



Federal Aviation
Administration

Center of Excellence for Technical Training and Human Performance

Overview of COE Research Focus Areas

COE 2nd Quarterly Meeting
November 30, 2016





Curriculum Architecture

Center of Excellence Focus Area – Curriculum Architecture

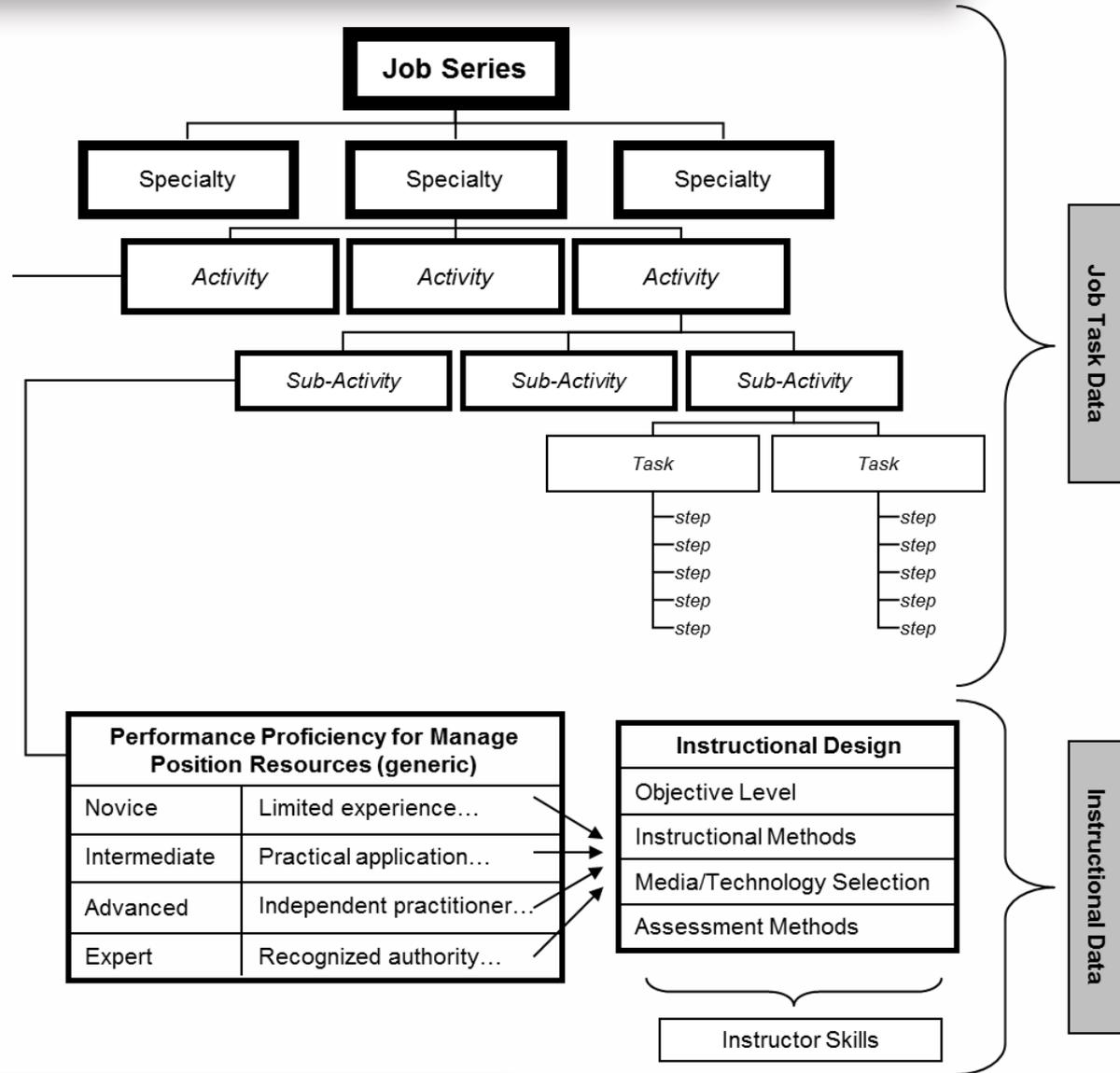
Presented by:

Greta Ballentine

Manger, Curriculum Team

AJI-2130


Curriculum Architecture is a framework for the structure and planning of training that brings all training under common job task analysis data, training data, and instructional guidelines.





