Moodie LRT Addendum
TAC#1 Attendance

February 13, 2017

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Bayshore Station to Moodie Drive LRT Extension Environmental Assessment Studies

Agenda

- Introductions
- TAC Roles and Responsibilities
- Background and Scope
- Network Options
- Bus Rapid Transit (BRT) conversion
- Light Maintenance and Storage Facility (LMSF)
- Moodie LRT Station
- Bayshore Station expanded bus terminal
- Schedule
- Next steps

TAC ROLES AND RESPONSIBILITIES

TAC Composition

- Working Group
  - **City of Ottawa**
  - Traffic Services Branch
  - Ottawa, Realty Services Branch
  - Recreation Planning & Facility Development Branch
  - Communications & Asset Management Unit
  - Transportation-Strategic Planning Unit
  - Recreation Planning & Facility Development Branch
  - Kanata LRT Extension EA
  - **Rideau Valley Conservation Authority**
  - **Environment Canada - EPA Division**
  - **National Capital Commission**
  - **MNR**

- Distribution list
  - **City of Ottawa**
  - Ottawa Public Works Department
  - Traffic Services Branch
  - Traffic Management Unit
  - Road Safety & Traffic Inv Unit
  - Traffic Operations Unit
  - Traffic Services Branch
  - Traffic Management Unit
  - Ottawa, Realty Services Branch
  - Recreation Planning & Facility Development Branch
  - Communications & Asset Management Unit
  - Transportation-Strategic Planning Unit
  - **MOECC**
  - **MCST**
  - **First Nations**

TAC Roles and Responsibilities

- Attend meetings at key milestones
- Provide discipline specific input
- Review draft materials provided
- Distribute information, as appropriate to colleagues

BACKGROUND & SCOPE

Background

- 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's initiated with this in mind

Scope of Environmental Assessment

- Conversion from BRT to LRT
- Siting of an LMSF beyond Bayshore
- Rationale:
  - City priorities for expansion to the west
  - LRT station closer to DND employment node
  - LMSF needed to support Confederation Line East and West extensions
  - Compliments Belfast MSF in east

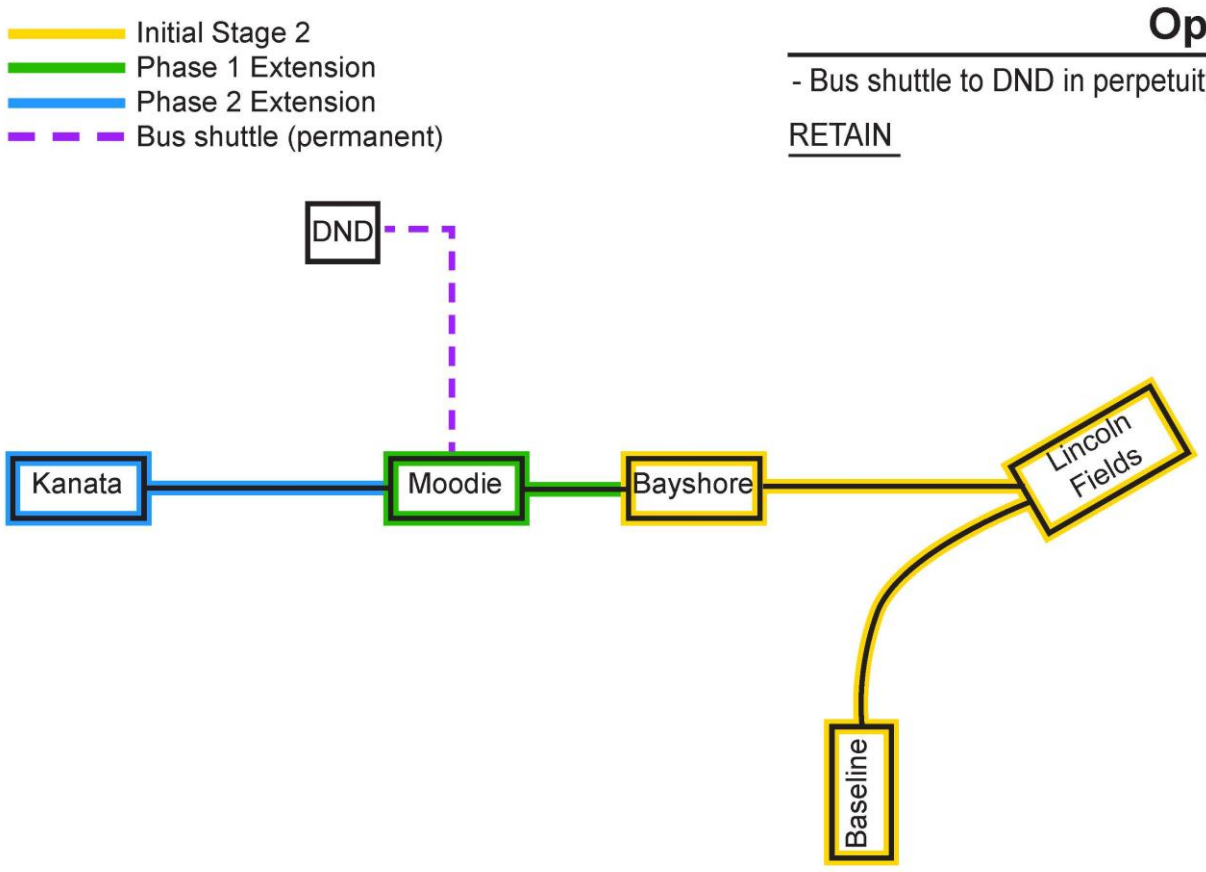
Study Process

- Modifications to approved EPR

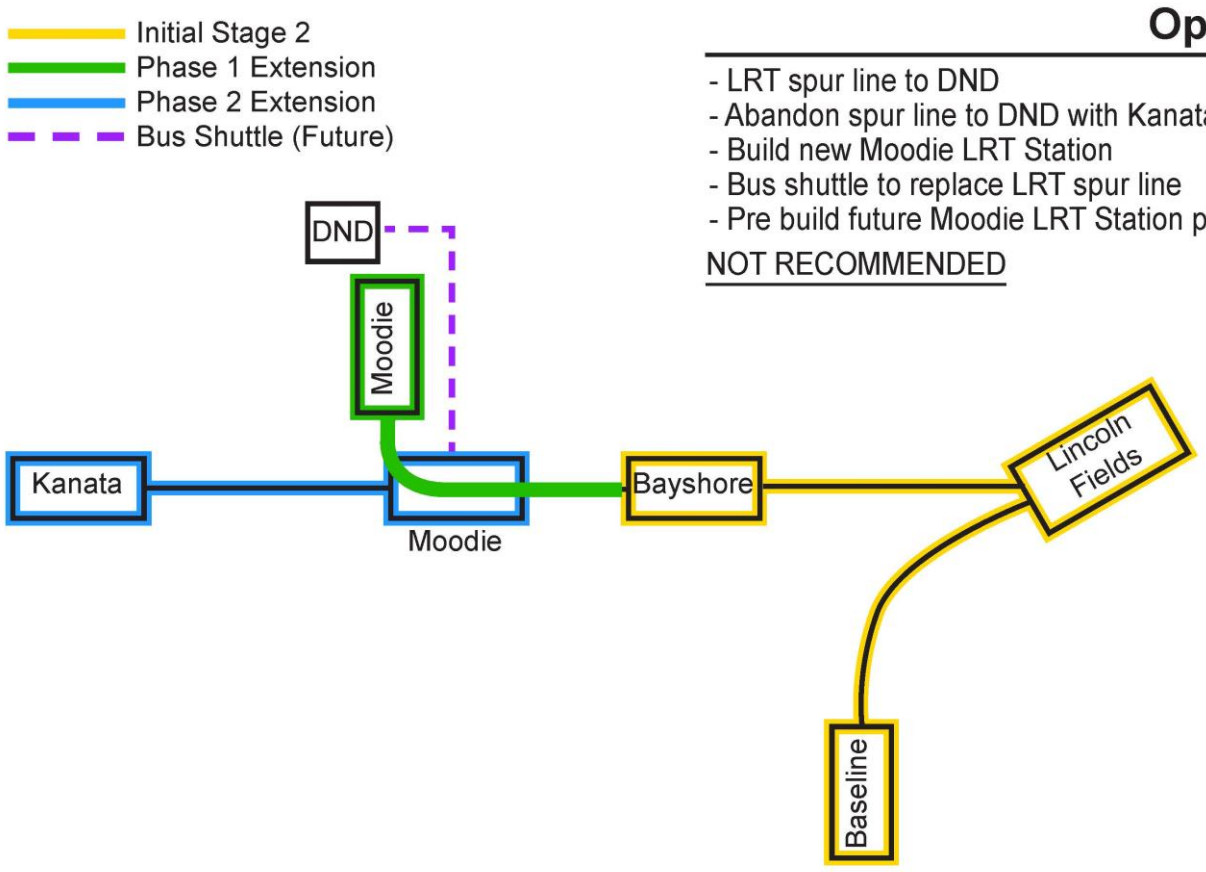
Modifications consistent with EPR	Insignificant modifications inconsistent with EPR	Significant modifications inconsistent with EPR
Proceed with modification	Prepare addendum	Prepare addendum
	Update local project file	Notice of Environmental Project Report Addendum
		Public Review
		Ministerial Approval

LRT NETWORK OPTIONS

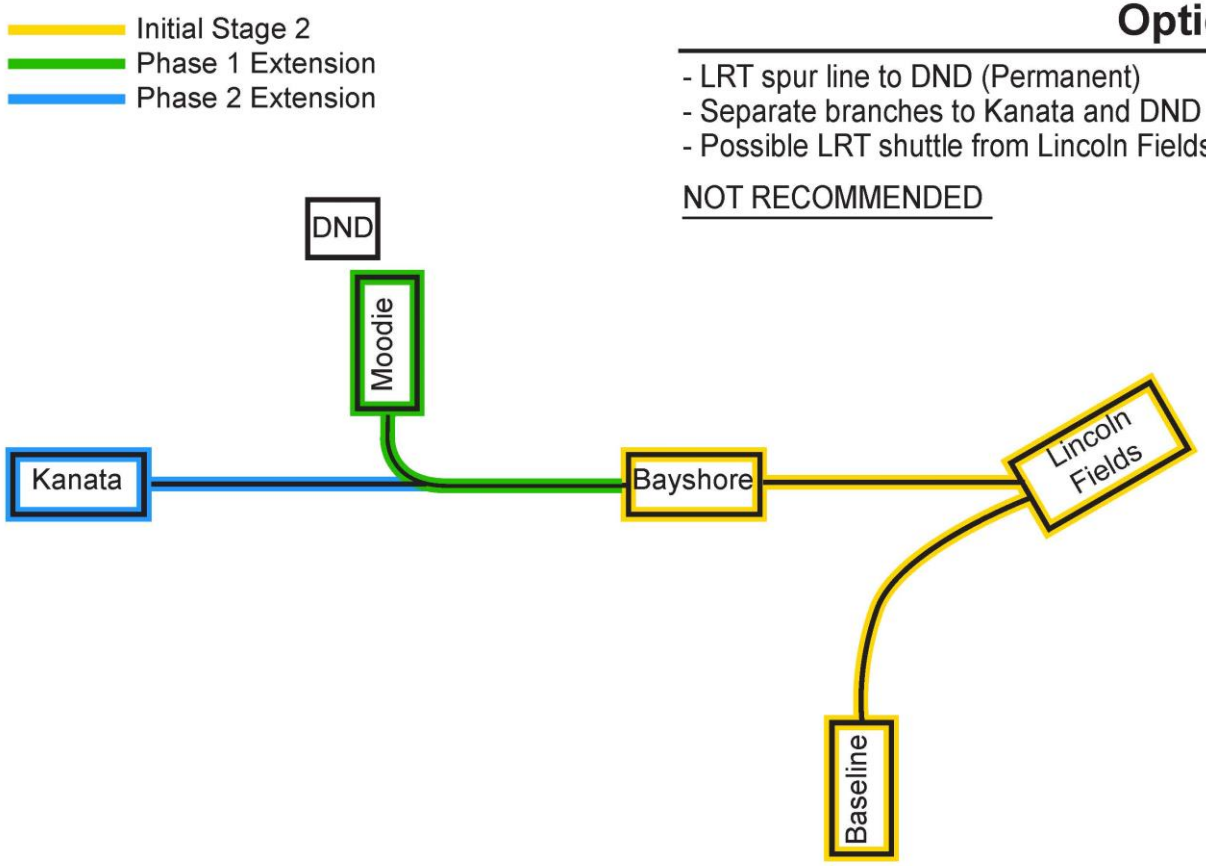
Option 1


Initial Stage 2
Phase 1 Extension
Phase 2 Extension
Bus shuttle (permanent)
Option 1
- Bus shuttle to DND in perpetuity
RETAIN
DND
Kanata
Moodie
Bayshore
Lincoln Fields
Baseline

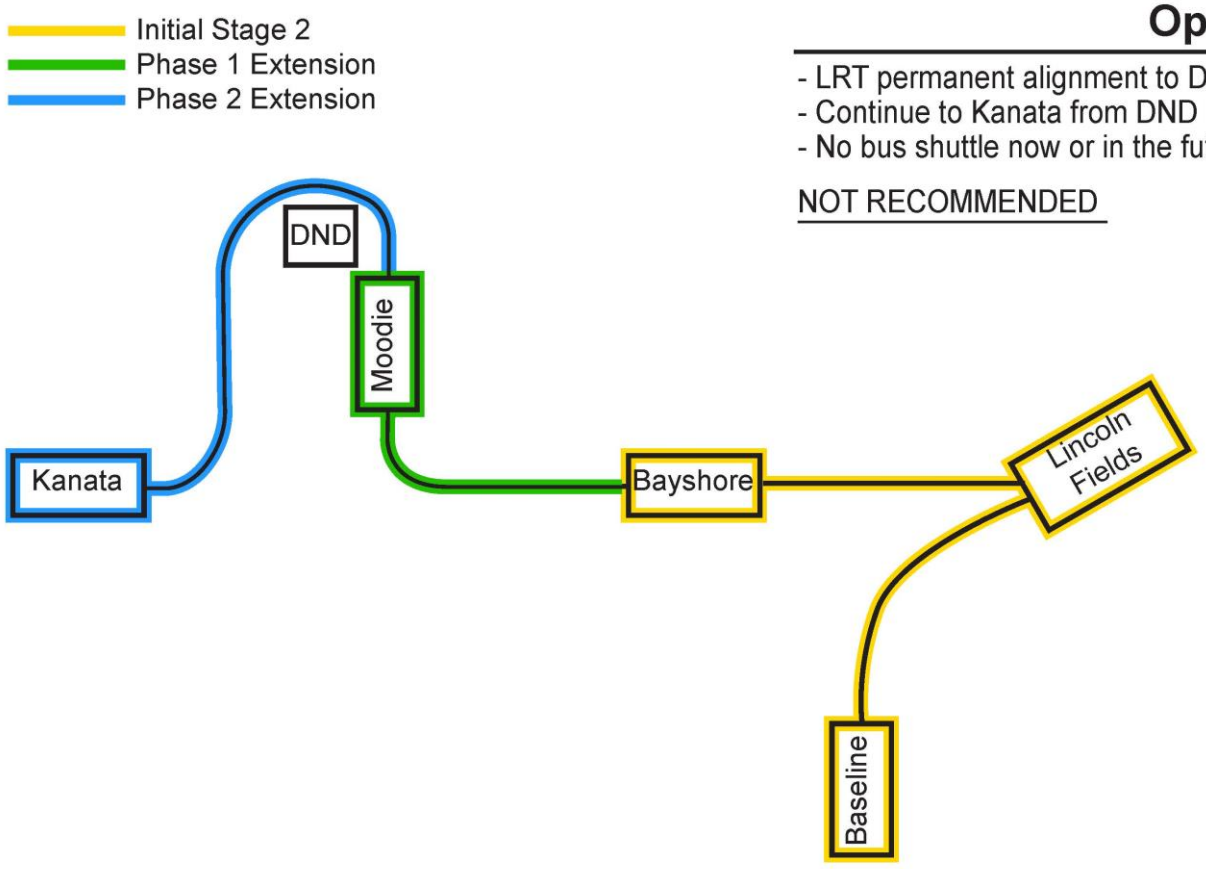
Option 2


Initial Stage 2
Phase 1 Extension
Phase 2 Extension
Bus Shuttle (Future)
Option 2
- LRT spur line to DND
- Abandon spur line to DND with Kanata LRT
- Build new Moodie LRT Station
- Bus shuttle to replace LRT spur line
- Pre build future Moodie LRT Station platform?
NOT RECOMMENDED
DND
Moodie
Kanata
Moodie
Bayshore
Lincoln Fields
Baseline

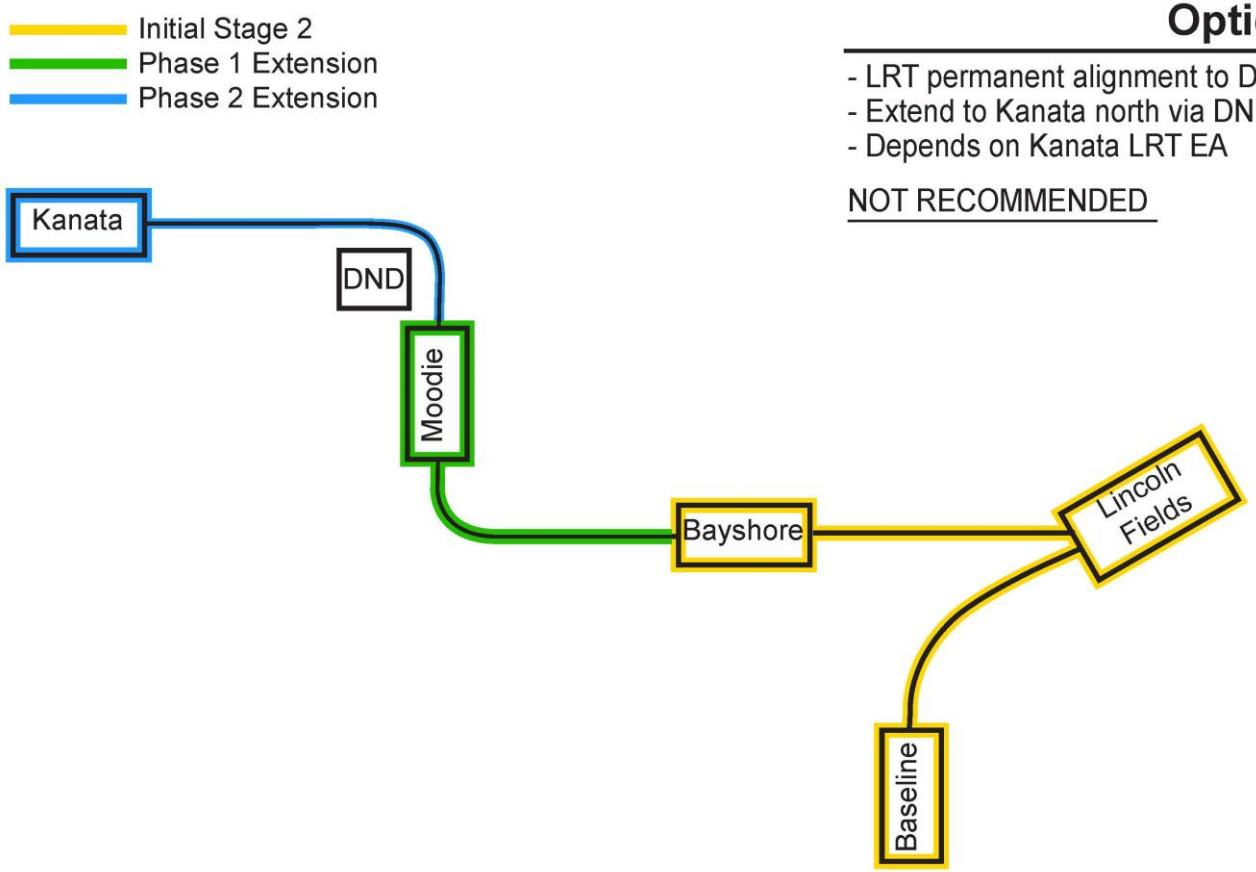
Option 2A


Initial Stage 2
Phase 1 Extension
Phase 2 Extension
Option 2A
- LRT spur line to DND (Permanent)
- Separate branches to Kanata and DND
- Possible LRT shuttle from Lincoln Fields to DND
NOT RECOMMENDED
DND
Moodie
Kanata
Bayshore
Lincoln Fields
Baseline

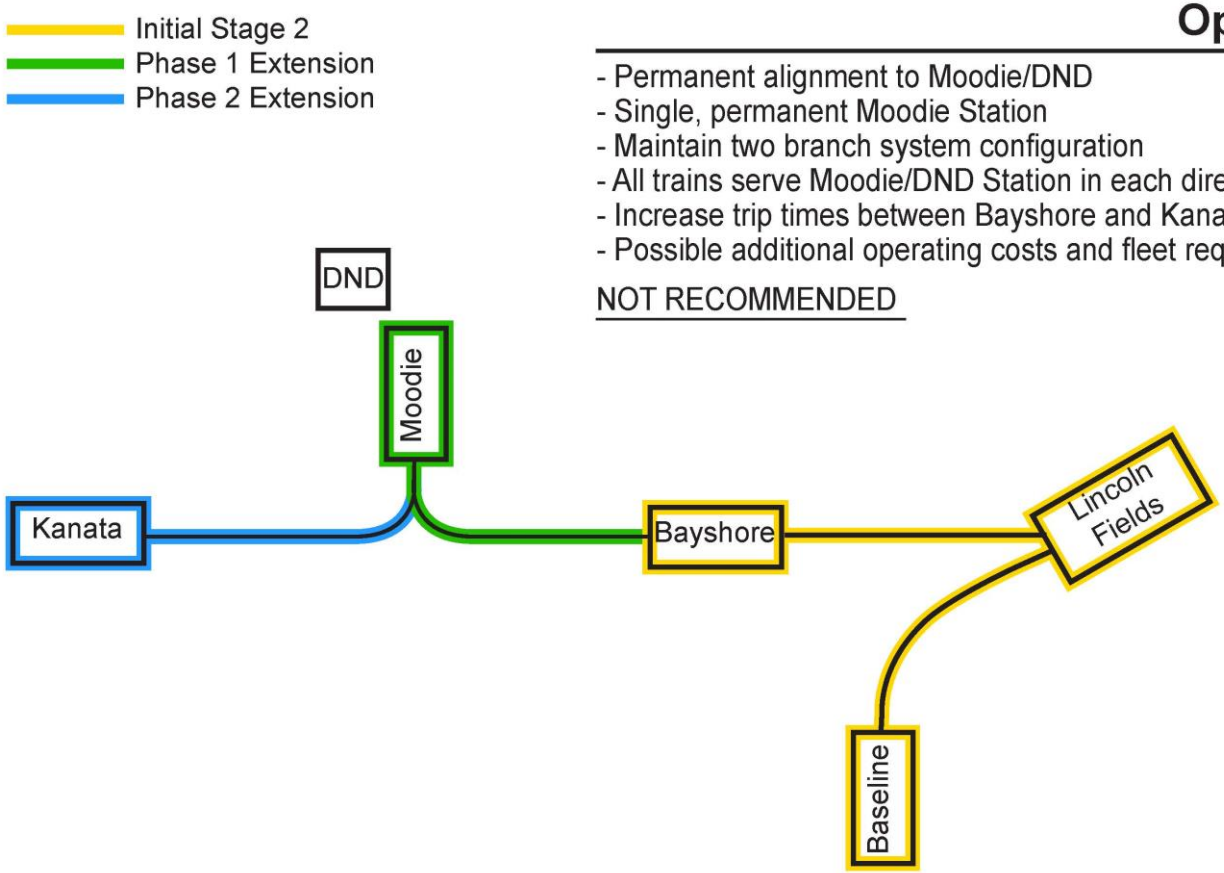
Option 3


Initial Stage 2
Phase 1 Extension
Phase 2 Extension
Option 3
- LRT permanent alignment to DND
- Continue to Kanata from DND
- No bus shuttle now or in the future
NOT RECOMMENDED
DND
Moodie
Kanata
Bayshore
Lincoln Fields
Baseline

Option 3A


Initial Stage 2
Phase 1 Extension
Phase 2 Extension
Option 3A
- LRT permanent alignment to DND
- Extend to Kanata north via DND
- Depends on Kanata LRT EA
NOT RECOMMENDED
Kanata
DND
Moodie
Bayshore
Lincoln Fields
Baseline

Option 4



Option 4

- Permanent alignment to Moodie/DND
- Single, permanent Moodie Station
- Maintain two branch system configuration
- All trains serve Moodie/DND Station in each direction
- Increase trip times between Bayshore and Kanata
- Possible additional operating costs and fleet requirements

NOT RECOMMENDED

Preferred Network Option

- Option 1 preferred:
  - ❑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)

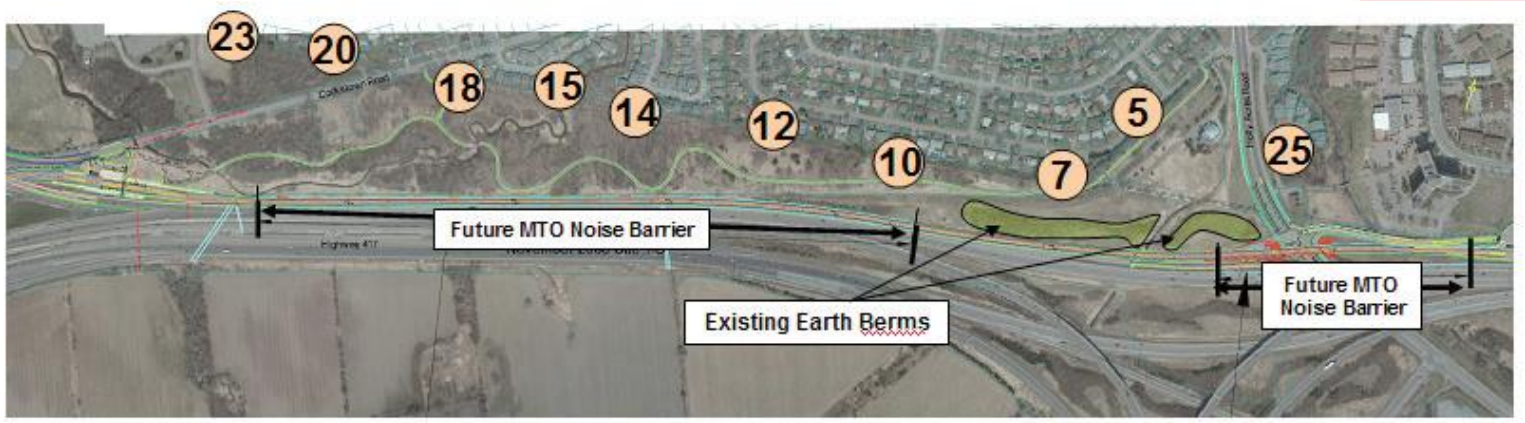
Vehicles


C96 CASTLEFRANK
4322
OC Transpo


Bayview Station
OC Transpo

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



Air Quality

- Conversion of BRT operations to electrically powered 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

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

BRT/LRT Station Design Issues

BRT Station :

- BRT platforms cannot be reused for LRT station
- Bus terminal must be expanded for LRT
- Kiss and ride facility
- No commuter parking

LRT Station:

- Two LRT platforms (side platform, 90m initially, 100 m ultimately)
- 8 bus bays/14 lay by spaces needed for feeder bus network
- Kiss and ride facility
- No commuter parking

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

Rationale for Preferred LMSF Strategy

- 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 Strategy

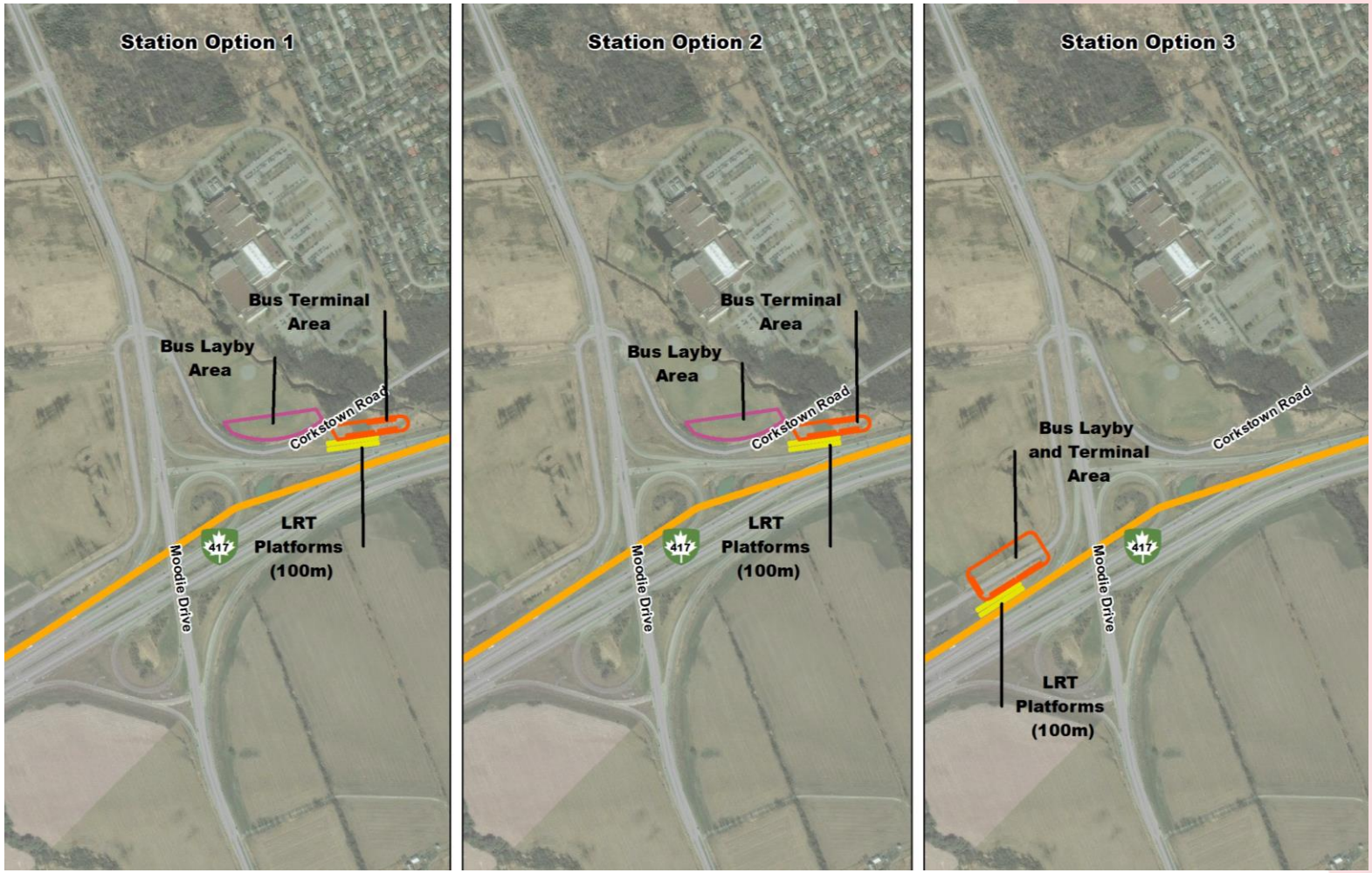
- Moodie/Kanata LMSF Site Preferred:
  - Extension of LRT to the west beyond Bayshore is a City priority
  - Lower cost to connect to LMSF as revenue service LRT is planned/no throw away costs
  - Purpose built facility can be implemented for all LMSF work
  - Lower deadhead mileage compared to Woodroffe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

