



Technical Memorandum #4
P-13-17

Transit Garage – Final Site Evaluation and Recommendation Report

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ORIGINATOR:	C. Prentice
REVIEWER:	D. Crosthwaite
AUTHORIZATION:	B. Mori
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1 Introduction

This technical memorandum is the fourth in a series and presents the final results of the detailed analysis and evaluation of potential sites for a new transit facility. The technical evaluation scoring can be used by the City to select the preferred site. It builds on the work documented in Technical Memoranda #1 and #2 as well as the conclusions reached in Technical Memorandum #3 which explored the suitability of re-using the current Townsend site. Reference to these reports should be made for details concerning the previous work.

Technical Memorandum #1 defined the future transit facility needs and site size and location criteria. A total of 138 sites were considered and a shortlist of seven sites identified. They were:

- 1801 Fisher Drive/290 Jameson Drive combined as one site;
- 551 Harper Road/1490 Crawford Drive combined as one site;
- 587 Harper Road;
- 107 Park Street North (GE Canada), northeast corner;
- 107 Park Street North (GE Canada), West side;
- 420 Ashburnham Drive; and
- 182 Townsend Street (existing site).

In Technical Memorandum #2 a detailed analysis of the seven shortlisted sites was undertaken according to 13 criteria in five categories addressing site conditions, the socio-cultural environment, the natural environment, the economic environment and the impact on transit operations. Site analysis included high level facility concepts for each site. The estimated capital cost for a new transit facility is \$33 million. During the site evaluation process, the 107 Park Street North, west side site was subsequently replaced with another GE Canada site at 1063 Monaghan Road. In the analysis, the existing Townsend Street site was noted as unable to accommodate the future transit facility. A life cycle cost analysis was also undertaken for each site which indicated increased annual transit operating costs as well as capital and land costs. A Public Open House was held on December 20, 2017 to solicit public comment on the identified sites and their evaluation. Following consideration of the public comment, the evaluation was finalized and the recommended site identified as 1801 Fisher Drive/290 Jameson Drive.

In view of the increased annual operating cost associated with a new location, Technical Memorandum #3 assessed potential re-development of the Townsend site together with additional land on Stewart Street and facility plan options based on concepts suggested by City staff. It was concluded that the Townsend site even with the additional site was not practical and would result in additional capital and operating costs compared to a one-site and one-facility option. The recommended site identified remained the 1801 Fisher Drive / 290 Jameson Drive.

For this Technical Memorandum #4, the following five sites including two new sites have been evaluated as the final locations under consideration:

- 551 Harper Road/1490 Crawford Drive combined as one site;
- 587 Harper Road;
- 420 Ashburnham Drive;
- New - privately owned sites combined as one site with the proposed addition of an adjacent property (Site A) for parking; and

- New - 910 Monaghan Road (Canoe Museum)/ 575 Romaine Street (former Evinrude plant) combined as one site.

These sites are the result of the following events:

- Original long list of 138 sites were considered and a shortlist of seven sites including the existing Townsend Street site were evaluated.
- The two GE Canada sites were eliminated after the City attempted to contact GE Canada regarding the availability of the potential sites but did not receive a positive response.
- From the analysis and conclusions in Technical Memorandum #3, the Townsend site and site options were eliminated in view of the operating and capital cost considerations associated with the two-site alternative.
- The originally recommended site at 1801 Fisher Drive and 290 Jameson Drive was subsequently sold to Hydro One leaving three potential sites.
- In view of the limited number of sites, the City advertised using a public RFI process to solicit potential sites and received two replies: the Canoe Museum and former Evinrude plant at 910 Monaghan Road/ 575 Romaine Street, and a combined site at privately owned site referred to as “Site A”.

As a result of this process, a final short list of the five sites has been evaluated according to the criteria and scoring established in Technical Memorandum #2 and re-stated in section 4 herein.

Based on the studies, analysis and evaluation of the revised shortlist of sites including consideration of the transit operating and capital cost impacts, **the site at 910 Monaghan Road/575 Romaine Street is ranked highest in the technical evaluation.**

2 Transit Facility Requirements

As defined in Technical Memorandum #1, the size of the future transit facility and related site requirements are based on a projected transit fleet of 90 buses by 2041 (25 years), a 40 per cent increase over the current fleet total of 64 buses. This estimate, which is subject to future transit service plans, population growth and transit ridership levels, is comprised of 70 buses for the conventional transit service and 20 for the specialized transit service. The vehicles would be a mix of full-size (12.2 metre) and smaller (7.6 metre) buses. To deliver transit services associated with this fleet size, there would be an estimated 225 employees, based on the existing employee/vehicle ratio of 2.3.

To accommodate the future transit fleet, employee, operations, vehicle maintenance and storage requirements, a facility of approximately 10,500 m², subject to detailed design, will be needed along with vehicle parking spaces for employees and visitors. Future parking needs will depend on the final location of the facility, the ability of employees to travel to the new site and the number of maintenance staff working at the facility. For the purpose of assessing the suitability of each site, a total of 135 spaces (0.6 spaces per employee) has been included in the facility site plan.

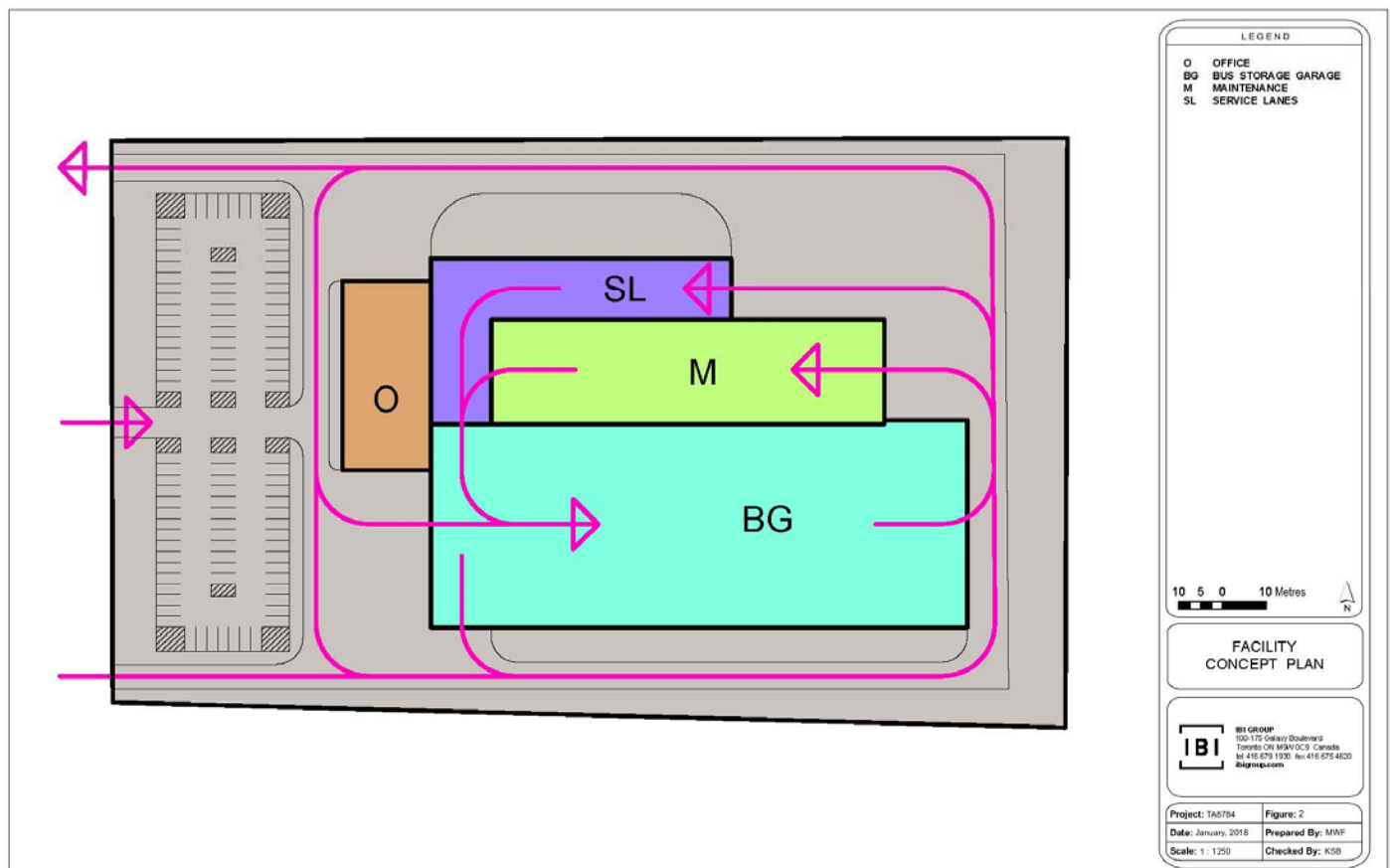
The facility size estimate includes the capability to undertake full vehicle maintenance with the exception of major component repairs and body refurbishing. This latter work is contemplated to be handled either at the City's public works facility at 791 Webber Avenue or out-sourced as is the current practice. The option of having all but minor “running repair” vehicle maintenance undertaken at the public works facility could still be followed in future. However, by including the capability to undertake full vehicle maintenance at a new transit facility at this time provides the

City with full flexibility in any future vehicle maintenance decisions independent of the site selection process.

Together with other site requirements related to driveways, staging areas, space for snow storage and by-law setbacks, a site size of up to approximately 3.2 hectares (8.0 acres) is needed, depending on the shape of the site and developable area. This size guideline was used to identify the various sites considered.

A representative transit facility concept plan based on the foregoing high-level fleet and facility needs planning estimates was prepared and is illustrated in Exhibit 1.

Exhibit 1: Representative Transit Facility Concept Plan



This concept plan was applied to each of the sites using available site plans to confirm the ability of each site to accommodate the future transit facility. The site plans with the transit facility located on each site are included in Appendix A, as Exhibits A1 to A5.

2.1 Transit Facility Cost

Based on the foregoing size guidelines for a future 10,500 m² transit facility and current construction costs, the estimated budget for the facility is **\$33 million** including contingencies and fixed assets, site preparation, internal site servicing, but excluding land, site specific additional costs and any related development costs.

For any new facility, there will be added annual operating (maintenance and utility) and staffing costs compared to the current facility arrangements due to its larger size.

3 Description of the Final Five Sites

The following is a general description of the five final sites. Exhibit 2 illustrates the location of the sites within the city along with the location of the existing Townsend facility and downtown transit terminal.

551 Harper Road/1490 Crawford Drive

These two sites, totalling 7.02 hectares (17.35 acres), are owned by the City with the 551 Harper Road site currently on long-term lease to CP Rail for rail maintenance purposes. The site is bounded to the west by an active CP Rail line, Harper Road to the east and Crawford Drive to the south. There are no structures on the site and there is a large woodland area on the westerly part of the site. A large portion of the 1490 Crawford Drive site is a former landfill and the site is anticipated to be heavily contaminated requiring significant remediation. The combined site is in the vicinity of the Harper Creek Provincially Significant Wetland, candidate significant wildlife habitat, and part of the Kawartha's Naturally Connected Natural Heritage System. The south-west portion of the site is within the ORCA Regulation Limit.

The site grade rises approximately 7 metres from the intersection of Crawford and Harper to the rail line and would require re-grading to make it suitable for development as a transit facility. An estimated 4.98 hectares (12.31 acres) of the site would be required for a transit facility in view of the shape of the site and related constraints.

587 Harper Road

This site is owned by the City and is currently occupied by Hydro One, and is adjacent to the City's former composting site. The site is 2.81 hectares (6.94 acres) in size and is generally flat although some grading would be required to make it suitable for re-development as a transit facility. The site is below the estimated size requirement of 3.2 hectares (8.0 acres) indicating that some compromises in the design of a transit facility would be required. The site is bounded by the CP Rail line to the south and by the City's former compost site and a number of natural heritage features to the north and northwest, including the Harper Creek Provincially Significant Wetland, unevaluated wetlands, candidate significant wildlife habitat and woodlands. A portion of the site is located within the Otonabee Region Conservation Authority (ORCA) Regulation Limit.

