



**NTSB** National Transportation Safety Board

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# Improving Safety Through Accident Investigation

**South Carolina Aviation Association  
February 8, 2008**

Robert L. Sumwalt  
Vice Chairman

# NTSB Activities - 2007

- Deliberated 26 major accident reports in Board Meetings (all transportation modes)
- Held Runway Incursion Symposium
- Launched on 190 regional accidents
- Participated with 10 foreign accident investigations
- Closed 102 Safety Recommendations



**Safety recommendations are the  
Safety Board's major product.**



# Since its inception in 1967, NTSB has issued 12,769 Safety Recommendations:

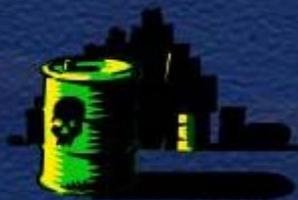
Pipeline 1235 (9.67%)



Marine 2317  
(18.15%)



Intermodal 234 (1.83%)

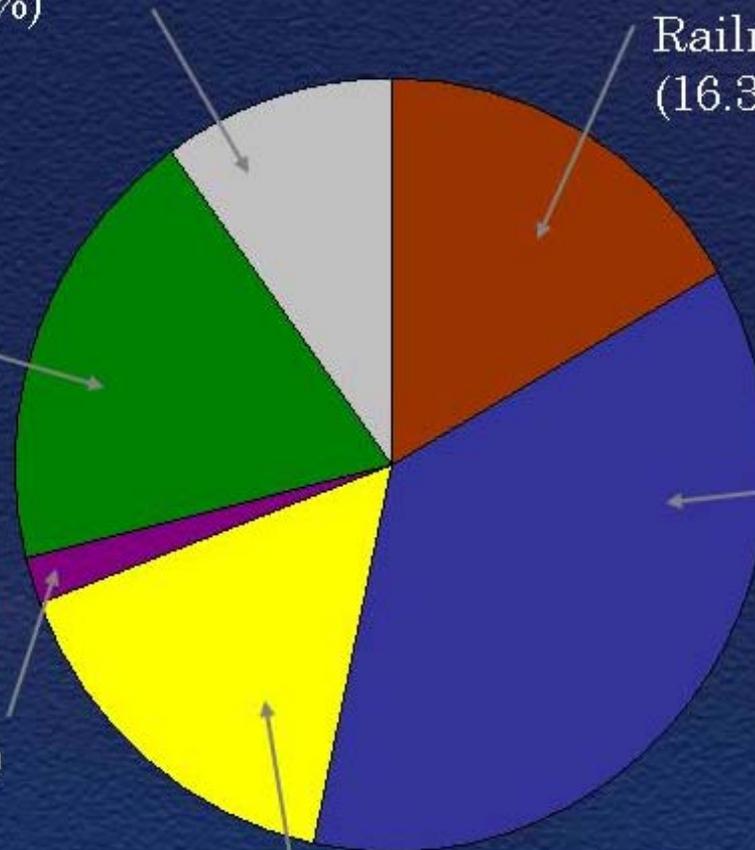


Highway 2115 (16.56%)

Railroad 2089  
(16.36%)



Aviation 4779  
(37.43%)





**NTSB**  
**MOST**  
**WANTED LIST**  
Transportation Safety  
Improvements

**2008**

*Critical changes needed to reduce  
transportation accidents and save lives.*

- Runway Safety
- Human Fatigue
- Aircraft in Icing Conditions
- Eliminate Fuel Tank Flammability
- Improved Recorders
- CRM



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# NTSB Investigative Process







## **At the Accident Site**

**A command center is established.**

**Specialty groups are formed under the leadership of the IIC and Safety Board specialists.**





## **Party System**

**Provide technical expertise**

**Ability to affect immediate safety changes**



## **At the Accident Site**

**Factual information and evidence  
is collected and documented.**

**Family Affairs specialists organize and facilitate  
services to survivors and families of victims.**





## **At the Accident Site**

**Daily progress meetings are held to discuss investigative progress and to keep all team members informed.**





## “Recorders”

The flight data recorder and cockpit voice recorder are delivered to the Safety Board’s laboratory in Washington, D.C. for readout as soon as they are recovered from the accident site.





