

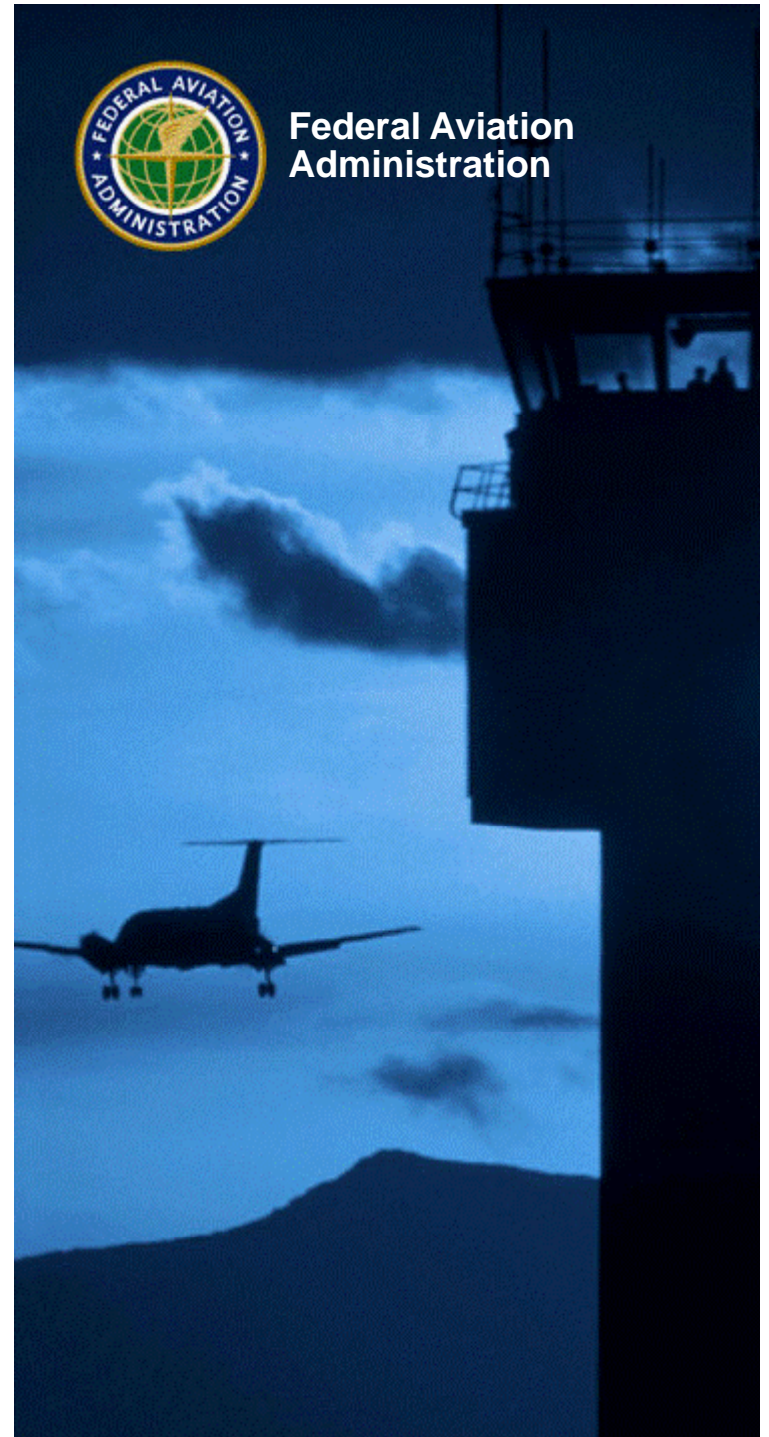
Data Communications Trajectory Operations

