

GARDINER EXPRESSWAY AND LAKE SHORE BOULEVARD EAST RECONFIGURATION ENVIRONMENTAL ASSESSMENT

Appendix T – Construction Staging Report of the Hybrid Alternative Designs

August 2014



WATERFRONToronto



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1.0 Construction Staging Report

This report provides a preliminary review of potential construction staging for the alternative designs considered for the Gardiner East Environmental Assessment (EA). The construction staging considered in this report is an example of how the construction staging may occur for each design alternative.

Construction staging for the three alternative designs, Hybrid 1, 2, and 3, is presented in terms of:

- Pre-stage work – involves the construction of all new facilities that can be completed without affecting traffic (i.e. new work that is away from existing roads) and work to establish detour routes prior to construction of the remainder of the new facilities;
- Stage 1 and 2 work – work related to the demolition of existing facilities and the construction of new facilities to achieve the alternative design; and
- Final stage work – work to dismantle temporary facilities that were in place to accommodate detours and work to complete surrounding road network to be in alignment with newly constructed alternative design.

The following sections provide the preliminary plans for each alternative design assessed in the Gardiner East EA. These plans provide an example of construction staging to a level that allows for the evaluation of construction impacts. For the preferred undertaking, more refined construction staging planning will be required. The refined construction staging plan will need to take into consideration the coordination of construction staging for the proposed public realm improvements along the full extents of the corridor. This report focuses on the transportation infrastructure changes for the Gardiner – Lake Shore Boulevard corridor between Cherry Street and Logan Avenue. Further, the process to refine the construction staging plan will require coordination with the Don Mouth Naturalization Project construction plan as the two projects have the potential to have overlapping construction periods. This will require coordination with the project co-proponents, Waterfront Toronto and the City of Toronto (the City), and the Toronto and Region Conservation Authority.

In developing the plan for road detours during construction, the City and/or its agents will consult with interested local stakeholders, landowners, local businesses, and community groups to receive their input, inform them of the traffic management plan, and receive their feedback on the plan. Further, during construction there will be public notifications of construction activities and timing including road closures and detours. Consultation with local stakeholders and community groups will continue during the construction period. Finally, in developing the traffic management plan, consideration will be made to the other infrastructure and planning projects that may have an overlapping construction period with the Gardiner East Project.

2.0 Hybrid Alternative 1 – Construction Staging Review

2.1 Key Features

Generally, the existing elevated F.G. Gardiner Expressway (FGE) will undergo life cycle rehabilitation as per the City's Maintain Scheme from Yonge Street to Cherry Street (at Bent 294); this section of the FGE will remain at its longitudinal and vertical alignment. For the section east of Cherry Street, a number of major structural work items will be carried out as follows:

- a) Logan Ramps - the FGE Logan ramps will be demolished.
- b) Don River Bridge - the existing Don River Bridge will be removed and replaced with a wider bridge carrying 7 lanes and 1 track. The new bridge will be longer to accommodate for the new widened Don River layout that is approved in the Keating Channel Precinct Environmental Study Report.
- c) Don Roadway - the existing Don Roadway between the Metrolinx Rail Bridge and Lake Shore Boulevard (LSB) will be widened and realigned to carry 4 lanes (2 northbound lanes (NBL) + 2 southbound lanes (SBL)) of traffic during construction staging.
- d) On/Off Ramps - LSB traffic east of the Don Roadway will access the FGE via new on and off ramps that will be constructed near Cherry Street. These two ramps will start from ground level approximately 250 m east of Cherry Street.
- e) Lake Shore Boulevard - a new 4 lane (2 eastbound lanes (EBL) + 2 westbound lanes (WBL)) LSB roadway will be constructed north of the existing FGE to carry westbound/eastbound traffic at ground level.

A pedestrian sidewalk and a multi-use path will be provided outside of the new LSB curbs.

The following new roadways within the Keating Channel Precinct will intersect with the new 6 lane LSB (to be confirmed with the Lower Don Lands Master Plan and Keating Channel Precinct Environmental Study Report):

- i. A new 2 lane (1 EBL + 1 WBL) Queen's Quay roadway will be constructed extending southward from the new LSB roadway and swinging west connecting to Cherry Street.
 - ii. A new 5 lane (2 SBL + 2 NBL + 1 NBL right turn lane (RL)) Munition Street will be constructed extending southward from the new LSB roadway crossing the existing LSB.
- f) F.G. Gardiner - the bridge deck will be narrowed down from 6 lanes to 4 lanes for an approximate 300 m long segment between Cherry Street and Munition Street.

In addition to the work items listed above, additional work will be required to further develop the area south of the Keating Channel and to construct two new structures crossing the Keating Channel (Munition Street-Keating Channel Crossing and New Street-Keating Channel Crossing). At this time, consideration of this work is premature; therefore, the associated structural items are excluded in this construction staging review.

2.2 Construction Staging Review and Recommendation – Hybrid Alternative 1

1. For this alternative the elevated structures east of Cherry Street will be removed and replaced with structures on an altered alignment. The new LSB roadway will be located north of the existing FGE. Complete demolition of the Logan Ramps and structural modification to the FGE will be carried out to allow the new LSB roadway to pass beneath. The total number of lanes in the FGE/LSB corridor will be reduced during construction due to the need to provide sufficient working areas for the new construction work, contractor access, as well as laydown areas and possibly prefabrication yards. Additionally, safety considerations will preclude the removal of major deck panels and substructure components over live traffic or public / inhabited areas due to the inherent danger / hazard associated with such significant operations.
2. Described below is a possible scheme for how the removal and new construction work can be staged to allow for this corridor to remain partially operational during construction; there may be costs associated with temporary strengthening of structures.
3. Traffic management under this alternative will consider the following:
 - o Utilizing Commissioners Street and/or Villiers Street to detour LSB traffic around the Gardiner East Ramp structures and the Don Roadway/LSB Intersection to facilitate the construction of this major intersection.
4. Potential Staging:
 - o Pre-Stage

The main objective of the Pre-Stage is to have as much construction work as possible carried out without interfering with existing traffic and roadways. This would involve construction of substantial structural and road works north of the Keating Channel and east of Cherry Street. A second objective of the pre-stage work is to construct all necessary temporary roads and structures for a traffic diversion route (carrying traffic from Don Roadway to, for example, Villiers Street or Commissioners Street and back on Lake Shore Boulevard just east of Cherry Street). Villiers Street has been identified as a possible traffic diversion (detour) route; Commissioners Street is another possibility. Other connections between LSB and the detour route east of Don Roadway should be investigated to enable the section of LSB between Don Roadway and Logan Avenue to be bypassed.

Construction during this period will include the following:

- § Widen the existing Don Roadway in both the NB and SB directions and realign to fit the future final alignment.
- § Construct a new 6 lane EB/WB detour. The detour will begin at the Don Roadway and LSB intersection, continue south to Villiers Street and/or Commissioners Street, across Villiers/Commissioners Street, and then back north of Keating Channel before finally connecting to existing LSB east of Cherry

Street. The work will include construction of a bridge crossing of, for example, a temporary timber deck bridge across Keating Channel (approximately 80 m east of Cherry Street), widening of Villiers Street, and adding temporary roadways to swing the traffic back to existing LSB. As noted above, a detour utilizing Commissioners Street should also be investigated along with Villiers Street, as well as establishing another, more eastern diversion off of LSB east of Logan Avenue. Allowances for pedestrians and cyclists will need to be considered along the detour route.

- § The existing Jarvis Ramp will be widened and the pavement remarked to carry two lanes with reduced speed. Widening of the ramp will assist in balancing the traffic capacity and carrying LSB traffic onto the FGE.
- § Begin construction of the FGE-Cherry Ramp Bridges that are not in conflict with the existing structure or the existing LSB (i.e. all except the west ends of both ramp bridges and the east end of EBL ramp bridge).
- § Construct portions of the new LSB roadway that are not in conflict with the existing structure or the existing LSB.

- Stage 1

Demolition work will include the following:

- § Shut down the DVP ramp that travels from the north to the west (N/W DVP ramp) and FGE WBL.
- § Shut down the WBL of the old LSB, Don River Bridge, and Logan Ramp. Demolish WBL of Logan Ramp and Don River Bridge.
- § The above ground demolition work shall be carried out over the weekend and during night time with protection to avoid fallen objects to the north side of the existing LSB. Also one lane of the north side of the existing LSB may be shut down to provide additional clearance.

Construction work will include the following:

- § Construct the north half of the Don River Bridge.
- § Construct the west end of the FGE WBL on ramp at Cherry Street.
- § Carry out structural modifications to the N/W DVP Ramp [bent 324 to PS3 for Ps ramp] by shifting the bent locations to provide horizontal clearance for the new LSB.
- § Continue construction of the new LSB WBL where not in conflict with the existing W/N DVP Ramp.
- § The WB/EB traffic will be shared with the new 6 lane detour.

o Stage 2

Demolition work will include the following:

- § Shut down the DVP Ramp that travels from the west to the north (W/N DVP ramp) and FGE EBL.
- § Shut down EBL of the old LSB, Don River Bridge, and Logan Ramp. Demolish EBL of Logan Ramp and Don River Bridge.
- § The above ground demolition work shall be carried out over the weekend and night time with protection to avoid falling objects to the south side of the existing LSB. Also one lane of the south side of the existing LSB may be shut down to provide additional clearance.

