

DRONE PRESENTATION



Michigan has approximately 687 Airports

- 15 Airports – Michigan with control towers in lower Michigan none in the UP
- Battle Creek, Benton Harbor, Detroit-City, Detroit Metro, Detroit-Willow, Flint, Grand Rapids, Jackson, Kalamazoo, Lansing, Muskegon, Pontiac, Oakland, Saginaw and Traverse City.
- Some of these airport-controlled spaces overlap into adjacent communities.
- Controlled airspace – airports that have a traffic controller are either Class A, B, C, D, and E.
- Piloting under VFR (Visual Flight Rules) and Drones cannot enter controlled airspace without ATC clearance prior to entering Class B, C or D airspace.
- Class A - 18,000 ft MSL to and including FL 600 and 12 nautical miles of coastline must be operated under Instrument Flight Rules (IFR)
- Class B - Surface to 10,000 feet MSL configurations depends upon the airport terrain and have two or more layers in upside down wedding cake with 5-mile radius.
- Must have operating two-way radios capable of communicating with ATC must be equipped with transponder
- Class C - Surface to 4,000 ft MSL above Airport elevation usually 5 nautical mile radius at surface 10NM on second layer (Flint-Bishop, Gerald Ford International and Capital City are Class C)

FAA PART 107 (14 CFR 107)

Pilot of Unmanned Aircraft System (UAS)

1. Must hold a pilot certificate issued by FAA.
2. Must have line of sight of the UAS or an observer that has line of sight with communications to the pilot.
3. Cannot operate from a moving plane, car or boat.
4. No alcohol or drug use that violates FAA rules.
5. Limited use at night.
6. Generally, cannot operate a UAS over humans who are outside.
7. Cannot operate a UAS in Class A, B, C, D or lateral boundaries of the surfaces of Class E without authorization from ATC.
8. Cannot operate a UAS that interferes with traffic patterns at any airport.
9. Cannot operate in restricted areas.

UAS Operating Limitations

1. May not exceed 100 miles per hour.
2. Generally, cannot be higher than 400 ft AGL.
3. Visibility must be at least 3 statute miles at control location.
4. Distance from clouds – 500 ft below and 2000 ft horizontally.
5. Must be at least 16 years of age.
6. Must be able to speak, read and write English.
7. Must pass the required FAA licensing requirements.

Recreational Drones

1. Must comply with FAA rules.
2. Must pass an aeronautical knowledge and Safety test.
3. Cannot fly into Controlled Airspace unless operator obtains clearance from the FAA Low Altitude Authorization and Notification Capability (LAANC).
4. Must register drones with FAA.
5. Must obtain a certificate and registration number which must be displayed on outside of drone.

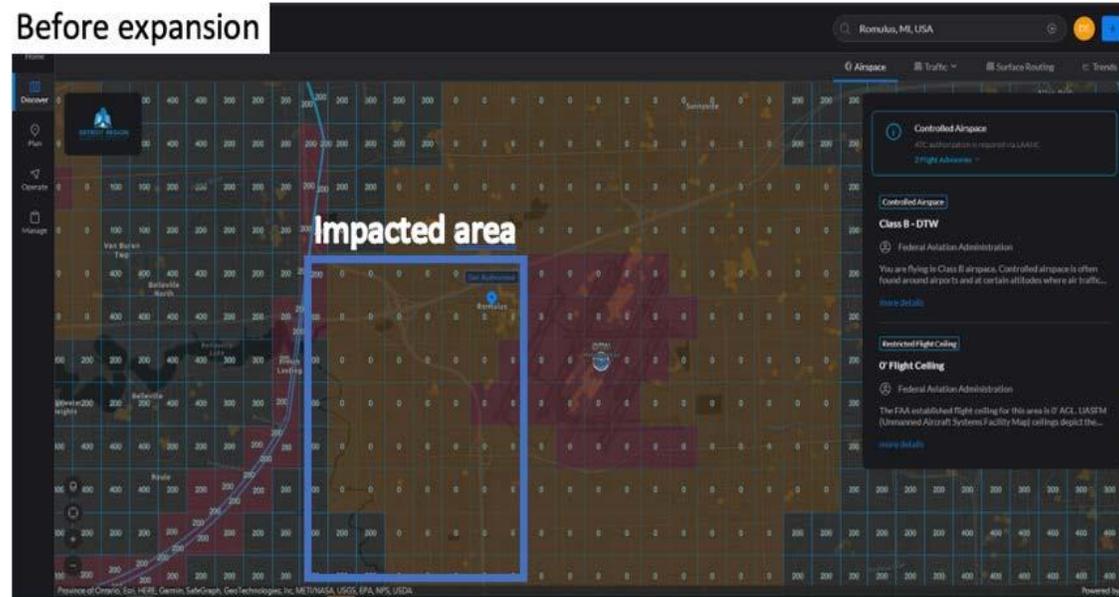
Preemption for FAA

- FAA does not completely preempt all state jurisdiction over aviation, but state or local authority is subordinate to federal law if the subject is covered by federal law.

