



*CAOA Winter Conference*  
*January 28, 2019*

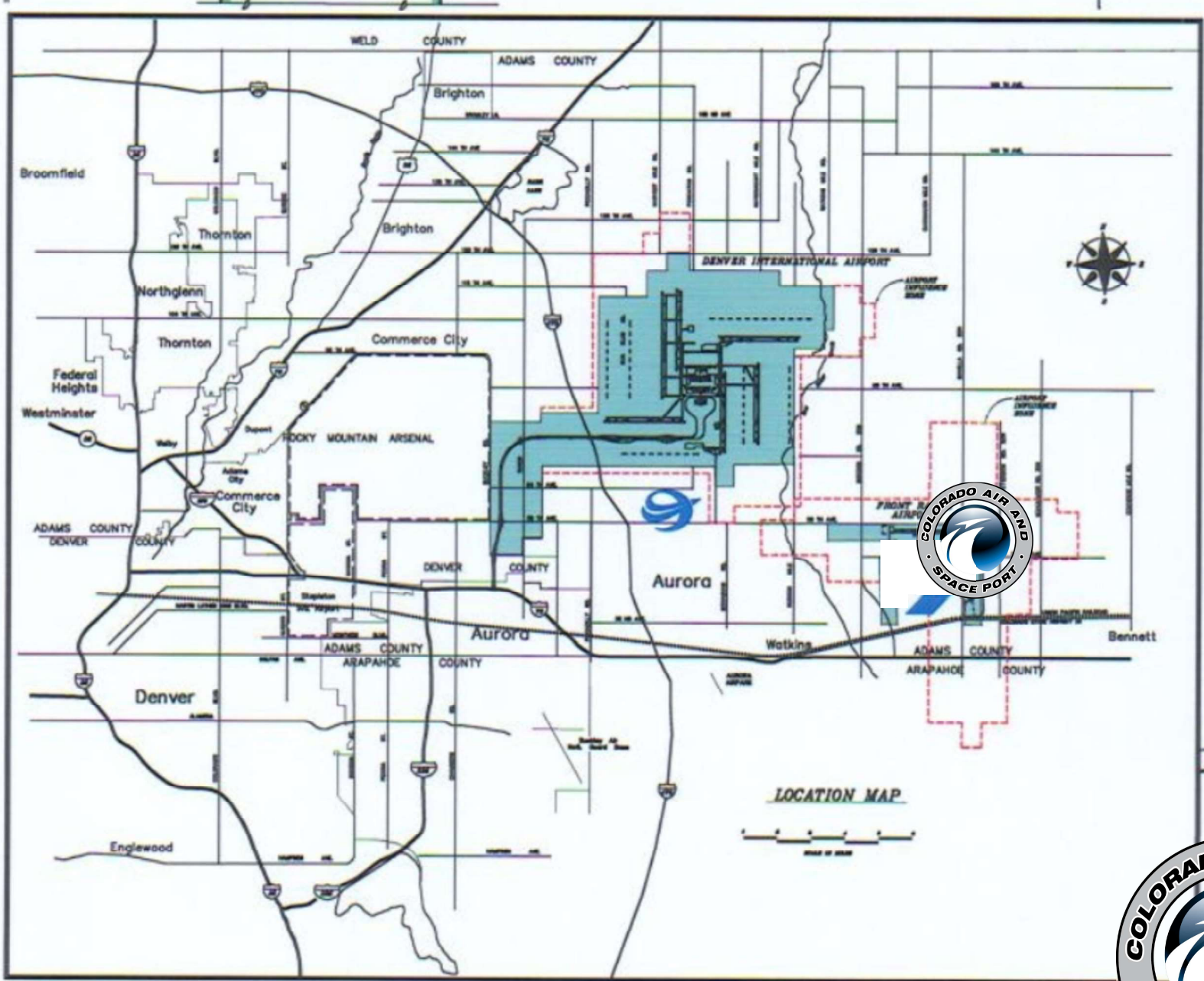
Dave Ruppel—Director  
Colorado Air and Space Port

