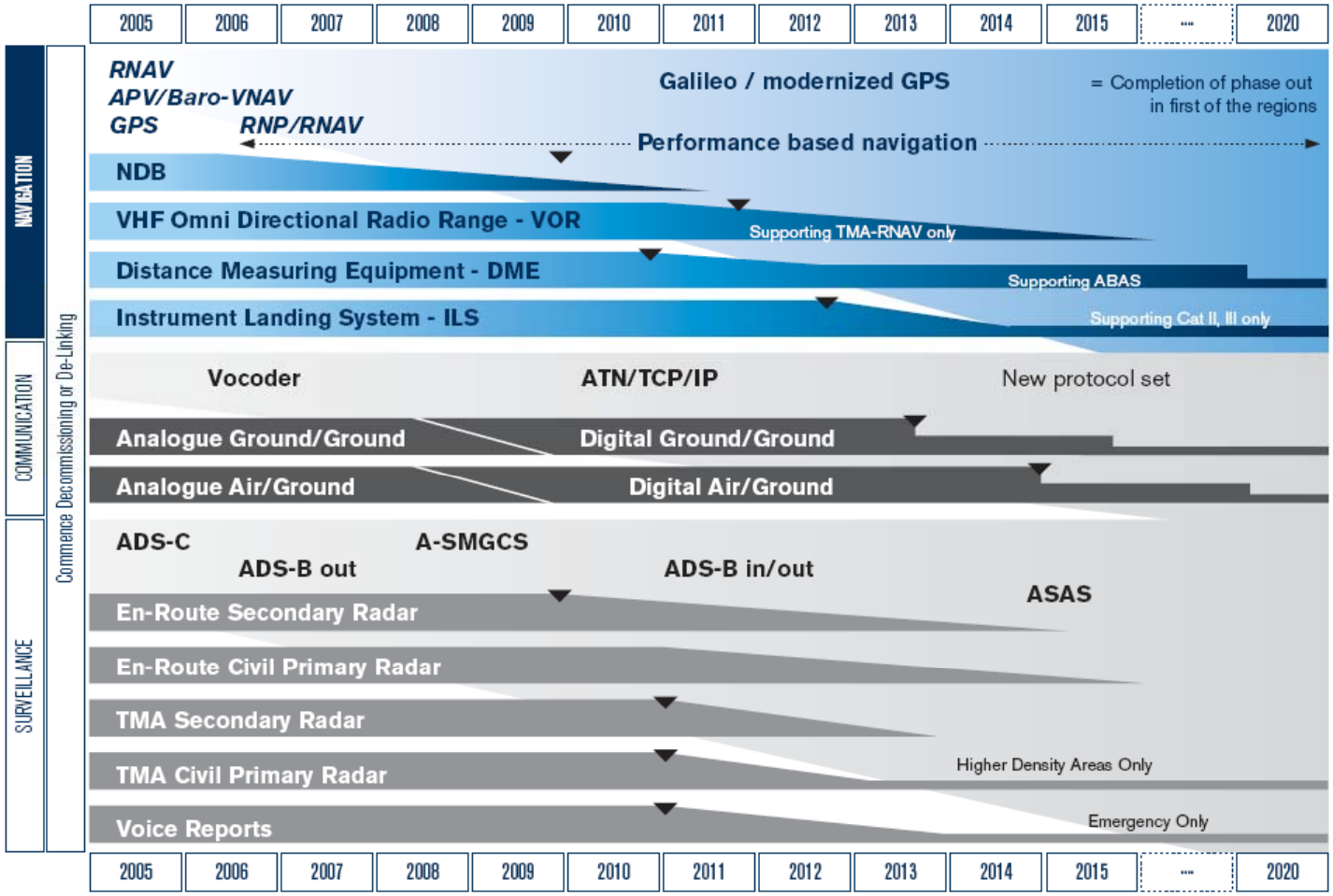
Benefits of CNS/ATM Implementation for the Region

to represent, lead and serve the airline industry

IATA today
www.iata.org

- 227 Airline Members from 143 countries accounting for 94% of total international traffic
- 200 partners
- Representation in 90 countries
- 1500 staff