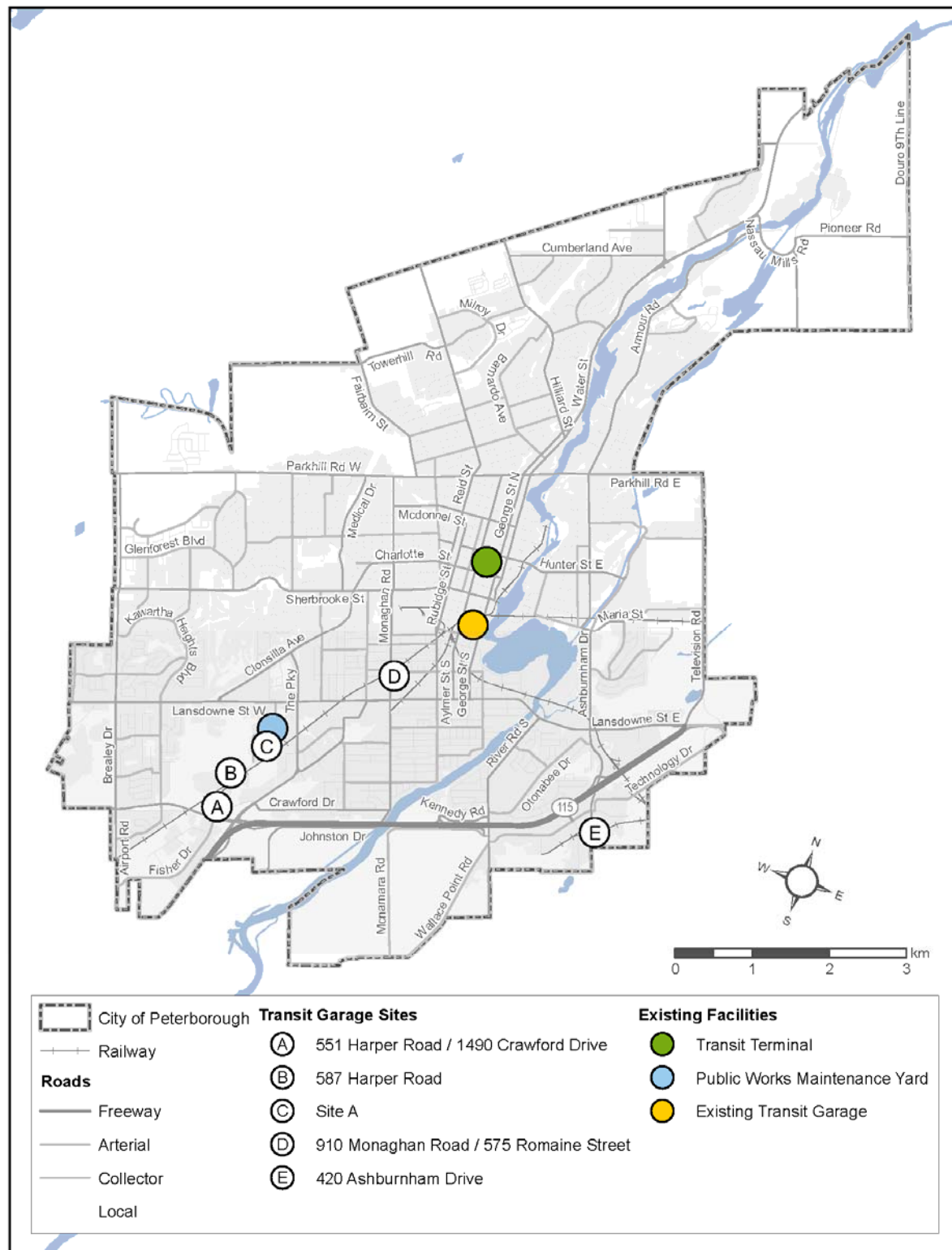
The existing Harper Road railway crossing is to be closed with all traffic being re-directed to a new crossing as a southerly extension of Rye Street. The existing portion of Harper/Rye Street extending to 587 Harper Road will become a stub dead-end roadway meaning that the site would have only one access point. Harper Road, itself, is in poor condition and will require rebuilding, at an estimated cost of \$900,000, to handle the volume of bus traffic which would need to be factored into the development costs for the site.

Site A

This site consists of two privately owned separate parcels of land, which are linked. Total site size is 2.61 hectares (6.45 acres). The site is close to the Public Works Webber Avenue Operations and Maintenance Facility so the requirement for maintenance of transit vehicles within a transit facility would be minimal consisting of a light duty maintenance bay plus one hoist bay. Accordingly, the estimated size of the transit facility could be reduced by 1,600 m², to approximately 8,900 m².

Generally, the site may be suitable for bus storage, bus servicing and office requirements although the shape and size of the site would require some design compromises for a transit facility.

Exhibit 2: Map of Sites



The sites will require some grading. The existing buildings are not suitable for incorporation into a new transit facility and will need to be demolished.

There are ORCA and floodplain restrictions that will need to be considered. A cold-water trout stream is adjacent to the site. A minimum 30 metre buffer / landscape strip will need to be provided along water courses which are environmentally sensitive areas and will need to be protected. As well, there is an (as of time writing this report) an unevaluated wetland immediately south of the creek. An Environmental Impact Assessment will be required to determine setback from the wetland, which may further reduce developable land. ORCA has also identified a meander belt limit across the south side of the property which will also need to be considered. As a result of the above factors, a large portion of Site A is anticipated to be unavailable for development. The presence of the cold-water stream, wetland and meander belt restriction creates an added challenge to development of this site with a secondary access.

Both parts of the combined site, are long and narrow presenting challenges for the layout of the required transit facility leaving inadequate space for employee parking. As a result, additional property, totalling 1.74 hectares (4.3 acres) would need to be purchased. However, a site visit revealed challenges with significant grade difference between Site A and the potential additional property, including stormwater management features that would interfere with development. The path of egress between the parking and the transit garage would present a marginally acceptable travel distance and elevation change for the staff.

While the total overall combined sites create a large enough property for Transit use, the site has design challenges and limited space for growth. Additionally, in order to proceed with Site A, property would be required to be purchased from multiple owners.

910 Monaghan Road/575 Romaine Street

This location combines two parcels of land, one fronting on Monaghan Road (#910) with a two-storey building, currently the site of the Canoe Museum, and the second parcel, 575 Romaine Street, the former Evinrude marine motor manufacturing plant. The Evinrude building is used for storage of Canoe Museum materials. The Canoe Museum is intending to relocate to Ashburnham Drive and have expressed a willingness to cooperate with the City to allow Transit Facility design and up-front work ahead of the move. The City has expressed interest in retaining the Canoe Museum building for Transit related office space and other City uses (office space, large public meetings and events). The office and meeting space would address City needs beyond the scope of the transit garage providing additional benefit to the City.

The site is 3.3 hectares (8.1 acres) in total which is sufficient to accommodate the future transit facility including full vehicle maintenance as well as retain the Canoe Museum building. A concept plan layout for the building, with the large vehicle storage building aligned along the north boundary of the site (to minimize noise) is illustrated in Appendix A.

The land is generally flat although with a moderate downward slope to the east. The former Evinrude plant site is bordered on the north side by residential housing and includes two access points between the houses to Romaine Street. A noise-attenuation wall is likely required adjacent to the residential area along the north boundary of site.

Consideration was given to the potential of incorporating the former Evinrude warehouse into the transit facility particularly for bus storage. However, not only would the building be expensive to rehabilitate and modify but, most critically, it is situated such that there is no capability for an access road to be constructed around the building, as would be required for fire services and transit operational purposes. As a result, the building would need to be demolished.

The project team is aware of historical land contamination. The City has satisfied itself regarding liability concerns and the project team has incorporated significant cost into the project for a major effort to remediate the site. Through a separate process, the City has explored

environmental issues related to underground contamination plume and past attempted remediation and remediation requirements going forward. The cost of remediation is estimated at \$3,872,500 but for evaluation and budgeting purposes a total remediation cost of \$8,872,500 has been used. This provides for a \$5,000,000 contingency should additional cleanup be identified during development.

420 Ashburnham Drive

This site of 2.88 hectares (7.12 acres) is owned by the City and is located at the south east corner of the city bordering an industrial area. The full site would be required for a transit facility. The site is bounded by Ashburnham Drive on the west, an abandoned rail line to the north, a Hydro One transformer station to the east and a private residence to the south. There are no structures on the site and is heavily treed. There is a significant elevation change with the site rising approximately 10 metres from north to south and west to east. Utilization of the site as a transit facility would require extensive earth removal and grading to make it level. The estimated cost for site work is \$3,000,000.

The south-east corner of the site is located within the ORCA Regulation Limit. Cold Springs and Yankee Bonnett PSW are adjacent to the site, and are part of the Kawartha's Naturally Connected Natural Heritage System.

Ashburnham Drive also rises on a hill to the south and the road is in need of rebuilding which would need to be factored into the development costs for the site. The estimated cost for roadway improvements is \$3,772,000. In addition, traffic signals would be required to facilitate safe entry and exit of vehicles to the site at an estimated cost of \$300,000.

182 Townsend Street (not part of final site list/not evaluated)

This is the existing site for the transit system operations and vehicle maintenance and servicing activities and is the former location of the public works vehicle maintenance and yard functions. It includes buildings for maintenance of the transit vehicles as well as a building to store and service (wash, fuel) the transit vehicles as well as office areas for transit operations and servicing employees. The vehicle maintenance activities for the public works vehicles have recently been relocated to a new facility at 791 Webber Avenue although minor maintenance and repair work continues to be undertaken at the Townsend site.

This location, including several design alternatives with additional land, was evaluated extensively in Technical Memorandum #3 and discounted from further consideration for logistical and cost reasons. The following is a brief review of the findings and conclusions from Technical Memorandum #3. For more detail, reference should be made to Technical Memorandum #3.

- During the site evaluation process, it was determined that the existing Townsend Street site would not be able to accommodate the required future transit facility. Alternative layouts for the facility were considered but could not be accommodated on the site as it is of insufficient size at approximately 1.72 hectares (4.25 acres), well below the site requirement of up to 3.2 hectares (8.0 acres). Should Jackson Creek be opened up, then this would reduce the available space.
- The existing transit storage, office and vehicle maintenance buildings are in poor condition, are at the end of their economic life and would need to be replaced.
- To permit reconstruction of the site for transit purposes, the existing transit operations and related vehicle maintenance activities would need to be temporarily re-located during re-construction. The estimated timeline for re-construction would be 24 months.
- There are environmental issues related to Jackson's Creek which would restrict the size and scope of re-use of the site thereby further limiting its re-use.

- In Technical Memorandum #3, alternative design concepts were explored using additional land at Stewart Street.
- Operational and capital cost analysis indicated that a two-site option would result in higher capital and annual operating costs compared to a one-site location.

4 Detailed Site Evaluation Criteria

At the outset of the site identification process and as described in Technical Memorandum #1, a preliminary range of criteria was prepared in order to identify potential sites. These criteria focussed on site size, shape, locale and availability. With the final shortlisting of the candidate sites described in the previous section, each of the sites were then subjected to more detailed evaluation according to a broader range of site-specific evaluation criteria. Thirteen criteria have been used as grouped under the following five categories.

1. Site Conditions/Operations

- Suitability of the Site
- Site Availability
- Ease of Site Access
- Site Contamination/Remediation

2. Socio-Cultural Environment

- Official Plan and Zoning Compliance
- Secondary Site Access
- Potential Impact on Adjacent Land Use
- Safety/Traffic Control Needs
- Traffic Impacts

3. Natural Environment

- Impacts on Natural Environment

4. Economic Environment

- Site Preparation and Servicing Costs
- Road Reconstruction Needs

5. Transit Operations

- Impact on Transit Operating Costs and Logistics

4.1 Description of Evaluation Criteria

Each of the thirteen evaluation criterion is described below.

- **Suitability of the Site** – this is a critical criterion which assesses the ability of the site to generally accommodate the future transit facility as defined at a high level in Section 2. In order to score this criterion, a concept plan for a representative facility was prepared, as illustrated in Exhibit 1, and positioned on each site to determine the ability of the site to accommodate the facility. It is to be noted that detailed design of the facility would be finalized at a later date once the City proceeds with

the new facility. The site is scored according to how adequately it can accommodate the facility including flexibility for any future expansion beyond this study horizon (25 years). The actual area required for the transit facility will be influenced by the site shape and conditions.

