



The Ohio State University Airport

SMS Implementation Study

The Ohio State University Airport
(Don Scott Field)

Columbus, Ohio

Presented at the
FAA SMS Roundtable

Thursday November 3, 2011
Washington, DC

Seth Young, Ph.D., C.M., CFI
OSU SMS Implementation Principal Investigator



SMS Implementation
Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

Agenda

- **KOSU Background**
- **SMS Progress and Activities Performed**
- **Issues and Concerns**
- **Q&A**



SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport



The Ohio State University Airport (KOSU) 14CFR Part 139 Class IV, GA Reliever

- 80,000 annual operations
- All departments operated by The Ohio State University
 - **FBO, Line Services, Airfield Operations, Aircraft Maintenance, Business Office, Flight Education**
- Home to several local company flight departments
- Approximately 170 based aircraft



SMS Implementation Study FAA SMS Roundtable Nov. 3, 2011



The Ohio State University Airport

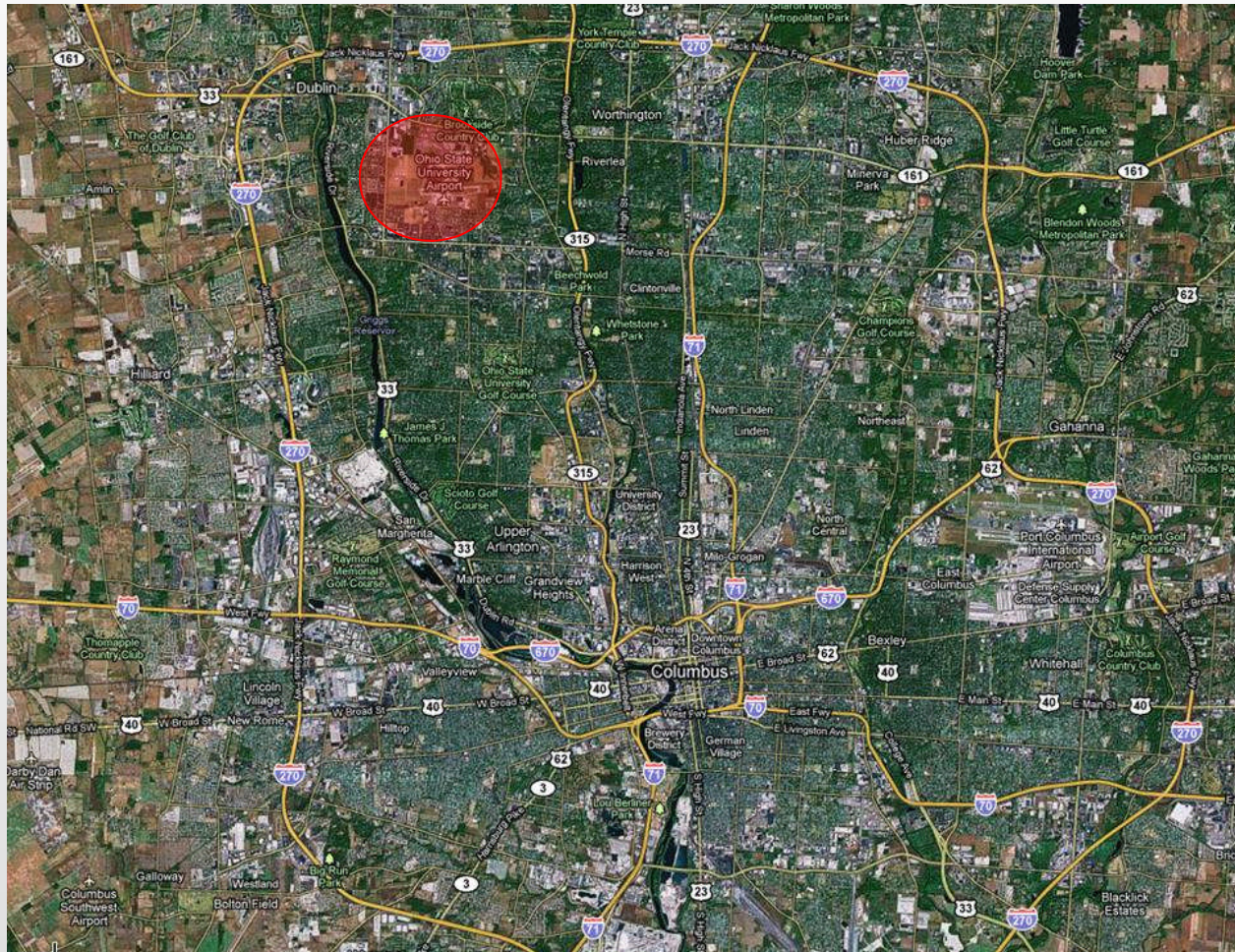


Image Source: Google



SMS Implementation
Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

KOSU





SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

Unit of OSU College of Engineering,
Department of Aviation

University owned and operated

- FBO
- Airfield/Facilities Maintenance
- Aircraft Maintenance Shop
- Community Outreach

Serves as academic flight lab for
Department of Aviation and
research lab for
OSU Center for Aviation Studies

Students employed in all areas of
the airport





SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

Project Summary

SMS Gap Analysis Pilot Project (Round 2), 2008.

Key Findings:

