

# The Future Is Here: Why Counties Should Prepare for Autonomous Technology

By Patrick J. Bresnahan, Ph.D.

**O**ver the past few years, many of our county colleagues have begun using drones for various operations. Most of these operations have been effective in their implementation and expanded the capabilities of our staff. Along with search and rescue, mapping and law enforcement are the most common applications currently.

The adoption and evolution of drone operations is at a pace rarely seen in county government. Every few months new and improved equipment and software becomes available that prompts expanded applications. Drones are becoming commonplace as clipboards are moving toward extinction. This evolution is just a small insight into the innovation and disruption coming from robotics and automated systems.

## What Are Autonomous Systems?

On college campuses across the country, you can observe the first-world luxury of food delivery robots scurrying on their missions.

Autonomous vehicles are currently shuttling people around both retirement and traditional communities in Florida and Arizona. In North Carolina, the National Park Service tested its first automated shuttle at Wright Brothers National Park during spring and summer 2021 in partnership with the North Carolina Department of Transportation.

These are all examples of autonomous systems, which encompass environments of air, land, and water. While you are likely most familiar with aerial missions conducted with drones, operations of autonomous technology on land and water are moving from the development and testing phases to practical applications.

Such transportation platforms include passenger automobiles, or robotaxis, as well as driverless minibuses. Water-based craft are already being used in South Carolina to map lake and river bottoms as technicians monitor progress from small boats or the shore.



Crewed Volocopter 2X lands in front of the Skyports and ADP veriport terminal at Pontoise-Corneilles Airfield in France. *Photo courtesy of Volocopter.*

## Benefits for County Governments

Most of the technologies are being employed without consideration of impacts or issues at the county government level. Yet autonomous technologies can and will have positive impacts in county government. As with aerial drones, autonomous equipment will improve and expand citizen services. For example, robotic crawlers are now used in a variety of pipes for pigging (maintaining and cleaning) and inspections. These crawlers collect data during operations and are available now for utilities and public works departments. Walking or crawling robots are already being used by electric utilities to collect data in confined or dangerous spaces.

Other systems collect data but only for immediate use. Autonomous mowers use sensors to collect information, but those data are only used to guide the equipment in completing a programmed task. As individual technology components of autonomous systems continue to improve at lightning speed, robotic mowers will be able to support significant operations in county facilities departments.

Most autonomous tools will fit into county operations with few issues. Industrial robotic mowers and pipe crawlers will require additional staff training but should have minimal impact at the administration level. Most likely, states will dictate the rules of the road for most autonomous vehicles such as trucks and passenger transports. However, there will be local input as to smaller autonomous platforms that will be used for transport and delivery. Some of those discussions will revolve around local infrastructure like sidewalks and pavement types. As with drones, we cannot foresee all the potential issues until practical applications begin.

## Potential Issues for Consideration

With the current benefits and future promise of autonomous systems, there are issues county governments must address for some platforms.

The most common relates to drone operations. Many counties have either passed or proposed ordinances restricting drone flights. Although these are likely reactions to citizen complaints, they are often unproductive. The most elementary point to be made about drone flight is that anywhere a craft flies, from the blade of grass to the heavens, is controlled by the Federal Aviation Administration (FAA). In what is

known as the National Airspace (NAS), the FAA determines where, how, and sometimes when registered craft can fly in the United States. So, counties that try to legislate where a drone can fly run into the domain of the federal government.

In 2015, the FAA published a factsheet outlining state and local government regulation issues. The FAA provided additional guidance in 2018 describing what aspects of drone operations local authorities can regulate. Those items include restricting take-off and landing loca-

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**Richland County Geographic Information Officer Patrick Bresnahan flies a drone at the Construction and Demolition Landfill in June.**

tions on public property as well as enforcing traditional laws of privacy and law enforcement actions. To assist county leaders nationwide, it has been recently suggested that the National Association of Counties (NACo) GIS Subcommittee and IT Standing Committee work with the Transportation Steering Committee to create a template of standard ordinance language to address drone issues in

individual communities.

