



▶ FAA approved Commercial Space Launch Site (spaceport)

▶ The first U.S. commercial spaceport to be co-located with a major commercial airport



Midland International  
Air & Space Port

## Spaceport Business Park

▶ Available sites allow commercial space companies an economical venue for testing, production and launch operations

▶ Opportunities for commercial development

**MAF**

# MIDLAND AIRPORT

## ► COMMERCIAL AIRPORT

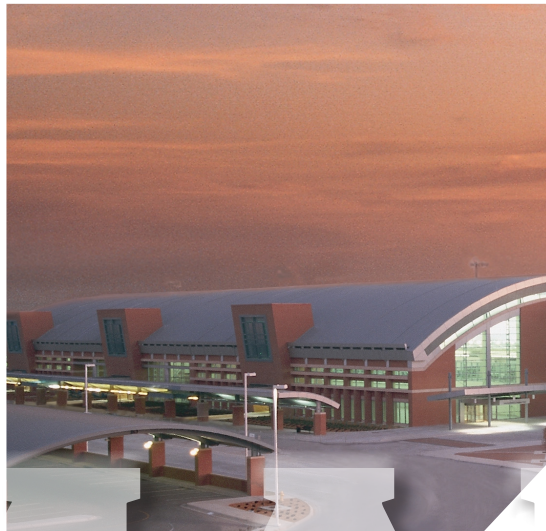
- Approximately 1,680-acre property located in Midland County, Texas, and owned by the City of Midland.
- MAF is classified by the FAA as a commercial primary small-hub airport and is certified under Federal Aviation Regulation (FAR) Part 139.
- Certified by the FAA under the Federal Aviation Regulation (FAR) Part 420 as a spaceport.
- MAF supports three airlines: American Eagle, Southwest Airlines, and United Express.
- More than 20 daily flight departures with non-stop service to Dallas Fort Worth, Dallas Love Field, Houston Intercontinental, Houston Hobby, Las Vegas, and Denver.
- Close to metropolitan area with a wide variety of quality lodging, restaurants and entertainment.
- Six rental car facilities.
- One fixed base operator (FBO), Landmark Aviation; two maintenance operators, Skywest Aviation, and Deer Horn Aviation Maintenance, Paint & Interior; Aircraft Rescue and Firefighting (ARFF) services; Transportation Security Administration; FAA facilities; and hangars for general aviation aircraft.
- Foreign Trade Zone #165 is located at MAF which is designated as a Port of Entry and has a U.S. Customs Office.

## ► SPECIFICATIONS

- Located at approximately 31 degrees, 56 minutes north latitude and 102 degrees 12 minutes west longitude.
- Elevation of 2871 feet above sea-level.
- The MAF property contains four runways and associated taxiways.
- 9500' x 150' runway, 16R/34L capable of wide body takeoffs and landings.
- Runway 4/22 spans 4,605 feet
- Runway 10/28 spans 8,302 feet
- Runway 16L/34R spans 4,247 feet
- Runway 16R/34L spans 9,501 feet
- Non-congested airspace and modern, spacious terminal with no flight/noise restrictions or imposed curfews.
- Progressive management approach to maintaining and improving infrastructure.



# Midland International Air & Space Port





# SPACEPORT BUSINESS PARK

## ▶ SPACEPORT OVERVIEW

- First commercial spaceport co-located with a major commercial airport and its services and resources.
- The spaceport area is within Midland International Air & Space Port and is under the control of the City of Midland.
- The Spaceport activity is a subset to the airport and set apart from the main terminal and ongoing commercial operations. The proposed launch vehicle that initiated the need for the Spaceport License was a Concept Y vehicle based on the XCOR Lynx Mark I and II, a HT/HL suborbital, reusable launch vehicle.

