



## Improving Transit for West and North London



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## Current Context

- Cognizant of current financial and funding reality in responding to Council motions
- Today is not a funding ask; seeking greater clarity on types of options Council prefers in order to do more detailed work
- Continue to support long-term transportation strategy to position the City for future economic recovery and potential stimulus funding

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## Funding Opportunities

- After 10 approved ICIP projects \$150.5 M remains in federal and provincial allocation
- Multi-Year Budget approved placeholders for West and North transit connections with matching municipal share:

Total Project Capital Budget Allocation	
WEST CONNECTION	\$73.7 M
NORTH CONNECTION	\$136.7 M

- Including the municipal contribution, an additional \$42M in transit infrastructure could be supported\*.

(\*noting the municipal share of approx. \$11M is currently unfunded)

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## West Resolution – November 2019

That the Civic Administration BE REQUESTED to review and report back with recommendations for providing higher order transit service and/or transit improvement projects to West London, including but not limited to potential modifications of the West Connection project that address:

- a) options for higher order transit serving West London, including the extension of service further west;
- b) local service integration opportunities;
- c) additional road design alternatives along the corridor, including a review of lane configurations and options for phased delivery;
- d) the possibility of a quick-start program that includes prioritized intersections with mixed traffic routes,
- e) opportunities for park and ride;
- f) the possible need for electric bus infrastructure; and
- g) the Civic Administration BE DIRECTED to consult with the London Transit Commission on the matters identified in part a), above

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## North Resolution – January 2020

That the following actions be taken with respect to the transit routes along Richmond Street and Western Road between the Masonville Transit Hub, Western University and the Downtown:

- a) The Civic Administration BE DIRECTED to work with the London Transit Commission to identify:
  - i) Enhancements to roadway geometry, including, but not limited to, intersection design;
  - ii) Traffic controls, including signal design and operations;
  - iii) Transit routing and stop locations; and
  - iv) Other potential short and long term improvements to enhance transit service and connectivity along these corridors; and,
- a) The Civic Administration BE DIRECTED to report back to a future meeting of the Strategic Priorities and Policy Committee, in advance of the next project intake opportunity for the Public Transit Infrastructure Funding – Transit Stream Program, with the results of the review set out in a) above.

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## Corridor Review Resources

North and West reviews completed separately, but to be considered in parallel. Analysis included:

- Qualitative assessments of measures to improve transit
- High-level concept drawings
- Conceptual roadway configurations
- Traffic modelling analysis
- High-level cost estimates



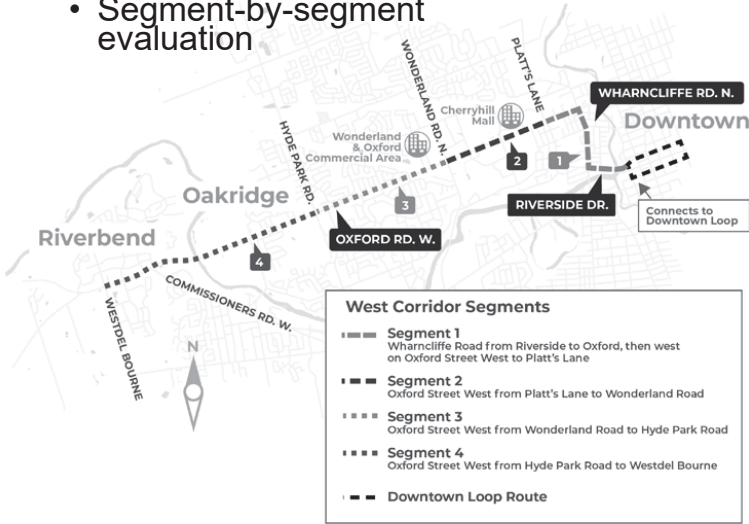
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# Reviews: West vs. North

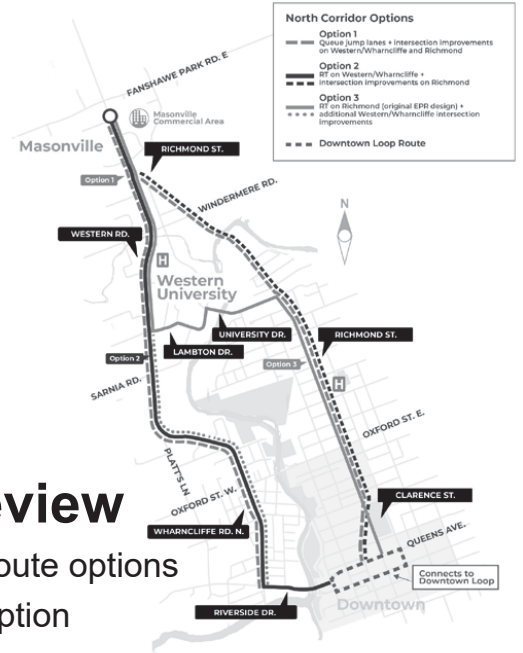
## West review

- Defined route
- Segment-by-segment evaluation



## North review

- Combined route options
- High-level option evaluation



# Today's Presentation

1. Background Information and Review Framework
2. West Corridor Review
3. North Corridor Review





## Part 1: Background Information and Review Framework



## Options Developed

Minor Transit Improvements /  
Lowest cost



- Express bus service
- Transit signal priority
- Intersection improvements (queue jump lanes)
- Convert an existing lane to two-way transit-only lane
- Convert two existing lanes to transit-only lanes
- Widen to add a two-way transit-only lane
- Widen to add transit-only lanes

Major Transit Improvements /  
Highest Cost



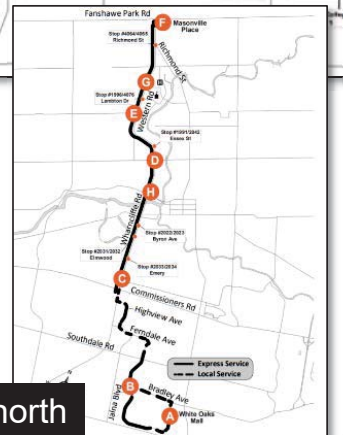
# Express Bus Service

- Fewer stops and more direct routes reduce travel times
- LTC already operates express service
- LTC reviews routes and service frequency annually with public input
- Doesn't require funding through ICIP
- Not carried forward for evaluation

Existing LTC Route 91 serves the west



Existing LTC Route 93 serves the north



# Transit Signal Priority

Part of Transportation Intelligent Mobility Management System (“TIMMS”)

