



TASAR Evaluation On-Board Alaska Airlines

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NASA Briefing

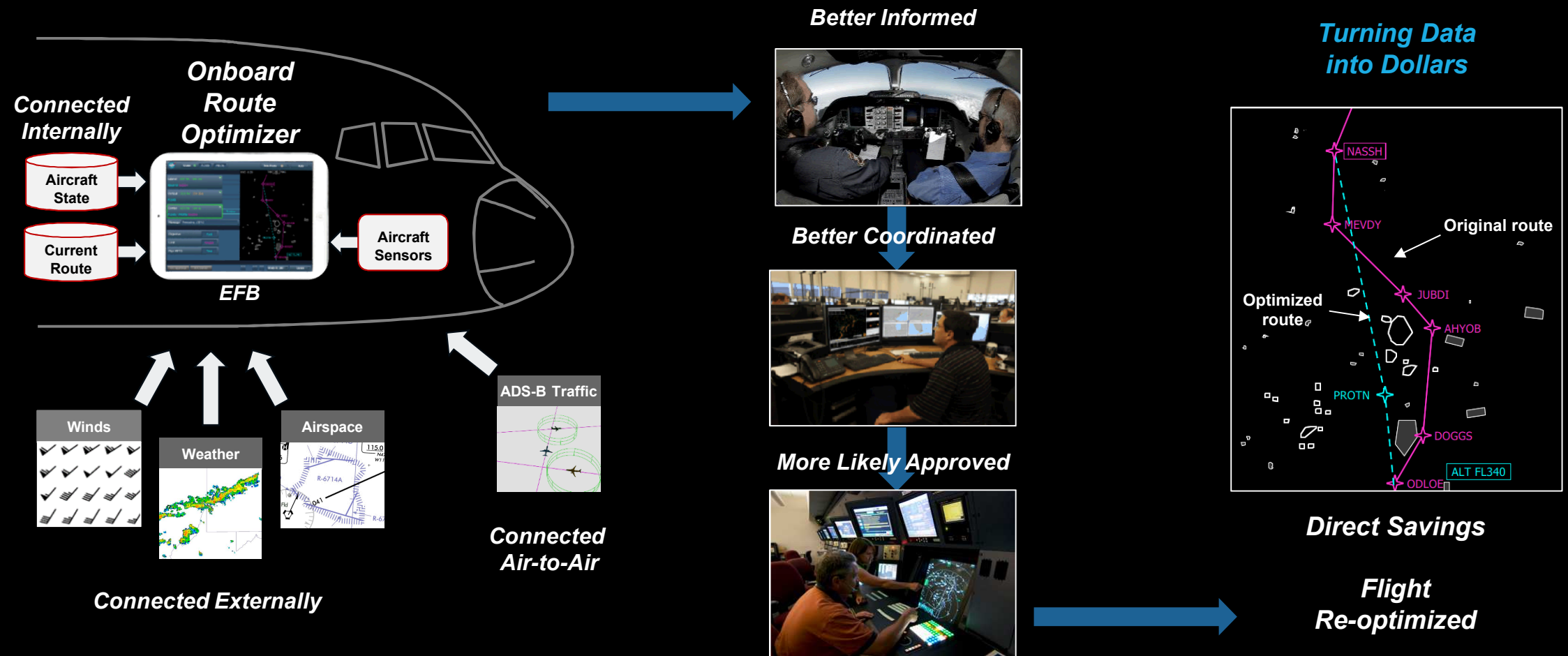
- TASAR Concept & Technology
- Operational Evaluation
- Estimated Benefits

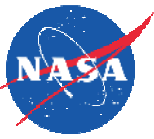
Alaska Briefing

- Optimization Culture
- TASAR Benefit Cases
- Future TASAR Work

Traffic Aware Strategic Aircrew Requests (TASAR)

Leveraging Cockpit Automation and Connectivity for Airborne Rerouting





TAP (Traffic Aware Planner)

Interactive Route Optimization App for Pilots

2016 NASA Software of the Year



Multi-dimensional optimization

Allows pilot to change optimization objective

Adaptable to different aircraft types

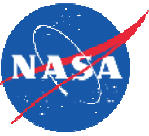
Installable on various EFB architectures

