

Early Turns & Prop Turns

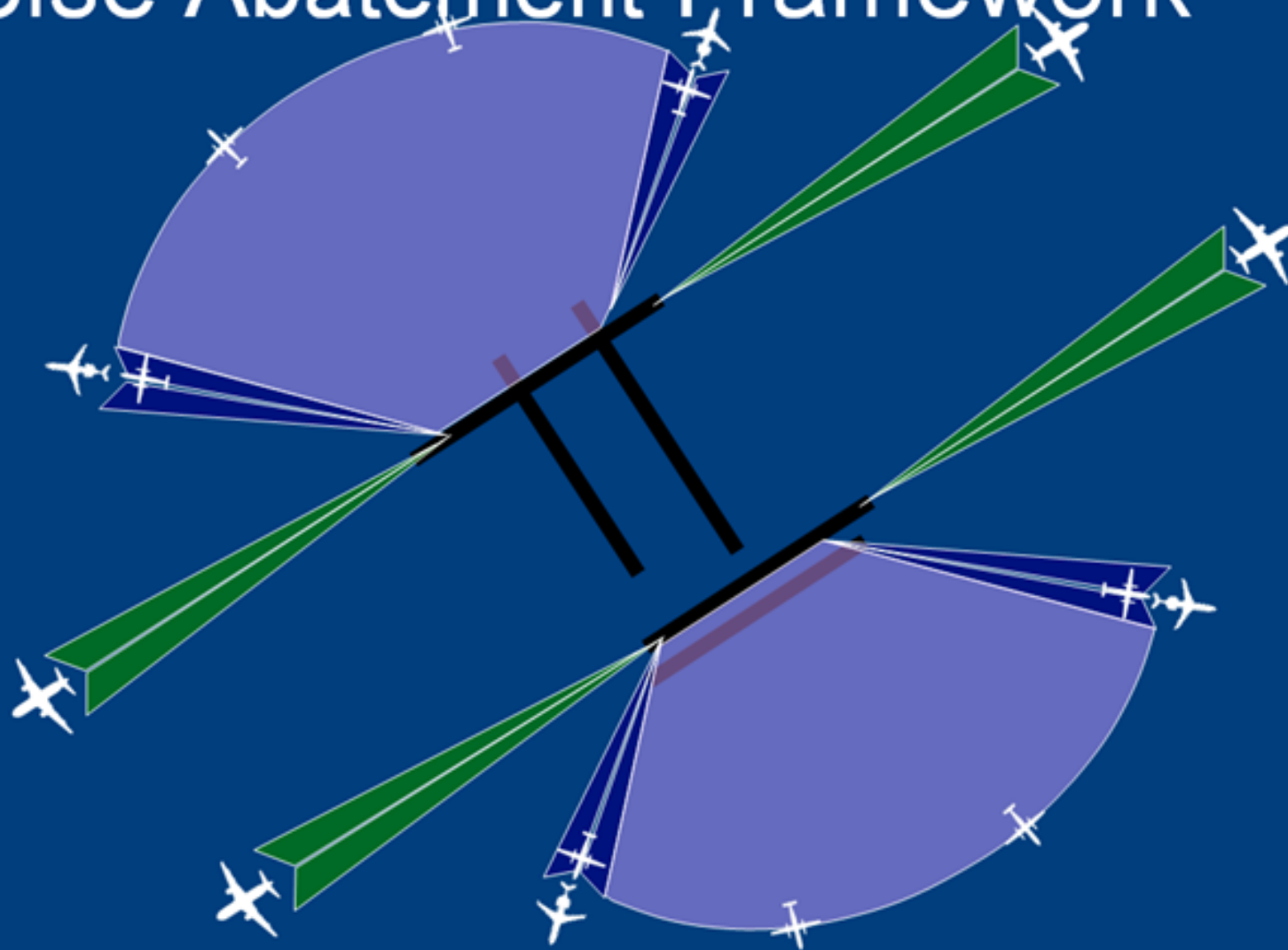
CENAC – March 28, 2012



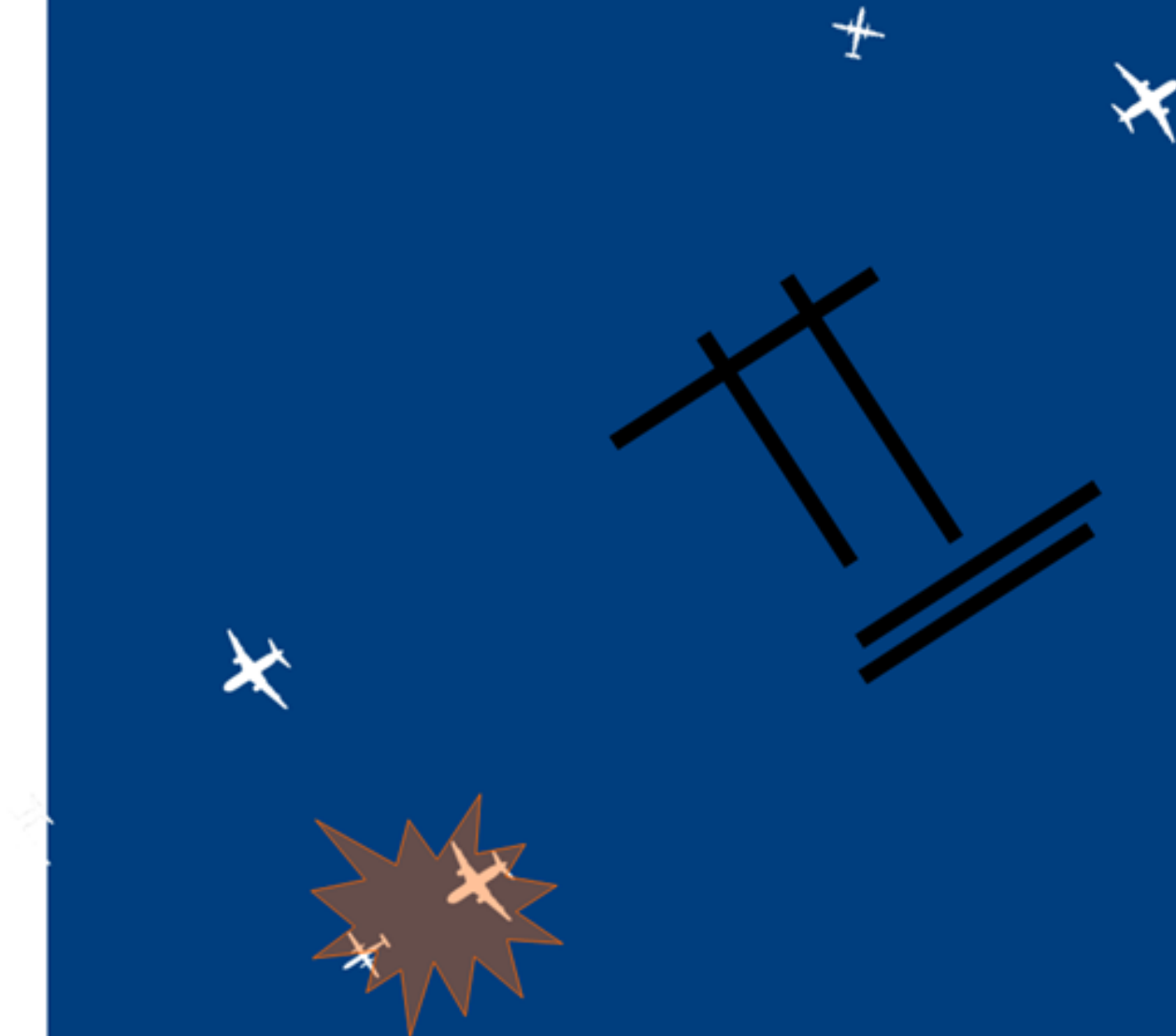
For You. The World.

