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## Reforming the Current Regulatory Framework for Commercial Drones: Retaining American Businesses' Competitive Advantage in the Global Economy

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## Reforming the Current Regulatory Framework for Commercial Drones: Retaining American Businesses' Competitive Advantage in the Global Economy

*Gina Y. Chen\**

*Abstract: The existing regulatory framework in the United States for unmanned aircraft systems (UAS, or drones) desperately needs updates in order to capitalize on the benefits of drones' commercial usage. American lawmakers can draw inspiration from foreign lawmakers and regulatory bodies in Canada, Australia, and Asia in creating a sensible framework that integrates the use of commercial drones.<sup>1</sup> A new regulatory framework customized to address the different usage priorities of commercial drones will unleash American businesses' potential to utilize drones in various commercial operations and to stay competitive in the fight for market share in capturing the multiple billion dollar global drones market.*

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<sup>1</sup> Commercial drones, for the purpose of this Note, include all private uses of unmanned aircraft for non-hobbyist and non-research private uses. The Federal Aviation Administration (FAA) categorizes drones according to usage, and has identified drones for non-recreational purposes, including commercial operations, as well as recreational and hobbyist purposes. *Unmanned Aircraft (UAS) Frequently Asked Questions*, FED. AVIATION ADMIN., <https://www.faa.gov/uas/faqs/> (last visited May 26, 2017).

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## I. INTRODUCTION

For the typical American, the word “drones” may conjure up images of raging battlefields, controversial targeted assassinations,<sup>2</sup> or the inept amateur hobbyists that crash drones into your neighbor’s backyard (or even the White House lawn<sup>3</sup>) in whimsical attempts at high-altitude photography. Precisely because of such public perceptions, the current debates surrounding the use of drones are complicated by the American public’s association of drones with controversial use in combat, police surveillance, as well as the general unease with considerations of privacy and safety presented by hobbyists’ use of drones. Undoubtedly, the general unease and caution from the public are also reflected in the Federal Aviation Administration’s (FAA) repeated delays in promulgating official rules in paving a clear regulatory framework for the use of commercial drones by American businesses. Unfortunately, the regulatory unease and the repeated negative portrayal of drones in the public realm as sinister killing robots or creepy surveillance machines hovering over backyards are overshadowing multitudes of significant and beneficial commercial uses of drones.

On December 1, 2013, Amazon broke the news to the public that the company was developing Amazon Prime Air, a delivery service that uses unmanned aerial vehicles (drones) to deliver lightweight packages to customers in thirty minutes or less.<sup>4</sup> Suddenly, perceptions of drones as possible facilitators of commerce in aiding our personal online–offline shopping transactions entered into the public’s minds. The usage of drones as a delivery vehicle that promises to enhance the modern day online shopping experience seems to be a major competitive business advantage that U.S. ecommerce companies are well-positioned to seize. The Commerce Department estimated that in 2014, total web sales in the United States totaled \$304.91 billion, surpassing the \$300 billion mark for the first time, making it “the fifth year in a row that web sales growth has been close to or above 15%.”<sup>5</sup> Against this background, the number of registered commercial

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<sup>2</sup> See Brian Fung, *Why Drone Makers Have Declared War On The Word “Drone”*, WASH. POST (Aug. 16, 2013), <http://www.washingtonpost.com/blogs/the-switch/wp/2013/08/16/why-drone-makers-have-declared-war-on-the-word-drone/> (“The drone industry—sorry, the *unmanned aerial systems* industry—is in the midst of a massive rebranding campaign. For most Americans today, the word ‘drone’ conjures images of lethal spy planes raining missiles down on targets in foreign theaters of war. But that perception doesn’t bode well for a burgeoning set of drone companies looking to shake up the civil aviation sector.”) (emphasis in the original).

<sup>3</sup> Michael D. Shear, *White House Drone Crash Described as a U.S. Worker’s Drunken Lark*, N.Y. TIMES (Jan. 28, 2015), at A15.

<sup>4</sup> Doug Gross, *Amazon’s Drone Delivery: How Would It Work?*, CNN (Dec. 2, 2013), <http://www.cnn.com/2013/12/02/tech/innovation/amazon-drones-questions>.

<sup>5</sup> Allison Enright, *U.S. Annual E-Retail Sales Surpass \$300 Billion for the First Time*, INTERNET RETAILER (Feb. 17, 2015), <https://www.internetretailer.com/2015/02/17/us-annual-e-retail-sales-surpass-300-billion-first-ti>.

drones operators is increasing rapidly around the globe, with Japan currently leading the race, followed by France.<sup>6</sup> In Japan, the country has allowed farmers to use drones to inspect crops and for other agricultural uses as far back as fifteen years ago,<sup>7</sup> and in Canada, drones have been used in numerous other commercial applications as the country has allowed for very flexible drones usage.<sup>8</sup> However, commercial drones usage is still considered a rarity in the United States largely due to the fact that the FAA forbids commercial drones except for those with special exceptions mainly granted to operators using drones for photography-related purposes.

Commercial use of drones by ecommerce companies and logistics companies in retail delivery is back in the public discourse and legislative agendas as other nations have already integrated commercial drones into their airspace in the race to capture greater market share in ecommerce and drones manufacturing.<sup>9</sup> There is exigent need to realize the potential for a multi-billion dollar industry through commercial drones usage in the United States by U.S. businesses. “The FAA estimates that private drones could constitute a \$90 billion industry within a decade,”<sup>10</sup> and “recent reports suggest Amazon may already be selling as many as 10,000 units per month.”<sup>11</sup> Moreover, *Business Insider* reports “12% of an estimated \$98 billion in cumulative global spending on aerial drones over the next decade will be for commercial purposes.”<sup>12</sup> According to the U.S. Department of Transportation, by 2035, the total number of unmanned aerial vehicle operations each year will approach 250,000, of which around 175,000 will be used for commercial activities, surpassing the number of manned aircraft operations, and constituting a drastic change in overall aviation activity.<sup>13</sup> Moreover, the U.S. commercial drone market is forecasted to grow to \$5 billion annually by

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<sup>6</sup> Geoff Murray, *Can the U.S. Catch Up In the Race for Drones?*, FORBES (Sept. 15, 2015), <http://www.forbes.com/sites/oliverwyman/2015/09/15/can-the-u-s-catch-up-in-the-race-for-drones/>.

<sup>7</sup> Bob Hazel & Georges Aoude, *In Commercial Drones, The Race is On*, OLIVER WYMAN (2015), [http://www.oliverwyman.com/content/dam/oliver-wyman/global/en/2015/apr/Commercial\\_Drones.pdf](http://www.oliverwyman.com/content/dam/oliver-wyman/global/en/2015/apr/Commercial_Drones.pdf); Telephone Interview with Connie A. Lahn, Managing Partner, Barnes & Thornburg LLP (Nov. 19, 2015).

<sup>8</sup> Telephone Interview with Connie A. Lahn, *supra* note 7.

<sup>9</sup> Nicholas Ryan Turza, *Dr. Dronelove: How We Should All Learn to Stop Worrying and Love Commercial Drones*, 15 N.C. J.L. & TECH. ON. 319 (2014).

<sup>10</sup> Daniel North, *Private Drones: Regulations and Insurance*, 27 LOY. CONSUMER L. REV. 334, 339 (2015).

<sup>11</sup> *Id.*

<sup>12</sup> Marcelo Ballve, *Commercial Drones: Assessing The Potential For A Dew Drone-Powered Economy*, BUSINESS INSIDER (Dec. 2, 2014), <http://www.businessinsider.com/the-commercial-drones-market-2014-10>.

<sup>13</sup> John A. Volpe Nat'l Transp. Sys. Ctr., U.S. DEP'T OF TRANSP. RESEARCH AND INNOVATIVE TECH. ADMIN., *Unmanned Aircraft System (UAS) Service Demand 2015-2035: Literature Review & Projections of Future Usage* (Sept., 2013), <https://fas.org/irp/program/collect/service.pdf>; Hazel & Aoude, *supra* note 7.