## Post On-Scene Work

Additional fact-finding work — including laboratory testing — continues for several months.





## Post On-Scene Work

**A public hearing, headed by a Board Member, may be held to clarify and air the facts of the investigation.**





# Board Meeting





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## Accident Case Study

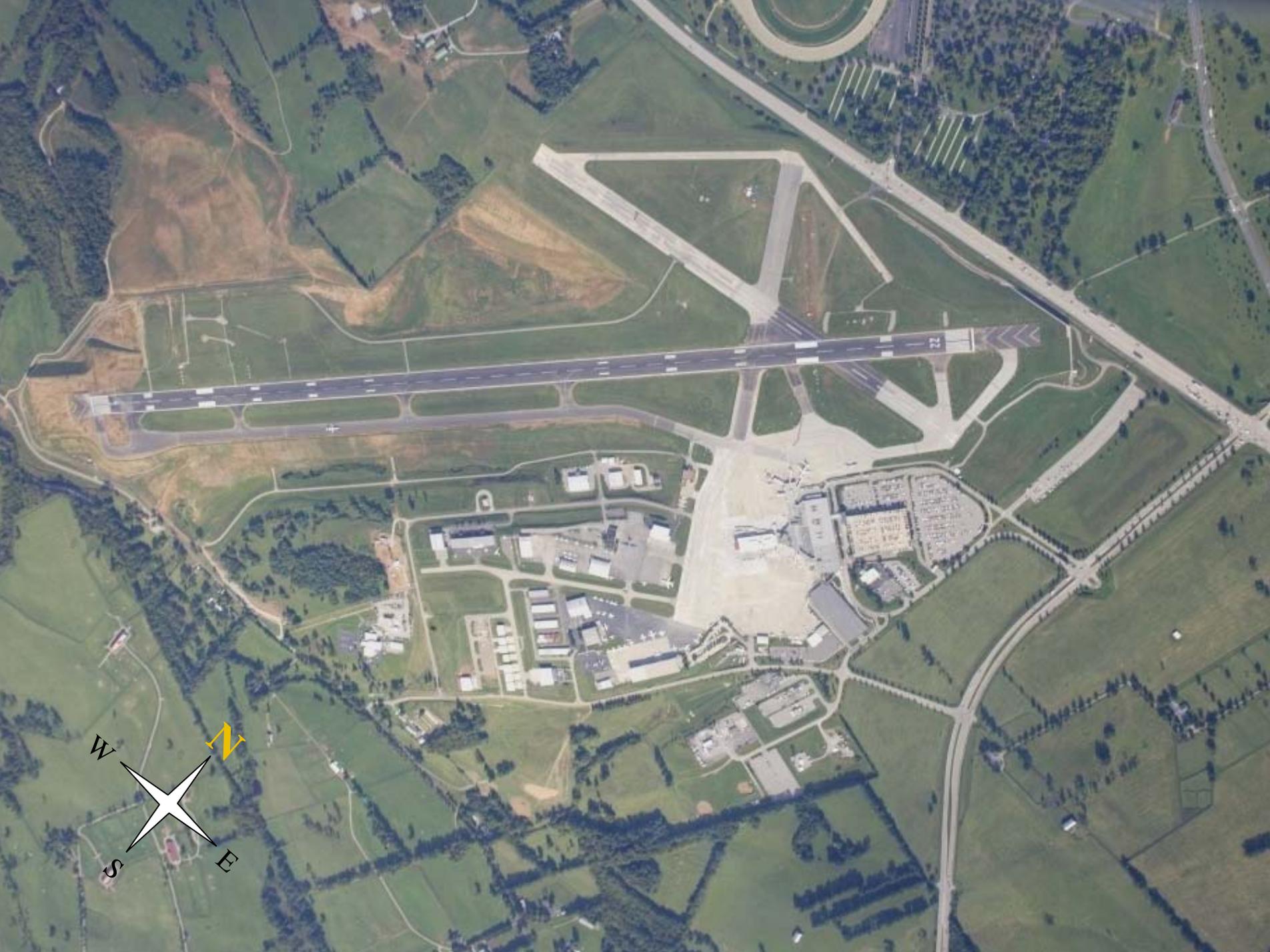
Comair 5191  
Lexington, KY  
August 27, 2006