NAVAIDS Transition Roadmap



CNS/ATM Communications

- Communications infrastructure is gradually being enhanced
- Inter-unit ground-ground communications are being phased to Internet protocols. New protocols for communication are in development with action targets of 2012-2015
- As data-link applications mature, there will be a natural evolution to more data and less voice

CNS/ATM Communications

- VDL Mode 2 - offers the best short to medium term communications infrastructure for controller-pilot data-link communications (CPDLC). IATA supports continued implementation of VDL mode 2

- Data-link is already used extensively by airlines for Aeronautical Operational Control (AOC)

CPDLC

- In suitable operational environments, CPDLC is preferred to voice communications as it helps to eliminate misunderstanding associated with voice comms
- Airlines: Equip aircraft
- Equipment manufacturers: Charge a fair price
- Airframe manufacturers: Charge reasonably for retrofit
- Communication S.P.: Provide an equitable service
- ANSP: Transparent charging scheme

CNS/ATM Navigation

- Growing number of LATAM/CAR air transport aircraft are equipped with GNSS coupled to FMS with INS/IRS
- Many of these aircraft are capable of meeting RNAV and RNP criteria
- Most of these aircraft can navigate with minimum reliance on ground NAVAIDS

CNS/ATM Surveillance

- PSR: No longer required for ATM services
- PSR: May be needed for safety mitigation in some terminal areas
- SSR: ADS-B OUT is the preferred option

ADS – C

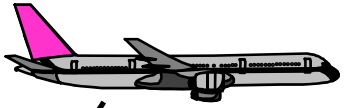
- Oceanic and Remote Airspace
- Data-link “Contract” between ATC and pilot
  - FMS derived position reports (IRS + GNSS)
    - (present position, next position, next + 1 position)
    - Usually given every 15 - 27 minutes
    - Displayed on scope similar to radar
  - Contract position report could include weather information (winds/temp)

ADS – B

- One second return rate
  (8 times more than average radar)
- Two variants; ADS-B OUT and ADS-B IN
- Facilitates radar like separation of 3-5 nm
- Operational since 2005.

CNS/ATM: Surveillance

Automatic Dependent Surveillance Broadcast "Out"



Position, Altitude, ID (call sign) velocity vector, etc.

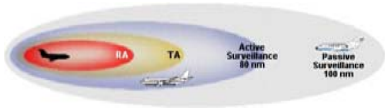
CNS/ATM: Surveillance

Everyone sees each other.

Note: airlines still evaluating the business case for ADS-B IN.

- Display on TCAS or other display
- Longer range than TCAS
- Can include velocity vector & identity

Enhanced "see & avoid" Air-Air Surveillance



- Display on MFD or PDA
- 1090Rx (not yet available)

ADS-B ground stations cost 1/10th the price of traditional radar

ADS-B
~ $100K-$400K USD

Cost Comparison

Maintenance
Power
Site space
Building
Road
Environmental
Rotating machinery

RADAR
~ $1M - $4M USD

Radar, ADS-C and ADS-B and the Air Traffic Controller's Display

Radar Tracks

ADS - B tracks

DIFFERENT SYMBOLS

ADS- C tracks

IATA Position

- Recognizes ADS-B as a prime enabler of ATM applications
  - safety and capacity benefits
- Supports the cost-effective implementation of ADS-B
- No adequate ground based surveillance is available in many areas of the world
  - ADS-B can provide a cost effective surveillance solution
- CNS vision includes: RNP, GLS, ADS-B

Implementation Issues

- Early benefits of ADS-B “OUT”
- Unwise to pursue ADS-B “IN” (CDTI) at this time
- CDTI should be on next-generation airplanes
- Most fleets have 1090 ES (LATAM)
  - Rest will have it soon
- IATA is grateful for Australia’s pioneering work on developing a benefits-driven implementation plan for ADS-B “OUT”

