8 May, 2018

DATA INFORMED DECISION MAKING

"SOURCES OF INFORMATION"

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Vice-President Safety and Quality

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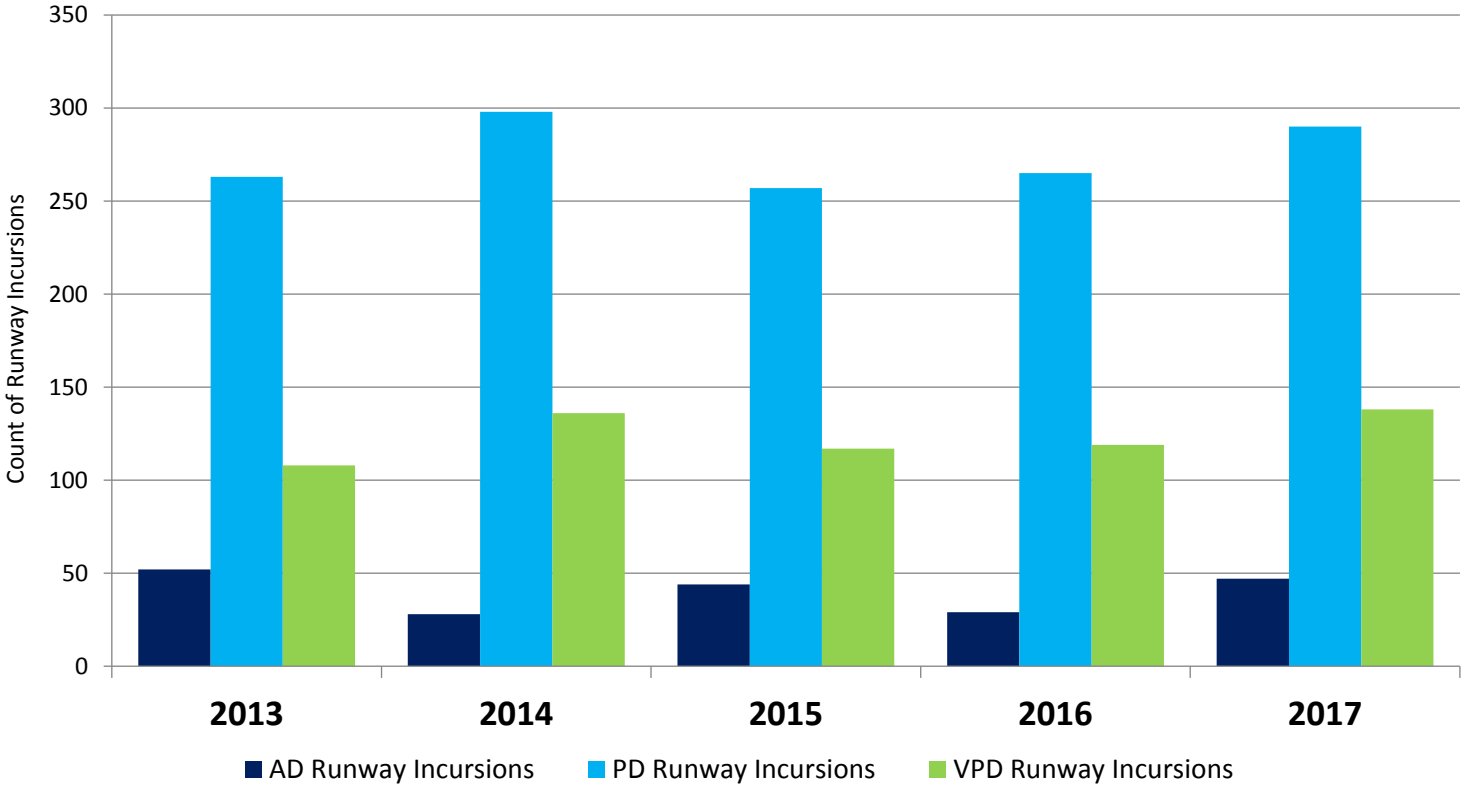
SOURCES OF INFORMATION

- AOR – Aviation Occurrence Report directly linked to Transport Canada reporting system
- Safety reviews of all Preliminary Safety Investigations and Safety Investigations
- Joint Safety Oversight Committee
- Clarifications and reviews processes for aviation events
- Transport Canada Observer on Safety Investigations
- Multiple sources of data for diverse events; Audio, Radar, Flight plans, AIM information, Technical Operations information
- Other stakeholders SMS information

