Portage & Main Microsimulation: Walls Down, Walking Up

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CITE Edmonton
June 2018

Intersection History

1872

Red River Cart Trails

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Intersection History

1913

“Chicago of the North”

Intersection History

1919

Winnipeg General Strike

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Intersection History

1959

Royal Tour

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Intersection History

1972

Bobby Hull signs with the Winnipeg Jets

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Intersection History

1976

Avco Cup Championship Parade

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Intersection History

1977

Underground Concourse Construction

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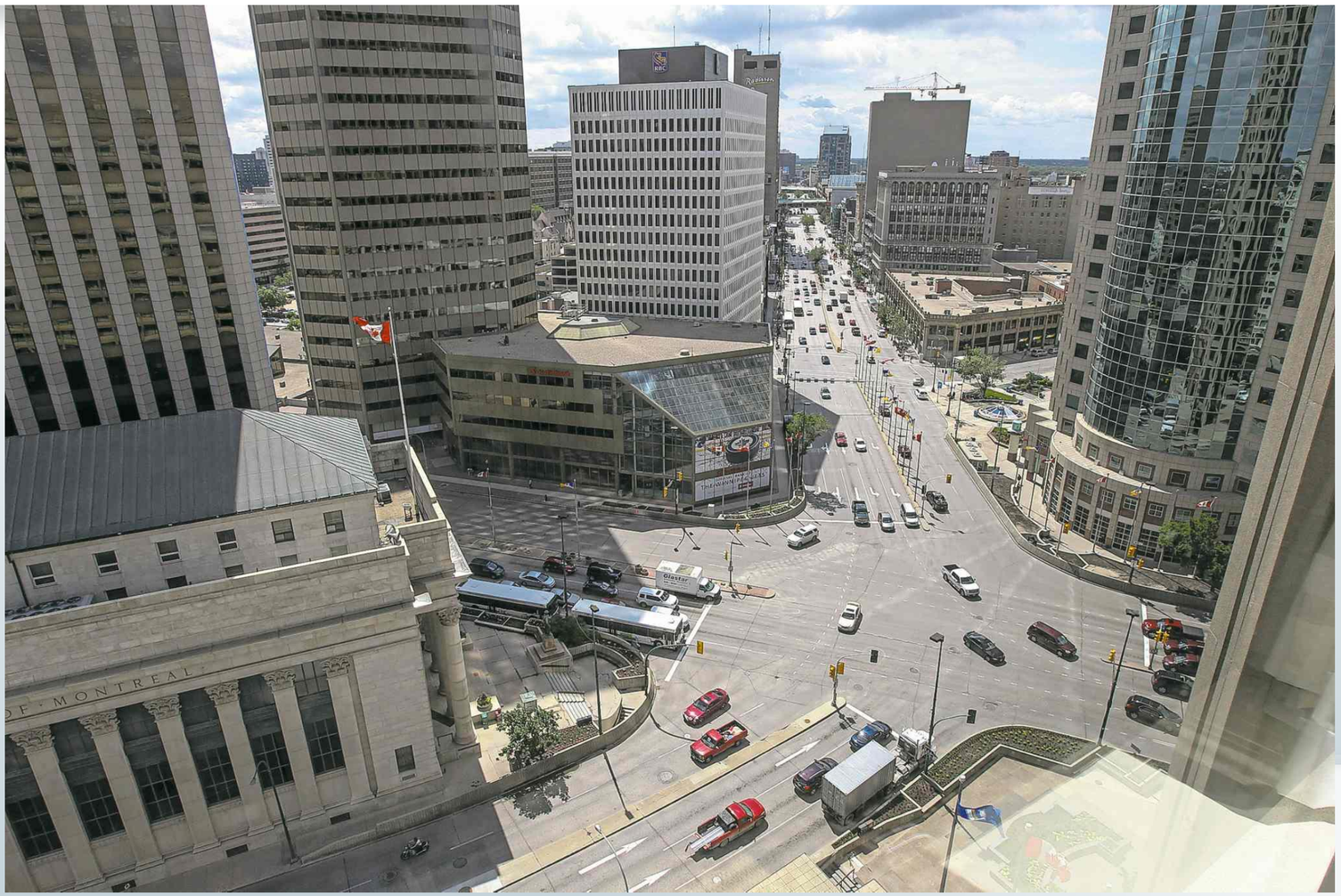
Intersection History



2016

Transportation Study

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Intersection History

2019

40-year agreement to restrict pedestrian access expires

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Winnipeg Transit to be hit hardest by reopening Portage and Main, study suggests

Dillon Consulting also concludes pedestrian safety would be at risk - but half of vehicles won't be affected

Bartley Kives · CBC News · Posted: Oct 13, 2017 8:10 PM CT | Last Updated: October 13, 2017

CAA members don't want Portage and Main reopened

By Lauren McNabb
Senior Anchor Global News

Intersection belongs to people

Portage and Main: it's not just an intersection, it's an idea. An idea that transcends the niggling confines of logistics or convenience. It's about a vision that reaches beyond mere cars and concrete. It's about a city with an imagination. If there was ever a city that needed one, we are it!

We need more fanciful notions, not fewer. The idea of Winnipeg includes a Portage and Main bustling with people and energy. That was taken from us. It's time to give it back.

OPINIONS ON OPENING PORTAGE AND MAIN DIFFER

City motion starts process that could open the intersection to pedestrians

DYLON MARTIN Follow @dylon_r_martin

NOVEMBER 16, 2017 1

WINNIPEG

Winnipeg at a crossroads: Is now the time to finally fix Portage and Main?

Momentum is slowly growing to remake one of Canada's mos intersections. **Oliver Moore** explores how it could bring new downtown Winnipeg

Report recommends pumping M into reopening Portage and Main to pedestrians

By: Kevin Rollason
Posted: **10/13/2017 4:58 PM** | Last Modified: 10/14/2017 9:18 AM

Winnipeg mayor wants to "breathe new life" into Portage and Main

The debate over whether or not to allow pedestrians to cross at Portage and Main will be front and centre this week. The president of the Times Square Alliance, will be in town Thursday to meet with the city and Winnipeggers about the possibility of reopening the downtown intersection to pedestrian traffic. He is expected to share insights learned in transforming Times Square. Global's Lorraine Nickel reports.

