

**WAAS/LASS Update to
ICG WG-A
30 July 2009**

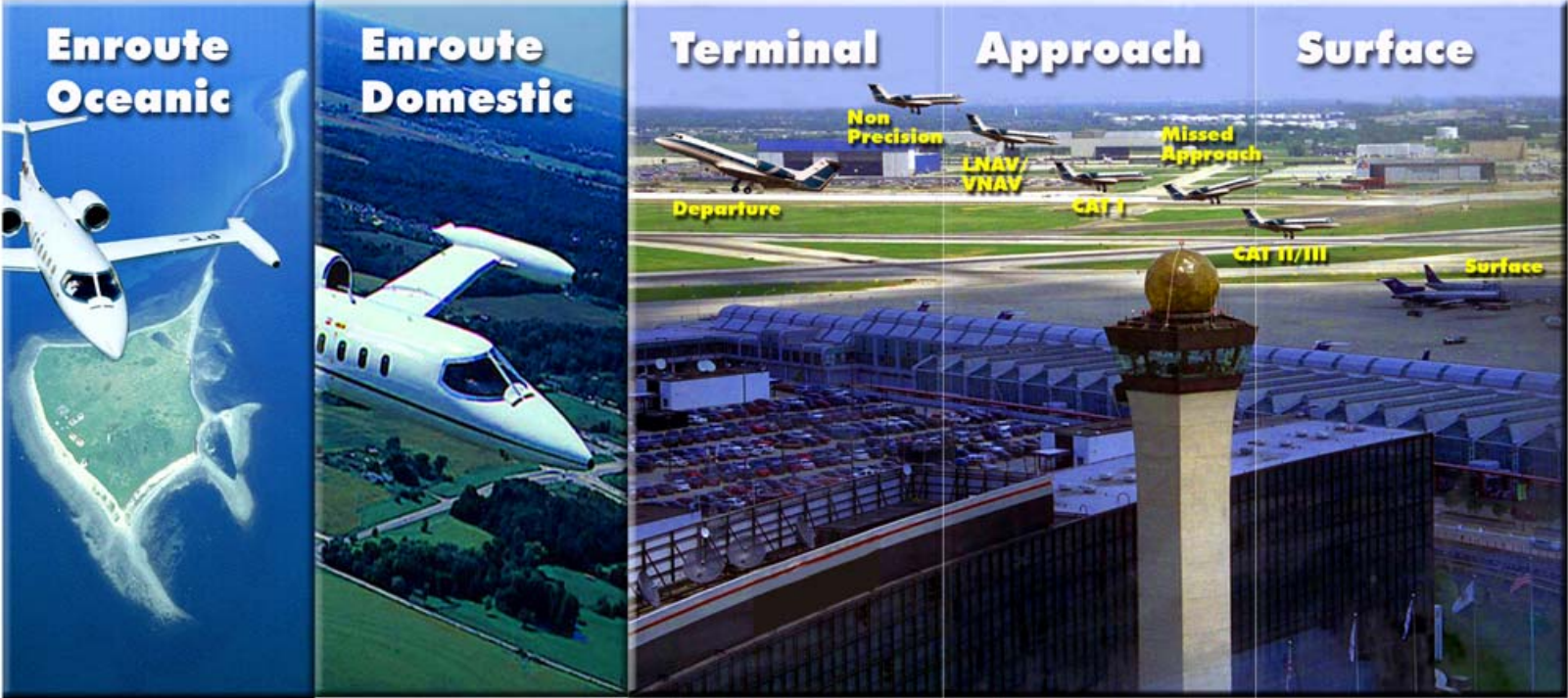


**Federal Aviation
Administration**



FAA Satellite Navigation Program

