

FAA Runway Safety Initiatives

Presented to: RASG

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Federal Aviation
Administration



Runway Safety: Surface Operations Risk Factors



Minimal separation and rapid pace



High-speed operations with little margin for error



Complex environment



**Low visibility in
poor weather**

Combination of Factors Minimizes Safety Margin





Global Runway Safety



Global Runway Safety Action Items

- **Runway safety teams should be established**
- **Focus areas:**
 - runway excursions
 - runway incursions
 - bird strikes
 - FOD
- **Technical solutions**
 - RSAs,
 - EMAS
 - Performance Based Navigation (PBN)
- **Aircraft situational awareness and moving maps**
- **ICAO compliant lighting and signs**
- **12 Regional RW Safety Seminars over next 2 years. First one was in Miami in U.S. in October 2011**



Agenda for Miami RRSS Oct 2011

- 1. Regional Runway Safety Seminar (RRSS) Outcome**
- 2. Runway Safety Team (RST)**
- 3. RASG-PA Role on RST**
- 4. Regional plan for developing RSTs**
- 5. National plan for developing RSTs**

RST Composition

- **Representatives from:**
 - Aerodrome operations
 - Air traffic service providers
 - Airlines or aircraft operators
 - Pilot and air traffic controller associations
 - Any groups with a direct involvement in runway operations

Runway Safety Team Role

- **Develop an action plan for runway safety**
- **Advise management on potential runway safety issues**
- **Recommend strategies for hazard removal**
- **Mitigation of the residual risk**

Action Items

- **Specific runway safety concern, issue or problem at that aerodrome**
- **Including changes to:**
 - Physical features of, or facilities at, the aerodrome
 - Air traffic control procedures
 - Airfield access requirements
 - Pilot and vehicle operator awareness
 - Production of hot spot maps

RASG-PA Role

- **Support the creation of RSTs**
- **Support RSTs in place**
- **Include the implementation of RSTs in the RASG-PA Aviation Safety Workshops**
- **Monitor the progress of the implementation of RSTs**
- **Review and collect information**
- **Report to ICAO**
- **RST Go Team**

