

PALM BEACH COUNTY  
BOARD OF COUNTY COMMISSIONERS

WORKSHOP SUMMARY

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Meeting Date: March 23, 2021

Submitted By: Department of Airports  
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I. EXECUTIVE BRIEF

**Title:** Presentation by Lilium and Ferrovial Airports (Ferrovial) regarding proposed regional air mobility service operations in Palm Beach County.

**Summary:** Lilium, an aviation development company with headquarters in Munich, Germany, and Ferrovial, an airport infrastructure development and management company with headquarters in Madrid, Spain, recently announced that they partnered to launch a regional air mobility service in the Central and South Florida regions utilizing electric vertical take-off and landing (eVTOL) aircraft being developed by Lilium. Lilium is currently seeking certification by the Federal Aviation Administration (FAA) of its eVTOL aircraft with the goal of obtaining certification by 2023; however, the timeframe for certification cannot be guaranteed and may extend beyond 2023. Lilium and Ferrovial are proposing to construct a network of 10 vertiports in Florida and are in the process of identifying sites for the construction of the vertiports by Ferrovial, pending final FAA certification of the eVTOL aircraft. Vertiports will consist of a landing/takeoff area, aircraft parking stands and terminal facilities. Lilium and Ferrovial are proposing to construct a vertiport within Palm Beach County and have expressed interest in a location on the Palm Beach International Airport (PBI) due to its proximity to population centers, convenient access to ground transportation and compatibility with existing land uses. While urban airport locations are desirable, the companies have indicated that airfield facilities are not a necessary component since the eVTOL aircraft will not require use of runways, taxiways or other airfield facilities and may be operated from non-airport locations. **Countywide (AH)**

**Background and Policy Issues:** In November 2020, Lilium announced its first vertiport location to be constructed in Florida at Lake Nona in Orlando. Vertiports provide the required infrastructure for landing, recharging, and departure of eVTOL aircraft. Although a number of companies are currently seeking certification, no eVTOL aircraft have received FAA certification to date. In addition to FAA certification of the eVTOL aircraft, aircraft operations and procedures will also be subject to FAA review and approval prior to commencement of passenger service. Due to stringent regulatory and safety requirements, the timeframe for completion of necessary regulatory reviews and approvals cannot be guaranteed at this time.

**Attachments:**

1. Presentation

=====  
Recommended By: Debra Bube 3-8-21  
Department Director Date  
Approved By: [Signature] 3/12/21  
County Administrator Date

**II. FISCAL IMPACT ANALYSIS**

**A. Five Year Summary of Fiscal Impact:**

Fiscal Years	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>
Capital Expenditures	_____	_____	_____	_____	_____
Operating Costs	_____	_____	_____	_____	_____
Operating Revenues	_____	_____	_____	_____	_____
Program Income (County)	_____	_____	_____	_____	_____
In-Kind Match (County)	_____	_____	_____	_____	_____
<b>NET FISCAL IMPACT</b>	<u><u>\$-0-</u></u>	<u><u>\$-0-</u></u>	<u><u>\$-0-</u></u>	<u><u>\$-0-</u></u>	<u><u>\$-0-</u></u>
<b># ADDITIONAL FTE POSITIONS (Cumulative)</b>	_____	_____	_____	_____	_____

Is Item Included in Current Budget? Yes \_\_\_ No \_\_\_  
 Does this item include the use of federal funds? Yes \_\_\_ No X

Budget Account No: Fund \_\_\_ Department \_\_\_ Unit \_\_\_ RSource \_\_\_  
 Reporting Category \_\_\_\_\_

**B. Recommended Sources of Funds/Summary of Fiscal Impact:**

No fiscal impact.

