Runway Maintenance

Predicting Community Impacts

Cynthia Woods
Toronto Pearson

Toronto Pearson is Canada‘s busiest airport, located in one of the fastest growing cities in North America and Canada’s most populous region.

There were 35.6m passengers and 336,800 aircraft movements in 2022 which is approximately 70% of pre-pandemic levels.

Toronto Pearson is operated by the Greater Toronto Airports Authority, a not for profit, private company.

Envirosuite Products

ANOMS 9

WebTrak

InsightFull

OPAS

Agenda

- Complexities – Runways & Communities
- Case Study – Runway 06L/24R Project
- Looking Forward

Complexities

Runways & Communities

Too Many Runways!

Toronto Pearson has five runways

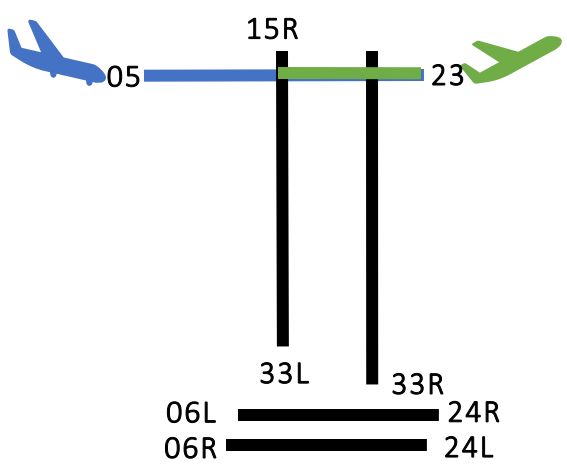
- Two north-south runways:
  - Runway 15L/33R
  - Runway 15R/33L

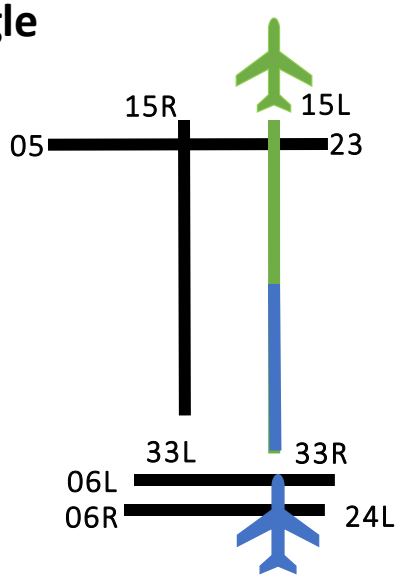
- Three runways east-west runways:
  - Runway 05/23
  - Runway 06L/24R
  - Runway 06R/24L

- Runways can be used from both ends, so while there are five runways, there are 10 operational ends for arrivals and departures
- ~ 90% east/west
- ~10% north/south

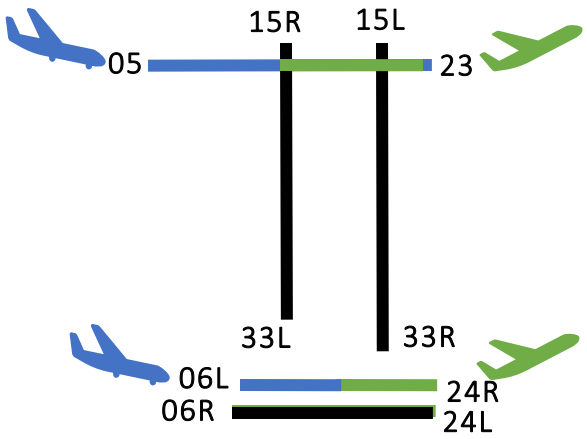
Runway Configurations – ‘it’s complicated’

