3) Property Ownership and Acquisition

<table>
<thead>
<tr>
<th>Site</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 7: Algoma</td>
<td>City of Ottawa</td>
</tr>
</tbody>
</table>

## 3.7 Site 8 Aviation Parkway

Figure 29 depicts the potential Aviation Parkway site.

### 3.7.1 Site Characteristics

1) **Topography and Grade**
   The site is relatively undeveloped and has a number of storm water outlets feeding into a watercourse. The pond area may require infill and relocation of the storm water management system. The land will require some grading.

2) **Land Use Compatibility**
   The land is zoned as ‘Open Space and Leisure’ and would need to be re-zoned to permit the construction of the M&S facility.

3) **Expansion Capability**
   The Aviation Parkway site is 18 hectares in area and exceeds the space requirement.

4) **Environment**
   - **Human**
     To the north are residential uses which may be impacted by construction and operational activities.
   - **Biological**
     The site has some ecological value, which may require some relocation and re-instatement. The site also has a watercourse close by that will require diversion. There is some mature wooded natural habitat.
   - **Physical**
     The geology of the site is shale.

### 3.7.2 Facility Operations

1) **Turnaround Loops**
   The size of the aviation parkway site will allow a turnaround loop; however, the impact of the Kettle Island interprovincial crossing highway modifications may limit this, and will require some further investigation.

2) **Municipal Services, Utilities and Power**
   Of important note is that the municipal services are non-existent and off-site. Construction of sewers and watermain will be required to service this site.

   Also, the watercourse is close to electrical power lines which will require special handling during construction. To the east of the site is a local electrical distribution substation, which may entail lower electrical construction costs but will require upgrade for the site.

<table>
<thead>
<tr>
<th>Site</th>
<th>Proximity</th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Park Drive</td>
<td>Site 8: Aviation Parkway</td>
<td>45° 25’ N</td>
<td>75° 36’ W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38.0°N</td>
<td>58.5°W</td>
</tr>
</tbody>
</table>
3) **Efficiency**  
The site has no existing roadway access. Access will have to be constructed from either the transitway, City Park Drive, Ogilvie Road or the Aviation Parkway.

4) **Track Redundancy and Reversal**  
The size and shape of the parcel of land will enable the track layout to provide redundancy. Reversals can be carried out in the space provided.

3.7.3 **Systems Operations**

1) **System Connectivity (Proximity to the Intended New Line)**  
The site is immediately next to the proposed alignment and therefore very attractive in terms of connectivity and optimum configuration for an M&S facility.

2) **Efficiency**  
The Aviation Parkway site is also considered one of the better positions as the vehicles will not have to travel any distances from the intended LRT alignment.

3) **Freight Rail Connectivity**  
There is no access to Freight Rail infrastructure in the vicinity of the site. Transfers to truck will be required for final delivery of LRV’s and other large components.

3.7.4 **Costs**

1) **Capital Costs**  
The site will require some grading and the construction of roads or ramps from existing highways to service the facility. Ideally, the pond will be filled and a new storm water management system to be created. It is also likely that some construction cost would be incurred in redirecting the stream.

Further costs would be incurred in the installation of new municipal services and utilities.

2) **Operating and Maintenance (O&M) Costs**  
As the site is next to the alignment this will ensure that O&M costs will be one of the lowest.

3) **Property Ownership and Acquisition**

<table>
<thead>
<tr>
<th>Site</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 8: Aviation Parkway</td>
<td>Province of Ontario (MTO), City of Ottawa, NCC</td>
</tr>
</tbody>
</table>

3.8 **Site 9 Pineview**

Figure 32 depicts the Pineview site.

3.8.1 **Site Characteristics**

1) **Topography and Grade**  
The land is relatively flat with some landscaping ponds which will require infilling.

2) **Land Use Compatibility**  
The land is zoned as ‘Open Space and Leisure’ and is within the Greenbelt and, as such, it may be an environmentally and politically sensitive choice.

3) **Expansion Capability**  
The area of the site is 12.5 hectares. There is limited scope for expansion unless more of the Pineview golf course is acquired at a later stage.

4) **Environment**  
   **Human**  
   No local residents would be affected by construction or operations; however, the golf course would be affected.
Biological
This site is located within the Greenbelt area and is surrounded by natural habitat to the south and east.

Physical
The site's geology is shale.

3.8.2 Facility Operations
1) Turnaround Loops
The site area is sufficient to establish a turnaround loop.

2) Municipal Services, Utilities and Power
The site is situated at a remote location which means that it has poor access to municipal services. These will incur additional construction costs.

Figure 33: Pineview Municipal Services, Utilities and Power

To the north are some electrical power lines which will require special handling during construction. Some concern has also been raised with regards to keeping the site drained, which will require additional consideration as part of a site design.

The additional power requirement for the facility will require an upgrade of the local electrical distribution system.

