

Bayshore Station to Moodie Drive LRT Extension Environmental Assessment Studies

Public Meeting 22 March 2017



- Introductions
- Background and Scope
- Network Options
- Bus Rapid Transit (BRT) conversion
- Light Maintenance and Storage Facility (LMSF)
- Bayshore Station Expanded Bus Terminal
- Schedule
- Next steps

BACKGROUND & SCOPE



Background

- BRT Transitway Extension from Bayshore Station to Moodie Drive currently under construction
- Expected revenue service in November 2017
- Conversion from BRT to LRT in the Ultimate Network but not in the Affordable Network
- Inclusion of Moodie LRT extension/LMSF within Stage 2 looking increasingly likely
- EA addenda's initiated with this in mind

Scope of Environmental Assessments

- Bayshore to Moodie
 - City priorities for expansion to the west
 - LRT station closer to DND employment node
 - Conversion from BRT to LRT
 - Siting of an LMSF beyond Bayshore
- Bayshore Expanded Bus Terminal
 - Updated ridership – more space required
 - Not needed if Moodie is end of line

Study Process

- Modifications to approved EPR

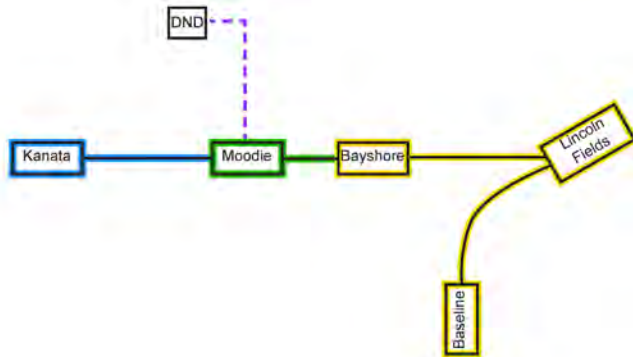
| Modifications consistent with EPR | Insignificant modifications inconsistent with EPR | Significant modifications inconsistent with EPR |
|-----------------------------------|---|---|
| Proceed with modification | Prepare addendum | Prepare addendum |
| | Update local project file | Notice of Environmental Project Report Addendum |
| | | Public Review |
| | | Ministerial Approval |

