



GAMA

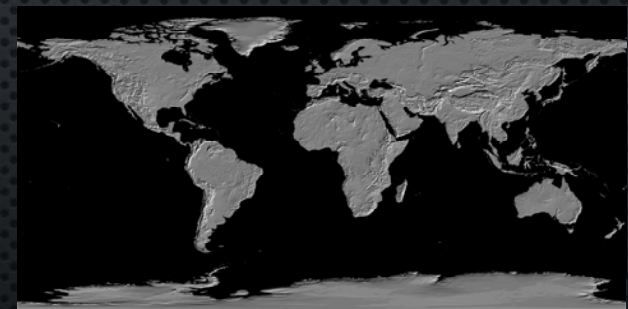
GENERAL AVIATION MANUFACTURERS ASSOCIATION

30. SEPT. 2016

GAMA HISTORY AND PURPOSE



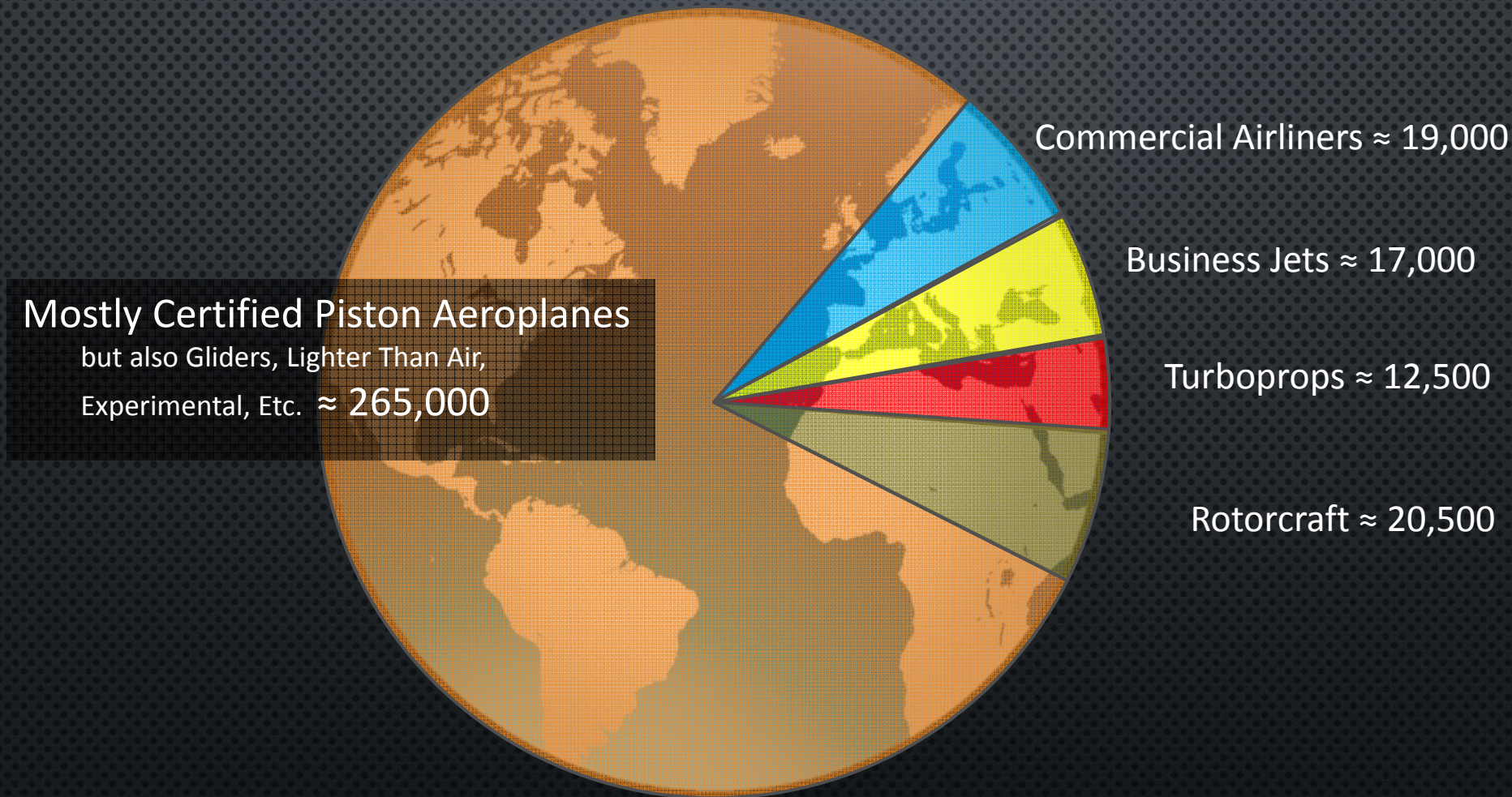
- FOUNDED IN 1970 TO “FOSTER AND ADVANCE THE GENERAL WELFARE, SAFETY, INTERESTS AND ACTIVITIES OF GENERAL AVIATION.”
- EXPANDED TO WORLDWIDE MEMBERSHIP IN 2001
- EXPANDED TO INCLUDE ROTORCRAFT & MRO IN 2011
- CREATED ASSOCIATE MEMBERSHIP FOR HYBRID & ELECTRIC PROPULSION IN OCTOBER 2015
- OFFICE LOCATIONS:
 - WASHINGTON, DC , USA (HEADQUARTERS)
 - BRUSSELS, BELGIUM



LOGO IS THE GREEK SYMBOL FOR THE LETTER
“GAMMA”



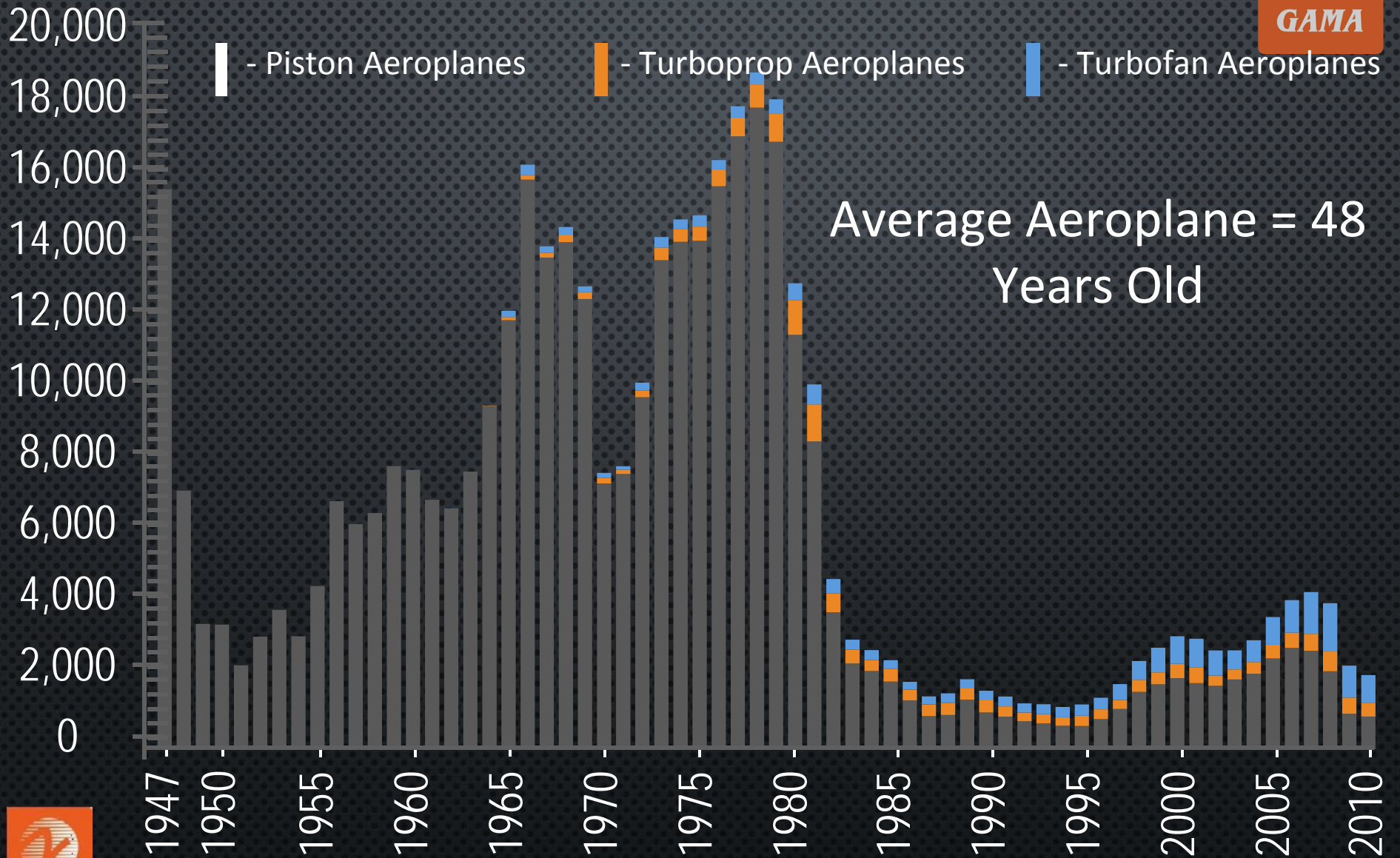
GLOBAL CIVIL TC AIRCRAFT POPULATION ≈ 334,000