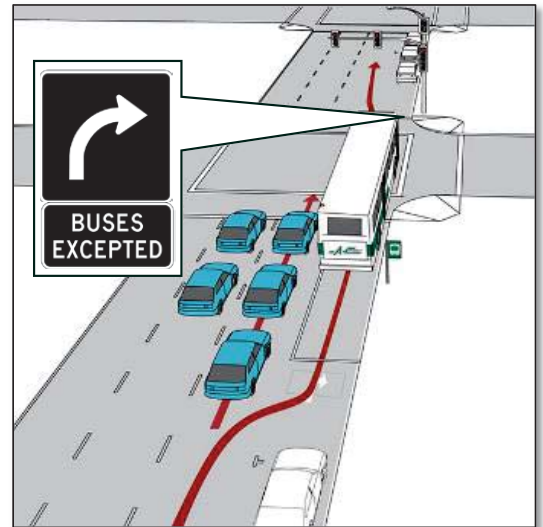
- Reduces intersection delays
- Shortens travel times for all modes
- Prepares transportation network for the future
- Includes Oxford St. to Sanatorium Rd.
- Includes Western Rd./Wharncliffe Rd. from Fanshawe Park Rd. to Riverside Dr.





## Intersection Improvements (Queue Jump Lanes)

- Curbside transit lanes allow buses to reach intersection during red signal
- Extending curbside lanes allows buses to bypass peak hour traffic queues up to 95% of the time
- Advance green signal further reduces transit travel times



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## Bus Bays

Bus bays not considered, due to:

- Reduced priority for buses, set back from intersection with no signal priority
- Increased transit travel times and operational concerns with merging
- Difficulty re-entering traffic: bus drivers must wait for gap to merge
  - Legislation requires motorists to yield to buses, but compliance is a challenge



Bus bay on Wellington Rd, south of Commissioners Rd

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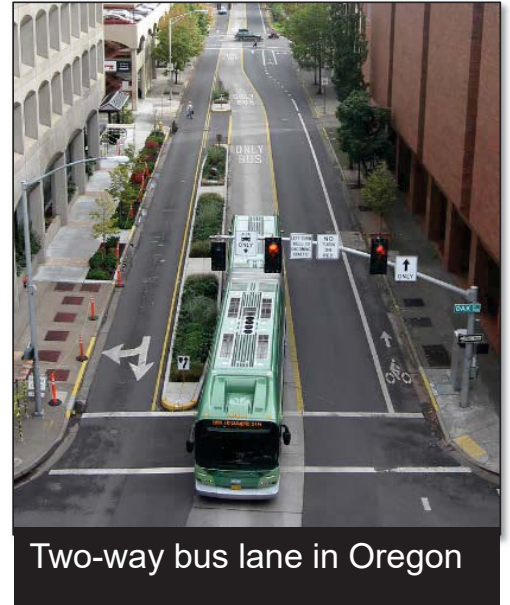
## Two-Way Transit Lanes

Options screened out:

1. Widening to add two-way transit lane
2. Converting existing lane to two-way transit lane

Not evaluated due to:

- Transit delays
- Complex design and operation
- Costs and impacts, compared to benefits



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## Convert Existing Lanes to Transit-Only Lanes

- Converts existing lanes, which minimizes widening
- Some widening still required at intersections and platform locations
- Benefits transit reliability and frequency
- Impacts traffic operations and reduces capacity
- Triggers need for centre median



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## Widen to add Transit-Only Lanes

- Transit-only lanes improve transit travel times and reliability
- Separates buses from general traffic and congestion
- Retains existing traffic capacity
- Triggers the need for a centre median



Wellington Rd will be widened at Commissioners Rd to add transit-only lanes

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## Short List of Options

Minor Transit Improvements /  
Lowest cost



- Express bus service
- **Transit signal priority**
- **Intersection improvements (queue jump lanes)**
- Convert an existing lane to two-way transit-only lane
- **Convert two existing lanes to transit-only lanes**
- Widen to add a two-way transit-only lane
- **Widen to add transit-only lanes**

Major Transit Improvements /  
Highest Cost

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# Evaluation Criteria

1. Benefit to transit operations
2. Increase in ridership
3. Benefit to traffic operations
4. Least property impacts
5. Least cultural heritage impacts
6. Least impact on trees
7. Least impact on utilities
8. Least impact on driveways
9. Redevelopment potential
10. Capital costs
11. Most consistent with City's policy objectives
12. Least Environmental Assessment implications



# Questions?

Any technical questions about the background information presented?



# Part 2: West Corridor Review

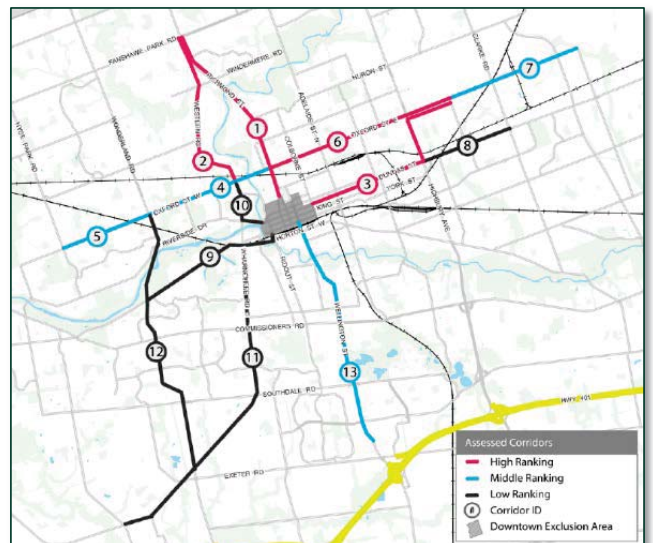


# West Route Background

The RTMP confirmed Oxford as the preferred BRT corridor, based on an evaluation of:

- Land use density
- Growth in people and jobs
- Major destinations
- Existing transit ridership

