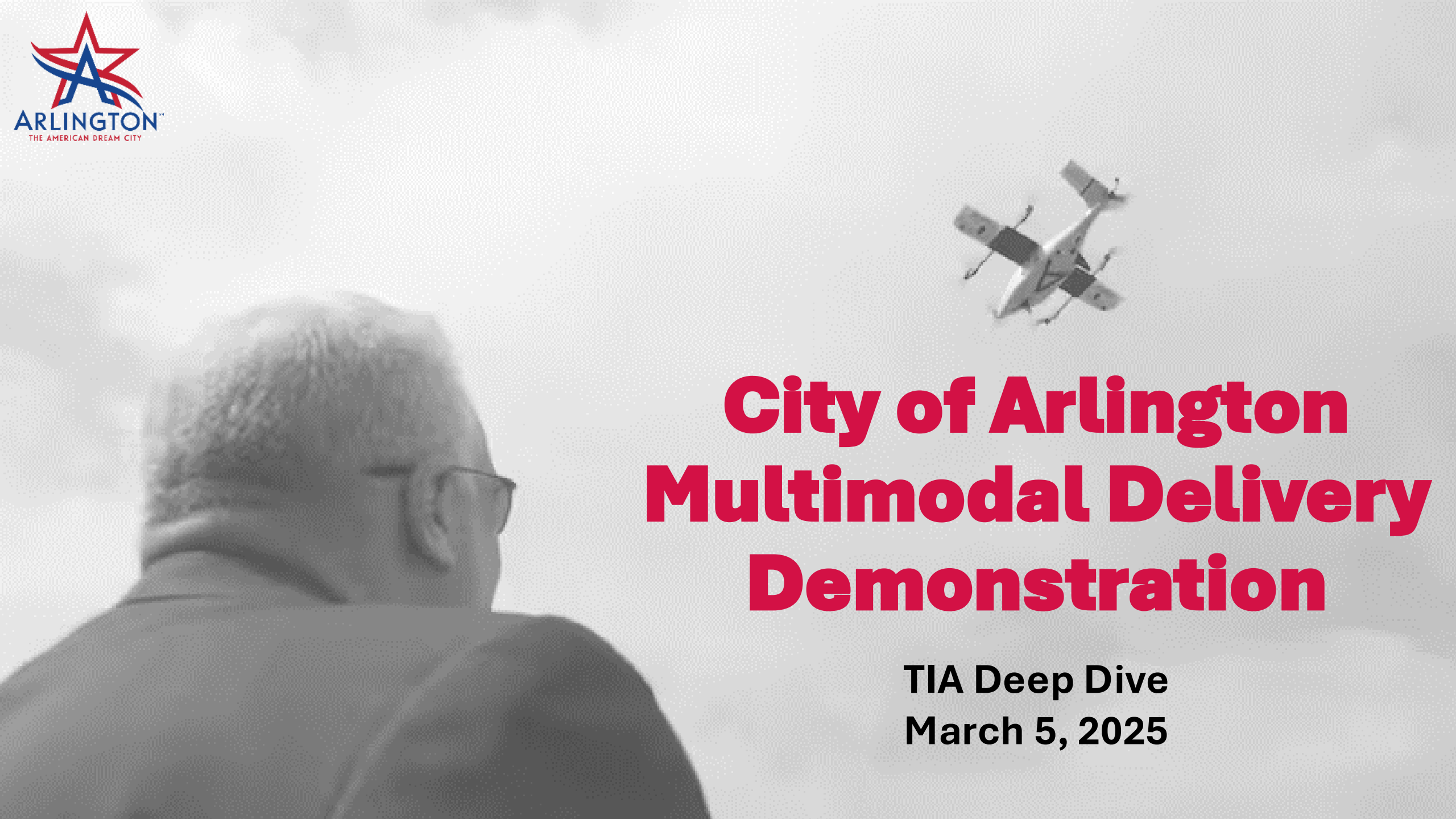


City of Arlington Multimodal Delivery Demonstration

TIA Deep Dive

March 5, 2025

Project Overview

- Project Description:
  - Test and evaluate innovative, autonomous food delivery
  - Using electric, autonomous air and ground robots for deliveries
  - Study public adoption trends and energy benefits
- Two year project, with funding from the US Department of Energy
  - Promote innovation in transportation to deploy clean energy technologies
- Project Team:

ARLINGTON
THE AMERICAN DREAM CITY

North Central Texas Council of Governments

TARRANT AREA FOOD BANK

UNIVERSITY OF TEXAS ARLINGTON

airspacelink™

CLEVON

AERIALOOP
DRONE DELIVERY AIRLINES

Community Engagement

Survey (Spring 2024)
Stakeholder Input (Spring 2024):

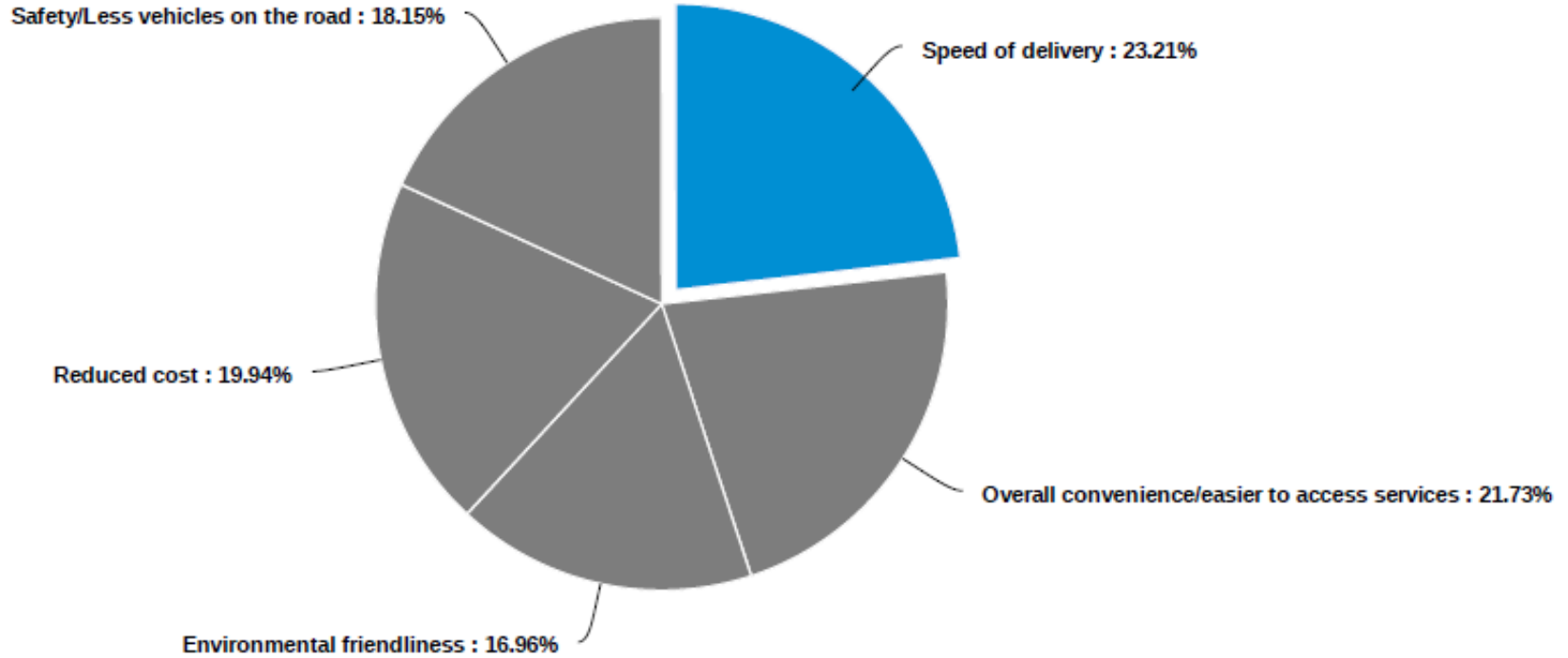
- DFW Clean Cities Coalition
- North Texas Uncrewed Aircraft Systems Task Force

Community Workshop (May 2024)
Neighborhood Presentations (Summer 2024)
Mailers, Website, Social Media posts (Summer 2024)

Survey Results

Survey conducted in May and June 2024; ~200 responses
76% of responders have ordered food or groceries online for home delivery
60% have some familiarity with uncrewed air or ground vehicles
11% have ever interacted with an uncrewed air or ground vehicle

Benefits of Uncrewed Air and Ground Delivery Vehicles



Survey Results

How much do you support the use of UAS (Uncrewed Aircraft System) or ground robot system for following purposes?