LRT NETWORK OPTIONS

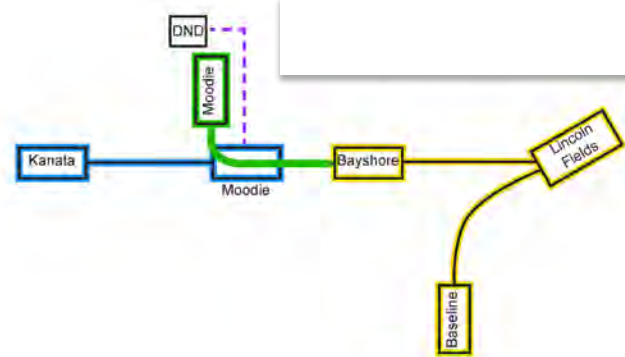


Network Options

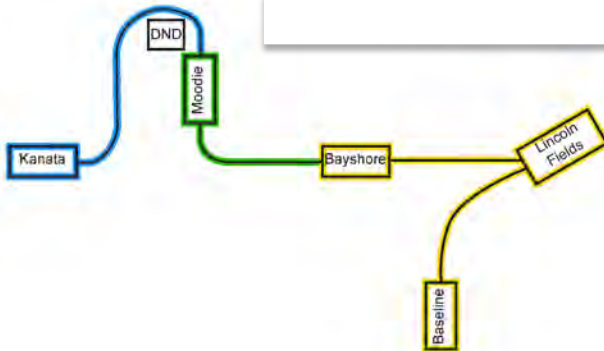
Option 1



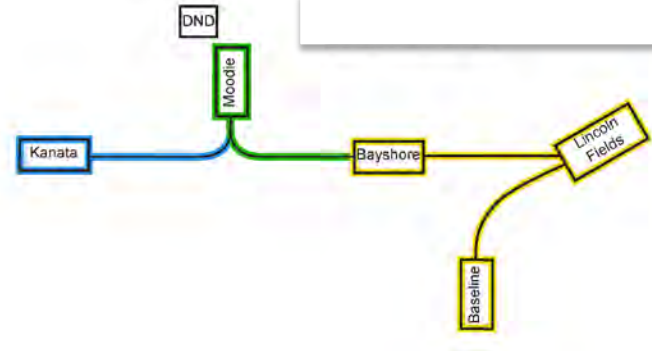
Option 2/2A



Option 3

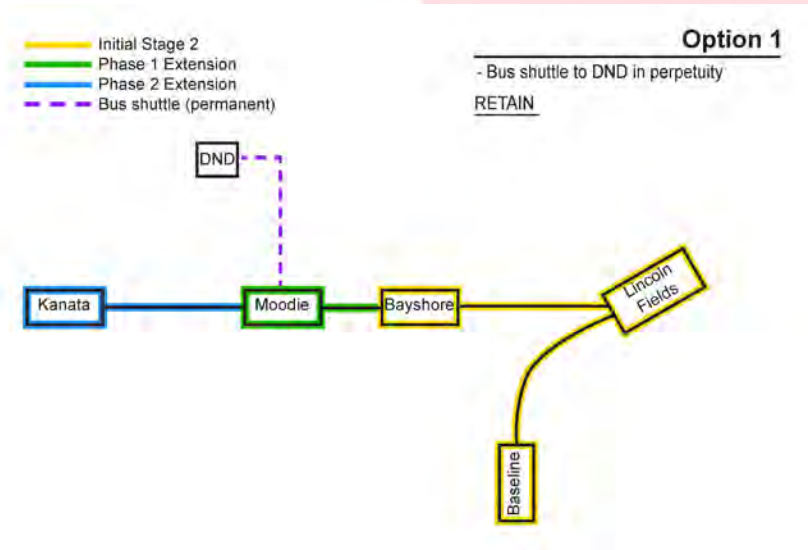


Option 4



Preferred Network Option

- No throw away capital costs/least cost to implement
- Through riders not impacted by LRT diverting to DND
- Most direct route to serve majority of passengers who are destined west of Moodie
- DND bus shuttle less costly to operate compared to LRT service
- Consistent with previous City studies re Kanata LRT extension/alignment



BRT TO LRT CONVERSION



Reuse of Existing BRT Infrastructure

- Alignment/retaining walls/noise barriers
- BRT Station (to the extent possible)
- 417 ramp grade separation
- Stillwater Creek improvements
- Holly Acres Bridge (as designed)
- Add Kiss and Ride
- Expand Bus terminal

Conversion from Buses to LRT Vehicles

- Conversion of BRT to LRT eliminates 200,000 bus trips annually
- Existing and future air quality conditions all fall below the allowable limits of CO, HC, NO_x, and PM



Noise & Vibration

- Existing background noise (Highway 417 traffic) is the predominant noise source
- Two noise barriers recommended to attenuate noise from future highway traffic to be retained
- Potential relocation of Holly Acres noise barrier to north side of new LRT bridge
- Vibration impacts not considered an issue/no mitigation needed



Storm Water Management/Drainage

- LRT impact is positive:
 - Decreased amount of impervious surfaces
 - No new SWM initiatives required
 - Maintain existing SWM initiatives implemented for BRT



Council Motion for Moodie Park and Ride

- Council approved the February 24 FEDCO motion as follows;
THEREFORE BE IT RESOLVED that staff be directed to explore opportunities for a Park and Ride to be located at the Moodie Station with consultation among all the large landowners in the immediate vicinity including leasing opportunities with the National Capital Commission;
 - THEREFORE BE IT FURTHER RESOLVED that staff report back to FEDCO by the end of 2017.
 - Moved by Mayor J. Watson (on behalf of Councillor S. Qadri)
- Stage 2 staff are investigating possible options

LIGHT MAINTENANCE & STORAGE FACILITY(LMSF)



Western LMSF Options

- Belfast MSF to be expanded to full capacity
 - Will handle all heavy maintenance/ inspections/overhauls of entire LRT fleet
- Three “light” MSF options in the west:
 - Utilize existing Baseline 3 cell box structure
 - Build Woodroffe LMSF as per West LRT EA
 - Build LMSF in LRT extension beyond Bayshore