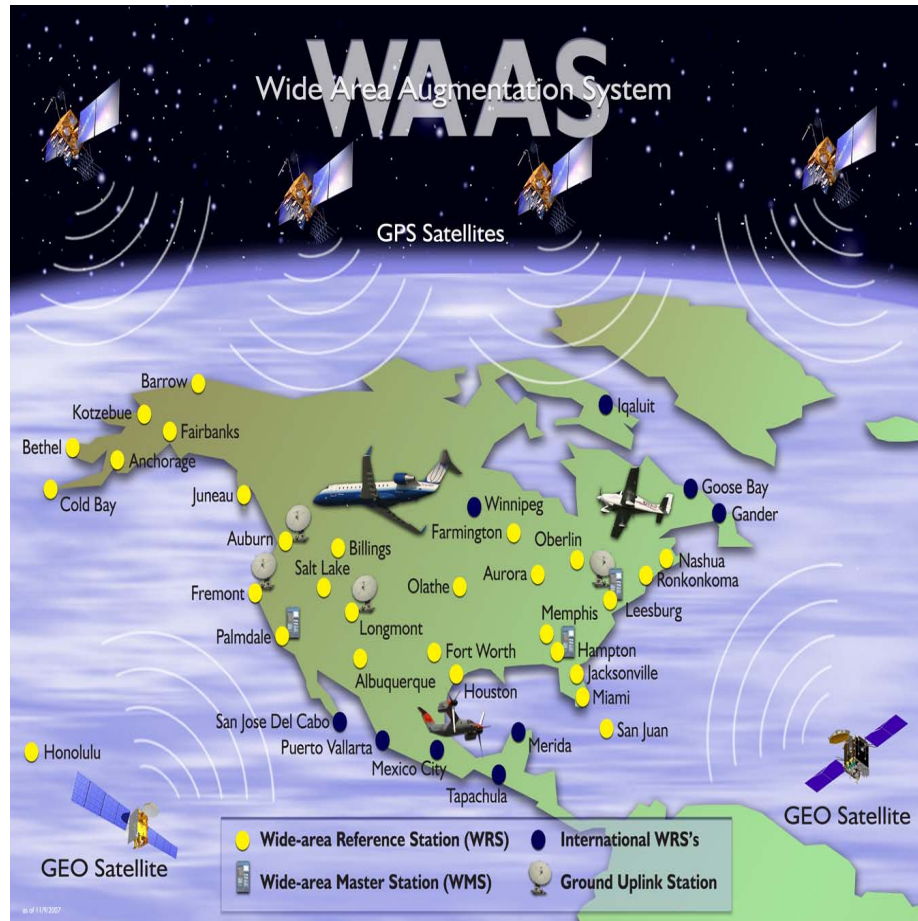
WAAS



LAAS



Wide Area Augmentation System



38 Reference Stations



3 Master Stations



4 Ground Earth Stations