RTMP Exhibit 3.7  
Results of Corridor Level Screening Assessment

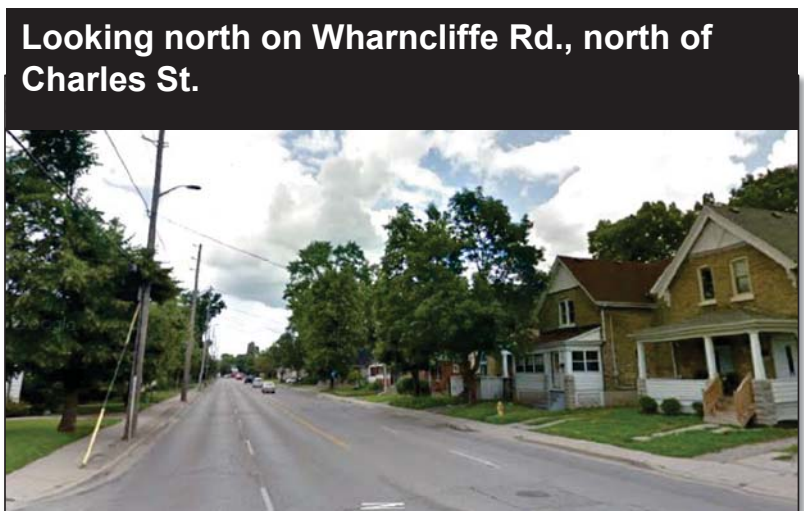


# West Corridor Review Area



## Segment 1: Wharncliffe Rd. and Oxford St W. from Riverside Dr. to Platt's Lane

- High traffic area
- Daytime truck route
- Blackfriars-Petersville heritage district
- Located in a floodplain
- Narrow road width





# Segment 1: Transit Options

**Option 1:  
Intersection Improvements**

Maintains traffic capacity

**Option 2:  
4 lanes**

Reduces traffic capacity

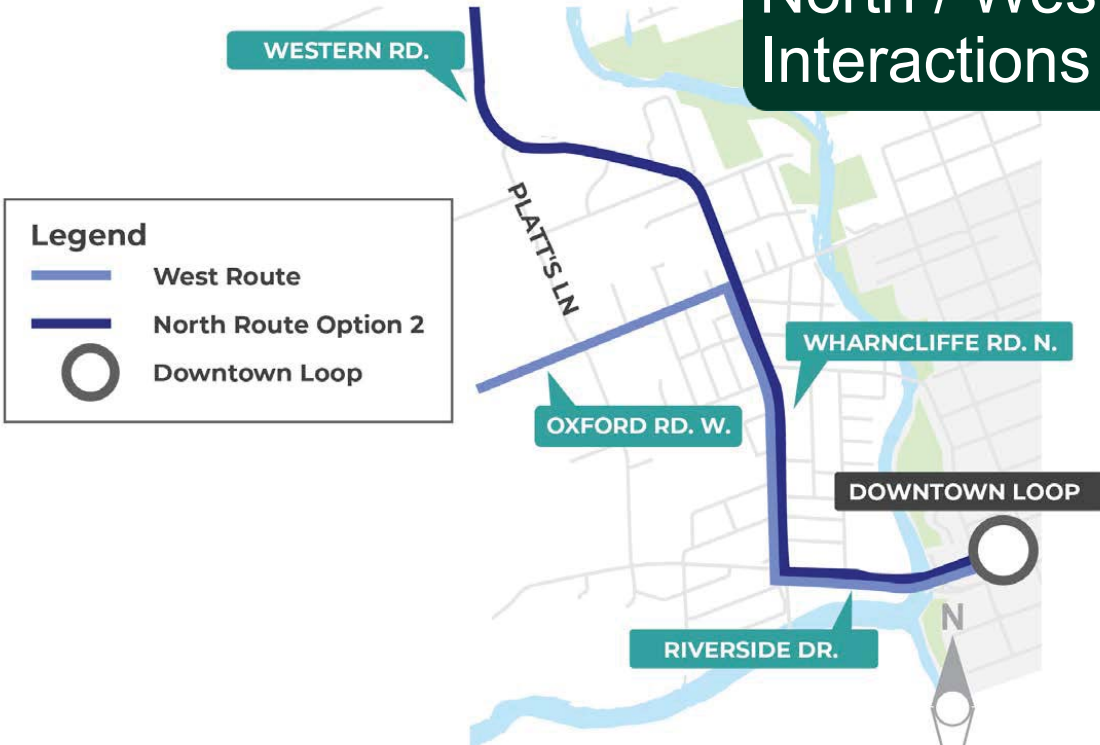
**Option 3:  
6 lanes**

Maintains traffic capacity

**Option 4:  
Transit signal priority**

Maintains traffic capacity

## North / West Corridor Interactions





# Option 1

Maintains 4 general traffic lanes, buses in mixed traffic, intersection improvements

KEY INDICATOR	DETAILS
Transit	Queue jump lanes allow buses to by-pass congestion at Riverside and Oxford west intersections, improving reliability.
Traffic	Maintains existing traffic capacity with no left-turn restrictions.
Heritage	Limits cultural heritage impacts (2 buildings)
Capital costs	Lower cost than options that propose widening to add transit-only lanes.
EA implications	No further studies required. City can proceed to detailed design.

Segment 1	Segment 2	Segment 3	Segment 4	WEST Summary 27
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# Option 2

Maintain 2 general traffic lanes (one lane in each direction), and convert 2 of the general traffic lanes to dedicated transit lanes

KEY INDICATOR	DETAILS
Transit	Removes buses from general traffic, improving transit reliability
Traffic	Reduces capacity for general traffic, results in increase in delays Centre median restricts left-turn to the signalized intersections
Heritage	Impactful to cultural heritage (22 buildings)
Capital costs	Higher capital costs associated with property acquisitions
EA implications	Addendum required to further assess heritage impacts

Segment 1	Segment 2	Segment 3	Segment 4	WEST Summary 28
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# Option 3

Maintain 4 general traffic lanes (two in each direction), and widen corridor to add 2 dedicated centre-running transit lanes

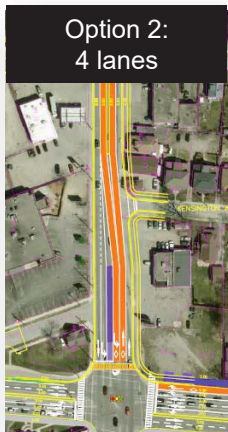
KEY INDICATOR	DETAILS
Transit	Removes buses from general traffic, improving transit reliability
Traffic	Maintains existing traffic capacity Centre median restricts left-turn to the signalized intersections
Heritage	Most significantly impact to cultural heritage (41 buildings)
Capital costs	Highest capital cost for segment 1 associated with property acquisitions
EA implications	Addendum required to further assess heritage impacts



# Segment 1: Transit Options 1, 2 & 3



**\$37.3M - \$41.9M**  
 Transit in mixed traffic  
 Maintains 4 gen. traffic lanes  
 Impacts 2 heritage properties



**\$54.6M – \$62.6M**  
 Transit in transit-only lanes  
 2 gen. traffic lanes (reduction)  
 Impacts 22 heritage properties



**\$66.6M – \$76.5M**  
 Transit in transit-only lanes  
 Maintains 4 gen. traffic lanes  
 Impacts 41 heritage properties



## Segment 2: Oxford Street W. from Platt's Lane to Wonderland Rd.

- Very high traffic area
- 24-hour truck route
- Opportunities for infill and intensification
- Wide road allowance
- Limited environmental features



Looking west on Oxford St. W., east of Cherryhill Mall



Looking west on Oxford St. W., east of Beaverbrook Ave.