Single

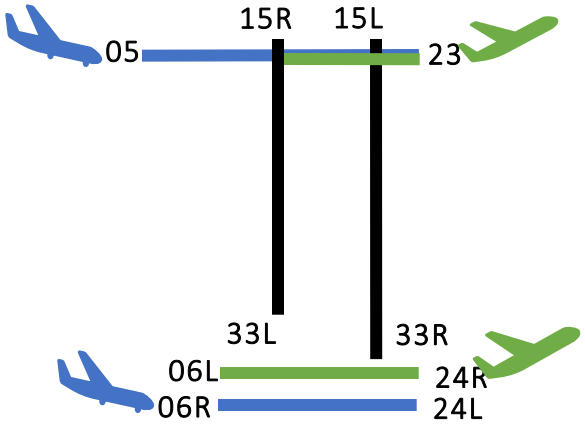




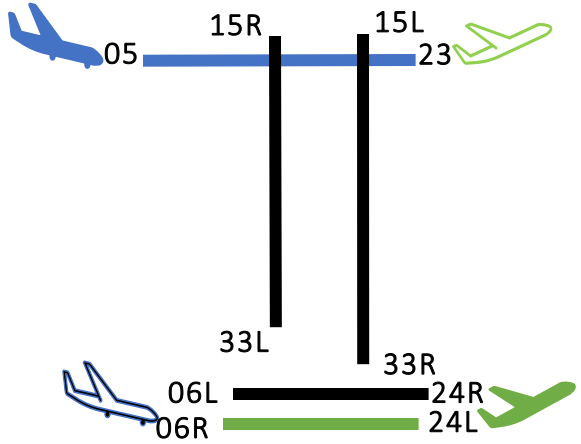
Dual

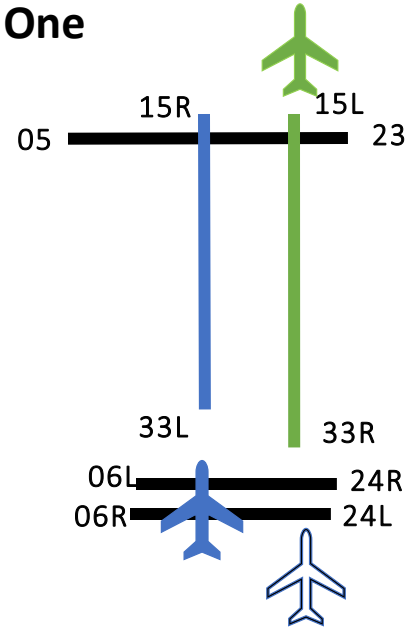


Triple

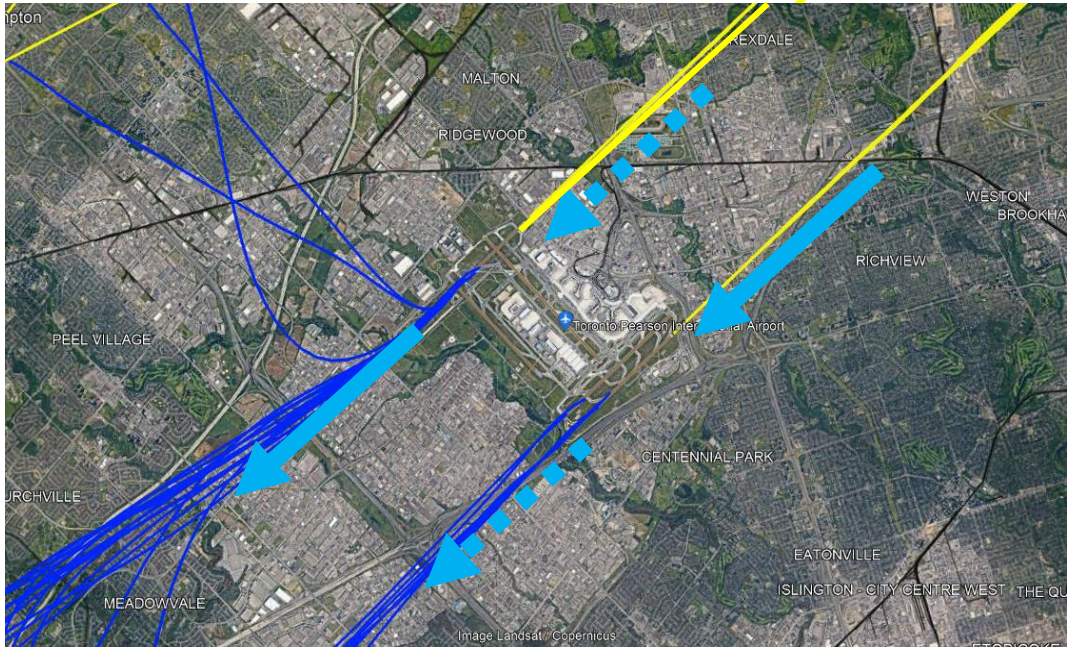


Land One, Depart One

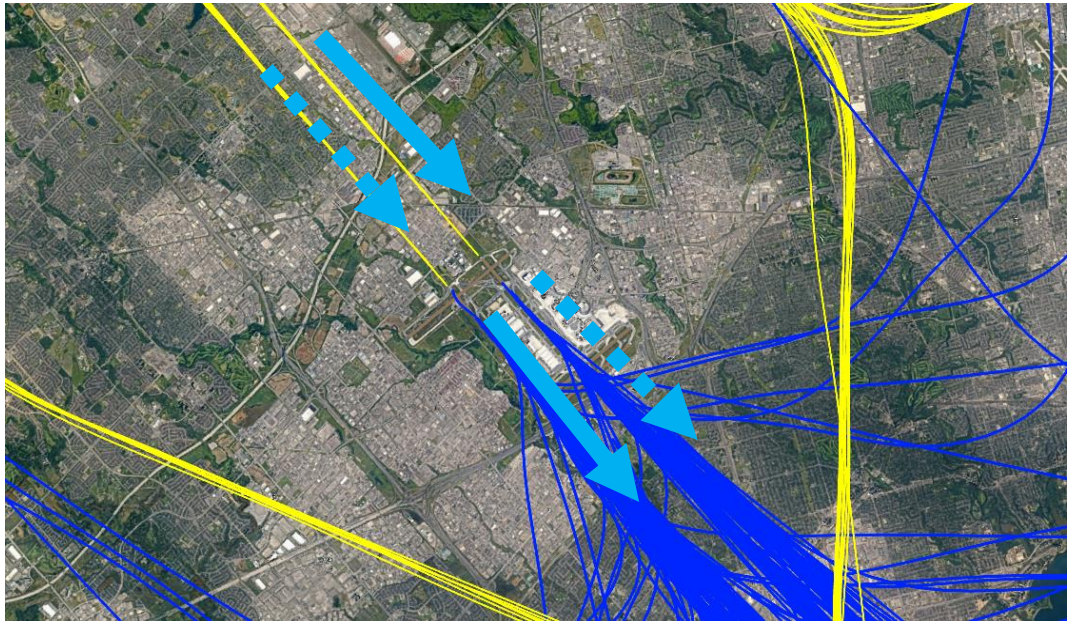


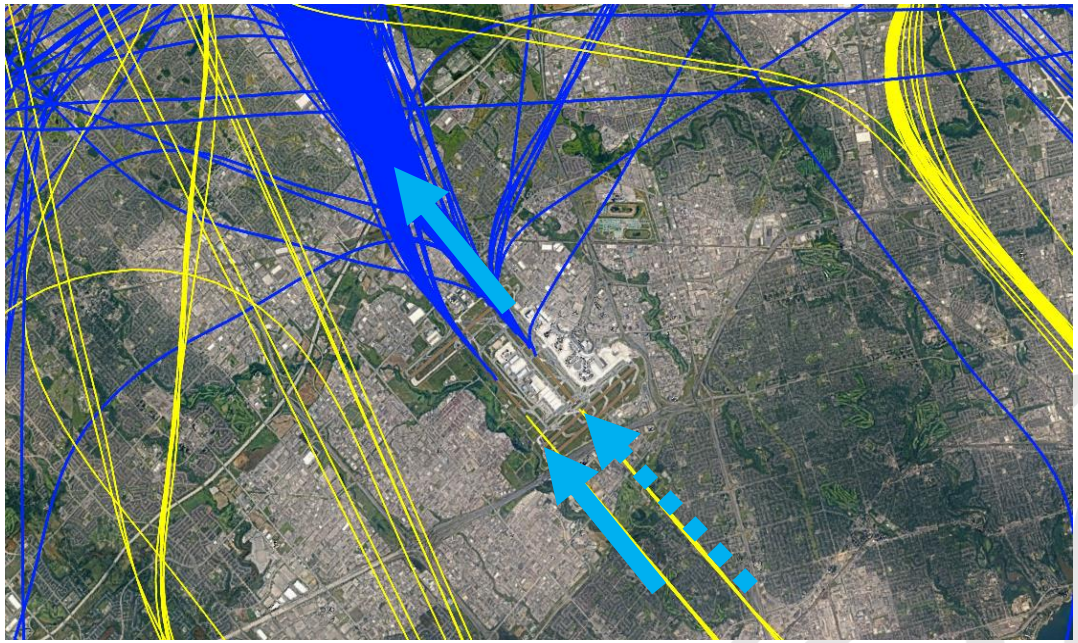


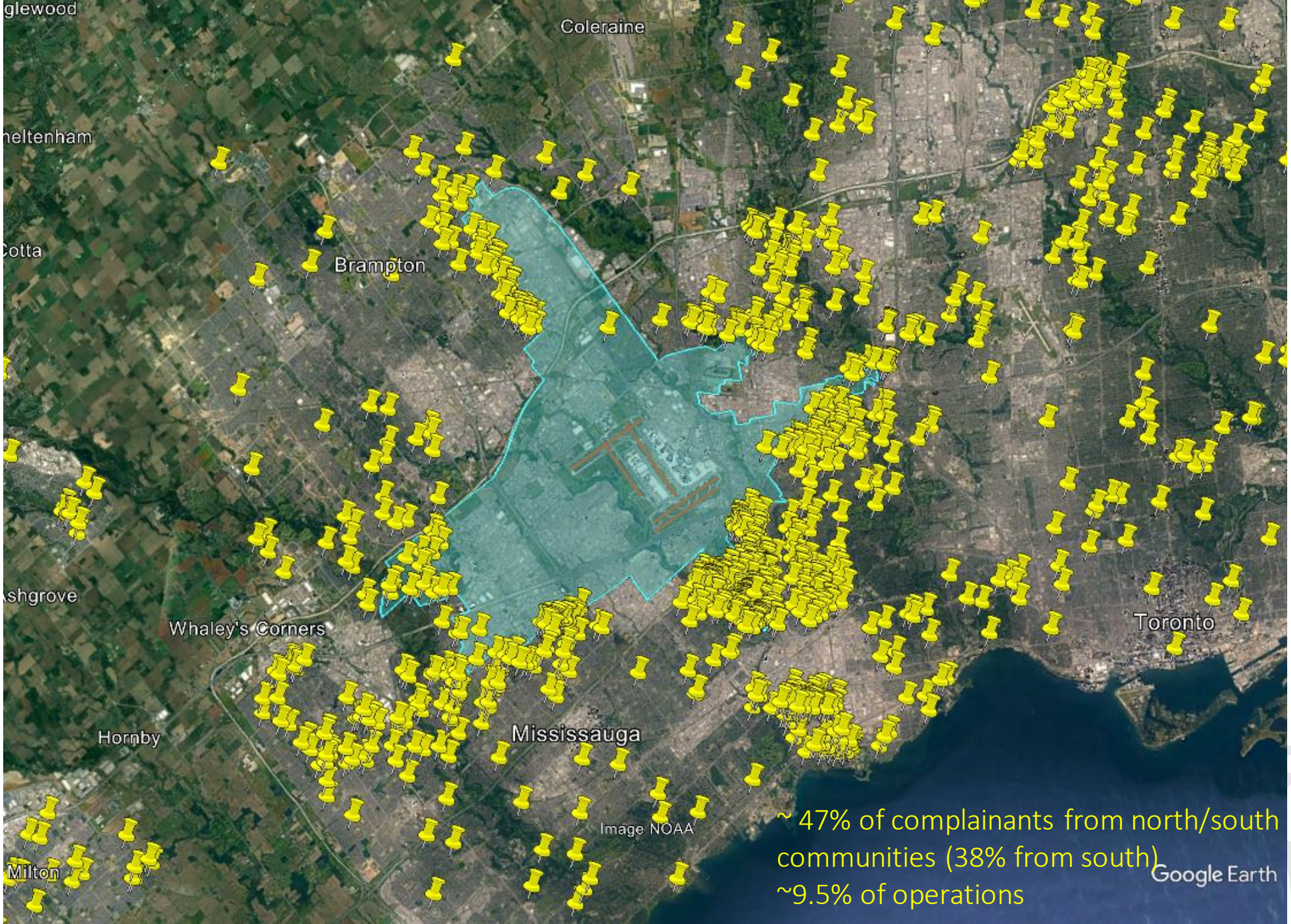
East/West configurations



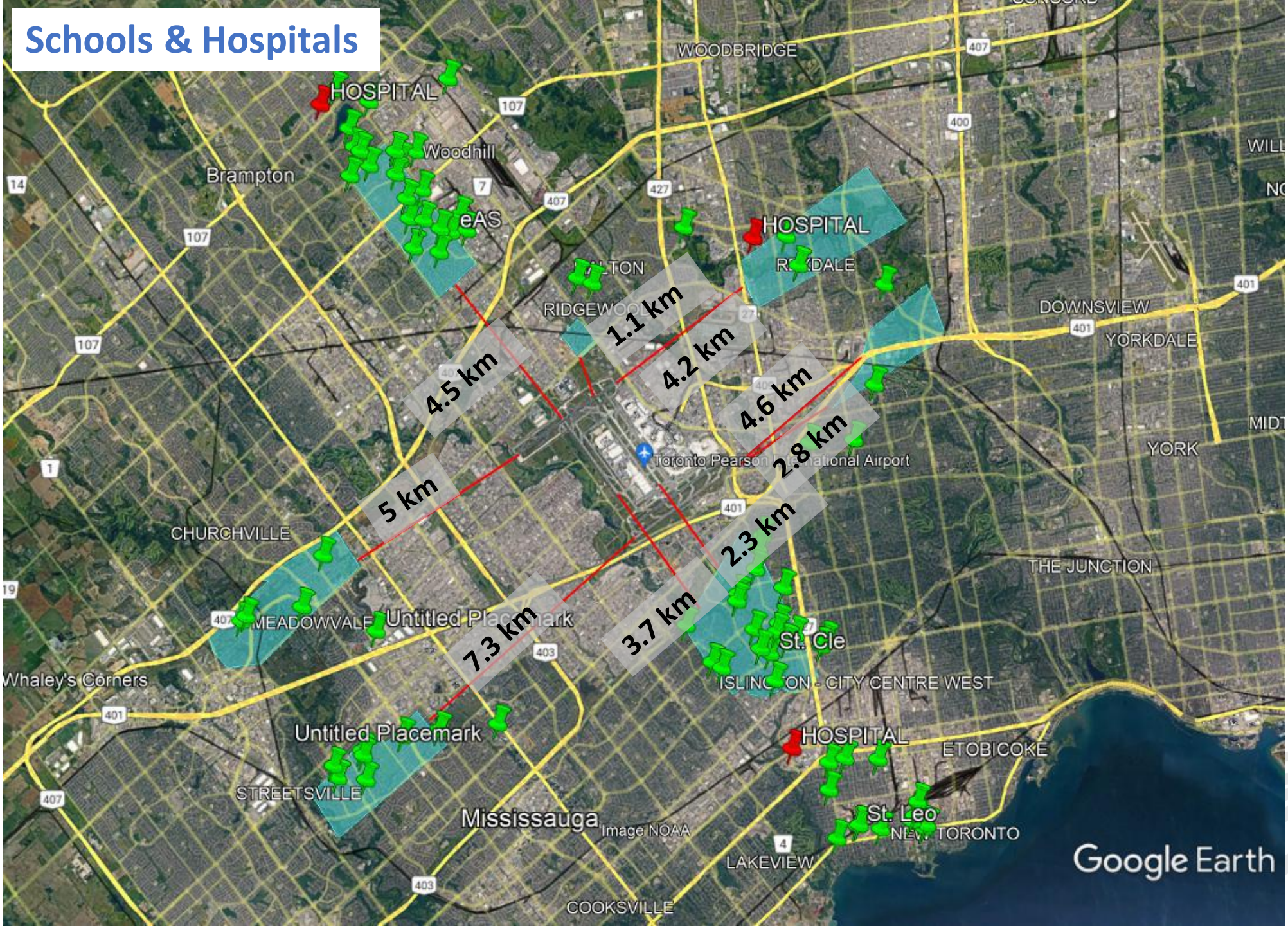
North/South configurations






Coleraine
Brampton
Whaley's Corners
Hornby
Mississauga
Toronto
Milton
Image NOAA
Google Earth
~ 47% of complainants from north/south communities (38% from south)
~9.5% of operations

Schools & Hospitals



Great Expectations

Local communities and elected officials expect and deserve notice and details on maintenance projects with major changes to community impacts.