## ▶ WHAT WE HAVE TO OFFER

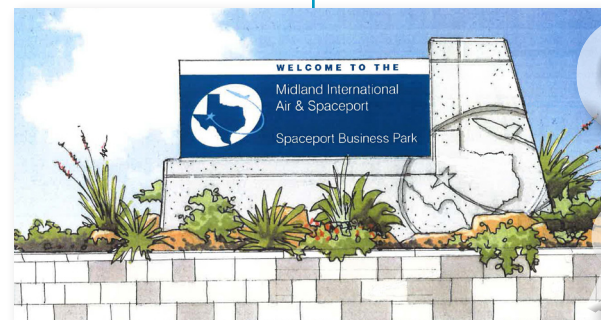
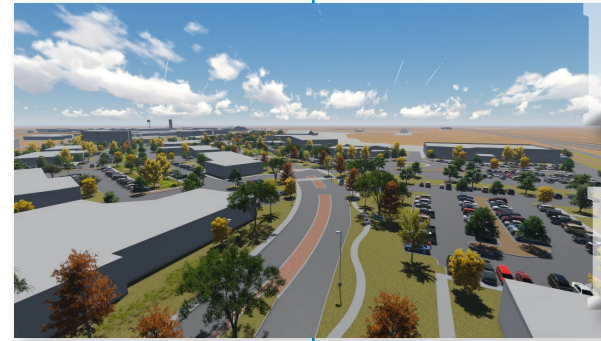
- 50-acres of land on the southeast side of the Midland International Air & Space Port has been designated as the Spaceport Business Park.
- XCOR Aerospace and Orbital Outfitters are the first two businesses to commit to locate at the Spaceport Business Park.
- Ground leases available for aerospace/aviation development adjacent to air carrier strength concrete ramp.
- Open areas for flight and energetic testing.
- Located in growing metropolitan area with many amenities.

## ▶ MDC'S ROLE

- The MDC has completed a Spaceport Master Plan and conceptual layout of the business park.
- The design and construction of the roads, landscaping and utilities began in 2015.
- The Spaceport Business Park will be marketed to the aerospace industry and the commercial space industry to continue to bring diversification to Midland.



- ▶ FAA Approved Commercial Space Launch Site (spaceport)
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- ▶ Available sites allows commercial space companies an economical venue for testing, production and launch operations
- ▶ Opportunities for commercial development
- ▶ The MDC can provide active business support for diversified companies
- ▶ Favorable regulatory environment
- ▶ Growing a cluster of innovative aerospace companies and a strong labor market of engineers and technical workers
- ▶ The Midland Altitude Chamber Complex (MACC) provides higher education R&D opportunities
- ▶ Higher education support for the aerospace industry
- ▶ Aerospace companies work closely with local school districts to focus on STEM fields



2019-2020

# SPACEPORT TENANTS



## ▶ XCOR AEROSPACE

- Midland International Air & Space Port is home to XCOR's Commercial Spaceflight Research and Development operations.
- XCOR is the first tenant at the Spaceport Business Park.
- Renovations are in progress to the existing hangar at the Spaceport Business Park.
- The XCOR Lynx is a piloted, two-seat, fully reusable liquid rocket-powered spacecraft that takes off and lands horizontally, and will rocket customers to space and back.

## ▶ COMPANY OVERVIEW

XCOR Aerospace is a small, privately-held corporation founded in 1999. The company has evolved from its original four founders, working out of their chief engineer's tiny hangar, to a team of 50+ highly-skilled, experienced and talented employees. The company is the path to the dream of spaceflight for its founders who recognize that the only way for them to get to space is to make it affordable for private citizens.

XCOR is focused on the research, development, project management, production and maintenance of safer, more reliable, reusable suborbital and orbital launch vehicles (RLVs), rocket engines and rocket propulsion systems. In sixteen years the first has developed and built thirteen different rocket engines and built and flown two manned rocket-powered aircrafts.





# SPACEPORT TENANTS



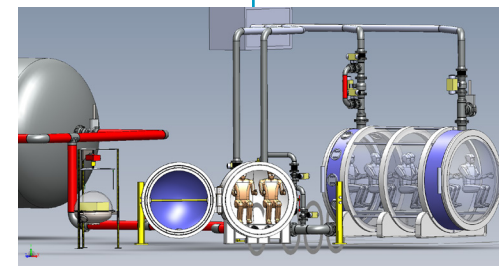
## ► ORBITAL OUTFITTERS

- Midland International Air & Space Port is home to Orbital Outfitter's Space Pressure Suit Manufacturing and Development Center.
- Orbital Outfitters is the second tenant at the Spaceport Business Park.
- Construction of the Midland Altitude Chamber Complex (MACC) will be completed by the end of 2015 and will be managed by Orbital Outfitters.