Segment 1

Segment 2

Segment 3

Segment 4

WEST Summary 31



## Segment 2: Transit Options

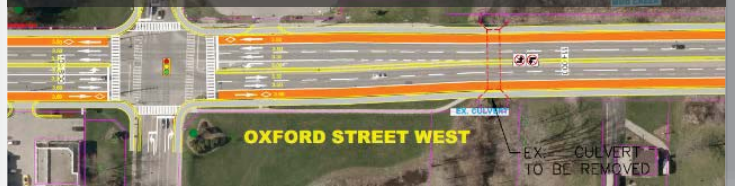
Option 1: Widen to add centre-running transit-only lanes (6 lanes)

Maintains traffic capacity



Option 2: Widen to add curbside transit-only lanes (6 lanes)

Maintains traffic capacity



Option 3: Intersection improvements and extending right-turn lanes (4 lanes)

Maintains traffic capacity



Option 4: Transit signal priority (4 lanes)

Maintains traffic capacity



Segment 1

Segment 2

Segment 3

Segment 4

WEST Summary 32





# Option 1 Preferred for Segment 2

Widen to 6 lanes. Maintain 4 general traffic lanes and add 2 centre-running transit-only lanes with median.

KEY INDICATOR	DETAILS
Transit	Removes buses from general traffic, improving transit reliability. Centre-running RT is the highest form for reliable, high-frequency transit.
Traffic	Widens road to add transit-only lanes, removing buses from mixed traffic and providing additional traffic capacity.
Intensification	Higher order transit supports infill and intensification and encourages sustainable transportation options.
Capital costs	Higher cost of widening options provide greatest benefit to transit and the overall transportation network, resulting in a positive ROI.



# Segment 3: Oxford St. W. from Wonderland Rd. to Hyde Park Rd.

- Mostly designated Neighbourhoods or Green Space
- High traffic area
- Daytime truck route
- Limited environmental features
- Mostly wide road allowance



Looking west on Oxford St. W., east of Laurel St.



Looking west on Oxford St. W., west of Fiddler's Green Rd.



# Segment 3: Transit Priority Options

**Option 1: Widen to add transit-only lanes (6 lanes)**  
Maintains traffic capacity

**Option 2: Convert 2 lanes to transit-only lanes (4 lanes)**  
Reduces traffic capacity

**Option 3: Intersection improvements (4 lanes)\***  
Maintains traffic capacity

**Option 4: Transit signal priority (4 lanes)**  
Maintains traffic capacity

\*Right-turn lane length sufficient to accommodate future demand



# Option 3 Preferred for Segment 3

Maintain 4 lanes for general traffic, with intersection improvements

KEY INDICATOR	DETAILS
Ridership	Density does not support infrastructure investment in transit-only lanes.
EA implications	Pre-approved under the Municipal Class Environmental Assessment process, therefore no further implications.
Capital costs	Investment costs appropriate given expected land use and ridership.
Intensification	Consistent with City's policy objectives, since majority of corridor is abutted by stable, residential neighbourhoods and green space.



# Segment 4: Oxford St. W. from Hyde Park Rd. to Westdel Bourne

- Mostly Neighbourhoods or Green Space designations
- Medium to high traffic volume
- Daytime truck route
- Some Environmentally Sensitive Areas

Looking west on Oxford St. W., west of Headley Dr.



Looking west on Oxford St. W, west of Commissioners Rd W.



Segment 1

Segment 2

Segment 3

Segment 4

WEST Summary 37



# Segment 4: Transit Priority Options

Option 1: Widen to add transit-only lanes (6 lanes)

Maintains traffic capacity



Option 2: Convert 2 lanes to transit-only (4 lanes)

Reduces traffic capacity



Option 3: Intersection improvements (4 lanes)

Maintains traffic capacity



Option 1: Transit priority measures (4 lanes)