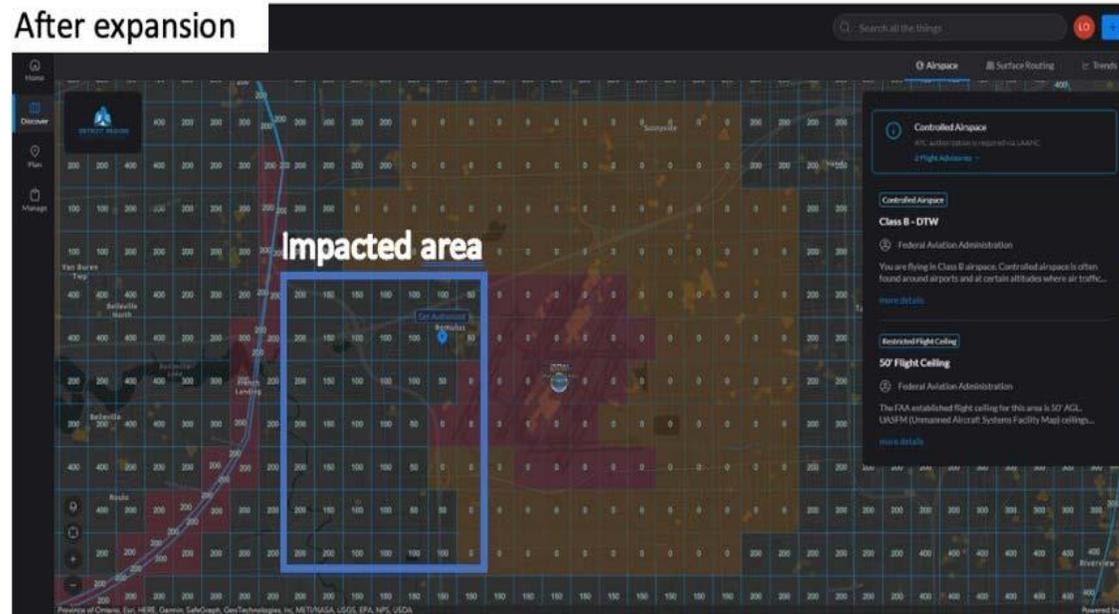
City of Romulus Drone Program

1. Conducted a UAS Readiness Assessment with Airspace Link.
 - a. Assessment confirmed the Airspace in Romulus was limited to zero flight height of UAS systems in almost the entire 36 square miles of Romulus, because of Detroit Metro Airport.
 - b. Commissioned Airspace Link to complete a study of the air traffic in and around Romulus and DTW.
 - i. Study prompted a submittal to FAA requesting changing of low altitude air flight around DTW. This was done in three waves opening up approximately 80% of the low altitude airspace for both recreational and commercial part 107 flights.

Before expansion



After expansion



2. Implemented public education through City of Romulus website with learn to flight and request authorization to fly programs.
3. Started training of internal personnel across multiple departments to include Public Safety – Police / Fire, DPW, Communications, DDA, Parks & Recreation.
4. Installed 5 passive antennas to track location and detect real-time drone flights.
Track data and flights.
 - a. Implemented internal policy and external ordinance for drone flights.

AIRSPACE LINK: To give an overview of their company and how they interact with the FAA with the LAANC system, explain what Airspace Links vision and mission is and how working with in Detroit and Romulus has started laying the foundation to an inter-connected state of Michigan.

Discuss the Trump Administrative order and the impact for the next year and long term.

June 2024

UAS Readiness Assessment

A unifying approach to
comprehensive UAS Readiness



PREPARED FOR

The City of Romulus, Michigan

PREPARED BY

Airspace Link, Inc



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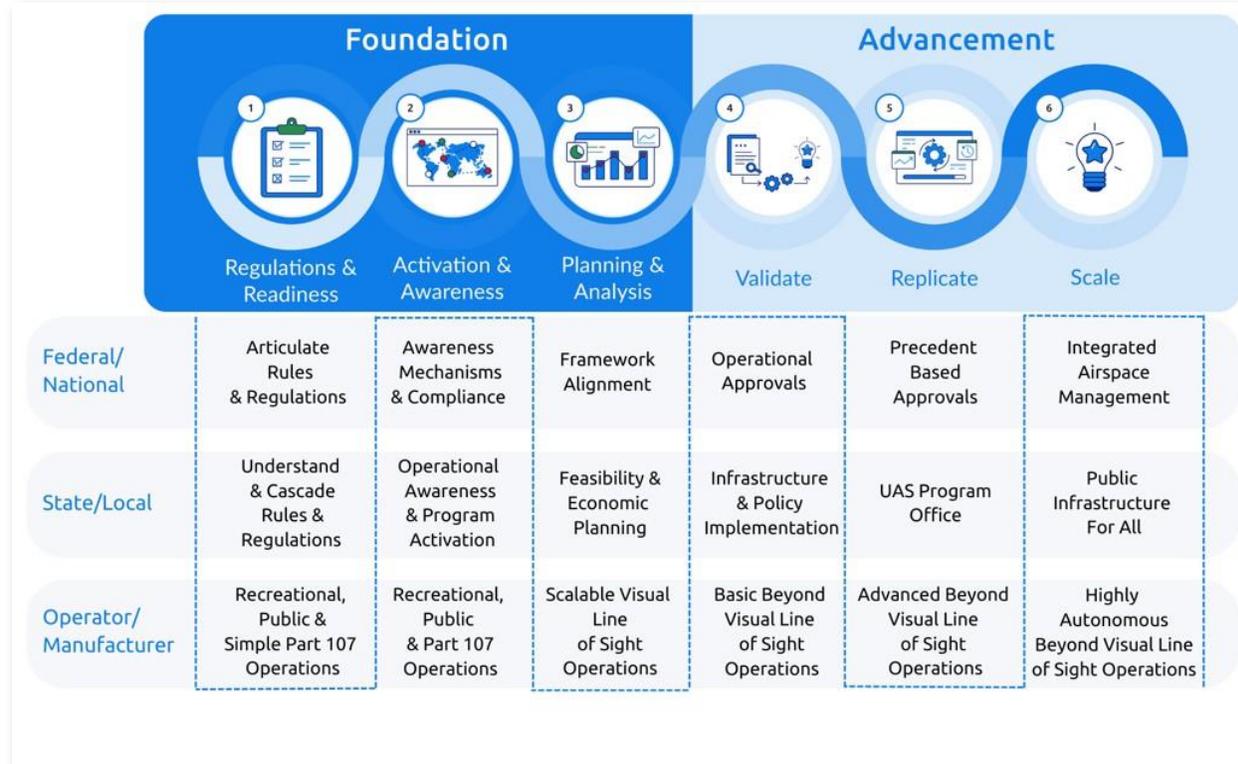
Executive Summary