Statement	Stongly Object	Object	Neutral	Support	Strongly Support	Overall
Military Activities	19 10.27%	11 5.95%	31 16.76%	42 22.7%	82 44.32%	185 100%
Search and Rescue Operations in Remote or Rugged areas	5 2.7%	2 1.08%	8 4.32%	34 18.38%	136 73.51%	185 100%
Aerial Mapping/ Surveying	6 3.28%	6 3.28%	25 13.66%	42 22.95%	104 56.83%	183 100%
Traffic Monitoring	14 7.57%	10 5.41%	27 14.59%	60 32.43%	74 40%	185 100%
Small Package Delivery	28 15.3%	25 13.66%	34 18.58%	44 24.04%	52 28.42%	183 100%
Recreational Use	17 9.29%	20 10.93%	66 36.07%	37 20.22%	43 23.5%	183 100%
Other	14 8.7%	10 6.21%	106 65.84%	14 8.7%	17 10.56%	161 100%

Survey Results

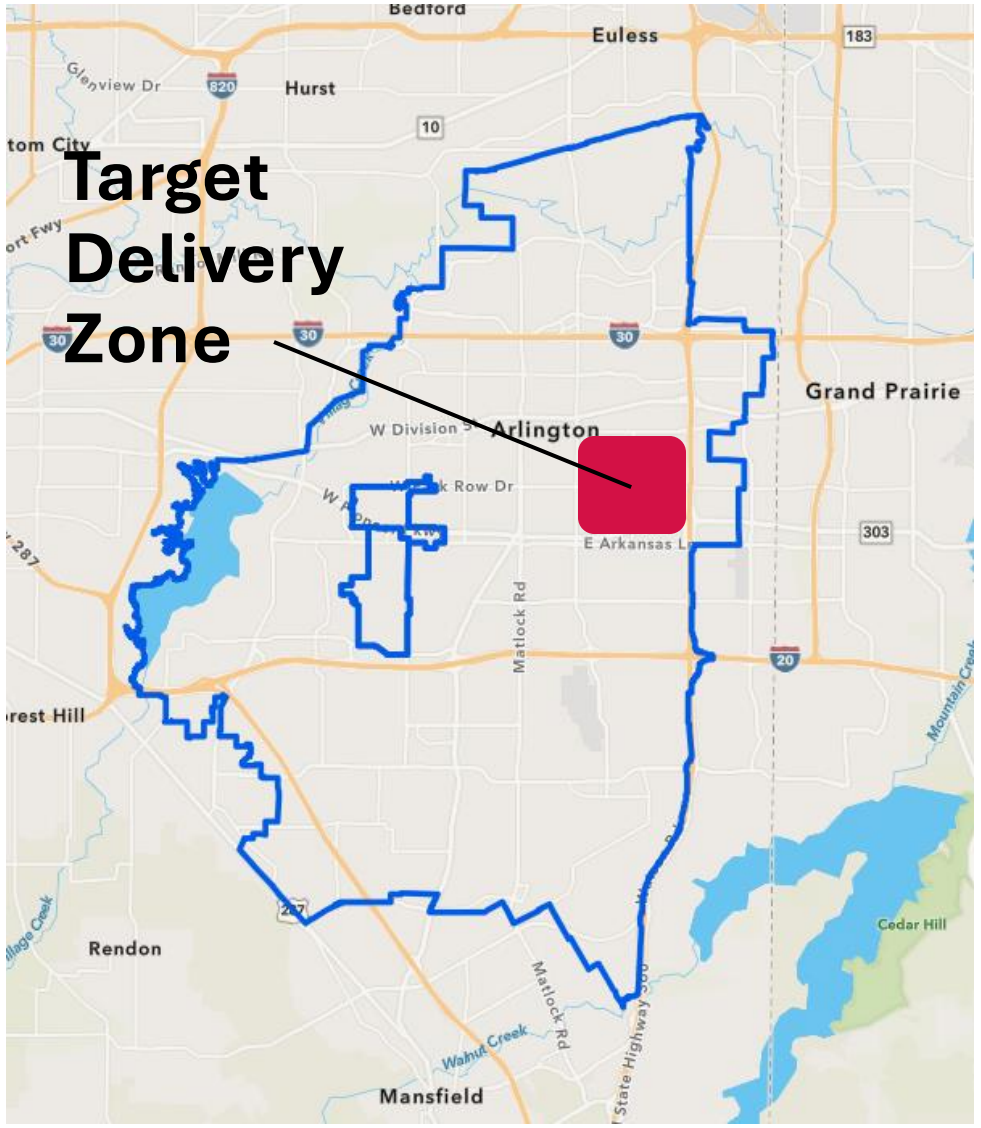
What are some concerns you might have around UAS (Uncrewed Aircraft System) or ground robot delivery system?