City commissions second study to examine re-opening Portage and Main to pedestrians

Global News RADIO 680 CJOB

By Christian Aumell
Reporter Global News

Few tangible benefits for opening Portage and Main to pedestrians

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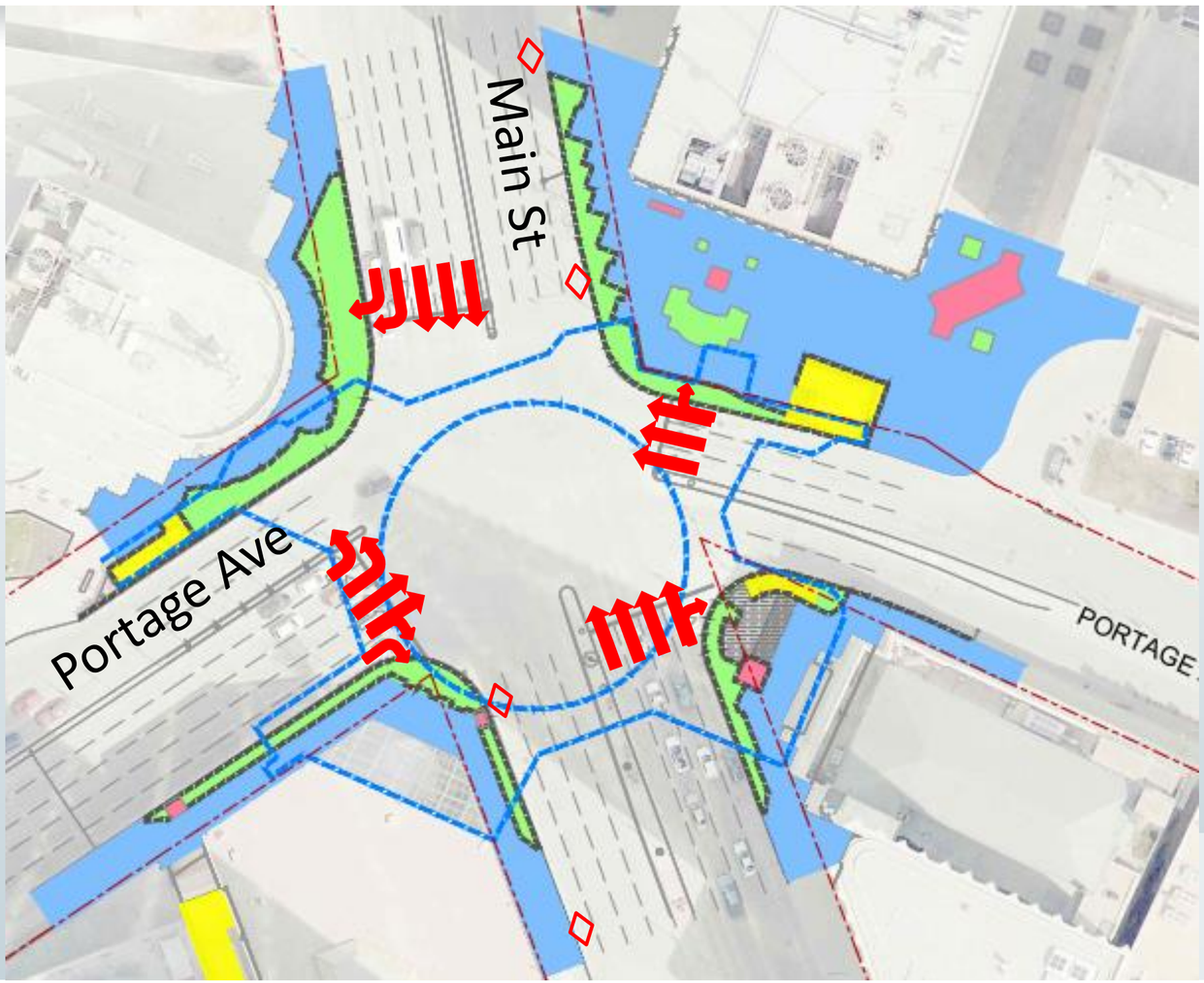
Scope of Work

- Perform a microsimulation of traffic at the intersection with pedestrians accommodated
- Three alternatives provided by City, two more developed by Dillon
- Scope limited to a basic functional opening of the intersection
- No placemaking or reinvention of connections between the surface and underground concourse

Intersection Configuration



- 18 lanes total entering intersection
- All left turns prohibited except EB Portage to NB Main (high volume)
- Portage Ave East has much lighter traffic than the other three legs

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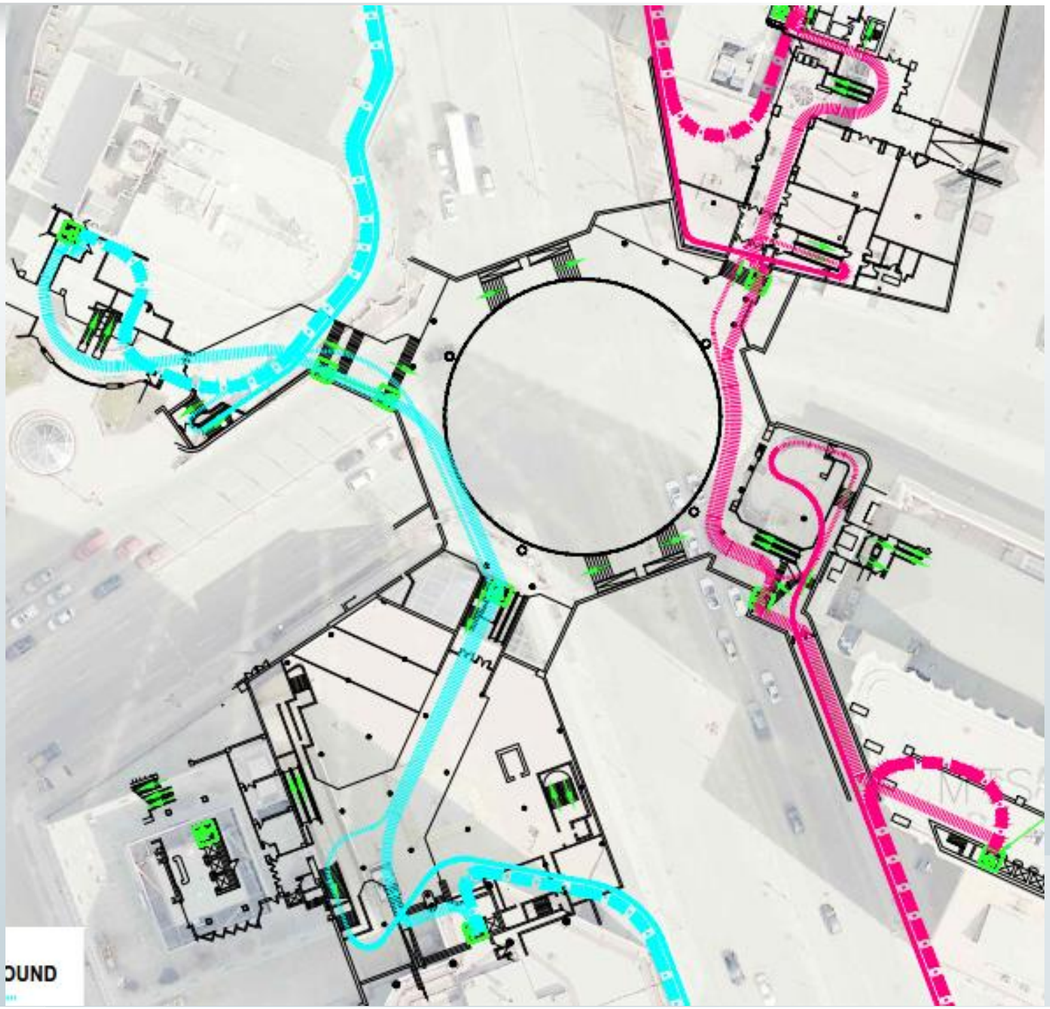
Underground Configuration