2017's Runway 05/23 closure led to an unexpected and massive shift in distribution of traffic, with a 680% increase in north/south operations. The extent of this change was not predicted or communicated.

We needed to overhaul how we assess and consult on maintenance projects!

Case Study

2022 Runway 06L/24R Rehabilitation Project

06L/24R

- On April 4, 2022 Toronto Pearson began an eight-month rehabilitation of 06L/24R, the airport's second-busiest runway.
- Full depth replacement of the runway followed by a lighting upgrade.

Phase 1 April to late June – west end of runway end and adjacent holding bay.
Phase 2 from Late June – mid September middle of section of the runway
Phase 3 mid September to mid November, east end of the runway and the adjacent holding bay

Just the Facts

We needed to be part of the conversation early and gather information:

1. What is happening?
2. When is it happening?
3. How will the configurations change, including primary versus secondary runway use?
4. Will the impacts change throughout the project?
5. Will our nighttime operations be affected?
    - Preferential runway system
    - Night flights
    - Power run locations

One Step at a Time

PROJECT STARTS

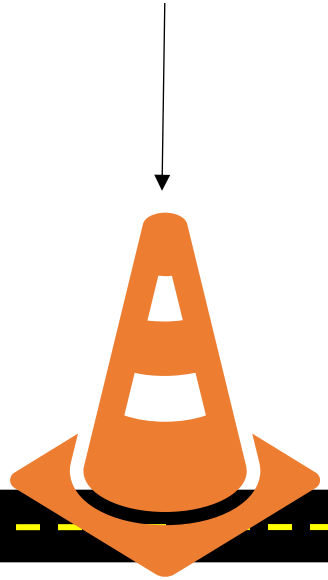
12-18 months Project announced

1 year Project working group regular meetings

6 months Consultation & Comms Plan built. High level comms to elected officials and communities begins

4 months refined assessment of throughput and schedule identifies likely configurations

3 months onward Geo-targeted outreach



1 year Initial assessment of potential community impacts Is this a big deal?

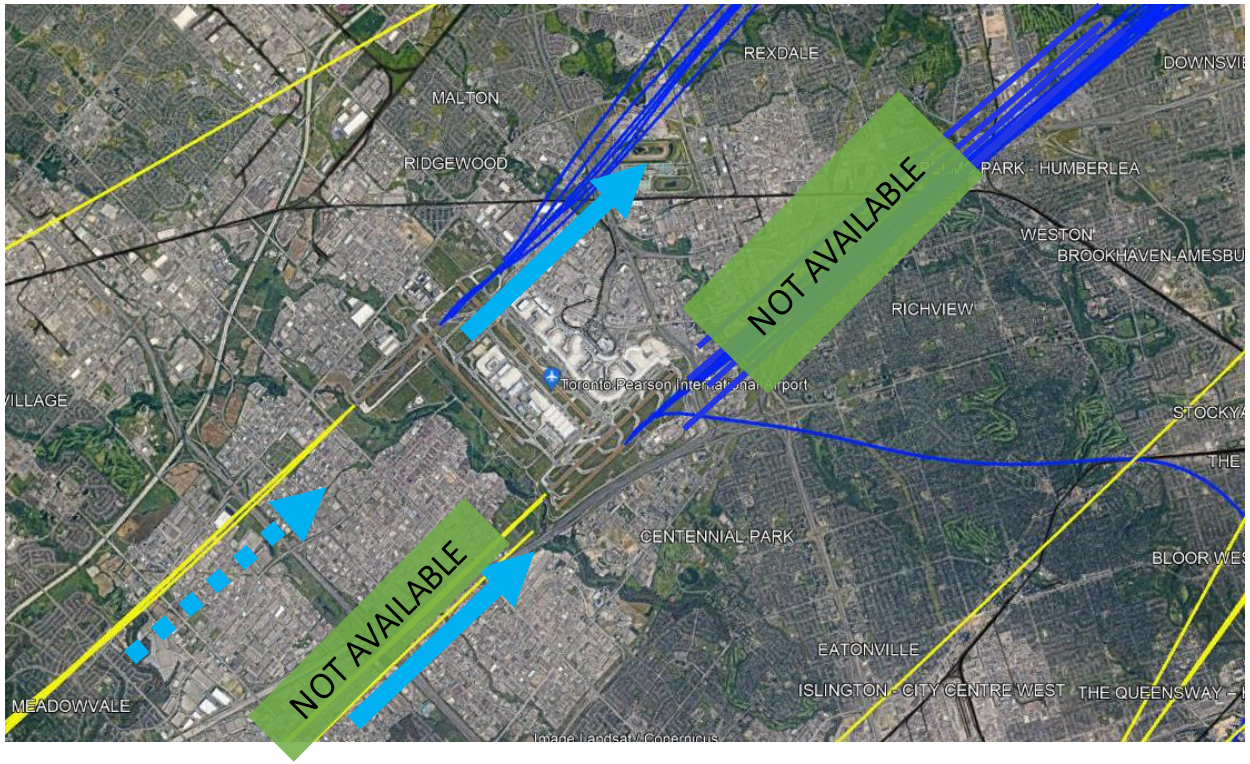
6-7 months Airport Stakeholder feedback and operational mitigations e.g. reduced schedule, timing of project

