Main Street Renewal

Functional, Preliminary Design and Detailed Design

Main Street (Echo Drive to the Rideau River),
Lees Avenue (Main Street to Chestnut Street), and
Rideau River Drive (Main Street to 130m south of Main Street)

Working Group Meeting #8 – April 10, 2013

Ottawa

Delcan Corush Sunderland Wright

Agenda

1. Meeting Objectives
2. Environmental Assessment – Alternative Designs
3. Alternative Design #5: Cycle Track
4. Preliminary Concept - Review Session
5. Lane Reduction Context: 2000 to 2013
6. Traffic Capacity Considerations
7. Round Table Discussion
8. Discussion

Project Limits

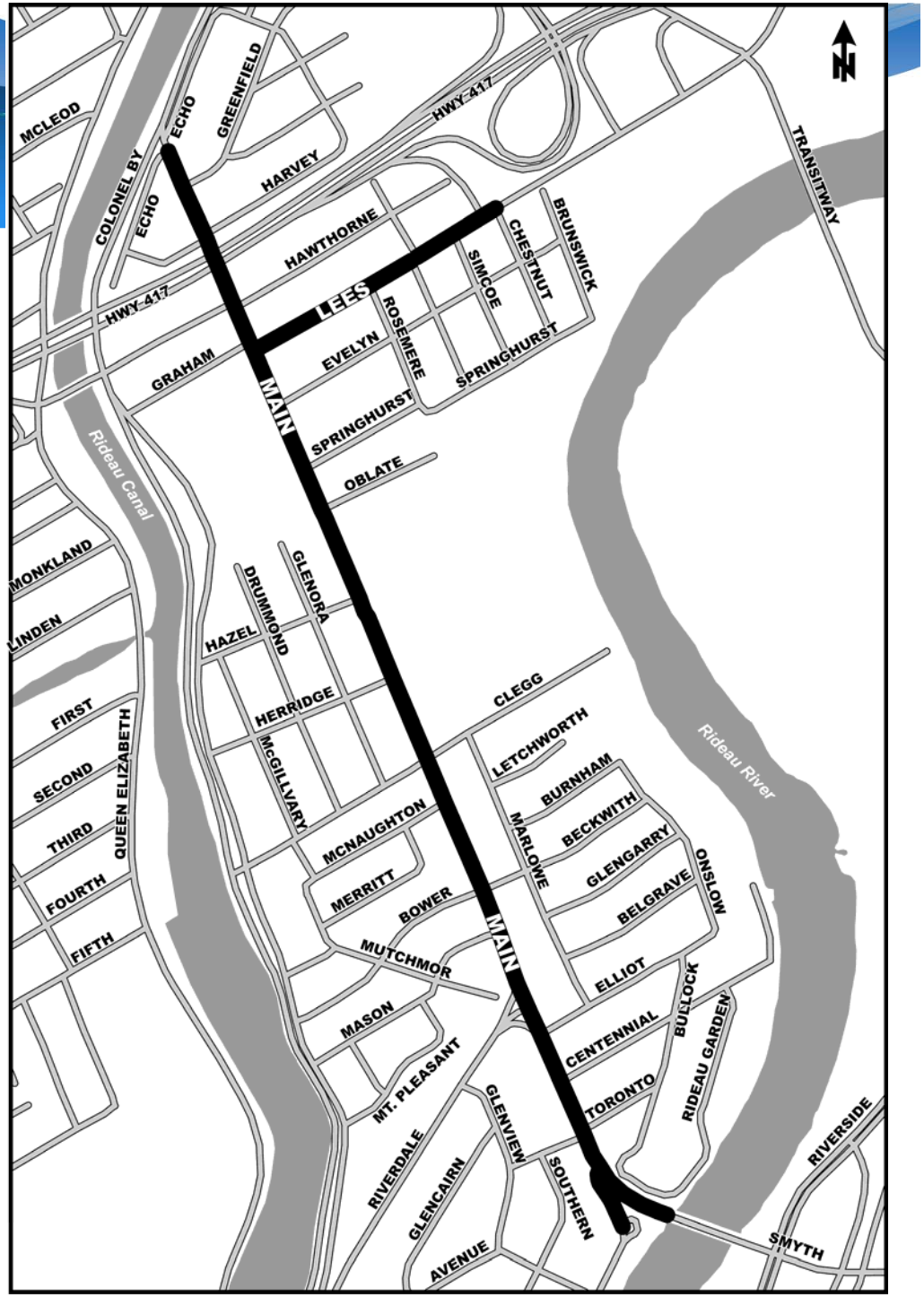
Main Street (Echo Drive to the Rideau River) – 17 blocks, 1,800m

Lees Avenue (Main Street to Chestnut Street) – 4 blocks, 90m

Rideau River Drive (Main Street to 130m south of Main Street) – 1 block, 450m

Full depth reconstruction of Main Street

Concurrent rehab of McIlraith Bbridge



Various Street Sectors

* Canal , North, Lees, Central, Residential, Riverdale, River
* Designs to match the varied context
* Right-of-way is generally 20m
* OP protects 23m (Echo to 417), 20m (417 to Clegg) and 23m (Clegg to bridge)
* 25m exist from Oblate to Clegg
* **However, need to design a complete street that fits in available right-of-way**

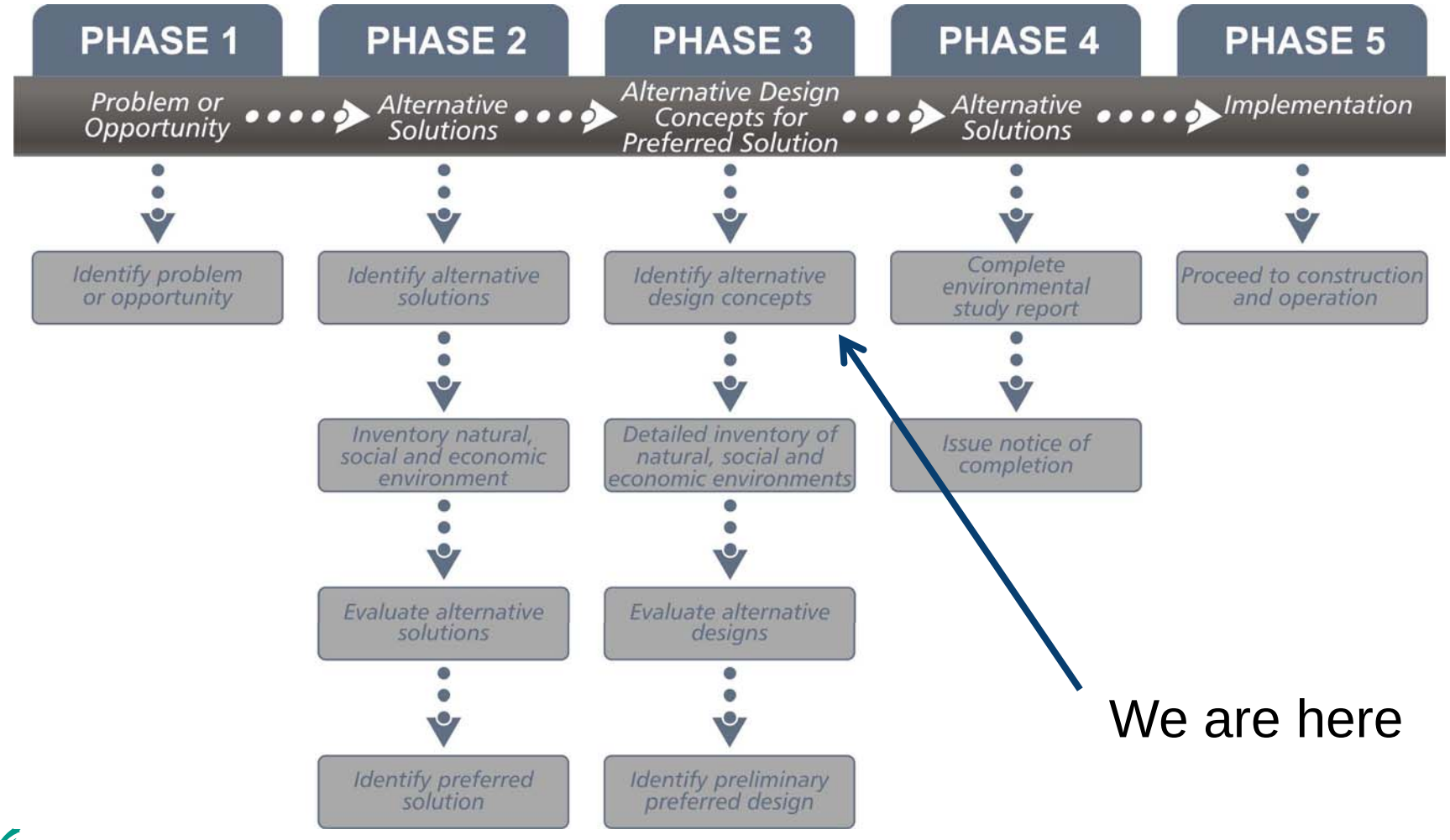
2013 Main Street Renewal

* Pursuit of Official Plan and TMP objectives for a more "complete street"
* Right-of-way is constrained to approximately 20m from Echo Drive to Oblate Drive
* An additional 5m exists between Oblate Drive and Clegg Street – three (3) blocks in the heart of the mainstreet
* Approximately 20m from Clegg Street to Riverdale
* Approximately 21.5m from Riverdale to McIlraith Bridge