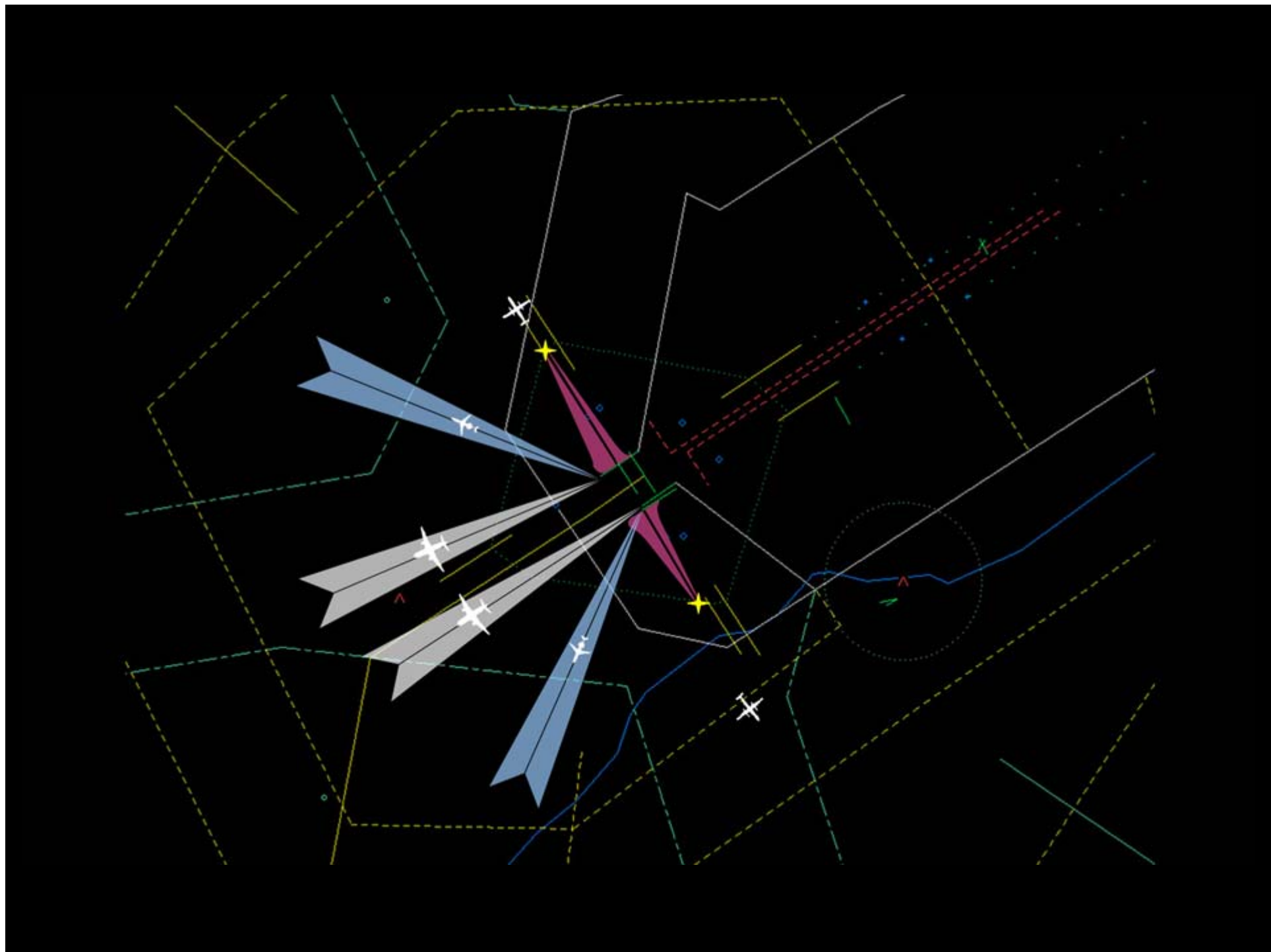
NAV CANADA BACKGROUND ON PROCEDURES

Noise Abatement Framework



Why Turn Airplanes?





PROPS & EARLY TURNS

Background - General

- Propeller Turns and Early Turns are departure procedures specifically designed to:
 - Allow aircraft to take a more direct route towards their destination, getting aircraft en route sooner
 - Increase runway capacity and efficiency
 - Reduce line-ups on the ground
 - Reduce fuel consumption and Greenhouse Gas emissions
- Used only if there is an operational advantage based on destination or aircraft line-up in the departure queue
- Initiatives undertaken in collaboration with the airline industry and NAV Canada
 - CENAC briefed and engaged; outcomes will continue to be reported through CENAC

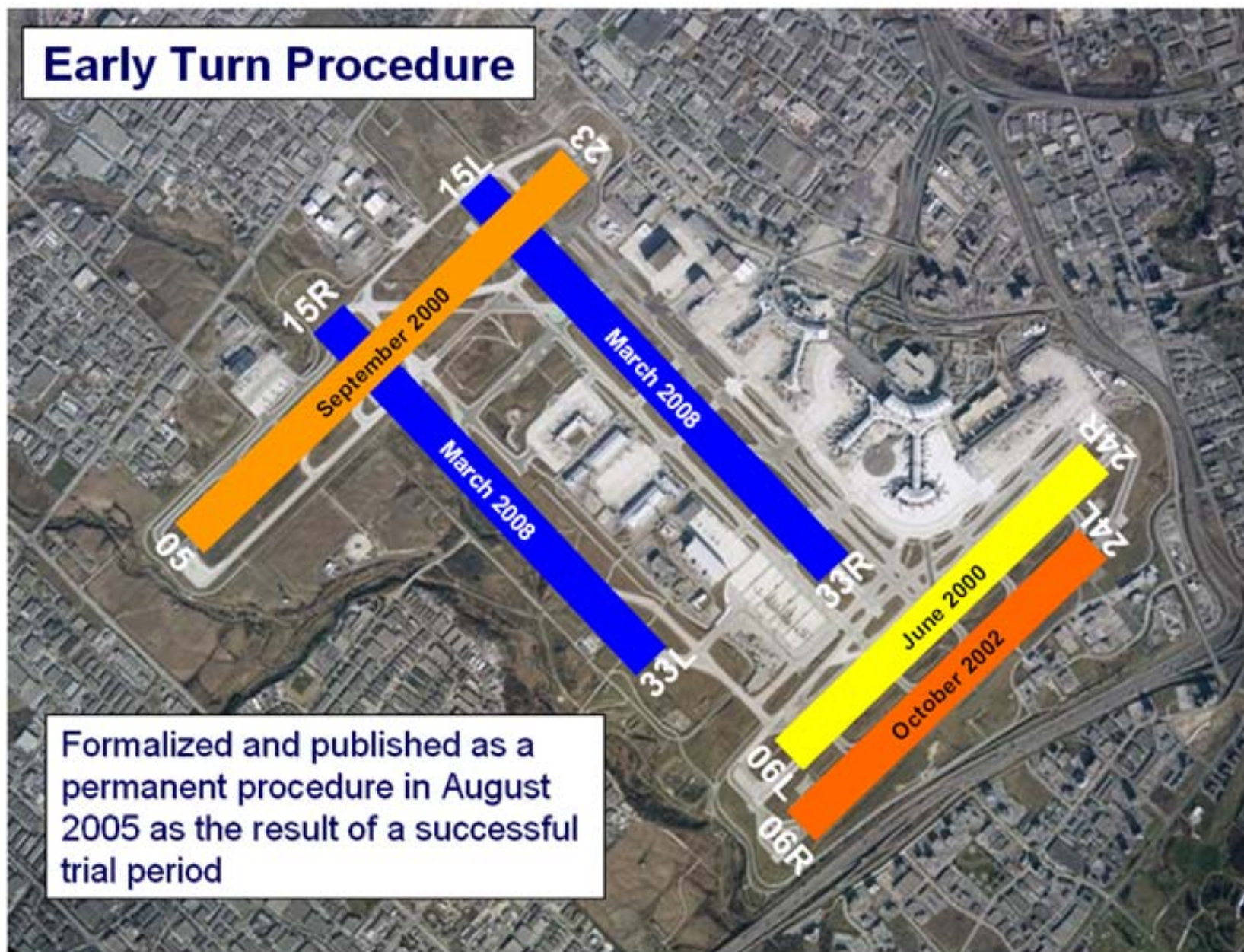
Background – Early Turn Trials (2000 to 2005)