Maintains traffic capacity



Segment 1

Segment 2

Segment 3

Segment 4

WEST Summary 38

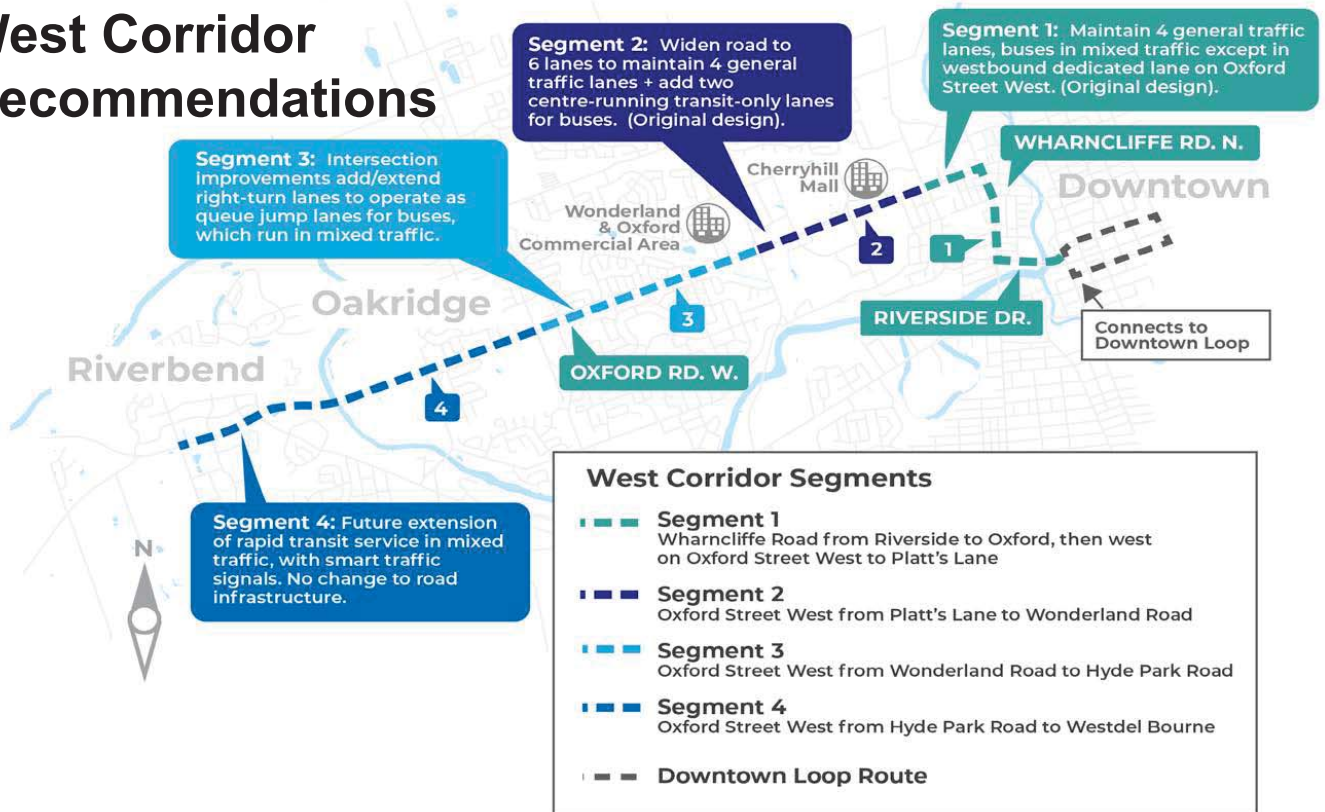


# Option 4 Preferred for Segment 4

Transit signal priority: future implementation of express transit operation in mixed traffic with smart signals to be determined through LTC service reviews.

KEY INDICATOR	DETAILS
Ridership	Density does not support infrastructure investment in transit-only lanes.
EA implications	Pre-approved under the Municipal Class Environmental Assessment process, therefore no further implications.
Capital costs	Investment in transit supportive infrastructure not justified at this time given expected land use and ridership.
Intensification	Place types in this segment don't support high-density development.

## West Corridor Recommendations





# West Corridor Recommendations

A total of \$73.7 million is in the capital budget for the West Connection.

Segment	Recommendation	Cost range *	
1	Wharncliffe/Oxford: from Riverside to Platt's Lane	Maintain 4 general traffic lanes, buses in mixed traffic with intersection improvements	\$37.3-\$41.9 M
2	Oxford: from Platt's Lane to Wonderland	Widen to 6 lanes. Maintain 4 gen. traffic lanes and add 2 centre transit-only lanes with median.	\$34.9-\$38.8 M
<b>Segment 1 and 2 Subtotal</b>		<b>\$72.2-\$80.7 M</b>	

\* Estimates reflect Total Project Cost, including the Federal, Provincial & Municipal Share.

Segment 1	Segment 2	Segment 3	Segment 4	<b>WEST Summary 41</b>
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# West Corridor Recommendations

A total of \$73.7 million is in the capital budget for the West Connection.

Segment	Recommendation	Cost range *	
1	Wharncliffe/Oxford from Riverside to Platt's Lane	Maintain 4 general traffic lanes, buses in mixed traffic with intersection improvements	\$37.3-\$41.9 M
2	Oxford from Platt's Lane to Wonderland	Widen to 6 lanes. Maintain 4 gen. traffic lanes & add 2 centre transit-only lanes with median.	\$34.9-\$38.8 M
<b>Segment 1 and 2 Subtotal</b>		<b>\$72.2-\$80.7 M</b>	
3	Oxford from Wonderland to Hyde Park	Maintain 4 gen. traffic lanes, buses in mixed traffic with intersection improvements.	\$8.8-\$13.5 M
4	Oxford from Hyde Park to Westdel Bourne	Buses in mixed traffic with smart traffic signals. No change to road infrastructure.	\$0.6 M
<b>West Corridor Recommendation (4 Segments) Total</b>		<b>\$81.5-\$94.8 M</b>	

\* Estimates reflect Total Project Cost, including the Federal, Provincial & Municipal Share.

Segment 1	Segment 2	Segment 3	Segment 4	<b>WEST Summary 42</b>
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# LTC Coordination

Local service integration	Fleet electrification
<ul style="list-style-type: none"><li>• LTC's 2018 Rapid Transit Integration Strategy gives direction</li><li>• LTC's annual service plan process responds to ridership shifts, allowing for modifications</li></ul>	<ul style="list-style-type: none"><li>• Modelling done during Master Plan and EA</li><li>• LTC analysis underway</li><li>• Decision-making for RT must be considered in context of larger fleet</li></ul>