- **Site Availability** – is the site available for purchase? Is there an existing business which would need to be relocated? Is the owner prepared to sell the property? Are there any known legal constraints? To score this criterion, contact has been made with the property owner to confirm availability. If there is an existing business on the site, a determination has been made as to whether or not the business can be relocated. The cost to purchase the land is considered in the cost analysis section of this report.
- **Ease of Site Access** – the site should be easily and readily accessed from main roads such that buses do not have to use secondary or minor streets and intrude into the surrounding neighbourhood. Ease of access from main roads also helps to ensure minimal delays in entering/exiting the site. Scoring is based on a visual analysis of the site location and surrounding road network.
- **Site Contamination/Remediation** – this criterion recognizes whether or not the site is contaminated and how readily the contamination can be remediated. Does the site require remediation? If so, to what degree. Scoring is based on local knowledge of the degree of contamination and the ability to remediate. Any costs associated with the mitigation would be included in the cost analysis section.
- **Official Plan and Zoning Compliance** – is the site properly zoned for the intended purpose and is the site consistent with the City's Official Plan and planning objectives? Essentially, is the site properly zoned for a transit facility? If the site is not properly zoned, consideration is given to the ability to re-zone the site. A low score reflects the need for re-zoning. An inability to re-zone the site would yield an Unacceptable score.
- **Secondary Site Access** – being able to deliver the committed public transit service is critical to the successful operation and value of the transit system. This criteria assesses the ability of transit vehicles to access the site via a secondary roadway and entrance in the event that the main entrance and roadway became obstructed. It is important that the transit vehicles have another way to go into revenue service or return to the garage. A low score indicates limitations in this regard.
- **Potential Impact on Adjacent Land Use** – this criterion considers the impact a transit facility might have on the surrounding neighbourhood and adjacent land uses in terms of noise, emissions and light intrusion. The evaluation considers the surrounding land uses and proximity to residential areas or land owners who might be affected. Any potential impact may require mitigation measures in the design of the facility or development of the site including retaining walls and specially-designed lighting. The assigned score reflects a collective assessment of the potential impact based on the expertise of the consulting team.
- **Safety/Traffic Control Needs** – this criterion considers any potential impact on the neighbouring residents, pedestrians and road traffic from a safety standpoint related to the movement of transit vehicles to and from the facility as well as the safe movement of transit vehicles and employees on and off the site. The scoring considers the need for measures to mitigate against any potential safety concerns such as the installation of traffic signals or re-design of the roadway. In such cases, the site receives a low evaluation and the cost associated with the mitigation measure included in the cost analysis section.

- **Traffic Impacts** – this criterion evaluates the impact of the added traffic volume associated with the movement of transit vehicles and transit employee vehicles on the main access street serving the facility. The scoring reflects the relative percentage increase over existing traffic volumes for the existing condition. No attempt is made to evaluate the future condition in view of the absence of future traffic volumes corresponding to the future build-out of the transit facility. A low percentage increase yields a higher scoring.
- **Impacts on Natural Environment** – this criterion considers the potential impact of a transit facility on the natural environment of both the site and the area adjacent or connected to the site. It assesses whether or not the facility will result in the displacement or disturbance to any designated natural heritage features (PSW, ANSI, ESA), watercourses/fish habitat, or wildlife habitat and whether or not there are any potential impacts to species at risk. The scoring is based on the expertise of natural heritage consultant and considers the input from stakeholders.
- **Site Preparation and Servicing Costs** – this criterion evaluates the degree to which the site requires grading, fill, removal of contaminated soil. It also considers whether or not the site is serviced. The costs associated with site preparation and servicing requirements would be included in the cost analysis section.
- **Road Reconstruction Needs** – this criterion reflects any need to rebuild the adjacent access road serving the site in order to handle the traffic generated by the transit facility and the weight of the transit buses. The costs associated with any road reconstruction requirement would be included in the cost analysis section.
- **Impact on Transit Operating Costs and Logistics** – this criterion reflects the relative change in the operating and capital costs of the transit system as well as the logistics associated with delivering transit services (moving buses and employees between the facility site and the starting/ending or relief points of transit service) for each site. The relative costs are summarized in the cost analysis section. Scoring for each site reflects the relative change (increase) in operating costs over the current condition.

4.2 Evaluation Scoring

Scoring for the evaluation of the sites used the following standard four-point scale:

- 0 = Unacceptable.
- 1 = Poor; with some major deficiencies.
- 2 = Acceptable; meets minimum criteria.
- 3 = Highly acceptable/Most desirable/Meets all of the design criteria

The scores for each site under each criterion were determined by members of the consulting team who combine expertise in the environment, the social and cultural environment, facility and site engineering, traffic planning and transit operations and vehicle maintenance.

No preferential weighting or scoring advantage was given to any of the criteria as determining an appropriate and balanced weighting can be problematic as well as subjective.

In the scoring process, where a site scored “0”, or Unacceptable, the scoring team considered potential alternatives or solutions before the score was finalized. For example, where a site scored “Unacceptable” under Secondary Access, the site and surrounding road network was reviewed to determine the feasibility of establishing a secondary access point before finalizing the score. Similarly, where the full facility requirements could not be accommodated on the site, the potential for relocating some employee vehicle parking off-site, for example, was considered

and, if found potentially feasible, a score of “1” was assigned to the “Suitability of the Site” criteria.

5 Evaluation of Sites

5.1 Site Scoring

Each of the final five sites was evaluated by the consulting team using the criteria and scoring protocol described in the preceding section and as was conducted in Technical Memorandum #2. The results of the scoring is summarized in Exhibit 3 with detailed evaluation and scoring presented in Appendix B.

Based on the scoring results, the five sites rank as follows:

1. 910 Monaghan Road/575 Romaine Street – 34 points
2. 420 Ashburnham Drive – 30 points
3. Site A – 28 points
4. 551 Harper Road/1490 Crawford Drive – 27 points
5. 587 Harper Road – 27 points

551 Harper Rd/1490 Crawford Dr. received a “0” score under the Natural Environment category due to significant environmental constraints as well as the presence of the landfill contents and challenges related to the disposal of such contents.

587 Harper Rd scored “0” under the Secondary Access criterion due to the single roadway access to the site which is a serious deficiency for a transit facility.

On the basis of the evaluation criteria, the highest ranking site is 910 Monaghan Road/575 Romaine Street followed by 420 Ashburnham Drive and Site A and 551 Harper Road/1490 Crawford Drive.

Specific details in support of the scoring of each site are explained below.

5.2 Specific Scoring Elements

As part of the site evaluation and scoring process, detailed analysis and cost estimates for certain of the criteria were developed, as applicable, as described below.

5.2.1 Site Availability

Site A and 910 Monaghan Road/575 Romaine Street sites are privately owned and would be subject to purchase by the City. The owners have expressed interest in selling their properties. As noted earlier, the property to the east of Site A, would need to be purchased in order to accommodate all of the transit facility functions, particularly employee parking. The City will need to determine if this site is available if this site is selected.

Each of the three remaining sites (551 Harper/1490 Crawford, 587 Harper, 420 Ashburnham) are owned by the City.

5.2.2 Site Contamination and Remediation

As noted in section 3, the 551 Harper Road/1490 Crawford Drive site and 910 Monaghan Road/575 Romaine Street sites have some degree of contamination.

The actual cost associated with remediation of either of these sites would have to be determined through a more detailed investigation as well as, with regard to the Monaghan/Romaine site, discussion with the owner prior to any purchase of the site.

The estimated cost to remediate the 551 Harper Road/1490 Crawford Drive site is \$15,000,000.

For the Monaghan/Romaine site, the environmental report from Cambium provides a worst case capitalized cost estimate of \$3,872,500 which is based on a number of factors identified during Environmental Site Assessments, past and current soil drilling and sampling, as well as consideration for pump-and-treat replacement costs, along with separate consideration for ongoing operational costs.

There is no known contamination of either the Site A or 420 Ashburnham Drive locations, although they are subject to environmental restrictions. The Phase 1 environmental assessment conducted for Site A did not identify any costs for remediation but a Phase 2 study is recommended based on current use of the site including fuel storage. The adjacent and required property was not examined as part of the site for consideration in this study.

5.2.3 Traffic Impacts

For the 910 Monaghan Road/575 Romaine Street and 420 Ashburnham Drive sites located on major streets, an analysis of the degree to which traffic generated by the transit facility (buses, employee and visitor cars, delivery vehicles) might increase traffic in the vicinity of the facility site was undertaken using available traffic counts provided by the City. The number of weekday transit-related vehicle movements for all purposes is currently estimated at 516. This is projected to increase by 40% over the next 25 years as the fleet size (64 to 90 buses), employee complement and related activities increase.

On this basis, the results of these analyses indicate that, for the 910 Monaghan Road/575 Romaine Street site:

- Traffic on Romaine Street would increase by 5% daily (existing traffic volumes of 3,325); and
- Traffic on Monaghan Road would increase by 2% (existing volumes of 14,465).

For the 420 Ashburnham Drive site:

- Traffic would increase by 37% daily. This latter percentage is high due to the low existing volumes on Ashburnham Drive (1,390 vehicles per day).

For the Site A location:

- Traffic volumes in general past these sites can be expected to change (increase) as a result of the planned new road alignment and underpass at the CP Rail tracks. Current traffic conditions indicate 4,120 total daily vehicle movements today on Harper Road.
- The added transit vehicle movements represent an increase of 13% over current conditions. While this percentage appears high, it could decline, percentage-wise, if general traffic volumes increase as a result of the new road configuration.

For the 587 Harper Road location, no traffic analysis was undertaken considering the fact that the street will not be a through-street.

Given its location in an industrial area, no traffic analysis was undertaken for 551 Harper Road/1490 Crawford as limited traffic impact can be expected.

5.2.4 Site Preparation and Servicing Costs

The 420 Ashburnham Drive site has a significant elevation change which will require levelling to suit a transit facility. The costs for this work is estimated at \$3,000,000. Actual costs would have to be determined by the City during the detailed design phase for the facility.

DRAFT

Exhibit 3: Final Evaluation of Sites

Criteria	Description	Sites				
		551 Harper Road/1490 Crawford Drive	587 Harper Road	Site A	910 Monaghan Road / 575 Romaine Street	420 Ashburnham Drive
SITE CONDITIONS / OPERATIONS						
Site Availability	Is the site available for purchase/no existing business?	3	3	1	3	3
Suitability of Site	Is site able to accommodate the future transit facility?	3	1	1	3	3
Ease of Site Access	Is the site readily accessible to/from main roads?	3	3	3	3	3
Site Contamination / Remediation	Is there known contamination and need for remediation?	0	3	3	2	3
SOCIO-CULTURAL ENVIRONMENT						
Official Plan and Zoning Compliance	Is property zoned for a transit facility and consistent with Official Plan?	3	2	3	3	3
Secondary Site Access	Is there a secondary access to/from the site?	3	0	2	3	2
Potential Impact on Adjacent Land Use	To what degree will facility impact (noise, emissions, light) adjacent land use excluding natural environment (see below)?	3	3	2	2	3
Safety / Traffic Control Needs	Can vehicles safely turn into/out of facility? Are traffic control measures required?	3	3	3	2	2
Traffic Impacts	To what degree does facility vehicle activity increase local traffic?	2	3	3	3	1
NATURAL ENVIRONMENT						
Impacts on Natural Environment	Will the facility result in the displacement or disturbance to any designated natural heritage features (PSW, ANSI, ESA), watercourses/fish habitat, or wildlife habitat? Are there any potential species at risk concerns?	0	1	2	3	2
ECONOMIC ENVIRONMENT						
Site Preparation and Servicing Costs	How much site prep (grading, fill) is required? Are services required?	0	3	2	2	2
Road Reconstruction Needs	Is reconstruction required for roads serving the site?	3	1	2	3	1
TRANSIT OPERATING COSTS AND LOGISTICS						
Impact on transit operating costs and logistics	To what extent does the location increase transit operating costs and bus travel times?	1	1	1	2	2
TOTAL		27	27	28	34	30

The estimated site preparation and servicing costs for the Site A location are \$6,450,000 based on an estimated \$400,000 for demolition of the buildings and a further \$400,000 for utilities above typical, new entrance, access to parking via grade differential and roadway improvements, significant regrading between three properties, environmental protective measures, creation of natural buffers, etc.

The 910 Monaghan Road/575 Romaine Street site is serviced but will require demolition of the former Evinrude buildings along with associated site preparation as noted previously. The estimated site preparation and servicing costs are estimated at \$3.56 million based on demolition of the building warehouse, site preparation and utilities above typical for new entrance and potential sound wall, and relocation of existing trunk sewer.

5.2.5 Safety/Traffic Control Needs

Due to the volume of traffic on Monaghan Road between Lansdowne Road and Romaine Street and the sightline issue on Ashburnham Drive, traffic control signals would be required at the primary access point to a transit facility. For the Monaghan/Romaine site, the installation of traffic signals should be reviewed in tandem with existing signals.

