TORONTO PEARSON FLIGHT PATHS

CONCEPTS FOR NOISE MITIGATION

GUIDING PRINCIPLES

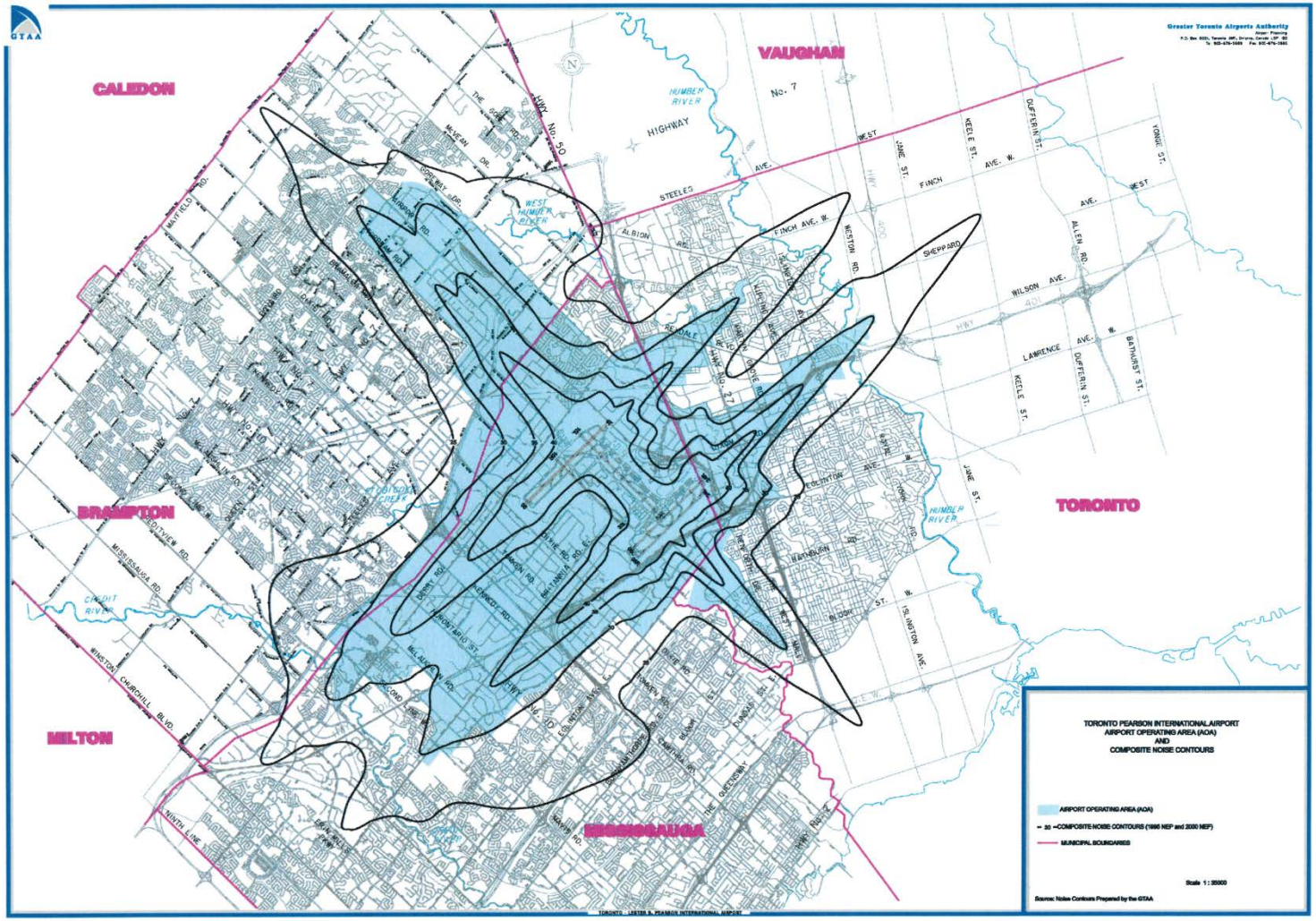
- Objectives:
  - Find opportunities to reduce the noise generated by Toronto Pearson arrivals and departures operating in proximity to residential areas
  - Investigate opportunities to shift flight paths to non-residential areas

- Understanding that:
  - Toronto Pearson is a Canada's largest airport and continued growth is forecast
  - All proposed solutions must be permitted in accordance with the appropriate regulatory framework. (CARs, AOA, Procedure Design Criteria etc.)
  - Safeguards in the system must be maintained or strengthened

GUIDING PRINCIPLES

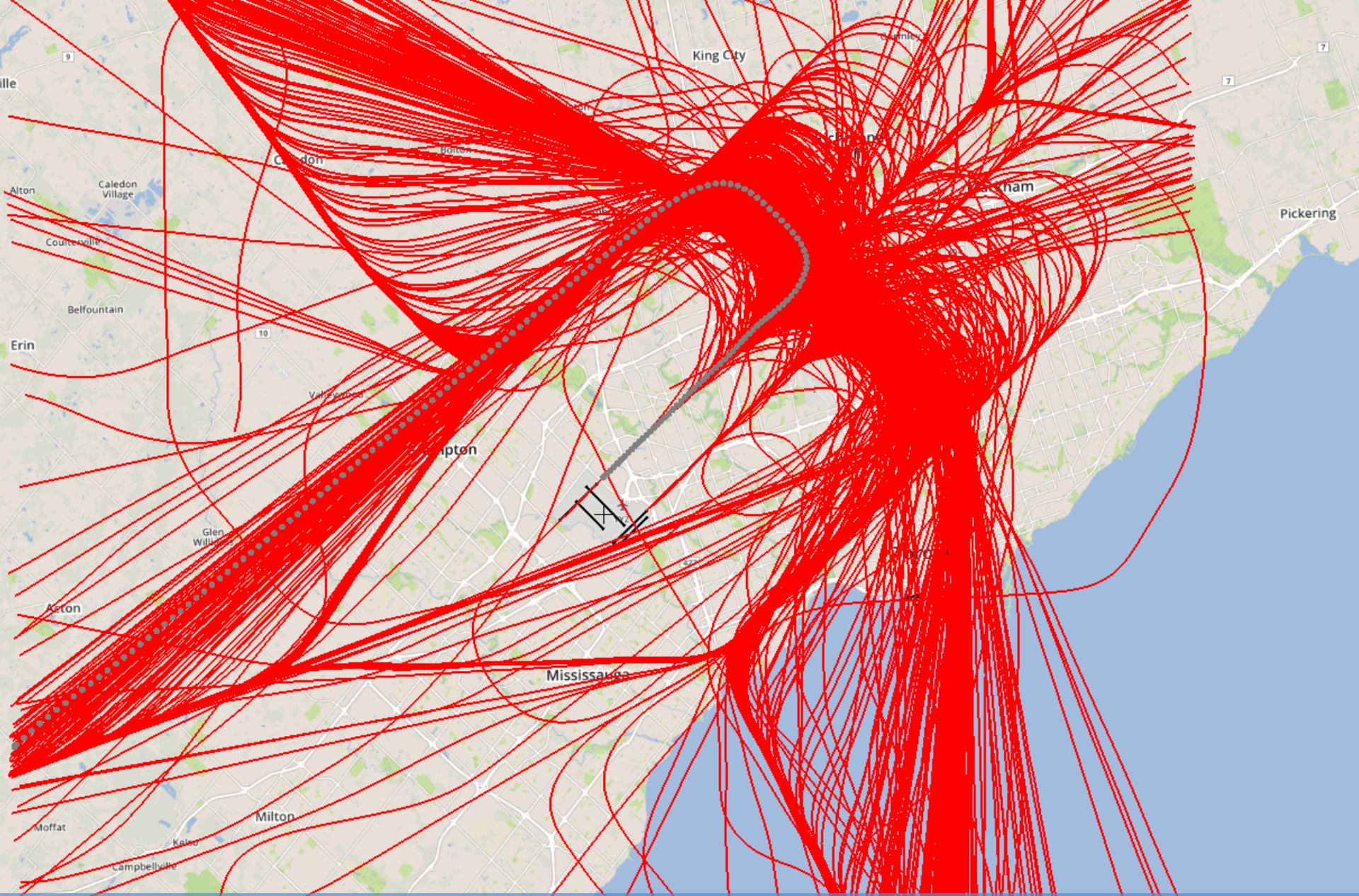
- Understanding that:
  - Night time noise mitigation initiatives are separate from, and not intended to effect, Pearson's unique night-time flight restriction programs
  - Community input is essential to guide the development and implementation of any potential noise mitigation strategies
  - Some mitigation options may be limited to periods of low traffic demand
  - Mitigation options which reduce capacity below current demand will not be considered
  - Noise mitigation options will consider both noise generation and frequency