5-6 months Refined project plan based on feedback

3-4 months Community Impact analysis to inform geo-targeted consultation

Phase 1 - East/West Configurations

Easterly configuration – Runways 05, 06R



Westerly configuration – Runways 23

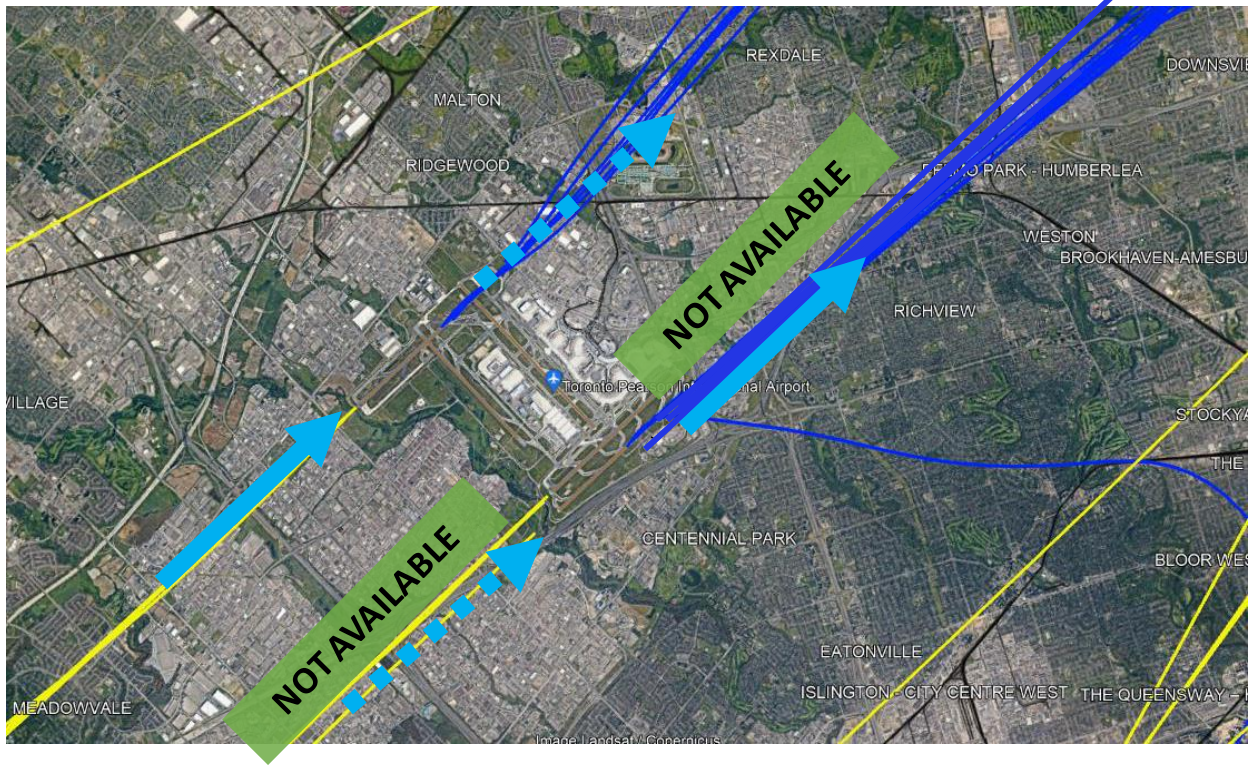
Primary arrival or departure runway

Secondary arrival or departure runway

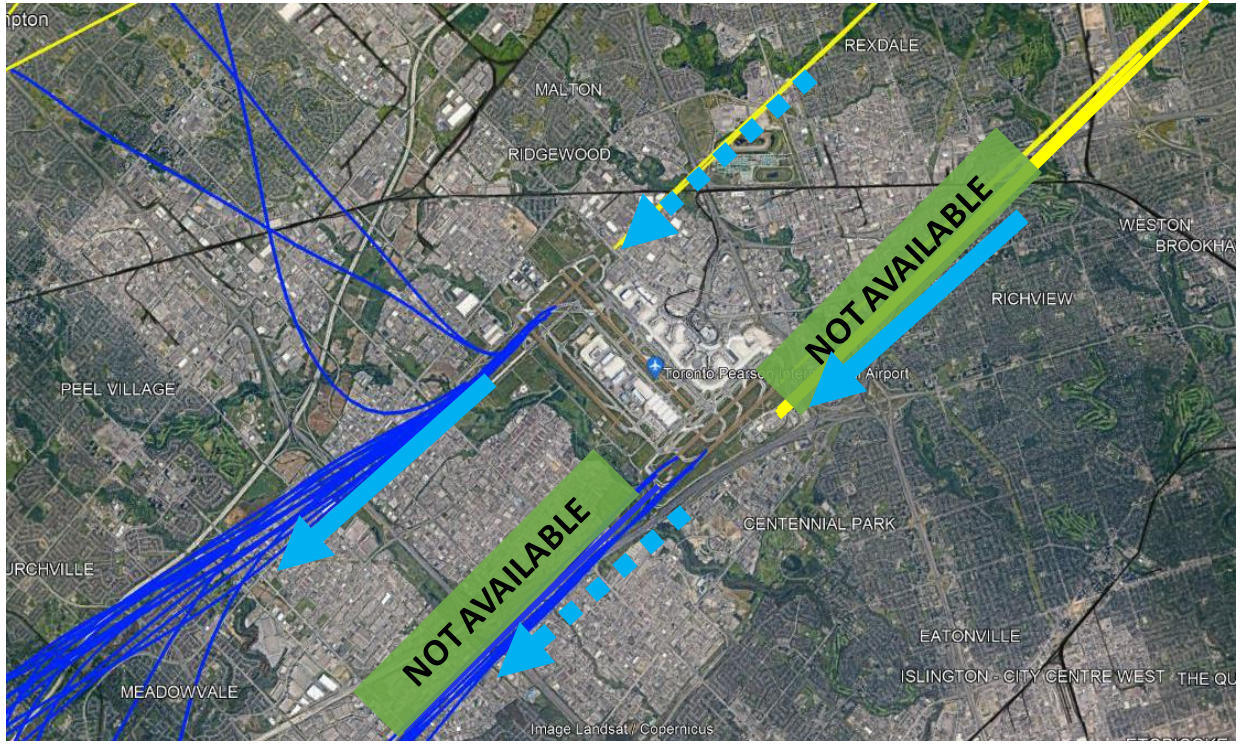
Opposite of typical primary/secondary runway use