Moodie/KanataLMSF 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

Candidate LMSF Sites

Station Locations Impacted by LMSF



LMSF Screening Criteria

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

LMSF Screening Criteria

Criteria	Indicator/Measurement
Facility Operations	
Expansion Capability	Ability to stage/expand facility
MSF Site Servicing	Access to Municipal Services, Utilities and Power Extent of reuse of existing infrastructure
Existing services	Minimizes conflicts with Municipal Services, Utilities and Power
Road access	Maximizes accessibility for, to, and from the MSF
LRT Station location	Ease of connection to future LRT station/mainline and BRT integration
BRT Station location	Maximizes integration with BRT station
Economics	
Capital Costs	Minimizes class D construction cost estimate
Property Ownership and Acquisition	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 *is not affordable*
- The remaining sites are feasible but will still require mitigation
- Of the five remaining sites:
  - Sites 5 and 8 have very high capital costs and will not be carried forward
- Sites 2,3 and 4 will be carried forward for further design refinement, evaluation and mitigation

MOODIE LRT STATION

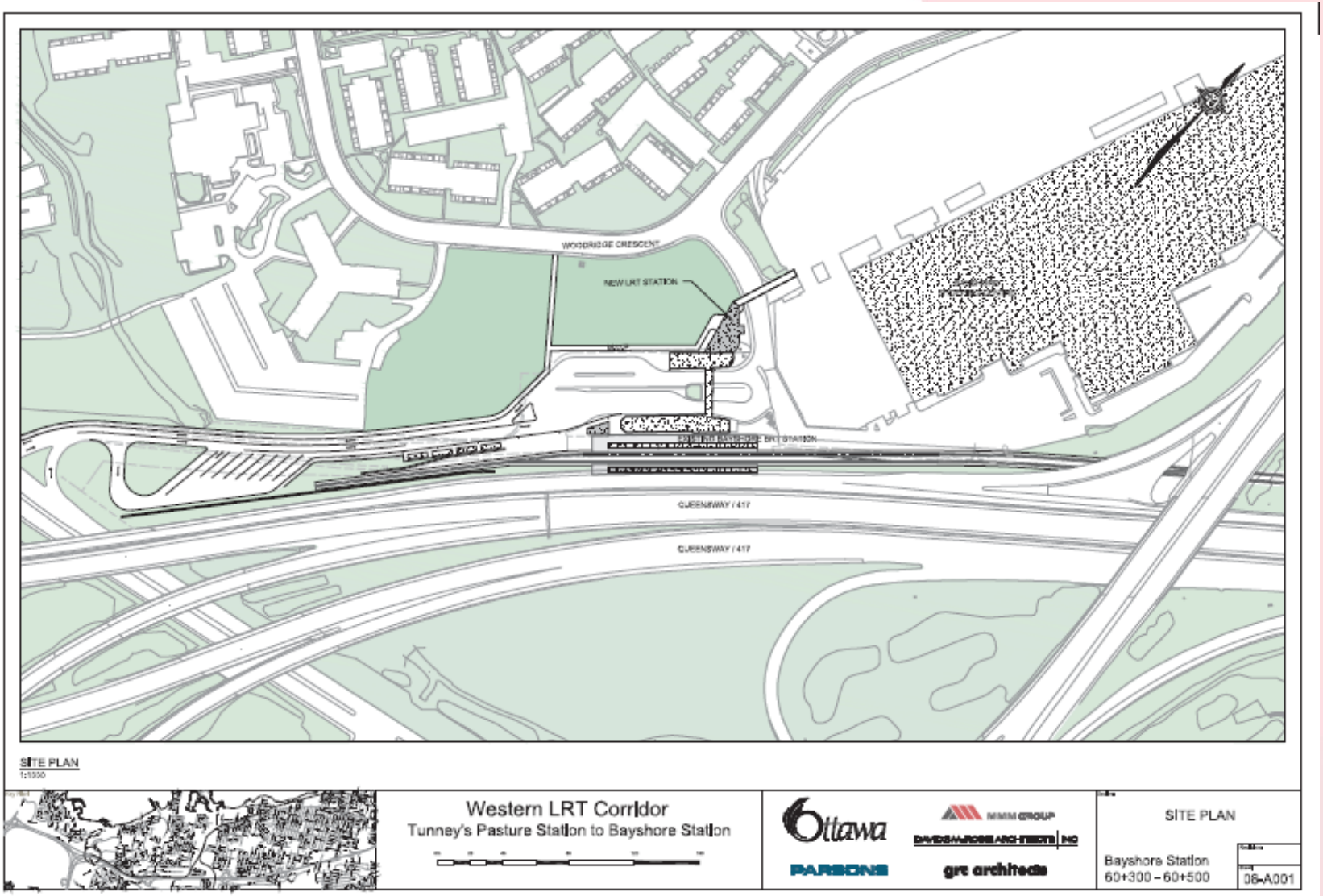
Moodie BRT & LRT Station Integration

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

BAYSHORE EXPANDED BUS TERMINAL

HISTORY

- Confederation West EA commenced in 2014:
  - Ridership projections based on 2013 Transportation Master Plan
  - Some additional bus laybys required
  - Layby space in area of Holly Acres grade separation
  - Grade separation needed for LRT not BRT
  - Holly Acres grade separation therefore deferred


WOODRIDGE CRESCENT
NEW LRT STATION
QUEENSWAY / 417
QUEENSWAY / 417
SITE PLAN
1:1000
Western LRT Corridor
Tunney's Pasture Station to Bayshore Station
Ottawa
PARSONS
MMM GROUP
DAVIES McFARLANE ARCHITECTS | MCG
grc architects
SITE PLAN
Bayshore Station
60+300 – 60+500
06-A001
STAGE 2
ETAPE 2
OTrain

Confederation West EA Process

- Stage 2 Preliminary Engineering:
  - Size/configuration of bus terminal confirmed late Fall 2016 following draft ridership forecasts
  - Noise, vibration, air quality studies then initiated
  - Not possible to complete studies in time to be included in Confederation West EA Study
  - Will be addressed as an addendum to the approved EA in early 2017

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

(1) With LRT extension to Corkstown

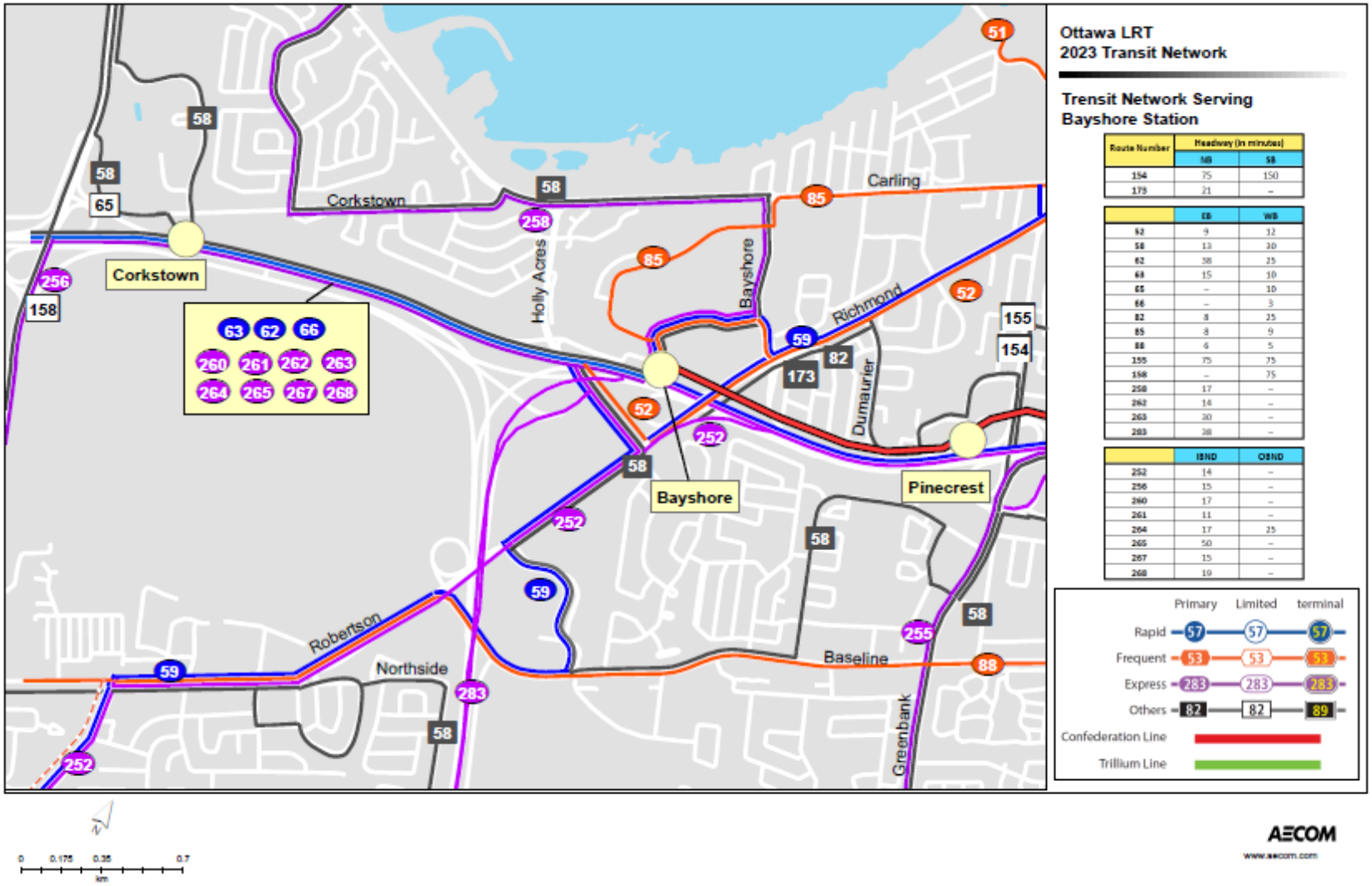
(2) 6 BRT platforms,5 local bus platforms

(3) 8 in the station area,10 in the layby area near Holly Acres

(4) 9 bus bays and 17 layby spaces in 2023. Opening day based on 2031 projections to allow for growth

(5) 4 bus bays and 4 laybys in 2023. Opening day based on 2031 projections

(6) 6 bus bays and 9 laybys in 2023 . Opening day based on 2031 projections



Route Number	Headway (in minutes)	
	NB	SB
154	75	150
173	21	–

	EB	WB
52	9	12
58	13	10
62	38	25
63	15	10
65	–	10
66	–	3
82	8	25
85	8	9
88	6	5
155	75	75
158	–	75
258	17	–
262	14	–
263	30	–
283	38	–

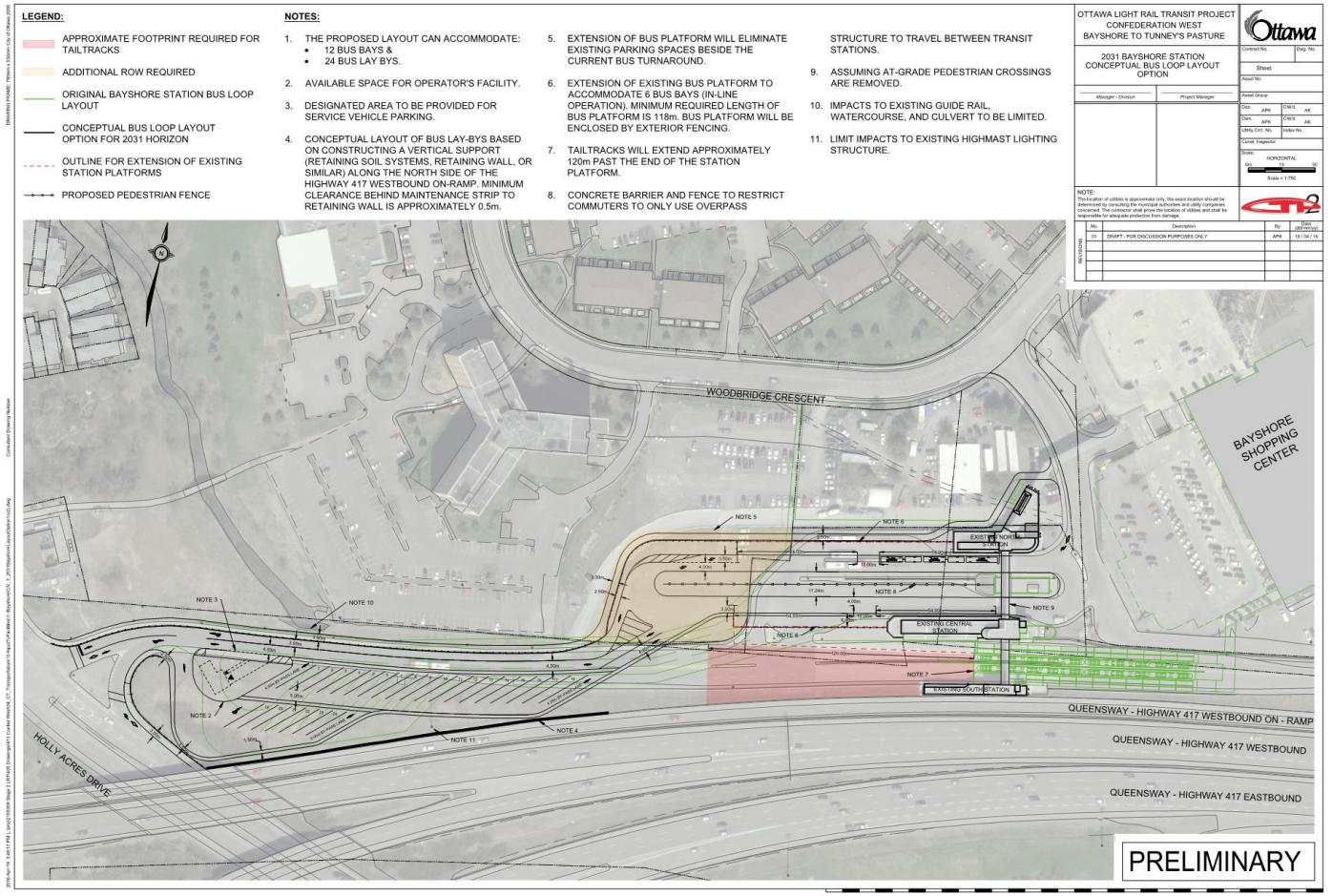
	IBND	OBND
252	14	–
256	15	–
260	17	–
261	11	–
264	17	25
265	50	–
267	15	–
268	19	–

0 0.175 0.35 0.7
km

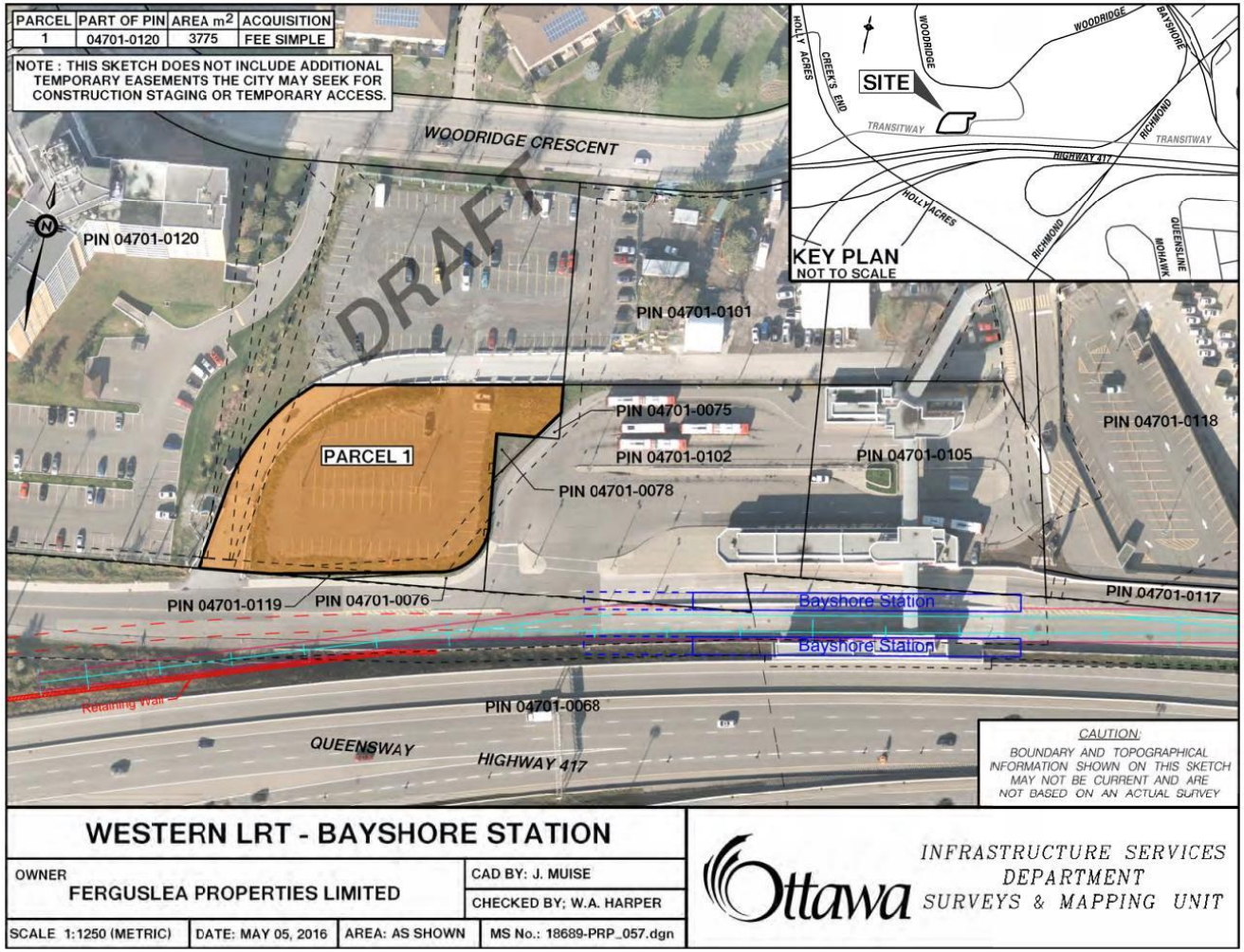
STAGE 2 ETAPE

OTrain

CONCEPTUAL LAYOUT OF BAYSHORE BUS TERMINAL



PRELIMINARY PERMANENT PROPERTY REQUIREMENTS



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 planned for early March, 2017
- Initial public meeting in mid March 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 2 LRT PROGRAM

Moodie LRT EA Addendum

TAC Meeting #1 – February 13, 2017

Minutes

Status:	Final
Place:	110 Laurier Avenue West, Richmond Room
Date:	February 13, 2017
Time:	9:00 am
Present:	Paul Croft (PC) – Morrison Hershfield Jeffrey Waara (JW) – City of Ottawa, Western BRT Project Manager (City) Burl Walker (BW) – City of Ottawa, Parks and Facilities Planning Arto Keklikian (AK) – National Capital Commission (NCC) Randy Molson (RM) – Transit Services (OCT) Genya Stefanoff (GS) – Transit Services (OCT) Eric Lalande (EL) – Rideau Valley Conservation Authority (RVCA) Angela Taylor (AT) – City of Ottawa Amy MacPherson (AM) – City of Ottawa Greg Kent (on phone) – City of Ottawa Charles Wheeler (CW) – CTP2 Kim Howie (KH) – CTP2 Kelly Roberts (KR) – CTP2
Regrets	Susan O'Connor

ITEM #	COMMENTS	ACTION BY
1.	Introductions were made around the table.	
2.	Background CW provided a brief background on the project and how it fits in with other projects including the current LRT planning, EA for Kanata LRT extension, and the current Western BRT construction.	Info
3.	Presentation CW and KR presented the prepared material to the group. (attached) Question from AK on terminus of the Kanata LRT. PC responded that the EA is currently looking at the route to get to Kanata but the terminus is currently identified as the Canadian Tire Centre. CW confirmed the current Moodie LRT BRT to LRT EA work being done by the study does not preclude other alignments west of Moodie that would be considered	Info

	by the Kanata LRT EA team and the two studies are being closely coordinated with each other. JW indicated that the community has already been told that the LRT route to Kanata could not be on the south side of Highway 417 and that the message should be consistent going forward. Comment from AK on the initial site location process included sites on farmland. Ensure that this is considered in the screening of LMSF options. KR confirmed the screening process incorporates the effects on Class 1-3 agricultural lands and lands that are being actively farmed. Question from BW whether the potential LMSF sites considered a staging of the size of the site and whether a smaller piece of property could work initially. CW explained that staged implementation will be considered in the assessment of the short listed sites as the initial size of the LMSF will be a sub-set of the ultimate size that needs to be protected for. The ultimate size in the very long term is used to identify potential sites to provide the flexibility to expand to the ultimate size over time as the LRT system is extended and fleet size grows. KR explained that criteria that were not distinguishing (would not help screen sites out) were not included in the pre-screening. Question from AK on whether the station location was considered during the screening. CW responded that the location of the station was considered and will be subject to further work during the next screening and assessment stages. Comment from AK to ensure that the Cumulative Effects be considered during the remainder of the study. KR responded that it is recognized that the site was not included when the current Cumulative Effects study was done and that this site will have to be considered. This request will be brought forward to the City.	Moodie EA Team Moodie EA Team CW
4.	Additional Comments/Questions AT asked about the timing for the selection of the preferred site. CW indicated hopefully late March/early April 2017 to facilitate the May/June public meeting on the preferred site, mitigative measures. BW questioned why the site across Highway 417 from Bayshore was not included in the initial site selection. CW responded that this site was ruled out as not feasible in the Western LRT EA due to implications of crossing the 416/417 interchange and this conclusion was carried forward to this study. KR requested that the members of the TAC review the material and please advise if they feel that any factors or considerations need to be	TAC

	added/adjusted in the pre-screening analysis. AK asked if the narrative document for the pre-screening will be provided. KR indicated that there is a background document to the screening discussion and it could be provided but it needs clean-up before distribution by Feb 17. CW commented that none of the sites were found to be within any flood limits. EL commented that LMSF options should include analysis of aquatic criteria. KR noted that Stillwater Creek meanders through the entire area and aquatics were looked at from a high-level point of view in screening to the short list. As all of the sites had potential impacts on aquatics, this will be an important factor in the more detailed examination of the short listed sites. AM noted that there are mitigations for other projects being done by NCC and the City in this area that may affect the location of additional mitigations if required for this project (space required). KR requested further information on the nature and location of the mitigation. RM asked for a confirmation that the ridership forecasts are expected to be completed by the end of Feb. CW confirmed that this is the plan.	
	Meeting was adjourned at 10:50 am	

Prepared by: K Howie
Reviewed by: C. Wheeler/K. Roberts
PLEASE NOTE: If your records of this meeting do not agree with this document, or if there are any omissions, please advise the writer within 2 days, otherwise the contents of this document shall be assumed accurate and correct.

Bayshore Station to Moodie Drive LRT Extension Environmental Assessment Studies

Advisory Committee Meeting
June 2017

Overview

- Introductions
- Project Overview:
  - Background Refresher
  - Project Updates
- BRT to LRT conversion:
  - Station location east or west of Moodie
  - Functional requirements for Moodie LRT station
  - Impacts and mitigation
- Light Maintenance and Storage Facility (LMSF)
  - Short listed sites evaluation (Options 2, 3 and 4)
  - Preliminary preferred site (Option 2)
- Park and Ride/response to Council motion
- Schedule
- Next steps/TPAP process and timing

BACKGROUND REFRESHER

Background

- BRT Transitway Extension from Bayshore Station to Moodie Drive currently under construction
- Expected revenue service is 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 as base scope
- EA planning initiated with this in mind

Scope of Environmental Assessment

- Bayshore to Moodie LRT:
  - City priority for LRT 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 LRT extended to Moodie as part of Stage 2
- Slightly different EA process for each change

Study Process

- Modifications to approved EPR – Expanded Bayshore Bus Terminal

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

Study Process

- EPR – Bayshore to Moodie LRT Extension
- Follow TPAP process to address public interest

Pre-planning	Notice of Commencement	Notice of Completion	Ministers Review
• **Data collection** • **Alternatives** • **Impact assessment** • **Stakeholder consultation** • **Draft reports**	• Consultation with interested persons including regulatory agencies and Aboriginal Communities • Documentation (EPR)	• Public review of EPR by interested persons including regulatory agencies and Aboriginal Communities • Opportunities for objections to be sent to Minister regarding areas of provincial interest	• Review EPR • Consider any objections
We are here	Up to 120 days	30 days	35 days

BRT TO LRT CONVERSION

Impacts and Mitigation

Impacts

- Alignment/retaining walls/noise barriers
- BRT Station
- 417 ramp grade separation
- Stillwater Creek improvements
- Holly Acres Bridge
- Add Kiss and Ride

Mitigation

- No additional mitigation required. West noise wall unchanged
- Minor design modifications
- Design modifications required
- Maintain existing improvements
- Opportunities to reduce width. Consideration of new location for east noise wall
- Added to BRT station

Park and Ride

- Council motion asked us to consider park and ride at Moodie LRT station
- Staff report will respond to this motion later this summer/early fall
- New expansive Park and Ride lot (free)not recommended at this location;
  - Lack of space immediately adjacent to Moodie LRT station
  - A parking deck would likely be required given space constraints
  - May be underutilized once LRT is extended to Kanata/potential for throw away capital costs
  - Would encourage additional traffic across the Greenbelt and is contrary to City and NCC policy
- Potential to provide a limited/short term (Gold level) park and ride using the existing Abbott Industries surface lot if unused spaces are available

Moodie Station-Functional Requirements with Moodie LRT

Bus Facilities/Kiss and Ride:

- 9 bus platforms including dedicated platform for OC Transpo DND shuttle
- Fare paid bus terminal
- 14 lay by spaces
- Bus operators building
- 11 kiss and ride spaces (number of spaces to be confirmed)

LRT Station:

- Same station architecture as Stage 1
- LRT platform (initially 90 metres in length, protection for 100 metres)
- Likely a side platform station but City will leave this to contractor to decide
- Redundant elevators
- Entrance and emergency exit
- Public washrooms

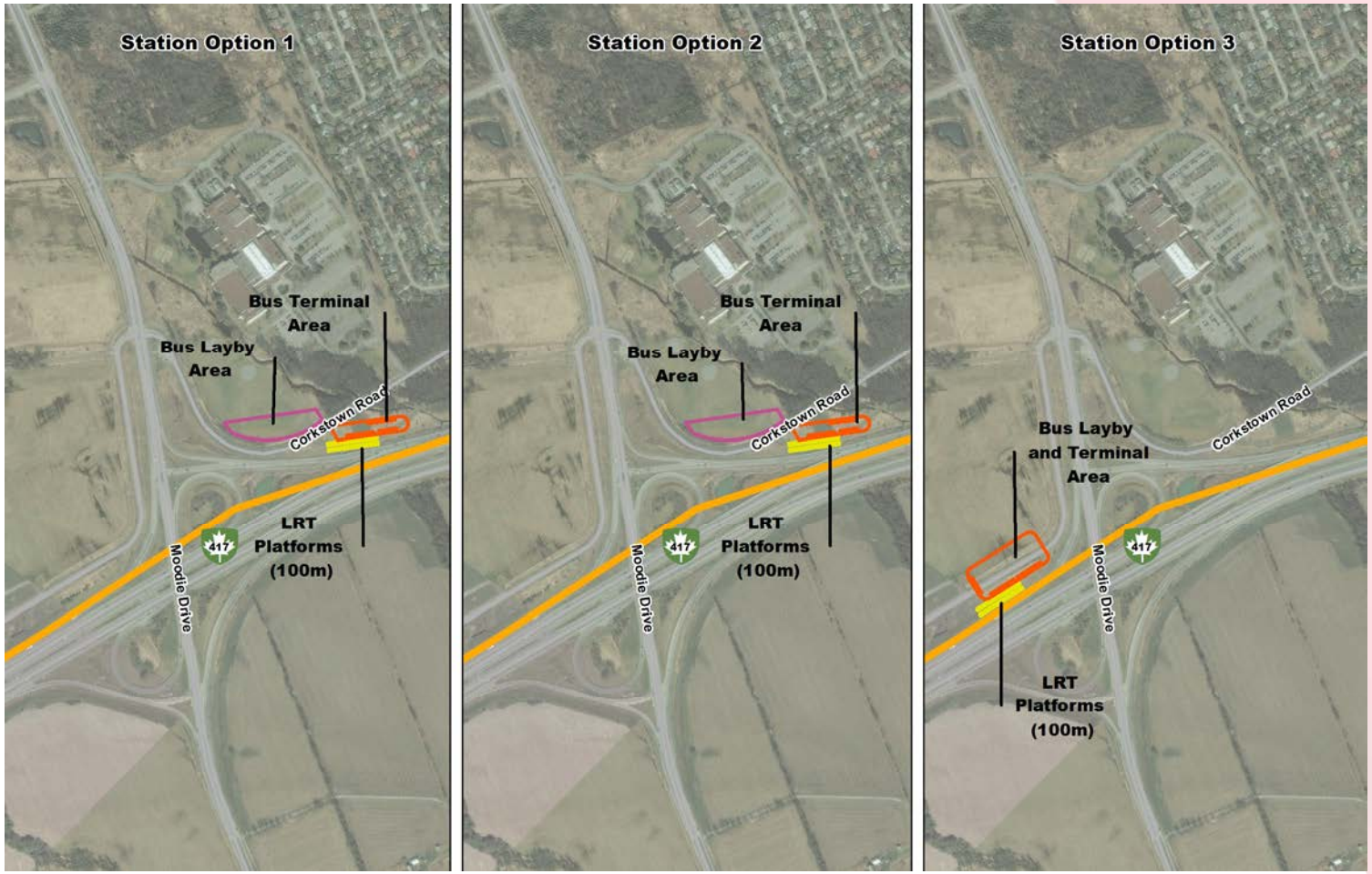
Other:

- Traction power sub station (TPSS) for station (and LMSF)