- Overall safe airport
- Informal safety management practices

SMS Draft Document, 2009

- Focused on SMS Policy and SRM Components



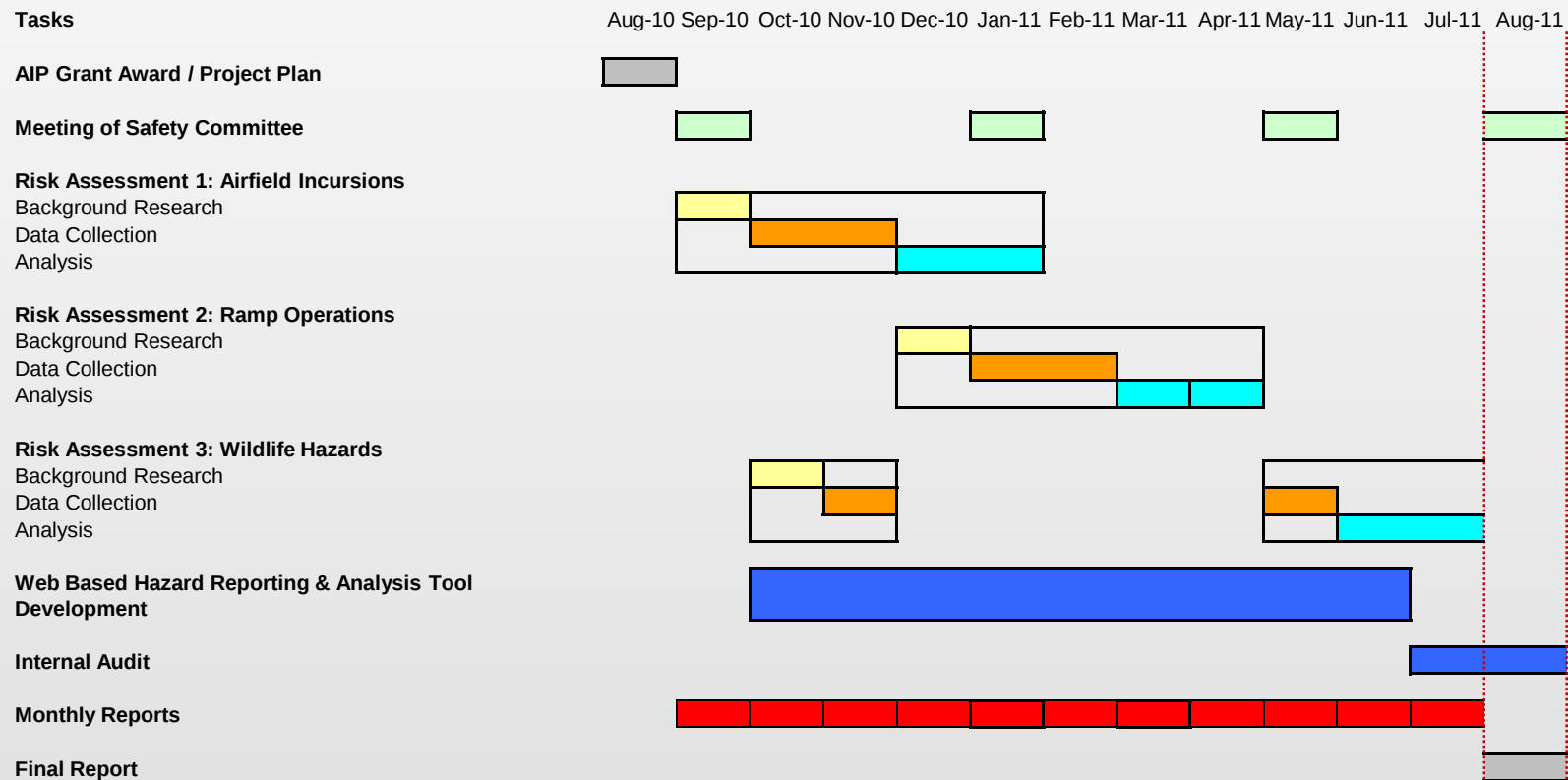
SMS Implementation Project, 2010 - 2011

Project Components

- Formation & Meetings of Airport SMS Safety Committee
- SRA Activities in three areas of operation:
 - Airfield Incursions
 - Wildlife Hazards
 - Ramp Operations
- Hazard Reporting Program
- SMS Website and web-based hazard analysis

To date: Project approximately 90% completed

Figure 1: SMS Project Schedule-The Ohio State University Airport
Timeline: August 2010 - August 2011 (Through Jan 2011)





SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

Airport Safety Committee

Name	Department/Organization
Dale Gelter	Airfield Operations
Sue Riggs	FBO Customer Service
Ashley Webb	University Flight Education
Tony Barrell	Aircraft Maintenance
Dan Murphy	FBO Line Service
Mike Fetch	ARFF
Deral Carson	Air Traffic Control
Tom Butler	USDA Wildlife Services
Colin Henry	MedFlight
Darrick Helmuth	Capital City Aviation (Flying Club)
Lowell Dowler	Corporate Flt. Dept. Tenant



Safety Risk Assessments – Defining the Risk

		5	4	3	2	1
Likelihood	Severity	No Safety Effect	Minor	Major	Hazardous	Catastrophic
A	Frequent	Low Risk	Medium Risk	High Risk	High Risk	High Risk
B	Probable	Low Risk	Medium Risk	High Risk	High Risk	High Risk
C	Remote	Low Risk	Low Risk	Medium Risk	High Risk	High Risk
D	Extremely Remote	Low Risk	Low Risk	Low Risk	Medium Risk	High Risk
E	Extremely Improbable	Low Risk	Low Risk	Low Risk	Low Risk	Medium Risk

High Risk
Medium Risk
Low Risk

Figure 2: FAA Predictive Risk Matrix (Source ACRP Report 1 Vol. 1)

		SEVERITY				
RISK MATRIX	LIKELIHOOD	No Safety Effect	Minor	Major	Hazardous	Catastrophic
		(A)	(B)	(C)	(D)	(E)
	Frequent (5)	LOW	MEDIUM	HIGH	HIGH	HIGH
	Probable (4)	LOW	MEDIUM	HIGH	HIGH	HIGH
	Remote (3)	LOW	LOW	MEDIUM	HIGH	HIGH
	Extremely Remote (2)	LOW	LOW	LOW	MEDIUM	HIGH
	Extremely Improbable (1)	LOW	LOW	LOW	LOW	MEDIUM

High Risk
Medium Risk
Low Risk

Figure 3: FAA Predictive Risk Matrix (Source ACRP Report 1 Vol. 2)



Safety Risk Assessments – Defining the Risk

Level of Severity:

A - No Effect:	No Injuries or damage
B - Minor:	No injuries, minor damage to property or equipment
C - Major:	Minor to moderate injuries, moderate to significant property damage
D - Hazardous:	Few major to fatal injuries, significant property damage
E - Catastrophic:	Several fatal and serious injuries, major property damage

Levels of Likelihood:

1 – Extremely Improbable:	Has never occurred at the airport (but could)
2 – Extremely Remote:	A highly irregular occurrence (perhaps once in 10 years)
3 – Remote:	An irregular and unexpected occurrence (perhaps 1 once per 6 months to year)
4 – Probable:	An irregular, but not unexpected occurrence (can expect to occur at least 1 per year)
5 – Frequent:	A regular occurrence (can expect to occur at least once 3-6 months)



SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

Safety Risk Assessments

- **Airfield Incursions**
- **Wildlife Hazards**
- **Ramp Area Analysis**



Multi-day efforts

- Initial meetings with SMS Safety Committee
- Individual interviews with airport users
- Hazard report collection
- Internal Analysis
- Review with SMS Safety Committee



SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

Hazard Reporting Data Collection Activities

- Red binders and signs located in various departments
 - Passenger terminal, Line Service, flight club, Flight Ed.
- Binder contains instructions, reporting forms, and submission envelope





SMS Implementation Study FAA SMS Roundtable Nov. 3, 2011



The Ohio State University Airport

Hazard Reporting Data Collection Activities

- Online reporting via OSU Airport SMS webpage

The screenshot displays the OSU Airport Safety Management Systems website. The left sidebar contains a 'Welcome!' message, a 'What is a "hazard report"?' section, a 'What is a Safety Management System (SMS)?' section, and a list of 'SMS Resources' including NPSM, Advisory Circular, and ACBP SMS Guidebook. The main content area shows the 'Submit Hazard Report' form with fields for Date, Name (optional), Organization (optional), Location, and Hazard Type (with radio buttons for Ramp Safety, Wildlife, Aircraft Incursion, Vehicle/Pedestrian Incursion, and Other). Below these are sections for 'Objects Involved', 'Persons Involved', and 'Wildlife Involved'.

OSU Airport Safety Management Systems

Home Submit Hazard Report

Welcome!

Welcome to the OSU Airport Safety Management Systems website. From here you may learn about the Safety Management System (SMS) Implementation that has been occurring over the past year, and access various helpful resources. On this site we will post news updates about Safety Committee meetings, FAA directives, and overall airport safety information. You may also submit a [hazard report](#).

What is a "hazard report"?

Employees, users, and organizations of the OSU Airport are encouraged to report safety hazards that may have been observed or encountered. This can be anything from confusing signage, procedures, unsafe acts witnessed, or anything safety related with regard to the ramp and airfield areas. These reports are non-punitive, and can be submitted anonymously, if desired. Participation is strictly voluntary, and highly encouraged to increase safety at OSU Airport.

What is a Safety Management System (SMS)?