- Just as the Industrial Revolution led to the creation of the American Railroad System and the post-war era led to the creation of the Interstate Highway System, today, we are embarking on a new chapter in infrastructure history: The Drone Revolution.
- To uncover key insights and recommendations to enable the safe integration of drones in the City of Romulus, Airspace Link conducted an Uncrewed Aerial System (UAS) Readiness Assessment. The assessment includes a comprehensive overview of the city drone ecosystem while documenting a cross-departmental inclusive view of objectives for future UAS integration and operational outcomes.
- The team engaged with seven departments and nine Romulus employees to understand the potential use cases for your community, assess the benefits of drone integration into existing operations, and determine the next steps needed to reach the city's UAS goals. We learned that there is a significant interest in drone-related initiatives, including training drone pilots, purchasing drones, and installing drone sensors in Romulus. We also identified critical needs and gaps that can be addressed with a well-planned drone program, which we discuss in our recommendations.
- Airspace Link is the leader in building and managing UAS digital infrastructure that supports the creation of "Highways in the Sky" to enable safe drone operations in communities nationwide. Our team of experts has spent eight weeks conducting interviews, analyzing the results, and crafting tailored recommendations. We are excited about Romulus' plans to expand its UAS program and establish the digital infrastructure to create a safe and scalable ecosystem. These initiatives will enable Romulus to become a leading center for advanced air mobility, ensuring the safe integration of drones within the Romulus community.



UAS-Ready Community

- Airspace Link has created a unified UAS Integration Framework and a blueprint for a UAS-Ready Community. These tools model comprehensive UAS integration and readiness, help guide stakeholders along the road to creating safe and effective UAS ecosystems and are used in this assessment to encourage communities to strive for their unique “ideal UAS community.”
- Figure 1 shows a summary of the UAS Integration Framework. The framework outlines UAS operator and national, state, and local government considerations at each milestone. These considerations reduce complexities, accelerate the benefits, and ensure safe, legal UAS operations that are in harmony with the communities they serve. We encourage you to read a detailed description of this framework in our [UAS Integration Framework](#) [whitepaper](#).



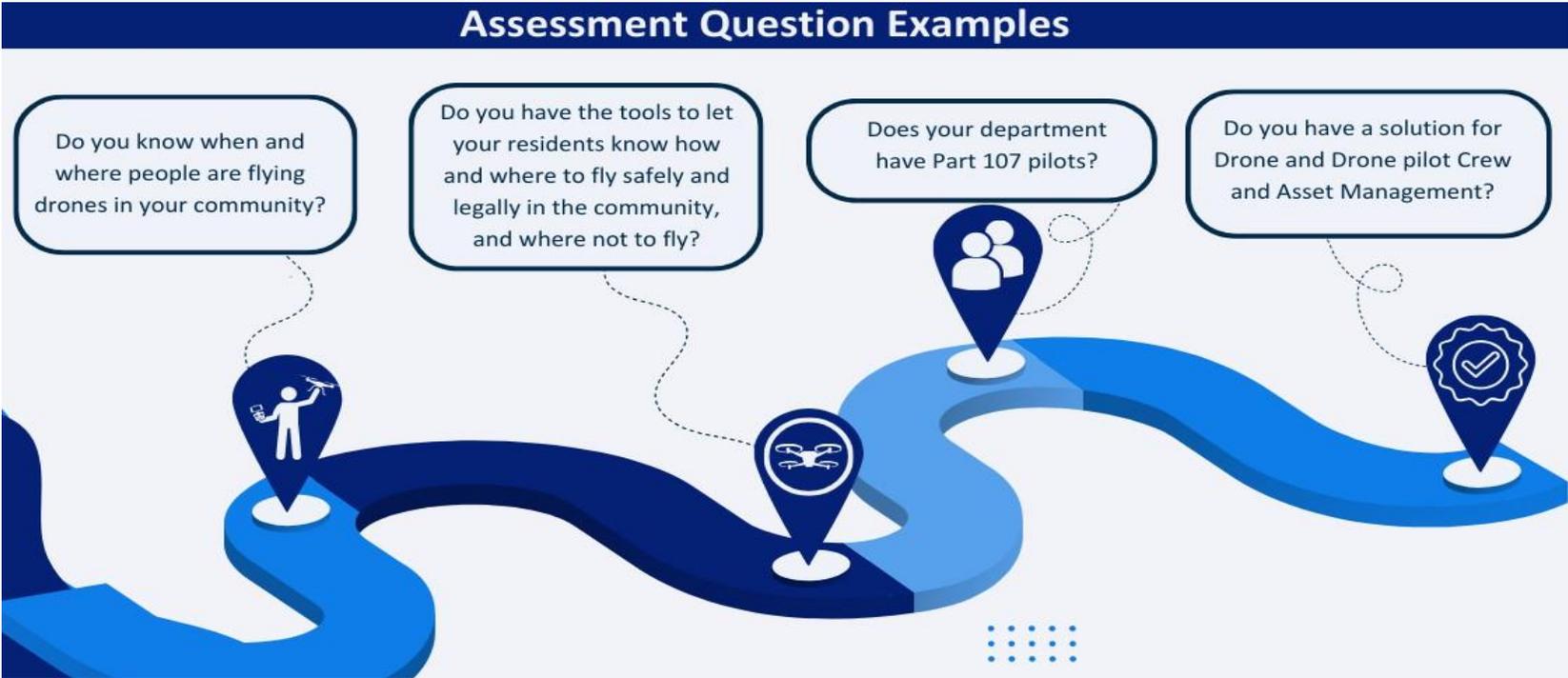
A comprehensive description of a UAS-Ready Community is presented in Appendix A. This illustration is meant to provide a general guideline relevant to all levels of local and state government. The UAS-Ready Community guideline and the UAS Assessment learnings inform our UAS readiness recommendations to the City of Romulus.

UAS Readiness Assessment: Process and Findings

- This section is dedicated to reviewing the assessment process for your city and the assessment results, including your current state of UAS readiness and Romulus' vision for a UAS-integrated future.
- **Participants**
- Airspace Link met with nine points of contact, representing five departments, between 2/29/2024 and 4/18/2024 to discuss Romulus' needs, challenges, and vision related to UAS integration and operations.

