The National Academies of
SCIENCES · ENGINEERING · MEDICINE

TRANSPORTATION RESEARCH BOARD

NextGen for Airports – Resources and Guidebooks

Wednesday, May 24, 2017
2:00pm to 3:30pm ET

Purpose

Discuss research about the Next Generation Air Transportation System (NextGen).

Learning Objectives

At the end of this webinar, you will be able to:

- Identify practical and actionable information for the implementation of Performance Based Navigation (PBN) flight procedures
- Understand effective methods for engaging airport stakeholders in the NextGen implementation process
- Understand what information stakeholders require and how to effectively encourage two-way communication

ACRP is an Industry-Driven Program

- Managed by TRB and sponsored by the Federal Aviation Administration (FAA).
- Seeks out the latest issues facing the airport industry.
- Conducts research to find solutions.
- Publishes and disseminates research results through free publications and webinars.

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Opportunities to Get Involved!

- ACRP's Champion program is designed to help early- to mid-career, young professionals grow and excel within the airport industry.
- Airport industry executives sponsor promising young professionals within their organizations to become ACRP Champions.
- Visit ACRP's website to learn more.

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Upcoming ACRP Webinars

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June 12th

Information Technology Systems at Airports

June 20th

Business Continuity Planning

for Disruptions at Airports

Additional ACRP Publications Available on this Topic

ACRP Report 150: NextGen for Airports, Volume 3: Resources for Airports

ACRP Report 150: NextGen for Airports, Volume 4: Leveraging NextGen Spatial Data to Benefit Airports: Guidebook

ACRP Report 150: NextGen for Airports, Volume 5: Airport Planning and Development

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Today's Speakers

NextGen for Airports

Sebastian Timar, Architecture Technology Corporation

Robb Varani, Ricondo & Associates

Presenting: Report 150, Volume 1 –

Understanding the Airport's Role in Performance-Based Navigation: Resource Guide

Randy Murphy, Grafton Technologies, Inc.

Presenting: Report 150, Volume 2 –

Engaging Airport Stakeholders: Guidebook

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ACRP Report 150, Volume 1: Understanding the Airport's Role in Performance-Based Navigation (PBN) Resource Guide

Sebastian D. Timar, Ph.D.
Architecture Technology Corporation

Robert Varani, CM, PMP
Ricondo & Associates, Inc.

Brian Townsend
BT Aeronautical Consulting

Wayne MacKenzie
Air Traffic Management Consulting

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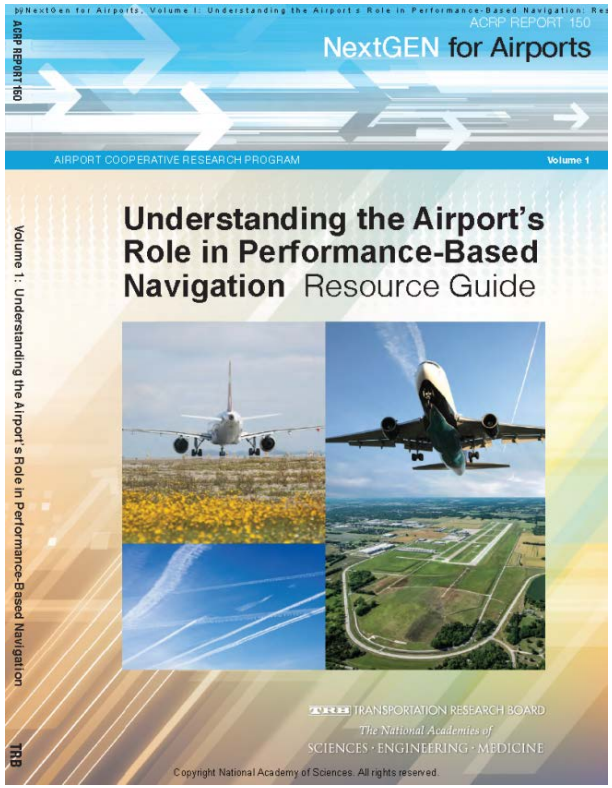
ACRP Report 150, Vol. 1: *Understanding the Airport's Role in PBN Resource Guide*

- Develop PBN Resource Guide for airport operators, planners, managers and other stakeholders
  - Background information
  - Components and applications
  - Impacts and issues
  - Environmental effects
  - Short- and long-term development plans
  - Assessment methods and metrics
  - Development and implementation guidance
  - **Case studies of previous implementations at airports & metroplexes**
  - Resources and references
- Published July 2016



http://www.trb.org/Publications/Blurbs/174588.aspx

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Problem

- **PBN departure, arrival and approach procedures can impact airports**
  - Improvements to safety, reliability, and efficiencies of the air services airports provide
    - E.g., reducing aircraft fuel burn and emissions
  - Noise exposure to surrounding communities
    - E.g., changing flight paths and noise distribution
- **Need for a comprehensive guidebook**
  - Understand PBN background, impacts, issues, development, implementation, assessment, resources
  - Engage in, influence and lead implementations of PBN flight procedures impacting their airports

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Approach

Component	Description
Literature Review	• PBN technical components; design & implementation methods, tools, and requirements; impacts

Stakeholder Outreach	• Perspectives concerning PBN, airport involvement and impact
	  • Airport, aircraft & air traffic system operators
	  • Aviation regulators
	  • Industry & community representatives
	  • Aviation researchers

Case Studies	• Previous implementations at selected airports & metroplexes
	  • Atlanta (ATL), Denver (DEN), Seattle-Tacoma (SEA), Minneapolis-St. Paul (MSP) and Henderson (HND) Airports
	  • Houston Metroplex

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PBN Components

Component	Description
Navigational Aids	• Satellite-based Global Positioning System (GPS) & enhancements • Aircraft- and ground-based navigation aids
Aircraft **Area Navigation**	• Fly routes independent of navigational aid locations • Area Navigation (RNAV) & Required Navigation Performance (RNP)
Aircraft **Lateral Navigation**	• Conform precisely to lateral path of flight procedure • RNAV 1: Within 1-nautical mile of flight route 95% of the time • RNP 1: Conformance monitoring & out-of-conformance alerting
Aircraft **Vertical Navigation**	• Satisfy altitude restrictions for precise obstacle and traffic clearance • Onboard planning and execution of fuel-efficient descents & climbs
Flight Procedures	• Leverage navigational aids and aircraft performance navigation capabilities in design • Different types of PBN routes/procedures for en route, terminal, arrival & departure, precision & non-precision approach applications

PBN Procedure Design Considerations

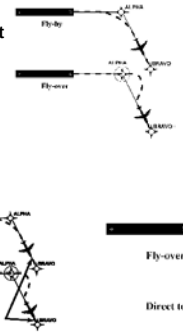
- Design factors include leg lengths, turning criteria, bank angle, descent rates, climb rates, speed, and others
- Flight variation as per waypoint and flight leg types, aircraft, airline pilot procedures, and flight management system performance
- Limits to what can be achieved with PBN

Lateral variation

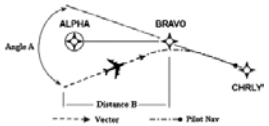
- **Waypoints**
  - **Fly-by vs. fly-over**

Initiate turn prior to waypoint

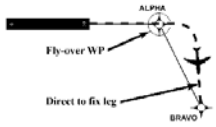
Initiate turn after waypoint

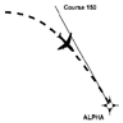


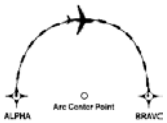
- **Leg types**
  - **Track to fix (TF), Direct to Fix (DF), Course to FIX (CF), Radius to fix (RF), Vector to Fix (VF)**



VF: Vector to STAR, SID or route waypoint







TF: Intercept leg, track to next waypoint; point-to-point leg

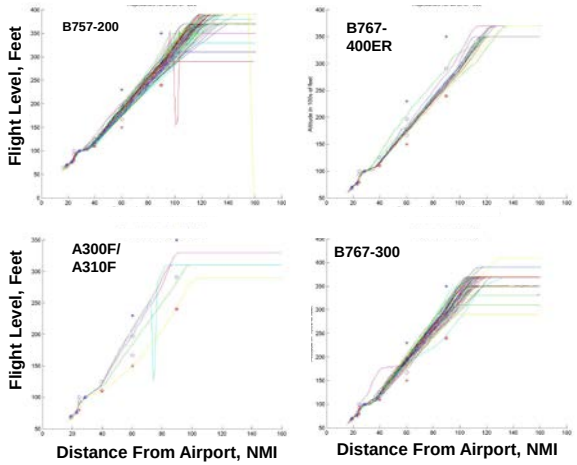
DF: Track from initial area direct to next waypoint

CF: Terminates at fix with specified course

RF: Constant radius circular path about turn center, ends at a fix

Source: FAA 2014

Vertical variation



Source: Nagle, Brooks and Clarke 2009

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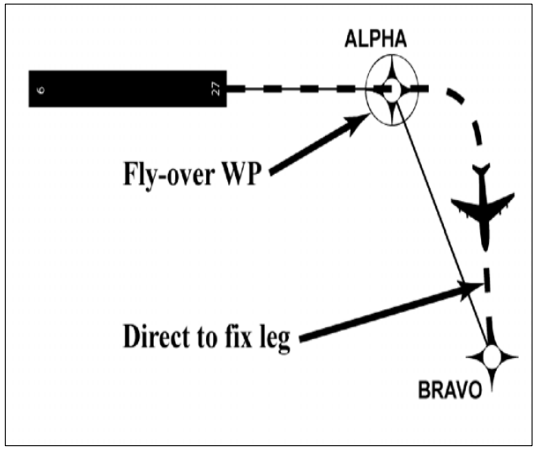
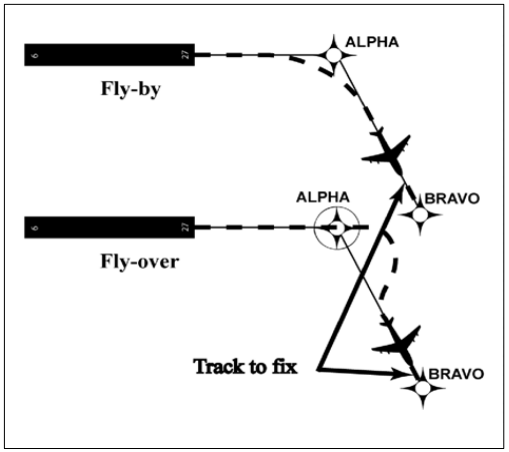
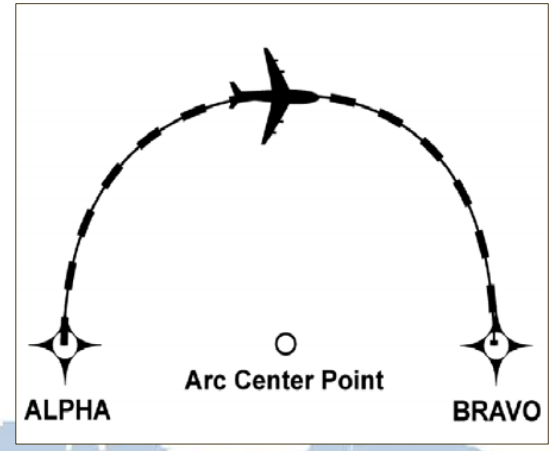
PBN Route Examples



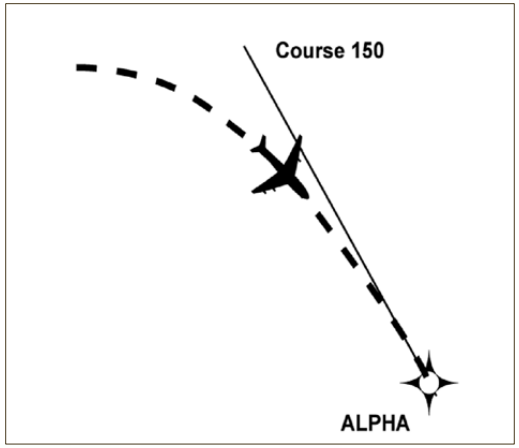
Direct to a Fix Leg



Track to a Fix Leg



Radius to a Fix Leg



Course to a Fix Leg

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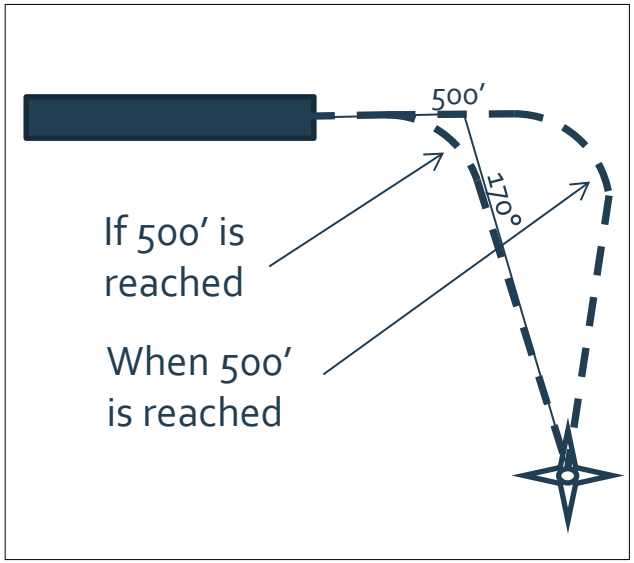
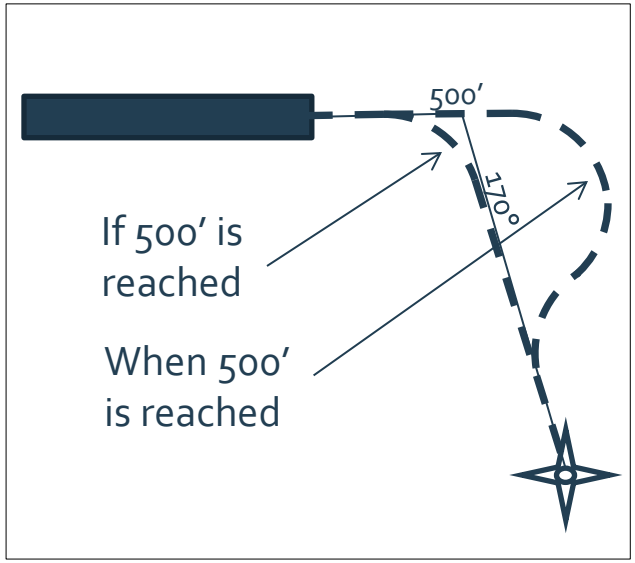
PBN Route Examples