- Variety of stairs, ramps, escalators, and elevators to access underground concourse
- Linked to downtown skywalk system
- Wheelchair users (thick lines) must use four or five elevators to cross the intersection

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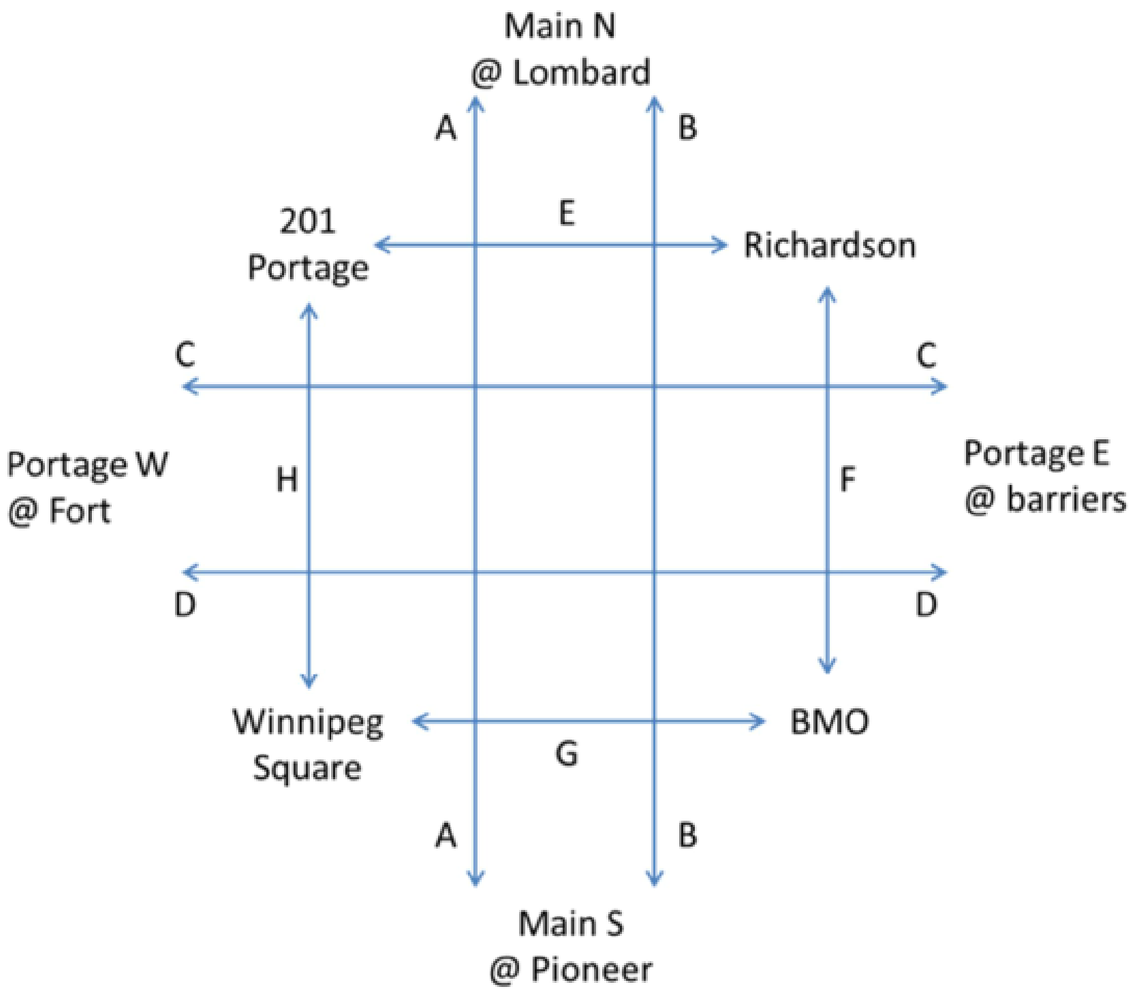
Pedestrian Pathfinding



- **Groundtruthing to determine measures of effectiveness (MoE)**
- **Travel times of 2.2 to 4.8 mins for able-bodied pedestrians**
- **Travel times of 6.7 to 9.1 mins for wheelchair users**

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Analysis Approach

- **Complex urban environment**
- **Pedestrian, transit, cars interacting**
- **Lynchpin intersection**
- **Queuing between intersections**

- **Microsimulation!**
  - Vissim with Viswalk plug-in

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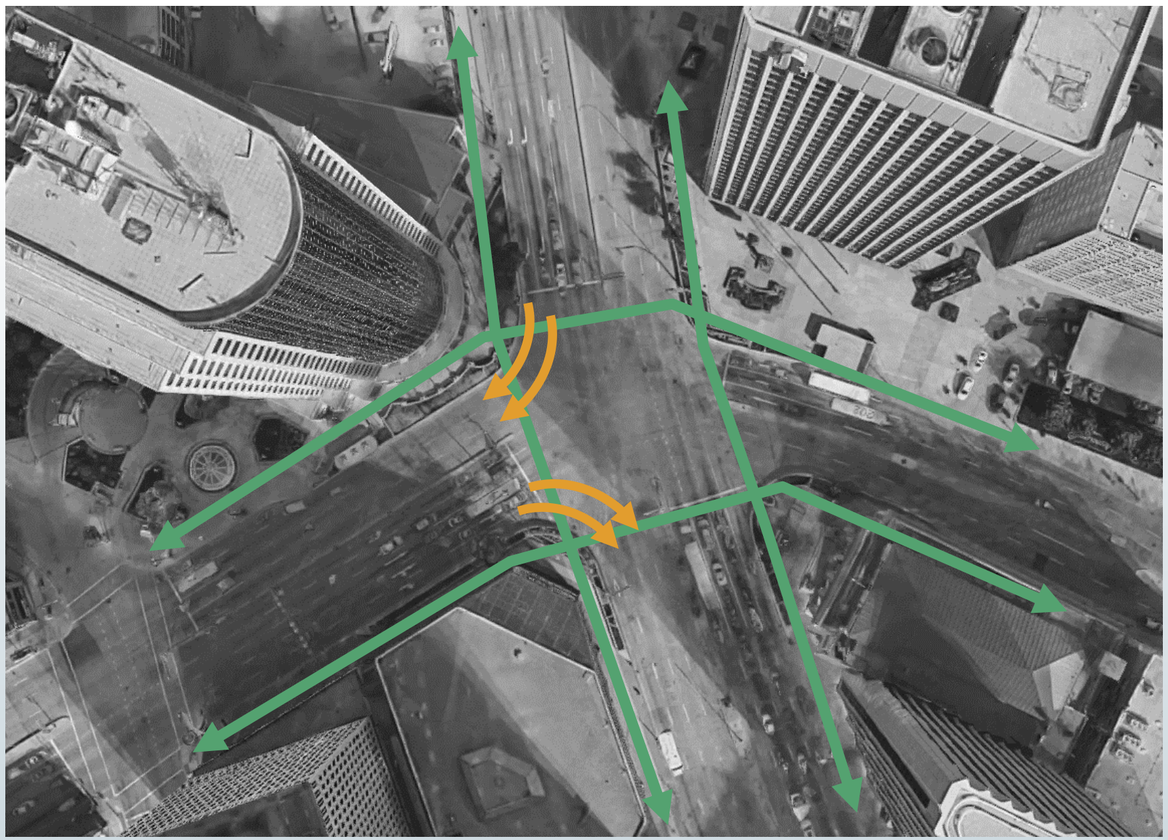
Data:

- Vehicle and pedestrian counts
- Signal timing
- Transit routes and schedules
- Parking regulations
- Visum and Synchro models
- Miovision videos (queuing)
- Pedestrian volume forecasts


LOMBARD
MAIN
NOTRE DAME
PORTAGE
PORTAGE
MAIN
FORT
PIONEER
Legend
Roads
Crosswalks
Sidewalks
Obstacles

MoE - Pedestrians

- **Safety**
  - Permitted Dual Right Turns
- **Performance**
  - Average Travel Time on each side



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MoE - Transit

- **Overall Model Performance**
  - Average Transit Vehicle Travel Speed
  - Person Hours of Delay
    - **Average Occupancy – 20 persons**
- **Average Travel Time for important movements**
  - To and from Graham Transit Mall
  - To / From model edges

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MoE - Vehicles

- **Overall Model Performance**
  - Average Travel Speed
  - Unmet Demand
  - Person Hours of Delay
    - **Average occupancy – 1.24 persons**
- **Portage / Main Performance**
  - Intersection LOS
  - Average Vehicle Delay
- **Average Travel Time**
  - To / from model edges

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Evaluation Framework

- **Complex interaction of:**
  - 3 Modes
  - 11 MOEs
  - 31 individual measurements
  - 5 alternatives
  - 2 time periods
- **How do we assess this?**

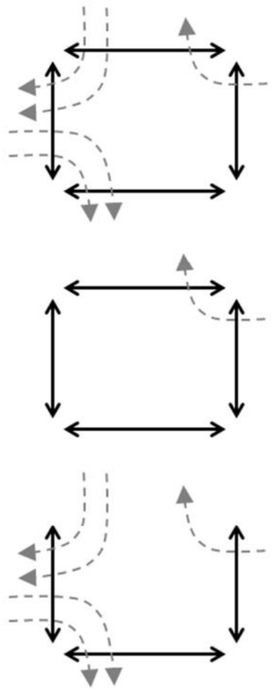
Evaluation Framework

- **Separated by mode**
- **Summary by MoE ‘Group’**
- **Fit on one 8.5 x 11” sheet**
- **Assign Green / Yellow / Red via professional judgement**

		Volume[1]	Existing		Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Automobiles	**Overall Model Performance**								
	Average Travel Speed (km/h)	-	20.4		15.0	10.4	12.1	15.5	15.5
	Unmet Demand	-	1		364	2,096	1,182	413	331
	Person Hours of Delay [2]		375		588	814	713	559	559
	Portage / Main Performance								
	Intersection Level of Service	-	B		E	F	E	D	D
	Intersection Avg Vehicle Delay (sec)	-	19.6		61.9	82.6	59.9	52.6	53.4
	Avg. Travel Time (min:sec)								
	Total	*6,240*	*0:25:44*		*0:50:31*	*1:11:20*	*0:59:48*	*0:38:18*	*0:38:57*
	Southbound Through	1,750	0:04:35		0:04:05	0:04:54	0:03:48	0:04:18	0:04:22
	Northbound Through	1,440	0:02:47		0:03:30	0:03:05	0:04:24	0:02:45	0:02:46
	Eastbound Left	860	0:02:23		0:03:33	0:05:40	0:04:49	0:04:22	0:04:31
	Eastbound Through	610	0:01:57		0:03:56	0:10:13	0:07:18	0:05:37	0:05:41
	Southbound Right	605	0:02:48		0:03:20	0:13:19	0:03:13	0:03:16	0:03:15
	Westbound Through	520	0:01:50		0:03:58	0:03:46	0:02:07	0:02:47	0:03:12
	Eastbound Right	280	0:04:44		0:06:00	0:11:04	0:09:10	0:07:26	0:06:55
	Westbound Right	130	0:02:41		0:10:23	0:10:29	0:04:41	0:07:47	0:08:15
	Northbound Right [3]	45	0:01:59		0:11:45	0:08:50	0:20:19	-	-
Pedestrians	**Safety**								
	Permitted Dual RT	-	-		Yes	No	Yes	Yes	Yes
	Avg. Travel Time (min:sec)		Able	Wheelchair					
	Total	*2,000*	*0:16:09*	*0:34:30*	*0:15:03*	*0:15:00*	*0:16:41*	*0:14:48*	*0:15:04*
	West Side	500	0:03:58	0:09:04	0:04:02	0:04:03	0:04:07	0:04:03	0:04:02
	East Side	500	0:04:45	0:08:01	0:03:53	0:03:54	0:03:57	0:03:43	0:03:58
	North Side [4]	500	0:03:51	0:09:08	0:04:07	0:04:04	0:05:31	0:04:02	0:04:03
	South Side	500	0:03:35	0:08:17	0:03:01	0:03:00	0:03:06	0:03:01	0:03:01
Transit	**Overall Model Performance**								
	Average Travel Speed (km/h)	-	10.3		8.0	4.4	5.6	8.2	8.6
	Person Hours of Delay [2]	-	550		757	1,229	1,098	710	671
	Avg. Travel Time (min:sec)								
	Total	*251*	*1:05:11*		*1:24:02*	*1:49:28*	*1:40:04*	*1:17:38*	*1:15:59*
	From Graham to North	44	0:09:19		0:15:30	0:11:48	0:22:33	0:09:31	0:09:21
	From Graham to South	39	0:07:03		0:06:14	0:06:39	0:08:09	0:06:16	0:06:04
	From North to Graham	31	0:08:47		0:09:27	0:17:15	0:10:33	0:09:51	0:09:49
	From South to Graham	16	0:04:30		0:04:43	0:07:33	0:06:57	0:05:03	0:04:52
	Eastbound Right	40	0:07:33		0:08:56	0:11:50	0:12:24	0:09:19	0:09:01
	Eastbound Left	25	0:06:32		0:07:47	0:11:30	0:10:49	0:08:31	0:08:01
	Northbound Left	24	0:06:18		0:06:37	0:07:57	0:07:25	0:06:53	0:06:53
	Westbound Through	11	0:04:30		0:12:34	0:12:25	0:06:04	0:09:09	0:09:28
	Southbound Right	11	0:06:17		0:06:53	0:13:34	0:07:00	0:06:54	0:06:53
	Eastbound Through	10	0:04:23		0:05:22	0:08:56	0:08:10	0:06:11	0:05:38

Alternative Analysis

- **Two Phases**
  - Phase 1: Three City Alternatives
    - **Variation of signal phasing and openings**
    - **Scramble pedestrian phase not feasible**



Alternative 1: Similar to existing signal phasing with the addition of pedestrian crosswalks on all four sides.