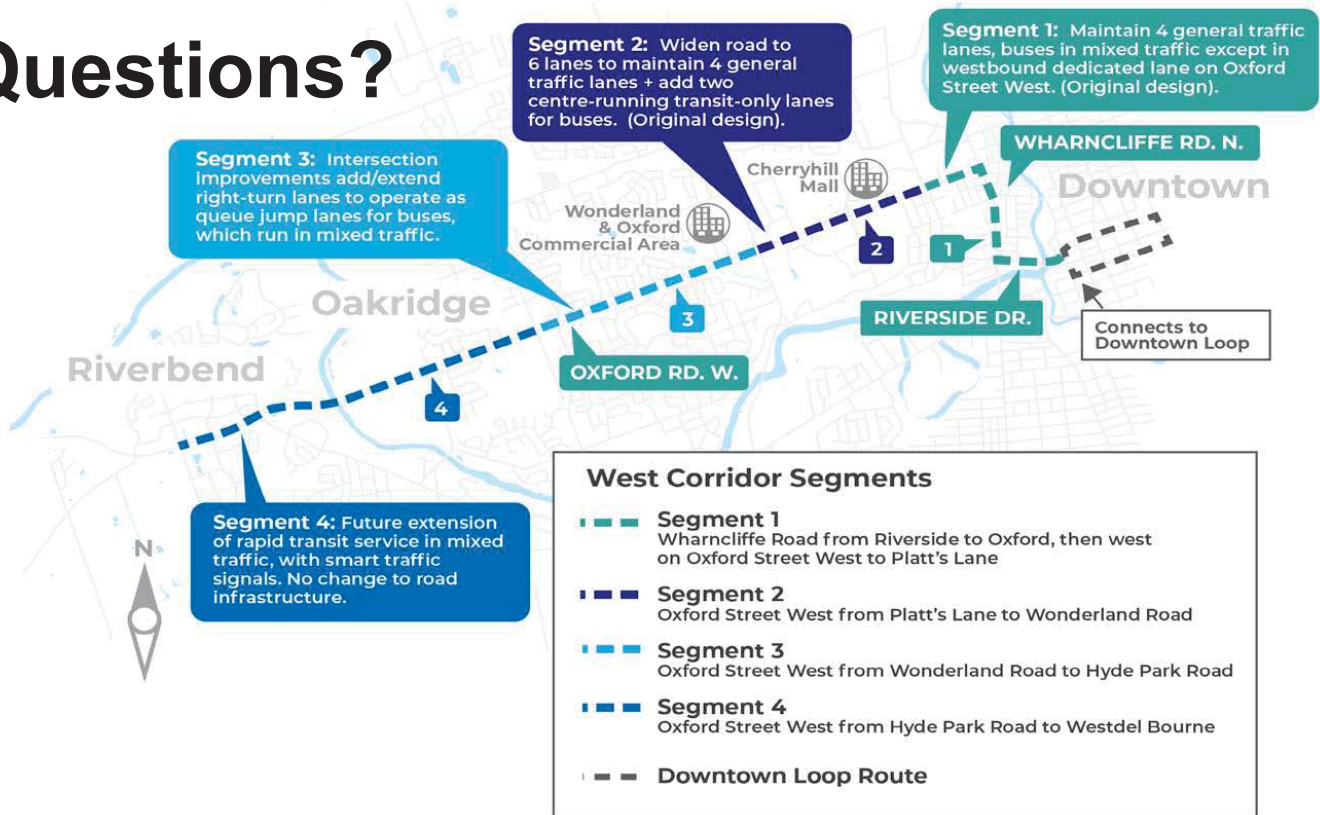


# Park and Rides

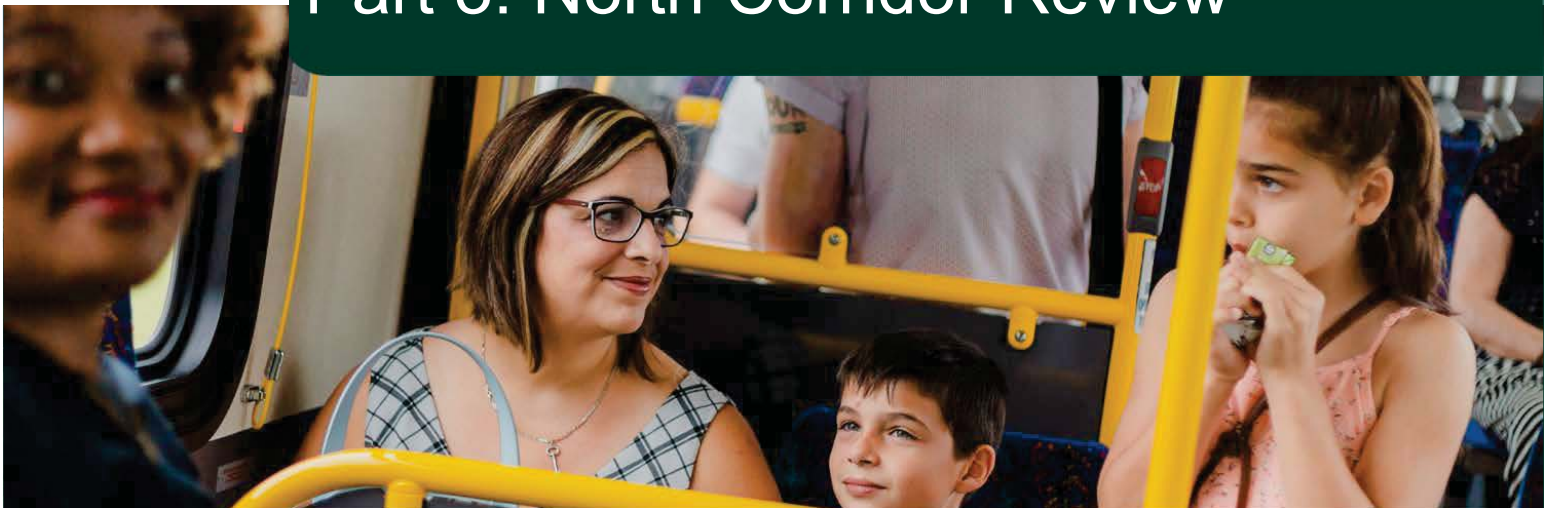
- Variety of ways to establish Park and Rides
- Challenging to find public opportunities to invest in P&Rs in funding window
- Future opportunities exist if transit extends west beyond original design, potentially aligned with development applications



# Questions?



## Part 3: North Corridor Review



# North Corridor Review

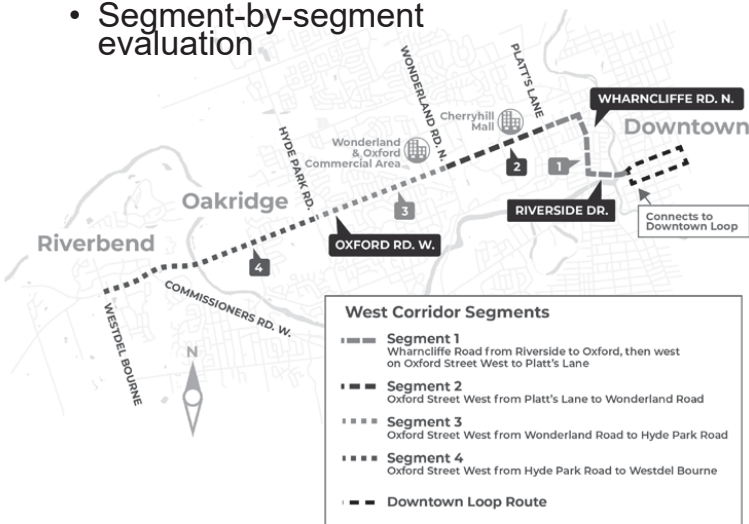
- Option 1:** Intersection improvements on Western and Richmond
- Option 2:** Rapid transit on Western + intersection improvements on Richmond
- Option 3:** Rapid transit on Richmond + intersection improvements on Western



