

Rideau Canal Corridor Pedestrian Crossing Study

**Queen Elizabeth Dr.: Preston St. to Laurier Ave.
&
Colonel By Drive: Hog's Back to Daly Ave.**

Background:

- Canal parkways evolved over past 100 years
- Today - heavily used corridors resulting from south Ottawa traffic
- Increasing demand for Capital Pathway System & Canal Skateway
- Valuable part of the “Capital Experience” with significant scenic entries to the Capital core (Rideau Canal World Heritage Site)

Background:

- Most access points to the pathways and skateway cross either Queen Elizabeth Drive or Colonel By Drive
- The public has often expressed concerns regarding the level of comfort for pedestrians crossing Queen Elizabeth Drive and Colonel By Drive.

Goal of Study:

- To identify key crossing points along Queen Elizabeth Drive and Colonel By Drive and to develop solutions to enhance the level of comfort for crossing pedestrians

Objectives of Study (Stantec's mandate):

- Identify potential problem crossing areas that warrant further study and select locations to be studied based on priorities and budgetary constraints
- Collect and analyze data pertaining to crossings to be studied
- Provide options on potential parkway corridor interventions
- Evaluate options and draw conclusions 
- Prepare study report.

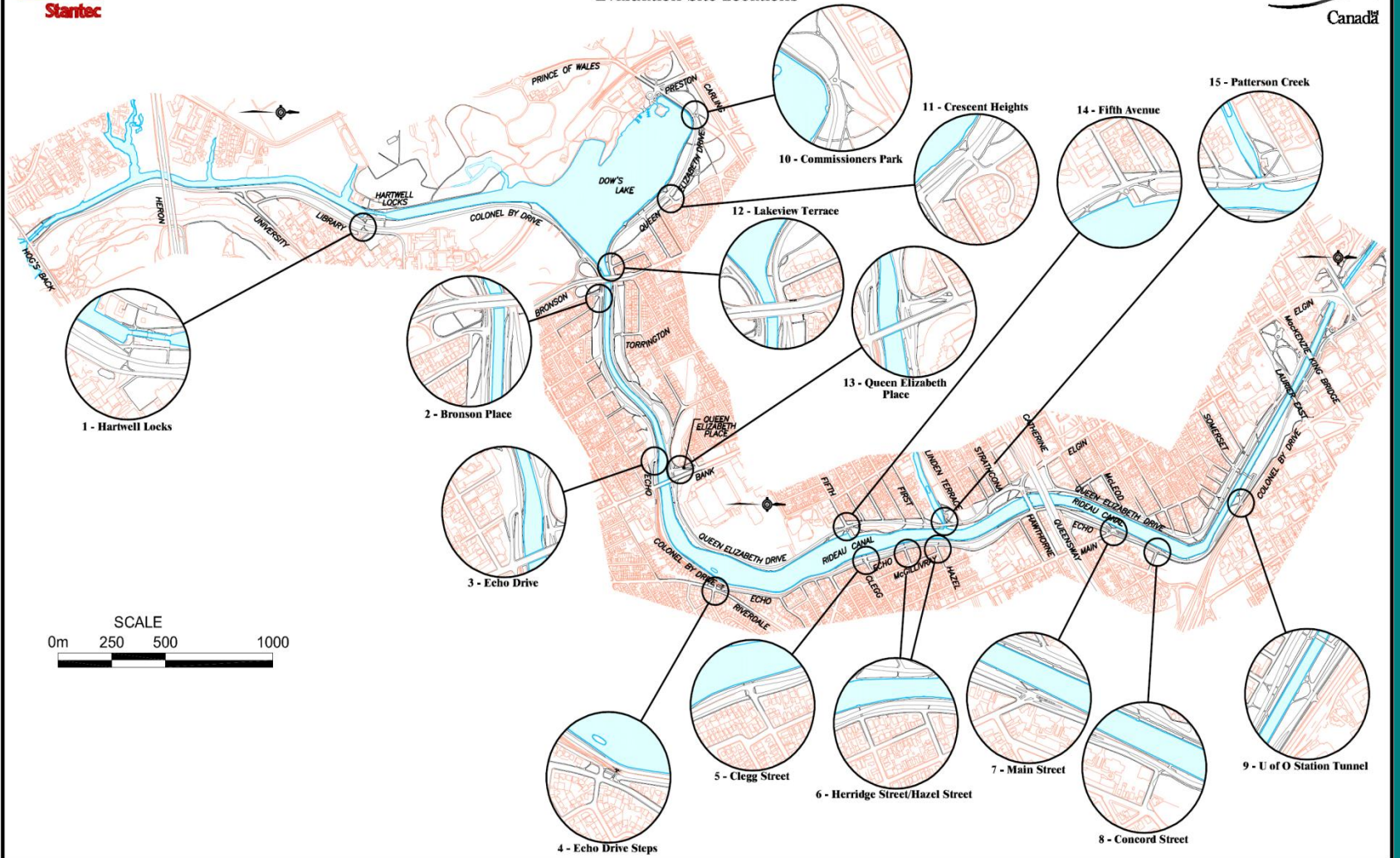
Determination of Crossing Locations:

Through workshop representation at Workshop No 1 (June 11, 2008) which was represented by numerous Community Associations and interest groups, and utilizing NCC staff experience the top priority locations were selected which included:

- 9 locations along Colonel By Drive
- 6 locations along Queen Elizabeth Drive

- 8 crossing locations were at intersections
- 7 crossing locations were mid block

RIDEAU CANAL CORRIDOR - PEDESTRIAN CROSSING STUDY: **QUEEN ELIZABETH DRIVE AND COLONEL BY DRIVE** Evaluation Site Locations



Evaluation Site Locations

Data Collection:

- Location specific data collection needs were identified.
- The sites identified were then categorized seasonally with respect to relative usage or when to best collect data for analysis.
- Data collection was undertaken during summer/ Fall seasons with a small portion collected in the winter season
- Study does not address the special event periods such as Tulip Festival, Winterlude weekends, Canada Day, etc.

Data Collection:

Included:

- Site Visits and photos
- Existing City Turning movement counts (incl. peds & bicycles)
- New Turning movement counts
- Multiple day Vehicle counts (tubes)
- Pedestrian delay/crossing counts
- Speed Surveys
- 3 yr. Collision Histories available full length of QED & Col By.

Analysis & Evaluation of Data

Un-signalized Intersection Capacity Analysis was undertaken for a number of the intersections as:

- 2-Way stop control
 - All-Way stop control
 - Single lane roundabout.
- 2 intersections were analyzed for pedestrian (half) signals.
 - Most locations were checked for Pedestrian Signals Warrants based on City criteria. Warrants were met at 4 locations.
 - All-Way stop intersection warrants were also checked at a number of locations. No location met warrants for All-Way stop control.

General Comments:

- Colonel By Drive is utilized more heavily as a commuter route during peak hours than Queen Elizabeth Drive and typically has:
 - Double the traffic volume during peak hours
 - Higher 85 percentile speeds (average 8 km/hr)
- Consideration of Pedestrian **Rideau Canal** crossing bridge is not in the mandate of this study
- Aerial photos (NCC & Ottawa emap) utilized for sight distances and dimensions.
- Future consideration for provision of pedestrian stairway(s) interconnecting Bank St. bridge with canal pathway – not in current mandate.

Measures Considered - Physical :

- **Road Narrowing & Intersection Narrowing:**

Limited opportunities

- **Refuge Islands:**



A number of opportunities to provide this option.
(Not a crosswalk.)

- **Grade Separation:**

Considered where Ped Signal warrants are met.

Measures Considered - Traffic Control :

- **All Way Stop Control:**
- **Pedestrian Signals (Half Signals):**

Unsuitable (capacity and warrants).

Considered where Ped Signal warrants are met.

Measures Considered - Traffic Control:

- **Roundabouts:** Considered at intersection locations with sufficient property availability.

Measures Considered - Other :

- Alter pedestrian walkways/ access
- Improved (year round) maintenance of existing pedestrian walkways/ stairs etc.
- Landscape enhancement/ reduction
- Relocate other NCC Facilities: Winter Canal access steps, pathways etc.

- Signage:



Pedestrian Ahead WC-7 : advisory sign.

Evaluation of Options:

Evaluation committee was established.

- Representing disciplines of: Transportation, Property Management, Parkways and Urban Planning and Landscape Architecture

Utilizing the “**Pairwise Comparison**” approach: two stages of evaluation were undertaken:

Stage 1:

A set of evaluation criteria to compare options for each site was identified by the consultant.

These evaluation criteria were then exposed to a “Pairwise Comparison” to establish the “relative importance” of the identified criteria (in percentage).

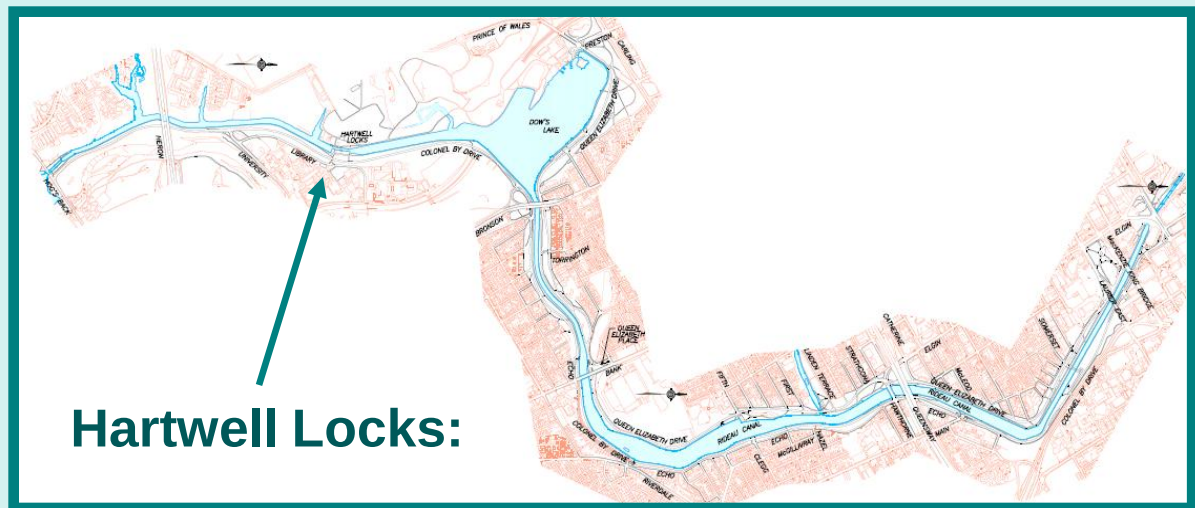
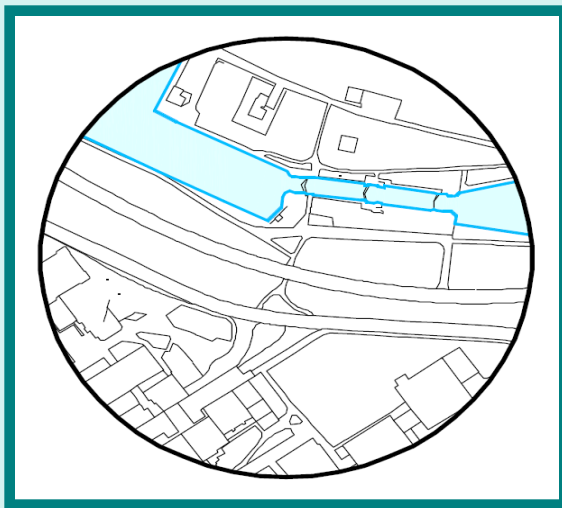
Table below identifies the relative importance criteria established and the results of the relative importance comparison of these criteria.

Stage 1: Relative Importance of Evaluation Criteria

Evaluation Criteria	Sub-Factors	Percentage
Safety	• safe pedestrian, vehicle & cycle environment • sight distance • vehicle speeds	30 %
Environment	• natural environment • air quality • noise quality	13 %
Aesthetics & Heritage	• views and vistas • aesthetics • heritage	26 %
Social	• cut through traffic • pedestrian crossing opportunities (comfort & security)	11 %
Operations	• vehicular, pedestrian and cycle movements	7 %
Cost	• capital and maintenance costs	13 %

Stage 2: Comparison of Options:

- Identified options - each location - were compared against each other, once again, utilizing pairwise comparison techniques and then multiplied by the established relative importance of the criteria to establish a weighted score for each of the options.
- Undertaken individually by each of the participants then compared upon completion with prioritization established.
- This provided a ranking of the options against one another for each location.
- Each site location was evaluated independently of the others.