# Growth in U.S. Spaceports: A 2017 Snapshot

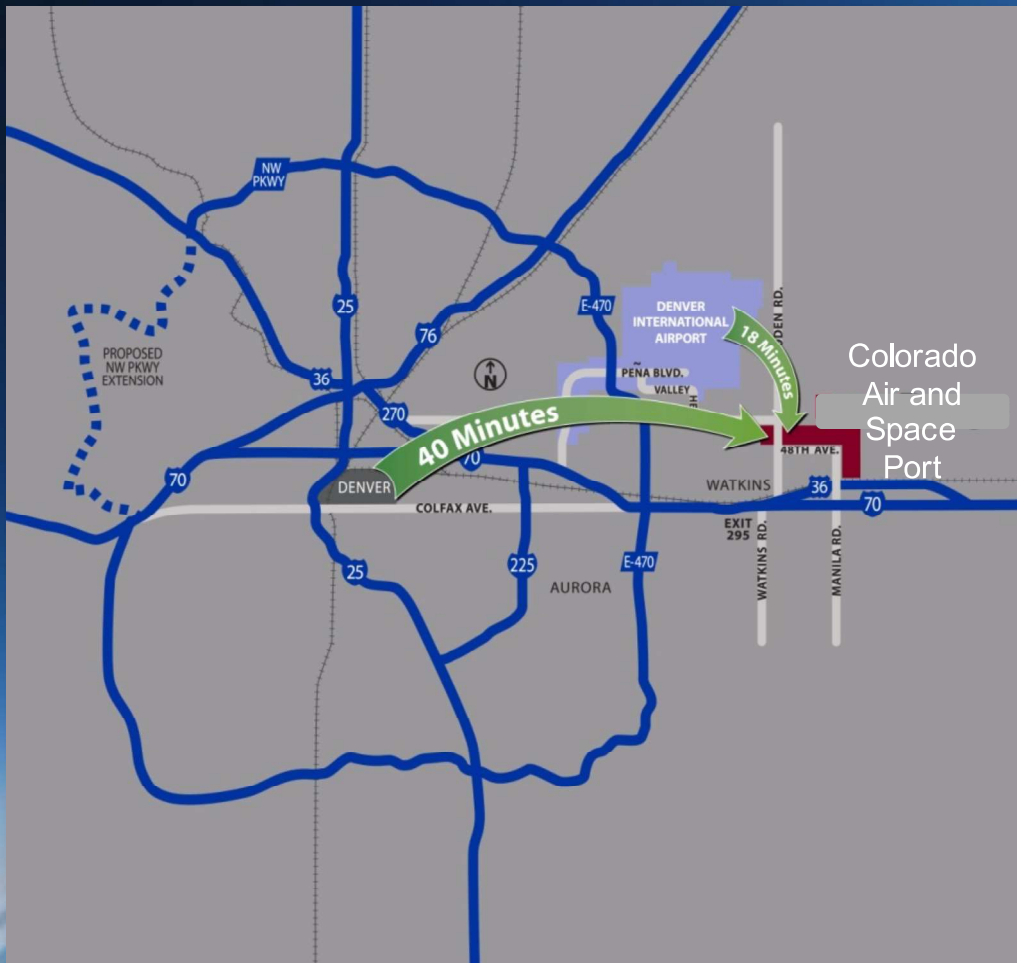


Sources: FAA and Map Resources. | GAO-17-88





# Convenient Location



- 6 miles SE of DEN
- 29 miles to downtown Denver
- Interstate highway system
- Railroad





- 1,000 On Airport Acres to Develop
- Strong Regional Support
- Great Airport Geometry
- Easy Multi Modal Access
- 6,500 Acre Planned Business Park Developing to the South
- 600 Acre Planned Business Park Developing to the East
- Surrounded by More Than 10,000 Acres future Industrial Zoned Room to Grow



# Spaceport License

- Adds FAA-Licensed sub-orbital spaceflight capabilities to current General Aviation operations
- Horizontal launch facility, using Reusable Launch Vehicles or “Spaceplanes” that take-off and land from the existing airport runways.
- Providing access to space for scientific research, education, and space tourism in the short-term; and point-to-point, high speed, sub-orbital transportation to other international spaceports in the future.
- There are three primary spaceplane Concepts, X, Y, and Z.



X



Y



Z

- “Concept X”, dual propulsion system, most viable option for Spaceport Colorado.