Vector to Altitude (VA) Followed by a DF



Vector to Altitude (VA) Followed by a CF

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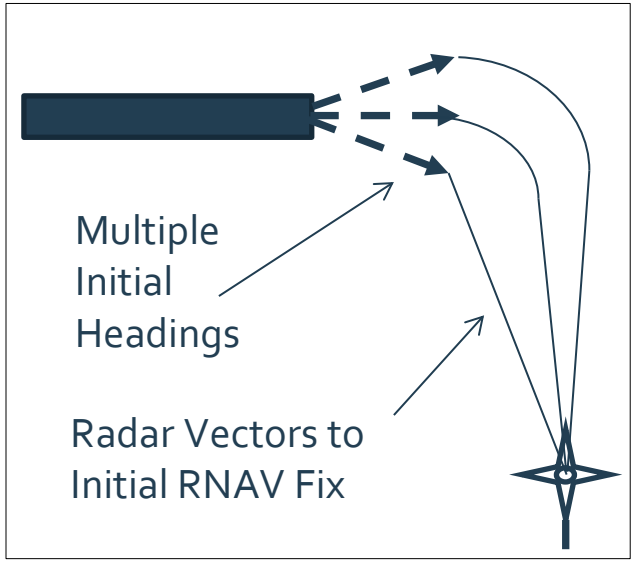
PBN Route Examples



Vector to an RNAV

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PBN Implementations: Near-Term

Application	Route/Procedure
Enroute / Terminal	• RNAV 2 Q-routes • RNAV 2 T-routes
Arrival & Departure	• RNAV 1 Standard Terminal Arrivals (STARs) • RNAV 1 Standard Instrument Departures (SIDs) • May be designed to permit Optimal Profile Descents (OPDs) or unrestricted climbs
Non-precision Approach	• RNAV Lateral Navigation (LNAV) Standard Instrument Approach Procedures (SIAPs) • RNAV RNP 0.3 SIAPs • Localizer Performance (LP) SIAPs
Precision Approach	• RNP Approval Required (AR), with Radius-to-Fix (RF) legs SIAPs • RNAV Lateral/Vertical Navigation (LNAV/VNAV) SIAPs • Localizer Performance with Vertical Guidance (LPV) SIAPs

PBN Implementations: Mid- to Far-Term

Time Frame	FAA PBN	FAA NextGen
Mid Term (5-10 years)	**Mixed Equipage** • Concept of operations • Requirements, criteria, rules and regulations • E.g., Best Equipped Best Served (BEBS)	**Data Comm** • In-flight route negotiation, airborne clearances **GBAS** • Support CAT II and III precision approaches **ADS-B Out** • ATC separation and advisory services (Jan 1, 2020 equipage mandate)
Far Term (10-20 years)	**Mixed Equipage** • Policy and operations implementation **Advanced SIDs, STARs, and SIAPs** • Integrated operations with NextGen technologies **Required Time of Arrival** **Dynamic RNP routes** **PBN for UAV operations**	**ADS-B In** • FIS-B, TIS-B, CDTI and Alerting, Interval Management, Advanced FIM, CSPRO, In-trail Procedures

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PBN's Possible Positive Impacts

- **Airport & Airspace Throughput**
  - Additional routes
  - Expand access to runways
  - Procedurally separate traffic flows
  - Reduce spacing minima
  - Enable other NextGen capabilities
- **Aircraft Fuel Burn & Emissions**
  - Fuel-efficient descents & climbs
  - Shorter routes
- **Aircraft Noise**
  - Avoid noise sensitive areas
  - Less noisy descents & climbs
- **Safety**
  - Fewer unstable approaches & go-arounds
  - Fewer clearance errors
- **Operational Costs**
  - Increase use of existing runways

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PBN's Possible Negative Impacts

Aircraft Noise

- Shifting noise to sensitive areas
- Focusing noise on an area

Costs vs. Benefits

- Fixed costs to develop, equip, train, implement
- Benefits vary by implementation

Mixed Equipage

- Aircraft performance differences can limit benefits
- Ground track adherence may vary

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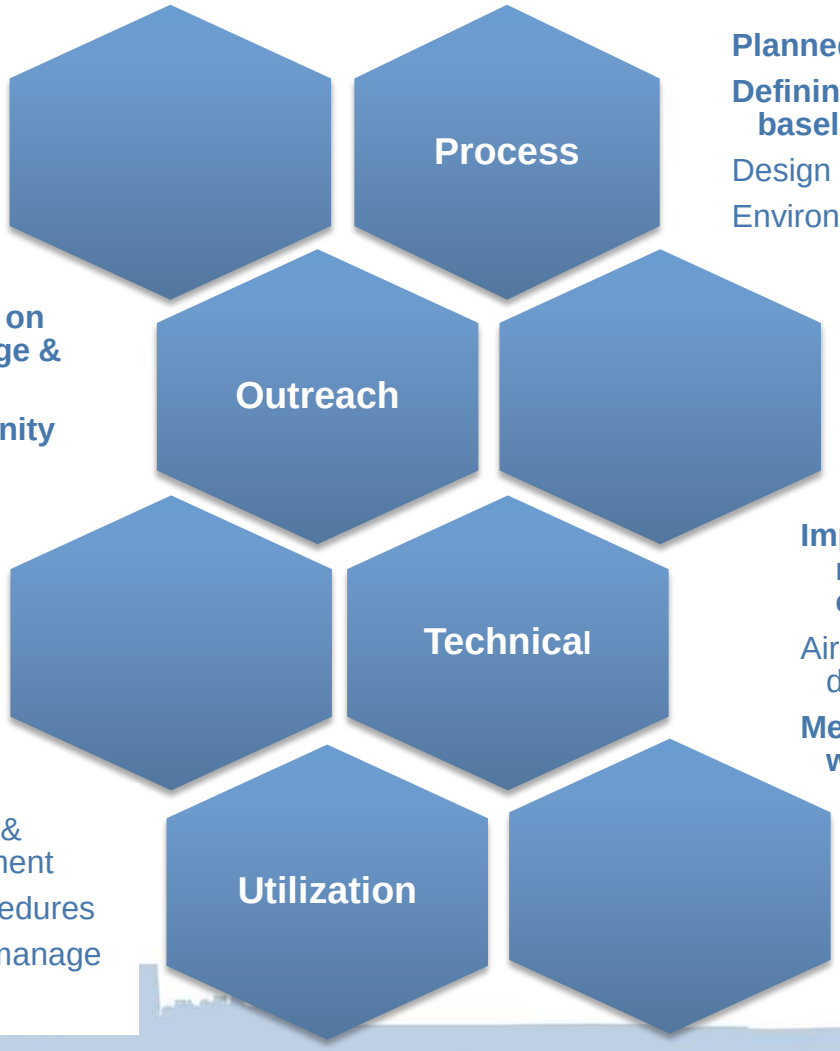
Case Studies of ATL, DEN, SEA, MSP, HND and Houston

Aspect	Description
Flight procedures	• RNAV 1 arrivals & departures, RNP Approval Required (AR) approaches • Established on RNP approaches (SEA, DEN) • Equivalent Lateral Spacing Offset departures (ATL)
Initiator	• Local FAA, aircraft operators, industry, airport authority, federal FAA
Airport involvement	• Advising (ATL, DEN, SEA) • Monitoring (MSP, HND, Houston)
Community outreach	• FAA briefing (Houston) • Airport-supported briefings by FAA/FAA contractor (DEN, SEA, MSP) • Airport outreach campaign (MSP) • Local design team briefings (ATL) • None (HND)
Challenges	• Community noise sensitivity, especially DEN, MSP, SEA, ATL • Developing new procedure design criteria (SEA, ATL) • Design constraints: Local terrain and proximate airport traffic flows (HND)

PBN Implementation Issues



Planned vs. actual timeframes

Defining design objectives & baseline, benefits assessment

Design team coordination

Environmental process

Opposition based on limited knowledge & understanding

Obtaining community buy-in

Implementation requirements & constraints

Aircraft performance differences

Meeting stakeholder needs while realizing benefits

Budgets, timelines & training to implement

Choice to use procedures

ATC resources to manage aircraft

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Procedure Design Team

FAA Flight Procedures Office

Flight Procedure Proponent

Aircraft Operator

FAA PBN Policy Support Group

Facilitator

Airport Authority or Operator

FAA Airports Office

Regional Airspace and Procedures Team (RAPT)

FAA Air Traffic Facilities

FAA Regional NextGen Branch

AeroNav Products

Procedure Design Analyst

FAA ATO Service Center Operations Support Group

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Procedure Environmental Review

Feet Above Ground Level	Environmental Review Requirements
18,000 and above	• Procedure changes possible via Categorical Exclusion (CatEx) • No screening or analysis required
10,000 to 18,0000	• Procedure changes possible via CatEx • Required: Fuel burn & CO2 emissions analyses; noise screening for special circumstances
3,000 to 10,000	• Procedure changes possible via CatEx • Required: Fuel burn & CO2 emissions analyses; noise screening and analysis, Environmental Assessment (EA) may be required
3,000 and below	• Procedure changes typically require EA • CatEx possible if non-noise sensitive area or reauthorized CatEx • Required: Fuel burn & CO2 emissions analysis, air quality under Clean Air Act; Environmental Impact Statement (EIS) & noise screening for noise-sensitive areas

Source: Government Accountability Office

- FAA Modernization and Reform Act of 2012 categorically excludes PBN procedures from environmental review process, as per specified criteria & judgement of FAA Administrator
- The FAA is incorporating environmental reviews into the PBN procedure design for its Metroplex program and 5-step process, preparing EAs for Metroplex airspace redesigns

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Lessons Learned for Airports

Component	Description
Initiation	• Local or federal FAA, aircraft operators, industry, or airport authorities • Diversity of objectives, e.g., reduce noise impact, reduce fuel burn & emissions, increase throughput, improve airspace design
Personnel	• Federal FAA, local FAA, contractors, aircraft operators, industry, airport • Need continuous collaboration among breath of design team members
Design	• Unique to airport & airspace, balances needs of stakeholders • May include air traffic control procedures and new design criteria
Environment	• Analysis depends on initiative, location and altitude regime • Legislative Categorical Exclusions have resulted in controversy
Outreach	• Early, with sufficient resources, and in terms relevant to community
Assessment	• Local needs, e.g., throughput, noise, fuel burn & emissions, flight distance and procedure usage
Outcomes	• Positive: Improving airport access, airspace & runway efficiency, reducing fuel burn & emissions, reducing noise impact • Negative: Shifting traffic and noise to other community segments

Airport Contributions to FAA 5-phase Process

Phase	Description
1) Preliminary Activities	• Establish relationships with local FAA, aircraft operators, local government & community representatives • Contribute airport and airspace operations, community noise sensitivities to specifying design objectives and constraints
2) Development Work	• Support procedure design & analysis, provide feedback • Conduct or support community outreach
3) Operational Preparations	• Conduct or support environmental review
4) Implementation	• Ensure final procedures compatible with stakeholder needs: airport, community, aircraft operators, others
5) Post Implementation Monitoring & Assessment	• Assess implementation as per airport- & community-relevant design objectives and constraints

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Pros-Cons of Including Airports

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Pros of Including Airports

Airfield & Airspace Knowledge
- Runway use & routes
- Noise-sensitive areas & obstacles
- Maintenance & development plans
- Studies to support design & evaluation

Community Resource & Advocate
- PBN education & initiative approval
- Represent concerns & needs

Planning to Maximize Benefits
- Infrastructure
- Services

Cons of Including Airports

Extended Implementation Time

Compromising Benefits to Other Stakeholders

Summary

- **PBN procedures can significantly impact airports**
  - Numerous possible positive impacts, e.g., airport, airspace & flight efficiency, noise mitigation
  - Some possible negative impacts, e.g., noise shifting & concentration
- **Airport authority can initiate, participate in and contribute to PBN procedure development**
  - Knowledge of airport, airspace, community and PBN to inform design and assessment
  - Advocate for and liaison to community & local government to ensure compatibility
- **Airport PBN Resource Guide intended to serve as key reference for airport authorities in PBN implementation initiatives**

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NextGen Guidance for Engaging Airport Stakeholders

ACRP Webinar

June 24, 2017

Grafton Technologies (Arora Engineers)
Harris Miller Miller & Hanson
Eastern Research Group

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Project Objective

Develop guidance and tools
to help airports engage stakeholders
in a manner that benefits
the implementation of NextGen