Alternative 2: Remove the permitted signal phases for dual right turns (SBR and EBR) when pedestrian crossing is permitted across those legs

Alternative 3: Same as #1 but no pedestrian crosswalk on the north side

Pedestrian crosswalk

Permitted right-turn across crosswalk

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Phase 1 Results

Mode	Realm	AM Peak Hour			PM Peak Hour		
		Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
Pedestrians	Safety						
	Travel Time						
Transit	Model Performance						
	Travel Time						
Automobiles	Model Performance						
	Portage / Main						
	Travel Time						

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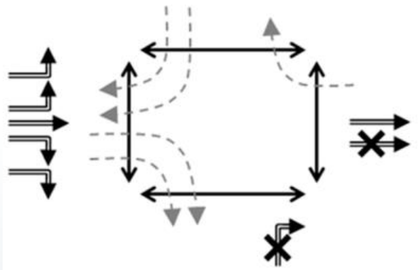
Phase 1 Results

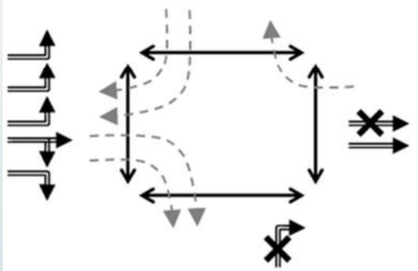
- **Able-bodied travel times**
  - Essentially unchanged vs. existing
- **Crossing for wheelchairs or mobility impaired**
  - 50-60% reduction from existing crossing time
  - No reliance on mall being open and lifts being operational
- **Small delays to transit vehicles = 25% to 90% increase in person delay**

Phase 2 Alternatives

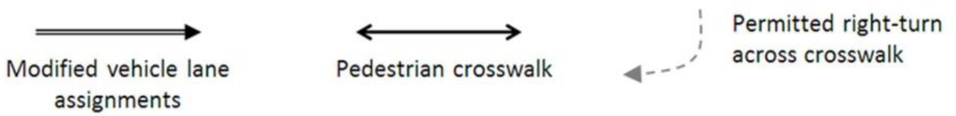
- **Alternative 1 as a base**
- **Modifications to:**
  - Lane assignments
  - Turning prohibitions



Alternative 4: Similar to existing signal phasing with the addition of pedestrian crosswalks on all four sides. Eliminate northbound right turn. Eliminate curb lane on eastern leg leaving the intersection. Re-allocate eastbound approach lanes.



Alternative 5: Similar to existing signal phasing with the addition of pedestrian crosswalks on all four sides. Eliminate northbound right turn. Eliminate median lane on eastern leg leaving the intersection. Re-allocate eastbound approach lanes.