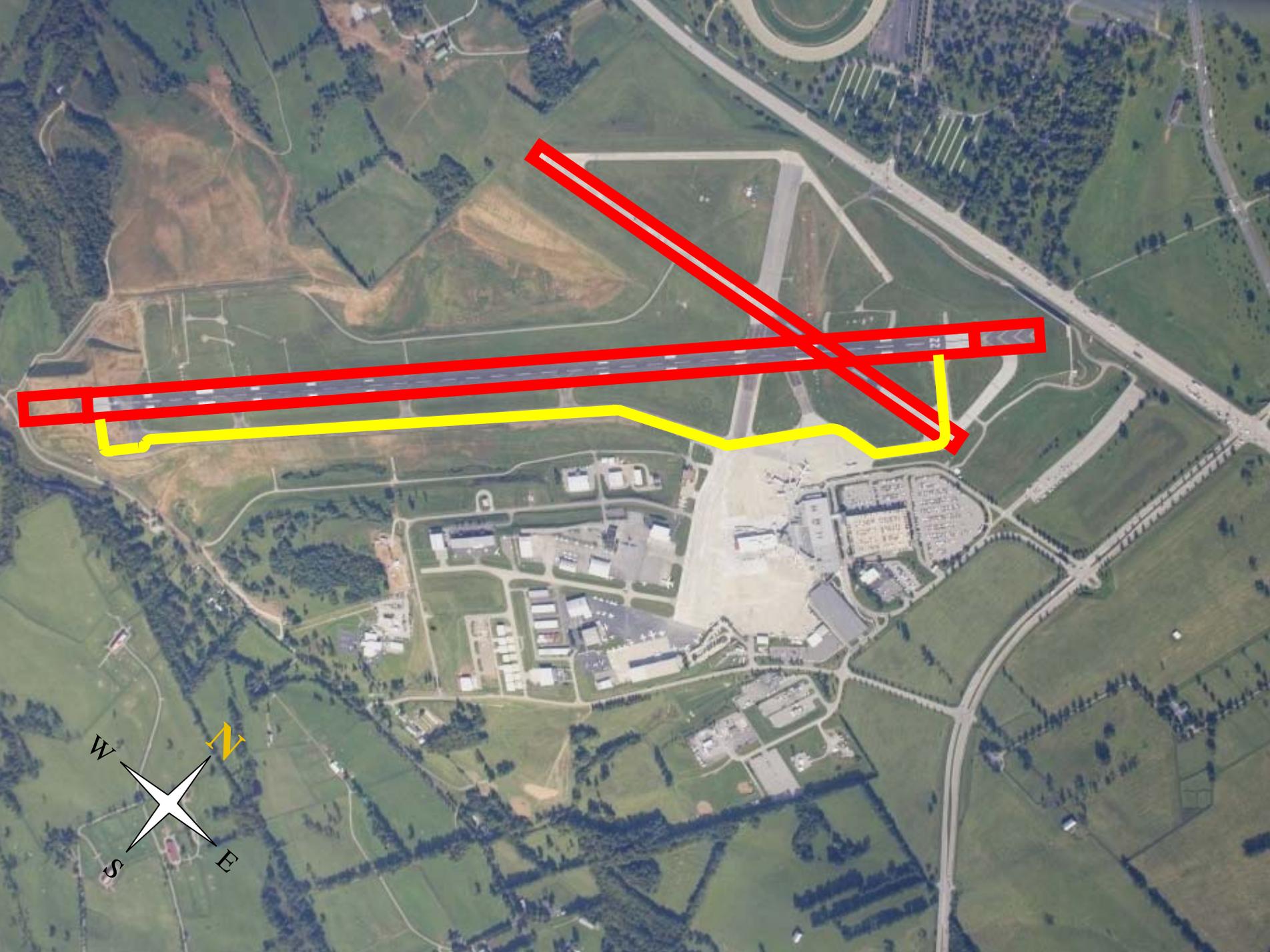
# Comair Airlines Flight 5191

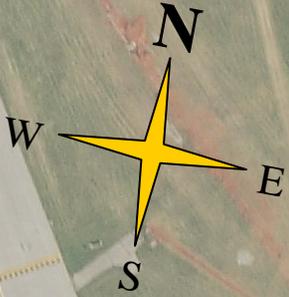
## Lexington, Kentucky

- Potential airport issues
- Potential ATC issues
- Potential operational issues
- Potential emergency response issues