## ► COMPANY OVERVIEW

Orbital Outfitters was founded in 2006 by Chris Gilman, Krysta Paradis, and Rick Tumlinson and specializes in a range of services to vehicle developers and other companies in the aerospace sector. Their two primary lines of business are the development of space and pressure suits and services offered through the Midland Altitude Chamber Complex.

Orbital Outfitters has supported both public and private customers including NASA, XCOR Aerospace, Hamilton Sunstrand, and SpaceX.





# MIDLAND ALTITUDE CHAMBER COMPLEX

# MACC

## ► OVERVIEW

The Midland Altitude Chamber Complex (MACC) is a world-class high-altitude test facility located at the Midland International Air & Space Port in Midland, Texas. The MACC is owned by the Midland Development Corporation and operated by Orbital Outfitters. It will support the testing and qualification of space and pressure suits, payloads, subsystems and components, as well as flight crew training operations.

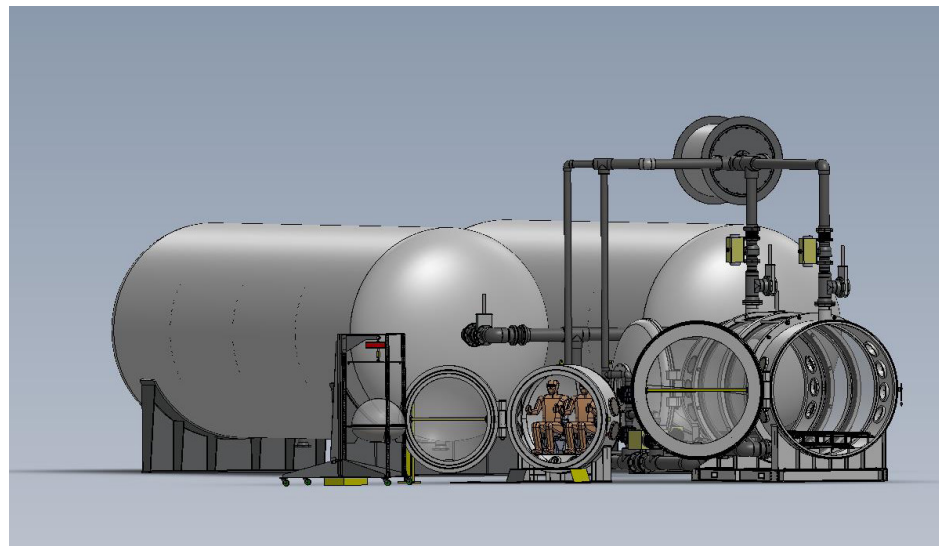
The complex features three hypobaric chambers for testing equipment and training personnel in normal and emergency flight conditions. The MACC has a small Equipment Chamber, a two-person Suit Chamber to test pressure suits, and a Cabin Chamber that can accommodate up to ten people or a vehicle cabin / flight deck. This complex will be the world's most advanced human-rated commercial altitude chamber facility capable of testing real flight hardware in accurate flight pressure conditions.

The two larger chambers will allow for testing of pressure suits prior to their operation. They will also provide valuable experience for high-altitude travelers to get the feel of wearing a pressure suit and performing tasks in a low-pressure environment. Travelers will have the opportunity to learn how to handle normal tasks and emergencies before deploying on a mission.

The chambers are attached to two large outdoor vacuum tanks for conducting simulation of various flight profiles and emergency rapid-decompression conditions. The Suit and Cabin chambers both can decompress to an altitude of 100,000-feet. For rapid, decompression operations, the Suit Chamber can decompress from sea-level to a 100,000-foot altitude in less than five seconds and the Cabin Chamber can decompress from sea-level to a 60,000-foot altitude in less than 15 seconds. All chambers can operate at altitudes up to 100,000-feet and permit accurate nominal flight pressure mission profiles to be flown as well.