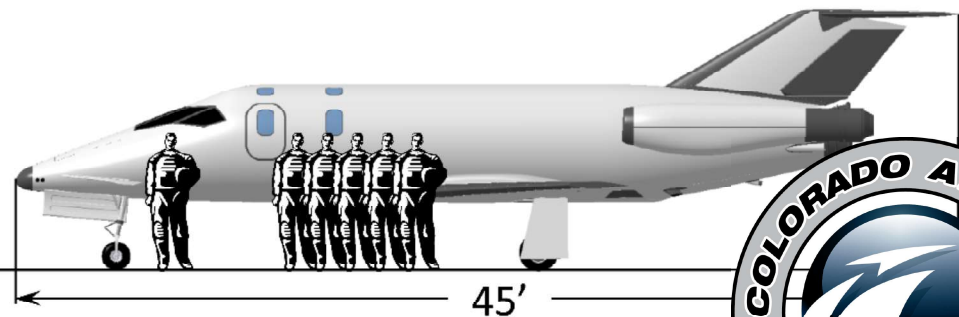
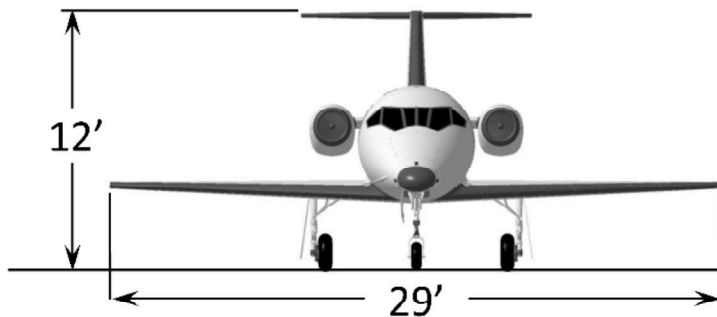
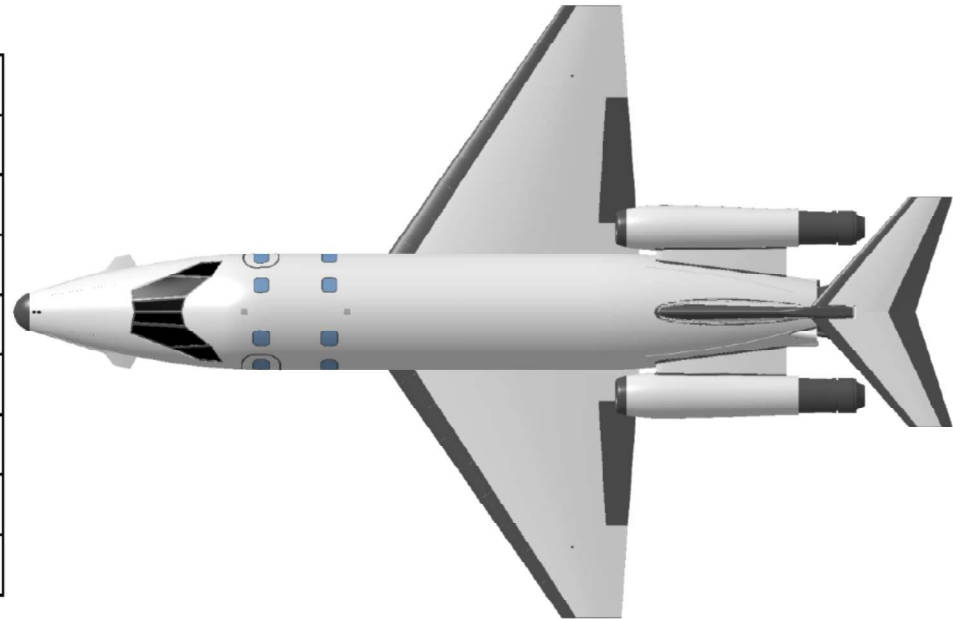
# Representative Concept RLV