2035, creating an additional 50,000 jobs.<sup>14</sup>

Imagine a not-too-distant future where groceries and packages from ecommerce orders are delivered to you and your neighbors' doorsteps by drones. However, if the FAA and U.S. lawmakers do not act fast in making clear rules that allow for the use of commercial drones by businesses, the United States risks losing out on billions of dollars in economic growth and job creation as customers and drones service providers seek other countries to carry out their business.<sup>15</sup>

Drones have the potential to be the major disruptive force in everything from agriculture, emergency rescues, and natural resource management to law enforcement, film production, and delivery services.<sup>16</sup> Since the announcement of Amazon Air Prime, the public's fascination with the use of commercial drones has been captured by aspirations of instantaneous deliveries that may transform the very nature of retail, ecommerce, as well as the logistics and shipping industries. However, any talk of rolling out the Amazon Air Prime program or to incorporate the use of drones into deliveries or other commercial activities is empty talk without addressing the current regulatory framework, which generally forbids the use of commercial drones.

This Note proceeds by presenting an overview of the current FAA regulatory landscape on drones in Part II and by introducing the legal evolution of aviation guidelines in the context of privacy concerns rooted in common law. In Part III, this Note introduces the current and potential contributions that commercial drones are capable of making across different industries. In Part IV, this Note takes a comparative look at the competitive global drones market and argues that regulatory agencies and state governments should hasten legislative efforts in finalizing a sensible framework that integrates commercial drones into U.S. airspace, reflecting the exigent need to capture enormous business opportunities against global competition. Parts V and VI argue that U.S. lawmakers can draw inspiration from legislative efforts in Canada, Australia, and Asia in addressing the public's misconceptions and fearful mindset on the use of commercial drones in proposing a tier-based regulatory framework to address the general hostility against drones in legislation passed at the state and local levels. Lastly, this Note concludes by calling for a proactive approach in adopting a regulatory framework that integrates commercial drones in a way that addresses common concerns of safety and privacy.

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<sup>14</sup> John A. Volpe Nat'l Transp. Sys. Ctr., *supra* note 13.

<sup>15</sup> Geoff Murray, *Can the U.S. Catch Up In the Race for Drones?*, FORBES (Sept. 15, 2015), <http://www.forbes.com/sites/oliverwyman/2015/09/15/can-the-u-s-catch-up-in-the-race-for-drones/>.

<sup>16</sup> Larry Downes, *America Can't Lead the World in Innovation If the FAA Keeps Dragging Its Feet on Drone Rules*, WASH. POST (Oct. 8, 2014), <https://www.washingtonpost.com/news/innovations/wp/2014/10/08/america-cant-lead-the-world-in-innovation-if-the-faa-keeps-dragging-its-feet-on-drone-rules/>.

## II. BACKGROUND

### A. FAA and the Current Regulatory Landscape

The FAA is charged with the task of regulating air space. Since 2007, the FAA has adopted a general ban on the use of drones for commercial purposes without a special permit.<sup>17</sup> Thus, flying drones for commercial use is currently illegal, absent special exemptions and authorizations. The existing drones regulations are divided into three categories distinguished by the operator's nature: public operations (governmental), civil operations (nongovernmental), and model aircraft operations (hobby or recreational).<sup>18</sup> Commercial drones fall into the category of civil operations (nongovernmental) under FAA guidelines. Current commercial use for drones requires case-by-case authorization via the [faa.gov](http://faa.gov) website.<sup>19</sup> The current system's categorization of commercial and recreational use of drones makes little sense in placing bans according to the commercial nature of operators, instead of regulating for usage safety, or activity. In essence, hobbyists' use of drones to take aerial photographs of their house is unregulated, but if the same pictures were taken by a commercial photographer for real estate agents trying to sell the house, the FAA's regulations would apply and the activity would be deemed illegal.<sup>20</sup> The regulatory framework's failure to recognize the equal risk that small drones can pose whether used for recreational or commercial purposes is a frustrating and gaping loophole.

Until the FAA promulgates its rule addressing the integration of small UAS (less than 55 lbs., which most commercial drones are), anyone wishing to operate a drone for commercial purposes must obtain a grant of exemption issued under Section 333 or a type and airworthiness certificate.<sup>21</sup> There are currently three methods for obtaining FAA approval for flying civil UAS: (1) Special Airworthiness Certificates for civil aircraft to perform research and development, crew trainings, and market surveys; (2) obtaining a UAS type and airworthiness certificate in the Restricted Category for special purpose or a type certificate for production of the UAS; and (3) petitioning for exemption with a civil Certificate Waiver or Authorization (COA) (also

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<sup>17</sup> Julianne Chiaet, *Drone Pilot Challenges FAA on Commercial Flying Ban*, SCI. AM. (Nov. 1, 2013), <https://www.scientificamerican.com/article/drone-pilot-challenges-faa-commercial-flying-ban/>.

<sup>18</sup> Jennifer Henry, Thompson & Knight LLP, *Commercial Use of Drones in a Holding Pattern* (Aug. 2014), <http://www.tklaw.com/files/Publication/2ef88801-d959-4149-88a1-93a9b70bb52f/Presentation/PublicationAttachment/d66c550a-9c22-46ff-a83f-9f09f9089687/FTD-1408-Henry.pdf>.

<sup>19</sup> FED. AVIATION ADMIN., *Busting Myths about the FAA and Unmanned Aircraft*, <https://www.faa.gov/news/updates/?newsId=76240>.

<sup>20</sup> Richard C. Balough, *Under Current Law, There's No Place for Commercial Drones*, CBA REC., April/May 2015, at 34, 36.

<sup>21</sup> FED. AVIATION ADMIN., *Unmanned Aircraft Systems (UAS) Section 333*, [https://www.faa.gov/uas/beyond\\_the\\_basics/section\\_333/](https://www.faa.gov/uas/beyond_the_basics/section_333/).

generally referred to as a Section 333 exemption) for civil aircraft to perform commercial operations in low-risk, controlled environments.<sup>22</sup> However, the COAs are largely issued for use by government and law enforcement, and experimental certificates are mostly issued for the research of safe drone flights, excluding commercial operations.<sup>23</sup> Moreover, the FAA's overall approach to the authorization of drones operations is through a case-by-case exemption basis. The existing categories and exemption-granting procedures thus fall short of meeting the needs of commercial drone operators that use drones for non-research related purposes, especially as part of the companies' business operations or as an integral part of the companies' distribution and logistics strategy.

In 2012, Congress mandated the FAA to complete an update of the regulatory framework that provides for speedy integration of drones into the national airspace system by September of 2015.<sup>24</sup> However, the FAA has repeatedly missed several congressionally mandated interim deadlines to revise the existing regulations.<sup>25</sup>

Current legislative rulemaking and the protracted delays have essentially paralyzed the commercial drones industry. Moreover, legislative rulemaking has been heavily influenced by debates and scholarship that "casts the entire industry as anathema to a progressively diminishing constitutional assurance against warrantless searches and seizures by the federal government."<sup>26</sup> Failures to impose penalties on the FAA for missing the 2015 deadline have frustrated many industry experts, legal counsels, and business operators.<sup>27</sup> In the current absence of comprehensive federal regulation, individual states have stepped up legislative efforts to regulate drone-related activity, and promulgated legislation restricting drones usage from the perspective of privacy laws and drawing on states' experience regulating different forms of civilian-on-civilian surveillance.<sup>28</sup> As a result, patchwork legislation and restraints imposed by different states have

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<sup>22</sup> *Id.*; FED. AVIATION ADMIN., *Special Airworthiness Certificate*, [https://www.faa.gov/aircraft/air\\_cert/airworthiness\\_certification/sp\\_awcert/](https://www.faa.gov/aircraft/air_cert/airworthiness_certification/sp_awcert/); UVA Sys. Ass'n, *333 Exemption FAQ*, <http://www.uavsa.org/333-faq/>.