- **Restricted to the hours of 7:00 am-11:00 pm**
- **Limited to:**
 - East/west runways
 - Specified headings
 - Particular aircraft types (CRJ1,CRJ2, E135, E145, E45X, J328, CL60, C750, GLEX, GLF4 and GLF5)

Background – Early Turn Trials (2000 to 2005)

- **Trial Findings:**
 - Improved runway utilization
 - Reduced emissions while airborne and by aircraft on the ground in the departure queue
 - Minimal noise impact on surrounding communities

Early Turn Procedure



Formalized and published as a permanent procedure in August 2005 as the result of a successful trial period

EARLY JET TURNS

Early Turn Procedure

Early Turn Procedure

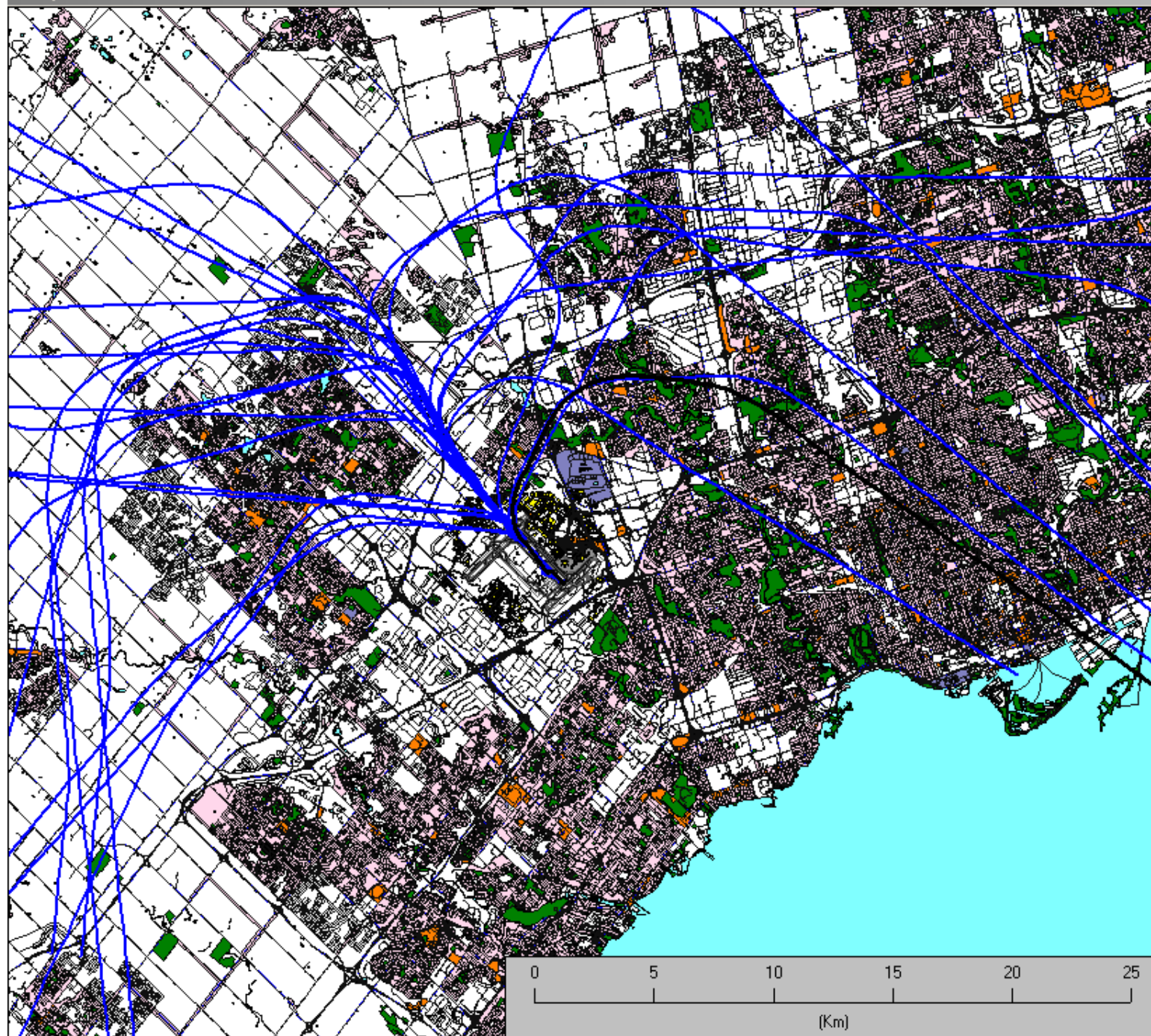
- Permit immediate departure turns shortly after takeoff for certain smaller jet aircraft
- Procedure was initiated on the east/west runways in 2000
- Became a formalized and published procedure in 2005

Hours

- 7:00 am and 11:00 pm
- Not used during the restricted hours (12:30 am – 6:30 am)

