NextGen ATC/TechOps Human Factors (BLI 1A11B)

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Program Overview

- The Enterprise Human Factor Development program will provide integrated guidance on human performance considerations to concept development, validation, and implementation teams.

- Research efforts to identify and mitigate systemic human factors considerations may yield the following benefits:
  - Increasing the utilization rate of concepts and systems among controllers;
  - Ensuring controller acceptance of concepts and systems;
  - Increasing safety through the mitigation of known human factors risks; and
  - Decreasing controller workload through improved tools and techniques.

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NextGen ATC/TechOps Human Factors

What are the benefits to the FAA?

- Human factors high-level (enterprise) guidance to assist with the evolution of the NAS infrastructure and its workforce

What determines success?

- Successful transition of Human Factors products.

- Early identification of HF opportunities, to minimize a program's cost, safety and operational risks.

NextGen ATC/TechOps HF "Team"

Sponsors and Customers:

- ANG   NextGen
- AJM   ATO Program Management Office ("PMO")
- AJI   ATO Safety and Technical Training
- AJV   ATO Mission Support Services
- AJT   ATO Air Traffic Services
- AJW   ATO Technical Operations

ANG-C1 Program Management:

- PM – Bill Kaliardos
  - Recently changed from Stephanie Kreseen (and Jerome Lard prior to Stephanie)

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Expected Accomplishments, FY 18-19
(under previous BLI)

- PBN Human Performance Metrics
  - General methods to "measure" PBN ops from a ATC HF perspective

- Established-on-RNP (EoR) HF Implementation Guidance
  - Improving future EoR implementation from a ATC HF perspective

- Time/Speed/Spacing Integration
  - Addressing suites of NextGen tools/procedures (vs. individual tools) from a ATC HF perspective

- ATC Human-System Contingency Ops
  - Investigating human-system resiliency and cognitive skill degradation, after long-term use of NextGen decision support tools (e.g., TSS tools)

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Emerging Research Topics, FY 18-20

Fielding capabilities by ~2022 ("operationalizing", next 5 years)
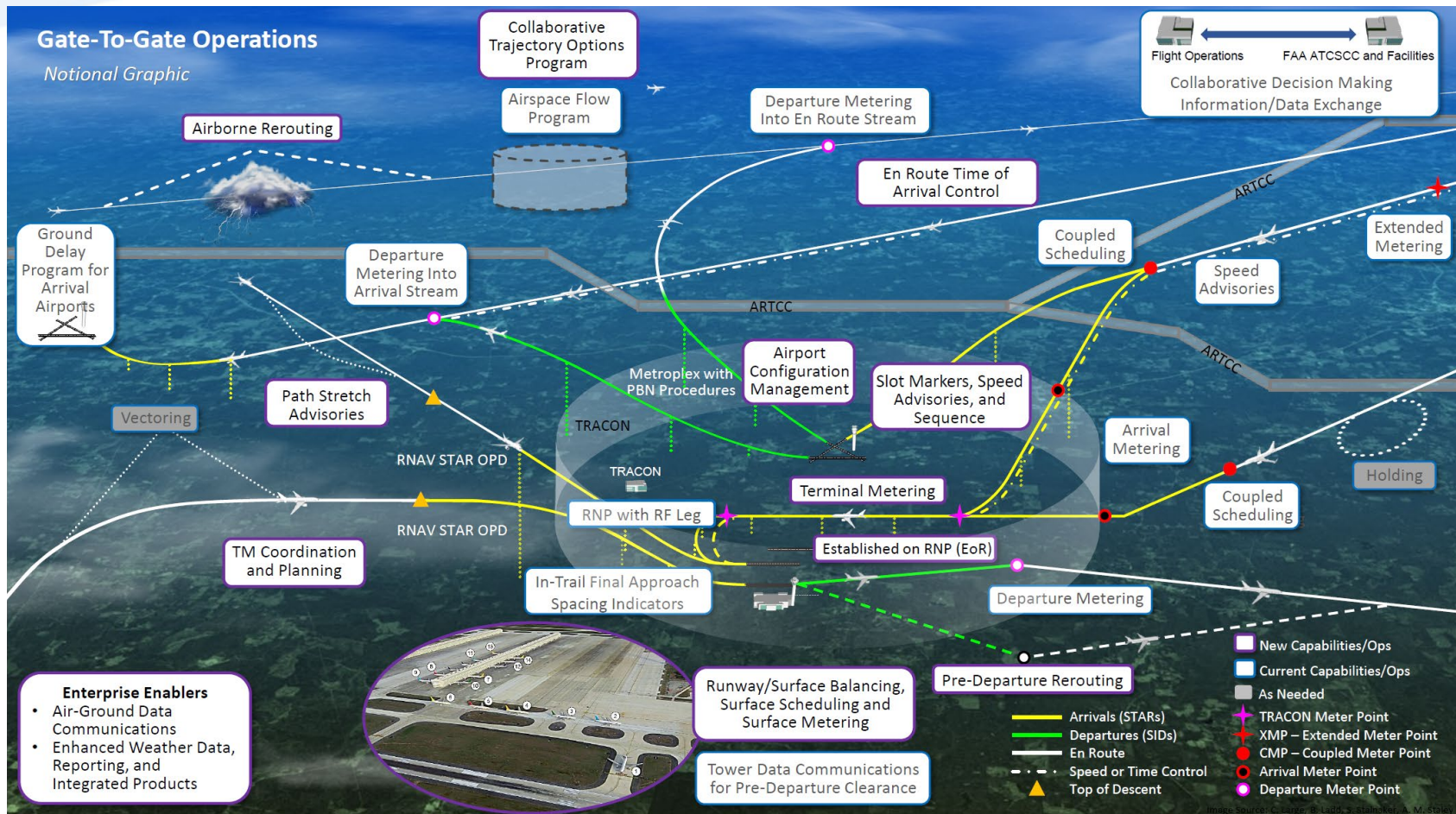
- HF <u>near</u>-term TBO*