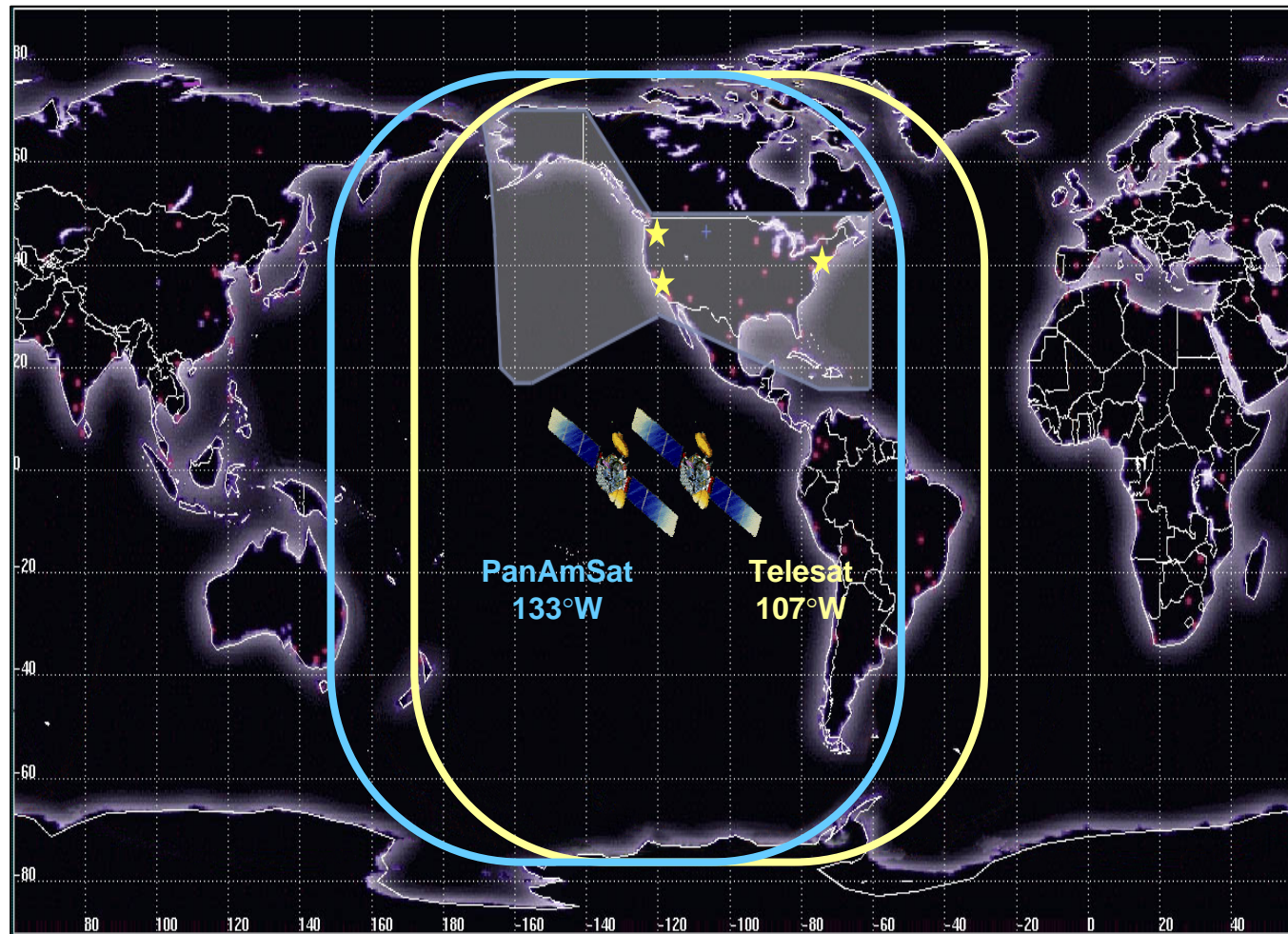


2 Geostationary Satellite Links

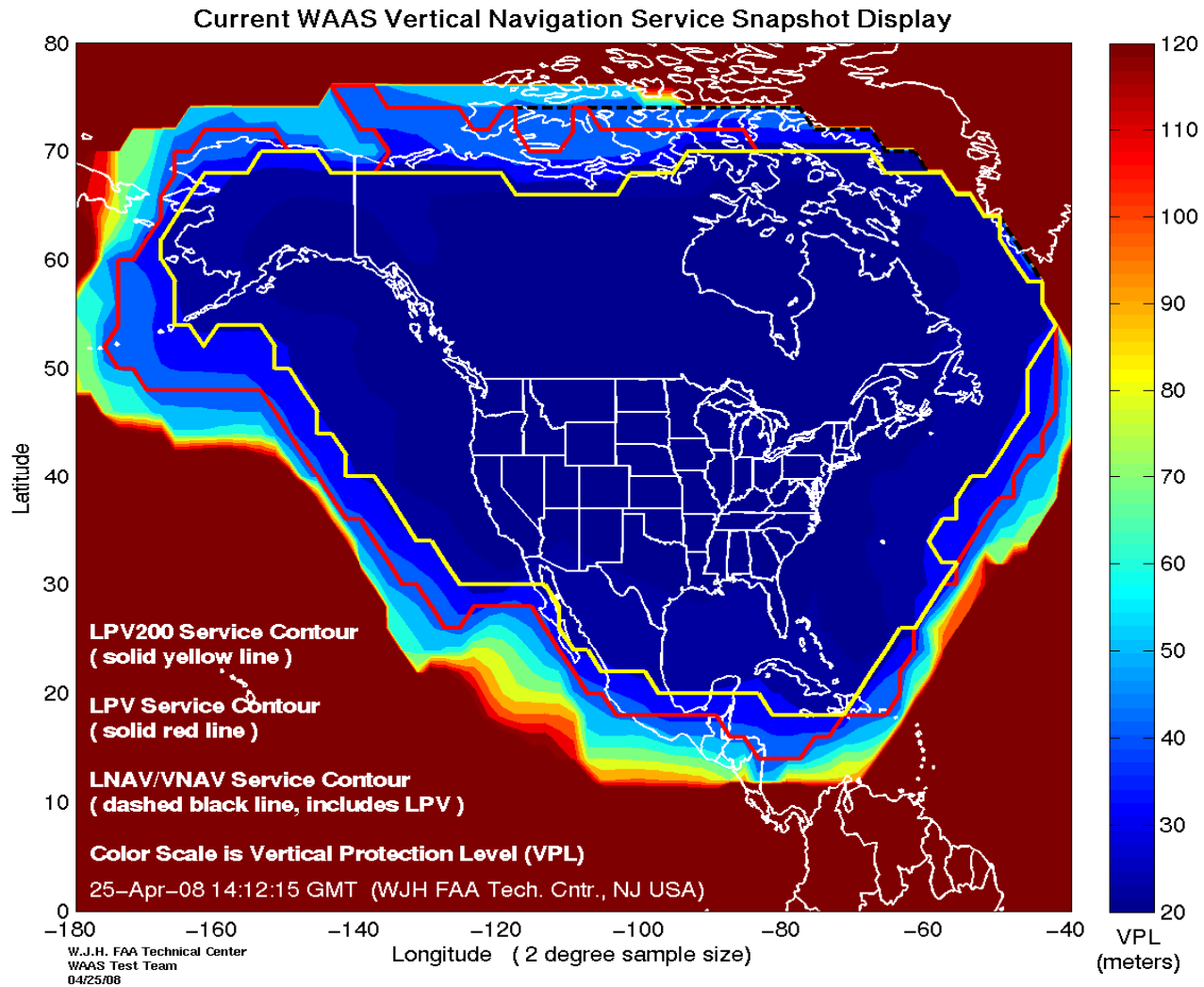


2 Operational Control Centers

Geostationary Satellites (GEO)