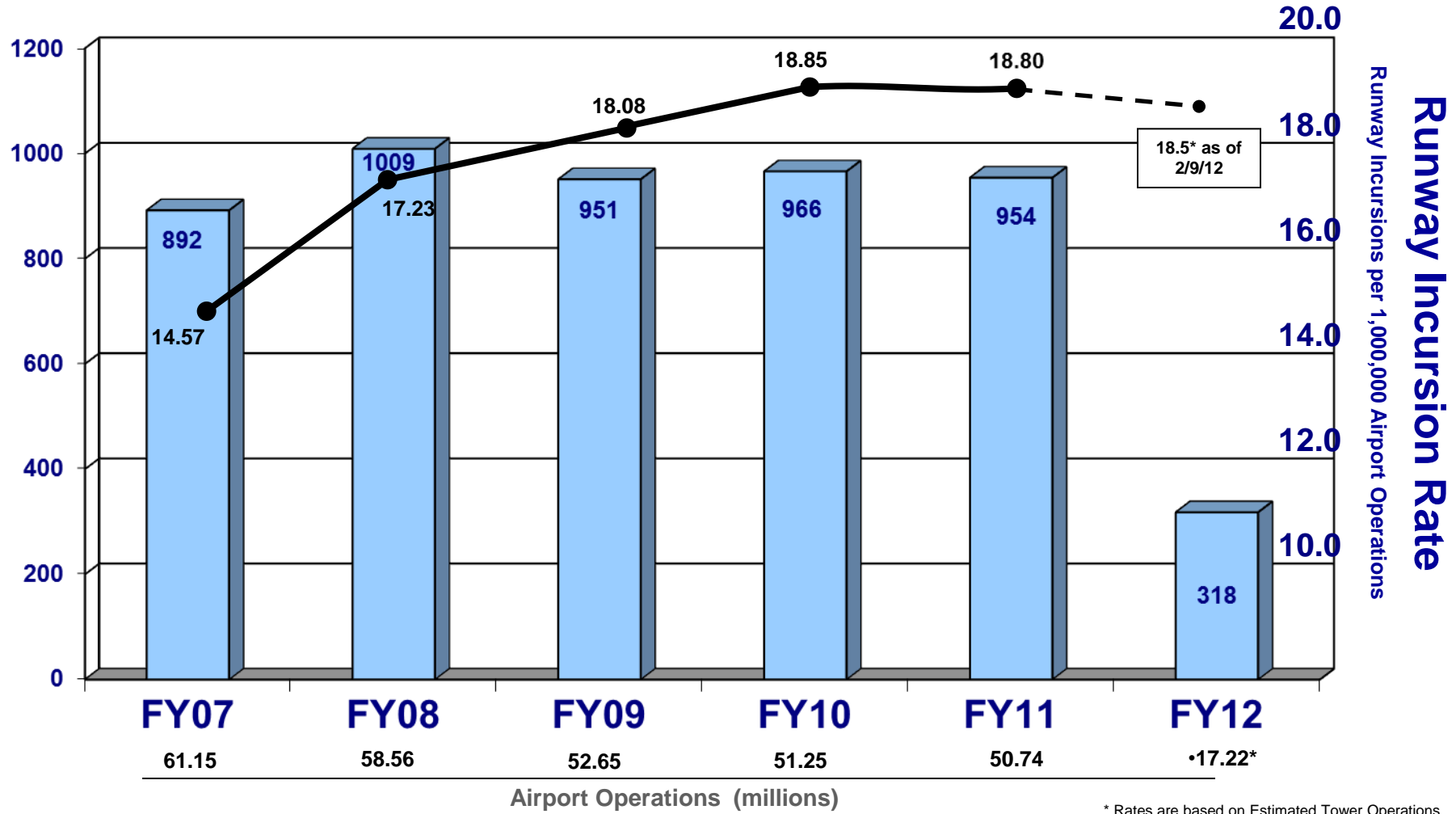
Regional Plan for Creation of RSTs

- **Commitment to develop RSTs by Regional States and stakeholders**
- **Identify RST mentors**
- **Identify champions**
- **Select pilots airports**
- **Set the timeframe**
- **Monitor progress**