The estimated cost for traffic signals is \$300,000 at each site, subject to detailed design of the access point and traffic signal requirements.

5.2.6 Road Reconstruction Needs

The roadways associated with serving the 587 Harper Road and 420 Ashburnham Drive sites are in poor condition and would need to be reconstructed to handle the potential transit-related activity, particularly the volume and weight of the buses. For 420 Ashburnham, the sightlines would also need to be improved by reducing the road gradient. High-level road reconstruction cost estimates indicate a cost of \$900,000 to reconstruct Harper Road from the transit facility site to Rye Street without curb and gutter, and \$3.772 million for 410 Ashburnham Drive from Neal Drive to south of the transit facility site, including installation of new services.

No road reconstruction would be required for either the Monaghan/Romaine, Harper/Crawford or Site A locations other than necessary work associated with access driveways for the transit facility.

5.2.7 Transit Operations and Logistics

Relocating the transit facility away from the current Townsend Street site will result in an increase in annual operating costs due to the added distance and time associated with buses and employees moving between either of the new locations and the start and finishing point of transit routes, primarily the downtown terminal. This cost includes additional time and logistics related to providing lunch breaks to bus operators and shuttling drivers at shift change times. Additional staff may be required for this purpose. A major factor which could influence operating costs associated with a new site, even one a short distance away from the existing site, would be changes to employee work rules and practices.

There will also be new capital costs for vehicles deployed to shuttle bus operators between the transit facility and their relief points. In addition, transit vehicles would need to be moved between the new facility location and the Webber Avenue Public Works yard for major repairs, depending on the vehicle maintenance model chosen, which could include towing of buses that cannot be legally driven on a public road. The estimated annual cost of towing could be in the order of \$12,000 based on an average of two tows per month (\$500 per occasion).

In order to quantify these costs for each site, a detailed analysis of bus and employee movements was prepared which included estimates of daily, weekly and annual vehicle and employee movements together with time and distance estimates between each of the sites and

the transit terminal and Webber Avenue yard based on existing conditions. These estimates considered a “base case” where all vehicle maintenance, except for major repairs (engine, transmission overhauls, body refurbishing and painting) were undertaken at a new transit facility. This approach minimizes the number of bus and employee movements and related logistics associated with moving vehicles between facilities.

A separate analysis was undertaken to represent the condition where all vehicle maintenance, except minor “running repairs” (replacement of lights, adjustments of mirrors, etc.) was undertaken at the Webber Avenue public Works facility. For cost estimating purposes, the transit system’s 2017 variable operating cost of \$76.95 per revenue vehicle-hour was used.

Exhibit 4, Exhibit 5, and Exhibit 6 present the results of the foregoing analyses. Detailed assumptions and calculations for these analyses are included in Appendix C. It is to be noted that, as a result of the recent move by public works to Webber Avenue and the separation of transit vehicle maintenance and operations activities, the transit department has increased its staff complement by one to handle the shuttling requirements.

Transit Operating Costs

As can be seen in Exhibit 4, the estimated annual increase in operating costs for each of the sites ranges between \$714,817 for the 910 Monaghan Road and 575 Romaine Street site to **\$1,127,211** for each of the 587 Harper Road, Site A and 551 Harper Road/1490 Crawford Drive sites. In comparison, the estimated annual operating cost for the current Townsend site is **\$467,380** which would indicate that the incremental increase for each of the other sites could be reduced by this amount. However, given the long-established work practices and work schedules for bus operators and other staff associated with the Townsend site, the actual current operating cost may be much less. Similarly, for the 910 Monaghan Road/575 Romaine Street site, although it is a relatively short distance from Townsend, an increase in operating costs can be expected because of changes to work practices.

Maintenance Costs with Separate Facilities

Having all vehicle maintenance, except for minor running repairs, undertaken at the Webber Avenue Public Works facility is projected to further increase the annual transit operating costs by between **\$79,080** for the 728 Rye Street/688 Harper Road site and **\$158,138** for the 420 Ashburnham Drive site as detailed in Exhibit 5. In comparison, the operating costs for the current 182 Townsend Street site is estimated at **\$143,764** qualified as noted above. This cost relates to the increase level of shuttling buses between the transit site and the Webber Avenue site for maintenance purposes and includes potential towing costs for inoperable buses.

Exhibit 6 presents the total combined annual operating and maintenance cost increases for each site under the “all vehicle maintenance at Webber Avenue” option. The 551 Harper Road/1490 Crawford Drive site would result in the highest annual operating cost increase at **\$1,235,039**, followed by the 587 Harper Road (**\$1,220,665**), 728 Rye Street/688 Harper Road (**\$1,206,291**) and 420 Ashburnham Drive (**\$1,120,392**) sites. 910 Monaghan Road/575 Romaine Street would have the lowest cost increase at **\$829,832**. As noted previously, the total operating and maintenance costs for the current Townsend site may be less than indicated with the resulting incremental increase for the other sites being higher.

Exhibit 4: Operational Deadhead Cost Summary by Site – Full Maintenance at Transit

Site Locations	Operational Trips between Site Locations and Transit Terminal				
	Distance (km)	Travel Time (min)	Annual Travel Time (h)	Annual Operational Trip Time (h)	Annual Operational Trip Costs
551 Harper Road/ 1490 Crawford Drive	6.0	20.5	14,648.62	14,648.62	\$1,127,211.05
587 Harper Road	5.5	20.5	14,648.62	14,648.62	\$1,127,211.05
Site A	4.9	20.5	14,648.62	14,648.62	\$1,127,211.05
910 Monaghan Road/ 575 Romaine Street	2.5	13.0	9,289.37	9,289.37	\$714,816.77
420 Ashburnham Drive	5.2	17.5	12,504.92	12,504.92	\$962,253.34
182 Townsend Street (Current Garage)	1.1	8.5	6,073.82	6,073.82	\$467,380.19

Exhibit 5: Cost to Shuttle Buses between Sites and Webber Avenue Maintenance Yard

Site Locations	Maintenance Trips between Site Locations and Webber Avenue Maintenance Yard						
	Single Trip Time (min)	Setup/Dropoff Time (min)	Shuttle Time (min)	Annual Setup/Dropoff Time (h)	Annual Shuttle Time (h)	Annual Maintenance Trip Time (h)	Annual Maintenance Trip Costs*
551 Harper Road/ 1490 Crawford Drive	5.0	10.0	10.0	622.67	622.67	1,245.33	\$107,828.40
587 Harper Road	3.0	10.0	7.0	622.67	435.87	1,058.53	\$93,454.14
Site A	1.0	10.0	4.0	622.67	249.07	871.73	\$79,079.88
910 Monaghan Road/ 575 Romaine Street	6.0	10.0	11.5	622.67	716.07	1,338.73	\$115,015.53
420 Ashburnham Drive	12.0	10.0	20.5	622.67	1,276.47	1,899.13	\$158,138.31
182 Townsend Street (Current Garage)	10.0	10.0	17.5	622.67	1,089.67	1,712.33	\$143,764.05

*Includes \$12,000 per year towing costs

**Estimated. Actual costs may be lower.

Exhibit 6: Total Operations and Maintenance Costs – Maintenance at Webber Avenue

Site Locations	Total Annual Deadhead Trip Cost
551 Harper Road/ 1490 Crawford Drive	\$1,235,039.45
587 Harper Road	\$1,220,665.19
Site A	\$1,206,290.93
910 Monaghan Road/ 575 Romaine Street	\$829,832.30
420 Ashburnham Drive	\$1,120,391.65
182 Townsend Street (Current Garage)	\$611,144.24

5.2.7.1 Cost Increase to Future Conditions

As noted earlier, the foregoing transit operating cost estimates are based on the current fleet and operating conditions for 64 transit buses. As the fleet expands to the projected total of 90 vehicles by 2041 (an increase of 40%) the foregoing costs would gradually increase accordingly. Therefore, by 2041, the annual operating cost increase for each of the sites, other than Townsend Street, under the “Maintenance at Transit Facility” scenario, would range between **\$1,000,743** and **\$1,578,095** in constant 2017 dollars as summarized in Exhibit 7. The future cost for the Townsend Street location is not projected due to the inability to accommodate the future facility needs on this site.

Exhibit 7: 2041 Transit Operating Cost Increase for the Sites – Maintenance at Transit Facility

Annual Transit Operating Cost Increase	Sites					
	551 Harper Road / 1490 Crawford Drive	587 Harper Road	Site A	910 Monaghan Road / 575 Romaine Street	420 Ashburnham Drive	182 Townsend Street* (Current Garage)
Current Condition	\$1,127,211	\$1,127,211	\$1,127,211	\$714,817	\$962,253	\$467,380
2041 Condition	\$1,578,095	\$1,578,095	\$1,578,095	\$1,000,743	\$1,347,154	\$654,332

*For illustrative purposes only since site cannot accommodate required future facility

For the “Maintenance at the Webber Avenue” scenario, by 2041 the transit system’s annual operating costs would increase by a further **\$130,836** to **\$221,393**, depending on the site, in constant 2017 dollars as summarized in Exhibit 8.

Exhibit 8: 2041 Additional Transit Operating Cost Increase for Sites – Maintenance at Webber Avenue

Annual Transit Operating Cost Increase	Sites					
	551 Harper Road / 1490 Crawford Drive	587 Harper Road	Site A	910 Monaghan Road / 575 Romaine Street	420 Ashburnham Drive	182 Townsend Street* (Current Garage)
Current Condition	\$107,828	\$93,454	\$79,080	\$115,016	\$158,138	\$143,764
2041 Condition	\$150,959	\$130,836	\$110,712	\$161,022	\$221,393	\$201,270

*For illustrative purposes only since site cannot accommodate required future facility

As a result, the total annual operating cost increase by 2041 associated with “Maintenance at Webber Avenue” would be the sum of the values in Exhibit 7 and Exhibit 8, as presented in Exhibit 9.

Exhibit 9: 2041 Total Transit Operating Cost Increase for Sites – Maintenance at Webber Avenue

Annual Transit Operating Cost Increase	Sites					
	551 Harper Road / 1490 Crawford Drive	587 Harper Road	Site A	910 Monaghan Road / 575 Romaine Street	420 Ashburnham Drive	182 Townsend Street* (Current Garage)
Current Condition	\$1,235,039	\$1,220,665	\$1,206,291	\$829,832	\$1,120,392	\$611,144
2041 Condition	\$1,729,054	\$1,708,931	\$1,688,807	\$1,161,765	\$1,568,547	\$855,602

*For illustrative purposes only since site cannot accommodate required future facility

By 2041, the total annual transit operating cost increase for each of the sites, other than Townsend Street, under the “Maintenance at Webber Avenue” scenario, would range between **\$1,249,965** for the 910 Monaghan Road/575 Romaine Street site and **\$1,729,055** for the 551 Harper Road/1490 Crawford Drive site in constant 2017 dollars.

5.2.7.2 Capital Cost for Shuttle Vans

In order to shuttle bus operators between each of the transit facility locations and their relief locations, except Townsend, it is estimated that two vans would be required at an estimated capital cost of \$100,000 every three to four years.

5.2.7.3 Transit Operational Review Impact on Cost Estimates

Although it is understood that the transit department may undertake an operational review in the near future which may consider some “de-centralizing” of routes away from the downtown terminal, it is not expected that such changes would have a significant impact on the foregoing transit operating cost estimates for each site especially considering the location of the sites are largely away from development and therefore the start and end point of routes.

6.1.7.4 Facility Maintenance Costs

In addition to the operating and maintenance shuttle costs, there will be added operating (maintenance and utility) and staffing costs for a new and larger facility compared to the current facility arrangements. These costs would need to be determined by the City.

5.3 Discussion of Site Scoring

The following provides a high-level summary of the key scoring elements for each site.

551 Harper Road/1490 Crawford Drive

- Site is owned by the City. No existing activities on the site.
- Significant potential Natural Environment impact. An Environmental Impact Assessment analysis would need to be conducted to determine potential impacts.
- Portion of site contains former landfill materials which would need to be removed and relocated. In the event that this site is not selected, the City is committed to site remediation work of capping the landfill. Significant financial risk associated with unknown contamination costs.
- Location will significantly increase annual transit operating costs.

587 Harper Road

- Site owned by City and is currently occupied Hydro One.
- Site is not zoned for intended function and conflicts with Official Plan designation.
- There is no secondary access to the site. Only access is by the stub end of Harper Road following the closure of the railway crossing.
- Harper Road would need to be reconstructed to handle the volume of bus traffic.
- Site size is insufficient to accommodate all facility elements which may require relocation of some facility elements such as employee parking.
- Location will result in increased annual transit operating cost.
- Site is adjacent to Harper Park, Harper Creek, and provincially significant wetland.