EXAMPLES OF DATA SHARED

- Safety performance internal and external benchmarking
- Operational risks
- Safety reviews

RUNWAY INCURSIONS



2017 includes events from Jan1-Nov31

Source: AOA, NC-SIS
Operational Analysis
Dec 2017

RUNWAY INCURSIONS 2017

TOP 1O AERODROMES

	AD	PD	VPD	Total RI	Traffic	Rate
St-Hubert	5	10	17	32	111,500	28.7
Montréal	3	21	6	30	215,700	13.9
Toronto	10	13	6	29	423,000	6.9
Fredericton	3	18	0	21	94,500	22.2
Pitt Meadows	1	13	5	19	105,000	18.1
Springbank	1	16	1	18	132,900	13.5
Toronto City Centre	3	8	6	17	121,200	14.0
Moncton	0	12	2	14	103,900	13.5
Calgary	0	11	2	13	213,200	6.1
Whitehorse	1	5	6	12	28,000	42.9
St-Jean	0	4	8	12	38,300	31.3
Langley	0	7	5	12	69,100	17.4

2017 includes events from Jan1-Nov31

Source: AOA, NC-SIS
Operational Analysis
Dec 2017

RUNWAY INCURSIONS 2017

TOP 1O AERODROMES BY RATE PER 100,000 MOVEMENTS

	AD	PD	VPD	Total RI	Traffic	Rate
Whitehorse	1	5	6	12	28,000	42.9
St-Jean	0	4	8	12	38,300	31.3
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2017 includes events from Jan1-Nov31

Source: AOA, NC-SIS, EXCDS
Operational Analysis
Dec 2017

DATA INFORMED DECISION

Methodology

- No previous studies on safety risks in English Second Language (ESL) environment

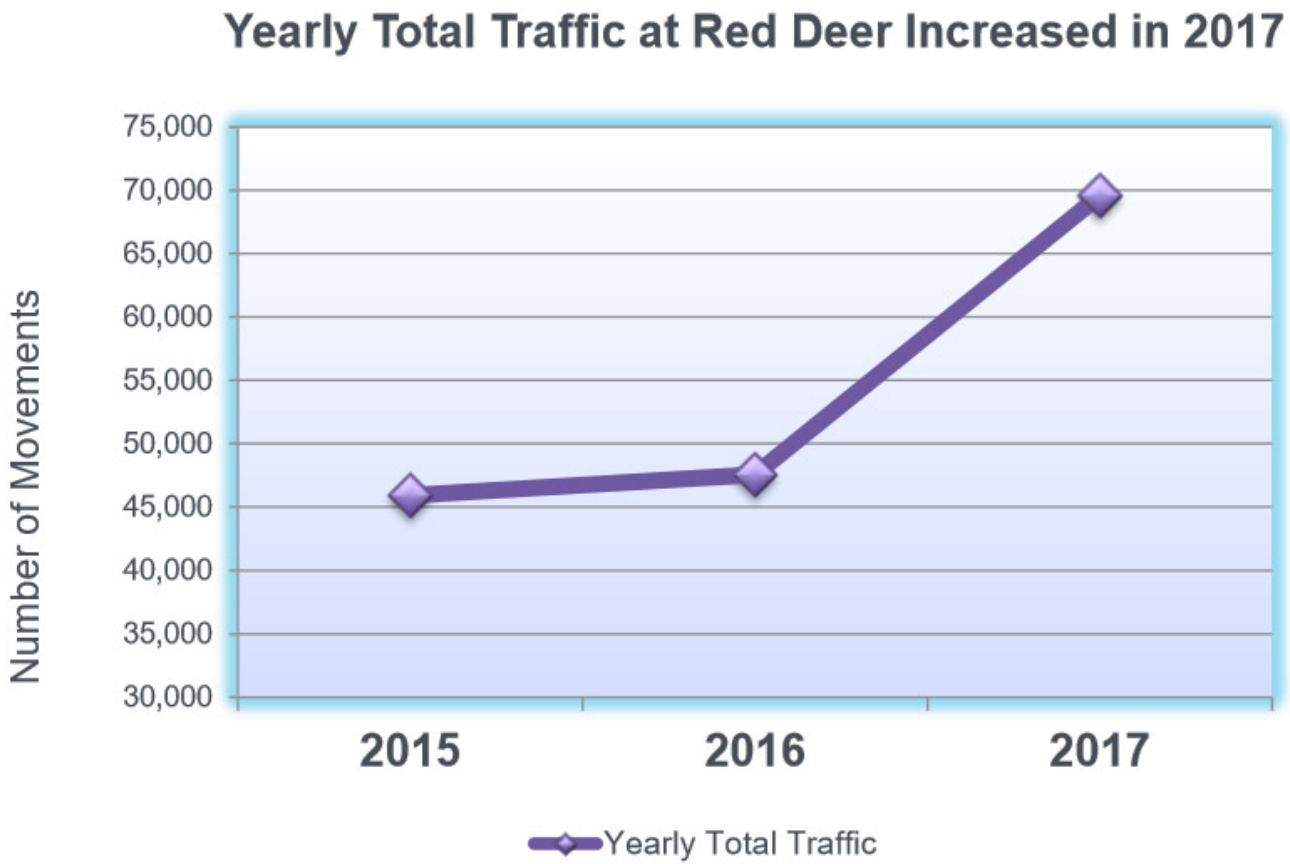
- Study considers
  - Air traffic mix and movements
  - Safety review based on known Aviation Occurrence Reports (AOR) and Operating Irregularities (OI)
  - Communications between ATS and pilots
  - Overall operating environment.