Construction work will include the following:

- § Construct the south half of the Don River Bridge.
- § Construct the east and west ends of the FGE EBL off ramp at Cherry Street.
- § Carry out structural modifications to the W/N DVP Ramp [bent 327 to 330 for Pn ramp] by shifting the bent locations to provide horizontal clearance for the new LSB.
- § Complete construction of the new LSB.
- § The WB/EB traffic will be shared among the new 6 lane detour.

o Final

Demolition work will include the following:

- § Remove the temporary timber deck bridge over Keating Channel.

Construction work will include the following:

- § Finish the new Queens Quay, Munition Street, and other road work as required to be in alignment with the final configuration.

- Widen the existing Don Roadway to two lanes in both directions.
- Construct six-lane detour from Don Roadway and LSB intersection down to Villers Street, over Keating Channel via construction of a new temporary bridge, and back to LSB west of Cherry Street.
- Widen existing Jarvis ramp to two lanes.
- Construct portions of FGE Cherry Ramp Bridges and new LSB, that are not in conflict with existing structure or the existing LSB.

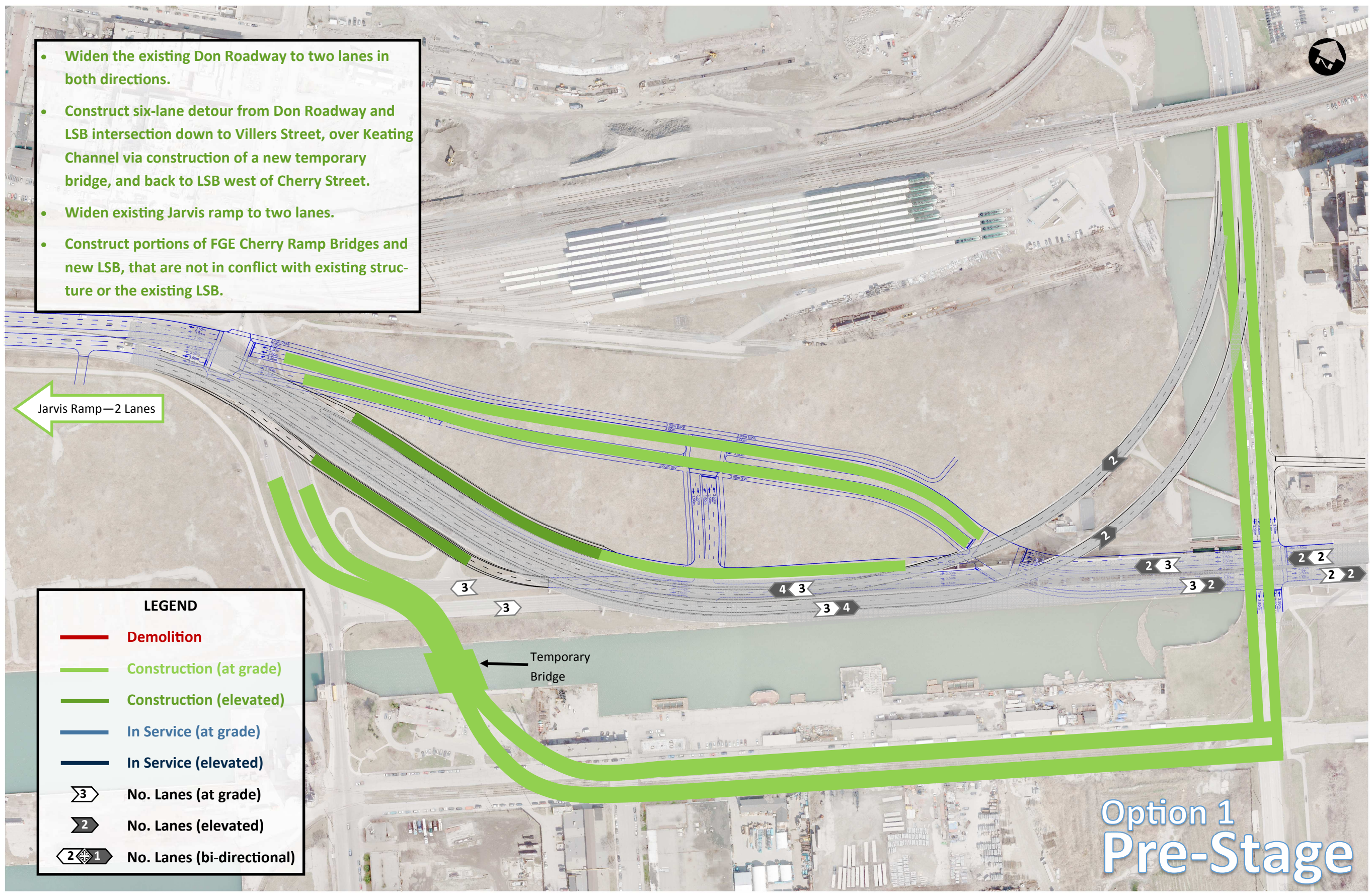
Jarvis Ramp—2 Lanes

LEGEND

- Demolition
- Construction (at grade)
- Construction (elevated)
- In Service (at grade)
- In Service (elevated)
- 3 No. Lanes (at grade)
- 2 No. Lanes (elevated)
- 2 1 No. Lanes (bi-directional)

Temporary Bridge

Option 1
Pre-Stage

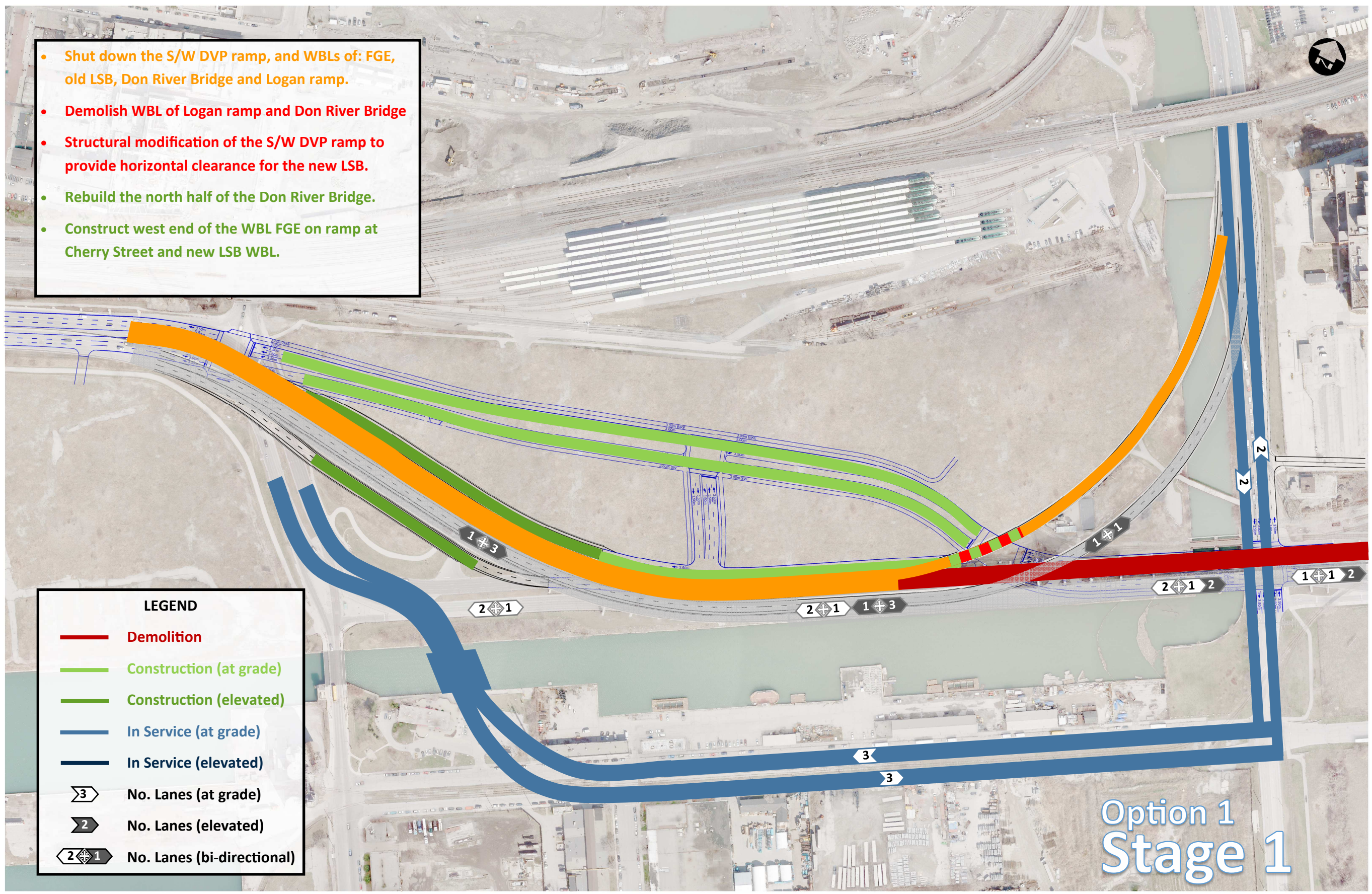


- Shut down the S/W DVP ramp, and WBLs of: FGE, old LSB, Don River Bridge and Logan ramp.
- Demolish WBL of Logan ramp and Don River Bridge
- Structural modification of the S/W DVP ramp to provide horizontal clearance for the new LSB.
- Rebuild the north half of the Don River Bridge.
- Construct west end of the WBL FGE on ramp at Cherry Street and new LSB WBL.