Risks

- Traceability is poor
- Proficiency levels attained appear low
- High potential for redundant material (and inconsistent or outdated)



Recommendations

- Full redesign is impractical, but maintenance could fill in basic proficiency and traceability holes
- Tag current and newly developed content



Current State

- Preliminary analyses for new development
- Aligning Tech Ops with new CAMI/Human Factors analyses
- Refreshing Air Traffic Control data
- Core Center of Excellence work
- *Good Stuff*
 - Aligned with Human Factors
 - Word is out there
 - Aviation Rulemaking Advisory Committee, simulation, strategic planning
- *Pain*
 - Overwhelming, manual work
 - Still inclined to do things in isolation
 - Difficult to trace back after development
 - Aging CA data (delivery, objectives, content)



Desired Future State

- Implement curriculum oversight at M/E Conf
- Job task analysis as metadata
- Convert data to database



Way Forward

- Cataloging content
- Evidenced-based decision making
- Content development
- Use of technology
- Macro-level curriculum oversight
- NextGen planning



Content Management and Delivery

Center of Excellence Focus Area – Content Management and Delivery

Presented by:

Gregory Sanders
Manager, Development Team
AJI-2120



Current State

- No standard development templates or development platform
- Under utilization of the Blackboard learning environment
- Plateau Question Editor not robust enough for training needs (not adaptive)
- No central training repository for National Training Courses
- No established learning taxonomies
- Simulations, Gaming, Virtual, Immersive and Mobile training not robust or under utilized



Desired Future State

- Standardized development templates and development platform (LCMS)
- Centralize and house National content (LCMS for web courseware and/or Blackboard for ILT)
- Establish standardized learning taxonomies
- Fully utilize the Blackboard Learning Environment capability
- Migrate to eLMS cloud environment
- Initiate a more robust testing engine within learning environment
- Improves simulations used for training
- Input gaming, virtual, immersive and mobile strategies, techniques and technologies into training environment