<table>
<thead>
<tr>
<th>Site</th>
<th>Proximity</th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Park Drive</td>
<td>Site 8. Aviation Parkway</td>
<td>45° 25'</td>
<td>75° 36'</td>
</tr>
<tr>
<td></td>
<td>Aviation Parkway</td>
<td>38.0°N</td>
<td>58.5°W</td>
</tr>
</tbody>
</table>

3) Efficiency
Road access can be achieved from Blair Road.

4) Track Redundancy and Reversal
Dual access is easily achieved as the facility is almost in parallel with the existing alignment and the track layout can accommodate this. Reversals can be carried out in the space provided.

Figure 34: Pineview Yard Layout

3.8.3 Systems Operations
1) System Connectivity (Proximity to the Intended New Line)
The site is closely located to proposed alignment and, therefore, is very attractive in terms of connectivity and optimum configuration for an M&S facility.

The site has some major advantages for an M&S facility, in that it is relatively close to the Blair station and, as the Transitway moves from the north to the south of highway 417, the alignment can easily connect to the maintenance facility and storage area. The position is good for a start/end service as it is beyond the Terminus location.

2) Efficiency
The Pineview site is considered one of the better positions as the vehicles do not have to travel any significant distance from the LRT alignment.

3) Freight Rail Connectivity
There is no access to the Freight Rail network. Transfers to truck will be required for final delivery of LRV’s and other large components.

3.8.4 Costs
1) Capital Costs
The construction of the M&S facility on this site would involve the construction of a bridge and ramps and some grading and land infill. There may also be some additional cost associated with the relocation of a water main that exists to the north.

Of important note is that the municipal services are non-existent and off-site. Construction of sewers and a watermain will be required to service this site.
2) Operating and Maintenance (O&M) Costs
Being an ‘end of line’ facility would have significant benefits to operational running costs and maintenance.

3) Property Ownership and Acquisition

<table>
<thead>
<tr>
<th>Site</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 9: Pineview</td>
<td>NCC (Leased to City of Ottawa).&lt;br&gt;City of Ottawa (small area of land close to 417 in north)&lt;br&gt;Private (small area of land either side of ramp on 417)</td>
</tr>
</tbody>
</table>

3.9 Site 10 Eastern Parkway
Figure 35 depicts the Eastern Parkway area.

3.9.1 Site Characteristics
1) Topography and Grade
The land is flat and requires little grading.

2) Land Use Compatibility
The area is zoned as ‘Agricultural’ and is located within the Greenbelt. This site would need to be re-zoned to permit the construction of the M&S facility. It should be noted that the Eastern Parkway area is outside the study zone and the LRT does not run this far out, although it follows the likely future route of an easterly expansion of the system to Orleans. Note that expansion to the east is beyond the 2031 planning period, unless specific density and ridership thresholds are reached.

It should be noted that commercial traffic is prohibited from the Rockcliffe Parkway and this will present some challenges for site support and deliveries. It is also located on the north side of the highway while the Transitway corridor has always been assumed to be protected on the south side.

3) Expansion Capability
The site is 15 hectares and can accommodate future expansion.

4) Environment
   Human
   It is important to note that the site is highly visible and in a prominent position adjacent to the Highway 174.

   Biological
   Although the area is designated agricultural, it forms part of the Greenbelt and will be affected by the NCC Greenbelt Master Plan.

   Physical
   The underlying geology is a mix of limestone and dolomite interbeds.

3.9.2 Facility Operations
1) Turnaround Loops
The area will permit a turnaround loop to be constructed.

2) Municipal Services, Utilities and Power
As this is a remote site, the municipal service and utilities are nonexistent and would need to be constructed to support the site.

Figure 36: Eastern Parkway Municipal Services, Utilities and Power
The additional power requirement for the facility will require an upgrade of the local electrical distribution system, and there are concerns of the proximity of a suitable distribution point that would be able to provide power without significant upgrade.

3) Efficiency
Access from the road would be a significant challenge and, not only would an additional interchange need to be
constructed, but also changes to the use of the parkway, to support site traffic.

4) Track Redundancy and Reversal
Dual access can be achieved with a site of this size. Reversals can be carried out in the space provided.

2) Efficiency
The site is the furthest away from the alignment and represents a less than desirable choice.

3) Freight Rail Connectivity
There is no access to the Freight Rail network. Transfers to truck will be required for final delivery of LRV’s and other large components. This site is located furthest from the nearest likely freight rail delivery point (Walkley Yard).

3.9.4 Costs
1) Capital Costs
Despite this being undeveloped land, the costs of installing municipal services; utilities and power will require significant investment. The site will also require some grading and the construction of new ramps and access to the road infrastructure.

2) Operating and Maintenance (O&M) Costs
The choice of this site will increase the operational and maintenance costs due to its remote location.