**Taxiway A**

**Taxiway A5**

**Taxiway A7**

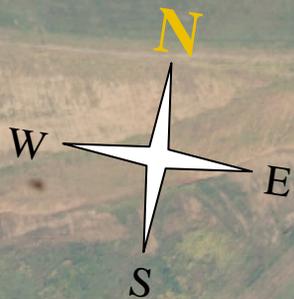
**27**

**26**

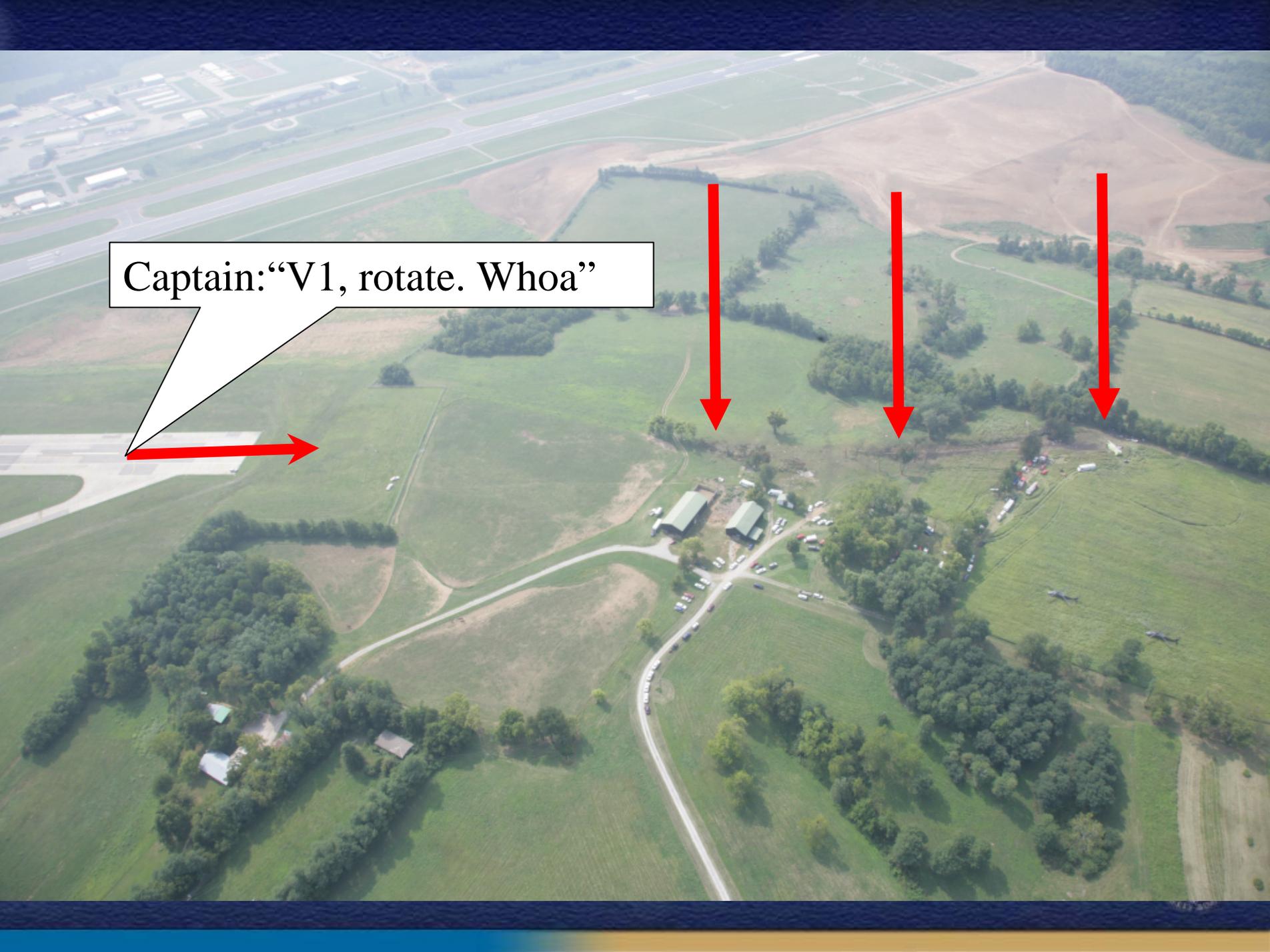




ATC: "...fly runway heading. Cleared for takeoff."