LEGEND

- Demolition
- Construction (at grade)
- Construction (elevated)
- In Service (at grade)
- In Service (elevated)
- 3 No. Lanes (at grade)
- 2 No. Lanes (elevated)
- 2 1 No. Lanes (bi-directional)

Option 1
Stage 1



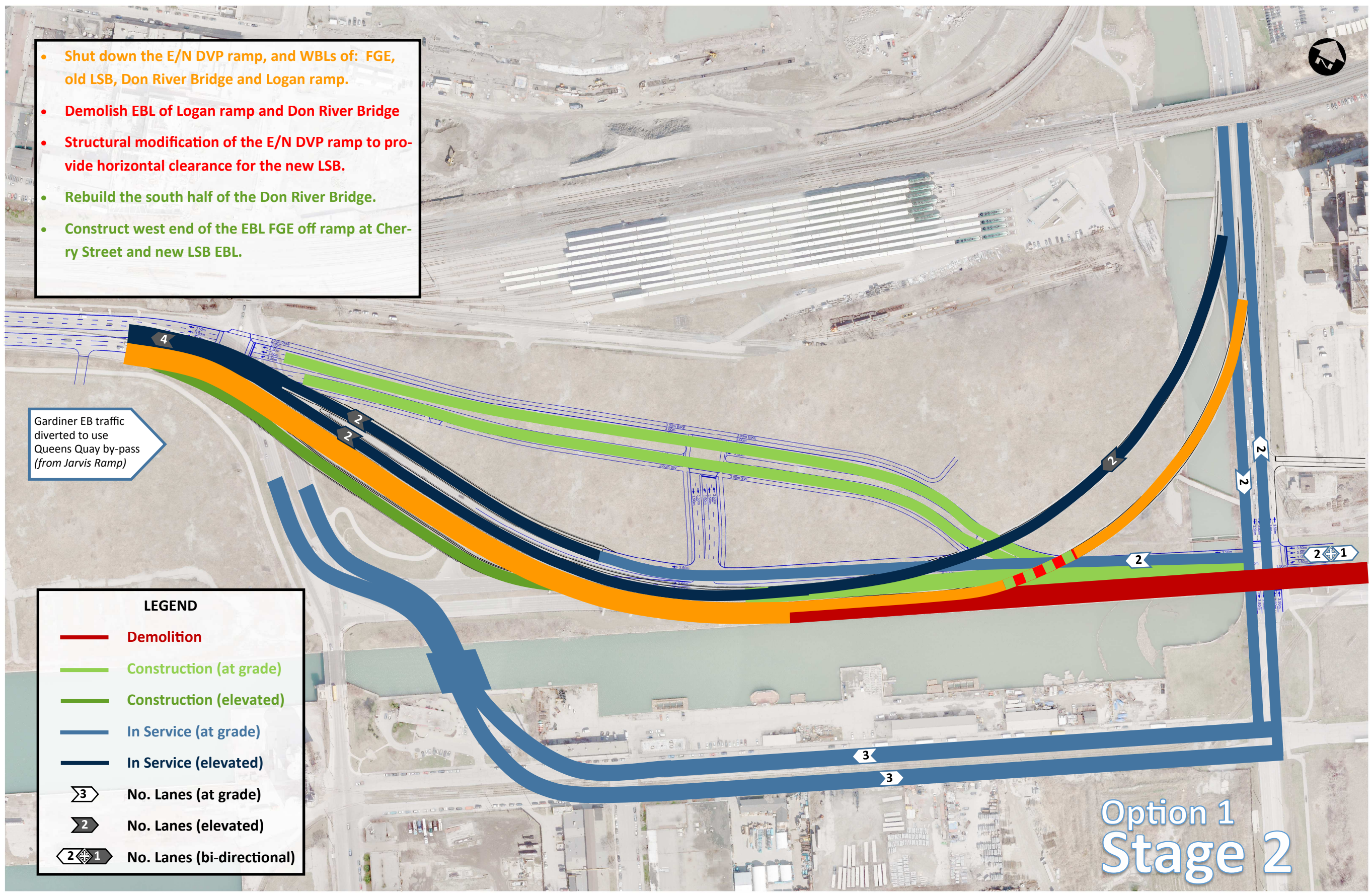
- Shut down the E/N DVP ramp, and WBLs of: FGE, old LSB, Don River Bridge and Logan ramp.
- Demolish EBL of Logan ramp and Don River Bridge
- Structural modification of the E/N DVP ramp to provide horizontal clearance for the new LSB.
- Rebuild the south half of the Don River Bridge.
- Construct west end of the EBL FGE off ramp at Cherry Street and new LSB EBL.

Gardiner EB traffic diverted to use Queens Quay by-pass (from Jarvis Ramp)

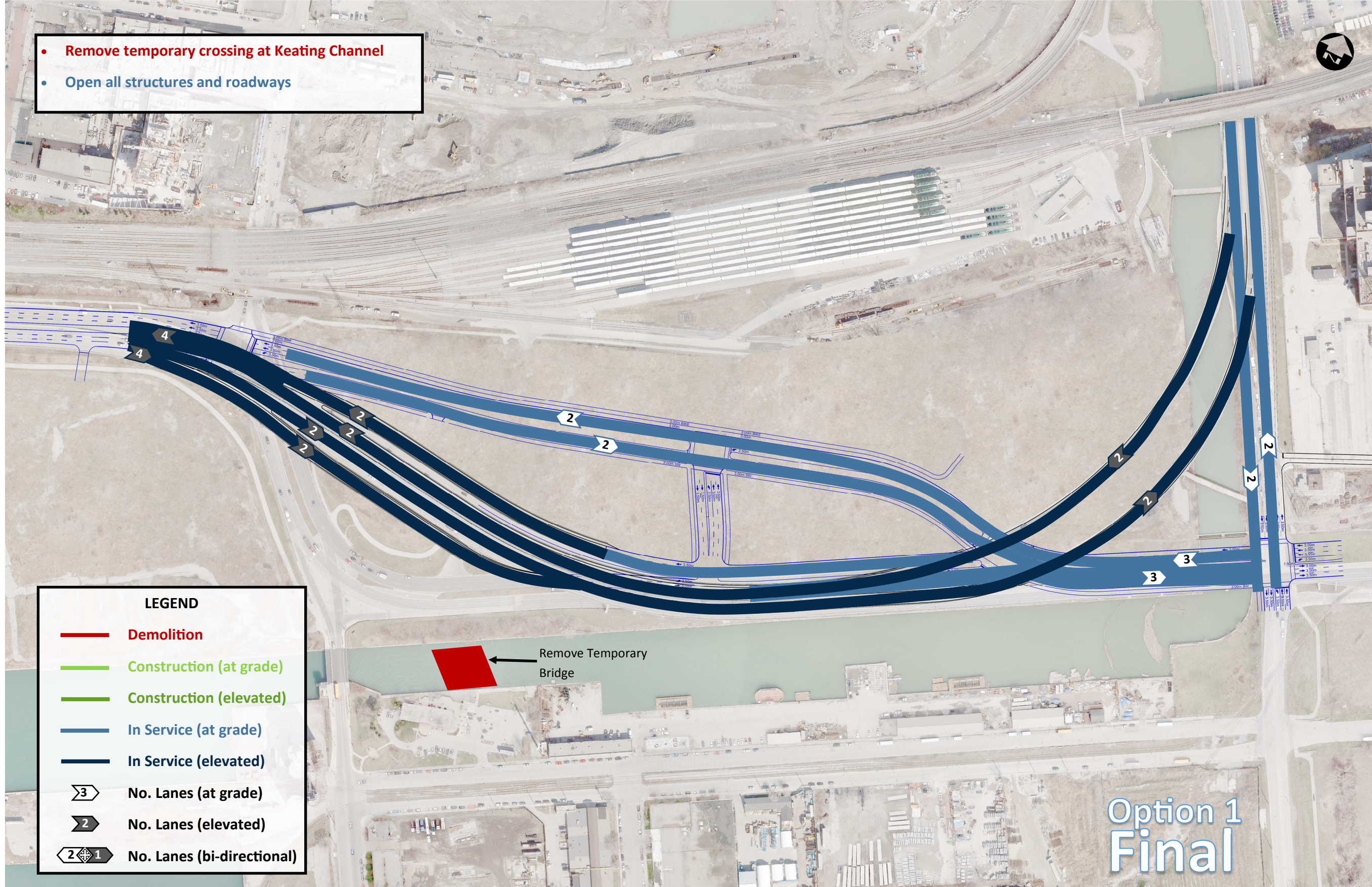
LEGEND

- Demolition
- Construction (at grade)
- Construction (elevated)
- In Service (at grade)
- In Service (elevated)
- 3 No. Lanes (at grade)
- 2 No. Lanes (elevated)
- 2 1 No. Lanes (bi-directional)

Option 1
Stage 2



- Remove temporary crossing at Keating Channel
- Open all structures and roadways



LEGEND

- Demolition
- Construction (at grade)
- Construction (elevated)
- In Service (at grade)
- In Service (elevated)
- 3 No. Lanes (at grade)
- 2 No. Lanes (elevated)
- 2 1 No. Lanes (bi-directional)

Remove Temporary Bridge

Option 1
Final

3.0 Hybrid Alternative 2A – Construction Staging Review

3.1 Key Features

Generally, the existing elevated F.G. Gardiner Expressway (FGE) will undergo life cycle rehabilitation as per the City's Maintain Scheme from Yonge Street to Cherry Street (at Bent 294); this section of the FGE will remain at its longitudinal and vertical alignment. For the section east of Cherry Street, a number of major structural work items will be carried out as follows:

- a) Logan Ramps - the FGE Logan ramps will be demolished.
- b) Don River Bridge - the existing Don River Bridge will be removed and replaced with a wider bridge carrying 7 lanes and 1 track. The new bridge will be longer as to accommodate the new widened Don River layout that is approved in the Keating Channel Precinct Environmental Study Report.
- c) DVP Ramps - the existing DVP ramps will be demolished.
Future traffic from the DVP will access the FGE via new DVP ramp bridges that will be constructed starting from south of the Metrolinx Rail Bridge and will connect directly to the existing FGE in the vicinity of Cherry Street. The two new DVP ramp bridges (2 lanes each) will be located north of the existing FGE.
- d) F.G Gardiner - the existing FGE main bridge from Cherry Street to Don Roadway will be demolished.
- e) Don Roadway - the existing Don Roadway between the Metrolinx Rail Bridge and LSB will be widened and realigned to carry 4 lanes (2 NBL + 2 SBL) of traffic during construction staging.
- f) On/Off Ramps - LSB traffic east of Don Roadway will access the FGE via new on and off ramps that will be constructed near Cherry Street. These two ramps will start from ground level approximately 250 m east of Cherry Street.
- g) Lake Shore Boulevard - the existing LSB between Cherry Street and Don Roadway will be bypassed freeing up space for future development.
A new 6 to 7 lane (3 EBL + 3 WBL+ left turn lane) LSB roadway will be constructed to carry WB/EB traffic at ground level and will extend to the Don River Bridge. The new LSB will be constructed north of the existing FGE and will generally run parallel to the new elevated DVP ramp structures.
A pedestrian sidewalk and a multi-use path will be provided outside of the new LSB curbs.
- h) Queens Quay - a new 2 lane (1 EBL + 1 WBL) Queens Quay Road Extension will be constructed from Cherry Street to future Munition Street north of the Keating Channel (to be confirmed with the Keating Channel Precinct Plan).

In addition to the work items listed above, additional work will be required to further develop the area south of the Keating Channel and to construct two new structures crossing the Keating Channel (Munition Street-Keating Channel Crossing and New Street-Keating Channel Crossing). At this time, consideration of this work is premature; therefore, the associated structural items are excluded in this construction staging review.

3.2 Construction Staging Review and Recommendation – Hybrid Alternative 2A

1. For this alternative, all elevated structures east of Cherry Street will be removed and replaced with structures on an altered alignment. The new LSB roadway and structures will be located north of the existing FGE. The total number of lanes in the FGE/LSB corridor will be reduced during construction due to the need to provide sufficient working areas for the new construction work, contractor access, as well as laydown areas and possibly prefabrication yards. Additionally, safety considerations will preclude the removal of major deck panels and substructure components over live traffic or public / inhabited areas due to the inherent danger / hazard associated with such significant operations.
2. Described below is a possible scheme for how the removal and new construction work can be staged to allow for this corridor to remain partially operational during construction; there may be costs associated with temporary strengthening of structures.
3. Traffic management under this Alternative will consider the following:
 - Utilizing Commissioners Street and/or Villiers Street to detour LSB traffic around the Gardiner East Ramp structures and the Don Roadway/LSB Intersection to facilitate the construction of this major intersection.
 - ½ and ½ staged removal and construction of the existing FGE and DVP ramp to allow for more temporary traffic lanes during construction.

4. Potential Staging:

- Pre-Stage

The main objective of the Pre-Stage is to have as much construction work as possible carried out without interfering with existing traffic and roadways. This would involve construction of substantial structural and road works north of the Keating Channel and east of Cherry Street. A second objective of the pre-stage work is to construct all necessary temporary road and structures for a traffic diversion route (carrying traffic from Don Roadway to, for example, Villiers Street or Commissioners Street, and then back north of Keating Channel before finally connecting to existing LSB east of Cherry Street). Villiers Street has been identified as a possible traffic diversion (detour) route; Commissioners Street is another possibility. Other connections between LSB and the detour route east of Don Roadway should be investigated to enable the section of LSB between Don Roadway and Logan Avenue to be bypassed

Construction during this period will include the following:

- § Widen the existing Don Roadway in both the NB and SB directions and realign to fit the future final alignment.
- § Construct a new 6 lane EB/WB detour. The detour will begin at the Don Roadway and LSB intersection, continue south to Villiers Street and/or

Commissioners Street, across Villiers/Commissioners Street, and then back north of Keating Channel before finally connecting to existing LSB east of Cherry Street. The work will include construction of a bridge crossing of, for example, a temporary timber deck bridge across Keating Channel (approximately 80 m east of Cherry Street), widening of Villiers Street, and adding temporary roadways to swing the traffic back to existing LSB. As noted above, a detour utilizing Commissioners Street should also be investigated along with Villiers Street as well as establishing another, more eastern diversion off of LSB east of Logan Avenue. Allowances for pedestrians and cyclists will need to be considered along the detour route.

- § The existing Jarvis ramp will be widened and the pavement remarked to carry two lanes with reduced speed. Widening of the ramp will assist in balancing the traffic capacity and carrying LSB traffic onto the FGE.
- § Begin construction of all structures and the new LSB roadway (north of the existing FGE between Cherry Street and Don Roadway) that are not in conflict with the existing structure or the existing LSB. The work would include part of the new Cherry Ramp Bridges (except the west ends), DVP Ramp Bridges (except the north and west ends), and the new LSB (except the east and west ends).

o Stage 1

Demolition work will include the following:

- § Shut down and demolish the N/W DVP ramp, FGE WBL, Logan Ramp WB, Don River Bridge WB, and existing LSB WBL.
- § The above ground demolition work shall be carried out over the weekend and during night time with protection to avoid falling objects to the north side of the existing LSB. Also one lane of the north side of the existing LSB may be shut down to provide additional clearance.

Construction work will include the following:

- § Construct the new Don River Bridge WB.
- § Construct the new N/W DVP Ramp and the remainder of the FGE WBL on ramp at Cherry Street.
- § Continue construction of the new LSB WBL where not in conflict with the existing W/N DVP ramp.
- § For the Don Roadway, the traffic shall be shifted to the east side.
- § The WB/EB traffic will be shared with the new 6 lane detour and the south half of existing LSB.

o Stage 2

Demolition work will include the following:

- § Shut down and demolish the W/N DVP ramp, FGE EBL, Logan Ramp EB, Don River Bridge EB, and existing LSB EBL.
- § The above ground demolition work shall be carried out over the weekend and night time with protection to avoid falling objects to the south side of the existing LSB. Also one lane of the south side of the existing LSB may be shut down to provide additional clearance.

Construction work will include the following:

- § Construct the new Don River Bridge EB.
- § Construct the new W/N DVP Ramp and the remainder of the FGE EBL off ramp at Cherry Street.
- § Complete the construction of the new LSB EBL where not in conflict with the N/W DVP ramp.
- § For the Don roadway, the traffic shall be shifted to the west side.
- § The WB/EB traffic will be shared among the new 6 lane detour and the north half of the new LSB.

o Final

Demolition work will include the following:

- § Remove the temporary timber deck bridge over Keating Channel.
- § Finish the new Queens Quay, Munition Street, Don Roadway, and other road work as required to be in alignment with final configuration.

- Widen the existing Don Roadway to two lanes in both directions.
- Construct six-lane detour from Don Roadway and LSB intersection down to Villers Street, over Keating Channel via construction of a new temporary bridge, and back to LSB west of Cherry Street.
- Widen existing Jarvis ramp to two lanes.
- Construct portions of structures and new LSB roadway north of existing FGE not in conflict with existing FGE structures.