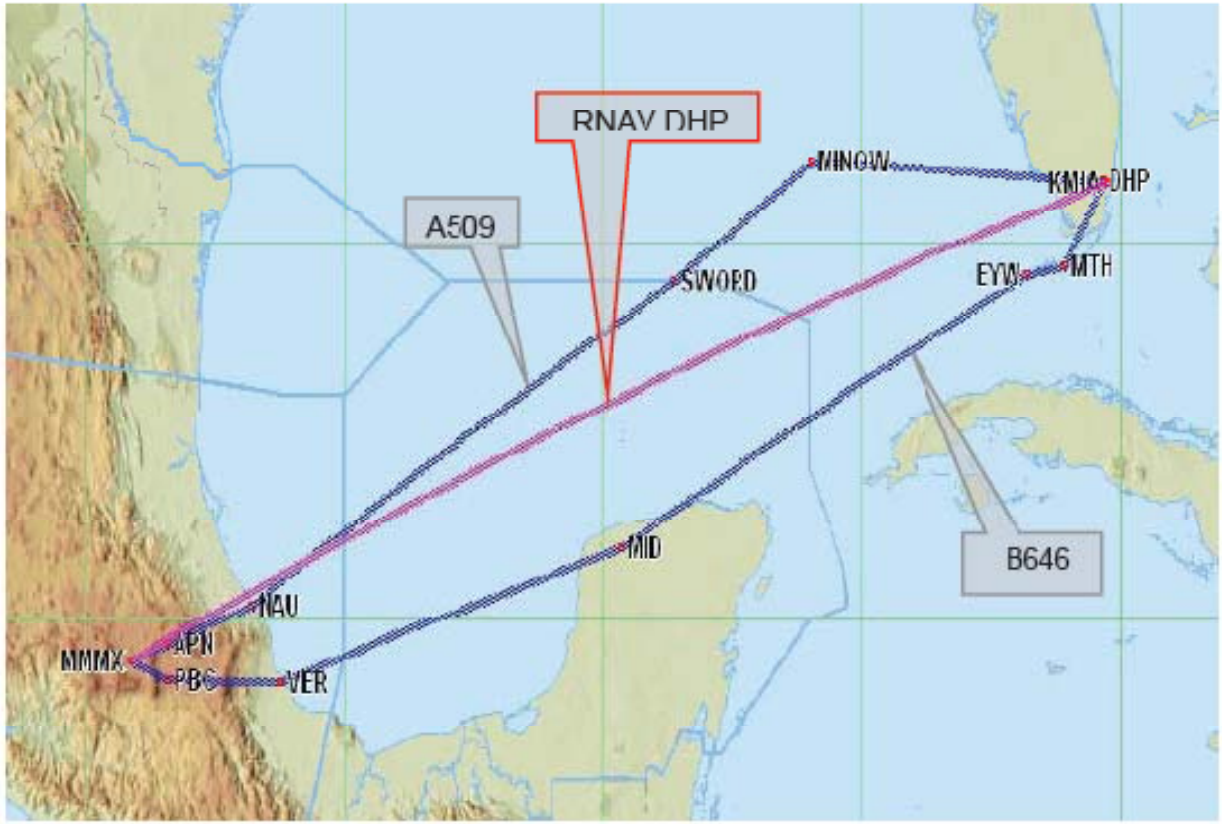
Regional Benefits

- Increase capacity
- Increase schedule flexibility
- Increase flight path efficiency
- Reduce disruption (delays, diversions and cancellations) due to congestion in the Gulf
- Provide increased route flexibility for traffic during convective weather events