# XP Specifications

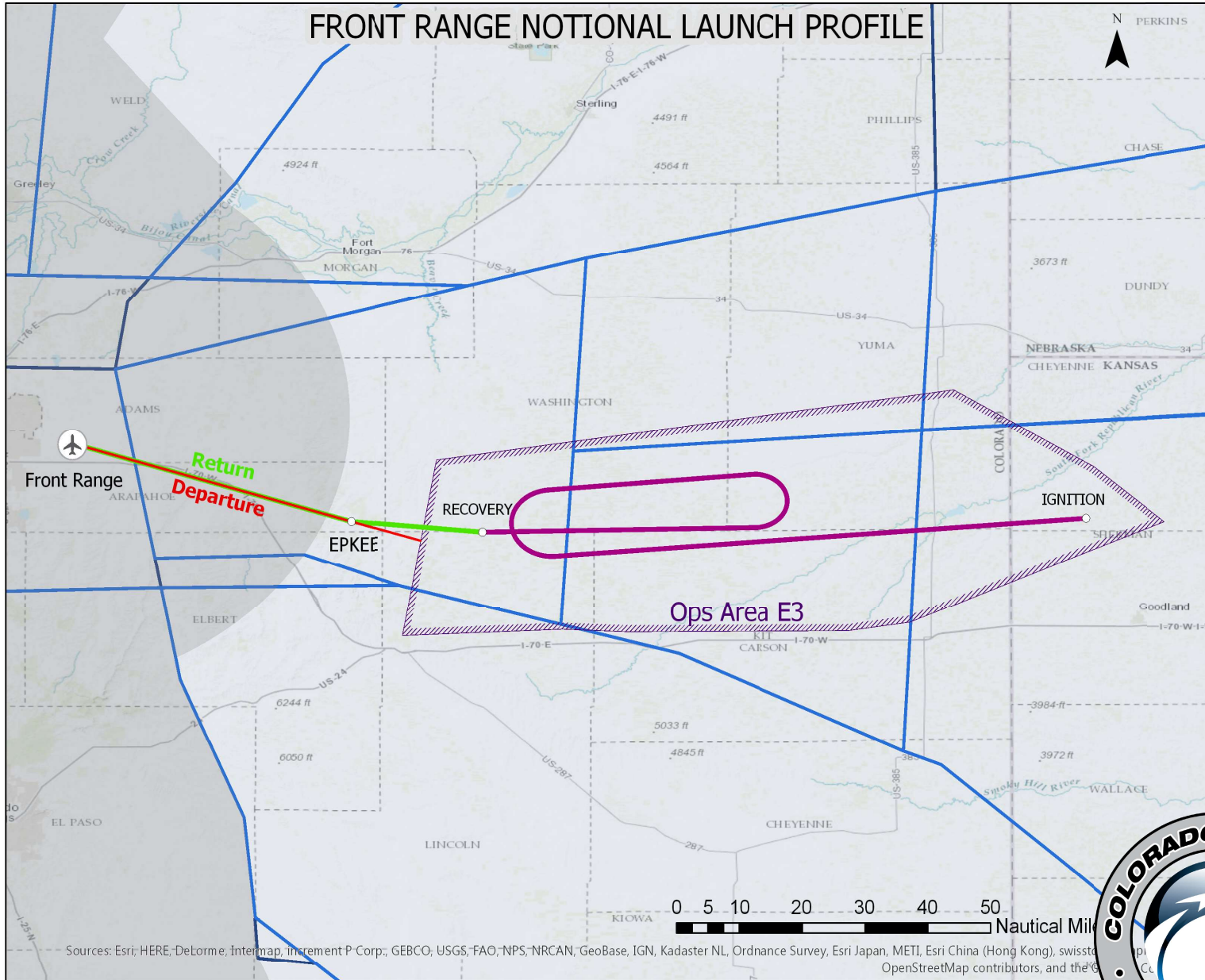


Cockpit Crew	1
Seating Capacity	5
Seat Pitch	36 in (0.91 m)
Takeoff Field Length	9200 ft (2800 m)
Landing Field Length	4300 ft (1300 m)
Max. Altitude	340,000 ft (104 km)
Mission Time ( $\mu$ G Time)	45 min (3+ min)
Jet Engine Type	GE J-85 w/ AB
Rocket Engine Type	Polaris AR-36