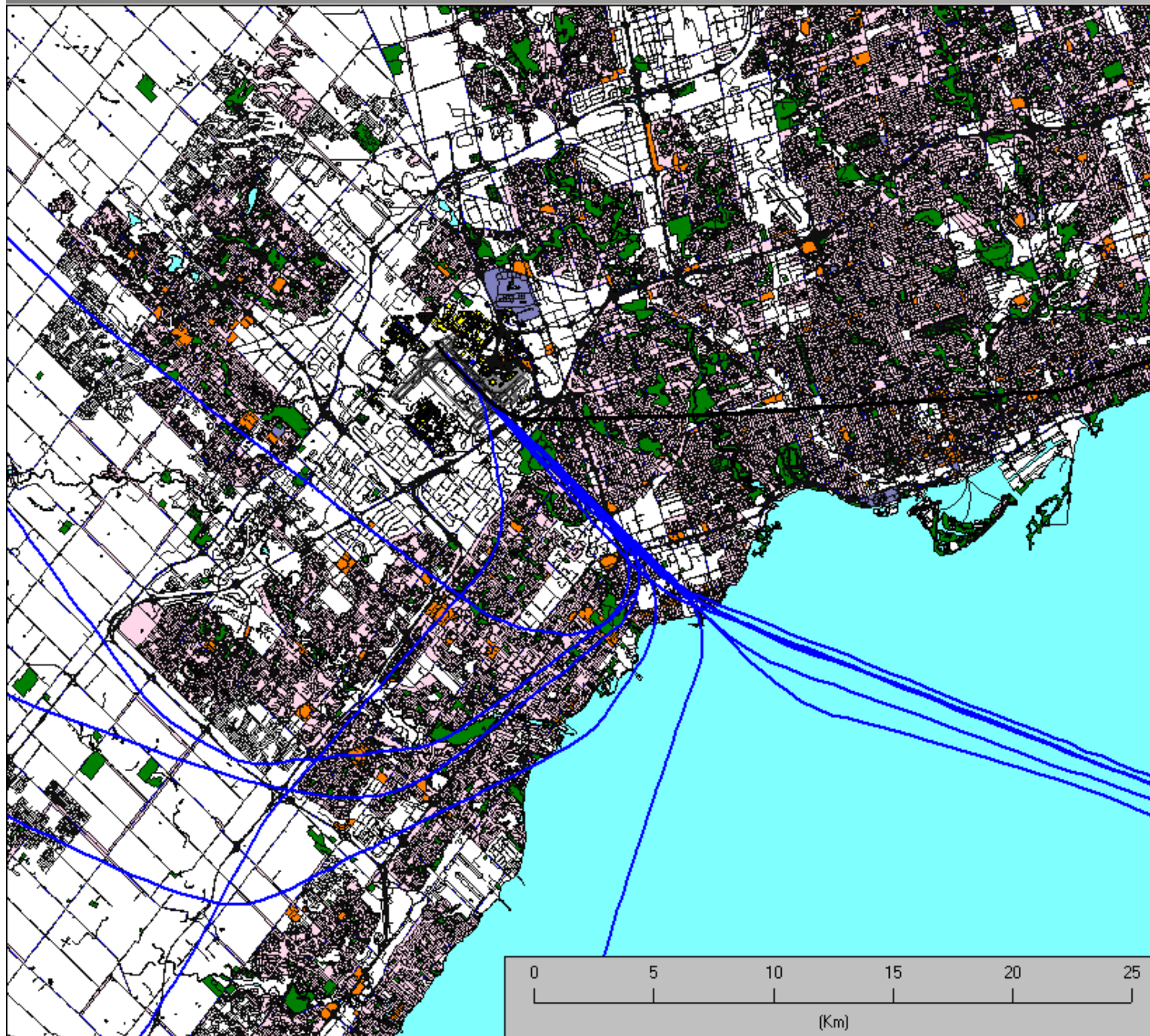
Early Turn Trial

- Expansion of the procedure to the north/south runways
- Started in March 2008, currently still under review
- Noise complaints related to the trials are tracked and recorded



Time : 14:06:21
Date : 12/28/2011
Type : CRJ2
Operation : DEP
Runway : 33R
Origin : CYZ
Destination : KJFK
Rwy Time :
Periode : 20111228 - 20111228
Filter :
 RUNWAY="33R" AND D_A_TIME >
 "0659" AND D_A_TIME < "2301" AND
 OPERATION="DEP" AND
 (AIRCRAFT_T="CRJ1" OR
Comments: "CRJ2" OR

**Early Turn
 Departures to
 the North**



Time : 17:24:16

Date : 9/24/2011

Type : CRJ2

Operation : DEP

Runway 15L

Origin : CYZ

Destination : CYSJ

Rwy Time :