Statement	No Concern	Somewhat Concerned	Extremely Concerned	Overall
Accidents and injury	35 19.77%	80 45.2%	62 35.03%	177 100%
Noise level	89 51.45%	63 36.42%	21 12.14%	173 100%
Loss of privacy	53 31.36%	55 32.54%	61 36.09%	169 100%
Theft of packages	32 18.93%	74 43.79%	63 37.28%	169 100%
Legal liability	43 25.6%	76 45.24%	49 29.17%	168 100%
Other	64 60.95%	21 20%	20 19.05%	105 100%

First Delivery Demonstration

Dates: September 9 to 13, 2024
Location: East Arlington neighborhoods
Target Participants: Food Bank clients, other residents
Goal: 150 grocery box deliveries

1. Food Bank packs grocery boxes
2. Aircraft transports grocery box from hub to distribution point
3. Grocery box transferred to ground robot
4. Ground robot transports boxes to participant home



Vehicle: Aerialoop ALT6-4 VTOL

- Speed: 50 mph
- Payload: 9 pounds
- Range: 25 miles
- Redundant rotors
- Built-in ballistic parachute
- Vertical take-off and landing, transitions to forward flight

Dimensions:

- Wingspan: 8½ feet
- Length: 6 feet

Aircraft Route

Air Robot Route (~0.45 miles)

Within City-owned park land

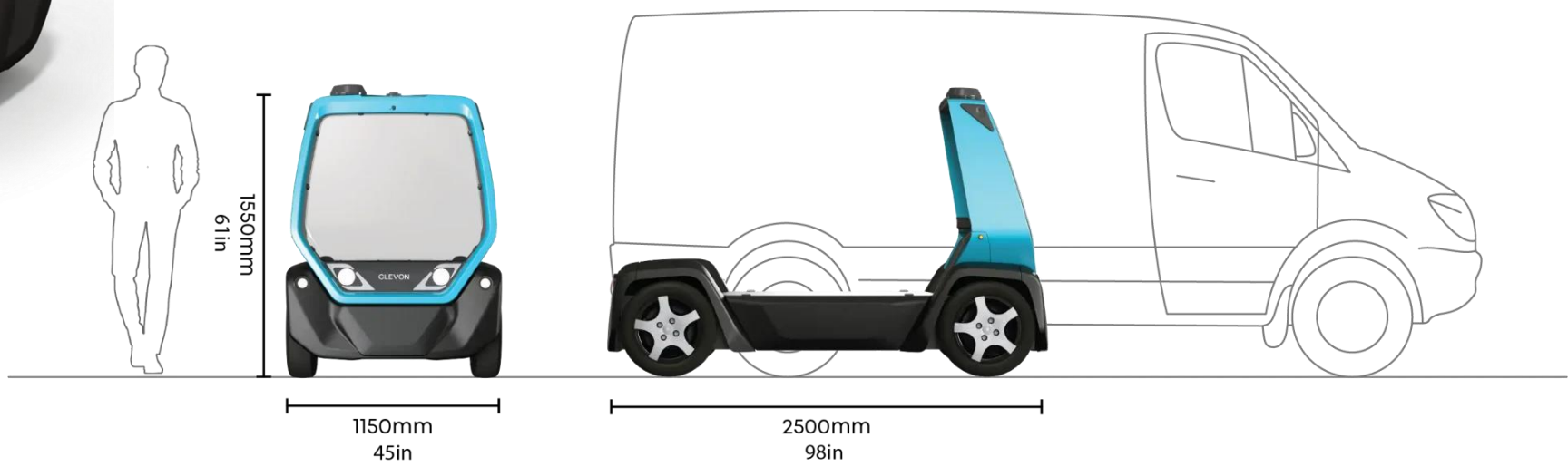
One street crossing, monitored

Pilot on each end of route,
maintained visual line of site

No FAA waiver required

Vehicle: Clevon Autonomous Robot Carrier*

- Speed: 15 mph max on 40 mph roads
- Sensors: 360 degree view
- Power: fully electric
- Range: 50 miles per charge
- Charging: ~1 hour