Leverages connectivity for operational savings

Powerful search algorithm finds non-obvious reroutes

Incorporates complex dynamic constraints

Operational Evaluation of TASAR Conducted with Alaska Airlines



- Partners since 2015
- Valued industry collaborators
- Three aircraft TASAR equipped
- Revenue service evaluation
- Assessed utility and benefits
- 90 valid flights for benefits analysis
- Facilitating tech transfer to industry

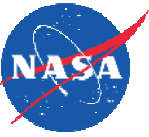
Industry Collaborators



Collins Aerospace



TAP Operators



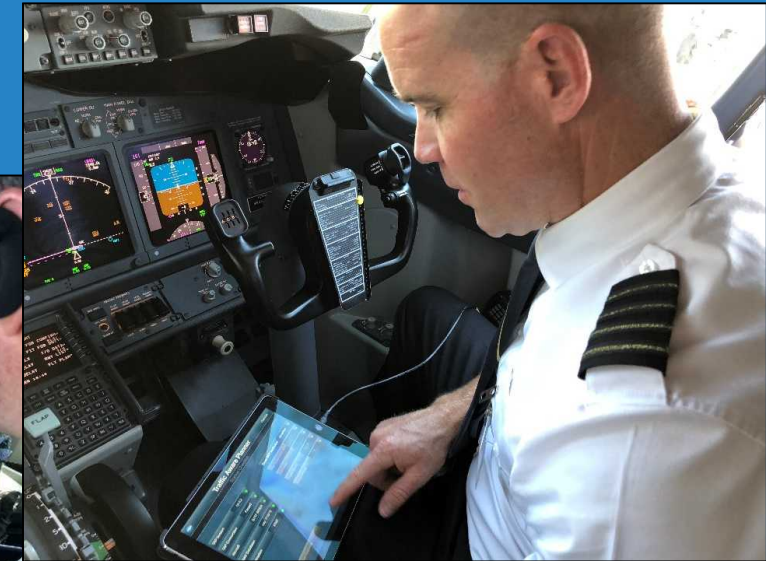
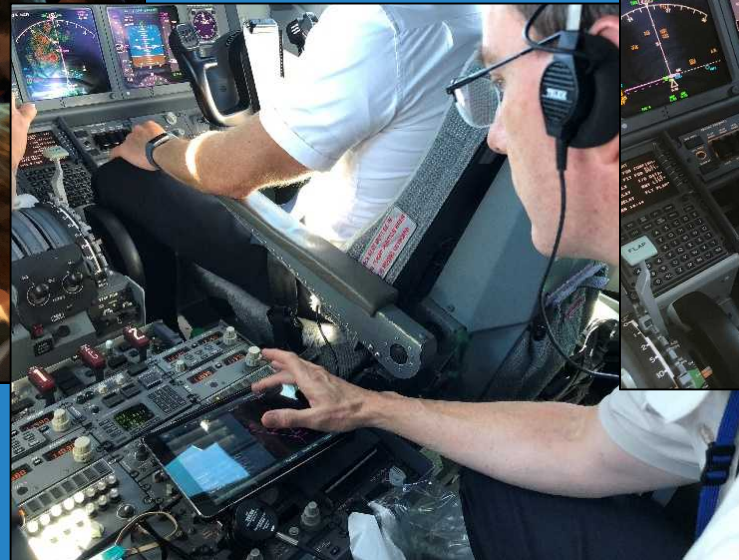
4 Technical Pilots, 4 Pilot Interns, 2 NASA Researchers