WAAS LPV Coverage

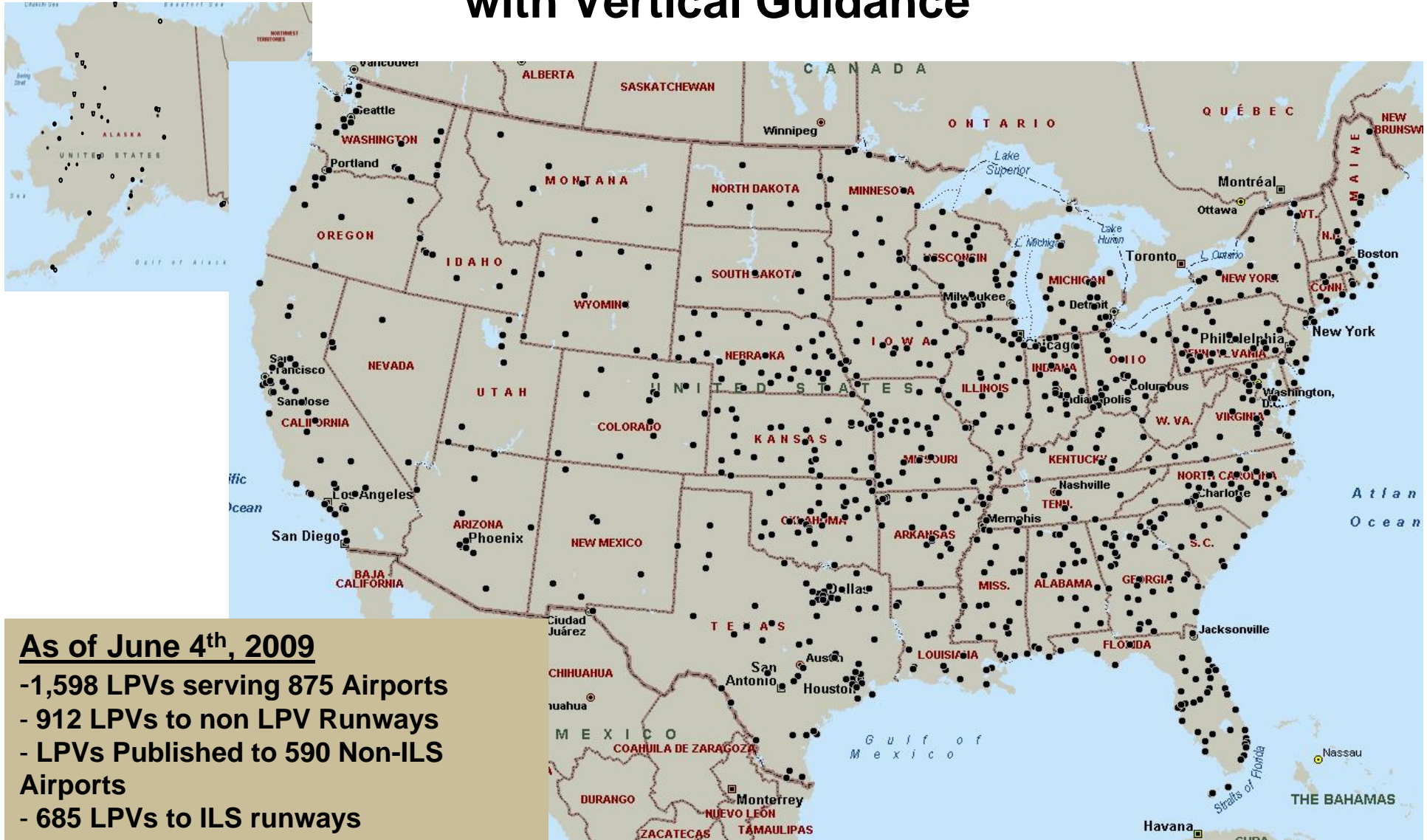


WAAS Avionics Status

- **Garmin:**
 - 43,000+ WAAS LPV receivers sold
 - Currently sole GA panel mount WAAS Avionics supplier
- **AVIDYNE & Bendix-King:**
 - SmartDeck glass panel and KSN-770 projected to market summer 2009
- **Universal Avionics:**
 - Full line of UNS-1 FMSs achieved avionics approval (TSOA) in 2007/2008
 - 700+ units sold (est. 500+ aircraft configured)
- **Rockwell Collins:**
 - Multiple recent (fall '08) WAAS Sensor/Rcvr & FMS avionics TSOAs
- **CMC Electronics:**
 - Achieved TSOA certification on both their 5024 & 3024 WAAS Sensors
- **Honeywell:**
 - Multiple FMSs to achieve WAAS acft cert. in 2009