**C. Departmental Fiscal Review:**

*Wendell Jensen*  
 \_\_\_\_\_

**III. REVIEW COMMENTS**

**A. OFMB Fiscal and/or Contract Development and Control Comments:**

*Lisa Martin* 3/4/21  
 \_\_\_\_\_  
 OFMB (AM) 3/4

*Dr. J. J. Juroba* 3/18/21  
 \_\_\_\_\_  
 Contract Dev. and Control  
 3-18-21 TJW

**B. Legal Sufficiency:**

*Anne Delgado* 3/19/21  
 \_\_\_\_\_  
 Assistant County Attorney

**C. Other Department Review:**

\_\_\_\_\_  
 Department Director

REVISED 11/17

(THIS SUMMARY IS NOT TO BE USED AS A BASIS FOR PAYMENT)



Creating a world where  
anyone can fly anywhere,  
anytime



ferrovial

Palm Beach County Commissioners M  
March 2021



# The highest performing eVTOL aircraft



- 185-mile range
- 185 mph speed
- 1 pilot, 4 passengers

- Safety level equivalent to commercial airliner
- Ultra-low noise

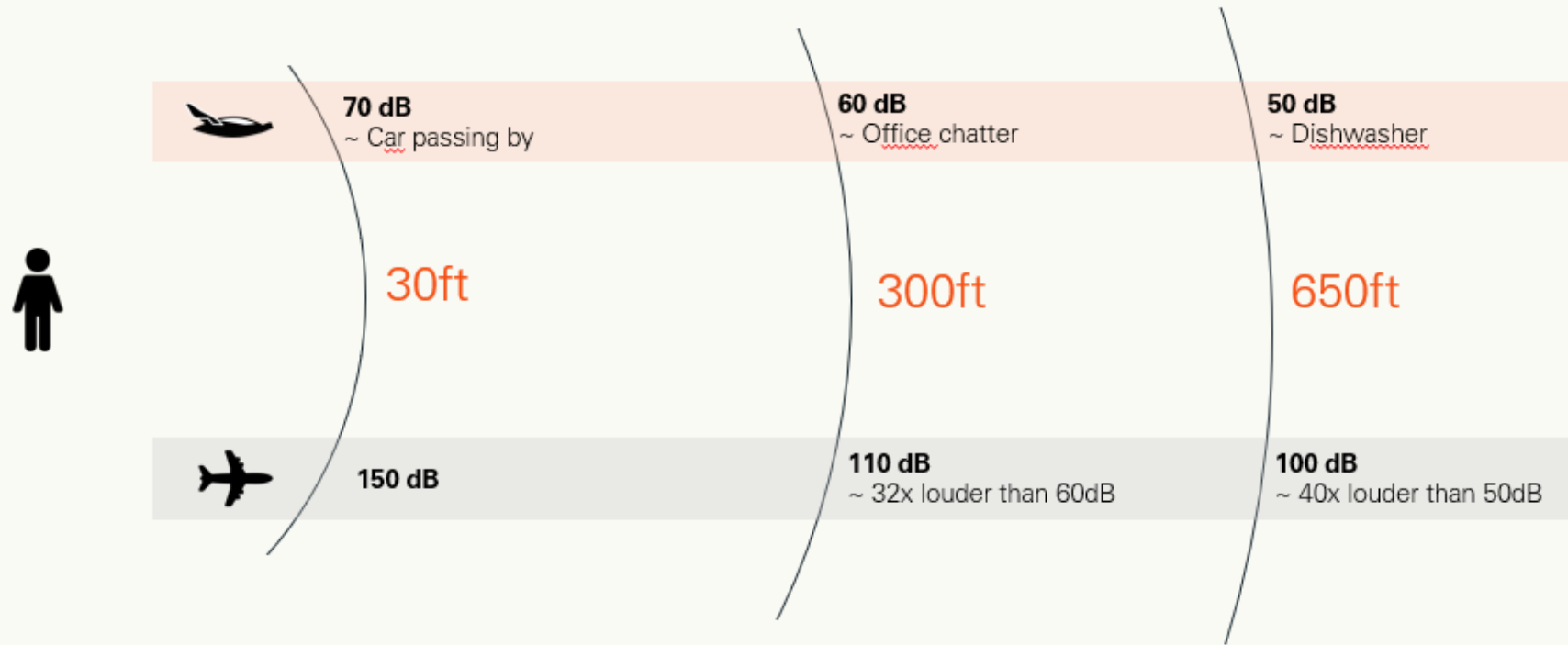
# Safety and simplicity

- Safety level  $10^{-9}$
- Ultra-redundancy:
- No single point of failure

- No aerodynamic control surfaces
- No variable blade pitch
- No gear boxes
- No water cooling or oil circuits