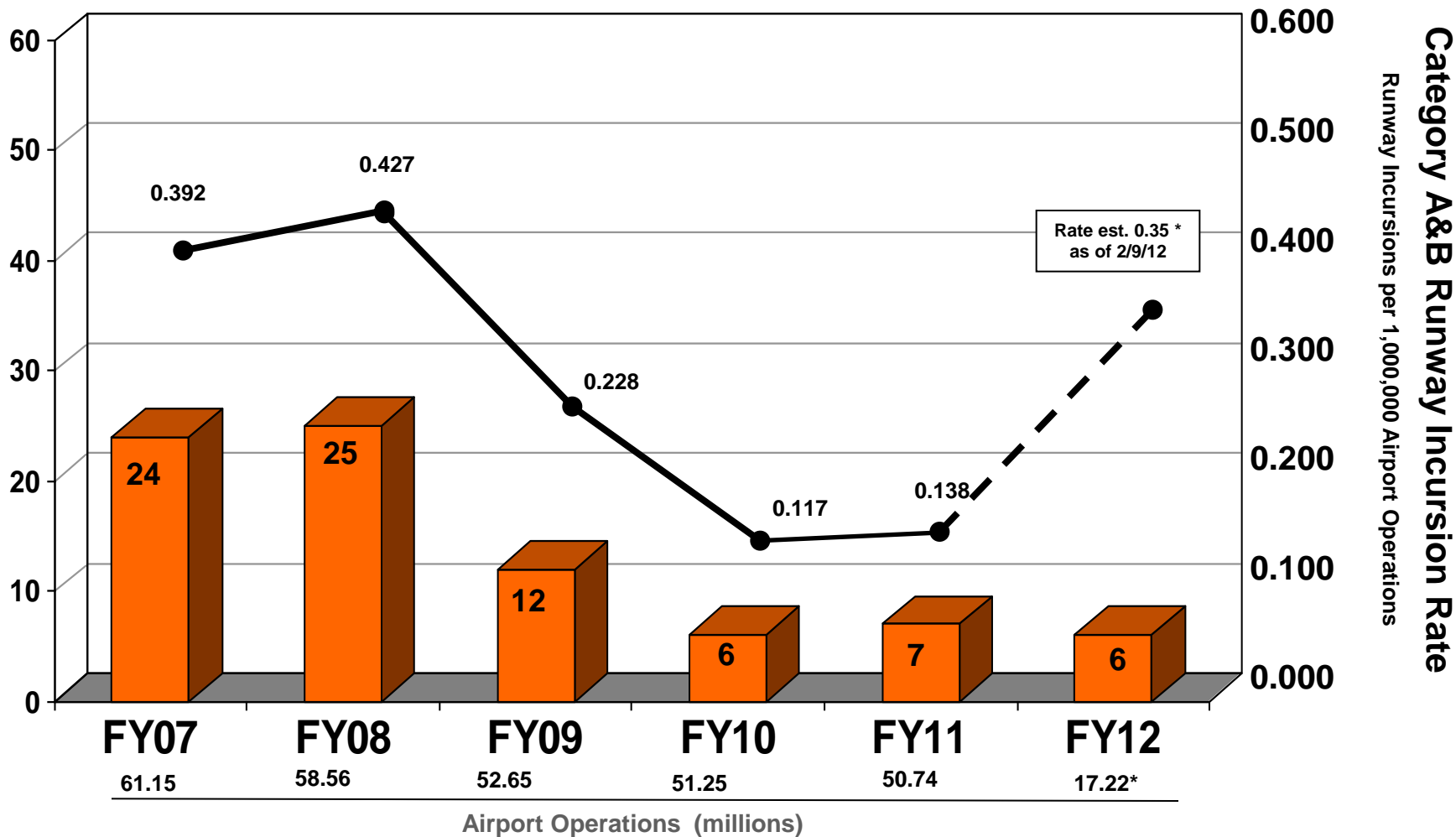
National Plan for Creation of RSTs

- **Commitment to develop by State and stakeholders**
- **Set the timeframe**
- **Goal to establish a RST at the busiest airport**
- **Establish RST in other airports**

All Categories of Runway Incursions



Category A&B Runway Incursions



* Rates are based on Estimated Tower Operations



New Airport Markings



Enhanced Taxiway Centerline



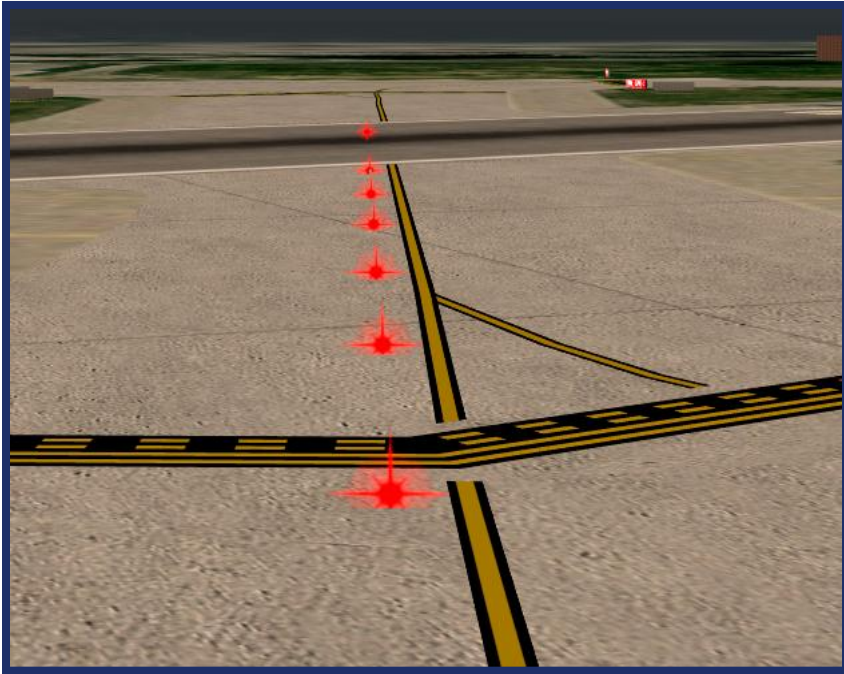
Surface Holding Position Signs

http://www.faa.gov/airports/airport_safety/signs_marking/





Runway Status Lights (RWSL) Configurations



Runway Entrance Lights (RELs)

Takeoff Hold Lights (THLs)