LMSF Location Options

- Baseline Station cleaning/ storage facility not ideal:
 - Not designed for storage and cleaning
 - Not all LMSF work could be performed here
 - Inferior to purpose built LMSF but could be an interim facility until new LMSF is affordable
 - If built first, convert to non revenue vehicle maintenance to avoid throw away costs
- Woodroffe LMSF:
 - Requires mitigation measures due to proximity to community
 - Not ideally located in terms of deadhead mileage
 - Lengthy elevated guideway from Baseline to LMSF does not attract ridership
 - Cost to connect to Woodroffe site is high due to extremely poor soil conditions
 - City has no plans to extend LRT beyond Baseline in the foreseeable future

Preferred LMSF Location

- Moodie/Kanata LMSF Site Preferred
- Extension of LRT to the west beyond Bayshore is a City priority
 - Lower cost to connect to LMSF as revenue service LRT is planned/no throw away costs
 - Purpose built facility can be implemented for all LMSF work
 - Lower deadhead mileage compared to Woodroffe site

LMSF Distance from the Main Line

Separation of an MSF from the main line affects:

- Increased labour costs to access the yard
- Increased deadhead mileage for LRT vehicles/mileage costs
- Increased maintenance costs for track, OCS, track bed, etc.
- The amount of time available for nightly maintenance of LRT infrastructure

Importance of Nightly Maintenance Window

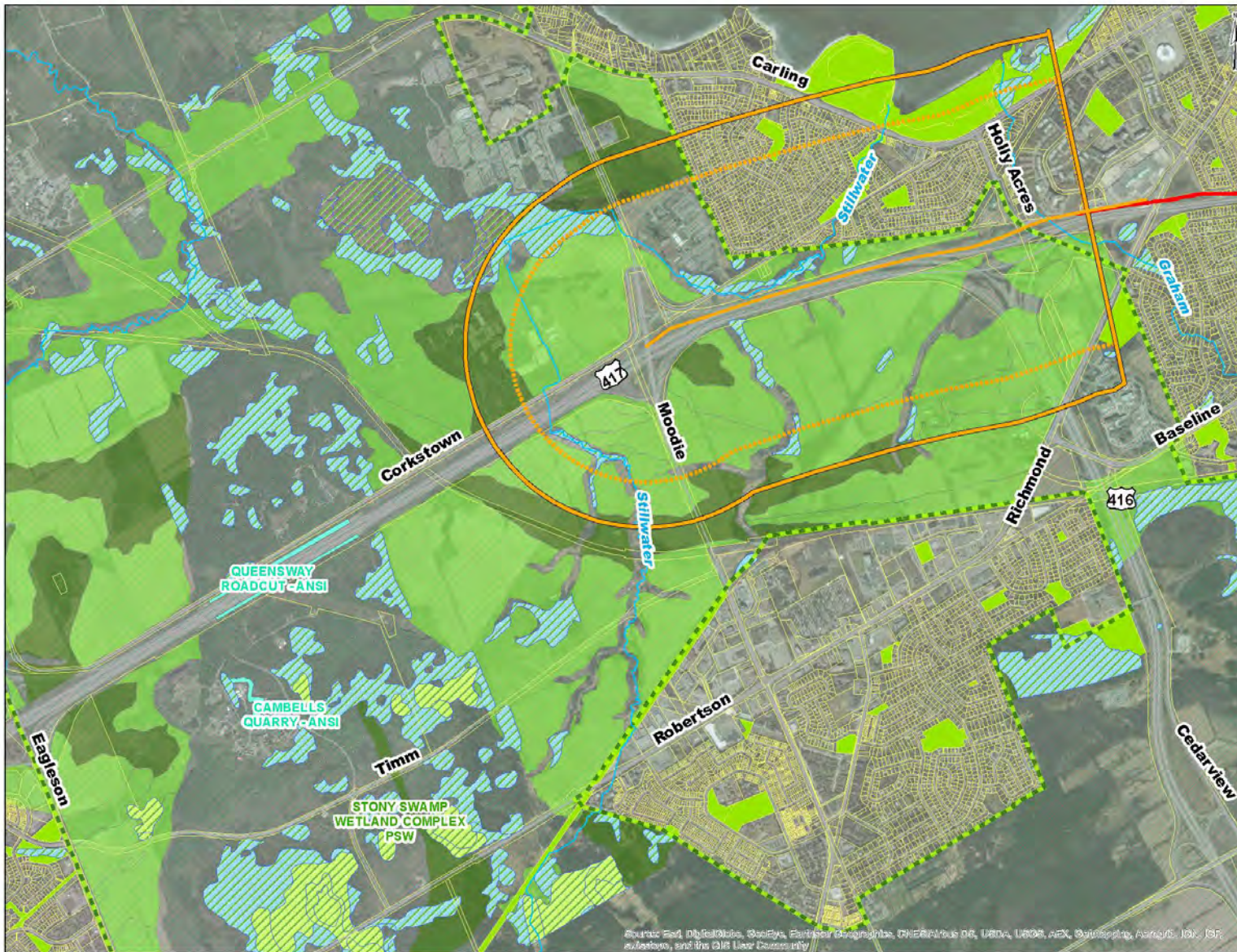
- Nightly maintenance window is 4-5 hours
- If it takes an additional 15 minutes inbound and outbound to get from the yard to the mainline the available nightly maintenance window is reduced 10-12.5 % in perpetuity