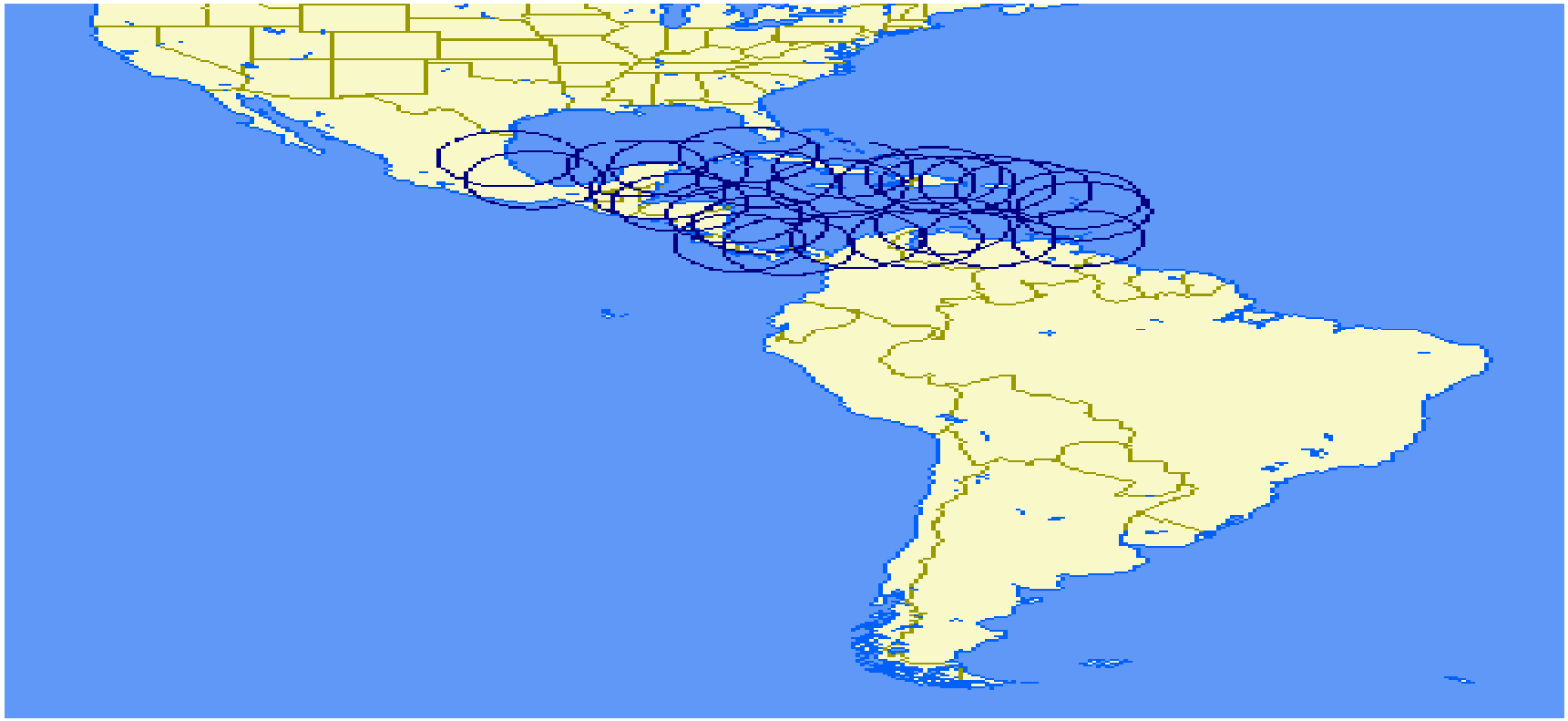
Gulf of Mexico - Savings

MIA-MEX Savings

↗33 NM (vs. A509)
↗53 NM (vs. B646)
↗USD 3.4M/yr



ADS-B Coverage



ADS-B Datalink Selection

- Mode S Extended Squitter (1090 ES) to be used as the single, interoperable data link for ADS-B in the near term
- 1090 ES is available, mature technology, enabling early implementation
- Boeing, Airbus, CANSO support 1090 ES
- IATA recognizes that a link with greater performance will be required in the future
- This selection must be made purely on application performance requirements and return on investment
  - not political considerations

Next Steps

- Develop an ADS-B OUT implementation plan to include:
  - identifying sub-regional areas where there is a positive cost/benefit for near-term implementation
  - standardized and systematic task-list approach to implementation
  - educational seminars for regulators, ANSPs and operators
- Near term ADS-B datalink selection
  - 1090 ES