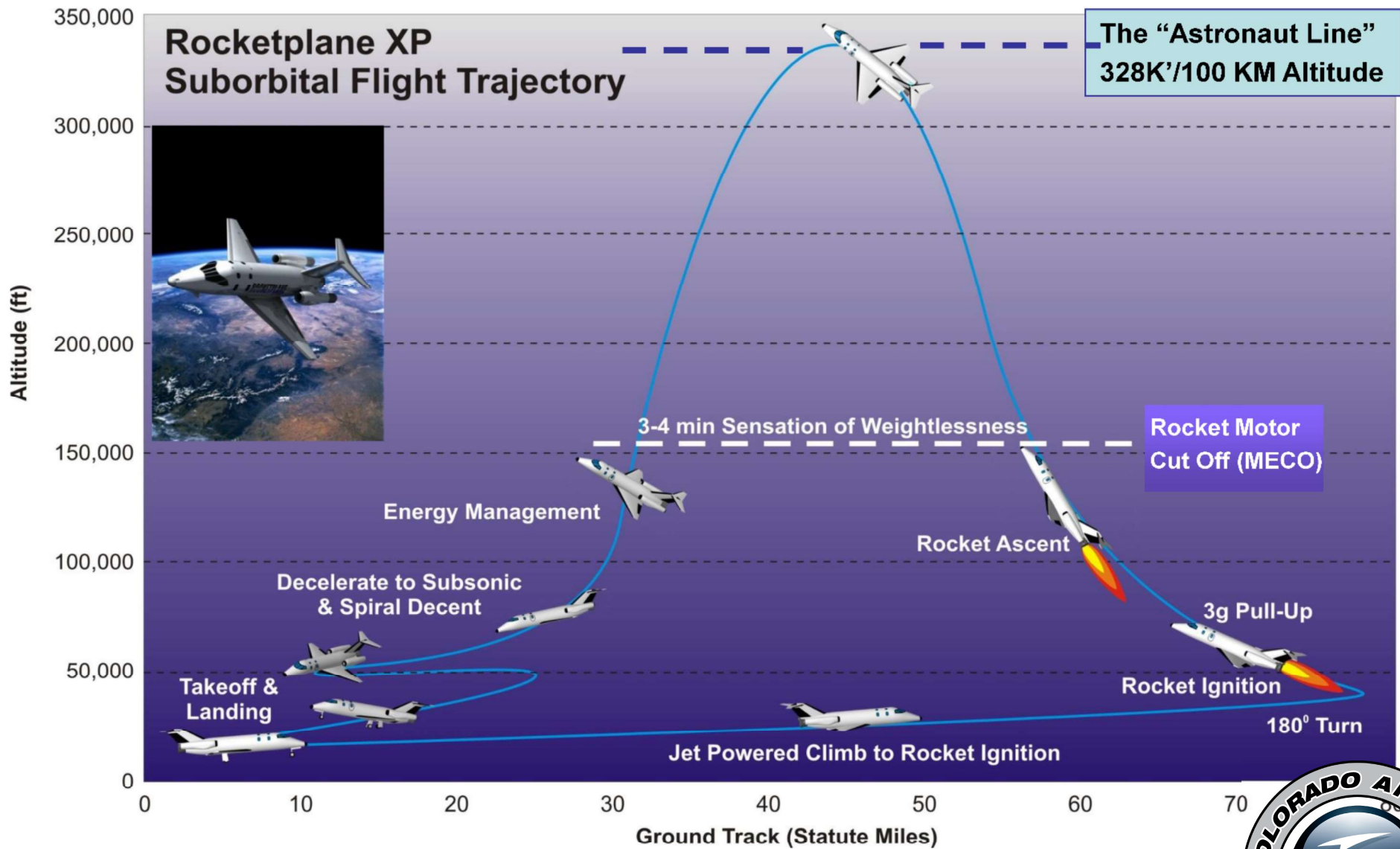
# FRONT RANGE NOTIONAL LAUNCH PROFILE



Sources: Esri; HERE-DeLorme, Intermap, increment P Corp.; GEBCO; USGS; FAO; NPS; NRCAN; GeoBase; IGN; Kadaster NL; Ordnance Survey; Esri Japan; METI; Esri China (Hong Kong); swisstopo; OpenStreetMap contributors, and the