COMPARABLE SITES

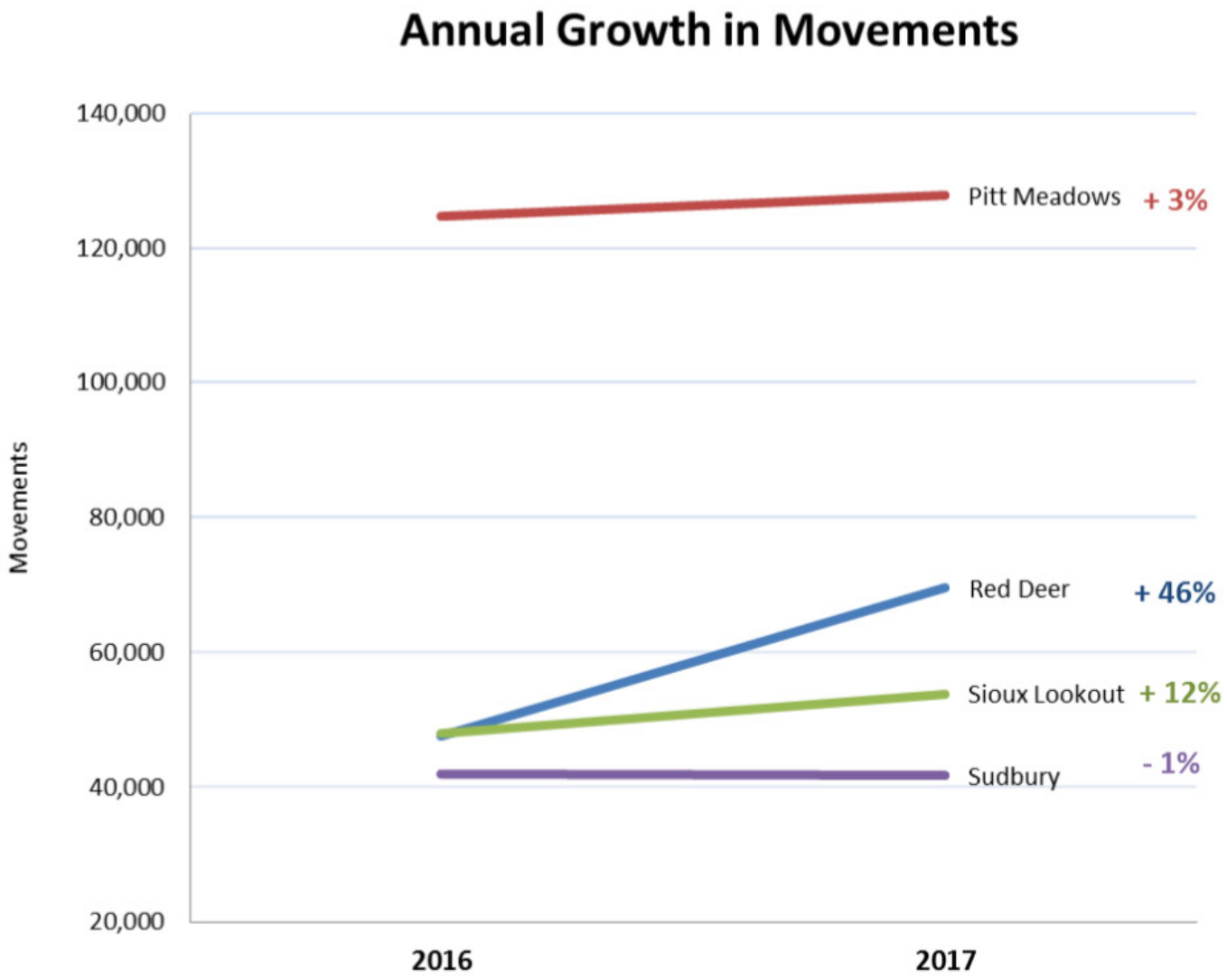
Location	Service	Focus on Pilot Training	Focus on ESL Pilot Training	Total Annual Traffic	Training Flights as a Percentage of Total Traffic
Red Deer	FSS	✓	✓	69,583	69%
Pitt Meadows	Tower	✓	✓	127,821	61%
Sioux Lookout	FSS	✗	✗	53,930	<1%
Sudbury	FSS	✓	✗	41,779	24%