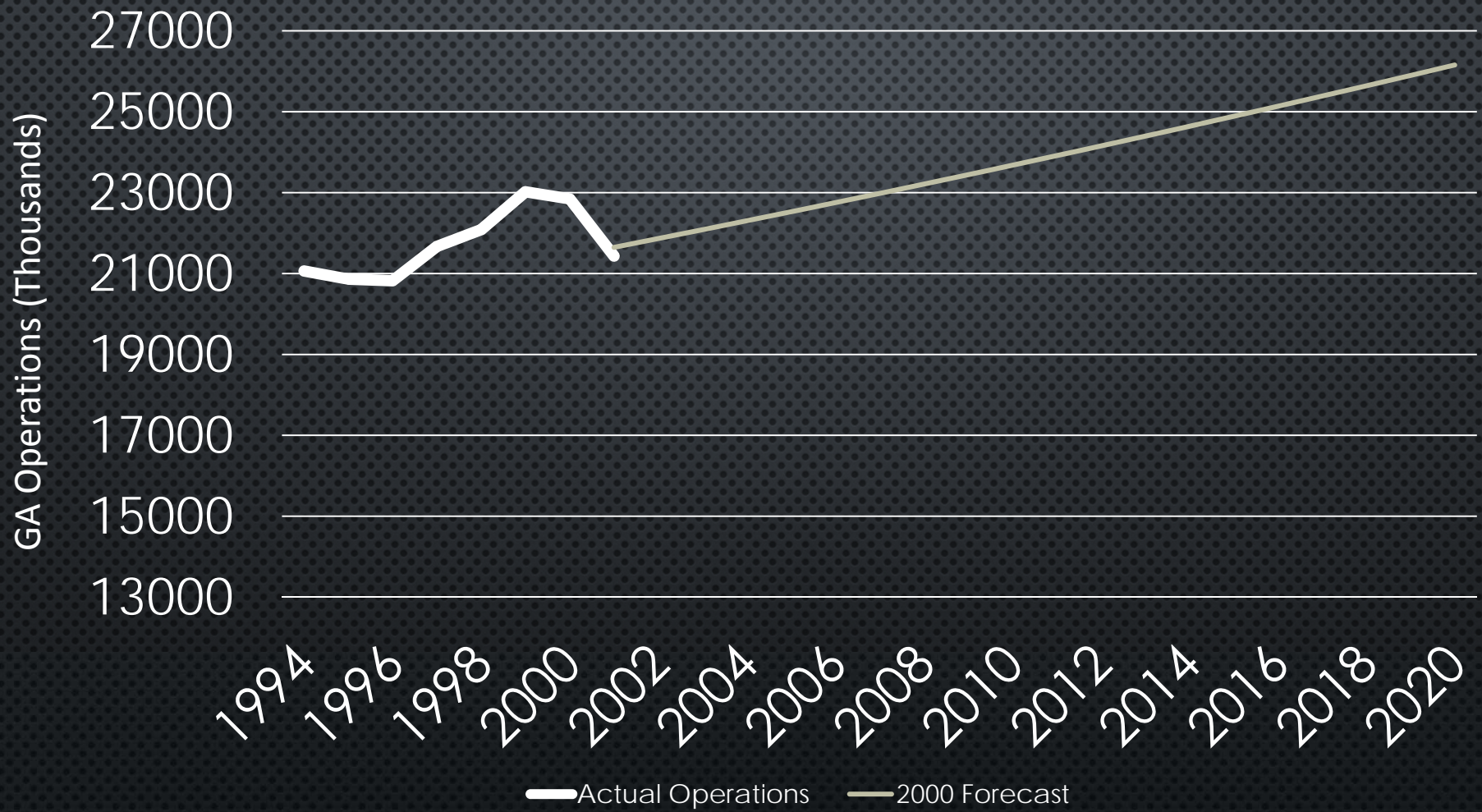
2013 GA TC AEROPLANE PRODUCTION



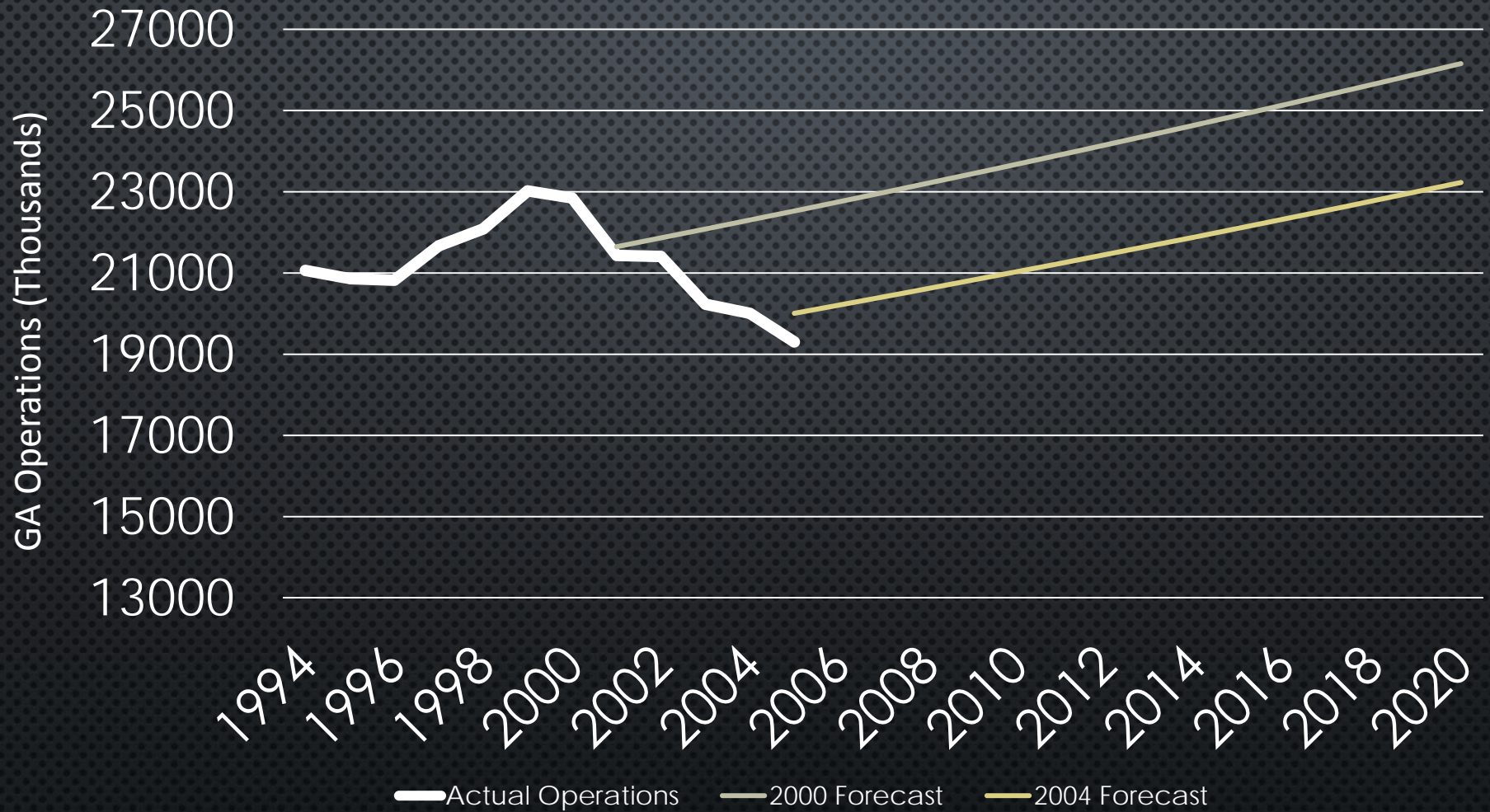
CS-23 Piston Aeroplanes Manufactured Annually