Environmental Assessment: Alternative Designs to Evaluate

Environmental Assessment

* Follows a five (5) step process



Five Alternative Designs

* **Alternative 1:** Status Quo (Four narrow vehicle lanes, with off-peak curb-lane parking on both sides)

* **Alternative 2:** Four vehicle lanes, including two wide shared vehicle/cycling lanes, with off-peak curb-lane parking on both sides)

* **Alternative 3:** Four lanes plus bike lanes, with no parking

* **Alternative 4:** Two lanes plus turning lanes and bike lanes, and with full-time parking in bays in locations

* **Alternative 5:** Two lanes plus turning lanes and segregated bike lanes (such as Cycle Track), and with full-time parking in bays in locations

* **Plus some "mixing and matching" along the street**

Alternative Design 5: Cycle Track

* Represents a good starting point for discussion of alternatives for Main Street Renewal

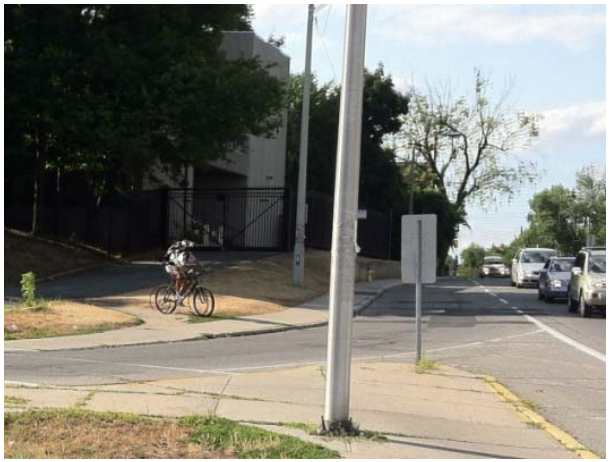
* One lane in each direction plus turn lanes where required … a vehicle lane reduction

* Cycle track provided along Main Street to Link McIlraith Bridge bike lanes to Oblate Drive

What is a Cycle Track?

A **cycle track** is a bicycle path along a city street that is physically separated from the motorized vehicle traffic lanes, but is separate from the sidewalk for pedestrians. It is generally separated from auto traffic by a raised curb, planting strip or on-street parking.

Existing Main Street Conditions



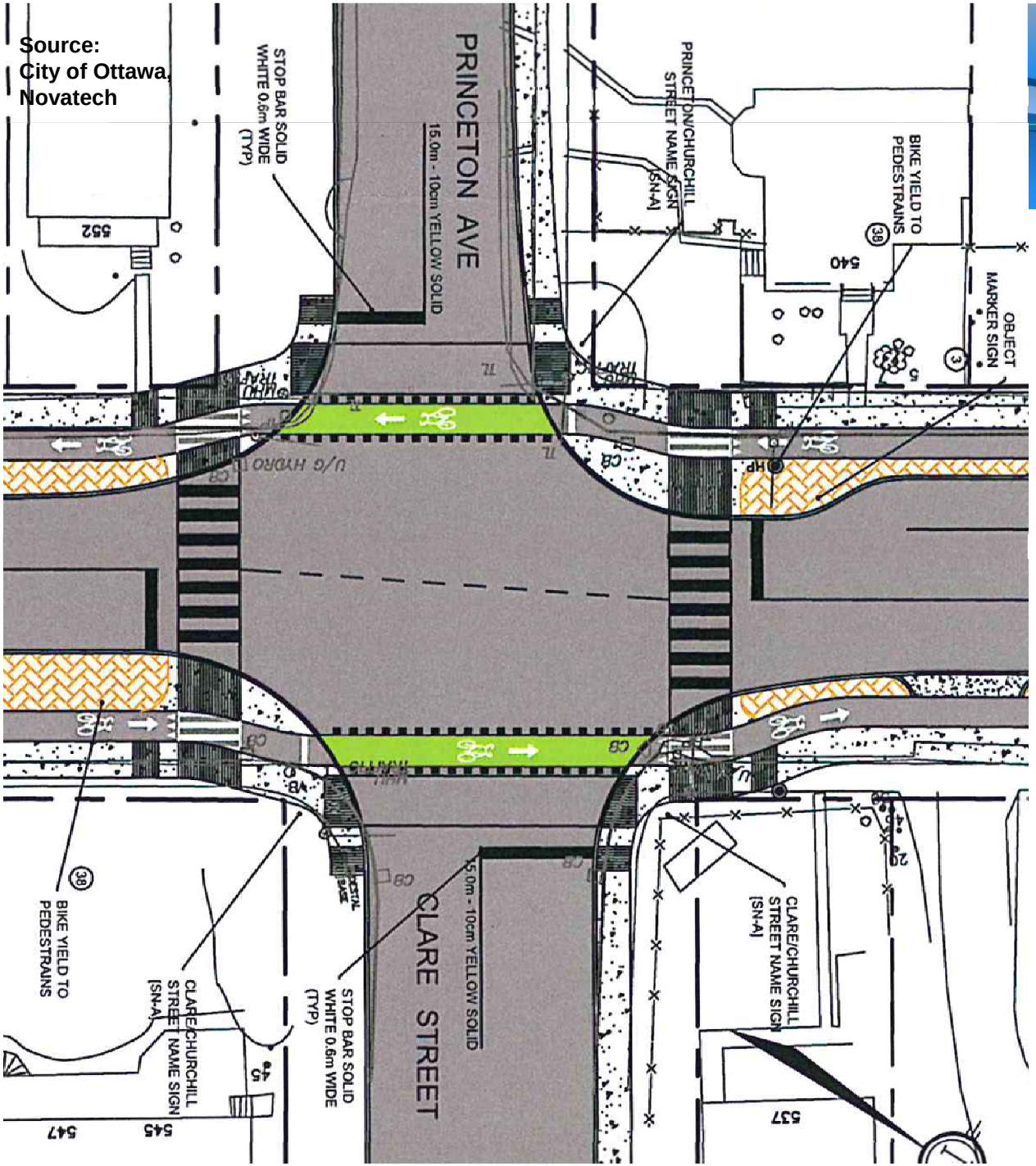
Examples of Cycle Tracks

Examples of Cycle Tracks

Examples of Cycle Tracks

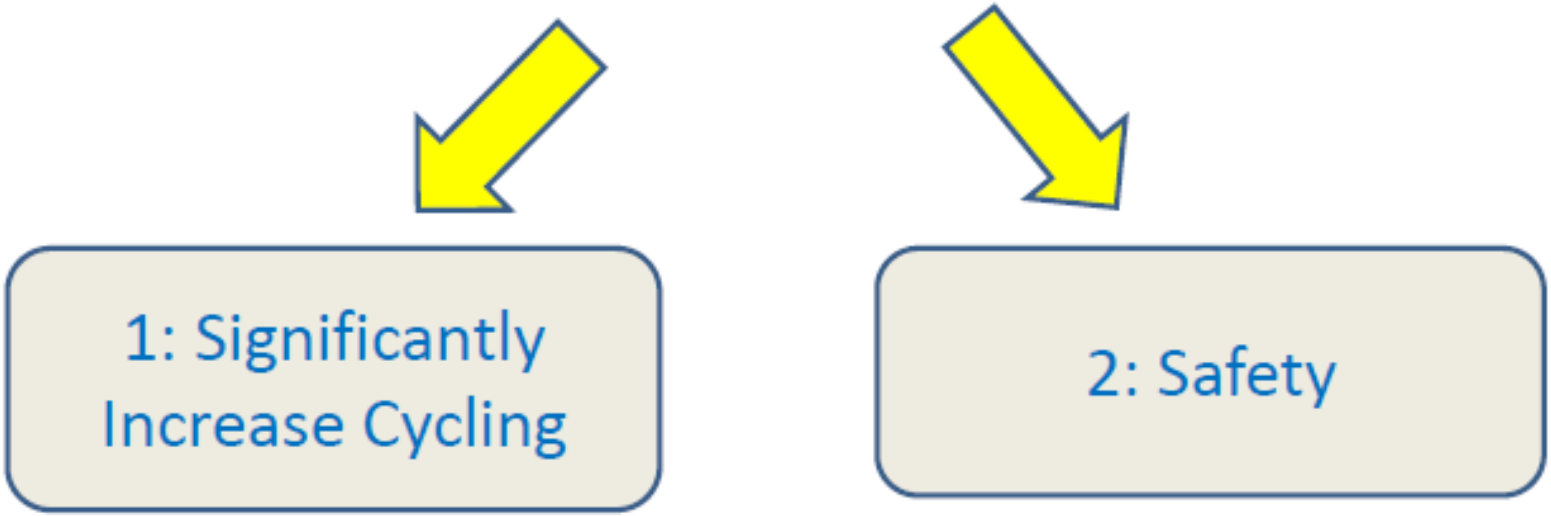
Churchill Avenue
Proposed Cycle Track

Churchill Avenue Cycle Track



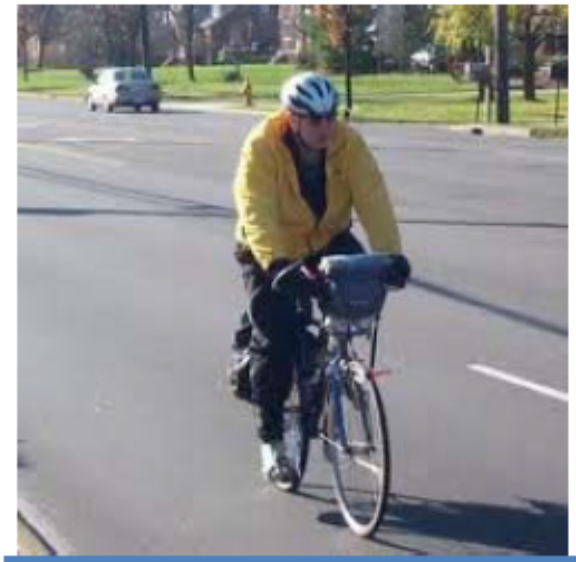
* Cycle lane moves through intersections at grade
* Use of "Elephant's Feet" to demarcate route
* Option to paint the lane for visual priority
* May be suitable for Main Street

Why Cycle Tracks?