# The Lilium Jet has ultra-quiet electric engines developed in-house

Noise level comparison at take-off: Single-aisle Commercial Jet vs. Lilium Jet



## Key benefits to the Palm Beach community, residents and businesses



- 1 An interconnected network creating accessibility and expanding economic opportunities for leisure and commerce
- 2 Zero-carbon emission technologies that reduce the environmental impact of transport in the region
- 3 Extremely quiet operations – no disturbance to the community
- 4 Reduces traffic load on other modes of transport in the region
- 5 Substantial time savings and convenience
- 6 Catalyst for further economic development and reinforces growing property values in Palm Beach County



# Agenda

**1** Strong Partners to Deliver

2 Project Description

3 Benefits for Palm Beach

4 Next Steps

## Lilium & Ferrovial partnership for Florida



- Lilium & Ferrovial formalize partnership to launch Regional Air Mobility service in Florida
- Partnership combines Ferrovial's vast experience in airport infrastructure and operations with Lilium's Regional Air Mobility service
- Agreement for 10 vertiports across 8 cities connecting Central and South Florida
- Fast growing network in a phased development
- Additional sites to be added as partnership scales with growth in demand

# About Ferrovial Group

- Ferrovial is one of **the world's leading infrastructure investors and operators**, dedicated to developing sustainable solutions.
- **Ferrovial Group has 20+ years of presence in the United States and is headquartered in Austin.** The Group has a local management headcount of 225, with a total headcount in Texas of roughly 2,000
- **Ferrovial Airports** integrates all airport management activities. We have operated 34 airports all around the world since 1998, and currently manage four airports with 90m passengers p.a.
- We are a **long-term partner** who strives to create value for society and our shareholders, investors, and employees

## FERROVIAL GROUP

**ferrovial**  
airports

- Ferrovial has developed **more than 11 P3s** in North America since 1999

**cintra**

- Cintra is toll roads division

**ferrovial**  
construction

- Active since 1999
- 800+ employees
- Offices in Austin, Atlanta and Los Angeles