AIRPORT OPERATING AREA



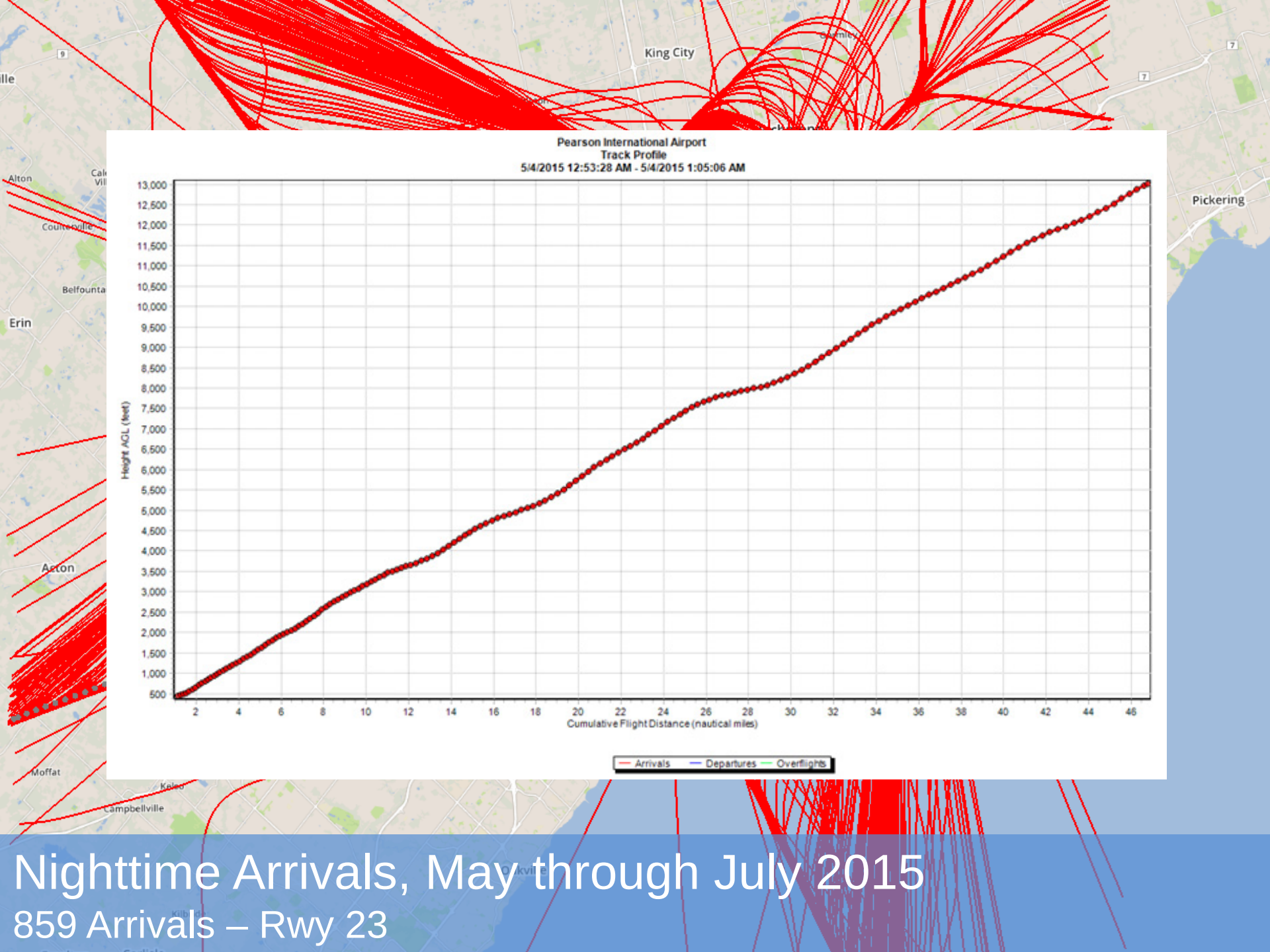
NAV CANADA

Toronto Pearson



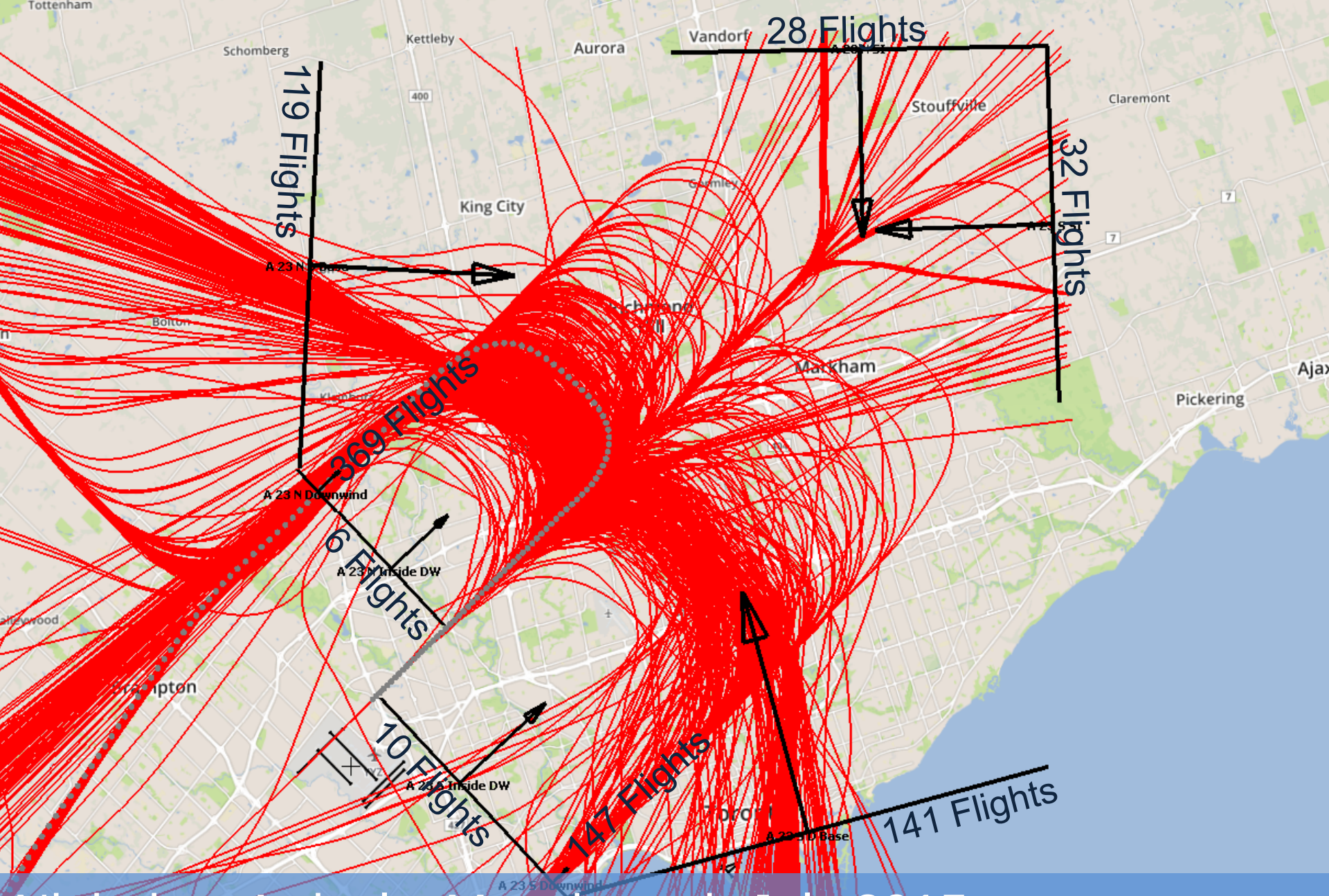
Nighttime Arrivals, May through July 2015