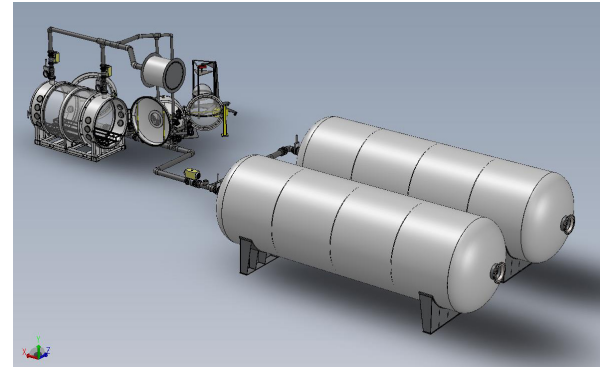
## ► HIGHLIGHTS

- Chambers with large clear acrylic areas allow visibility of chamber contents / occupants
- Reconfigurable to accommodate customer test parameters and goals
- Large elevated Control Room with visitor viewing area
- Flexible training and data review area
- System meets strict ASME and PVHO safety standards



## ▶ MACC VACUUM SYSTEM

- Two tanks totaling 8450-cubic-feet
- Large vacuum pump permitting multiple rapid decompression runs per day
- Small vacuum pump for Equipment Chamber operations
- Flexible controls for nominal and emergency mission profiles



## ▶ MACC EQUIPMENT CHAMBER

The MACC Equipment Chamber allows users to test the capabilities of equipment or components to withstand the effects of low pressure in a flight altitude environment. The chamber is capable of maintaining altitude indefinitely in support of equipment assessments and long-duration user / university experiments. Additional chambers can be added and customized to user requirements, such as glove boxes, larger or smaller test volumes, etc.

An acrylic dome supports direct observation and photo/video recording of work being conducted. All vacuum, vent, and electrical pass-throughs are located in the lower steel dome of the chamber to avoid obscuring view of the article under test.



## FEATURES

- Sea-level to 100,000-foot operating altitude
- Maintains and/or adjusts altitude indefinitely
- Accommodates 500 lbs, 8U test article
- 11.8-cubic-foot internal volume
- 36-inch diameter transparent acrylic dome
- Controllable manually or via customer laptop
- Adjustable work height
- Movable to accommodate user privacy or physical space requirements
- Custom variants can be built to user specifications including glove boxes

## ► MACC SUIT CHAMBER

The MACC Suit Chamber provides accurate flight ascent and descent pressure profiles from sea-level to an altitude of 100,000-feet and supports rapid decompression from sea-level to 100,000-feet in under 5 seconds. The chamber consists of a six-foot diameter steel cylinder with a transparent domed acrylic full-diameter door. It is capable of supporting two persons, seated, in pressure suits. Occupants are visible from the control room and by personnel in the chamber room.

The suit chamber is used for testing flight suits and for training personnel in flight pressure conditions. Flight pressure suits can be tested without humans to provide feedback on suit performance under low-pressure conditions, to evaluate design of the suits, and to assess performance of the suit support systems such as regulators, controls, and software in extreme conditions. The suit chamber also accommodates training of personnel for space flight. They will:

- Understand the effects of rapid decompression
- Practice conducting manual operations in low pressure conditions
- Learn how to handle emergencies
- Simulate flight profiles for a wide range of space flight vehicles.

Safeguards in place include accommodations for redundant monitoring of occupants, as well as redundant air and cooling supply and emergency egress if necessary. Monitors and recording instruments can be mounted to fixtures inside and outside the chamber to record occupant activities.



## FEATURES

- Accommodates two persons in pressure suits
- 5-foot-diameter chamber with 95 cubic-foot internal volume
- 120-degree acrylic dome on full diameter door permits excellent visibility of occupants
- Supports user defined flight profiles from sea-level to 100,00-feet
- Provides rapid decompression from Sea-Level to 100,000-feet in under 5 seconds
- Maximum decompression rate of 10.8 psi/sec
- Reconfigurable interfaces to accommodate various pressure suit and chamber configurations
- Certified to ASME and PVHO standards