Department	Contact Person	Title	Interview Date
Building & Planning	Jeff Kemp Jr.	Director	February 29 th , 2024
Fire	Ken Chapman	Deputy Chief – Fire and Emergency Services	March 8 th , 2024
	Gino Gonzalez	Firefighter/paramedic	
Downtown Development Authority	Jerry Frayer	Director and Economic Development Liaison	March 28 th , 2024
Economic Development	Kevin Krause	Director of Community Safety & Development	March 28 th , 2024
Police	Robert Pfannes	Police Chief	April 15 th , 2024
Public Works	Roberto Scappa)cci	Director	April 18 th , 2024
	Donald Straub	Assistant Director	
Assessor	Julie Albert	Director	April 18 th , 2024

During the interviews, we reviewed the list of questions sent in advance to the participants and discussed each department's specific circumstances and aspirations. Figure 2 highlights a few of the questions asked and reviewed during the interviews.



Assessment Findings

- Current State
- Based on data collected during our interviews and research into your city, and after careful analysis and review, we place the City of Romulus at level 1 while actively transitioning to level 2 of our UAS Framework.
- Drone Usage by Romulus City Departments:
 - The Fire Department is part of the Hazardous Materials Response Team (HAZ-MAT) of the Western Wayne County Fire Department Mutual Aid Association.
 - The Building & Planning Department has contractors who use drones to plan real estate development and inspect roofs in the area.
 - The Public Works Department also has contractors who use drones. Drone use cases include inspection of drainage, roads, and building foundations.
- **Utilizing existing investments:**
 - The city utilizes Esri ArcGIS products efficiently and works with Rimer GIS, a professional GIS Services consultant. Esri ArcGIS products are an excellent foundation for a thriving drone management program for any local government.

Future State

- Listening to the departments' representatives, we learned that the City of Romulus aspires to reach framework level 4 within the next few years. In particular, the city is interested in continuing its significant progress toward UAS leadership in Michigan, including initiatives such as:
 - The Building and Planning Department is interested in using drones in-house for inspections and site/property monitoring. Achieving this goal would involve purchasing a drone to be used by this department and training 1-2 employees to use it.
 - The Fire and Police Departments are interested in utilizing drones for emergency and disaster response. A recent example showcasing the need for an efficient drone response is a train derailment incident in Romulus on November 2nd, 2023. A 97-car train derailed 14 of its cars on north-south CSX tracks in the city. One of the cars was placarded to have a hazardous material, molten sulfur, but luckily, it was empty at the time of the incident. However, first responders had to come closer to the car to check on the potentially hazardous material-bearing car than safety precautions dictate. Numerous department representatives mentioned that a drone could have been the safe and cost-efficient solution for such an incident.
 - The Police and the Fire Departments see value in a 'Drone as First Responder' program to increase police response effectiveness.
 - The Fire and Police Departments are interested in looking into submitting and implementing COA and TBVLOS waivers for emergency response.

- Utilizing railways passing through Romulus for drone operations—On 4/24/2024, the city provided Detroit Region Aerotropolis with a letter of support for a grant proposal to utilize state-owned railways for UAS transportation of 3D-printed additively manufactured cargo in collaboration with Airspace Link and Automation Alley and in direct connection with [Project DIAMOnD](#). If this proposed project is approved by Michigan’s Office of Mobility and Electrification, it will serve as an extension of the [Advanced Aerial Innovation Region \(AAIR\) Initiative](#) and further position Romulus as a UAS leader in the area.
- Training for Part 107 Certificates – the City of Romulus has embarked on a workforce development journey with Airspace Link and the Unmanned Safety Institute. The city is looking to train 13 new Part 107 pilots who will be able to fly city-owned drones and support the recommendations mentioned in this report.
- Drone Policy—Most departments indicated that a drone policy setting forth regulations for planning and conducting drone flights would benefit the city as a whole or their department.

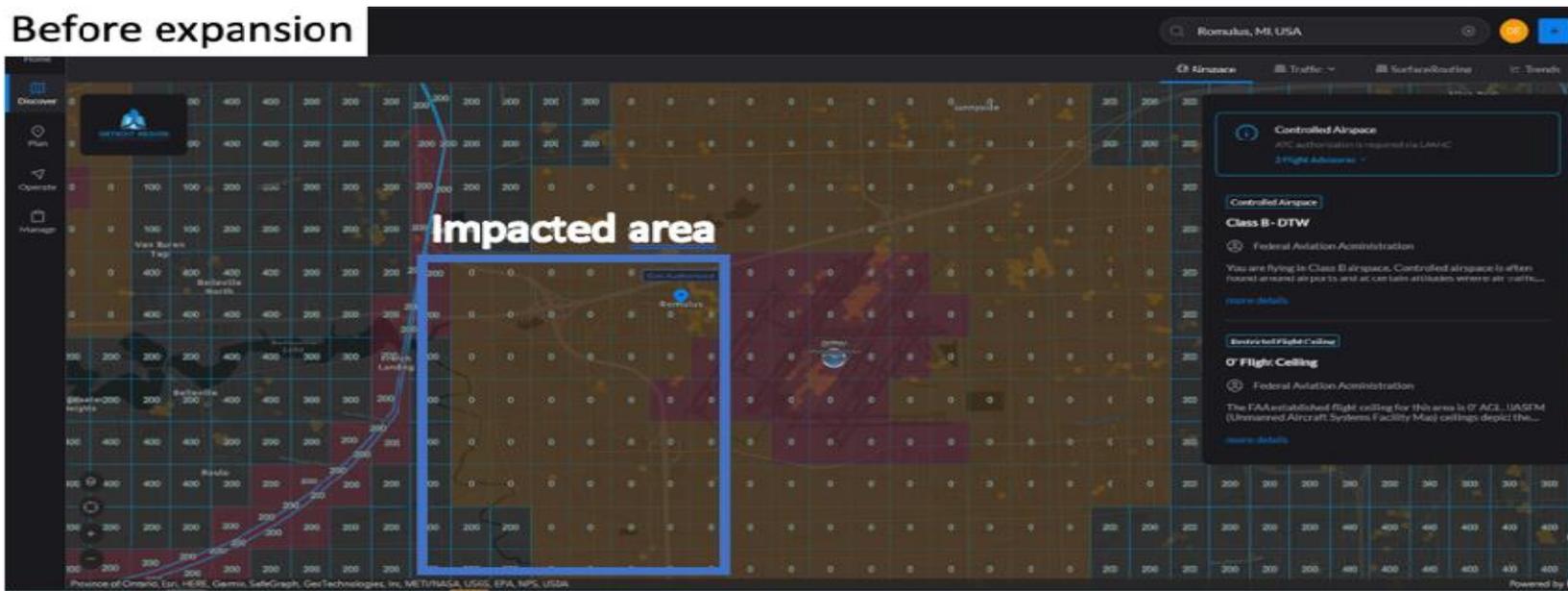
Changes to the Airspace Access in Romulus