LMSF Distance Criteria to the Main Line

- Vast majority of Canadian MSF's (light and heavy rail) are within 200 m of the mainline including all 5 existing TTC rail yards
- Existing Belfast MSF is 525 m from main line
- Woodroffe MSF (1200 m) is excessive leading to LMSF search in Moodie LRT area
- 750 m adopted as a search criteria (50 % longer than Belfast MSF distance to main line)



Moodie/Kanata LMSF Site Alternatives

- Alternative LMSF locations identified using the following site characteristics:
 - **Topography and Grade:** Level ground
 - **Size:** Approximately 16 hectares
 - **Environment:** Avoid areas of geographical, environmental and historical importance
 - **Connections:** Connect to LRT corridor
 - **Access Redundancy:** Two tracks required for LMSF access and egress



Legend

- Moodie-Kanata LRT Extension
- Confederation Line - West
- ⋯ MSF Search Zone - 750m
- MSF Search Zone - 1000m
- Road Network
- Property Parcels
- Watercourses / Waterbody
- Greenbelt
- Parks
- Wetland Significance**
- ▨ Not evaluated per OWES
- ▨ Evaluated-Other
- ▨ Evaluated-Provincial
- ANSI**
- ▨ ANSI, Earth Science
- Agriculture Capability**
- 1
- 2
- 3