**webber**

- Acquired in 2005
- 1,700+ employees
- Headquartered in Houston

**\$14bn**

Ferrovial investment in its portfolio of airports since 2007

REVENUES

**\$6.8bn**

MARKET CAP

**\$20.5bn**

EMPLOYEES

**89,968**

**ferrovial**

airports

Full operation of our airports

**Heathrow**

- Traffic: 80.9m pax
- Ownership: 25%

GLASGOW AIRPORT 

- Traffic: 8.9m pax
- Ownership: 50%

**Aberdeen International Airport**

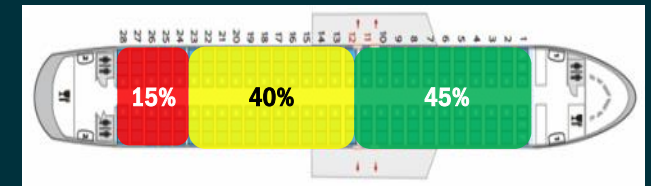
- Traffic: 3.0m pax
- Ownership: 50%

**SOU** Southampton Airport

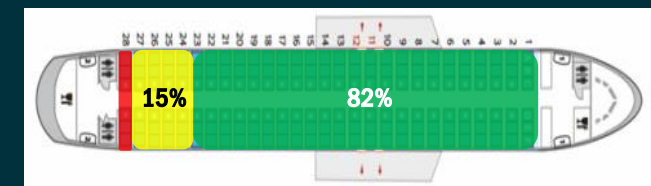
- Traffic: 1.8m pax
- Ownership: 50%

Passenger experience improvement at Heathrow from Ferrovial Airport's ownership

2007



2019



Legend: ■ Poor ■ Good ■ Great or Excellent

Note: Figures as of YE 2019, <sup>1</sup> As of November 2020

# Ferrovial's Broad Commitment to Investing in Transport Innovation

## AIVIA



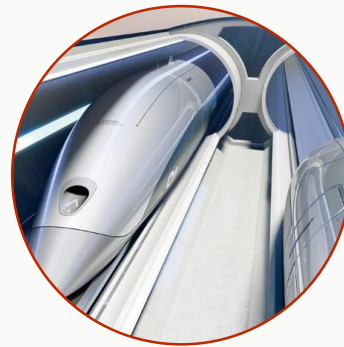
- AIVIA Orchestrated Corridors is an initiative for the development of 5G-connected roads of the future
- Managed lane technologies
- Support of autonomous vehicles
- Improves safety and efficiency
- Reduces environmental impact

## Carsharing



- Free Floating Car Sharing ZITY Madrid and Paris
- 750 fully electric cars
- City+metro area 400km range
- 300k+ registered users
- Reduces urban congestion
- Reduces environmental footprint

## Hyperloop



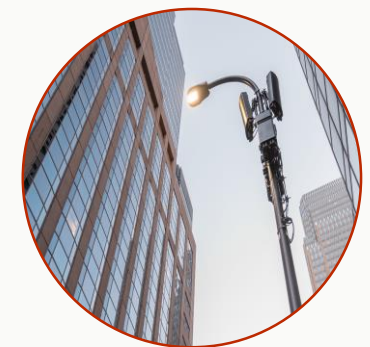
- Transport via pressured tube - magnetic levitation system
- Efficiency of rail...
- Speed of aviation
- Exploring project in the Great Lakes region of the U.S.

## MaaS



- Wondo: First Mobility-as-a-Service platform in Madrid, launched in 2018
- Ride-sharing & demand responsive transport services
- Integrated payments
- Mobile app platform comparing alternative modes of urban transport

## 5G



- 5G communication technologies offers breakthrough opportunities for integration into transport infrastructure and urban mobility solutions
- Working on deployment in toll roads, 5G neural networks in airports, and micro applications in cars and urban areas

### STRATEGIC PARTNERS





## Lilium company overview

- World class leadership
  - Four expert founders
  - Former leaders from Airbus, Raytheon and Boeing
- Well-funded by top tier investors
  - USD 375mn+ raised from Atomica, Tencent, LGT, Baillie Gifford and Obvious Ventures
- In certification process with EASA and FAA
  - Aircraft in certification under existing regulation
- Setting highest standards in aerospace engineering
  - Strategically located in the heart of a high-tech manufacturing and aerospace ecosystem
  - Pilot line factory already constructed
- 700+ employees co-located on site
  - Engineering, manufacturing & commercial teams

# A clear path to certification and industrialization



2016-17

## Technology Demonstrator

- First full-scale 2-seater
- Demonstration vehicle
- Off-the-shelf parts



2017-19

## Aircraft Demonstrator

- Full performance and weight 5-seater
- Custom built parts



2019-23

## Certification and Industrialization

- Build-up of OOs per year
- Certification of aircraft & manufacturing processes
- Design to make, cost, operate, and maintain