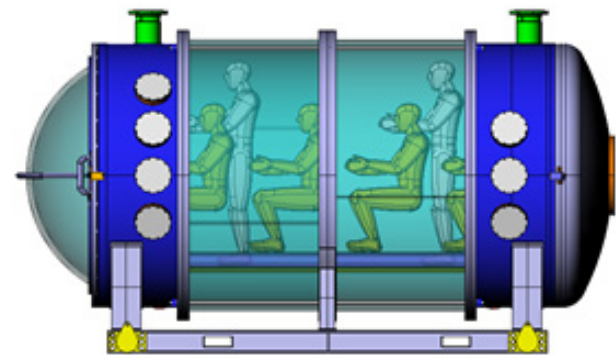
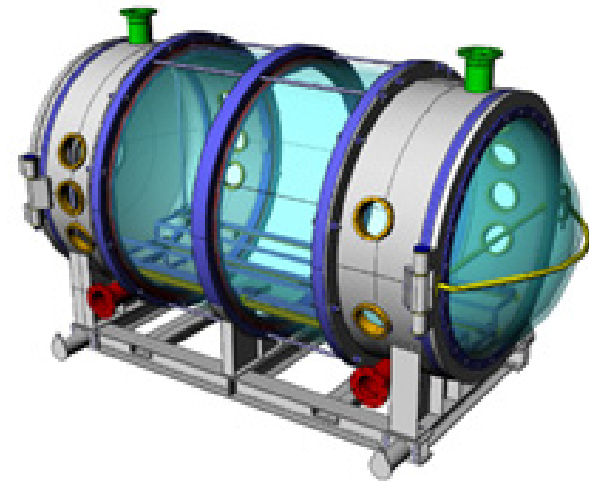
## ► MACC CABIN CHAMBER

The MACC Cabin Chamber provides accurate flight ascent and descent pressure profiles from sea-level to an altitude of 100,000-feet and supports rapid decompression from sea-level to 60,000-feet in under 15 seconds. The chamber consists of a 7.5-foot-diameter steel and acrylic cylinder with a domed acrylic full-diameter door on the front and a 24-inch-diameter window in the full diameter aft door. It is capable of supporting a ten-person crew in pressure suits. It also will accommodate a vehicle cabin or flight deck, allowing occupants to review operations prior to actual flight. Occupants are fully-visible from the control room and by personnel in the chamber room.

The Cabin Chamber can be used for testing pressure suits, cabin and flight deck equipment and the interfaces between them as well as training personnel in flight pressure conditions. Testing will provide feedback on suit and crew performance under low-pressure conditions and assess performance of the cabin environmental control and life support subsystems, as well as suit support systems, regulators, controls, and software. The cabin chamber also accommodates training of personnel for space flight. They will:

- Understand the effects of rapid decompression
- Practice conducting manual operations at altitude
- Learn how to handle emergencies
- Simulate flight profiles for a variety of space flight vehicles.

Safeguards in place include accommodations for redundant monitoring of occupants, as well as redundant air and cooling supply and emergency egress if necessary. Monitors and recording instruments can be mounted to fixtures inside and outside the chamber to record occupant and systems activities.



## FEATURES

- Accommodates up to 10 persons in pressure suits
- 7.5-foot- diameter chamber with 680-cubic-foot internal volume
- 120-degree acrylic dome on full diameter door and two full diameter acrylic chamber cylinders permits excellent visibility of occupants and internal equipment under test
- Supports defined flight profiles from sea-level to 100,00-feet
- Provides rapid decompression from sea-level to 60,000-feet in under 15 seconds
- Maximum decompression rate of 10.8 psi/sec
- Reconfigurable interfaces to accommodate various pressure suit and chamber configurations
- Certified to ASME and PVHO standards