In order for the OSU Airport to provide the safest environment possible for its staff and pilots, the airport has decided to implement a Safety Management System (SMS). By definition a SMS is, "formalized approach to managing safety by developing an organization-wide safety policy, developing formal methods of identifying hazards, analyzing and mitigating risk, developing methods for ensuring continuous safety improvement, and creating organization-wide safety promotion strategies." SMS will allow the airport to strengthen its overall safety by consistently considering safety in all aspects of the airport operations. So, what does this mean to you?

There are four pillars of SMS - Safety Policy, Safety Assurance, Safety Risk Management, and Safety Promotion - that will be affecting all areas of the airport. Safety Policy is related to the fundamentals of safety management that the airport has committed to and is a coherent aspect of all procedures. The OSU airport has also formed a Safety Committee that is composed of members representing a multitude of interests and is devoted to continued improvement of policies and all other aspects of SMS. Safety Risk Management and Safety Assurance work together to proactively prevent accidents or any other mishap. Any individual at the airport can assist in Safety Risk Management by submitting a hazard report. This simple form allows the airport to collect data on the hazards. A risk assessment is then performed on the hazard and the necessary procedures are performed accordingly. In order for these risks to stay at bay, Safety Assurance consistently measures the effectiveness of the risk control and ensures the hazard has not become more of a danger. The final pillar, Safety Promotion involves all members of the airport community. Staff and all levels of management can contribute a positive attitude towards

News

Airport Safety Committee Meeting will be held Thursday, June 16th at 9:00am in the OSU Airport Administration Building Classroom.

4/27/2011 - OSU Airport Safety Website now up and running! Check this site for news, safety announcements, and all other things pertaining to OSU Airport safety. You may also use this site to submit a hazard report, anonymously if desired.

SMS Resources

- [NPSM](#)
- [Advisory Circular](#)
- [ACBP SMS Guidebook](#)

OSU Airport Safety Committee

Name	Department/Organization
Dale Gelter	Airfield Operations
Sue Riggs	FBO Customer Service
Ashley Webb	Flight Education
University	
Tony Barrell	Aircraft Maintenance
Dan Murphy	FBO Line Service
Mike Fetch	ARFF
Daniel Pearson	Air Traffic Control

Submit Hazard Report

Home Submit Hazard Report

Submit Hazard Report

Date

Name (optional)

Organization (optional)

Location

Hazard Type

☐ Ramp Safety
☐ Wildlife
☐ Aircraft Incursion
☐ Vehicle/Pedestrian Incursion
☐ Other

Objects Involved

Persons Involved

Wildlife Involved



SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011

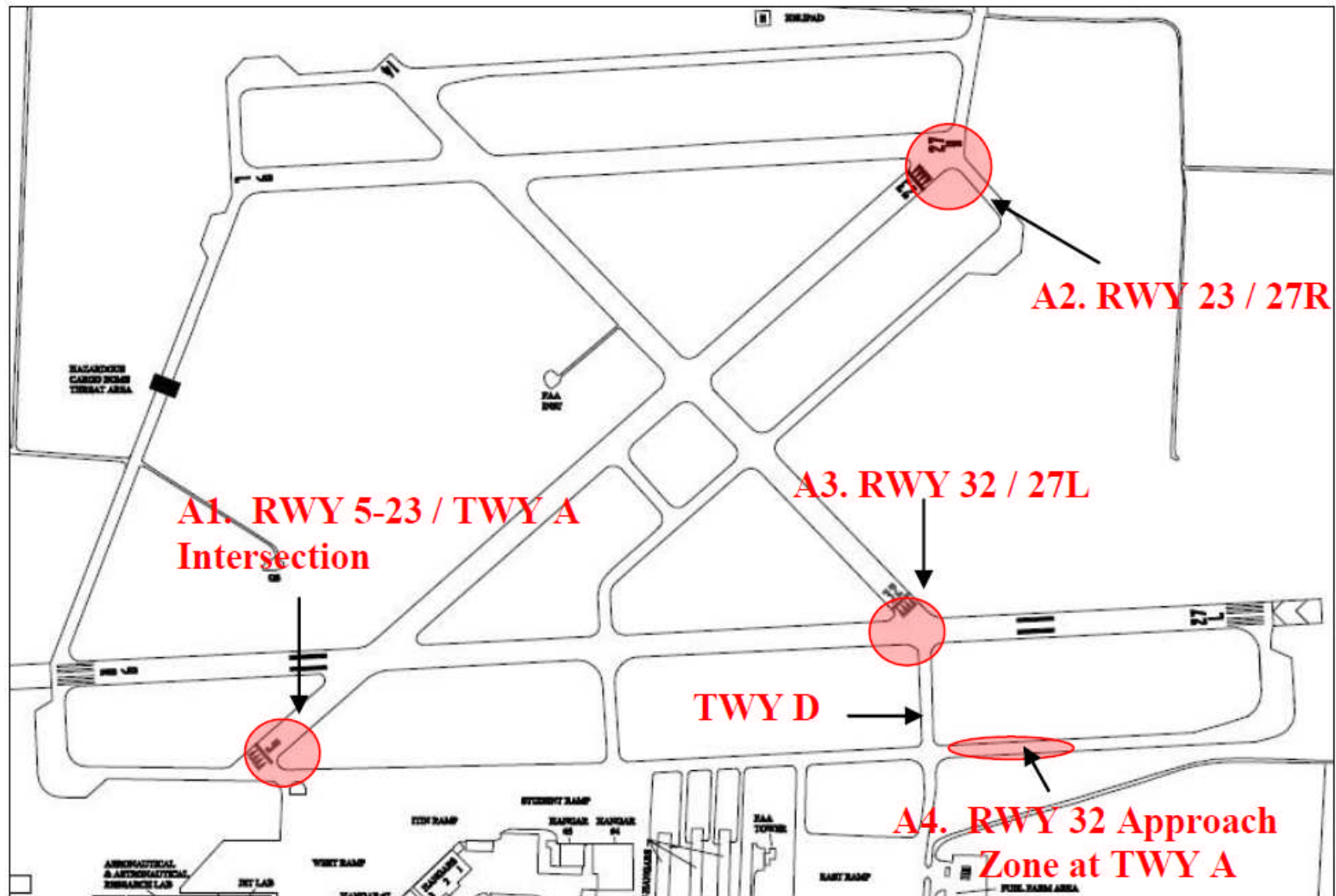
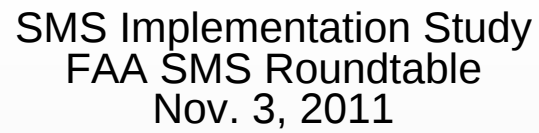


The Ohio State University Airport

Safety Risk Assessments – Airfield Incursions

Identified Hazards in Airfield Incursions Risk Assessment

Hazard	Location
A1. Absence of marked run-up area for RWY 5	Taxiway “A”
A2. Multiple runway thresholds at one taxiway	Taxiway “C” and RWY 27R/RWY 23
A3. RWY 32 threshold proximity to RWY 27L	Int. of TWY “D”, RWY 27L and RWY 32
A4. RWY 32 approach zone on TWY “A”	TWY “A” east of TWY “D”