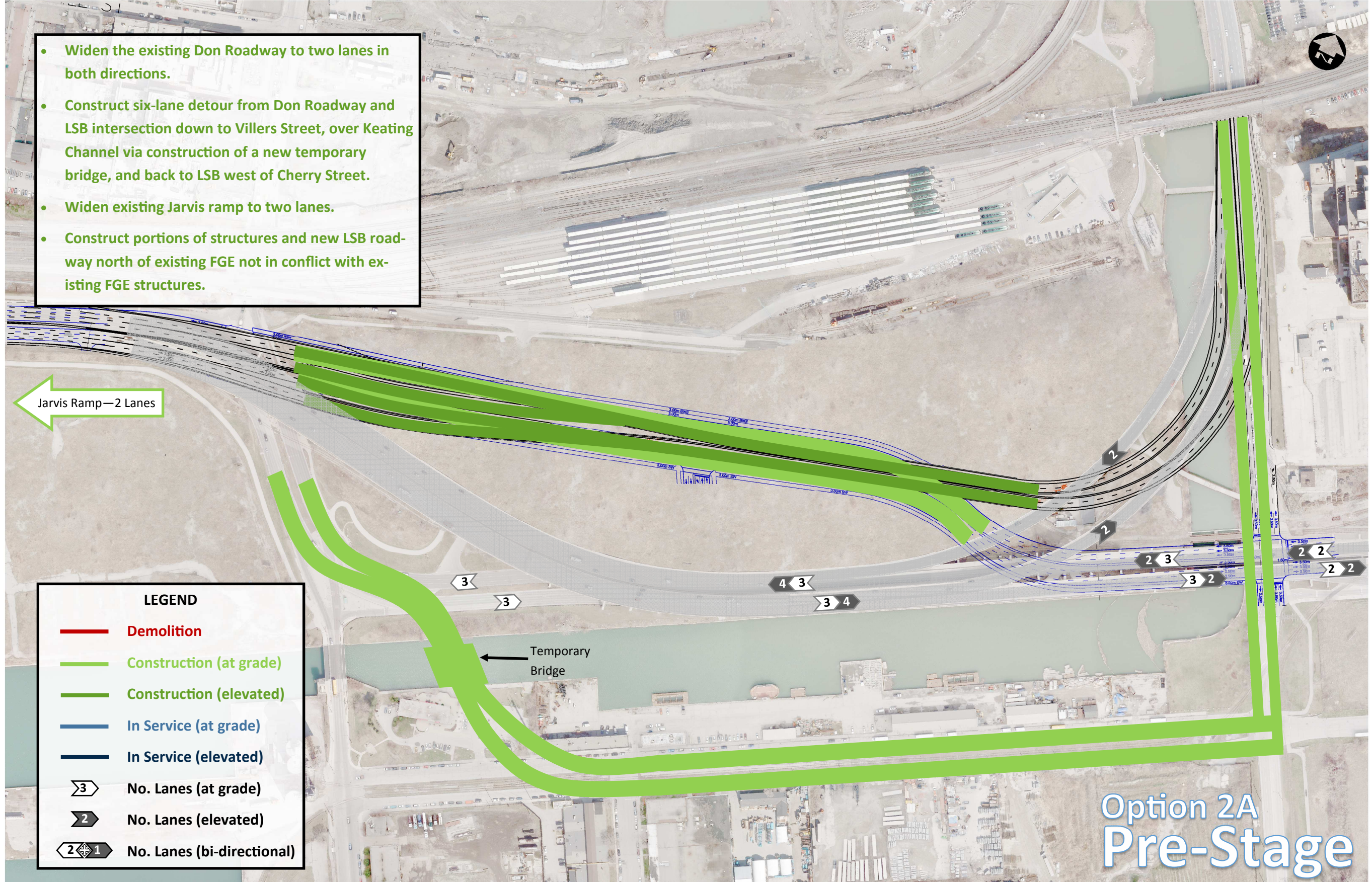
Jarvis Ramp—2 Lanes

LEGEND

- Demolition
- Construction (at grade)
- Construction (elevated)
- In Service (at grade)
- In Service (elevated)
- 3 No. Lanes (at grade)
- 2 No. Lanes (elevated)
- 2 1 No. Lanes (bi-directional)

Temporary Bridge

Option 2A
Pre-Stage

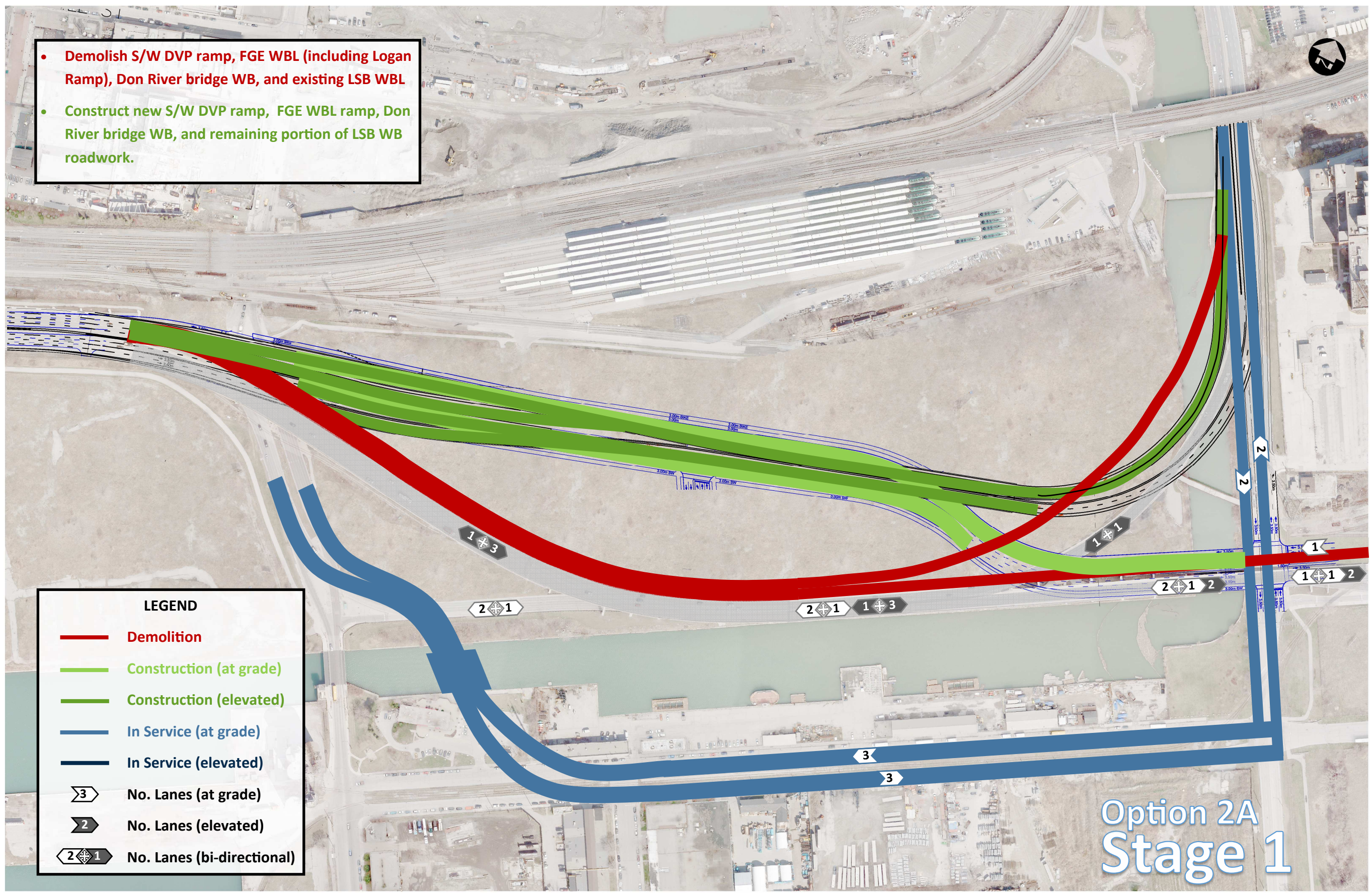


- Demolish S/W DVP ramp, FGE WBL (including Logan Ramp), Don River bridge WB, and existing LSB WBL
- Construct new S/W DVP ramp, FGE WBL ramp, Don River bridge WB, and remaining portion of LSB WB roadwork.

LEGEND

- Demolition
- Construction (at grade)
- Construction (elevated)
- In Service (at grade)
- In Service (elevated)
- 3 No. Lanes (at grade)
- 2 No. Lanes (elevated)
- 2 ↔ 1 No. Lanes (bi-directional)

Option 2A
Stage 1



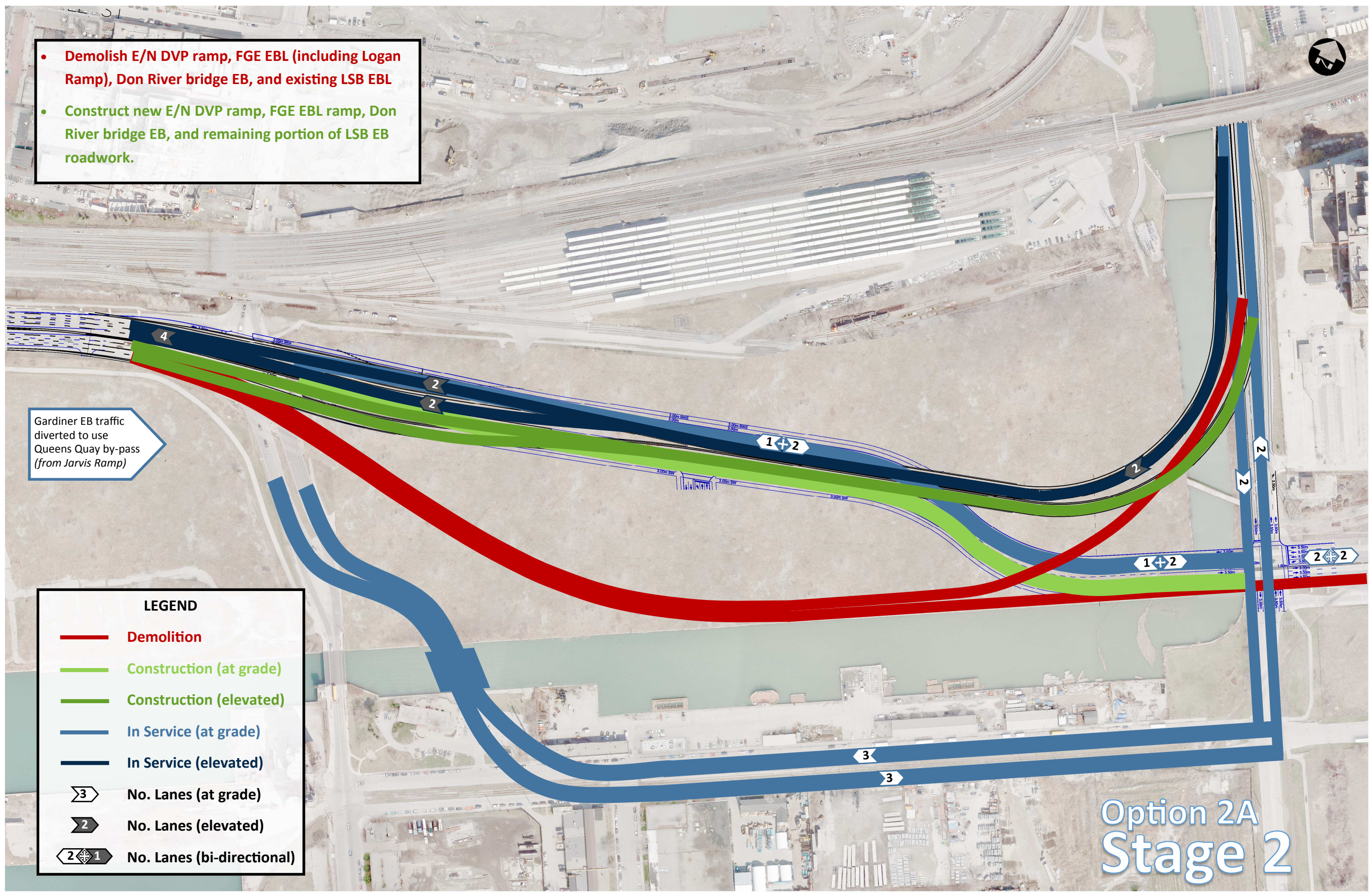
- Demolish E/N DVP ramp, FGE EBL (including Logan Ramp), Don River bridge EB, and existing LSB EBL
- Construct new E/N DVP ramp, FGE EBL ramp, Don River bridge EB, and remaining portion of LSB EB roadwork.