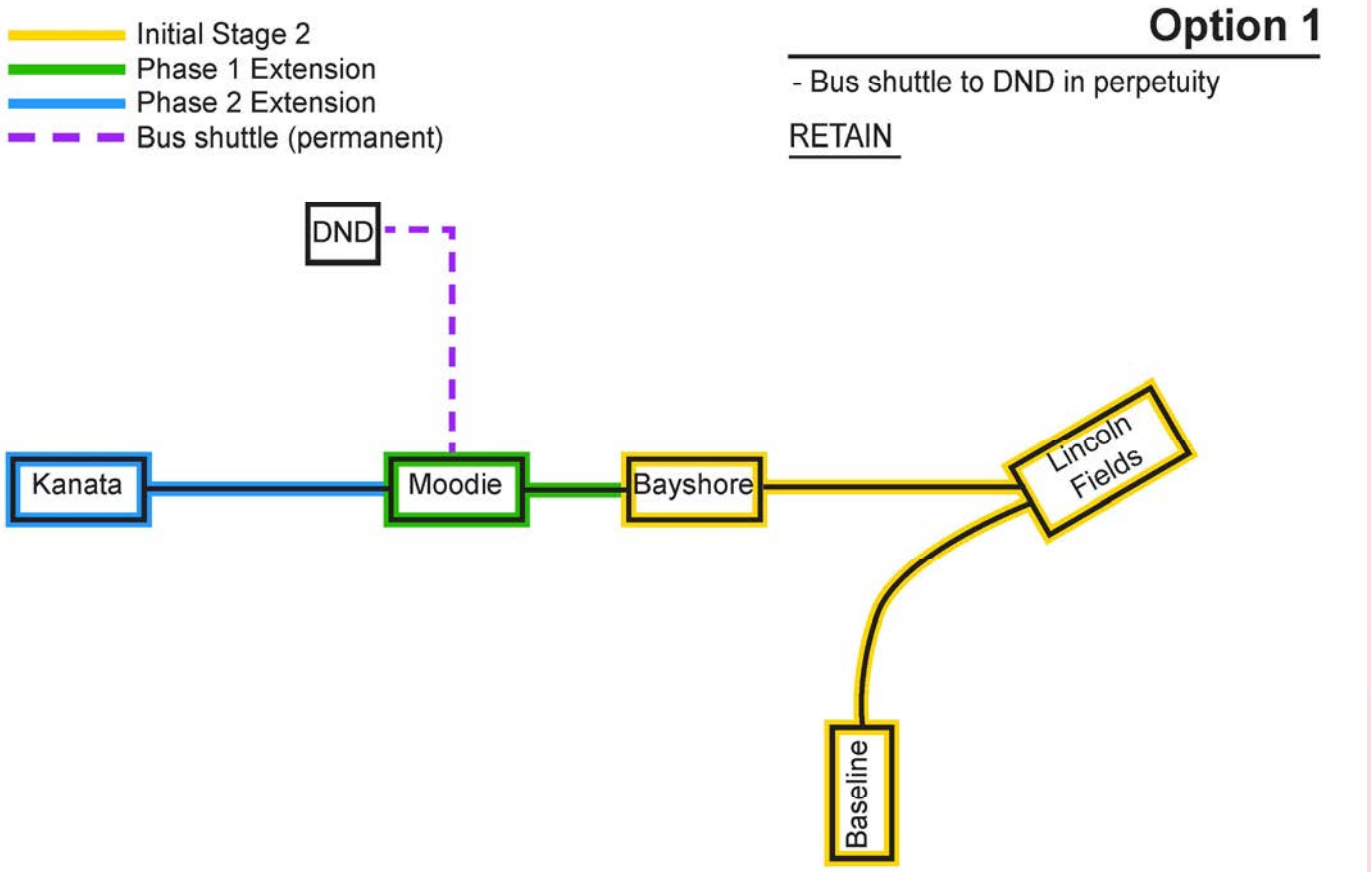
Moodie LRT Station

- Previous BRT studies strongly preferred an easterly station location
- Re-assessed to reflect bus access to LRT station rather than thru Transitway bus operations
- East and west station locations identified and evaluated (3 options)
- Evaluated based on connectivity, road network modifications, bus travel time/quality of bus service, land use, views and vistas, station catchment area for walk in traffic

Station Options Considered



Feeder Bus Network to Moodie LRT station



Station Location Options

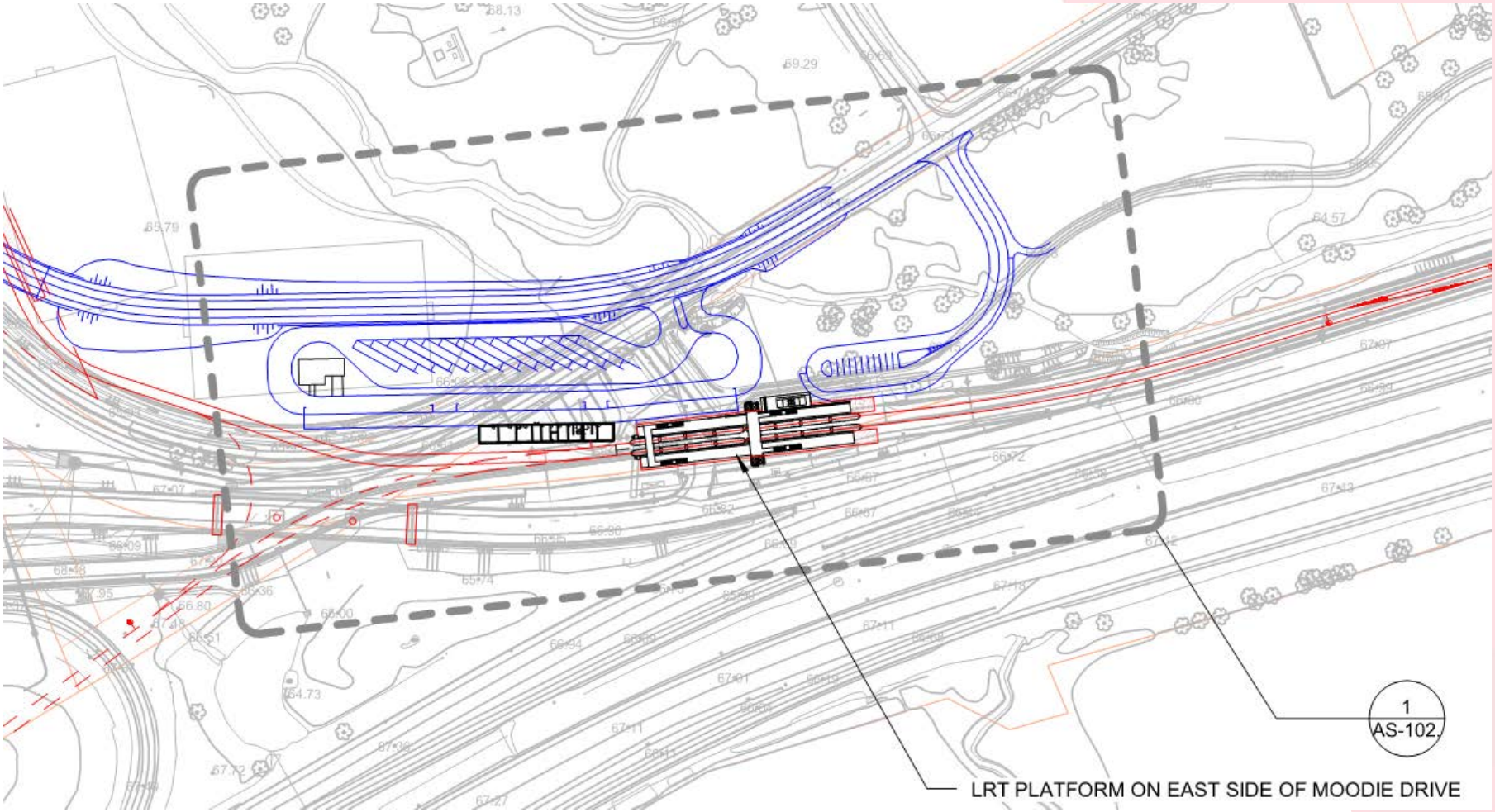
- East side station location must facilitate yard leads to LMSF Option 2
- West side location must be compatible with LMSF Options 3 and 4
- LMSF yard leads involve modifications to Corkstown Rd alignment (varies by option) which affects bus access
- Connectivity, station catchment area and bus travel time/quality of service are key drivers of preferred station location

Evaluation of Preferred Station Location

- East station option :
  - Some re-use of existing BRT facilities
  - Provides better connection NCC trails
  - More accessible to residential community and Abbott lab based on 600 metre catchment area
  - Shorter distance for DND shuttle service
  - Less impact on views and vistas/lower visibility for “capital arrivals”
  - Lower impact on existing land uses and avoids impacts on Wesley Clover park in favour of impacting soccer field
- Extent of reconfiguration of Corkstown Rd is similar in both options (not a decision factor)
- East side station is therefore the preferred location

East Side Station Concept

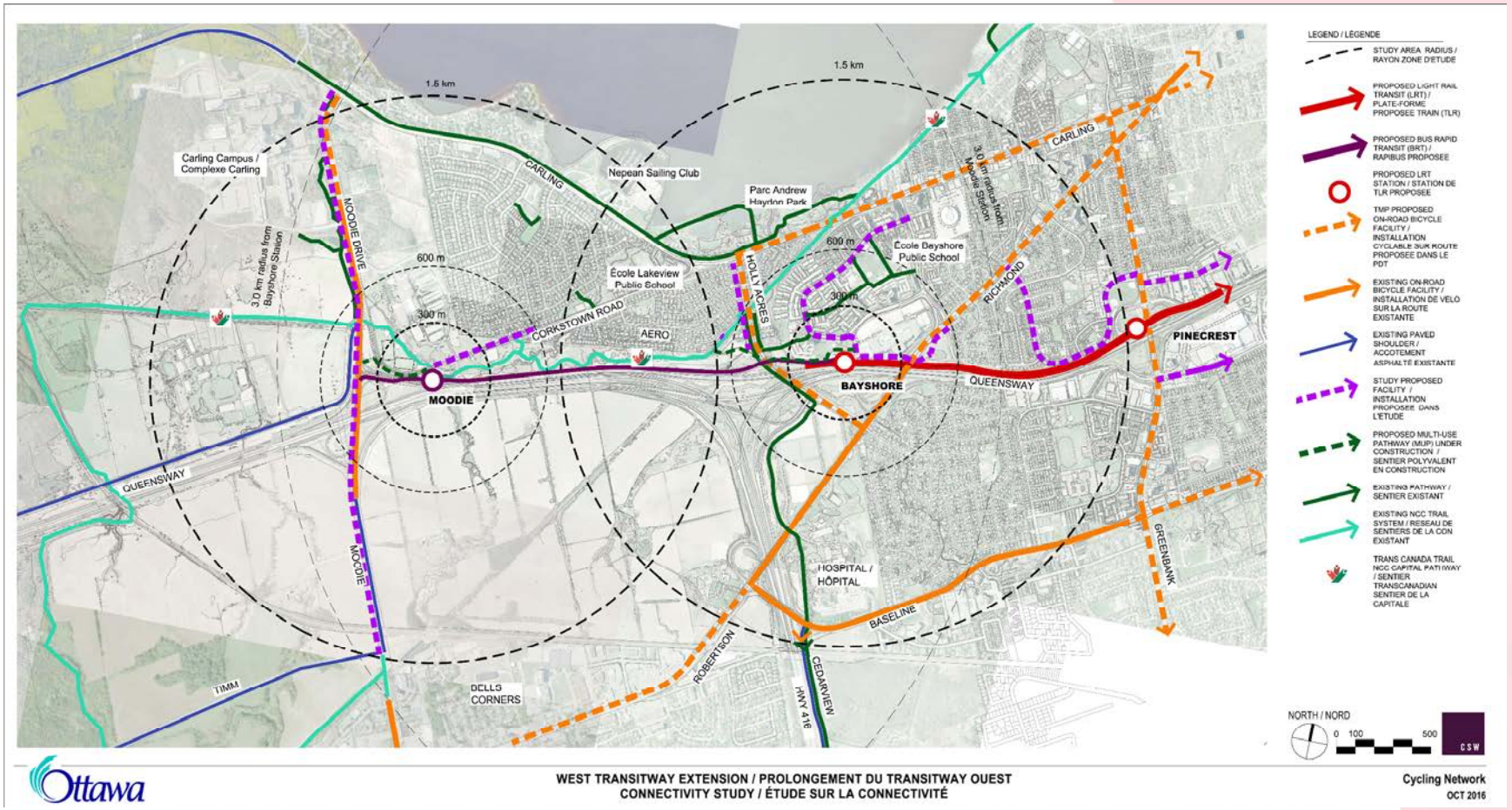
Moodie Station Draft Layout



East Station Location- Connectivity Implications

- BRT project will construct some new cycling/pedestrian connections (e.g. sidewalk along Corkstown Road to Crystal Beach)
- Some connections will be left to LRT project to implement (e.g. Moodie/Corkstown crossings)
- LRT connectivity study will identify additional pedestrian/cycling connections

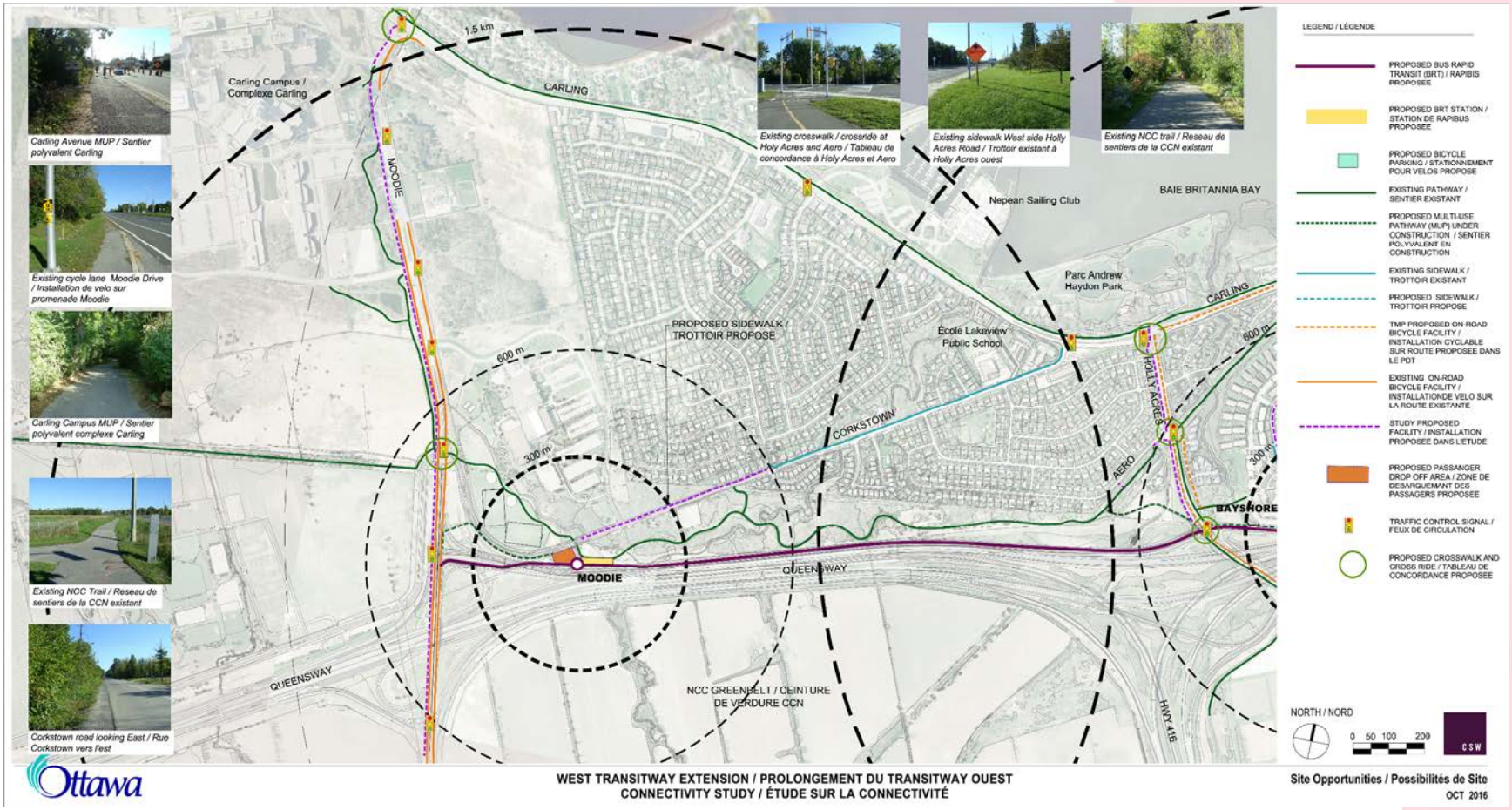
Cycling Network



STAGE 2 ETAPE 2

OTrain

BRT Connectivity



STAGE 2 ETAPE 2

OTrain

LIGHT MAINTENANCE & STORAGE FACILITY(LMSF)

Screening of Shortlisted LMSF sites

Evaluation Criteria

- Transportation and Connectivity
  - Connectivity (pedestrians and cyclists); Local traffic
- Social
  - Views and vistas; Noise/Air Quality/Vibration; Existing land use; Land Availability
- Biophysical
  - Groundwater; Water quality/Drainage; Fish habitat; Species at Risk; Significant Wildlife Habitat
- Operations
  - Operational flexibility; Station Options; Deadhead time
- Costs
  - Affordability (capital and operating)

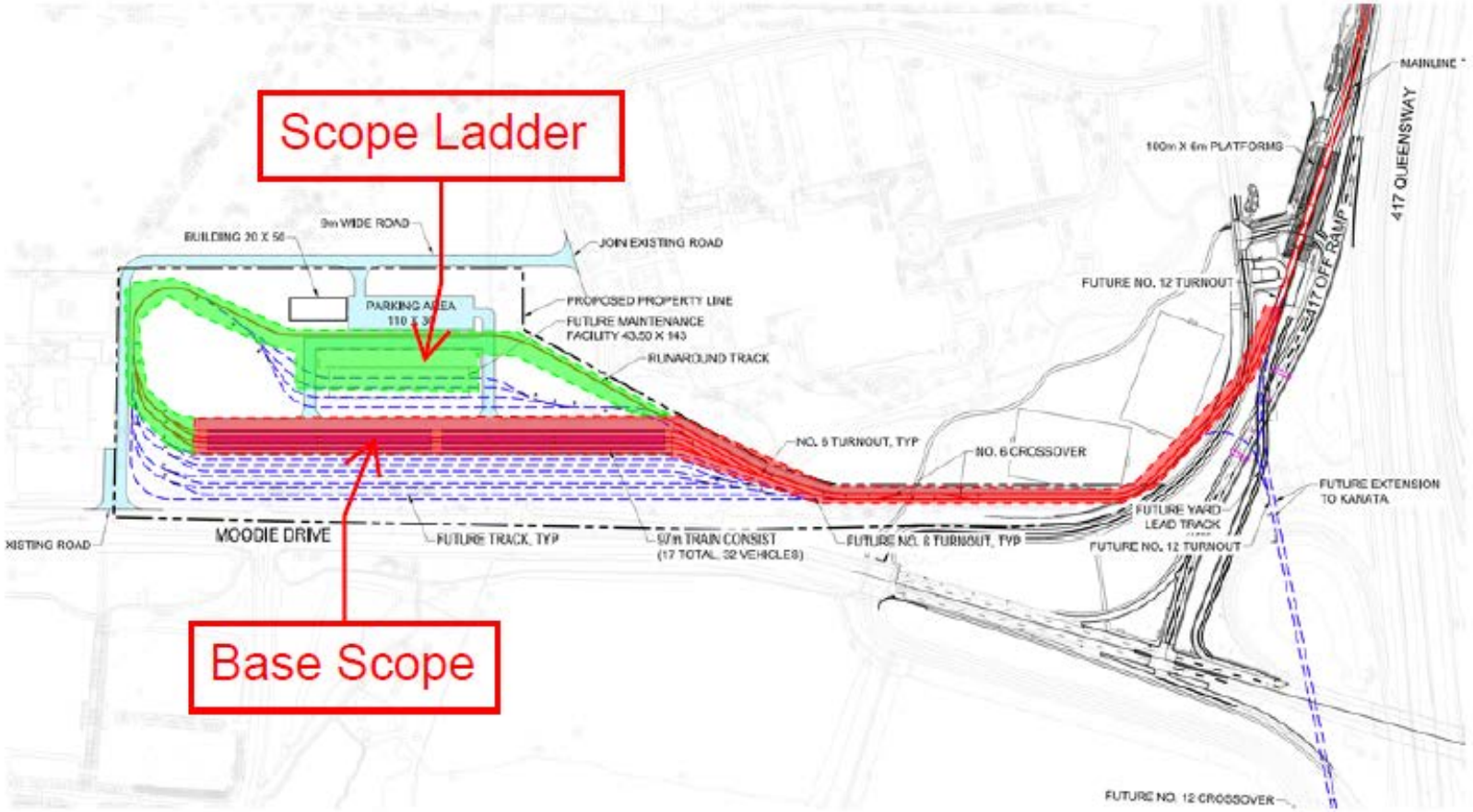
Evaluation Results

	Criteria	Option 2	Option 3	Option 4
Transportation and Connectivity	Connectivity (pedestrians and cyclists)		✓	✓
	Local traffic			✓
Preferred				✓
Social	Views and vistas	✓	✓	
	Noise/Air Quality/Vibration		✓	
	Existing land use	✓		
	Land Availability	✓		
Preferred		✓		
Biophysical	Groundwater	✓	✓	✓
	Water quality/Drainage			✓
	Fish habitat	✓	✓	✓
	Species at Risk		✓	✓
	Significant Wildlife Habitat		✓	✓
Preferred				✓
Operations	Operational flexibility		✓	
	Station Options	✓	✓	
	Deadhead time	✓		
Preferred		✓		
Costs	Affordability (capital and operating)	✓		
Preferred		✓		
Overall Preferred		✓		

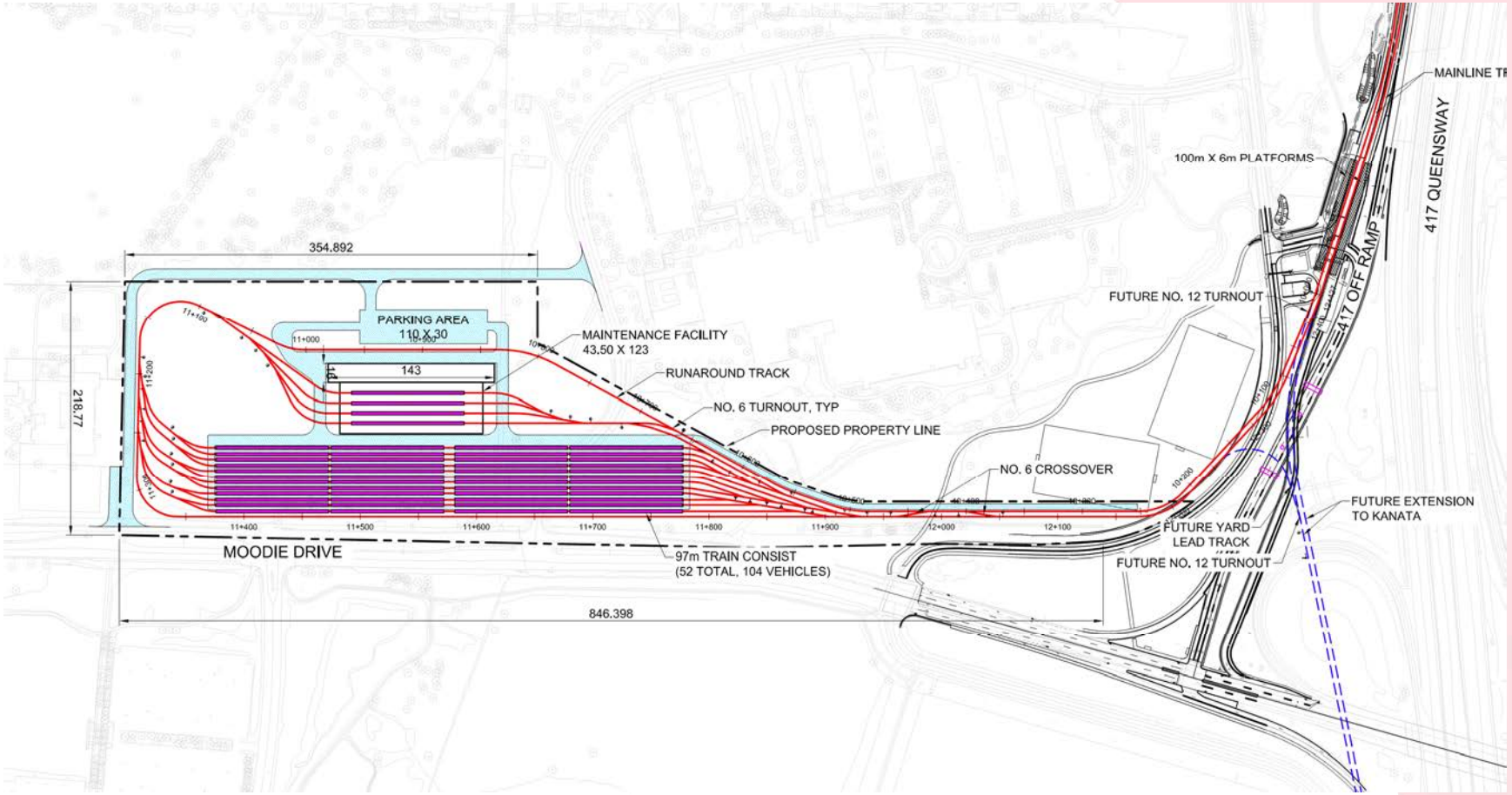
Rationale for Option 2 as Preferred

- An LMSF must be affordable and meet operational needs for the long term
- Option 3 is not preferred on any of the 5 major evaluation categories
- Option 2 is preferred in terms of land use, operations and costs
- Option 4 is preferred for transportation/connectivity and biophysical but mitigation strategies are available for other options
- Capital and operating cost premiums for Options 3 and 4 will affect City finances/affordability :
  - Options 3 and 4 are $10.6M and $ 9.3M more expensive than Option 2
  - Also have higher deadhead mileage costs and larger impact on nightly maintenance window
- Overall, Option 2 preferred due operational and cost advantages
- Mitigation strategies to be developed and committed in EPR and reflected in preliminary engineering

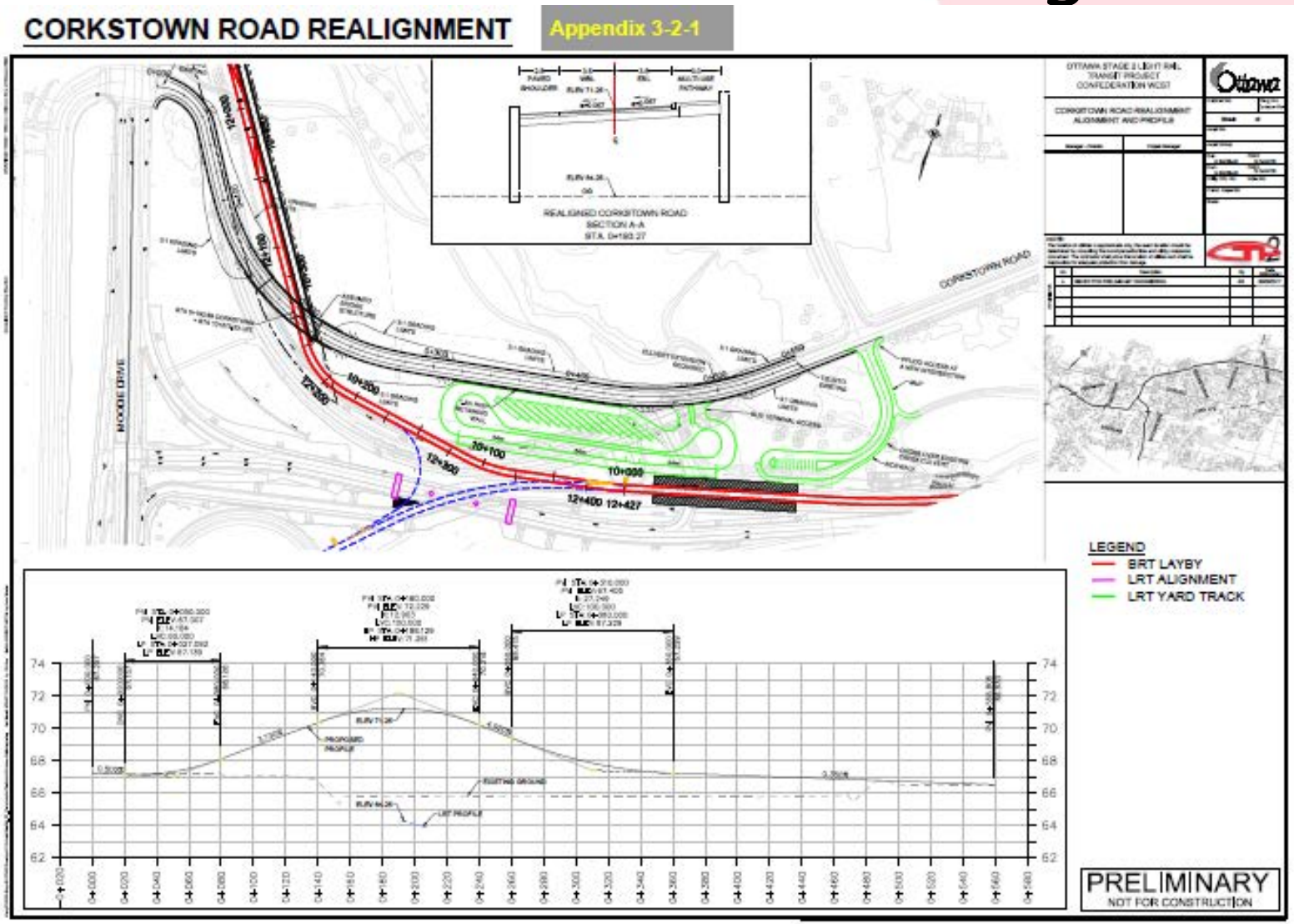
Option 2- 2023 LMSF Layout



Option 2-Ultimate LMSF Layout



Corkstown Road Realignment



Transportation and Connectivity Impacts and Mitigation

Impacts

- Connectivity
- Local traffic

Mitigation

- Maintain existing pathways
- Add MUP connecting community to Moodie Dr
- Formalize desire lines (existing informal pathways)
- Relocate Abbott road access to Moodie Drive

Social Impacts and Mitigation

Impacts

- Views and vistas
- Increase in noise
- Existing land use
- Land Availability

Mitigation

- Context sensitive design of buildings to match rural character
- 6 metre high noise wall on north side and 8 meter wall on east side
- Greenbelt Master Plan update and compensation plan to be developed in consultation with NCC/Community
- Negotiations with NCC/Abbott Industries are underway

Biophysical Impacts and Mitigation

Impacts

- Groundwater
- Water quality/Drainage
- Fish habitat
- Species at Risk
- Significant Wildlife Habitat

Mitigation

- Context sensitive design
- Maintain cut/fill balance
- Stillwater Creek mitigation
- Avoid Chorus Frog habitat
- Additional bat roosting surveys to determine impacts and inform mitigation strategy
- Compensation for loss of Natural linkage area

Operational Impacts and Mitigation

Impacts	Mitigation
• Operational flexibility	• Turn-around loop for trains in yard
• Station options	• East side station is compatible with LMSF Option 2
• Deadhead costs and impact on nightly maintenance window	• None required