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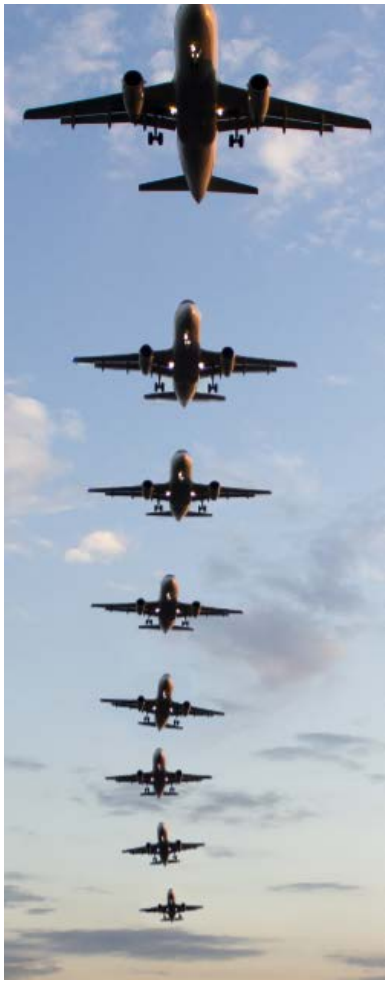
Project Approach

- Preliminary Research
  - Prioritization
  - Stakeholder Tools & Methods
  - Steps to Develop Tools
  - Coordination with other projects
- Develop One Set of PBN Tools
  - Interactive Flow Chart
  - Library of Tools
  - Cost Schedule
- Case Studies
- Prepare Final Deliverables



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Credits

Research Team

Grafton Technologies (Arora Engineers)

Harris Miller Miller & Hanson

Eastern Research Group

CRP Staff

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Theresia H. Schatz, *Senior Program Officer*
Terri Baker, *Senior Program Assistant*
Eileen P. Delaney, *Director of Publications*
Sharon Lamberton, *Editor*

Panel

Patty Clark, *Port Authority of New York & New Jersey, New York, NY (Chair)*
Pamela Drew, *ITT Excelis, Great Falls, VA (formerly)*
Daniel H. Frazee, *San Diego International Airport, Carlsbad, CA (retired)*
Mark Hopkins, *Delta Air Lines, Atlanta, GA*
Sandra J. Lancaster, *Dallas/Fort Worth International Airport, DFW Airport, TX*
Seth B. Young, *The Ohio State University, Columbus, OH*
Kent Duffy, *FAA Liaison*
Rhonda Solomon, *FAA Liaison*

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High-Level Findings

Engaging stakeholders in the process of implementing NextGen is essential to ensure an effective and equitable result

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High-Level Findings

Airports play a critical role in the implementation of NextGen, yet many have struggled to become engaged

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High-Level Findings

- PBN, Surface Operations, and Multiple Runway Operations are the NextGen Initiatives most relevant to airports in the short term
- Airport stakeholders do not fully understand the technical details, but want to determine impact
- Noise is the most tangible impact
- Lack of airport and community engagement has had bad effects and is being remedied
- General information needs to be accompanied by assessment of impact and schedule
- Delivered via meetings, fliers, web, and press

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Our Deliverables

- Guidebook
  - NextGen from an Airport's Perspective
  - Airport Stakeholders in NextGen
  - Engagement Methods and Materials
  - Establishing an Engagement Program
  - Case Studies
- Electronic Deliverables
  - Adaptable Engagement Materials
  - Tools to Facilitate Engagement
  - Additional Resources

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Interactive Flow Chart

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Interactive Flow Chart

Preliminary Activities	Development Work	Operational Preparations	Implement	Monitoring & Evaluation

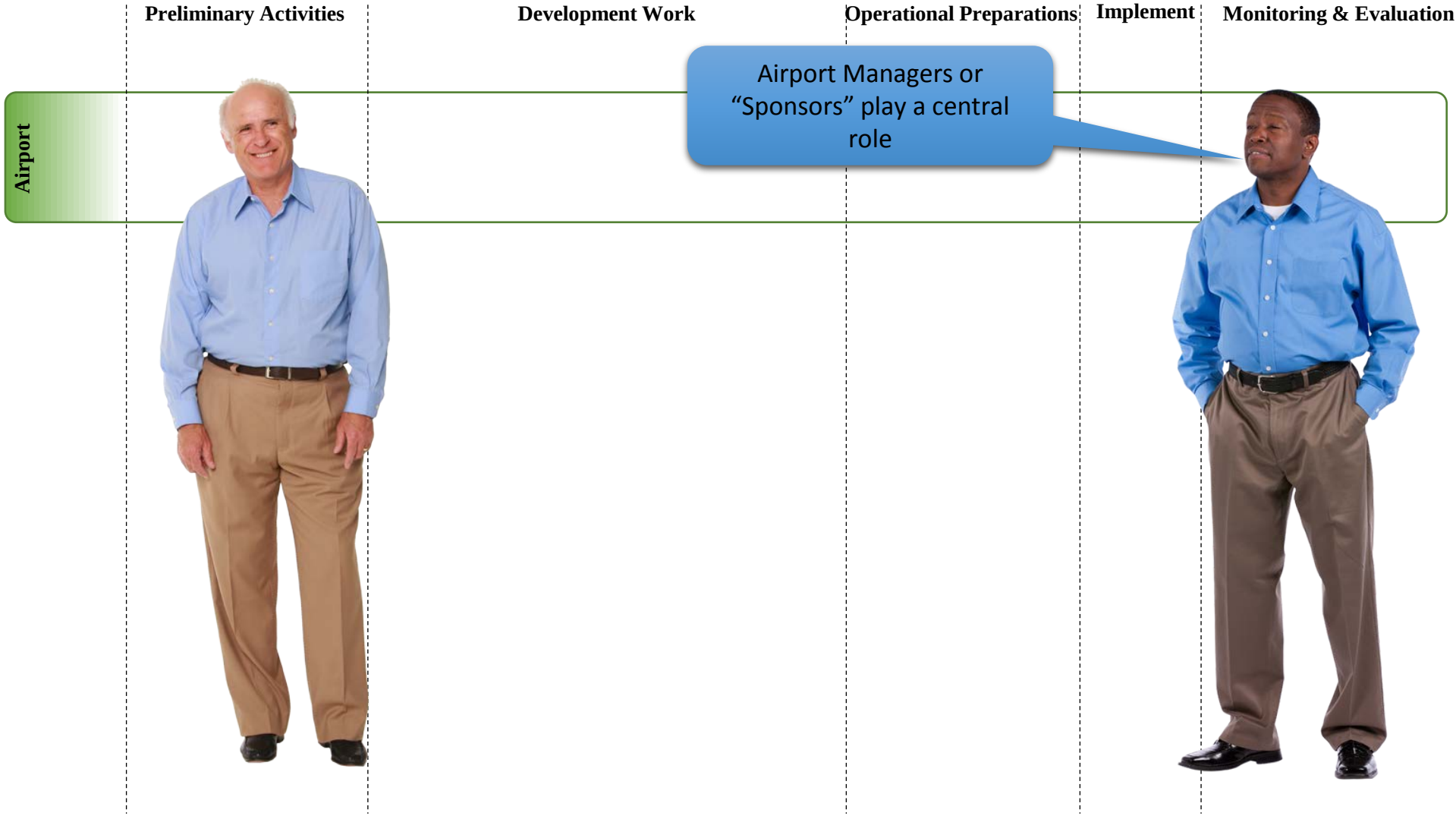
There are five phases to implementing PBN procedures

Interactive Flow Chart

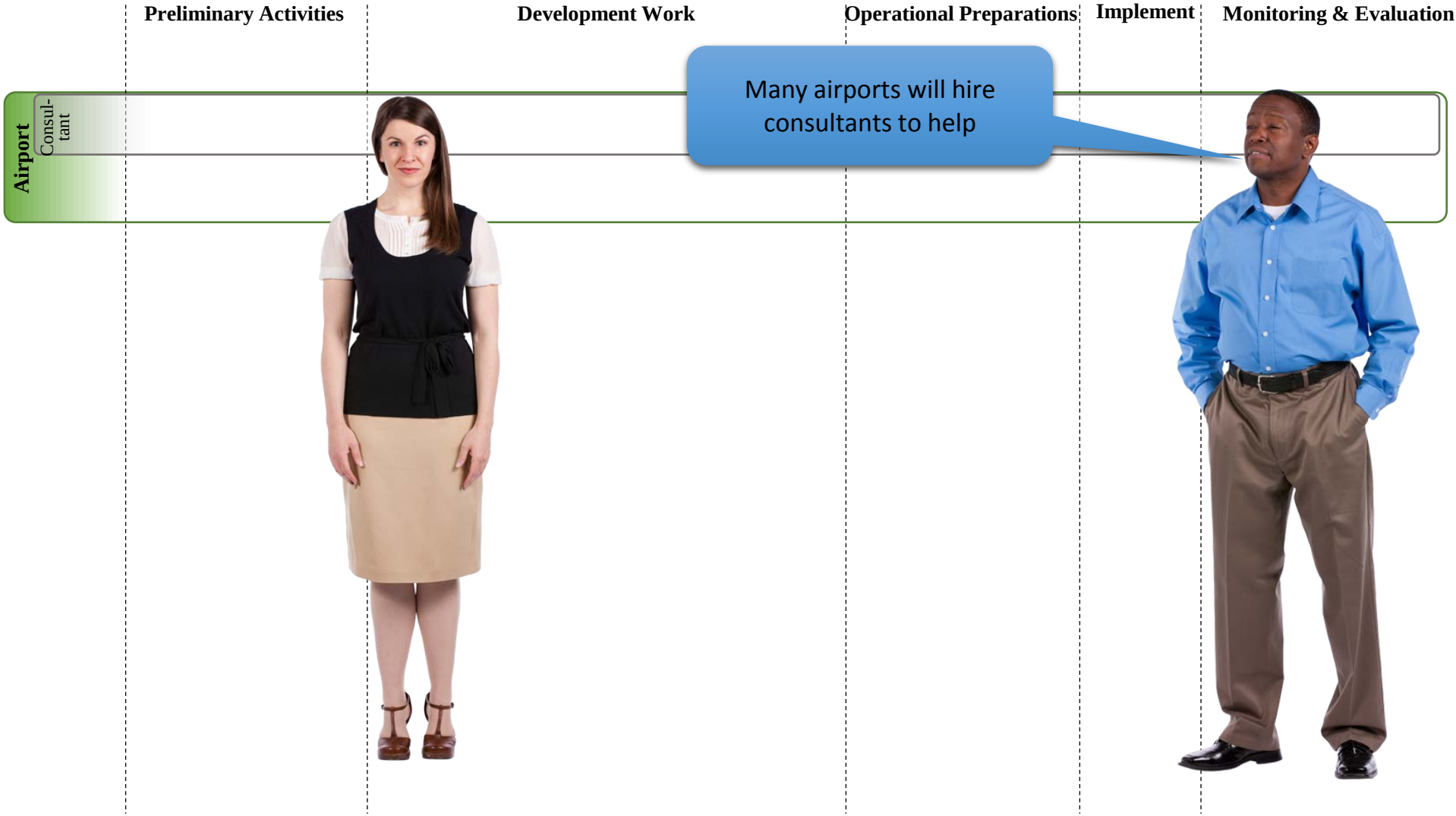
Preliminary Activities	Development Work	Operational Preparations	Implement	Monitoring & Evaluation