The City of Romulus is interested in establishing a drone park and increasing use of UAS within the city. The best locations for this purpose (and the majority of the city) are in an area featuring grid ceilings of 0 W AGL (above ground level), which is a significant barrier for UAS flights. Airspace Link conducted a geographic assessment to determine what existing parks within the limits of the City of Romulus are best suited to be drone parks. Air traffic data was pulled from a recent Michigan Department of Transportation study and showcases the traffic volume around DTW during the busiest three-month period of the year. This data was factored into the site selection criteria for the parks to determine the proximity of these parks to overhead air traffic and which parks were suitable for use while maintaining safe vertical separation from air traffic into and out of DTW. The study found that Elmer Johnson Park and Henry Ruff Park (Locally known as St. John's Lodge #44 Community Park) were two suitable candidates for drone park designations as air traffic patterns were found at altitudes above 1200 W AGL.

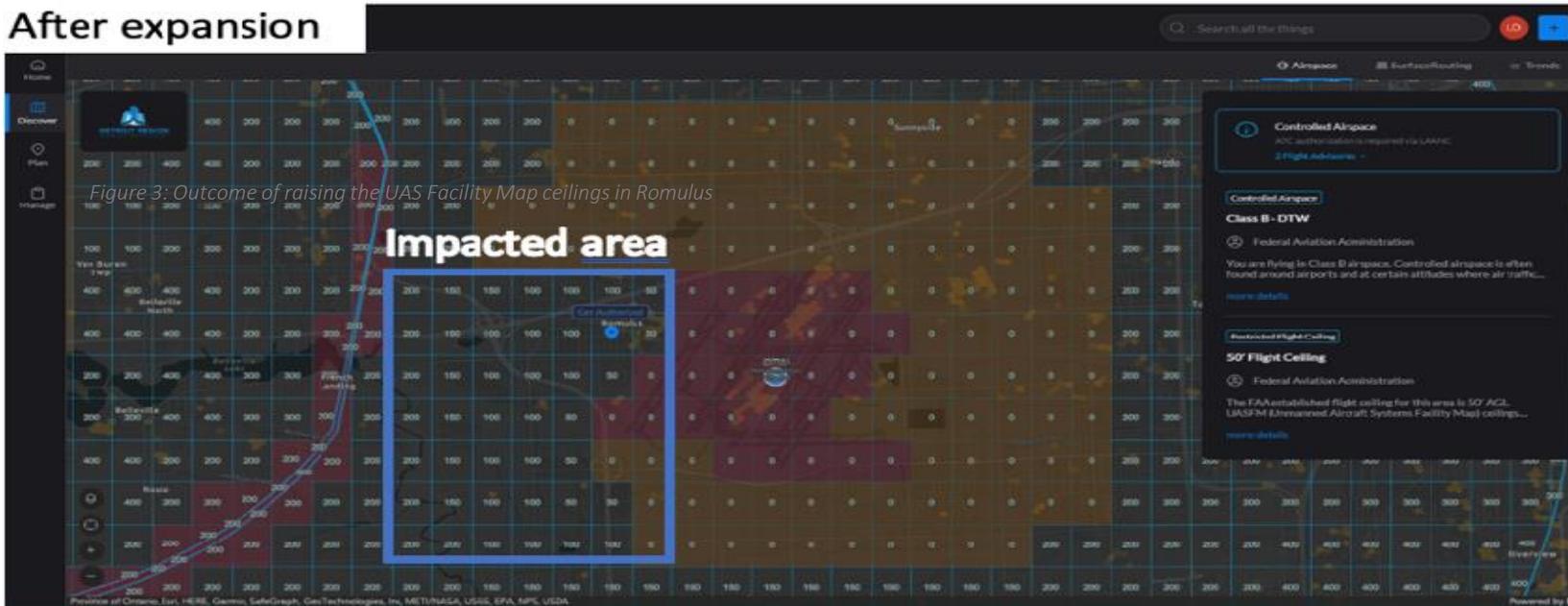
To achieve this conclusion, Airspace Link has conducted a preliminary analysis for the placement of a drone park. This analysis consists of ground risk analysis, air traffic analysis, and site selection. A detailed report of these analyses and selections was presented to the City of Romulus. As a next step, the City of Romulus has worked with the Airspace Link to submit a request to raise the UAS Facility Map ceilings over these parks.

The submission was successful, and the City of Romulus expanded the drone-accessible airspace in the city near Detroit Metropolitan Airport (DTW). In more detail, Romulus comprises 177 grids, of which 154 had a ceiling of 0 W AGL before 10/20/23, prohibiting UAS operations. 34 grid cells were changed on 10/20/2023.

Before expansion



After expansion



Romulus is working towards a second phase of increasing airspace accessibility in the area. While the first phase focused on the downtown and residential areas, including locations of schools with an opportunity for STEM-related UAS activities, the second phase will focus on commercial areas. Romulus was primarily interested in raising segment ceilings over an industrial park in the north of the city and some neighborhoods in the southeast. These changes will facilitate industry growth and allow for commercial UAS operations.