Captain: "V1, rotate. Whoa"

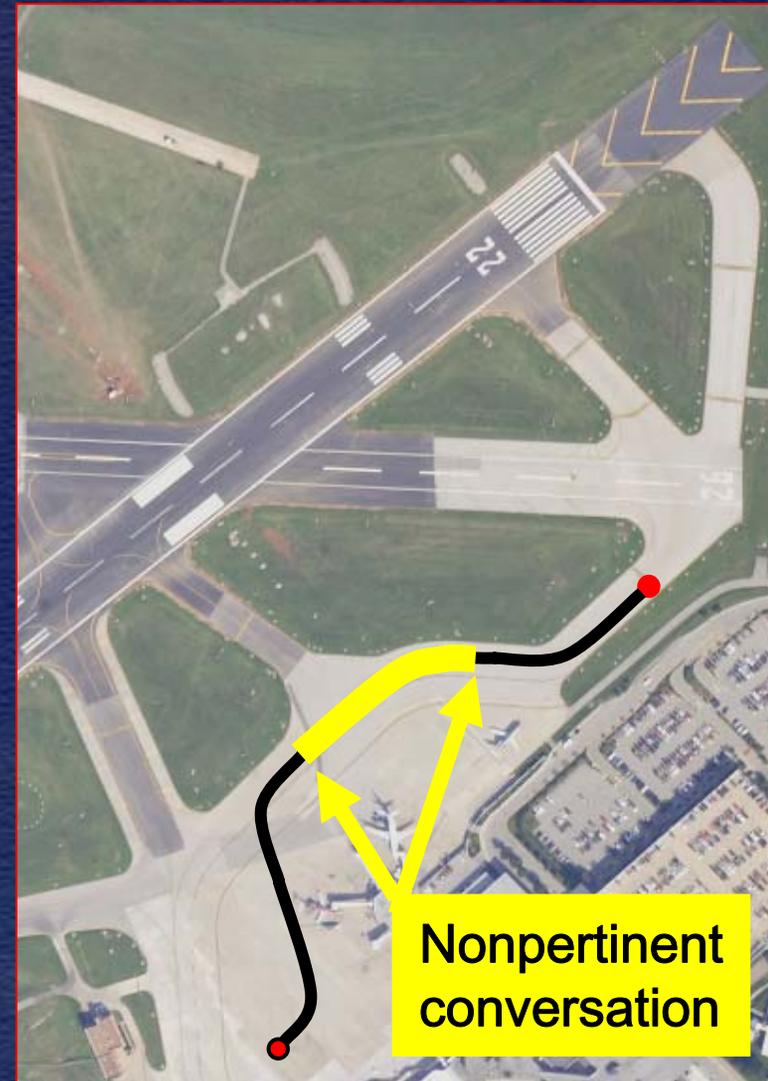


# Findings

- No pre-existing airplane failures
- No restrictions to visibility
- Flight crew
  - Properly certificated
  - No medical factors

# Operational Issues

- Setting tone during preflight
  - Casual and relaxed
  - Checklist “at your leisure”
  - Abbreviated taxi briefing
- Noncompliance with sterile cockpit rule
  - 40 of the 150 seconds during taxi were violations of sterile cockpit rule
- Distraction likely contributed to loss of positional awareness



# NTSB Finding

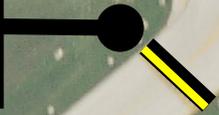
- “The flight crew’s noncompliance with standard operating procedures, including the captain’s abbreviated taxi briefing and both pilots’ nonpertinent conversation, most likely created an atmosphere in the cockpit that enabled the crew’s errors.”