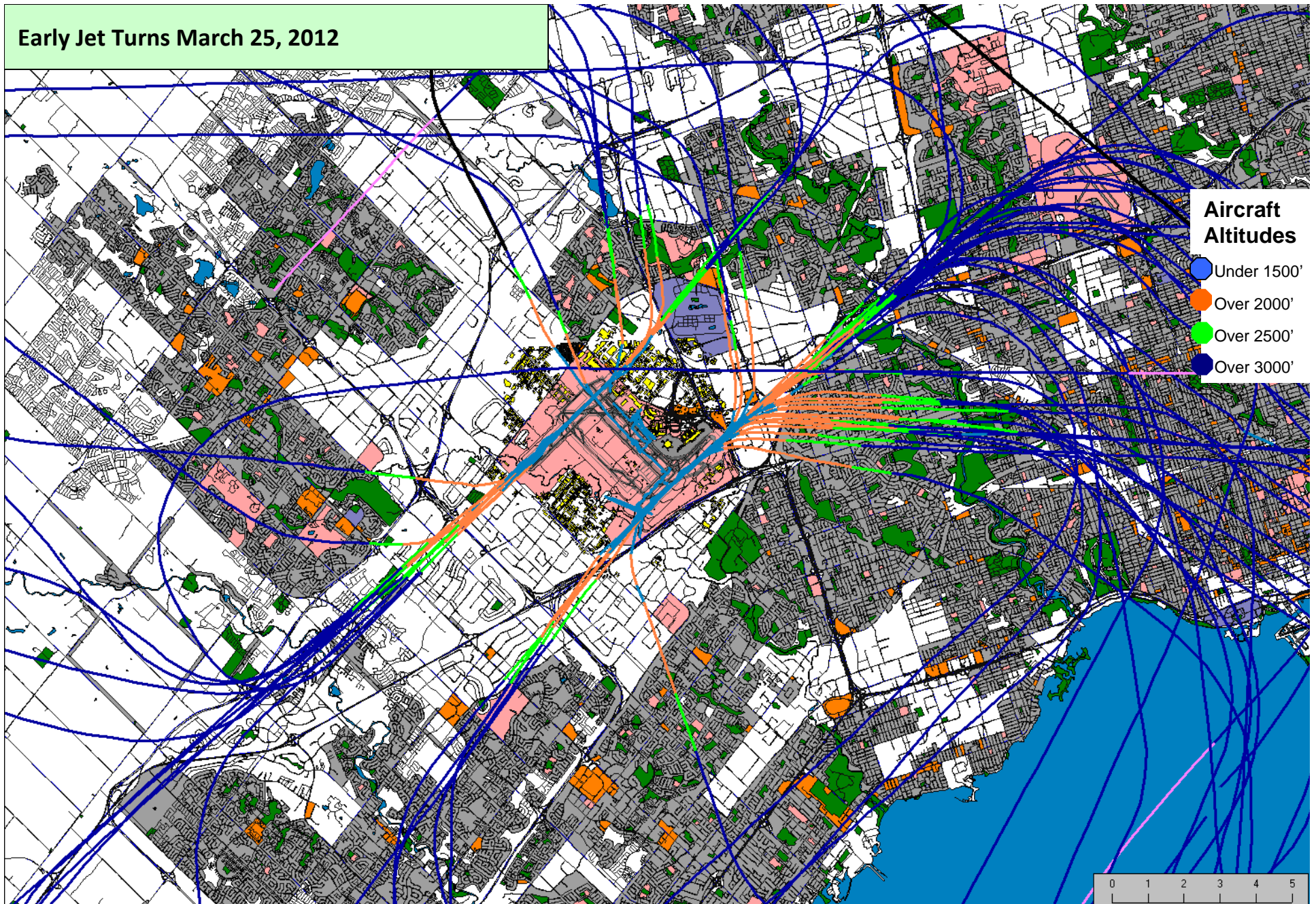
Periode : 20110924 - 20110924

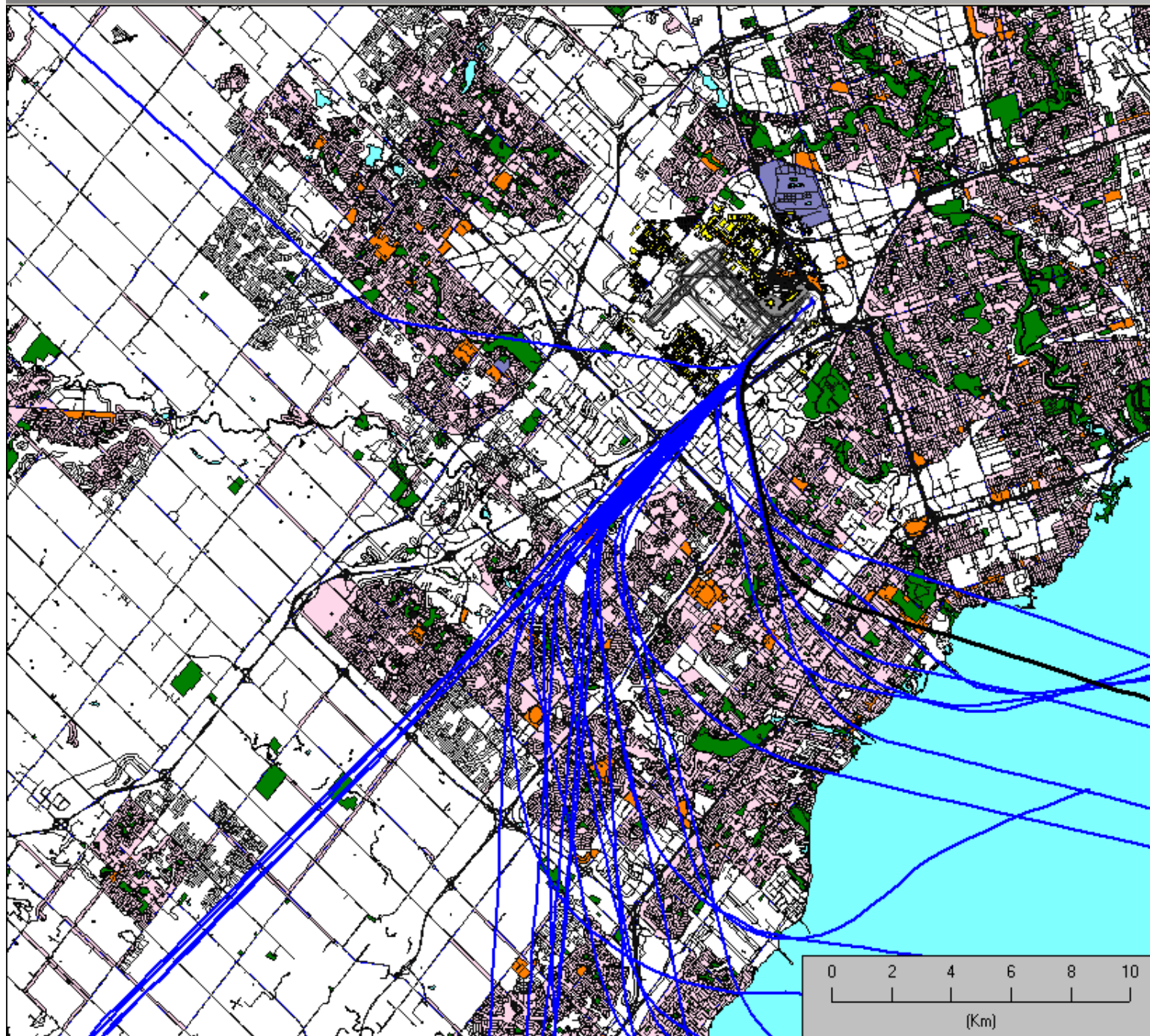
Filter :

RUNWAY="15L" AND D_A_TIME >
"0659" AND D_A_TIME < "2301" AND
OPERATION="DEP" AND
(AIRCRAFT T ="CRJ1" OR
Comments: "CRJ2" OR

**Early Turn
Departures to
the South**

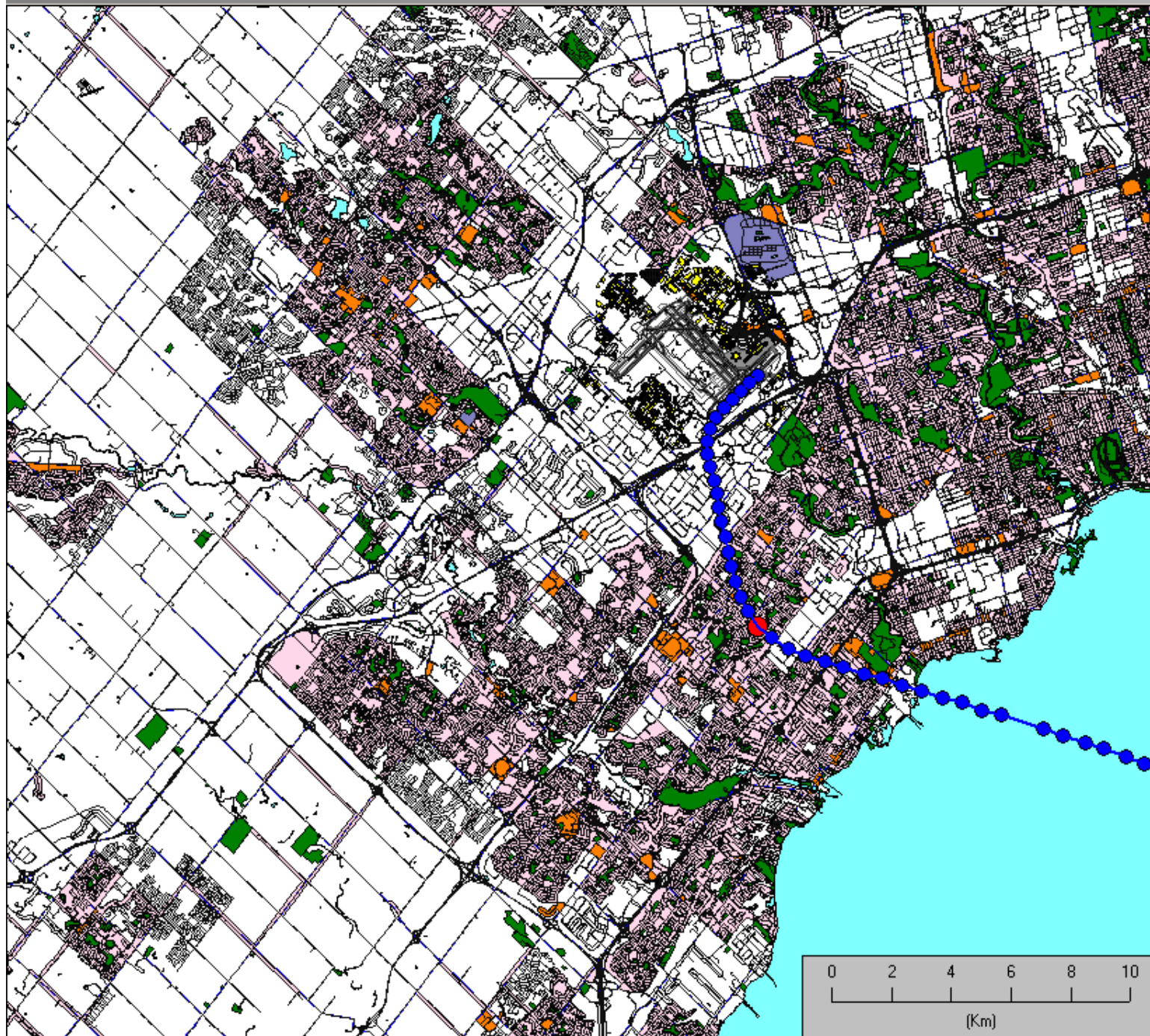
Early Jet Turns March 25, 2012





Approved
ETP jet
departures

Runway 24
Right



**Early Jet
Turn
Runway 24
Right

CRJ2

At 4200'
Above
Ground**

PROP TURNS

Prop Turns

Propeller Turns

- Slower departing propeller aircraft turn after takeoff
- Faster, larger jets continue to use the standard departure flight paths
- Utilized on all runways
- Standard procedure since the 1970s

