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## A Future of Unmanned Aerial Vehicles

Division 4: Homeland Protection and Air Traffic Control

The Laboratory has been working alongside the Federal Aviation Administration (FAA) since the 1950s and continues to do so as unmanned aerial vehicle (UAV) technology becomes a more pressing issue. Though UAVs have continued to be produced, regulations have not been modified since they were first outlined in 2006. Now that these vehicles are being used for tasks such as package delivery, medical supply delivery, and infrastructure inspection, the need for regulations regarding them has become more pressing.

Ngair Underhill, Surveillance Systems, Group 42, has spent much time thinking about these issues in collaboration with the FAA and has broken her thought process into three parts. “The first step is always an exercise of imagination and investigation,” said Underhill. “What is our UAV domain going to look like? Will it operate like a set of roads?” There are many different possibilities that the future of UAVs could hold and Laboratory staff are currently in the phase of trying to anticipate and get ahead of public safety concerns. This leads to the second step: policy.

“This involves everything from requiring identification on UAVs, to making sure that they have collision



avoidance on them so they don’t hit each other, manned aircraft, or quite frankly birds, infrastructure, or other obstacles,” she said. “How fast should they be allowed to operate? Are there bird sanctuaries that they should not be allowed to operate near? How far from power lines must they fly—unless they’re inspecting the power lines in which case are they safer if they fly sufficiently close to them?”

The third step is technology and development. “When all of the rules are finalized, groups will adjust so that they fit into the ecosystem,” Underhill explained. “This may

mean they just need to adjust their operations to fulfill some criteria, but others may require research and development. For instance, if the FAA requires a certain UAV of a given weight to still be able to fly even after one engine dies, that might mean revisiting design for the platforms to meet that requirement.”

The Laboratory has a handful of different technologies already in development to try and ease the strain of this transition for unmanned vehicles.