Site A

- Portion of the site is known to be available to be acquired; located close to the Public Works Maintenance yard on Webber Avenue. Availability of third property is unknown.
- Transit facility could be reduced by approximately 1,600 m² with lower capital cost as it would not need to include full maintenance capability
- All major maintenance would need to be performed at Public Works yard.
- Combined site is irregular in shape which would result in some design limitations on transit building.
- Site A on its own is too small. A third adjacent property is required.
- Existing buildings would need to be demolished.
- Environmental considerations would reduce available land for development. Special care and additional costs would be required due to proximity to Harper Creek and unevaluated wetland south of the site.

- Traffic impact of transit vehicle activity on Harper Road and Rye Street is moderate at 13% and could be lower depending on future traffic increase due to realignment of Rye Street.
- Location will result in increased annual transit operating cost.

910 Monaghan Road/575 Romaine Street

- Site is available; existing Canoe Museum building could be re-purposed for Transit Office space and other City uses.
- Site is of sufficient size to accommodate all transit facility elements including full maintenance.
- Proximity to residential housing could require noise attenuation wall.
- Existing warehouse building would need to be demolished.
- Historical contamination poses a financial risk.
- Traffic impact of transit vehicle activity on Monaghan Road and Romaine Street is low, at 2% and 5%.
- Location will result in lowest increase in annual transit operating cost among sites under consideration.

420 Ashburnham Drive

- Site is owned by the City.
- Site has a significant elevation change requiring grading to make it suitable.
- Ashburnham Drive will need to be reconstructed to handle transit vehicles.
- Sightline issues for vehicle access to/from Ashburnham will require traffic signals.
- The volume of transit-related vehicle activity is estimated to increase daily traffic on Ashburnham by 37%.
- Site has second lowest annual transit operating cost increase.
- Site is limited to only one access point.

5.4 Life Cycle Cost Comparison of Sites

As noted in the site evaluation process, there are a number of operating and capital cost considerations associated with each of the sites. These costs vary by site. Some have been considered in the scoring decisions while others are separate and additional to the scoring. Exhibit 10 presents a summary of the operating and capital cost implications for each of the sites. It is to be noted that the costs are estimates and are subject to more detailed analysis once the City confirms the recommended site and proceeds with the new transit facility project. The 2041 transit operating cost estimates are in constant 2017 dollars.

Land costs are estimated based on an average of \$425,000 per acre. The estimated transit facility cost in 2018 dollars is \$32.9 million (10,500 m² facility) for all sites except Site A where the facility cost is estimated at \$25.7.0 million for an 8,900 m² building. The aforementioned facility estimates do not include servicing, site grading and improvements.

Exhibit 10: Operations and Capital Cost Summary for Sites

Cost Factor	Sites				
	551 Harper Rd/ 1490 Crawford Dr	587 Harper Rd	Site A	910 Monaghan Rd/ 575 Romaine St	420 Ashburnham Dr
Site Capital Costs					
Site Size	17.4 acres	6.9 acres	6.4 acres + 4.3 acres*	8.1 acres	7.1 acres
Land Cost	City owned	City owned	\$2,732,710 + \$1,836,040*	\$1,133,000	City owned
Environmental Remediation	\$15,000,000	\$1,000,000	\$400,000	\$8,872,500	\$250,000
Safety/Traffic Control Needs	\$0	\$0	\$0	\$300,000	\$300,000
Site Preparation and Servicing	\$6,210,000	\$4,164,000	\$6,450,000	\$3,560,000	\$3,000,000
Road Reconstruction	\$0	\$900,000	\$0	\$0	\$3,772,000
Total Site Capital Costs	\$21,210,000	\$6,064,000	\$11,418,750	\$13,865,000	\$7,322,000
Facility Cost	\$32,849,000	\$32,849,000	\$25,649,000	\$31,599,000	\$32,849,000
Total Capital Cost	\$54,059,000	\$38,913,000	\$37,067,750	\$45,464,500	\$40,171,000
Transit Capital Cost	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
2041 Annual Transit Operating Cost Impact					
Operating Costs Assuming Maintenance at New Facility					
Annual Environmental Cost	\$200,000	\$10,000	\$25,000	\$150,000	\$0
Maintenance Costs	\$1,578,095	1,578,095	1,578,095	\$1,000,743	\$1,347,154
Total Operating with Maintenance at Transit	\$1,778,095	\$1,588,095	1,603,095	\$1,150,743	\$1,347,154
Operating Costs Assuming Maintenance at Public Works:					
Annual Environmental Cost	\$200,000	\$10,000	\$25,000	\$150,000	\$0
Base Operating	\$1,578,095	\$1,578,095	\$1,578,095	\$1,000,743	\$1,347,154
Shuttle to Webber	\$150,959	\$130,836	\$110,712	\$161,022	\$221,393
Total Operating with Maintenance at Webber	\$1,929,054	\$1,718,931	\$1,713,807	\$1,211,765	\$1,568,547

* Includes adjacent land

5.4.1 Life Cycle Cost Impact

On a 30-year life cycle cost basis beyond full build-out of the transit facility by 2041, the annual transit operating cost increase associated with each site clearly influences the cost equation compared to capital and property cost considerations including the need for grading and soil

remediation at, for example, the Ashburnham site. Exhibit 11 summarizes the life cycle cost comparison for the sites.

Exhibit 11: 30-Year Life Cycle Cost Comparison

Cost Factor	Sites				
	551 Harper Rd/ 1490 Crawford Dr	587 Harper Rd	Site A	910 Monaghan Rd/ 575 Romaine St	420 Ashburnham Dr
Site Capital	\$21,210,000	\$6,064,000	\$11,418,750	\$13,865,000	\$7,322,000
Facility Capital	\$32,849,000	\$32,849,000	\$25,649,000	\$31,599,000	\$32,849,000
Transit Capital*	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
Total Capital	\$55,059,000	\$39,913,000	\$38,067,750	\$46,464,000	41,171,000
Annual Operating Cost Increase**					
Maintenance at Transit	\$53,342,850	\$46,742,850	\$48,092,850	\$34,522,290	\$40,414,620
Maintenance at Webber					
Base operating cost increase	\$53,342,850	\$46,742,850	\$48,092,850	\$34,522,290	\$40,414,620
Cost to Shuttle Buses to Webber	\$4,528,770	\$3,925,080	\$3,321,360	\$4,830,660	\$6,641,790
Total – Maintenance at Webber	\$57,871,620	\$50,667,930	\$51,414,210	\$39,352,950	\$47,056,410
Total Operating and Capital Cost – Maintenance at Transit	\$108,401,850	\$86,655,850	N/A	\$80,986,290	\$81,585,620
Total Operating and Capital Cost – Maintenance at Webber	\$112,930,620	\$90,580,930	\$89,481,960	\$85,816,950	\$88,227,410

*For recurring cost of shuttle vans every 3 years (10 x \$100,000)

**Constant 2017 dollars

N/A – not applicable

Taken together, the 30-year operating and capital costs for each of the sites provides a more comprehensive picture of the overall financial impact to the City in deciding between the sites. The Monaghan/Romaine site has the overall lowest combined cost, followed by the Ashburnham site, if maintenance is done at the transit facility. Specifically:

- While the Monaghan/Romaine site has one of the highest capital cost at \$46,464,000, it has the lowest operating cost impact, at \$34,522,290. The total life-cycle operating and capital cost is therefore **\$80,986,290**.
- Site A has the lowest capital cost at \$38,067,750 but has a higher operating cost of \$48,092,850, if maintenance is done at the transit facility, (which is not feasible for this site and therefore is Not Applicable). The total life-cycle operating and capital cost is therefore **\$86,160,600**.

- The Ashburnham Drive site has a marginally lower total life-cycle operating and capital cost compared to Site A, if maintenance is done on site, at **\$81,585,620**. If maintenance is done at Webber, Ashburnham would still have a slightly lower cost than Site A at **\$88,227,410**.

*Based on the combined 30-year operating and capital costs, the Monaghan/Romaine site has the lowest overall cost impact at **\$80,986,290** if maintenance is done at the transit facility.*

5.4.2 Transit Maintenance at Webber Public Works Yard

As indicated in the previous cost summaries and Exhibit 11, undertaking maintenance of the transit fleet at the Webber Avenue Public Works yard would incur additional annual operating costs associated with shuttling buses between the transit facility and the Public Works Yard. Over 30 years, the cost to maintain the transit fleet at the Webber facility compared to maintaining the fleet at the transit facility would result in additional operating costs of between **\$3,321,360** (Site A) to **\$6,641,790** (Ashburnham). For this reason, maintenance of the transit fleet except for major repairs, should be undertaken at the new transit facility. This is not feasible for Site A

5.5 Technically Preferred Sites

On the basis of the results of the evaluation scoring, and consideration of the capital and operating cost analysis, the preferred site for a new transit operations and maintenance facility is **910 Monaghan Road/575 Romaine Street**. The sites availability, overall size, and lowest operating cost are key factors in the sites ranking. This site also carries moderate risk associated with past uses.

420 Ashburnham Drive is the second ranked site. The ownership, operating cost and lower risk of this site contribute to its overall ranking.

6 Approved Site

6. This Section Left Blank Intentionally. To be completed upon City of Peterborough Council Selection of Approved Site.

Appendix A – Site Plans

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Exhibit A1: 551 Harper Road/1490 Crawford Drive Site Plan