There are also several stakeholders who get involved in these phases

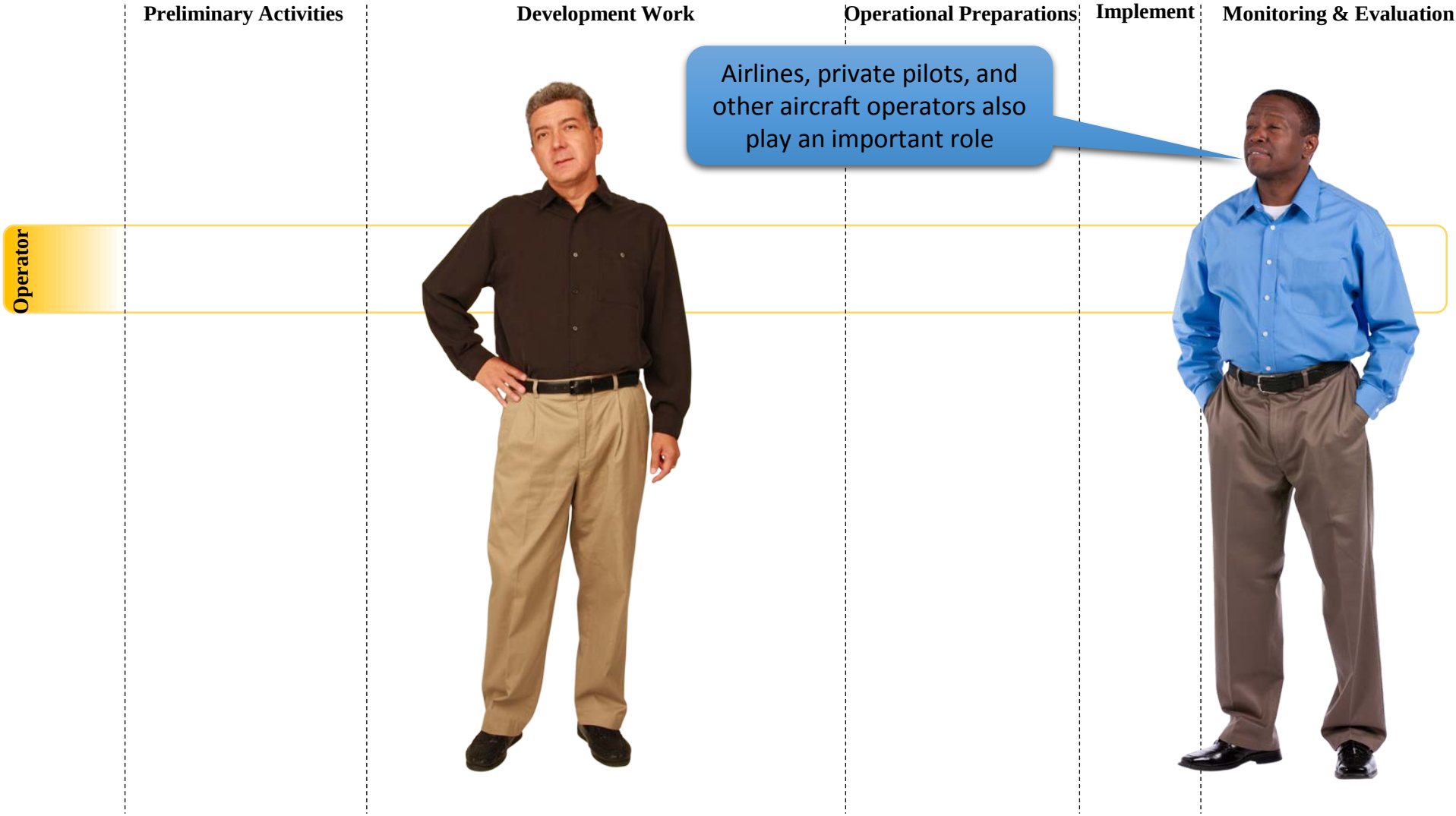
Interactive Flow Chart



Interactive Flow Chart



Interactive Flow Chart

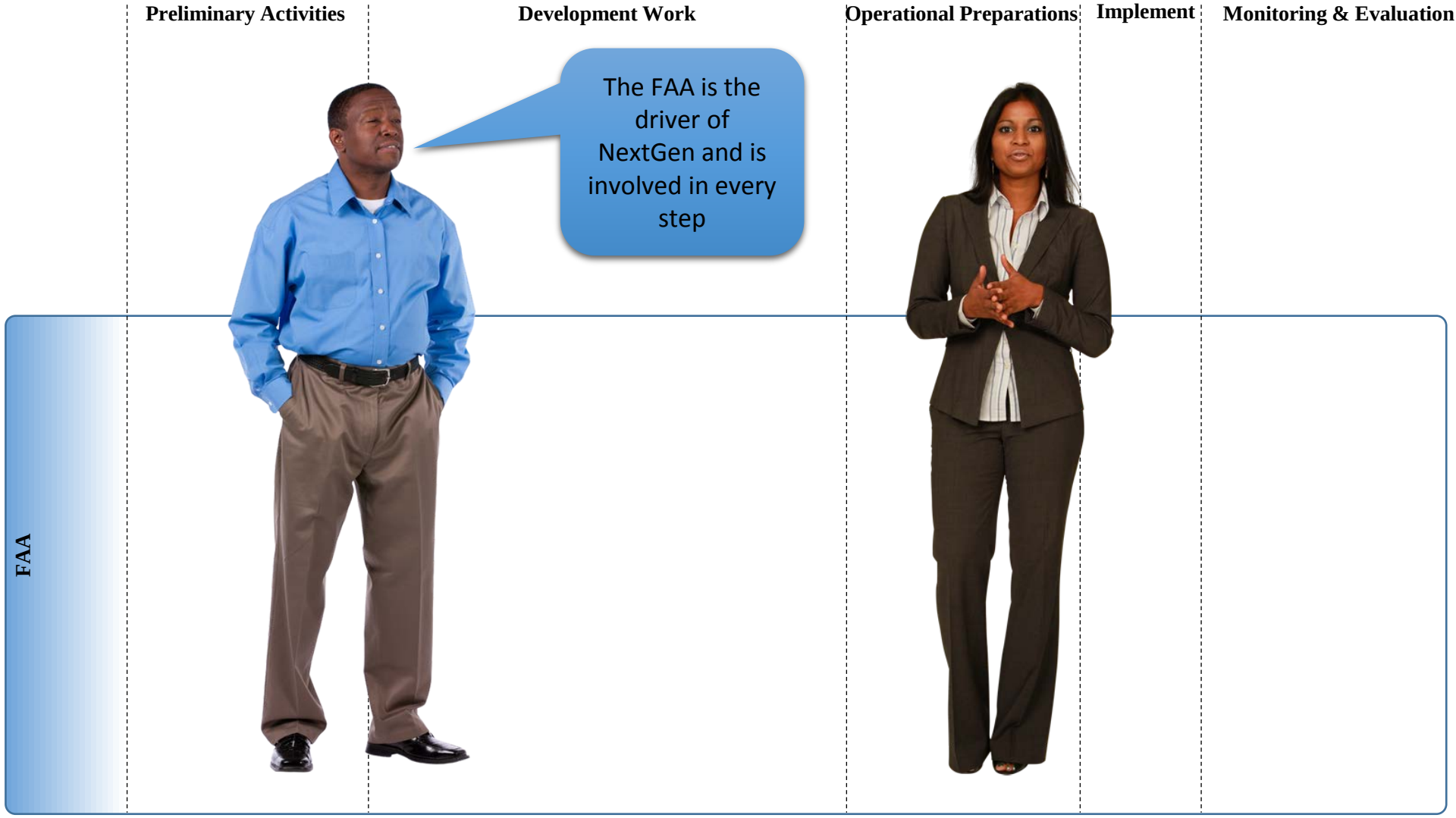


Interactive Flow Chart

	Preliminary Activities	Development Work	Operational Preparations	Implement	Monitoring & Evaluation
Comm-unity					

Members of the community around airports are important stakeholders

Interactive Flow Chart



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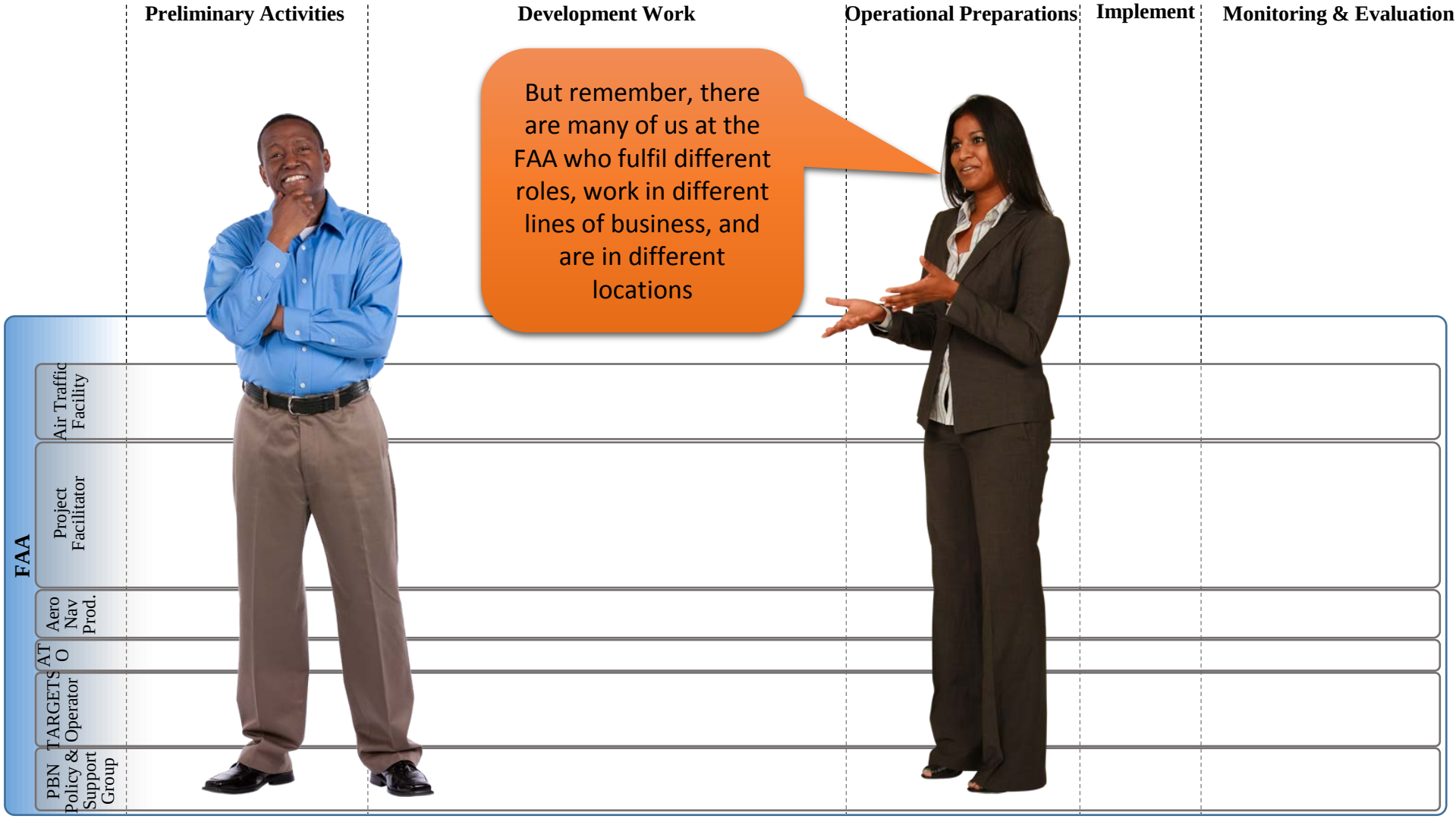
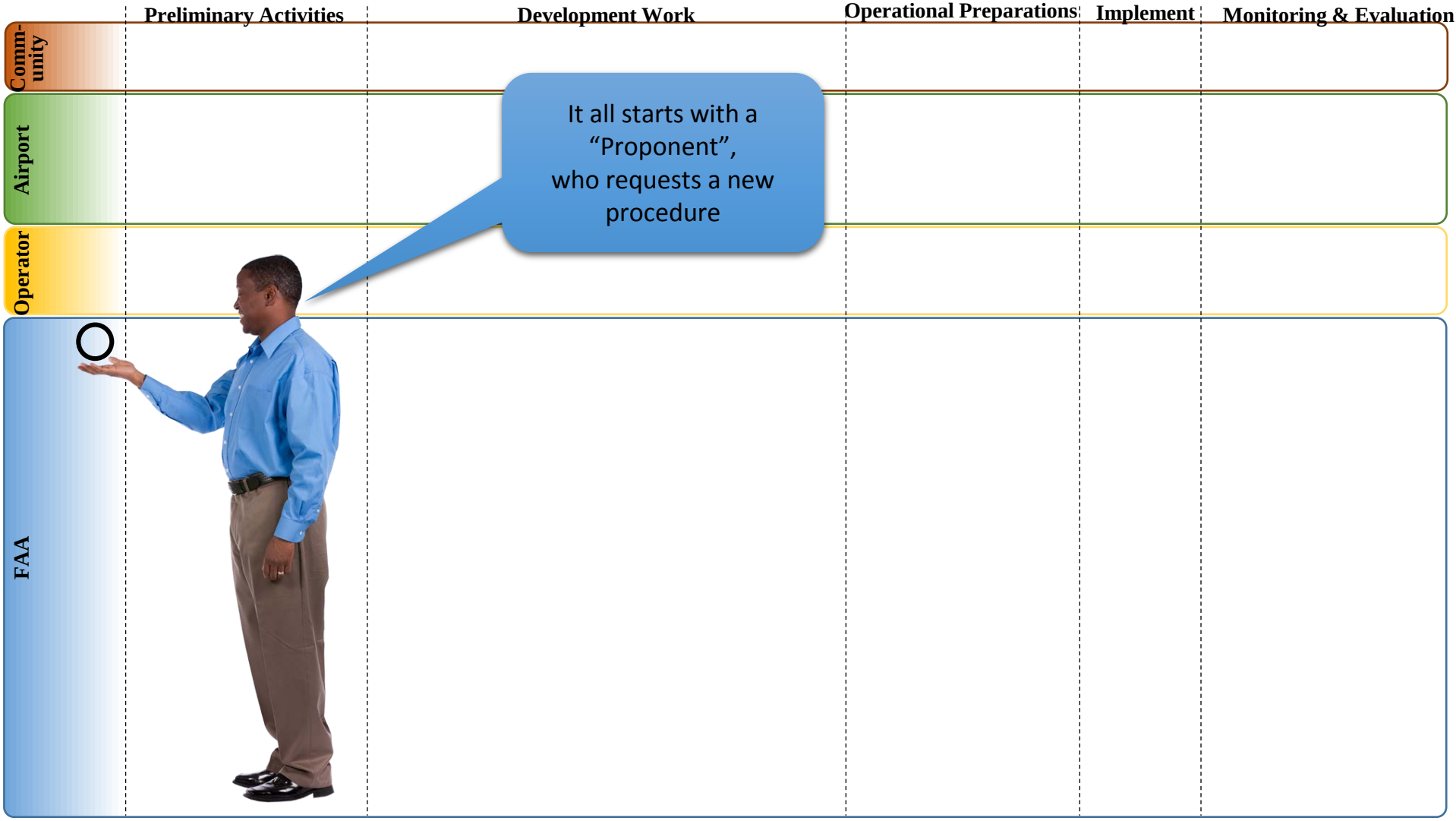
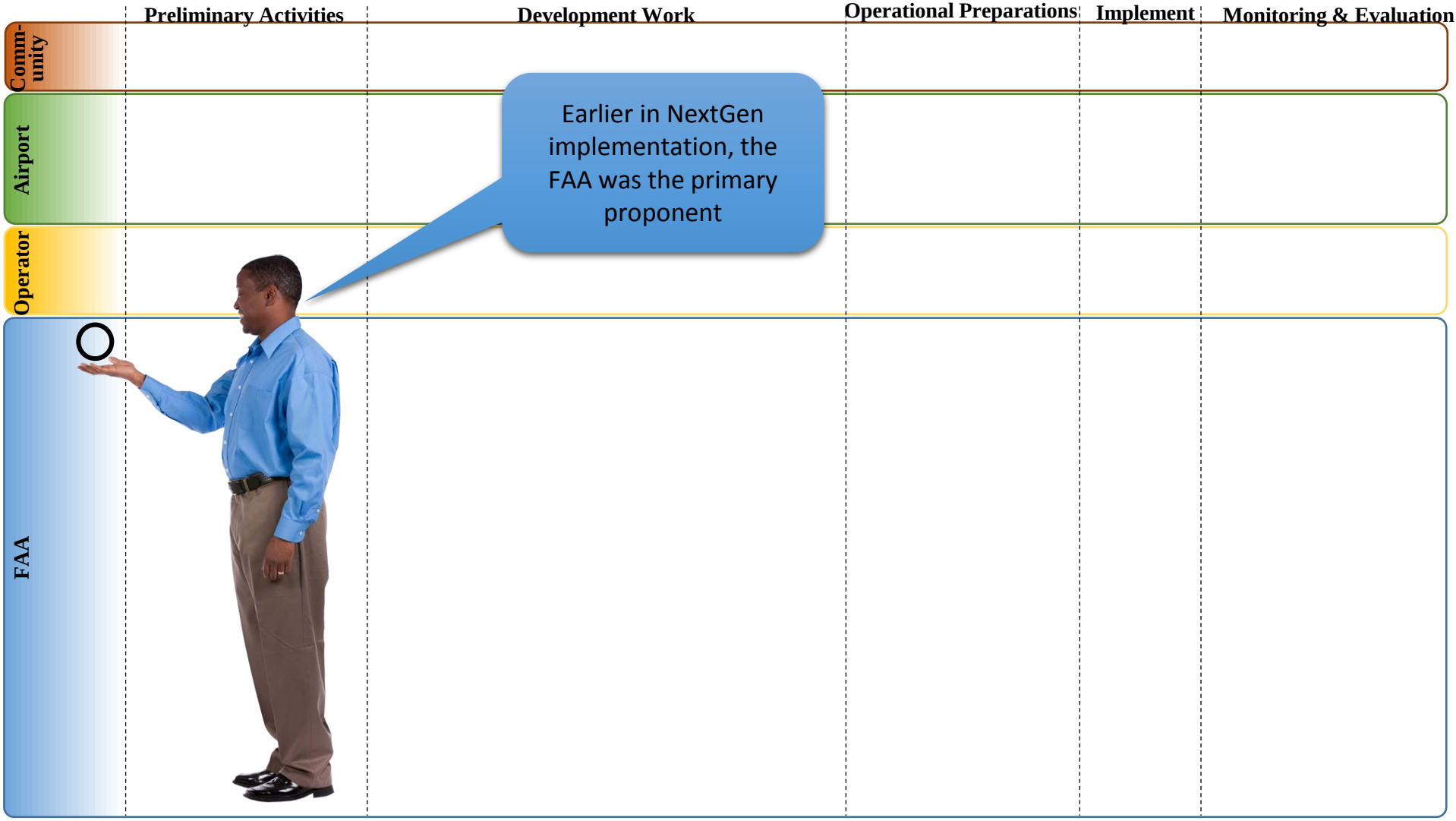