Gardiner EB traffic diverted to use Queens Quay by-pass (from Jarvis Ramp)

LEGEND

- Demolition
- Construction (at grade)
- Construction (elevated)
- In Service (at grade)
- In Service (elevated)
- 3 No. Lanes (at grade)
- 2 No. Lanes (elevated)
- 2 1 No. Lanes (bi-directional)

Option 2A
Stage 2



- Remove temporary crossing at Keating Channel
- Open all structures and roadways



LEGEND

- Demolition
- Construction (at grade)
- Construction (elevated)
- In Service (at grade)
- In Service (elevated)
- 3 No. Lanes (at grade)
- 2 No. Lanes (elevated)
- 2 1 No. Lanes (bi-directional)

Remove Temporary Bridge

Option 2A
Final

4.0 Hybrid Alternative 3 - Construction Staging Review

4.1 Key Features

Generally, the existing elevated F.G. Gardiner Expressway (FGE) will undergo life cycle rehabilitation as per the City's Maintain Scheme from Yonge Street to Cherry Street (at Bent 294); this section of the FGE will remain at its longitudinal and vertical alignment. For the section east of Cherry Street, a number of major structural work items will be carried out as follows:

- a) Logan Ramps - the FGE Logan ramps will be demolished.
- b) Don River Bridge - the existing Don River Bridge will be removed and replaced with a wider bridge carrying 7 lanes and 1 track. The new bridge will be longer to accommodate the new widened Don River layout that is approved in the Keating Channel Precinct Environmental Study Report.
- c) DVP Ramps - the existing DVP ramps will be demolished.
Future traffic from the DVP will access the FGE via new DVP ramp bridges that will be constructed starting north of the Metrolinx Rail Bridge and will connect directly to the existing FGE in the vicinity of Cherry Street. The two new DVP ramp bridges (2 lanes each) will be located north of the existing FGE. To accommodate the new horizontal curve of the new DVP ramp bridges, the north ramp bullnose shall be shifted further north encroaching into the Metrolinx Rail Bridge. The existing east spans of the Metrolinx Rail Bridge will need to be replaced with the east abutment relocated further into the embankment to the east. No profile adjustments to the rails will be required.
- d) F.G Gardiner - the existing FGE main bridge from Cherry Street to Don Roadway will be demolished.
- e) Don Roadway - the existing Don Roadway between the Metrolinx Rail Bridge and LSB will be widened and slightly realigned to carry 4 lanes (2 NBL + 2 SBL) of traffic during construction staging.
- f) On/Off Ramps - LSB traffic east of Don Roadway will access the FGE via new on and off ramps that will be constructed near Cherry Street. These two ramps will start from ground level approximately 250 m east of Cherry Street.
- g) Lake Shore Boulevard - the existing LSB between Cherry Street and Don Roadway will be bypassed freeing up space for future development.
A new 6 to 7 lane (3 EBL + 3 WBL+ left turn lane) LSB roadway will be constructed to carry WB/EB traffic at ground level and will extend to the Don River Bridge. The new LSB will be constructed north of the existing FGE and will generally run parallel to the new elevated DVP ramp structures.
A pedestrian sidewalk and a multi-use lane will be provided outside of the new LSB curbs.
- h) Queens Quay - a new 2 lane (1 EBL +1 WBL) Queens Quay Road extension will be constructed from Cherry Street to future Munition Street north of the Keating Channel (to be confirmed with the Keating Channel Precinct Plan).

In addition to the work items listed above, additional work will be required to further develop the area south of the Keating Channel and to construct two new structures crossing the Keating Channel (Munition Street-Keating Channel Crossing and New Street-Keating Channel Crossing). At this time,

consideration of this work is premature; therefore, the associated structural items are excluded in this construction staging review.

4.2 Construction Staging review and Recommendation – Hybrid Alternative 3

1. For this alternative, all elevated structures east of Cherry Street will be removed and replaced with structures on an altered alignment. The new LSB roadway and structures will be located north of the existing structures/roadways. The total number of lanes in the FGE /LSB corridor will be reduced during construction due to the need to provide sufficient working areas for the new construction work, contractor access, as well as laydown areas and possibly prefabrication yards. Additionally, safety considerations will preclude the removal of major deck panels and substructure components over live traffic or public / inhabited areas due to the inherent danger / hazard associated with such significant operations.
2. Described below is a possible scheme for how the removal and new construction work can be staged to allow this corridor to remain partially operational during construction; there may be costs associated with temporary strengthening of structures.
3. Traffic management under this alternative will consider the following:
 - o Utilizing Commissioners Street and/or Villiers Street to detour LSB traffic around the Gardiner East Ramp structures and the Don Roadway/LSB Intersection to facilitate the construction of this major intersection.
 - o ½ and ½ staged removal and construction of existing FGE and DVP ramps to allow more temporary traffic lanes during construction.
4. Potential Staging Alternative:
 - o Pre-Stage

The main objective of the Pre-Stage is to have as much construction work as possible carried out without interfering with existing traffic and roadways. This would involve construction of substantial structural and road works north of the Keating Channel and east of Cherry Street. A second objective of the pre-stage work is to construct all necessary temporary road and structures for a traffic diversion route (carrying traffic from Don Roadway to, for example, Villiers Street or Commissioners Street, and then back north of Keating Channel before finally connecting to existing LSB east of Cherry Street). Villiers Street has been identified as a possible traffic diversion (detour) route; Commissioners Street is another possibility. Other connections between LSB and the detour route east of Don Roadway should be investigated to enable the section of LSB between Don Roadway and Logan Avenue to be bypassed.

Construction during this period will include the following:

- § Staged replacement of existing Metrolinx Rail Bridge to a longer span structure for the segment crossing over the existing Don Valley Parkway and Don Roadway. [The existing bridge is currently carrying 4 tracks but is wide enough to carry 5 tracks and it appears that a staged replacement can be carried out. Consideration shall be made to request Metrolinx to reduce the number of active tracks during construction to facilitate the construction work. The articulation of the piers and choice of superstructure type will need to also take into consideration the required roadway clearance standards and the new lanes arrangement]. Further reviews and liaison with Metrolinx will be required to resolve the final requirements for the new structure and construction staging.
- § Widen the existing Don Roadway in both the NB and SB directions and realign to fit the future final alignment.
- § Construct a new 6 lane EB/WB detour. The detour will begin at the Don Roadway and LSB intersection, continue south to Villiers Street and/or Commissioners Street, across Villiers/Commissioners Street, and then back north of Keating Channel before finally connecting to existing LSB east of Cherry Street. The work will include construction of a bridge crossing of, for example, a temporary timber deck bridge across Keating Channel (approximately 80 m east of Cherry Street), widening of Villiers Street, and adding temporary roadways to swing the traffic back to existing LSB. As noted above, a detour utilizing Commissioners Street should also be investigated along with Villiers Street as well as establishing another, more eastern diversion off of LSB east of Logan Avenue. Allowances for pedestrians and cyclists will need to be considered along the detour route.
- § The existing Jarvis ramp will be widened and the pavement remarked to carry two lanes with reduced speed. Widening of the ramp will assist in balancing the traffic capacity and carrying LSB traffic onto the FGE.
- § Begin construction of all structures and the new LSB roadway (north of the existing FGE between Cherry Street and Don Roadway) that are not in conflict with the existing structure or the existing LSB. The work would include part of the new Cherry Ramp Bridges (except the west ends), DVP Ramp Bridges (except the north and west ends), and the new LSB (except the east and west ends).
- § Construct a longer Metrolinx Rail Bridge for the segment crossing over the existing Don Roadway. [Given that the existing bridge is currently carrying only 4 tracks and is wide enough to carry 6 tracks, it appears that a half and half replacement and reconfiguration can be carried out at this structure.]

o Stage 1

Demolition work will include the following:

- § Shut down and demolish the N/W DVP ramp, FGE WBL, Logan Ramp WB, Don River Bridge WB, and existing LSB WBL.
- § The above ground demolition work shall be carried out over the weekend and during night time with protection to avoid falling objects to the north side of the existing LSB. Also one lane of the north side of the existing LSB may be shut down to provide additional clearance.