Why Cycle Tracks?

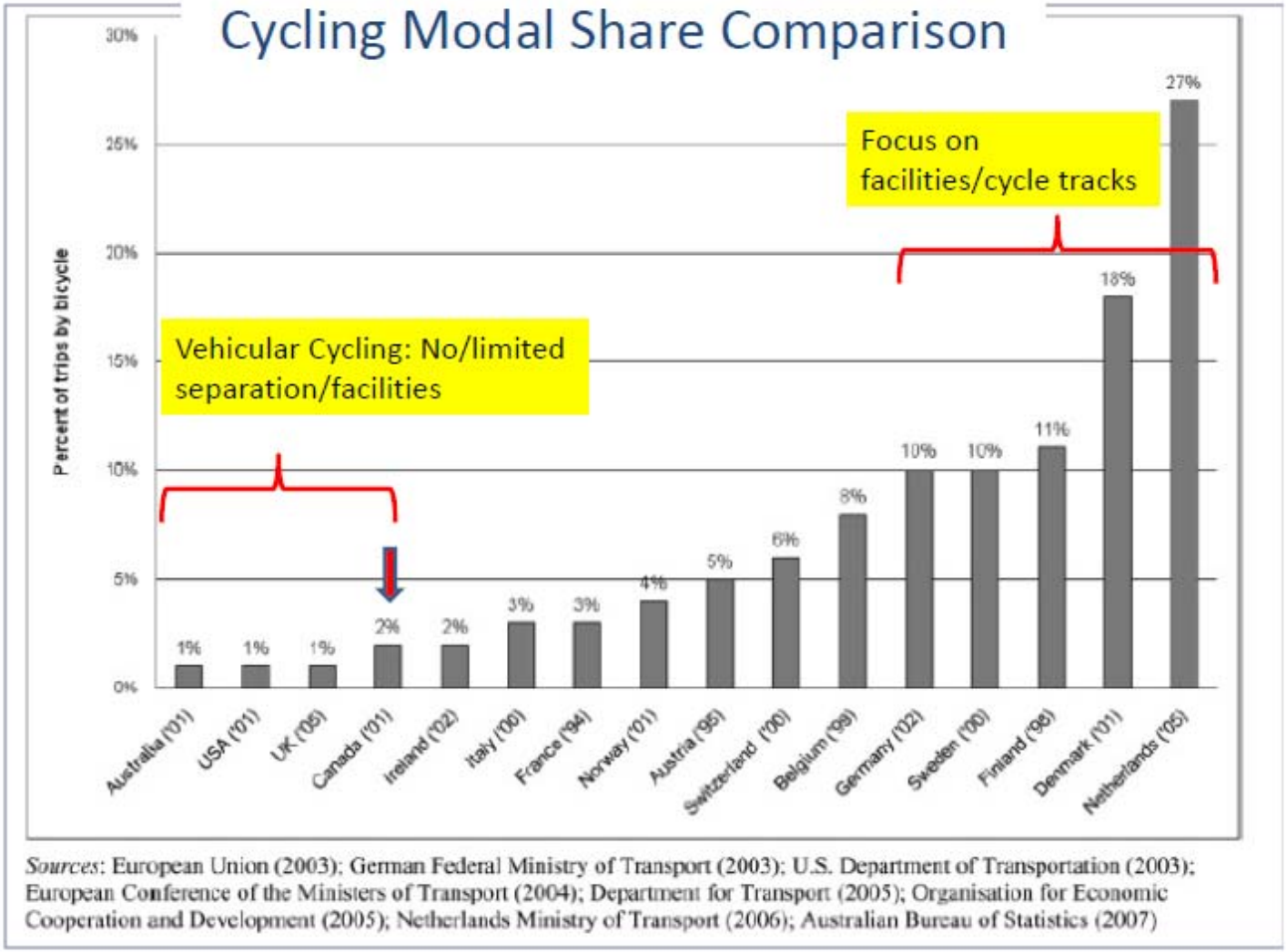
1: Significantly Increase Cycling



1-2 % of population feels comfortable in mixed traffic

50-70 % of population would cycle on segregated facilities

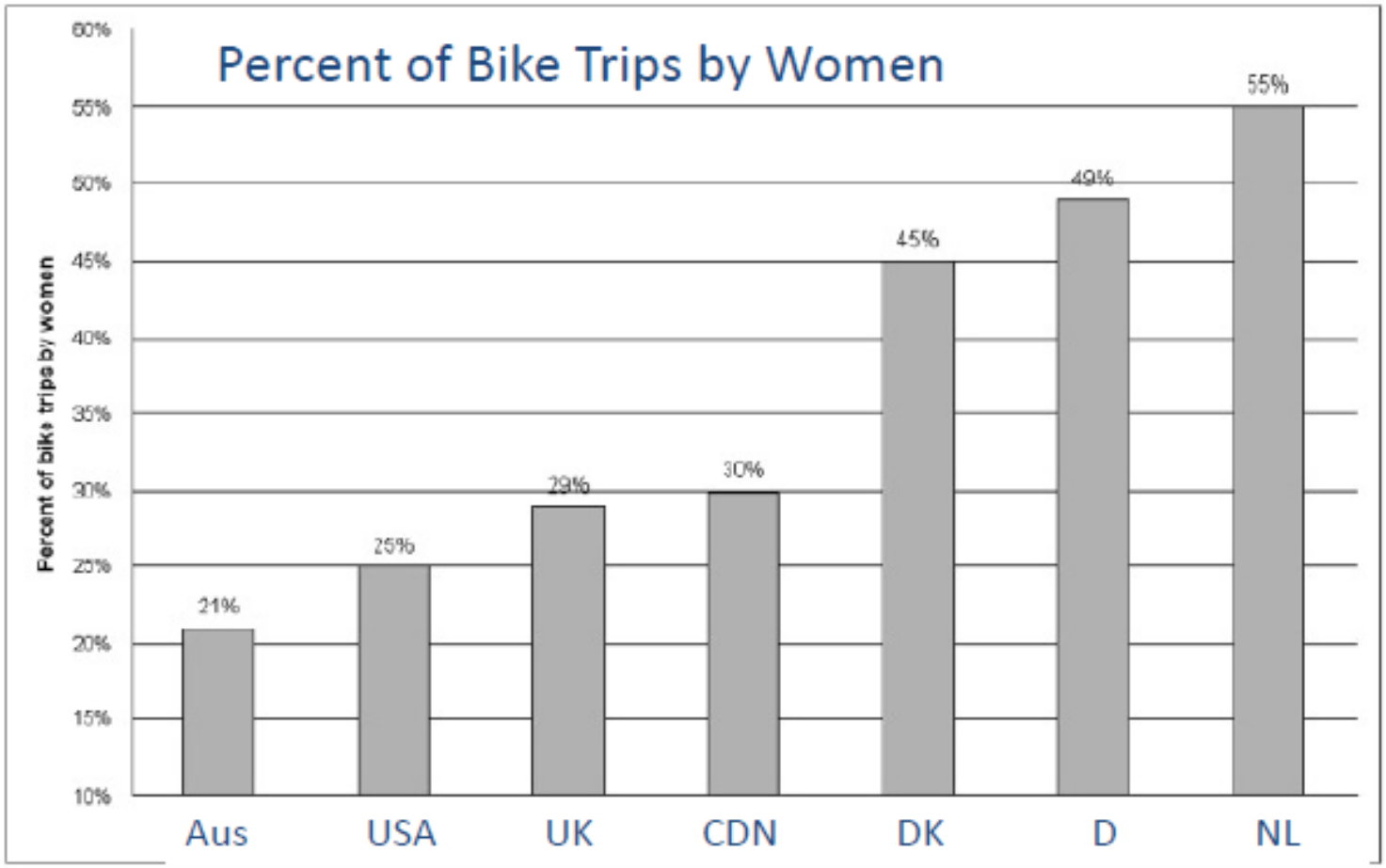
Cycle Modal Share Comparison



Sources: European Union (2003); German Federal Ministry of Transport (2003); U.S. Department of Transportation (2003); European Conference of the Ministers of Transport (2004); Department for Transport (2005); Organisation for Economic Cooperation and Development (2005); Netherlands Ministry of Transport (2006); Australian Bureau of Statistics (2007)