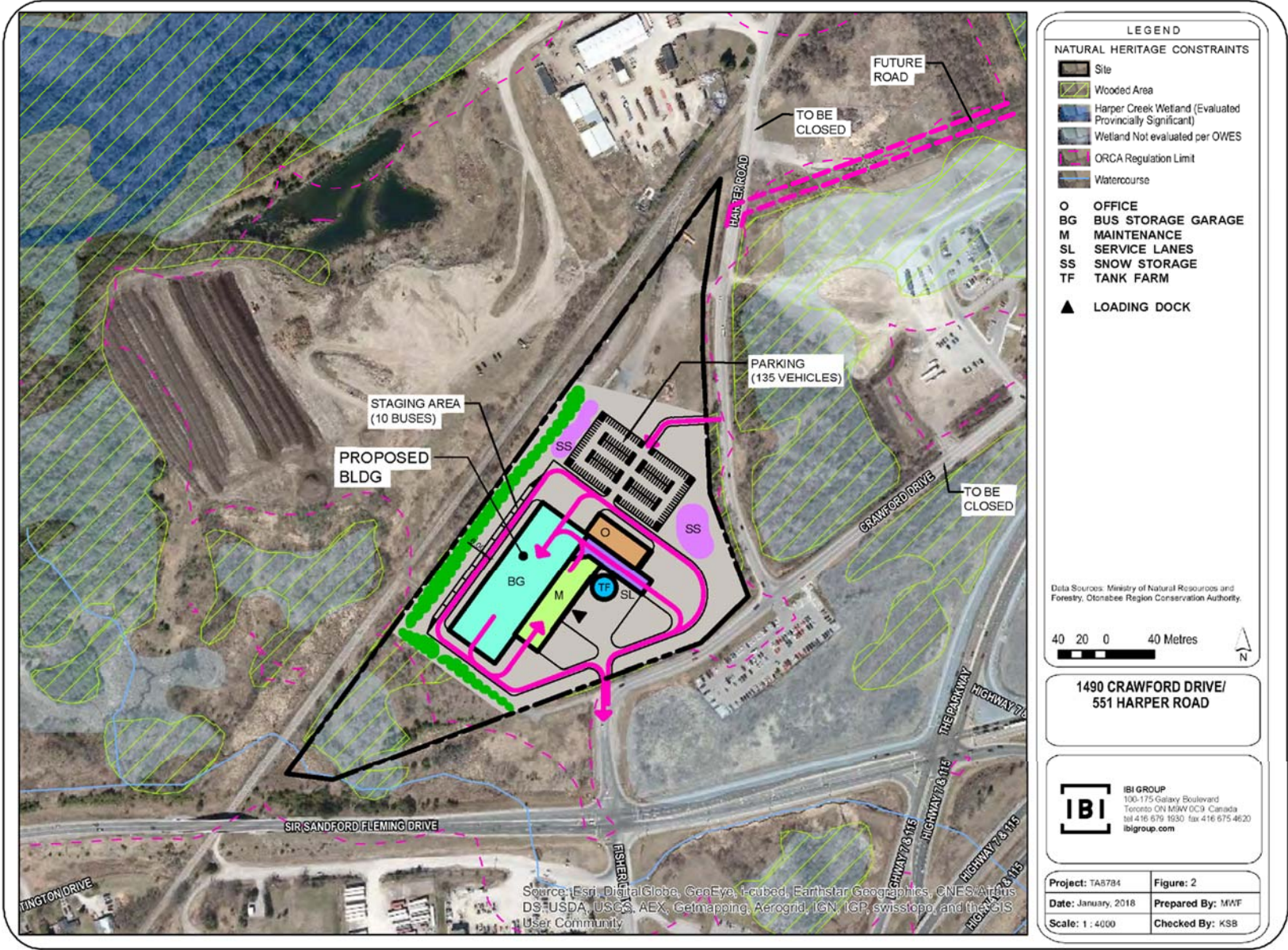


Exhibit A2: 587 Harper Road Site Plan

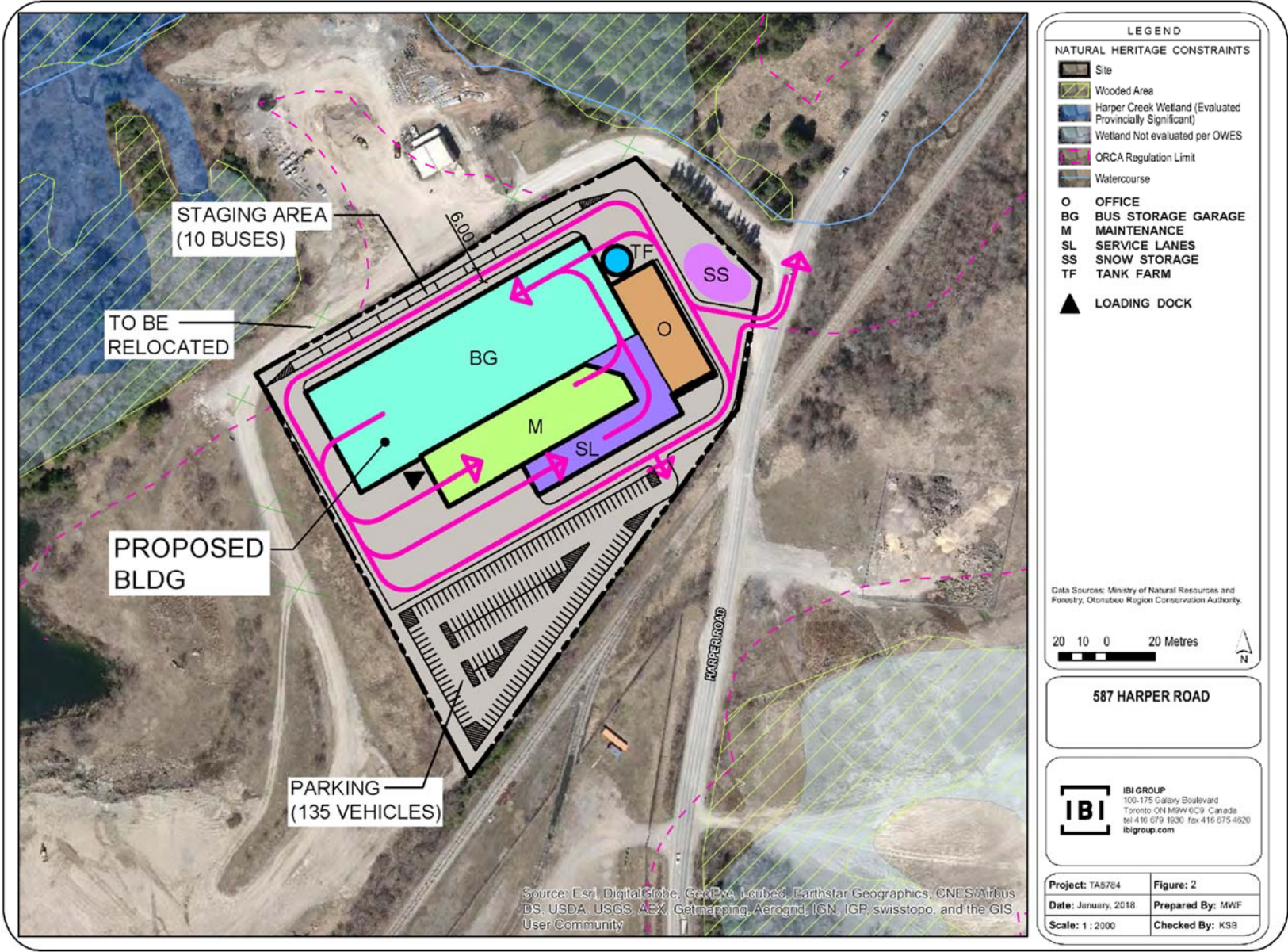


Exhibit A3: Site A

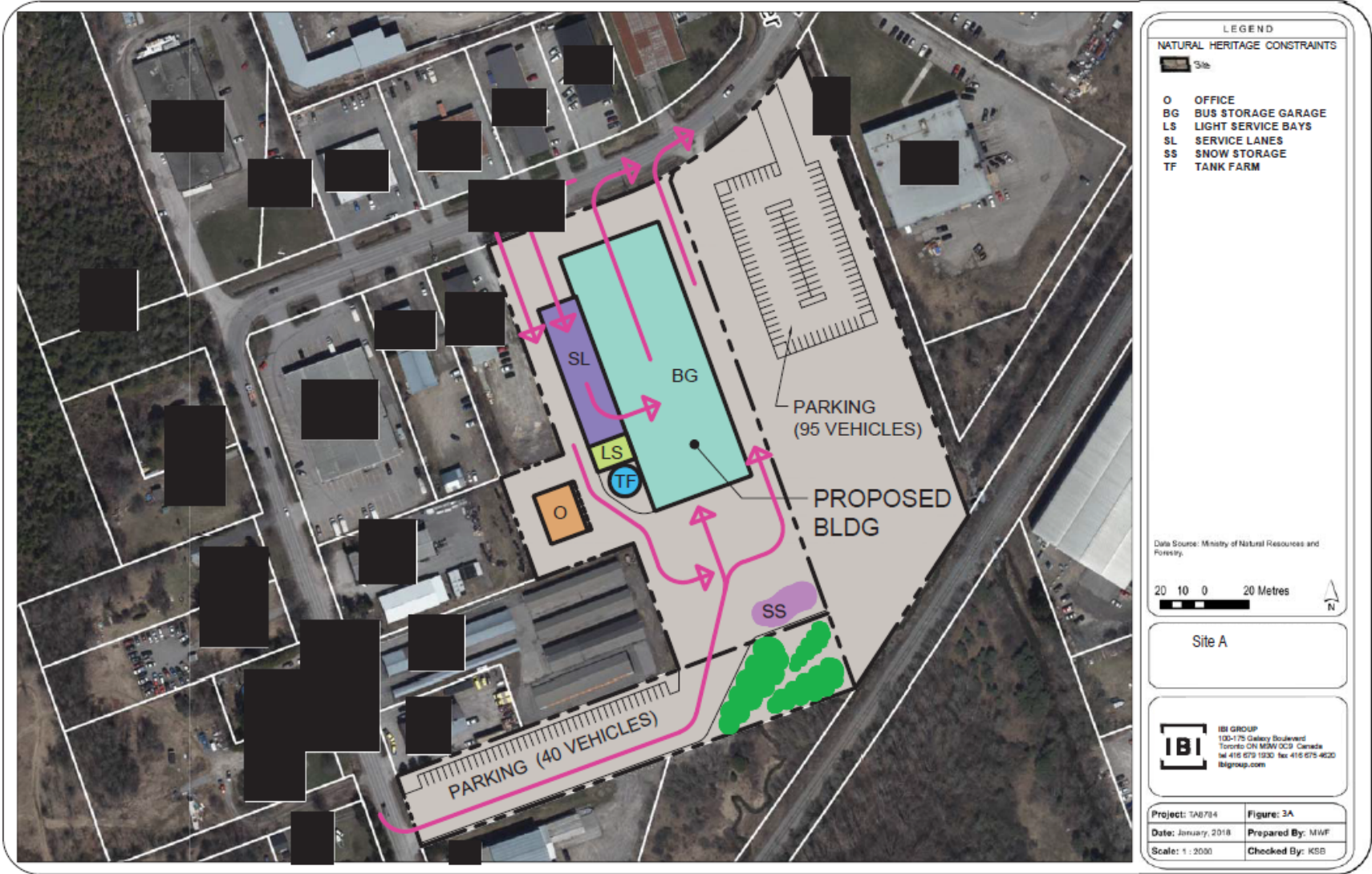


Exhibit A4: 910 Monaghan Road/575 Romaine Street Site Plan

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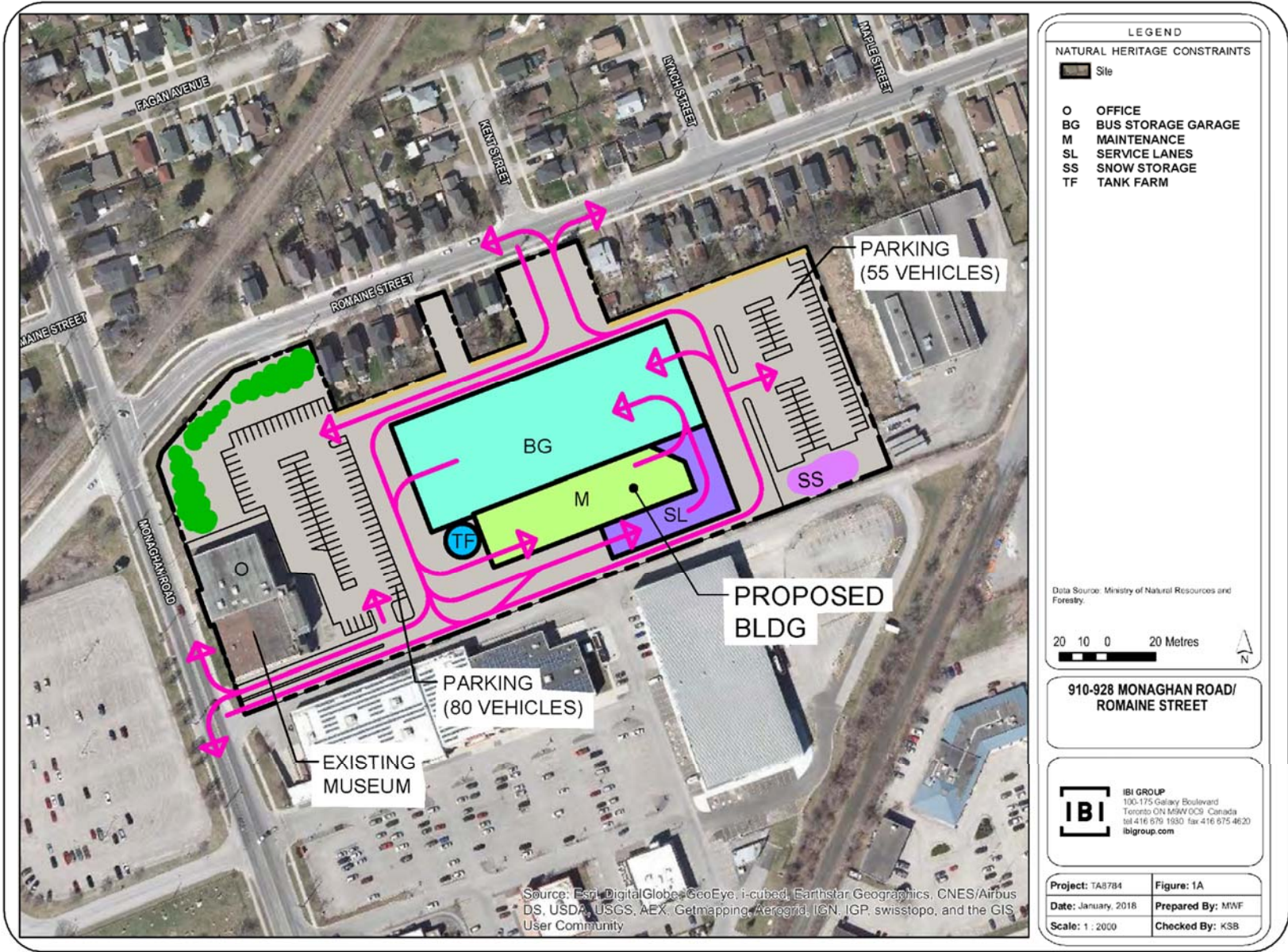
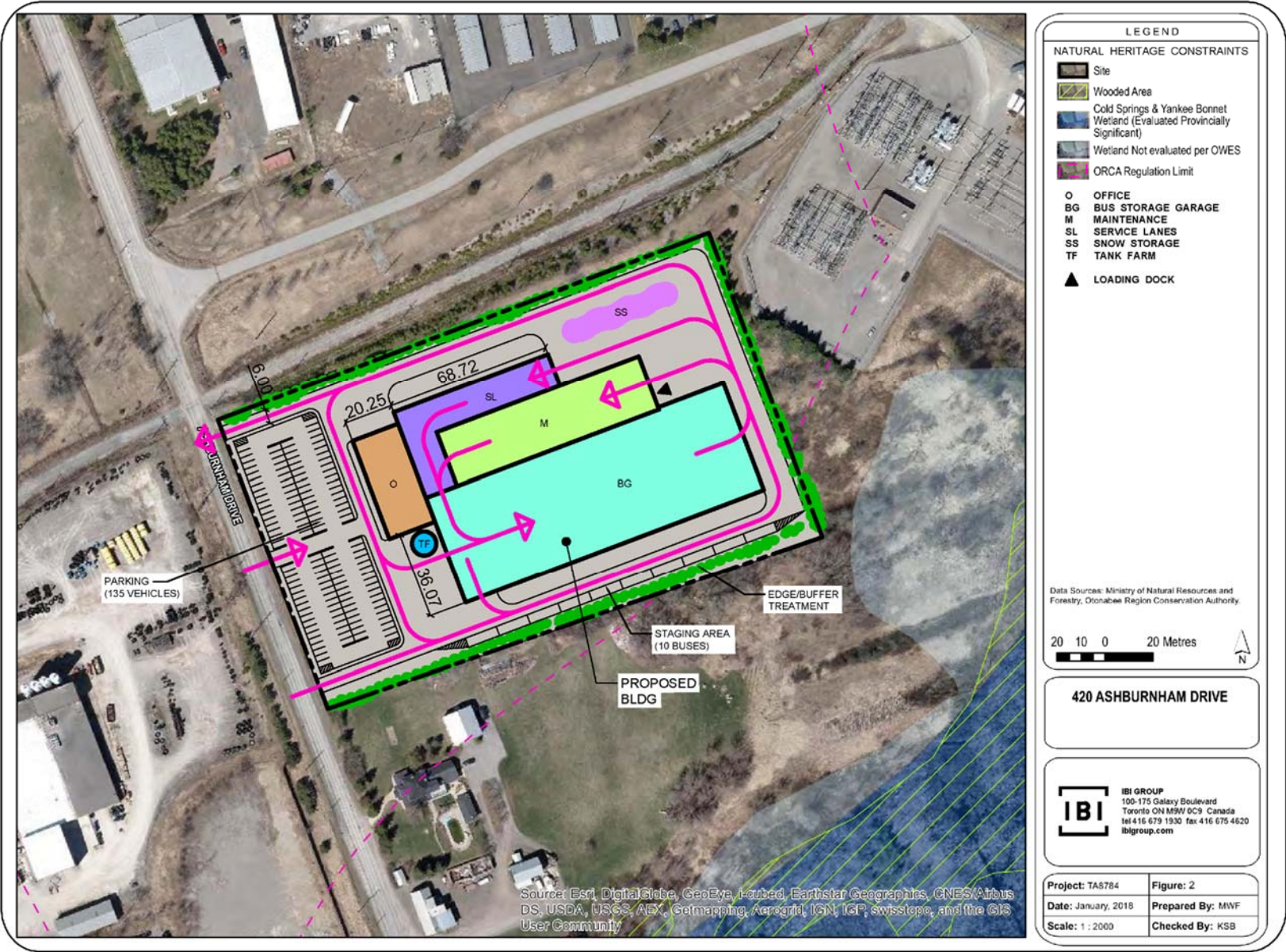


Exhibit A5: 420 Ashburnham Drive Site Plan



Appendix B – Detailed Site Scoring

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Site - 551 Harper Road/1490 Crawford Drive			
Criteria	Description	Scoring	Explanation
SITE CONDITIONS / OPERATIONS			
Site Availability	Is the site available for purchase/no existing business?	3	Site is available (City owned). No existing activities on site.
Suitability of Site	Is site able to accommodate the future transit facility?	3	Site will accommodate the transit facility
Ease of Site Access	Is the site readily accessible to/from main roads?	3	Site can be accessed from Harper Road and Crawford Drive
Site Contamination / Remediation	Is there known contamination and need for remediation?	0	The site is a former land fill. Process or ability to remove land fill is uncertain
SOCIO-CULTURAL ENVIRONMENT			
Official Plan and Zoning Compliance	Is property zoned for a transit facility and consistent with Official Plan?	3	Site is zoned for intended use.
Secondary Site Access	Is there a secondary access to/from the site?	3	Secondary access would be available from Harper Road
Potential Impact on Adjacent Land Use	To what degree will facility impact (noise, emissions, light) adjacent land use excluding natural environment (see below)?	3	Facility would have minimal impact on surrounding land uses due to location and largely undeveloped nature of the area
Safety / Traffic Control Needs	Can vehicles safely turn into/out of facility? Are traffic control measures required?	3	Vehicles can safely access site. Traffic control measures would not be required.
Traffic Impacts	To what degree does facility vehicle activity increase local traffic?	2	Transit vehicle activity would have a moderate impact on existing road traffic volume a concern expressed in the Public Open House

Site - 551 Harper Road/1490 Crawford Drive			
Criteria	Description	Scoring	Explanation
NATURAL ENVIRONMENT			
Impacts on Natural Environment	Will the facility result in the displacement or disturbance to any designated natural heritage features (PSW, ANSI, ESA), watercourses/fish habitat, or wildlife habitat? Are there any potential species at risk concerns?	0	Due to the presence of woodlands and wetland (unevaluated), an Environmental Impact Assessment needs to be conducted to determine potential impacts to these features. Consideration for impacts to the features present on adjacent lands, including the Harper Creek PSW, candidate Significant Wildlife Habitat and part of the Kawartha's Natural Connected Natural Heritage System should be made. The south-west portion of the site is within the ORCA Regulation Limit (to be confirmed by GIS mapping). A permit may be required from the ORCA under O. Reg. 167/06. The site is also a former land fill and the process for removal and disposition of the fill is uncertain.
ECONOMIC ENVIRONMENT			
Site Preparation and Servicing Costs	How much site prep (grading, fill) is required? Are services required?	0	Site will require removal of former land fill and extensive remediation, post construction monitoring etc..
Road Reconstruction Needs	Is reconstruction required for roads serving the site?	3	Roads serving the site will not require reconstruction
TRANSIT OPERATING COSTS AND LOGISTICS			
Impact on Transit Operating Costs and Logistics	To what extent does the location increase transit operating costs and bus travel times?	1	Location will significantly increase transit operating cost due to distance from downtown. If vehicle maintenance is handled at Webber Street, costs will increase further.
TOTAL		27	

Site - 587 Harper Road			
Criteria	Description	Scoring	Explanation
SITE CONDITIONS / OPERATIONS			
Site Availability	Is the site available for purchase/no existing business?	3	Site is available (City owned). Existing business is relocating
Suitability of Site	Is site able to accommodate the future transit facility?	1	Site size is insufficient to accommodate all facility functions and comply with necessary environmental setbacks. Off-site employee parking will be required with corresponding increase in transit operating costs.
Ease of Site Access	Is the site readily accessible to/from main roads?	3	Site would be accessed from Harper Road
Site Contamination / Remediation	Is there known contamination and need for remediation?	3	There is no known contamination of the site
SOCIO-CULTURAL ENVIRONMENT			
Official Plan and Zoning Compliance	Is property zoned for a transit facility and consistent with Official Plan?	2	Site is zoned for Open Space and not for the intended function. Conflicts with Official Plan designation.
Secondary Site Access	Is there a secondary access to/from the site?	0	There is no available secondary access to the site due to closure of railway crossing and dead-ending of street.
