

Look Ma, No Pilot!

Congress, the FAA, and the Future of Unmanned Aircraft Systems (UAS)

Michael Goldman

Today, over 300 businesses produce over 1,000 different Unmanned Aircraft Systems (“UAS”) ranging in size from a medium-sized passenger jet to a small winged insect.¹ They are mostly banned in U.S. airspace today, but this is about to change as a result of provisions recently passed by Congress in February 2012 as part of the FAA Modernization and Reform Act (“the FAA Act”).

For UAS or “drone” makers, the change in the new law regulating UAS comes at a particularly good time (UAS are commonly referred to as “drones” or Unmanned Aircraft Vehicles (“UAV”)). With the winding-down of the war in Afghanistan, where drones have been used to gather intelligence and fire missiles, these manufacturers have been awaiting lucrative new opportunities at home. The market for drones is valued at \$5.9 billion and is expected to double in the next decade, according to industry figures.² Drones can cost millions of dollars for the most sophisticated varieties to as little as \$300 for one that can be piloted from an iPhone.³

The possibilities for drones appear limitless. Last year, to cite one example, a Louisiana farmer began hunting feral pigs at night by outfitting a model airplane with a heat-sensing camera that soared around his brother’s rice farm, feeding live aerial images of the pigs to the farmer on the ground, who relayed the pigs’ locations by radio to a friend with a shotgun.⁴

In Idaho, wildlife biologists started using a drone for counting fish nets after a helicopter crash killed two researchers and a pilot.⁵ Other agriculture researchers are developing techniques to use drones equipped with infrared sensors to detect patches of dry ground in fruit tree orchards.⁶ And there is the example of the West Coast real estate agent who was using a drone--perhaps illegally--to take photos from unusual elevations of a residential property he was selling to

spark buyer interest.⁷

Current Regulation of UAS

Presently, UAS are operated in U.S. airspace primarily under a Certificate of Authorization (“COA”) or Waiver issued by FAA to local governmental entities, which precludes operations for compensation or hire. UAS are not allowed to fly in U.S. airspace without a COA or other authorization. Under a COA, UAS operations are permitted only for specific times, locations, and operations. FAA bans UAS on a wide scale because they do not have adequate “detect, sense and avoid” technology to protect against midair collisions.

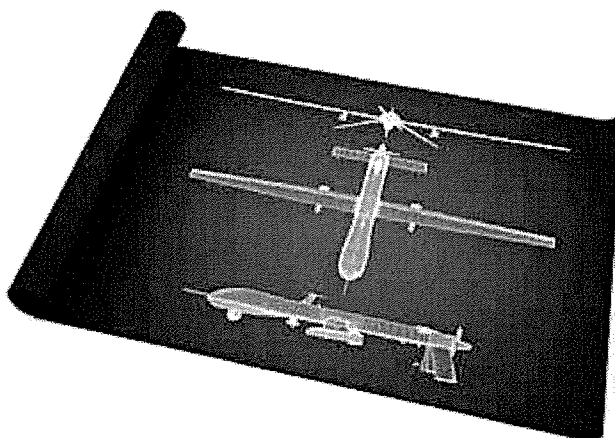
FAA currently licenses only state and local governments with such COAs. FAA records show that there are 294 active COAs and 140 pending as of September 2011.⁸ In 2011, FAA issued over 300 COAs to police, fire, and other government agencies. The COA process is available to such public entities including local law enforcement and state universities that want to fly a UAS in civil airspace.

Current recreational use of UAS is covered by FAA Advisory Circular (AC) 91-57, which limits operations to below 400 feet. This FAA regulation developed in the 1970s to “regulate” amateur use of radio-controlled model airplanes restricted these early UAS to below 400 feet, required them to always be in view of their controllers on the ground, and prohibited them from being flown over built-up areas. For other, non-governmental UAS operations there is the FAA’s Special Airworthiness Certificate (“SAC”)—Experimental Category. The SAC-Experimental is the only certification available to a civil operator of UAS that is not a local government entity. Compensation or for hire operations are not allowed under a SAC either.

New Regulation Under FAA Modernization and Reform Act of 2012

The FAA Modernization and Reform Act of 2012 was signed into law by President Obama on February 14, 2012. (Citations below are to sections of the FAA Act).