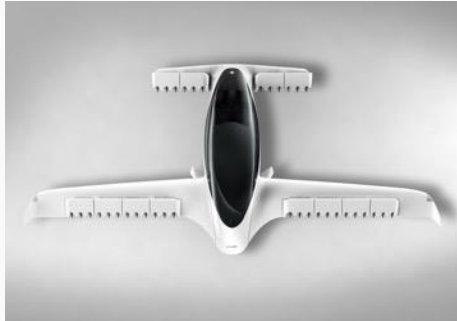


2023-25

## Scale-up for launch

- Ramp-up production capacity to +000s aircraft per year

# Designed to safely transport millions of passengers per year



## Aircraft

- Type certification under 14 CFR part 23
- Commercial certificated pilot on-board
- Certified aircraft design and production organization (DOA, POA)
- Certified to the same safety standard as commercial airliner (10<sup>-9</sup>)



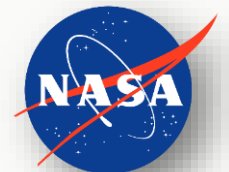
## Operations

- Operations in both controlled and uncontrolled airspace
- Traffic coordination under existing rules of the air
- Certification under 14 CFR part 135

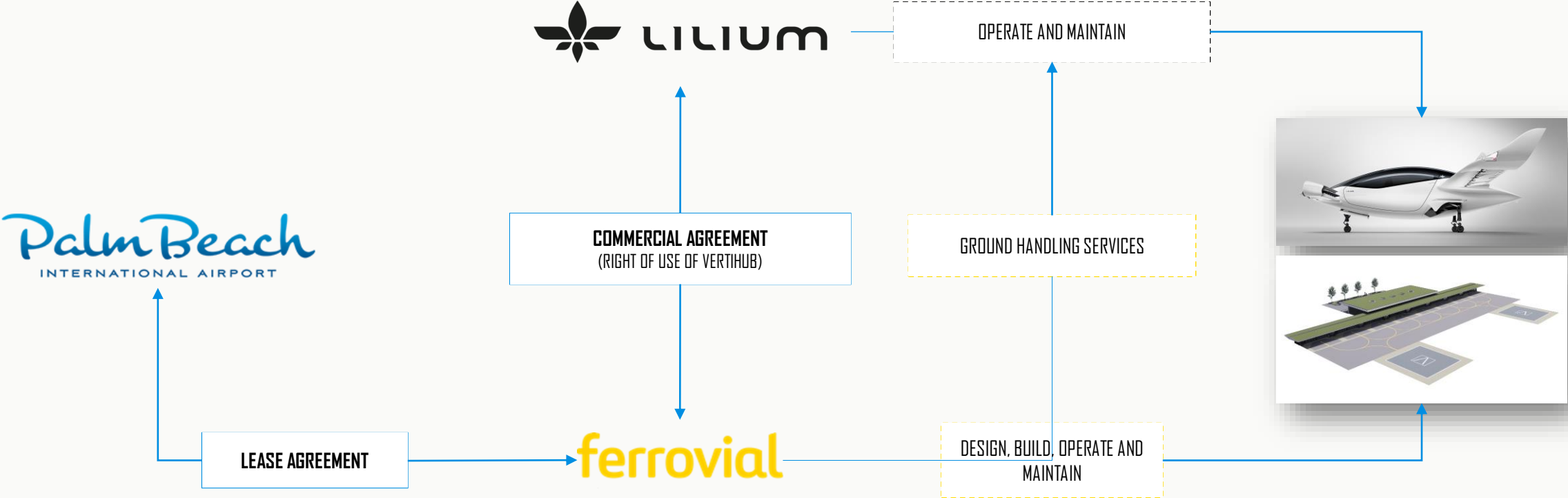


## Take-off and Landing Facilities

- Operated into and out of certified landing sites
- Fit for different environments
  - Large airports (high manoeuvrability and precision)
  - Inner-city location (low noise profile and high safety level)