<sup>23</sup> *Unmanned Aircraft Operations in the National Airspace System*, DEP'T OF TRANSP., [https://www.faa.gov/documentLibrary/media/Notice/N\\_JO\\_7210.889\\_Unmanned\\_Aircraft\\_Operations\\_in\\_the\\_NAS.pdf](https://www.faa.gov/documentLibrary/media/Notice/N_JO_7210.889_Unmanned_Aircraft_Operations_in_the_NAS.pdf).

<sup>24</sup> See FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 332, 126 Stat. 11, 73 (2012) (mandating that the Department of Transportation "develop a comprehensive plan to safely accelerate the integration of civil unmanned aircraft systems into the national airspace system").

<sup>25</sup> Jason Koebler, *The FAA Has Missed Its Congressionally Mandated Deadline to Regulate Drones*, MOTHERBOARD (Oct. 1, 2015), <http://motherboard.vice.com/read/the-faa-has-missed-its-congressionally-mandated-deadline-to-regulate-drones>.

<sup>26</sup> Timothy M. Ravich, *Commercial Drones and the Phantom Menace*, 5 J. INT'L MEDIA & ENT. L. 175, 197 (2015).

<sup>27</sup> See Telephone Interview with Connie A. Lahn, *supra* note 7.

<sup>28</sup> Margot E. Kaminski, *Drone Federalism: Civilian Drones and the Things They Carry*, 4 CAL. L. REV. CIRCUIT 57 (2013).



contributed to the overall confusion and frustration at the lack of any concerted efforts at creating uniform standards. Potential contest of laws among states and the FAA have also raised federalism concerns. Spurred by the public's distrust of drones and the associated misconceptions of commercial drones, legislation has been proposed in forty-three states, and restrictions and outright bans on drones have already been passed or were being considered in thirty states as far back as 2013.<sup>29</sup> Citizens of different communities have been vocal in their opposition to the use of drones in law enforcement, especially when it comes to surveillance, rejecting the potential use of drones by the police as "an assault on my community."<sup>30</sup> Thus, it is imperative for lawmakers and lobbyists to distinguish the different uses for drones and help the public see commercial drones in a better light.

### B. Regulatory Exemptions

One way that commercial drone operators have consistently sought for exemptions under current FAA bans is through the filing of a Section 333 Exemption. Section 333 Exemptions are mainly used by drone operators to "perform commercial operations in low-risk, controlled environments."<sup>31</sup> There are seven factors that the FAA considers, at a minimum, in evaluating the safety risks for commercial drones; "size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security."<sup>32</sup> Maintaining the balance between protecting consumer values such as privacy and making space or providing incentives to encourage new technologies to develop has been the struggle for lawmakers in pushing through meaningful rules on commercial drones. Out of the more than 1,600 companies that have filed for Section 333 Exemptions, around 600 exemptions have been granted, with an expected exemption rate of around 50 petitions per week.<sup>33</sup>

Despite the steady stream of exemptions granted, because of the long

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<sup>29</sup> Allie Bohm, *Status of Domestic Drone Legislation in the States*, AMERICAN CIVIL LIBERTIES UNION (Feb. 15, 2013), <https://www.aclu.org/blog/status-domestic-drone-legislation-states?redirect=blog/technology-and-liberty/status-domestic-drone-legislation-states>.

<sup>30</sup> Larry Downes, *Is the Drone's Potential Being Shot Down Too Fast?* HARV. BUS. REV. (Apr. 23, 2013), <https://hbr.org/2013/04/is-the-potential-of-the-drone/>.

<sup>31</sup> UVA Sys. Ass'n, *333 Exemption FAQ*, <http://www.uavsa.org/333-faq/>. In defining "controlled" environments, the FAA usually grants exemptions to operations of drones over unpopulated areas or locations where consent from residents or individuals in the drones' path are easily obtained such as outdoor filming studios and movie sets. Telephone Interview with Connie A. Lahn, Managing Partner, Barnes & Thornburg LLP (Nov. 19, 2015).

<sup>32</sup> Section 333(b) of Public Law 112-95 (H. R. 658-62), [https://www.faa.gov/uas/media/Sec\\_331\\_336\\_UAS.pdf](https://www.faa.gov/uas/media/Sec_331_336_UAS.pdf).

<sup>33</sup> FED. AVIATION ADMIN., *UAS Use & Regulation* (June 24, 2015), [http://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga\\_166749.pdf](http://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga_166749.pdf).

delay between the filing and granting of exemptions, by the time approvals are obtained, the particular commercial drone design may have become obsolete, as was the case for Amazon.<sup>34</sup> Ecommerce giants such as Amazon have taken their drone testing abroad to countries like the United Kingdom where the government acted quickly to allow companies such as Amazon to do research.<sup>35</sup> Google has also moved large portions of its drone research operations overseas to Australia.<sup>36</sup> These moves by U.S. companies due to the rapid innovation in the drone industry outpacing U.S. regulatory approvals should send an urgent message to lawmakers to either step up the regulatory approvals process or to overhaul the system entirely.

### C. Common Law Roots

Common law elements of torts and trespass have complicated the regulatory framework for the national airspace. Clashes with constitutional rights such as those guaranteed by the Fifth Amendment have highlighted the tensions between landowners and aviators as courts try to define the elements of actionable trespass.<sup>37</sup> The critical issue has been where the drones are permitted to fly, and has been generally treated as a federal law matter.<sup>38</sup>

Previous legal disputes surrounding drones centered on the perceived rights extending from land ownership rights. Common law established that the landowner owned the skies and the space above his or her land as well as below through the ancient Roman doctrine of “*cujus est solum ejus est usque ad coelom et ad inferos*.”<sup>39</sup> Any interference into the protected space of the landowner, the space above and below the landowner’s land, was considered a trespass.<sup>40</sup> However, the doctrine as part of American common law was challenged with the advent of aviation as seen in the various trespass and nuisance suits that came before the courts against aircraft operators.<sup>41</sup>

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<sup>34</sup> Jay Greene, *Amazon Says FAA Drone Approval Already Obsolete*, THE SEATTLE TIMES (Mar. 27, 2015), <http://phys.org/news/2015-03-amazon-faa-drone-obsolete.html> (Paul Misener, Amazon’s vice president, stated “[W]e innovate so rapidly that the UAS approved last week by FAA has become obsolete.”).

<sup>35</sup> *Id.*

<sup>36</sup> Bob Hazel & Georges Aoude, *supra* note 7, at 3.

<sup>37</sup> See Walter S. King, *The Fifth Amendment Takings Implications of Air Force Aircraft Overflights and the Air Installation Compatible Use Zone Program*, 43 A.F. L. REV. 197, 198 (1997) (“These cases caught the American courts without a coherent legal doctrine with which to address the clashes between landowners and aviators. ‘To hold that every overflight was an actionable trespass would hamper the young industry and the military’s ability to train; yet, to allow every low-flying barnstormer to terrorize rural communities with no consequence seemed an equally bad alternative.’”).

<sup>38</sup> Ravich, *supra* note 26, at 185.

<sup>39</sup> Latin for “whoever’s is the soil, it is theirs all the way to Heaven and all the way to hell,” a maxim generally used to suggest that a landowner owned all the space above and below his or her property, and any interference would result in a trespass. Turza, *supra* note 9, at 326.