*... a mild mannered approach to
getting there*

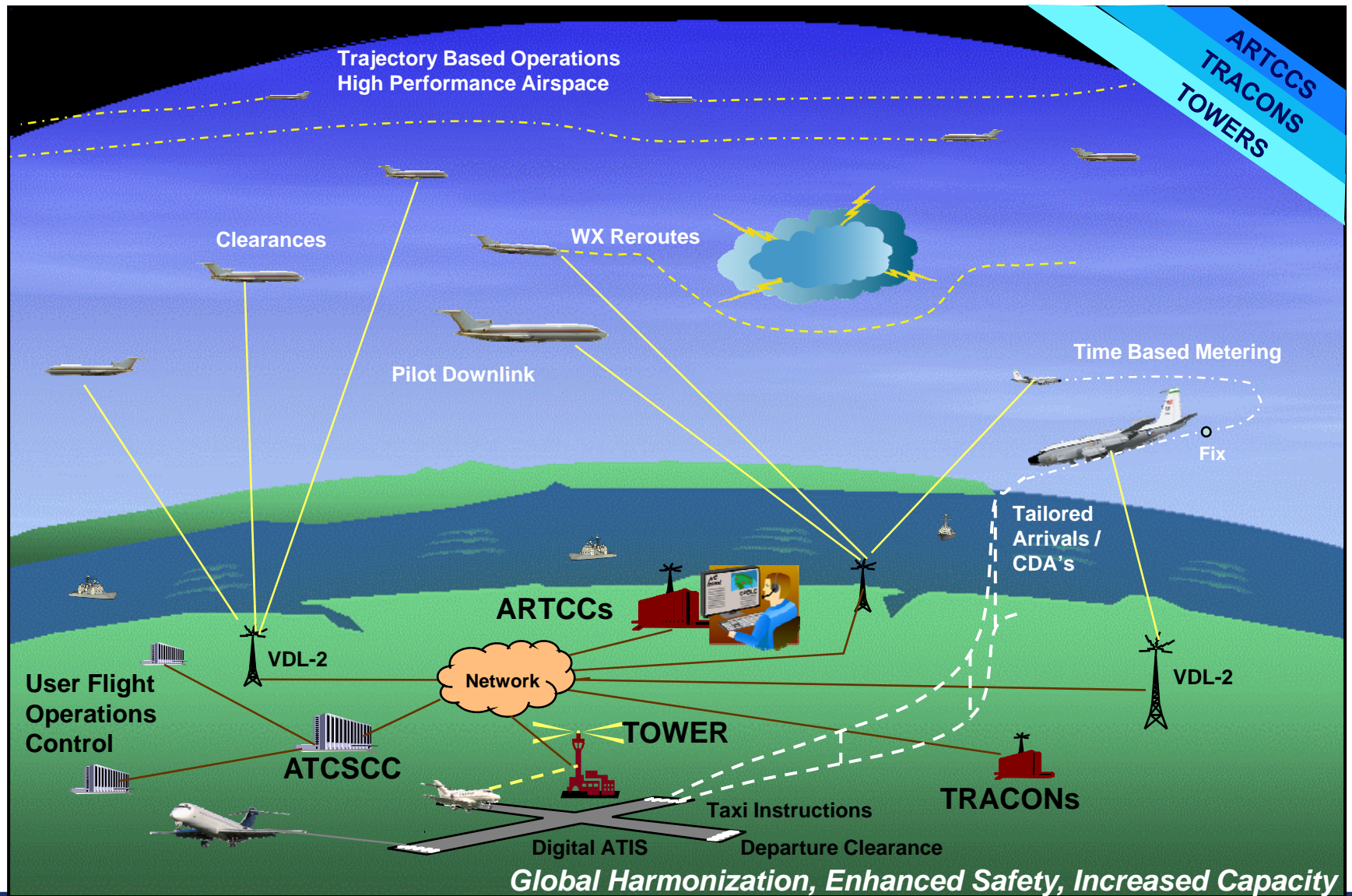
Jim Eck
ICNS Conference
May 15, 2009



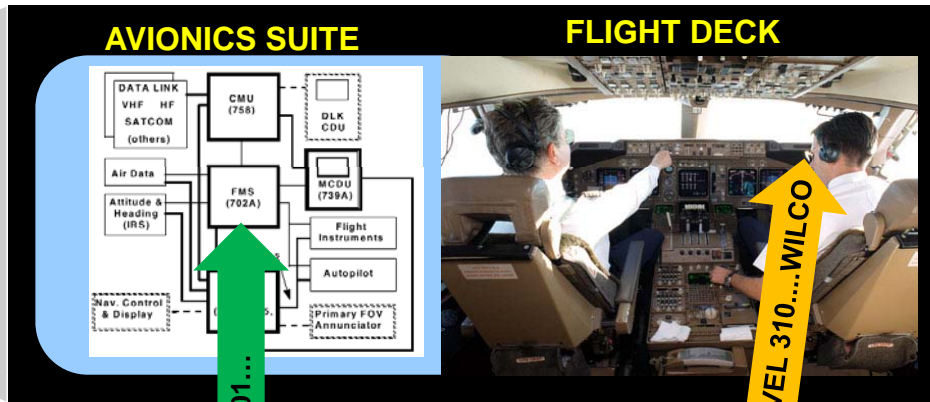