Cost Impacts and Mitigation

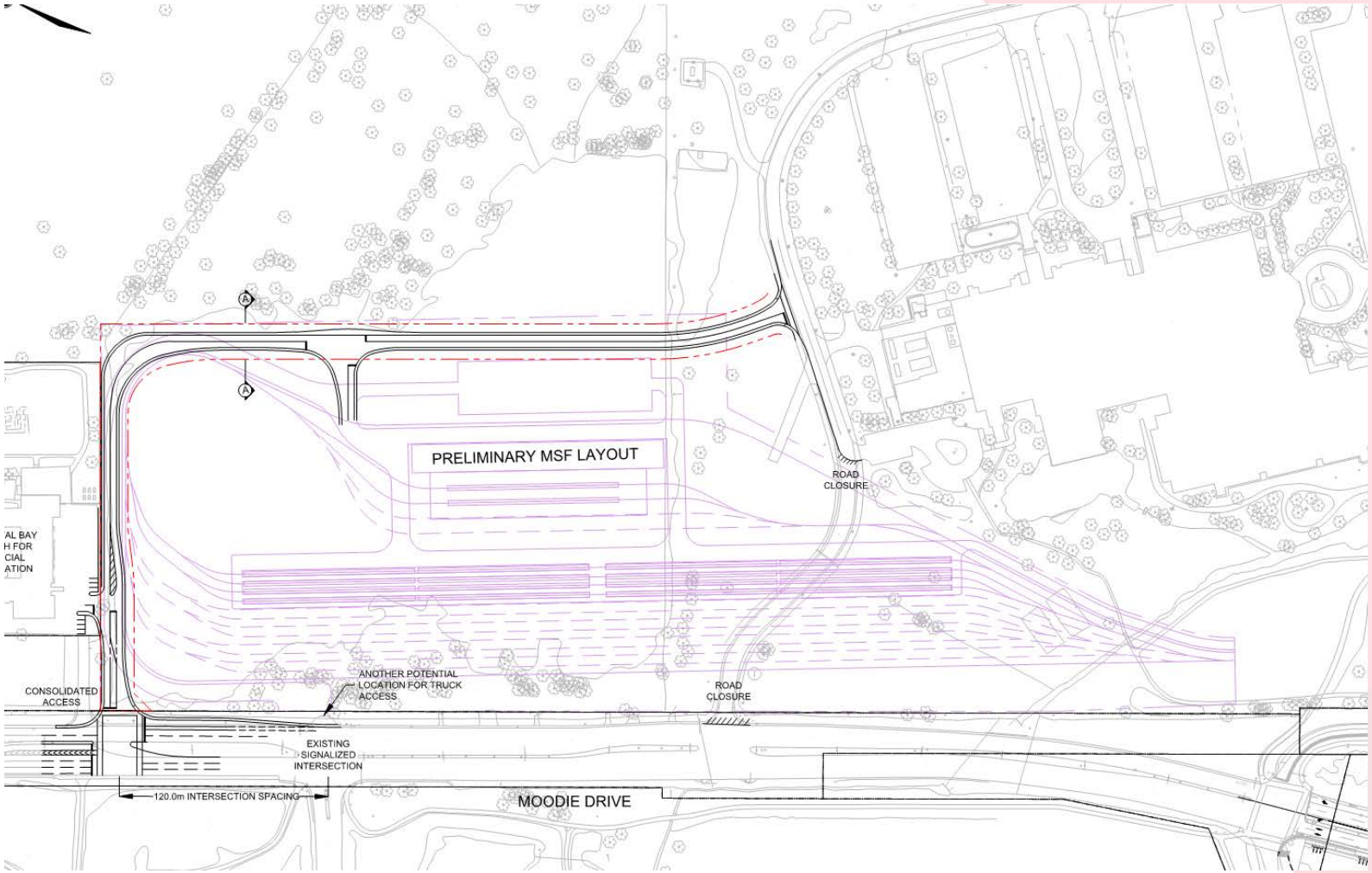
Impacts

- Affordability (capital and operating)

Mitigation

- None required
- LMSF Option 2 expected to be within affordability envelope

Abbott Access to Moodie Drive to be Relocated



Predicted Noise Levels for Option 2 with Mitigation

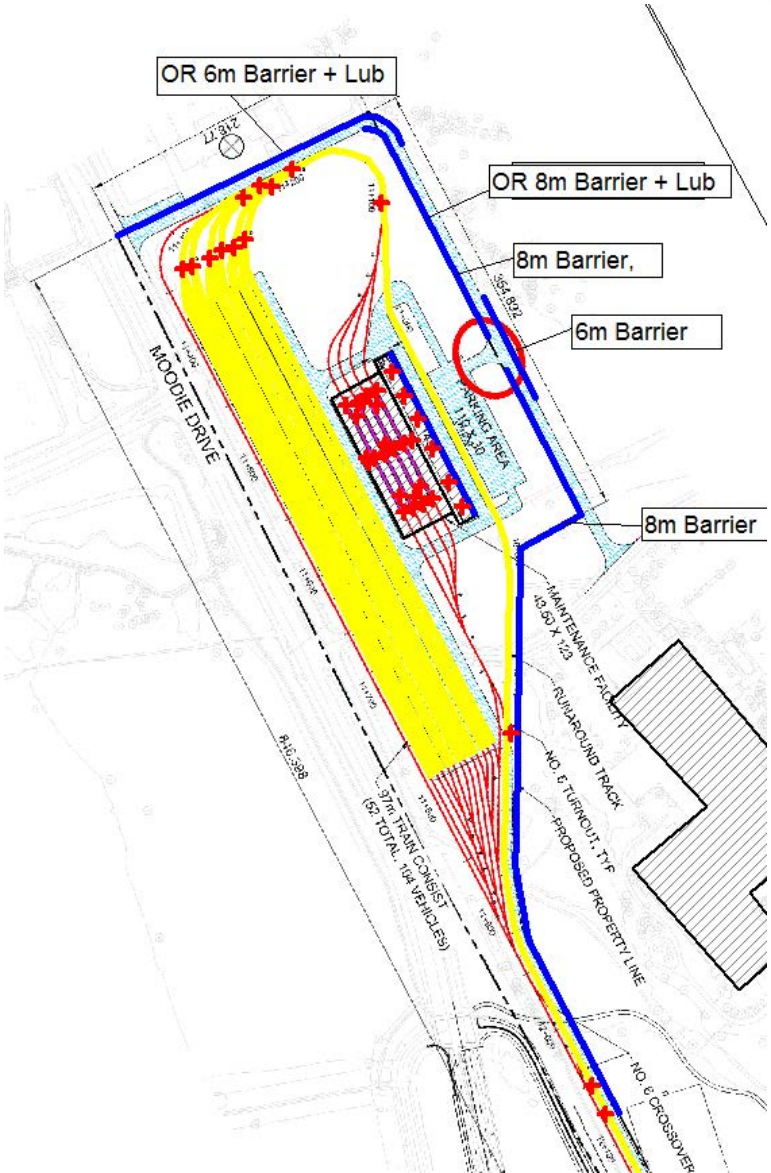
With Mitigation

Location	Overall Noise Level, 1hr Leq (dBA)		Facility Only Noise, 1hr Leq (dBA)	Projected Noise Impact	Noise Violation Exist – City of Ottawa	Exceedance of Noise Impact - MOECC	Additional Mitigation Investigation Required
	No Project (Ambient)	With Project (Nighttime)	Yard Noise	Change (dB)	Change > 5 dB	Yard Noise > Ambient	
R01	45	48	44.9	3	No	No	No
R02	45	48	45.4	3	No	No	No
R03	46	49	45.6	3	No	No	No
R04	42	43	34.9	1	No	No	No
R05	42	42	31.5	0	No	No	No
R06 (Daytime only)	56	57	48.1	1	No	No	No

Mitigation:

6m barrier(north side),8m barriers (east side) and rail lubrication system for runaround track

Mitigation of LMSF Ambient Noise with Noise Barriers



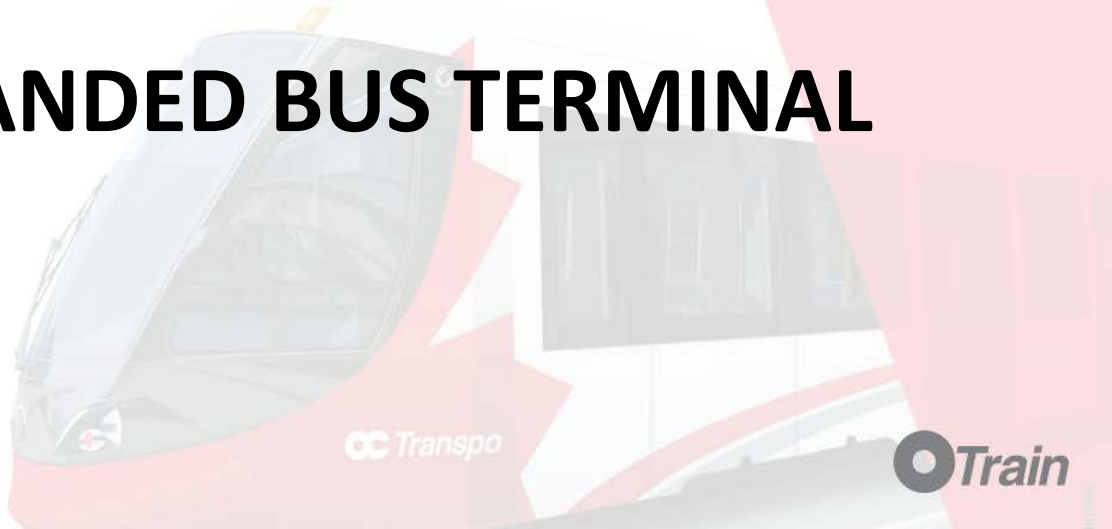
EMI/Stray Current

- EMI/stray current condition survey will be undertaken to establish pre-existing conditions
- Baseline monitoring of EMI and stray current levels compared to pre-existing background levels
- Based on revenue service EMI and stray current levels
- Stage 1 predicted and actual will be available as well
- Evaluations based on industry standards for EMI/stray current comparison to baseline conditions
- Mitigation and monitoring of both EMI/stray current levels as required by industry standards

CADD Renderings of Station/LMSF

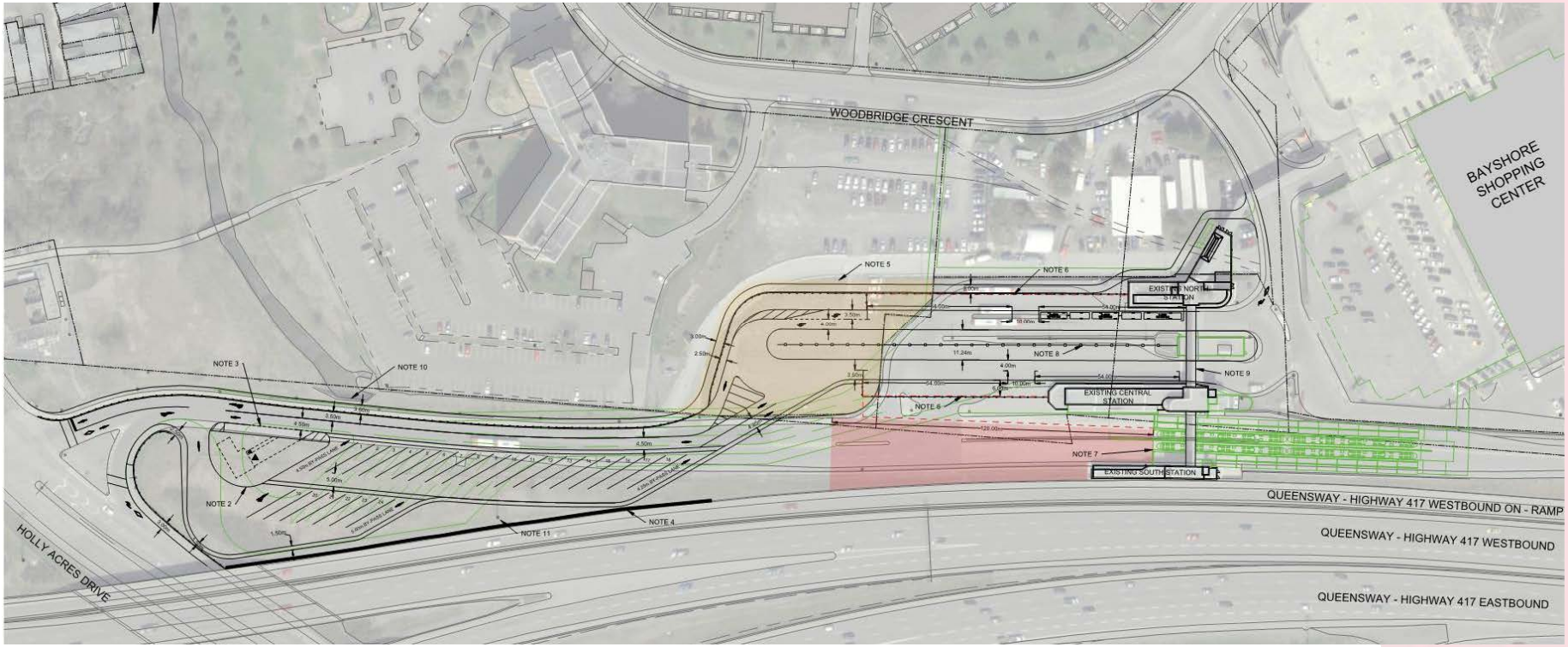
- To be prepared by City, high quality images
- Views at grade and birds eye view
- Various images from Abbott office building/residential community to be prepared showing;
  - LMSF/new road access to Moodie
  - Corkstown grade separation
  - Moodie LRT station/Highway 417
- Will be available in mid to late July

BAYSHORE EXPANDED BUS TERMINAL



Conceptual Layout of Expanded Bus Terminal

- Not required if Moodie LRT is part of Stage 2



Impacts and Mitigation

Impacts	**Mitigation**
• Noise	• No additional noise mitigation required
• Land acquisition	• Negotiate long term acquisition of property for expanded terminal (lease is likely pending Kanata LRT extension)
• Connectivity	• No additional mitigation

NEXT STEPS IN EA PROCESS

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

- Second public meeting is June 13,2017
  - Moodie LRT/LMSF preferred site and mitigation measures
- Complete preliminary engineering of preferred LMSF site and LRT extension
- Report to City Council in September, 2017 re completion of EA
- EA approval in Fall 2017
- Stage 2 contract award in August 2018 including Moodie LRT/LMSF base scope and or scope ladder

Questions

STAGE 2 LRT PROGRAM

Moodie LRT EA Addendum

TAC Meeting #2 – June 1, 2017

Minutes

Status:	Final
Place:	110 Laurier Avenue West, Richmond Room
Date:	June 1, 2017
Time:	9:30 am
Present:	Jeffrey Waara (JW) – City of Ottawa, Western BRT Project Manager (City) Burl Walker (BW) – City of Ottawa, Parks and Facilities Planning Angela Taylor (AT) – City of Ottawa Amy MacPherson (AM) – City of Ottawa Mike Schmidt (MS) – City of Ottawa, OTP Ethel Craft (EC) – City of Ottawa OTP/OTC Curtis Rampersad (CR) – City of Ottawa Bina – (BC) – National Capital Commission Natalie Ognibene (NO) – National Capital Commission Martha Lush (ML) – CTP2 Charles Wheeler (CW) – CTP2 Kim Howie (KH) – CTP2 Kelly Roberts (KR) – CTP2 Paul Croft (PC) – CTP2

ITEM #	COMMENTS	ACTION BY
1.	Introductions were made around the table.	
2.	Background CW provided a brief background on the project and presented the overview of the project and what will be covered in the formal presentation.	Info
3.	Presentation CW presented the prepared material to the group. (attached) Questions during presentation: BC asked for confirmation that impacts on the floodplain will be addressed. We will be doing further work on this issue during the	Info

	Preliminary Engineering. There is some data from Kanata South Link project that may be additional to this project. BC indicated that there is a request to transfer that data to us. There was some discussion that Site 3 likely has some SAR. BC/NO will look for some more information on the Natural Link basis. BC requested access to the plan for Kanata. NCC has concerns about Watt's Creek at Eagleson. PC indicated that there are already plans in place for this location. AT will forward to BC. BC/JW indicated that groundwater needs to be examined further. The BRT construction encountered groundwater issues but they were manageable. The group was supportive of the selection of Site 2 for the LMSF. Some discussions about whether EA approval should be sought at this time. The Federal EA approvals are an issue with the size of the facility and the decision was made not to seek federal approval at this time. AM commented that mitigations should be available for the loss of the linkage area. Looking at opportunities along Stillwater to ensure connection, so the team needs to understand the linkages better. KR to schedule meeting PC and ML to discuss connectivity in regards to the realignment of Corkstown Road. BC suggested that discussions should take place with the school as well. AM suggested that some additional explanation of EMI/EMC would be warranted for the public presentations.	BC BC/NO AT KR PC/ML
	Meeting was adjourned at 11:00 am	

Prepared by: K Howie
Reviewed by: C. Wheeler/K. Roberts
PLEASE NOTE: If your records of this meeting do not agree with this document, or if there are any omissions, please advise the writer within 2 days, otherwise the contents of this document shall be assumed accurate and correct.

Moodie LRT Addendum
PAC#1 Attendance

March 6, 2017

Name	Organization	Email
Mairi Miller	Crystal Bay Community Assoc.	mairitm@live.ca
NATHALIE LEVASSEUR	WESLEY CLOVER PARKS	NATHALIE.LEVASSEUR@WESLEYCLOVERPARKS.COM
~~Rich Nelson~~		~~Crystal Beach/Lakeview C~~
Rich Nelson	crystal Beach Comm Assoc.	ricknelson@rogers.com
IAN MCCONNACHIE	CRYSTAL BEACH LAKEVIEW COMM. ASSOC.	ian.mcconnachie@symmetrico.com
PAUL JOHANIS	GREENSPACE ALLIANCE	pjohanis@rogers.com
Scott Forum	Qualicum Graham Park	president@qualicum.ca
Peggy McGillivray	Crystal Beach Lakeview	pegmcg30@gmail.com

Bayshore Station to Moodie Drive LRT Extension Environmental Assessment Studies - Presentation to Public Advisory Committee

March 6, 2017

Agenda

- Introductions
- Planning Advisory Committee (PAC) Roles and Responsibilities
- Background and Scope of Project
- Rapid Transit Network Options
- Bus Rapid Transit (BRT) conversion to LRT
- Light Maintenance and Storage Facility (LMSF)
- Moodie LRT Station
- Bayshore Station expanded bus terminal
- Schedule
- Next steps

PAC ROLES AND RESPONSIBILITIES

PAC Composition

- Local Community Associations
- City Advisory Committees
- Advocacy Groups
- Major Commercial Property Owners

PAC Roles and Responsibilities

- Attend meetings at key milestones. PAC meetings to be held prior to Public meetings
- Provide community input on issues and concerns
- Feedback on study process and conclusions as EA work unfolds
- City will document issues and concerns and develop mitigation strategies
- PAC to comment on strategies

BACKGROUND & SCOPE

Background

- 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
- Staff report/FEDCO support of Moodie extension/LMSF, subject to affordability
- EA's initiated in late 2016 with this in mind

Scope of Environmental Assessment

- Conversion from BRT to LRT
- Siting of a western LMSF beyond Bayshore
- Rationale:
  - City priority for LRT expansion to the west
  - LRT station closer to DND employment node
  - LMSF needed to support Confederation Line East and West extensions
  - Western LMSF compliments Belfast MSF in east

Study Process

- Modifications to approved EPR

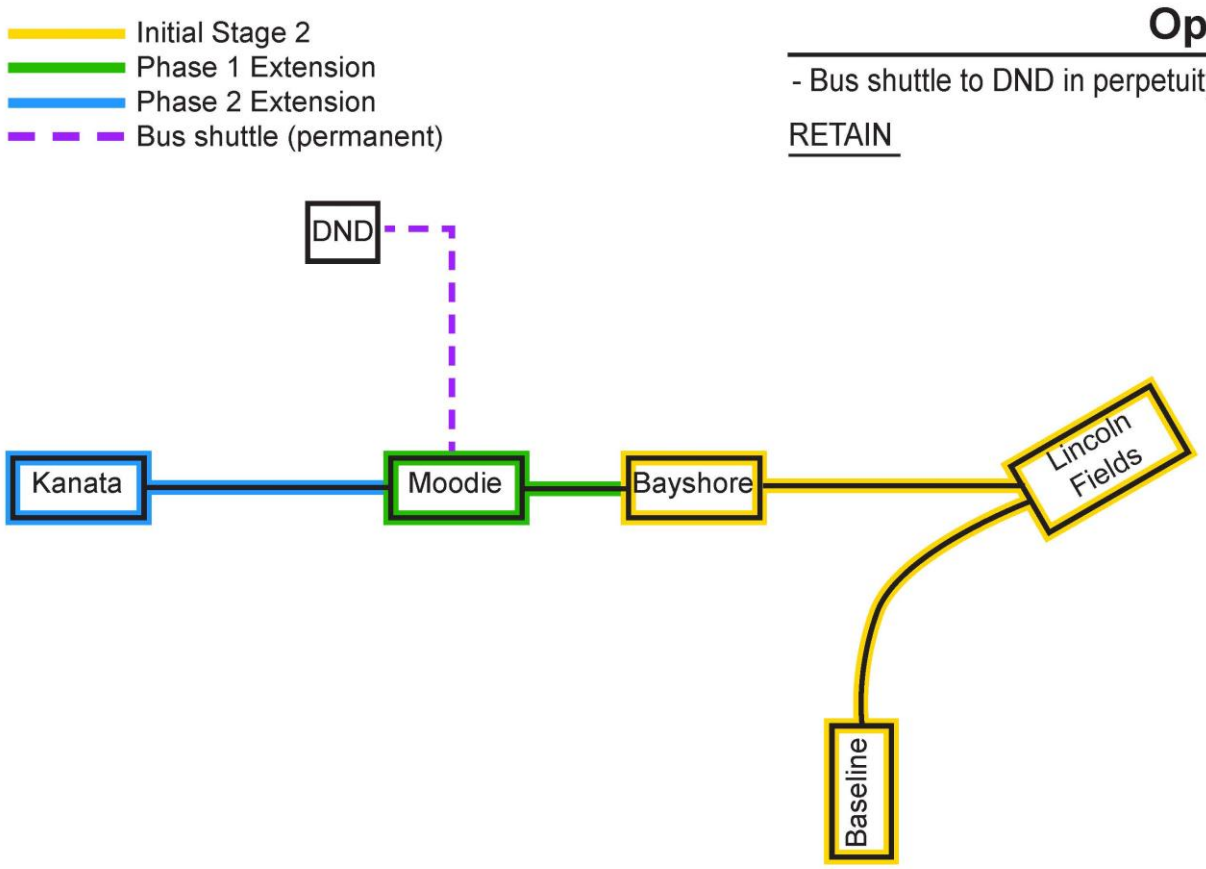
Modifications consistent with EPR	Insignificant modifications inconsistent with EPR	Significant modifications inconsistent with EPR
Proceed with modification	Prepare addendum	Prepare addendum
	Update local project file	Notice of Environmental Project Report Addendum
		Public Review
		Ministerial Approval

LRT NETWORK OPTIONS

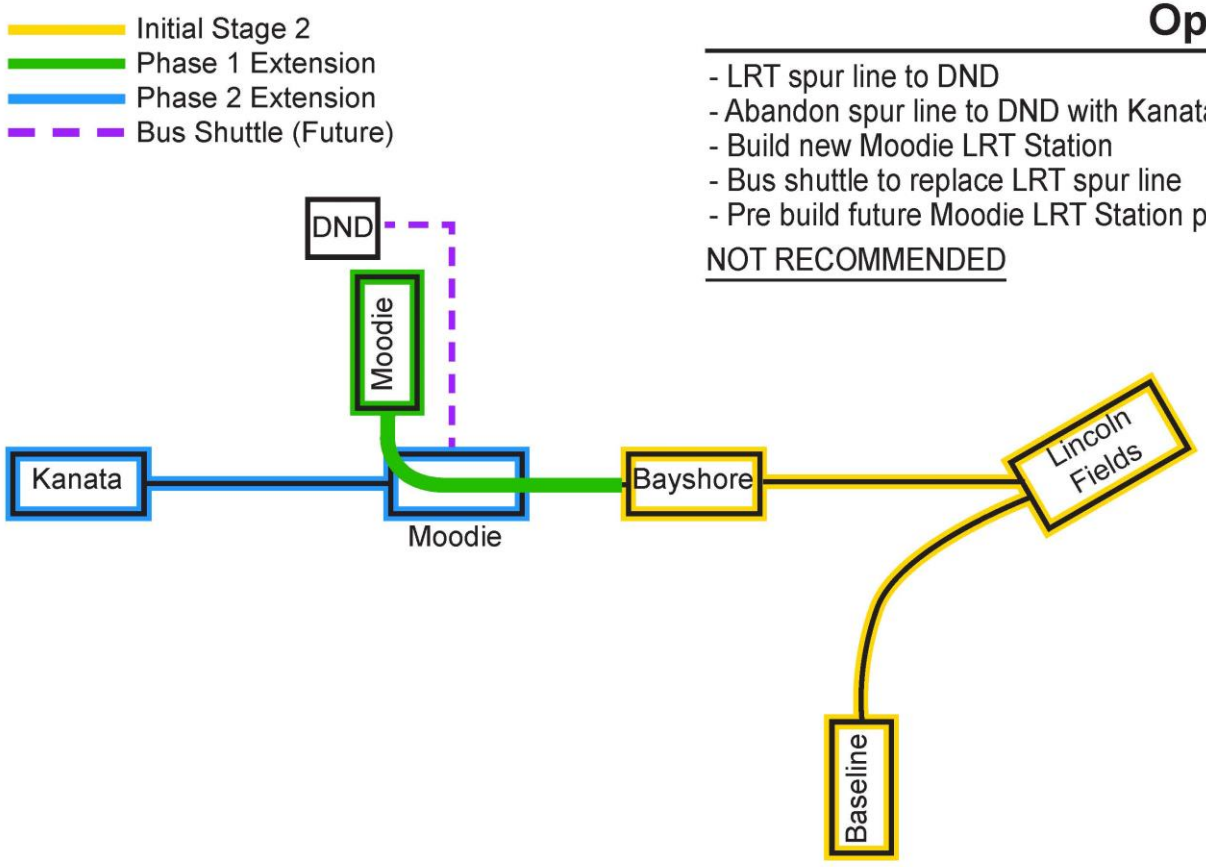
Rapid Transit Network Options

- Moodie will act as a terminal station until Kanata LRT is in place
- What should end of the line look like as a terminus?
- What should the terminal station protect for in terms of future westerly extension on the north side of Highway 417?
- To serve DND with LRT or buses, that is the question?
- Various rapid transit network options must be considered first to inform station location/alignment while protecting for extension to the west

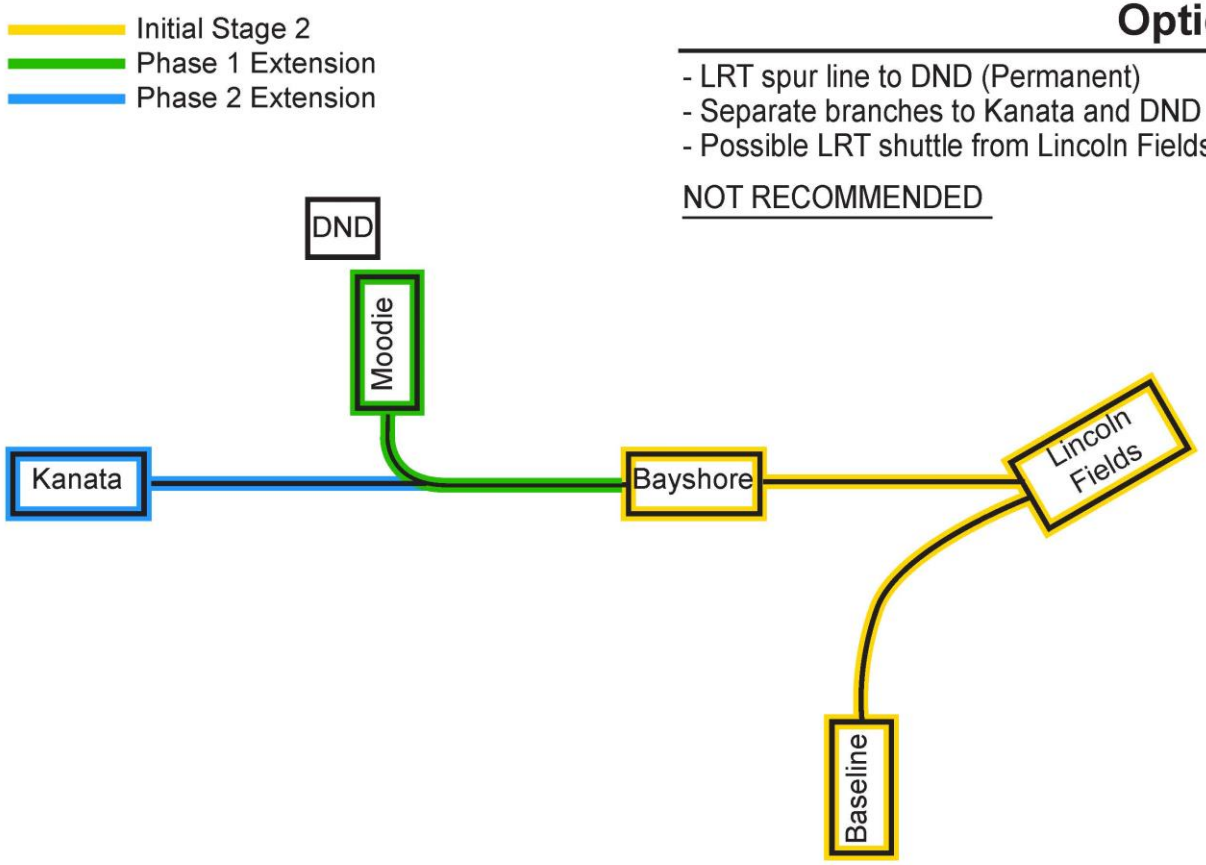
Option 1


Initial Stage 2
Phase 1 Extension
Phase 2 Extension
Bus shuttle (permanent)
Option 1
- Bus shuttle to DND in perpetuity
RETAIN
DND
Kanata
Moodie
Bayshore
Lincoln Fields
Baseline