Cycling Comfort and Inclusiveness

Indication of Cycling Comfort

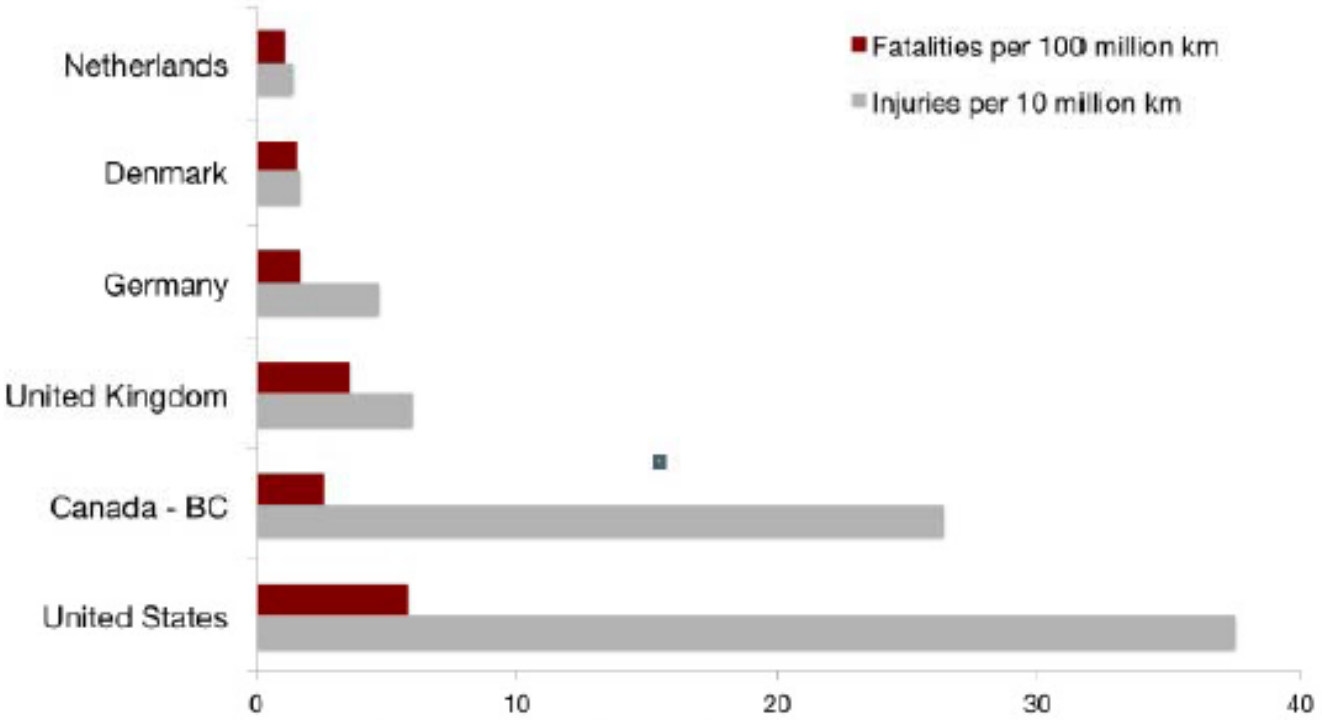


Sources: German Federal Ministry of Transport (2003); U.S. Department of Transportation (2003); Danish Ministry of Transport (2005); Statistics Netherlands (2005); Australian Bureau of Statistics (2007); Department for Transport (2007) and information provided directly by bike planners in Canadian provinces and cities

Pucher, Buechler: Making Cycling Irresistible

Why Cycle Tracks?

2: Cycling Safety



[data sources: International - Pucher & Buehler *Transport Reviews* 2008;28:495-528
BC - Motor Vehicle Branch, 2005 to 2007, TransLink's 2008 Trip Diary Survey, Census 2006]

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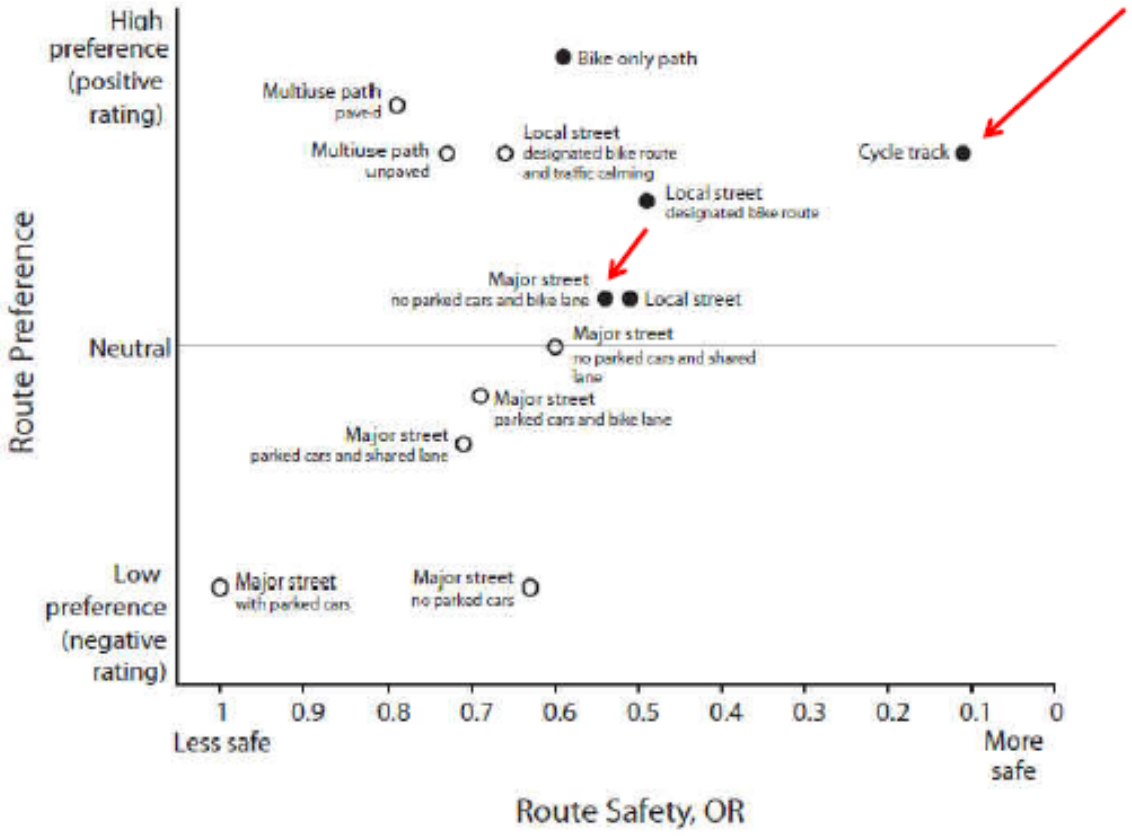
Safety and Route Preference



Source. Route preference data from 2006 Metro Vancouver opinion survey.[24]

Note. OR = odds ratio. Closed circles represent route types with positive preference rating and adjusted injury OR < 0.6 (safest route types). Open circles represent route types with negative or neutral preference rating or adjusted injury OR ≥ 0.6. "Sidewalk or other pedestrian path" was not included because this route type was not queried in the preference survey. ORs for injury risk are plotted in reverse order.

Meghan Winters, Cycling in cities

Ottawa

Cycling Tracks and Safety?

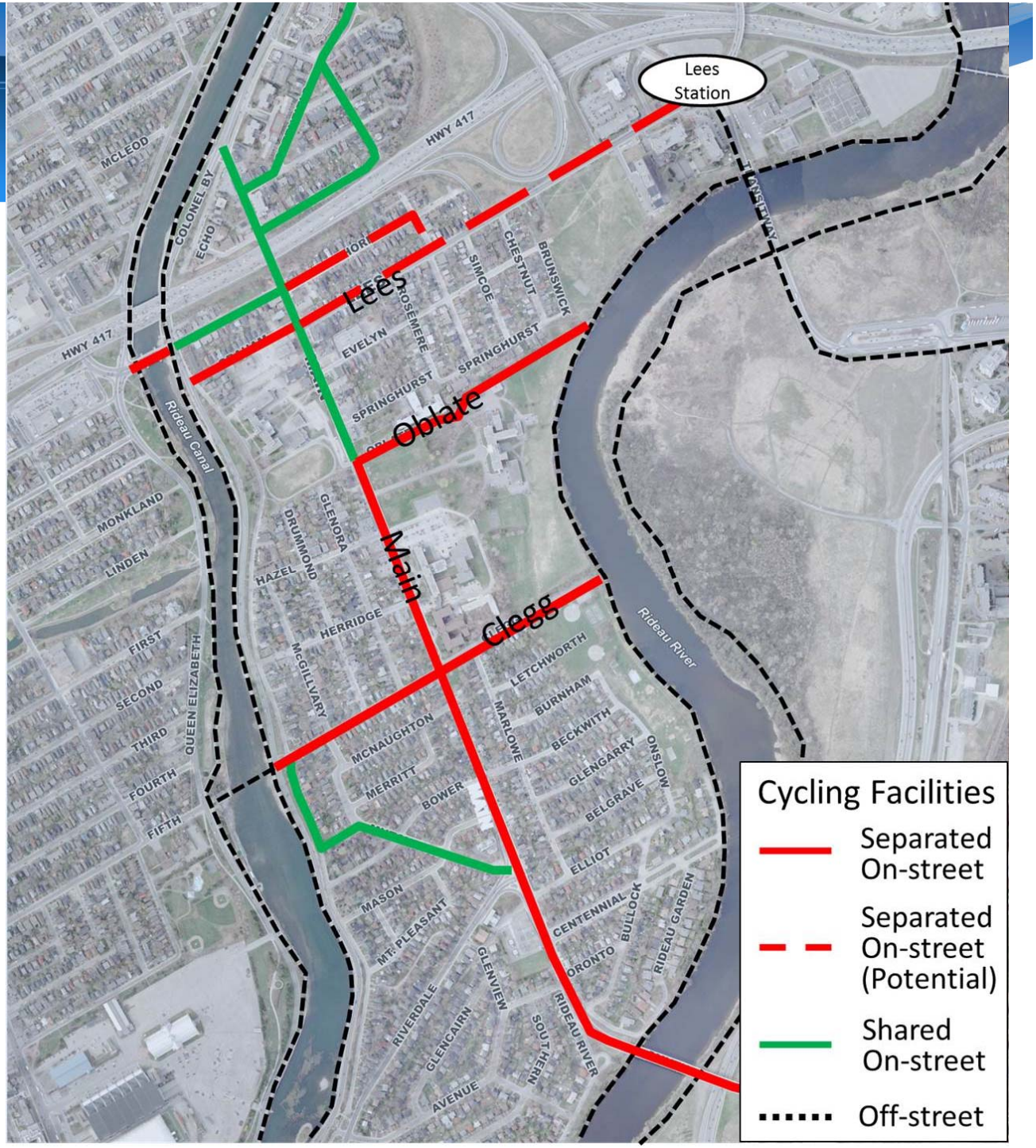
* Very few cycle tracks in North America – poor understanding of the concept and the potentials

* Safety perception: it is safer than on road or painted bicycle lane

* Safety data (limited NA information): less collisions at midblock, importance of design at intersections

Resulting Community Cycling Network

* Similar to Council Approved CDP, 2011



Lane Reduction Context 2000 to 2013

2000 Streetscaping and Transportation Study

* A civic discussion dating back 13 years or more

Main Street
Transportation and Streetscaping Study

3.6 Longer Term Options for Main Street

The measures presented in Table 4 could be implemented if/when additional road capacity is provided elsewhere in the southeast sector of Ottawa that would attract traffic volume away from Main Street.

