



NASA System-Wide Safety (SWS) Project
Safety Metrics Research



Goals of NASA System Wide Safety Project

- To help maintain and improve the safety of the National Airspace System
- Identify hazards that could degrade safety and lead to incidents or accidents and how they may combine to create hazardous situations
- Monitor safety metrics (e.g., “big data”) and develop a mathematical model that could predict risks
- Need your help to identify hazards and problems you deal with in your every day operations
- Our method will be to “walk through” some typical flights and discuss how you manage them
- We are visiting several airlines to collect data
- The information will not be identifiable to you or your airline



Definitions

- Unsafe events occur when safety is compromised
 - These are events that are undesirable, such as loss of separation, tailwind landings, unstable approach, etc.
 - Unsafe events can lead to incidents or accidents
- Hazards are conditions that contribute to unsafe events
- Hazards can be categorized into broad themes
 - Airspace and surface-related
 - Cognitive or human workload-related
 - Environmental
- Safety metrics are quantities of interest that could be evaluated based on available data and are predictive of an unsafe event



Procedure

- Walk through three typical scenarios:
 1. Easy domestic flight
 2. Complex domestic flight
 3. International flight
- Focus on phases of the operation:
 1. Pushback and taxi out
 2. Departure and climb out
 3. En route cruise
 4. Descent and approach
 5. Landing and taxi in
- Discuss hazards and how they are evaluated (safety metrics) for each stage of the flight