Airspace Link has supported Romulus in creating a UAS Facility Map analysis and submitting it to the FAA to consider raising the ceilings in the requested area. The FAA has asked for evidence of UAS activity in the region from businesses and residents and encouraged operators to utilize UAS under the current restrictions. The FAA will further consider this request once this evidence is presented. Romulus and Airspace Link are working together to implement the digital and physical infrastructure needed to generate this activity and expect to follow up with the FAA in the future.

UAS Infrastructure

The City of Romulus is working on installing and activation UAS detection sensors in key city locations. This installation aims to facilitate awareness of current UAS traffic for safety, security of critical infrastructure, and economic development purposes. This investment will also enable the city's upcoming drone operations and promote accountability through reporting. Airspace Link is assisting Romulus in determining adequate and cost-efficient UAS sensors and has presented a proposal to the city.

UAS Assessment Recommendations

In this section, we translate the aggregated UAS Assessment findings into recommended action items customized to support the City of Romulus in achieving level 4 of the UAS Integration.

To assist Romulus in addressing these recommendations and advancing your UAS-Ready Community, Airspace Link is proud to offer products and services that support these recommendations and is happy to recommend other industry partners who can help the city in its UAS journey. We name our relevant products, services, and partners in the table below. To facilitate strategic planning, we identify an estimated cost for each of our recommendations. This estimate is based on our current industry knowledge, is meant for budgetary purposes only, does not constitute a quote for products or services, and may differ for your community.

Table 2: UAS Assessment Recommendations for the City of Romulus

Framework Level	Recommendation	Available Industry Solutions	Estimated Budget*	Required
General Recommendations for the City of Romulus				
1	Implement a UAS regulatory knowledge campaign, establish a UAS policy, and extend the use of the UAS management software purchased by the city (AirHub® Portal). Continue the work required to establish a drone park and conduct UAS related community outreach.		\$15,000- \$30,000	
1,2	Train city employees as Part 107 pilots and utilize the UAS Crew and Asset management solution offered by AirHub® Portal. Utilize GIS data and map air and ground hazards, establish a DFR program, purchase drones for the various departments and use drones for mapping and data capture.		\$50,000- \$100,000	
1,2,3	Finalize a plan to add sensors and other UAS infrastructure and start the process for TBVLOS for the Police Department and COA for the Fire Department.		\$100,000+	
1,2,3,4	Install UAS sensors and implement a shared UAS infrastructure approach and enable BVLOS operations for various stakeholders.		\$150,000+	
Departments: Economic Development and Downtown Authority				
1	Establish a unified UAS local policy that aligns with FAA regulations and have it approved by the City of Romulus' council.	Policy support package	\$20,000	
1	Invite a Subject Matter Expert to lead a federal/state regulatory workshop to inform and educate city employees.	SME consul-ng	\$1,000+ travel expenses	

1	Establish community centered drone workgroups or townhall meetings to share UAS planning progress and receive feedback from the community.		
1	Ensure all organizational drones are registered with the FAA through DroneZone .		\$5 per drone registration
1	Ensure all organizational drones are equipped with Remote ID capabilities.		\$100 per Remote ID external unit for older drones
1	Continue the work to establish a drone park for recreational and educational use.	Consulting services	<\$3,000
1	Implement UAS operations management software for use across the organization.		
	Communicate federal, state, and local UAS laws and regulations to the community on a dedicated website, through the FlySafe program operated by the City and supported by Airspace Link. Include relevant links such as DroneZone for drone registration, TRUST for recreational pilot registration and so on.		
1	Ensure UAS flights are planned using a pre-flight planning application (AirHub Portal), and requesting federal authorization, utilizing Low Altitude Authorization and Notification Capability (LAANC) established by the FAA	The FlySafe Program, including AirHub® Portal Licenses	Covered by the FlySafe Program cost, already purchased by the City of Romulus
1	Publish Drone Flight Advisories to notify the community of areas to avoid flying, including airports, sensitive infrastructure, and events. Communicate detailed event and contact information directly to your community, helping operators plan their operations and minimizing the risk to the community. Utilized the FlySafe page for this purpose.		
1	Establish the cadence and tools to inform the community of organizational drone operations in the the City of Romulus area.		
2	Keep track of organizational crew and assets (drones and drone pilots) utilizing a dedicated UAS crew and asset management solution (AirHub Portal). The crew and asset solution would allow you to track and monitor drone and pilot registration, usage, and activity and achieve comprehensive baseline of asset and pilot management capabilities.		
2	Establish and adopt a common data model to be used city wide that will support data capture from all departments and will integrate with the existing GIS solution (ArcGIS).		
2	Compile existing GIS data to support drone operation analysis and planning		
2	Map airspace and ground risks within Romulus jurisdiction and share with the organization and with the FAA as part of the request to change flight ceiling in additional locations.	Implementation services, utilizing AirHub® Insights	\$5,000-\$20,000, depending on the area.

2	Ensure all organizational drone operators hold current Part 107 registration. Expand the training and train 13 more Part 107 pilots across the city. Including 1 employee from the Economic Development Department and one employee from the Downtown Authority Department.	Unmanned Safety Institute (USI) Part 107 training.	See proposal sent by USI (\$500 per pilot for virtual training)
3	Research and join regional drone initiatives that facilitate access to long distance showcase operations, funding, introduction to innovative solutions, and data sharing.		
3	Continue working with Airspace Link to finalize a feasibility study to determine the best locations for UAS sensor implementation	Loca-on analysis and alignment with sensor providers (utilizing AirHub Insights)	.
3-4	Finalize the contract and establish a license to install Remote ID Receivers for drone tracking and invest in UAS infrastructure.	Airspace Link recommended UAS sensors by AeroDefense and put forth a proposal to the City of Romulus	Sensor installment starts at \$30,000 and covers between 5-15 miles.
3	Collect telemetry from public or commercial drones to compare actual flights to planned flights and ensure compliance and safety.	Connect ground control system and UAS management software	
3	Establish a streamlined process for managing requests for drone services. Drone as a Service (DaaS) is a centralized solution, allowing various agency departments to benefit from drone capabilities without owning and managing drone operations on their own. The Community Cable Television Department can serve as the provider for this initiative	DaaS integration support	
3	Create a drone site assessment for economic development purposes. Select appropriate sites for vertiports or takeoff and landing areas and ideal flight routes to attract businesses to the area.		
3	Create a roadmap to scale towards advanced UAS operations (BVLOS).		
3	Regulate locations for drone take-offs and landings, based on authoritative data sources, to mitigate potential conflicts with residential areas and other sensitive land uses.		
Departments: Building & Planning			
2	Purchase 1-2 drones for the department and train one employee as Part 107 pilots.		
2	Use drones for imagery and data capture to facilitate updated mapping of the Romulus area.	Use Esri SiteScan and departmental drones, or contract with SkyLadder or similar imagery and mapping services	Contract services: \$10,000- \$50,000, depending on area and needs.