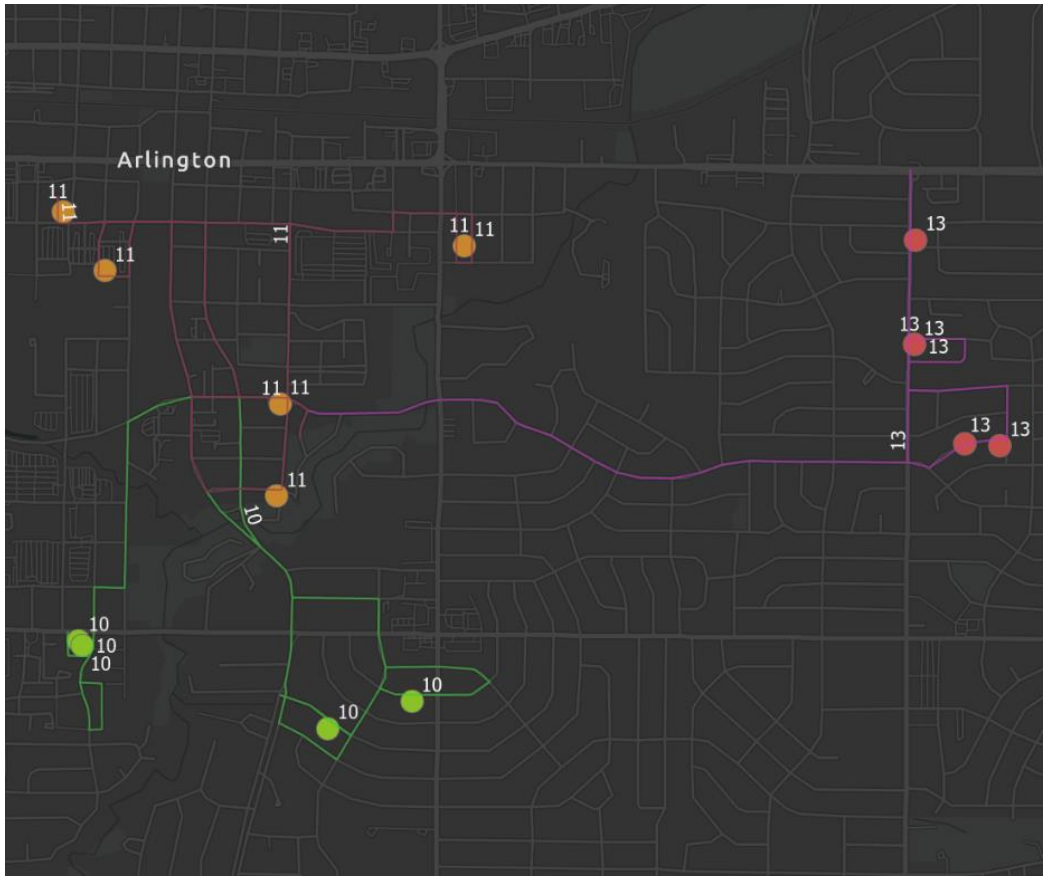


*Clevon is only participating in Demonstration 1

Ground Routes

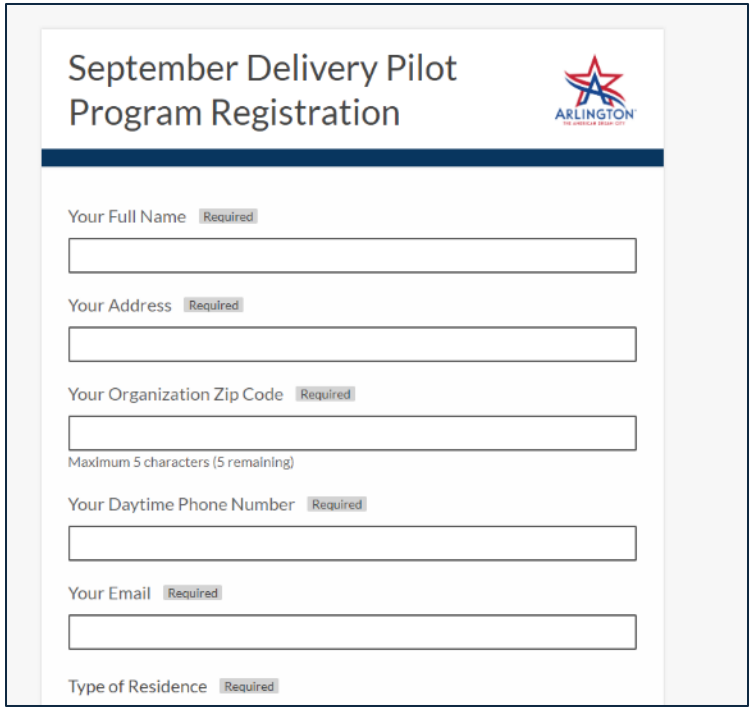
Eligible Delivery Zone (3.5 sq miles)

Ground Robot Example Routing



Participant Experience

1. Participants sign up online or by calling the City.
2. City verifies address and adds delivery to the route plan; participants notified of delivery date, time window, and code to open delivery bay.
3. On delivery date and time, participants wait for the ground robot to roll up to their residence.
4. Type in unique code to receive grocery delivery.
5. Fill out a quick survey about the experience.



Results – Flight Operations

81 grocery boxes transferred

162 flights total

Date	Time Range	Total Flights	Total Grocery Boxes	Battery Charges
Mon, Sept. 9, 2024	10:33 – 16:26	28	14	7
Tue, Sept. 10, 2024	8:34 – 16:40	38	19	10
Wed, Sept. 11, 2024	8:41 – 13:33	24	12	6
Thurs, Sept. 12, 2024	8:30 – 17:08	60	30	15
Fri, Sept. 13, 2024	8:42 – 11:04	12	6	3

Results – Ground Operations

139 grocery boxes delivered

26 routes total

Date	Time Range	Routes Completed	Total Grocery Boxes	Hand Delivered
Mon, Sept. 9, 2024	9:57 – 15:26	5	25	4
Tue, Sept. 10, 2024	10:00 – 14:59	6	33	9
Wed, Sept. 11, 2024	9:10 – 13:16	5	27	6
Thurs, Sept. 12, 2024	8:53 – 13:36	5	27	15
Fri, Sept. 13, 2024	10:14 – 14:32	5	27	13

Results - Participant Survey

Satisfied with delivery service?