A 4 - 22



A 26



26

# Potential Airport Issues

- Taxiway identifiers on chart were inaccurate
- NOTAM not available to crew
  - flight crew paper work
  - ATIS

# Potential ATC Issues

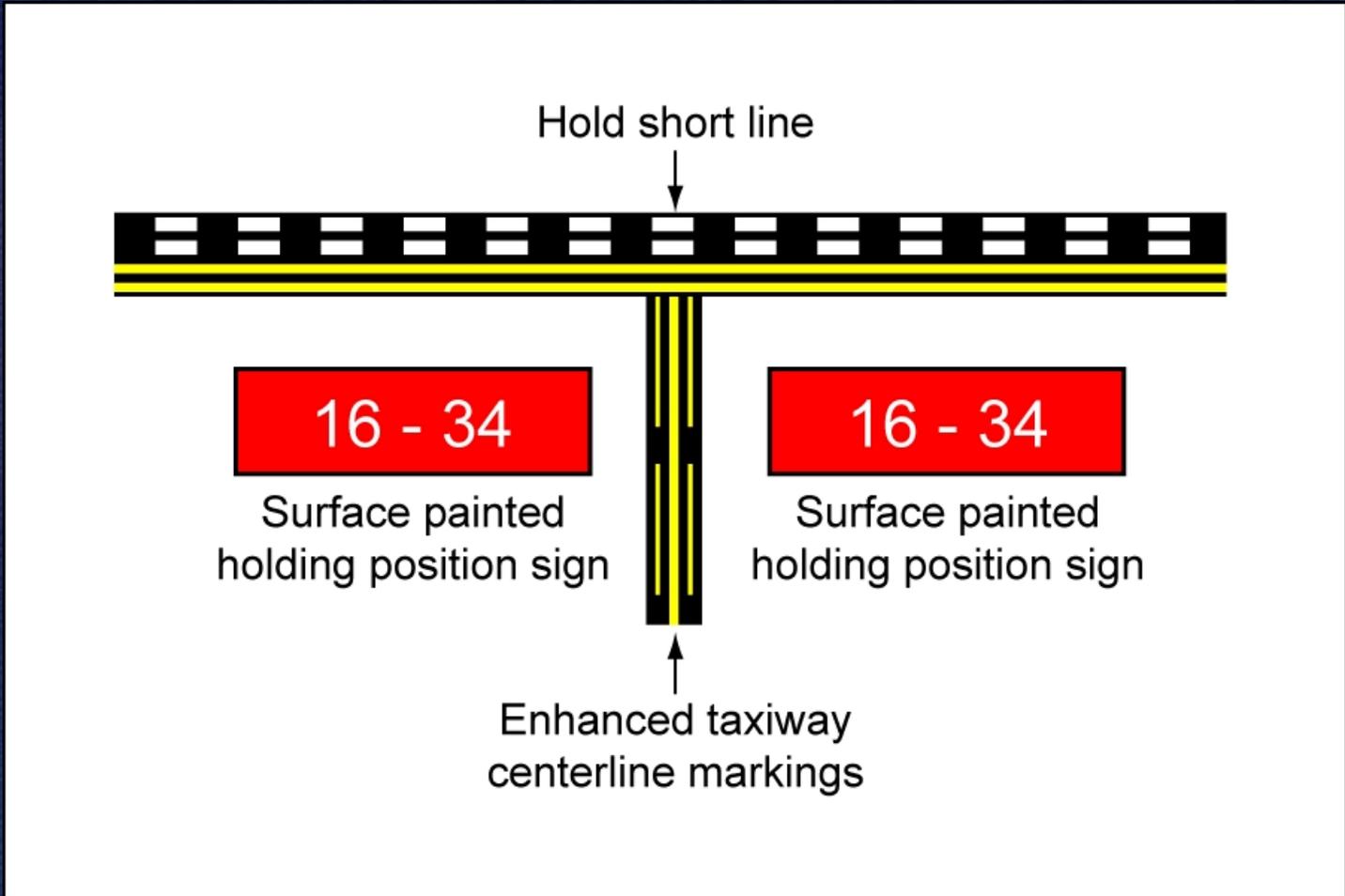
- One controller on duty vs. two
- Controller fatigue
- Controller task prioritization

# Probable Cause

“Flight crewmembers’ failure to use available cues and aids to identify the airplane’s location on the airport surface during taxi and their failure to cross-check and verify the airplane was on the correct runway before takeoff. Contributing to the accident [was] the flight crew’s nonpertinent conversation during taxi, which resulted in a loss of positional awareness ...”