<sup>40</sup> *Id.*

<sup>41</sup> *Id.*

In 1926, with hopes of unleashing the potential of the aviation industry, Congress enacted the Air Commerce Act that gave the U.S. government “complete and exclusive national sovereignty in the air space” navigated by aircrafts.<sup>42</sup> Subsequently, Congress delegated authority to the Civil Aeronautics Authority, predecessor of the FAA, to determine the height at which navigable airspace begins, and set the threshold at five hundred feet.<sup>43</sup> In 1946, the Supreme Court in the seminal case of *United States v. Causby* weighed individual citizens’ private property rights—farmers who alleged military aircraft that flew at low altitudes terrified his chickens to kill themselves, thus suffering the loss of the use and value in his commercial chicken farm—against the government’s argument that the flight occurred within the navigable airspace and therefore did not constitute a taking of property.<sup>44</sup> The Court held for the farmers. However, writing for the majority, Justice William O. Douglas noted that the ancient doctrines that extended land ownership “to the periphery of the universe . . . has no place in the modern world,” noting the absurdity of the doctrine applied in modern times where transcontinental flights would have been subjected to endless trespass suits.<sup>45</sup> In supporting the purpose behind the Air Commerce Act of 1926 in facilitating commerce, Justice Douglas nodded to “Congress’s analogy of the regulation of navigable airspace to the regulation of navigable waters under the interstate commerce clause.”<sup>46</sup> Thus, the priority placed on navigable airspace as an important channel of commerce has existed since the very beginnings of U.S. aviation law.<sup>47</sup>

*Causby* established a standard for the adjudication of trespass claims against private aircraft operators, requiring landowners to have “exclusive control of the immediate reaches of the enveloping atmosphere.”<sup>48</sup> The trespass and nuisance suits brought by landowners against jet or commercial flight operators are conceivably different from the risks that drones may face, especially because commercial drones are much smaller, lighter, and quieter.<sup>49</sup> Therefore, commercial drones are likely to cause little threat of tortious trespass claims or concerns with private property rights in efforts to integrate commercial drones into the national airspace.<sup>50</sup>

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<sup>42</sup> *Id.*; Air Commerce Act of 1926, Pub. L. No. 69-254, 44 Stat. 568 (1926).

<sup>43</sup> Turza, *supra* note 9, at 326.

<sup>44</sup> *United States v. Causby*, 328 U.S. 256 (1946).

<sup>45</sup> *Id.* at 260–61.

<sup>46</sup> Turza, *supra* note 9, at 328; King, *supra* note 37, at 199.

<sup>47</sup> Turza, *supra* note 9, at 326.

<sup>48</sup> *Id.* at 329; *United States v. Causby*, 328 U.S. at 264.

<sup>49</sup> Turza, *supra* note 9, at 331.

<sup>50</sup> *Id.* at 332.

#### D. Privacy Concerns

Perhaps one of the biggest public concerns regarding the use of drones is the potential abuse of privacy rights. The FAA has blamed concerns over privacy as a reason for the agency's repeated delays in meeting the required deadlines to establish test sites for drone flights.<sup>51</sup> Some drones operate exclusively for purposes connected with the use of a camera while other drones are specifically designed and tasked with the delivery or lifting of heavy objects or the application of fertilizers for crops.<sup>52</sup> Understanding the functionality and design of drones, especially the difference between commercial drones and hobbyists' use of drones with cameras, will help assuage fears and correct misconceptions of all drones as invasive photo-taking machines.

The public's perception of drones, as mentioned before, is that of "weaponized flying robots whose potential for intrusion is all too real in an era of Edward Snowden, high-definition-display smartphones, and global positioning satellites."<sup>53</sup> Thus, privacy and safety concerns pose risks of seriously chilling the nascent commercial drones market. It is both unfair and counterproductive to confuse military or hobbyists' use of drones with commercial drones. Commercial drones are cheaper, more widely available to consumers, do not have munitions or missiles, and are owned and used for private purposes.<sup>54</sup>

Moreover, it is important to distinguish commercial drones from drones used for law enforcement purposes. Public drones used for law enforcement purposes, such as surveillance, taint public perception of drones and cause the public to associate drones with unwelcomed governmental interference and with possible violations of civil liberties.<sup>55</sup> The most significant difference between public drones and commercial drones is the issue of legality as "government operated drones are routinely given waivers to fly,

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<sup>51</sup> Eric Engleman & Alan Levin, *Drone Spying in U.S. Skies Prompts Privacy Plans Slowing Flights*, BLOOMBERG NEWS (Feb. 13, 2013, 1:43 PM), <http://www.bloomberg.com/news/2013-02-13/drone-spying-in-u-s-skies-prompts-privacy-plans-slowing-flights.html>.

<sup>52</sup> Steven Dent, *What You Need to Know About Commercial Drones*, ENGADGET (June 13, 2014), <http://www.engadget.com/2014/06/13/commercial-drone-explainer>.

<sup>53</sup> Ravich, *supra* note 26, at 197.

<sup>54</sup> Turza, *supra* note 9, at 319; see Chris Anderson, *We Shouldn't Fear Personal Drones*, TIME (Jan. 31, 2013), <http://ideas.time.com/2013/01/31/why-we-shouldnt-fear-personal-drones/?iid=op-main-lead> ("Personal versions are small, cheap and easy to use. They cost as little as \$300 and are GPS-guided fully-autonomous flying robots . . . They fly themselves, from takeoff to landing, and can even follow the terrain for miles. There are already more in the hands of amateurs than the military, and some of the uses may surprise you. Civilian drones don't just do the 'dull, dirty and dangerous' jobs better; they can also make the expensive ones cheaper.").

<sup>55</sup> See Richard M. Thompson II, Cong. Research Serv., R42701, *Drones in Domestic Surveillance Operations: Fourth Amendment Implications and Legislative Responses*, Summary (Apr. 3, 2013), <http://www.fas.org/sfp/crs/natsec/R42701.pdf>.

while commercial drones are illegal.”<sup>56</sup> The process to obtain waiver or authorization to operate a public drone takes from 60 to 90 days, whereas the process for evaluating petitions for commercial drones exemptions is typically 120 days.<sup>57</sup>

### III. COMMERCIAL DRONES AND THEIR USAGE

Currently, through the process of obtaining waivers and exemptions, the primary uses for commercial drones include: (1) precision agriculture that employs drones to detect health of crops, differences in crop conditions, and determine fertilizer and pesticide needs where the use of drones could improve crop yields by 15 percent while reducing fertilizer use by 40 percent;<sup>58</sup> (2) public safety that uses drones for “search-and-rescue, wildfire monitoring, barricaded suspects, and surveillance;”<sup>59</sup> (3) aerial photography, which the technology for such use is already relatively mature and quicker to adopt, making photography from high attitudes much more affordable in industries from Hollywood filming to fashion;<sup>60</sup> and (4) other applications including mail, small package delivery, infrastructure monitoring, and wildlife conservation that are currently in nascent technological development and testing due to regulatory difficulties.<sup>61</sup> Of the four primary uses for commercial drones mentioned above, agricultural use is projected to make up about 80 percent of the commercial industry, followed by public safety use as the second largest market for commercial drones.<sup>62</sup> Most significantly, conservative projections of the “other applications” of commercial drones usage in mail and small package delivery, infrastructure monitoring, and wildlife conservation are expected to exceed commercial drones’ usage in the public safety market in size.<sup>63</sup>

Thus, instead of citing privacy concerns as a cause of delay in promulgating new guidelines for commercial drones, the FAA’s bigger concerns may be pushbacks from industries that are apprehensive about the disruptive nature of commercial drones and possible changes in business

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<sup>56</sup> Turza, *supra* note 9, at 325.

<sup>57</sup> *Unmanned Aircraft (UAS) Questions and Answers*, FED. AVIATION ADMIN., <https://www.faa.gov/uas/faqs/>.

<sup>58</sup> Bob Hazel & Georges Aoude, *supra* note 7, at 4.

<sup>59</sup> *Id.*

<sup>60</sup> *Id.*; see Brooks Barnes, *Drone Exemptions for Hollywood Pave the Way for Widespread Use*, N.Y. TIMES, Sept. 26, 2014, at B1; Christine Magee, *Drones Take the Runway at New York Fashion Week*, TECHCRUNCH (Sept. 15, 2015), <http://techcrunch.com/2015/09/14/drones-take-the-runway-at-new-york-fashion-week/>; Wendy Donahue, *5 Haute-Tech Moments from New York Fashion Week*, CHI. TRIB. (Sept. 17, 2015), <http://www.chicagotribune.com/lifestyles/style/sc-fash-0921-moments-from-new-york-fashion-week-20150917-story.html>.

<sup>61</sup> Bob Hazel & Georges Aoude, *supra* note 7, at 4.

<sup>62</sup> *Id.*

<sup>63</sup> *Id.*

operations and processes that may ensue from widespread commercial drones usage. Though the manufacturing of drones can undoubtedly be a force for job creation domestically, drones' widespread usage may also contribute to a more streamlined workforce by eliminating jobs in other sectors.