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1 See, e.g. A small UAS – the Wasp, http://www.avinc.com/uas/small_uas/wasp/.

2 Teal Group: 2011 World UAV Market Profile and Forecast, March 1, 2011, http://tealgroup.com/index.php?option=com_content&view=article&id=74:teal-group-predicts-worldwide-uav-market-will-total-just-over-94-billion-&catid=3&Itemid=16.

3 See “Drones with an Eye on the Public,” NY TIMES, Feb. 18, 2012, <http://www.nytimes.com/2012/02/18/technology/drones-with-an-eye-on-the-public-cleared-to-fly.html?pagewanted=all>.

4 *Id.*

5 *Id.*

6 *Id.*

7 *Id.*

8 See FAA’s UAS November 3, 2011 Presentation: http://www.faa.gov/airports/great_lakes/airports_news_events/2011_conference/Media/0830-Unmanned%20Aircraft%20Systems.pdf.

Converging Tracks Public-Private Partnerships and the Railroads

By Wesley Thompson

On April 16, 2012 the ABA's Section on Public Utility, Communications and Transportation Law hosted its Annual CLE event in Washington, D.C. The following article briefly summarizes a panel discussion on public private partnerships ("P3s") and the railroad industry that was convened as part of this event, and seeks to provide a brief introduction to P3s before highlighting key related legal and policy issues.

An Introduction to P3s

In its presentation, Norfolk Southern ("NS") offered a broad definition of P3s.¹ NS next discussed P3s in the context of the passenger-freight relationship, detailing two categories of projects: light rail sharing an operating corridor, such as the Charlotte Area Transit System in North Carolina; and heavy rail sharing tracks, such as Chicago's METRA or Washington, D.C.'s Virginia Rail Express. Burlington Northern Santa Fe ("BNSF") did not offer its own definition of P3s, but did note that it categorizes projects based generally on their scope and geographic scale.

However one defines them, this panel discussion made clear that P3s are big business. Since 2000, Virginia alone has leveraged over \$1.4 billion to deliver \$5 billion in infrastructure. The CREATE program in the Chicago metropolitan region has received over \$850 million in funds for 70 projects expected to generate tens of billions in economic benefits to the region.² Numerous other projects around the country reveal just how great an appetite both public and private entities have for these projects, with public sector demand coming from all levels of government.

BNSF highlighted the "Tower 55" project in Texas as an example of a model program. By adding 24,000 feet of new track, replacing bridges, and eliminating grade crossings in the area, this partnership between BNSF, Union Pacific ("UP"), the U.S. Department of Transportation ("DOT"), and others, sought to relieve congestion at a crossover that BNSF described as "one of the most significant rail

bottlenecks in North America." This project is expected to generate \$600 million to \$1 billion in public benefits, at a cost of \$104 million, about a third of which came from DOT.

What Policymakers Should Consider When Approaching Railroad P3s

An underlying message of both BNSF's and NS' presentations was that, at their core, P3s require mutual understanding and mutual benefit to be successful. Both companies highlighted key incentives and challenges as well as special issues that shape the industry's opinion of and approach to P3s.

Mutual economic benefit is an obvious incentive for P3s. In the Tower 55 example highlighted above, both BNSF and UP will receive financial benefits from the reduced congestion and improved capacity at the crossover while being relieved of some of the associated capital investment costs. At the same time, the public receives benefits such as reduced shipping delays, reduced air pollution from idling engines, and