# Project execution



### Responsibility





# Agenda

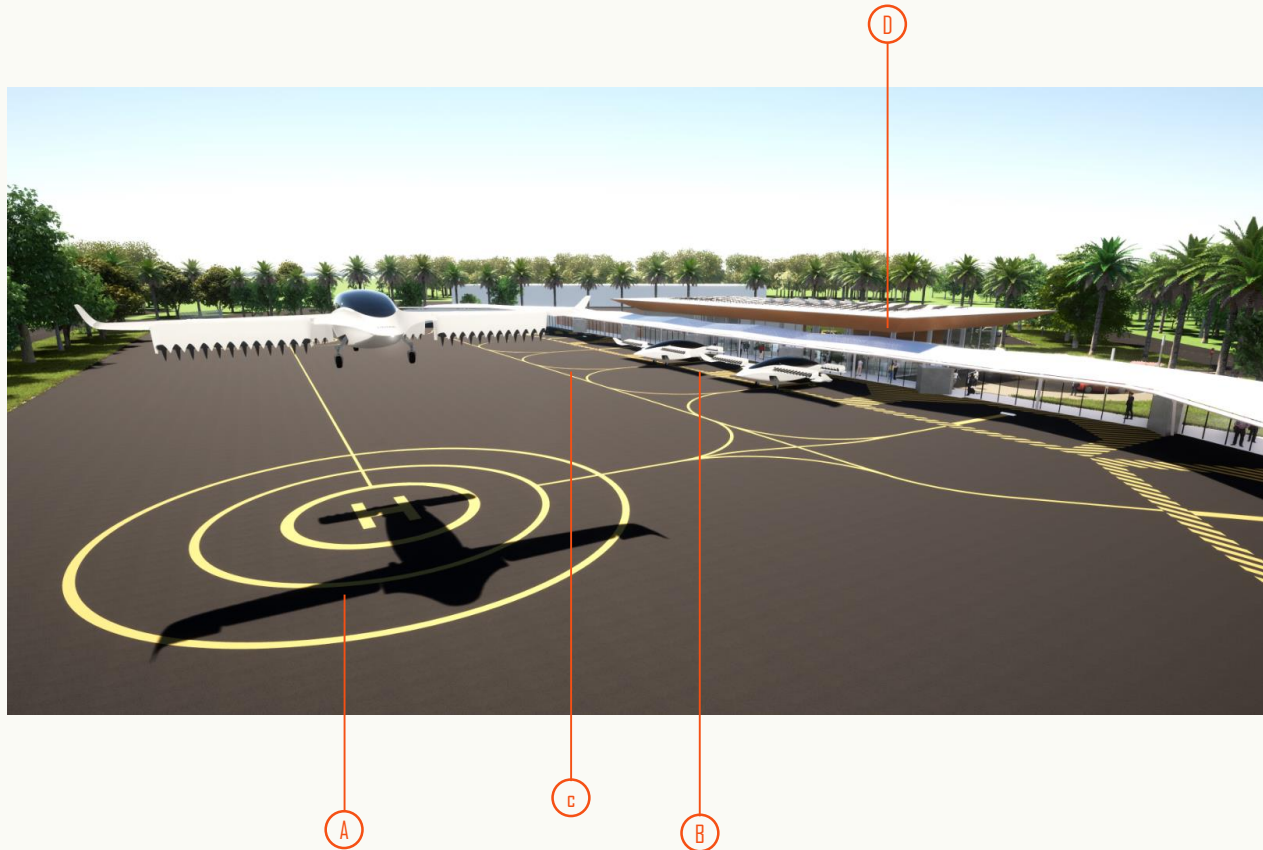
1 Strong Partners to Deliver

**2 Project Description**

3 Benefits for Palm Beach

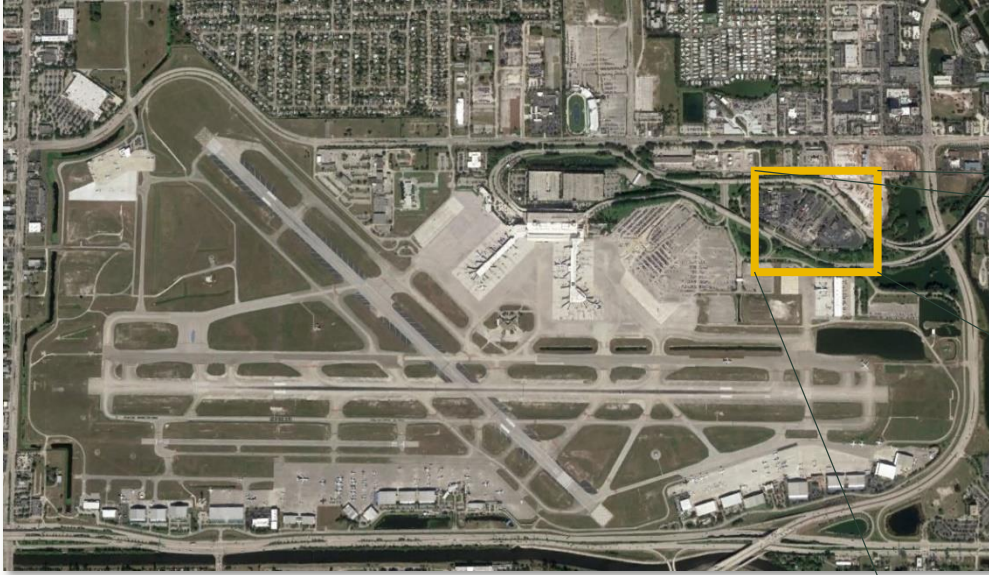
4 Next Steps

# Lilium and Ferrovial to design a vertiport tailored for PBI...



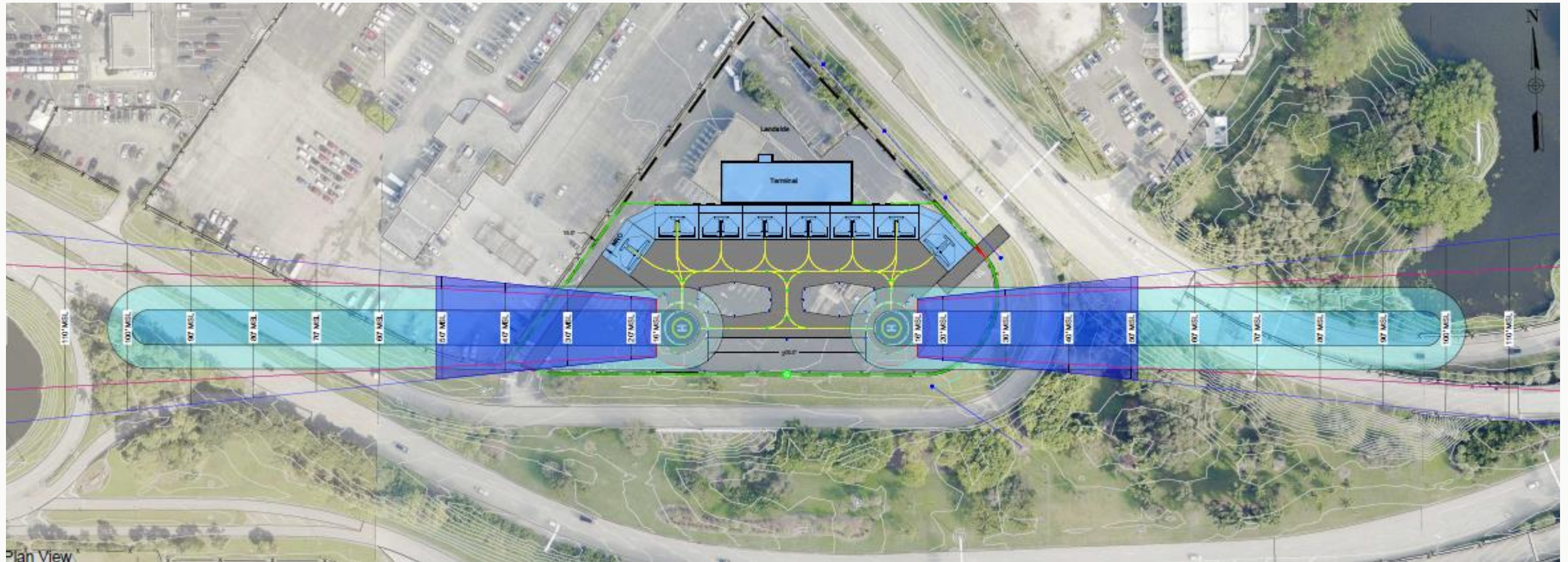
- A Take-off Area**  
Area specially dedicated to take-off and landing driven by established guidance for heliports
- B Parking Stands**  
Area to board/disembark, load/unload, clean, check and charge the aircrafts as well as transfer flight data
- C Taxiways**  
Area connecting Parking Stands to Take-off Area
- D Terminal**  
Area designed to deliver a seamless and frictionless experience for our customers