1097 Arrivals – Rwy's 24L/R & 23



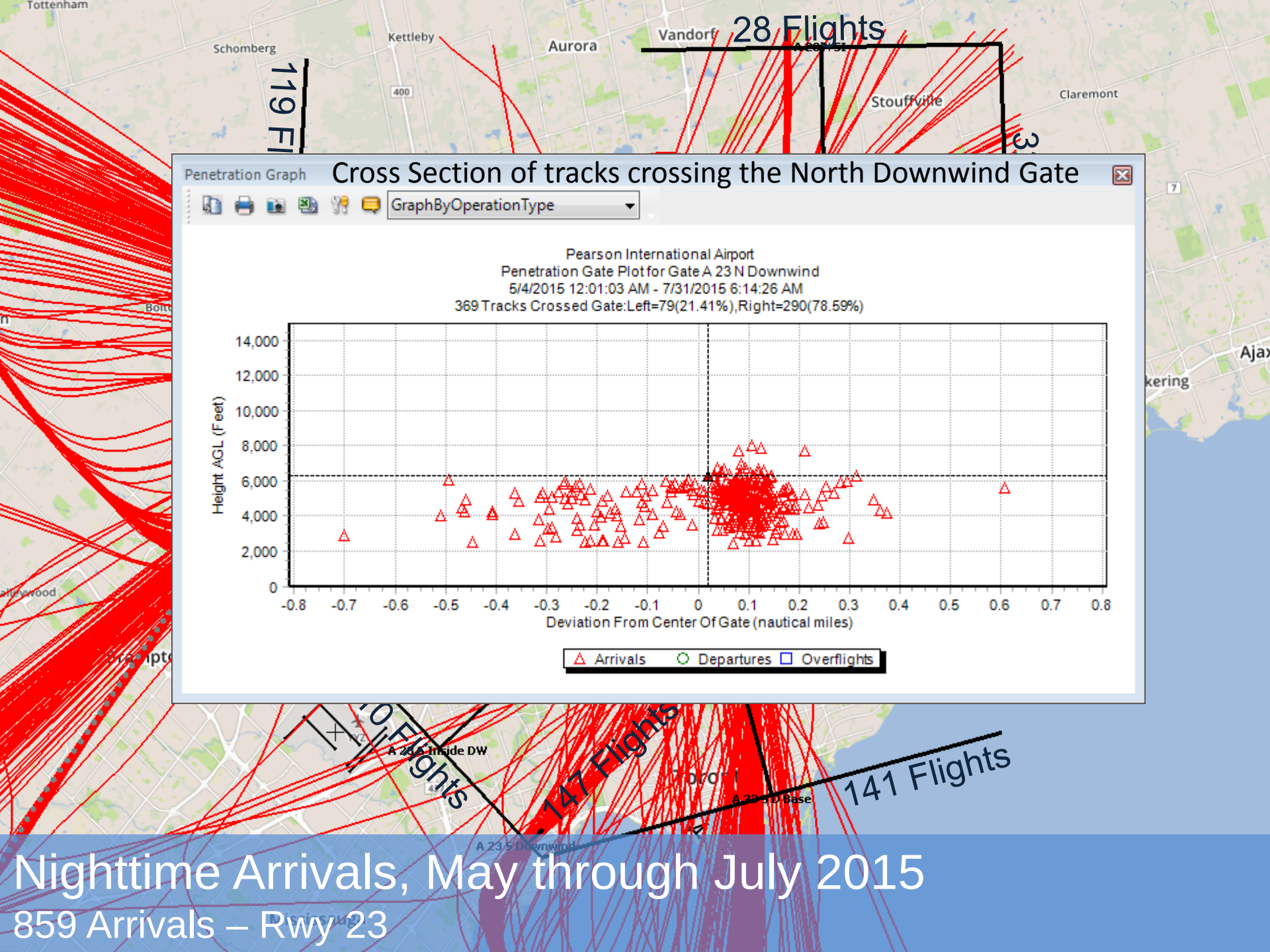
Nighttime Arrivals, May through July 2015