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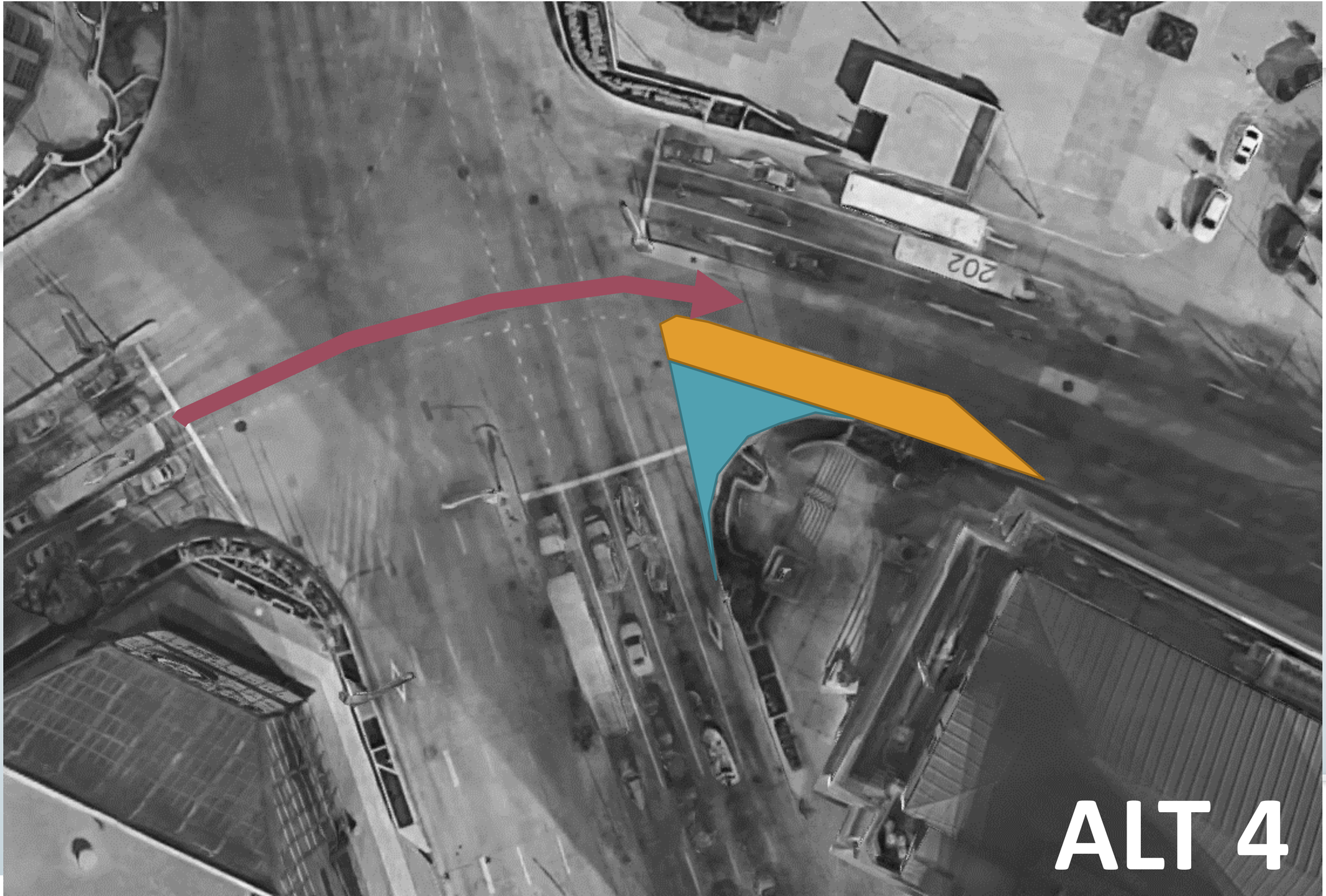
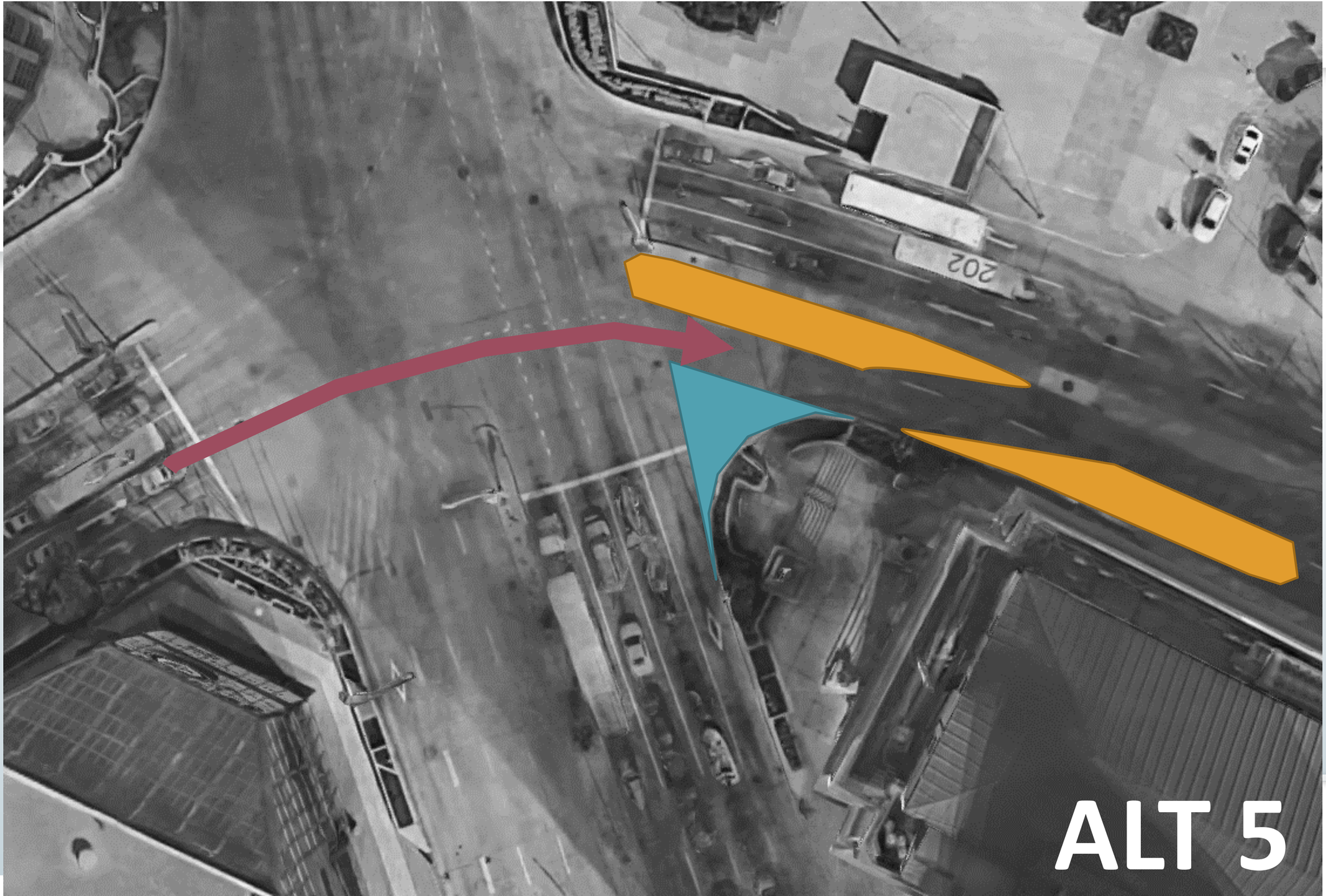

202
ALT 4


202
ALT 5

Phase 2 Results

Mode	Realm	AM Peak Hour		PM Peak Hour	
		Alt 4	Alt 5	Alt 4	Alt 5
Pedestrians	Safety				
	Travel Time				
Transit	Model Performance				
	Travel Time				
Automobiles	Model Performance				
	Portage / Main				
	Travel Time				

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Phase 2 Results

- **Improved operations all around from Alternative 1**
  - Person-hours of delay far reduced
- **No significant difference between Alternative 4 and 5**
  - Minor transit difference
- **Minor to moderate effect on transit and cars versus existing**

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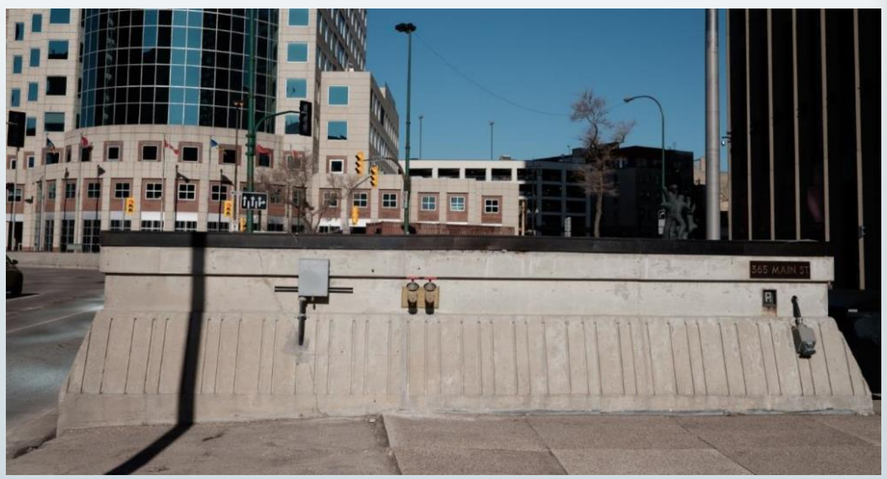
Phase 2 Results

- **Alternative 4 was preferred**
  - Contiguous pedestrian space
  - Better transit performance
- **Further testing**
  - Leading Pedestrian Intervals
  - Pedestrian volume sensitivity

Safety and Risk Analysis

- All four crossings should be opened to create a ‘typical’ intersection
- Risk to pedestrians is over zero, but no different than at other intersections
- Leading Pedestrian Interval recommended, used at Main & Broadway
- Current barrier walls have dangerous blunt ends