Classroom and
Computer-
Based Training



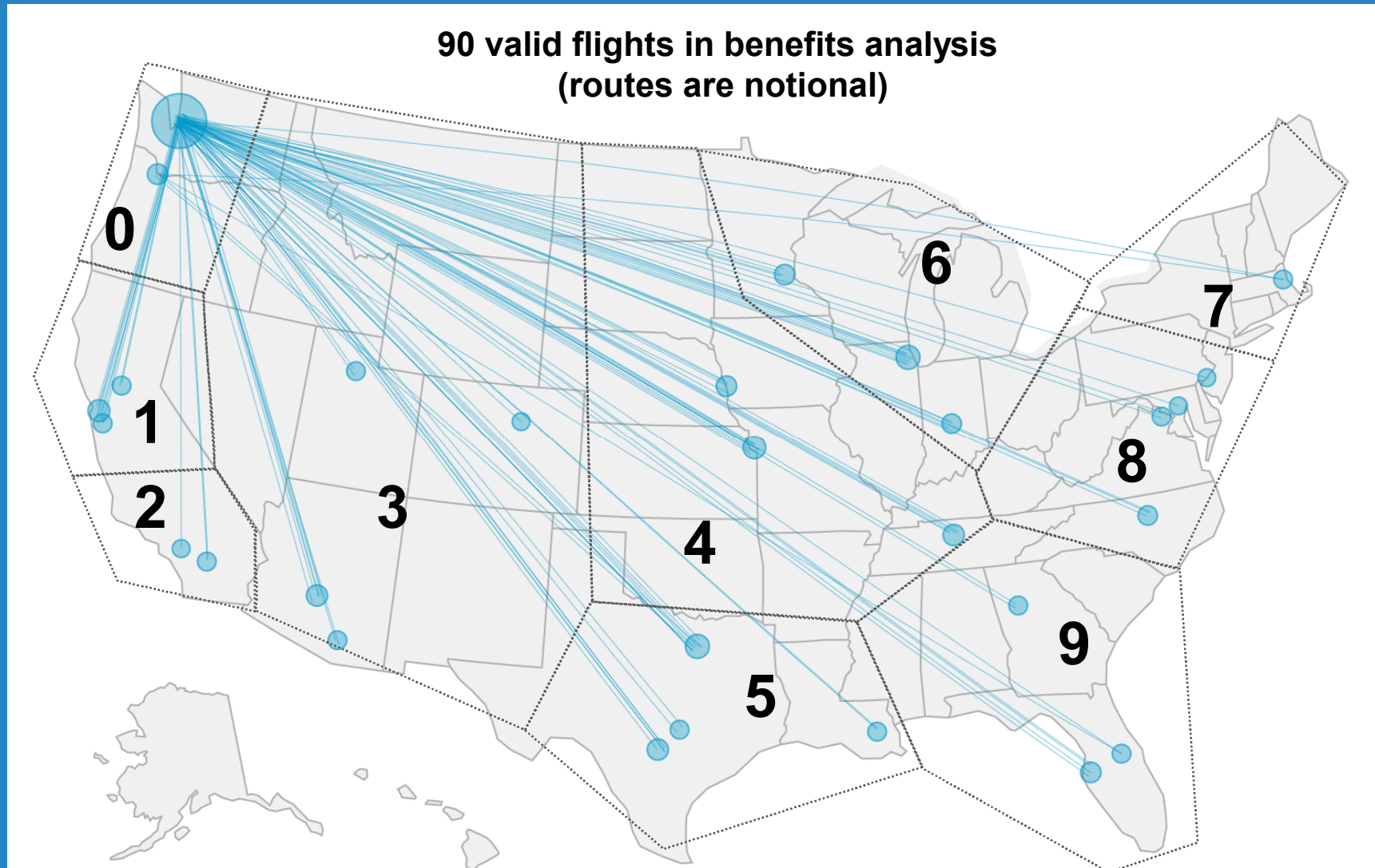
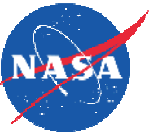
Training in
Alaska Flight
Simulator