Fielding capabilities after ~2022 (includes system development)

- HF considerations of UAS compliance with visual procedures
- HF <u>mid</u>-term TBO
- HF Cross-domain automation enhancements
- HF Traffic Flow Management concept development

Trajectory-Based Operations

Candidate Capabilities for Near-term TBO…

Function Category	Capabilities	Supporting Technologies
PBN	**RNAV STAR Optimum Profile Descent (OPD)** **RNAV SIDs** **RNP / RNP with RF leg** **Established on RNP (EoR)***	FMS/ RNAV (LNAV/VNAV), RNP, RNP-AR, A-RNP
Strategic Planning / Flow Management	**Airspace Flow Program (AFP), Ground Delay Program (GDP)** **Collaborative Decision-Making*** **Collaborative Trajectory Options Program (CTOP)*** **TM Coordination and Planning**	TFMS/ FSM SWIM, TFMS, Operator Ground Automation TFMS/ FSM TBFM/ TM Ops Dashboard and Planning Tool
Route Management	**Automated Reroutes** **Pre-Departure Rerouting*** **Airborne Rerouting***	TFMS/ ERAM PDRR ABRR

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Function Category	Capabilities	Supporting Technologies

Time-Based Scheduling (Airborne and Surface)	**Arrival Metering**
	Coupled Scheduling/Extended Metering
	Departure Metering (scheduling) into Arrival Stream
	Departure Metering (scheduling) into En Route stream
	Terminal Metering
	Runway/Surface Balancing
	Surface Scheduling and Metering
		TBFM/
		    GIM-S
		    T-to-T, IDAC
		    EDC, IDAC
		     TSAS
		TFDM

En Route and Terminal Spacing Tools	**Delay Countdown Timer**
	Speed Advisories
	In-Trail Final Approach Spacing Indicators
	Path Stretch Advisories
	Slot Markers, Speed Advisories, and Sequence
	En Route Time of Arrival Control (TOAC)
		TBFM/ DCT/MRL
		    GIM-S
		    ATPA
		    Path Stretch
		    TSAS
		TBFM, FMS/ RTA

Surface Management	**Tower Data Communications for Pre-Departure Clearance** **Electronic Flight Data*** **Airport Configuration Management**	Tower Data Link Services TFDM
Enterprise Enablers	**Information and Data Exchange** **Air-Ground Data Communication** **Enhanced Weather Data, Reporting, and Integrated Products**	SWIM En Route Initial Services NWP, CSS-Wx

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