Phase 2 & 3 - East/West Configurations

Easterly configuration – Runways 05, 06L, 06R



Westerly configuration – Runways 23, 24L & 24R

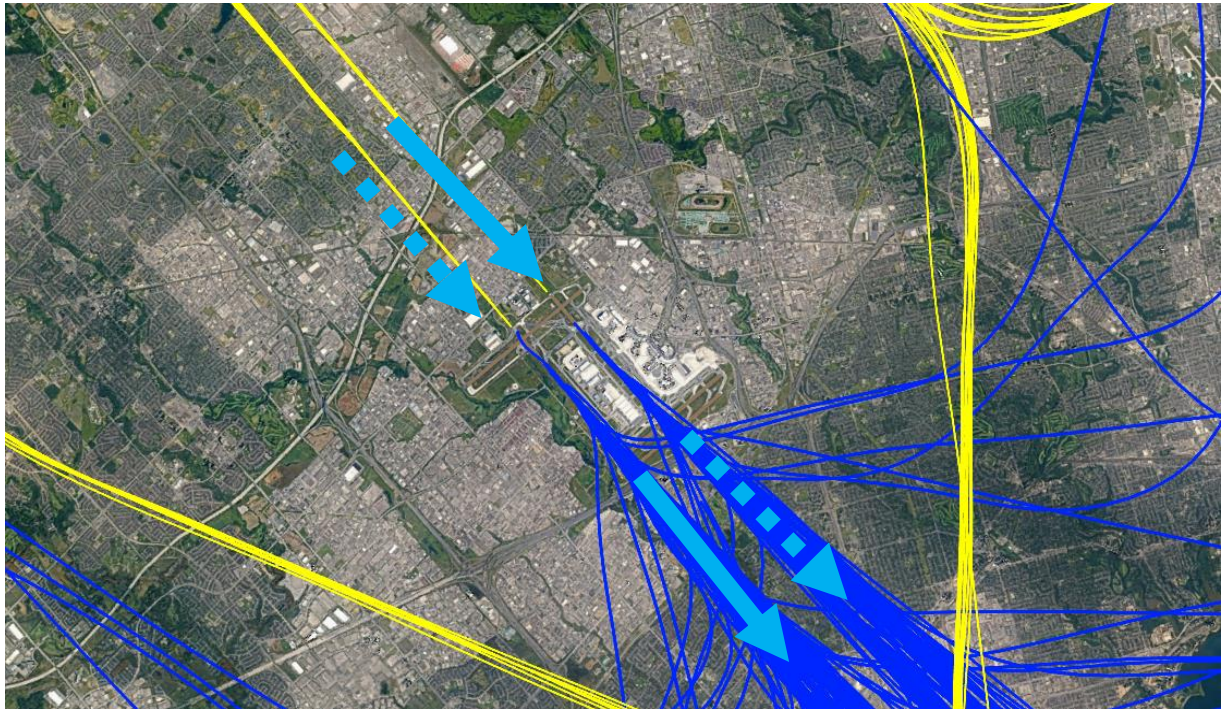


Primary arrival or departure runway

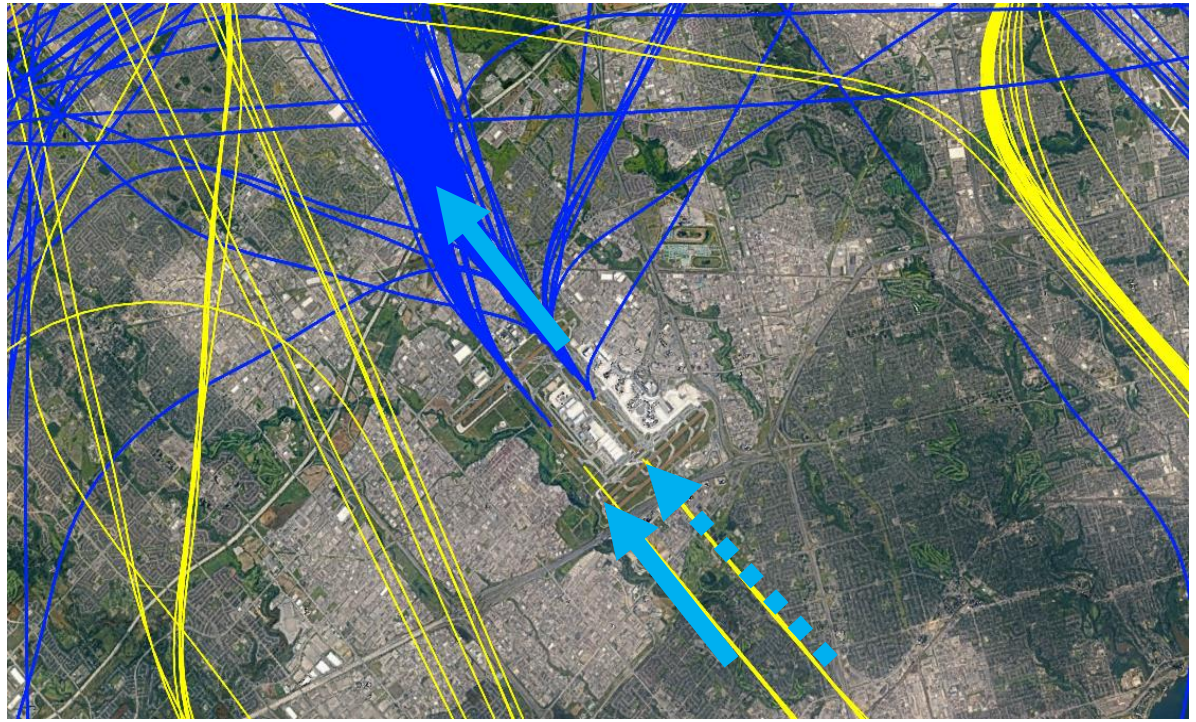
Secondary arrival or departure runway

Phase 1, 2 & 3 – North/SouthConfigurations

Southerly configuration – Runways 15L & 15R



Northerly configuration – Runways 33L & 33R

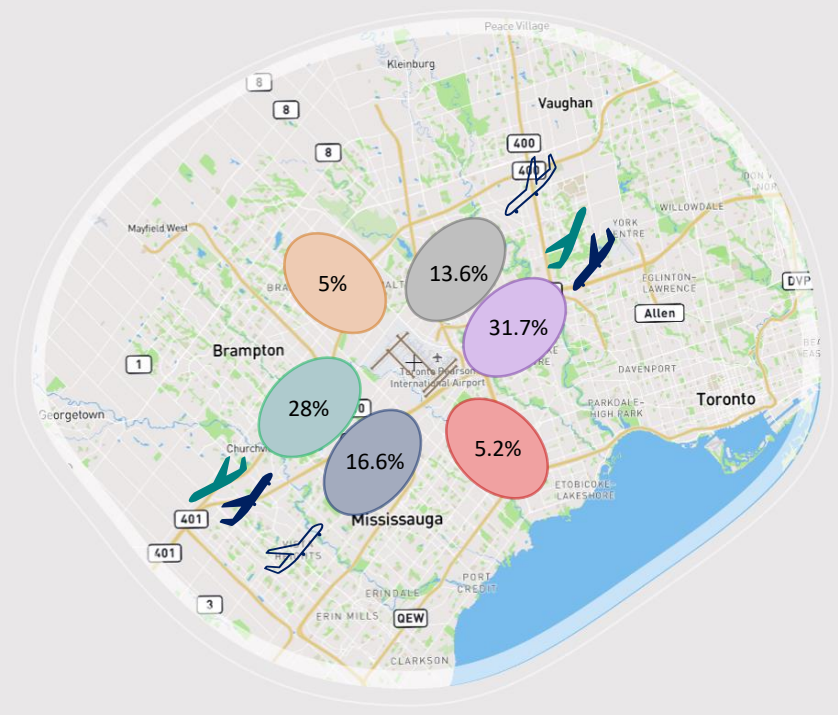


Primary arrival or departure runway

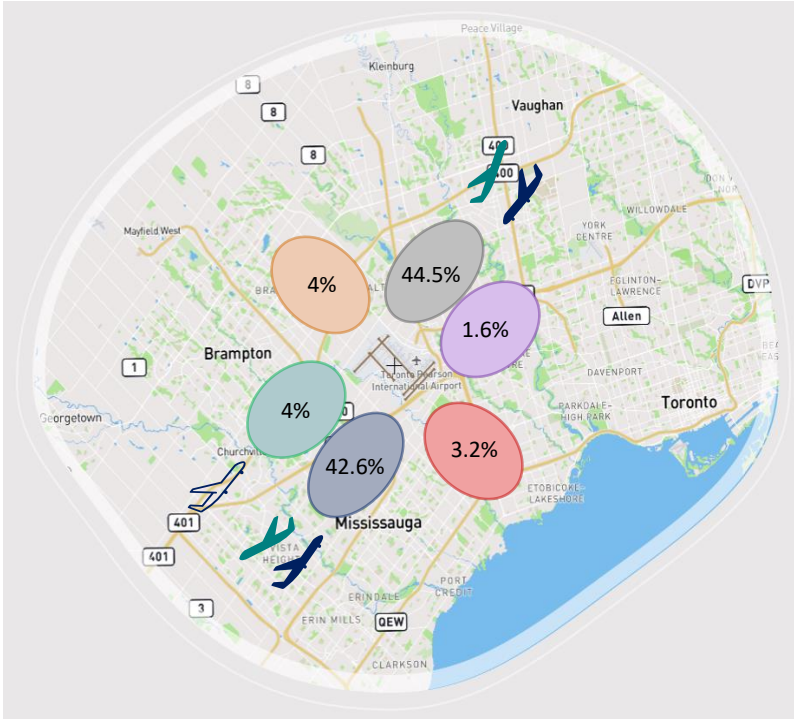
Secondary arrival or departure runway

Traffic Distribution Changes

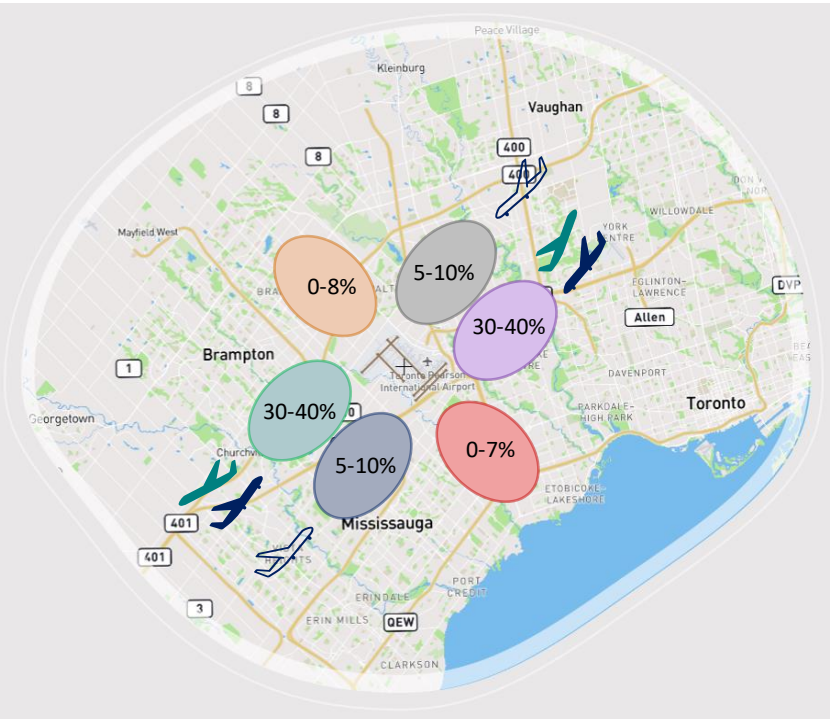
2019



Phase 1

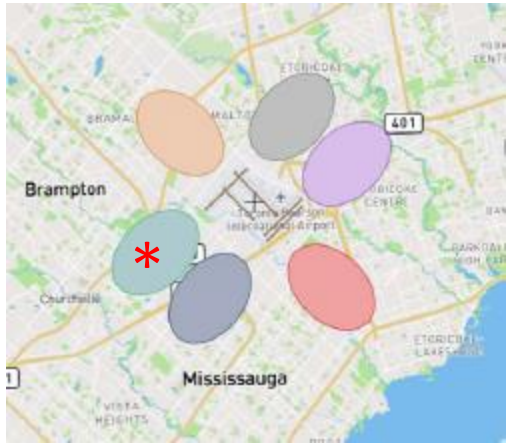


Phase 2 & 3



- 2019 was used as a base year for comparison as it was the last full year of regular operations prior to the pandemic
- sustained North/South operations were not expected due to the workplan and an adjusted airline schedule
- available east/west runways would be used, however the traffic distribution differs from typical operations