TAP Operators
in Jump Seat



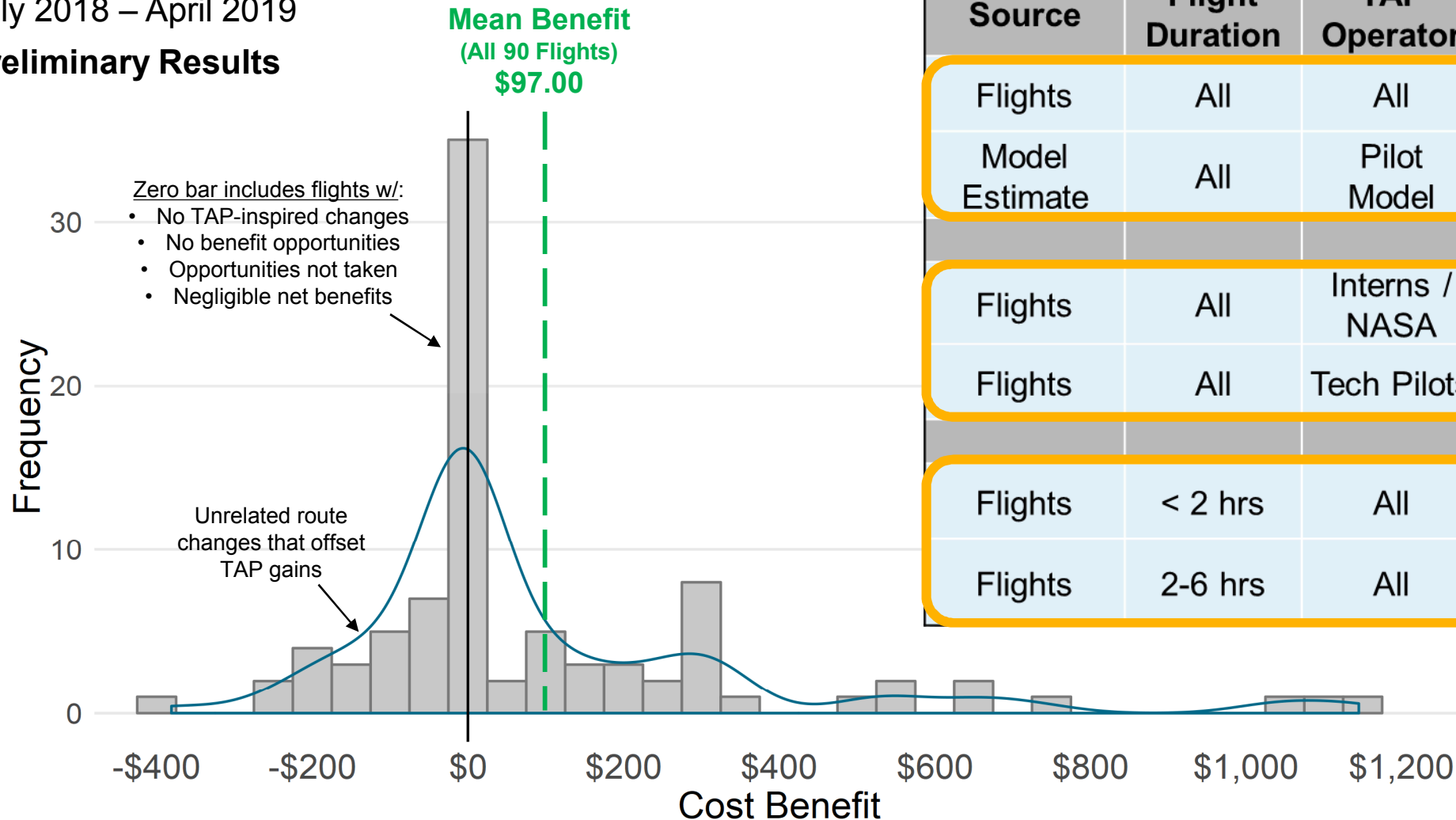
TAP Operators
in Flight Seats

Airports Were Assigned to Zones for Route Selection and Balancing



Benefits Driven by Method of Use and Types of Opportunities

90 Evaluation Flights
July 2018 – April 2019
Preliminary Results



Source	Flight Duration	TAP Operator	Mean Benefit	# Flights
Flights	All	All	\$97	90
Model Estimate	All	Pilot Model	\$136	466
Flights	All	Interns / NASA	\$59	58
Flights	All	Tech Pilots	\$166	32
Flights	< 2 hrs	All	(\$26)	12
Flights	2-6 hrs	All	\$116	78