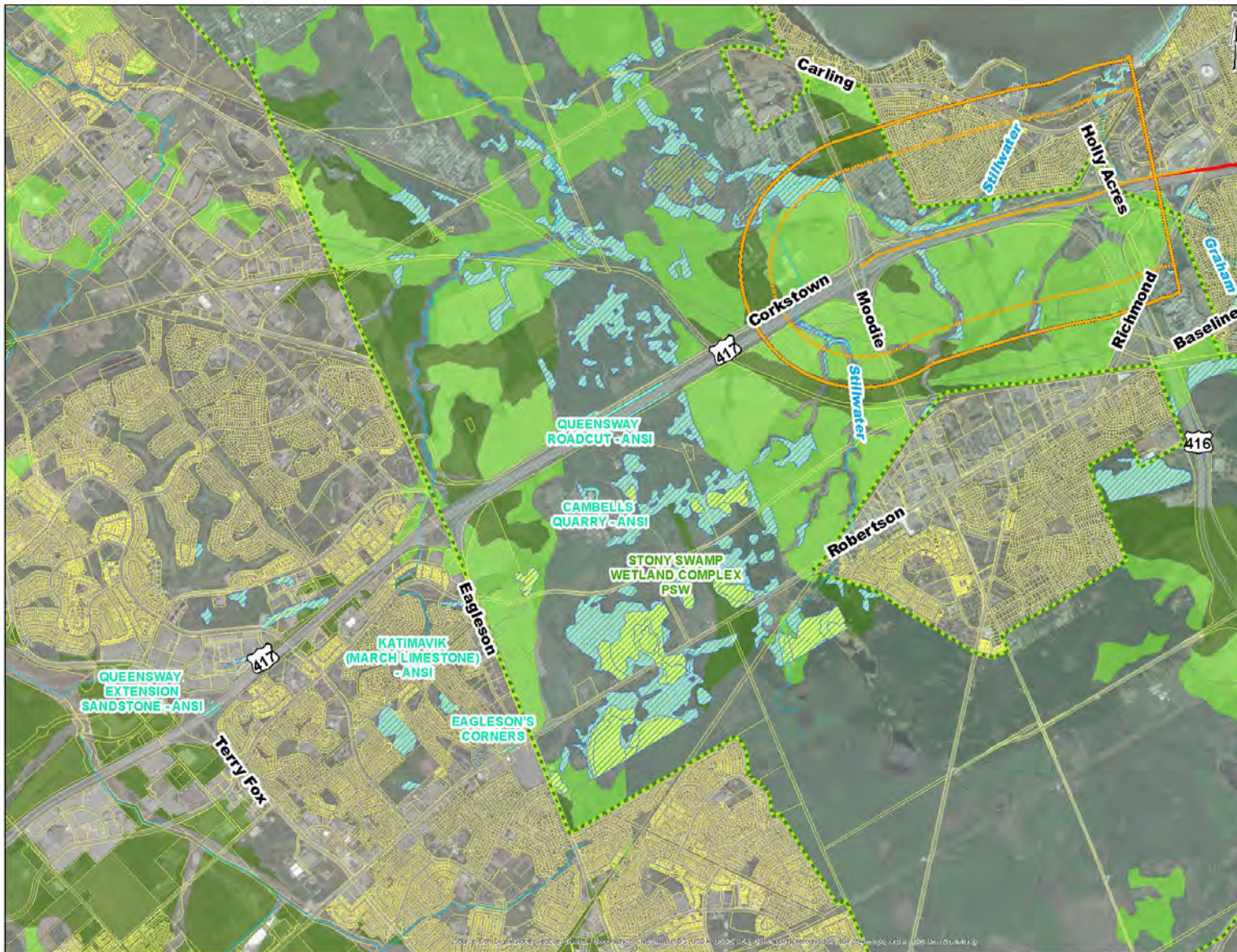



Scale: 1:20,000
 0 0.25 0.5 1 Kilometers

Title: Ottawa Light Rail Transit
 Moodie Extension -
 MSF Siting Assessment Criteria

Date: February, 2017 Drawing No.: Overview

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, AeroGRID, IGN, SPT, Airbus, and the City of Ottawa



- Legend**
- Moodie-Kanata LRT Extension
 - Confederation Line - West
 - MSF Search Zone - 750m
 - MSF Search Zone - 1000m
 - Road Network
 - Property Parcels
 - Watercourses / Waterbody
 - Greenbelt
 - Wetland Significance**
 - Not evaluated per OWES
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 - ANSI**
 - ANSI, Earth Science
 - Agriculture Capability**
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 - 2
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Scale: 1:30,000
 0 0.25 0.5 1 Kilometres

Task: Ottawa Light Rail Transit
 Moodie Extension -
 MSF Siting Assessment Criteria

Date: February, 2017 Drawing No.: Overview

Candidate LMSF Sites



LMSF Screening Criteria

| <i>Criteria</i> | <i>Indicator/Measurement</i> |
|--|---|
| <i>Social Environmental Characteristics</i> | |
| <i>Effects to local residents</i> | Minimizes effects on visual intrusion, noise air quality, vibration |
| <i>Site safety</i> | Ability to restrict access to the MSF |
| <i>Agricultural capacity</i> | Minimizes effects on Class 1-3 agricultural lands or land under active use |
| <i>Transportation network</i> | Minimizes effects on existing and future transportation network. |
| <i>Pedestrian/cyclists</i> | Minimizes effects on existing and future pedestrian movements |
| <i>Existing land uses</i> | Minimizes effects on existing and planned land uses |
| <i>Heritage / Culture</i> | Minimizes effects on areas identified or having potential for archaeological or cultural significance |
| <i>Bio-Physical Environmental Characteristics</i> | |
| <i>Soil types</i> | Geotechnical characteristics to support a facility of this type |
| <i>Impacted Materials</i> | Minimizes potential to encounter impacted materials |
| <i>Key terrestrial features</i> | Minimizes effects on key terrestrial systems and features |
| <i>Key aquatic features</i> | Minimizes effects on key aquatic systems and features |
| <i>Geological faults</i> | Avoids areas of active faults |

LMSF Screening Criteria

| <i>Criteria</i> | <i>Indicator/Measurement</i> |
|---|---|
| <i>Facility Operations</i> | |
| <i>Expansion Capability</i> | Ability to stage/expand facility |
| <i>MSF Site Servicing</i> | Access to Municipal Services, Utilities and Power Extent of reuse of existing infrastructure |
| <i>Existing services</i> | Minimizes conflicts with Municipal Services, Utilities and Power |
| <i>Road access</i> | Maximizes accessibility for, to, and from the MSF |
| <i>LRT Station location</i> | Ease of connection to future LRT station/mainline and BRT integration |
| <i>BRT Station location</i> | Maximizes integration with BRT station |
| <i>Economics</i> | |
| <i>Capital Costs</i> | Minimizes class D construction cost estimate |
| <i>Property Ownership and Acquisition</i> | Minimizes costs based on land use types and number of property owners |