# MAPS

## CONCEPTUAL SITE USAGE PLAN

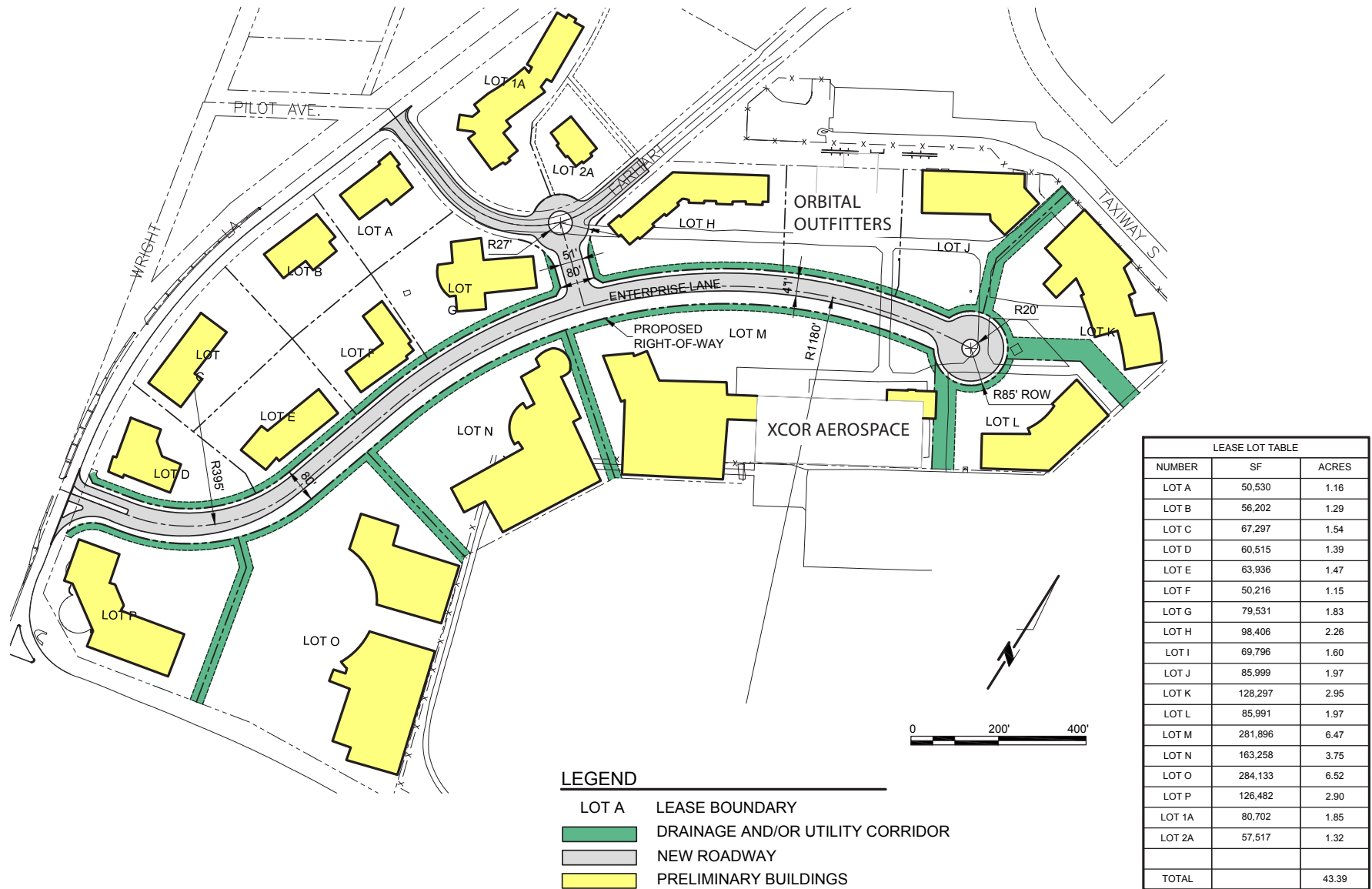


These maps show a conceptual layout of the Midland Spaceport Business Park. All lot sizes and shape are flexible and negotiable. If you have specific requirements or questions, please let us know .