**Federal Aviation
Administration**



Data Communications CONOPS



Faster than a speedy voice channel...

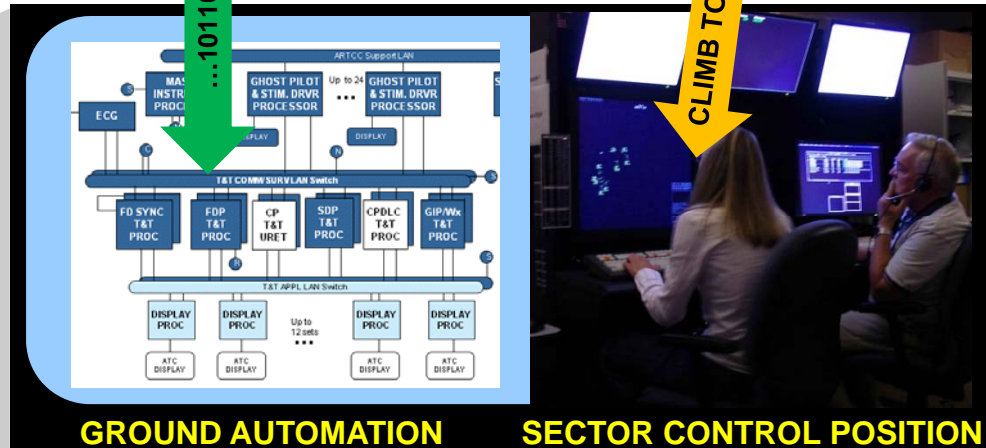


DATA

... 10110011101101001 ...