Simulation and Part Task Training

Center of Excellence Focus Area – Simulation and Part Task Training

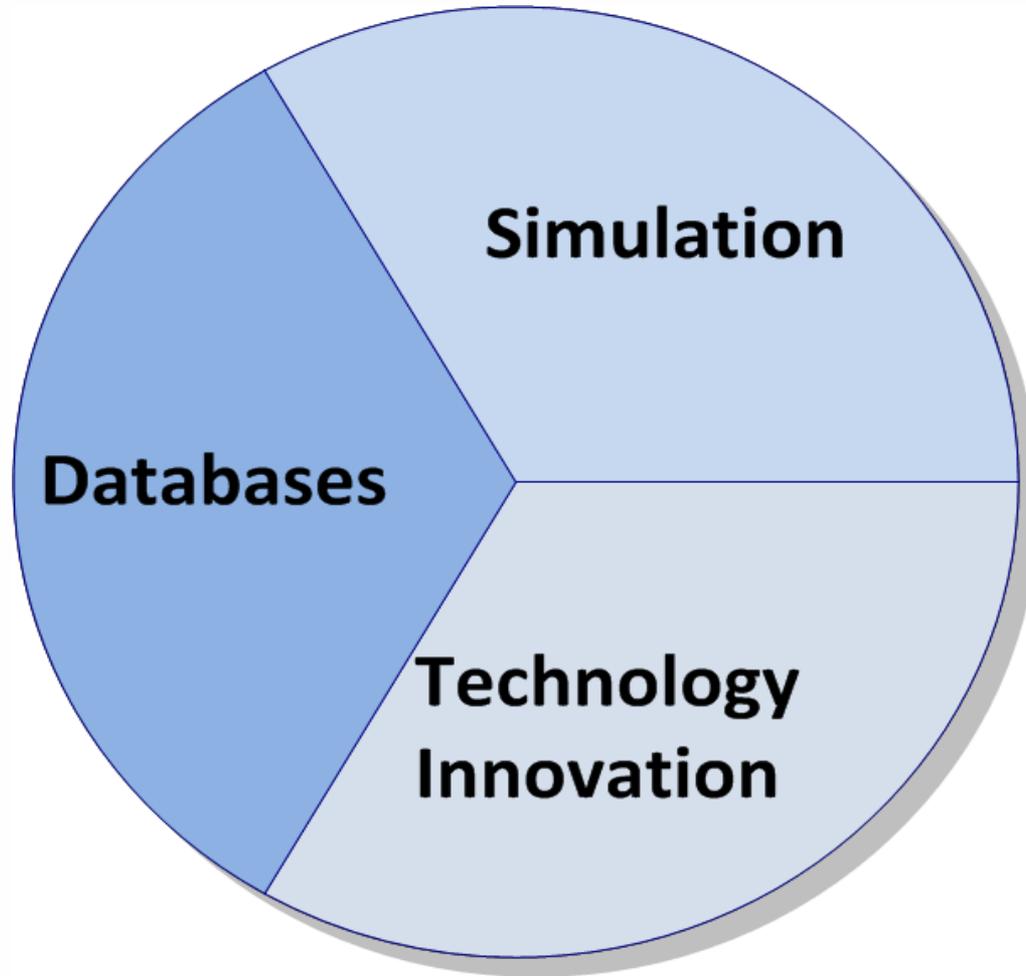
Presented by:

Mark Folsom

Manager, Training Technology Team

AJI-2230

Training Technology Strategy





Current State

- Simulation is provided for Terminal and Enroute controller training
 - Terminal – Tower Simulation Systems, ATCoach, and a variety of scenario development tools
 - Enroute – Test & Training Lab (TTL) and a variety of scenario development tools
 - No simulation for technician training
- Databases track controller and technician training
 - One for technician training, four for controller training
 - Most database are written in older unsupportable code
- Technology Innovation, an area where we are looking into several potential solutions for simulation, improving processes for evaluating training technology, etc.



Desired Future State

- Researching the potential to develop a common air traffic simulation platform that can be used across terminal/enroute.
- Develop a Technical Operations simulation capability/products.
- Consolidation of the different training databases into one or two depending on the domain.
- Focus on further developing and refining the use (policy), and supporting (oversight) the current suite of simulation products.
 - Define specific set of core skills, targeted curriculum.
 - Baseline performance for advancement.
 - Minimum scenario formats, templates, etc.



Human Factors

Center of Excellence Focus Area – Human Factors

Presented by:

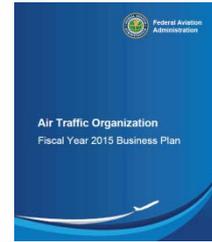
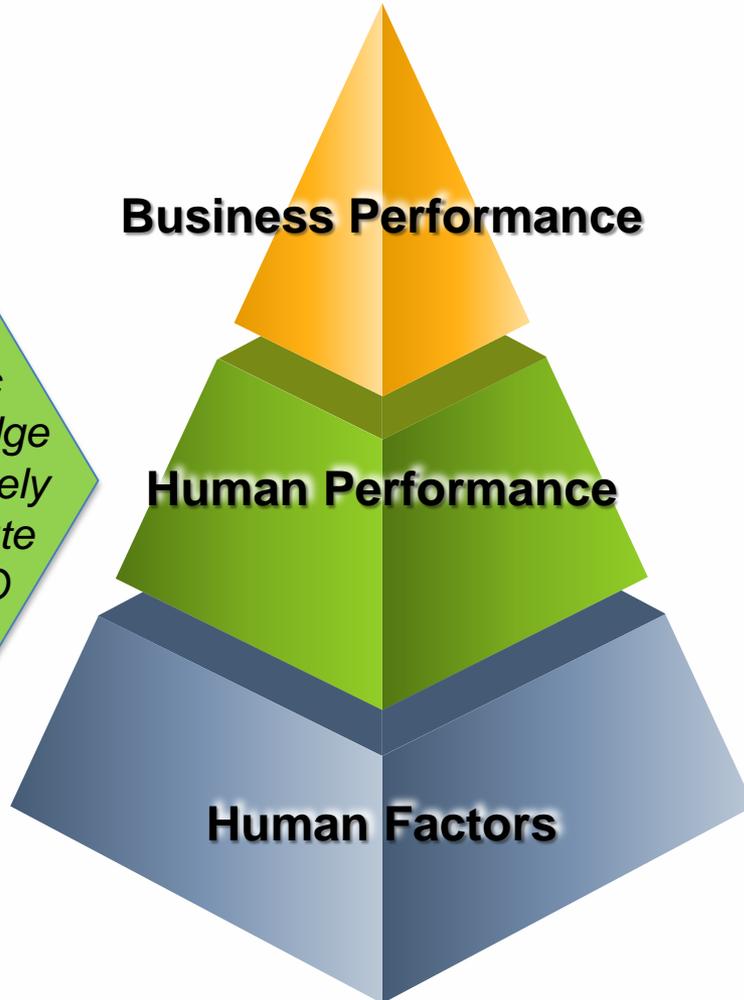
Katrin Helbing

Human Factors Scientist, Human Performance Team

AJI-155

Defining Human Performance

Human Performance is about using scientific human factors knowledge directly and consultatively to support and contribute to the needs of the ATO and its users