- **NextNav:**
 - TSO-145c/DO-229D approved WAAS (mini) Beta1 and (Max) Beta 1,2,3 sensors



Airports with WAAS Supported Instrument Approaches with Vertical Guidance



As of June 4th, 2009

- 1,598 LPVs serving 875 Airports
- 912 LPVs to non LPV Runways
- LPVs Published to 590 Non-ILS Airports
- 685 LPVs to ILS runways



Aircraft Supplemental Type Certificates (STC): Completed & In-Work

Completed:

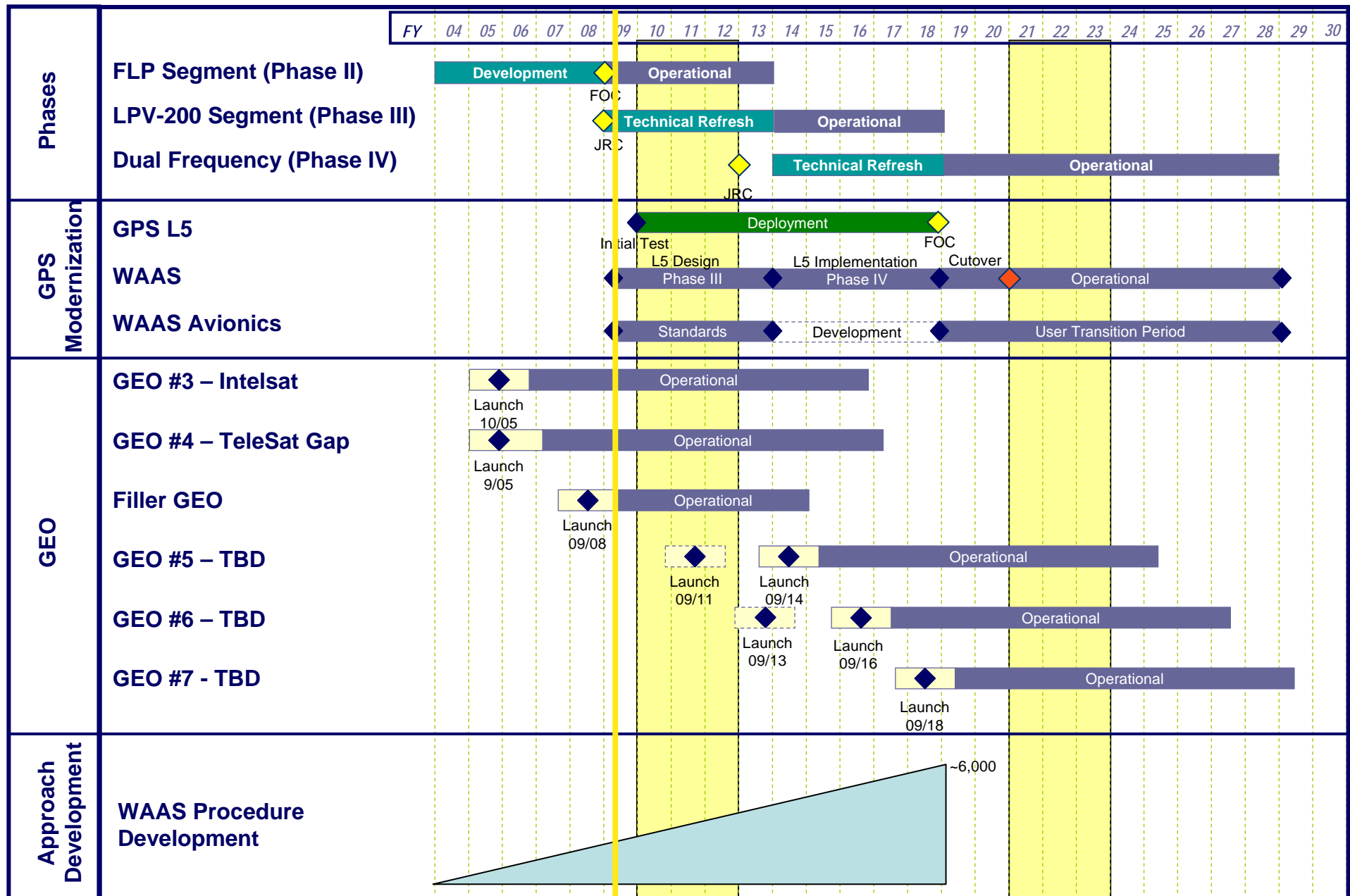
- Bombardier: Challenger CL-600/601, CL-604, CRJ-200
- Cessna Citation Jet: CJ-1+, CJ-2+, CJ-3
- Beechcraft: King Air-300 (FAA Flt Insp acft)
- LEAR : 40, 40XR, 45, 45XR, 60
- **Boeing: B-737-200**