VOICE

CLIMB TO FLIGHT LEVEL 310... WILCO

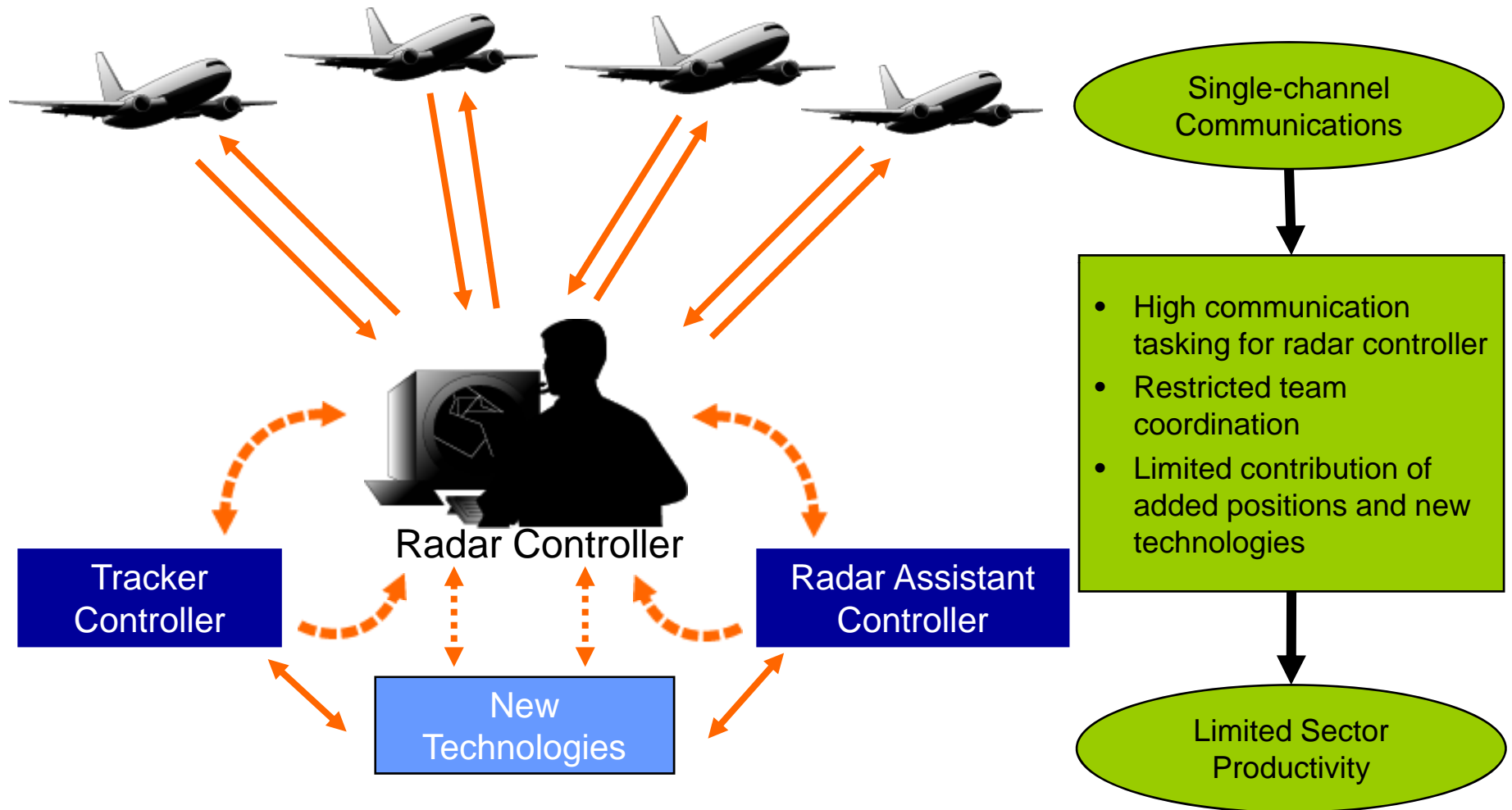


GROUND AUTOMATION

SECTOR CONTROL POSITION

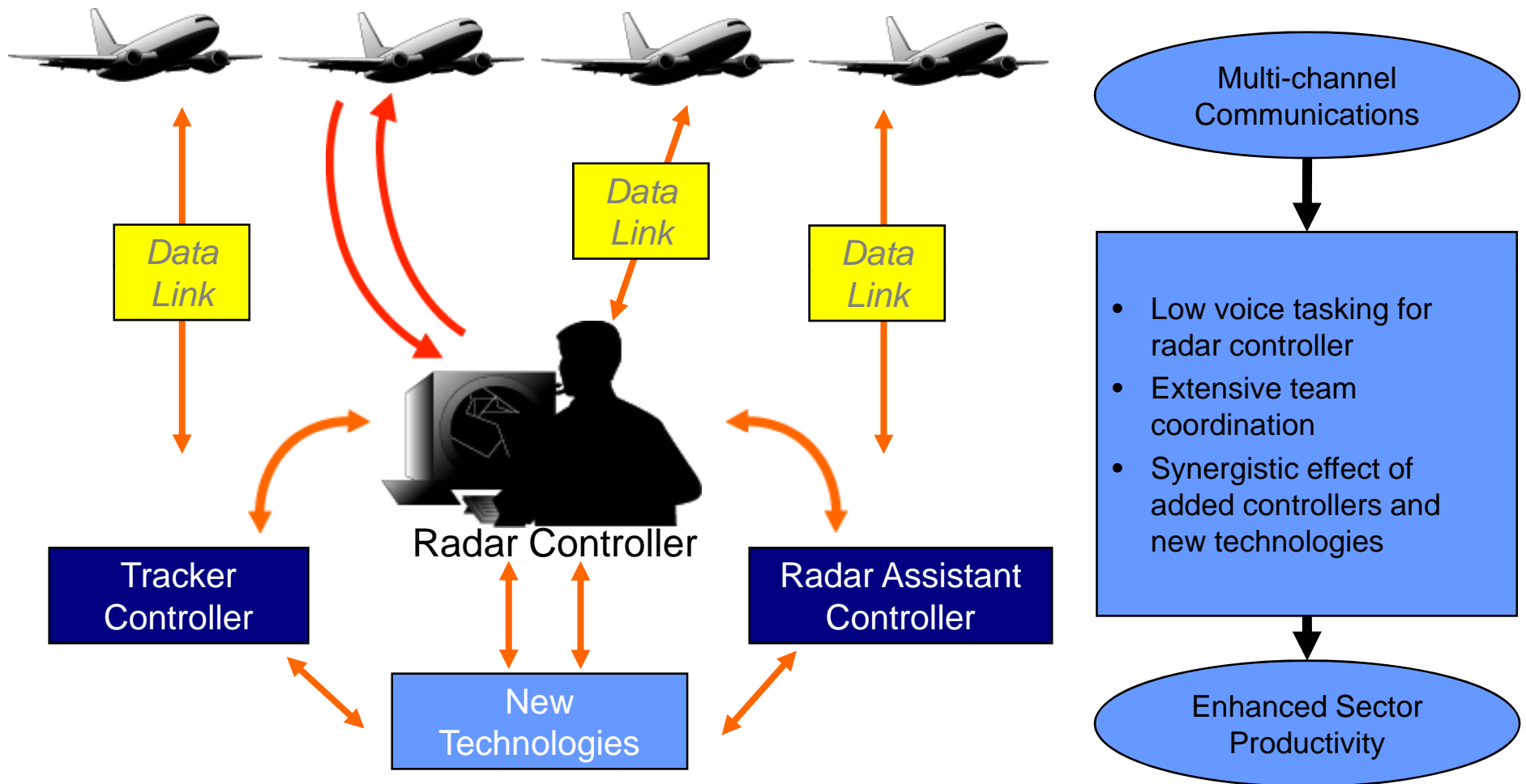


Congested Voice Radio Frequency



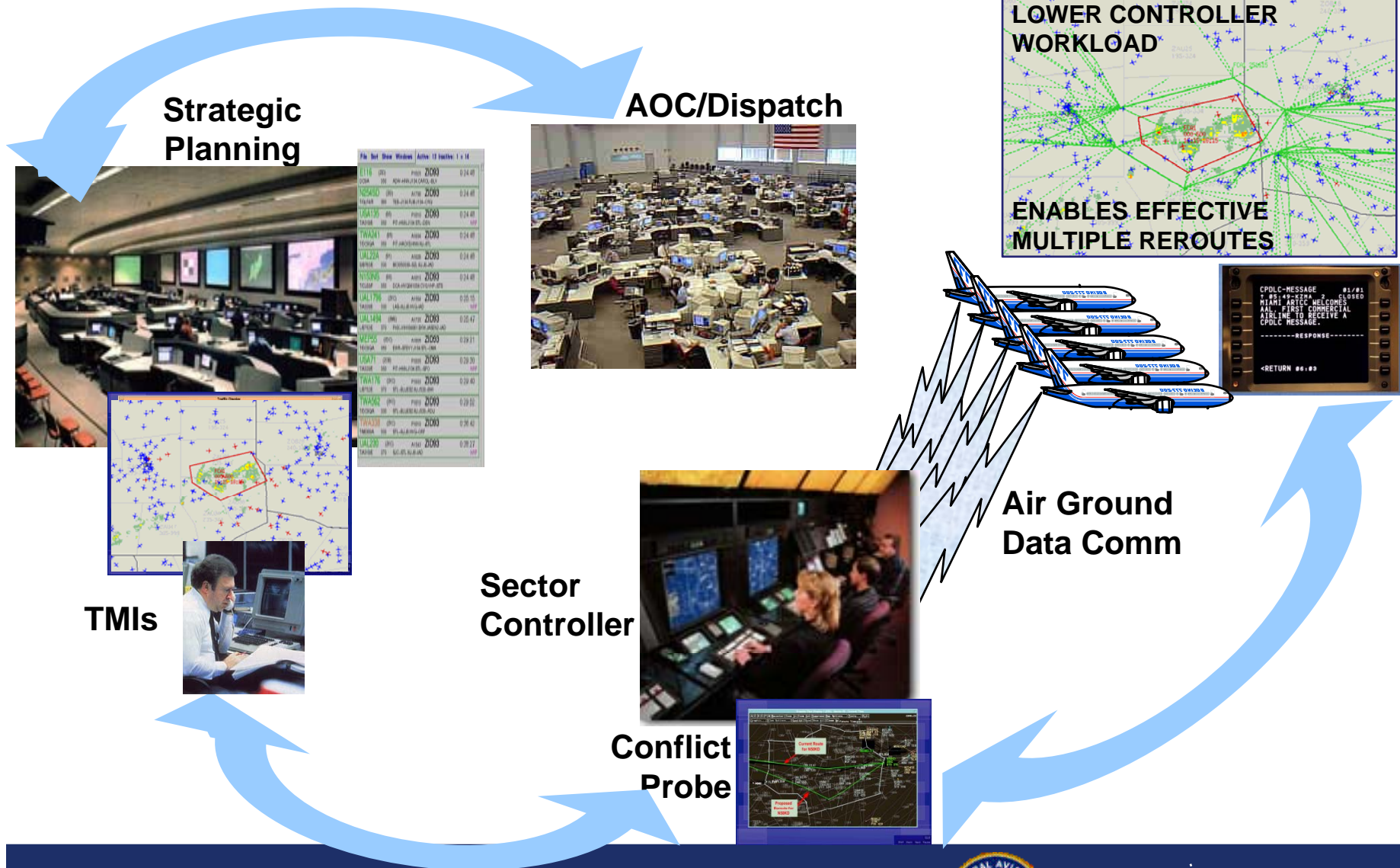