#### IV. THE COMPETITION AND FRUSTRATIONS

The fate of Flying-Cam can perhaps better illustrate the compelling business case for commercial drones and the resulting frustrations.<sup>64</sup> Flying-Cam is the aerial filming company that Hollywood blockbusters turned to for cost-effective means of capturing shots through drone technology, a much more appealing alternative to film crews' budgets than using piloted helicopters.<sup>65</sup> Flying-Cam's drones have been using innovative techniques to capture footage in films ranging from the *Mission Impossible* franchises and *Skyfall* to *Harry Potter*, earning the company's founder an Academy Award in 1995 for his technical achievement.<sup>66</sup> However, Flying-Cam's operations in the United States effectively came to a halt in 2011 when the FAA notified the company and the film industry that the 2007 ban on commercial use of drones made such operations illegal until regulations were finalized.<sup>67</sup> Soon after, Flying-Cam laid off U.S. workers, other companies doing similar work closed their doors, and Flying-Cam relocated its operations overseas to countries such as England, France, and China where regulators have acted quickly to adopt rules encouraging the use of commercial drones.<sup>68</sup> Flying-Cam's recent work in a *Transformers* sequel, *Smurfs II*, and a Sony Playstation advertisement were done in Hong Kong and European countries with regulations that allowed for the use of commercial drones.<sup>69</sup>

Perhaps in sensing the lost opportunities presented to American companies and film industry leaders, the FAA finally granted Hollywood drone exemptions in the September of 2014, marking a milestone in the grueling battle for agency action on commercial drones.<sup>70</sup> The exemptions granted in 2014 also marked the first time that companies in the United States will be able to legally use drones to fly over people.<sup>71</sup>

Putting such exemptions in perspective, farmers in Japan have already

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<sup>64</sup> See Rick Newman, *Despite Amazon's Big Plans, the Feds Are Grounding the Drone Industry*, YAHOO! FIN. (Dec. 16, 2013, 10:38 AM), <http://finance.yahoo.com/blogs/the-exchange/if-amazon-and-jeff-bezos-really-want-to-fly-drons—they-should-consider-what-happened-to-this-company-155839191.html>.

<sup>65</sup> *Id.*

<sup>66</sup> *Id.*

<sup>67</sup> *Id.*

<sup>68</sup> *Id.*

<sup>69</sup> *Id.*

<sup>70</sup> See Barnes, *supra* note 60.

<sup>71</sup> *Id.*

been using commercial drones for decades to inspect crops.<sup>72</sup> Moreover, the Yamaha RMAX helicopter, one of the few commercial drones that weigh more than 55 pounds, has been used for more than twenty years without reports of having resulted in any human injury since its first operation.<sup>73</sup> It was only in May of 2015 that the FAA finally moved to approve the use of Yamaha commercial drones in agriculture by granting a Section 333 exemption, almost a year after the Yamaha Motor Corporation petitioned for the exemption.<sup>74</sup> Despite obtaining the exemption from the FAA, Yamaha still needs to obtain further approval from the FAA to fully utilize all of its agricultural services, including spraying.<sup>75</sup>

In the world of ecommerce delivery, the United States is also trailing behind countries such as Australia and China.<sup>76</sup> Australian startups Zookal and Flirty have already started delivering textbook orders by commercial drones, thanks to Australia's regulatory framework designed to address the quickly developing and proliferating use of drones, and to encourage the opportunities brought by the adoption of drone technology.<sup>77</sup>

Legal teams across the United States that specialize in drone regulation have echoed the frustrations that their clients are witnessing, "we are going to see companies go to Canada to test their drones, to test implementation to perfect their services, as it is not currently happening in the U.S."<sup>78</sup> Connie Lahn, a leading legal advisor in the area of UAV regulation as the founder and co-chair of her firm's Unmanned Aerial Vehicle (UAV) Practice Group, stated that the current FAA rulemaking process for commercial drones has been "very disappointing."<sup>79</sup> Lahn's clients were initially excited by the prospects of using drones for agricultural applications, but are now disappointed upon seeing the repeated delays in promulgating guidelines that were supposed to be issued years ago.<sup>80</sup> Currently, drone lobbyists are deeply mired in tight battles with growing numbers of advocates concerned with

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<sup>72</sup> Bob Hazel & Georges Aoude, *supra* note 7, at 2.

<sup>73</sup> *Id.*; See Telephone Interview with Connie A. Lahn, *supra* note 8.

<sup>74</sup> John Goglia, *FAA Finally Approves Yamaha Ag Drone, Reveals How Shockingly Behind US Civil Drone Industry Is*, FORBES (May 12, 2015), <http://www.forbes.com/sites/johngoglia/2015/05/12/faa-finally-approves-yamaha-ag-drone-reveals-how-shockingly-behind-us-civil-drone-industry-is/>.

<sup>75</sup> *Id.*

<sup>76</sup> Chris Welch, *Zookal Will Deliver Textbooks Using Drones in Australia Next Year*, THE VERGE (Oct. 15, 2013), <http://www.theverge.com/2013/10/15/4840706/zookal-will-deliver-textbooks-with-drones-in-australia>; see Gwynn Guilford, *Australia and China are way ahead of Amazon in the commercial drone race*, QUARTZ (Dec. 2, 2013), <http://qz.com/152788/australia-and-china-are-way-ahead-of-amazon-in-the-commercial-drone-race/>.

<sup>77</sup> Catherine Shu, *Australian Startups Zookal and Flirty to Begin Delivering Textbook Orders by Drone*, TECHCRUNCH (Oct. 14, 2013), <http://techcrunch.com/2013/10/14/australian-startups-zookal-and-flirty-to-begin-delivering-textbook-orders-by-drone/>.

<sup>78</sup> Telephone Interview with Connie A. Lahn, *supra* note 8.

<sup>79</sup> *Id.*

<sup>80</sup> *Id.*

privacy and the possibility of mass surveillance in abusive use by police.<sup>81</sup>

U.S. regulatory efforts to keep up with the rapid increase in demand for commercial drones lag far behind other countries.<sup>82</sup> In the numerous other usages for commercial drones, delivery companies such as FedEx, UPS, and DHL are also well poised to take advantage of drone technology as part of the companies' operative strategies and daily delivery operations. The business case for using commercial drones as delivery vehicles is strong, as the potential for cheaper and faster delivery than human and truck deliveries is readily apparent. The United States is already being left behind in the global drone race, given that drone-based agricultural and delivery services are taking off in countries like Japan, Australia, and Canada.<sup>83</sup>

The relevance and exigency to retail and ecommerce companies such as Amazon, together with logistics and shipping industries, to push through comprehensive guidelines that integrate commercial drones into the national airspace cannot be overstated. The use of commercial drones may become a key advantage and differentiator that help ecommerce companies realize nearly immediate deliveries, an advantage that will help ecommerce retailers across the globe differentiate from one another as the competition heats up for customer satisfaction and retention.

#### A. The Desperate Need for a New Framework

The FAA's repeated delays in pushing through regulatory change, most recently in missing the Congressionally mandated 2015 deadline to integrate drones, and specifically commercial drones, into the federal air space,<sup>84</sup> can potentially jeopardize America's commercial and technological competitive advantage.

The United States has always positioned itself at the frontier of technological and digital innovations. However, the staled efforts from the FAA to issue guidelines for commercial drones could cause the United States to lose the edge in experimenting new uses for drones and tapping into unknown markets.

U.S. lawmakers need to be more concerned with losing innovative jobs and key market share in the global commercial drones market and the affiliated business services in the twenty-first century, and seriously consider the real gains that drones will offer.<sup>85</sup> The current vacuum in the legal

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<sup>81</sup> *Id.*

<sup>82</sup> Arthur Herman, *Japan's Drone Opportunity*, HUDSON INST. (June 10, 2015), <http://www.hudson.org/research/11359-japan-s-drone-opportunity>.

<sup>83</sup> *Id.*; see Downes, *supra* note 16.