Potential Impact on Adjacent Land Use	To what degree will facility impact (noise, emissions, light) adjacent land use excluding natural environment (see below)?	3	Site will have minimal impact on adjacent land uses due to largely undeveloped nature of area.
Safety / Traffic Control Needs	Can vehicles safely turn into/out of facility? Are traffic control measures required?	3	Vehicles can safely access site. No requirement for traffic control measures
Traffic Impacts	To what degree does facility vehicle activity increase local traffic?	3	Facility vehicle activity will have minimal impact on local traffic due to dead-end nature of roadway

Site - 587 Harper Road			
Criteria	Description	Scoring	Explanation
NATURAL ENVIRONMENT			
Impacts on Natural Environment	Will the facility result in the displacement or disturbance to any designated natural heritage features (PSW, ANSI, ESA), watercourses/fish habitat, or wildlife habitat? Are there any potential species at risk concerns?	1	Due to the presence of a PSW, unevaluated wetlands, candidate Significant Wildlife Habitat and woodlands on adjacent lands (within 120 m), an Environmental Impact Assessment needs to be conducted to determine potential impacts to these features. Consideration for impacts to features present on adjacent lands that are part of the Kawartha's Natural Connected Natural Heritage System should be made. Edges of the site are within the ORCA Regulation Limit. A permit may be required from the ORCA under O. Reg. 167/06.
ECONOMIC ENVIRONMENT			
Site Preparation and Servicing Costs	How much site prep (grading, fill) is required? Are services required?	3	Site will require normal level of site preparation including removal of existing buildings. Site is serviced.
Road Reconstruction Needs	Is reconstruction required for roads serving the site?	1	Harper Road will require reconstruction along full length to handle bus activity
TRANSIT OPERATING COSTS AND LOGISTICS			
Impact on Transit Operating Costs and Logistics	To what extent does the location increase transit operating costs and bus travel times?	1	Location will result in significant annual increase in transit operating costs due to distance from downtown terminal. If vehicle maintenance handled at Webber Street, transit operating cost would increase further.
TOTAL		27	

Site -A			
Criteria	Description	Scoring	Explanation
SITE CONDITIONS / OPERATIONS			
Site Availability	Is the site available for purchase/no existing business?	1	Submitted by one site owner in response to the City issued RFI, price unknown. Uncertainty pertaining to adjacent site availability
Suitability of Site	Is site able to accommodate the future transit facility?	1	Insufficient size. Additional land required. Issue with the creek may eliminate the connection of the sites.
Ease of Site Access	Is the site readily accessible to/from main roads?	3	Have existing access from Rye and Harper. Relocating the access from Rye St. may improve the site circulation. Subject to setback issues for creek – meander belt may affect secondary access
Site Contamination / Remediation	Is there known contamination and need for remediation?	3	Level 2 study recommended due to current use. No known contamination
SOCIO-CULTURAL ENVIRONMENT			
Official Plan and Zoning Compliance	Is property zoned for a transit facility and consistent with Official Plan?	3	Industrial City
Secondary Site Access	Is there a secondary access to/from the site?	2	Rye and Harper. Subject to setback issues for creek
Potential Impact on Adjacent Land Use	To what degree will facility impact (noise, emissions, light) adjacent land use excluding natural environment (see below)?	2	Trout creek and setback distance from it may...
Safety / Traffic Control Needs	Can vehicles safely turn into/out of facility? Are traffic control measures required?	3	Possible sightline issues with future underpass (railway)
Traffic Impacts	To what degree does facility vehicle activity increase local traffic?	3	Moderate increase of 13% subject to future traffic increase due to construction of railway underpass

Site A			
Criteria	Description	Scoring	Explanation
NATURAL ENVIRONMENT			
Impacts on Natural Environment	Will the facility result in the displacement or disturbance to any designated natural heritage features (PSW, ANSI, ESA), watercourses/fish habitat, or wildlife habitat? Are there any potential species at risk concerns?	2	Proximity to creek; to be reviewed. The creek meander belt as well as protection of the watercourse must all be considered. An unevaluated wetland is also in close proximity to the site. EIS will be required and there is moderate potential for increased setbacks and mitigation.
ECONOMIC ENVIRONMENT			
Site Preparation and Servicing Costs	How much site prep (grading, fill) is required? Are services required?	2	Building demolition, fuel tank removals, relocated entrance from Rye, paving and grading. If adjacent site purchased, significant elevation difference
Road Reconstruction Needs	Is reconstruction required for roads serving the site?	2	Road will need to be upgraded, may already be in the plans
TRANSIT OPERATING COSTS AND LOGISTICS			
Impact on Transit Operating Costs and Logistics	To what extent does the location increase transit operating costs and bus travel times?	1	Location will result in significant annual increase in transit operating costs due to distance from downtown terminal.
TOTAL		28	

