Safety Impact Assessment of the End-Around Taxiway at the Dallas/Fort Worth International Airport Using ASDE-X Data

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DFW

EAT Motivation

EAT Objectives/Performance Measures

Data Analysis

Conclusions

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The DFW International Airport

Operations at DFW

Early 2000: over 800,000 operations

Hub for American Airlines and Delta Airlines

Runway Safety

Runway Incursions

Runway Collisions
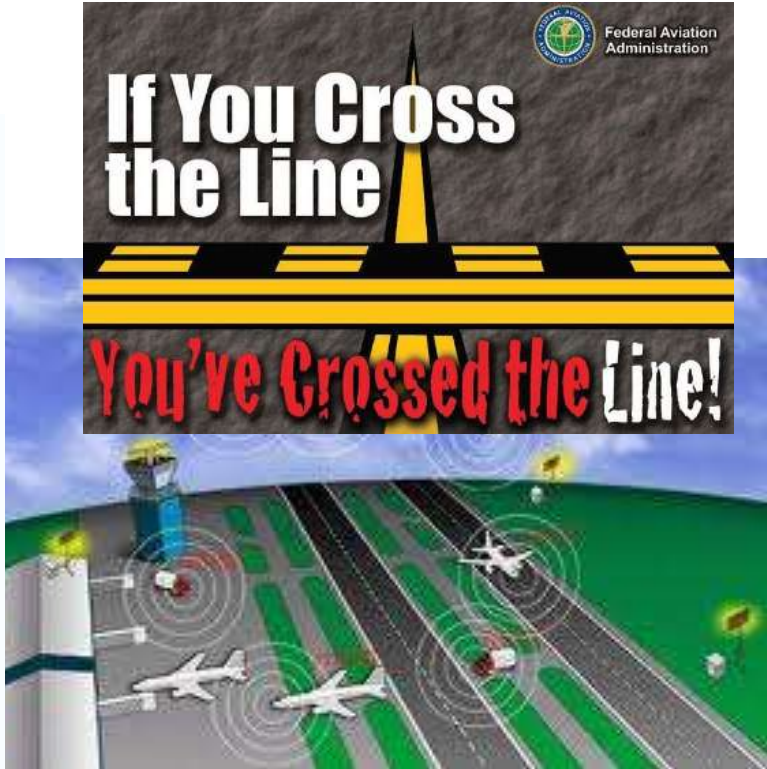
The End-Around Taxiway

Conceived in the early 2000s

Cooperation with NASA

Goals:

Reduce Runway Incursions

Improve Efficiency of Operations

The End-Around Taxiway

17L and 17C Arrivals

Use allowed during South Flow Only

Latest SOP April 2011

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Research Motivation

How well has the EAT achieved its goals?

Runway Incursions at DFW Before/After EAT and RWSL

BEFORE	Type: Pilot Deviation	
Category	17R/35L	17C/35C
A	0	0
B	0	0
C	1	0
D	2	2
Totals	3	2

AFTER	Type: Pilot Deviation	
Category	17R/35L	17C/35C
A	0	0
B	0	0
C	3	0
D	0	0
Totals	3	0

- 40% Runway Incursions

Research Methodology

Data source: ASDE-X database

Operations Considered:
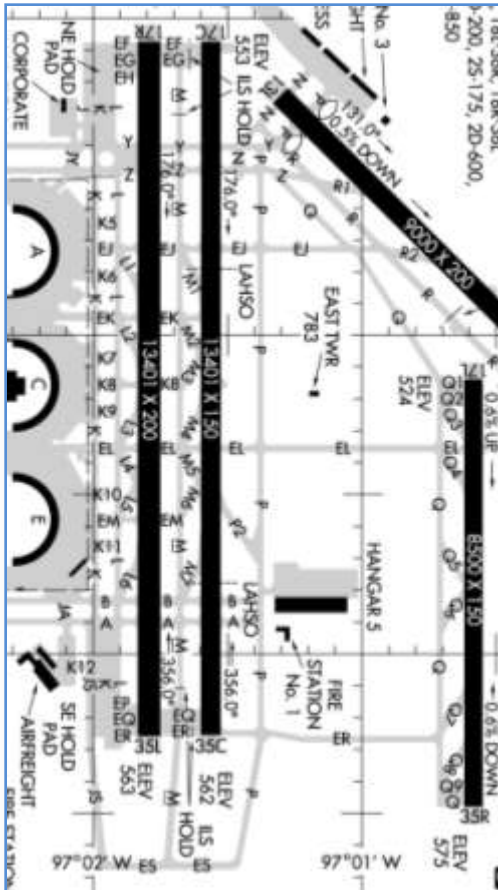## RWY 17L Arrivals Crossing RWY 17C

Simple Random Sample

Before EAT   **After EAT**

Validation with random days

Runway 17L Arrivals Crossing 17C

Before the EAT (April to Nov. 2008)

17L Arrivals Crossing 17C		
Y	0%	
Z	14%	19%
EJ	5%	
EL	46%	46%
B	24%	
ER	11%	35%

After the EAT (April to Nov. 2011)

17L Arrivals Crossing 17C		
Y	2%	
Z	12%	15%
EJ	1%	
EL	2%	1.5%
B	1%	
ER	31%	32.5%
ES (EAT)	51%	

Runway 17L Arrivals Crossing 17C

Before/After EAT

	RWY 17C Taxiways	Observed Crossings / EAT Use After EAT	Expected Crossings / EAT Use After EAT	Chi Square
RWY CROSSING	Y	97	330	164
	Z			
	EJ			
	EL			
LAHSO	B	152	174	3
	A			
	EQ			
	ER			
EAT	ES	255	8 E-05 ≈ 0	≈ 800,000,000
	Total	504	504	≈ 800,000,000

$\alpha = 0.05$ d.o.f. $= 1$ $\chi^2_{0.05,1} = 7.882$

DFW EAT Achievements:

- Contributed to 40% Reduction RI

- Runway Crossing Reduction

- Estimated Usage 51%

- Changed Runway 17C Crossing Distribution

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Future Research

- 17R Crossings analysis

- Comparison of usage during atypical operating conditions (runway closures, weather, etc.)

- Environmental and Economic Analyses