ATO BUSINESS GOALS



ENABLES

Level of effectiveness achieved by ATO employees in their work

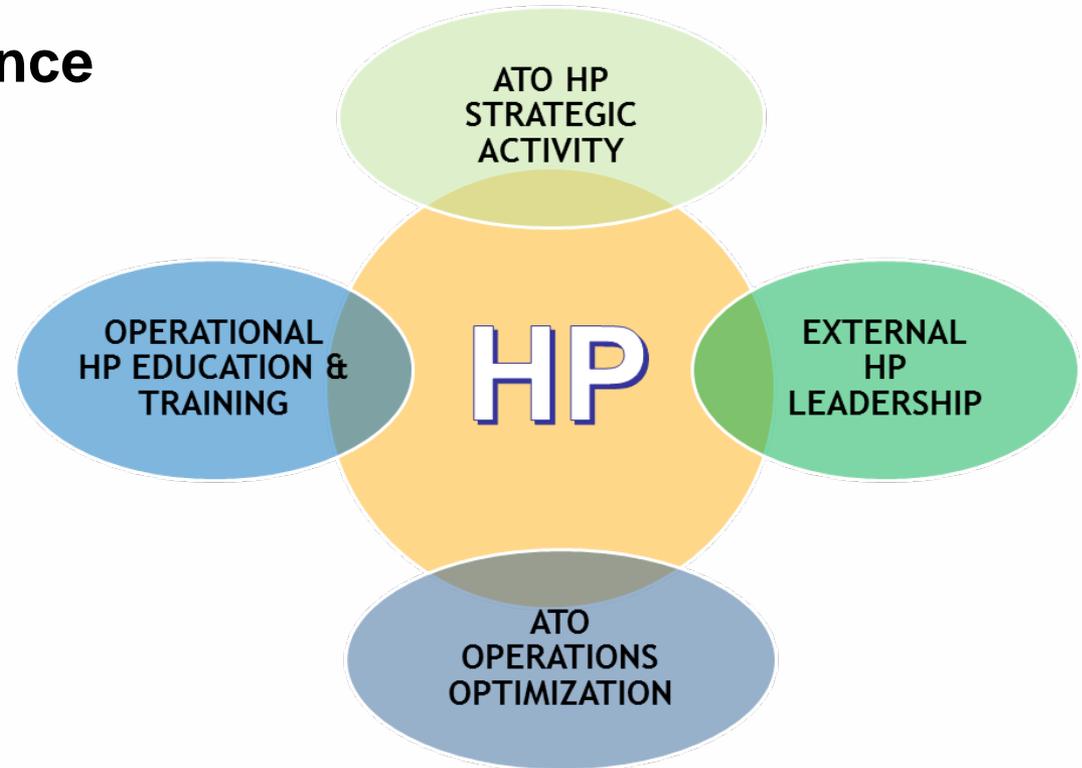


SUPPORTS

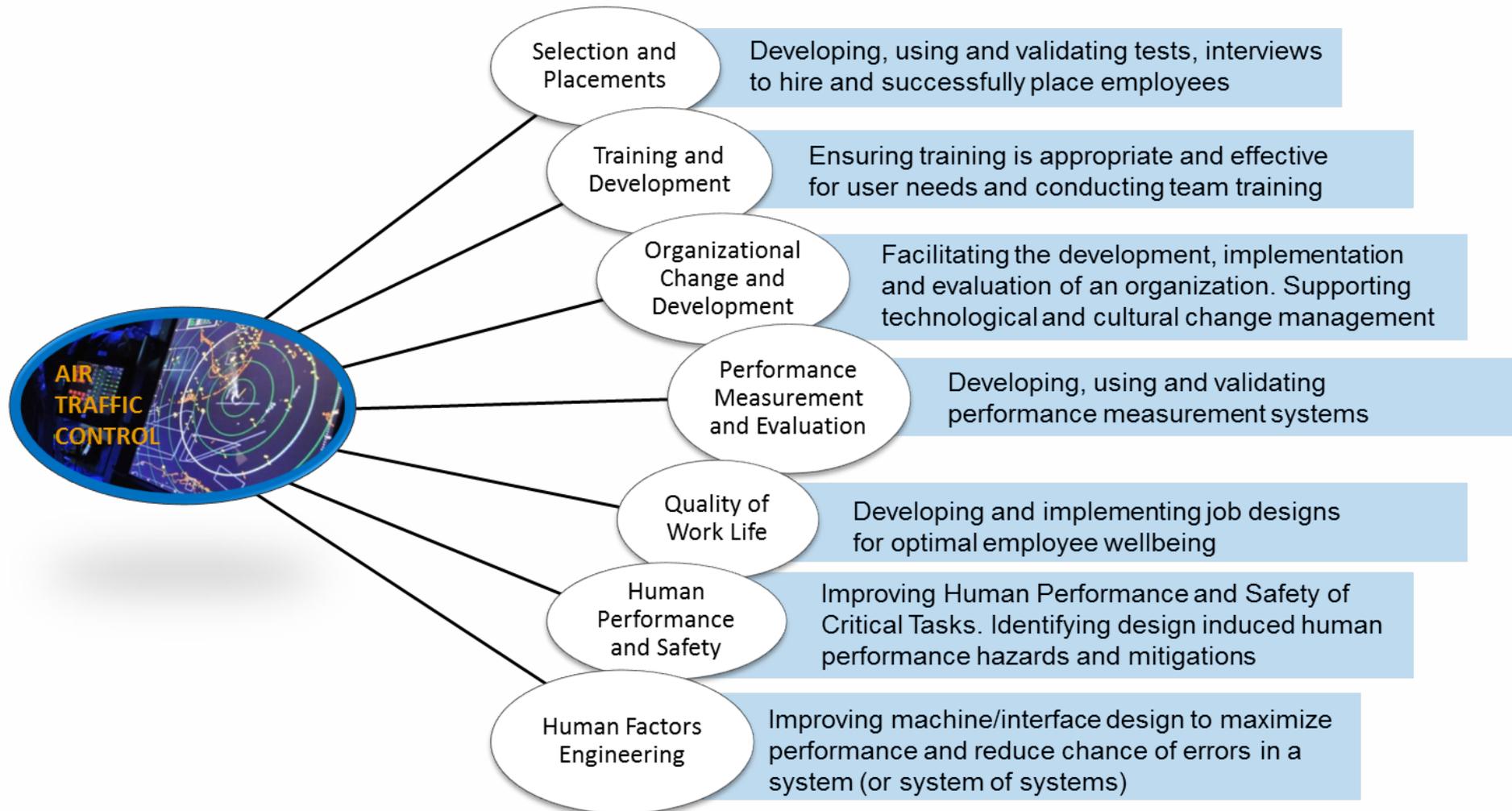
Influences that underlie the work of ATO employees and the discipline that optimizes these influences