TRAFFIC ANALYSIS FOR RED DEER

2015	2016	2017
46 K →	47K →	70K



TRAFFIC COMPARISONS



SAFETY EVENTS

		2016	2017
Pitt Meadows	ATS OI	1	2
	Non ATS OI	12	38
	Not an OI	74	71
Red Deer	ATS OI	1	2
	Non ATS OI	3	24
	Not an OI	33	89
Sioux Lookout	ATS OI	2	1
	Non ATS OI	7	4
	Not an OI	72	90
Sudbury	ATS OI	0	0
	Non ATS OI	1	6
	Not an OI	78	113

COMMUNICATIONS

- ICAO called for higher proficiency levels in English language
- In 2003 adopted Annex 1 Amendment 164 outlining Proficiency Requirements in Common English.
- Minimum requirement for English language ability is the ICAO Language Proficiency Rating Scale Level 4 (Operational Level) graded by:
  - 1. Accuracy of pronunciation,
  - 2. Ability in relevant grammatical structures and sentence patterns,
  - 3. Vocabulary range and accuracy,
  - 4. Fluency (ability to produce stretches of language at an appropriate tempo),
  - 5. Accurate comprehension on common, concrete, and work-related topics, and
  - 6. Interaction ability (ability to give immediate, appropriate, and informative responses).

COMPARISON OF FSS AND TOWER RADIO TRANSMISSION STATISTICS

Location	Average daily # of Radio Transmissions	Average Duration of a Transmission (seconds)	Average Time between two Subsequent Transmissions	Average time between two subsequent Pilot Transmissions (minutes: seconds)
Red Deer	3553	4	24 seconds	1:17
Pitt Meadows	3379	2	25 seconds	6:13

In 2017, Pitt Meadows had 127,821 movements versus 69,583 in Red Deer

SPEECH RATE

- Speech rate in the listening comprehension section of the Japanese Language Proficiency Certification test for pilots as established by the Japanese Civil Aviation Bureau
  - median speech rate of 4.5 syllables per second for the test outcome
- Compared this rate with the median of 6.1 syllables per second in actual ATC communications in English
- Compared to 5.1 and 4.7 syllables per second respectively in English movies and English TV news.

CONGESTION QUOTIENT

a measure of the level of radio frequency congestion

Congestion Quotient = $\frac{\textit{Actual number of transmissions}}{\textit{Expected number of transmissions}}$

Expected Number of Transmissions =
(Average number of transmissions per aircraft) X (Number of aircraft in vicinity)