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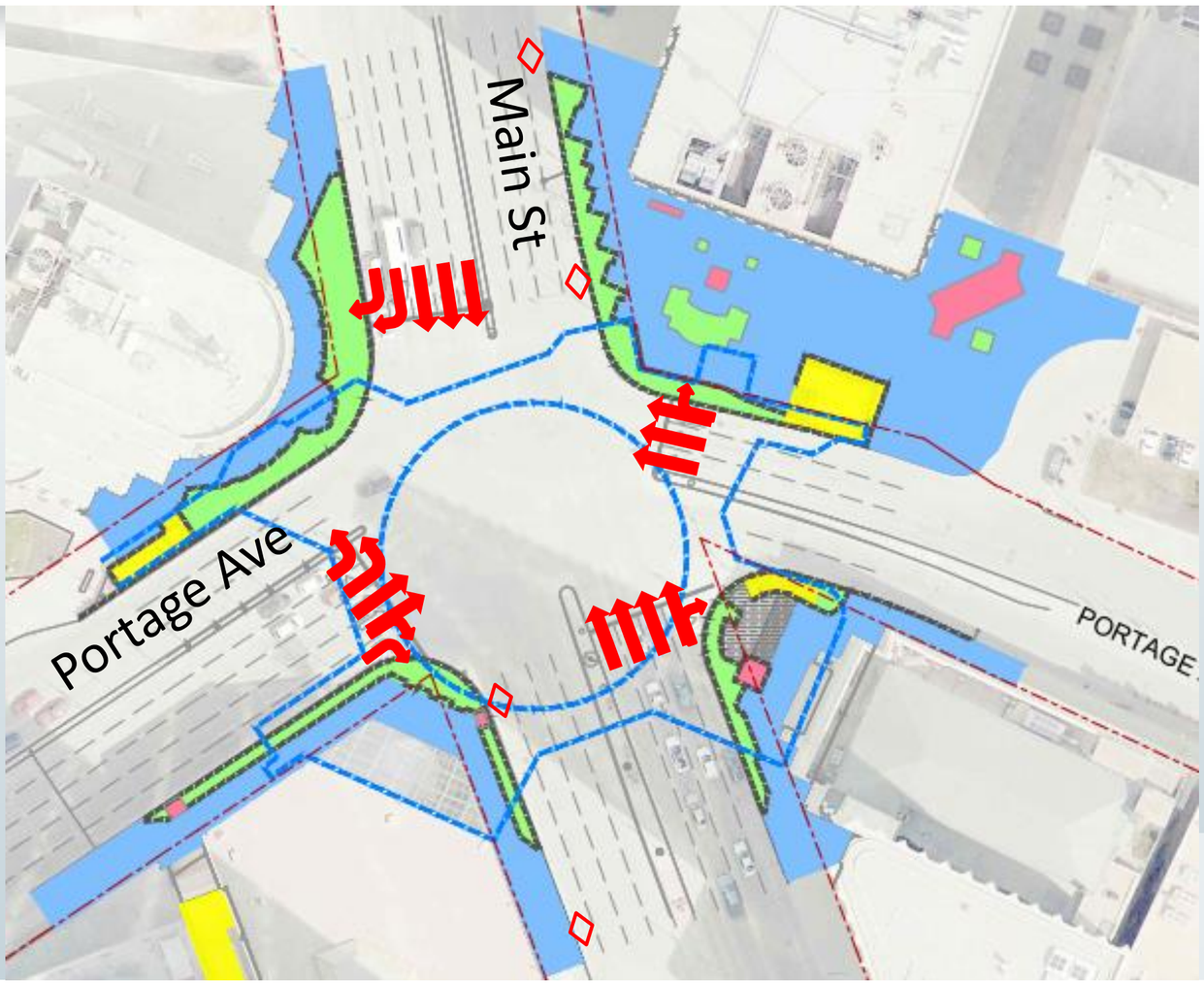
Conceptual Design



- **Existing configuration**

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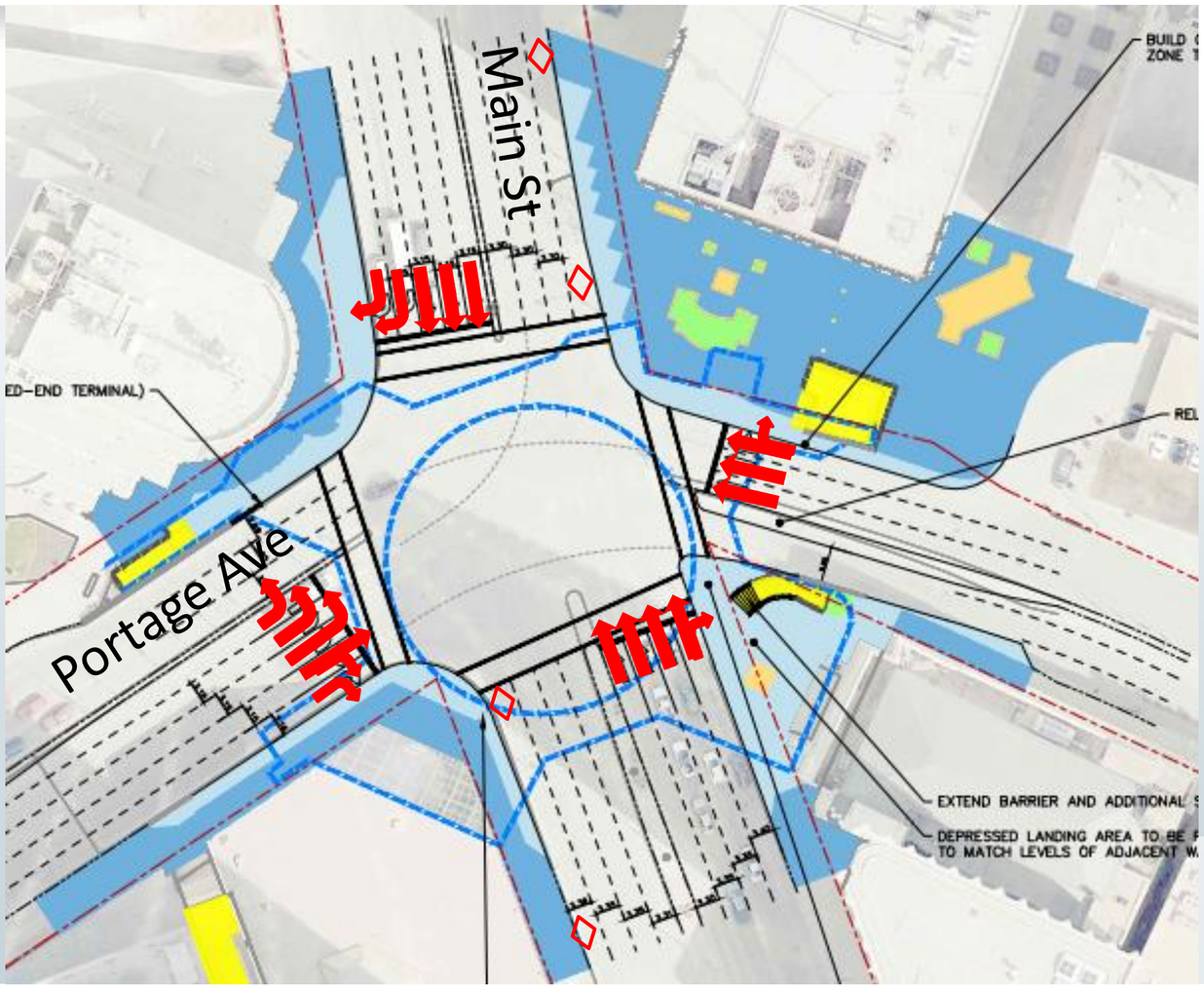
Conceptual Design