# The Rocketplane Flight Profile



# Possibilities

Space Tourism

Space Pilot Training

Payload Delivery

Small Satellites

Research Experiments

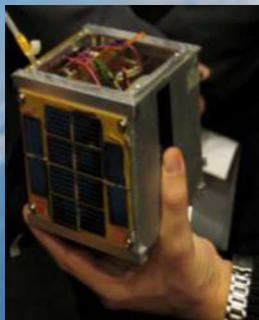
Manufacturing

Space & Ground Vehicles

Monitors, Sensors and

Electronics

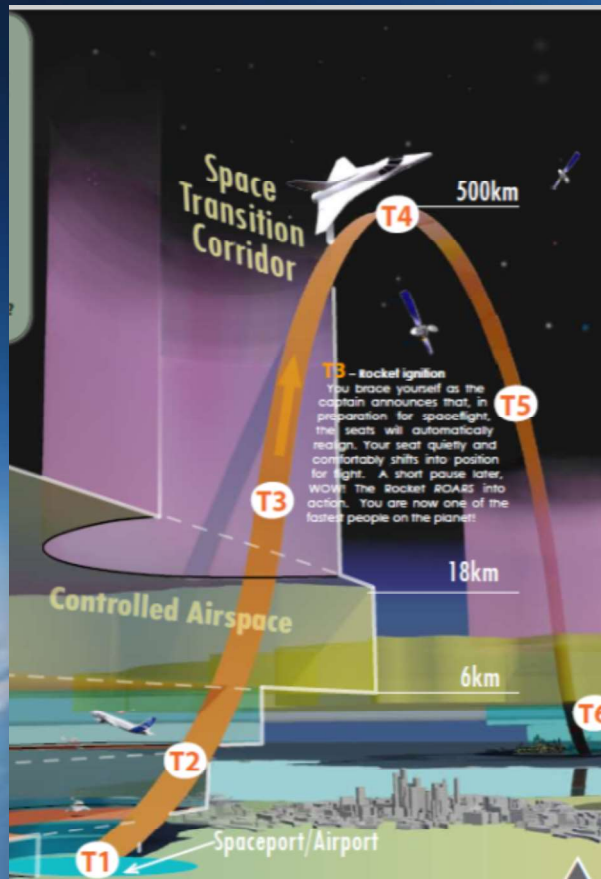
UAV's & Robotic Systems



# The Long Term: VIP & Cargo P-T-P 10+ years? Commercial P-T-P 15 -20 years?



Skylon Spaceplane - REI



Denver International Airport (DEN) to—	Distance: (Statute Miles/Nautical Miles)	Conventional Airline Travel Time—(H:M)	Suborbital Travel Time—(H:M)
New York (JFK)	1,622/1,409	4:00	0:25
Honolulu (HNL)	3,361/2,921	7:41	0:52
London (LHR)	4,660/4,049	9:00	1:12
Tokyo (HND)	5,811/5,050	12:20	1:30
Buenos Aires (EZE)	5,940/5,162	14:07	1:32
La Paz (LPB)	4,550/3,954	23:40	1:10
Sydney (SYD)	8,356/7,261	18:29	2:09
Johannesburg (JNB)	9,587/8,331	21:10	2:28