3) Property Ownership and Acquisition

<table>
<thead>
<tr>
<th>Site</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 10: Eastern Parkway</td>
<td>NCC Greenbelt</td>
</tr>
</tbody>
</table>

4. EVALUATION OF CANDIDATE SITES

An evaluation of candidate sites was followed, with each alternative ranked in terms of “responsiveness” to the relevant criteria on a scale of 0-3; from least to most responsive, using the indicators identified. The overall, most responsive alternative was then identified by summarizing the degree to which each of the criteria and associated indicators were met. The responsiveness was ranked for each of the alternatives.
<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Candidate Site 1</th>
<th>Candidate Site 2</th>
<th>Candidate Site 3</th>
<th>Candidate Site 4</th>
<th>Candidate Site 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical Access</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Resource Availability</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Environmental Impact</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Social Impact</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Table 1: Evaluation Summary of Candidate Sites**
Table 2: Evaluation of Candidate Sites (Comparative Evaluation)

<table>
<thead>
<tr>
<th>Option</th>
<th>Evaluation criteria: Site characteristics</th>
<th>Evaluation criteria: Facility Operations</th>
<th>Evaluation criteria: System Operations</th>
<th>Evaluation criteria: Costs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1: Bayview (North and South)</td>
<td>1.2</td>
<td>2.3</td>
<td>3.0</td>
<td>2.3</td>
<td>8.8</td>
</tr>
<tr>
<td>Option 2: Hurdman (North)</td>
<td>1.3</td>
<td>3.0</td>
<td>2.8</td>
<td>2.0</td>
<td>8.7</td>
</tr>
<tr>
<td>Option 3: Hurdman (South)</td>
<td>0.8</td>
<td>2.8</td>
<td>2.3</td>
<td>1.0</td>
<td>7.9</td>
</tr>
<tr>
<td>Option 4: Tremblay</td>
<td>2.0</td>
<td>2.8</td>
<td>2.3</td>
<td>1.7</td>
<td>8.1</td>
</tr>
<tr>
<td>Option 5: St. Laurent Bus Depot</td>
<td>3.0</td>
<td>2.5</td>
<td>1.7</td>
<td>1.7</td>
<td>8.8</td>
</tr>
<tr>
<td>Option 6: Industrial / St Laurent-Innes St / St Laurent</td>
<td>2.8</td>
<td>2.5</td>
<td>1.3</td>
<td>1.3</td>
<td>8.0</td>
</tr>
<tr>
<td>Option 7: Algoma</td>
<td>2.7</td>
<td>2.5</td>
<td>2.0</td>
<td>2.0</td>
<td>7.8</td>
</tr>
<tr>
<td>Option 8: Aviation Parkway</td>
<td>1.5</td>
<td>2.3</td>
<td>2.0</td>
<td>2.0</td>
<td>7.8</td>
</tr>
<tr>
<td>Option 9: Pineview</td>
<td>1.2</td>
<td>2.3</td>
<td>2.0</td>
<td>2.0</td>
<td>7.7</td>
</tr>
<tr>
<td>Option 10: Eastern Parkway</td>
<td>1.7</td>
<td>1.8</td>
<td>0.3</td>
<td>0.3</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Table 3: Evaluation of Candidate Sites (Percentage Ranking)

<table>
<thead>
<tr>
<th>Option</th>
<th>Evaluation criteria: Site characteristics</th>
<th>Evaluation criteria: Facility Operations</th>
<th>Evaluation criteria: System Operations</th>
<th>Evaluation criteria: Costs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1: Bayview (North and South)</td>
<td>7.0</td>
<td>9.0</td>
<td>9.0</td>
<td>7.0</td>
<td>67%</td>
</tr>
<tr>
<td>Option 2: Hurdman (North)</td>
<td>8.0</td>
<td>12.0</td>
<td>7.0</td>
<td>6.0</td>
<td>69%</td>
</tr>
<tr>
<td>Option 3: Hurdman (South)</td>
<td>5.0</td>
<td>11.0</td>
<td>7.0</td>
<td>6.0</td>
<td>60%</td>
</tr>
<tr>
<td>Option 4: Tremblay</td>
<td>12.0</td>
<td>11.0</td>
<td>7.0</td>
<td>5.0</td>
<td>69%</td>
</tr>
<tr>
<td>Option 5: St. Laurent Bus Depot</td>
<td>18.0</td>
<td>10.0</td>
<td>3.0</td>
<td>5.0</td>
<td>79%</td>
</tr>
<tr>
<td>Option 6: Industrial / St Laurent-Innes St / St Laurent</td>
<td>17.0</td>
<td>10.0</td>
<td>4.0</td>
<td>5.0</td>
<td>73%</td>
</tr>
<tr>
<td>Option 7: Algoma</td>
<td>16.0</td>
<td>10.0</td>
<td>6.0</td>
<td>4.0</td>
<td>71%</td>
</tr>
<tr>
<td>Option 8: Aviation Parkway</td>
<td>9.0</td>
<td>9.0</td>
<td>6.0</td>
<td>6.0</td>
<td>63%</td>
</tr>
<tr>
<td>Option 9: Pineview</td>
<td>7.0</td>
<td>10.0</td>
<td>6.0</td>
<td>6.0</td>
<td>60%</td>
</tr>
<tr>
<td>Option 10: Eastern Parkway</td>
<td>10.0</td>
<td>7.0</td>
<td>0.0</td>
<td>1.0</td>
<td>38%</td>
</tr>
</tbody>
</table>
### 4.1 Short Listed Sites