Hours

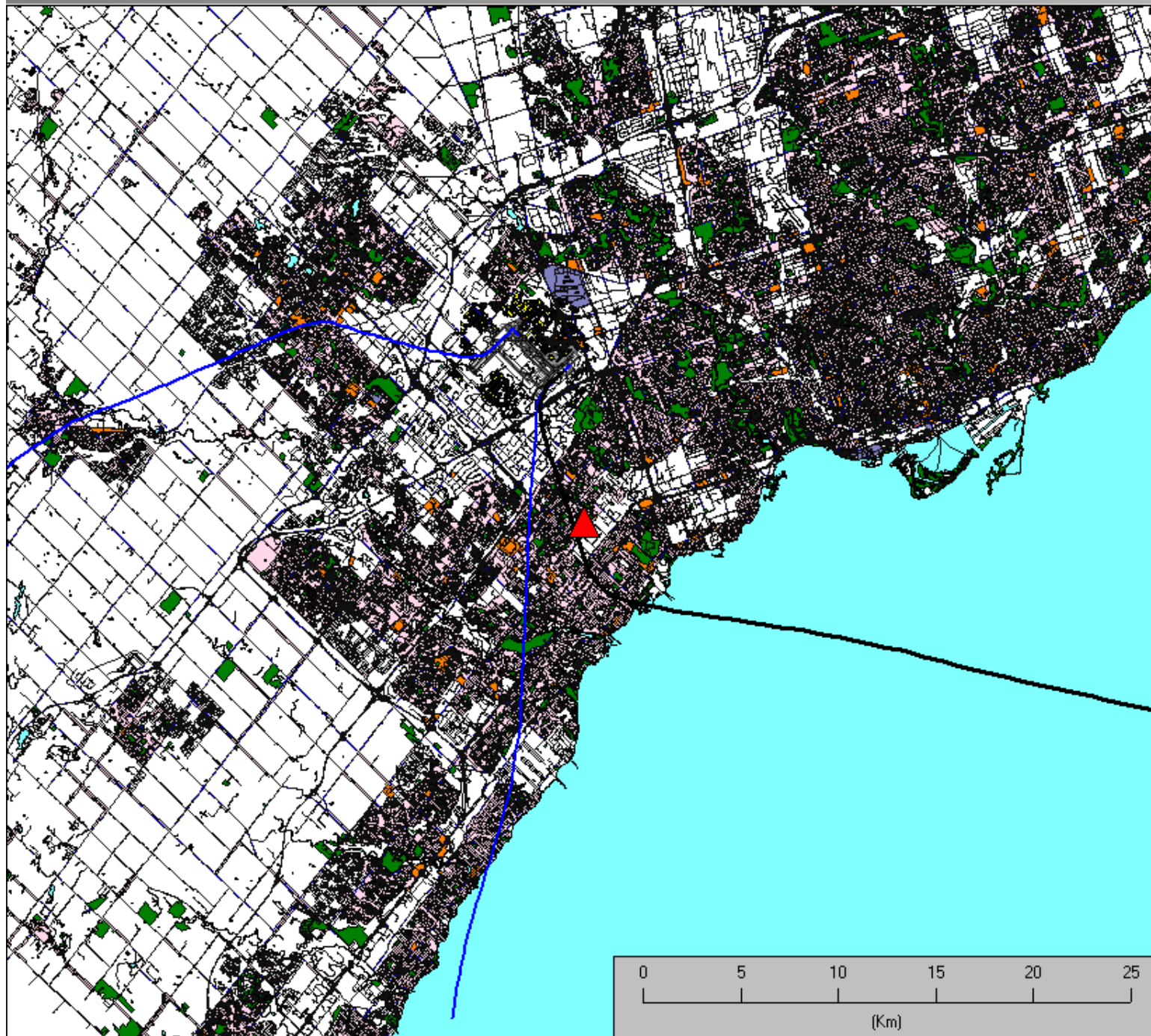
- 7:00 am – 11:00 pm
- Not used during the restricted hours (12:30 am – 6:30 am)

Prop Turn Extended Hours Trial

- Extension of hours of the propeller turns from 7:00 am to 11:00 pm to 6:30 am to 11:30 pm
- Started in March 2008, currently still under review
- Noise complaints related to the trials are tracked and recorded

Prop Turns

- **6:30 – 7:00 am**
 - Heavily loaded with departures
 - Departure queue based on demand coming out of the restricted hours
 - Average 2 to 3 prop departures daily (approximately)
- **11:00 – 11:30 pm**
 - Mixed with large/heavy aircraft (overseas) and small commuter aircraft (Sudbury, London, etc.)
 - Departure queue based on mix of traffic
 - Average 4 to 5 prop departures daily (approximately)

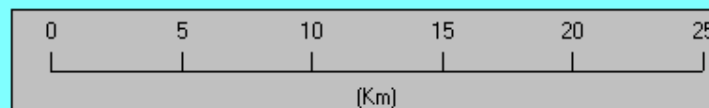


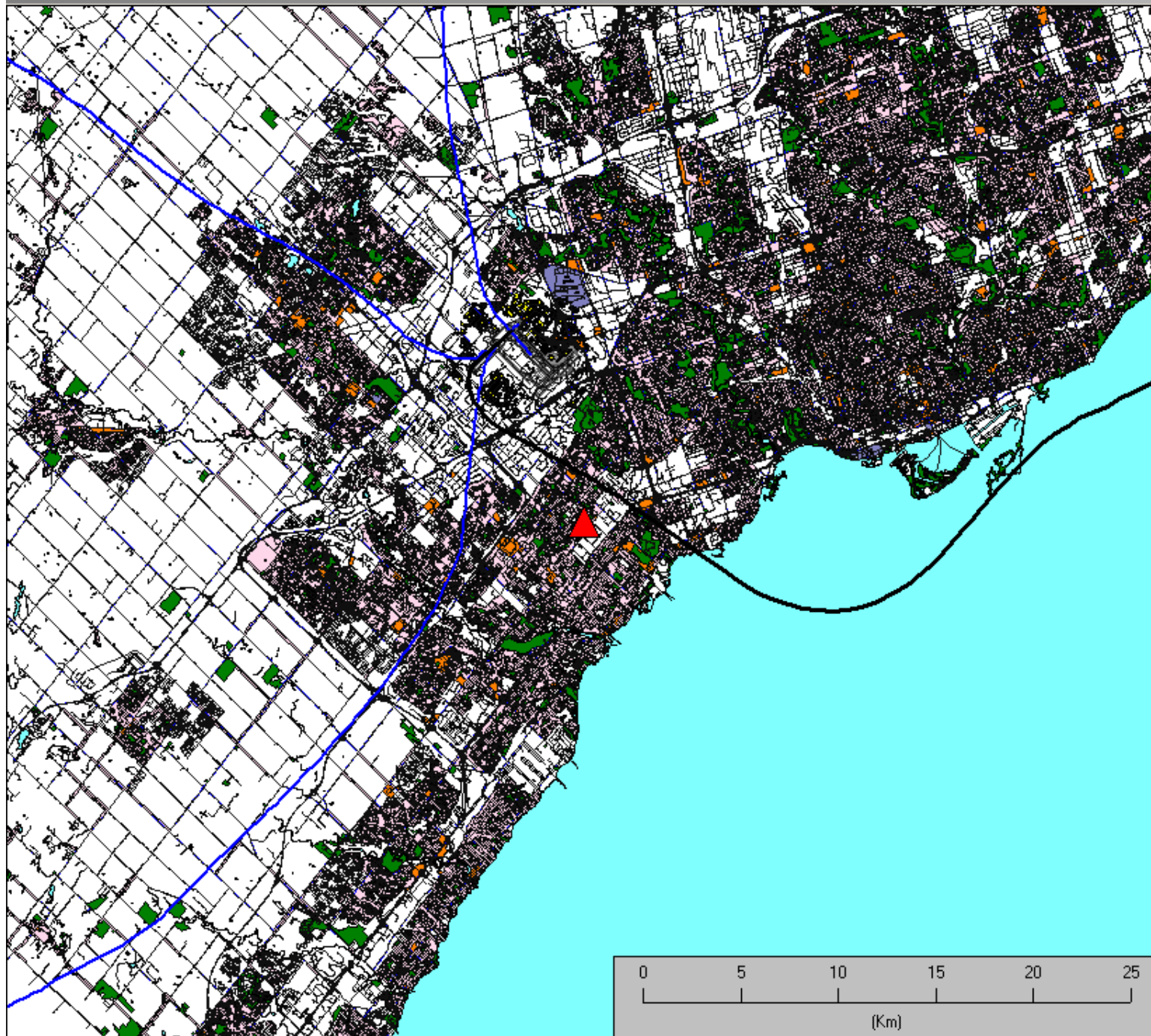
Time : 06:57:16
Date : 3/9/2012
Type : DH8D
Operation : DEP
Runway : 24R
Origin : CYZ
Destination : KEWR
Rwy Time :