Hartwell Locks:

Concerns Identified at Workshop:

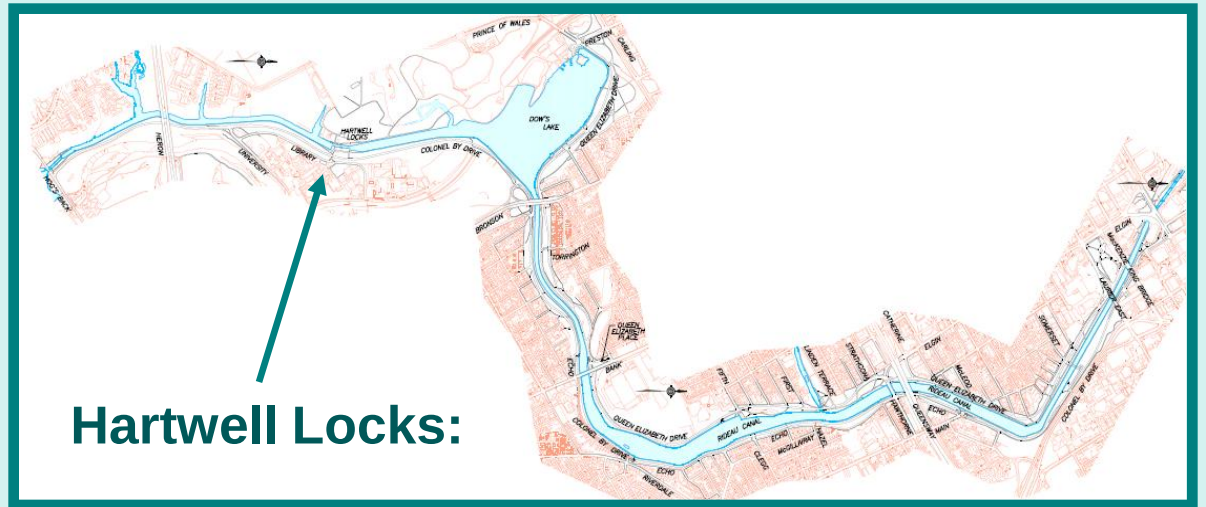
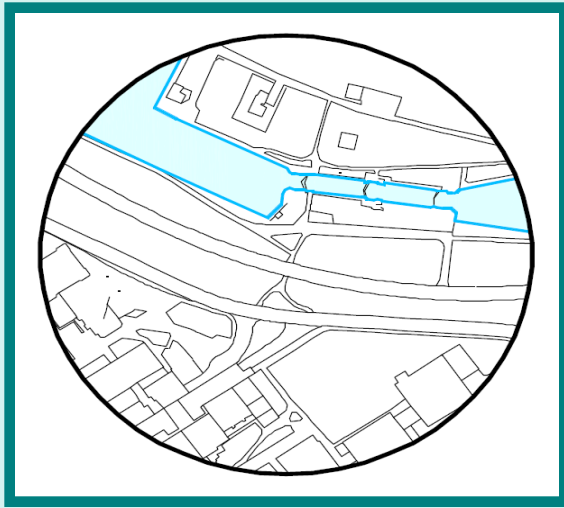
- Major Pedestrian/cyclist crossing from Carleton U. to Experimental Farm
- Crossing Sight Distance

Data Collection and Analysis:

- Mid block crossing
- Pedestrian Delay Survey: Percentile Ped Signals warranted: **185%**
- 85% Percentile speed: **72 km/hr.**
- Pedestrian Collisions **1** Ped
(midblock) **1** Bicycle
- Sight distance: **Fair**

Opportunities for Improvement:

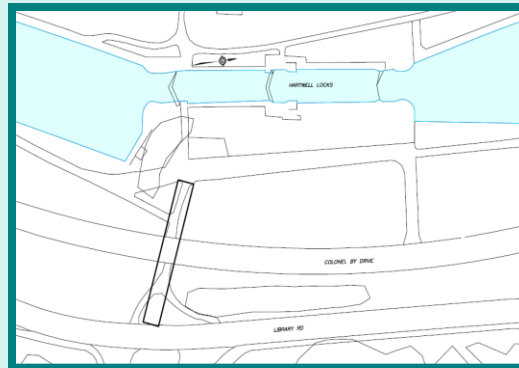
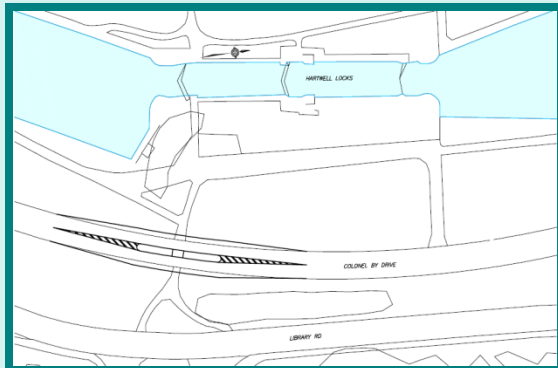
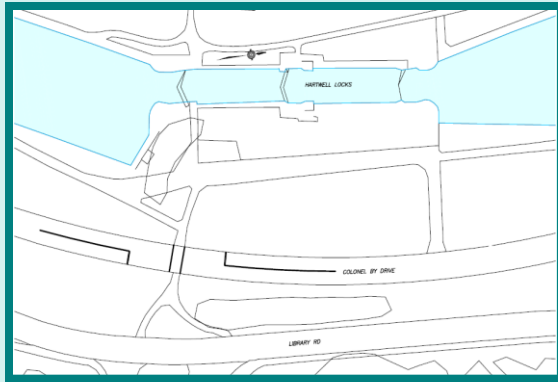
- | | |
|------------------------|-----------------------|
| • Redirect Pedestrians | No |
| • Road Narrowing | No |
| • Refuge Median | Yes |
| • Signalized Crossing | Yes |
| • Grade Separation | Yes (Warrants) |
| • Signage | Yes |

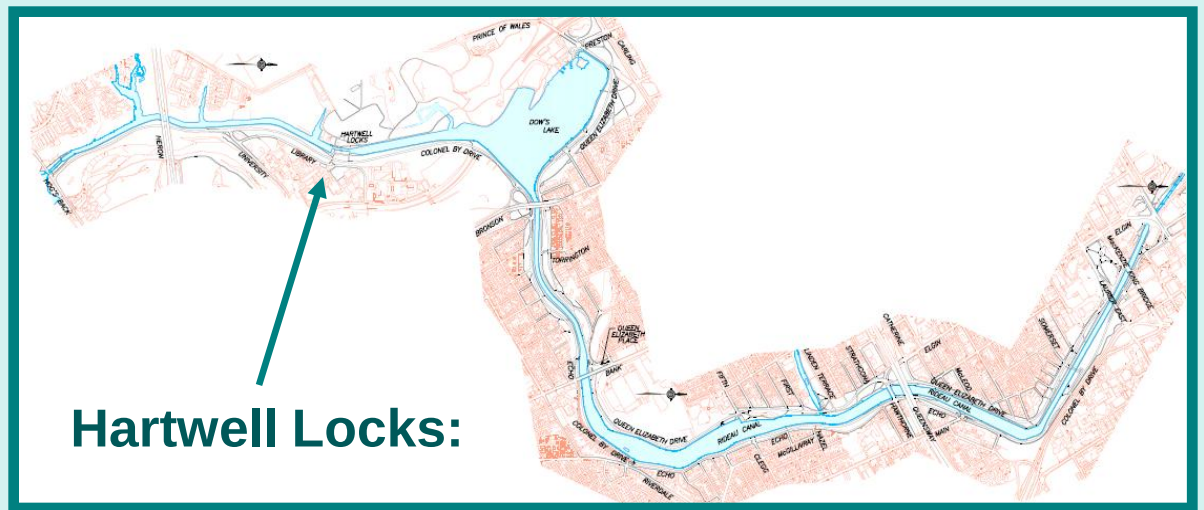


Hartwell Locks:

Options:

- 1: Do Nothing
- 2: Signalized Ped Crossing
- 3: Pedestrian Refuge Island
- 4: Crossing Grade Separation





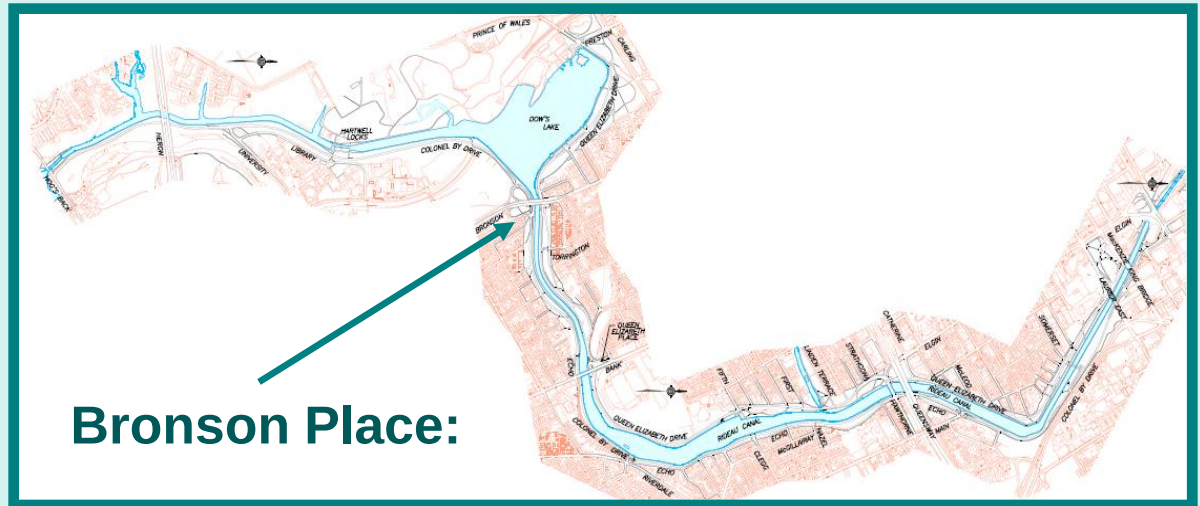
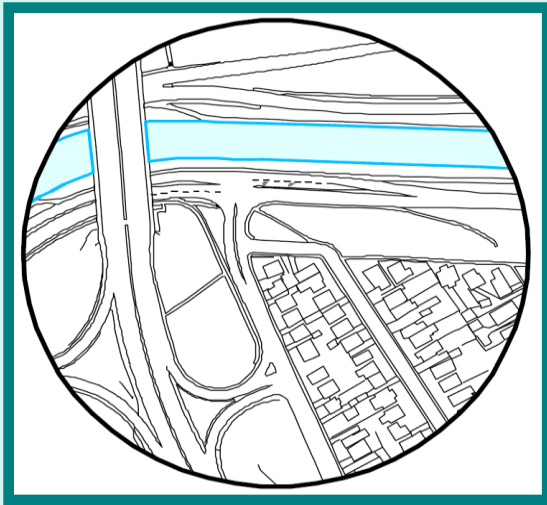
Hartwell Locks:

Options	Safety	Environment	Aesthetics & Heritage	Social	Operations	Capital & Maintenance cost	Weighted Score	Rank
Relative Criteria Weight (%)	30	13	26	11	7	13		
1 Do Nothing	1	4	3	1	1	5	49	4
2 1/2 Signals - Peds	4	2	2	4	3	3	60	2
3 Ped Refuge Island	3	2	4	3	4	3	64	1
4 Ped Grade Separation	5	1	1	5	4	1	57	3

Conclusion:

The following options warrant consideration:

- Pedestrian Refuge Island
- Signalized Pedestrian Crossing



Bronson Place:

Concerns Identified at Workshop:

- Heavy West bound Left turn volumes
- High Ped crossing volume
- High vehicle volume

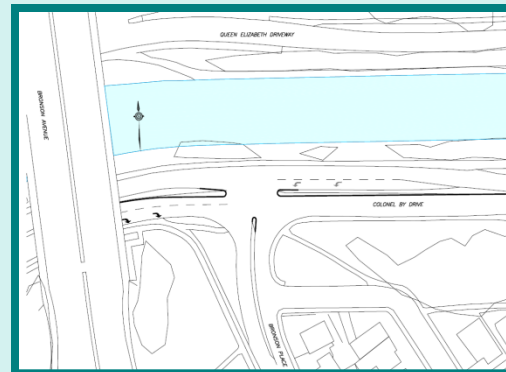
Data Collection and Analysis:

- Intersection crossing
- Pedestrian Delay Survey: Percentile
Ped Signals warranted: **24%**
- 85% Percentile speed: **65 km/hr.**
- Pedestrian Collisions **0**
- Sight distance: **Poor (EB)**

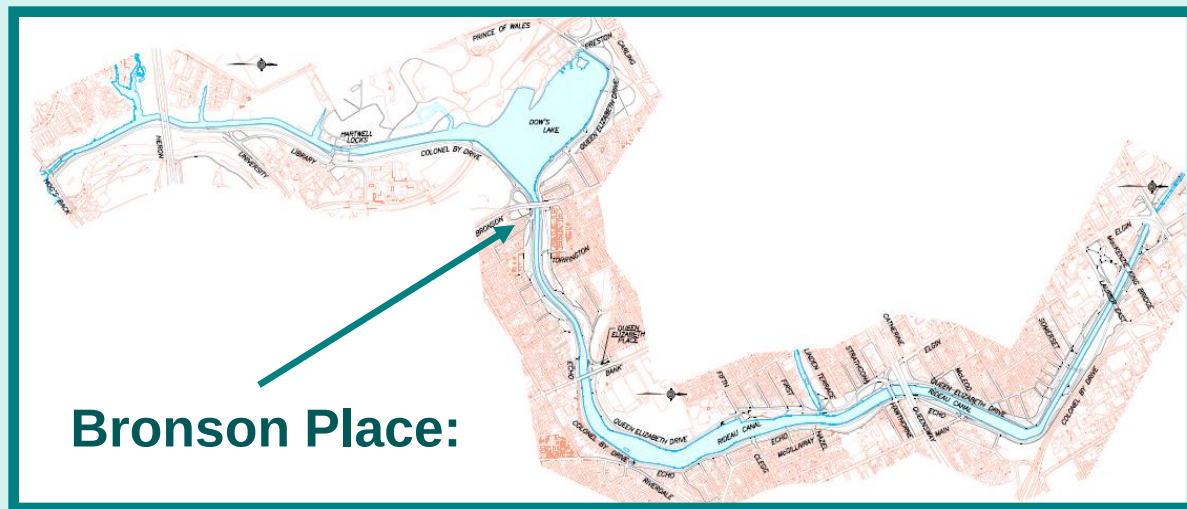
Opportunities for Improvement:

- | | |
|-------------------------|------------|
| • Refuge Median | Yes |
| • Intersection Geometry | Yes |
| • Signalized Crossing | No |
| • Signage | Yes |

OPTIONS:



1. Do Nothing
2. Intersection Improvements

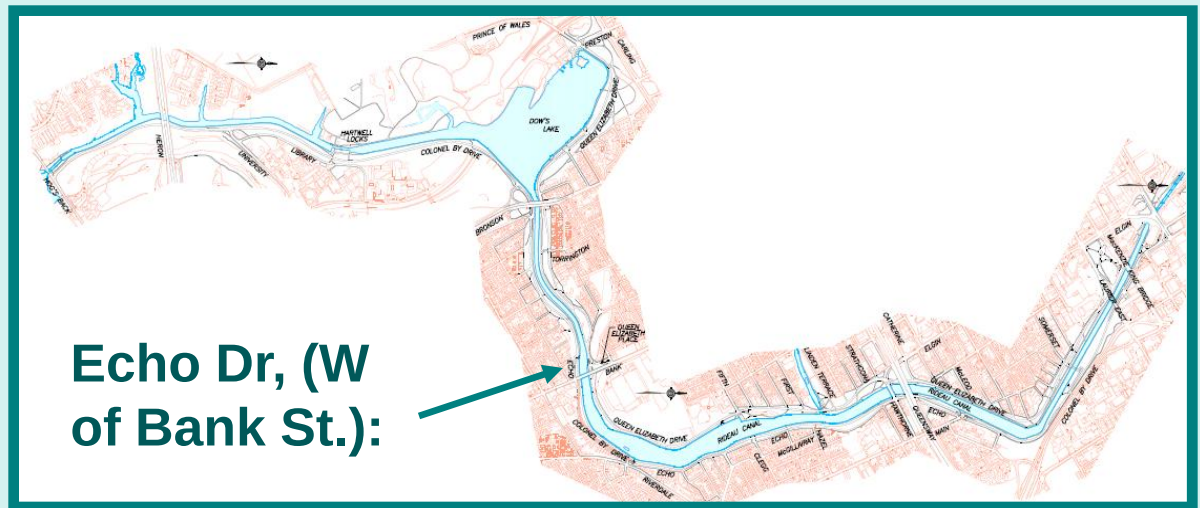


Bronson Place:

Options	Safety	Environment	Aesthetics & Heritage	Social	Operations	Capital & Maintenance cost	Weighted Score	Rank
Relative Criteria Weight (%)	30	13	26	11	7	13		
Score for Each Criterion								
1 Do Nothing	1	3	2	2	1	5	43	2
2 Intersection Improvements	2	3	3	3	2	3	53	1

Conclusion:

Intersection Improvements warrant consideration



Concerns Identified at Workshop:

- Poor Access from Bridge
- Not maintained in winter
- High vehicle – ped conflicts - unsafe

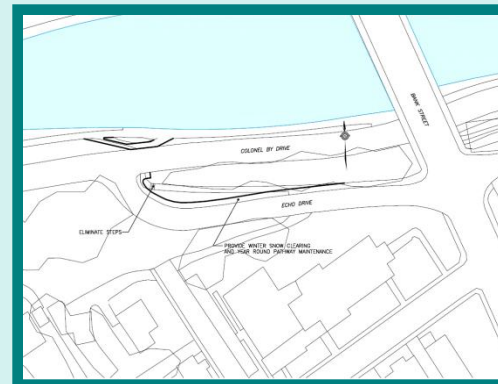
Data Collection and Analysis:

- Intersection crossing
- Pedestrian Delay Survey: Percentile
Ped Signals warranted: **71%**
- 85% Percentile speed: **65 km/hr.**
- Pedestrian Collisions **0**
- Sight distance: **Poor**

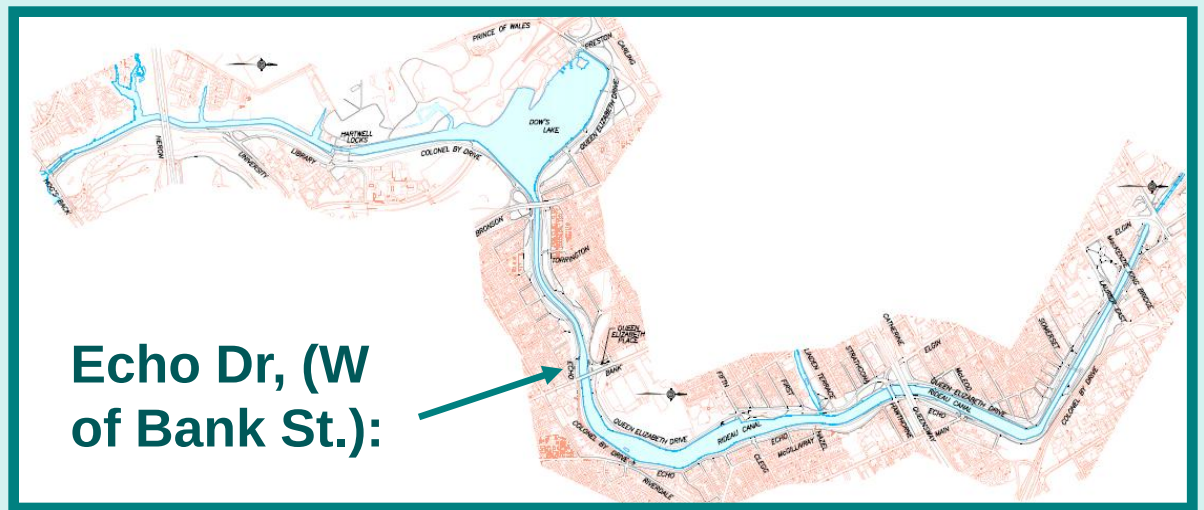
Opportunities for Improvement:

- | | |
|------------------------|------------|
| • Refuge Median | No |
| • Redirect Pedestrians | No |
| • Signalized Crossing | No |
| • Signage | Yes |

OPTIONS:



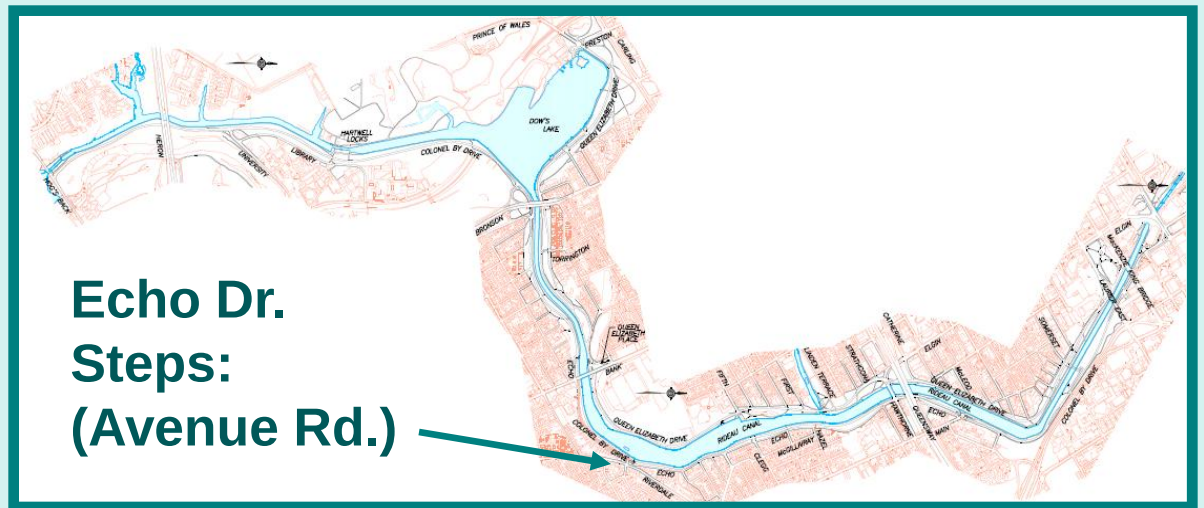
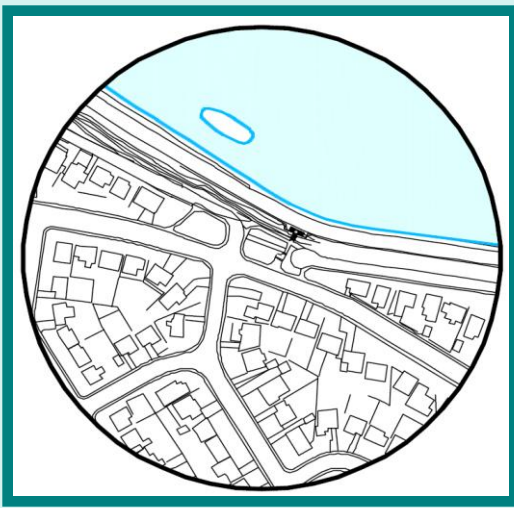
1. Do Nothing
2. Pathway Improvements



Options	Safety	Environment	Aesthetics & Heritage	Social	Operations	Capital & Maintenance cost	Weighted Score	Rank
Relative Criteria Weight (%)	30	13	26	11	7	13		
Score for Each Criterion								
1 Do Nothing	3	3	4	1	4	4	65	2
2 Pathway Improvements	4	3	4	5	4	2	74	1

Conclusion:

Pathway Improvements warrant consideration



Echo Dr. Steps: (Avenue Rd.)

Concerns Identified at Workshop:

- Insufficient storage at stair landing
- Not maintained in winter

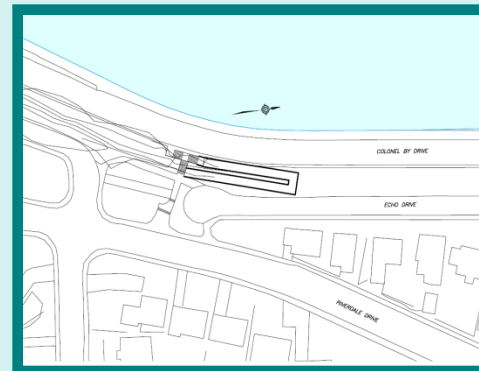
Data Collection and Analysis:

- Mid block crossing
- Pedestrian Delay Survey: Percentile
Ped Signals warranted: **20%**
- 85% Percentile speed: **67 km/hr.**
- Pedestrian Collisions **0**
(midblock)
- Sight distance: **Good**

Opportunities for Improvement:

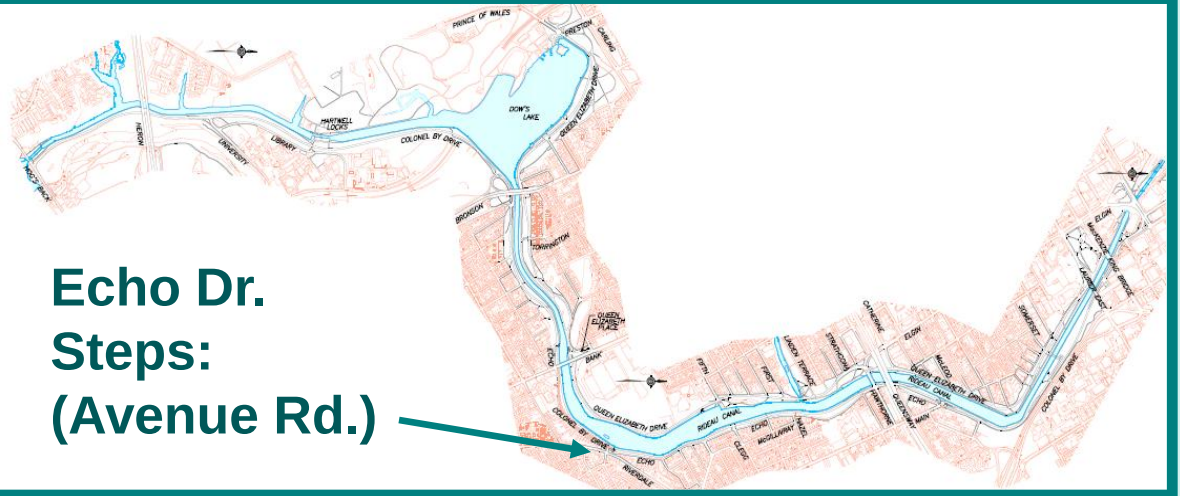
- | | |
|-----------------------|------------|
| • Refuge Median | No |
| • Maintenance | Yes |
| • Signalized Crossing | No |
| • Signage | Yes |

OPTIONS:



1. Do Nothing
2. Stairway/access Improvements

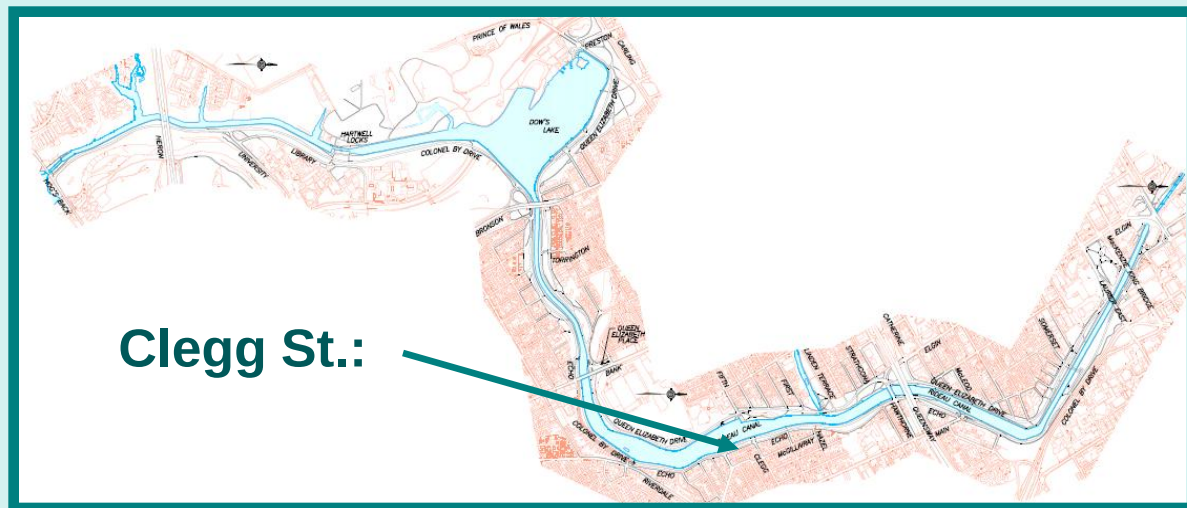
Echo Dr. Steps: (Avenue Rd.)