Interactive Flow Chart

Interactive Flow Chart



Interactive Flow Chart



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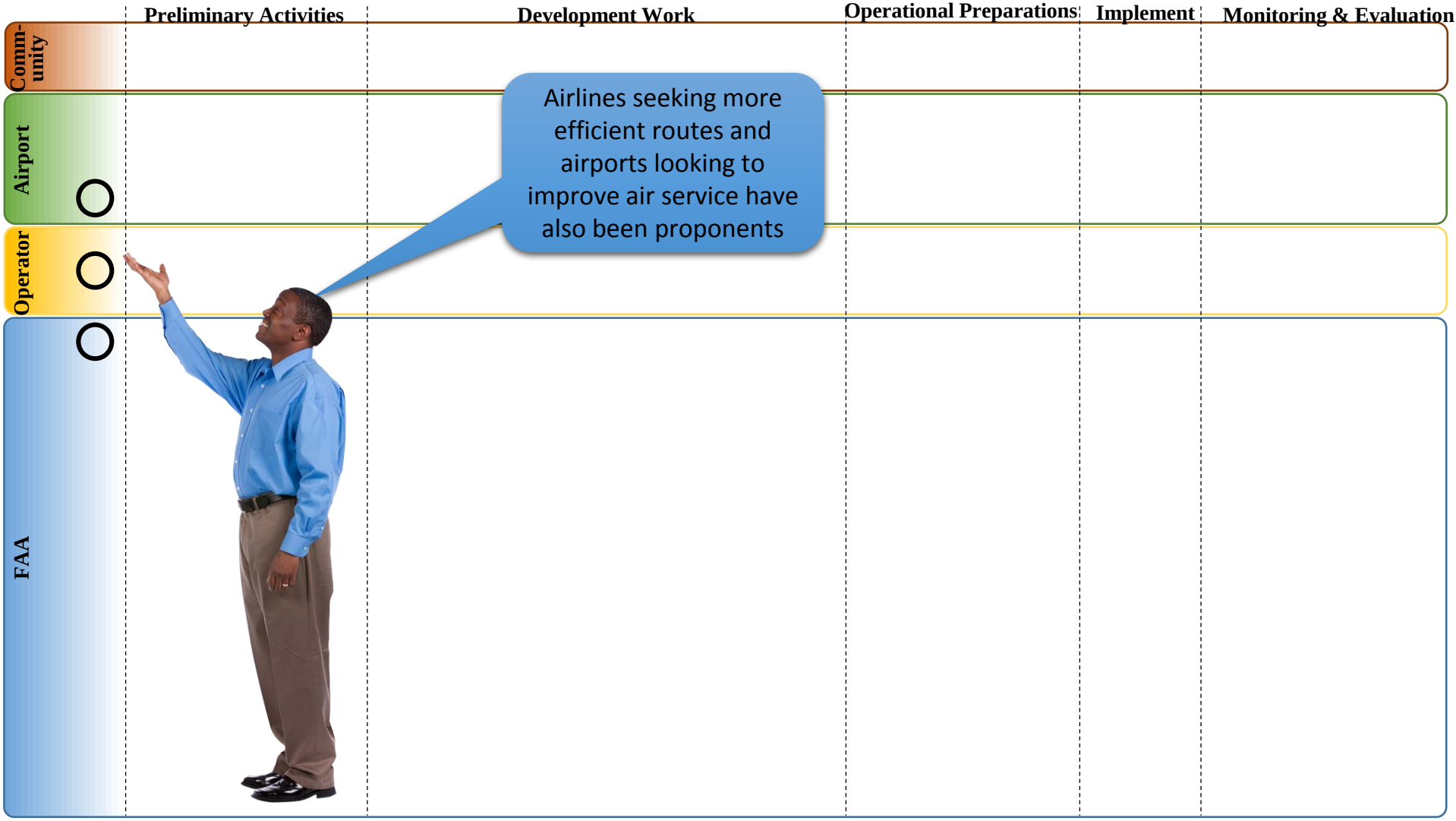

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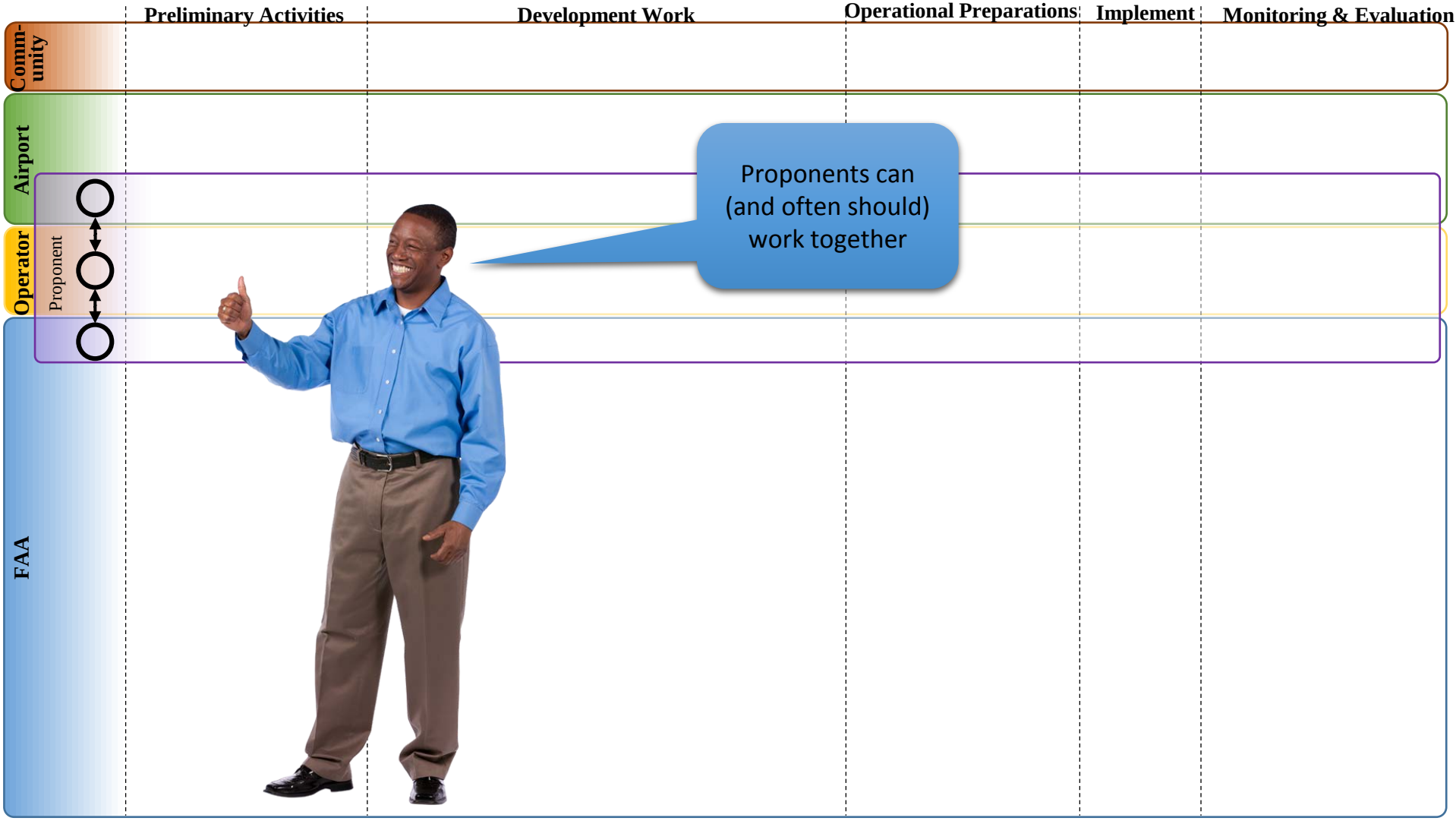

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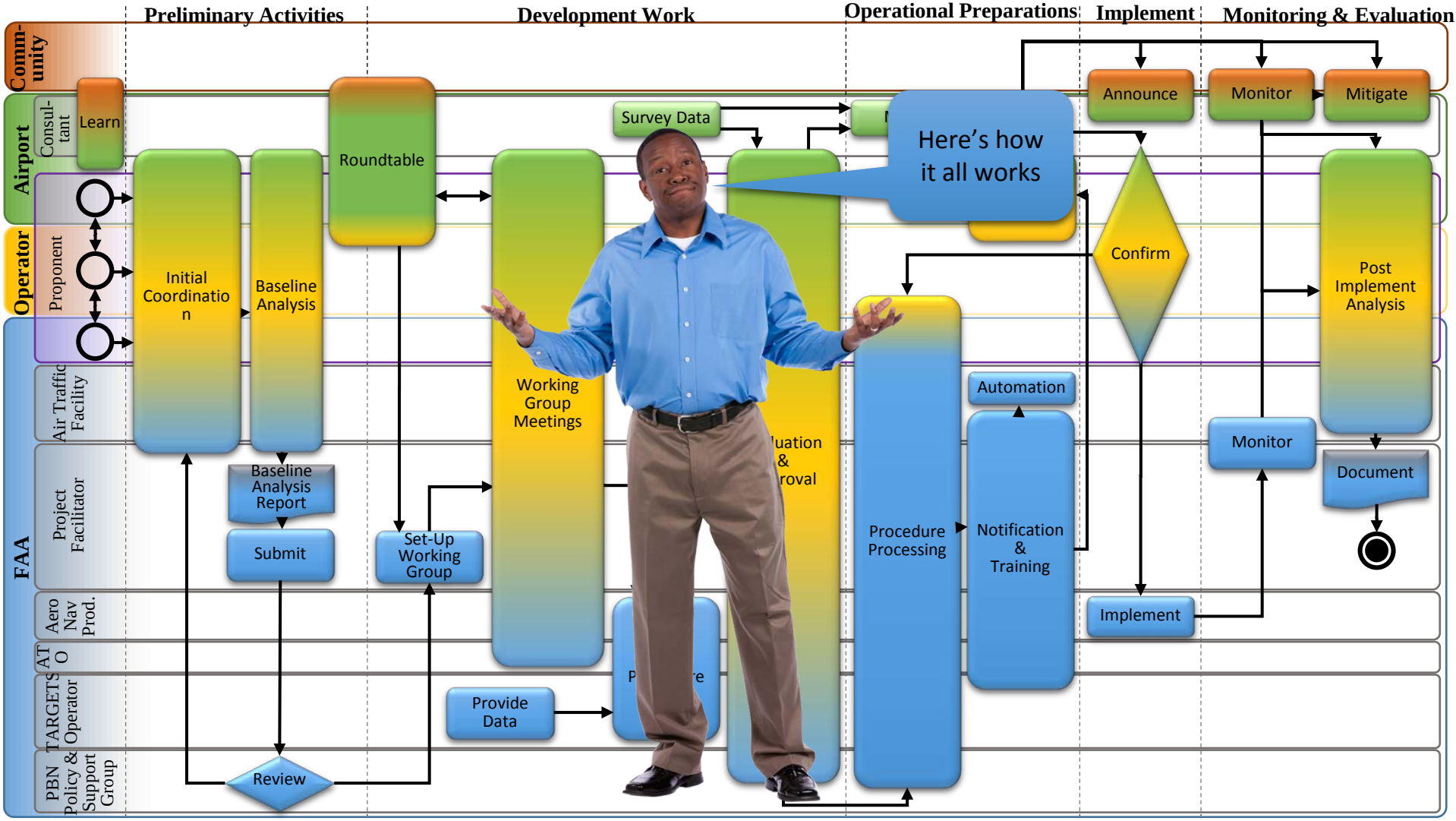