859 Arrivals – Rwy 23



Nighttime Arrivals, May through July 2015

859 Arrivals – Rwy 23

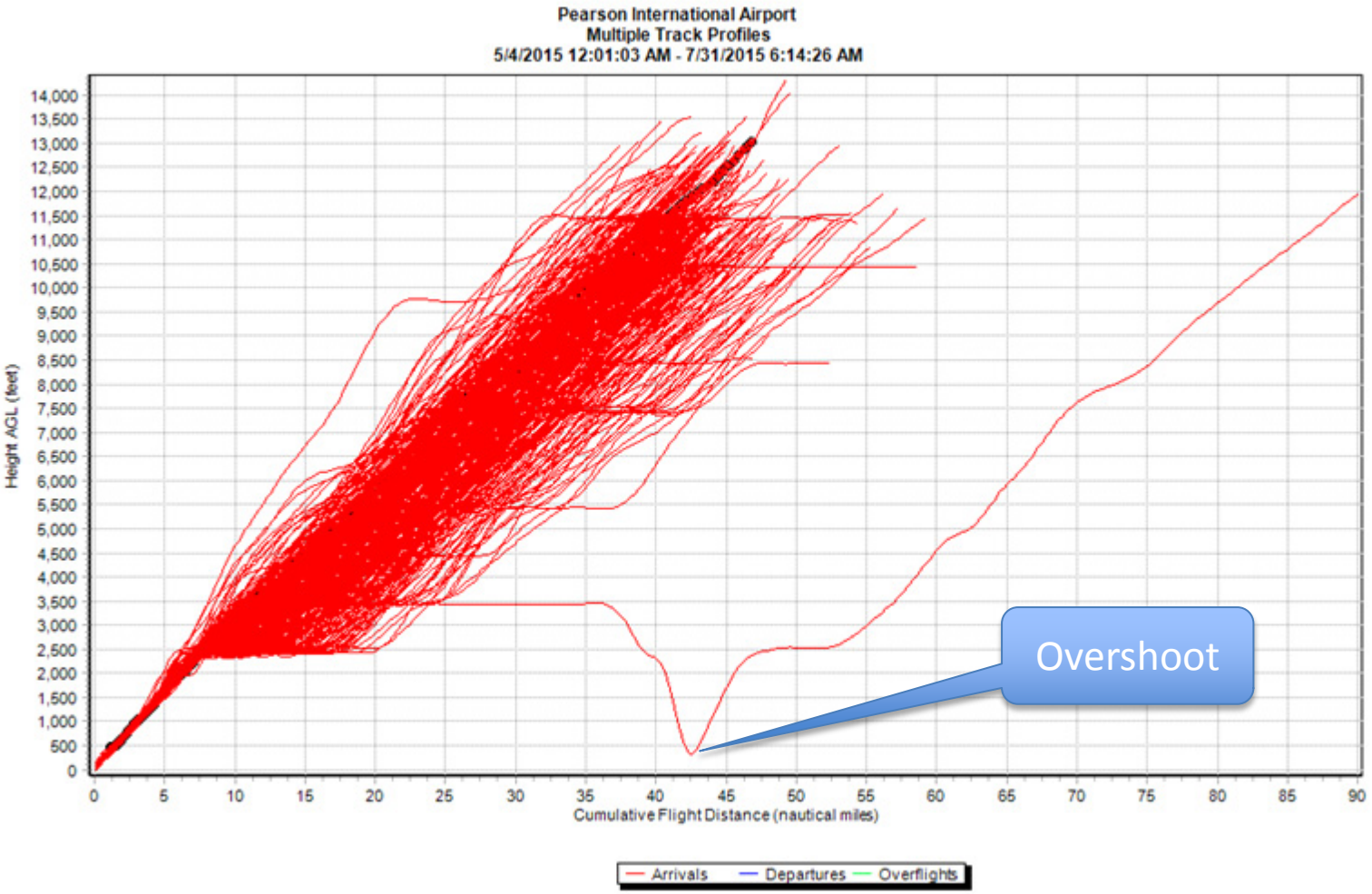


Nighttime Arrivals, May through July 2015

859 Arrivals – Rwy 23

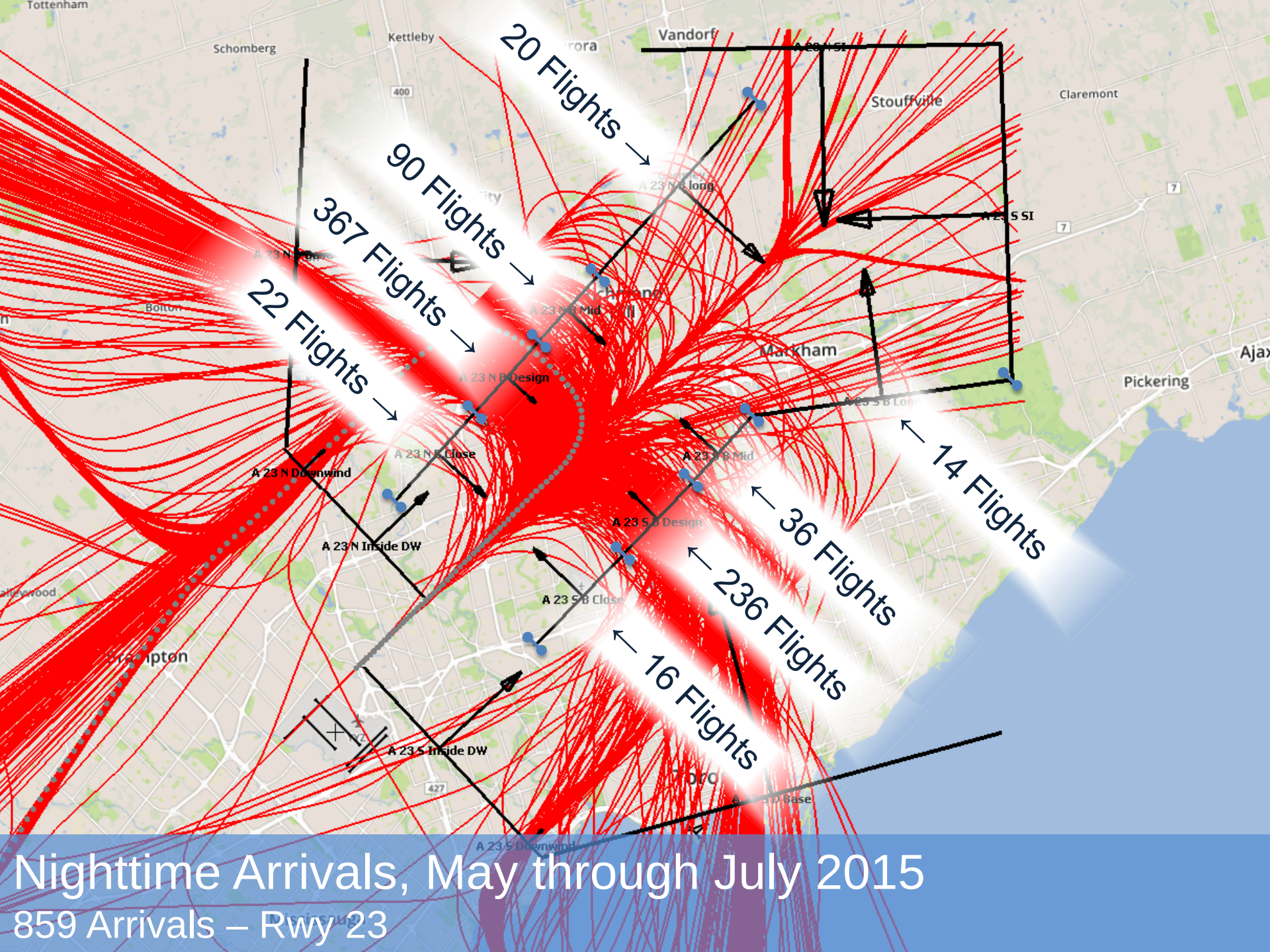
Tracks Only

Profile View of tracks in the North Downwind



Nighttime Arrivals, May through July 2015

859 Arrivals – Rwy 23

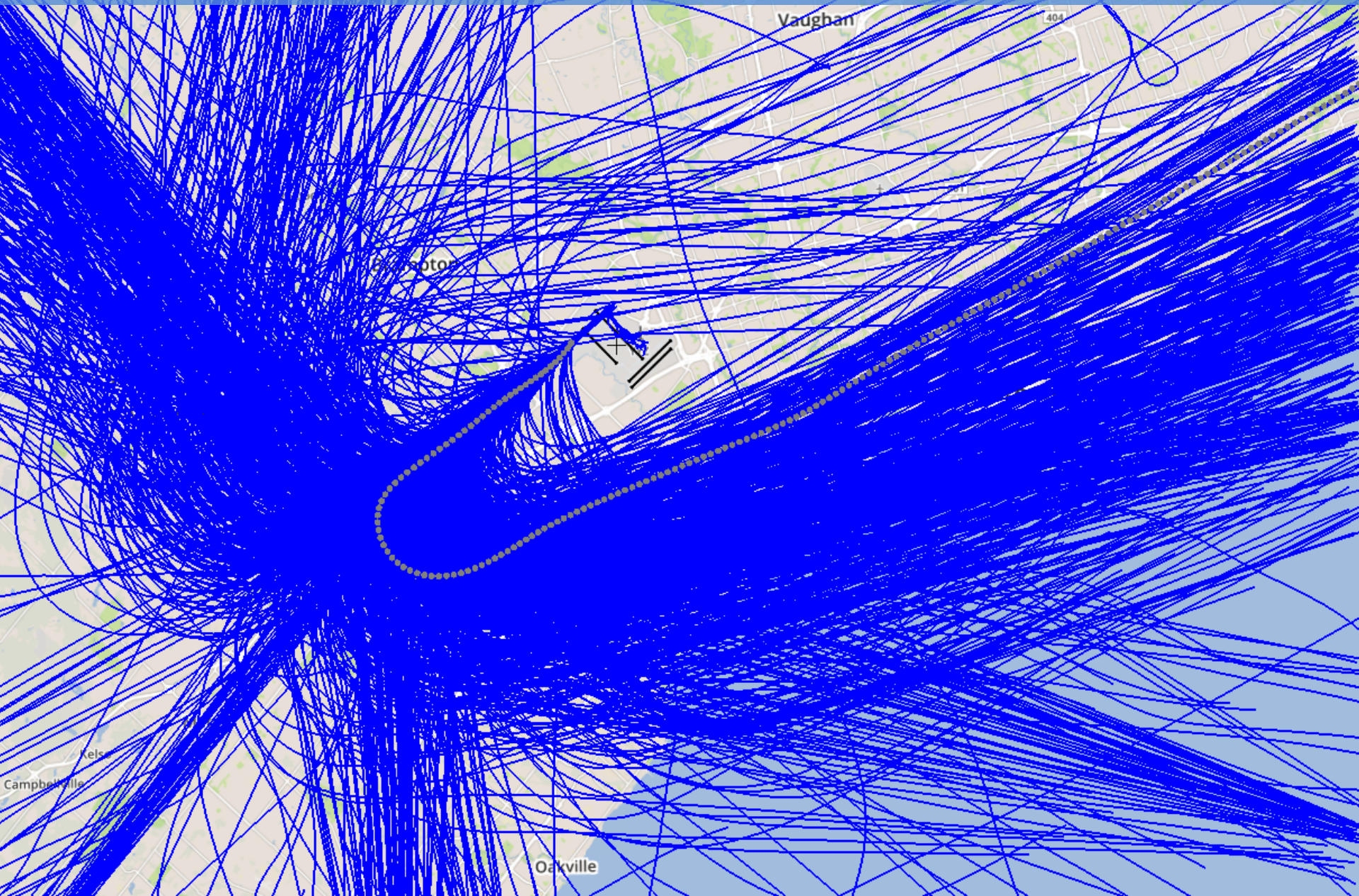


Nighttime Arrivals, May through July 2015

859 Arrivals – Rwy 23

Nighttime Departures, May through October 2015

1312 Departures – Rwy 23



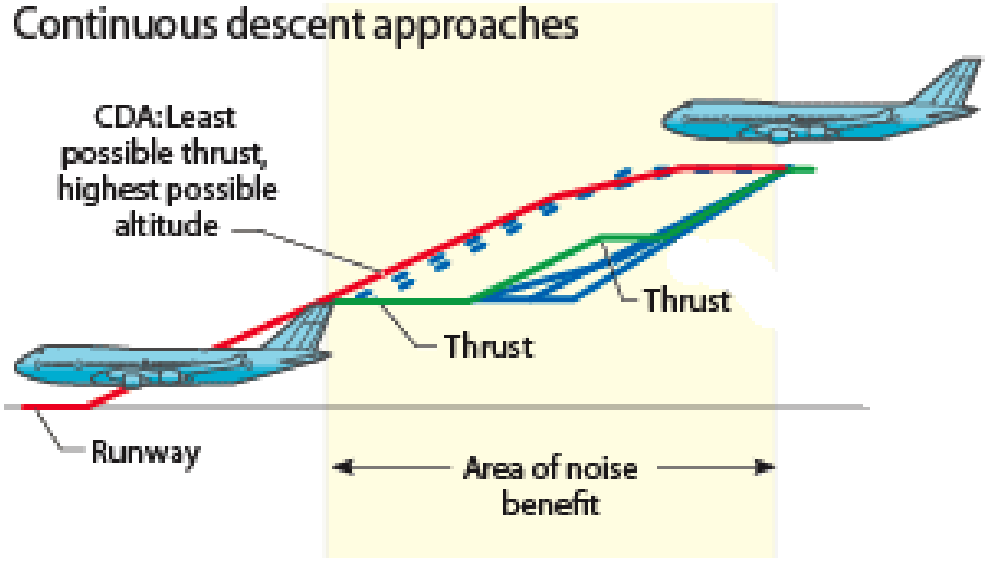
IDEA #1

NEW APPROACHES FOR NIGHT TIME OPERATIONS

- During busy daytime periods, the safe management of air traffic necessitates certain procedures. However, when traffic volumes are lighter at night, and single runway operations are being used, there are options to improve descent profiles that could reduce noise impacts.

- *Proposed Approach*: Design new approaches for use during designated night-time operations.

RNAV APPROACH



RNAV APPROACH

SUMMARY

- Would require new procedure to be designed and published with specified hours of use

- Study points
  - Noise benefit / impact
  - RNAV equipage rates for night operations
  - What hours/traffic volume is this viable