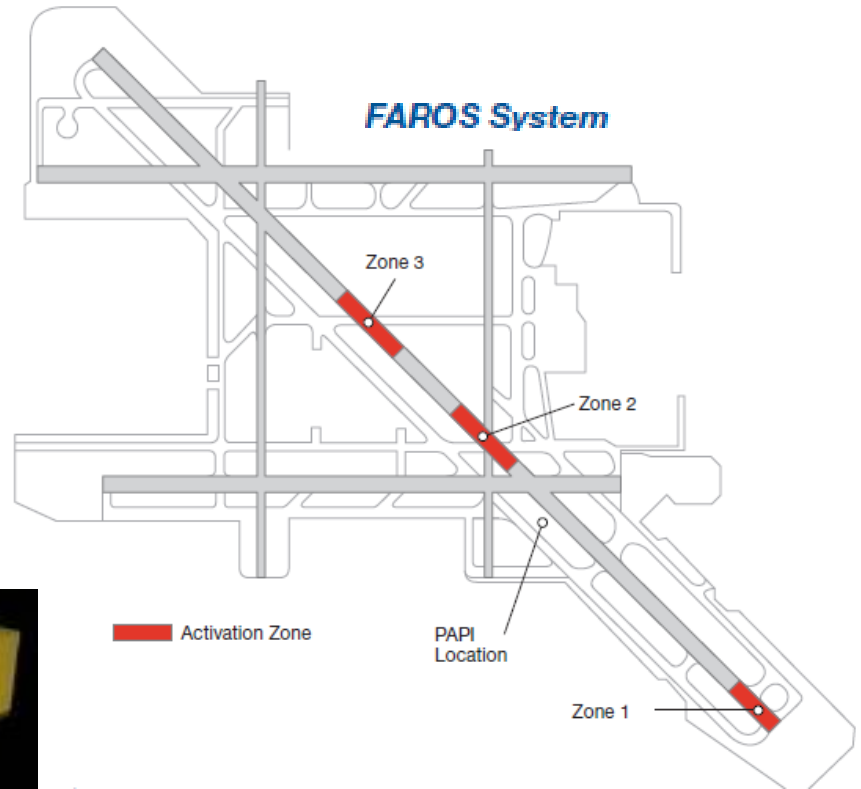


RWSL Installation Plan

- **RWSL will be installed at 23 ASDE-X airports**
- **Contract awarded fall 2008**
- **FAA owns, operates, and maintains entire system**
- **Initial Operational Readiness Summer 2012**