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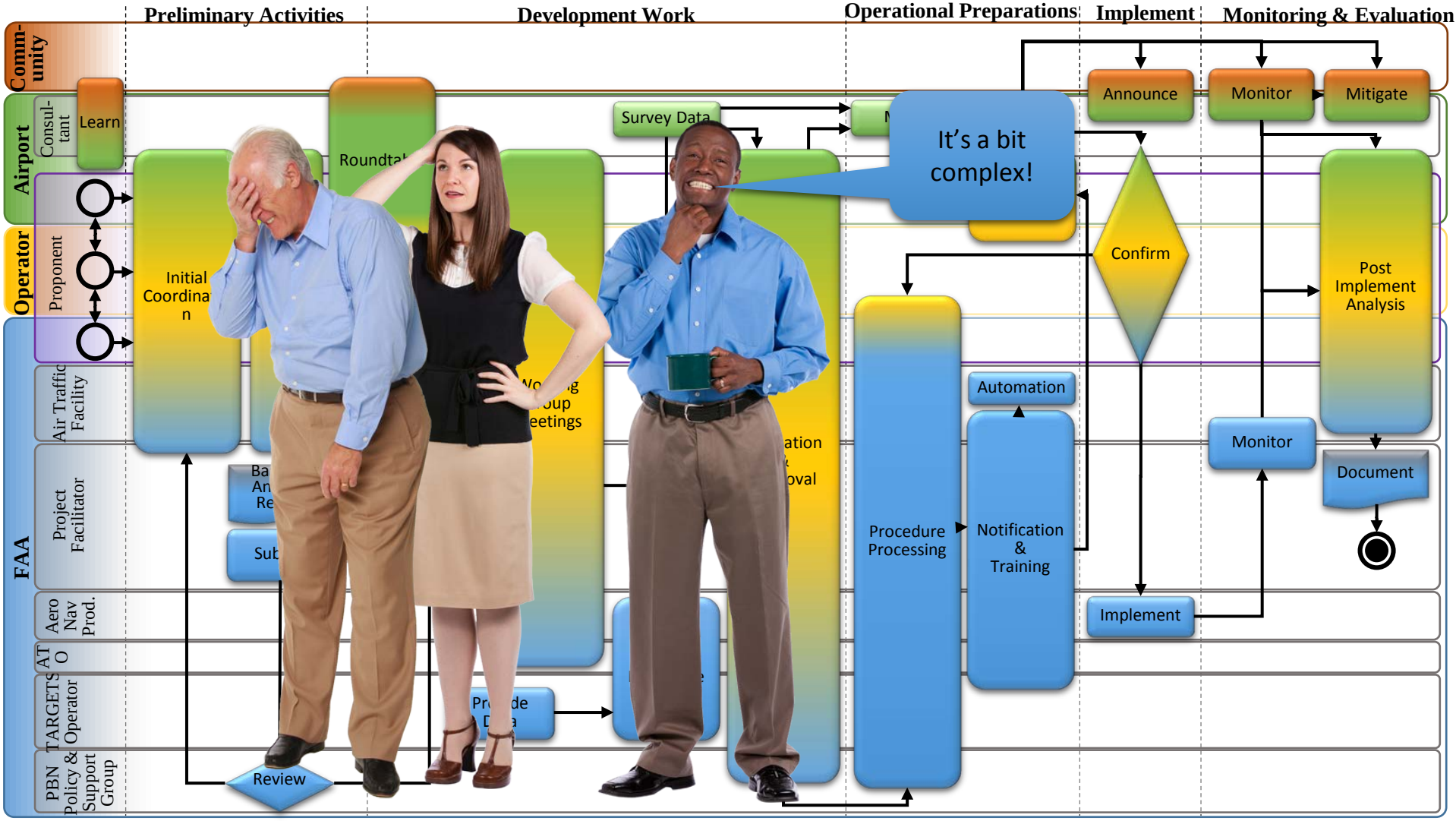

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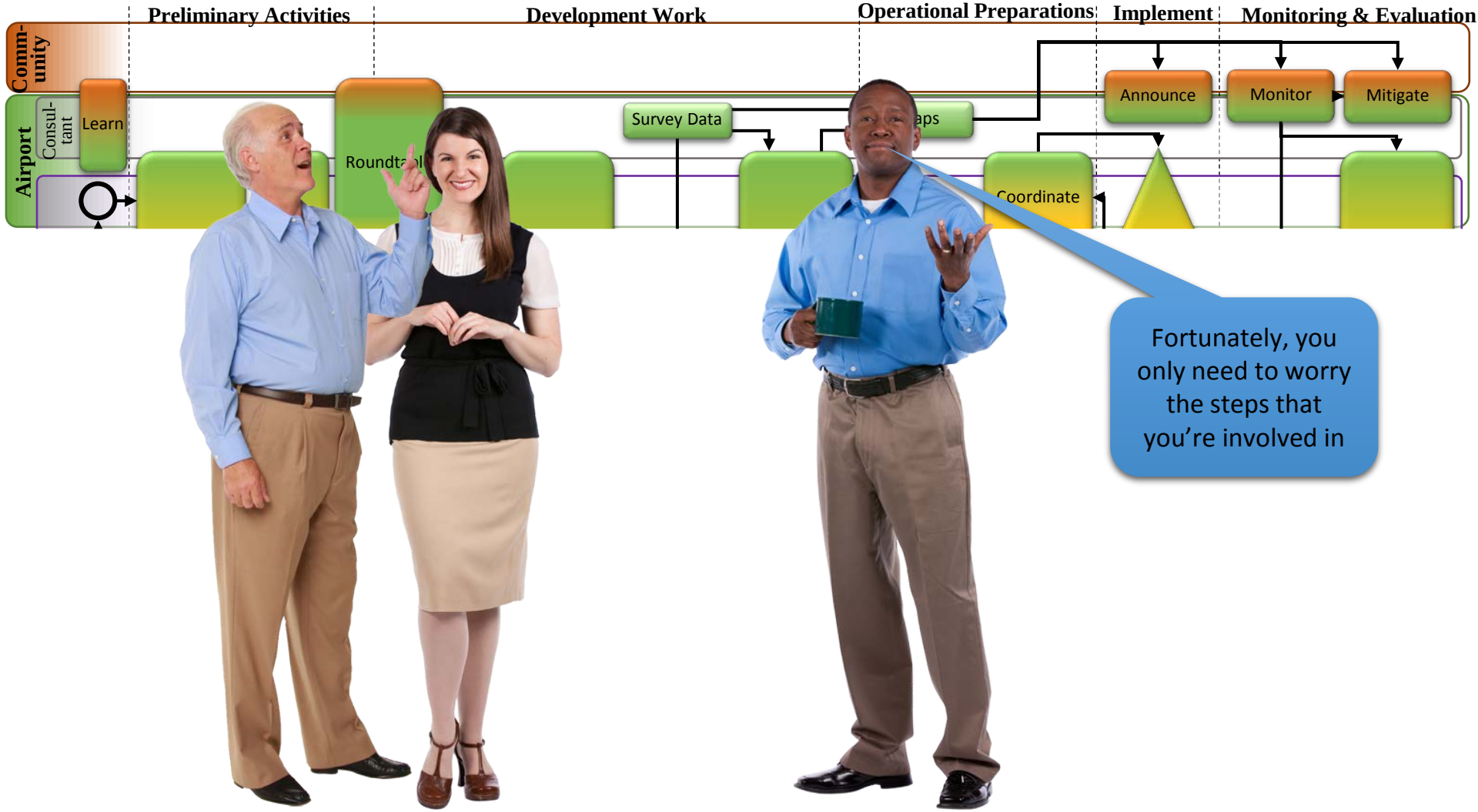

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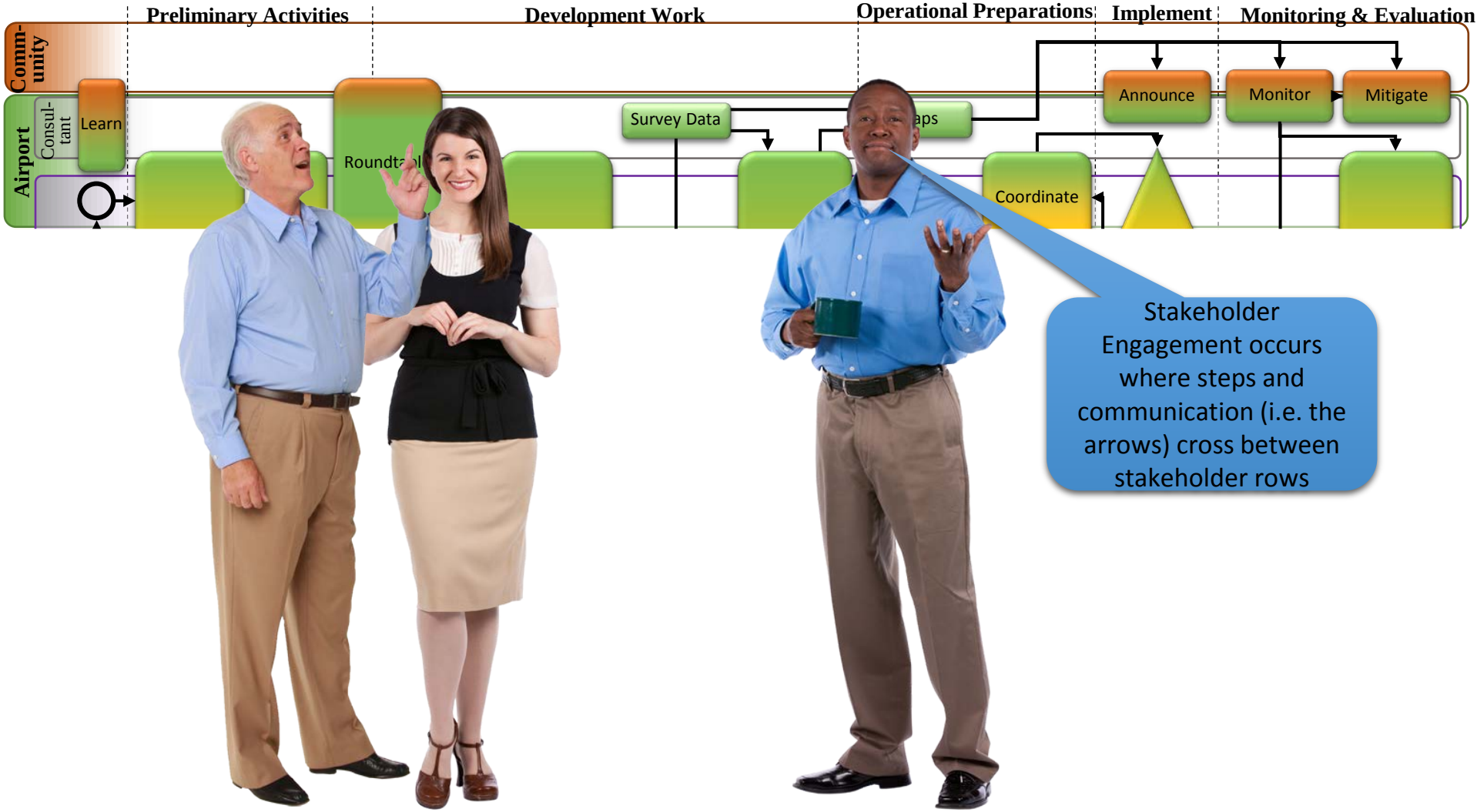
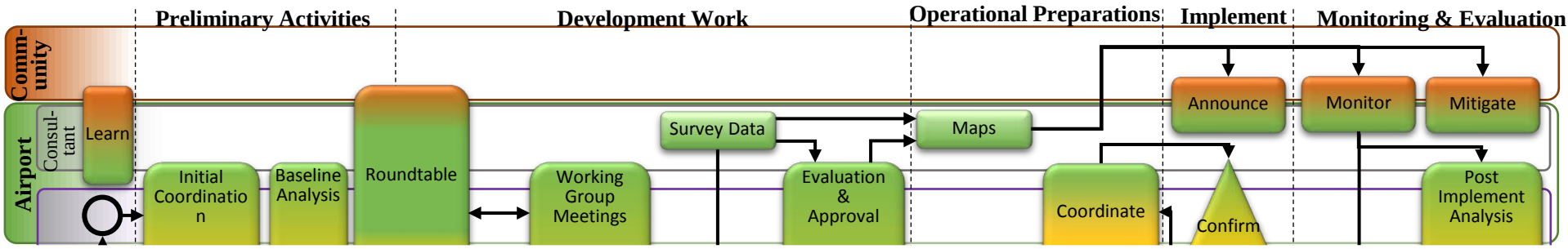


Interactive Flow Chart



Roles & Responsibilities of a Proponent

The primary roles and responsibilities of the proponent include:

- Submitting a proposal for a new procedure
- Participating in the Working Group meetings, especially to provide background information and justification for the requested procedure, and to assist in drafting the Project Mission Statement and Baseline Analysis Report

FAA JO 7100.41

Interactive Flow Chart

Why be a Proponent?