The weighted average methodology scores St. Laurent Depot, Bayview North and South, Tremblay and Hurdman North as the sites with the most potential for M&S facility, despite their inherent development, public sensitivity and ownership issues.

By using the percentage ranking methodology, we produce more realistic choices in terms of development potential. However, by using this method, we must understand that the choices proposed would not be as efficient in terms of facility or system operations, and would potentially incur more construction cost than the choices proposed by the weighted average methodology.

The percentage ranking analysis reveals three candidate sites that may be suitable. The table below provides details of their advantages and disadvantages:

<table>
<thead>
<tr>
<th>Site</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| St. Laurent Bus Depot | • Appropriate use of zoned land.  
• Centralised facility.  
• Little or no environmental issues.  
• Requires purchase of a single additional Site. | • Higher connectivity costs.  
• Higher O&M costs.  
• Requires major development of existing Bus Depot site.  
• Higher construction costs.  
• May impact bus operations. |
| Industrial St. Laurent – Innes St / St. Laurent | • Appropriate use of zoned land.  
• Close to size required.  
• Good road and rail access.  
• With other land | • Two distinct parcels of land.  
• Higher O&M costs.  
• Higher construction costs.  
• More complex track layout. |

### 5. FINAL SITE SELECTION

#### 5.1 Overview

Although three sites have been short listed, the proximity to the alignment and cost of implementation of Sites 6 and Site 7 preclude their use as the final site. As such, Site 5 and its surrounding area up to the western side of the Belfast Road bridge has been evaluated to determine the optimum site positioning.

It should be noted that after some additional site investigations it was found that a tunnel crossing under the Belfast Road bridge and the CN Rail track, or a route to the south west of the bridge, would entail high engineering and construction costs due to the bridge angle, type of construction, and the angle of intersection of the new “cut and cover” tunnel with the existing rail line. Furthermore, there are some additional rail facilities to the west of the bridge, which have been identified as the railway signaling system, which would also require relocation and reconstruction.

The Figure 38 shows a proposed new connection between the transitway and the M&S facility. This uses a northbound connecting track which utilizes a “cut and cover” tunnel to pass perpendicular and underneath to the CN track, and run in parallel with the northbound Belfast Road underneath the area allocated for the Hydro-One corridor. The “cut and cover” tunnel will then part in easterly and westerly directions to connect to the main track.

The location of the “cut and cover” is critical as a number of placement criteria must be met:

1. The track emanating from the VIA Rail station must match the vehicle technology gradient requirements. The closer the westward “cut and cover” tunnel exit moves towards the station, the more difficult this becomes to maintain.
2. The “cut and cover” tunnel must surface at an appropriate gradient for entry into the yard. As the yard moves in a westerly direction, a gradient suitable for the vehicle technology becomes more difficult to achieve without lowering the entire site to maintain a nominal gradient.
3. The “cut and cover” tunnel must have enough depth to safely pass underneath the CN Rail track and support the freight loads safely.
4. Once the “cut and cover” tunnel passes underneath the CN Rail track it must move back to grade which requires a minimum length of track which must intersect with the main track grade.
5. The tunnel must be deep enough or pass to the west side of the existing Hydro-One pylon, or must integrate the pylon foundations into the tunnel structure.
Within this zone of interest, three M&S facility locations have been established against the site evaluation criteria developed earlier in this report.

**Location 1: Easterly Position** (Using part of the existing St Laurent Bus Depot parking lot).

**Location 2: Westerly Position** (Using the existing OC Transpo storage area and westerly properties).

**Location 3: Central Position** (Using existing OC Transpo storage area, 767 Belfast Road and Pepsi bottling plant).

5.2 **Location 1 Easterly Position**

Figure 39 depicts the Easterly Position of the M&S facility.

5.2.1 **Site Characteristics**

1) **Topography and Grade**
   The area is flat and will require some grading to ensure the best possible surface for the track layout.

2) **Land Use Compatibility**
   The area is zoned ‘Industrial’ and the M&S facility will utilize the sites of the existing OC Transpo storage yard, the Pepsi bottling plant and a section of the existing OC Transpo parking lot.