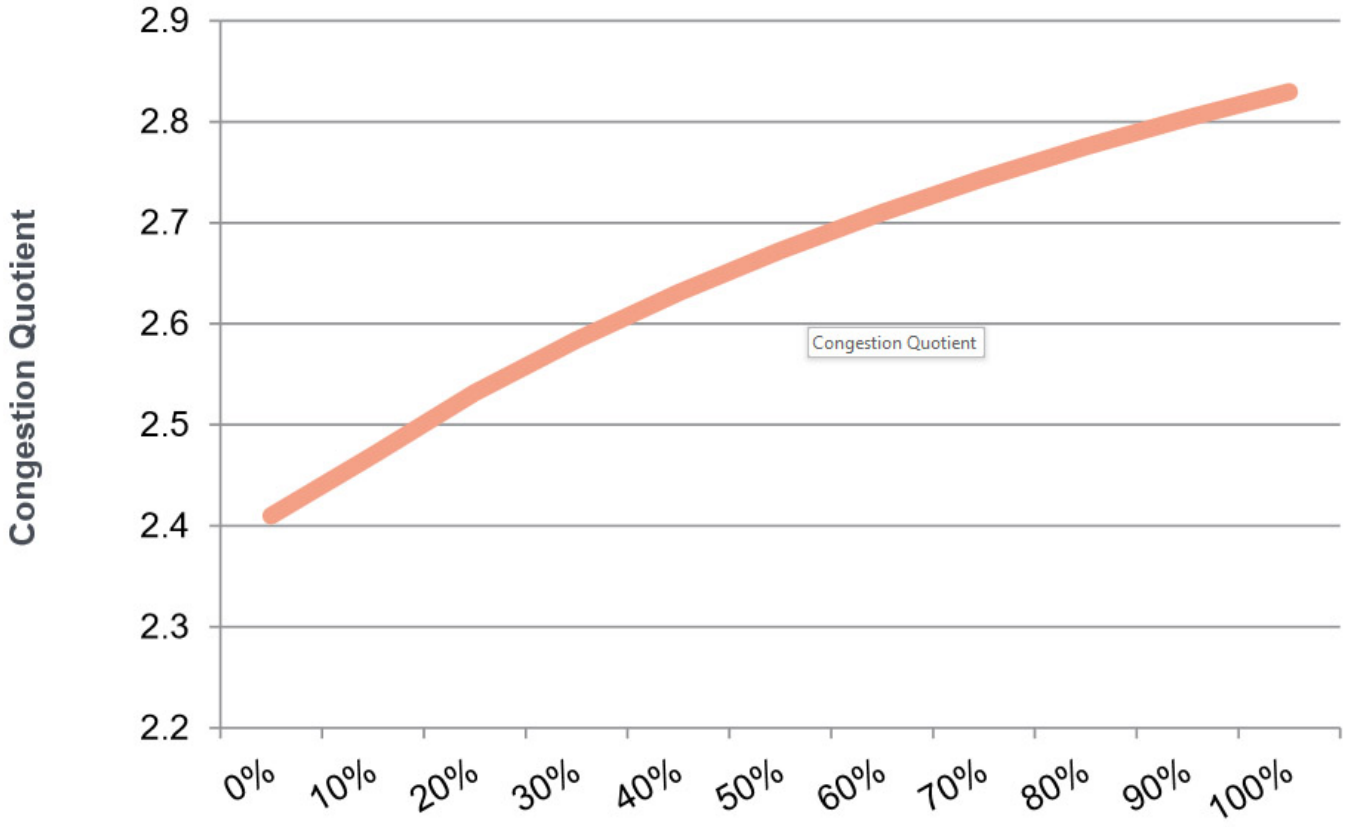
Average number of transmissions per aircraft:

- Average number of conversations between ATS and pilot during short flights: 4 per aircraft
- Average number of transmissions per conversation: 4 (identify, repeat, request, confirm)
- Average number of transmissions per aircraft: 16 (4 conversations * 4 transmissions per conversation)

CONGESTION QUOTIENT FOR JANUARY 20-26, 2018

Location	Service	Training Activity	ESL Training	Radius of Potential Influence from Airport (nm)	Aircraft in Vicinity	Actual Radio Transmissions	Expected Number of Transmissions	Congestion Quotient
Red Deer	FSS	Yes	Yes	6	522	20088	8352	2.41
Pitt Meadows	TOWER	Yes	Yes	4	728	20288	11648	1.74
Sioux Lookout	FSS	No	No	6	981	20953	15696	1.33
Sudbury	FSS	Yes	No	8	587	15573	9392	1.66

RED DEER'S RADIO FREQUENCY GETS MORE CONGESTED AS TRAINING ACTIVITY INCREASES.



IN CLOSING

- We openly share our Safety data with our Regulator and all other aviation stakeholders
- We strive to continuously improve Safety
- It is a collective effort
- But.....

Safety data needs more protection if we want to do more.

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