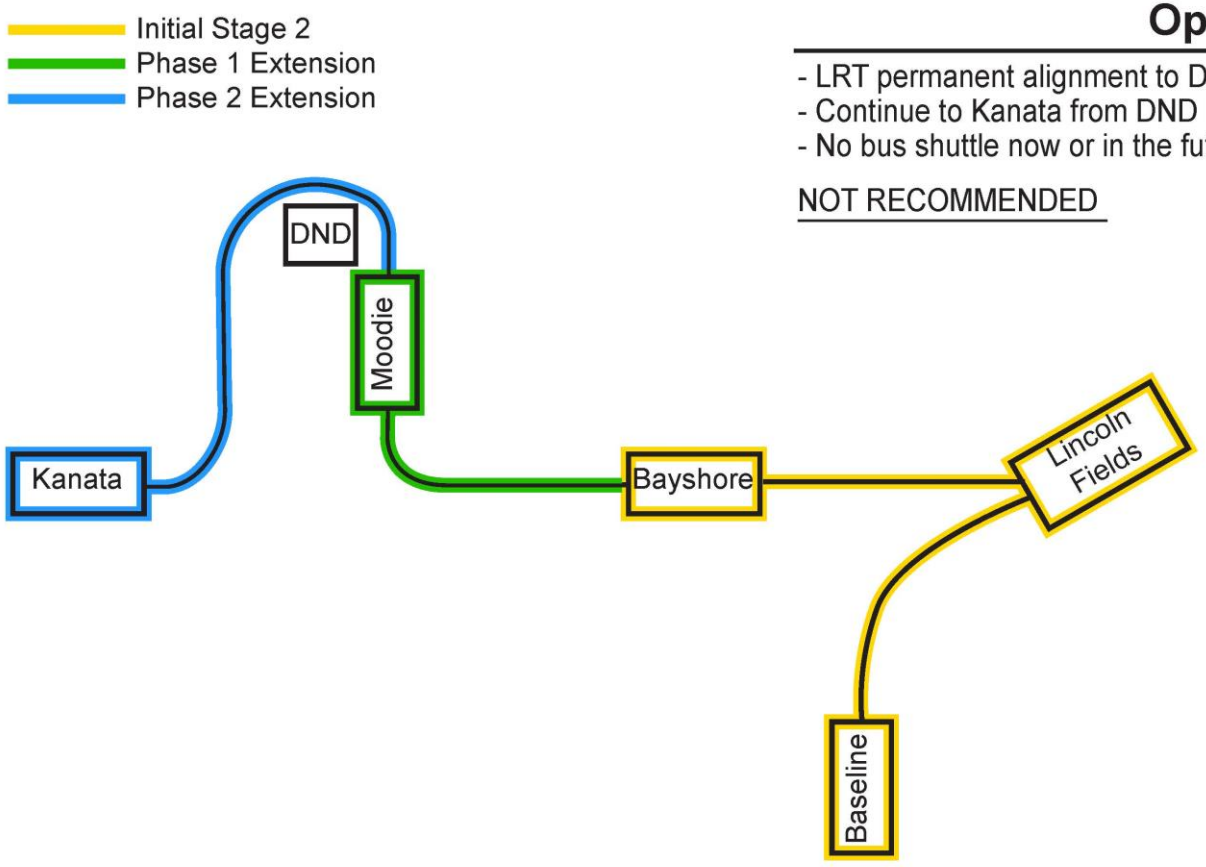
Option 2


Initial Stage 2
Phase 1 Extension
Phase 2 Extension
Bus Shuttle (Future)
Option 2
- LRT spur line to DND
- Abandon spur line to DND with Kanata LRT
- Build new Moodie LRT Station
- Bus shuttle to replace LRT spur line
- Pre build future Moodie LRT Station platform?
NOT RECOMMENDED
DND
Moodie
Kanata
Moodie
Bayshore
Lincoln Fields
Baseline

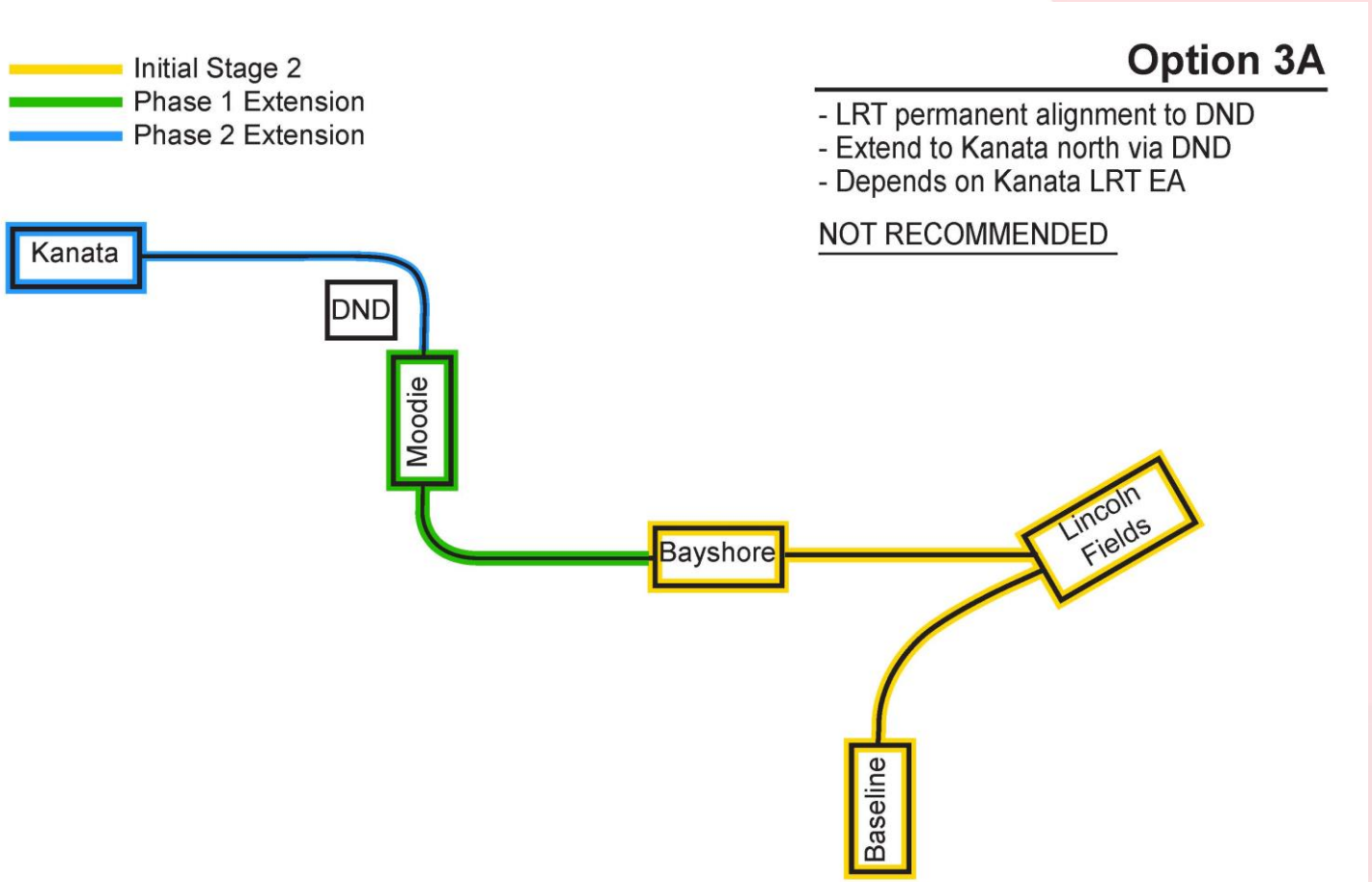
Option 2A


Initial Stage 2
Phase 1 Extension
Phase 2 Extension
Option 2A
- LRT spur line to DND (Permanent)
- Separate branches to Kanata and DND
- Possible LRT shuttle from Lincoln Fields to DND
NOT RECOMMENDED
DND
Moodie
Kanata
Bayshore
Lincoln Fields
Baseline

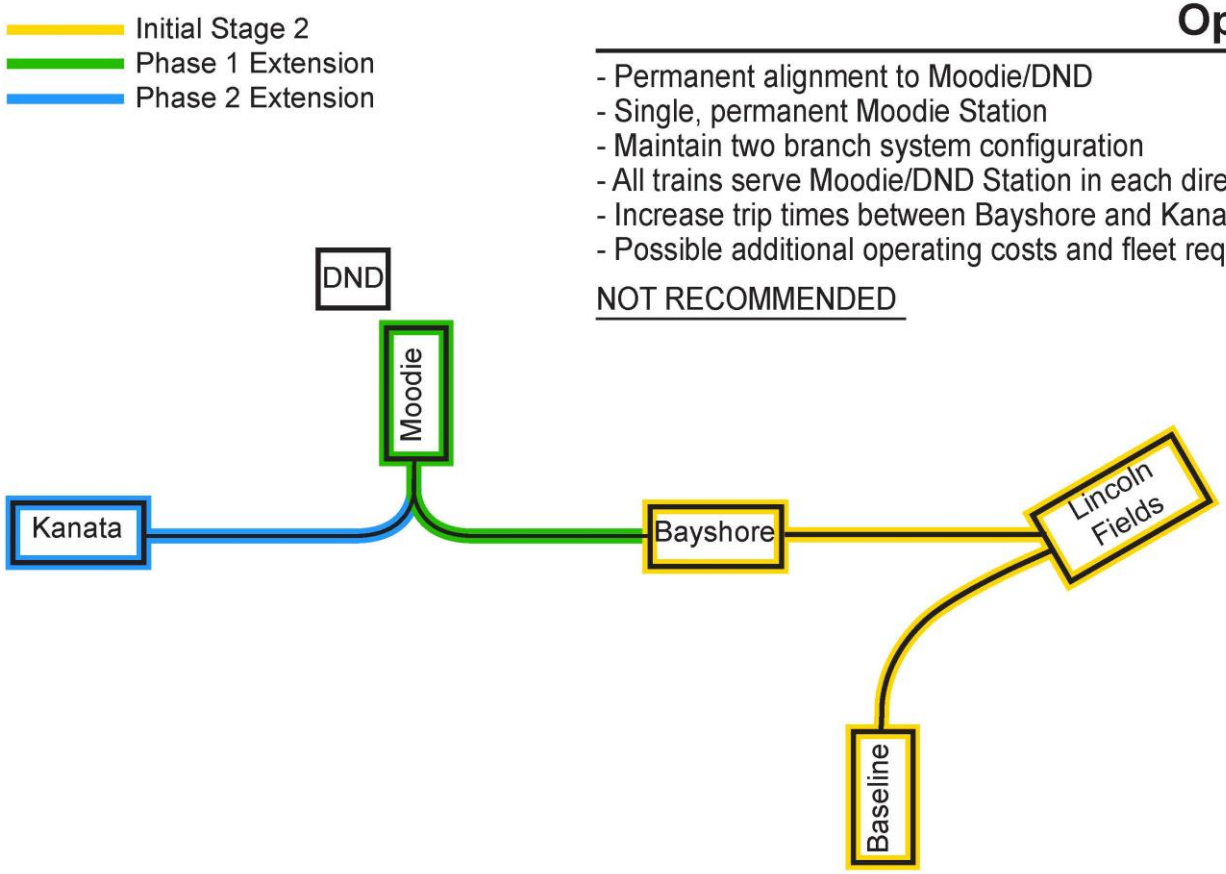
Option 3


Initial Stage 2
Phase 1 Extension
Phase 2 Extension
Option 3
- LRT permanent alignment to DND
- Continue to Kanata from DND
- No bus shuttle now or in the future
NOT RECOMMENDED
DND
Moodie
Kanata
Bayshore
Lincoln Fields
Baseline

Option 3A


Initial Stage 2
Phase 1 Extension
Phase 2 Extension
Option 3A
- LRT permanent alignment to DND
- Extend to Kanata north via DND
- Depends on Kanata LRT EA
NOT RECOMMENDED
Kanata
DND
Moodie
Bayshore
Lincoln Fields
Baseline

Option 4


Initial Stage 2
Phase 1 Extension
Phase 2 Extension
Option 4
- Permanent alignment to Moodie/DND
- Single, permanent Moodie Station
- Maintain two branch system configuration
- All trains serve Moodie/DND Station in each direction
- Increase trip times between Bayshore and Kanata
- Possible additional operating costs and fleet requirements
NOT RECOMMENDED
DND
Moodie
Kanata
Bayshore
Lincoln Fields
Baseline

Preferred Network Option

- Option 1 preferred:
  - 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

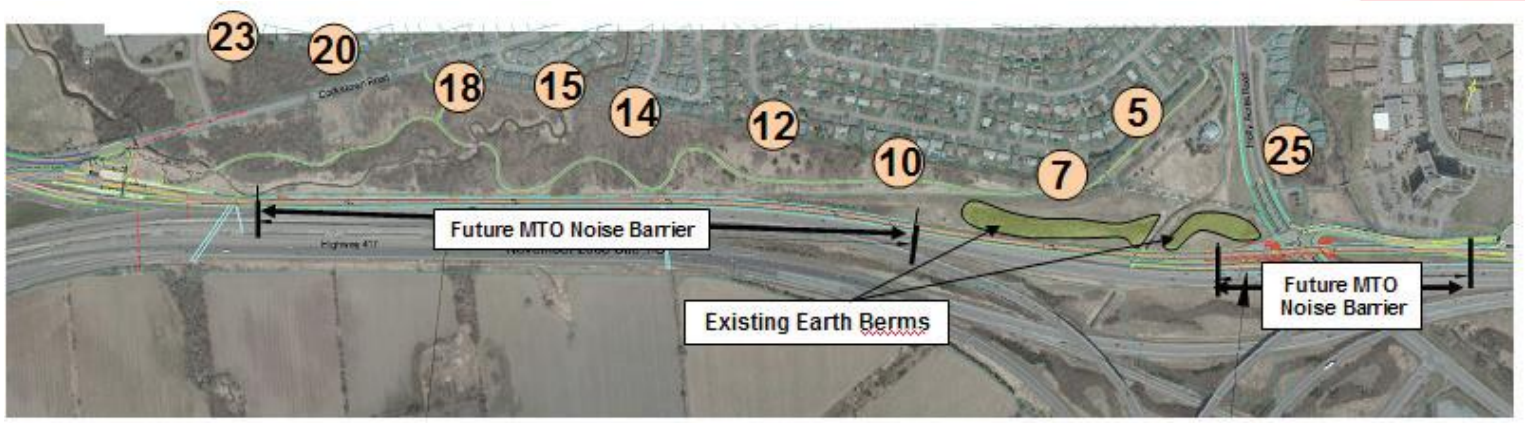
Maximize Reuse of Existing BRT Infrastructure

- Alignment/retaining walls/noise barriers
- BRT Station (to the extent possible)
- 417 ramp grade separation
- Stillwater Creek improvements
- Holly Acres Bridge (as designed)

Conversion from Buses to LRT Vehicles

Noise & Vibration

- Existing background noise (Highway 417 traffic) is the predominant noise source
- Two noise barriers proposed to attenuate noise from future highway traffic to be retained. The west wall is currently under construction
- The east wall (at Holly Acres) is currently under review to confirm the location for the current construction – north of Highway 417 or north side of new LRT bridge. Ultimate location is north of LRT.
- Vibration impacts not considered an issue/no mitigation needed



Air Quality

- Conversion of BRT operations to electrically powered LRT eliminates 200,000 bus trips annually from Bayshore to Moodie
- Moodie LRT will have a positive impact on air quality
- Existing and future air quality conditions all fall below the allowable limits of CO, HC, NO_x, and PM

Storm Water Management/Drainage

- LRT impact is expected to be net positive:
  - Decreased amount of impervious surfaces due to conversion of pavement to ballasted track
  - Offset by surface station footprint
  - Maintain existing SWM initiatives implemented for BRT
  - Need for new SWM to be analyzed once station location/LMSF is real

BRT/LRT Station Design Issues

BRT Station :

- BRT platforms cannot be reused for LRT station
- Bus terminal must be expanded for LRT
- Kiss and ride facility
- No commuter parking

LRT Station:

- Two side platforms (90m initially, 100 m ultimately)
- 9 bus bays/14 lay by spaces needed for feeder bus network
- Kiss and ride facility
- No commuter parking

FEDCO Motion re Moodie Park and Ride

- 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

Rationale for Preferred LMSF Strategy

- 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 Strategy

- 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 Site Search Criteria

Two key questions to inform LMSF site search:

1. What is the maximum practical distance that an LMSF can be located away from the main line?
2. Environmental and policy context within that zone?

Implications of LMSF Distance from the Main Line

Separation of an LMSF from the main line effects

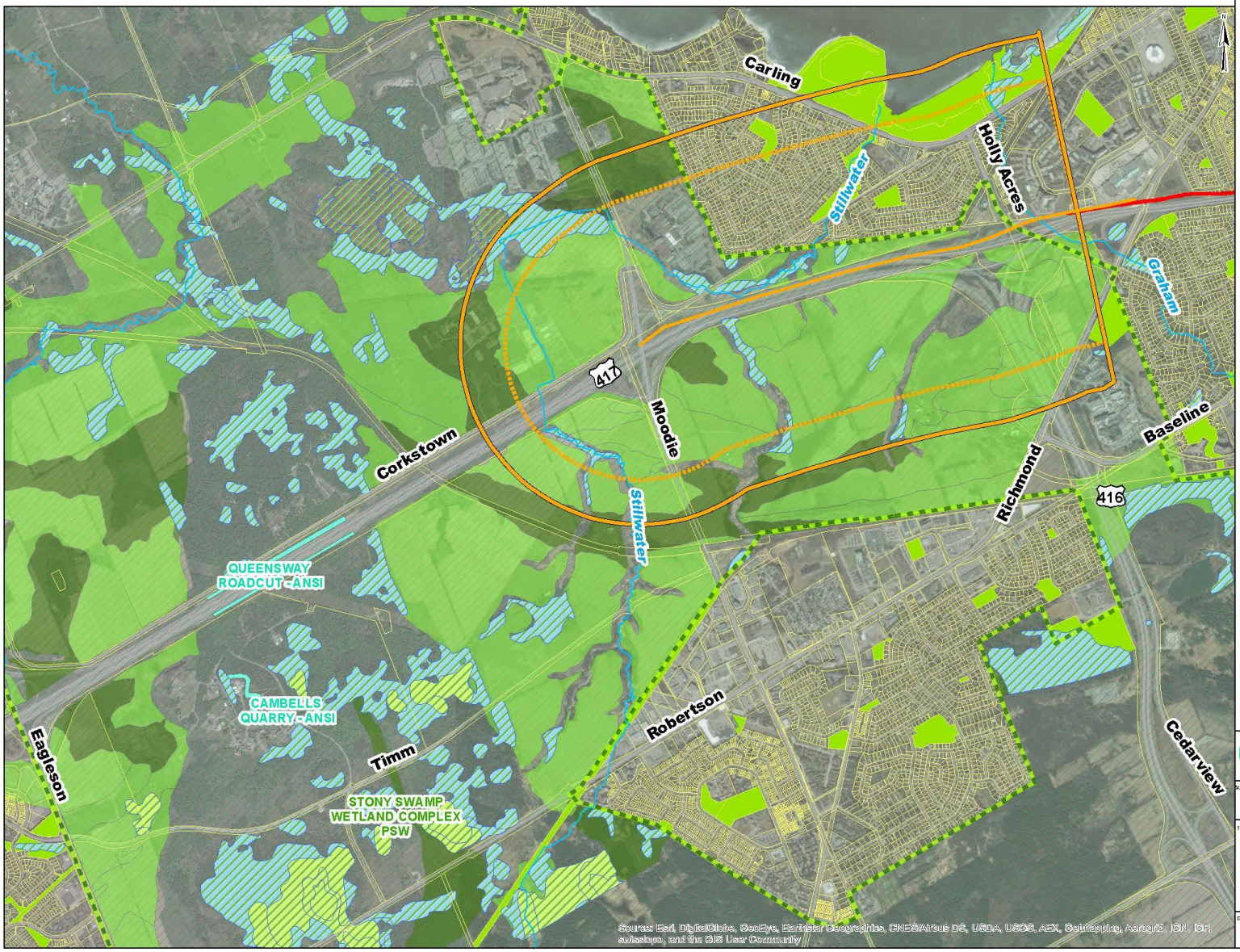
- Increased operator hours/driver costs to access the mainline/yard
- Increased deadhead mileage resulting in increased vehicle maintenance and power costs for LRT
- Increased maintenance costs for track, OCS, track bed, systems, etc.
- Negative impact on time available for nightly maintenance of LRT infrastructure/productivity

Importance of Nightly Maintenance Window

- Revenue operations are typically 19-20 hours per day
- Nightly maintenance window is 4-5 hours per night
- Less the time it takes to get from LMSF to the mainline and to the section of track/tunnel requiring maintenance and then back again at end of the shift
- If it takes an additional 15 minutes inbound and outbound to get from the LMSF to the mainline, the available nightly maintenance window is reduced 10-12.5 % in perpetuity
- As a result, an LMSF must be sited within close proximity to the main line

LMSF Distance Criteria to the Main Line

- Ideally the LMSF should be directly adjacent to the main line to preserve the nightly maintenance window
- Existing Belfast MSF is 525 metres from main line
- This is at the outer limits of a practical distance
- Vast majority of Canadian MSF's (light and heavy rail) are within 200 metres of the mainline including all 5 existing TTC rail yards
- Recent TTC Rail Yard Needs Study identified the preferred site for a future yard being 800 metres from main line
- Distance from Baseline to Woodroffe MSF (1200 m) is considered excessive and contributed to LMSF search beyond Bayshore
- 750 metres adopted as a search criteria (50 % longer than Belfast MSF distance to main line)
- Ensures that MSF sites will be within the Moodie LRT EA study area (1250 m radius)



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

Ottawa

Scale: 1:20,000

0 0.25 0.5 1 Kilometers

Title:

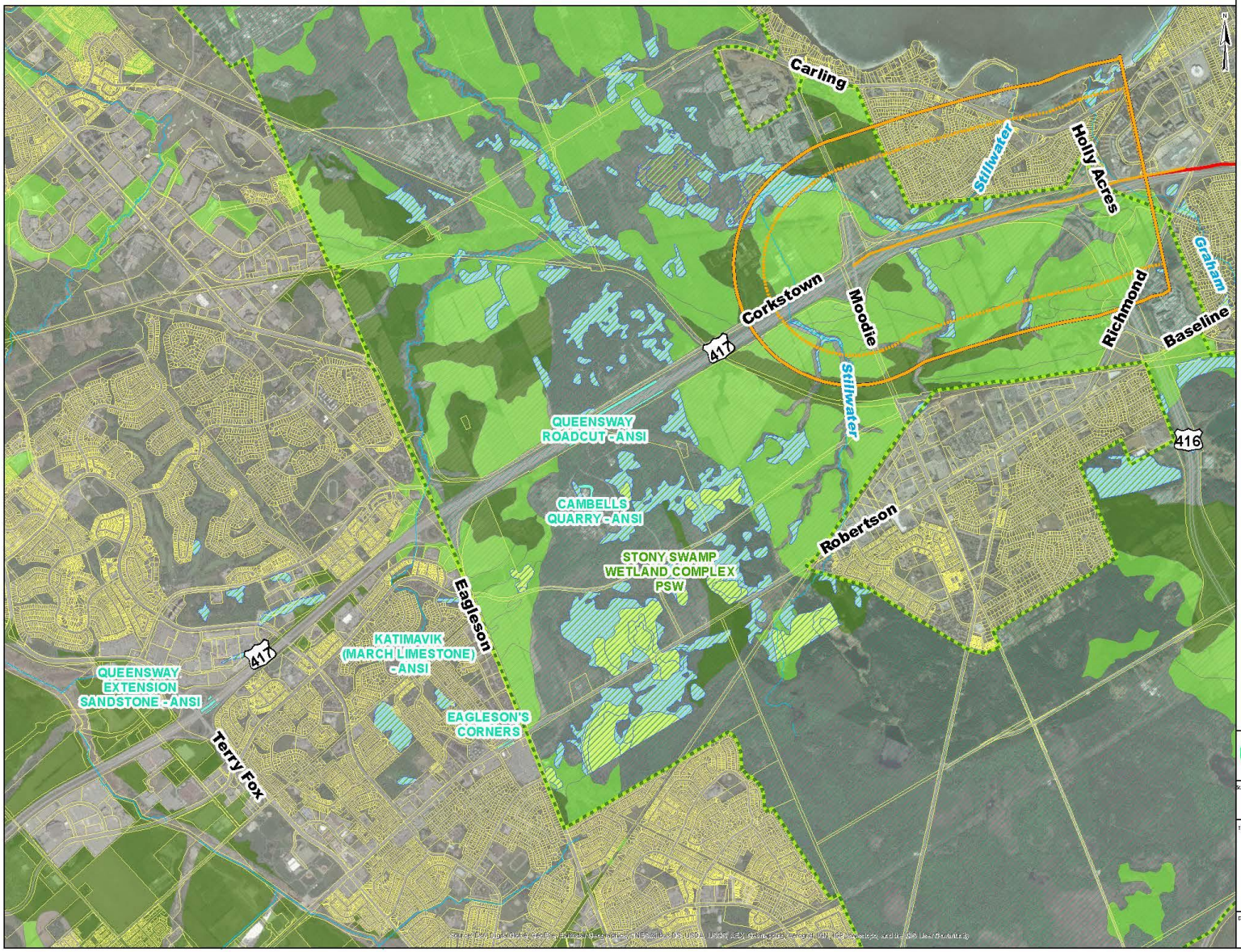
Ottawa Light Rail Transit Moodie Extension - MSF Siting Assessment Criteria

Date: February, 2017

Drawing No.: Overview

STAGE 2 ETAPE 2

OTrain


Carling
Stillwater
Holly Acres
Graham
Corkstown
Moodie
Richmond
Baseline
417
Stillwater
416
QUEENSWAY ROADCUT - ANSI
CAMBELLS QUARRY - ANSI
STONY SWAMP WETLAND COMPLEX PSW
Robertson
Eagleson
KATIMAVIK (MARCH LIMESTONE) - ANSI
417
QUEENSWAY EXTENSION SANDSTONE - ANSI
EAGLESON'S CORNERS
Terry Fox
Legend
Moodie-Kanata LRT Extension
Confederation Line - West
MSF Search Zone - 750m
MSF Search Zone - 1000m
Road Network
Property Parcels
Watercoures / Waterbody
Greenbelt
Wetland Significance
Not evaluated per OWES
Evaluated-Other
Evaluated-Provincial
ANSI
ANSI, Earth Science
Agriculture Capability
1
2
3
Scale:
1:30,000
Kilometers
Title:
Ottawa Light Rail Transit
Moodie Extension -
MSF Siting Assessment Criteria
Date:
February, 2017
Drawing No.:
Overview

Moodie/Kanata LMSF Site Alternatives

- Alternative LMSF locations identified using the following site characteristics:
  - **Topography and Grade**: Level ground
  - **Size**: Approximately 16 hectares in size for ultimate fleet size including Kanata LRT
  - **Environment**: Avoid areas of geographical, environmental and historical importance
  - **Connections**: Connect to LRT corridor in an efficient manner respecting maximum separation (750 m)
  - **Access Redundancy**: Two tracks required for LMSF access and egress
- 8 sites identified as having these characteristics

Candidate LMSF Sites

LMSF Screening Criteria

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

LMSF Screening Criteria

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

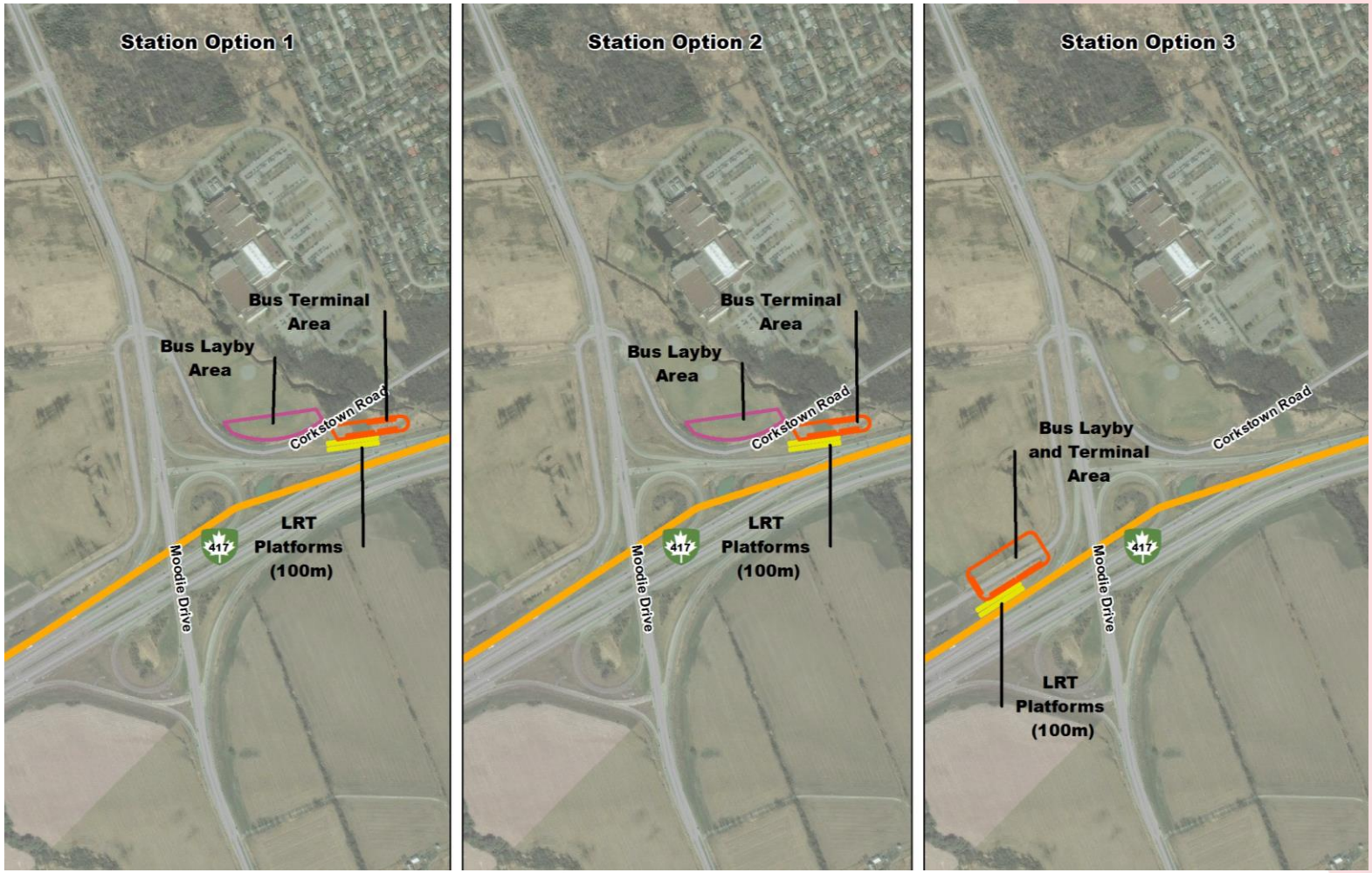
- Site 1 and 6 *do not meet 25% of the criteria, Site 1 has the largest number of criteria not met*
- Site 7 and 8 *are not affordable*
- The remaining sites are feasible but will still require some mitigation
- Of the four remaining sites:
  - Sites 2, 3, and 4 have the most evaluations that best meet 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 LRT STATION

Moodie LRT Station Integration/Location

- Overhead pedestrian connection from LRT platform to bus terminal
- Redundant elevators to all levels
- Same architecture/passenger experience as Stage 1 stations
- Fare paid bus terminal
- Public washrooms
- Location of station affected by LMSF yard tracks
- Station locations can be east/west of Moodie