Options	Safety	Environment	Aesthetics & Heritage	Social	Operations	Capital & Maintenance cost	Weighted Score	Rank
Relative Criteria Weight (%)	30	13	26	11	7	13		
Score for Each Criterion								
1 Do Nothing	3	4	4	2	4	5	72	1
2 Stairway/Access Improvements	4	1	1	5	4	1	51	2

Conclusion:

No options identified that warrant further consideration.



Clegg St.:

Concerns Identified at Workshop:

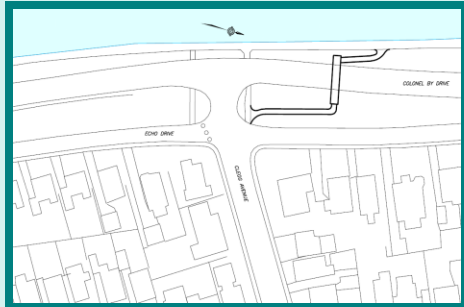
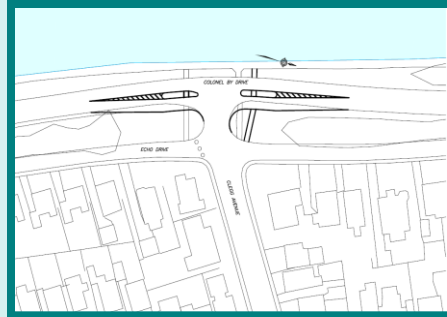
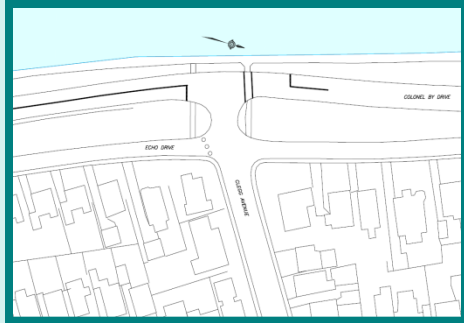
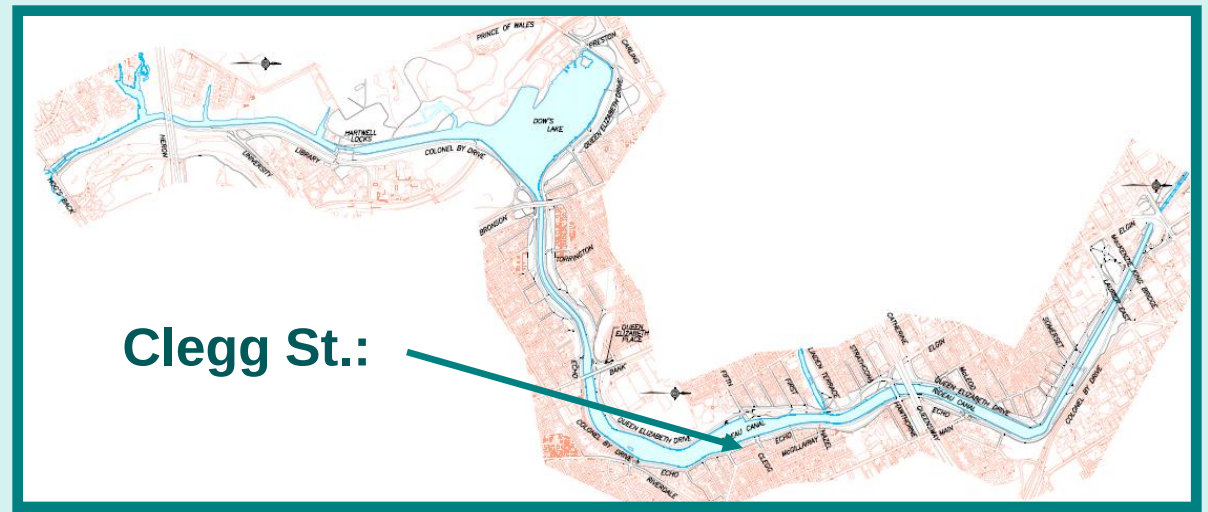
- Major crossing location, peds, cyclists
- High pedestrian volumes
- High desire for canal crossing bridge

Data Collection and Analysis:

- Intersection crossing
- Pedestrian Delay Survey: Percentile
Ped Signals warranted: **131%**
- 85% Percentile speed: **68 km/hr.**
- Pedestrian Collisions **0**
- Sight distance: **Fair/Good**

Opportunities for Improvement:

- | | |
|------------------------|-----------------------|
| • Redirect Pedestrians | No |
| • Road Narrowing | No |
| • Refuge Median | Yes |
| • Signalized Crossing | Yes |
| • Grade Separation | Yes (Warrants) |
| • Signage | Yes |



OPTIONS:

1. Pedestrian Signals (1/2 signals)
2. Refuge Median
3. Grade Separation
4. Do Nothing



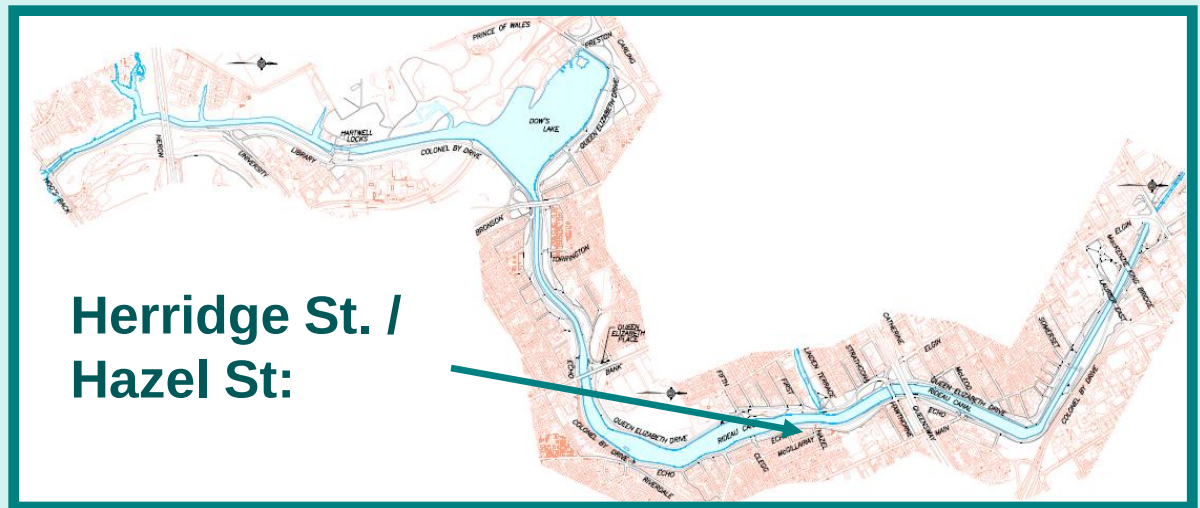
Clegg St.:

Options	Safety	Environment	Aesthetics & Heritage	Social	Operations	Capital & Maintenance cost	Weighted Score	Rank
Relative Criteria Weight (%)	30	13	26	11	7	13		
Score for Each Criterion								
1 1/2 Signals - Peds	4	2	2	4	3	3	60	2
2 Ped Refuge Island	3	2	4	3	4	3	64	1
3 Ped Grade Separation	5	1	1	5	4	1	57	3
4 Do Nothing	1	4	4	1	1	5	54	4

Conclusion:

The following options warrant further consideration:

- Pedestrian Refuge Island
- Signalized Pedestrian Crossing



**Herridge St. /
Hazel St:**

Concerns Identified at Workshop:

- Pedestrian crossing safety
- Limited sight distance
- Close proximity of Echo Dr to Col By.

Data Collection and Analysis:

- Mid block crossings
- 85% Percentile speed: **68 km/hr.**
- Pedestrian Collisions **0**
(Midblock)
- Sight distance: **Poor**

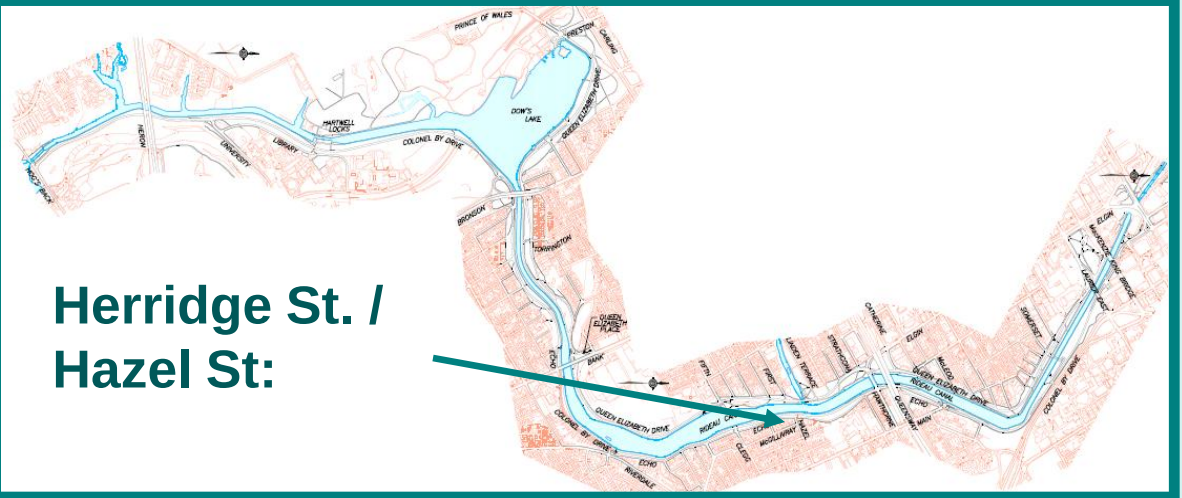
Opportunities for Improvement:

- | | |
|------------------------|------------|
| • Refuge Median | No |
| • Road Narrowing | No |
| • Redirect Pedestrians | Yes |
| • Signage | Yes |

OPTIONS:

1. Do Nothing.
2. Increase sight distance by removing vegetation between Echo Dr. & Col By.
3. Discourage crossings at Herridge & Hazel and encourage crossings at Clegg. Increase vegetation buffer between Echo and Col By.