LOW *EFFECTIVE* CAPACITY

Congested Sector with Data Comm



HIGH *EFFECTIVE* CAPACITY

More powerful than a normal Link...



Final Evolution of the Air Traffic Clearance New Language Composed by Automation

Point Type
Fly-by waypoint

Turn Direction
Left

0,L,934,N59302E017443,1279,090456

Turn Radius
9.34 NM

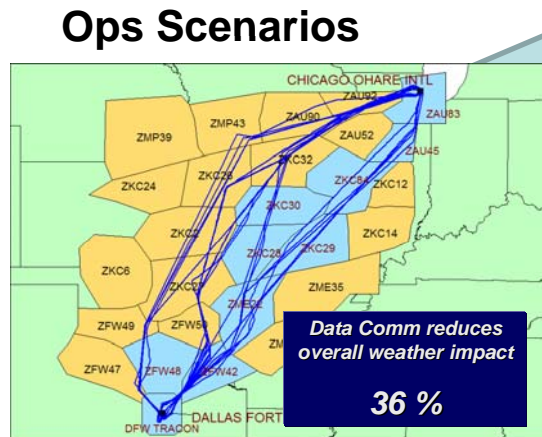
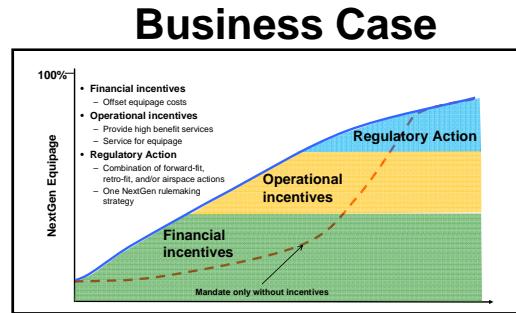
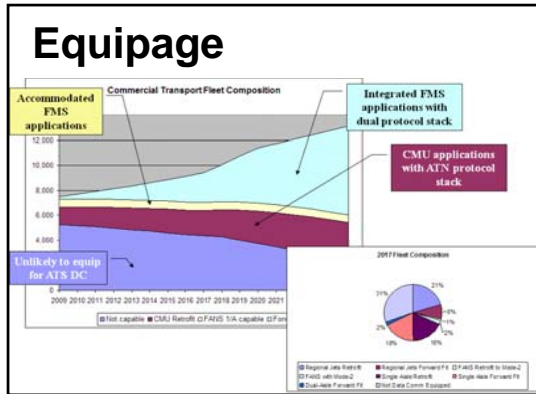
Lat / Lon
N59°30.2'
E017°44.3'