Table 4: Longer Term Options for Main Street.

No.	Location	Recommended Measure	Cost	Stage
A1	Main street	Physically narrow Main Street from four to three lanes between Riverdale Avenue and Oblate Avenue. *This would allow for wider sidewalks and/or a boulevard, or bicycle lanes, or a protected parking lane on one-side (i.e., bulb-outs). The centre lane would be used for opposing left-turns.* *Analysis indicates a reduction in current volume up to 30% would be required to meet the Region's 0.90 v/c guideline for acceptable intersection performance.*	Unknown at this time.	2

prepared for
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prepared by
DELCAN
1223 Michael Street, Suite 100
Gloucester, Ontario
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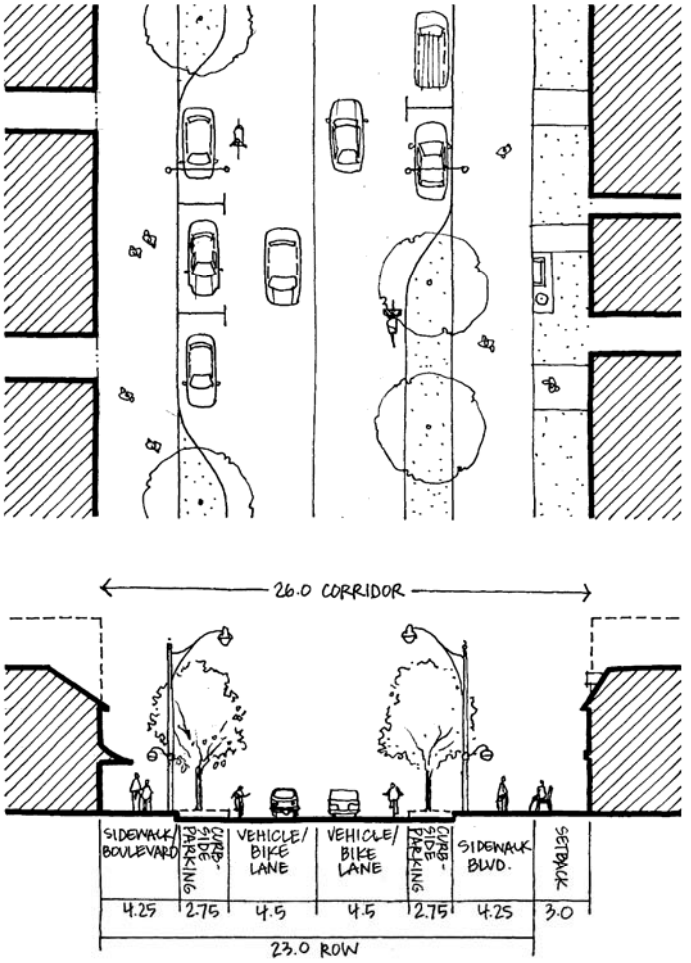
August 2000

Road Corridor Design Guidelines 2000

1. Keep the number and width of travel lanes as few and narrow as possible, while considering safety and capacity requirements, to reduce the amount of asphalt, to reduce the width of cross-walks, and to dedicate as much of the ROW as possible to the road edge.



Deleting vehicle lanes in favour of tree islands, shared cycling lanes, and permanent on-road parking will narrow the roadway and allow for wide, unobstructed sidewalks. This design is appropriate for both urban and village settings.

2011 Community Design Plan

4.11 Transportation and Streetscape Improvements

This map outlines the streetscape improvements that have a traffic function in the study area according to the Main Street Transportation and Streetscape Study (August, 2000). Six refinements to the study recommendations are proposed for further assessment and a seventh item is based on one of the long-term options:

1. widen sidewalks on Main Street,
2. install "bulbouts" at Beckwith Road around the Brantwood Gates,
3. widen sidewalks on Lees Ave.,
4. permit parking in the "non-peak" direction on Main Street during peak hours,
5. install angle parking on Harvey Street just east of Main Street,
6. consider installation of a roundabout at the Main/Riverdale intersection, and
7. consider options for the fourth lane should Main Street be narrowed from 4 to 3 lanes.

2003 Official Plan Policy for Mainstreets

* ***To achieve the vision for Mainstreets . .. Where the City is proposing public works within a Mainstreet's right-of-way, it will consider changes such as the institution of on-street parking, improvements to the pedestrian and cycling environment, streetscape enhancements, lane reductions and measures to enhance transit ridership in the area.*** *(Section 3.6.3.11)*

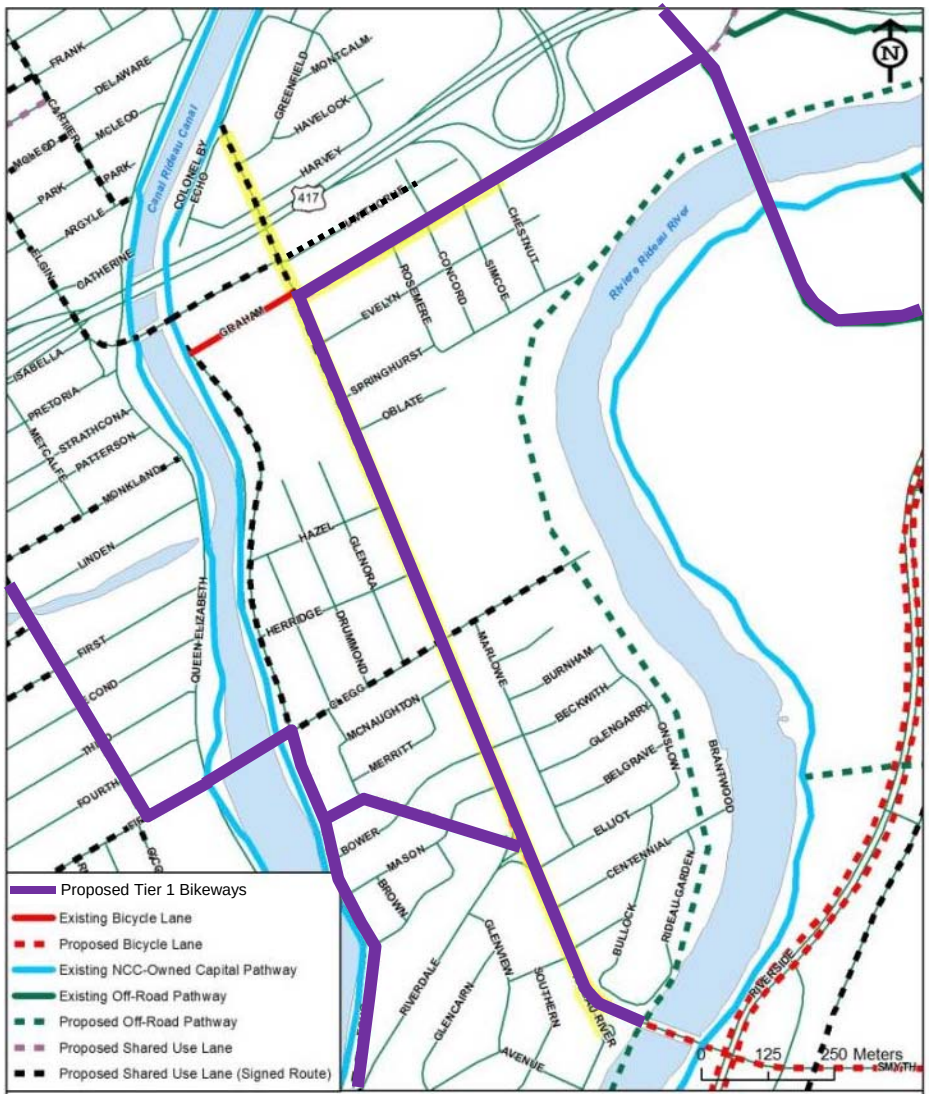
2008 Transportation Master Plan

* **Road Design:** ... The City has developed and will apply design guidelines to ensure that all road corridors **support adjacent land uses, enhance safety, offer supportive environments for walking, cycling, and transit use**, provide adequate lighting and maximize greening opportunities.