3) **Expansion Capability**
   Land to the west of the site (7.3 hectares) associated with properties on 645, 681, 707, 731, 747 and 767 Belfast Road could be purchased when the need arises or when it becomes available, and will approximately double the storage area of the facility if needed in the future.

4) **Environment**
   **Human**
   Earlier in the report it was stated that there was no perceivable impact on residents. However, development of this site should ensure that local residents are less disadvantaged by site work, construction noise and ongoing operational effects. The construction of the “cut and cover” tunnel which passes underneath or to the side of the Hydro-One corridor, running to the north of Belfast Road, will temporarily disrupt the residents whose rear yards will be affected by the digging of the tunnel trench.

   Screening and noise attenuation can be carried out and, in fact, there will be an overall net benefit to the appearance of the industrialized area with landscaping. While farthest from the residential uses, this site has the least amount of room for screening.

   **Biological**
   There is some biodiversity in the area, but this can be restored with a re-instatement or replacement program.

   **Physical**
   The underlying geology is designated as shale and may be pertinent during the excavation of the M&S building which requires deep foundations to support the pit areas within the floor.

5.2.2 **Facility Operations**

1) **Turnaround Loops**
   The layout of the track in this area provides very large curves for the movement of vehicles. This, coupled with continuous welded rail, provides the opportunity to have quieter running than that normally associated with tight curves and jointed track, helping to reduce the impacts of ambient environmental noise.

2) **Municipal Services, Utilities and Power**
   The industrialised area ensures that there are some well established services available. Although electrical power exists at 1710 Russell St., Hydro-One has an overhead
pylon system that can be reached at Belfast Bridge. Providing redundant supplies could be achieved, this may be a strategic access point that would enable either building a primary power supply for the facility or a redundant connection.

The size and ability of the Hydro-One system to carry the additional power demands for the facility has not yet been established.

3) Efficiency
Road access from Belfast road is very good and requires very little in the way of modification, although the impacts to the OC Transpo parking lot will necessitate some modification of the parking and cause a redistribution of spaces to the west.

4) Track Redundancy and Reversal
The track area has been configured as a continuous loop which allows the vehicles to enter on one line and re-insert themselves back onto the main track or enter the storage or maintenance tracks, change driving ends and/or reverse out.

5.2.3 Systems Operations

1) System Connectivity (Proximity to the Intended New Line)
Of the three locations, the Easterly Position is the furthest away from the alignment; however, this distance has a number of benefits:

1) The distance of the line enables it to be used as a training or test track during off peak hours.
2) The track requires a “cut and cover” tunnel which can act as a temporary shelter for trains that are awaiting insertion into service.
3) Although some disruption will occur in the construction, the finished “cut and cover” tunnel will still allow access to the Belfast Road properties at 645, 681, 707, 731, 747 and 767.

2) Efficiency
The dead head distance from the alignment to the M&S facility is approximately 1100 metres from the main alignment.

Because this site is integrated into the St. Laurent Depot, it may not be suitable as a P3 project.

3) Freight Rail Connectivity
The location of the M&S facility is adjacent to the CN Rail corridor and it should be noted that the area once supported heavy rail sidings from the main line. Reinstatement of this could be beneficial for the delivery of vehicles if economically viable.

5.2.4 Costs

1) Capital Costs
The location of the site leads to the highest construction costs associated with the extra length of tunnel (approximately $16 Million).

The cost of access reinstatement and replacement of front yard parking to the properties along Belfast Road is also the highest.

2) Operating and Maintenance (O&M) Costs
The longer distance from the alignment will entail the largest additional power consumption and additional non-revenue kilometers for the vehicle fleet.

3) Property Ownership and Acquisition

<table>
<thead>
<tr>
<th>Site</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC Transpo Storage</td>
<td>City of Ottawa</td>
</tr>
<tr>
<td>Botting plant</td>
<td>Pepsi Cola Corporation</td>
</tr>
</tbody>
</table>

This site requires acquisition of the Pepsi bottling plant which is considered to be the most expensive to acquire. It also requires that the front yards of all the other properties along Belfast Road be acquired for the “cut and cover” tunnel.

5.3 Location 2: Westerly Position

Figure 40 depicts the Westerly Portion of the M&S facility.

5.3.1 Site Characteristics

1) Topography and Grade
The area is predominantly flat and will require some additional grading to the far west side as the area slopes
towards the CN Rail line. One important note is that to achieve an appropriate gradient for the “cut and cover” tunnel and the closer proximity of the site to the western approach means that there is some additional risk of increased grading to lower the facility or to enable the optimum positioning of switches and crossovers for the line.

2) Land Use Compatibility
The area is zoned ‘Industrial’ and the M&S facility will utilize the sites of 645, 681, 707, 731, 747 and 767 Belfast Road.

3) Expansion Capability
Any spare land to the west of the site is fairly limited and will only permit a very small amount of expansion. Any major expansion will be achieved by the later purchase of the Pepsi bottling plant and will provide an additional 5.1 hectares of land.