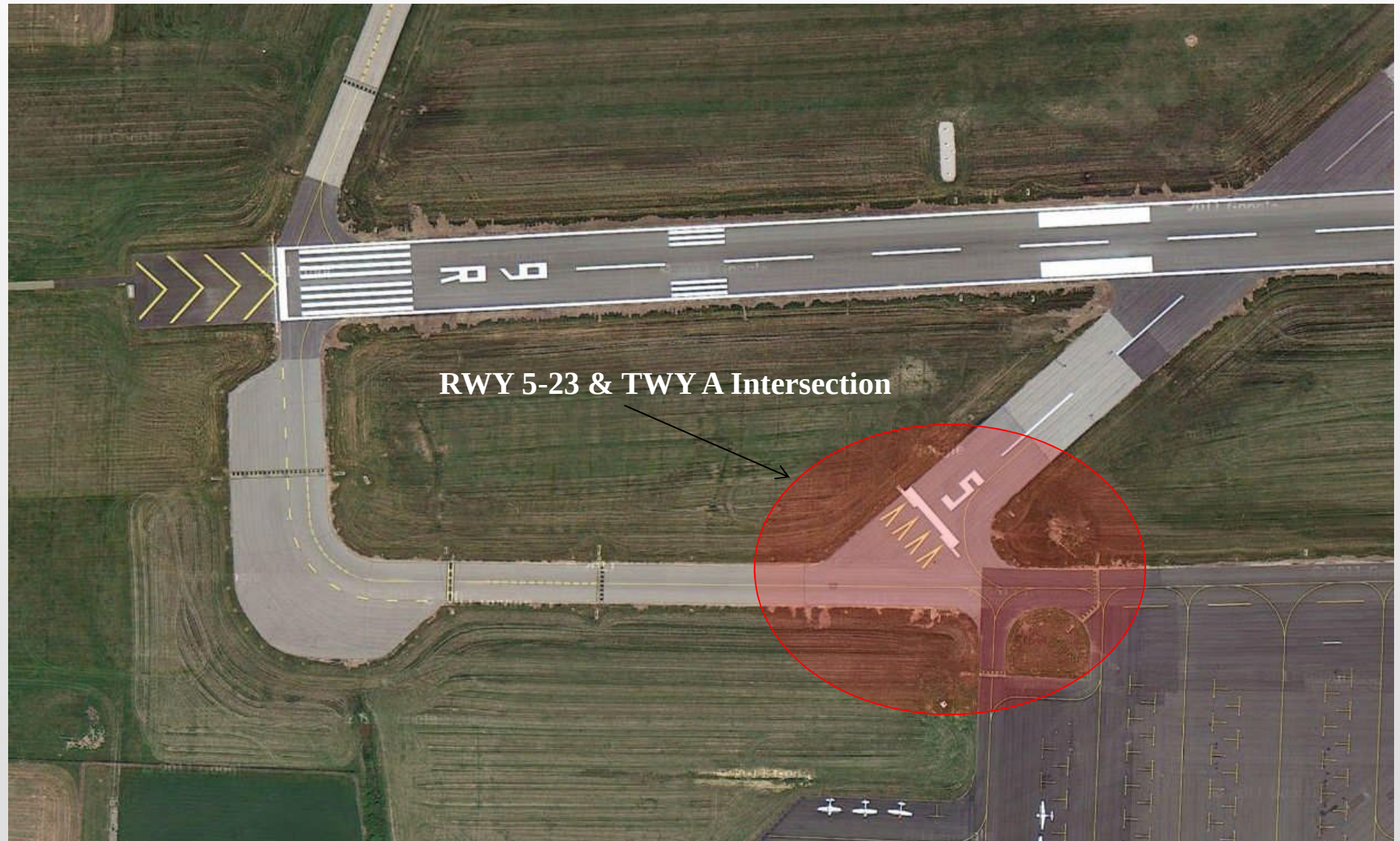




SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport





SMS Implementation Study FAA SMS Roundtable Nov. 3, 2011



The Ohio State University Airport



RISK MATRIX		SEVERITY				
		No Safety Effect (A)	Minor (B)	Major (C)	Hazardous (D)	Catastrophic (E)
LIKELIHOOD	Frequent (5)	LOW	MEDIUM	HIGH	HIGH	HIGH
	Probable (4)	LOW		HIGH	HIGH	HIGH
	Remote (3)	LOW	LOW	MEDIUM	HIGH	HIGH
	Extremely Remote (2)	LOW	LOW	LOW	MEDIUM	HIGH
	Extremely Improbable (1)	LOW	LOW	LOW	LOW	HIGH MEDIUM

■ High Risk
■ Medium Risk
■ Low Risk

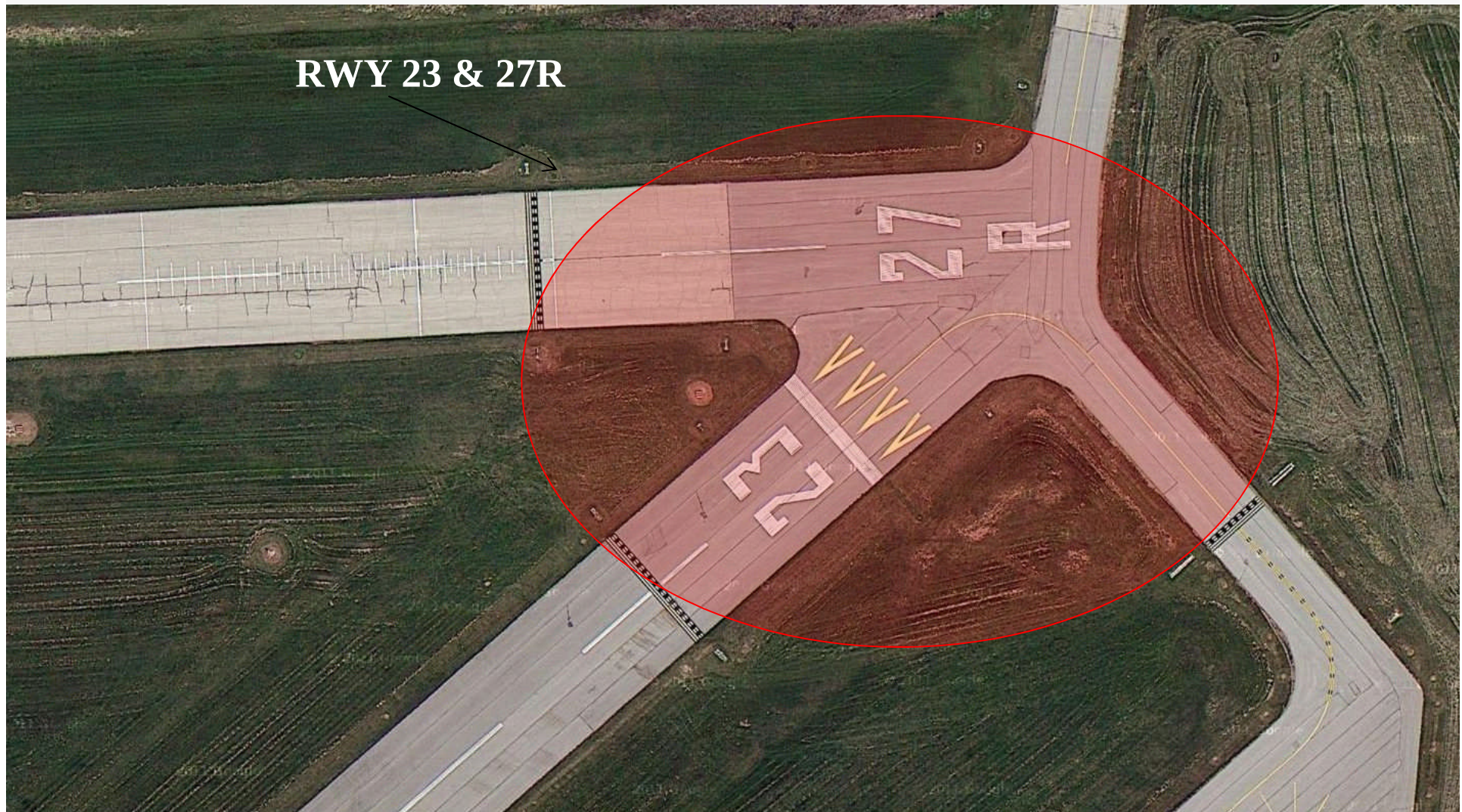
Risk Severity		Risk Likelihood
Description	Slight impacts on airport reputation. Minor physical discomfort Little to no financial loss Slight reduction in safety margin	Once every 3-6 months
Classification	Minor (B)	Probable (4)



SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport





SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport



RISK MATRIX		SEVERITY					High Risk Medium Risk Low Risk
		No Safety Effect (A)	Minor (B)	Major (C)	Hazardous (D)	Catastrophic (E)	
LIKELIHOOD	Frequent (5)	LOW	MEDIUM	HIGH	HIGH	HIGH	
	Probable (4)	LOW	●	HIGH	HIGH	HIGH	
	Remote (3)	LOW	LOW	MEDIUM	HIGH	HIGH	
	Extremely Remote (2)	LOW	LOW	LOW	MEDIUM	HIGH	
	Extremely Improbable (1)	LOW	LOW	LOW	LOW	HIGH MEDIUM	

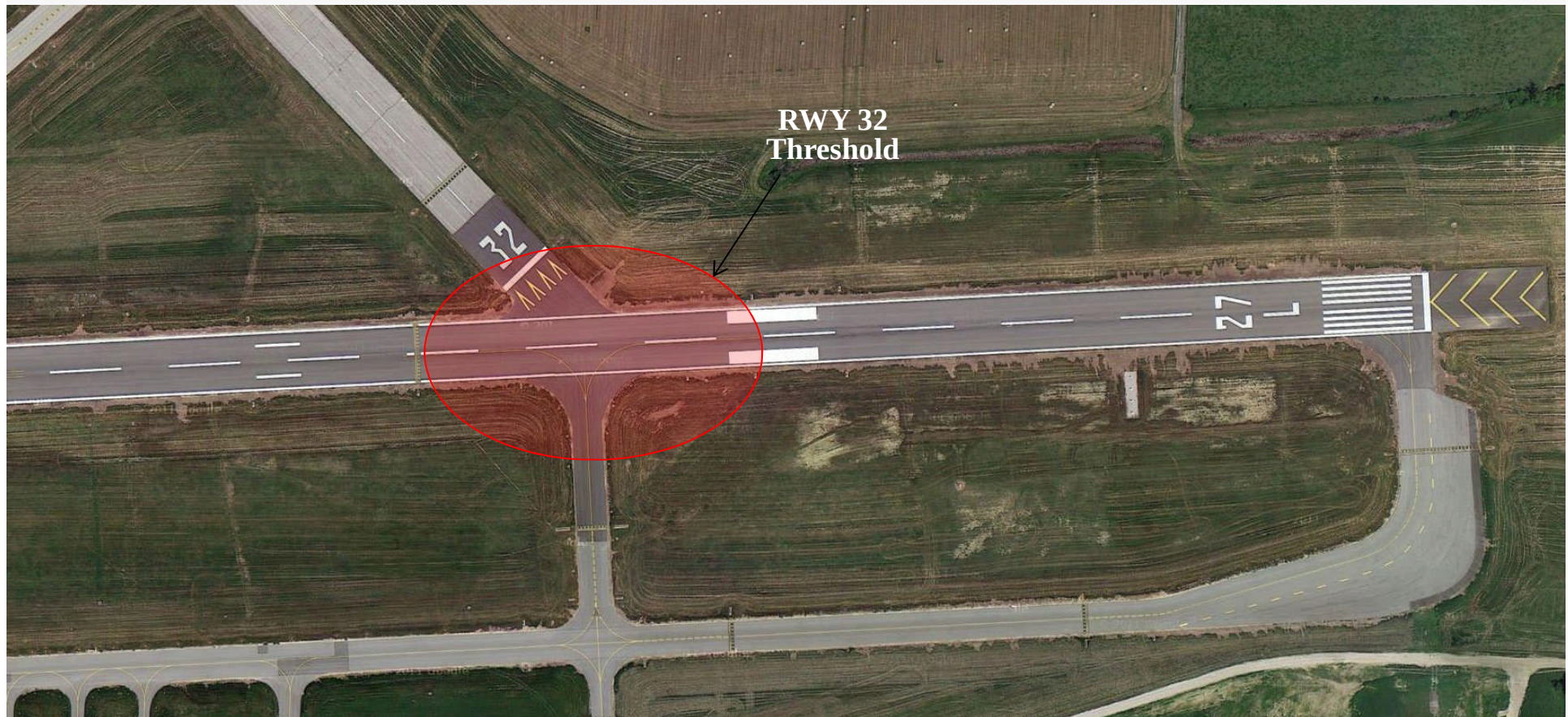
Risk Severity		Risk Likelihood
Description	Slight impacts on airport reputation. Minor physical discomfort Little to no financial loss Slight reduction in safety margin	Once every 3-6 months
Classification	Minor (B)	Probable (4)



SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport





SMS Implementation Study FAA SMS Roundtable Nov. 3, 2011



The Ohio State University Airport



RISK MATRIX		SEVERITY					High Risk Medium Risk Low Risk
		No Safety Effect	Minor	Major	Hazardous	Catastrophic	
		(A)	(B)	(C)	(D)	(E)	
LIKELIHOOD	Frequent (5)	LOW	MEDIUM	HIGH	HIGH	HIGH	
	Probable (4)	LOW	MEDIUM	HIGH	HIGH	HIGH	
	Remote (3)	LOW		MEDIUM	HIGH	HIGH	
	Extremely Remote (2)	LOW	LOW	LOW	MEDIUM	HIGH	
	Extremely Improbable (1)	LOW	LOW	LOW	LOW	HIGH MEDIUM	