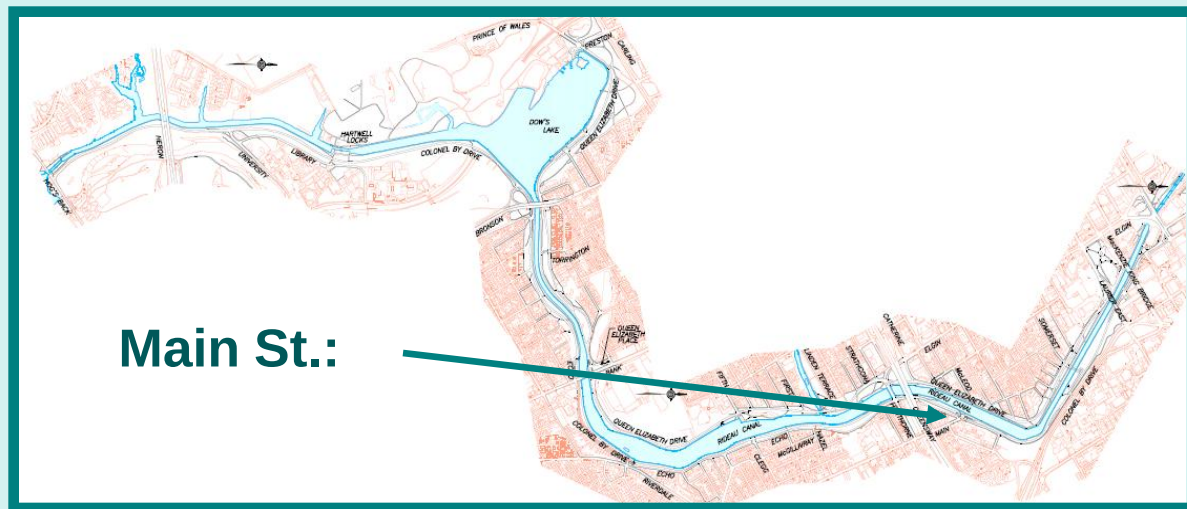
Herridge St. / Hazel St:



Options	Safety	Environment	Aesthetics & Heritage	Social	Operations	Capital & Maintenance cost	Weighted Score	Rank
Relative Criteria Weight (%)	30	13	26	11	7	13		
Score for Each Criterion								
1 Do Nothing	3	4	4	2	3	5	71	1
2 Landscape - Sight Distance	3	1	1	4	4	3	48	3
3 Discourage Crossings - Add landscape buffer	4	4	4	2	2	3	70	2

Conclusion:

Adding a Landscape Buffer warrants consideration

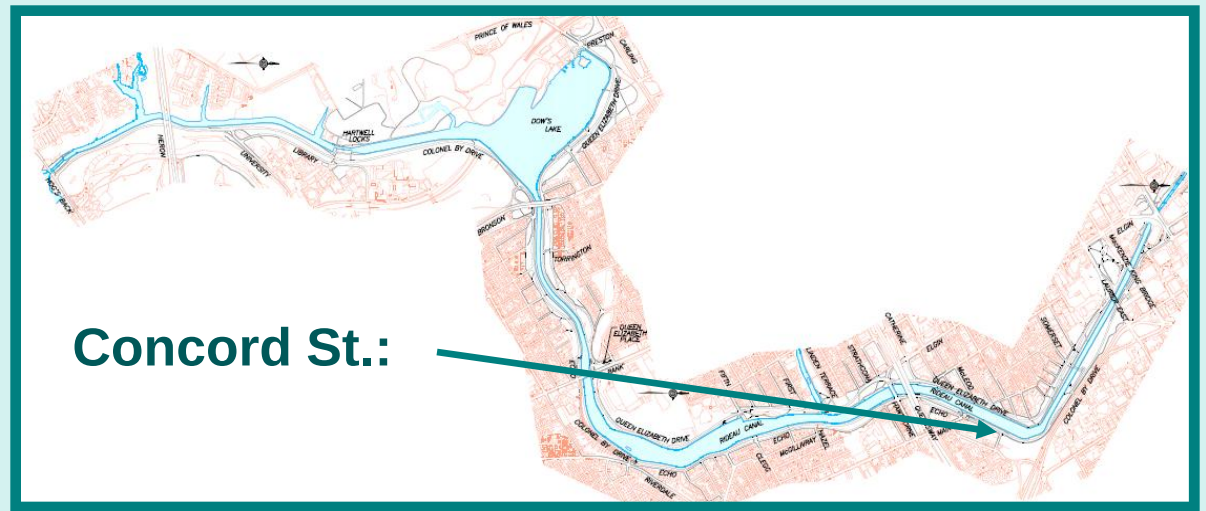
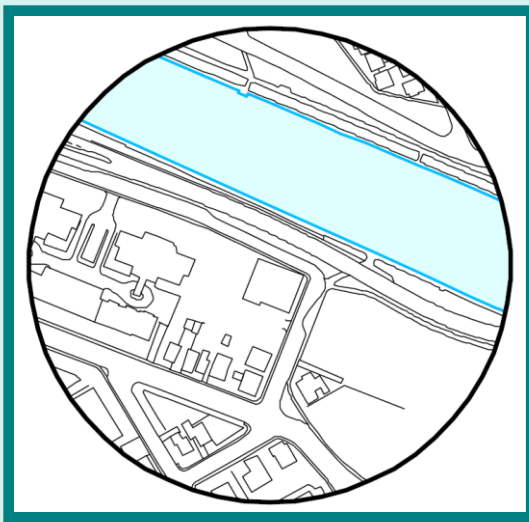


Main St.:

Options	Safety	Environment	Aesthetics & Heritage	Social	Operations	Capital & Maintenance cost	Weighted Score	Rank
Relative Criteria Weight (%)	30	13	26	11	7	13		
Score for Each Criterion								
1 Do Nothing	3	4	4	3	3	5	73	2
2 Intersection Improvements	4	4	4	4	4	3	77	1

Conclusion:

Intersection Improvements warrants consideration.



Concord St.:

Concerns Identified at Workshop:

- Natural Pedestrian Crossing location
- Skater access location

Data Collection and Analysis:

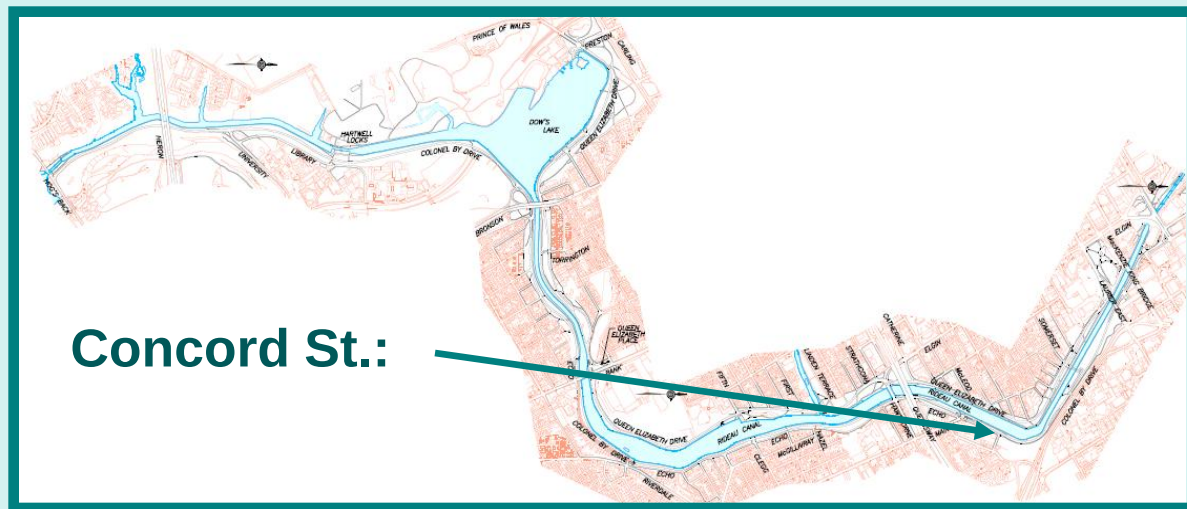
- Mid block crossing
- Pedestrian Delay Survey: Percentile
Ped Signals warranted: **35%**
- 85% Percentile speed: **65 km/hr.**
- Pedestrian Collisions **0**
- Sight distance: **Poor**

Opportunities for Improvement:

- | | |
|------------------------|----------------------|
| • Redirect Pedestrians | Yes (limited) |
| • Road Narrowing | No |
| • Refuge Median | No |
| • Signage | Yes |

OPTIONS:

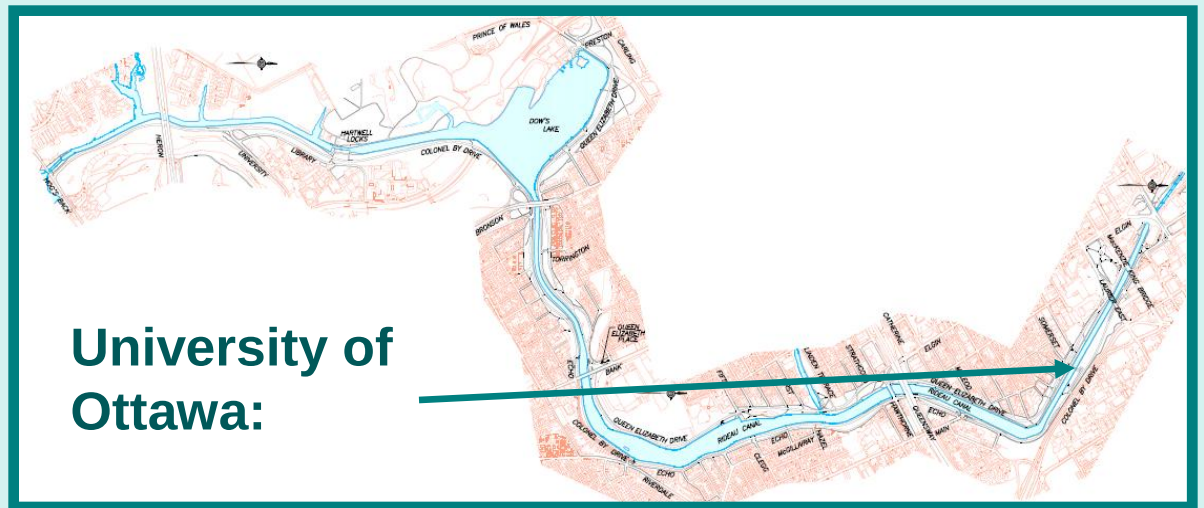
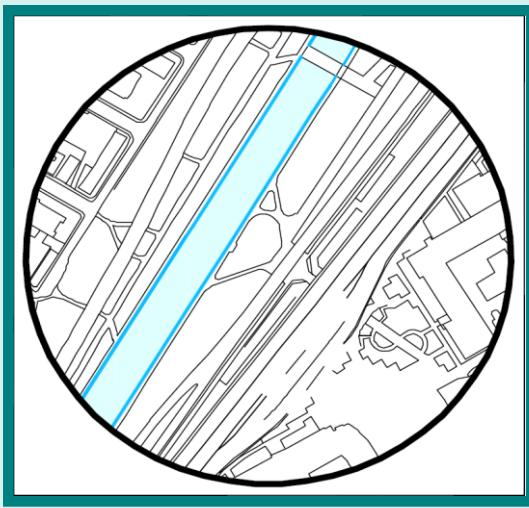
1. Do Nothing.
2. Discourage / eliminate existing crossing opportunities. Move Canal Winterlude facilities to adjacent Main St.



Options	Safety	Environment	Aesthetics & Heritage	Social	Operations	Capital & Maintenance cost	Weighted Score	Rank
Relative Criteria Weight (%)	30	13	26	11	7	13		
Score for Each Criterion								
1 Do Nothing	3	3	3	3	3	5	65	1
2 Discourage crossings	4	3	2	2	3	3	59	2

Conclusion:

No options identified that warrant further consideration.



**University of
Ottawa:**

Concerns Identified at Workshop:

- Increased pedestrians
- Wait time at signals too long
- Many peds crossing at “Don’t walk”

Data Collection and Analysis:

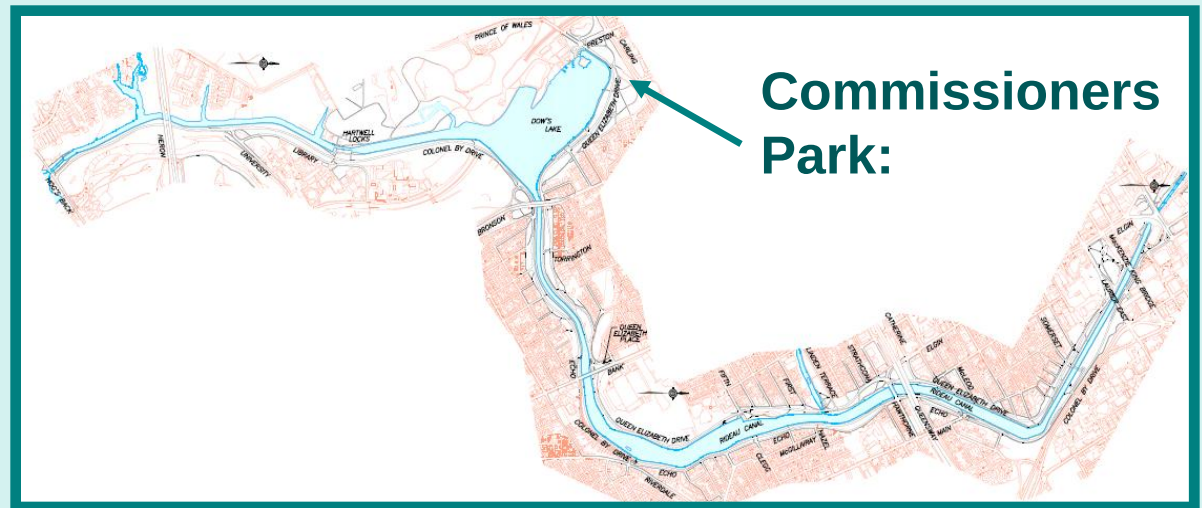
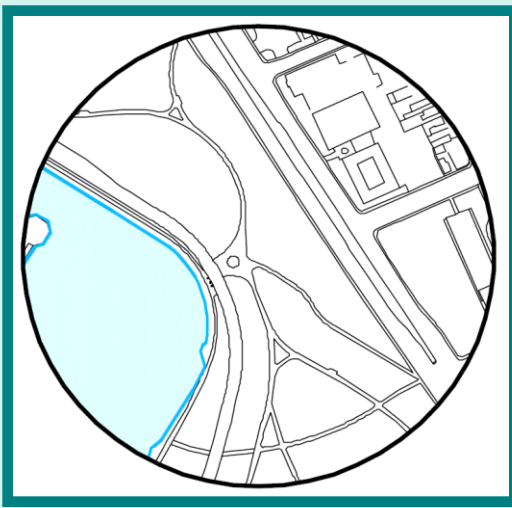
- Mid block crossing
- Vehicle & pedestrian counts
- 85% Percentile speed: **65 km/hr.**
- Pedestrian Collisions **2** (bicycle)
- Sight distance: **Good**

Opportunities for Improvement:

- | | |
|------------------------|------------|
| • Redirect Pedestrians | No |
| • Road Narrowing | No |
| • Refuge Median | No |
| • Adjust Signal Timing | Yes |

OPTIONS:

1. Do Nothing.
 - Recent Signal timing adjustments by City signals group undertaken



Concerns Identified at Workshop:

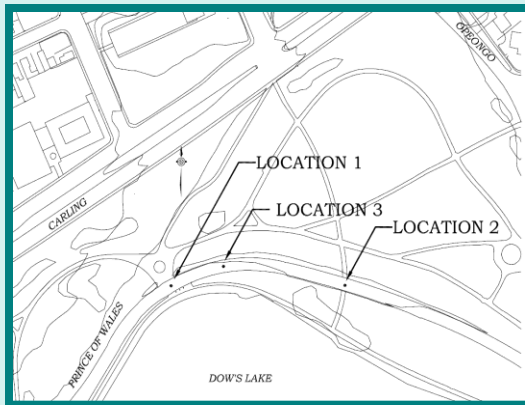
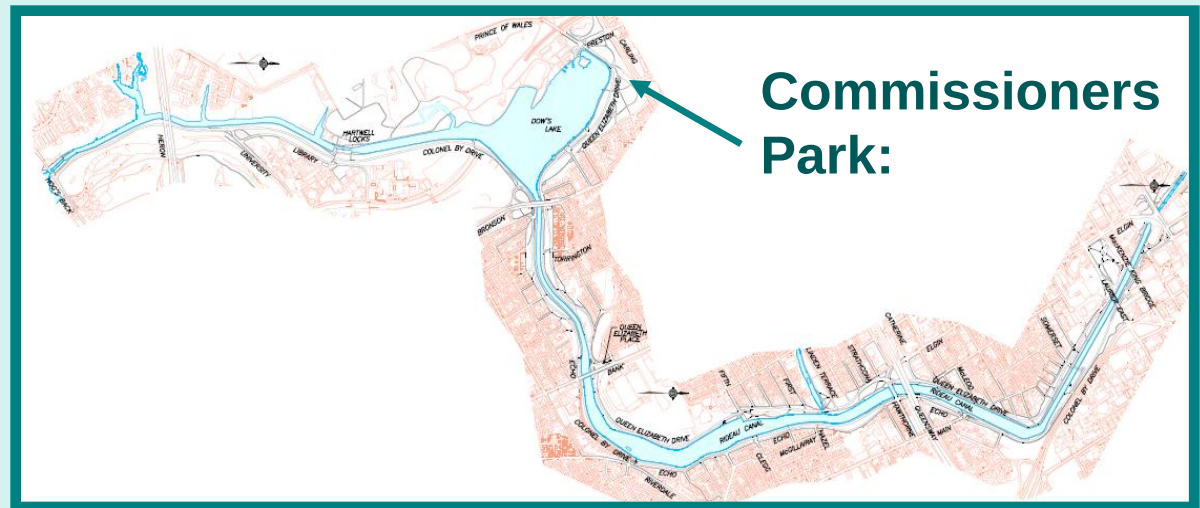
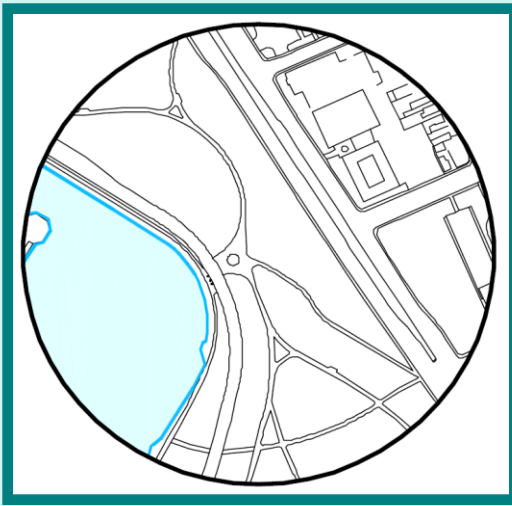
- Unsafe Crossing
- High pedestrian crossing volumes

Data Collection and Analysis:

- Mid block crossings
- Pedestrian Delay Survey: Percentile
Ped Signals warranted:
 Combined: **169 %**
 Location 1: **102-115 %**
 Location 2: **82-100%**
- 85% Percentile speed: **55 km/hr.**
- Pedestrian Collisions **1** (bicycle)
- Sight distance: **Poor**

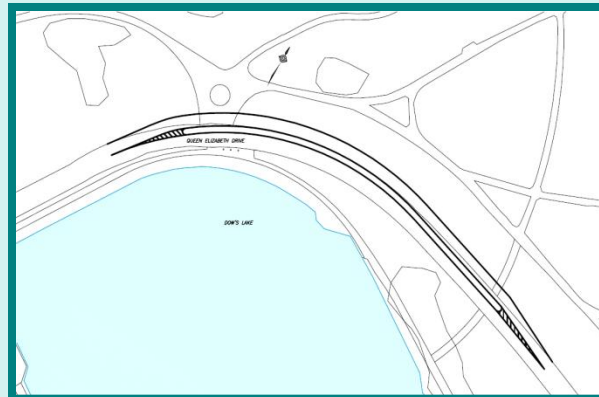
Opportunities for Improvement:

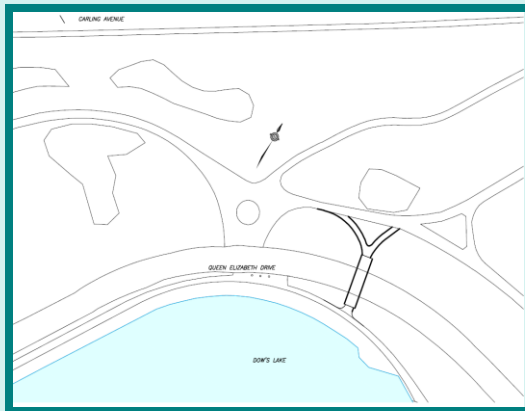
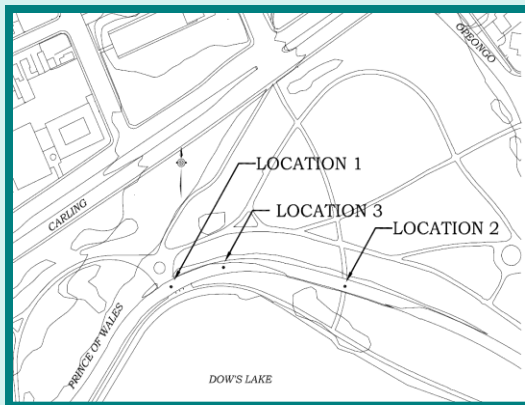
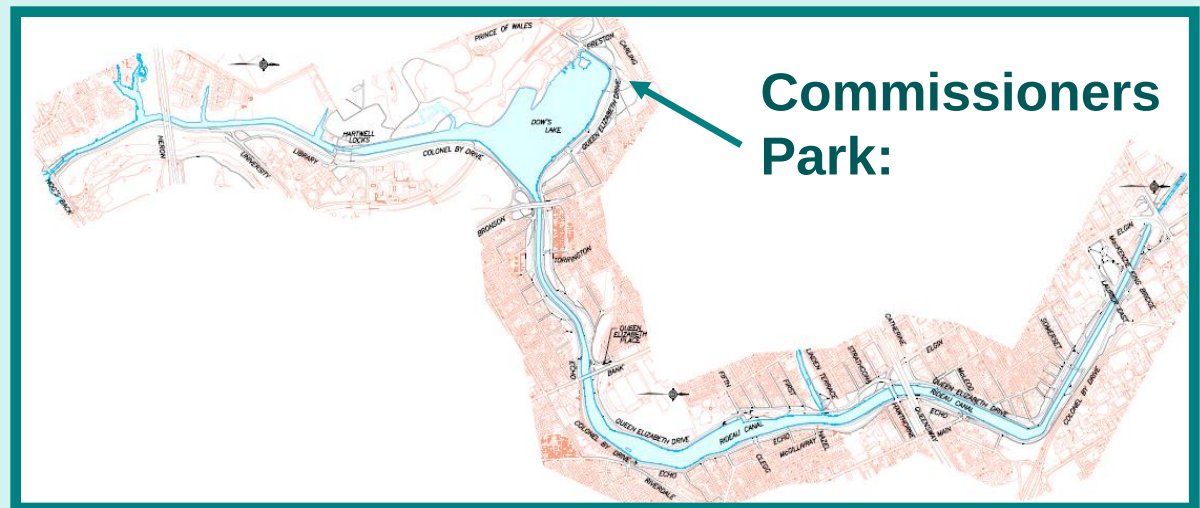
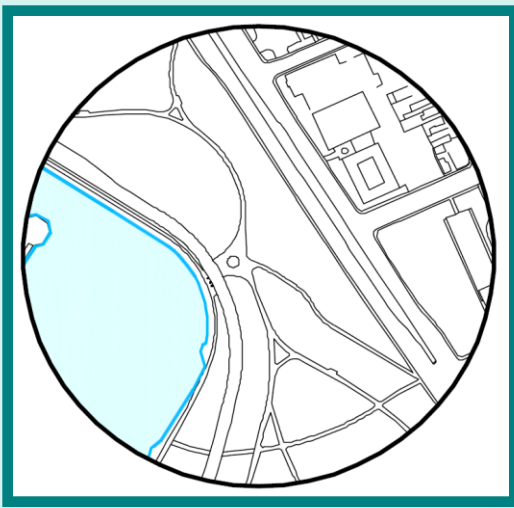
- Redirect Pedestrians **Yes**
- Road Narrowing **No**
- Refuge Median **Yes**
- Signalized Crossing **No** (Sight Distance)
- Grade Separation **Yes** (Warrants)
- Signage **Yes**



OPTIONS:

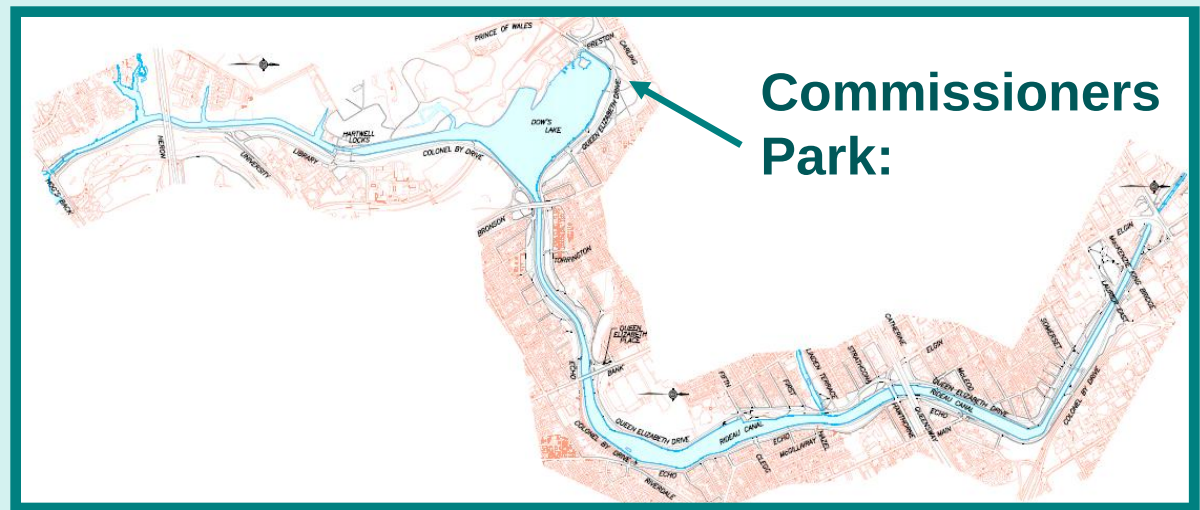
1. Widen road to provide refuge median at locations 1 & 2
2. Construct wider median the full distance between locations 1 and 2





OPTIONS:

1. Widen road to provide refuge median at locations 1 & 2
2. Construct wider median the full distance between locations 1 and 2
3. Construct grade separated crossing in vicinity of location 3



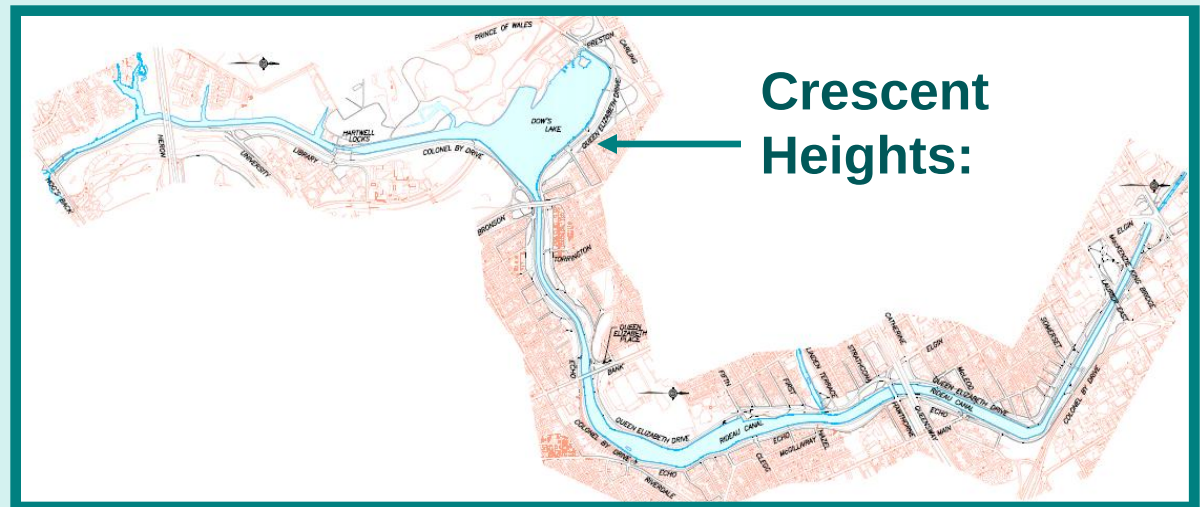
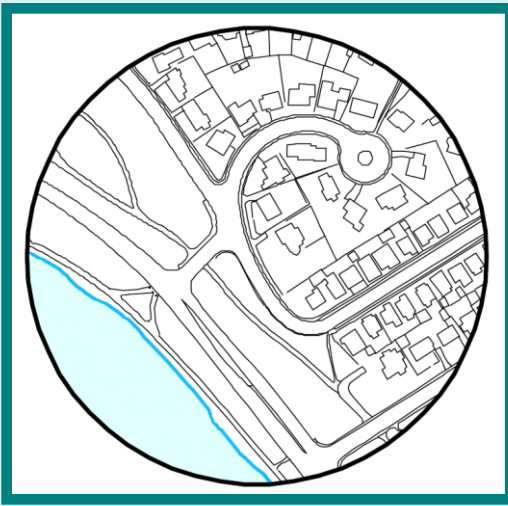
Options	Safety	Environment	Aesthetics & Heritage	Social	Operations	Capital & Maintenance cost	Weighted Score	Rank
Relative Criteria Weight (%)	30	13	26	11	7	13		
Score for Each Criterion								
1 Median Refuge(s)	4	3	4	3	3	4	74	1
2 Divided Parkway	4	3	4	3	3	3	71	2
3 Ped Grade Separation	5	4	1	4	4	1	63	3
4 Do Nothing	1	5	5	1	1	5	62	4

Conclusion:

In conjunction with major review of Commissioners Park pathway alignments, the following options warrant consideration:

- Pedestrian Refuge Island
- Divided Parkway

Pathway re-alignments may also create opportunities for pedestrian crossing signals.