4) Environment

Human
The westerly position has a higher risk of impacting residents, as this site is the closest to the properties directly overlooking the CN Rail line. The construction of the “cut and cover” tunnel which passes underneath the Hydro-One corridor, running to the north of Belfast Road, will temporarily disrupt the residents whose rear yards will be affected by the digging of the tunnel trench. Screening and noise attenuation can be carried out and, in fact, there will be an overall net benefit to the appearance of the industrialized area. While closest to the residential uses, this site has the most amount of room for screening.

Biological
There is some biodiversity in the area, but this can be replaced with a re-instatement or replacement program.

Physical
The underlying geology is shale and may be pertinent during the excavation of the M&S building which requires deep foundations to support the pit areas within the floor.

5.3.2 Facility Operations

1) Turnaround Loops
The layout of the track in this area provides very large curves for the movement of vehicles. This, coupled with continuous welded rail, provides the opportunity to have quieter running than that normally associated with tight curves and jointed track, helping to reduce the impacts of ambient environmental noise. The design of the layout would have to consider the potentially greater impacts of train movements on local residents.

2) Municipal Services, Utilities and Power
The industrialised area ensures that there are some well established services available. Although electrical power exists at 1710 Russell St., Hydro-One has an overhead pylon system that can be reached at Belfast Bridge. Providing redundant supplies could be achieved, this may be a strategic access point that would enable either building a primary power supply for the facility or a redundant connection.

The size and ability of the Hydro-One system to carry the additional power demands for the facility has not yet been established.

3) Efficiency
Road access from Belfast road is very good and requires very little in the way of modification.

4) Track Redundancy and Reversal
The track area has been configured as a continuous loop which allows the vehicles to enter on one line and re-insert themselves back onto the main track or enter the storage or maintenance tracks, change driving ends and/or reverse out.

5.3.3 Systems Operations

1) System Connectivity (Proximity to the Intended New Line)
Of the three locations, the Westerly Portion is the closest to the alignment; however, this distance has a number of benefits:

1) The distance of the still line enables it to be used as a training or test track during off peak hours.
2) Although shorter, the “cut and cover” tunnel will still be able to act as a temporary shelter for trains that are awaiting insertion into service.

2) Efficiency
The dead head distance from the alignment to the M&S facility is approximately 400 metres from the main alignment.

Because this site is fully segregated from the St. Laurent Deport, it is likely to be the most attractive as a P3 project.

3) Freight Rail Connectivity
The location of the M&S facility is adjacent to the CN Rail corridor and it should be noted that the area once supported heavy rail sidings from the main line. Reinstatement of this could be beneficial for the delivery of vehicles if economically viable.

5.3.4 Costs

1) Capital Costs
The location of the site leads to the lowest construction cost associated with the length of the “cut and cover” tunnel (approximately $13 Million).
There is no access reinstatement cost associated with this site.

2) Operating and Maintenance (O&M) Costs
The distance from the alignment will entail the lowest power consumption and minimize non-revenue kilometers for the vehicle fleet.

3) Property Ownership and Acquisition

<table>
<thead>
<tr>
<th>Site</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC Transpo Storage</td>
<td>City of Ottawa</td>
</tr>
<tr>
<td>767 Belfast</td>
<td>Greater Ottawa Investments</td>
</tr>
<tr>
<td>747 Belfast</td>
<td>Greater Ottawa Investments</td>
</tr>
<tr>
<td>731 Belfast</td>
<td>W G Investments Ottawa Ltd</td>
</tr>
<tr>
<td>707 Belfast</td>
<td>791111 Ont Ltd</td>
</tr>
<tr>
<td>681 Belfast</td>
<td>l’association des Enseignants Franco-Ontariens</td>
</tr>
<tr>
<td>645 Belfast *</td>
<td>Condominium Corporation</td>
</tr>
</tbody>
</table>

* 645 Belfast Road could remain in position; however, the “cut and cover” tunnel entrance position makes the reinstatement of access difficult.

This site does not require acquisition of the Pepsi bottling plant, which is considered to be the most expensive to acquire.

5.4 Location 3: Central Position
Figure 41 depicts the Central Position of the M&S facility.

5.4.1 Site Characteristics

1) Topography and Grade
The area is predominantly flat and may require some additional grading to the west side as the area slopes towards the CN Rail line.

2) Land Use Compatibility
The area is zoned ‘Industrial’ and the M&S facility will utilize the existing sites of the Pepsi Bottling plant, the OC Transpo storage yard, and 767 Belfast Road to provide the required area.

3) Expansion Capability
Expansion of the site will be achieved using the areas (5.1 hectares) associated with properties on 645, 681, 707, 731 and 747 Belfast or to the east by using some of the existing OC Transpo parking lot.