## Reviews: West vs. North

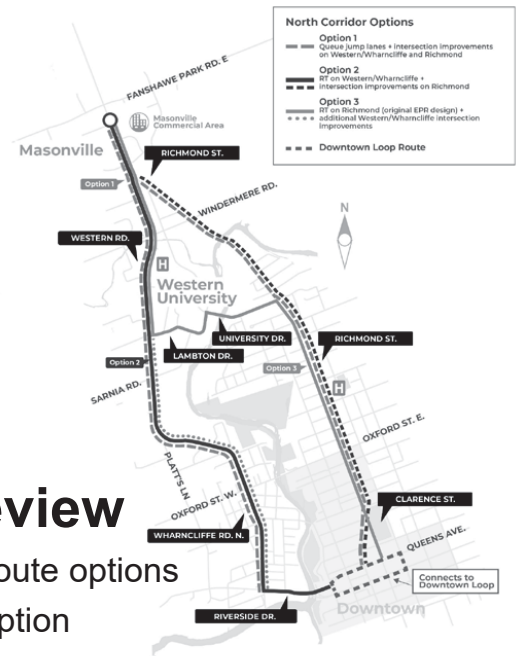
### West review

- Defined route
- Segment-by-segment evaluation



### North review

- Combined route options
- High-level option evaluation





# Option 1: Intersection Improvements on Western Rd. and Richmond St.



- Shared right-turn/bus queue jump lanes at select intersections along Richmond St. and Western Rd./Wharncliffe Rd.
- Enhanced intersection improvements at select Richmond St. intersections
- Works with recommended mixed traffic option for Wharncliffe Rd. south of Oxford St. (West Corridor Option 1)

Option 1

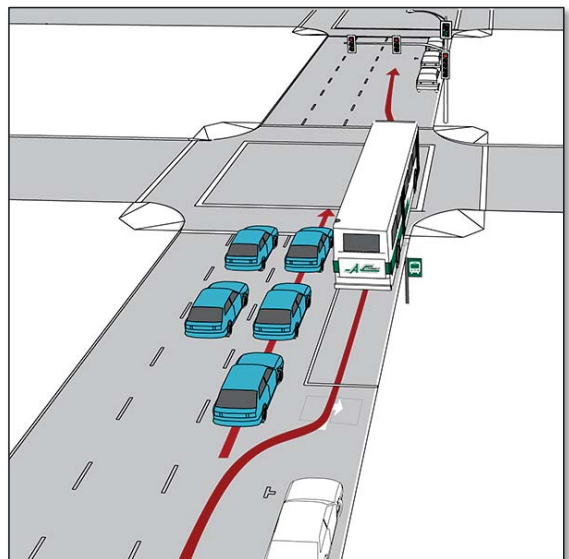
Option 2a/b

Option 3

NORTH Summary

# Enhanced Intersection Improvements

- Lack of turn lanes on Richmond St. from Central Ave. to Western Rd. delay general traffic and transit
- Congestion at some intersections would obstruct the benefit of queue jump lanes
- Introducing vehicle turn lanes at select intersections would ease congestion from turn movements, improving mobility for transit and drivers



Option 1

Option 2a/b

Option 3

NORTH Summary



# Option 1: Intersection Improvements on Western Rd. and Richmond St.

KEY INDICATOR	DETAILS
<b>Transit</b>	Minor benefit to local and express bus routes. Buses operating in mixed traffic still subject to delays. Not anticipated to attract significant ridership.
<b>Traffic</b>	Maintains existing capacity. No anticipated change to Western Rd operations. Richmond St operations expected to improve.
<b>Impact</b>	Least impact to trees, utilities, property and heritage conservation.
<b>Policy</b>	Does not encourage the redevelopment and intensification envisioned by London Plan.
<b>Cost</b>	Lowest capital cost to implement.



# Option 2: RT on Western with Intersection Improvements on Richmond



- Centre-running rapid transit on Western Rd./Wharncliffe Rd.
- Plus:
- Shared right-turn/bus queue jump lanes on Richmond with additional improvements at select intersections (consistent with Option 1)
- 3 “sub-options” considered for Western Rd./Wharncliffe Rd. between Platt’s Lane and Oxford St.

# Option 2: Western Road North of Platt's Lane



**Widen road to 6 lanes to add centre-running transit-only lanes and maintain 4 lanes of general traffic**

- Centre-running RT is consistent with the EA from Masonville to Lambton Dr.
- Centre-running RT would continue south on Western Rd to Platt's Lane
- Sub-options were considered for Western/Wharncliffe Rd. south of Platt's Lane

