

Houston is more closely identified with space than any other American city.

It is home to the Johnson Space Center. The city has sports teams named “Astros” and “Rockets” and “Comets.” Even the first word spoken from the moon was “Houston.” For all that, Houston has never been the launch site for a spacecraft.

The plan is for that to change. According to Mario Diaz, head of the Houston Airport System, by 2016 or 2017 the city’s third airport, Ellington, will be reborn as Spaceport Houston.

The traditional sites for rocket launches have been somewhat remote. The Kennedy Space Center’s launch sites on Merritt Island, Fla., are miles from the nearest neighbors. Vandenberg Air Force Base in California, where satellites are launched into polar orbit, juts out into the Pacific Ocean. The reason, Diaz explained, is that big rockets make bad neighbors.

“When you must lift such weight with no aeronautical features like wings that provide lift, you get lots of noise, toxic fuels, and chemicals,” Diaz said. “We just don’t want that.”

The future Spaceport Houston already has lots of neighbors. Ellington Airport is hemmed in between Pasadena and Clear Lake in the suburbs southeast of the city. The airport is used by the military, NASA, and general aviation, and those customers will have to share three 9,000-foot runways with

the new space-faring ones. Instead of rockets, the plan is for the spaceport to be the take-off and landing spot for horizontally launched suborbital vehicles, such as Virgin Galactic’s SpaceShipTwo and XCOR’s Lynx.

Horizontally launched vehicles have many advantages, according to Sirisha Bandla, assistant director of the Commercial Spaceflight Federation. “They have quick call-ups, turn-around times, and access to the payload afterwards,” she said. “You can launch them multiple times in a day, giving you frequent access to space. A lot of sub-orbital research can be done in the near term because of that frequent access.”

Because “space launch” no

longer refers solely to a vertical, rocket-powered take-off as per the Space Shuttle, the industry has designated three launch concepts that incorporate the burgeoning commercial sector: X, Y, and Z. “Concept Y is a vertical lift vehicle,” Diaz said. “We won’t have any of these at Ellington. Concept X is a vehicle that takes off and lands like a regular aircraft, but it is rocket-powered with oxidizers.” The XCOR Lynx is a Concept X vehicle that can take off and land up to four times in one day.

“Concept Z uses a carrier aircraft, and the spacecraft is cuddled in the wings,” Diaz said. “At 50,000 feet to 60,000 feet, the spacecraft is dropped, and its rockets fire.”

SpaceShipTwo is a Concept Z vehicle. It is a larger version of the Ansari X Prize-winning SpaceShipOne. Both vehicles were designed and built by Burt Rutan’s company, Scaled Composites. The carrier aircraft is the WhiteKnightTwo, and SpaceShipTwo is the suborbital vehicle.

Between the Lynx and SpaceShipTwo, “there are already more than 700 tourist reservations,” said Bandla.

The first hurdle for achieving spaceport status and launching these and other vehicles is licensing, which Diaz said will cost Houston about \$1 million.

“Historically, it’s taken between three to five years to get the License to Operate a

# DOWN TO LAUNCH IN HOUSTON

BY BRIDGET MINTZ TESTA



## GATEWAY TO SPACE

The planned spaceport in Houston is designed to support vehicles that lift off and land horizontally, like conventional aircraft. Future expansion could see the construction of a passenger terminal.

Image: Houston Airport System





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Launch Site, or LSO,” said Brian Gulliver, deputy service leader for spaceport planning at RS&H, an engineering firm with multiple specialties. The industry wants to reduce that time to 12 to 18 months, including the six months it takes the Federal Aviation Administration to review an application.

That’s right: the FAA issues LSOs, not NASA. The space agency’s charter limits it to research, development, and exploration.

An LSO requires a long list of approvals. “Environment and safety are the two biggest parts of the effort—more than half of it,” Gulliver said. The prospective spaceport must coordinate

its flight activities with the military, multiple FAA groups, local airports, and any other affected entities—also a big job.

There’s another major hurdle: the climate of the commercial space launch industry.

“It’s a confidence factor,” Diaz said, “not any specific vehicle or launch.” If commercial space launches are going well, customers will come. A string of launch failures will drive them away. If Ellington

gets the license—and if the industry flourishes—Diaz said that Spaceport Houston might extend one runway to 11,000 feet and build a terminal with three or four gates.

If the industry flourishes, Bandla sees even more possibilities for new spaceports like Houston’s. “The industry is so new that it’s almost like a disruptive technology,” she said. “It could be like a new computer revolution.”

With several commercial launch sites to choose from, what will attract customers to Spaceport Houston?

According to Diaz, Houston’s advantages include the Johnson Space Center, a large number of

aerospace companies, and a low-cost business environment.

Training facilities for tourist- or passenger-astronauts (who must deposit around \$250,000 per ticket for a future ride on Virgin Galactic’s SpaceShipTwo) could be big, too. “Going to space is not like flying in an aircraft,” Diaz said. “You need more than a two-minute stewardess talk. You need to understand hypoxia, keep your composure, and understand the complexities and risks of spaceflight.”

If there’s any place that understands the complexities and risks of spaceflight, it would be Houston. **ME**

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