Concerns Identified at Workshop:

- Unsafe Crossing – Road too wide
- Vehicle speeds
- Left turn vehicles

Data Collection and Analysis:

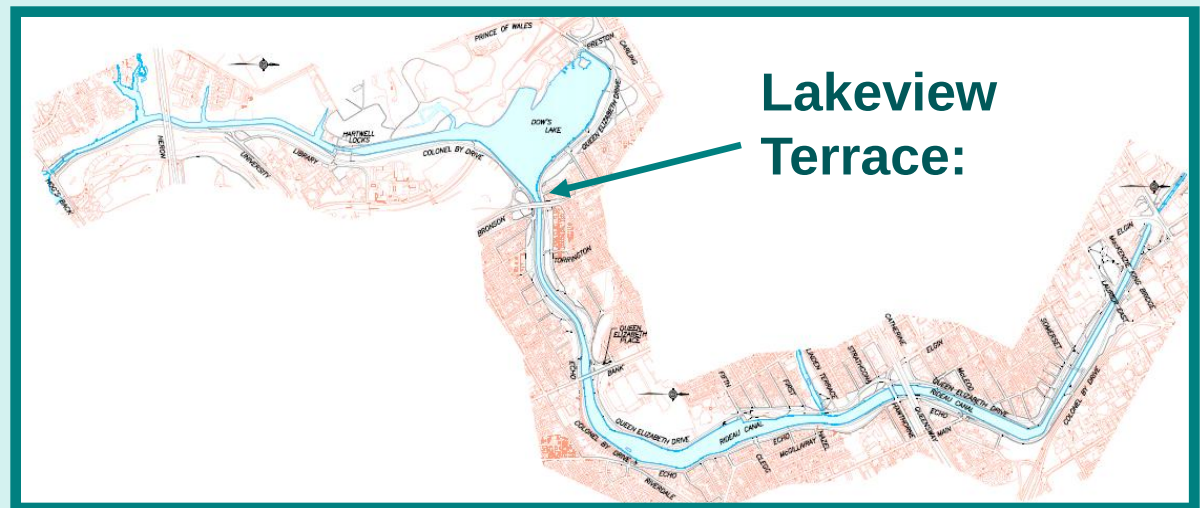
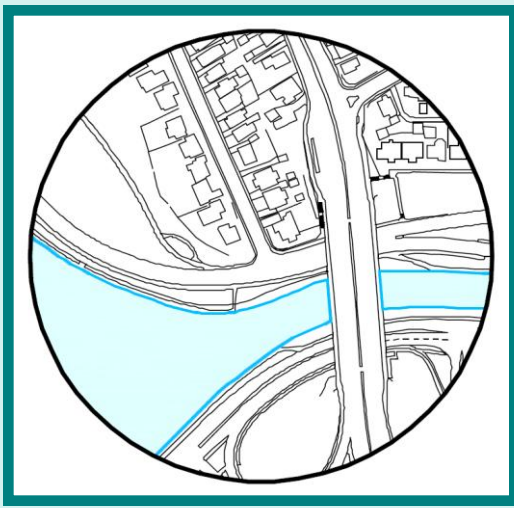
- Intersection crossing
- Pedestrian Delay Survey: Percentile
Ped Signals warranted: **6 %**
- 85% Percentile speed: **57 km/hr.**
- Pedestrian Collisions **0**
- Sight distance: **Good**

Opportunities for Improvement:

- | | |
|------------------------|-----------|
| • Redirect Pedestrians | No |
| • Road Narrowing | No |
| • Refuge Median | No |
| • Signalized Crossing | No |

OPTIONS:

1. Do Nothing.



Concerns Identified at Workshop:

- Limited Sight Distance
- Unsafe

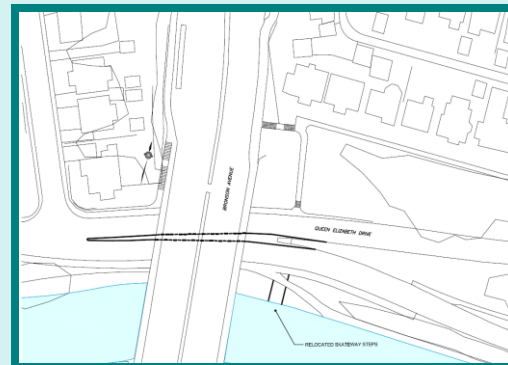
Data Collection and Analysis:

- Intersection crossing
- Pedestrian Delay Survey: Percentile Ped Signals warranted: **36 %**
- 85% Percentile speed: **61 km/hr.**
- Sight distance: **Very poor**
- Pedestrian Collisions **0**

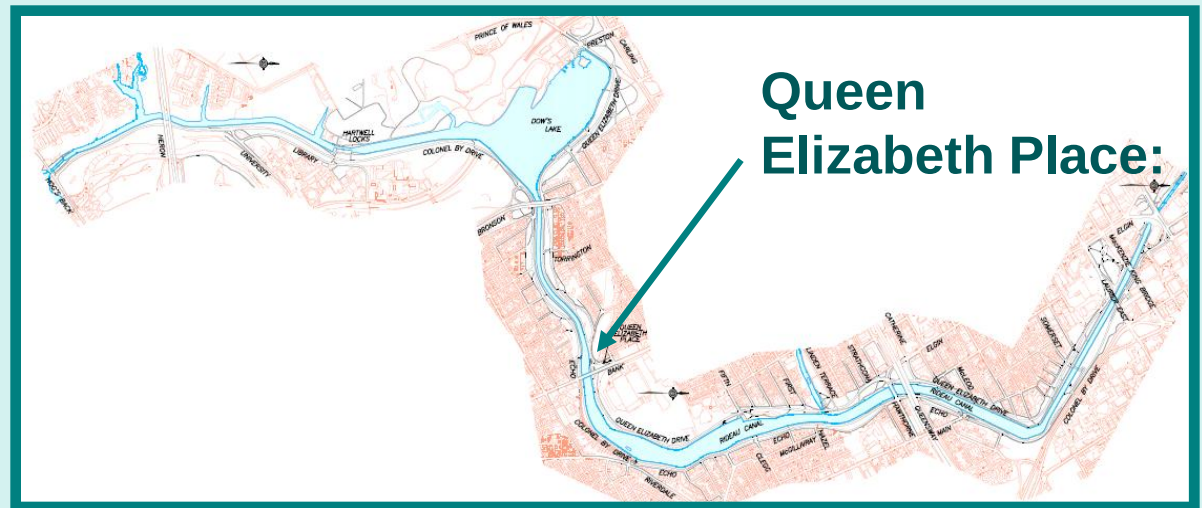
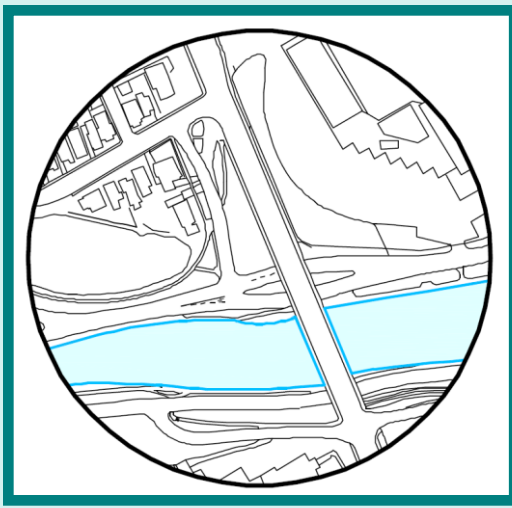
Opportunities for Improvement:

- | | |
|------------------------|------------|
| • Redirect Pedestrians | Yes |
| • Road Narrowing | Yes |
| • Refuge Median | Yes |
| • Signalized Crossing | No |

OPTIONS:



1. Do Nothing
2. Refuge median & redirect pedestrians



Concerns Identified at Workshop:

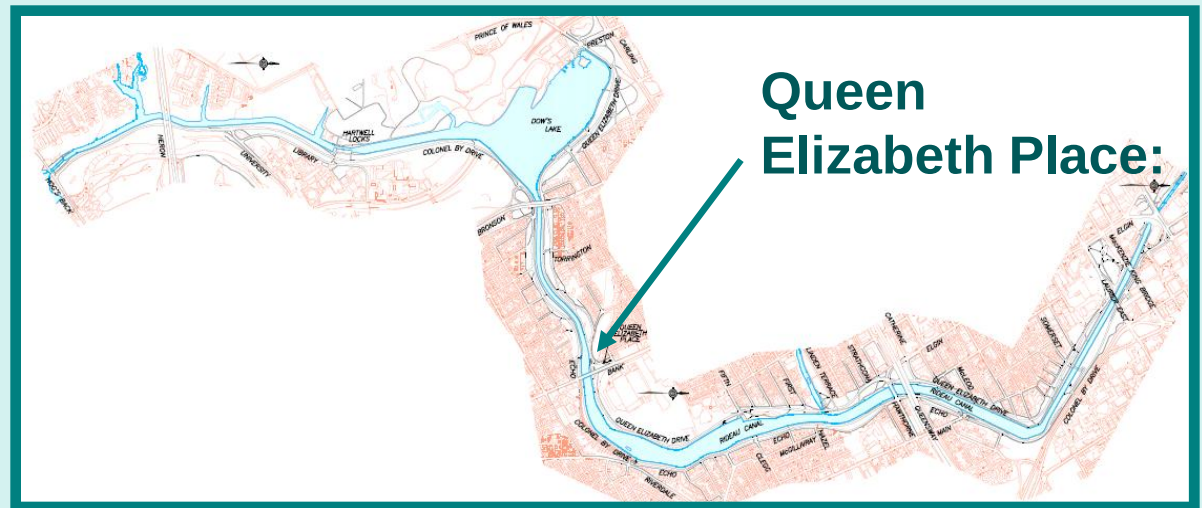
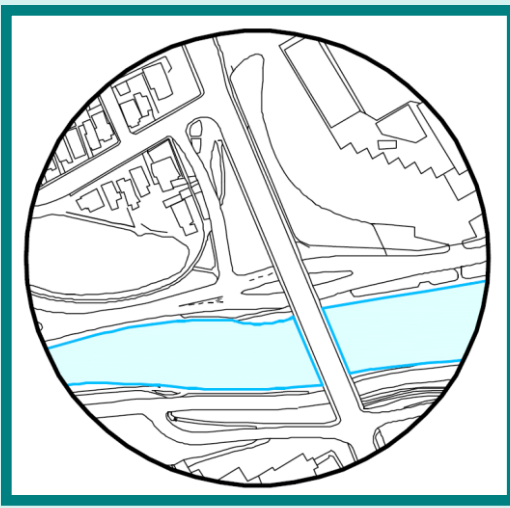
- Bicycling Route Access to QED
- High pedestrian volumes
- Bad sight lines

Data Collection and Analysis:

- Intersection crossing
- Pedestrian Delay Survey: Percentile
Ped Signals warranted: **67% / 41%**
- 85% Percentile speed: **62 km/hr.**
- Sight distance: **poor (WB)**
- Pedestrian Collisions **0**
- Intersection geometry constrained by
Bridge Abutments

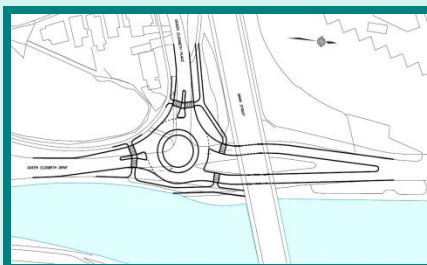
Opportunities for Improvement:

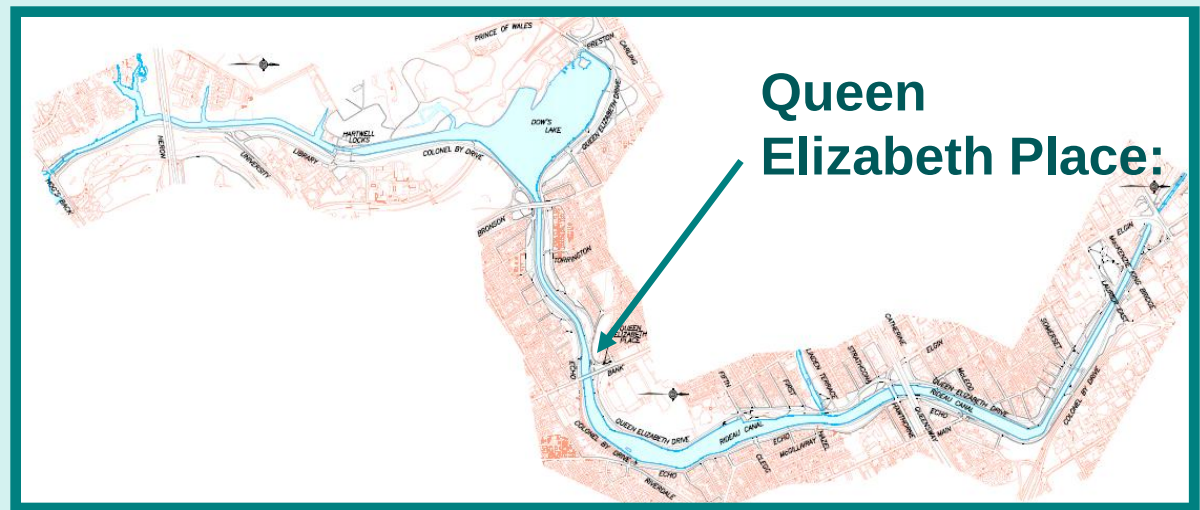
- | | |
|---------------------------|------------|
| • Redirect Pedestrians | No |
| • Road Narrowing | Yes |
| • Intersection Geometrics | Yes |
| • Signalized Crossing | No |
| • Signage | Yes |



OPTIONS:

1. Maintain (minor road) stop control intersection with geometric changes.
2. Same as Option 1 except eliminate WB right turn lane.
3. Construct a single lane roundabout.
4. Do Nothing





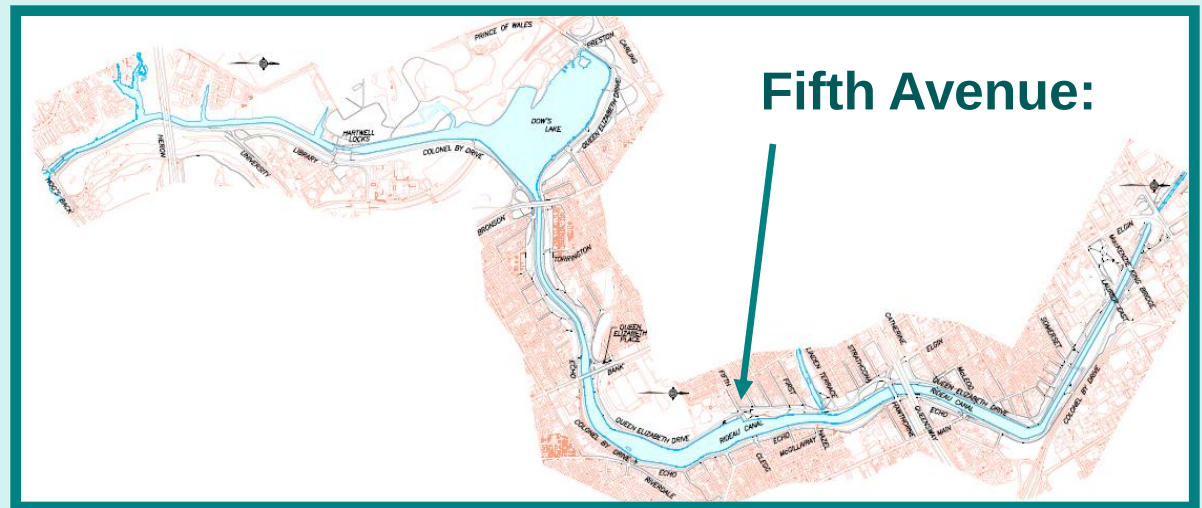
Queen Elizabeth Place:

Options	Safety	Environment	Aesthetics & Heritage	Social	Operations	Capital & Maintenance cost	Weighted Score	Rank
Relative Criteria Weight (%)	30	13	26	11	7	13		
Score for Each Criterion								
1 Intersection Improvements 1	3	3	3	3	4	4	64	3
2 Intersection Improvements 2	3	4	4	4	3	3	70	1
3 Single lane Roundabout	4	3	4	4	4	1	70	1
4 Do Nothing	2	4	4	2	2	5	63	4

Conclusion:

The following options warrant consideration:

- Convert intersection to a Roundabout
- Maintain minor road stop control with new splitter island on south side and elimination of southbound right turn lane.



Concerns Identified at Workshop:

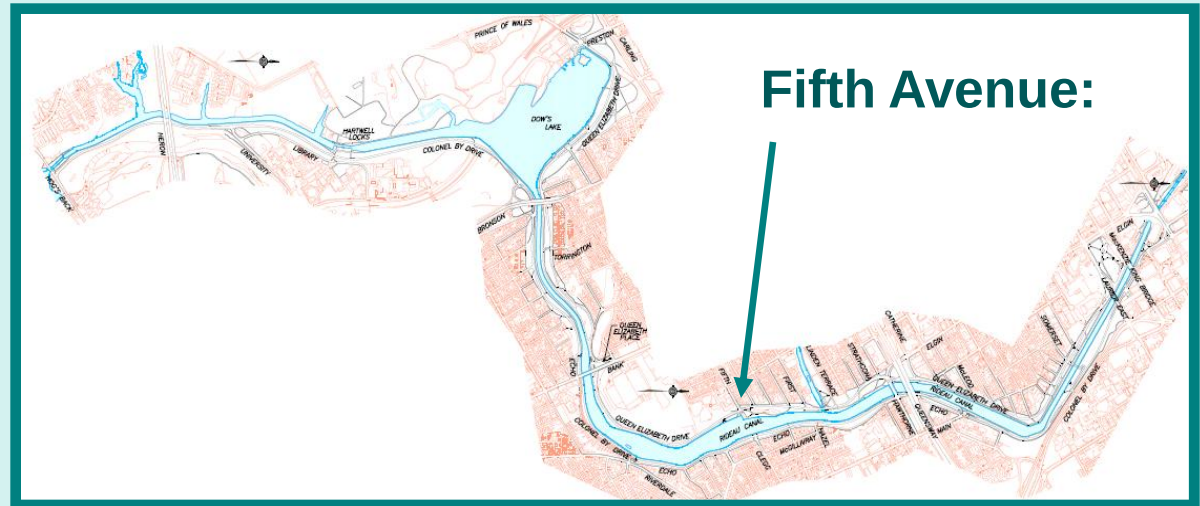
- High volume all season ped crossing
- Year round restaurant access location
- Prime location for future Rideau Canal ped bridge crossing

Data Collection and Analysis:

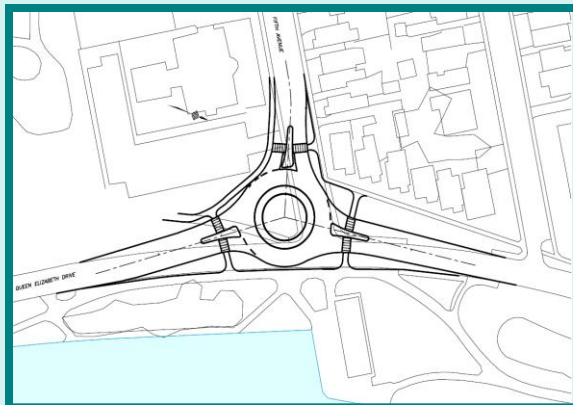
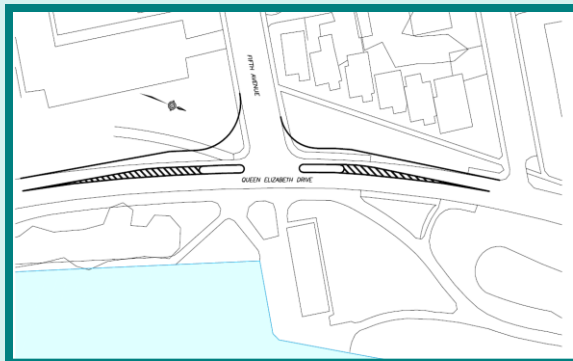
- Intersection crossing
- Pedestrian Delay Survey: Percentile Ped Signals warranted: **122%**
- 85% Percentile speed: **60 km/hr.**
- Pedestrian Collisions **0**
- Sight distance: **Good**
- All way stop control **No**

Opportunities for Improvement:

- Redirect Pedestrians **No**
- Road Narrowing **No**
- Refuge Median **Yes**
- Intersection Geometrics **Yes**
- Signalized Crossing **Yes**
- Grade separation **Yes** (Warrants)
- Signage **Yes**

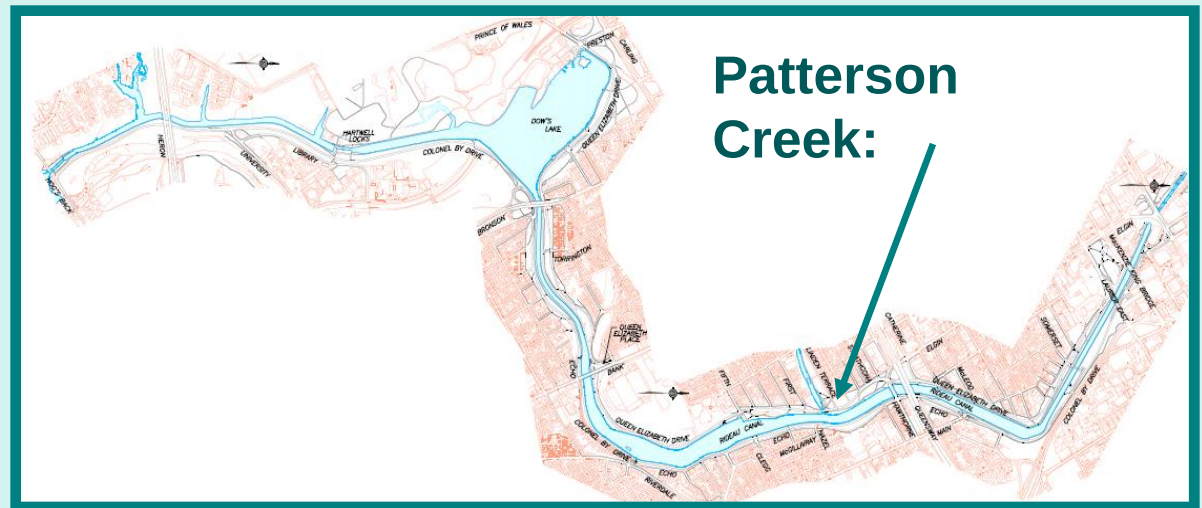
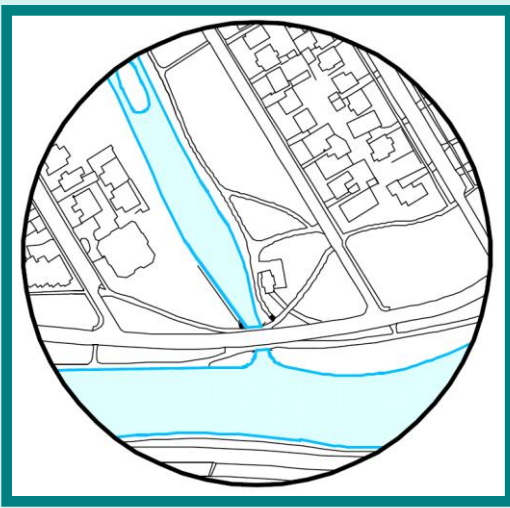


Fifth Avenue:



OPTIONS:

1. Install pedestrian crossing signals (1/2 signals) at intersection – stop sign control at Fifth Ave. approach.
2. Pedestrian refuge islands.
3. Single Lane Roundabout.
4. Grade separated ped crossing
5. Do nothing



Concerns Identified at Workshop:

- 2 pathways each side funnel adjacent to QED
- Path linkage to school & park cause congestion
- High Winterlude usage

Data Collection and Analysis:

- Mid block crossing
- Pedestrian Delay Survey: Percentile
Ped Signals warranted: **50%**
- 85% Percentile speed: **61 km/hr.**
- Pedestrian Collisions **0**
- Sight distance: **Good**

Opportunities for Improvement:

- | | |
|------------------------|------------|
| • Redirect Pedestrians | No |
| • Road Narrowing | No |
| • Refuge Median | No |
| • Signalized Crossing | No |
| • Signage | Yes |

OPTIONS:

1. Do Nothing.
2. Signage on QED approaches.



Next Steps:

- Prepare workshop report and distribute to participants
- Consultant finalizes report
- Prepare recommendations
- Plan improvements of individual pedestrian crossing locations and develop cost estimates
- Prioritize improvements as part of the capital budget 5-year plan update
- Urban lands master plan preparation informs on lower priority crossing locations