(Executive Summary, Page vii)

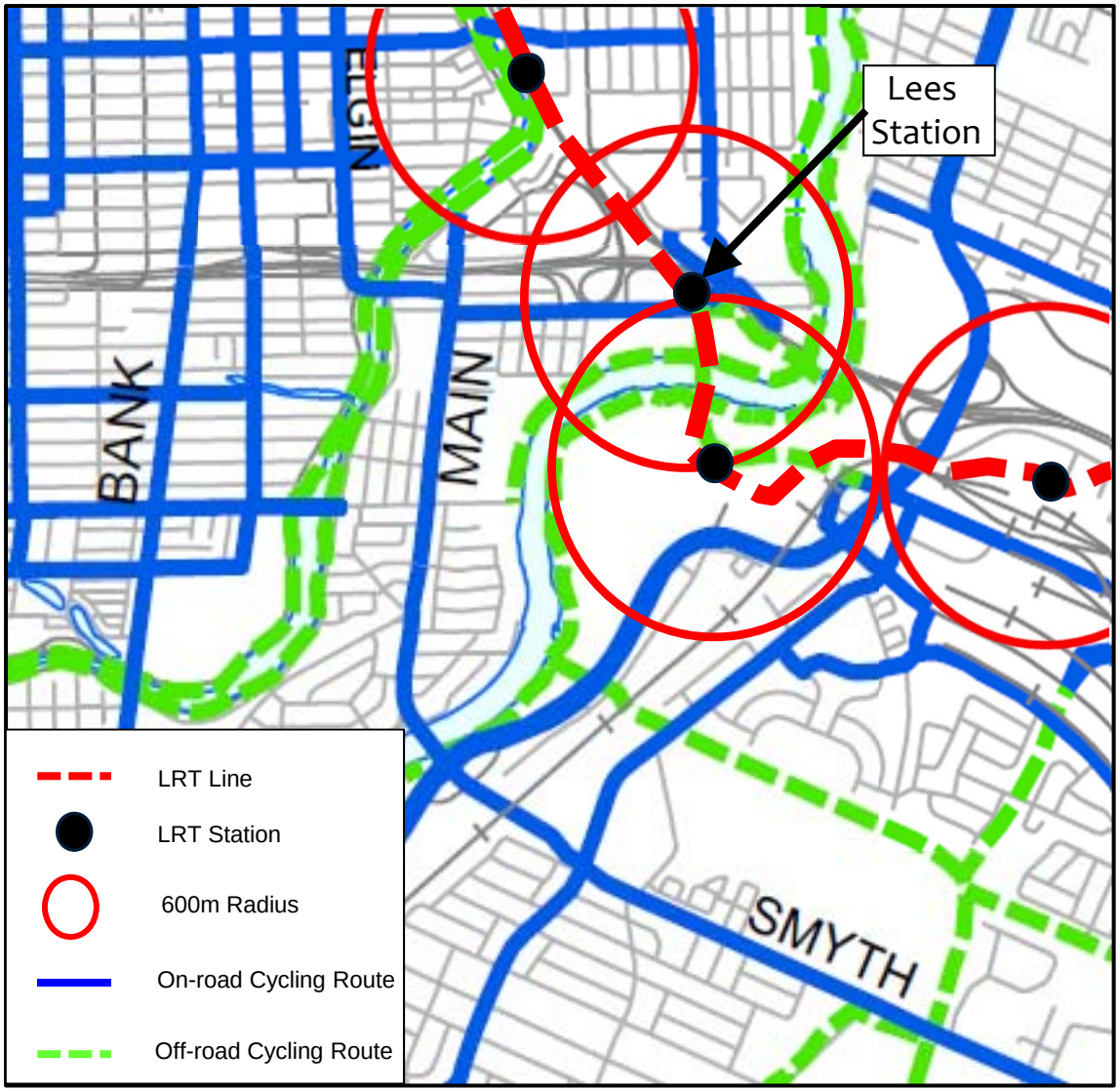
2013 Ottawa Cycling Plan Update

* Major revision underway with expected completion in November 2013
* Proposed '**Tier 1**' bikeways (in purple) as part of the Cycling Plan update
* Identifies intended routes for high-quality bicycle facilities
* Main South of Lees, Lees, and Mutchmor to be Tier 1



Confederation Line

* Opportunities for cycling connections to Lees LRT station



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Rideau Canal Crossing

* Multi-use (pedestrian and cycling) linkage over the Rideau Canal
* To connect Fifth Avenue in the Glebe with Clegg Street
* Also planned Rideau River West Pathway

Preliminary Recommended Concept (Sept 2012)

Opportunity is Now

* Complete road reconstructions come only once in a generation so what is built now will not be changed for many years

* The general population will not be encouraged to use bicycles for transportation along the corridor without bike lanes that look and feel comfortable to use

* Potential is real for Old Ottawa East to become a model of a cycling-friendly community

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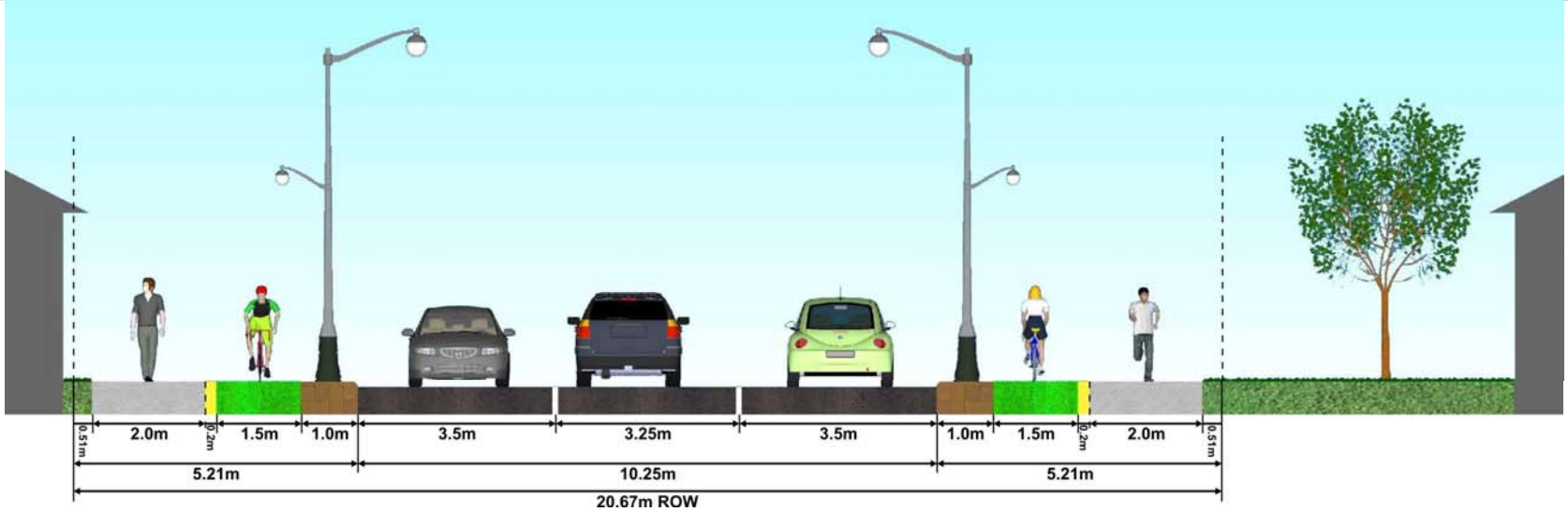
Two + Turn Lanes and Cycle Track Can Fit



* Would fulfill many objectives
* On-street parking can be accommodated at some mid-block locations
* Some opportunities for streetscaping
* Means a reduction in capacity, particularly peak hour capacity

Preliminary Concept Review

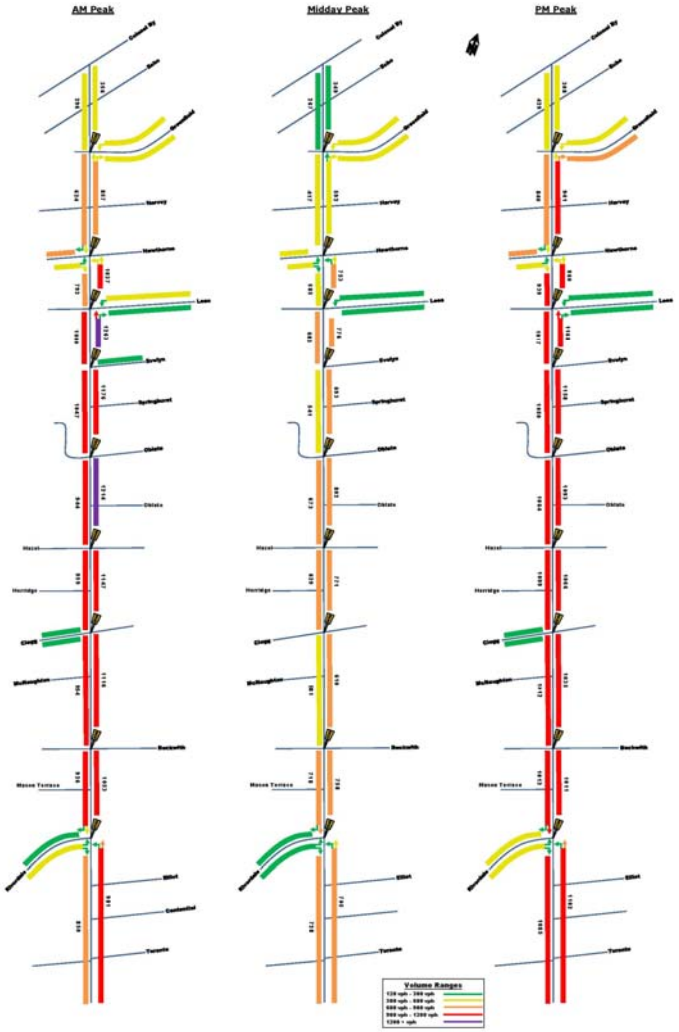
Vehicle Traffic Considerations

Existing Vehicle Capacity

* Main Street has a four lane cross-section from Hwy 417 to the McIlraith Bridge (just three lanes north of 417)
  - Through most intersections, there are two through lanes (shared through-right and through-left) in each direction
    - Auxiliary turn lanes exist at Greenfield (one of three lanes) and at Riverdale (northbound left and southbound right)
  - Mid-block, between 417 and Mason Terrace, on-street parking is permitted during the off-peak periods, and hence the road supplies just one clear lane in each direction