<sup>84</sup> Jason Koebler, *The FAA Has Missed Its Congressionally Mandated Deadline to Regulate Drones*, MOTHERBOARD (Oct. 1, 2015), <http://motherboard.vice.com/read/the-faa-has-missed-its-congressionally-mandated-deadline-to-regulate-drones>.

<sup>85</sup> Turza, *supra* note 9, at 321.



framework for commercial drones upsets the uniformity of airspace regulations across the nation, and thus fails to serve the interests of interstate commerce. Moreover, looking at countries that have used commercial drones extensively, even if the applications were just for agriculture or aerial photography, can show that the United States can legislate around the issues the public and lawmakers are concerned about. The current U.S. regulatory framework can draw inspiration from foreign nations' newly adopted laws and integrate commercial drones into the daily operations of businesses as a facilitator of commerce and trade. Similarly, many of the foreign nations started revamping their existing regulations on aircrafts only after drones gained continuous popularity in the United States and abroad while posing some safety and privacy concerns.

Proponents of state-by-state experimentation in pushing forth private and commercial drone legislation in finding the appropriate legal framework are against the preemption of state drone regulation by federal laws.<sup>86</sup> However, putting lawmaking efforts on commercial drones into the local and state governments' hands seriously misses and morphs the differences between commercial and public uses of drones to the detriment of effectively integrating commercial drones into the national airspace.<sup>87</sup> The current regulatory vacuum for commercial drones has prompted states to craft legislation for the purpose of protecting privacy, spurred by the public's fear of surveillance drones, instead of focusing on effectively promoting interstate commerce through comprehensive commercial drones regulation.<sup>88</sup> Moreover, the concerns and fears over privacy brought by the public uses of drones in law enforcement that underpin most states' legislative efforts are largely inapplicable to commercial drones.<sup>89</sup> Thus, the FAA can prevent the unnecessary banning of generally harmless commercial drones' usage by states out of privacy concerns in narrowly defined applications in agriculture,<sup>90</sup> infrastructure monitoring, or wildlife conservation in many states across the United States by acting quickly to legalize or allow for the use of commercial drones. Otherwise, state and local governments will be jumping into the legislative foray to ban drone operations before commercial drones ever take off.

Additionally, without comprehensive federal regulation, points of contention between individual states' drone regulations and the FAA will continue to drag and delay the development and utilization of commercial drones. The U.S. Government has exclusive sovereignty of the U.S. airspace pursuant to 49 U.S.C. 40103, and the FAA has been delegated the authority

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<sup>86</sup> See Kaminski, *supra* note 28 (arguing in favor of the experimentation of state-by-state laws on civilian drones).

<sup>87</sup> Turza, *supra* note 9, at 353.

<sup>88</sup> *Id.* at 354.

<sup>89</sup> *Id.*

<sup>90</sup> *Id.*

to promulgate regulations on air traffic regulations for aircrafts and UAS.<sup>91</sup> The issue of whether federal law preempts state or local requirements for drones depends on the nature of the specific requirements adopted in different states.<sup>92</sup> In determining the appropriateness of preemption, the Department of Transportation looks at the specific individual state's requirements on a case-by-case basis "to make sure they don't conflict with FAA's authority to provide safe and efficient use of U.S. airspace."<sup>93</sup>

Instead of the current patchwork regulatory framework complicated by individual states' different stances on drones usage and applications, adopting a central application system for the granting of permits, similar to the one recently adopted by Singapore, could make the entire regulatory landscape more streamlined and uniform.<sup>94</sup>

## V. DRAWING INSPIRATIONS FROM ABROAD

Because one of the key impediments to the use of commercial drones in the United States has been the restrictive nature of U.S. aviation laws, looking at the regulatory changes affected by a few other countries can help shed light onto creative lawmaking that addresses and balances the needs of the industry against concerns of safety and privacy.

### A. Australia: Categorization by Weight

In June of 2015, The Australian reports that Australia's Civil Aviation Safety Authority (CASA) is set on relaxing the rules for lightweight drones weighing less than two kilograms.<sup>95</sup> Before the announcement, an unmanned operator's certificate was required for any commercial use of drones.<sup>96</sup> The relaxation of the rules will allow commercial operators to fly lightweight drones such as those with HD video capabilities without obtaining certificates or licenses.<sup>97</sup> The two-kilogram weight limit will essentially allow businesses and other operators to fly drones weighing less than two kilograms without CASA approval before launching the flight operations for commercial purposes.<sup>98</sup> The relaxed rules will allow real estate firms to capture overhead footage of homes, and allow others such as architects,

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<sup>91</sup> 49 U.S.C. § 40103 (2016).

<sup>92</sup> *Id.*

<sup>93</sup> *Id.*

<sup>94</sup> See Herman, *supra* note 82.

<sup>95</sup> Chris Griffith, *CASA Set to Relax Rules for Lightweight Drones*, THE AUSTRALIAN (June 9, 2015), <http://www.theaustralian.com.au/business/latest/casa-set-to-relax-rules-for-lightweight-drones/news-story/104de6ba030cd06b056adfb5f15374a0>.

<sup>96</sup> *Id.*

<sup>97</sup> *Id.*

<sup>98</sup> Luke Hopewell, *Australia's Drone Cops Say New Laws Are Coming Soon*, GIZMODO (Apr. 28, 2015), <http://www.gizmodo.com.au/2015/04/australias-drone-cops-say-new-laws-are-coming-soon/>.

professional photographers, journalists, and farmers to operate drone activities lawfully.<sup>99</sup> Peter Gibson, the spokesperson of CASA, stated that the decision was made after weighing the safety risks of remotely piloted aircrafts, and that “the risk was sufficiently low enough to not need the extra layer of regulation.”<sup>100</sup>

However, unlicensed commercial operators will still need to follow the same drone operating rules as applied to recreational users, including staying at least 30 meters away from people, keeping the drone under 400 feet, avoiding operating the drone above large gatherings of people, keeping the drone within the line of sight, and staying at least 5 kilometers away from a place where planes take off or land from.<sup>101</sup>

CASA’s rulemaking efforts in recognition of commercial drones’ weight differences, along with the associated operational differences in balancing safety concerns and the burgeoning demand for the use of commercial drones should clearly be applauded. Similar to the long FAA approval process in the United States, the approval process in Australia can also take months and cost applicants thousands of dollars.<sup>102</sup> CASA is also proposing to categorize all commercial drones into four weight classes, imposing more stringent controls as the drones increase in size.<sup>103</sup>

Australia’s recent move to relax drones regulations can provide interesting insights into rethinking the current U.S. drones regulatory landscape, specifically, the classification of different drones by weight, as well as the consideration of legalizing commercial drone operations for the lightest categories.

#### B. Canada: Risk-based Approach to Safety Regulation

Many experts have pointed to Canada’s permissive and flexible regulations pertaining to commercial drones in making the country a world leader in the growing drones industry.<sup>104</sup> Drones used for commercial work or research must carry a Special Flight Operating Permit if they are unable to satisfy strict exemption requirements such as operating in extremely remote locations.<sup>105</sup> Canada’s decade-long history of regulating drone use has made

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<sup>99</sup> Griffith, *supra* note 95.

<sup>100</sup> *Id.*

<sup>101</sup> Hopewell, *supra* note 98.

<sup>102</sup> Mark Corcoran, *Drones Set for Commercial Take-off*, AUSTRALIAN BROADCASTING COMMISSION (ABC), May 23, 2013, <http://www.abc.net.au/news/2013-03-01/drones-set-for-large-scale-commercial-take-off/4546556>.

<sup>103</sup> *Id.*

<sup>104</sup> Gordon Omand, *Are Canada’s Drone Regulations Too Permissive?*, THE CANADIAN PRESS, (Aug. 16, 2015), <http://www.ctvnews.ca/canada/are-canada-s-drone-regulations-too-permissive-1.2519071>.