In-Work:

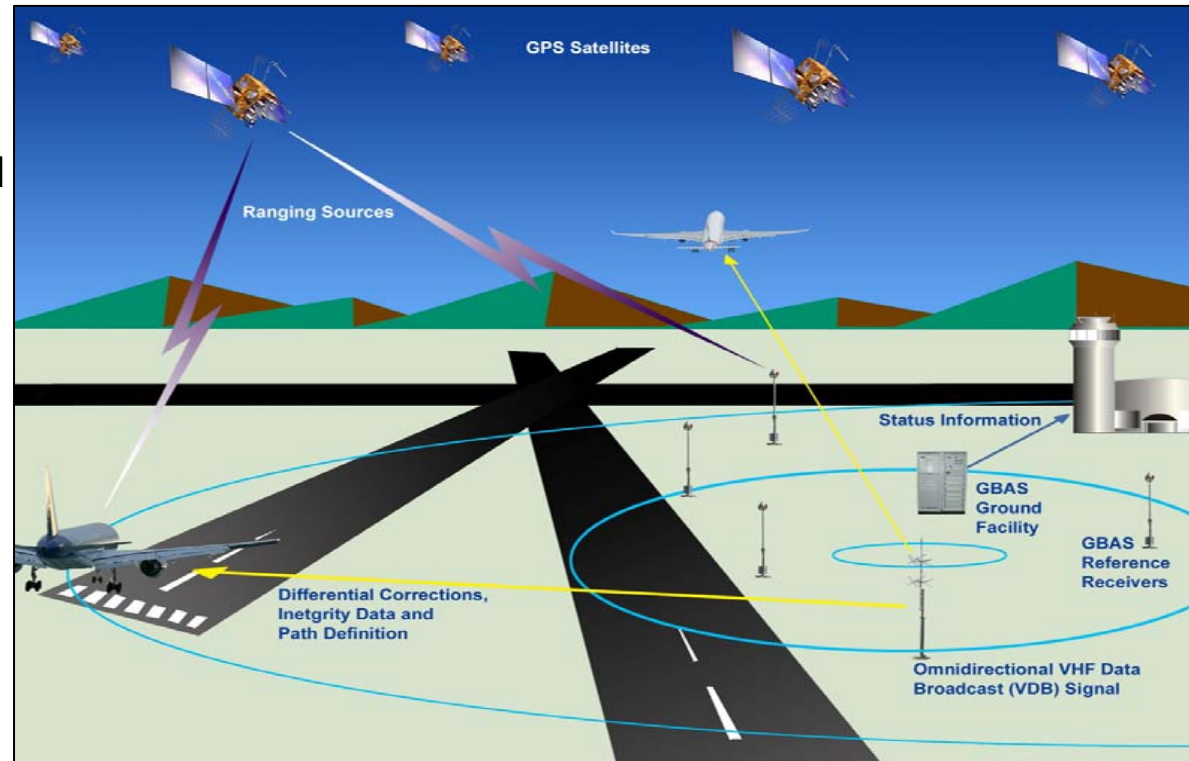
- Agusta: A-109
- ATR-42
- Beech: Be-200, Be-300, Premier-1, King Air-200/300
- Boeing: B-727, B-737**
- BELL 412
- Cessna Citation: II, 550, 560/XL/XLS, 650, VII, Bravo, Encore
- C-9
- Northrop Grumman T-38
- Gulfstream G-II, G-III, G-IV, G-150, G-200
- DeHaviland: Dash-8
- Falcon: 10, 20, 50, 2000
- Hawker: 125-700B
- King Air: 300, 350, **RC-12**
- LEAR: 31A, 35A, **C-21A**
- Lockheed Martin: **C130J**
- McDonnell-Douglas: MD-87
- PC-12
- Bombardier: Global 5000/Express, Q-Series, Q-400, CL-300, CL-605
- Sikorsky: S76, S76-B, S-76C++
- Bombardier: CRJ-700/900
- Hawker: 400XP, 800XP
- Dassault Falcon: 50EX, 2000EX
- Piaggio: P-180
- Airbus: A-350, A400**