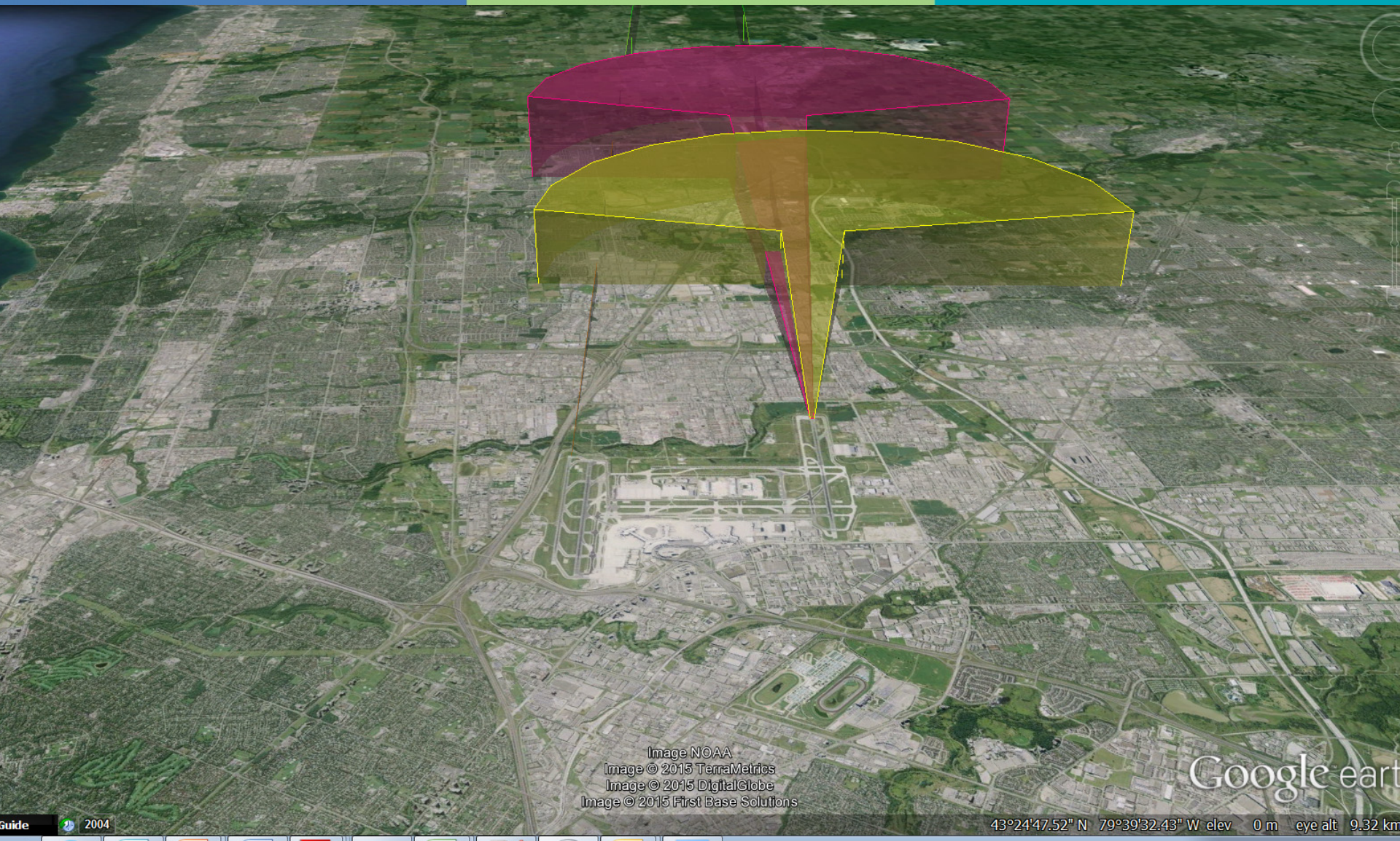
IDEA #2

NEW DEPARTURE PROCEDURES FOR NIGHT OPERATIONS

- There are opportunities to alter night-time departure procedures during lower traffic volume periods when only one runway is in use for departures. Increasing the altitude achieved before aircraft turns are permitted may deliver noise benefits for those under the departure flight path.

- *Proposed Approach*: Design new departures for use during designated night-time periods.

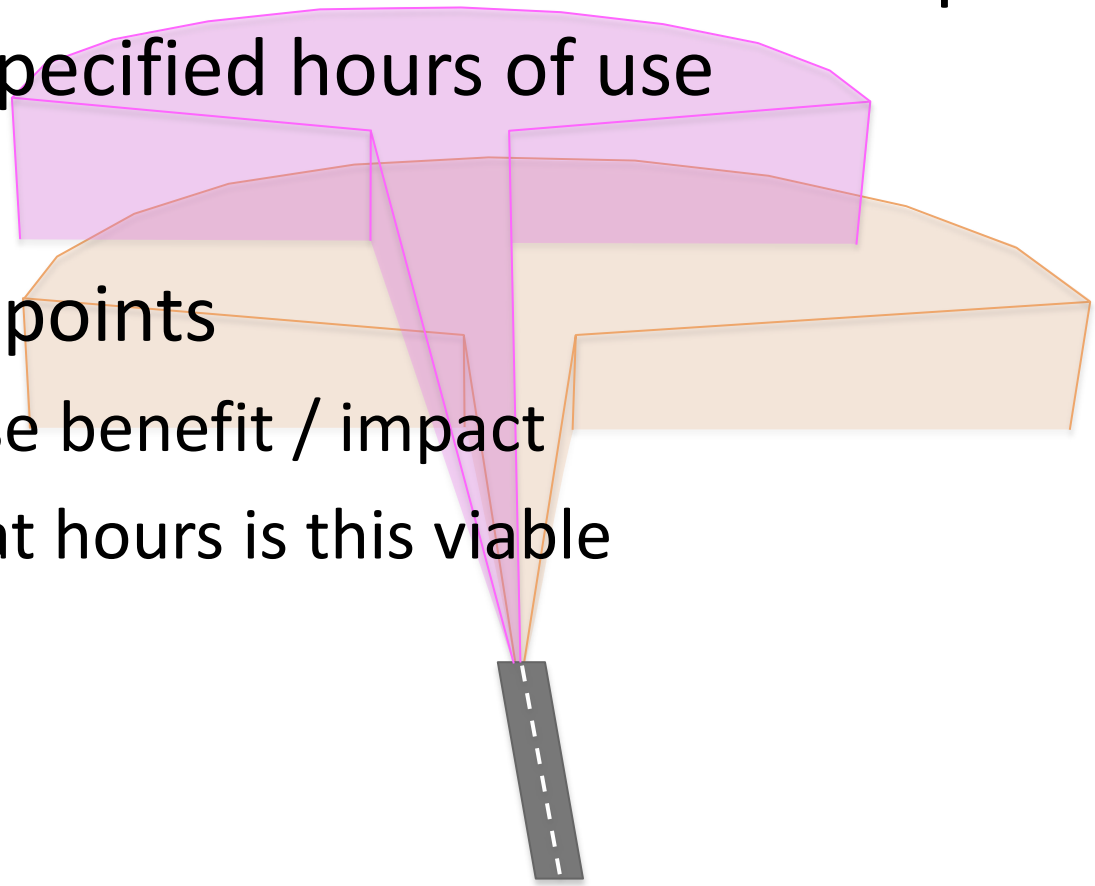
NIGHTTIME OPS



NIGHT TIME DEPARTURES

SUMMARY

- Amendment to noise abatement procedures with specified hours of use



- Study points
  - Noise benefit / impact
  - What hours is this viable

IDEA #3

INCREASE DOWNWIND ARRIVAL SPEEDS

- Changing the published speeds on the "downwind" portion of the arrival flight path from 200 knots to 210 knots may reduce noise in some areas of the city.

- *Proposed Approach*: Study the noise benefits of increasing speeds.