Periode : 20120309 - 20120309

Filter :
 OPERATION="DEP" AND D_A_TIME
 > "0630" AND D_A_TIME< "0659"
 AND (AIRCRAFT_T LIKE "DH8*" OR
 AIRCRAFT_T ="PC12" OR
Comments: JKE "B19") ORDER BY

Prop Turns
Extended Hours
0630-0659





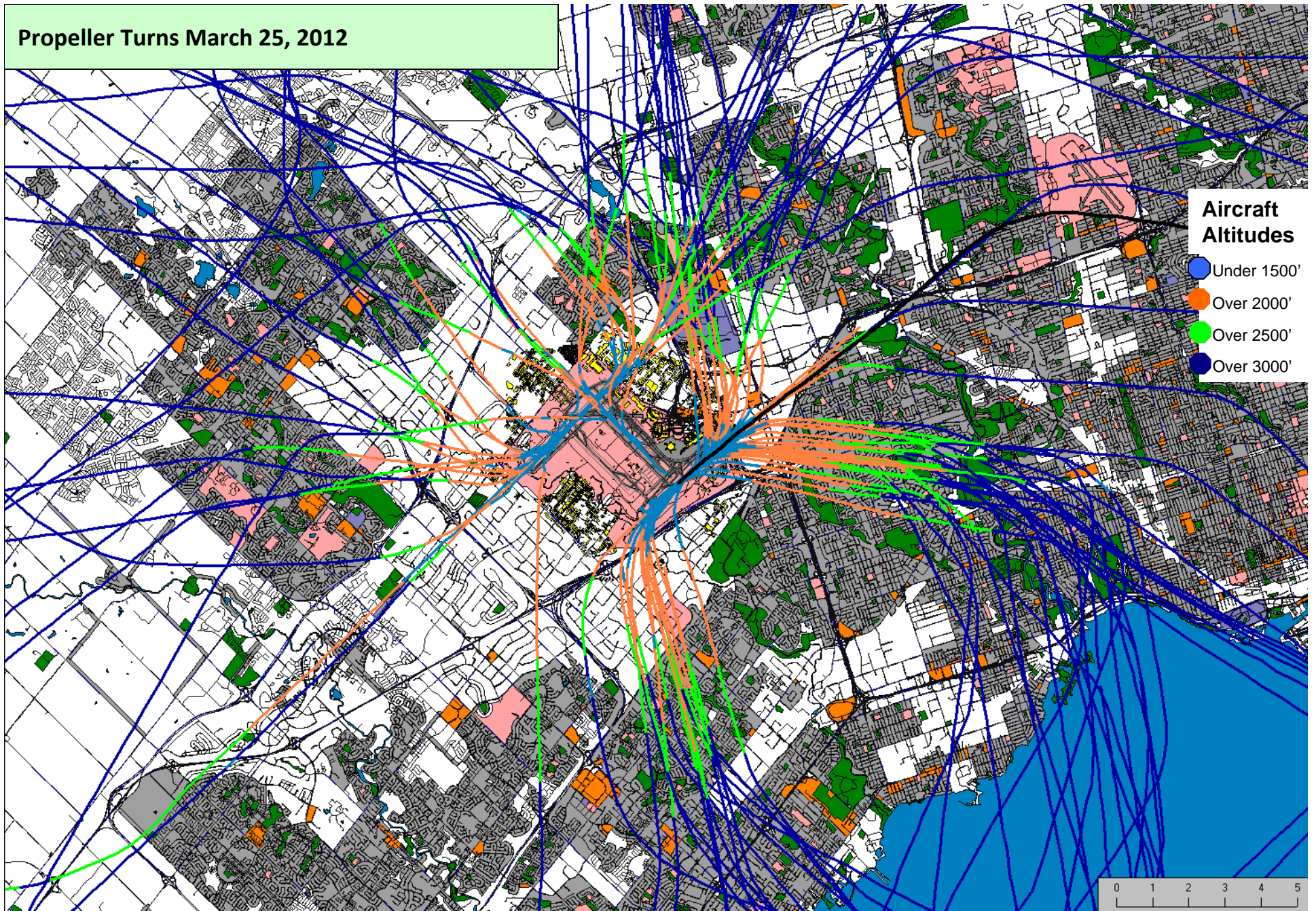
Time : 23:12:50
Date : 3/10/2012
Type : DH8D
Operation : DEP
Runway : -
Origin : CYZ
Destination : CYQB
Rwy Time :

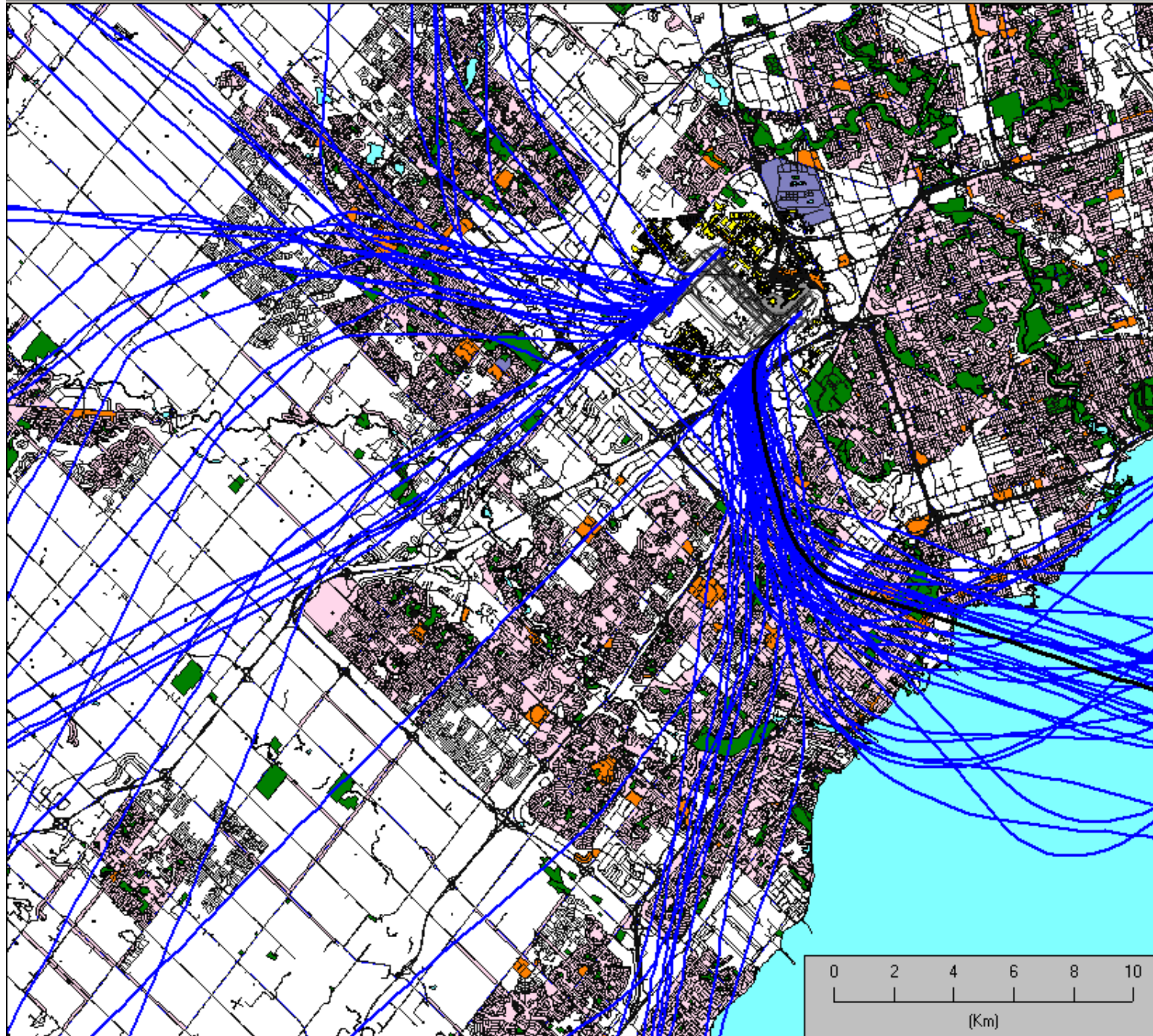
Periode : 20120310 - 20120310

Filter :
 OPERATION="DEP" AND D_A_TIME
 > "2300" AND D_A_TIME< "2329"
 AND (AIRCRAFT_T LIKE "DH8*" OR
 AIRCRAFT_T ="PC12" OR
Comments: JKE "B19") ORDER BY