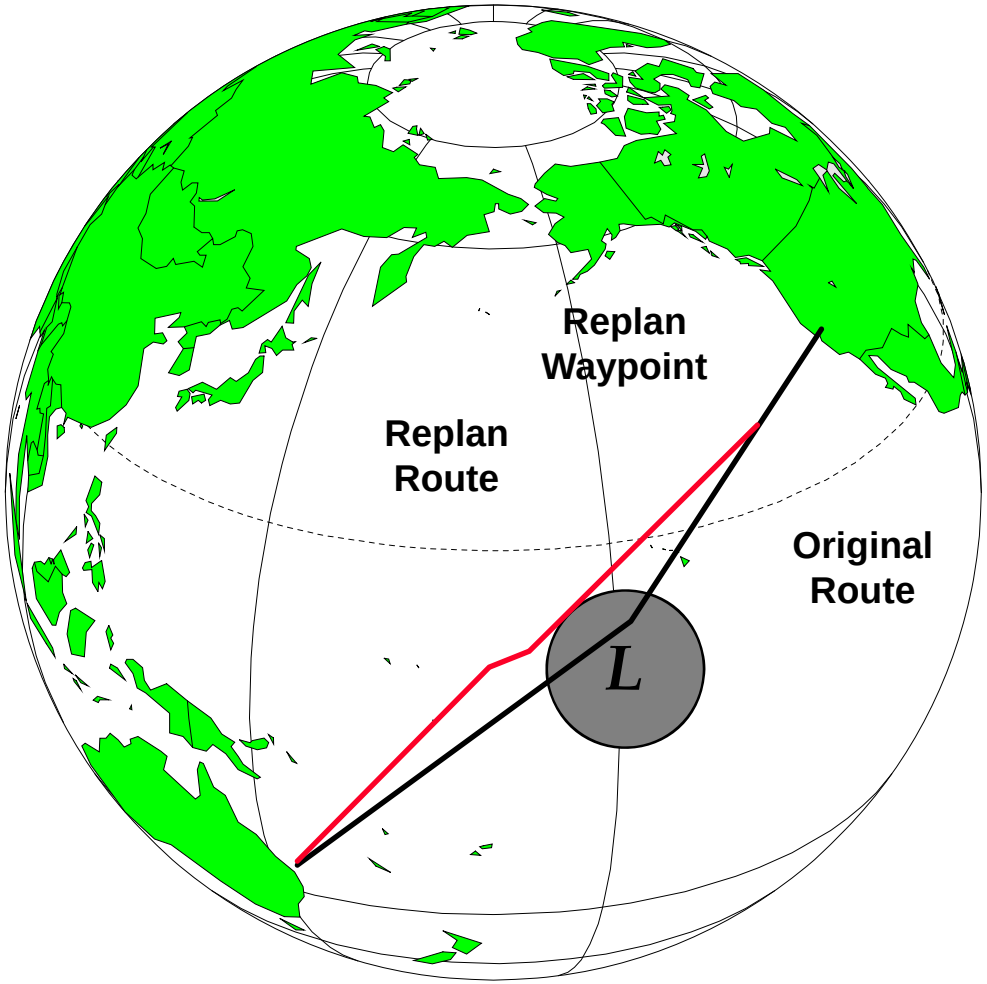
CNS/ATM: Air Traffic Management

- Difference between ATC and ATM
  - ATC is concerned with the separation of aircraft
  - ATM focuses on efficient management of the airspace
    - ATC plus air traffic flow management plus airspace management plus a special emphasis on flight efficiency and fuel conservation.

Practical Elements of ATM

- Reduced Separation
- Flexible instead of Fixed Tracks
  - Daily Flex Tracks
  - Dynamic Airspace Re-routing
  - User Preferred Trajectories
- RNAV approaches instead of “dive & drive”

Dynamic Aircraft Route Planning (DARP)



- Evolutionary implementation
- Pilots can change route based on real winds (instead of forecasted winds used at time of filing a flight plan).
  - Trials started 1996 in South Pacific
- Equipment Requirements
  - FANS
- Cost Benefit
  - Approx 10,000 USD savings per flight on a typical LAX-SYD

Our common goal:

A harmonized set of global standards that will make the safest form of transport

…even safer

THANK YOU

to represent, lead and serve the airline industry