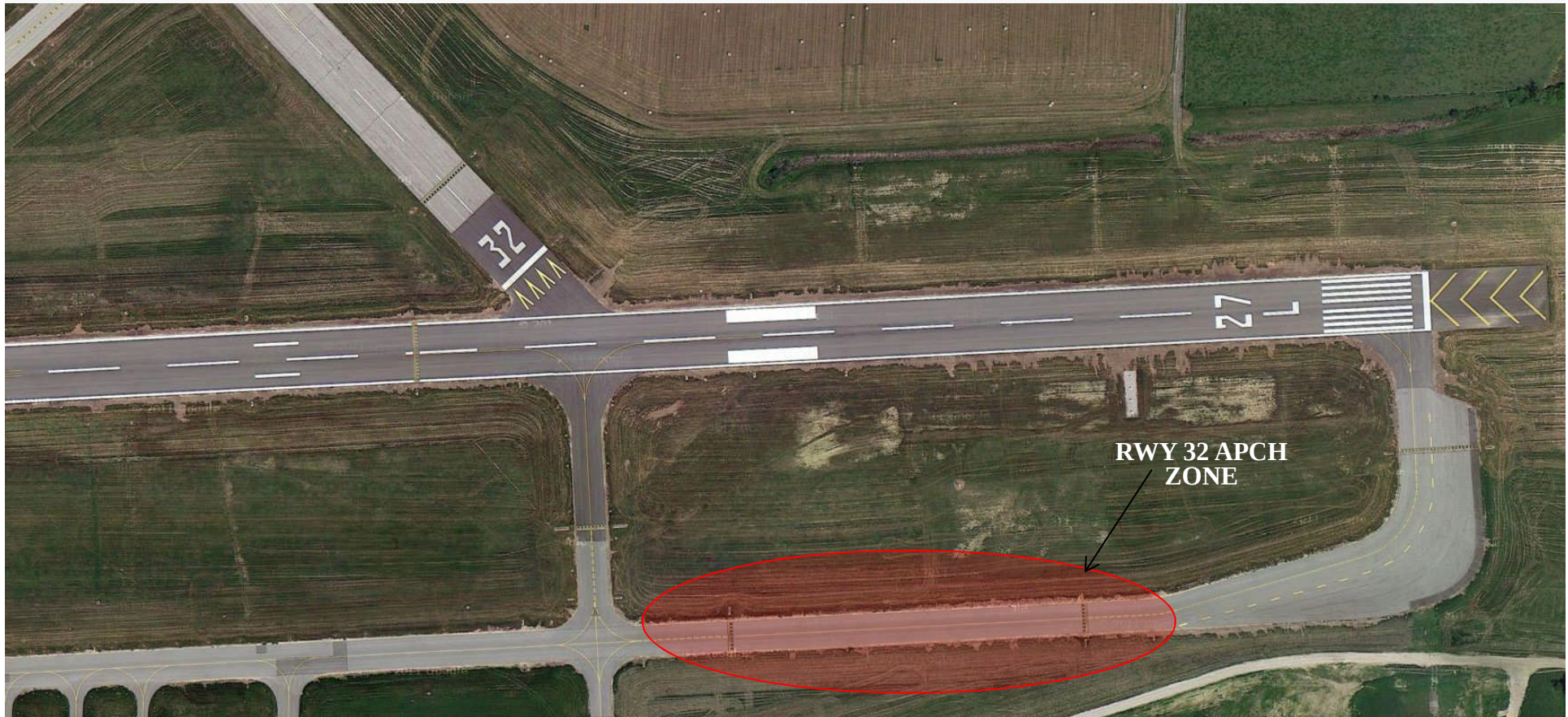
Risk Severity		Risk Likelihood
Description	Slight impacts on airport reputation. Minor physical discomfort Little to no financial loss Slight reduction in safety margin	Once every 6-12 months
Classification	Minor (B)	Remote (3)



SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport





SMS Implementation Study FAA SMS Roundtable Nov. 3, 2011



The Ohio State University Airport



RISK MATRIX		SEVERITY					High Risk Medium Risk Low Risk
		No Safety Effect	Minor	Major	Hazardous	Catastrophic	
		(A)	(B)	(C)	(D)	(E)	
LIKELIHOOD	Frequent (5)	LOW	MEDIUM	HIGH	HIGH	HIGH	
	Probable (4)	LOW	MEDIUM	HIGH	HIGH	HIGH	
	Remote (3)	LOW		MEDIUM	HIGH	HIGH	
	Extremely Remote (2)	LOW	LOW	LOW	MEDIUM	HIGH	
	Extremely Improbable (1)	LOW	LOW	LOW	LOW	MEDIUM HIGH	

Risk Severity		Risk Likelihood
Description	Slight impacts on airport reputation. Minor physical discomfort Little to no financial loss Slight reduction in safety margin	Once every 6-12 months
Classification	Minor (B)	Remote (3)



SMS Implementation Study FAA SMS Roundtable Nov. 3, 2011

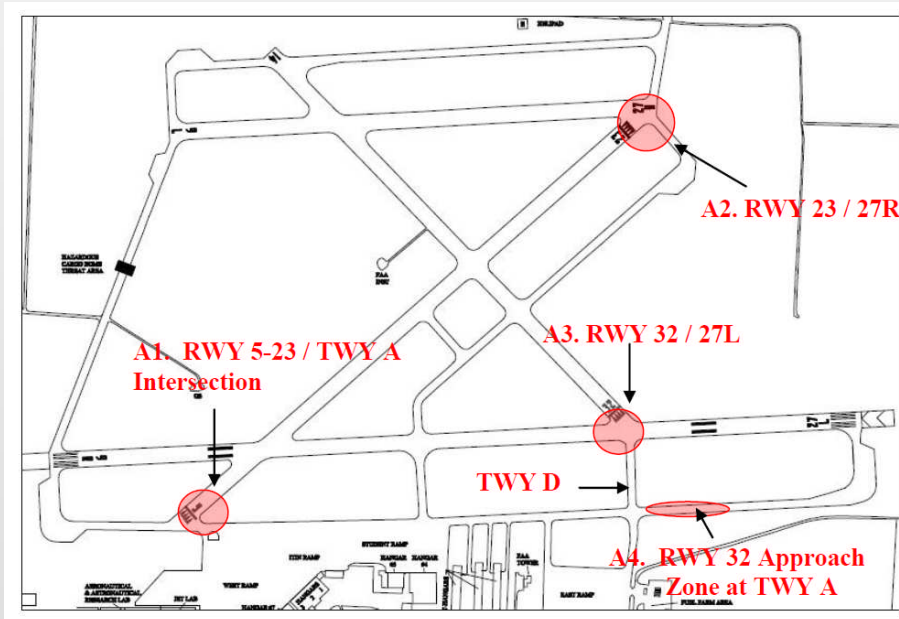


The Ohio State University Airport

Safety Risk Assessments – Airfield Incursions

Identified Hazards in Airfield Incursions Risk Assessment

Hazard	Location
A1. Absence of marked run-up area for RWY 5	Taxiway "A"
A2. Multiple runway thresholds at one taxiway	Taxiway "C" and RWY 27R/RWY 23
A3. RWY 32 threshold proximity to RWY 27L	Int. of TWY "D", RWY 27L and RWY 32
A4. RWY 32 approach zone on TWY "A"	TWY "A" east of TWY "D"



RISK MATRIX		SEVERITY				
		No Safety Effect (A)	Minor (B)	Major (C)	Hazardous (D)	Catastrophic (E)
LIKELIHOOD	Frequent (5)	LOW	MEDIUM	HIGH	HIGH	HIGH
	Probable (4)	LOW	A1 A2	HIGH	HIGH	HIGH
	Remote (3)	LOW	A3 A4	MEDIUM	HIGH	HIGH
	Extremely Remote (2)	LOW	LOW	LOW	MEDIUM	HIGH
	Extremely Improbable (1)	LOW	LOW	LOW	LOW	HIGH MEDIUM

High Risk
Medium Risk
Low Risk



Safety Risk Assessments – Airfield Incursions

RISK MATRIX		SEVERITY				
		No Safety Effect (A)	Minor (B)	Major (C)	Hazardous (D)	Catastrophic (E)
LIKELIHOOD	Frequent (5)	LOW	MEDIUM	HIGH	HIGH	HIGH
	Probable (4)	LOW	A1 A2	HIGH	HIGH	HIGH
	Remote (3)	LOW	A3 A4	MEDIUM	HIGH	HIGH
	Extremely Remote (2)	LOW	LOW	LOW	MEDIUM	HIGH
	Extremely Improbable (1)	LOW	LOW	LOW	LOW	HIGH MEDIUM