<sup>105</sup> *Id.*

Canada a leader of regulatory framework for commercial drones.<sup>106</sup>

On the basis of the federal government's constitutional power over aeronautics, the Canadian federal government, through Transport Canada, has primary jurisdiction over the regulation of UAVs.<sup>107</sup> As specified in the Canadian Aviation Regulations (CARs), operators of UAVs must refrain from operating the aircrafts in a manner that is, or is likely to be, hazardous to aviation safety, thereby establishing a catch-all safety provision that prohibit instances of flying drones near airports or commercial airspace.<sup>108</sup>

Unless an exemption applies, UAV operators must also obtain a Special Flight Operations Certificate (SFOC) through Transport Canada prior to the launch of the UAV.<sup>109</sup> The SFOC application process and complexity varies according to the nature of the proposed operation, but generally requires:

the name and contact information of the applicant; address of the person with operational control; method by which the operator may be contacted directly during operation; the type and purpose of the operation; the dates, alternate dates, and times of proposed operation; complete description of all pertinent flight data on the aircraft to be flown; security plan for the area(s) of operation and to be overflown to ensure no hazard is created to persons or properties on the surface; emergency contingency plan dealing with possible disasters resulting from the operation; name of person responsible for the supervision of the operation, if different from the operator; detailed plan describing how the operation will be carried out, including information such as altitudes and routes used; the insurance coverage carried by the applicant; and any other information pertinent to the safe conduct of the operation requested by Transport Canada.<sup>110</sup>

The overall purpose of the SFOC application review is to ensure that safety and other related risks can and have been adequately addressed.<sup>111</sup> Noteworthy from the list of requirements the SFOC seeks from applicants is the insistence on UAV operators to carry insurance. American lawmakers can certainly look to the comprehensive factors that Transport Canada requires in granting of operation permits.

In November 2014, Transport Canada introduced temporary exemption to the SFOC rule for vehicles under 25 kilograms.<sup>112</sup> Again, one sees

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<sup>106</sup> *Id.*

<sup>107</sup> Constitution Act, 1867, ss. 91; Canada Transportation Act, S.C. 1996, c. 10.

<sup>108</sup> Martin Sheehan & Michael Parrish, *Regulation of Unmanned Aerial Vehicles ("Drones") in Canada*, LITIGATION & DISPUTE RESOLUTION BULLETIN, FASKEN MARTINEAU, [http://www.fasken.com/drones-canada/#\\_ftn6](http://www.fasken.com/drones-canada/#_ftn6).

<sup>109</sup> *Id.*

<sup>110</sup> *Id.*

<sup>111</sup> *Id.*

<sup>112</sup> Danny Bradbury, *Transport Canada Speeds Towards Commercial Drone Regulations* (June 8, 2015), <http://www.itworldcanada.com/article/transport-canada-speeds-towards-commercial-drone->

countries enacting regulations based on categorizing drones according to weight and exempting the lightest commercial drones. The temporary exemptions are set to expire in December 2016, and Transport Canada introduced more permanent rules through a Notice of Proposed Amendment in May of 2015.<sup>113</sup> Transport Canada has proposed three categories for vehicles under 25kg: (1) a relatively complex operations category for flying in built-up areas, (2) a limited category for operations in more remote areas, and (3) a very small operations category for vehicles under 2 kilograms.<sup>114</sup> Operators in the above-mentioned three categories, subject to certain conditions, would not need an SFOC.<sup>115</sup>

The categorical exemptions that Transport Canada proposed paint a picture of coordinated and comprehensive efforts the Canadian federal government is prepared to take in legislating progressively to take account of the quickly evolving drones industry and the manifold business opportunities it presents. Moreover, the Canadian government has integrated concerns over safety into the regulations by requiring operators to carry insurance as well as implementing a catch-all safety provision that protects against operations that may have any likely chance of being hazardous to aviation safety.

### C. Hong Kong and Singapore: Addressing Privacy Concerns

Similar to the major metropolitan areas in the United States, Singapore and Hong Kong are two jurisdictions that are densely populated and urbanized with tech-savvy populations that are very engaged and comfortable with ecommerce.

Hong Kong has become the world's biggest drone hub—"more than 90 percent of the world's drones are shipped out through the city."<sup>116</sup> Hong Kong's dominance in the drone industry can be attributed to the relative freedom drones operators are allotted for experimentation and development of new uses, especially the lack of permit or license requirements as dictated by the Civil Aviation Department (CAD).<sup>117</sup>

Perhaps most innovative regulation coming from Hong Kong is its Guidance Note issued by the Hong Kong Privacy Commissioner on March 31, 2015, addressing various privacy concerns.<sup>118</sup> The Guidance calls for the

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regulations/375229.

<sup>113</sup> Transport Canada, *Notice of Proposed Amendment – Unmanned Air Vehicles*, <http://wwwapps.tc.gc.ca/Saf-Sec-Sur/2/NPA-APM/doc.aspx?id=10294>.

<sup>114</sup> Bradbury, *supra* note 112.

<sup>115</sup> *Id.*

<sup>116</sup> Gabriela Kennedy & Karen H.F. Lee, *The Regulation of Drones in the Asia Pacific Region: Focus on the New Data Privacy Guidance Note in Hong Kong*, 15 BLOOMBERG BNA, 3 (2015).

<sup>117</sup> Charles Lanyon, *Is Hong Kong A Wild Frontier For Drones? Lack of Rules Prompts Fears Over Privacy and Safety*, S. CHINA MORNING POST (May 11, 2015), <http://www.scmp.com/lifestyle/article/1789450/hong-kong-wild-frontier-drones-lack-rules-prompts-fears-over-privacy-and>.

<sup>118</sup> Kennedy & Lee, *supra* note 116; *see* OFFICE OF THE PRIVACY COMMISSIONER FOR PERSONAL

serious assessment of “alternative use of less privacy intrusive means of collection and use of personal data,”<sup>119</sup> calling for a determination of whether the use of drones is necessary and proportional to the benefit derived from the drones’ usage.<sup>120</sup> Additionally, the Guidance Note provides specific recommendations for the responsible use of drones that include: (1) “Flight paths should be carefully planned” in order to avoid the unnecessary collection of personal data and “to avoid flying close to other people or properties;”<sup>121</sup> (2) “if recording is intended, the recording criteria (what, where and when to record) should be pre-defined to avoid over-collection of information, some of which may be related to individuals,” and must erase any irrelevant data recorded by the drone as soon as practicable;<sup>122</sup> (3) encryption should be used to avoid interception by unrelated parties and “access control function must be considered to prevent the recording falling into the wrong hands;”<sup>123</sup> (4) transparency in the operation of drones is critical through the informing of affected individuals of the purpose of any image or video recording of them, through public social media announcement of intended use, and to have the logo and contact details of drone operator placed on the drone, etc. (though the area covered by drone could be vast, the Note advises the use of a flashing light during the recording session).<sup>124</sup> Hong Kong’s Privacy Commissioner’s specific focus on drones and its privacy concerns through the new Guidance Note can serve as a model for crafting policies in the United States that address the U.S. public’s privacy concerns.

In Singapore, the Unmanned Aircraft (Public Safety and Security) Act of 2015, effective as of June 1<sup>st</sup>, 2015, centralized the regulatory power over drones in the Civil Aviation Authority of Singapore (CAAS), the equivalent of the FAA in the United States.<sup>125</sup> The Act dictated that operating drones for any business purposes such as commercial activities will require an Operator Permit and Activity Permit, regardless of the total weight of the unmanned aircraft.<sup>126</sup>

The Operator Permit issued by the CAAS is essentially a permit-

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DATA, HONG KONG, *Guidance Note: Guidance on CCTV Surveillance and Use of Drones*, [http://www.pcpd.org.hk/english/resources\\_centre/publications/files/GN\\_CCTV\\_Drones\\_e.pdf](http://www.pcpd.org.hk/english/resources_centre/publications/files/GN_CCTV_Drones_e.pdf).

<sup>119</sup> OFFICE OF THE PRIVACY COMMISSIONER FOR PERSONAL DATA, HONG KONG, *supra* note 118. Guidance Note specifies that “the intrusion on privacy can only be justified if it is proportional to the benefit to be derived, or else it could amount to unfair collection of personal data” and would amount to a breach of the Personal Data (Privacy) Ordinance.