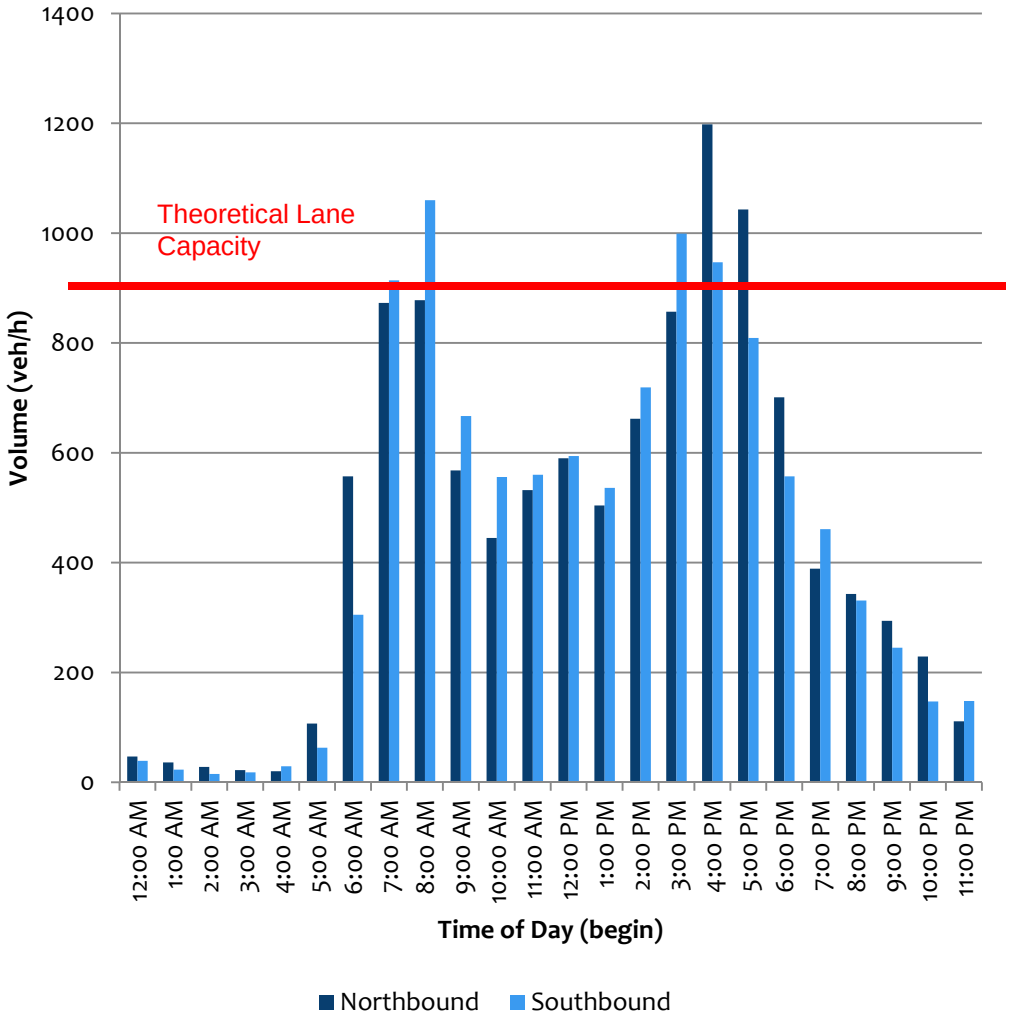
Existing Traffic Volumes

* Weekday commuter peak hour volumes range between 900 and 1,200 veh/h
* Midday volumes are in the order of 600 to 800 veh/h
* Volumes are relatively balanced by direction (i.e., no predominant direction of travel in either peak)
* Heavier turning movements include:
  - Riverdale, Lees, Hawthorne, Greenfield



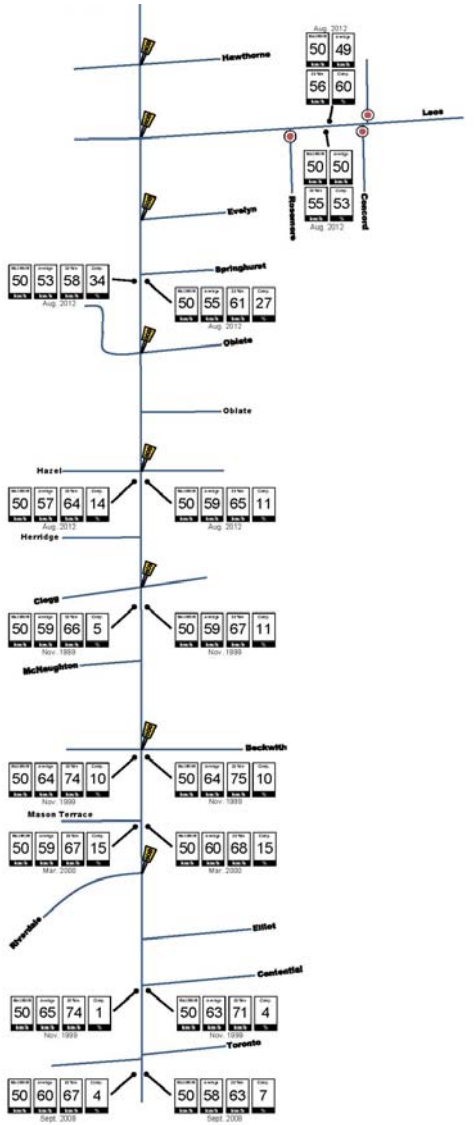
Existing Traffic Volumes (con't)

* Temporal breakdown of volume at Clegg (Fall 2012)
  - Morning Peak Period:
    - SB: 915 to 1060 veh/h
    - NB: 870 veh/h
  - Afternoon Peak Period:
    - SB: 810 to 1,000
    - NB: 860 to 1,200
  - Theoretical Capacity:
    - 900 veh/h per lane



Existing Vehicle Speeds

* Posted speed limit 50 km/h
* History and concern regarding speeding:
  - Particularly evident south of Beckwith with several blocks exhibiting 85th percentile speeds in excess of 70 km/h



Existing Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Main/Greenfield	D(E)	0.87(0.99)	WBL(WBL)	17.4(24.0)	B(C)	0.69(0.80)
Main/Hawthorne	D(D)	0.87(0.85)	EBT(EBT)	25.6(34.1)	B(B)	0.69(0.69)
Main/Graham/Lees	E(C)	0.91(0.76)	WBL(WBL)	19.3(19.2)	B(A)	0.61(0.58)
Main/Evelyn	A(A)	0.51(0.42)	NBT(NBT)	10.6(3.5)	A(A)	0.50(0.41)
Main/Oblate	A(A)	0.53(0.49)	NBT(SBT)	6.0(3.9)	A(A)	0.45(0.46)
Main/Hazel	A(A)	0.48(0.44)	NBT(SBT)	5.8(5.2)	A(A)	0.45(0.43)
Main/Clegg	A(A)	0.60(0.54)	EBT(NBT)	8.9(8.7)	A(A)	0.51(0.52)
Main/Beckwith (signal)	A(A)	0.35(0.34)	NBT(SBT)	2.4(2.2)	A(A)	0.35(0.34)
Main/Beckwith (stop)	D(E)	33.0(38.6)	WBL(WBL)	0.6(0.6)	A(A)	-
Main/Riverdale	C(D)	0.74(0.83)	EBL(NBL)	13.2(18.2)	A(C)	0.56(0.72)

Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.

* All intersections currently operating at LoS C or better
* Some movements operating at capacity

Analysis

* Intersection capacity analyses were performed to assess the implications of possible lane reductions on Main Street:
  - Assuming existing traffic volumes:
    - four lanes are required in the section of Main Street somewhere north of Oblate Avenue (as existing)
    - two lanes (plus auxiliary turn lanes) may be feasible in the southern area of the Main Street Corridor
    - acceptable intersection LoS, however, the potential for **queue spill back** into adjacent intersections identified as an issue
    - approaching Riverdale, two southbound through lanes needed

Analysis (con't)