Construction work will include the following:

- § Construct the new Don River Bridge WB.
- § Construct the new N/W DVP Ramp and the remainder of the FGE WBL on ramp at Cherry Street.
- § Continue construction of the new LSB WBL where not in conflict with the existing W/N DVP ramp.
- § For the Don Roadway, the traffic shall be shifted to the east side.
- § The WB/EB traffic will be shared with the new 6 lane detour and the south half of existing LSB.

o Stage 2

Demolition work will include the following:

- § Shut down and demolish the W/N DVP ramp, FGE EBL, Logan Ramp EB, Don River Bridge EB, and existing LSB EBL.
- § The above ground demolition work shall be carried out over the weekend and night time with protection to avoid falling objects to the south side of the existing LSB. Also one lane of the south side of the existing LSB may be shut down to provide additional clearance.

Construction work will include the following:

- § Construct the new Don River Bridge EB.
- § Construct the new W/N DVP Ramp and the remainder of the FGE EBL off ramp at Cherry Street.
- § Complete the construction of the new LSB EBL.
- § For the Don Roadway, the traffic shall be shifted to the west side.
- § The WB/EB traffic will be shared among the new 6 lane detour and the north half of the new LSB.

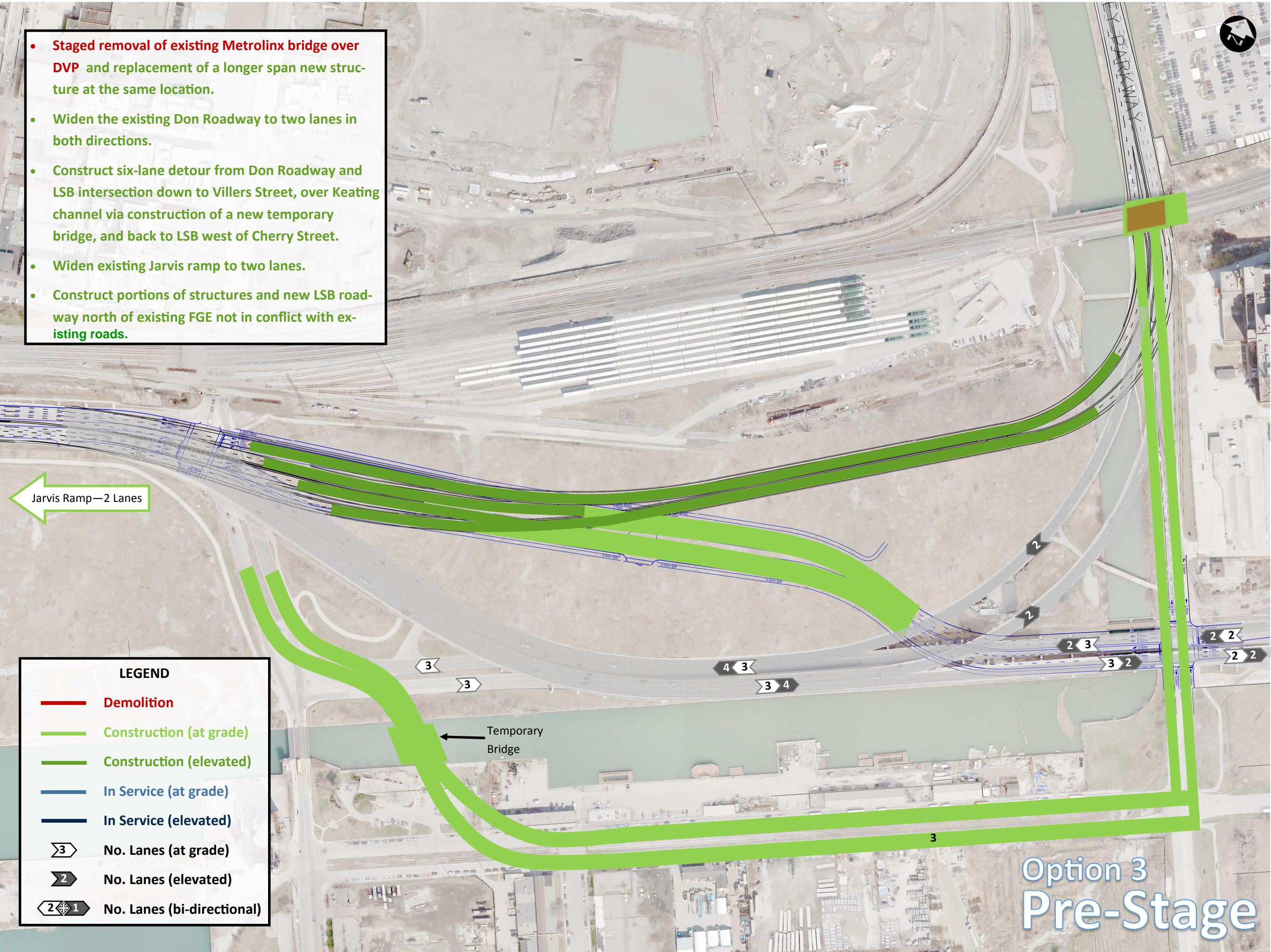
o Final

Demolition work will include the following

- § Remove the temporary timber deck bridge over Keating Channel.

- § Finish the new Queens Quay, Munition Street, Don Roadway, and other road work as required to be in alignment with final configuration.

- **Staged removal of existing Metrolinx bridge over DVP and replacement of a longer span new structure at the same location.**
- **Widen the existing Don Roadway to two lanes in both directions.**
- **Construct six-lane detour from Don Roadway and LSB intersection down to Villers Street, over Keating channel via construction of a new temporary bridge, and back to LSB west of Cherry Street.**
- **Widen existing Jarvis ramp to two lanes.**
- **Construct portions of structures and new LSB roadway north of existing FGE not in conflict with existing roads.**



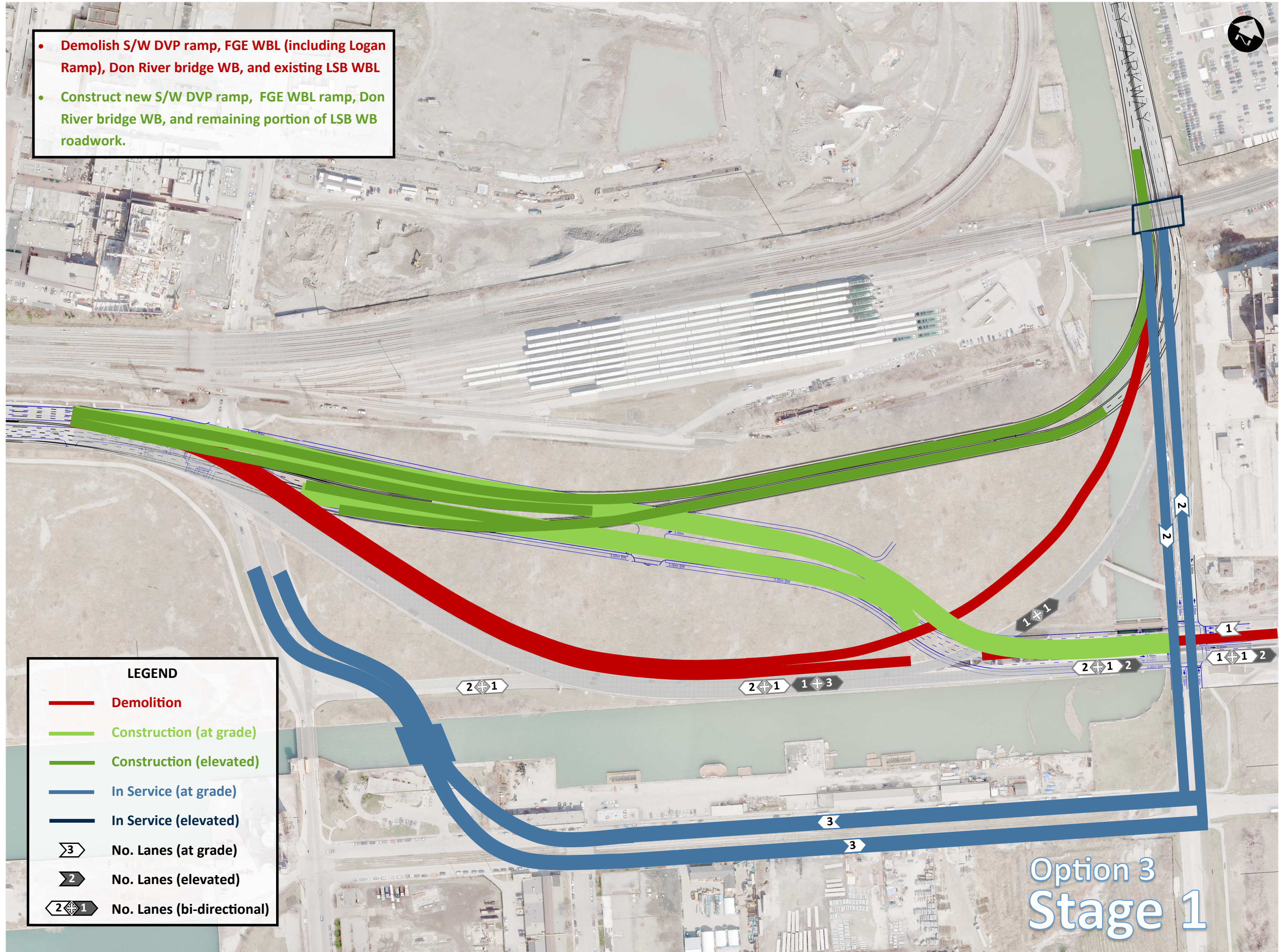
Jarvis Ramp—2 Lanes

LEGEND	
	Demolition
	Construction (at grade)
	Construction (elevated)
	In Service (at grade)
	In Service (elevated)
	No. Lanes (at grade)
	No. Lanes (elevated)
	No. Lanes (bi-directional)

Temporary Bridge

Option 3
Pre-Stage

- Demolish S/W DVP ramp, FGE WBL (including Logan Ramp), Don River bridge WB, and existing LSB WBL
- Construct new S/W DVP ramp, FGE WBL ramp, Don River bridge WB, and remaining portion of LSB WB roadwork.