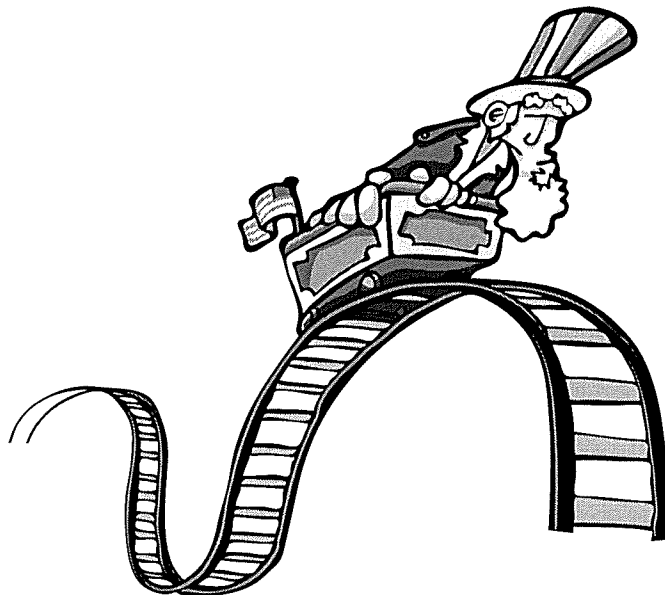
reduced road congestion caused by blocked grade crossings.

Beyond the obvious benefits, however, are several intangible benefits. One key benefit that BNSF highlighted was the improved relationship between their company and policymakers at all levels of government. Simply put, when policymakers and companies work together to plan and execute these projects, there are greater opportunities to develop mutual understanding between the parties. Similarly, at a time when many state and local jurisdictions are facing budget crunches, P3s create opportunities for policymakers to have tangible successes to highlight to their constituents at a reduced cost.

While the value of these incentives cannot be overstated, both NS and BNSF highlighted numerous interrelated legal, economic, and customary issues that must be balanced if a P3 is to be successful. Failure to balance these issues, or find the "sweet spot" as BNSF discussed, could cause the project to harm the interest of the parties involved, causing even the most well-intentioned plan to end in failure.

With regard to infrastructure P3s like Tower 55, BNSF believes that "control over the finished product is paramount." Especially with regard to maintenance and performance standards, BNSF main-

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¹ NS defined a P3 as: "a government services, infrastructure or business venture; funded and operated through a partnership of a government and one or more private entities; where the private party both (a) provides the service, infrastructure or venture (b) and assumes substantial financial, technical and operational risk in the project, in each case for a defined contract period."

² See, e.g., CHICAGO REGION ENVIRONMENTAL AND TRANSPORTATION EFFICIENCY PROGRAM, CREATE PRESENTATION (Oct. 2011), http://www.createprogram.org/linked_files/2011_10_Overview_ppt.pdf.

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- Under the FAA Modernization and Reform Act:
- By May 14, 2012, the FAA must allow local government and public safety agencies such as police and first responders to fly UAV weighing 4.4 pounds or less under an altitude of 400 feet. The FAA must also arrange with appropriate local government agencies to simplify the process of issuing COA such as: (1) including an expedited application and appeal process; (2) requiring a decision by FAA to approve or deny within 60 business days; and (3) allowing for one-time approval of similar operations carried out during a fixed period of time. (§334(c)(1)).
 - On May 14, 2012 FAA announced that it had met this first mandate under the FAA Act by developing an automated, web-based COA application process, extending the length of authorizations from 12 to 24 months, and establishing a process with the Justice Department's National Institute of Justice that allows local law enforcement agencies to receive an operational COA after demonstrating UAS proficiency with a training and performance evaluation COA.⁹
 - By August 14, 2012, the FAA must determine if certain types of government and commercial drones can operate safely in the national airspace system (NAS) prior to completion of the comprehensive integration plan discussed below. The FAA must base this determination on whether the UAS can perform without hazard to the public or national security. (§333(a)-(b)).
 - Also by August 14, 2012, the FAA must establish a 5 year program to integrate UAS into the national airspace system at 6 test ranges and within 6 months after establishing the program, a project shall be operational at the test range. To select a test range location, the FAA will take in consideration the geographic and climatic diversity as well as the location of ground infrastructure and research needs. NASA and the Department of Defense will also consult on the test ranges. (§332(c)).
 - Further, by August 14, 2012, the FAA will start expanding the use of small UAS in the Arctic. The FAA will work with relevant federal agencies and national and international communities to designate permanent areas in the Arctic where small UAS can operate on a 24 hour basis for research and commercial purposes. Within one year after designating the locations, the FAA will implement a process to approve applications to use UAS in the Arctic. (§332(d)).
 - By February 2013, the FAA shall develop and submit to Congress a comprehensive plan to integrate UAS into the NAS by September 30, 2015. The plan will specifically: (1) define acceptable standards for operation and certification; (2) ensure all UAS include a sense-and-avoid capability; and (3) establish requirements for the operator and pilot of a civil UAS and the licensing and registration requirements. (§332).
 - By August 14, 2014 the FAA will further establish rules for smaller commercial UAS, up to 55 pounds, to operate in the NAS (§332(b)(1)). Special rules for model aircraft will also be issued if the aircraft is flown strictly for hobby or recreational use. (§336).
 - Finally, by September 2015, the FAA will implement the procedure for certification to operate public UAV in the national airspace system. (§334). The FAA will also allow for the safe integration of UAV into U.S. airspace, including commercial users specifically by September 30, 2015. (§332(a)(3)). The FAA will conduct all safety studies that are essential to support this integration. (§335). The FAA will also promulgate rules for certifying public operators and handling airspace safety issues. The rules will