3	Utilize drones for parcel and building planning, in collaboration with existing GIS services.		
Department: Fire			
1	Create a Fire Department drone policy, illustrating strategic and tactical processes for drone operations by the department		
2	Purchase between 1-2 drones for the use of the Fire Department		~\$20,000
2	Train three employees as Part 107 pilots		~\$500 per employee
3	Apply for a Certificate of Waiver or Authorization (COA). The COA will allow the Fire Department to use drones for public safety and emergency response activities without needing authorization for each flight.	Implementation services	~\$5,000
Department: Police			
1	Ensure all departmental drones are registered with the FAA through DroneZone.		
1	Ensure all departmental drones are equipped with Remote ID capabilities		
2	Purchase between 1-2 drones for the use of the Police Department		~\$20,000
2	Train three employees as Part 107 pilots		~\$500 per employee
2	Initiate a Drone as a First Responder (DFR) program and initiate a knowledge campaign to educate the public on the benefits of this program.	We recommend a 4 weeks DFR Pilot program, offered by Flying Lion, or similar providers	~\$30,000
2	Publish Advisories- drone advisories are a powerful tool for governments to communicate potentially dangerous areas for drone operation. The nature of these advisories is up to the governing body but typically includes large events- such as a parade, convention, or sporting event.	The FlySafe Program	Included in the City's FlySafe license
3	Submit an application to the FAA for a Tactical Beyond Line of Sight (TBVLOS) waiver. This authorization allows the department to conduct beyond line of sight operations in scenarios such as search and rescue operations over large areas, monitoring incidents in remote locations, or conducting surveys in situations where maintaining direct visual contact with the drone might be challenging or impractical.	Implementation services in support of the applications	
3	Create a compliance reporting plan to stay in compliance with the TBVLOS requirements	AirHub Portal Crew and Asset Management (CAM)	Included in the City's FlySafe license
Departments: Public Works and Assessment			
2	Train two Public Works employees as Part 107 pilots		~\$500 per employee
2	Use drones for imagery and data capture for inspection and maintenance projects	Esri Site Scan or Drone2Map or other drone data collection software	\$5,000- \$10,000

2	Use drones for measurement of large areas, as part of assessment processes		
2	Ensure transparent communication with the residents regarding the use of drones, times of flights, and locations of flights		

*Some recommendations have associated recurring costs (such as software as a service), and **SOME** have a one-time cost (such as policy package, purchase of drones, etc.).

Summary

It's been our pleasure to work with and support the City of Romulus with critical insights and a framework for a comprehensive roadmap to UAS readiness. Our goal in this assessment was to align the city on the current use of drones and future planning/objectives to ensure efficient growth and integration of UAS systems and operations. We recommend an annual budget of \$40,000-\$80,000 for the first year and \$100,000-\$200,000 for the second year to achieve the recommendations above. We look forward to continuing this journey with the City of Romulus, helping implement these recommendations, and fostering the growth of a UAS-Ready Community.



Additional Resources

- Subject Matter Experts at Airspace Link have prepared various whitepapers and case studies encompassing a wide range of UAS-related knowledge. We invite you to review these resources on Airspace Link's website and contact us with any questions:

- 1. Airspace Link's UAS Integration Framework
- 2. Exploring the Transformative Effects of Drone Technology Use Cases and Benefits
- 3. City of Ontario, California Case Study

Airspace Link is a key participant in Detroit's Advanced Aerial Innovation Region (AAIR). The AAIR is a first-of-its-kind air mobility and drone technology initiative. The initiative is a Public Private Partnership led by the Michigan Department of Transportation and Michigan Central.

We'd also like to take the opportunity to share with you a UAS Connected Corridor Feasibility Analysis conducted by Airspace Link for the Michigan Department of Transportation. Airspace Link offers several levels of feasibility analysis and similar services, preparing communities of all sizes for scalable UAS operations.



Appendix A: UAS-Ready Community - Step by Step

- The table below details the various components of a UAS-Ready Community for Framework Levels 1, 2, and 3. Advanced levels build upon levels 1-3 and merit further discussion.