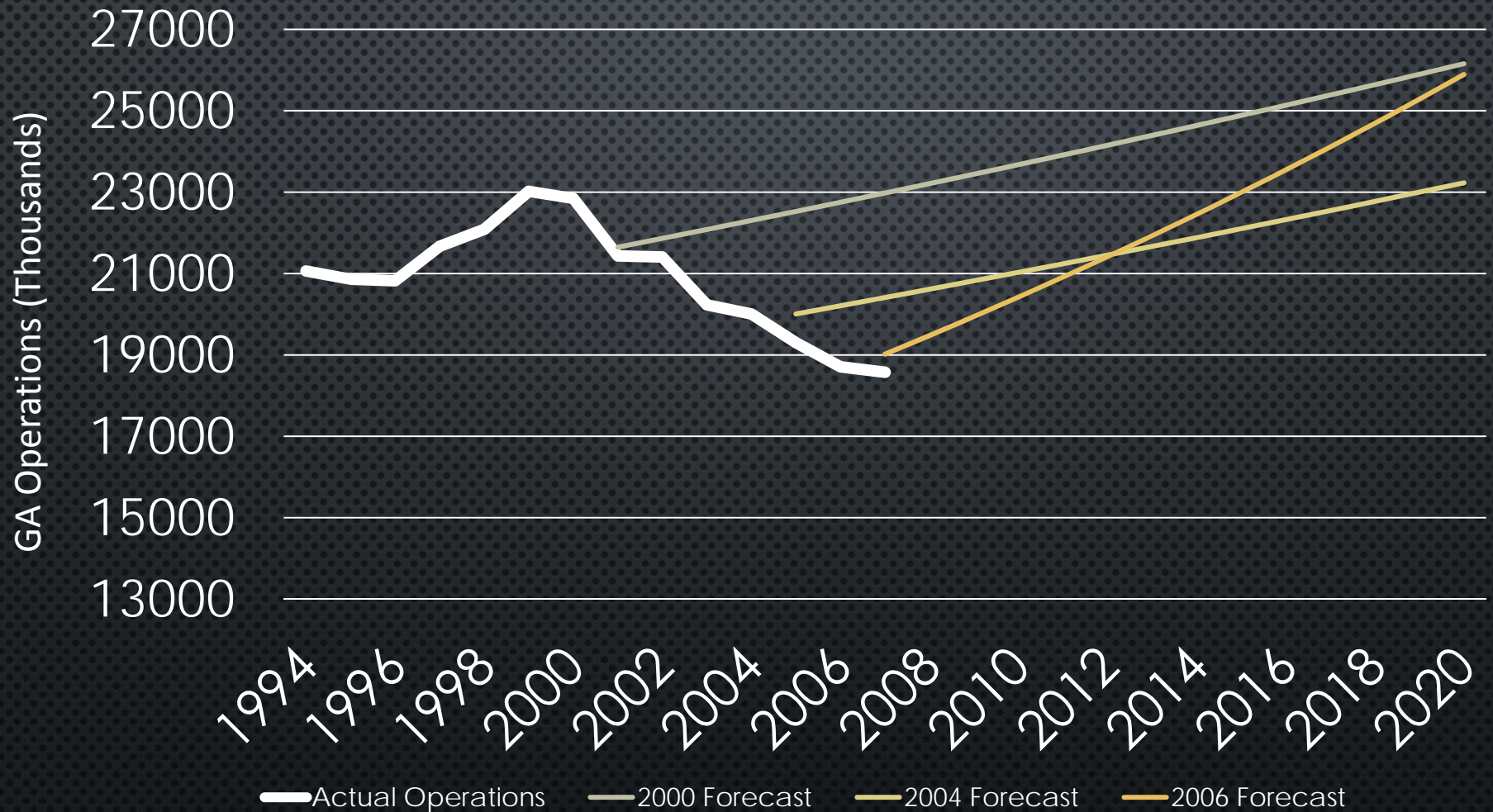
GA TOWER OPERATIONS (FAA & CONTRACT ITINERANT)