FAROS



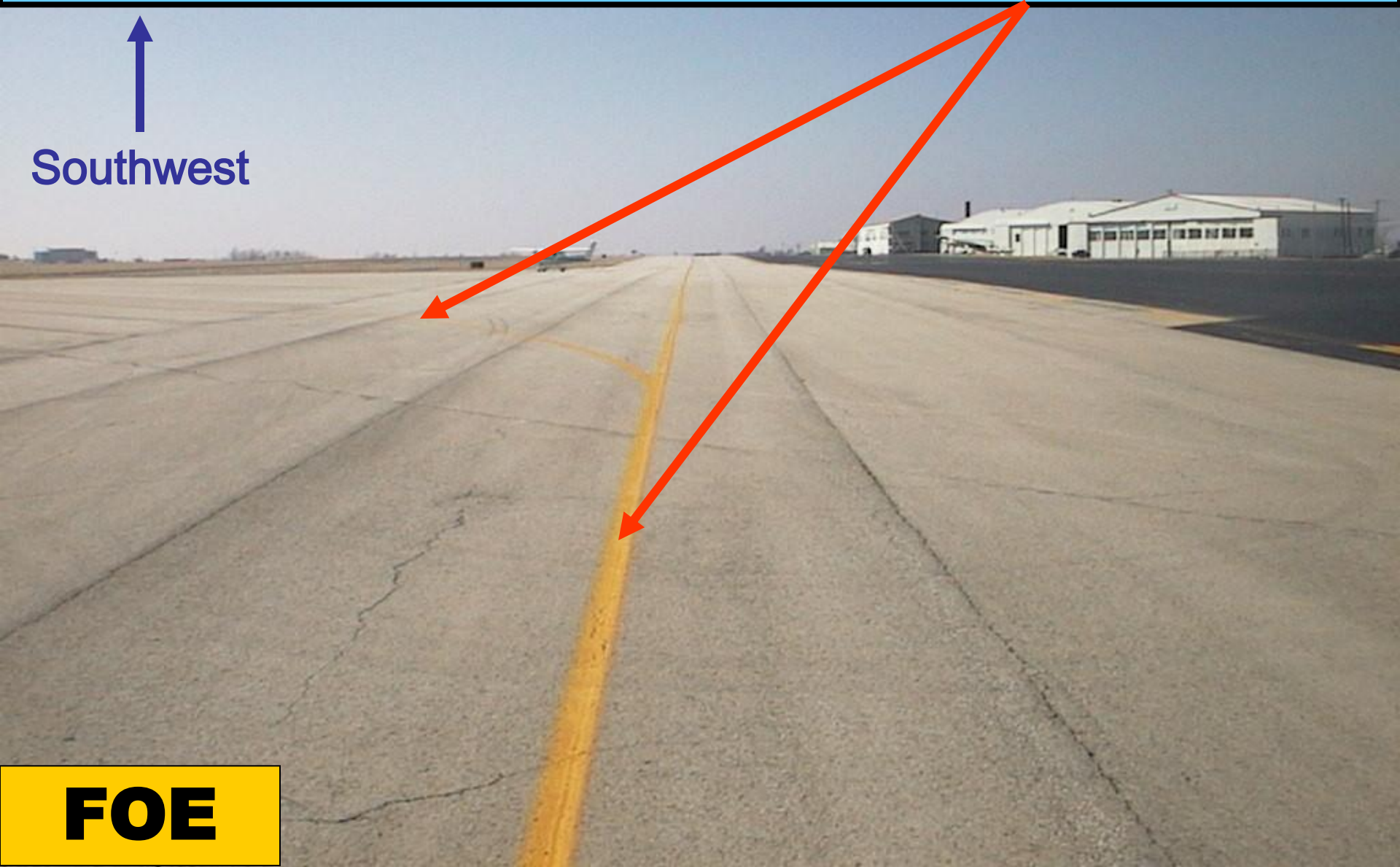
Participation in RSATs



Recommendation – Highlight the taxiway centerline from Alpha around the corner towards Runway 3 and install a surface painted destination sign for Runway 3.



Southwest



FOE

Recommendation Implemented



FOE

LESSONS LEARNED

- **BURBANK,
CALIFORNIA**



Lack of RESA



Engineered Materials Arresting System (EMAS) Installations



Baton Rouge Metropolitan Airport, LA



Roanoke Regional Airport, WV



Little Rock Airport, AR



Greater Binghamton Airport, NY

Photos Courtesy
of ESCO



Successful EMAS Capture



Courtesy: ESCO

**EMAS capture of a Boeing 747 at JFK International Airport, NY
January 2005**



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Successful EMAS Capture



**EMAS capture of a Falcon 900 at Greenville Downtown Airport, SC
July 17, 2006**



Successful EMAS Capture



Successful EMAS Capture



Key West



NGG GLASOPOR EMAS

COMPANY AND PRODUCT BACKGROUND

- **NGG is Norway’s leading environmental services provider, who offers a waste management and recycling solutions.**
- **They developed an energy absorbing loose fill material made of recycled glass called “Glasopor”.**
- **In cooperation with the Norwegian aviation authority (Avinor) and Protection Engineering Consultants (PEC), performed an ACRP study to develop an EMAS made of Glasopor.**



NGG GLASOPOR EMAS



- **Glasopor ranges in size from 2-3 inches in volume to small particles of dust.**



NGG GLASOPOR EMAS



- **Glasopor EMAS consists of 3 components:**
 - Glasopor material
 - Protective cover layer
 - Sub-structure for anchoring



Wildlife Hazard Mitigation R&D



- **Purpose: Reduce Wildlife Strike Risk to Aircraft**



The Problem

- **Bird populations are increasing.**
 - Canada Geese increased 7.3% per year from 1980 to 2010.
 - 13 of 14 species over 8 pounds have significantly increased.
- **Birds staying in urban areas.**
- **Commercial aircraft movements are increasing in U.S.**
 - 18 million in 1980
 - 25.2 million in 2010
 - 37 million estimated in 2030
- **Reported strikes have gone up 5x since 1990**
 - 1,759 in 1990
 - 9,622 in 2010



Impacts from strikes

- **1990 to 2010**
- **10 strikes resulted in 24 fatalities**
- **56 aircraft destroyed**
- **448,138 hours of aircraft downtime**
- **\$394 million in losses**



Wildlife Hazard Assessment

- **Identify species, numbers, locations, local movements**
- **Daily and seasonal occurrences of observed wildlife**
- **Describe existing wildlife hazards to air carrier operations**
- **Review strike records**
- **Identify wildlife attractants on and off airport**
- **Provide recommendations for reducing wildlife hazards**