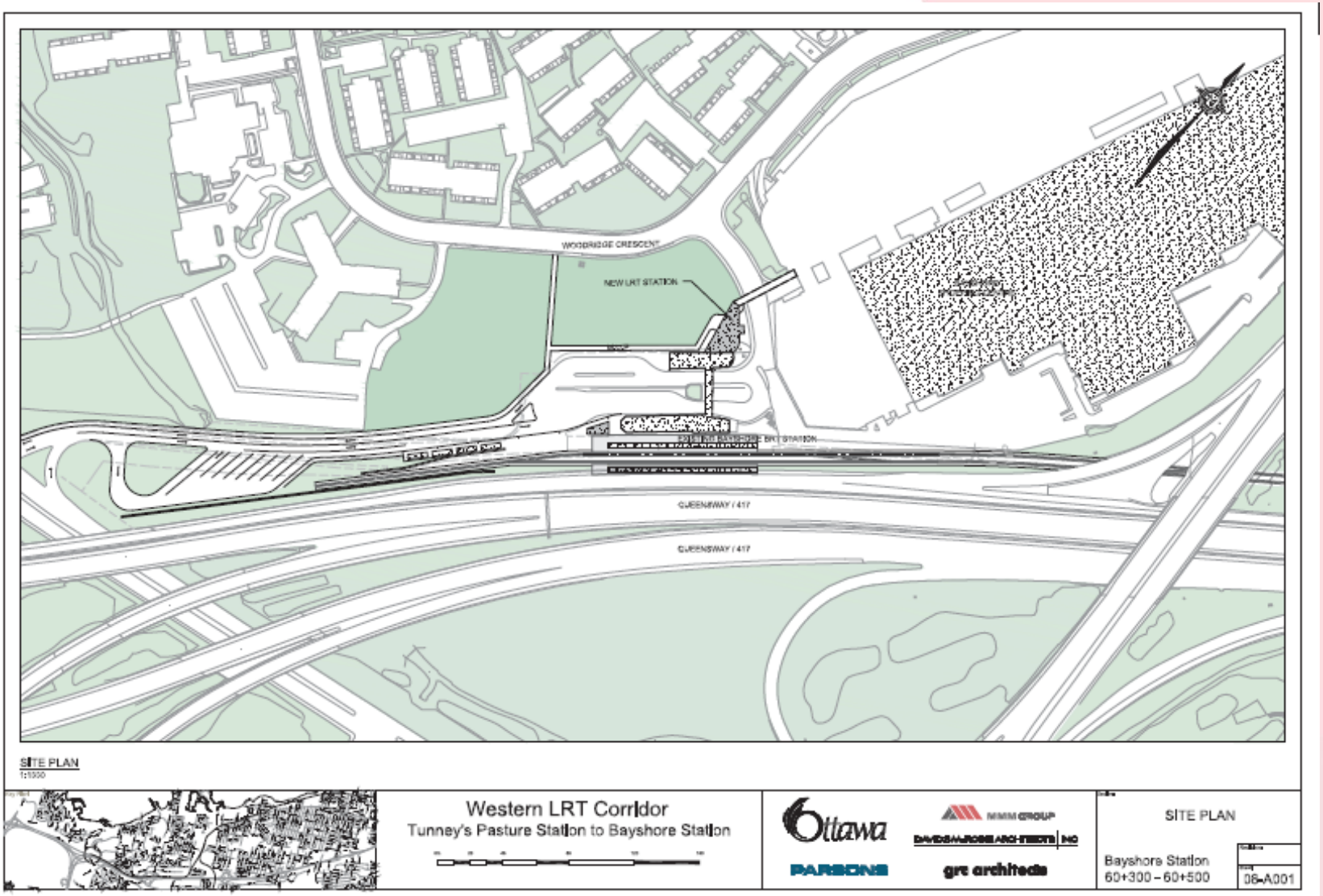
Station Locations Impacted by LMSF



BAYSHORE EXPANDED BUS TERMINAL

History

- Confederation West EA commenced in 2014:
  - Ridership projections based on 2013 Transportation Master Plan
  - Some additional bus laybys required but within City lands
  - Layby space in area of Holly Acres grade separation
  - Despite community concerns, grade separation not needed for BRT
  - Holly Acres grade separation deferred to LRT project



SITE PLAN
1:1000

Western LRT Corridor
Tunney's Pasture Station to Bayshore Station

SITE PLAN

Bayshore Station
60+300 – 60+500

06-A001

STAGE 2 ETAPE 2

OTrain

Confederation West EA Process

- Stage 2 Preliminary Engineering:
  - Size/configuration of bus terminal confirmed late Fall 2016 following draft ridership forecasts
  - A larger bus terminal needed than defined in EA
  - Noise, vibration, air quality studies then initiated
  - Not possible to complete studies in time to be included in Confederation West EA Study
  - Will be addressed as an addendum to the approved EA in early 2017

Bus Facility Requirements at Bayshore

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

Bayshore/Moodie Bus Facility Requirements

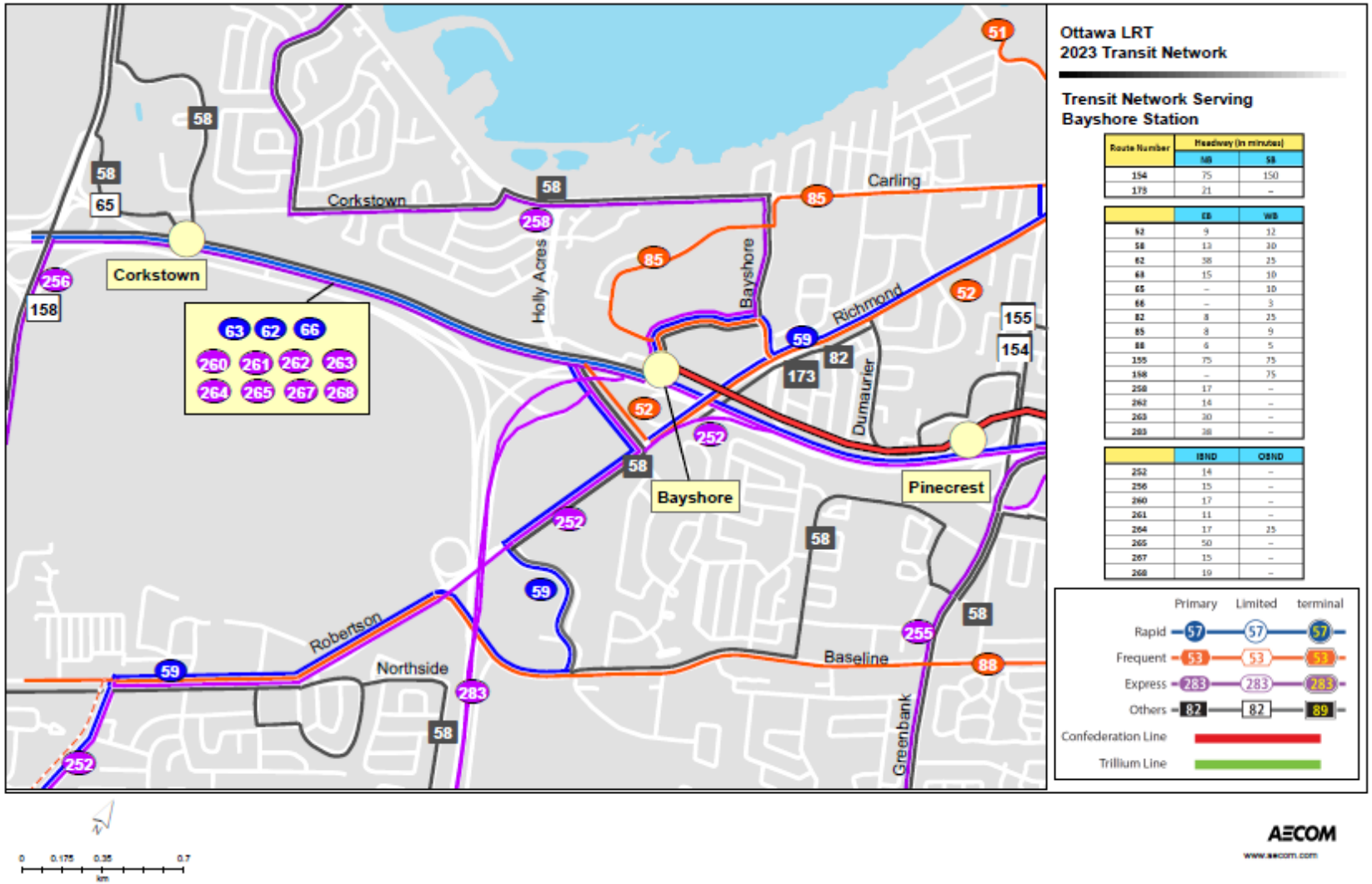
Source	Without Moodie LRT Extension(4)				With Moodie LRT Extension(4)			
	Bayshore		Moodie		Bayshore(1)		Moodie(1)	
	Bays	Laybys	Bays	Laybys	Bays	Laybys	Bays	Laybys
EA Concept	9	10+8(3)	NA	NA	NA	NA	NA	NA
July Stage 2 Forecasts(2031)	12	24	NA	NA	5	6	9	14
Existing	11(2)	8-10	NA	NA	NA	NA	NA	NA

(1) With LRT extension to Moodie

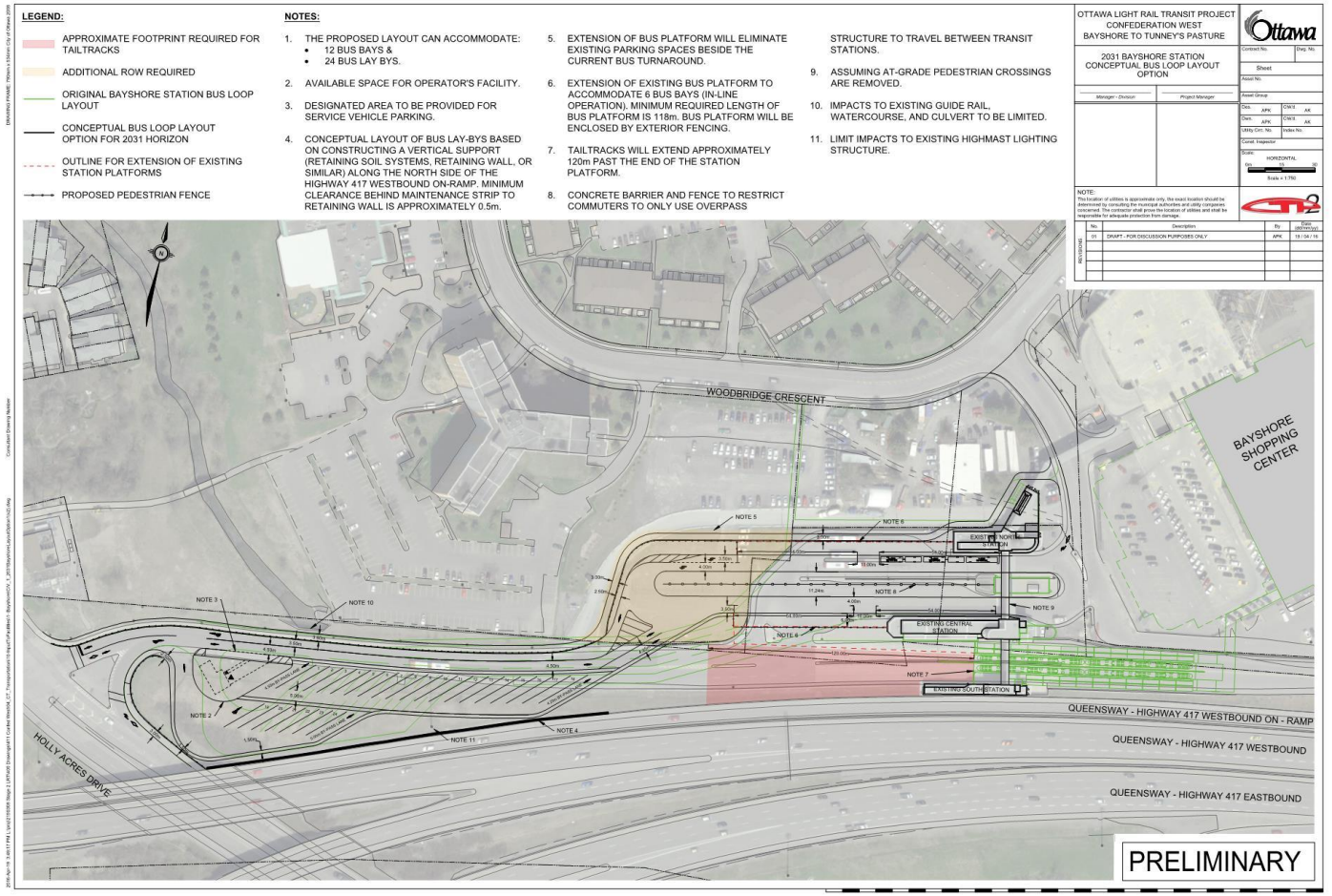
(2) 6 BRT platforms,5 local bus platforms

(3) 8 in the station area,10 in the layby area near Holly Acres

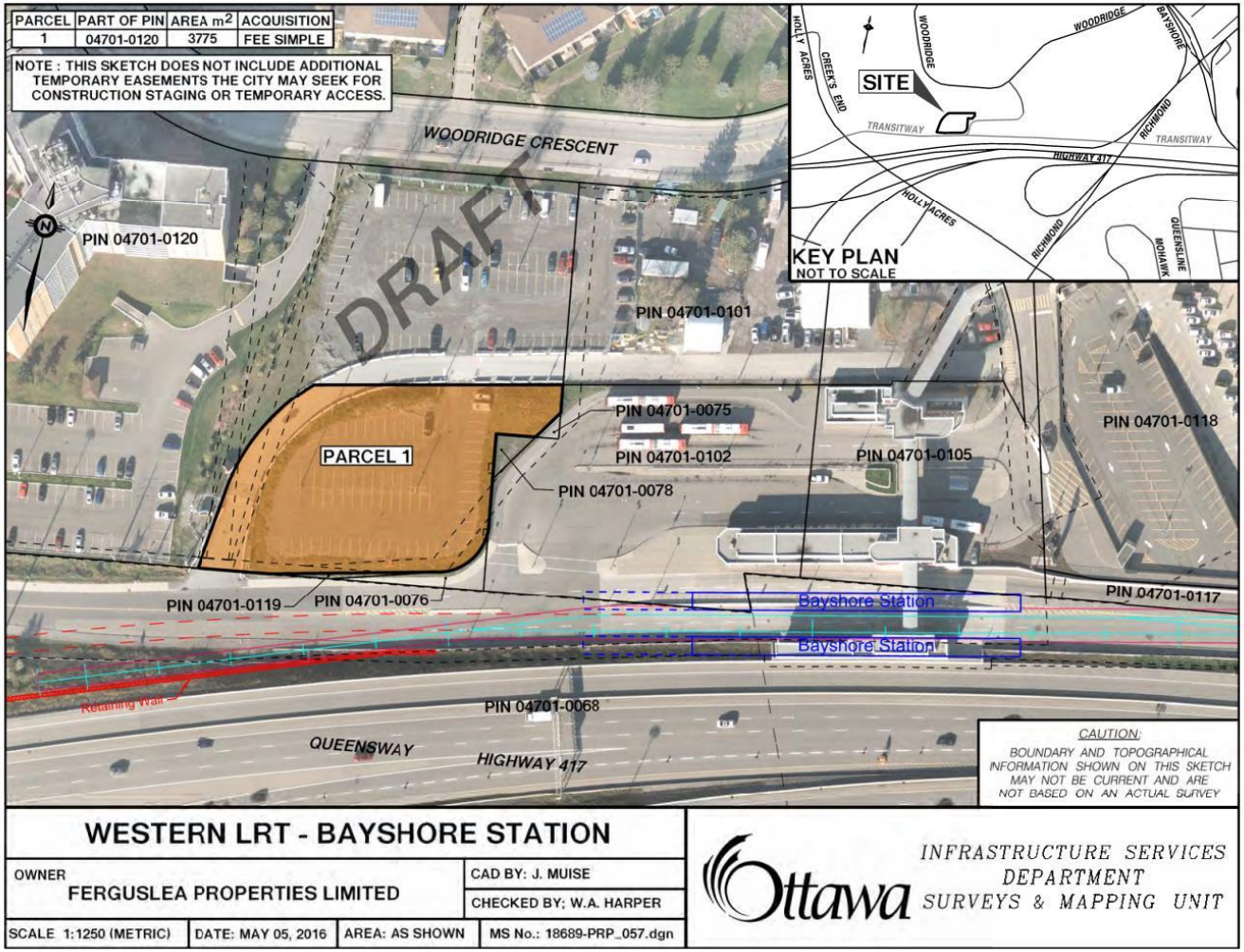
(4) Bus bays and layby spaces based on 2031 projections to allow for growth


Ottawa LRT
2023 Transit Network
Trensit Network Serving
Bayshore Station
Corkstown
Bayshore
Pinecrest
Carling
Richmond
Dumaurier
Holly Acres
Robertson
Northside
Baseline
Greenbank
Primary
Limited
terminal
Rapid
Frequent
Express
Others
Confederation Line
Trillium Line
AECOM
www.aecom.com
STAGE 2
ETAPE 2
OTrain

Conceptual Layout of Bayshore Bus Terminal



Preliminary Permanent Property Requirements



Noise and Air Quality 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
- Air quality analysis will be available by mid March

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

- Initial public meeting now confirmed for March 22 (Maki Community House Centre)
- 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 August, 2017 re completion of EA
- EA approval in Fall 2017
- Stage 2 contract award in May 2018 including Moodie LRT/LMSF if affordable

Questions

STAGE 2 LRT PROGRAM

Moodie LRT EA Addendum

PAC Meeting #1 – March 6, 2017

Minutes

Status:	Final	
Place:	145 Woodridge Crescent	
Date:	March 6, 2017	
Time:	6:00 pm	
Present:	Mairi Miller – Crystal Bay Community Association Nathalie Levasseur – Wesley Clover Parks Rick Nelson – Crystal Beach Lakeview Community Association Ian McConnachie – Crystal Beach Lakeview Community Association Paul Johanis – Greenspace Alliance Scott Pegrum – Qualicum Graham Park Peggy McGillivray – Crystal Beach Lakeview Community Association Charles Wheeler – CTP2 Kim Howie – CTP2 Kelly Roberts – CTP2	
Regrets		
ITEM #	**COMMENTS**	**ACTION BY**
1.	CW welcomed the group to the meeting and provided some information on the meeting purpose.	
2.	Presentation CW and KR presented the prepared material to the group. (attached) The following questions were raised after the presentation. Q: Have there been other options considered for getting passengers to DND beside a bus shuttle, which could be expensive? Options could be people movers/moving sidewalk. A: Other options such as people movers, moving sidewalks were not reviewed as the implementation for this type of system is not a straightforward endeavor would be costly to construct and operate and presents CPTED concerns. OC Transpo has committed to providing a bus shuttle. Q: Why is consideration not being given to construct the Holly Acres Bridge as part of the BRT construction? A: The bridge was deferred as part of the tender for the BRT and if it were to be put back in now it would delay the opening of the BRT giving less time for it to operate prior to being converted to LRT. The feeder bus savings of going to	

	Moodie with the BRT would also not be realized. The bridge is not required from a noise perspective for the BRT and will now be triggered by LRT construction Q: Why open the BRT at all? Why not wait and just convert to LRT? A: Several years of feeder bus savings would not be realized by not implementing the BRT as planned. Throw away costs to convert to LRT are in the area of $5M and operating savings help offset that. If it had been known before the BRT work started that Moodie may be affordable, the approach may have been different. Moodie is now thought to be affordable because of the change in maintenance approach for the Stage 2 LRT and financing savings realized. Q: When will the BRT be shut down between Lincoln Fields and Bayshore to construct LRT? A: We will not be shutting down the majority of the BRT until very late in the construction. Staging concepts have been developed to allow us to maintain service on the Transitway until the testing and commissioning stages near the end of the construction period. Q: During the construction of the Holly Acres bridge, how will the BRT be affected due to the space required to construct the bridge. A: The BRT will have to be shut down for this work but we have yet to do any work on the detailed staging of this portion of the project. This will be reviewed as the Moodie LRT of the EA progresses. Q: How will the Holly Acres Bridge be built if the Bayshore bus terminal is expanded? A: It will be more difficult to build the Holly Acres bridge after opening LRT to Bayshore first but with proper construction staging we are confident that the impact on bus operations can be minimized. Q: The BRT EA deferred the Holly Acres Bridge because it would be too expensive to shut down the BRT to build bridge so how are we doing it now? A: Cost was only one factor in the decision to defer the bridge. The noise analysis indicated that it was not required for BRT operations. The staging for the construction of the bridge will be more complex for any work that overlaps the BRT operations but the intent is to shut down the BRT to facilitate the remainder of the bridge construction with BRT detours in place around the bridge construction when necessary Q: What specifically is being asked of the Crystal Bay Community representative at this meeting as we are somewhat removed from the LRT conversion portion of the work? A: We would like the representative to take this information back to their respective groups and to comment on the sites being reviewed for the MSF and provide any comments. Q: What is the current timing of shut down to build LRT? A: We are not able to dictate timing to the contractor who will build the LRT but there will be constraints included in the contract. This will include deferring the most expensive and disruptive parts of the BRT diversion to the latest possible date. This saves operating costs for the bus detours. This portion of the BRT will likely be operational for 2018-20/21. We will specify the constraints to encourage deferring the work on this section until later in the construction	

	period. Q: Can some of the techniques currently being used for bridge replacement be used for new bridges? A: Rapid replacement technology can be used for replacement but typically not used for this situation (new construction). Q: Is there any work being done on the north side of Highway 417 for the widening that would affect LRT construction. A: As the 417 widening extends only to Highway 416, there is little or no adjacent construction with LRT. The bundling of the 417 widening with the LRT project will ensure that one contractor is responsible for construction coordination Q: How will the buses from Kanata get into the LRT Station at Corkstown? A: We have started to look at this and the new ramp structure being constructed to allow buses to turn right directly into the station from northbound Moodie will not be available after LRT due to space constraints for tracks. Buses will have to use Corkstown Road to access the LRT station. We are looking at station locations on the east and west of Moodie Drive and how this affects bus operating costs. Q: Is it expected that bus volumes will be higher from Kanata once LRT is in place? A: We have looked at the bus routes with the Corkstown station in place. Some of the local buses will go to Corkstown but not all of the local Kanata buses will go there. We will try to avoid the need for a transfer to Kanata but operating cost will be a factor in this service planning decision by OC. Q: Option 2 seems like it would be best to put the station on the east side closer to DND together with the MSF. It will be in place for 20 years so why not. A: There is no way to push the station further north on the east side of Moodie Drive without have a separate line. The trains cannot use the same track as the MSF and there is not space for both. Q: Are the MSF sites below ground or at grade? A: They will be at grade. Q: The MSF site size of 16 hectares was identified. What is the space requirement for the station? A: We do not have that level of detail yet. We are continuing to work on station layouts. It should be noted that the 16 hectares is for the full MSF layout including the trains required to go to Kanata. The opening day layout will be for only 34 vehicles instead of the 96 ultimate. As a result, we need to build 50-60% of yard area in 2023. We also need to make sure the flexibility is there to expand the site when we need to. Q: Who make the determination of how significant the changes are the EA. How does the addendum decision get made? A: The EA team decides in the end what the impacts are and what process needs to be followed. We can't do this at this time but will be able to determine this later. MOECC will also be involved with the team to ensure that the appropriate process is followed.	

	Q: If Moodie doesn't happen with Stage 2 could the site could get pushed further west? A: The LRT may be built without the MSF but the MSF will not be built unless the LRT is not being extended to Moodie. The MSF could be in Kanata if a site is not found in this location. A comment was made by one of the attendees that site 2 is subject to flooding. Q: What will be the access to Site 4? A: The track access to this site will be below Highway 417. The tracks have to be low to get under the Moodie interchange and there is not enough space to bring the tracks back up and over the highway. Q: Why not use the existing rail corridor to cross the highway? A: This is not in the plan as the turns are not appropriate for an LRT vehicle. Q: What happens to Corkstown Road if site 3 is developed. A: We were looking at ways to move the site to the south and maybe re-reroute Corkstown Road around the site. If this is not feasible or doesn't make sense, Corkstown will likely go over the yard access tracks. Q: Why is site 3 being considered as Wesley Clover is planning a significant amount of work. A: We need to do more work on the feasibility of it and have specific discussions with them to determine their plans. Q: How much parking will be at the MSF? A: Staff would use it but we have not worked out the exact details of this this yet. Q: Would pedestrian access be included with these options? A: Connectivity will be included in the work. Will do a connectivity study and expect that access to the DND site from the LRT station will be a factor. One of the principles of the project is that connectivity needs have to be included to ensure that passengers can get to the station sites. Comment: Wesley Clover currently has issues with moving people who visit their site around (getting to bus stops, walking, cycling) and is currently challenging and dangerous. Q: The original BRT proposal had pathways on west side on Moodie and commitments were made during the BRT work to improve pedestrian concerns. A: LRT is not changing any commitments made by the BRT and they will not be affected by the switch to LRT. If there are detailed questions on particular locations, please forward them to us. Q: Train movements from Kanata will have to be reviewed if the MSF is on the south side of Highway 417 A: Agreed and this is part of the scope of the work. Comment: The existing rail line could be used as an access to the south MSF from Kanata. Q: Will the shuttle to DND be only DND personnel? A: No, it will be a normal OC Transpo route that anyone will be able to use so	

	could be a benefit to the Crystal Bay community. Q: Is there anything envisioned for south east corner of Moodie Drive and Carling Avenue for this project? A: No. Only Option 1 which was screened out. Q: Is it an issue to have the MSF site beside the school for Option 2? Pollution issues? A: We do not consider it an issue as the site handles electrically powered trains. There will be noise from the yard but there are lots of examples of yards near residential uses and it is possible to screen adjacent uses from the LMSF site Noise studies will be done and mitigations measures will be implemented. Q: Deadheading is being used by Go Train and OC Transpo now so why such an emphasis on that? A: Inner city/commuter train yards are much more difficult to find and construct in burden areas as the trains are longer and this creates severe constraints on the sites available . As a result Go commuter trains have much longer deadhead mileage to a yard compared to LRT or heavy rail yards which are typically located directly adjacent o the main line.	
	Meeting was adjourned at 8:00 pm	

Prepared by: K Howie
Reviewed by: C. Wheeler/K. Roberts
PLEASE NOTE: If your records of this meeting do not agree with this document, or if there are any omissions, please advise the writer within 2 days, otherwise the contents of this document shall be assumed accurate and correct.

Bayshore to Moodie BRT to LRT Conversion
Public Advisory Committee Meeting
Bayshore Public School, 145 Woodridge Crescent, Nepean ON

June 1, 2017

Name	Organization	Email
Bill Fenton	CBLCA	Fenton.bill@sympatico.ca
Rick Nelson	CBLCA	ricknelson@rogers.ca
NATHALIE LEVASSEUR	WESCEY CLOVER PARKS	NATHALIE.LEVASSEUR@WESLEYCLOVERPARKS.COM

Bayshore Station to Moodie Drive LRT Extension Environmental Assessment Studies

Advisory Committee Meeting
June 2017

Overview

- Introductions
- Project Overview:
  - Background Refresher
  - Project Updates
- BRT to LRT conversion:
  - Station location east or west of Moodie
  - Functional requirements for Moodie LRT station
  - Impacts and mitigation
- Light Maintenance and Storage Facility (LMSF)
  - Short listed sites evaluation (Options 2, 3 and 4)
  - Preliminary preferred site (Option 2)
- Park and Ride/response to Council motion
- Schedule
- Next steps/TPAP process and timing

BACKGROUND REFRESHER

Background

- BRT Transitway Extension from Bayshore Station to Moodie Drive currently under construction
- Expected revenue service is 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 as base scope
- EA planning initiated with this in mind

Scope of Environmental Assessment

- Bayshore to Moodie LRT:
  - City priority for LRT 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 LRT extended to Moodie as part of Stage 2
- Slightly different EA process for each change

Study Process

- Modifications to approved EPR – Expanded Bayshore Bus Terminal

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

Study Process

- EPR – Bayshore to Moodie LRT Extension
- Follow TPAP process to address public interest

Pre-planning	Notice of Commencement	Notice of Completion	Ministers Review
• **Data collection** • **Alternatives** • **Impact assessment** • **Stakeholder consultation** • **Draft reports**	• Consultation with interested persons including regulatory agencies and Aboriginal Communities • Documentation (EPR)	• Public review of EPR by interested persons including regulatory agencies and Aboriginal Communities • Opportunities for objections to be sent to Minister regarding areas of provincial interest	• Review EPR • Consider any objections
We are here	Up to 120 days	30 days	35 days

BRT TO LRT CONVERSION

Impacts and Mitigation

Impacts	Mitigation
• Alignment/retaining walls/noise barriers	• No additional mitigation required. West noise wall unchanged
• BRT Station	• Minor design modifications
• 417 ramp grade separation	• Design modifications required
• Stillwater Creek improvements	• Maintain existing improvements
• Holly Acres Bridge	• Opportunities to reduce width. Consideration of new location for east noise wall
• Add Kiss and Ride	• Added to BRT station

Park and Ride

- Council motion asked us to consider park and ride at Moodie LRT station
- Staff report will respond to this motion later this summer/early fall
- New expansive Park and Ride lot (free) not recommended at this location;
  - Lack of space immediately adjacent to Moodie LRT station
  - A parking deck would likely be required given space constraints
  - May be underutilized once LRT is extended to Kanata/potential for throw away capital costs
  - Would encourage additional traffic across the Greenbelt and is contrary to City and NCC policy
- Potential to provide a limited/short term (Gold level) park and ride using the existing Abbott Industries surface lot if unused spaces are available

Moodie Station-Functional Requirements with Moodie LRT

Bus Facilities/Kiss and Ride:

- 9 bus platforms including dedicated platform for OC Transpo DND shuttle
- Fare paid bus terminal
- 14 lay by spaces
- Bus operators building
- 11 kiss and ride spaces (number of spaces to be confirmed)

LRT Station:

- Same station architecture as Stage 1
- LRT platform (initially 90 metres in length, protection for 100 metres)
- Likely a side platform station but City will leave this to contractor to decide
- Redundant elevators
- Entrance and emergency exit
- Public washrooms

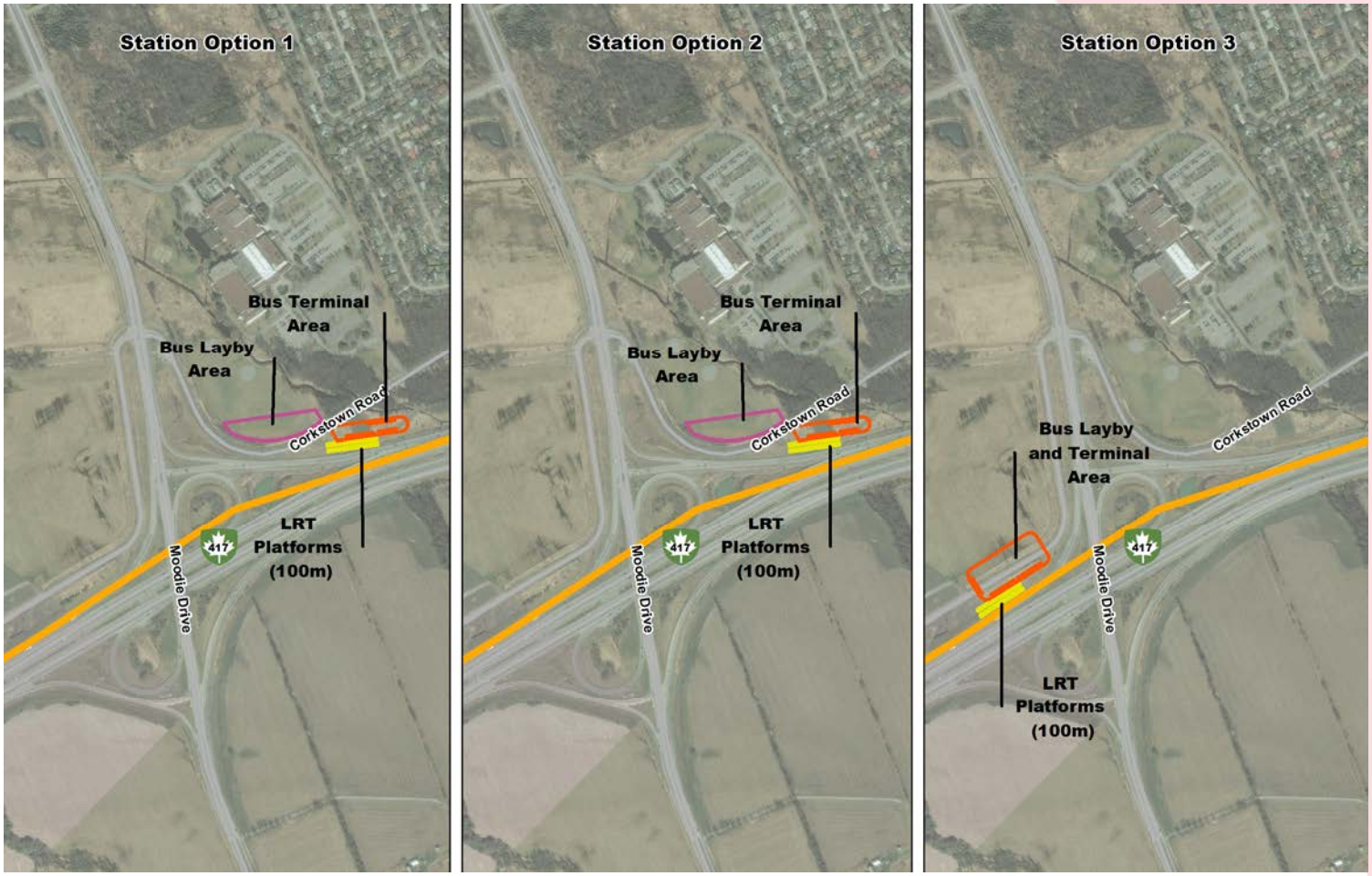
Other:

- Traction power sub station (TPSS) for station (and LMSF)

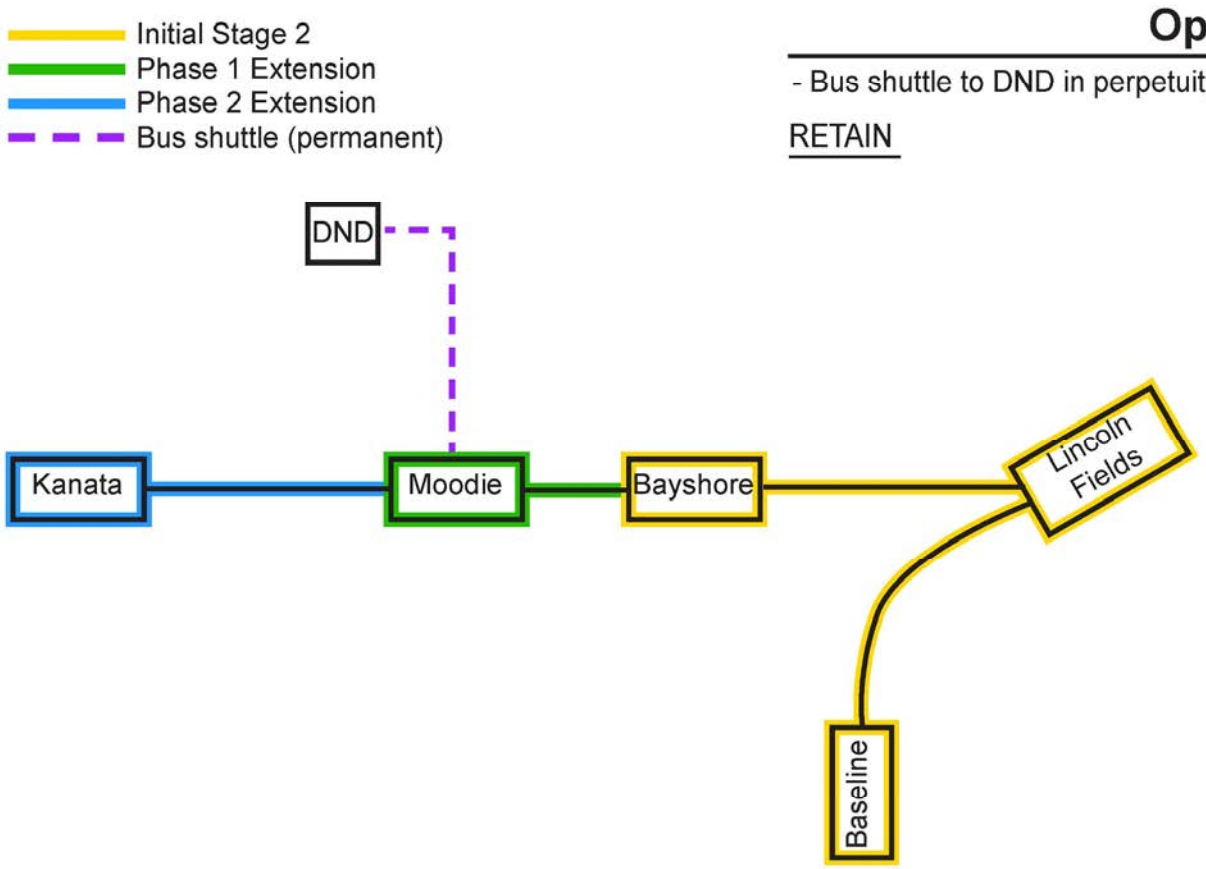
Moodie LRT Station

- Previous BRT studies strongly preferred an easterly station location
- Re-assessed to reflect bus access to LRT station rather than thru Transitway bus operations
- East and west station locations identified and evaluated (3 options)
- Evaluated based on connectivity, road network modifications, bus travel time/quality of bus service, land use, views and vistas, station catchment area for walk in traffic

Station Options Considered



Feeder Bus Network to Moodie LRT station



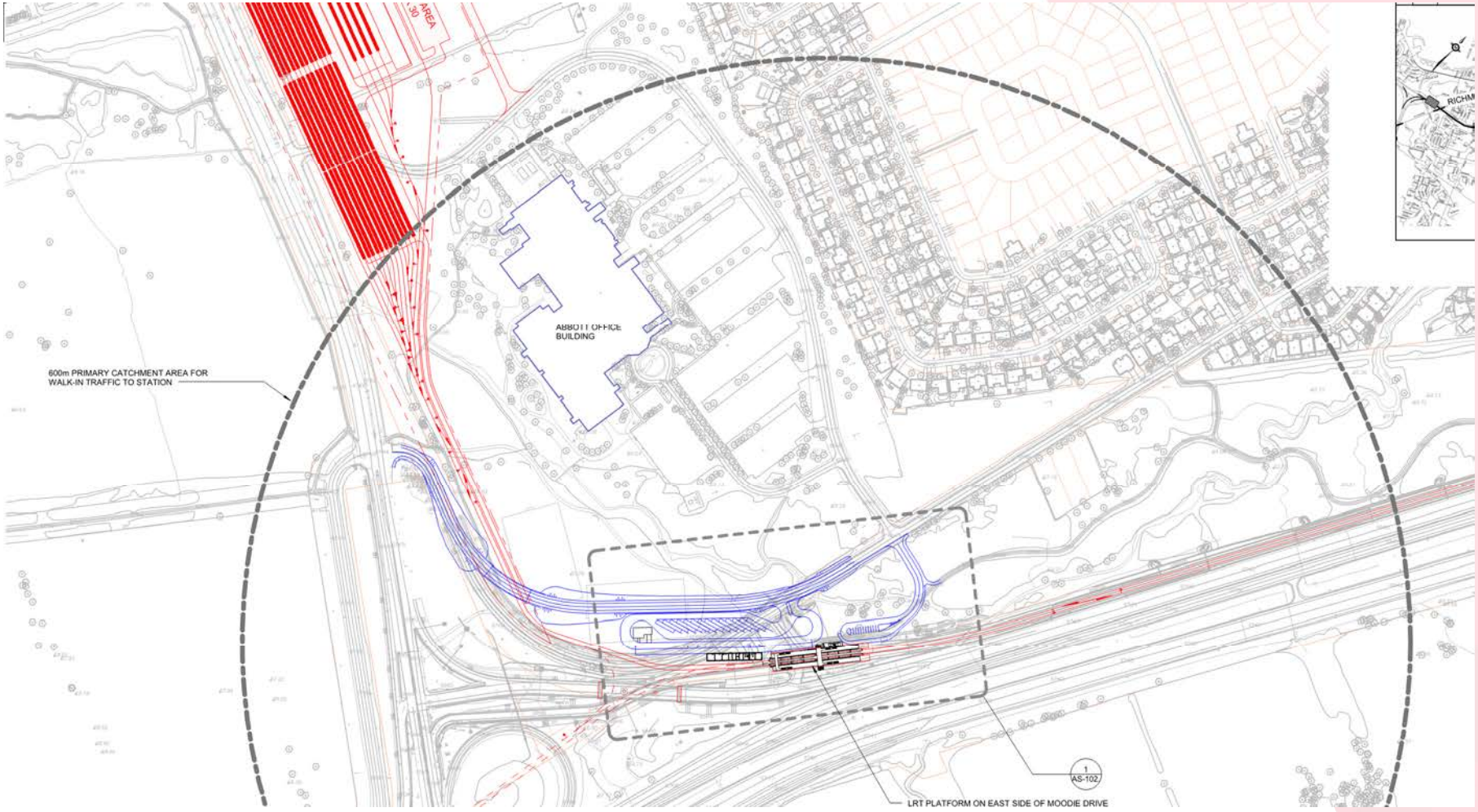
Station Location Options

- East side station location must facilitate yard leads to LMSF Option 2
- West side location must be compatible with LMSF Options 3 and 4
- LMSF yard leads involve modifications to Corkstown Rd alignment (varies by option) which affects bus access
- Connectivity, station catchment area and bus travel time/quality of service are key drivers of preferred station location

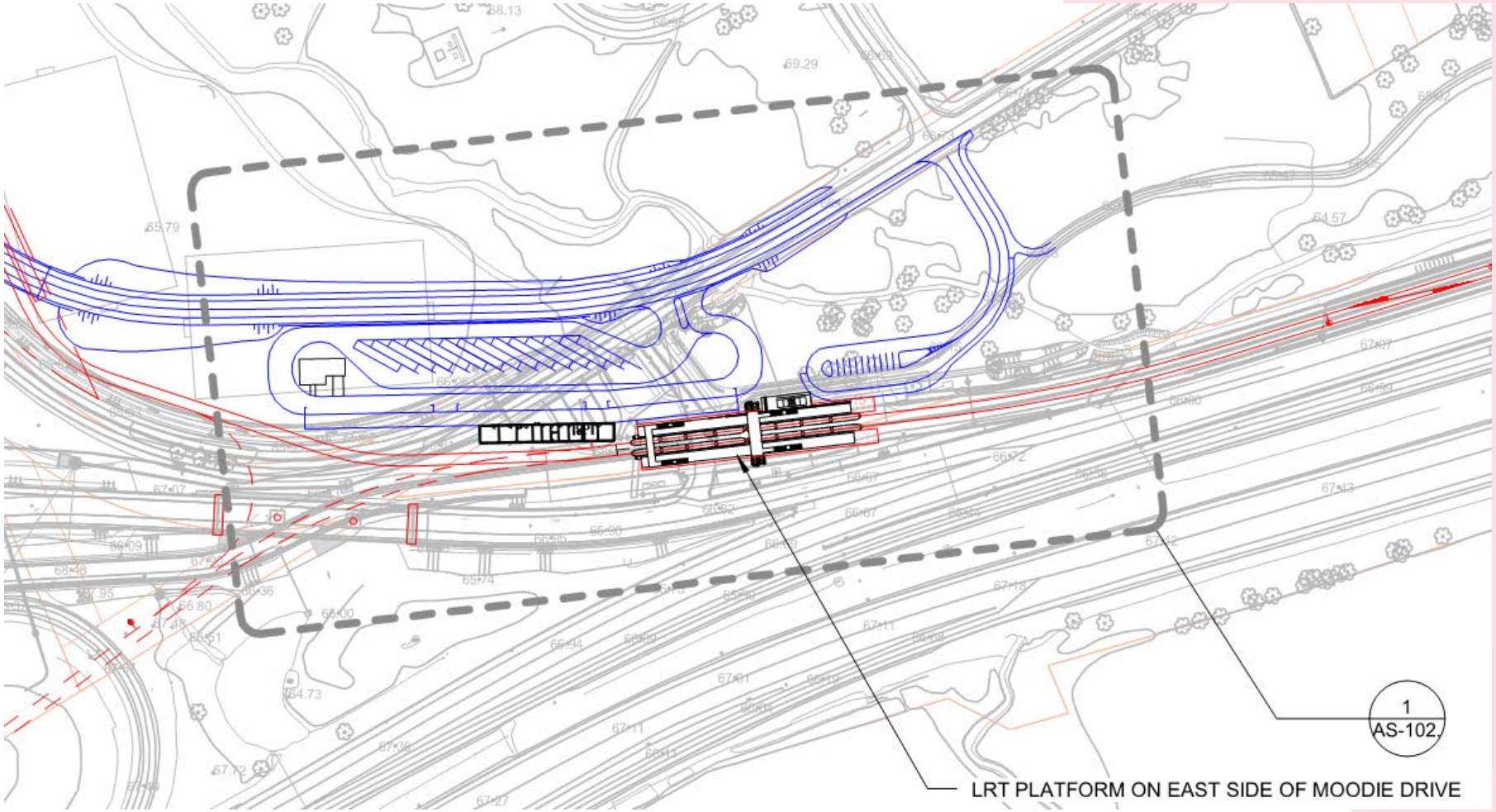
Evaluation of Preferred Station Location

- East station option :
  - Some re-use of existing BRT facilities
  - Provides better connection NCC trails
  - More accessible to residential community and Abbott lab based on 600 metre catchment area
  - Shorter distance for DND shuttle service
  - Less impact on views and vistas/lower visibility for “capital arrivals”
  - Lower impact on existing land uses and avoids impacts on Wesley Clover park in favour of impacting soccer field
- Extent of reconfiguration of Corkstown Rd is similar in both options (not a decision factor)
- East side station is therefore the preferred location

East Side Station Concept



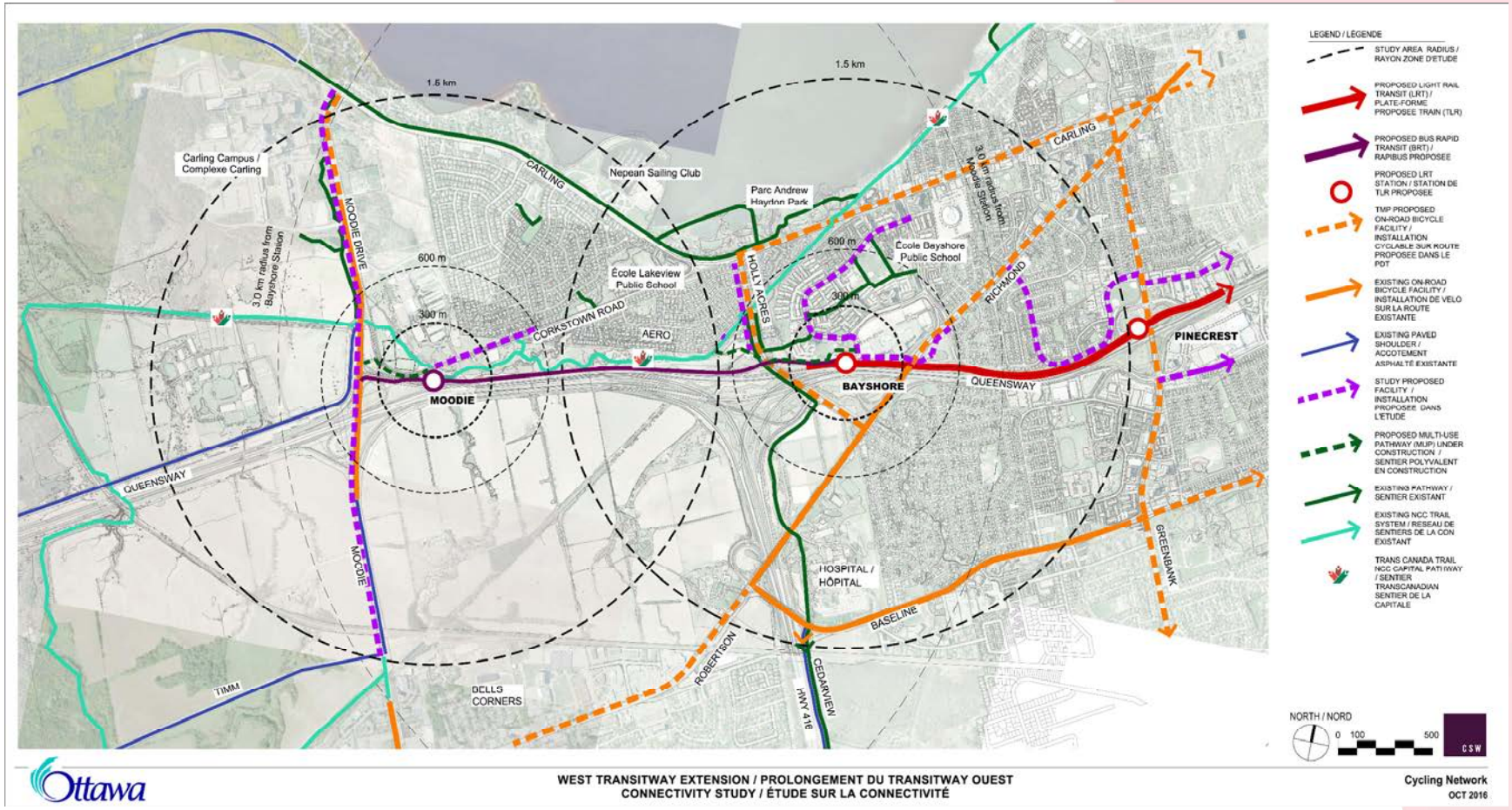
Moodie Station Draft Layout



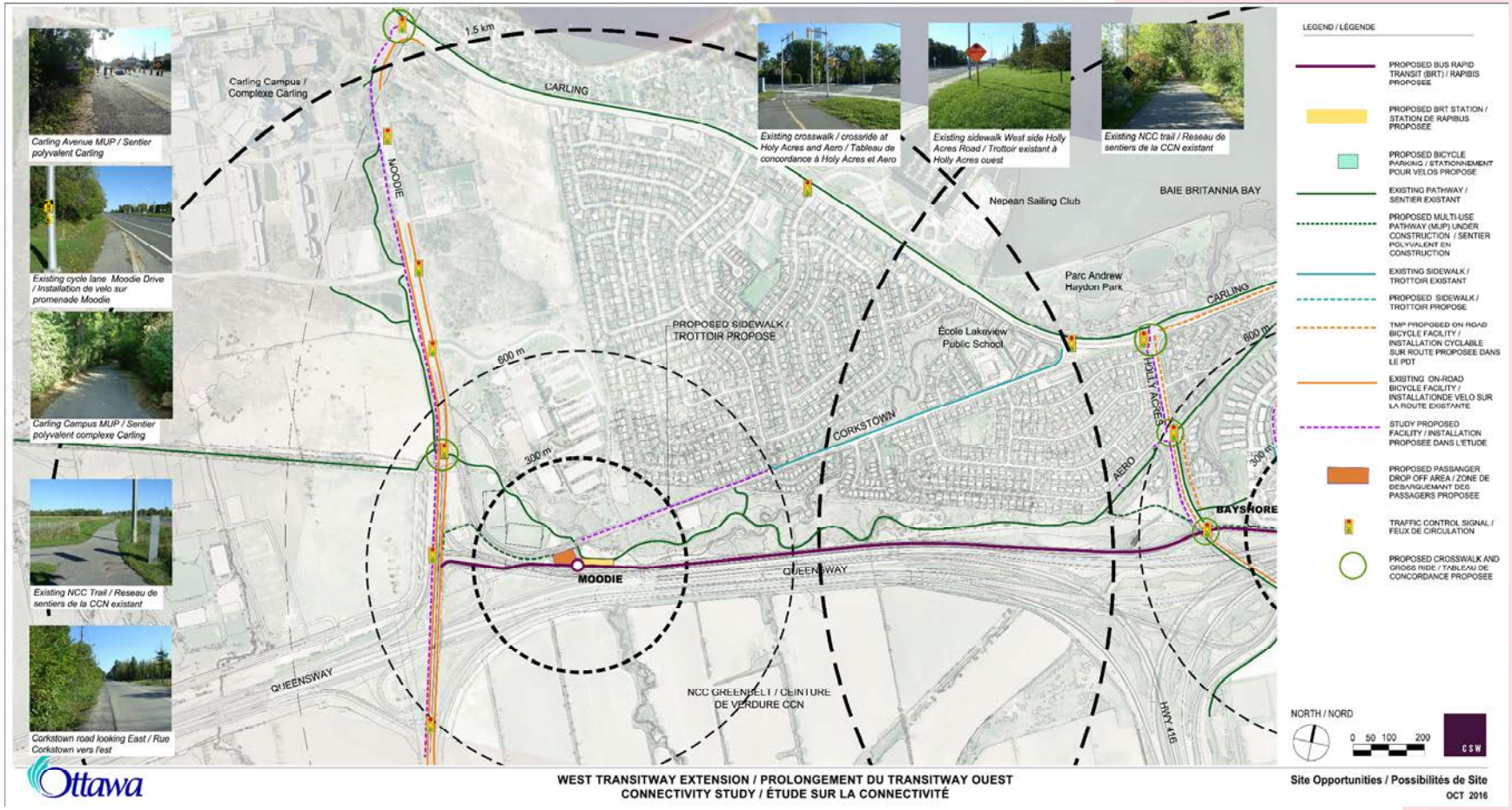
East Station Location- Connectivity Implications

- BRT project will construct some new cycling/pedestrian connections (e.g. sidewalk along Corkstown Road to Crystal Beach)
- Some connections will be left to LRT project to implement (e.g. Moodie/Corkstown crossings)
- LRT connectivity study will identify additional pedestrian/cycling connections

Cycling Network



BRT Connectivity



LIGHT MAINTENANCE & STORAGE FACILITY (LMSF)

Screening of Shortlisted LMSF sites

Evaluation Criteria

- Transportation and Connectivity
  - Connectivity (pedestrians and cyclists); Local traffic
- Social
  - Views and vistas; Noise/Air Quality/Vibration; Existing land use; Land Availability
- Biophysical
  - Groundwater; Water quality/Drainage; Fish habitat; Species at Risk; Significant Wildlife Habitat
- Operations
  - Operational flexibility; Station Options; Deadhead time
- Costs
  - Affordability (capital and operating)

Evaluation Results

	Criteria	Option 2	Option 3	Option 4
Transportation and Connectivity	Connectivity (pedestrians and cyclists)		✓	✓
	Local traffic			✓
Preferred				✓
Social	Views and vistas	✓	✓	
	Noise/Air Quality/Vibration		✓	
	Existing land use	✓		
	Land Availability	✓		
Preferred		✓		
Biophysical	Groundwater	✓	✓	✓
	Water quality/Drainage			✓
	Fish habitat	✓	✓	✓
	Species at Risk		✓	✓
	Significant Wildlife Habitat		✓	✓
Preferred				✓
Operations	Operational flexibility		✓	
	Station Options	✓	✓	
	Deadhead time	✓		
Preferred		✓		
Costs	Affordability (capital and operating)	✓		
Preferred		✓		
Overall Preferred		✓		

Rationale for Option 2 as Preferred

- An LMSF must be affordable and meet operational needs for the long term
- Option 3 is not preferred on any of the 5 major evaluation categories
- Option 2 is preferred in terms of land use, operations and costs
- Option 4 is preferred for transportation/connectivity and biophysical but mitigation strategies are available for other options
- Capital and operating cost premiums for Options 3 and 4 will affect City finances/affordability:
  - Options 3 and 4 are $15M and $ 48M more expensive than Option 2
  - Also have higher deadhead mileage costs and larger impact on nightly maintenance window
- Overall, Option 2 preferred due operational and cost advantages
- Mitigation strategies to be developed and committed in EPR and reflected in preliminary engineering

Light vs. Heavy Vehicle Maintenance Facilities

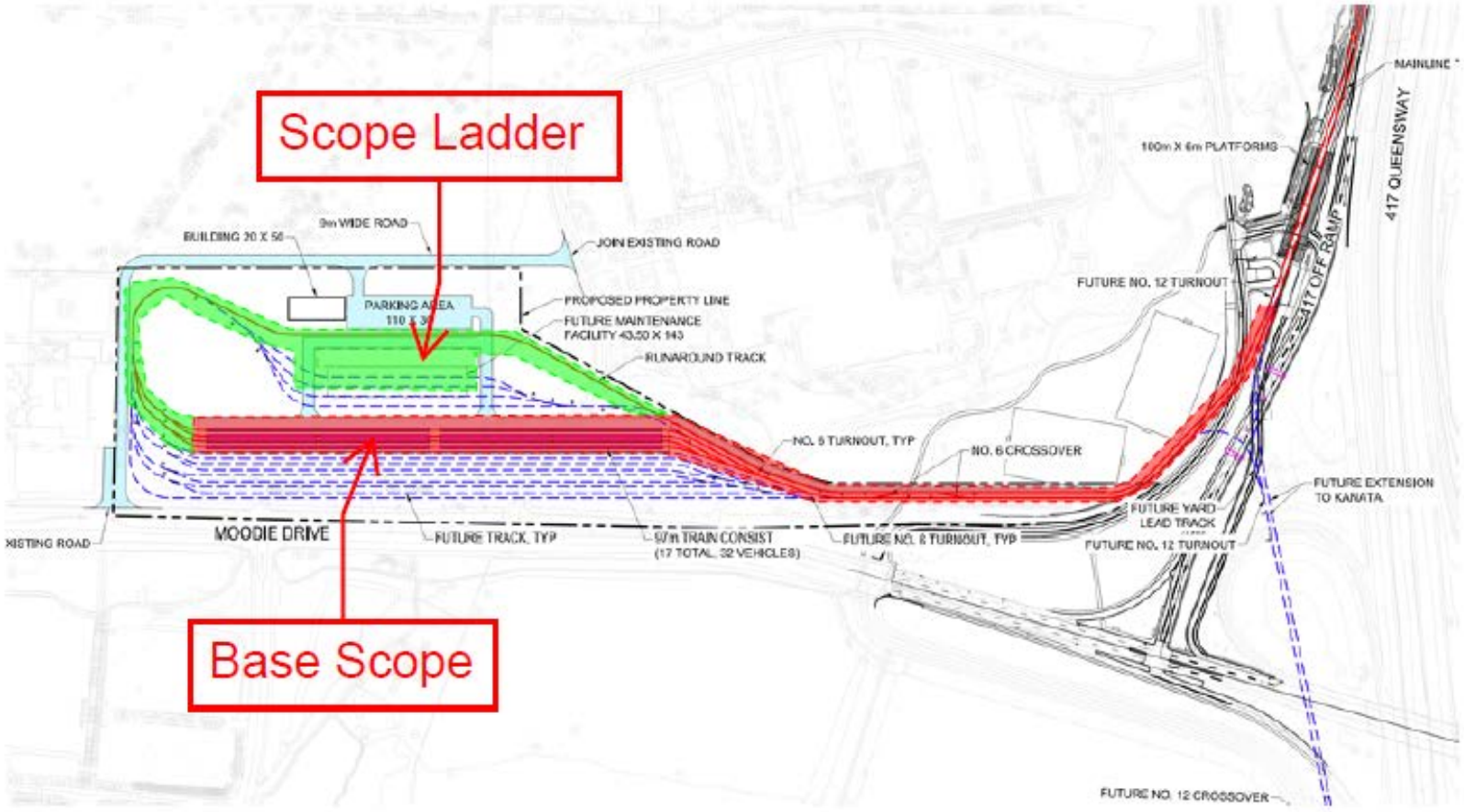
Light Maintenance at Moodie LMSF

- Operator reporting facility plus maintenance staff on selected shifts
- Overnight covered storage
- Interior vehicle cleaning
- Graffiti clean up
- Minor repairs(seats, doors, windows)
- Small parts inventory
- Filling sand boxes

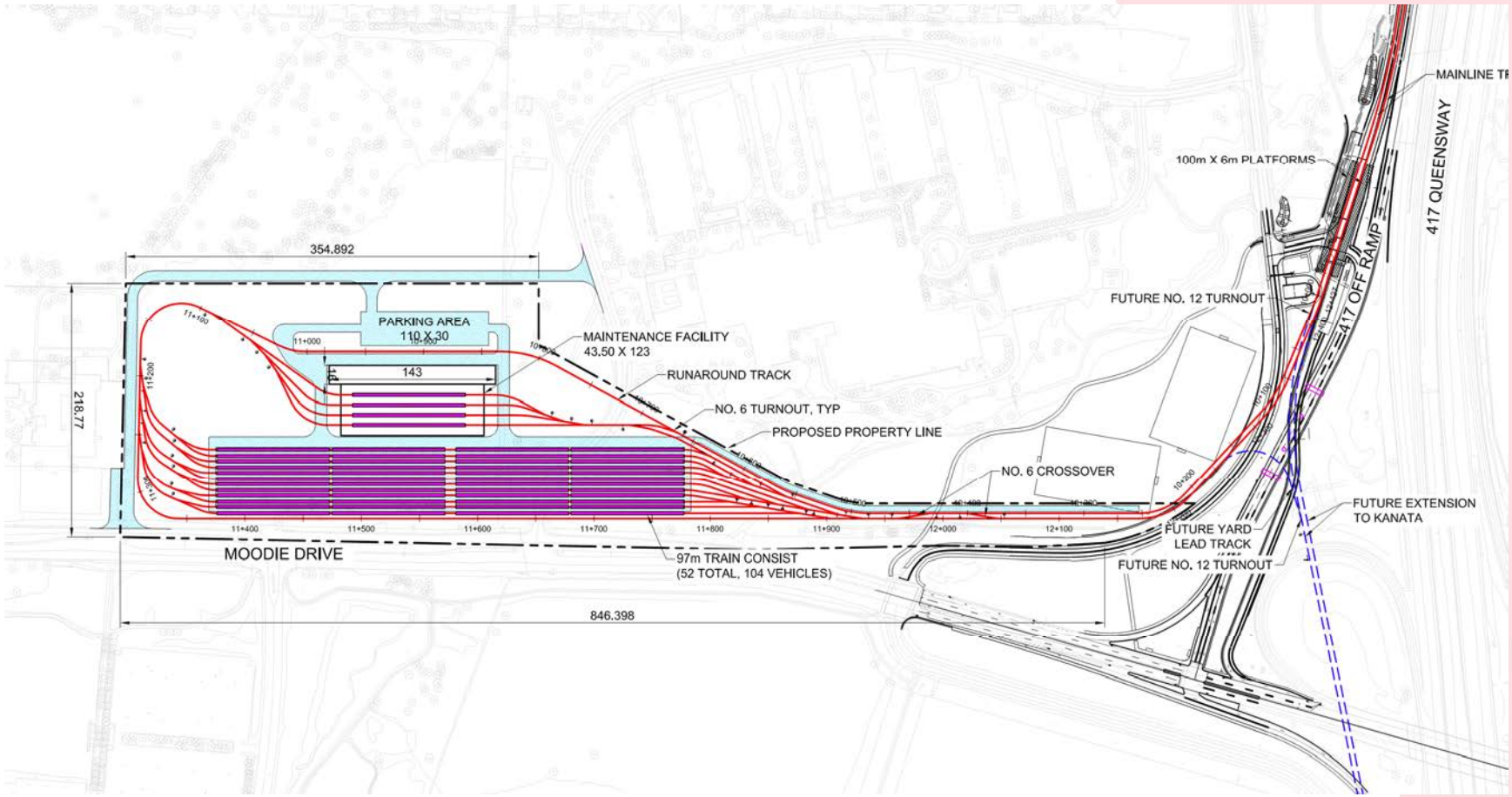
Heavy Maintenance at Belfast MSF

- 24/7 facility with main administration building for operators and vehicle maintenance staff on multiple shifts
- Overnight covered storage
- Wheel truing
- Inspections and overhauls
- Component replacement
- HVAC repairs
- Removal of bogies/trucks/axles
- Exterior car wash
- Full parts inventory for all vehicle components
- Underground pits/elevated gantry's for major repairs
- Vehicle hoists