94% very satisfied and satisfied

Easy to access groceries?

98% very easy and easy

Delivery process feel secure?

96% very secure and secure

Likely to use service again?

94% very likely and likely

Demonstration 2 Plans

Goals:

- Complete >150 deliveries
- Onboard new ground robot provider
- Expand flight path for aerial robot
- Allow participants more control over deliver times
- Gather more post-delivery survey responses
- Streamline food packaging process

Next Steps

- Preparing for Spring 2025 demonstration
  - Finalize operational area and air robot routing
  - Participant recruitment
  - Apply lessons learned from Demonstration #1
- Final reporting and deliverables
  - Cost Model
  - Energy and Emissions Analysis
  - Scalability and Replication Guide

Discussion

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Advanced Air Mobility (AAM) in Sugar Land

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Advanced Air Mobility (AAM)

Advanced Air Mobility "Air Taxi"

- 2019 – Airport Master Plan
- 2021 – ASU Capstone Project
- 2023 – Wisk Introduction
- 2024 – Wisk Chooses Sugar Land
- 2025 – Vertiport Design

Wisk Gen 6 Aircraft

- Testing eVTOL since 2010
- Target price is $3 per passenger mile (Comparable to Uber Black)
- 120 knot cruising speed (138 mph)
- **<u>Autonomous (pilotless) with human oversight</u>**
- 90 mile range @ 2,500’-4,000’ cruise