4) Environment

Human
This site is marginally closer to the residents on the north side of the CN line than the Easterly Position, but not as close as the Westerly Position. As with the Easterly Position, mitigation measures can be established which will minimize the impact of this.

The construction of the “cut and cover” tunnel which passes underneath the Hydro-One corridor, running to the north of Belfast Road, will temporarily disrupt the residents whose rear back lots will be affected by the digging of the tunnel trench.

Screening and noise attenuation can be carried out and, in fact, there will be an overall net benefit to the appearance of the industrialized area.

Biological
There is some biodiversity in the area, but this can be restored with a re-instatement or replacement program.

Physical
The underlying geology is designated as shale and may be pertinent during the excavation of the M&S facility building which requires deep foundations to support the pit areas within the floor.

5.4.2 Facility Operations

1) Turnaround Loops
The layout of the track in this area provides very large curves for the movement of vehicles. This, coupled with continuous welded rail, provides the opportunity to have quieter running than that normally associated with tight curves and jointed track, helping to reduce the impacts of ambient environmental noise.

2) Municipal Services, Utilities and Power
The industrialised area ensures that there are some well established services available. Although electrical power exists at 1710 Russell St., Hydro-One has an overhead pylon system that can be reached at Belfast Bridge.
Providing redundant supplies could be achieved, this may be strategic access point that would enable either building a primary power supply for the facility or a redundant connection.

The size and ability of the Hydro-One system to carry the additional power demands for the facility has not yet been established.

3) Efficiency
Road access from Belfast road is very good for the M&S facility; however, the properties at 681, 707, 731, 747 Belfast Road will require modifications to their frontal access and may require turning restrictions for vehicular access.

4) Track Redundancy and Reversal
The track area has been configured as a continuous loop which allows the vehicles to enter on one line and re-insert themselves back onto the main track or enter the storage or maintenance tracks, change driving ends and/or reverse out.

5.4.3 Systems Operations
1) System Connectivity (Proximity to the Intended New Line)
The Easterly Position is situated approximately 800 metres away from the alignment; however, this distance has a number of benefits:
1) The distance of the line enables it to be used as training or test track during off peak hours.
2) The track requires a “cut and cover” tunnel which can act as a temporary shelter for trains that are awaiting insertion into service.
3) Although some disruption will occur in the construction, the finished “cut and cover” tunnel will only allow unchanged access to 645 Belfast Road. The remaining properties at 681, 707, 731, 747 will require a shared access road with main access being achieved at 681 Belfast Road.

2) Efficiency
The dead head distance from the alignment to the M&S facility is approximately 800 metres from the main alignment.
There is likely sufficient separation from the St. Laurent Depot to facilitate a P3 project.

3) Freight Rail Connectivity
The location of the M&S facility is adjacent to the CN Rail corridor and it should be noted that the area once supported heavy rail sidings from the main line.
Reinstatement of this could be beneficial for the delivery of vehicles if economically viable.

5.4.4 Costs
1) Capital Costs
The location of the site leads to an approximate cost of $14 Million for the “cut and cover” tunnel.
There is a cost associated with the reinstatement of access to the properties along Belfast Road, but not as great as for the Easterly Position.

2) Operating and Maintenance (O&M) Costs
The distance from the alignment will entail the second largest additional power consumption and non-revenue kilometers for the vehicle fleet.

3) Property Ownership and Acquisition

<table>
<thead>
<tr>
<th>Site</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>681 Belfast*</td>
<td>L'association des Enseignants</td>
</tr>
<tr>
<td></td>
<td>Franco-Ontariens</td>
</tr>
<tr>
<td>645 Belfast*</td>
<td>Condominium Corporation</td>
</tr>
</tbody>
</table>

* denotes properties where front yard land acquisition is required for “cut and cover” tunnel.

6. EVALUATION OF ST. LAURENT DEPOT SITE
An additional evaluation of the Easterly, Westerly and Central Positions within the overall St. Laurent Depot site was undertaken, with each alternative ranked in terms of “responsiveness” to the relevant criteria on a scale of 0-3; from least to most responsive, using the indicators identified. The overall most responsive alternative was then identified by summarizing the degree to which each of the criteria and associated indicators were met. The responsiveness was ranked for each of the alternatives (see Table 5).

It is more important to note that this was a completely separate evaluation, and that the ranking scale is meant to distinguish the three St. Laurent Depot Positions and is not related to the rankings contained in the evaluation of the ten original candidate sites.

The evaluation has been carried out as two assessments:
1) In accordance with the existing standard ‘comparative evaluation’ methodology; this provides an unbiased comparison of the locations and the evaluation criteria (see Table 6).