  - Typical operations (2019 example) - areas to the northwest and southeast experience the most traffic
  - Phase 1 – traffic was expected to be concentrated to the northeast and southwest
  - Phase 2 & 3 – traffic similar to typical operations with areas to the northwest and southeast experiencing the most traffic, some North/South operations expected in Phase 3

NORTHWEST DOWNWIND



- Brampton, Malton
- Maple/Vaughan, Richmond Hill, Thornhill, Rexdale
- Midtown Toronto, North York, Weston, Markham
- Etobicoke-Lakeshore, Alderwood, Long Branch, Markland Wood
- Meadowvale, Alderwood, Erin Mills, Streetsville, Clarkson, Port Credit, Oakville
- * Brampton, Georgetown, Milton, Meadowvale, Streetsville

MAR07-APR03	1,416
APR 4-MAY 1	980
	-436 Ops

SELAP

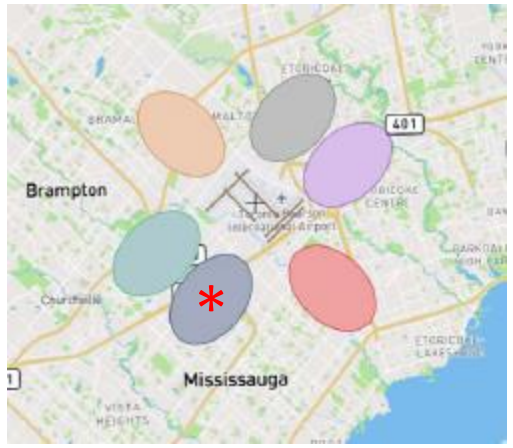
DUNOP

LITRO

DERLI

Ballinafad
Brampton
Toronto Pearson International Airport
Churchville
Acton
Rockwood
Mississauga
VISTA HEIGHTS
ERINDALE
ERIN MILLS
CLARKSON
Milton
Moffat
Campbellville
Aberfoyle
Morriston
Freelton
Carlisle
ORCHARD
BRONTE
HEADON FOREST
Oakville
125
410
401
7
3
1
40
19
20
6
97
QEW