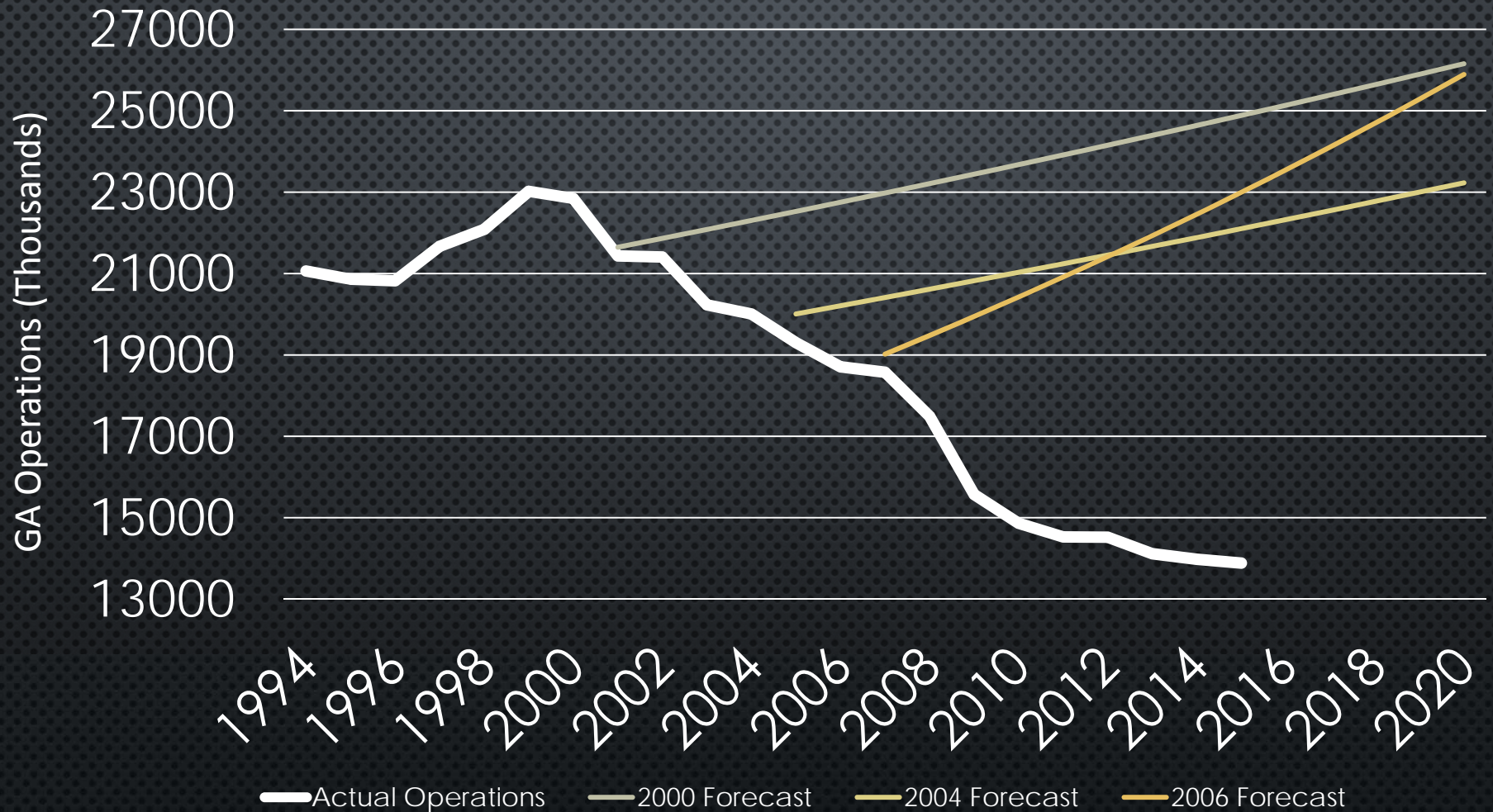
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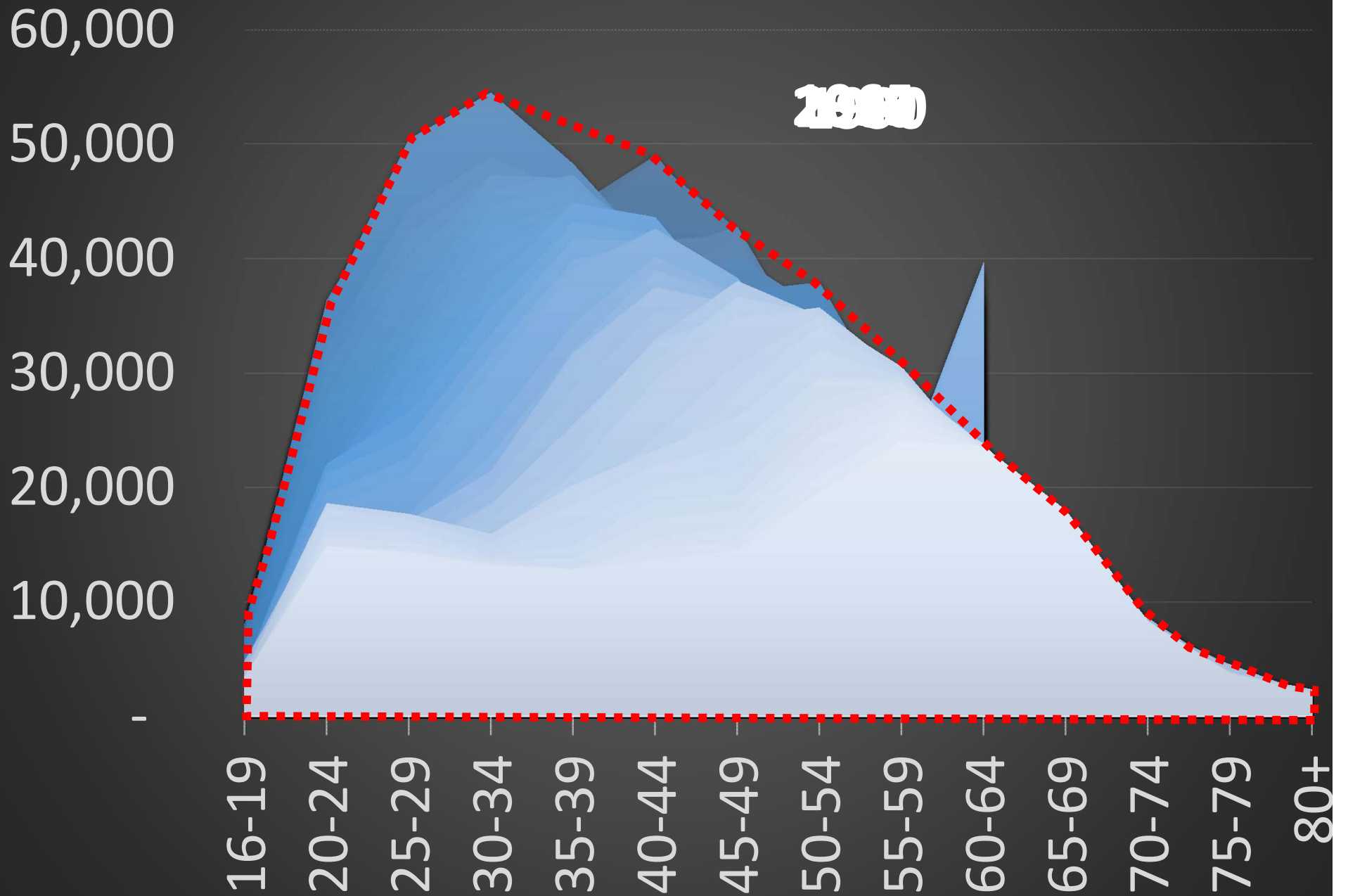
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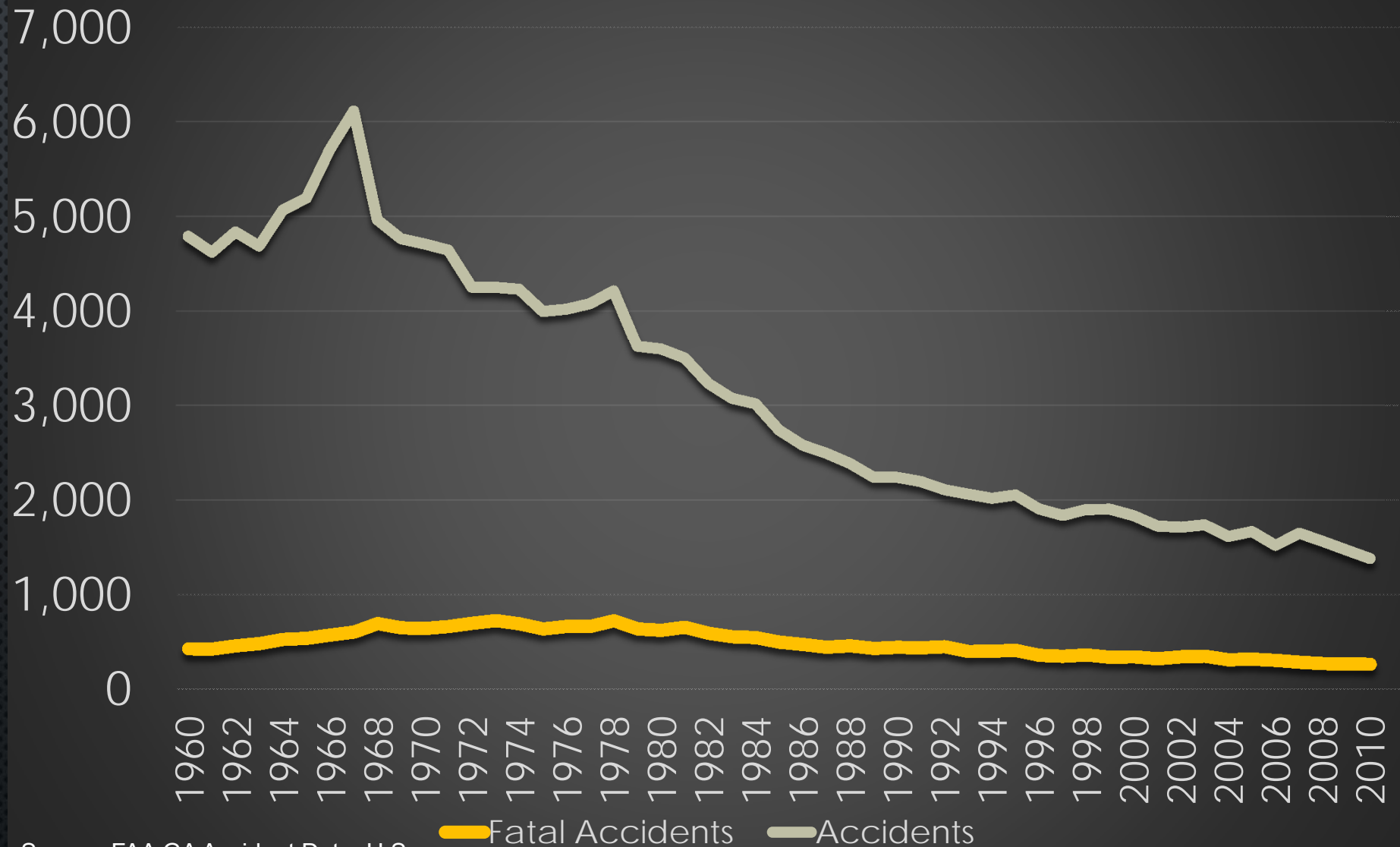
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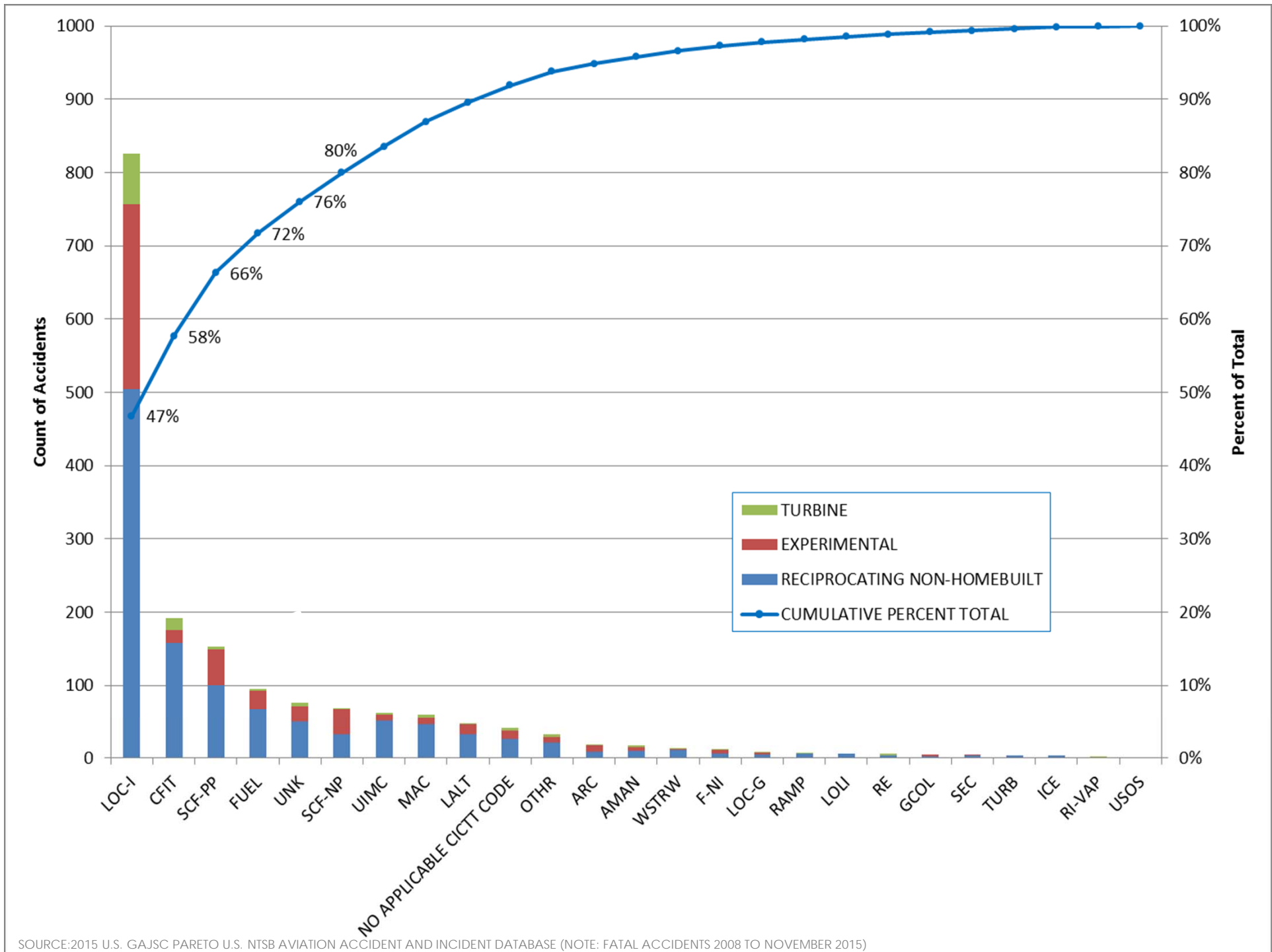
FAA Active Private Pilots v. Age