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AIRLINES



TASAR at Alaska Airlines

- Optimization Culture
- TASAR Benefit Cases
- Future TASAR Work





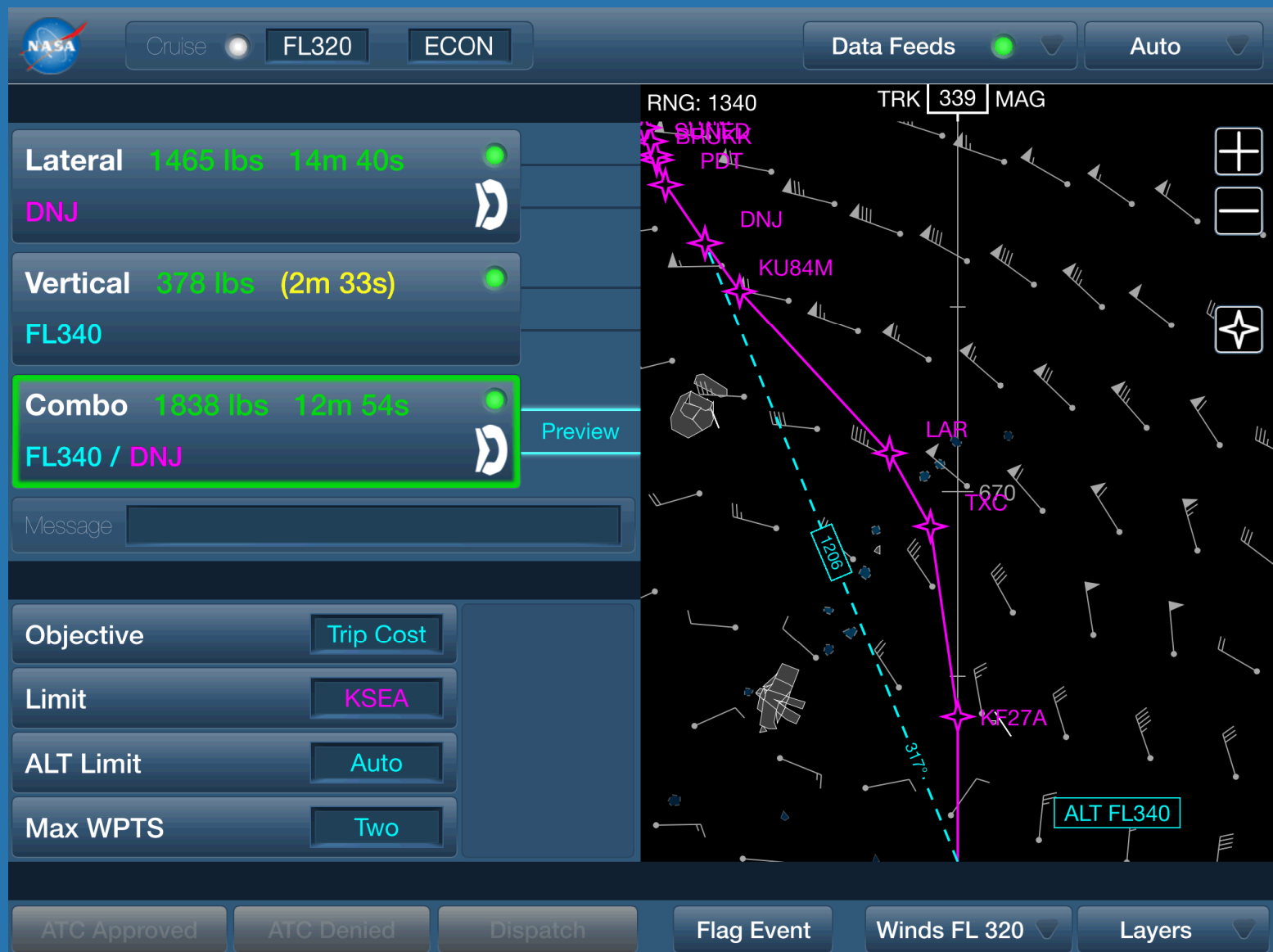
We have the culture but are we doing it right every time?