LMSF Evaluation

| | |
|---|-------------------------|
| ✓ | Best Meets Criteria |
| • | Somewhat Meets Criteria |
| ✗ | Does not Meet Criteria |

| | Social | | | | | | | Bio-Physical | | | | | Operations | | | | | Economics | |
|---|-----------------|-------------|--------------|--------------|----------------------|--------------------|--------------------|--------------|--------------------|----------------------|------------------|-------------------|------------|-------------------|-------------|-------------|-------------|-----------|----------|
| | Local residents | Site safety | Agricultural | Road Network | Pedestrian /cyclists | Existing land uses | Heritage / Culture | Soil types | Impacted Materials | Terrestrial features | Aquatic features | Geological faults | Servicing | Existing Services | Road Access | LRT Station | BRT Station | Capital | Property |
| Site 1: (East of Moodie, near Carling) | ✗ | • | ✗ | • | ✗ | ✓ | • | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | • | \$ | ✓ |
| Site 2: (East of Moodie, north of soccer fields) | • | • | • | • | • | • | • | ✓ | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | • | ✓ | • | \$\$ | ✓ |
| Site 3: (West of Moodie north of Queensway) | ✓ | • | • | • | ✓ | ✗ | • | • | ✓ | • | ✗ | ✓ | • | ✗ | ✓ | ✓ | ✓ | \$\$ | • |
| Site 4: (West of Moodie/Regional Road 59 south of Queensway) | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | • | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | • | • | • | \$\$ | • |
| Site 5: (East of Moodie/Regional Road 59, south of Queensway) | • | • | ✗ | ✓ | • | • | ✗ | ✗ | ✓ | ✓ | • | ✓ | • | ✗ | ✓ | • | ✓ | \$\$ | • |
| Site 6: (Far East of Moodie/Regional Road 59, south of Queensway) | ✓ | ✓ | ✗ | • | ✓ | ✓ | ✗ | • | ✓ | • | ✗ | ✗ | ✗ | ✓ | • | ✓ | ✓ | \$\$ | • |
| Site 7: (West of 416, south of Queensway) | ✓ | ✓ | ✗ | • | ✓ | ✓ | ✗ | • | ✓ | ✓ | ✗ | • | ✗ | ✓ | • | ✓ | ✓ | \$\$\$ | • |
| Site 8: (West of 416 near Baseline Road, south of Queensway) | • | • | ✗ | • | • | ✓ | ✗ | • | ✓ | • | ✓ | • | ✗ | ✓ | • | ✓ | ✓ | \$\$\$ | • |

Screening of Shortlisted LMSF sites

- Site 1 and 6 *do not meet 25% of the criteria, Site 1 has the largest number of criteria not met*
- Site 7 and 8 *are not affordable*
- The remaining sites are feasible but will still require mitigation
- Of the four remaining sites:
 - Sites 2,3, and 4 have the most evaluations that best meet the criteria
 - Site 5 is similar with variable soils conditions that create constructability challenges
- Sites 2,3 and 4 will be carried forward for further design refinement, evaluation and mitigation



Moodie BRT & LRT Station Integration

- Pedestrian connection from LRT platform to bus terminal
- Redundant elevators
- Same architecture / passenger experience as Stage 1 stations
- Fare paid bus terminal
- Public washrooms