Altitude
12,790 feet

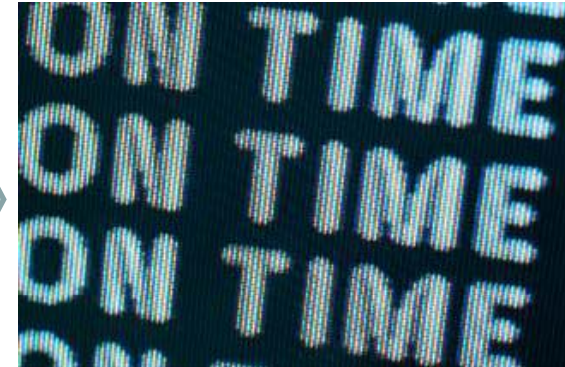
Time
09:04:56

- 1,,,N59397E017581.
- 1,R,113,N59401E018009,108,090122.
- C,,,N59376E018019,500,090227.
- 0,R,557,N59359E017585,769,090306.
- 0,L,934,N59302E017443,1279,090456.
- 0,,,N59070E017184,2511,090907.
- 0,R,1893,N59044E017155,2604,090932.
- B,,,N58515E016548,3032,091149.
- 8,,,N58380E016335,3500,091408.
- 0,,,N58366E016312,3500,091423.
- 0,,,N57592E015342,3500,092051.
- 0,,,N57388E015041,3500,092420.
- 0,,,N57024E014122,3500,093032.
- 0,,,N56455E013489,3500,093323.
- 9,,,N56354E013354,3500,093504.

Able to leap traditional barriers in a single bound...



Partnering



Airspace User Benefits

Look! Up in the sky! It's a UAV! It's a plane! It's equipped with DataComm!



Yes, it's Data Communications

Strange visitor from the planet NextGen

It can change the course of mighty traffic flows to

**Reduce
Weather Delays**



And, even disguised as the mild mannered segment 1, it fights a never ending battle against

**Congestion
Emissions
& Noise**



It can bend profiles to optimize descent for

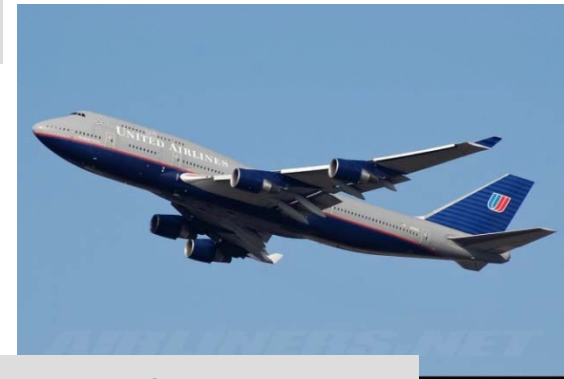
**Improved
Flight Efficiency**



To Produce

**Energy
Savings**

**On-time Performance
& Schedule Integrity**



4DT

4D Trajectories negotiated between Aircraft and Service Provider are operated seamlessly

Separation Zone



Position Uncertainty



Integrated information is exchanged with the flight deck

Data Comm between the ground systems and the flight deck is established when the flight begins and is maintained continuously and seamlessly



Intent

Data Communications

How We Want to Fly!

How We Need to Fly!

Data Comm is routine for air traffic management in Trajectory Operations airspace

Data Comm Services