⁹ See <http://www.faa.gov/news/updates/?newsId=68004>.

address the inclusion of an expedited application process to issue COA, and the responsibilities of a public operator on UAV.

The National Defense Authorization Act (NDAA), signed into law on December 30, 2011, also had requirements for establishment of UAS test ranges similar to that in the FAA Modernization and Reform Act. It directed FAA to select the six test ranges within 180 days after December 30, 2011 or by June 30, 2012. (H.R. 1540, §1097).

The new federal law as noted compels the FAA to allow drones to be used for all sorts of commercial endeavors—from selling real estate and dusting crops, to monitoring oil spills and wildlife, even shooting Hollywood films. Local police and emergency services will also be freer to send up their own drones. While this use of drones has privacy advocates raising concerns, “some do-it-yourself drone flyers believe the ease of sending cheap pilotless planes and choppers airborne gives citizens a powerful tool for keeping public servants on the ground honest.”¹⁰ The surge of UAS will have the FAA seeking to make the skies friendlier for unmanned aircraft of all sizes.

The FAA must now come up with rules for certifying operators and addressing airspace safety issues. Stated most simply, the FAA for traditional manned aircraft now regulates the maker of the aircraft, the operator (airline, commercial or private operator) and the pilot. If the FAA follows this same paradigm for UAS, it will be issuing type certificates to UAS manufacturers, operating certificates to companies and individuals that own and operate drones, and licenses to each and every UAV ground controller—the effective pilot of the drone. Or the FAA could come up with a new paradigm for UAS and initially grant a broad waiver from regulatory licensing requirements for smaller drones operating under restrictive conditions; these restrictions could include a certain maximum weight (e.g., 50 lbs), operations below a prescribed altitude (e.g., 1,000 feet), but requiring operations in the controller's line-of-sight and away from densely populated areas.

Case-by-case licensing would be the rule for larger drones, those that seek to operate in airspace used by commercial and private manned aircraft, or those operating over populated areas.

There are the kinds of decisions FAA must make in the coming months between now and September 2015.

Recent Developments and Concerns

On March 9, 2012 FAA issued its request for comments from the public on the congressional requirement that FAA select 6 UAS test ranges, and received over 200 comments from the public in May 2012. In July 2012, or shortly thereafter, the FAA is expected to request proposals to manage the test sites to be selected. FAA expects to select the 6 test sites by December 2012 and expects them to be operational in 2013. Under the FAA Modernization and Reform Act the FAA must act on the 6 sites within 180 days of enactment, or by August 14, 2012. (§332(c)).

The *DOT Report on Significant Rulemakings—August 2012* has an FAA rulemaking in the works to develop a Special Federal Aviation Regulation (SFAR) to enable small UAS under 55 pounds to safely operate in limited portions of the NAS. The rulemaking is to develop policies, procedures and standards to ensure that risks are adequately mitigated, such that safety is maintained for the entire aviation community. The SFAR is expected to permit small, low-flying commercial UAS to operate within visual line-of-sight of its controller without

¹⁰ Marcus Wohlsen, “Drones Coming to a Sky Near You as Interest Surges,” ASSOCIATED PRESS, <http://news.yahoo.com/drones-coming-sky-near-interest-surges-150302837.html> (Apr. 1, 2012).

case-by-case licensing. The FAA expects to publish the rulemaking by the end of the year, with a final rule issued by August 2014.