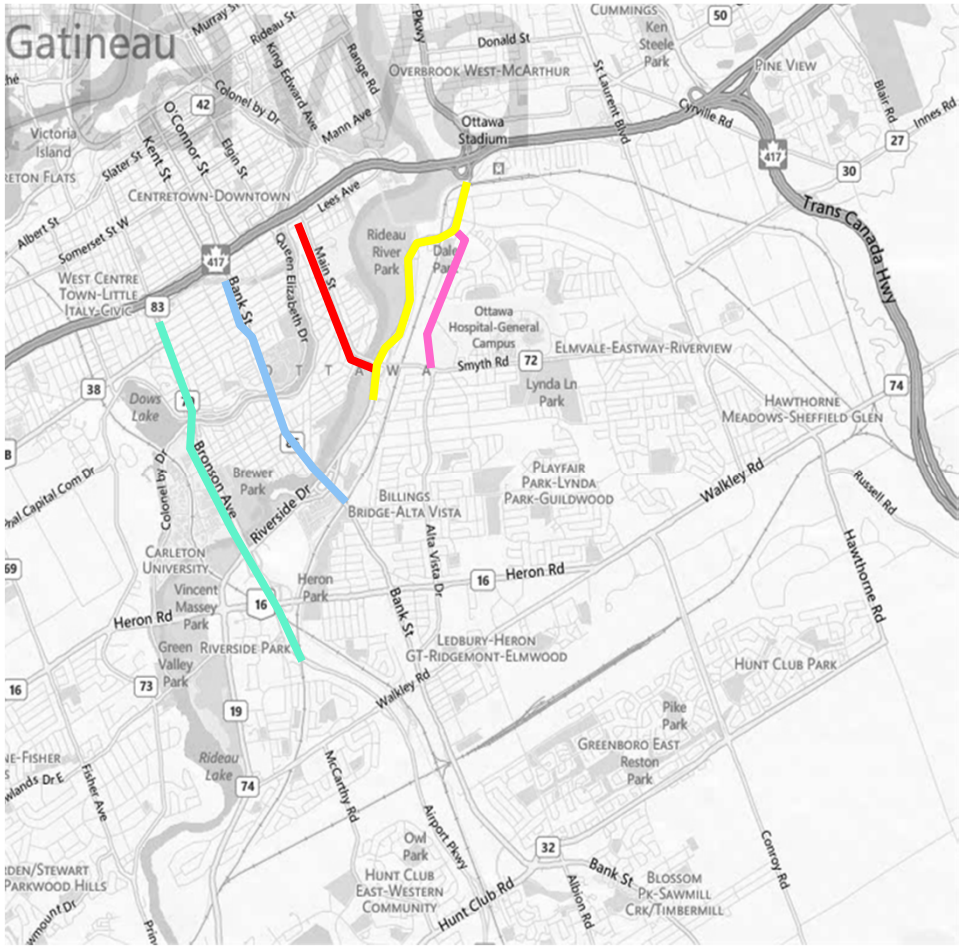
- Peak hour volume reductions of up to 25% (300 veh/h) within the Corridor would be needed to mitigate the queue spill-back issue:
  A. travel to alternative routes

     (i.e., Riverside, Alta Vista, etc.: minimal residual capacity)
  B. travel on alternative modes (i.e., transit, bike, walk: < 7% today)
  C. travel outside of the peak hour (i.e., peak spreading)

Approach A - Alternative Routes

- Peak hour volume reductions on Main St of 300 veh/h (peak direction)

Alternative Route	Assessment	Likelihood for Traffic to Divert
Bronson Avenue	Access at south limited to Hunt Club and Heron Road; 4-lane cross-section (2 travel lanes per direction); longer distance from Main Street	Low
Bank Street	Alternative to Alta Vista-Smyth Route; 4-lane cross-section (2 travel lanes per direction), with on-street parking considerations during off-peaks through Old Ottawa South and the Glebe	Low
Riverside Drive	Considered a back-tracking route if heading west on H417; minimal delays until Industrial Drive (which is a bottleneck)	High
Alta Vista Drive	Alternative to Riverside Drive (but lower speed limit 50 km/h); 2-lane cross section (1 travel lane per direction); no traffic control until near Industrial (which is a bottleneck)	Medium

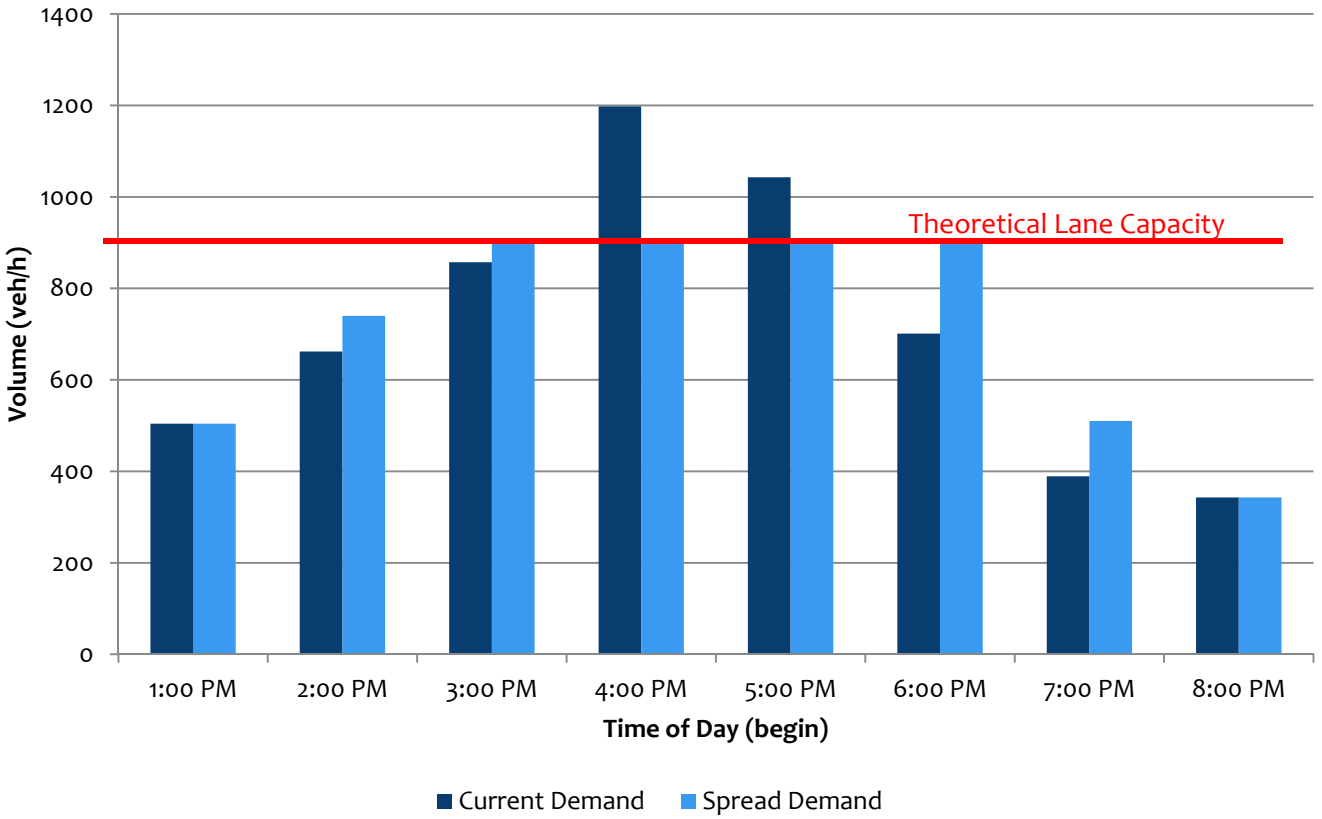


Approach B – Alternative Modes

- Peak hour volume reductions on Main St of 300 veh/h (peak direction)
  - currently in the AM peak hour, there are 1530 persons northbound crossing the McIlraith Bridge:
    - 1,175 drivers (77%) + 225 passengers (15%) + 60 cyclists (<4%) + 10 pedestrians (<1%) + 60 transit riders (<4%)
    - auto occupancy of 1.2 ppv
  - to achieve the required 300 veh/h reduction, a theoretical shift in modal share would be needed as follows:
    - 875 drivers (57%) combined with …
    - 525 passengers (34%) OR (1.6 ppv)
    - 360 cyclists (24%) OR
    - 310 pedestrians (20%) OR
    - 360 transit riders (24%).
  - none of the above shifts, in isolation, are considered achievable, but perhaps in combination:
    - 875 drivers (57%) + 265 passengers (17%) + 130 cyclists (<8%) + 60 pedestrians (<4%) + 200 transit riders (<13%)
    - auto occupancy 1.3 ppv

Approach C – Peak Spreading

- Peak hour volume reductions on Main St of 300 veh/h (peak direction)
  - spread any excess demand (beyond theoretical capacity) onto shoulder hours:



Analysis (con't)

- According to TRANS model projections, two way-volumes on Main Street are expected to decline by approximately 300 veh/h at 2031:
  - increased transit modal share across the Rideau River Central/Queensway Screenline
  - reassignment of some traffic to AVTC

Analysis (con't)

- The proposed development of the Oblate/University/Sister Lands is expected to generate between 200 and 400 veh/h
  - assumes an aggressive non-auto modal share for the site
  - the majority of this site traffic (2/3) expected to/from the north (making use of the 4-lane section)

Other Traffic Considerations

* Other notable traffic operational issues to consider should lane reductions on Main Street be pursued:
  - Auxiliary left-turn lanes … would be warranted at almost all intersections
  - Transit performance … may be comprised with increased congestion
  - Mid-block activity … stopped vehicles will impose greater delays to upstream traffic (i.e., buses at stop, waiting to make turns into private driveways, curb-side drop off, service vehicles, etc.)
  - Pedestrians … the envisioned increase in pedestrian activity is likely to take away available green time at signalized intersections that is currently serving north-south travel

Other Traffic Considerations (con't)

- Safety … the existing data indicates no particular collision trends, however the reduced number of lanes may influence safety to some degree (trade-off between reduced speed versus higher traffic density)
- Community infiltration … some drivers may elect to divert to the local road network if Main Street becomes congested, including for example Marlowe Crescent to the east
- Emergency vehicle response times … time is an important consideration given Main Street provides a direct connection to the General Campus and CHEO
- Trucks … Main Street is designated truck route
- EDR … Main Street is a designated emergency detour route for Highway 417

Discussion