- High Risk
- Medium Risk
- Low Risk



Safety Risk Assessment – Wildlife Hazards

- Historical FAA Strike Data and Recent Strike Data
- Worked with on-site USDA professional

Identified Hazards in Wildlife Hazards Risk Assessment

Hazard	Location
W1. Grass height not maintained regularly	Airfield
W2. Vulture attractants in fields near AOA	Fields near east end of TWY A
W3. Ornamental Trees near AOA	Southwest corner of Hangar 4, control tower



SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport





SMS Implementation Study FAA SMS Roundtable Nov. 3, 2011



The Ohio State University Airport

Identified Hazards in Wildlife Hazards Risk Assessment

Hazard	Location
W1. Grass height not maintained regularly	Airfield
W2. Vulture attractants in fields near AOA	Fields near east end of TWY A
W3. Ornamental Trees near AOA	Southwest corner of Hangar 4, control tower

RISK MATRIX		SEVERITY				
		No Safety Effect (A)	Minor (B)	Major (C)	Hazardous (D)	Catastrophic (E)
LIKELIHOOD	Frequent (5)	LOW	MEDIUM	HIGH	HIGH	HIGH
	Probable (4)	LOW	W1 W2	HIGH	HIGH	HIGH
	Remote (3)	LOW	W3	MEDIUM	HIGH	HIGH
	Extremely Remote (2)	LOW	LOW	LOW	MEDIUM	HIGH
	Extremely Improbable (1)	LOW	LOW	LOW	LOW	HIGH MEDIUM

- High Risk
- Medium Risk
- Low Risk



Safety Risk Assessment – Ramp/Non-movement area

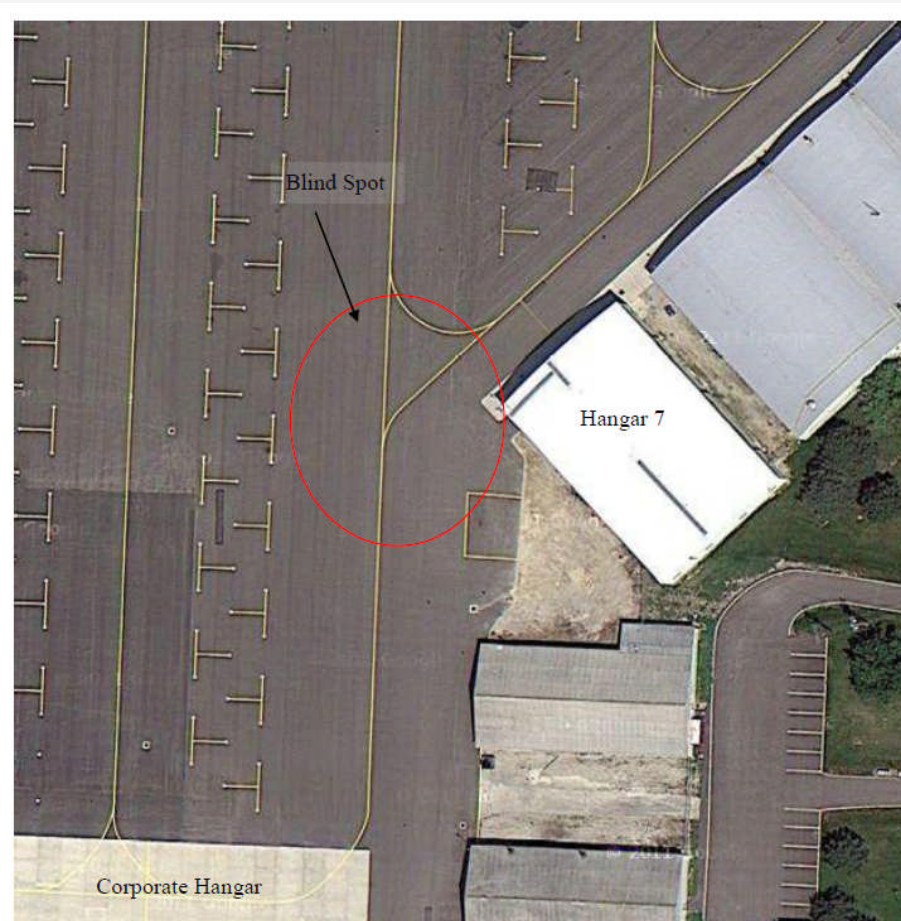


Identified Hazards in Ramp Operations Risk Assessment

Hazard	Location
R1. Untrained Drivers on Ramp	Main Ramp
R2. Blind Spot at Hangar Corner	Northeast corner of Hangar 4
R3. Entrance to FBO from Ramp	Terminal entrance vestibule



Safety Risk Assessment – Ramp/Non-movement area



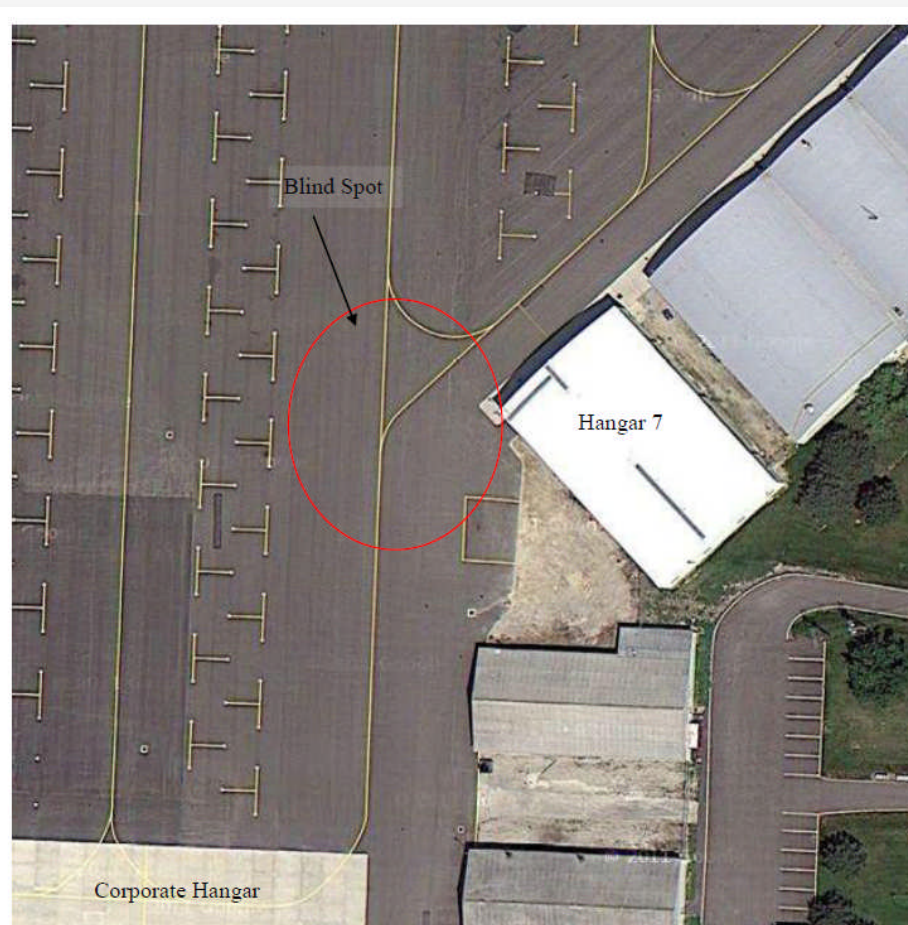


SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

Safety Risk Assessment – Ramp/Non-movement area



RISK MATRIX		SEVERITY				
		No Safety Effect (A)	Minor (B)	Major (C)	Hazardous (D)	Catastrophic (E)
LIKELIHOOD	Frequent (5)	LOW	MEDIUM	HIGH	HIGH	HIGH
	Probable (4)	LOW		HIGH	HIGH	HIGH
	Remote (3)	LOW	LOW	MEDIUM	HIGH	HIGH
	Extremely Remote (2)	LOW	LOW	LOW	MEDIUM	HIGH
	Extremely Improbable (1)	LOW	LOW	LOW	LOW	HIGH MEDIUM