Wildlife Hazard Management Plan

- **Provide measures to alleviate or eliminate wildlife hazards.**
- **Identify persons who have authority for implementing the plan.**
- **Priorities for needed habitat modification.**
- **Identification of resources for the plan.**
- **Procedures to be followed during air carrier operations.**
- **Wildlife control measures.**
- **Plan reviewed and approved by FAA**

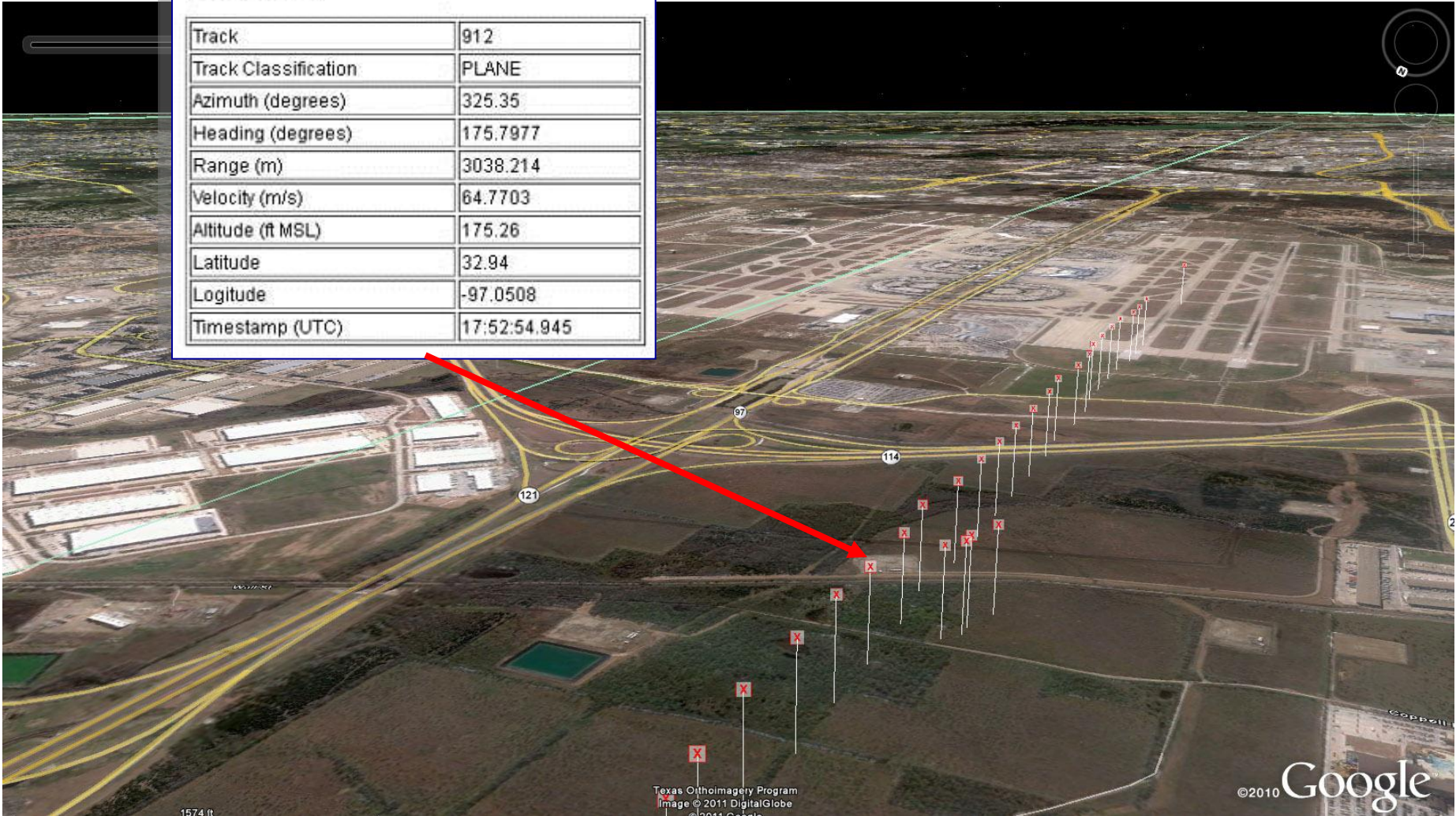


BSTAR



Track ID: 912

Track	912
Track Classification	PLANE
Azimuth (degrees)	325.35
Heading (degrees)	175.7977
Range (m)	3038.214
Velocity (m/s)	64.7703
Altitude (ft MSL)	175.26
Latitude	32.94
Longitude	-97.0508
Timestamp (UTC)	17:52:54.945



