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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

The DFW International Airport



Operations at DFW

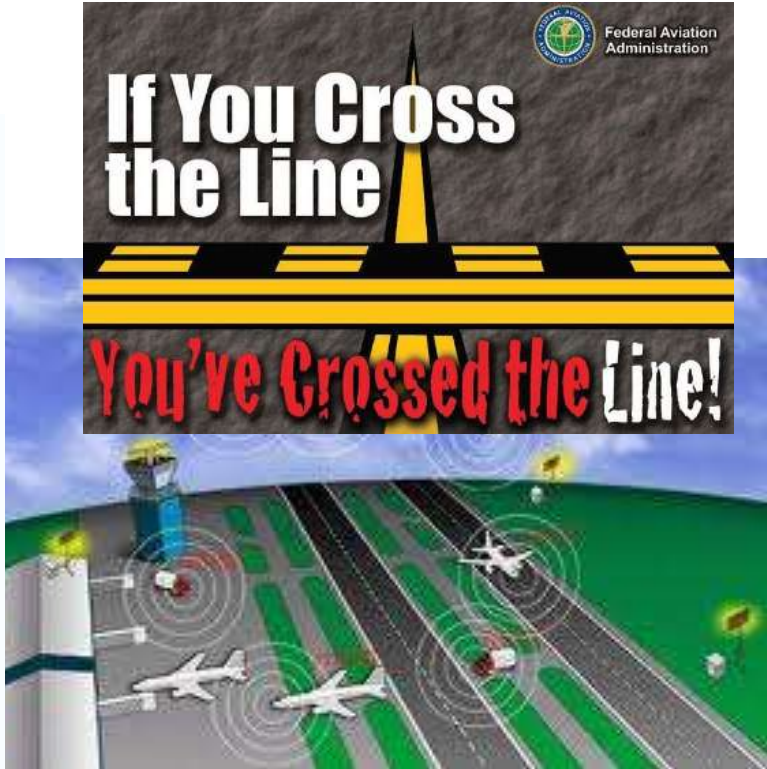
Early 2000: over 800,000 operations

**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**

Research Motivation

How well has the EAT achieved its goals?

Runway Incursions at DFW

Before/After EAT and RWSL

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

AFTER	Type: Pilot Deviation	
	17R/35L	17C/35C
Category		
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**

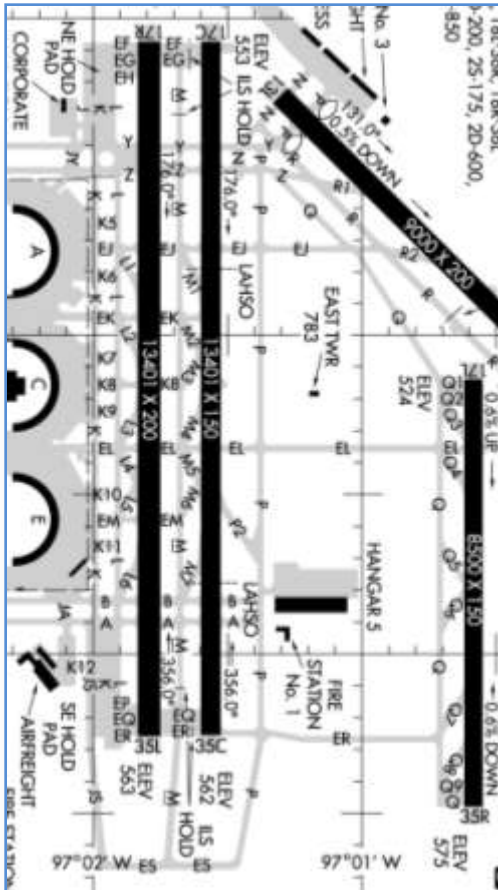
Simple Random Sample

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%	19%
Z	14%	
EJ	5%	46%
EL	46%	
B	24%	
ER	11%	35%

**After the EAT
(April to Nov. 2011)**

17L Arrivals Crossing 17C		
Y	2%	15%
Z	12%	
EJ	1%	1.5%
EL	2%	
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 \approx 0	\approx 800,000,000
	Total	504	504	\approx 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**

Future Research

- **17R Crossings analysis**
- **Comparison of usage during atypical operating conditions (runway closures, weather, etc.)**
- **Environmental and Economic Analyses**

Acknowledgements