U.S. GENERAL AVIATION ACCIDENTS



Source: FAA GA Accident Data, U.S.



SOURCE: 2015 U.S. GAJSC PARETO U.S. NTSB AVIATION ACCIDENT AND INCIDENT DATABASE (NOTE: FATAL ACCIDENTS 2008 TO NOVEMBER 2015)

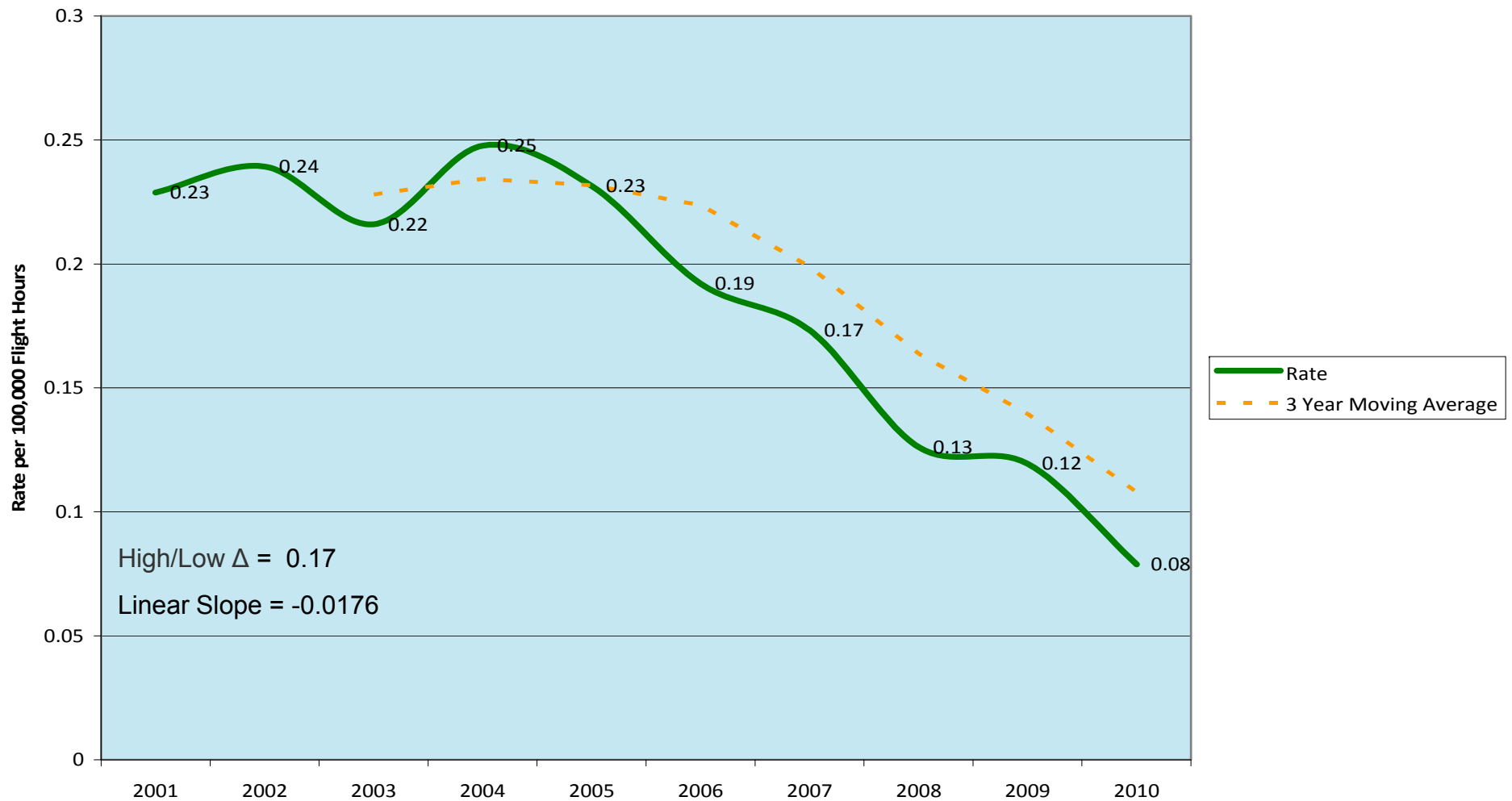
GAJSC GA ACCIDENT RATE CY2001 – CY2010, CFIT