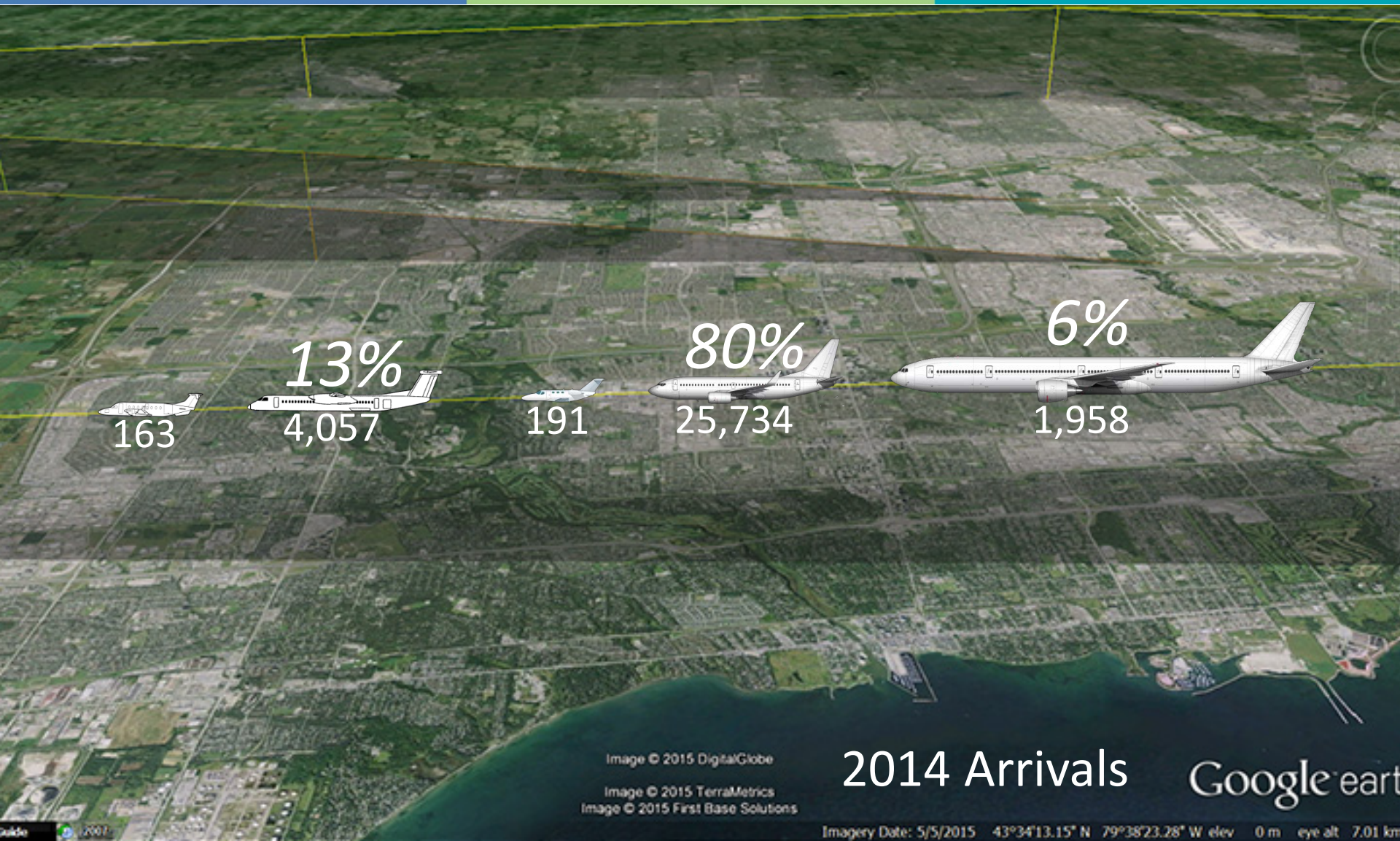
TRAFFIC MIX

Performance Categories

CYYZ Arrivals:

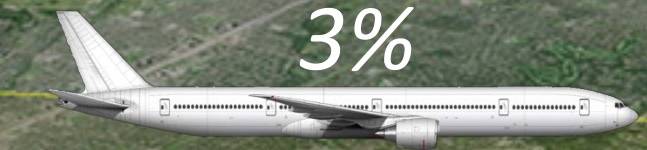
Category	*Weight*	*Annual Count*	
Heavy Jets	≥300,000 lbs	22,391	10%
Medium Jets	>15.5 to <300	155,579	72%
Light Jets	≤15,500 lbs	1,159	<1%
Medium Prop	>15,500 lbs	35,907	17%
Light Prop	≤15,500 lbs	2,211	1%

TRAFFIC MIX


13%
80%
6%
163
4,057
191
25,734
1,958
Image © 2015 DigitalGlobe
Image © 2015 TerraMetrics
Image © 2015 First Base Solutions
2014 Arrivals
Google earth
Imagery Date: 5/5/2015 43°34'13.15" N 79°38'23.28" W elev 0 m eye alt 7.01 km

TRAFFIC MIX

2014 Arrivals



3%

2,077

82%

50,972

356

14%

8,700

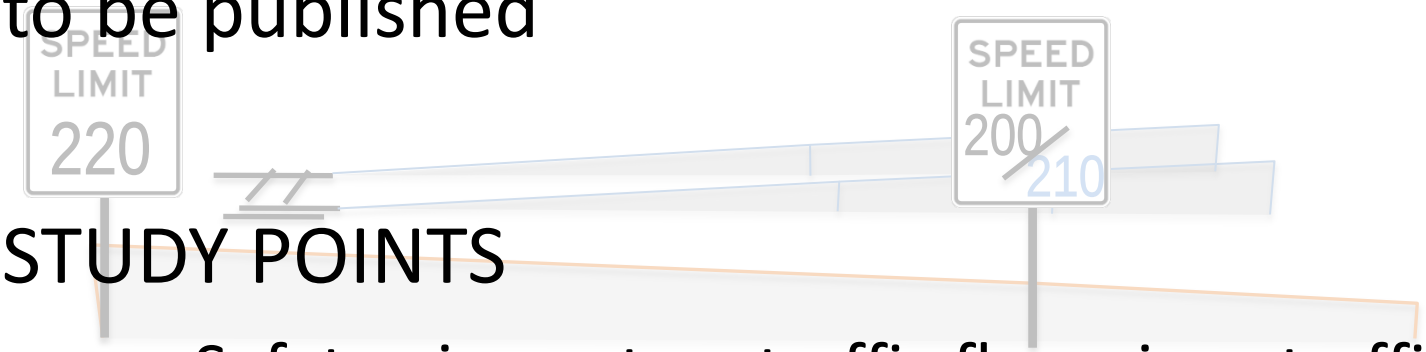
273

Google earth

SPEED RESTRICTIONS

SUMMARY

- Would require amendment to existing STARS to be published



- STUDY POINTS
  - Safety - impact on traffic flow given traffic mix - risk of overtake
  - Noise benefit / impact

