m	\$125.00	\$112,500	
55	Concrete paving to walkways	1,100	m2	\$75.00	\$82,500	
56	Extra over for ramps	1	sum	\$10,000.00	\$10,000	
57	Extra over for stairs	1	sum	\$15,000.00	\$15,000	
58	Heavy duty concrete paving	700	m2	\$125.00	\$87,500	
59	Concrete equipment pads	1	sum	\$45,000.00	\$45,000	
60	Line painting to parking lot	268	No	\$35.00	\$9,380	
61	Line painting to driveways - directional	1	sum	\$15,000.00	\$15,000	

**ELEMENTAL ESTIMATE**  
**WINDSOR TRANSIT GARAGE - APPENDIX H - OPTION 3 PHASE 1 (71 buses)**  
**ORDER OF MAGNITUDE CLASS D ESTIMATE (Rev.4)**  
 October 22, 2021 (August 2021 Estimate Reconciliation)



No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b><u>D1.13 - Improvements</u></b>						<b>\$1,007,500</b>
62	Retaining walls	1	sum	\$300,000.00	\$300,000	
63	Railings	1	sum	\$30,000.00	\$30,000	
64	Chain link fence	2,000	m	\$215.00	\$430,000	
65	Gates including foundations	1	sum	\$120,000.00	\$120,000	
66	Bollards	30	No	\$1,500.00	\$45,000	
67	Parking signage	1	sum	\$5,000.00	\$5,000	
68	Bicycle racks, benches, garbage cans, etc.	1	sum	\$7,500.00	\$7,500	
69	Planter walls	1	sum	\$30,000.00	\$30,000	
70	Site signage	1	sum	\$40,000.00	\$40,000	
<b><u>D1.14 - Landscaping</u></b>						<b>\$440,500</b>
71	Seed and topsoil	9,500	m2	\$15.00	\$142,500	
72	Planting beds including topsoil and planting material	1	sum	\$100,000.00	\$100,000	
73	Large trees	60	No	\$950.00	\$57,000	
74	Small trees	120	NO	\$550.00	\$66,000	
75	Shrubs, plantings, and ground covers	1	sum	\$75,000.00	\$75,000	
<b>TOTAL FOR SITE WORK - Site Development</b>		<b>3.24</b>	<b>64,554</b>	<b>m2</b>	<b>\$75.84</b>	<b>\$4,895,831</b>
<b><u>D1.2 SITEWORK - Mechanical Site Services</u></b>						
76	G3010 Water Supply	19,940	m2	\$6.50	\$129,607	
77	G3020 Sanitary Water	19,940	m2	\$4.00	\$79,758	
78	G3030 Storm Sewer	19,940	m2	\$35.00	\$697,883	
79	G3090 Other Site Mechanical Utilities	19,940	m2	\$9.00	\$179,456	
<b>TOTAL FOR SITE WORK - Mechanical Site Services</b>		<b>3.24</b>	<b>64,554</b>	<b>m2</b>	<b>\$16.83</b>	<b>\$1,086,703</b>
<b><u>D1.3 SITEWORK - Electrical Site Services</u></b>						
80	G4010 Electrical Distribution	19,940	m2	\$60.00	\$1,196,370	
81	G4020 Site Lighting	19,940	m2	\$15.00	\$299,093	
82	G4030 Site Communications & Security	19,940	m2	\$5.50	\$109,667	
83	G4090 Other Site Electrical Utilities	19,940	m2	\$10.00	\$199,395	
<b>TOTAL FOR SITE WORK - Electrical Site Services</b>		<b>3.24</b>	<b>64,554</b>	<b>m2</b>	<b>\$27.95</b>	<b>\$1,804,525</b>