SOURCE: NTSB AVIATION ACCIDENT/INCIDENT DATABASE, FAA GA SURVEY DATA 2001 – 2010.

NOTE: 66% OF FATAL ACCIDENTS HAVE BEEN FINALIZED FOR 2010.

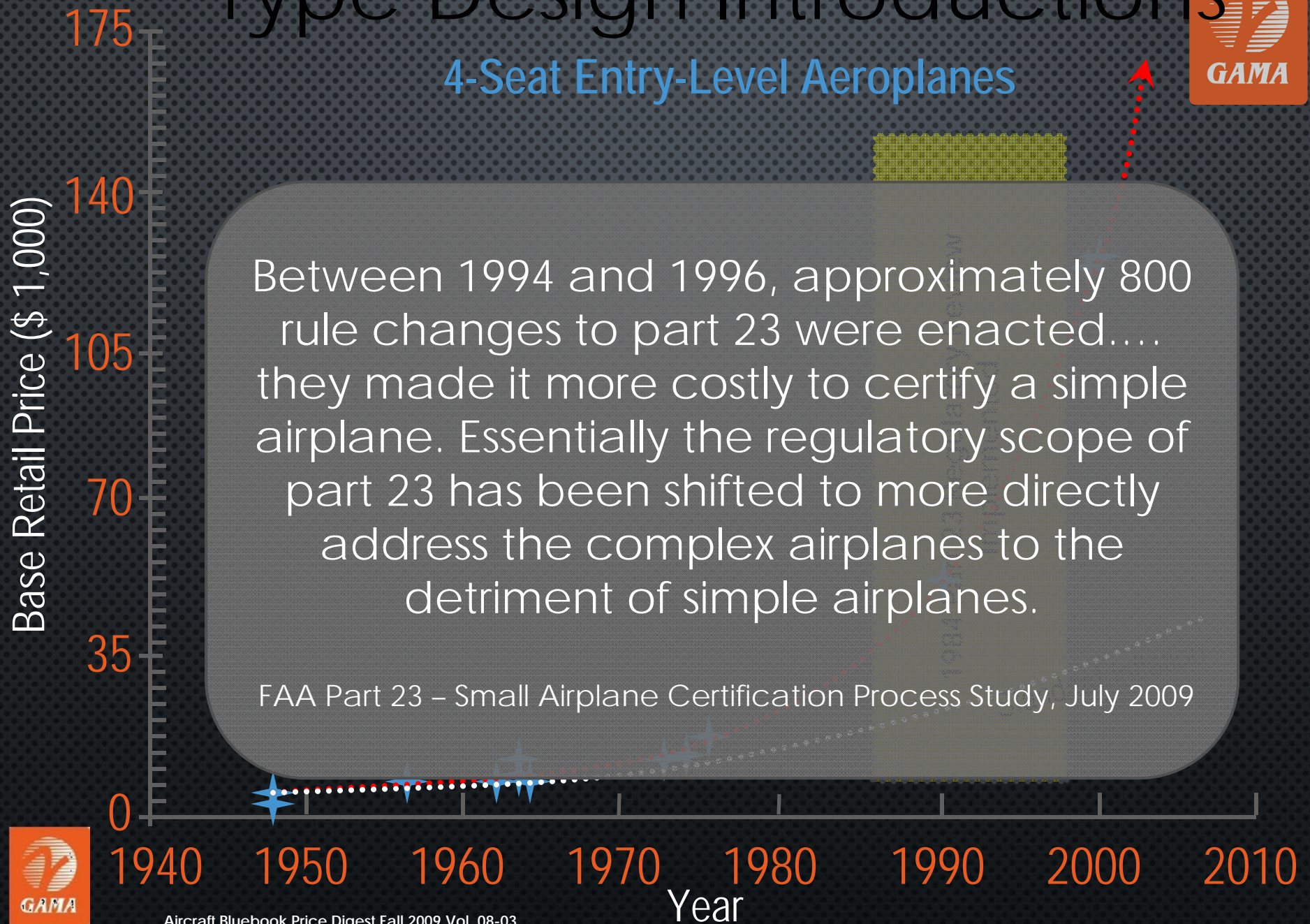


Controlled Flight Into Terrain



Type Design Introductions

4-Seat Entry-Level Aeroplanes



SEPARATING SAFETY REQUIREMENTS FROM METHODS OF COMPLIANCE



Authority



Current Part-23

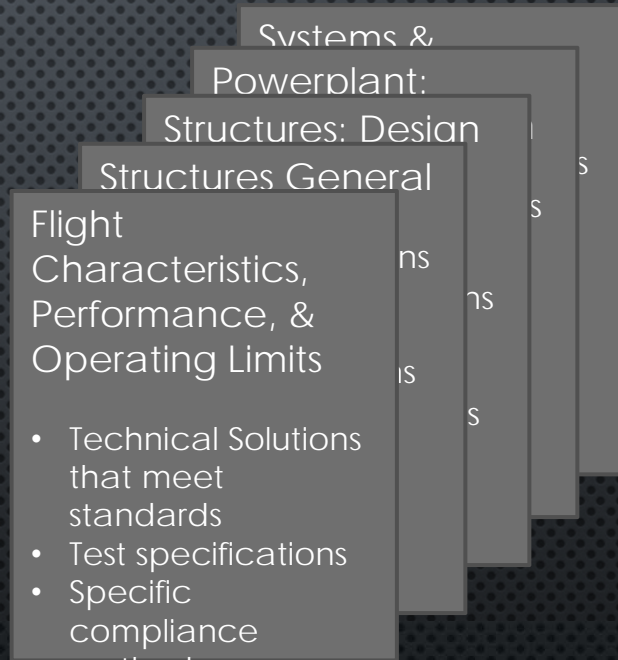


New Part-23

High-level requirements. (safety driven)
NO technical solutions prescribed
No tiers or categories