Ottawa Preliminary Short-list Evaluation Criteria

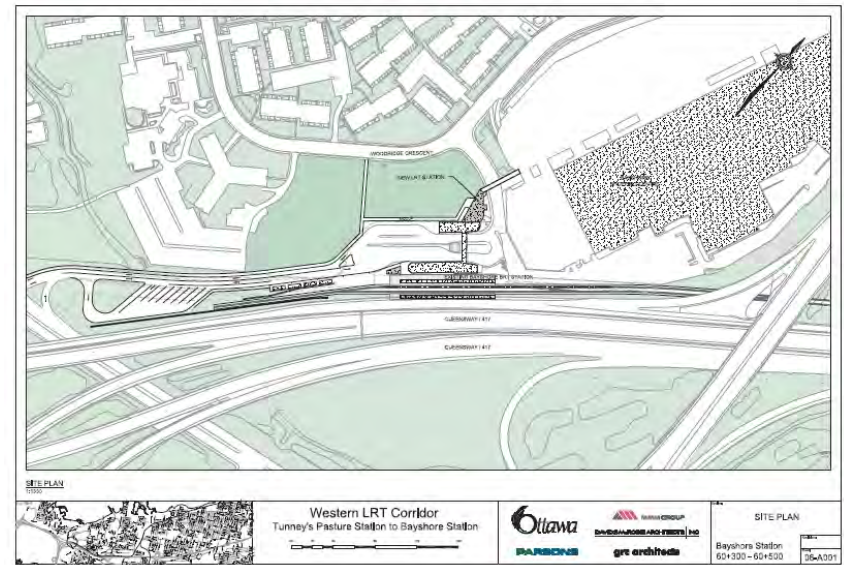
- Connectivity (pedestrians and cyclists)
- Local traffic
- Bus travel time, quality of service and bus transfers
- Views and vistas
- Noise/Air Quality/Vibration
- Groundwater
- Water quality/Stillwater Creek
- Fish habitat
- Species at Risk
- Operational flexibility
- Affordability (capital and operating)
- Existing land use

BAYSHORE EXPANDED BUS TERMINAL



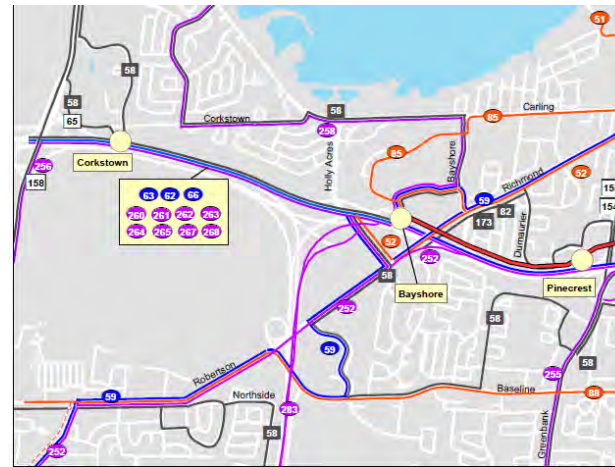
Bus Facility Requirements at Bayshore

- EA concepts for bus terminal impacted by:
 - July ridership forecasts
 - Increased bus facility requirements
 - Station on a skew angle
 - Configuration of tail track
- Bus facility also impacted by possible Moodie LRT extension