...that fits within and further develops the existing property

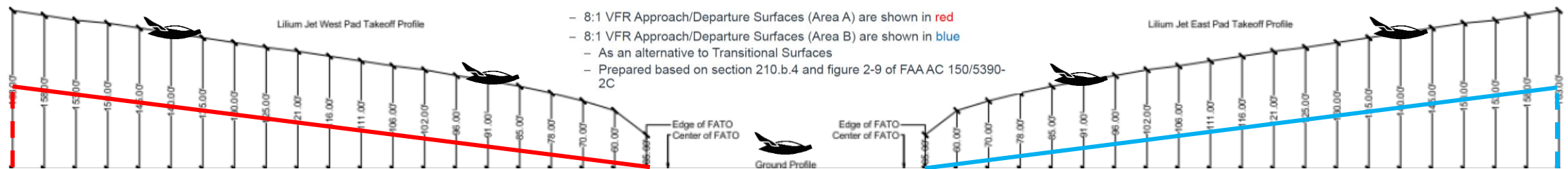


- Separate from airport operations
- Adjacent to main passengers' flows
- NO modification to access roads

# PBI vertiport preliminary concept



Plan View



- 8:1 VFR Approach/Departure Surfaces (Area A) are shown in red
- 8:1 VFR Approach/Departure Surfaces (Area B) are shown in blue
- As an alternative to Transitional Surfaces
- Prepared based on section 210.b.4 and figure 2-9 of FAA AC 150/5390-2C

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# PBI: at the Heart of our Florida Regional Air Mobility Network



- PBI is the gateway for connecting with Miami and South Florida
- Palm Beach – Miami: over 7 million road trips per year



# Enhances connectivity across the region for West Palm Beach residents...

Reduced trip time<sup>1</sup> by **70%** compared to car travel to major destinations

Miami in 20 minutes  
Orlando in 50 minutes  
Tampa in 60 minutes

Time saved value<sup>2</sup> of **\$30m** for key routes  
(Miami, Fort Myers, Tampa and Orlando)

# While driving economic benefits, creating jobs, and reducing CO<sub>2</sub> emissions

## Economic Benefits

**\$54mn<sup>1</sup>**  
Direct and indirect economic benefits

- Over \$54mn in economic benefits induced from passengers travelling to Palm Beach International vertiport and the value of travel time saved across available routes

## Jobs

**150 Direct Jobs<sup>2</sup>**  
Created by the Lilium Service

- Including pilots, maintenance staff and ground staff hired by Lilium and its partners at the Palm Beach International vertiport

## CO<sub>2</sub> Reduction

**6,000 t CO<sub>2</sub> reduction<sup>3</sup>**  
versus status quo

- Impact of replacing 6% of the cars from West Palm Beach to Fort Lauderdale and Miami – saving the carbon equivalent of 1,500 cars per year



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## Next steps

- Confirm County interest for Regional Air Mobility
- Negotiate lease terms for PBI property
- Greet community and address outstanding questions





ferrovial

... for a world on the move