Human Performance Process Areas

1. **ATO Human Performance Strategic Activities**
2. **External Human Performance Leadership**
3. **ATO Operations Optimization**
4. **Operational Human Performance Education & Training**



Domains of Human Performance



Simply Put...

Do we have the
right people

in the
right roles

with the
right information

and the
right skills

and the
right tools

and the
right role models

with the
right motivation

to do the job?





Analytics

Center of Excellence Focus Area - Analytics

Presented by:

Frank Toner

Manager, Planning and Analytics Team

AJI-2210



Background

- The FAA requires research into strategies for implementation of learning analytics that can inform recommendations on the best processes and systems for training
- Beyond simple training completion records, analytics can provide
 - insights into the relative merits of different training environments
 - instructional strategies
 - overall learner progress in training initiatives



Current State

- Technical training for our controllers and technicians has not changed significantly over the years.
 - In-resident training for basic classroom and lab
 - Limited use of simulation
 - Multiple systems with no standard for requirements or design
- We face an urgent need to modernize training programs.
 - Make use of new technologies and efficiencies
 - Make use of modern teaching methods
- Constraints
 - No single tool to allow for data collection to provide a holistic scorecard
 - Budget
 - Requirements to train certified workforce
 - We use people vs technology



Desired Future State

- Unification and Integration of tools and resources
 - Better, faster, cheaper
 - More responsive to learning style of today's students
 - Capitalize on technology
- Mitigate safety vulnerabilities and generate efficiencies through risk based thinking and management
 - Scenario-based training
 - Use of gaming technology/simulations
- Just-in-time training protocols
- Training for *regulators* versus *inspectors*



Way Forward

- Assess technical training analytics requirements and needs
- Evaluate existing training practices, processes, tools and infrastructure in use today
- Identify industry best practices and emerging technologies that align to technical training analytical requirements and needs
- Perform GAP analysis to determine which practices, processes and technologies will enhance and advance technical training
- Develop, acquire, and implement using informed decisions



Safety

Center of Excellence Focus Area - Safety

Presented by:

Bob Whitworth

Manager, Air Traffic Training

Policy and Requirements Team

AJI-2320



FAA Business Plan Goals FY 17

- *Make Aviation Safer and Smarter/Risk-Based Decision Making*

Build on safety management principles to proactively address emerging safety risk by using consistent, data-informed approaches to make smarter, system-level, risk-based decisions.

- *Deliver Benefits through technology/infrastructure/National Airspace System*

Lay the foundation for the NAS of the future by achieving prioritized NextGen benefits, integrating new user entrant, and delivering more efficient, streamlined services.

- *Enhance Global Leadership/Global Leadership*

Improve safety, air traffic efficiency, and environmental sustainability across the globe through an integrated, data-driven approach that shapes global standards, enhances collaboration and harmonization, and better targets FAA resources and efforts.



Current State

- We are working on:
 - Risk Based Decision Making
 - Safety Benefits Through Technology
 - Global Leadership



Desired Future State

- Sharing of technology
- Sharing of lessons learned
- International harmonization
- Partnerships and sharing of best practices with academia and industry



Safety



In Conclusion

All of these efforts support the overall goal: **safety**, which *informs and drives all that we do*.