SOUTHWEST DOWNWIND



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MAR 7-APR 3:	1,316
APR 4-MAY 1 '23	2,703
	+1,387 Ops

DARPU
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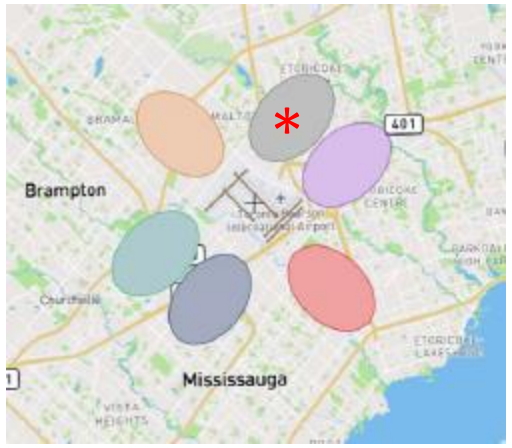

* Maple/Vaughan, Richmond Hill, Thornhill, Rexdale

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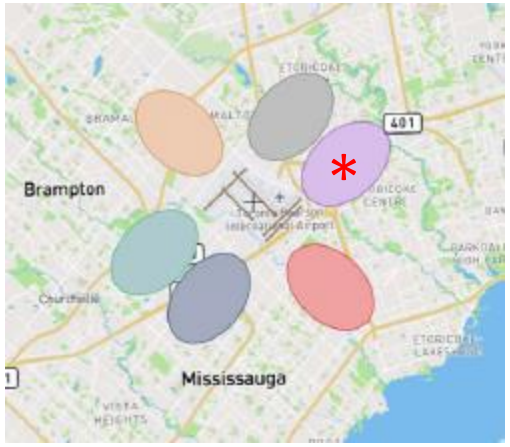
- Brampton, Georgetown, Milton, Meadowvale, Streetsville

MAR 7-APR 3	1,289
APR 4- MAY 1	2,597
	+1,308 Ops

NORTHEAST DOWNWIND

SATUR
MIPED
LEVIG
DAVIK
Stouffville
Claremont
OAK RIDGES
King City
Richmond Hill
VICTORIA SQUARE
GREENSBOROUGH
Peace Village
Markham
Kleinburg
Vaughan
SCARBOROUGH NORTH
SCARBOROUGH-ROUGE PARK
DON VALLEY NORTH
SCARBOROUGH-GUILDWOOD
WILLOWDALE
YORK CENTRE
SCARBOROUGH CENTRE
ETOBICOKE NORTH
MALTON
EGLINTON-LAWRENCE
Allen
SCARBOROUGH SOUTHWEST
BEACHES-EAST YORK
ETOBICOKE CENTRE
DAVENPORT
Toronto Pearson International Airport
Toronto
400
404
401
DVP
27
7
6
5

SOUTHEAST DOWNWIND



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- Brampton, Georgetown, Milton, Meadowvale, Streetsville

MAR 7-APR 3	2,841
APR 4-MAY 1	2,329
	-512 Ops

DUNOL
DAVNO
DEKNI
MAROD
DVP
Allen
Markham
Richmond Hill
Vaughan
Toronto
Toronto Pearson International Airport

How did we do?

What we got right

Quadrant	Phase 1		Phase 2 & 3	
	Predicted	Actual	Predicted	Actual
Northwest	4-6%	8.1%	30-40%	36.8%
Southwest	35-45%	37.5%	5-10%	7.3/%
Northeast	35-45%	39.8%	5-10%	11.2%
Southeast	1-3%	3.7%	30-40%	33.3%
North	4-6%	6.2%	0-8%	6.3%
South	2-4%	4.6%	0-.7%	4.6%

What we missed

- We hadn't expected a significant change in the downwind arrival phase. After hearing from residents from affected areas, we did some more analysis to determine level of change and geo-targeted consultation in affected areas
- One area was completed a few days earlier than the other work in phase 1 than we expected which prompted phase 2 impacts to start a few days earlier than predicted.

Putting the analysis to good use

- Able to identify reputational risks to organization

- Influencing Resourcing:
  - Executive support – including added headcount for duration of the project
  - Approved budget and endorsement of a comprehensive communications and consultation plan
  - Strong support from government relations, communications and digital teams
  - Involvement on project team

- Informing Community Outreach Efforts

Outreach Tactics

Outreach and Communications:

- dedicated website to keep community members informed about project updates
- ground-breaking ceremony with the Minister of Transportation, CEO of the GTAA, local elected officials, and senior members of our contractor and GTAA construction management team.
- monthly e-newsletters to a distribution list of approximately 12,000 subscribers, and regular e-newsletters to engaged stakeholders (Neighbourhood Table)
- "gamification" content on Instagram to add an element of fun – engaged close to 400 Instagram users.
- Four sets of geotargeted automated phone messages to over 165,000 households around the airport
- Mail drop postcards delivered by Canada Post to over 50,000 households
- Three full-page wrap print advertisements to over 500,000 local residents.
- Virtual briefings for elected officials, neighbourhood table members and residents
- Over 30 dedicated briefings with elected officials
- One on one briefings with residents
- Person of Pearson – employee profile of project team members

Goodwill gestures

- For the first time, Visa giftcards offered to residents affected by project
- Runway Rehab branded Ice cream truck sent to community events in most affected communities

Looking Forward

Prepare for stringent regulation

Bill C-52 introduced in June "to ensure accountability and transparency in the national transportation sector for Canadians" includes consultation requirements for permanent and *temporary* "alterations" to flightpaths.

Temporary alteration - "lateral positioning of a flight path being used by an aircraft operator below an altitude of 2438 metres (8000 feet) above ground level over a residential area;" for a period of less than one year.

Notice to be provided at least 60 days in advance of change and must include:

(a) the purpose of the alteration;
(b) the anticipated effect on noise levels;
(c) the general area that is likely to be affected;
(d) the number of residents who are likely to be affected;
(e) the proposed date of the implementation of the alteration;
(f) the proposed end date of the alteration;
(g) the name and contact information of the proponent;
(h) the contact information of the noise management committee; and
(i) any information prescribed by regulation.

Challenge to predict the future by looking to the past

- The expectation is growing for accurate and detailed predictions of changing community impacts due to maintenance, growth, new procedures.
- How can we better leverage ANOMS with its wealth of historical data on flight traffic patterns and levels, runway use, noise and complaints together with other tools and inputs?

Aspirational Impact Prediction Package

Past versus future - by runway operation, phase of flight, community, electoral district:

- Traffic distribution
- Traffic frequency
- Flight patterns
- Altitudes
- Complaints and Complainants
- Periods of respite
- Number of residents affected
- Number of noise events above 70, 75 and 80 dBA for each noise monitor (noise modeling for areas with no monitor would be a bonus)

Thank You!