2) A ‘percentage ranking’ methodology; which weights the site characteristics to provide findings that more realistically portray public opinion, regardless of the outcome of the categories. This method was chosen as the ‘comparative evaluation’ can favour a location which has issues of complex development, ownership or public sensitivity (see Table 7).
### Table 5: Evaluation Summary of Locations

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Location 1: Easterly Position</th>
<th>Location 2: Westerly Position</th>
<th>Location 3: Central Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topography</td>
<td>2 Requires some grading and infill.</td>
<td>2 Requires some grading and infill.</td>
<td>3 Requires some grading and infill.</td>
</tr>
<tr>
<td>Land use compatibility</td>
<td>A-1 Zoned ‘Industrial’. Farthest from Residential area (200m).</td>
<td>A-2 Zoned ‘Industrial’. Closest to area.</td>
<td>A-3 Limited expansion without additional sites to the West. (Multiple site purchases)</td>
</tr>
<tr>
<td>Shape and size of facility</td>
<td>2 Good expansion with ability to purchase properties to the west.</td>
<td>3 Limited expansion without additional sites to the West. (Multiple site purchases)</td>
<td>2 Limited expansion without additional sites to the West. (Multiple site purchases)</td>
</tr>
<tr>
<td>Overall Score</td>
<td>323</td>
<td>222</td>
<td>333</td>
</tr>
<tr>
<td>Environmental Impact</td>
<td>3 Little room for mitigation of impacts on Residential area.</td>
<td>2 Little room for mitigation of impacts on Residential area.</td>
<td>3 Little room for mitigation of impacts on Residential area.</td>
</tr>
<tr>
<td>Overall Score</td>
<td>332</td>
<td>222</td>
<td>333</td>
</tr>
<tr>
<td>Accessibility</td>
<td>3 No perceived issues.</td>
<td>2 No issues, layout sized for obtaining from existing facilities.</td>
<td>3 No perceived issues.</td>
</tr>
<tr>
<td>Overall Score</td>
<td>333</td>
<td>222</td>
<td>333</td>
</tr>
<tr>
<td>Potential for future development</td>
<td>2 Good compromise on closeness to main alignment and test track length.</td>
<td>3 Close to rail line and old connecting track main alignment and test track length.</td>
<td>2 Close to rail line.</td>
</tr>
<tr>
<td>Overall Score</td>
<td>223</td>
<td>232</td>
<td>132</td>
</tr>
<tr>
<td>Facility Operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proximity to alignment</td>
<td>2 Closest to alignment.</td>
<td>2 Good compromise on closeness to alignment.</td>
<td>2 Closest to alignment.</td>
</tr>
<tr>
<td>Length and complexity of spur line</td>
<td>3 Close to rail line.</td>
<td>2 Close to rail line and old connecting track main alignment and test track length.</td>
<td>2 Close to rail line and old connecting track main alignment and test track length.</td>
</tr>
<tr>
<td>Overall Score</td>
<td>223</td>
<td>232</td>
<td>132</td>
</tr>
<tr>
<td>Costs</td>
<td>2 Lowest cost.</td>
<td>3 Medium cost.</td>
<td>3 Highest cost.</td>
</tr>
<tr>
<td>Overall Score</td>
<td>333</td>
<td>222</td>
<td>133</td>
</tr>
<tr>
<td>Ownership and acquisition</td>
<td>3 City of Ottawa, Pepsi Cola Corporation, 767 Belfast, 747 Belfast, 731 Belfast, 707 Belfast, 707 Belfast, 681 Belfast, Belfast.</td>
<td>2 Medium cost.</td>
<td>2 Medium cost.</td>
</tr>
<tr>
<td>Overall Score</td>
<td>131</td>
<td>222</td>
<td>333</td>
</tr>
</tbody>
</table>

### Table 6: Evaluation of Locations (Comparative Evaluation)

<table>
<thead>
<tr>
<th>Evaluation criteria: Site characteristics</th>
<th>Location 1: Easterly Position</th>
<th>Location 2: Westerly Position</th>
<th>Location 3: Central Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Score</td>
<td>7.7</td>
<td>10.5</td>
<td>9.0</td>
</tr>
</tbody>
</table>

### Table 7: Evaluation of Locations (Percentage Ranking)

<table>
<thead>
<tr>
<th>Evaluation criteria: Site characteristics</th>
<th>Location 1: Easterly Position</th>
<th>Location 2: Westerly Position</th>
<th>Location 3: Central Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Percentage Ranking</td>
<td>69%</td>
<td>83%</td>
<td>77%</td>
</tr>
</tbody>
</table>

### 6.1 Location Comparison

Under both the ‘comparative evaluation’ and the ‘percentage ranking’ methodologies, the Westerly Position emerges as the preferred site for the M&S facility.

Its principal advantages are that it is the least expensive in terms of capital costs and maintenance and operation costs, and that it is considered to be the least expensive and least complicated in terms of land acquisition.

It should be noted, as well, that the entrance track into the facility will have to be carefully designed because of its grade, and that the test track is less than ideal.
APPENDIX A  SUPPORTING GEOGRAPHICAL MAPS