# NSG 8 Verticals of NewSpace™

Spacecraft

Launch Vehicle Providers

Human Spaceflight

Microgravity Research

Spaceland

In-Space Services

Space Resources

Space-Based Energy

**1st Vertical**

**2nd Vertical**

**3rd Vertical**

**4th Vertical**

**5th Vertical**

**6th Vertical**

**7th Vertical**

**8th Vertical**

1st Vertical

2nd Vertical

3rd Vertical

4th Vertical

5th Vertical

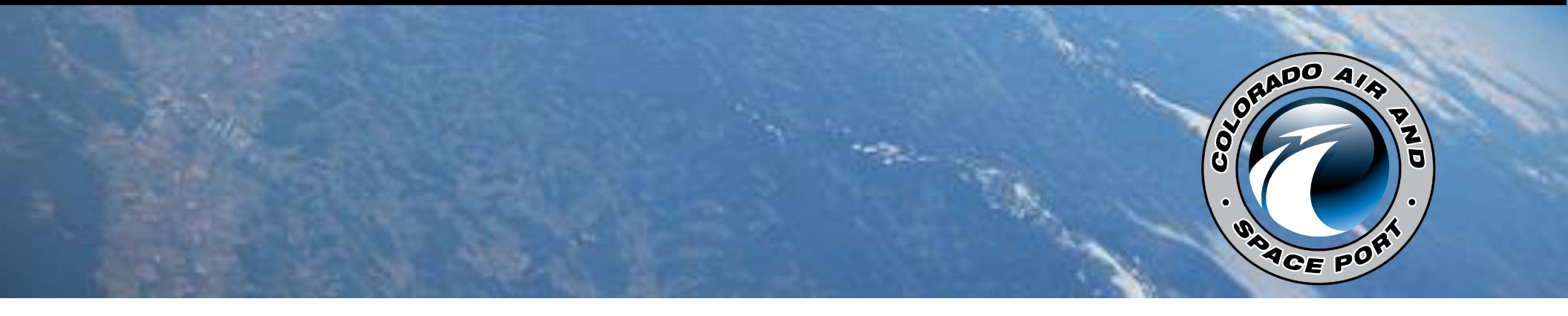
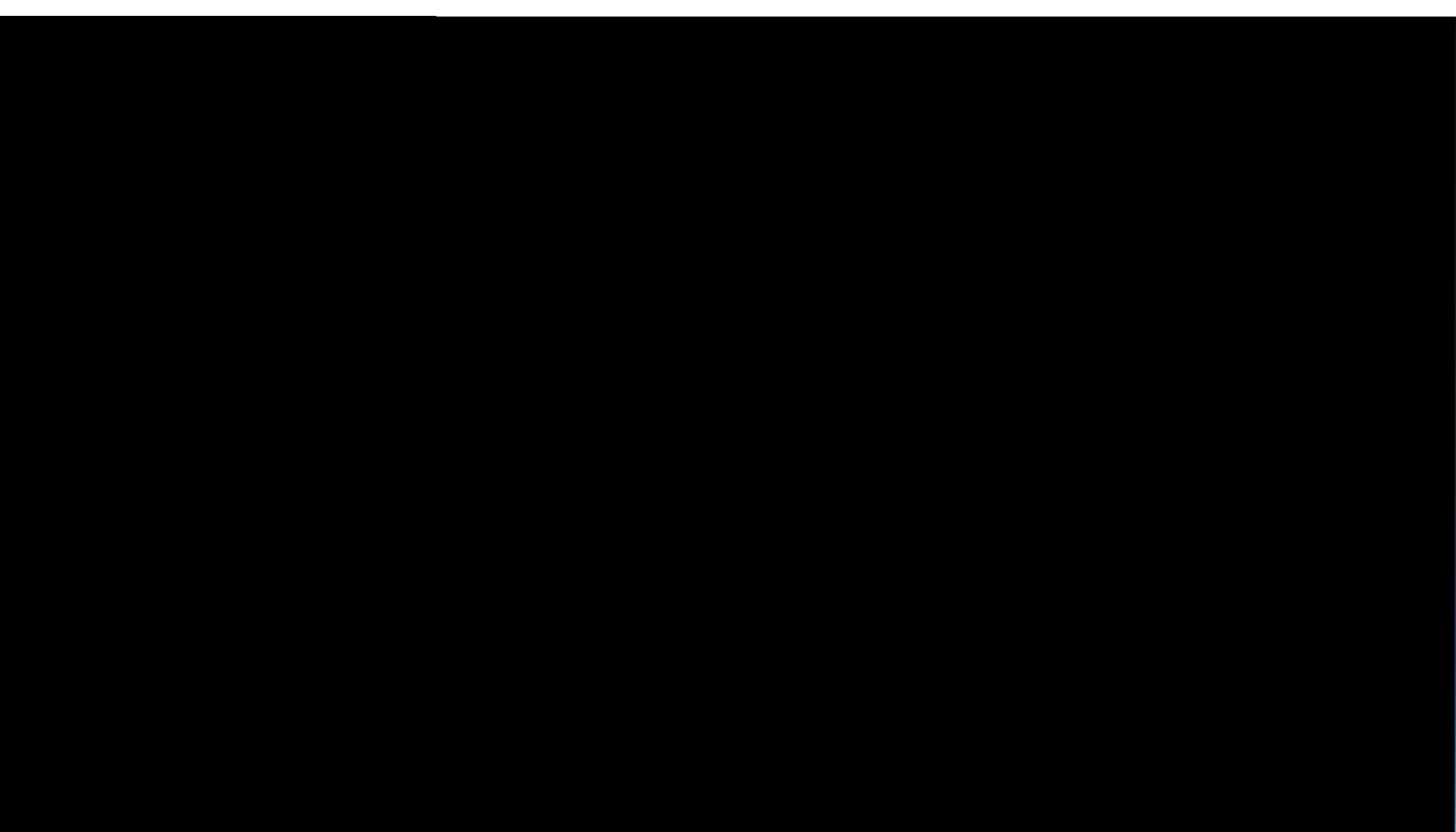
6th Vertical

7th Vertical

8th Vertical

Existing Markets Potential Markets





# Questions?

