

## Drones over the Road<sup>1</sup>

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Although there seems to be a lot of activity right now around getting unmanned aircraft flying in some useful way, it's difficult to see any organized pathway to regulatory approval of large numbers of commercial UAS in the foreseeable future. Regardless the level of demonstrated aircraft performance and reliability, there is no agreed air traffic regulatory approach for approving wide spread UAS operations over the non-participating public, or over non-welcoming property owners.

There is however a way to get small UAS—including package delivery craft—flying safely and acceptably to the public in a fairly immediate timeframe. Why not authorize small hover-capable UAS to operate at an altitude less than 400 feet, over existing public roads and streets, using the same rules of the road that apply to ground vehicles? This means operating at a minimum altitude to the right of the road—below centerline, stopping/hovering at intersections if necessary to detect and accommodate conflicting traffic (perhaps using the four-way stop rule that traffic to the right proceeds first), and faster traffic passing above slower traffic at graduated altitudes up to the 400 foot maximum. The “last 100 feet” to destination off the public right of way would be with permission of the landowner, just as it is today for ground vehicles under ordinary trespass laws.

As a technology/performance matter, we're pretty much ready for this. A large percentage of small UAS types are hover-capable. Survey/mapping technology may already provide adequate ground reference information, and GPS/avionics and mounted camera technology might suffice for one meter flight path accuracy. Current state of the art on-board surveillance and collision avoidance technology may provide sufficient latency and accuracy for in trail operations at speeds envisioned. At some point, traffic management, metering and prioritization mechanisms might be required in congested environments (unlike cars, UAS can safely hover in place only so long as fuel lasts), but this would not be needed immediately.

Over-the-road operations avoid most of the thorny legal, policy, and safety issues inherent in point-to-point flight. From the safety perspective, little or no risk of collision with manned aircraft exists since general aviation is prohibited from flying under 400. Potential injury and damage risk to people and assets on the ground are bounded, calculable and minimized. Unlike random routings, persons on the road under the UAS flight path are protected by their vehicle roofs from collisions from above. And residual potential underlying personal and vehicle property damage risk is readily calculable using local, state, and federal traffic count data. State third-party liability insurance minima applicable to ground vehicles might be extended to cover over-the-road UAS, or route/vehicle specific coverage made available as a way of assuring anyone injured or damaged by a UAS is adequately compensated since these amounts already are deemed reasonable for anticipated ground traffic counts.

As opposed to point-to-point routes, operation over road rights of way does not infringe private property rights of road-adjacent landowners. As far as nuisance goes, even the noisiest drones probably are less audibly annoying than the motorcyclists and trucks that operate on roads without restriction. And it's hard to argue that a UAS at less than 400 feet is more of a privacy concern to

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homeowners than vehicles that already are passing or parking without objection on the adjacent road. To the extent that a UAS is delivering a package to a residence or private business, it should be traversing the last 100 feet with the same property owner permission already required of a USPS or other delivery company truck on the analogous mission.

Admittedly, over-the-road UAS operation would be less operationally efficient in terms of time and fuel than point-to-point routes. But maybe half-a-loaf at this point is better than none. Many of the legal and policy barriers to point-to-point low level UAS operations are pretty significant, and immediate solutions are elusive. Plans to allow land owners to opt out of UAS operations (“geo fencing”) will no doubt create a patchwork of prohibited airspace and complicated routings that might well prove more circuitous than the over the road route between the same points. And it’s not clear at this point how FAA will determine what level and type of UAS operations—if any--over the non-consenting (and possibly objecting) general public are “acceptably” safe.

Rather than tackle UAS safety standards writ large, FAA could tailor limited measures just for over-the-road operations. FAA might only require the UAS manufacturer/operator to demonstrate a level of vehicle frangibility sufficient so as not to penetrate the average ground vehicle; or perhaps demonstrating the ability to soft-land (parachute?) or ditch on the road shoulder in case of aircraft disablement would suffice. Or maybe the maximum size or weight of the UAS and payload only might be prescribed, and the rest be left to the third-party liability and insurance world to figure out.

But better to get a majority of UAS flying in the short term than virtually none at all—maybe ever, which is where we seem to be headed now.