- **Option with triple EB left-turn**
- **Reduce to one thru lane on EB Portage**
- **Expand sidewalk in SE corner around sunken stairs**

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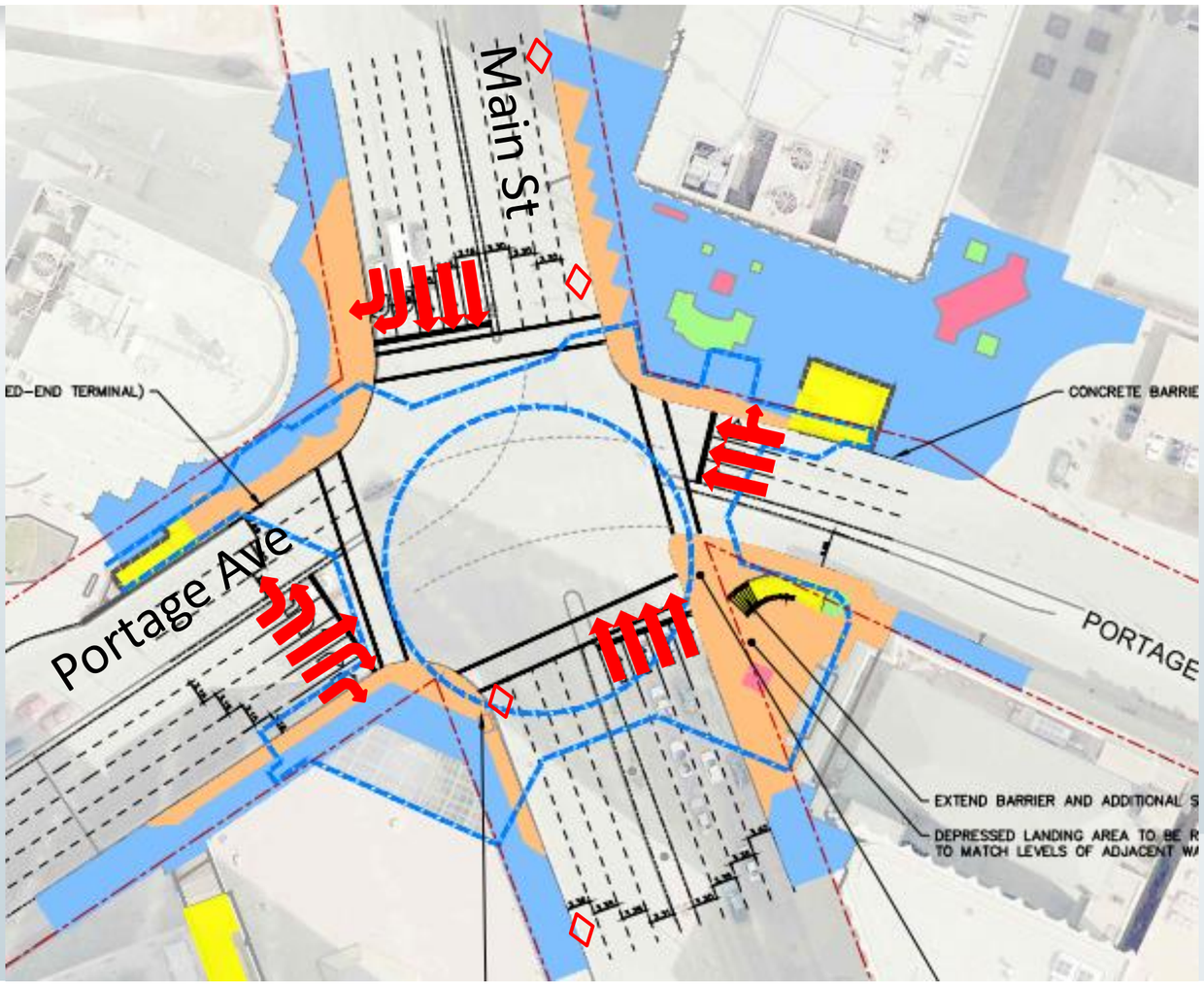
Conceptual Design



- **Recommended option**
- **Reduce to one thru lane on EB Portage**
- **Expand sidewalk in SE corner around sunken stairs**
- **Eliminate NB right-turn**

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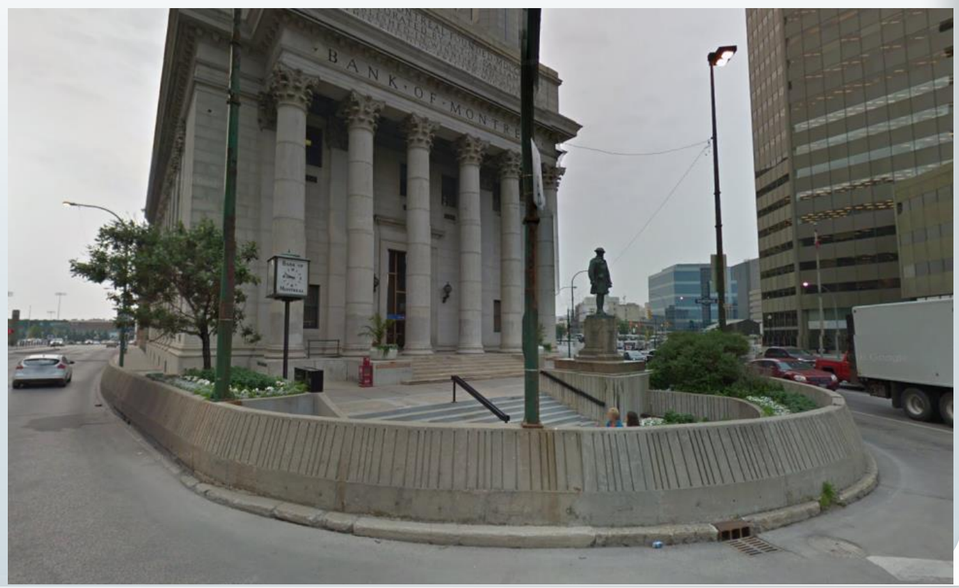
Conceptual Design



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Conceptual Design

- **Construction cost $6.1M**
- **Transit capital cost $5.5M**
- **Signature streetscaping extra**

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What Happens Next?

- City of Winnipeg has agreement with all property owners to reopen the intersection to pedestrians
- Putting out RFP for a holistic preliminary design of the intersection

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Questions?

- **Show video**

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