Improve Air Service Capacity
- Lengthen Runway
- Increase Operations
- Improve Minimums

Environmental Improvement
- Less Noise
- Lower Emissions

Save Fuel

Air Traffic Control Efficiency
Reduce Delays

Flyer

Back

WHAT IS NextGen?

Next Generation Air Transportation System (NextGen) is a collection of technologies and practices that is transforming our nation's air traffic control system. By replacing ground-based technologies and data with modernized, satellite-based systems; upgrading communications among pilots, air traffic controllers, and others; and making other NextGen-related upgrades, the Federal Aviation Administration, airports, and airlines are bringing the next generation of safer, more efficient, and faster air travel to our doorstep.

NextGen at

Safer, Greener, More Efficient Airports and Aircraft

Approximately 7,000 aircraft depart, fly, and land all over the United States at any given time. Yet the demand for more flights is growing. NextGen is helping commercial airports, as well as small general aviation airports, meet this demand while improving safety, efficiency and environmental performance:

Safety - NextGen's improvements in data communications reduce the use of voice radio traffic for controlling air traffic. This helps air traffic controllers avoid mishearing flight clearances and controller-to-pilot instructions and reduces controller workload, all of which improve safety. Other NextGen improvements will improve the sequencing of aircraft so that they can safely fly in closer proximity.

Efficiency - NextGen technologies provide better and more frequent data to improve collaborative decision-making for the aviation industry. These technologies are designed to accommodate increasing air travel and will result in more on-time arrivals for passengers.

Environment - By **allowing more direct routing, shortening flight segments**, reducing delays and cutting aircraft exhaust emissions, NextGen is helping airlines and airports minimize local air pollution. NextGen's navigational improvements also enable smoother ascents and descents, which save emissions and reduce carbon footprints from each flight.

What Does NextGen Mean For Our Community?

In our neck of the woods, NextGen is giving us the tools we need to reduce pollution, flight delays—and local noise. Using NextGen technologies, pilots can reduce power, nearly to a glide, from many miles away as they approach an airport to land their aircraft. This reduces airplane noise from throttling the engines that is now typical during step-down approaches to airports. Additionally, NextGen is giving pilots more opportunity to efficiently maneuver around densely populated residential areas during takeoffs and landings.

New Technologies: Performance Based Navigation

Performance-based navigation (PBN) is an important part of NextGen. PBN helps aircraft use airspace more efficiently, reducing aircraft emissions, concentrating noise over smaller areas and increasing safety and more on-time arrivals, no matter the weather conditions. It provides real-time, precision data to pilots and air traffic controllers, which facilitates satellite-guided operations and departures, and more direct routes at high and low altitudes. The largest airports in the country have already made adopting PBN procedures a top priority.

More Satisfied Customers

NextGen is affecting the everyday experience of the flying public. For example, NextGen helps controllers, pilots, and airline dispatchers keep aircraft safely separated on new predictable flight paths, even when bad weather threatens scheduled arrivals and departures. Passengers are experiencing fewer delays and spending less time sitting on the ground and holding in the air. These new NextGen arrival procedures not only ease congestion, they even provide a smoother ride.

Adjust and print this tri-fold flyer to distribute at meetings or send to stakeholders (click on it to open a PDF or editable MS Word version)

Fact Sheet

Back

KNOWING nextgen

NextGen
WE'RE GOING PLACES

What is NextGen?

Safer, Greener, More Efficient Airports and Aircraft

Adjust and print this fact sheet to distribute at meetings or send to stakeholders (click on it to open a PDF or editable MS Word version)

Frequently Asked Questions

Back

KNOWING nextgen

NextGen
FAQs for Airport Communities

1. **What is NextGen?**
   NextGen is short for "Next Generation of Air Transportation Systems." It is a collection of technologies and practices that are transforming our nation's air traffic control system into a safer, more efficient, and less polluting set of aviation improvements that will benefit our community and the whole country.
2. **Why do we need NextGen?**
   Approximately 7,000 aircraft are taking off, flying, and landing all over the United States at any given time. Yet the demand for more flights is growing. NextGen is helping commercial airports, as well as small general aviation airports, expand their capacity safely and efficiently and in an environmentally sensitive manner to meet this demand.
3. **How is NextGen different from our current air traffic control system?**
   NextGen technologies are satellite-based and provide better and more frequent data exchange among many parties involved in the safe and efficient operation of aircraft throughout the National Airspace System. Also, NextGen's data communications procedures reduce the use of voice radio traffic for controlling air traffic. This helps pilots and air traffic controllers avoid mishearing flight clearances and controller-to-pilot instructions and reduces controller workload, all of which improve safety.
4. **How will NextGen change my travel experience?**
   With NextGen, air travel should be safer and with fewer delays. NextGen helps helps controllers, pilots, and airline dispatchers keep aircraft safely separated on precision flight paths, even when bad weather threatens scheduled arrivals and departures. Among the many benefits NextGen brings, passengers experience fewer delays and spend less time sitting on the ground and holding in the air. These new NextGen arrival procedures not only ease congestion, they even provide a smoother ride.

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Gen?
The entire aviation industry is working collaboratively to introduce NextGen across the entire National Airspace System, including airports, large and small. The Federal Aviation Administration, the National Air Traffic Controllers Association, airports, pilots, airlines, and local communities each have an important role to play, depending on the NextGen practice or technology in question.

10. **What is Performance Based Navigation (PBN)?**
    An important collection of NextGen technologies, PBN provides real-time, precision data to enable satellite-guided arrivals, departures, approaches, and routes at high and low altitudes.

Adjust and print these frequently asked questions to distribute at meetings or send to stakeholders (click on it to open a PDF or editable MS Word version)

Presentation

Back

Adjust this MS PowerPoint presentation to use at your meetings on NextGen (click to open)

Agenda for Meetings

Agenda for Community Meeting on NextGen Implementation

- Introduction of Speakers
- Our Airport
  - Past
  - Present
  - Future
- Our Community
  - Past
  - Present
  - Future
  - Aviation Benefits
  - Aviation Impacts
- Our NextGen
  - What is NextGen?
  - What are its effects?
  - What does it mean for us?
- Noise is a big concern
  - Why is noise a big concern?
  - What can be done?
  - What are we doing?
- What can you do?
- What's Next?

Agenda for Airport Meeting with Operator or FAA

- Introduction of Attendees
- Objective of Proponent(s)
- Current Situation
  - Based aircraft, operations, primary operators, passenger enplanements, cargo volume
  - Runway configuration
  - Nearby airports and their traffic patterns
  - Demographic of surrounding area
- Current Issues Faced
  - Noise
  - Obstacles
  - Airspace Congestion
- Future Situation
  - Forecast of enplanements and cargo volume
  - Anticipated changes in operations or operators
- Planned Airport Changes
  - Overview of Master Plan
  - New procedures
  - New navigational equipment
- Process for Implementing Changes
  - Overview
  - Who should be involved
  - Schedule and milestones
  - Data collection
- Action items and next steps

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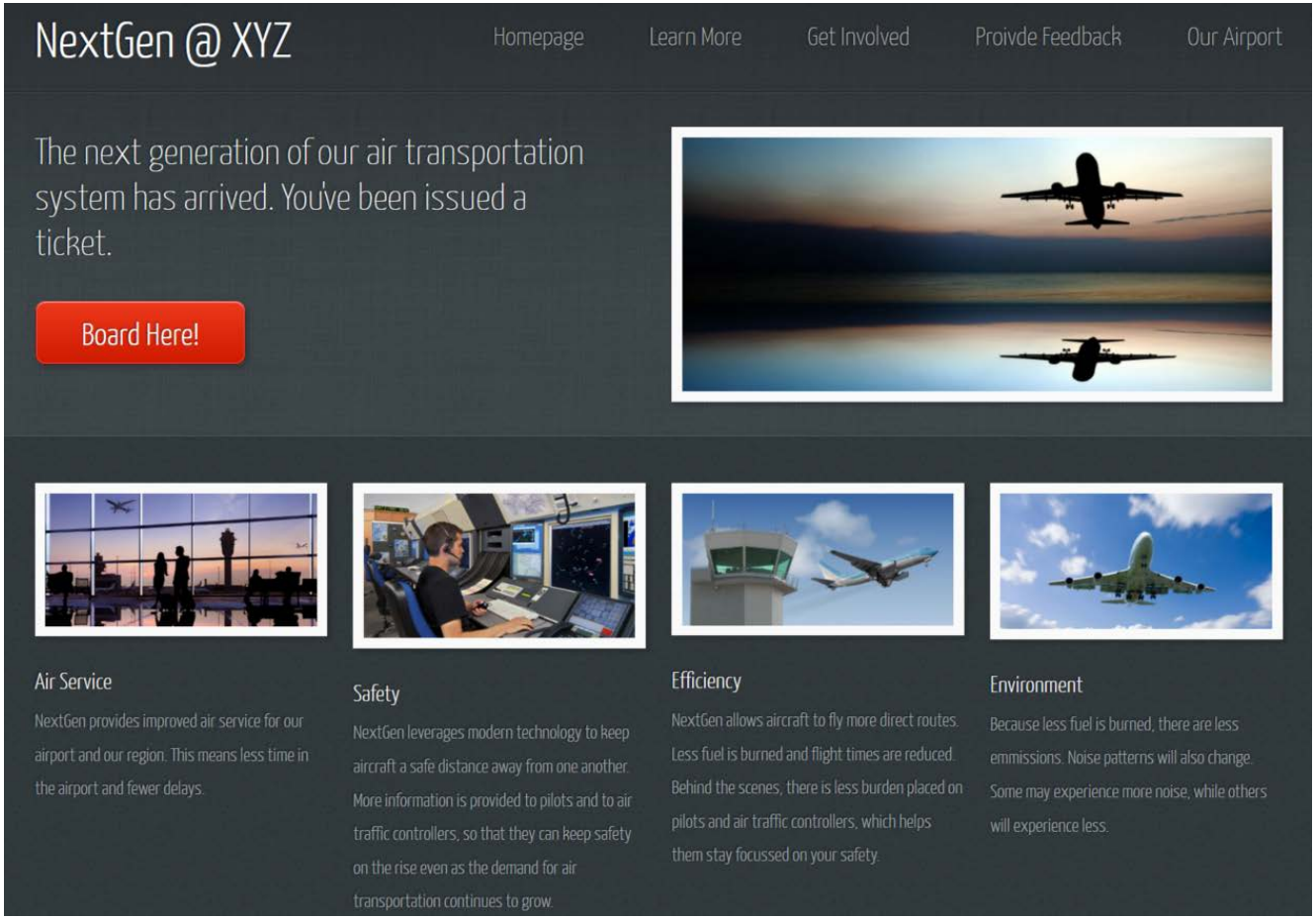
Web-Site Template



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Presentation Template

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Press Release

Sample NextGen
Press Release
For Airports

Contact: [Insert Name]
[Insert Contact Info]

For Immediate Release

NextGen Improvements to Air Traffic Are Underway at [Airport Name]

[Location], [Date] — The Federal Aviation Administration (FAA), [Airport Name], and airlines are bringing the next generation of safer, more efficient, and faster air travel to [local city/region/state]. Through the Next Generation Air Transportation System or NextGen, [Airport Name] is implementing [insert specific NextGen initiatives airport is implementing] to serve air travelers and the region.

The NextGen improvements that [Airport Name] is implementing are positively affecting the everyday experience of travelers. For example, these improvements help controllers, pilots, and airline dispatchers keep aircraft safely separated on new precision flight paths, even when bad weather threatens scheduled arrivals and departures. Travelers at [Airport Name] should find that flights become more reliable; that fewer flights are cancelled; and that there are fewer delays and less time sitting on the ground and holding in the air. Also, businesses in and around the airport may benefit from increased airport activity.

More specifically, [Airport Name] is rolling out a variety of new procedures and technologies, such as [description of new technologies]. Once these are established, [Airport Name] will continue to work closely with the FAA and airlines to build on this progress by [additional description of new technologies].

As the demand for more flights increases, [Airport Name] will continue to modernize and comply with FAA guidance by implementing NextGen and improving safety, efficiency, and environmental performance.

For more specific information about how [Airport Name] is managing FAA NextGen's new flight procedures, please contact [Airport Contact Information].