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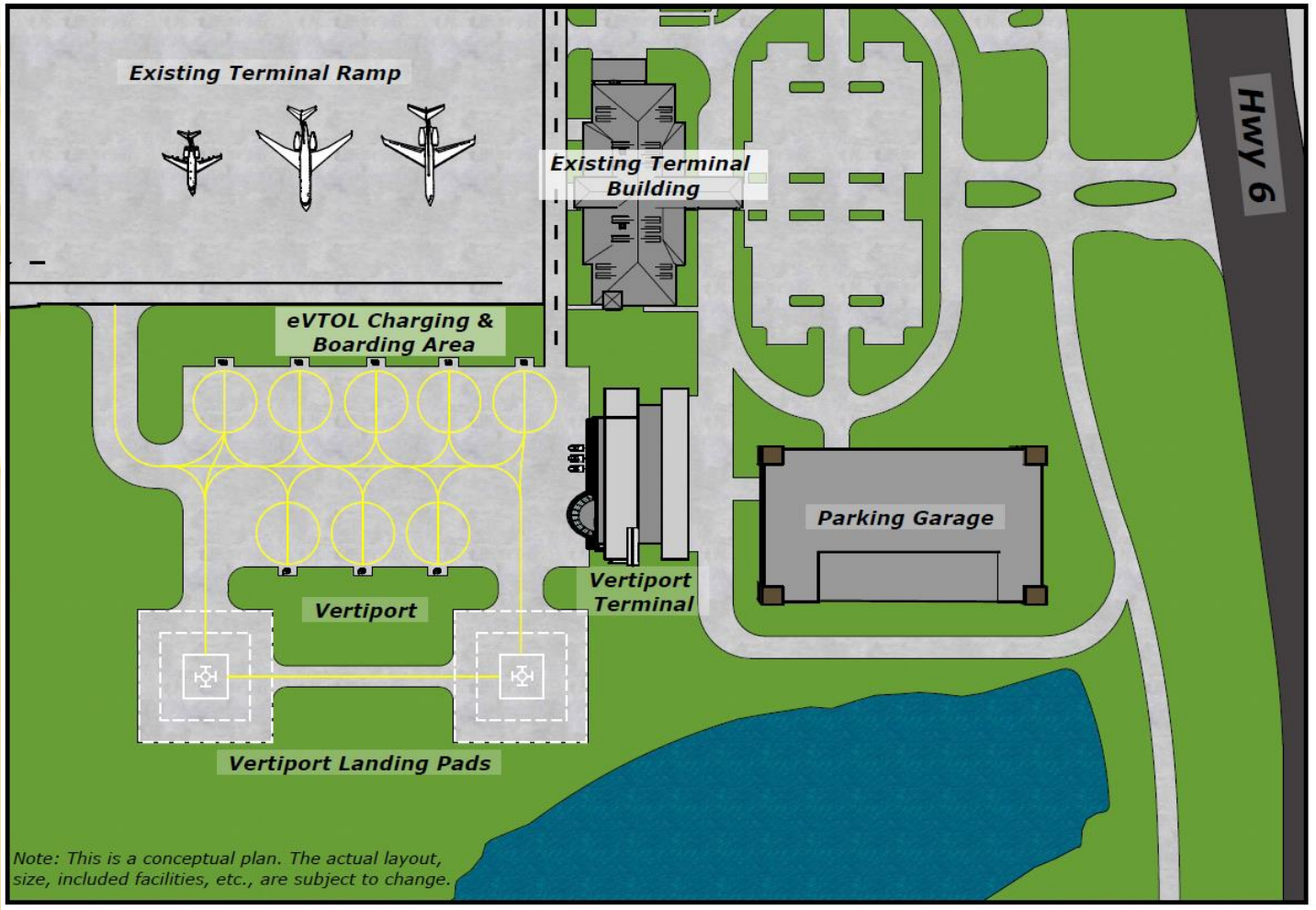
REGIONAL AIRPORT

SGR Vertiport (Concept)



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REGIONAL AIRPORT

What are the benefits?

Faster travel to **Houston** and surrounding areas:

- Less stress getting to airports
- Work commutes downtown
- Sporting or entertainment events
- Restaurants
- Beach/Cruise Terminal?
- Visiting friends/family
- Many others

Questions?