International Aviation Community



Flight Characteristics, Performance, & Operating Limits

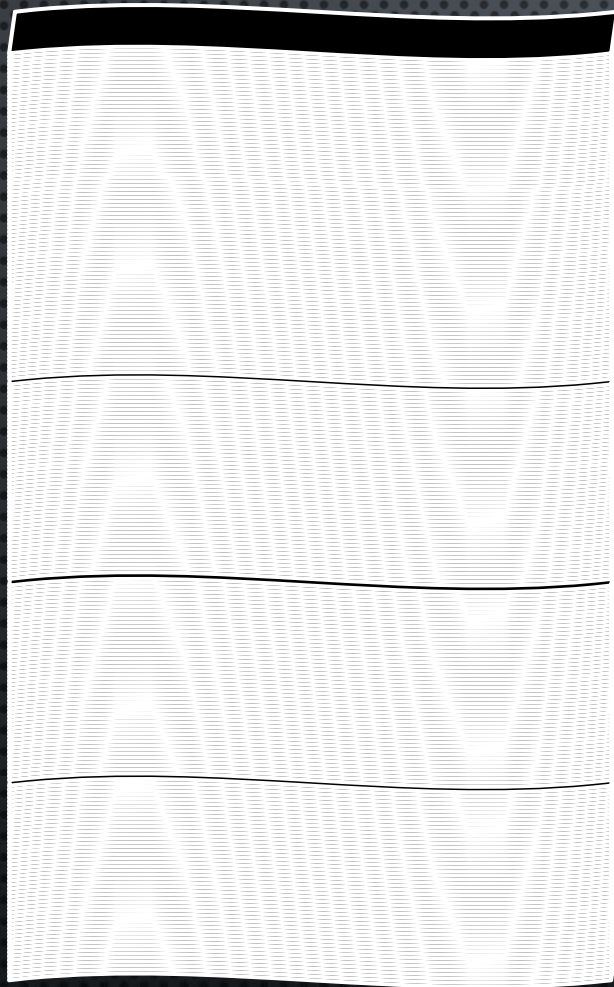
- Technical Solutions that meet standards
- Test specifications
- Specific compliance methods

Detailed Design Standards

- Tiered where it makes sense
- Contains detailed compliance requirements
- Current CS-23 used as a starting basis

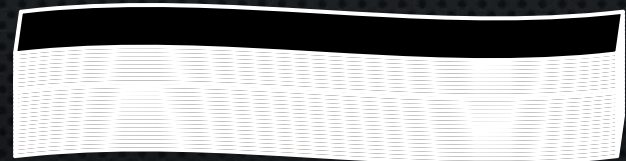
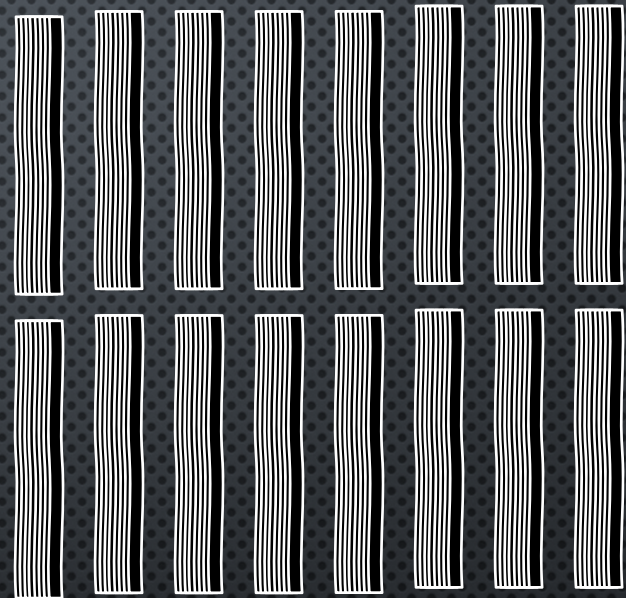


THE DRAFT PART-23



Current Part 23 (180 Pg.)

Consensus Stds.



Future Part (30 Pg.)



FAA PART 23 NPRM

- SIGNIFICANT CHANGES
 - ENABLES HYBRID & ELECTRIC PROPULSION
 - LOSS OF CONTROL
 - NON-AEROBATIC AIRPLANES: MUST WARN OF INADVERTENT STALL & MUST NOT INADVERTENTLY DEPART CONTROLLED FLIGHT
 - AEROBATIC AIRPLANES: MUST BE SPIN RECOVERABLE FROM ANY SPIN
 - ICING: IMPLEMENTS NEW ABILITY TO FLY BEYOND §25 APPENDIX C ICING OR DETECT & EXIT
 - NEW HIRF & LIGHTNING RULES

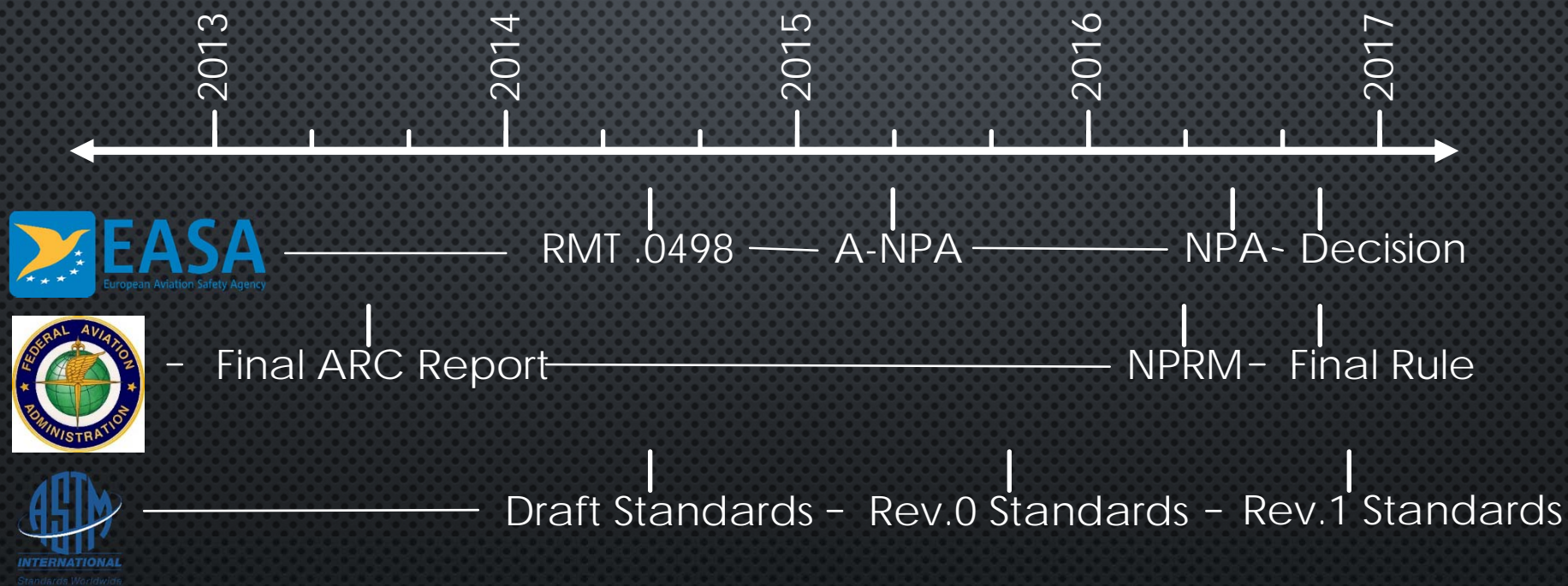


FAA PART 23 NPRM

- SIGNIFICANT CHANGES
 - INTRODUCES AIRWORTHINESS LEVELS
 - LEVEL1: 0 TO 1 PAX
 - LEVEL2: 2 TO 6 PAX
 - LEVEL3: 7 TO 9 PAX
 - LEVEL4: 10 TO 19 PAX
 - INTRODUCES HIGHSPEED/LOWSPEED
 - LOW SPEED: $V_{MO} \leq 250$ KCAS (M0.6)
 - HIGH SPEED: $V_{MO} > 250$ KCAS (M0.6)



CS-23 / PART-23 PROGRESS



GAMA ELECTRIC PROPULSION INNOVATION COMMITTEE (EPIC)