WAAS Enterprise Schedule



Local Area Augmentation System (LAAS)

- Multiple Runway Coverage for Cat-I, II, III Precision Approach
- Offset landing thresholds and flexible glide-path to mitigate wake turbulence
- Reduced Ground Movement Delays By Eliminating ILS critical areas
- Enabler of 3 D RNP Procedures, OPDs
- Enabler for closely Spaced Parallel Approaches
- Enabler simultaneous Independent Approaches

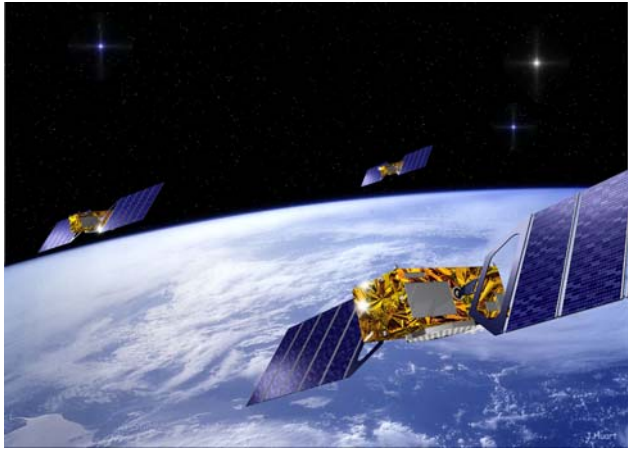


LAAS Pathway Forward

- CAT-I System Design Approval (SDA) at Memphis - 2009
- LAAS Government-Industry Partnership Implementation Project at Newark and Memphis
- CAT-III Prototype Validation by - 2010
- CAT-III Investment Decision by - 2012
- Evaluating Potential to Leverage Resources with DoD Joint precision Approach Landing System (JPALS)



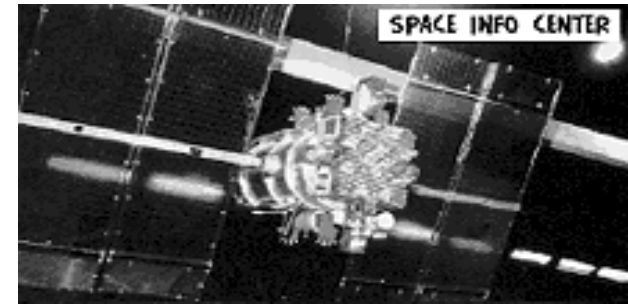
Future Considerations



Galileo (EU)



COMPASS



GLONASS



GPS