

# Quantifying Wx Benefits

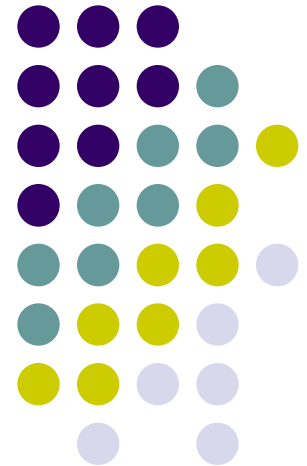


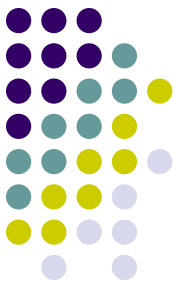
- Refresher on how weather was justified.
- Lessons learned.
- Incorporating airline industry needs and benchmarks to validate business cases?

Nicholas Stoer, Consultant, Retired FAA Exec

# Weather Program Justification -1980's

- PATCO Strike August 1981
- Response: NAS Plan, Brown Book, 12/1981
  - FAA/NWS/USAF Infrastructure Obsolete, Underfunded
  - Brown Book presented R&D and investment strategy
  - Emphasis: Prevent/reduce weather delays, fatalities
- Buy-in from DOT, OMB, Congress and Stakeholders (all were initially dubious that FAA could produce)





## Major Take-aways 1982 vs. Today

- Different eras. 1980's and 1990's had a safety focus plus infrastructure modernization, expansion.
- Virtually all 80's and 90's systems had easy-to-measure site-specific benefits.
- 21<sup>st</sup> Century & NextGen. Weather benefits harder to measure and validate:
- Promised weather benefits shifted to network capacity requiring controller and pilot interpretation and judgment.
- Mustard and Catsup era begins.



## Needs in the 1980's

- Replace obsolete radars – go digital with ASR-9, ARSR-4, NEXRAD, TDWR
- Replace obsolete displays and processors
  - En Route HOST computers
  - Terminal ARTS systems
  - Automate/Consolidate Flight Service (325 down to 80)
- Hundreds of weather-related gaps – Glide slopes and RVR, LLWAS, AWOS, ASOS

# 80's Cost-Benefit Framework



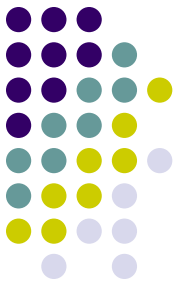
- Easy to grasp cookie cutter approach.
- Once proof of concept was established, agencies used site-specific criteria to determine how many units would be needed. Easy to budget.
- Several major weather systems were jointly funded by FAA, NWS and DOD (NEXRAD, ASOS, ASR-9, others). Useful check and balance strategy.
- Major cost avoidance benefit: Downsizing labor FTEs. Flight Service from >5,000 in 1981, < 800 today. Technicians from >14,000 in 1981, < 9,000 today.

# FAA Priorities in Early 1990's

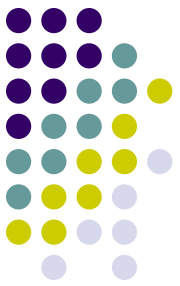


- Deploy programs launched in the 1980's
- Exploit new tools and concepts, new Air Traffic Control System Command Center (ATCSCC)
- Finish and stabilize training of 15,000 controllers hired between 1982 and 1994
- Cope with rapid traffic growth
- Redress poor safety record of 1980's and early 1990's
- Better understand and articulate benefits

# Evaluation Tools from 80's, 90's, Impact of AAS Debacle



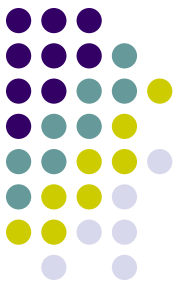
- MCR Federal Cost/Benefit Studies
- FAA Policy Office. Investment Criteria program by program: objectives, how many (i.e. which locations) devices needed. Control tower sites, ASOS, LLWAS sites
- Learn from deployment experience
- Justification Earthquake – the Advanced Automation System debacle of 1993
- FAA credibility at stake, Major Reset



## Acquisition Management System (AMS)

- AAS Debacle triggered many changes.
- Blue Ribbon review in 1995 and 1996.
- 1996 - FAA sought and got relief from Federal Acquisition Regulations (FARS).
- Also relief from Title V personnel rules.
- Led to new AMS process with life cycle reviews, Joint Resources Committee.





## Changing Aviation Environment – late 90's

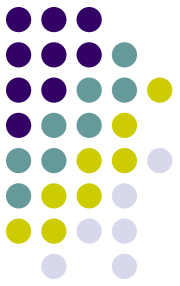
- By mid-1990's two parallel phenomena emerging:
  - Safety had improved (fewer fatal crashes, operational errors, near-misses, GA accidents)
  - TDWR success and air carrier microburst training eliminated microburst crashes
  - Traffic flattened out – flat spots in economy
  - HOST, VSCS, STARS, ARTS III deployed
  - 1997 - National Civil Aviation Review Commission (Mineta Commission)

# Segue to NextGen - 2003



- FAA: What would/should the system look like in 2015, 2020, 2025?
- Harmonize with Europe/SESAR.
- FAA needed a Brown Book sequel
- Capacity, delay and environment became the new Holy Grails – how to achieve?
- HOST computers to morph into En Route Automation Modernization (ERAM)
- How fit weather tools into ERAM and STARS?

# JPDO Weather Working Group



- Conceived in 2003. Met bi-monthly 2004 to 2008.
- ATM Weather Integration Plans (several versions)
- REDAC Weather-ATM Integration Working Group (10/07)
- Discussed at multiple FPAW meetings
- FAA operational & acquisition offices - light participation
- Challenges:
  - NNEW = Common Support Services – Weather
  - 4D Weather Cube = NextGen Weather Processor
  - New Themes: Performance Based Navigation, Optimized Descents, Time-Based Flow Metering, Collaborative Decision Making
  - NWS roles and systems. USAF role unclear.