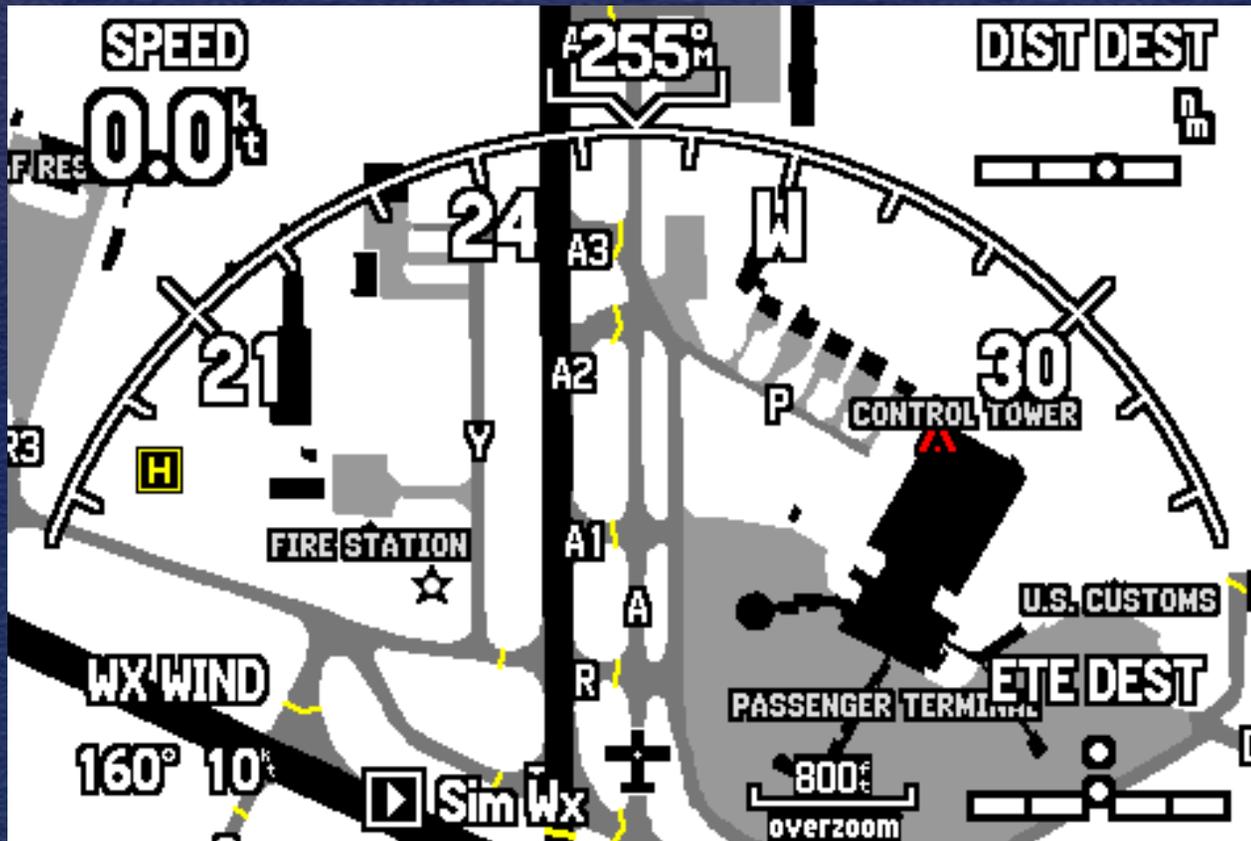
# Prevention

- Other accidents and incidents demonstrate pilots vulnerable to surface navigation errors
- Need to cross-check and confirm position



# Prevention

- Moving map displays and cockpit runway alerting systems



# DUI

- In the entire 46-year history of US commercial jet aviation, there have been approximately 5700 fatalities involving US-operated airline jets (excluding terrorists activities.)
  - Alcohol-related traffic accidents claim that amount of victims every four months in US!
- South Carolina - 2006
  - More than 500 lives lost due to alcohol-related traffic accidents.
  - More than 50 percent of highway deaths



**The Safety Board remains  
the eyes and ears of the  
American public for  
transportation safety.**



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