Vertical	Details
Level 1: Regulations and Readiness	
Federal, State, and Regional Regulations	An extensive knowledge of federal, state, and regional UAS regulations and how they directly affect the community.
	Regular review cycles of regulatory changes.
	Effective means of cascading federal, state, and regional UAS regulations and changes in regulations to the community.
LAANC Process	A user-friendly and accessible tool for drone operators to gain Low Altitude Authorization and Notification Capability (LAANC) approval from the FAA for drone operations. This approval authorizes drone flights within controlled airspace around airports.
Drone Registration	Organizational and commercial drones registered with the FAA through DroneZone .
Local UAS Policy	A comprehensive local UAS policy that considers federal and state regulations, safety community engagement and feedback, risk management, innovative approaches to UAS commercialization, and ways to minimize residential disturbance.
	Regular review and updating cycles of the local UAS policy to reflect regulatory changes and community feedback
UAS Allowed and Restricted Areas	Designated allowed and restricted areas for drone operations, landing, and take-off, based on regulatory current information, ground and risk hazards, and zoning considerations.
	A real-time online tool to communicate drone operations restrictions and hazards to the community, including when and where drone flights are permitted.
Designated Areas for Recreational Drone Use	Accessible guidelines for recreational UAS use, focusing on safety, privacy, and respect for community spaces.
	Designated specific areas in parks or open spaces where families and recreational drone pilots can safely operate UAS. Clear signage and informational materials in these zones and on the community's website and community outreach channels.
Registered Recreational Pilots	A knowledge campaign informing recreational pilots of the need to register with the FAA, take the Recreational UAS Safety Test (TRUST) exam, and stay in compliance with all regulations.
Community Engagement	Collaborative UAS policy alignment, local business and residents partnerships, townhall meetings.
Level 2: Activation and Awareness	
UAS Planning and Awareness Community Tool	An online real-time tool used to educate advanced and 107 operators, residents, and businesses on rules and regulations to ensure they can fly compliantly and safely.
	A UAS management solution, allowing the government organization to oversee UAS planning and operations.
Operator Readiness- UAS Part 107 Pilots	Registered Part 107 drone pilots, employed by local government, contractors, or commercial entities.
UAS Workforce Development Initiatives	UAS workforce development initiatives led by local government, academic institutes, and economic development organizations. UAS workforce includes drone pilots, IT personnel, project managers, educators, GIS experts, etc.

UAS STEM Initiatives	UAS teaching in STEM education initiatives (middle schools, high schools, colleges, etc.)
Public Safety Drone Operations	Drone usage by police, fire, and other public safety departments, including Drone as a First Responder (DFR) program, drones for search and rescue, drones for traffic accident support and other emergencies.
Other Public Use of Drones	Drone use cases in the public service beyond public safety, such as infrastructure inspection, mapping, and so on.
UAS Crew and Asset Management	A software solution allowing the local government to track and monitor drone and pilot registration, usage, and activity and achieve comprehensive baseline of asset and pilot management capabilities.
UAS Detection and Tracking	Detection and tracking of historical and real time UAS activity in the community's jurisdiction, allowing for increased safety, protection of privacy, and compliance with federal, state, and local regulations.
UAS Advisories	A real time notification tool, allowing the local government to publish permanent and temporary advisories related to restricted and allowed areas for drone operations, times and dates of restrictions, and means for request additional information.
GIS Data in Support of UAS Integration	Integration of local GIS data with the chosen UAS software solution to increase accuracy and identification of hazards.
Compliance with Remote ID	An updated knowledge of the new FAA 'Remote ID' regulation and a plan to ensure the organization's pilots and community are in full compliance with this regulation.
Level 3: Planning and Analysis	
Certificate of Waiver or Authorization (COA)	An FAA authorization for law enforcement or firefighting departments to use drones for activities related to public safety and security, such as search and rescue, accident investigation, disaster response, and surveillance in certain situations. The COA outlines the specific conditions under which these agencies can operate drones, including factors like airspace limitations, operational restrictions, and safety protocols.
Public Safety Tactical Beyond Visual Line of Sight (TBVLOS)	An FAA approval to tactically fly drones beyond the visual line of sight by law enforcement, firefighting, or emergency response agencies. This authorization is given for scenarios such as search and rescue operations over large areas, monitoring incidents in remote locations, or conducting surveys in situations where maintaining direct visual contact with the drone might be challenging or impractical.
UAS Program Center, Department, or Office	A dedicated UAS program center to oversee drone operations by the organization, integration of commercial and community drone operations, invest in UAS infrastructure, and much more.
UAS Showcase Operations	Showcase operations to test and validate use cases such as cargo delivery, medical services, and emergency response.
Process and Blueprint for Onboarding UAS Operators	An established local process to remove barriers for new UAS operators and use cases within the community organizations. Focuses on a process to submit and gain approval for BVLOS operations.
UAS Infrastructure Planning	A detailed budgeted plan for the required UAS infrastructure to empower public and commercial UAS operations and facilitate scalable UAS use cases. UAS infrastructure plan includes communication solutions, UAS radars, digital infrastructure, passive tracking of crewed aviation, and so on. The plan should also identify the ideal locations that maximize coverage and coincide with suggested routes for UAS.
UAS Radars	Strategically located UAS radars to track real-time UAS operations. UAS radars' locations should be informed by the UAS Infrastructure Plan.
BVLOS Waiver Application	Successful BVLOS application for public or commercial use case within the jurisdiction.
Designated Routes for UAS Operations	GIS-based identified routes for safe and efficient UAS operations. These routes can be repeatedly used for public and commercial use cases.

Take-off and Landing Zoning Planning	Regulate locations for drone take-offs and landings, based on authoritative data sources, to mitigate potential conflicts with residential areas and other sensitive land uses.
Regional Initiatives	Taking part in regional UAS initiatives that facilitate access to long distance showcase operations, funding, introduction to innovative solutions, and data sharing.
Expanding Commercial Use Cases	Increased number of commercial UAS use cases and flights, including delivery, event management, photography, and construction.
Expanding Public Use Cases	Increased number of UAS public use cases and flights, including emergency response, utility management, and mapping.
Drone as a Service (DaaS)	A streamlined process for managing requests for drone services. A centralized solution, allowing various agency's departments to benefit from drone capabilities, without owning and managing drone operations on their own.
Level 4-6: Validate, Replicate, and Scale	
Levels 4-6 focus on validating, replicating, and scaling UAS operations. As most communities are looking to implement levels 1-3 at this time, we name here only a few contributions to levels 4-6.	Implementing BVLOS flights with advanced communication, radar (crewed aviation surveillance), and control technologies.
	Navigating the regulatory landscape with waivers, exemptions, and tailored permissions. Utilizing high-end drones with safety features like parachutes and advanced sensors.
	Addressing safety concerns such as the probability of a drone crashing or colliding with other airspace users
	Ensuring pilots have adequate training, logged flight hours, and minimal crash records.
	Successfully scaling BVLOS drone operations across the region.
	Integrated Airspace Management, Public Infrastructure for all, highly autonomous operations.