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Establishing an Engagement Program

1. Understand issues and concerns
2. Establish a strategy
3. Assign roles and responsibilities
4. Develop and deliver materials
5. Evaluate and monitor progress

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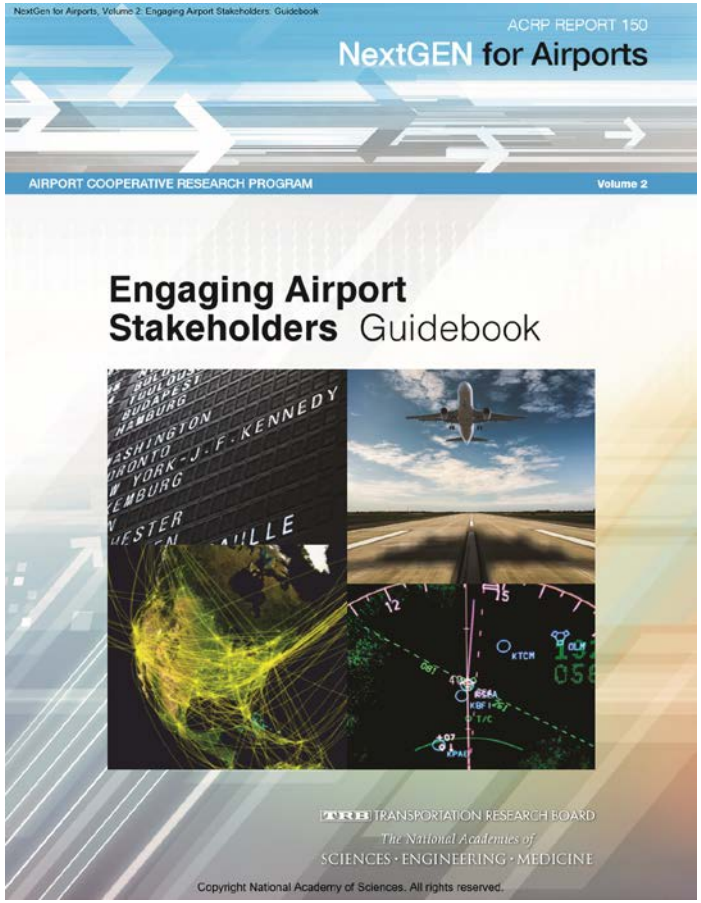
Accompanying Guidebook



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Detailed Case Studies

Proactive Engagement at Dallas/Fort Worth International Airport
Metroplex Planning at Denver International Airport
Implementation of the TNNIS Departure at LaGuardia Airport
PBN Implementation at Seattle-Tacoma International Airport
Support from the Puget Sound Regional Council
Preparations at King County International Airport/Boeing Field
Unique Challenges at Snohomish County Airport/Paine Field
Improved Air Service at Beverly Regional Airport
Modernization at Chicago O'Hare International Airport
Exemplary Collaboration at European Airports

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The FAA has Updated Procedures

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Air Traffic Organization Policy

ORDER JO 7100.41A

Effective Date:
April 29, 2016

SUBJ: Performance Based Navigation Implementation Process

1. This order provides a standardized five-phase implementation process related to Performance Based Navigation (PBN) procedures and/or routes, referred to as the "Performance Based Navigation Implementation Process," which has been deemed compliant by the Office of Safety (AJI) and meets the requirements set forth by Federal Aviation Administration (FAA) Air Traffic Organization's (ATO) Safety Management System (SMS).
2. National initiatives with defined alternative processes, such as Metroplex, are not subject to this order. A national initiative without an alternative process, such as VOR MON, would be subject to this order.
3. This order is to be used in conjunction with other FAA orders and directives related to procedure development and implementation.

Original signed by

Heather Hemdal
Director, Air Traffic Procedures
Mission Support Services

4/27/2016
Date Signed

Distribution: Electronic

Initiated By: AJV-14
Performance Based Navigation Policy and Support Group

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The FAA is Proactively Reaching Out

NextGEN

Community Involvement

As the FAA carries out its mission to provide the safest, most efficient aerospace system in the world, we are accountable to the American public.

The views of communities–including local residents, the general public, and stakeholders–are important to the FAA as we take the next steps to advance the national airspace system. The FAA is committed to inform and involve the public, engage with communities and give meaningful consideration to community concerns and views as we make aviation decisions that affect them.

Activity Near You

Metroplex

- Atlanta
- Charlotte
- Cleveland-Detroit
- Denver
- Houston
- Las Vegas
- North Texas
- Northern California
- South Central Florida
- Southern California

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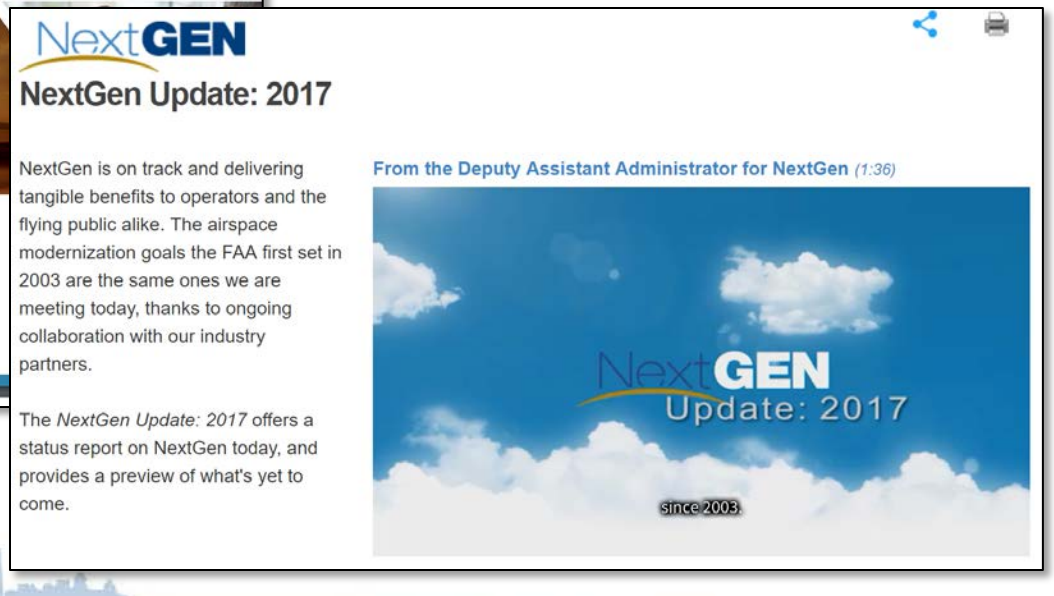
The FAA has Developed Engagement Materials



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Committees and Working Groups Responded

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Regional Associations Have Gotten Involved

Puget Sound NextGen

iOS iPad Education

Puget Sound Regional Council

General aviation airports within the central Puget Sound region are preparing for the arrival of NextGen air traffic control — a switch from radar to a satellite based system with significant safety and operational benefits. A study by the Puget Sound Regional Council, in conjunction with the Federal Aviation Administration, identified constraints on general aviation access to the airports in the region and concepts for improving air traffic control, reduction of noise and emissions and improved safety with the implementation of NextGen strategies.

Free

Own Wish

Buy

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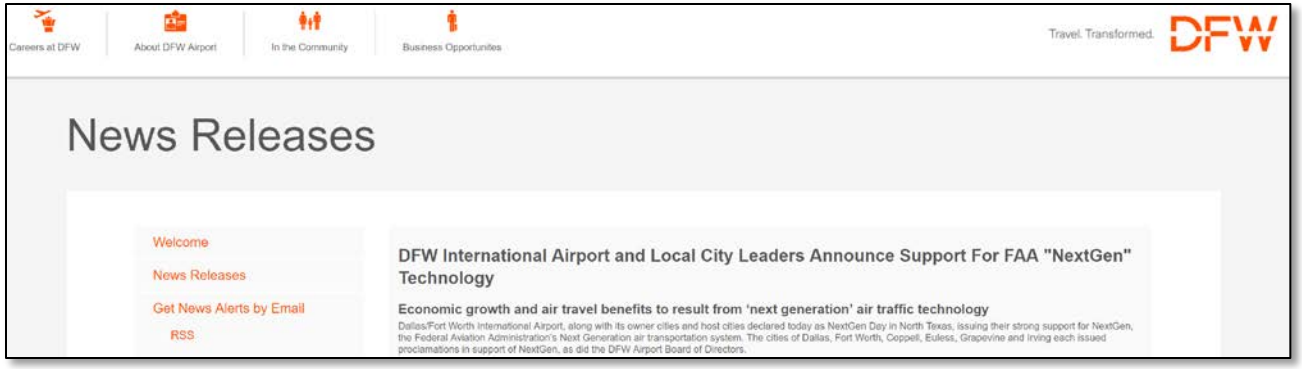
Many Airports Continue to Engage



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Press has Improved

The Columbus Dispatch

WHICH FINALISTS DO YOU KNOW?
CLICK TO FIND OUT.

For this Westerville student, the...

Man crawls to safety 4 days after falling from cliff

New furniture store open only at week's end, offers 'finds'

Ohio twins, dancers on Ariana Grande's tour, safe after blast

Online Training Solutions
Architecture | Engineering
Construction | Facility Management
RedVector
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NextGen air-traffic control system coming to John Glenn airport

the Burbank Leader

Times Community News / Burba

New air-traffic control system unlikely to increase noise around Hollywood Burbank Airport, FAA official says

How Boston Gradu
Disrupting The Aut
Insurance Industry

ADVERTISEMENT

In Case You Missed I

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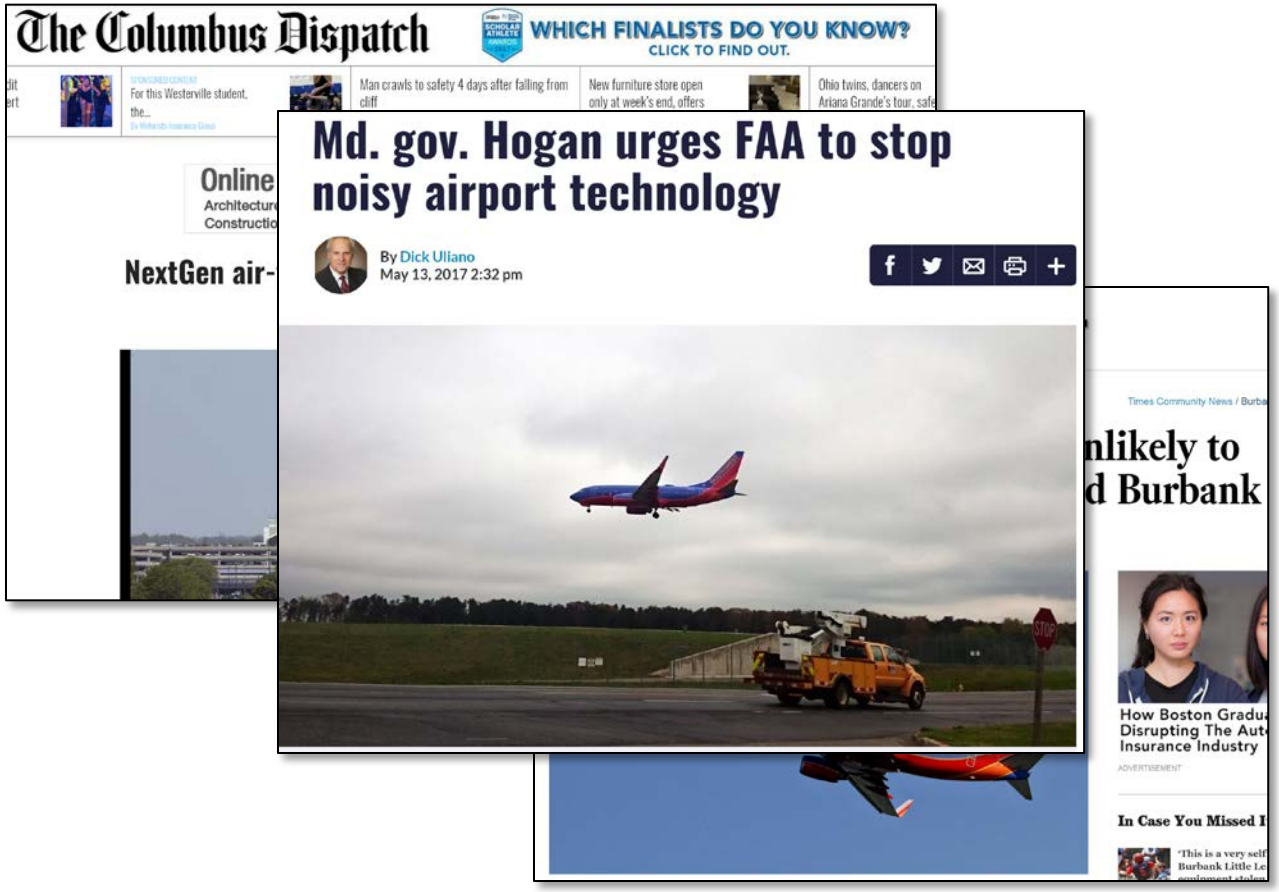
Press has Improved?



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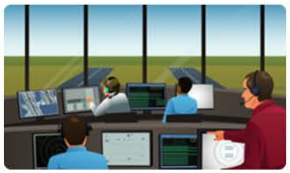
Success is Growing

NextGEN

Performance Success Stories

Recent NextGen Success Stories



Aircraft Fly More Efficiently More Often with EoR at Denver

NetJets Benefits from DeKalb-Peachtree's Satellite-Enabled Approaches

Precise Approaches Boost JetBlue's Performance at JFK

In-Trail Procedures: Saving Fuel and Boosting Pilots' Situational Awareness in Oceanic Airspace

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Success is Growing because of People

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Panelists Presentations

http://onlinepubs.trb.org/onlinepubs/webinars/170524.pdf

After the webinar, you will receive a follow-up email containing a link to the recording

Today's Participants

- Kent Duffy, *Federal Aviation Administration,* kent.duffy@faa.gov
- Bob Hemm, *Logistics Management Institute,* rhemm@lmi.org
- Virginia Stouffer, *Logistics Management Institute,* vstouffer@lmi.org
- Bill Dunlay, *Leigh Fisher,* bill.dunlay@leighfisher.com
- Mark Ricketson, *Woolport, Inc.,* mark.ricketson@woolpert.com

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- Prepare a proposal to conduct research.
- Get involved in TRB's Aviation Group of committees.
- Take part in the Champion or Ambassador Programs.

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