Feb 2, 2011 10:53:20 am

Track ID: 195

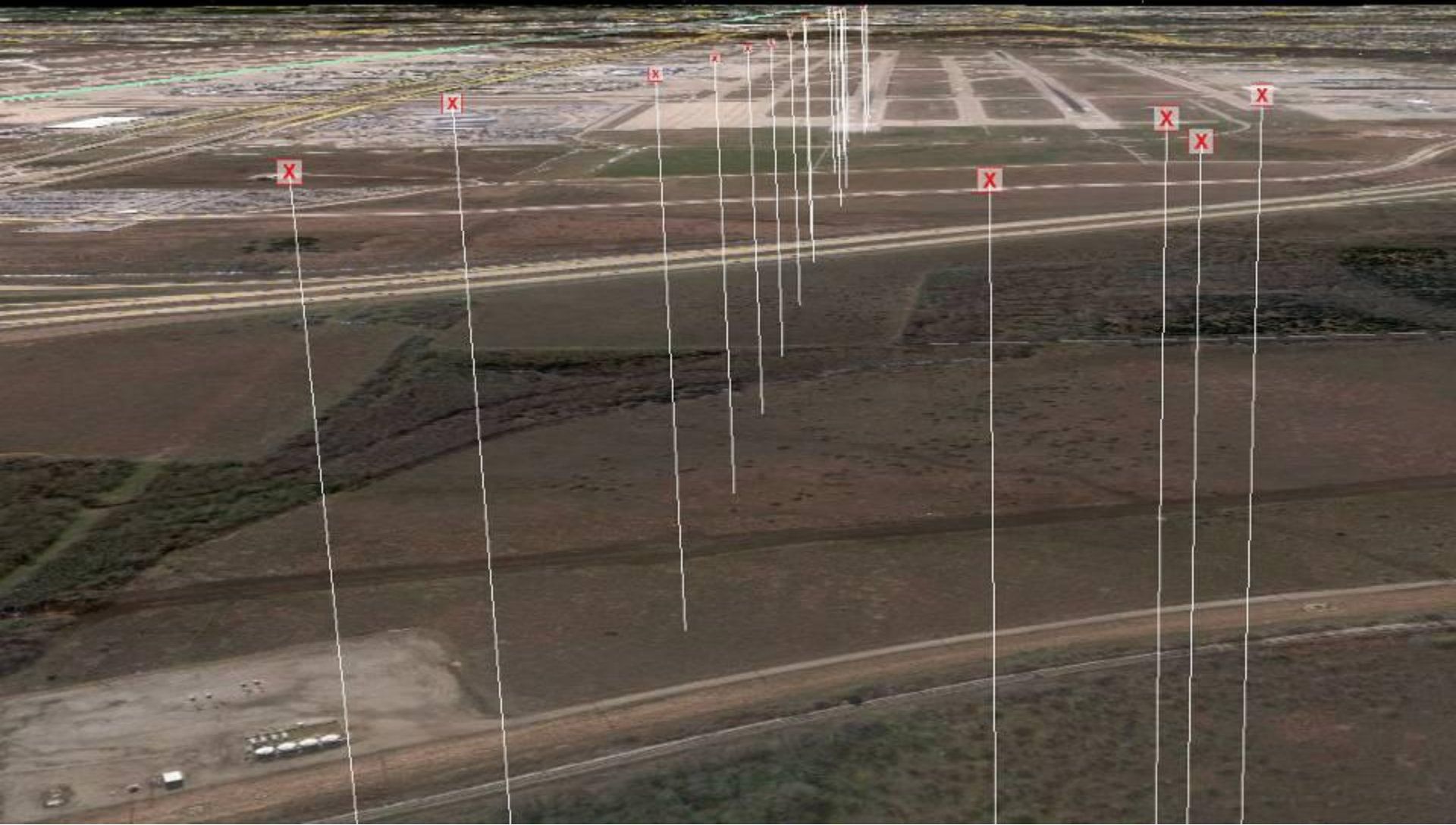
Track	195
Track Classification	BIRD
Azimuth (degrees)	321.8445
Heading (degrees)	4.2627
Range (m)	3030.5582
Velocity (m/s)	22.1553
Altitude (ft MSL)	175.26
Latitude	32.939
Longitude	-97.0523
Timestamp (UTC)	17:52:49.578
Biomass Index (BMI)	-8