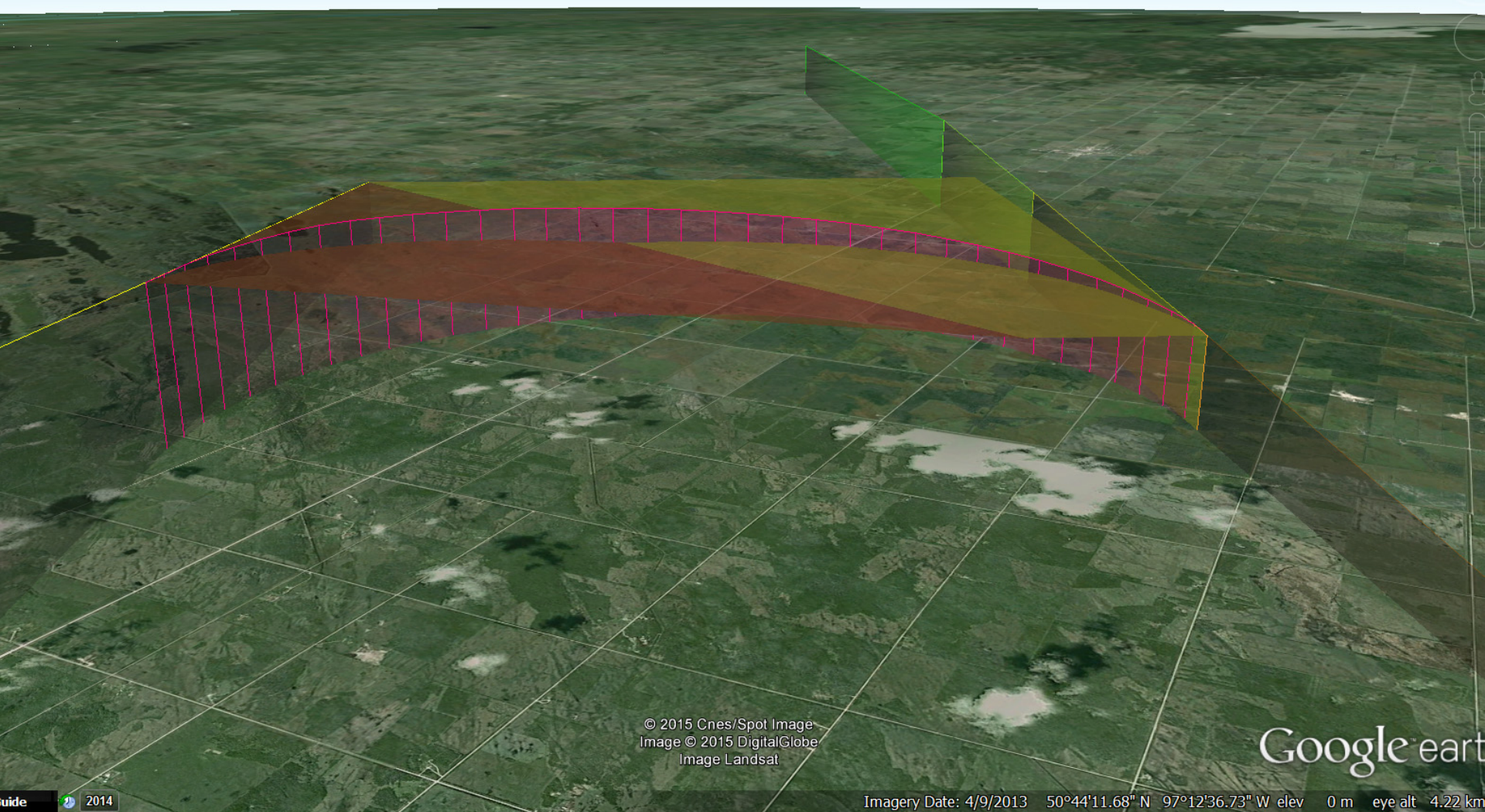
IDEA #4

USE NEW TECHNOLOGY TO REDUCE THE NEED FOR LOW ALTITUDE LEVELLING

- There are noise impacts associated with power increases necessary to achieve low altitude level flight for parallel arrivals. New technologies could reduce the need for those level portions in flight profile and permit quieter, constant descent operations.

- *Proposed Approach*: Study the potential use of new technologies.

RNP DEPLOYMENT

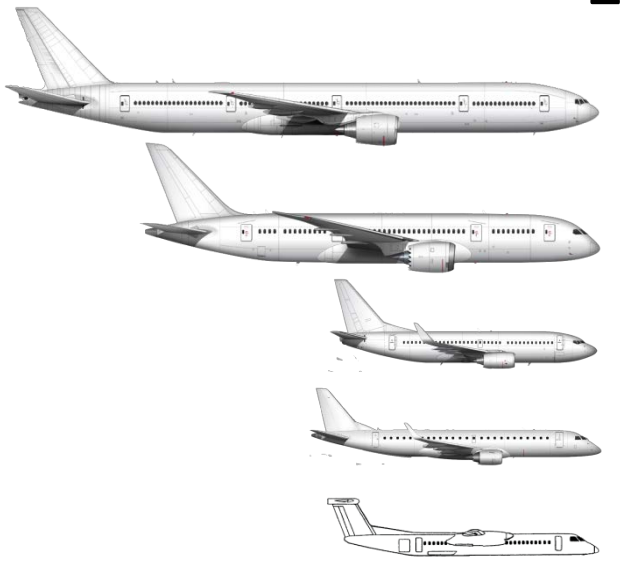


WHEN CAN WE USE RNP?

RNP (Required Navigation Performance) Approaches require:

- Specialized certified equipment in the airplane
- Crew training and certification

Eligible Aircraft:



	2014/week	
	145	3%
	31	1%
	761	18%
	588	14%
	210	5%
		41%

NAV CANADA

Toronto Pearson

IDEA #5

ESTABLISH WEEKEND PREFERENTIAL RUNWAYS

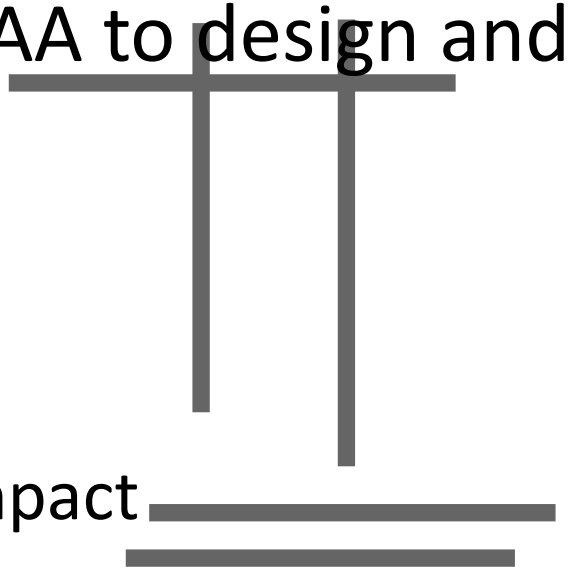
- Traffic volumes on Saturdays and most of Sunday tend to be lower than other days of the week. Alternating runways could provide periods of weekend respite from noise for communities impacted by these operations.

- *Proposed Approach*: Study the feasibility of establishing weekend preferential runways.

WEEKEND RUNWAY ALTERNATION

SUMMARY

- Would require amendment to published airport Noise Abatement Procedures
- Would require GTAA to design and publish a schedule



- Study points
  - Noise benefit / impact
  - Determine traffic levels at which proposal is viable

IDEA #6

ALTERNATE NIGHT-TIME PREFERENTIAL RUNWAYS

- Preferential runways exist to ensure that aircraft landing and departing overnight impact the fewest people. The possibility to alternate use of night-time preferential runways might result in sharing night-time noise impacts from aircraft operations across more communities.

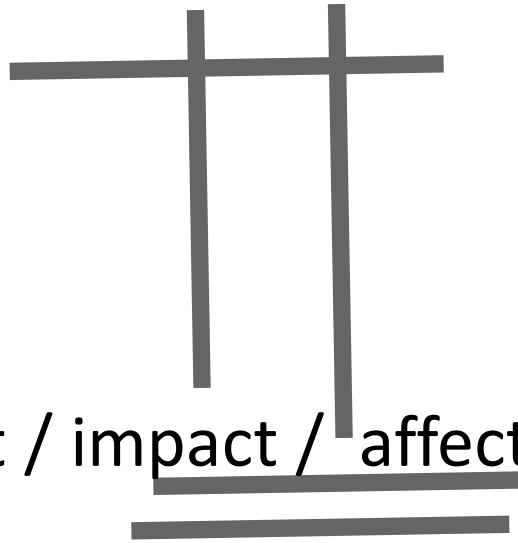
- *Proposed Approach*: Review the continued appropriateness of existing night-time preferential runways to ensure they meet the stated objectives.

NIGHT TIME PREFERENTIAL RWYS

NIGHT TIME PREFERENTIAL RUNWAYS

SUMMARY

- Would require amendment to published airport Noise Abatement Procedures



- Study points
  - Noise benefit / impact / affected population

NEXT STEPS

Meetings being arranged in May with to brief last summer's roundtable participants on the technical analysis and seek input on options developed

- Based on input received we will finalize the procedures for noise analysis
- Third party to undertake assessment of the noise benefits/impacts
- Noise report will form the basis of Community Engagement to follow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