### Drone Flights and Local Control

One very important note about drone flights and local control. As drones became more practical for business uses, a few local governments across the country promoted shooting them if citizens found

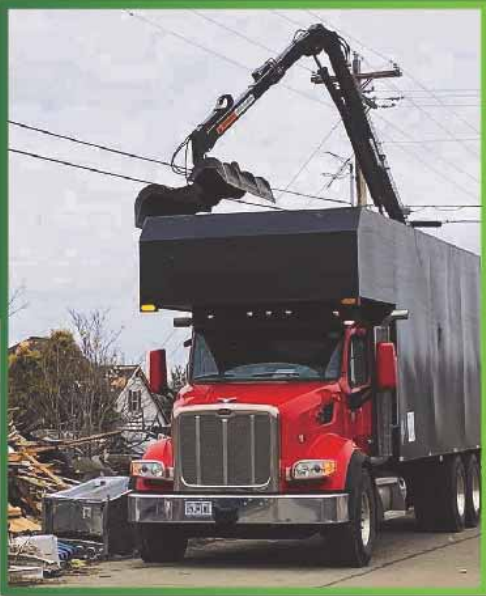
### Resources ...

**NACo's Exploratory Committee on Artificial Intelligence** | Sign up to receive updates on the committee's work and opportunities to get involved at [www.naco.org](http://www.naco.org).

**Grounded: Beyond the Technical Mapping**, police, fire and other city and county departments across the country have had millions of dollars of equipment grounded in the past several years. Federal government agencies, private utilities and entire states have banned drones manufactured in other countries. As one of these manufacturers represents approximately 90 percent of the U.S. public safety market, such drone bans can be costly for counties.



Connected Autonomous Shuttle Supporting Innovation, or CASSI, was launched at Wright Brothers National Memorial in Kill Devil Hills, N.C. in 2021. Photo courtesy of the N.C. Department of Transportation.



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them to be a nuisance. The same recommendation floats around on neighborhood social media sites frequently. Shooting a drone is a federal offense. The FAA requires working drones be registered and assigned an aircraft number, just as with commercial airliners. The aircraft must be visibly marked with that number and its registration maintained throughout its lifespan. The operator must also be certified by the FAA to fly the drone and maintain that certification through continued training. Thus, shooting a drone is similar to shooting at an airplane!

### The Future Is Here: Veriports and Local Aerial Transportation Sector Impacts

Although many local governments have experience using drone technologies and addressing related issues, the future is here and is much more complex. Consider autonomous airborne transportation. The day of the Jetsons may finally be upon us with flying taxis expected to be in service for the Paris Olympics next summer. Technology advances move as quickly as aircraft takeoffs these days, and county officials must be aware of the landscape covering a variety of artificial intelligence aspects and plan for potential impacts.

The framework for Urban Air Mobility (UAM) and Advanced Air Mobility (AAM) is on its way to completion with work by the FAA. This new aviation transportation system is classified by short hops (UAM) and longer-range trips (AAM) using a variety of aircraft with a common capability to depart and arrive in spaces much smaller than traditional airport runways. Most of the aircraft being tested are also powered by electric motors. Thus, electric Vertical Take-Off and Landing (eVTOL) craft will create less noise than traditional combustion propulsion.

The use of eVTOLs is not in the distant future. The FAA expects to certify the first round of aircraft for flight in this new category by the fourth quarter of 2024. In March 2022, the FAA published interim guidance, via an engineering brief, to support the design and operation of facilities for eVTOL operations known as Veriports. This new industry will require significant input and support from county governments with the involvement of multiple thematic departments. Counties must consider the approval of geographic locations for Veriports and the impact of zoning, ingress and egress of ground vehicles, and possible noise issues. Like any other construction, utilities, permitting, and inspections must be provided.


Questions for consideration include:

- How will county permitting and inspections be impacted by new technologies?
- What new training must inspectors have for such equipment and technologies?
- Licensing and taxation issues must also be decided.

### Conclusion

The topic of autonomous technologies is being seriously discussed in several NACo committees. The result of such work is often white papers, templates, or policy examples to guide and assist leaders. In May, NACo announced the formation of an Artificial Intelligence

Exploratory Committee. The group will examine emerging policies, practices and potential applications and consequences of AI, which includes autonomous technology. The work will focus on the lens of county governance policies and practices, operations and constituent services, public trust, privacy and security, and workforce productivity and skills development.

Because South Carolina already has a significant footprint of automobile and aircraft production, it lends itself to the technological evolution of those industries. Thus, we can expect autonomous transportation on our roads and in our skies sooner than most expect. These issues are at the doorstep of our county membership. The question is, are you aware and preparing? 

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