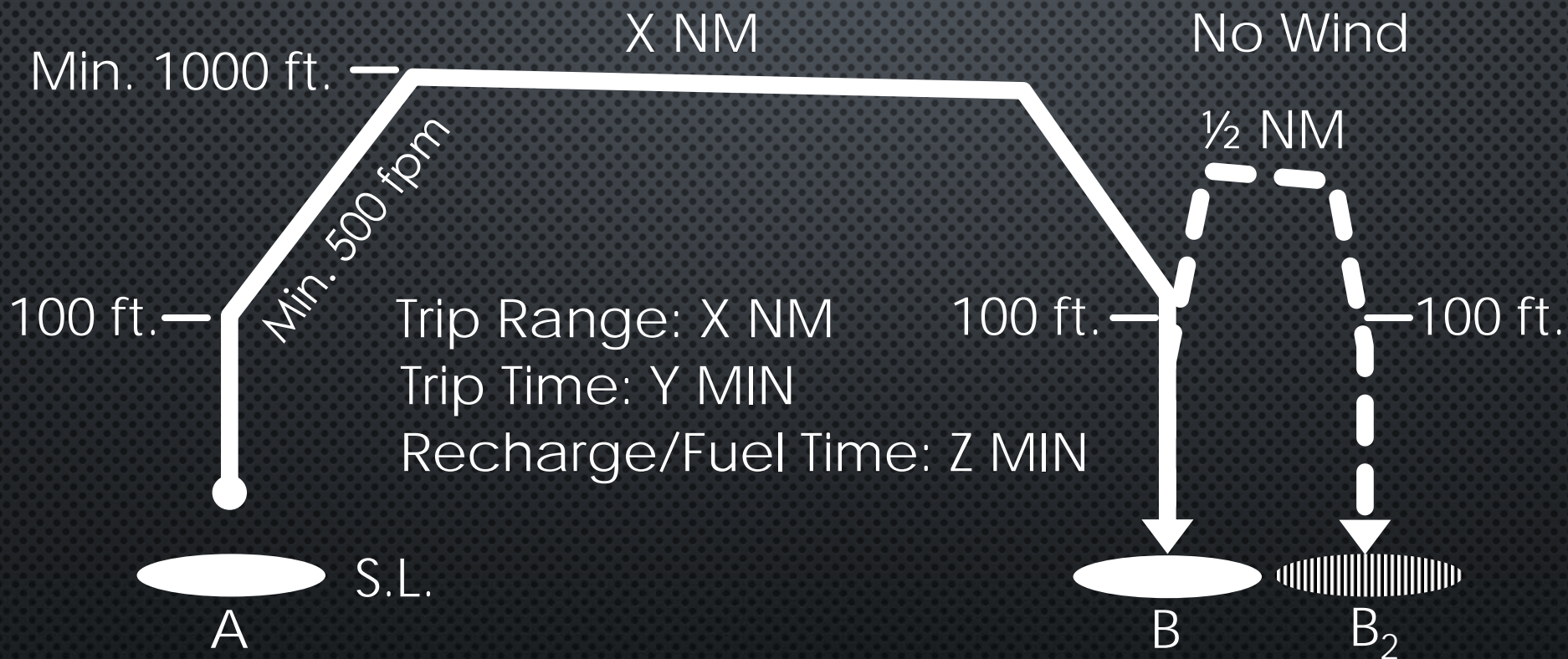


EPIC: GOALS & CURRENT INITIATIVES

- ADVOCACY & COORDINATION FOR
 - HYBRID/ELECTRIC PROPULSION DESIGN & OPERATIONS
 - SIMPLIFIED VEHICLE DESIGN & OPERATIONS
- COMMON METRICS FOR HYBRID/ELECTRIC OPERATIONS
- SIMPLIFIED VEHICLE AD-HOC COMMITTEE
- HYBRID/ELECTRIC VEHICLE ENERGY RESERVE CRITERIA



EXAMPLE: DRAFT VTOL MISSION METRIC



* Includes preflight checks, liftoff, transition/climb, cruise, transition/descent, land, balk liftoff, transition/climb, translate, land, normal shutdown & specified reserve.



GAMA PUBLICATION NO. 16

**HYBRID & ELECTRIC PROPULSION
PERFORMANCE MEASUREMENT**

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INTEGRATE DON'T SEGREGATE...

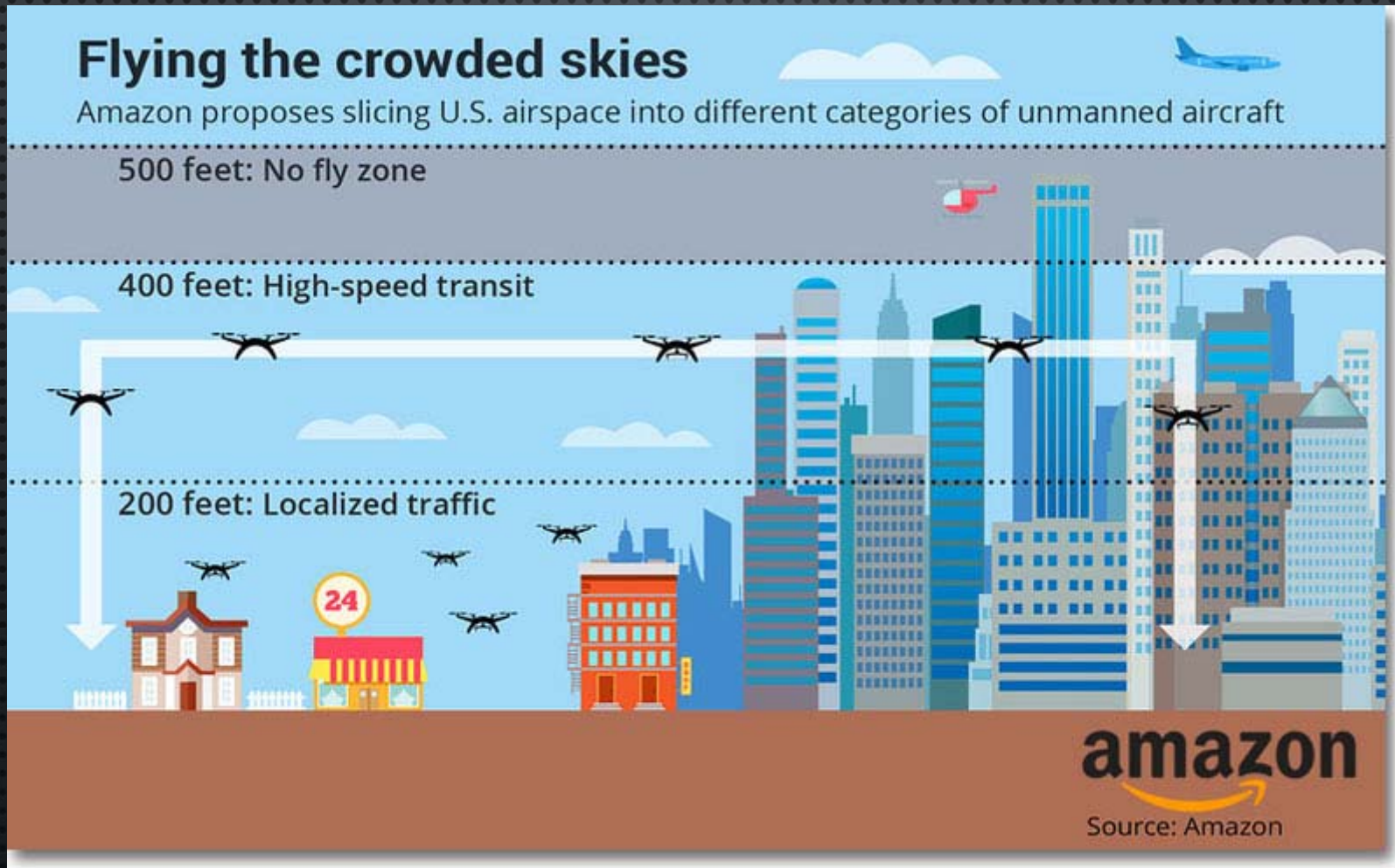
Flying the crowded skies

Amazon proposes slicing U.S. airspace into different categories of unmanned aircraft

500 feet: No fly zone

400 feet: High-speed transit

200 feet: Localized traffic



amazon
Source: Amazon



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