While businesses, especially drone manufacturers, are celebrating the opening of the skies to these unmanned aerial vehicles, the law raises new worries about how much detail the drones will capture about lives down below—and what will be done with that information. Safety concerns like midair collisions and property damage on the ground are also an issue.

The FAA has yet to indicate that it will adopt any privacy rules for drones. Although federal law until now had prohibited drones except for recreational use or for some waiver-specific law enforcement purposes, the agency has issued only warnings, never penalties, for unauthorized uses. The new FAA Act provisions raise various new privacy concerns such as how much detail should drones capture about what is happening at ground level and who is to monitor and control the information viewed.

The U.S. Supreme Court has not found individuals to have Fourth Amendment privacy rights with respect to aerial surveillance because of the ability that anyone might have to observe what could be viewed from the air.¹¹ American courts thus have generally permitted surveillance of private property from public airspace. The likely proliferation of drones, privacy experts believe, will force American courts to re-examine how much surveillance can be conducted from a UAS without a search warrant.

On the safety front, the FAA is attempting to regulate the safety process sufficiently to avoid collisions with piloted aircraft or another UAS, crashes of UAS into populated areas, and even incidents that might endanger the UAS flight crew.

One solution is harnessing sense-and-avoid technology as the key to getting UAS into U.S. airspace. The deadline of September 30, 2015, for integration of UAS into U.S. civil airspace, set in the new FAA Act, is expected to be met using Ground-Based Sense-And-Avoid technology (“GBSAA”).

Using ground radars, GBSAA will also allow “routine access” to airspace for unmanned aircraft transiting between their bases and restricted areas used for training. “Normalized access,” allowing UAS to “file and fly” anywhere in the NAS, will require Air-Borne Sense-And-Avoid technology (“ABSAA”) in addition to GBSAA. Work on

¹¹ *Florida v. Riley*, 488 U.S. 445 (1989); see also, *California v. Ciraldo*, 476 U.S. 207 (1986).

GBSAA systems that can be certified by the FAA is already under way, but ABSAA development is at an earlier stage. A multi-sensor system developed by the Air Force Laboratory will transition to the Northrop Grumman RQ-4 Global Hawk program this year.¹²

Another possible solution is to have UAS manufacturers supply purchasers with up-to-date information on what is required to fly their newly-acquired UAS in the NAS. Under one proposal, a UAS purchaser could not immediately use a UAS right after purchase without first obtaining whatever authorization from FAA was required. The information would be provided as a requirement when purchasing or leasing a UAS.¹³ Ideally, the manufacturer would offer training and continuing support.¹⁴ The prospective purchaser would also be required to visit with the UAS manufacturer to understand the safety features and operational procedures and gain further experience by attending exhibitions and demonstrations.¹⁵

Conclusion

The UAS industry in the U.S. is undergoing a major transition. Currently, because of absent or incomplete legal and regulatory structures to safely integrate UAS into the NAS, the time needed to resolve UAS airspace issues are key factors in limiting the growth of the civil UAS market. Therefore, Congress’ FAA Modernization and Reform Act of 2012 is a big step in fostering this non-military UAS market sector. However, during this transitional period, the civil UAS market will likely be concentrated around government organizations requiring military-type surveillance systems such as police and fire departments, border patrol organizations, and companies or institutions concerned with scientific monitoring and data collection. Once the FAA establishes by 2015 airspace standards, regulations, and procedures, a commercial, non-governmental UAS market should slowly emerge.¹⁶

¹² U.S. DEP’T OF DEFENSE, UNMANNED SYSTEMS INTEGRATED ROADMAP FY2011-2036, 57-58.

¹³ Albert Rango & Andrea Laliberte, *Impact of Flight Regulations on Effective Use of Unmanned Aircraft Systems for Natural Resources Applications*, JOURNAL OF APPLIED REMOTE SENSING, Vol 4, Issue 043539, 4 (2010).

¹⁴ *Id.* at 9.

¹⁵ *Id.*

¹⁶ See Teal Group 2011 Market Study.



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