Texas Orthoimagery Program
Image © 2011 DigitalGlobe
© 2011 Google

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FAA Airport Technology Research & Development

FAA Technical Center

- \$29 Million in funding FY 2012
- Research Areas:
 - Pavements
 - Planning and design
 - Lighting and marking
 - Rescue and firefighting
 - Wildlife hazard mitigation
 - Runway safety

<http://www.airporttech.tc.faa.gov/>

Airport Cooperative Research Program (ACRP)

- \$15 Million in FY 2012
- Over 101 studies underway
- 93 studies published

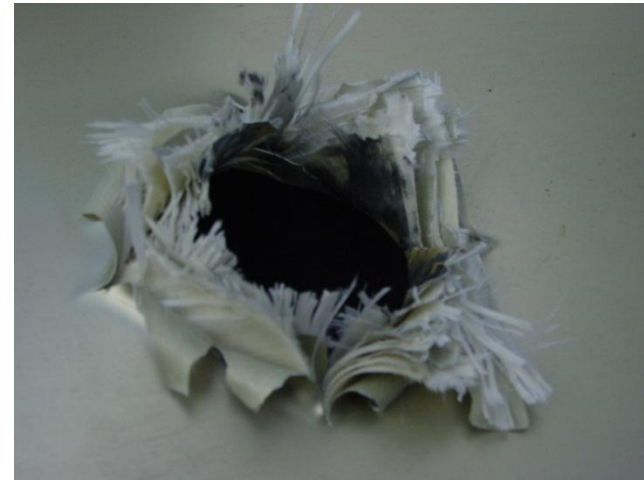
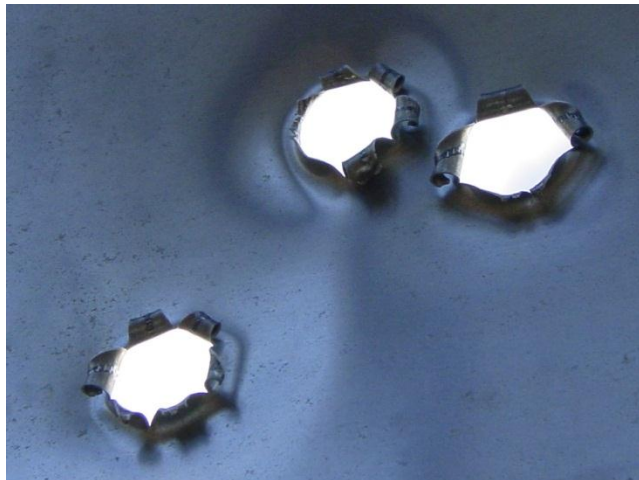
<http://www.trb.org/ACRP/Public/ACRP.aspx>



Fire Research Mock-up Section



ARFF – Penetrating Nozzles



ARFF – High Reach Extendible Turret (HRET)

Current Generation

- 2nd level penetration possible, however, vehicle will be too close to burning aircraft and aircraft must be level.
- Penetrating nozzle should be as close to 90 deg. to skin as possible.
- Penetrating nozzle should be in-line with boom arm.



Automated FOD Detection



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Why is the FAA Interested?



"It has become clearer that this was a unique accident caused by a one-off chance of a piece of metal lying on the runway".

-Concorde crash
preliminary report



06/23/2008

Automated FOD Detection

X Sight - FODetect



Tarsier Camera in operation



Tarsier Camera in operation



Example FOD finds by the QinetiQ system



Automated FOD Detection

- **Develop performance standards for Automated FOD Detection Systems.**
- Published Technical Note documenting research.
- Developed FAA Advisory Circular 150/5220-24, *Airport Foreign Object Debris (FOD) Detection Equipment*
- Enable civil airports opportunity to apply for Federal funding to procure systems



National Airport Pavement Test Facility



Instrumented Test Track at the NAPTF, FAA Technical Center
http://www.faa.gov/airports/engineering/pavement_design/



NAPTF Test Vehicle