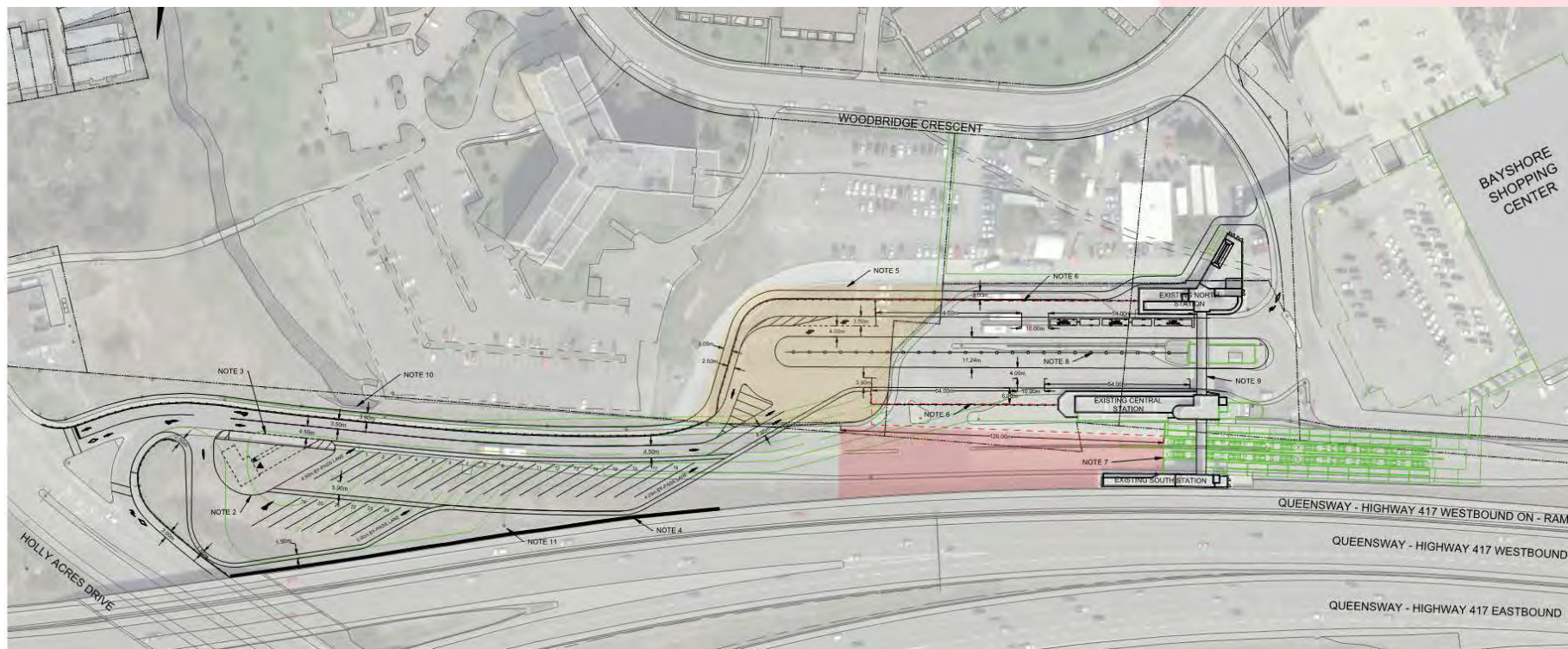


Bayshore/Moodie Bus Facility Requirements

| Source | Without Moodie LRT Extension | | | | With Moodie LRT Extension | | | |
|---|------------------------------|---------|--------|--------|---------------------------|--------|-----------|--------|
| | Bayshore | | Moodie | | Bayshore(1) | | Moodie(1) | |
| | Bays | Laybys | Bays | Laybys | Bays | Laybys | Bays | Laybys |
| EA Concept | 9 | 10+8(3) | NA | NA | NA | NA | NA | NA |
| July Stage 2 Forecasts(2031) | 12(4) | 24(4) | NA | NA | 5(5) | 6(5) | 8(6) | 14(6) |
| Existing | 11(2) | 8-10 | NA | NA | NA | NA | NA | NA |



Conceptual Layout of Expanded Bus Terminal



Noise Analysis

- Expanded bus terminal analyzed for compliance with MOECC noise guidelines(NPC-300)
- Plane of window and outdoor living space assessed for closest receptors for daytime and nighttime
- Expanded bus terminal complies with all applicable MOECC performance limits
- No mitigation required

NEXT STEPS IN EA PROCESS



Development of Short-Listed Sites

- Investigate shortlisted sites in more detail:
 - LMSF track access/grades/length of connection
 - Impact of LMSF connections on station location
 - Layout/functional planning of LMSF
 - Preliminary design of LRT terminal station
 - Impacts and mitigation measures
 - Respond to public comments and issues
 - Capital and operating cost estimates
 - Define property requirements
 - Feasibility: cost and approvals
 - Consideration of addendum requirements

Moodie LRT/LMSF Implementation Scenarios

- With Moodie LRT/LMSF as part of Stage 2 scope:
 - Complete EA and preliminary engineering for LRT extension and LMSF
 - Include in Stage 2 RFP as recommended scope
 - EA for expanded Bayshore bus terminal to proceed to protect project if Bayshore is the terminus
- In the unlikely event Moodie LMSF site is not feasible:
 - Western LMSF location deferred to Kanata LRT EA
 - Interim storage and cleaning facility at Baseline and expanded Belfast MSF (east) in the interim

Future Public Consultation/EA Schedule

- PAC meeting held on March 6, 2017
- Initial public meeting on March 22, 2017
- Second public meeting in May/June 2017
 - Moodie LRT/LMSF preferred site and mitigation measures
- Complete preliminary engineering of preferred LMSF site and LRT extension
- Report to City Council in July, 2017 re completion of EA
- EA approval in Fall 2017
- Stage 2 contract award in May 2018 including Moodie LRT/LMSF

Questions

← STAGE
ETAPE ↓ 2 →