LEGEND

- Demolition
- Construction (at grade)
- Construction (elevated)
- In Service (at grade)
- In Service (elevated)
- 3 No. Lanes (at grade)
- 2 No. Lanes (elevated)
- 2 ↔ 1 No. Lanes (bi-directional)

Option 3
Stage 1



- Demolish E/N DVP ramp, FGE EBL (including Logan Ramp), Don River bridge EB, and existing LSB EBL
- Construct new E/N DVP ramp, FGE EBL ramp, Don River bridge EB, and remaining portion of LSB EB roadwork.

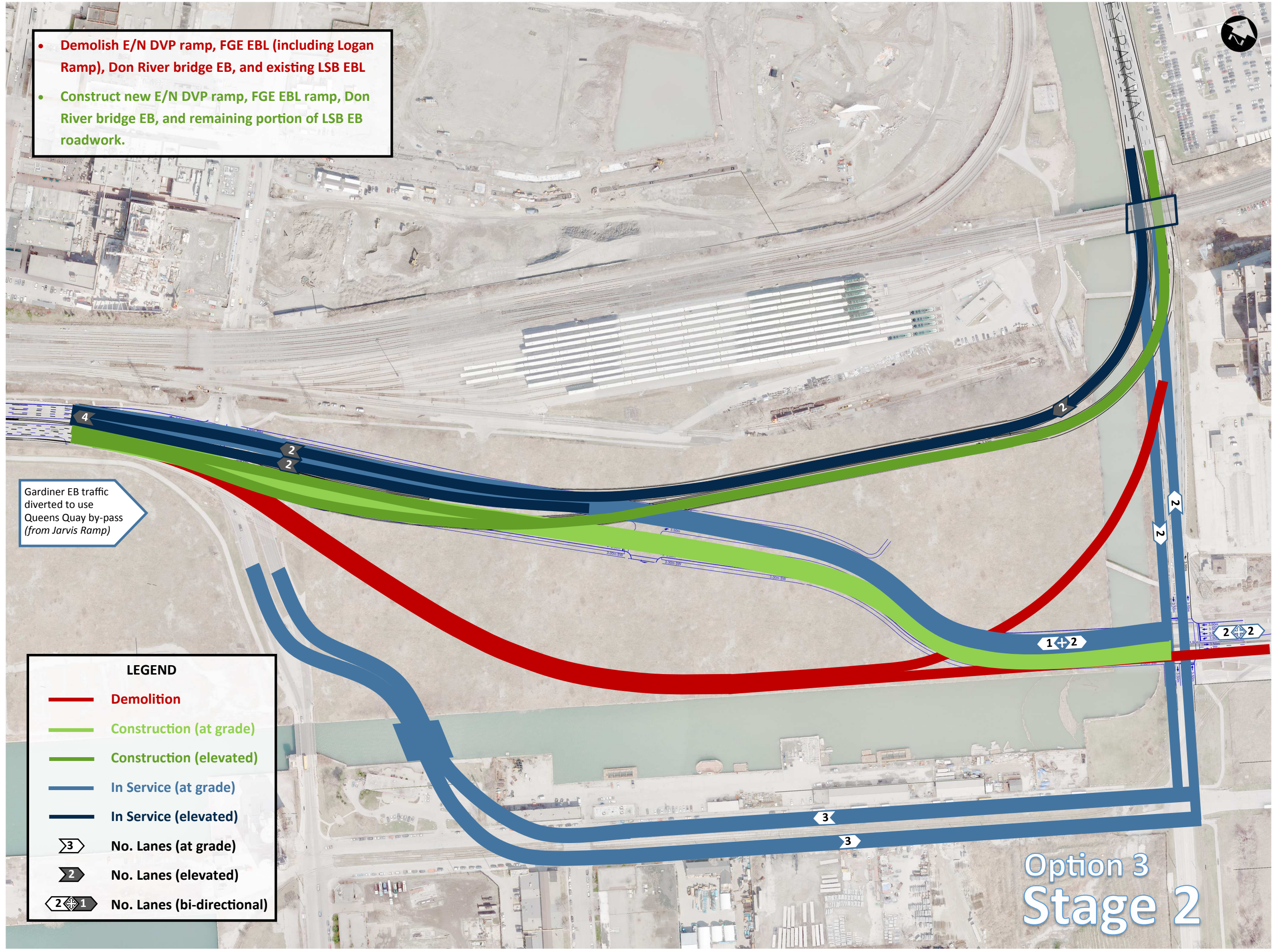


Gardiner EB traffic diverted to use Queens Quay by-pass (from Jarvis Ramp)

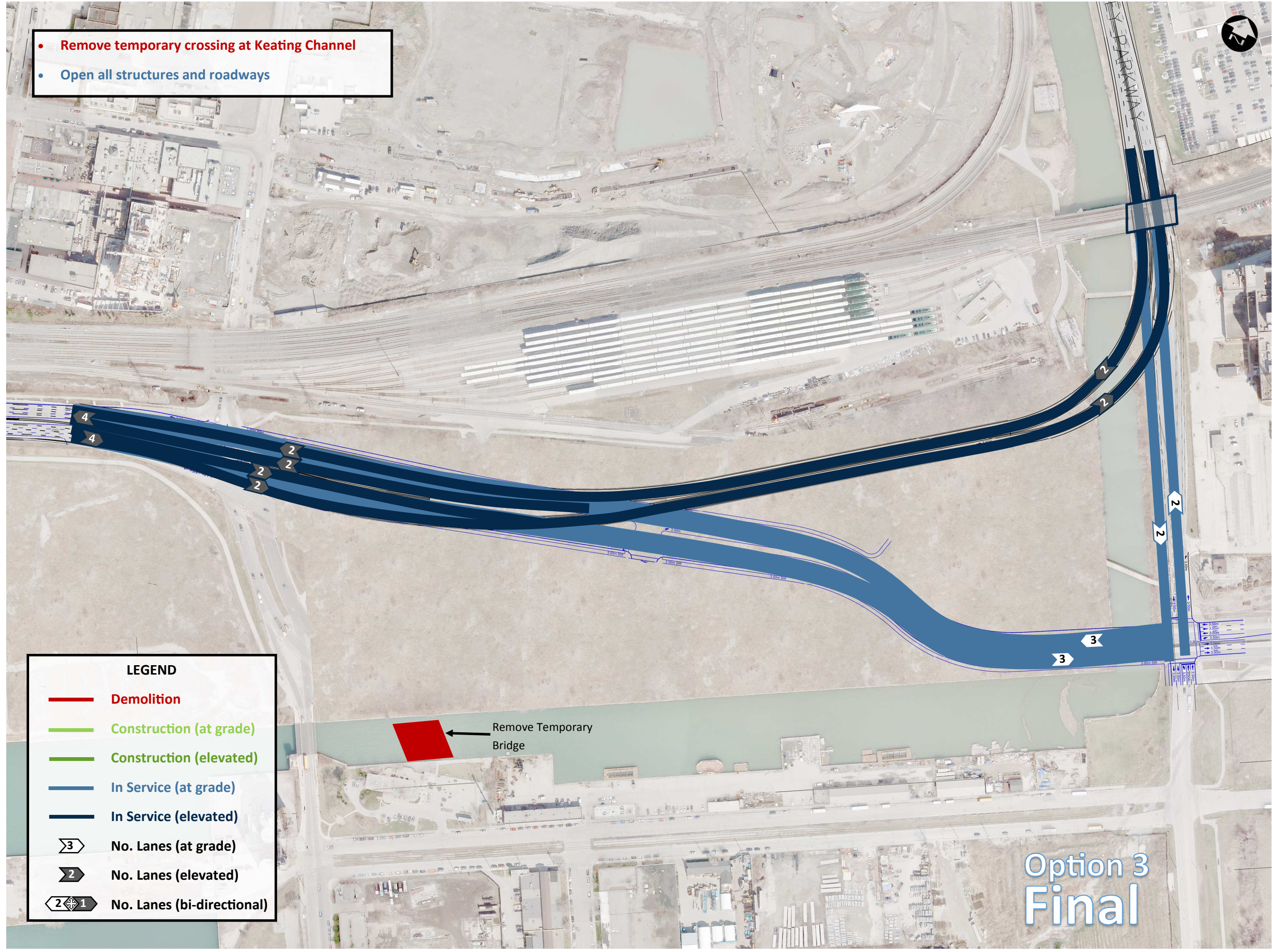
LEGEND

- Demolition
- Construction (at grade)
- Construction (elevated)
- In Service (at grade)
- In Service (elevated)
- 3 No. Lanes (at grade)
- 2 No. Lanes (elevated)
- 2 1 No. Lanes (bi-directional)

Option 3
Stage 2



- Remove temporary crossing at Keating Channel
- Open all structures and roadways



LEGEND	
	Demolition
	Construction (at grade)
	Construction (elevated)
	In Service (at grade)
	In Service (elevated)
	No. Lanes (at grade)
	No. Lanes (elevated)
	No. Lanes (bi-directional)

Remove Temporary Bridge

Option 3
Final