Site - 910 Monaghan Road / 575 Romaine Street			
Criteria	Description	Scoring	Explanation
SITE CONDITIONS / OPERATIONS			
Site Availability	Is the site available for purchase/no existing business?	3	Site available. Price unknown
Suitability of Site	Is site able to accommodate the future transit facility?	3	Accommodates transit site plus other City needs
Ease of Site Access	Is the site readily accessible to/from main roads?	3	Yes, from Monaghan and Romaine
Site Contamination / Remediation	Is there known contamination and need for remediation?	1	Contamination identified and partially remediated. \$3.88M to complete
SOCIO-CULTURAL ENVIRONMENT			
Official Plan and Zoning Compliance	Is property zoned for a transit facility and consistent with Official Plan?	3	Majority is Industrial City with some Residential (North Edge)
Secondary Site Access	Is there a secondary access to/from the site?	3	Yes, but through residential
Potential Impact on Adjacent Land Use	To what degree will facility impact (noise, emissions, light) adjacent land use excluding natural environment (see below)?	2	Will need to buffer for residential on Romaine Street
Safety / Traffic Control Needs	Can vehicles safely turn into/out of facility? Are traffic control measures required?	2	Traffic control will need detailed review. Romaine has sight line issues, can make entry only to site from Romaine
Traffic Impacts	To what degree does facility vehicle activity increase local traffic?	3	Impact minimal at 2% on Monaghan and 5% on Romaine

Site - 910 Monaghan Road / 575 Romaine Street			
Criteria	Description	Scoring	Explanation
NATURAL ENVIRONMENT			
Impacts on Natural Environment	Will the facility result in the displacement or disturbance to any designated natural heritage features (PSW, ANSI, ESA), watercourses/fish habitat, or wildlife habitat? Are there any potential species at risk concerns?	3	None
ECONOMIC ENVIRONMENT			
Site Preparation and Servicing Costs	How much site prep (grading, fill) is required? Are services required?	2	Large building demolition and site access revisions
Road Reconstruction Needs	Is reconstruction required for roads serving the site?	3	Minimal
TRANSIT OPERATING COSTS AND LOGISTICS			
Impact on Transit Operating Costs and Logistics	To what extent does the location increase transit operating costs and bus travel times?	3	Has lowest operating cost increase of sites
TOTAL		34	

Site - 420 Ashburnham Drive			
Criteria	Description	Scoring	Explanation
SITE CONDITIONS / OPERATIONS			
Site Availability	Is the site available for purchase/no existing business?	3	Site is available (City owned). No existing activity on site
Suitability of Site	Is site able to accommodate the future transit facility?	3	Site will accommodate the transit facility
Ease of Site Access	Is the site readily accessible to/from main roads?	3	Site is accessible from Ashburnham Drive
Site Contamination / Remediation	Is there known contamination and need for remediation?	3	There is no known contamination of the site
SOCIO-CULTURAL ENVIRONMENT			
Official Plan and Zoning Compliance	Is property zoned for a transit facility and consistent with Official Plan?	3	Site is zoned for intended use.
Secondary Site Access	Is there a secondary access to/from the site?	2	Secondary access is restricted and dependent on an alternative separate access point from Ashburnham Drive
Potential Impact on Adjacent Land Use	To what degree will facility impact (noise, emissions, light) adjacent land use excluding natural environment (see below)?	3	Facility will have limited impact on adjacent land use due to largely rural and industrial nature of location
Safety / Traffic Control Needs	Can vehicles safely turn into/out of facility? Are traffic control measures required?	2	Due to road grade, sightlines for vehicle turning into/out of facility and road traffic is restricted. Road needs to be regraded to reduce gradient and traffic signals installed for transit vehicles to access/exit site
Traffic Impacts	To what degree does facility vehicle activity increase local traffic?	1	Transit vehicle activity will increase road traffic by 37% on a daily basis although largely due to existing low volume of traffic

Site - 420 Ashburnham Drive			
Criteria	Description	Scoring	Explanation
NATURAL ENVIRONMENT			
Impacts on Natural Environment	Will the facility result in the displacement or disturbance to any designated natural heritage features (PSW, ANSI, ESA), watercourses/fish habitat, or wildlife habitat? Are there any potential species at risk concerns?	2	The south-east corner of the site is within the ORCA Regulation Limit. A permit may be required from the ORCA under O. Reg. 167/06. Due to the presence of a PSW and wetlands on adjacent lands (within 120 m), an Environmental Impact Assessment needs to be conducted to determine potential impacts to these features. Consideration for impacts to the features present on adjacent lands part of the Kawartha's Natural Connected Natural Heritage System should be made.
ECONOMIC ENVIRONMENT			
Site Preparation and Servicing Costs	How much site prep (grading, fill) is required? Are services required?	2	Site will require significant grading with retaining walls. Site is serviced
Road Reconstruction Needs	Is reconstruction required for roads serving the site?	1	Ashburnham Drive will need to be re-constructed south of Neal Drive to top of grade to handle bus traffic and reduce road gradient
TRANSIT OPERATING COSTS AND LOGISTICS			
Impact on Transit Operating Costs and Logistics	To what extent does the location increase transit operating costs and bus travel times?	2	Location will significantly increase transit operating costs due to distance from downtown. If all vehicle maintenance is to be handled at Webber Street, transit operating costs will increase further
TOTAL		30	

Appendix C – Transit Costing Analysis

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Weekdays/Year	Saturdays/Year	Sundays/Year	Holidays/Year	Operating Cost/Hour	Annual Towing Costs
252	52	52	9	\$76.95	\$12,000.00

Trip Type	Trips per Weekday	Trips per Saturday	Trips per Sunday	Trips per Holiday
Mainenance	12	9	4	4
Operations	144	68	50	50

Option A - Using only city streets (excluding Highway 7)

Candidate Garage Locations	Maintenance Trips between Candidate Garage Locations and Maintenance Facility (791 Webber Avenue)						
	Single Trip Time (min)*	Setup/Dropoff Time (min)**	Shuttle Time (min)***	Annual Setup/Dropoff Time (h)	Annual Shuttle Time (h)	Annual Maintenance Trip Time (h)	Annual Maintenance Trip Costs****
182 Townsend Street (Current Garage)	10.0	10.0	17.5	622.67	1,089.67	1,712.33	\$143,764.05
910 Monaghan Road / 575 Romaine Street	6.0	10.0	11.5	622.67	716.07	1,338.73	\$115,015.53
Site A	1.0	10.0	4.0	622.67	249.07	871.73	\$79,079.88
587 Harper Road	3.0	10.0	7.0	622.67	435.87	1,058.53	\$93,454.14
1490 Crawford Drive / 551 Harper Road	5.0	10.0	10.0	622.67	622.67	1,245.33	\$107,828.40
420 Ashburnham Drive	12.0	10.0	20.5	622.67	1,276.47	1,899.13	\$158,138.31

Candidate Garage Locations	Operational Trips between Candidate Garage Locations and Transit Terminal (190 Simcoe Street)				
	Distance (km)	Travel Time (min)***	Annual Travel Time (h)	Annual Operational Trip Time (h)	Annual Operational Trip Costs
182 Townsend Street (Current Garage)	1.1	8.5	6,073.82	6,073.82	\$467,380.19
910 Monaghan Road / 575 Romaine Street	2.5	13.0	9,289.37	9,289.37	\$714,816.77
Site A	4.9	20.5	14,648.62	14,648.62	\$1,127,211.05
587 Harper Road	5.5	20.5	14,648.62	14,648.62	\$1,127,211.05
1490 Crawford Drive / 551 Harper Road	6.0	20.5	14,648.62	14,648.62	\$1,127,211.05
420 Ashburnham Drive	5.2	17.5	12,504.92	12,504.92	\$962,253.34

Candidate Garage Locations	Total Annual Deadhead Trip Cost
182 Townsend Street (Current Garage)	\$611,144.24
910 Monaghan Road / 575 Romaine Street	\$829,832.30
Site A	\$1,206,290.93
587 Harper Road	\$1,220,665.19
1490 Crawford Drive / 551 Harper Road	\$1,235,039.45
420 Ashburnham Drive	\$1,120,391.65

* Includes actual experience

** = 7 + 3 minutes

*** = 2 people one way + 1 person return + 5 min set up/drop off time. Divided in half to assume this happens only half the time (but could be worse)

**** Includes \$12,000 per year towing costs

Weekdays/Year	Saturdays/Year	Sundays/Year	Holidays/Year	Operating Cost/Hour	Annual Towing Costs
252	52	52	9	\$76.95	\$12,000.00

Trip Type	Trips per Weekday	Trips per Saturday	Trips per Sunday	Trips per Holiday
Mainenance	12	9	4	4
Operations	144	68	50	50

Option B - Using all roads (including Highway 7)

Candidate Garage Locations	Maintenance Trips between Candidate Garage Locations and Maintenance Facility (791 Webber Avenue)						
	Single Trip Time (min)*	Setup/Dropoff Time (min)**	Shuttle Time (min)***	Annual Setup/Dropoff Time (h)	Annual Shuttle Time (h)	Annual Maintenance Trip Time (h)	Annual Maintenance Trip Costs****
182 Townsend Street (Current Garage)	10.0	10.0	17.5	622.67	1,089.67	1,712.33	\$143,764.05
910 Monaghan Road / 575 Romaine Street	6.0	10.0	11.5	622.67	716.07	1,338.73	\$115,015.53
Site A	1.0	10.0	4.0	622.67	249.07	871.73	\$79,079.88
587 Harper Road	3.0	10.0	7.0	622.67	435.87	1,058.53	\$93,454.14
1490 Crawford Drive / 551 Harper Road	5.0	10.0	10.0	622.67	622.67	1,245.33	\$107,828.40
420 Ashburnham Drive	10.0	10.0	17.5	622.67	1,089.67	1,712.33	\$143,764.05

Candidate Garage Locations	Operational Trips between Candidate Garage Locations and Transit Terminal (190 Simcoe Street)				
	Distance (km)	Travel Time (min)***	Annual Travel Time (h)	Annual Operational Trip Time (h)	Annual Operational Trip Costs
182 Townsend Street (Current Garage)	1.1	8.5	6,073.82	6,073.82	\$467,380.19
910 Monaghan Road / 575 Romaine Street	2.5	13.0	9,289.37	9,289.37	\$714,816.77
Site A	4.9	20.5	14,648.62	14,648.62	\$1,127,211.05
587 Harper Road	5.5	20.5	14,648.62	14,648.62	\$1,127,211.05
1490 Crawford Drive / 551 Harper Road	6	20.5	14,648.62	14,648.62	\$1,127,211.05
420 Ashburnham Drive	5.2	17.5	12,504.92	12,504.92	\$962,253.34

Candidate Garage Locations	Total Annual Deadhead Trip Cost
182 Townsend Street (Current Garage)	\$611,144.24
910 Monaghan Road / 575 Romaine Street	\$829,832.30
Site A	\$1,206,290.93
587 Harper Road	\$1,220,665.19
1490 Crawford Drive / 551 Harper Road	\$1,235,039.45
420 Ashburnham Drive	\$1,106,017.39

* Includes actual experience

** = 7 + 3 minutes

*** = 2 people one way + 1 person return + 5 min set up/drop off time. Divided in half to assume this happens only half the time (but could be worse)

**** Includes \$12,000 per year towing costs

Option A - Using only city streets (excluding Highway 7)

Candidate Garage Locations	Distance (metres) to Maintenance Facility (791 Webber Avenue)	Distance (metres) to Transit Terminal (190 Simcoe Street)
182 Townsend Street (Current Garage)	3800	1100
910 Monaghan Road / 575 Romaine Street	2100	2500
Site A	400	4900
587 Harper Road	1000	5500
1490 Crawford Drive / 551 Harper Road	1600	6000
420 Ashburnham Drive	5900	5200

Option B - Using all roads (including Highway 7)

Candidate Garage Locations	Distance (metres) to Maintenance Facility (791 Webber Avenue)	Distance (metres) to Transit Terminal (190 Simcoe Street)
182 Townsend Street (Current Garage)	3800	1100
910 Monaghan Road / 575 Romaine Street	2100	2500
Site A	400	4900
587 Harper Road	1000	5500
1490 Crawford Drive / 551 Harper Road	1600	6000
420 Ashburnham Drive	7000	5200