# Option 2: Western Rd./Wharncliffe Rd. South of Platt's Lane

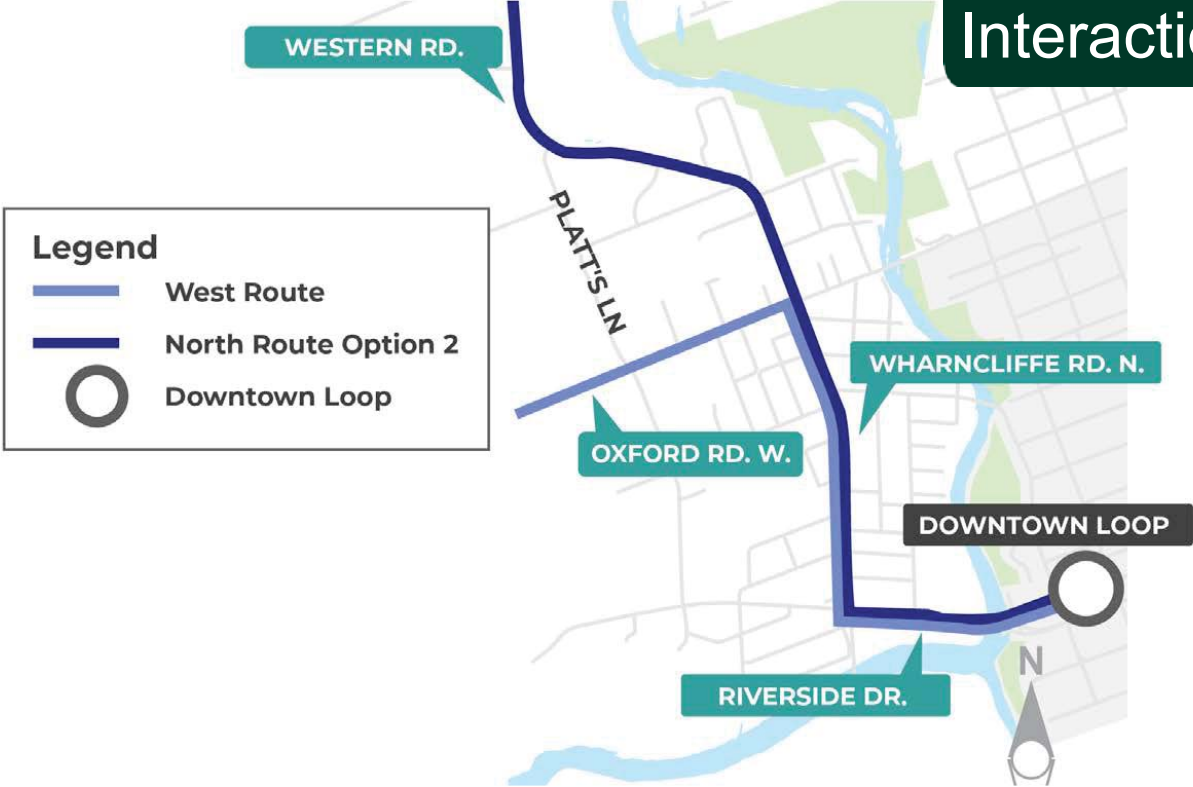


**2a:** existing conditions south of Platt's Lane, RT buses run in mixed traffic

**2b:** convert 2 general traffic lanes to transit-only lanes south of Platt's Lane

**2c:** widen south of Platt's Lane to add 2 transit-only lanes, maintaining 4 general traffic lanes (SCREENED OUT)

# North / West Interactions

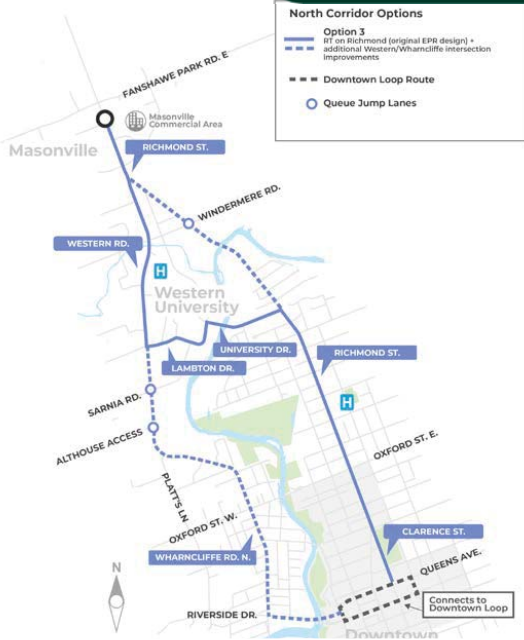


# Option 2: RT on Western and Intersection Improvements on Richmond

KEY INDICATOR	DETAILS
<b>Transit</b>	Removes buses from general traffic, improving transit reliability and frequency. RT route would serve fewer key destinations than Option 3.
<b>Traffic</b>	Widening for centre-running transit retains existing roadway capacity. Traffic constraints anticipated in non-widened sections. Centre median restricts left turns, but improves safety.
<b>Impact</b>	Most impactful on properties, heritage conservation, trees and utilities. Option 2b has greatest impacts, triggering full removal of 23 heritage properties.
<b>EA Implications</b>	Requires additional studies and EA addendum.
<b>Policy</b>	RT service encourages redevelopment and intensification though limited in some areas by floodplain and heritage conservation district.
<b>Cost</b>	High capital costs, including large land component



# Option 3: RT on Richmond with Intersection Improvements on Western



- Centre-running rapid transit south from Masonville Place following:
  - Richmond St. to Western Rd.(widen)
  - Western Rd. to Lambton Dr. (widen)
  - 3 stops serving Western University (convert)
  - Richmond to Downtown Loop (convert)

Plus:

- Shared right-turn/bus queue jump lanes at select Western Rd. intersections



# Option 3: RT on Richmond with Intersection Improvements on Western

KEY INDICATOR	DETAILS
<b>Transit</b>	Removes buses from general traffic, improving transit reliability and frequency. Longest RT route, serving the greatest number of potential passengers.
<b>Traffic</b>	Re-distributes traffic volume over the Wellington and Richmond Corridors. Minor traffic delay on Richmond south of the University – only during peak times. Centre-median restricts left-turns, but improves roadway safety.
<b>Impact</b>	Widening impacts to properties, heritage conservation, trees and utilities. Overall, less impacts than Option 2
<b>Policy</b>	RT service encourages redevelopment and intensification.
<b>Cost</b>	High capital cost provides for the most transit benefit.



# North Corridor Recommendations

A total of \$136.7 million is in the capital budget for the North Connection.

Option	Description	Cost Range *
1	Intersection improvements along both Western and Richmond	\$17.6 M - \$24.1 M
2a	Rapid transit on Western (mixed traffic south of Platt's) with intersection improvements on Richmond	\$108.5 M - \$133.0 M
2b	Rapid transit on Western (convert two lanes south of Platt's) with intersection improvements on Richmond	\$136.4 M - \$168.0 M
3	Rapid transit on Richmond with intersection improvements on Western	\$154.6 M - \$172.0 M

\* Estimates reflect Total Project Cost, including the Federal, Provincial & Municipal Share.

Segment 1	Segment 2	Segment 3	Segment 4	<b>WEST Summary 59</b>
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# Transit approaches for further consideration

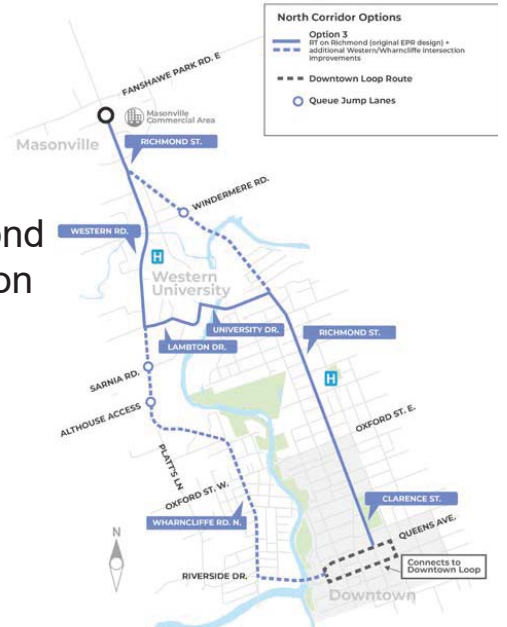
## Option 1 INTERIM MEASURES

Intersection improvements on Western and Richmond



## Option 3 LONG-TERM MEASURES

RT on Richmond with intersection improvements on Western



Option 1	Option 2a/b	Option 3	<b>NORTH Summary 60</b>
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# Questions?

## Option 1



## Option 3



# Discussion of Corridor Reviews