Prop Turns
Extended Hours
11:00-1129 pm

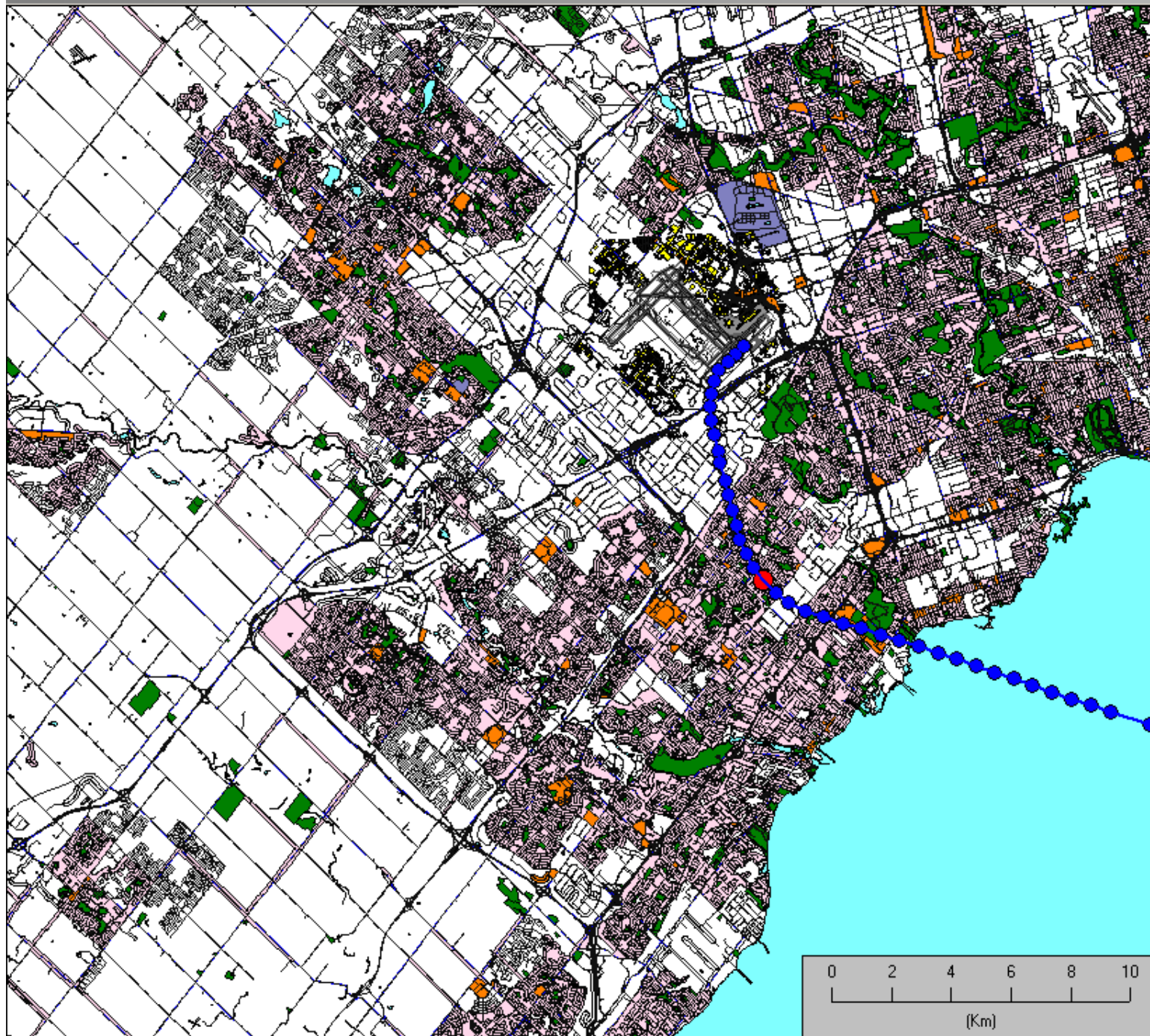
Propeller Turns March 25, 2012





**Prop
Departures**

**Runways 23
and 24 Right**



Prop Turn

Dash 8

**At 4300'
Above
Ground**

**Runway 24
Right**

Trial Statistics

6:30 to 7:00 am	Prop Turns		
	Eligible	Turned	% turned
Mar-Dec 2008	934	857	91.80%
Jan-Dec2009	722	695	96.30%
Jan-Dec2010	255	246	96.50%
Jan-Dec 2011	504	455	90.30%
Total	2415	2253	93.30%

11:00 to 11:30 pm	Prop Turns		
	Eligible	Turned	% turned
Mar-Dec 2008	783	626	79.90%
Jan-Dec2009	777	670	86.20%
Jan-Dec2010	871	768	88.20%
Jan-Dec2011	972	851	87.60%
Total	3403	2915	85.70%

Date	Early Turns North/South Runways		
	Eligible	Turned	% turned
Mar-Dec 2008	1525	305	20.00%
Jan-Dec2009	3110	651	20.93%
Jan-Dec2010	2562	623	24.32%
Jan-Dec 2011	2027	307	15.15%
Total	9224	1886	20.45%

Trial Complaint Statistics

Prop Trial Complaints

Year	6:30 - 7:00 am	11:00 - 11:30 pm	Total
2008	12	8	20
2009	7	1	8
2010	0	1	1
2011	1	2	3
2012 YTD	21	8	29
	41	20	61

Prop Turns Complaints

Year	Total
2008	128
2009	76
2010	11
2011	8
2012 YTD	128
	351

Early Turn Trial Complaints - North/South Runways

Year	Total
2008	2
2009	3
2010	1
2011	0
2012 YTD	0
	6

Early Turn Complaints

Year	Total
2008	167
2009	65
2010	18
2011	8
2012 YTD	1
	259

Moving Forward

- Continue to communicate trial details to elected officials, communities, stakeholders and flight crews
- Portable noise monitoring in the areas impacted by trial procedures to quantify the noise impacts on surrounding communities
- Noise complaints related to the trials continue to be tracked and recorded
- Emission savings related to the trials to be further analyzed
- Trial updates to be reported back to CENAC

Emission Savings

Summary of Trials – Greenhouse Gases


Prop Aircraft Extended Hours Trial – All Runways:

- 5 types of turboprop aircraft
- 6:30 am – 7:00 am and 11:00 pm – 11:30pm
- March 2008 – December 2011, 5818 eligible flights and 5168 made the turn

Early Jet Turn Trial – North/South Runways:

- 11 types of smaller jet aircraft
- 7:00 am – 11:00 pm
- March 2008 – December 2011 , 9224 eligible and 1886 of made the turn

For March 2008 to December 2011, the savings amounted to:



Props:	273.1 tonnes
Jets:	<u>254.1 tonnes</u>
Total:	527.2 tonnes

Thank you



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