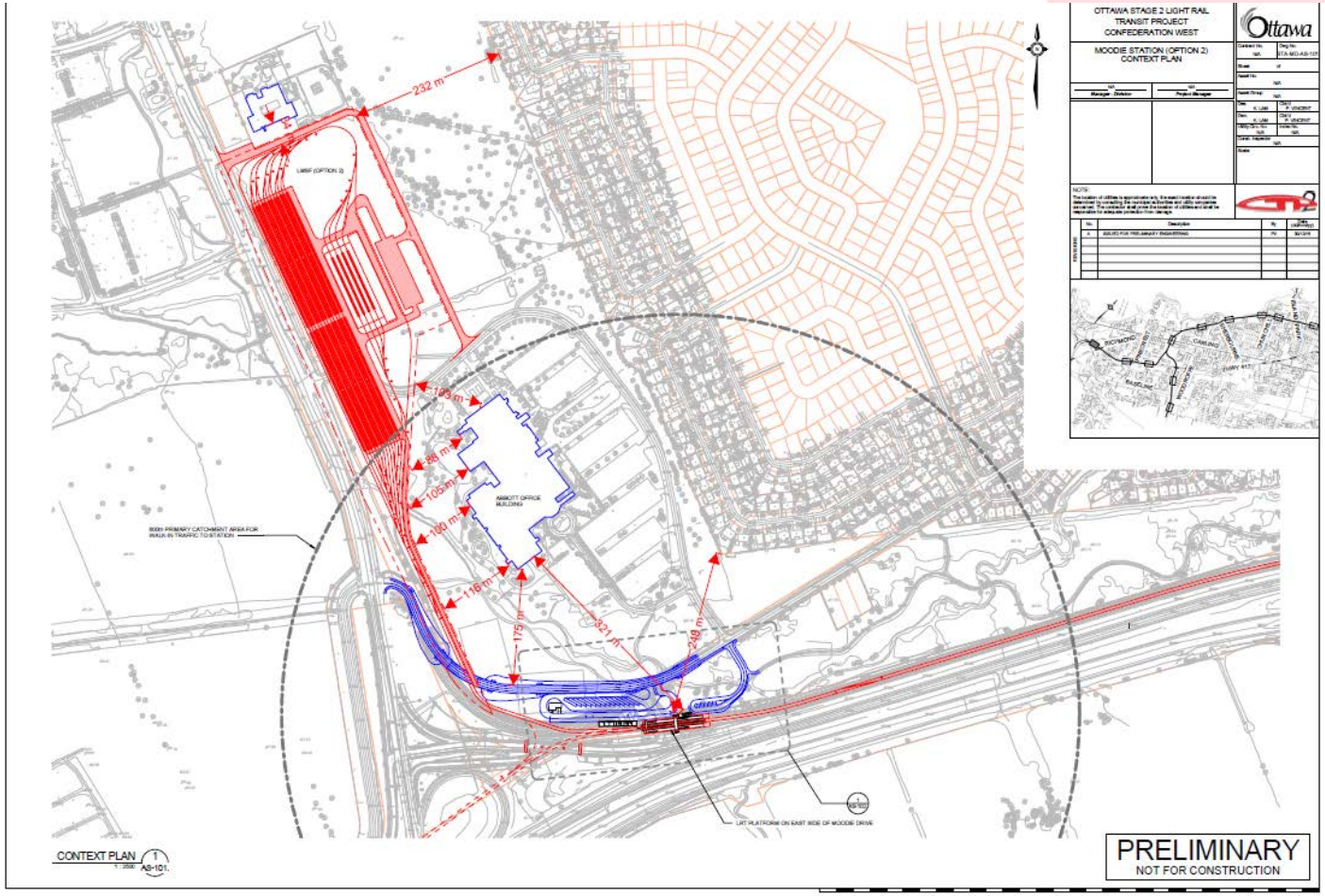
Option 2- 2023 LMSF Layout



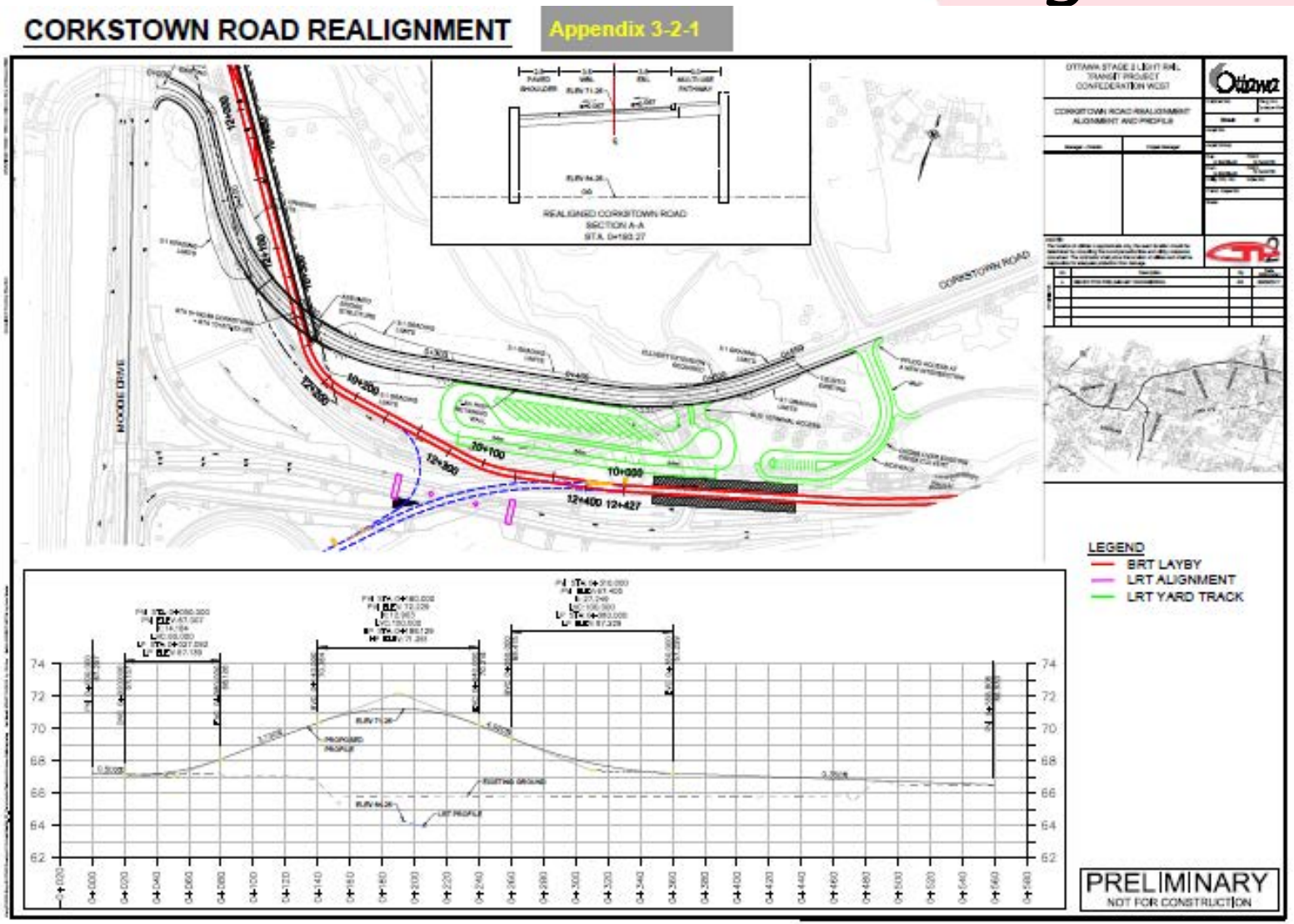
Option 2-Ultimate LMSF Layout



Proximity of Station/LMSF to Surrounding Community



Corkstown Road Realignment



Transportation and Connectivity Impacts and Mitigation

Impacts

- Connectivity
- Local traffic

Mitigation

- Maintain existing pathways
- Add MUP connecting community to Moodie Dr
- Formalize desire lines (existing informal pathways)
- Relocate Abbott road access to Moodie Drive

Social Impacts and Mitigation

Impacts

- Views and vistas
- Increase in noise
- Existing land use
- Land Availability

Mitigation

- Context sensitive design of buildings to match rural character
- 6 metre high noise wall on north side and 8 metre wall on east side
- Greenbelt Master Plan update and compensation plan to be developed in consultation with NCC/Community
- Negotiations with NCC/Abbott Industries are underway

Biophysical Impacts and Mitigation

Impacts

- Groundwater
- Water quality/Drainage
- Fish habitat
- Species at Risk
- Significant Wildlife Habitat

Mitigation

- Context sensitive design
- Maintain cut/fill balance
- Stillwater Creek mitigation
- Avoid Chorus Frog habitat
- Additional bat roosting surveys to determine impacts and inform mitigation strategy
- Compensation for loss of Natural linkage area

Operational Impacts and Mitigation

Impacts	Mitigation
• Operational flexibility	• Turn-around loop for trains in yard
• Station options	• East side station is compatible with LMSF Option 2
• Deadhead costs and impact on nightly maintenance window	• None required

Cost Impacts and Mitigation

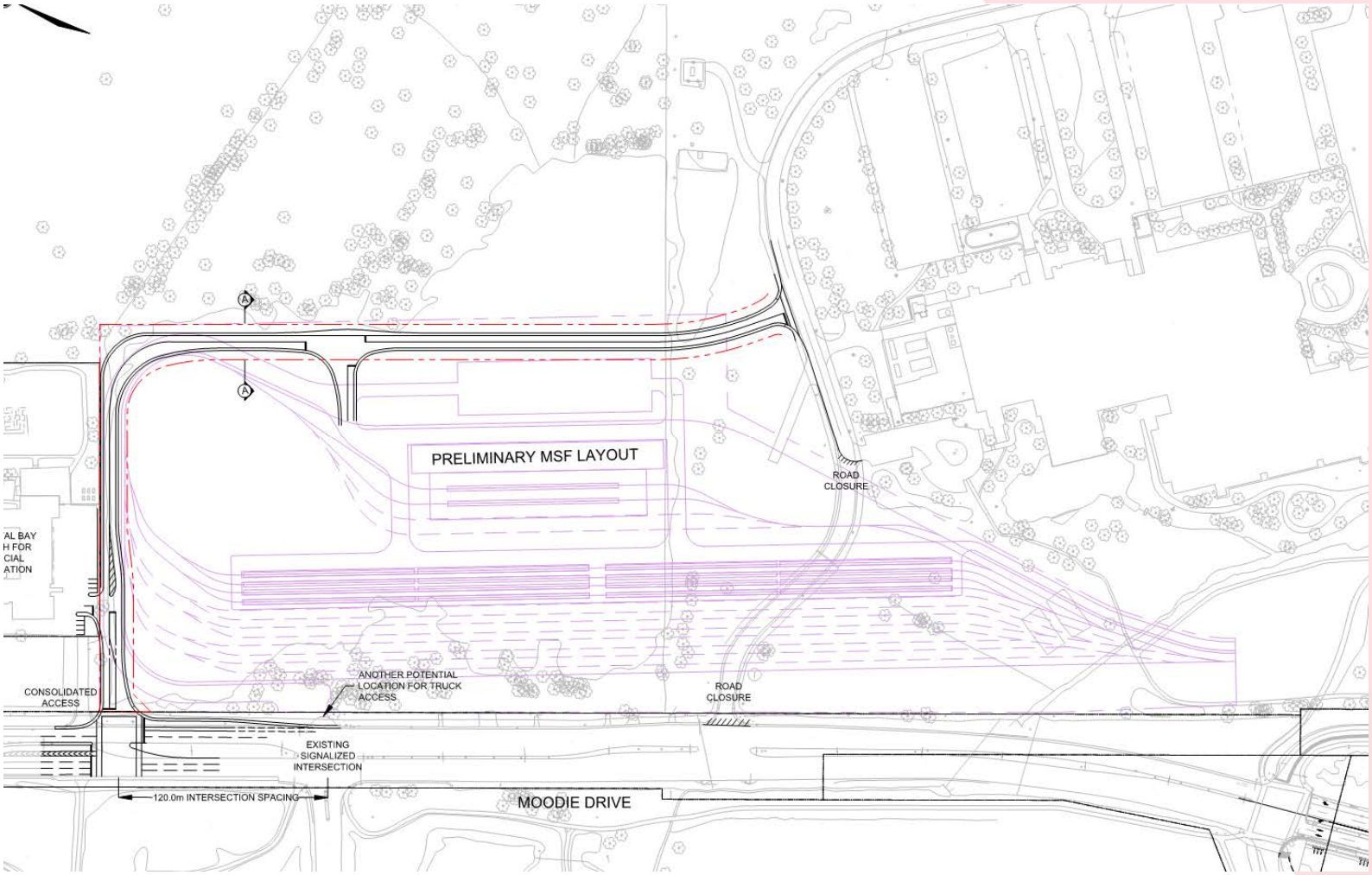
Impacts

- Affordability (capital and operating)

Mitigation

- None required
- LMSF Option 2 expected to be within affordability envelope

Abbott Access to Moodie Drive to be Relocated



Predicted Noise Levels for Option 2 with Mitigation

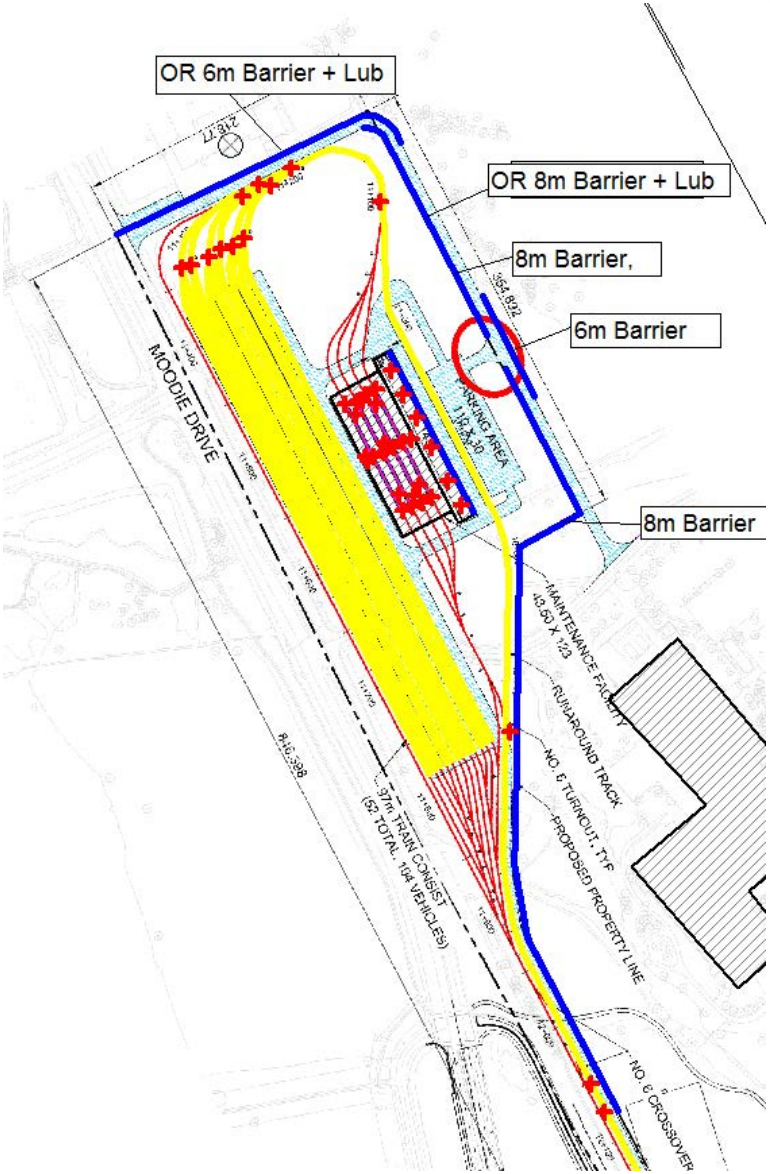
With Mitigation

Location	Overall Noise Level, 1hr Leq (dBA)		Facility Only Noise, 1hr Leq (dBA)	Projected Noise Impact	Noise Violation Exist – City of Ottawa	Exceedance of Noise Impact - MOECC	Additional Mitigation Investigation Required
	No Project (Ambient)	With Project (Nighttime)	Yard Noise	Change (dB)	Change > 5 dB	Yard Noise > Ambient	
R01	45	48	44.9	3	No	No	No
R02	45	48	45.4	3	No	No	No
R03	46	49	45.6	3	No	No	No
R04	42	43	34.9	1	No	No	No
R05	42	42	31.5	0	No	No	No
R06 (Daytime only)	56	57	48.1	1	No	No	No

Mitigation:

6m barrier(north side),8m barriers (east side) and rail lubrication system for runaround track

Mitigation of LMSF Ambient Noise with Noise Barriers



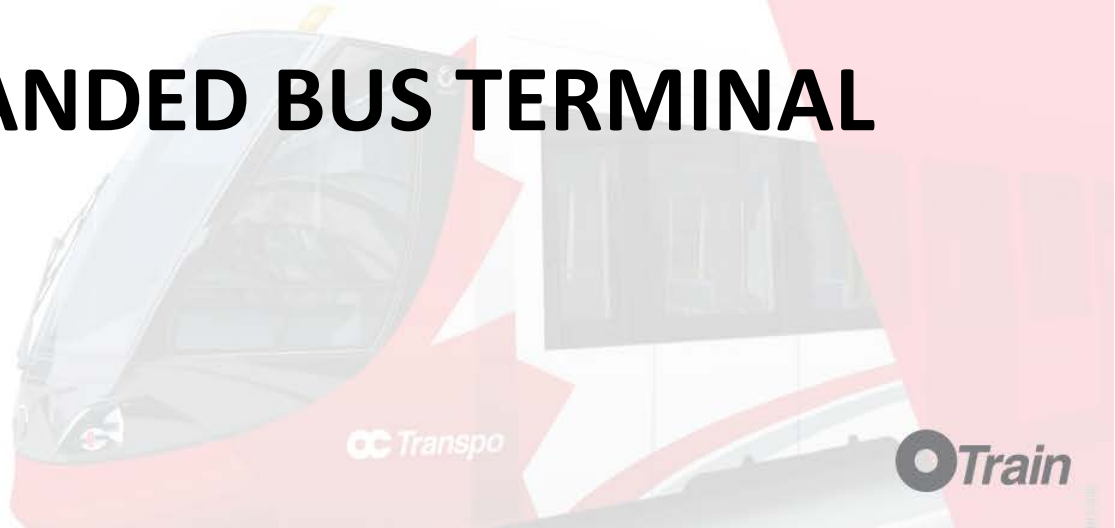
EMI/Stray Current

- EMI/stray current condition survey will be undertaken to establish pre-existing conditions
- Baseline monitoring of EMI and stray current levels compared to pre-existing background levels
- Based on revenue service EMI and stray current levels
- Stage 1 predicted and actual will be available as well
- Evaluations based on industry standards for EMI/stray current comparison to baseline conditions
- Mitigation and monitoring of both EMI/stray current levels as required by industry standards

CADD Renderings of Station/LMSF

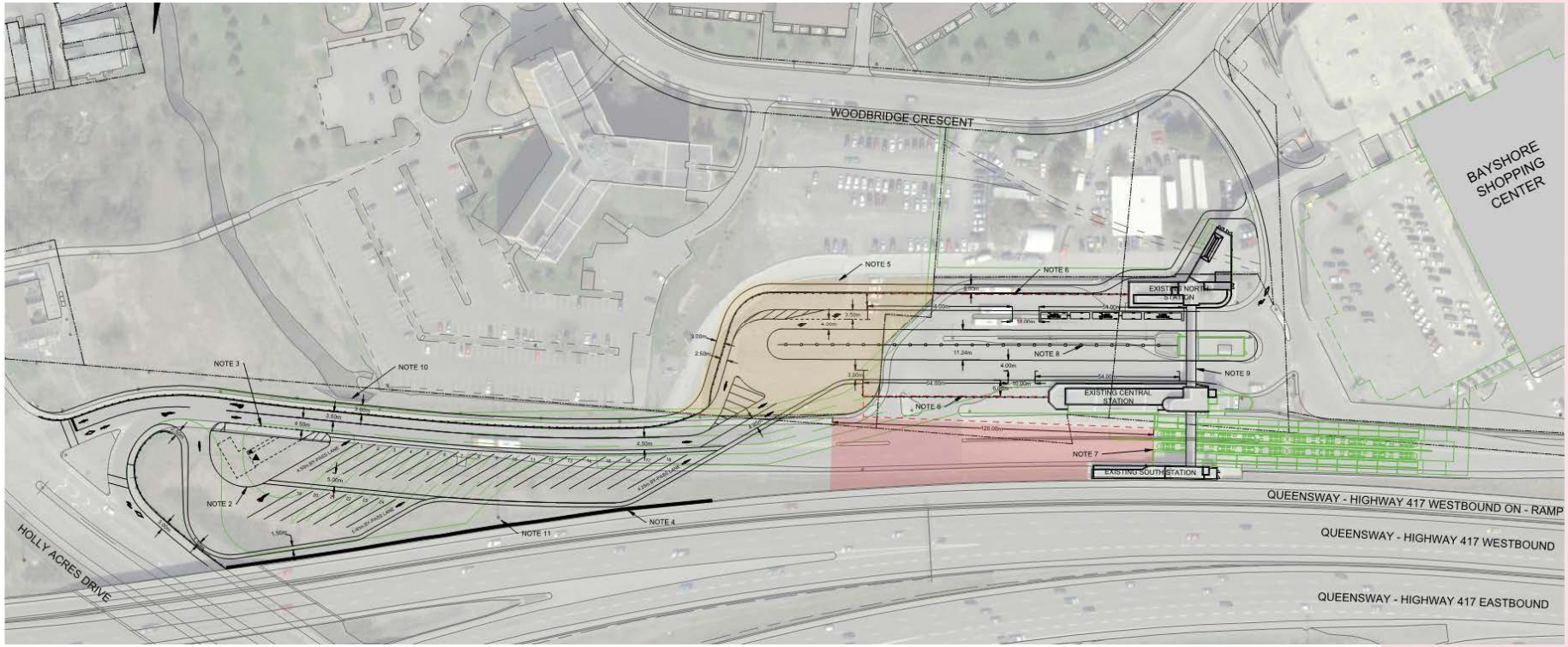
- To be prepared by City, high quality images
- Views at grade and birds eye view
- Various images from Abbott office building/residential community to be prepared showing;
  - LMSF/new road access to Moodie
  - Corkstown grade separation
  - Moodie LRT station/Highway 417
- Will be available in mid to late July

BAYSHORE EXPANDED BUS TERMINAL



Conceptual Layout of Expanded Bus Terminal

- Not required if Moodie LRT is part of Stage 2



Impacts and Mitigation

Impacts	Mitigation
• Noise	• No additional noise mitigation required
• Land acquisition	• Negotiate long term acquisition of property for expanded terminal (lease is likely pending Kanata LRT extension)
• Connectivity	• No additional mitigation

NEXT STEPS IN EA PROCESS

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

- Second public meeting is June 13, 2017
  - Moodie LRT/LMSF preferred site and mitigation measures
- Complete preliminary engineering of preferred LMSF site and LRT extension
- Report to City Council in September, 2017 re completion of EA
- EA approval in Fall 2017
- Stage 2 contract award in August 2018 including Moodie LRT/LMSF base scope and or scope ladder

Questions

STAGE 2 LRT PROGRAM

Moodie LRT EA Addendum

PAC Meeting #2 – June 01, 2017

Minutes

Status:	DRAFT	
Place:	Bayshore Public School, 145 Woodridge Crescent	
Date:	June 1, 2017	
Time:	6:15 pm	
Present:	Nathalie Levasseur – Wesley Clover Parks Rick Nelson – Crystal Beach Lakeview Community Association Bill Fenton – Crystal Beach Lakeview Community Association Charles Wheeler – CTP2 Kelly Roberts – CTP2E Ethel Craft - TSD	
Regrets		
ITEM #	**COMMENTS**	**ACTION BY**
1.	CW welcomed the group to the meeting and provided some information on the meeting purpose.	
2.	Presentation CW presented the prepared material to the group. (attached) Community members discussed the study process regarding the Bayshore Bus Terminal and reference was made throughout the presentation by the community members to the BRT in order to draw linkages to the LRT extension. A connectivity issue was brought up by community members regarding Corkstown Road in that there were no sidewalks or lights on this road. . The residents of this community feel that traffic attracted to the station will be rerouted onto Corkstown Road which will increase traffic. In particular the community was concerned about kiss and ride traffic using Corkstown Rd(which cannot be avoided) and deadhead buses using Corkstown to get to Holly Acres. C. Wheeler agreed to discuss the deadhead bus concern with OC Transpo prior to the June 13 public meeting. In general, the community feels there will be a major transportation interchange which will bring in too much activity particularly with an east side station location.	

	As long as there is pedestrian connectivity to Wesley Clover which brings people to their site with an east side station location , Wesley Clover is satisfied wih the conclusion that an east side station is preferred and Wesley Clover doesn't foresee any safety issues with people walking from the station to their area. The City believes the east location is the preferred station location and the EPR will reflect this preference and address the community concerns with specific mitigation strategies. The following questions and comments were raised throughout the presentation. Q: Is there a lot of storm sewer work taking place? A: All the drainage implemented for the BRT will be reutlized . Additional drainage facilities may be needed for LRT and LMSF facilties recognizig the sensitivty of Stillwater Creek . Q: Will this be the terminus of the LRT as this is being implied when reference is made to design modifications? A: This is the Stage 2 terminus Q: Has consideration been given to moving the 417 on ramp, far south as this was part of 2012 EPR? A: We will not be moving the 417 on ramp. Q: Are you going to undo all the damage at Holly Acres? What is being done in regards to the BRT, will it stay as it was before? A: There is a myth that we are going through the middle of the berm at Holly Acres. What has been removed gives the appearance of more than 10% and we understand that the community is bothered but what they are currently seeing but the reinstatement at the end of the construction will reflect the 10 % reduction in the south face of the berm. The height, acoustic benefits and landscaping of the berm will not be affected and therefore the community concerns abiout the impact on the berm are misplaced . Q: Does Gold level parking imply we need to pay? A: Yes there will be a cost involved based on current OC policies. Q: Why are you having elevators? A: Passengers will have to go up and over the tracks from the platform and redudant elevators is OC policy Q: Is it a double track or single track? A: The track will be double. Q: Where will the kiss and ride be located at the station? A: Yes, 11 spaces currently planned, size to be confirmed	

	Comment: There is quite a bit of land being taken from the soccer field A: Correct, with the station facilties in between the relocated Corkstown Rd and the LRT, some land is required and will be better defined at the June 13 public meeting. The City is currently in discussion with the NCC in regards to this land. Comment: Buses come in and drop people at the station - the Community does not want to see any buses (especially deadhead buses) using Corkstown Road as they are concerned about East Bound traffic, The City will follow up with OC Transpo as noted above. Comment: Community members suggested a pedestrian tunnel under Moodie, and indicated that there is one on March Road that this idea could be modeled from. A: There are safety concerns with underground tunnels in terms of CPTED, with focus on avoiding predictable paths to follow vulnerable pedestrains. Over/underpasses are also considered movment predictors, tunnels are not the first starting point for safe access to Wesley Clover . Q: What is the timeline for the connectivity study? A: We are underway with the connectivity study and we are committed to completing it by year end including public consultation. Q: Where will the bicycle path go? A: A study is underway as to where the bicycle path will go. This will have to be addressed in our Preliminary Engineering. Q: There will be problems with the eastbound buses to the LRT station. It is also very dangerous for bikes, not in complicance for EPR A; Buses currently operate safely on the bridge and will continue to do so with the LRT in place Q: Can bike and pedestrians cross the LRT at grade? A: Bike and pedestrians can not cross the LRT grade as the LRT must be fully grade separated. Existing pedestrian and cycling connections will remain but may not be in the same place with Q: What is the frequency of the trains? A: At night, it could be 7 to 8 minutes. Q: How many trains will be at this location? A: There will be 34 vehicles on opening day, which consists of 17 trains. The ultimate capacity we are looking at is for 94 vehicles at this location which will take into consideration extra vehicles to get to Kanata. The number is based on peak point ridership increasing 15% with the Kanata LRT. We are not saying there will be 94 vehicles at this site, but this property would need to handle up to this number.	

	Q: Will the LMSF be evaluated on its own? A: The LMSF is reviewed in terms of flexibility for station location but the two evaluations of the LMSF and preferred station location were done separately . Q: If the station is pushed to the far side of Moodie, would this change the evaluation of the LMSF? A: No Q: If the grade goes up on Corkstown Road, can you build a station into the grade? A: Yes you can build a station into the grade, however, this would be a more expensive station. As this would cost more money, there is no rationale for doing it. Q: If the station was on the west side of Moodie, would the costs for the LMSF go down by $14M? Has this been thought about? The station should be independent of LMSF. A:. The cost would change would change however the net cost differential between the options would be the same Q: Are there buildings for the vehicles? A: There is a requirement to have covered storage. A maintenance building is a scope ladder for the procurememt, and if affordable would be in place in 2023 in addition to the covered vehicle storage Q: Will the yards be lite at night? A: Yes the yards will be lit. Q: Does nightly maintenance consist of heavy duty noise? A: No, heavy maintenance will take place at Belfast. Nightly maintenance focuses on the interior of the vehicle and is considered light maintenance and is therefore less noisy than the facility at Belfast. Q: Is there any effect of stray currents on people? A: No there is not effect of stray currents on people Q: If the LMSF does not receive support, will the LRT still extend to ? A: Yes, it is possible that it will still go in at Moodie. An inferior and interim LMSF facility can be built at Baseline to match Belfast if the LMSF is not approved however the preferred location is Moodie. OC Transpo does not support the use of the Baseline facility and strongly prefers Moodie as the opening day western maintenance facilty . The Woodroffe LMSF site has been dropped from further considetration despite the EA approval of the site Due to grade separation over Tallwood, and with the soil being bad, the LMSF connection to Woodroffe LMSF(1.2 kilomtres of non revenue tracks) can't go underground and therefore must be elvated at a significant capital cost.	

	As well, the site is beyond the 750 criteria for a yard to the main line and is therefore not an ideal site fronm a cost of deadhead mileage perspective. All this being said, Council will be making the final decision on this. Comment: The community members mentioned that they have been told the noise barriers at Holly Acres will be relocated. A: We have mentioned to Peggy that a noise analysis will be done and that the preferred location from the noise analysis will be implemented	
	Meeting was adjourned at 8:40 pm	

Prepared by: E Craft
Reviewed by: C. Wheeler/K. Roberts
PLEASE NOTE: If your records of this meeting do not agree with this document, or if there are any omissions, please advise the writer within 2 days, otherwise the contents of this document shall be assumed accurate and correct.