Benefit Case #1

Home Run





Benefit Case #2

Small Cumulative Gains

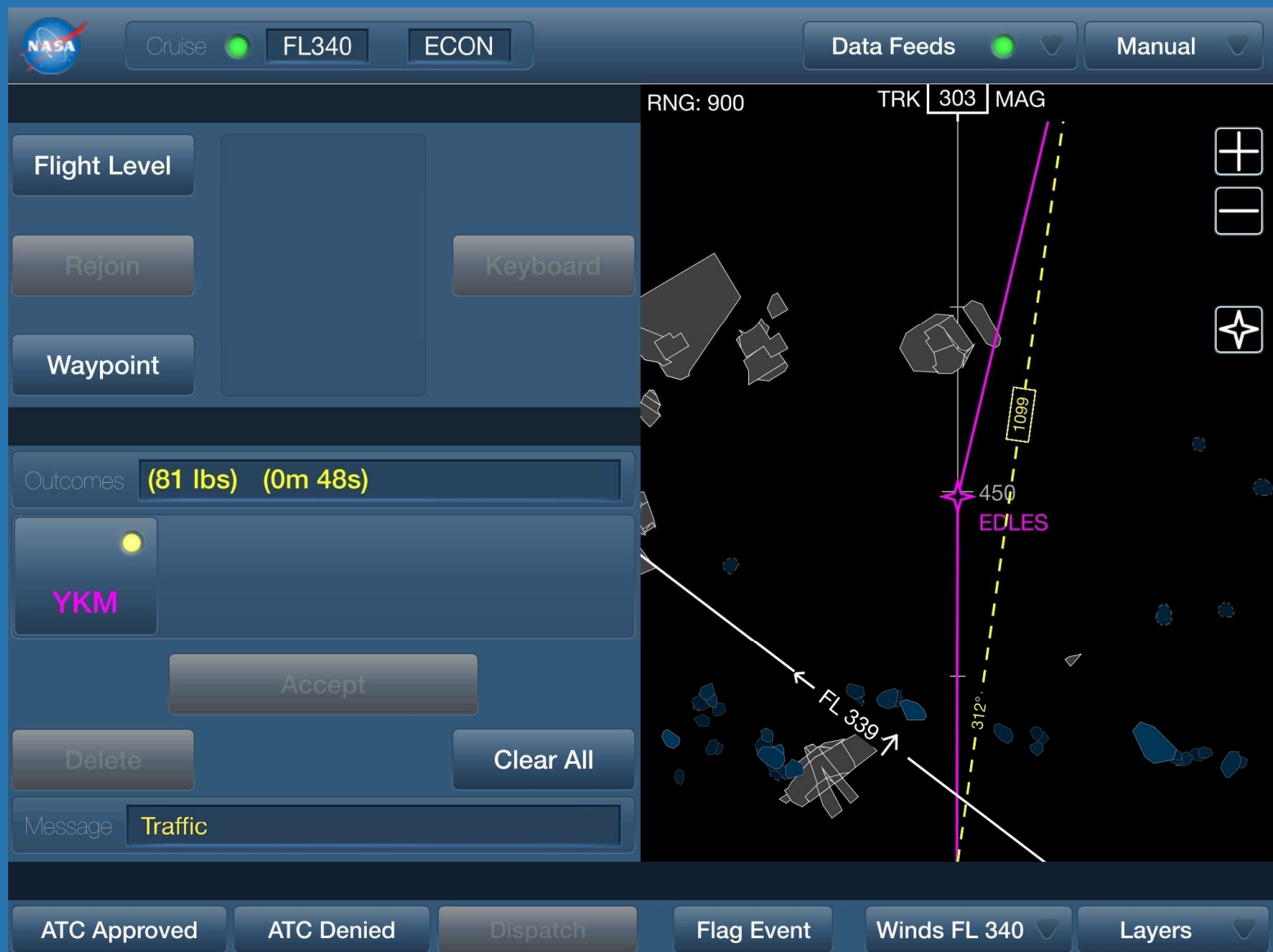






Benefit Case #4

Flight Plan Validation





The Future

Equipping with AID's
APIJet





The Future

Commercial Development Trial



Collins Aerospace



gogo[®]





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NASA Langley Technology Licensing

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