No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
<b><u>D2.1 ANCILLARY WORK - Demolition</u></b>						
<b><u>D2.11 - Demolition</u></b>						
	See separate estimate for demolition of existing buildings and site improvements					See Separate Estimate
<b><u>D2.12 - Hazardous Materials</u></b>						
84	This estimate excludes allowances for asbestos abatement and the handling of hazardous materials					<b>Excluded</b>
	<b>TOTAL FOR ANCILLARY WORK - Demolition</b>	0.00	0	m2	\$0.00	\$0
<b><u>D2.2 ANCILLARY WORK - Alterations</u></b>						
<b><u>D2.21 - Alterations</u></b>						
	NIL					
	<b>TOTAL FOR ANCILLARY WORK - Alterations</b>	0.00	0	m2	\$0.00	\$0
<b>Z. GENERAL REQUIREMENTS &amp; CONTINGENCIES</b>						
<b><u>Z1.1 GENERAL REQUIREMENTS &amp; FEES - General Requirements</u></b>						
<b><u>Z1.11 - Supervision &amp; Labour Expenses</u></b>						
1	Allowance for the General Contractor's supervision & labour expenses as follows:		1	sum	\$3,804,142	\$3,804,142 7.0%
	- supervision and coordination of subcontractors					
	- site superintendent and vehicle					
	- general labour expenses					
	Average per month based on a construction schedule of 30 months				\$126,805	
<b><u>Z1.12 - Temporary Conditions</u></b>						
1	Allowance for the temporary conditions provided by the General Contractor including:					Included above
1	Allowance for the temporary conditions provided by the General Contractor including:					
1.1	Access to site					
	- traffic control					
	- pedestrian safety					
	- removal of exterior cladding for access					
	- temporary closure panels					
1.2	Site accommodations:					
	- temporary site office					
	- temporary signage					
	- telephone and fax					
	- stationary supplies and office equipment					
1.3	Site protection:					
	- hoarding and gates					
	- safety guard rails					
	- fire extinguishers					
	- first aid kits					
	- temporary shoring					
	- temporary stairs and ladders					
	- protection for site elevators and flooring					

**ELEMENTAL ESTIMATE**  
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No.	Description	Quant.	Unit	Unit Rate	Sub Total	Total
1.4	Temporary utilities: - temporary construction power panels - temporary water source					
1.5	Site clean up: - daily clean up in addition to the trades - final cleaning - dump bins - dumping charges					
1.6	Equipment: - material hoisting equipment - cranes and operators - small tool rental - pumps and pumping equipment					
1.7	Miscellaneous - CPM scheduling - land surveying - testing and inspections - photography					
	<b>Cash Allowances</b>					<b>\$0</b>
1	Independent inspection and testing				See Project Soft Costs	
	<b>Z1.13 - Permits, Insurance &amp; Bonds</b>					<b>\$760,828</b>
1	Building permit fees <i>(input lump sum fee)</i>				See Project Soft Cost Estimate	
2	General Liability and Builder's Risk insurance <i>(enter \$/1000)</i>	\$6.50	1 LS	\$353,242	\$353,242	
3	Labour & Material and Performance bonding <i>(enter \$/1000)</i>	\$7.50	1 LS	\$407,587	\$407,587	
	<b>TOTAL FOR GEN. REQ'MENTS &amp; FEES - Gen. Req'ments</b>	1.00	19,940 m2	\$228.94	\$4,564,971	8.4%
	<b>Z1.2 GENERAL REQUIREMENTS &amp; FEES - Fees</b>					
	<b>Z1.21 - General Contractor's Fees</b>					
1	Allowance for the General Contractor's Fees (Overhead and Profit). (applied to measured works plus general requirements)		1 LS	\$1,630,347	\$1,630,300	3.0%
	<b>TOTAL FOR GEN. REQ'MENTS &amp; FEES - Fees</b>	1.00	19,940 m2	\$81.76	\$1,630,300	3.0%
	<b>Z2.1 CONTINGENCY - Design &amp; Pricing Contingency</b>					
1	Design & Pricing Contingency as a percentage of the above to cover increases in the overall scope of the design during the remaining stages of the design phase (applied to measured works plus general requirements and fees)					
1.1	- Architectural		1 sum	\$3,897,393	\$3,897,393	20.0%
1.2	- Structural		1 sum	\$2,821,938	\$2,821,938	20.0%
1.3	- Building Mechanical		1 sum	\$2,855,137	\$2,855,137	20.0%
1.4	- Building Electrical		1 sum	\$761,370	\$761,370	20.0%
1.5	- Civil Sitework		1 sum	\$1,086,875	\$1,086,875	20.0%
1.6	- Mechanical Site Services		1 sum	\$241,248	\$241,248	20.0%
1.7	- Electrical Site Services		1 sum	\$400,604	\$400,604	20.0%
1.8	- Ancillary Work		1 sum	\$0	\$0	20.0%
	<b>TOTAL CONTINGENCY - Design &amp; Pricing Contingency</b>	1.00	19,940 m2	\$605.06	\$12,064,600	