# MAPS

## CONCEPTUAL LEASE LOT LAYOUT

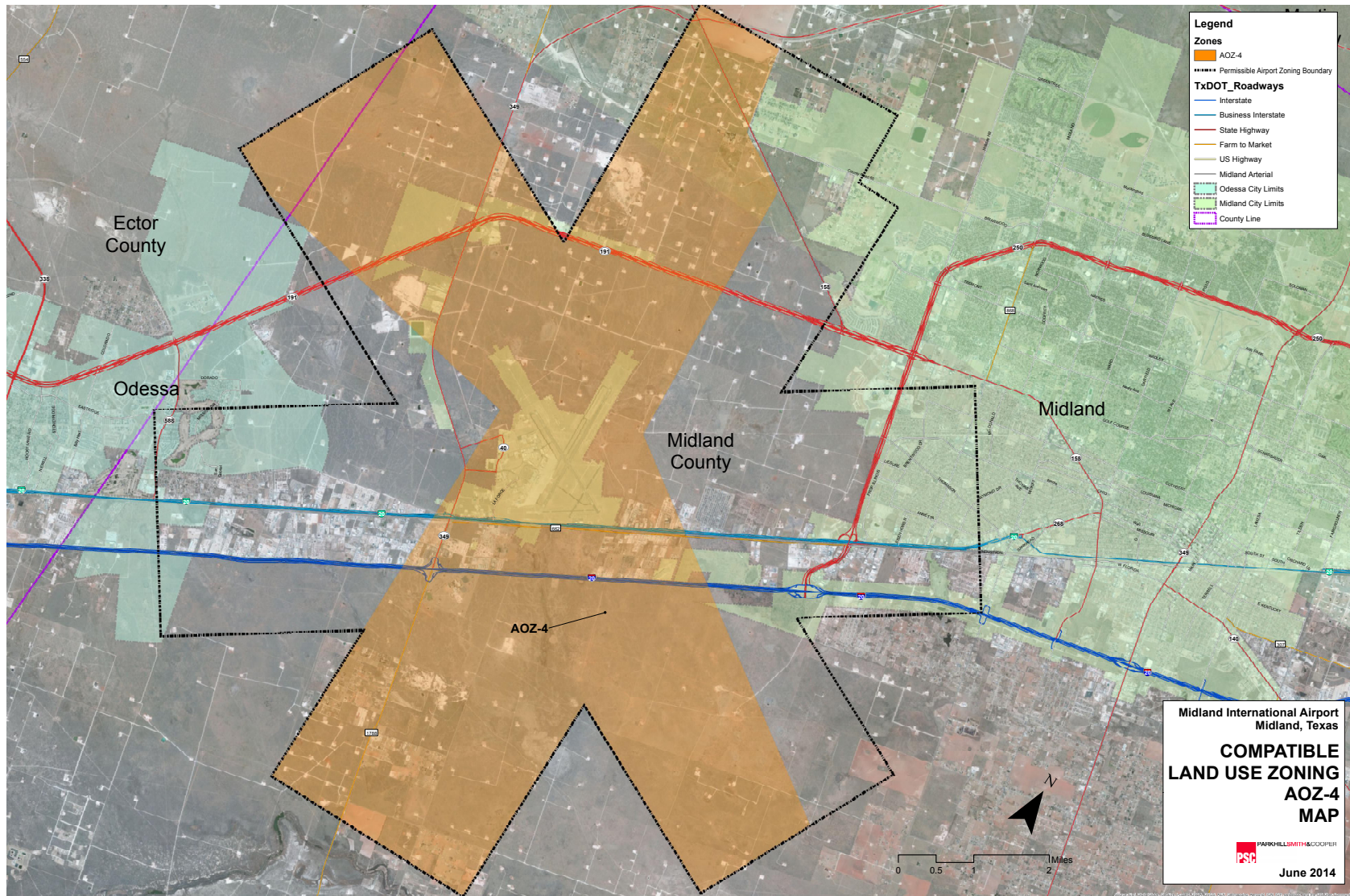






# MAPS

## COMPATIBLE LAND USE ZONING MAP



The Compatible Land Use Zoning Map shows the extent of the new area around the Midland International Air & Space Port that may be subject to local land compatibility zoning regulations.





# MAPS

## AIRPORT AERIAL



The airport is located on Business I-20. The airport is located 10-miles from downtown Midland and 11-miles from downtown Odessa.





Spaceport

- Launch Viewing Center
- Spaceport Visitor Center & Restaurant
- XCOR Aerospace
- Orbital Outfitters
- Loral ICOR Systems
- Thiokol Propulsion Systems

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