■ High Risk
■ Medium Risk
■ Low Risk

	Risk Severity	Risk Likelihood
Description	Slight impacts on airport reputation. Minor physical discomfort Little to no financial loss Slight reduction in safety margin	Once every 1 month
Classification	Minor (B)	Probable (4)



SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

Safety Risk Assessment – Ramp/Non-movement area



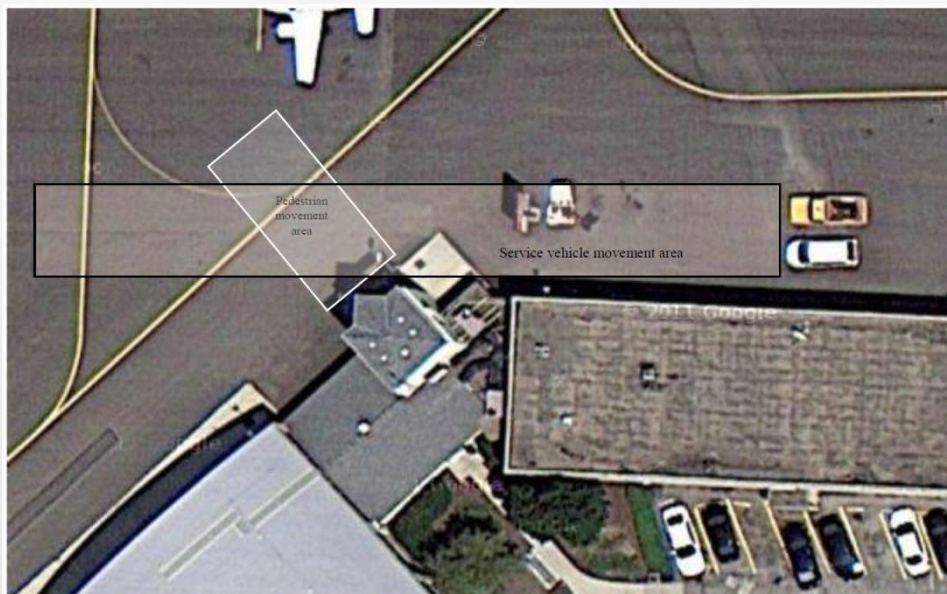


SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

Safety Risk Assessment – Ramp/Non-movement area



RISK MATRIX		SEVERITY				
		No Safety Effect (A)	Minor (B)	Major (C)	Hazardous (D)	Catastrophic (E)
LIKELIHOOD	Frequent (5)	LOW	MEDIUM	HIGH	HIGH	HIGH
	Probable (4)	LOW	MEDIUM	HIGH	HIGH	HIGH
	Remote (3)	LOW	LOW	MEDIUM	HIGH	HIGH
	Extremely Remote (2)	LOW	LOW	LOW	MEDIUM	HIGH
	Extremely Improbable (1)	LOW	LOW	LOW	LOW	MEDIUM

■ High Risk
■ Medium Risk
■ Low Risk

	Risk Severity	Risk Likelihood
Description	Minor to moderate injuries, moderate to significant property damage	A highly irregular occurrence (perhaps once in 10 years)
Classification	Major (C)	Extremely Remote (2)



SMS Implementation Study FAA SMS Roundtable Nov. 3, 2011

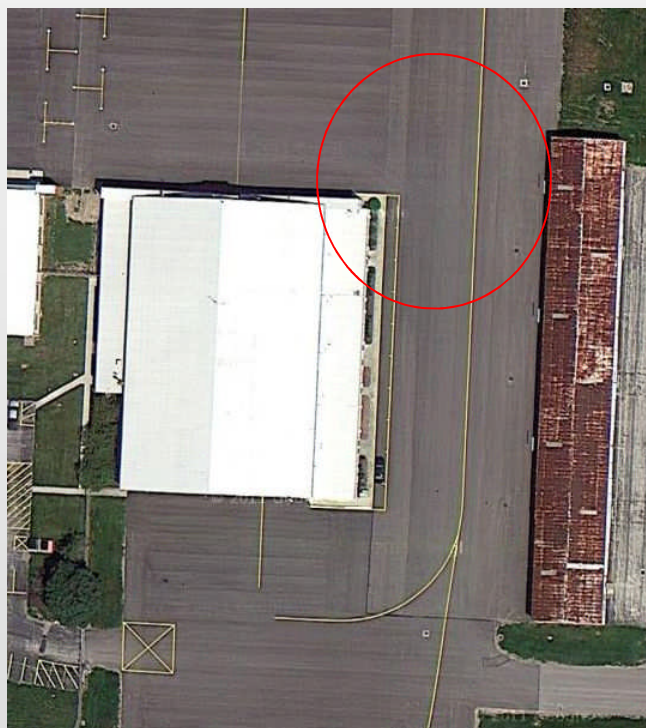


The Ohio State University Airport

Safety Risk Assessment – Ramp/Non-movement area

Identified Hazards in Ramp Operations Risk Assessment

Hazard	Location
R1. Untrained Drivers on Ramp	Main Ramp
R2. Blind Spot at Hangar Corners	Northeast corner of Hangars 4 & 7
R3. Entrance to FBO from Ramp	Terminal entrance vestibule



RISK MATRIX		SEVERITY				
		No Safety Effect	Minor	Major	Hazardous	Catastrophic
		(A)	(B)	(C)	(D)	(E)
LIKELIHOOD	Frequent (5)	LOW	MEDIUM	HIGH	HIGH	HIGH
	Probable (4)	LOW	R1b R3	HIGH	HIGH	HIGH
	Remote (3)	LOW	R2	MEDIUM	HIGH	HIGH
	Extremely Remote (2)	LOW	LOW	R1a	MEDIUM	HIGH
	Extremely Improbable (1)	LOW	LOW	LOW	LOW	HIGH MEDIUM

■ High Risk
■ Medium Risk
■ Low Risk



SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

Next Steps

- Implementing resolutions to medium risk areas
- Completion of program audit
- Acceptance and promotion of safety culture
- Increase participation in hazard reporting process
- Further formalization of the SMS process
- Will need to hire a dedicated SMS manager eventually



SMS Implementation Study
FAA SMS Roundtable
Nov. 3, 2011



The Ohio State University Airport

Contact information:

Seth Young
Center for Aviation Studies
The Ohio State University
e-mail: young.1460@osu.edu
Tel. 614-292-4556

Thank you. Questions welcomed.