<sup>120</sup> Kennedy & Lee, *supra* note 116, at 4.

<sup>121</sup> OFFICE OF THE PRIVACY COMMISSIONER FOR PERSONAL DATA, HONG KONG, *supra* note 118.

<sup>122</sup> *Id.*

<sup>123</sup> *Id.*

<sup>124</sup> *Id.*; Kennedy & Lee, *supra* note 116, at 4.

<sup>125</sup> Herman, *supra* note 82.

<sup>126</sup> CIVIL AVIATION AUTH. OF SINGAPORE, *Flying of Unmanned Aircraft* (June 5, 2015), <http://www.caas.gov.sg/caas/en/ANS/unmanned-aircraft.html>.

granting mechanism put in place to ensure operators who are experienced and competent meet the utmost safety requirements.<sup>127</sup> Moreover, the Operating Permit will require applicants to submit proof of “the applicant’s organizational set-up, competency of the personnel especially those flying the unmanned aircraft, procedures to manage safety including the conduct of safety risk assessments, and the airworthiness of each of the aircraft.”<sup>128</sup> The Activity Permit issued by the CAAS attempts to address situational-specific risks associated with particular types of activities “at a specific area of operation, and which are of specific operational profiles and conditions.”<sup>129</sup>

Singapore’s dual-permit system is an innovative attempt to address the safety concerns of drones. Dangerous materials such as weapons and any other biochemical or radioactive material are clearly prohibited under Singapore’s enhanced regulatory framework.<sup>130</sup> In implementing a new framework for commercial drones regulation in the United States, U.S. lawmakers can certainly look towards the dual-permit system as an inspiration. At the same time, in acknowledging the various safety risks that drones may bring, clear prohibitions and repercussions need to be adopted to ban the carrying of dangerous or illegal substances, as well as the possibility of introducing insurance into the framework by requiring commercial operators of drones to carry specific insurances as a risk-spreading mechanism to enhance safety.

Perhaps most significantly, Singapore’s newly established regulatory regime provides a centralized, one-stop shop for submission of permit applications<sup>131</sup> that the United States FAA can certainly learn from in order to avoid the current discrepancies in the regulatory landscape complicated by different states’ and local governments’ incompatible regulations.

## VI. DESIGNING A NEW REGULATORY FRAMEWORK

Based on the different regulatory frameworks adopted by countries discussed above with economies and industries similar to the United States, this note proposes the FAA to consider a tier-based incremental approach in promulgating guidelines addressing the use of commercial drones.

Due to the complexity of the current airspace system, under such guidelines, the FAA can fulfill its duty to ensure the safety of the airspace by approving categorical commercial drones usage based on a set of factors and categories including weight, distance or flight path, point of origin or destination, and usage priority. Additionally, a risk-based incremental

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<sup>127</sup> *Id.*

<sup>128</sup> *Id.*

<sup>129</sup> *Id.*

<sup>130</sup> CHANNEL NEWSASIA, *Bill to Regulate Drones Tabled in Parliament* (Aug. 22, 2015), <http://www.channelnewsasia.com/news/singapore/bill-to-regulate-drones/1781136.html>.

<sup>131</sup> *Id.*

approach that balances safety and privacy, similar to the one promulgated by Hong Kong, can serve as an additional framework that allows policymakers to assess activities along a spectrum of safety and privacy risks in order to allow for the quick approval of activities that have both low safety and low privacy risks.

For example, using drones in precision agriculture is a usage that has very low safety and privacy concern given that such usage is typically conducted in remote areas with low population density, few physical and spatial obstacles, and few privacy concerns. Thus, commercial drones usage in agriculture should be introduced as soon as possible given the track record of such drones usage in agriculture in countries such as Japan and Australia with stellar safety records, in addition to agriculture drones' huge growth potential and its current under-capitalization.

A tier-based regulatory framework can also factor into the levels of priority given the different use potentials for commercial drones. Drones usage in agriculture and filmmaking should be given high priority given the widespread use of drones in agriculture and in the film industry in other countries with similar agricultural footprints and entertainment industries.

Such a tier-based increment system can also aim to address skeptics' concerns over privacy and safety issues because the regulations and safety precautions will be tailored to different categories of drones, dependent on size, carriage weight, and usage, allowing for quick approval of low-risk and safe usage of drones while devoting limited regulatory resources on larger drones' higher risks and greater usage potentials.

## VII. CONCLUSION

In light of increased competition to attract commercial drones, business from other countries and the different countries' accompanying permissive drone regulations, it is imperative for the United States FAA to step up its rule-making efforts to revamp the regulatory framework in order to integrate drones into the federal air space. A billion-dollar industry with huge growth and job-creation potential is currently in a standstill due to regulatory inaction. Lawmakers cannot hold the commercial drone industry in paralysis by fear and concerns of safety and privacy primarily posed by public and law enforcement uses of drones, while the rest of the world forges forward in pioneering drones technology and the use of commercial drones. Moreover, current U.S. regulations allow for small drones operated by hobbyists with little to no regulation, while the same drones operated for commercial uses are prohibited.

Supporting the legalization of commercial drones does not mean the neglect of safety or privacy concerns. U.S. lawmakers can look toward foreign jurisdictions such as Australia, Canada, Hong Kong, and Singapore in adopting a tier-based regulatory framework that protects public safety by



maintaining licenses, insurances, or pass safety tests, not unlike the requirements needed for operating cars or planes.

Seeing how countries ranging from Japan to Canada have allowed for the extensive operation of drones for decades should serve as an inspiration for U.S. lawmakers that the issues currently stalling regulatory rulemaking can be legislated around and addressed. Time is more urgent than ever for the FAA to put together a comprehensive tier-based incremental framework that permits the use for commercial drones.

#### VIII. POSTSCRIPT

On June 1, 2016, the FAA implemented new regulations that went into effect on August 29, 2016 for the use of small UAS (small drones). The new rules significantly simplified both the commercial and civil regulations for drones weighing less than 55 pounds. After the implementation of the new rules, the FAA projected that the commercial drone fleet will grow from 42,000 from the end of 2016 to about 442,000 aircrafts by 2021, a tenfold growth, and the aviation safety agency said there could be as much as 1.6 million commercial drones in use by 2021.<sup>132</sup> Undoubtedly, the new regulations are expected to free much of the airspace for commercial usage of drones and the FAA is optimistic about the positive commercial and business effects the new regulations will bring. However, the new regulations do not yet allow the use of drones in package delivery, which has been highly explored and publicized by large ecommerce companies such as Amazon.

It was only in June of 2014 that the FAA approved the first commercial UAS flights over land by approving the use of drones by the energy corporation BP to use in aerial surveys in Alaska.<sup>133</sup> In granting BP the permission to use commercial drones, Transportation Secretary Anthony Foxx stated that “the technology is quickly changing, and the opportunities are growing.”<sup>134</sup> Prior to the new 2016 rules, commercial drone operators had to apply for special waivers from the FAA for each contemplated flight operation, an extremely costly process in time and money. The previous regulatory scheme effectively handcuffed many companies from experimenting and exploring the benefits of drones in their respective industries due to the high barriers to entry from onerous exemption requirements.

The new 2016 small UAS rules include restrictions such as requiring the drones to remain in visual line of sight of the pilot, limiting the operation

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<sup>132</sup> David Shepardson, *U.S. Commercial Drone Use to Expand Tenfold by 2021*, BUS. INSIDER (Mar. 21, 2017), <http://www.businessinsider.com/r-us-commercial-drone-use-to-expand-tenfold-by-2021-government-agency-2017-3>.

<sup>133</sup> Press Release, FED. AVIATION ADMIN., FAA Approves First Commercial UAS Flight over Land (June 10, 2014), [https://www.faa.gov/news/press\\_releases/news\\_story.cfm?newsid=16354](https://www.faa.gov/news/press_releases/news_story.cfm?newsid=16354).

<sup>134</sup> *Id.*

of drones to daylight hours or twilight with appropriate lighting, and capping maximum groundspeed at 100 mph and maximum altitude at 400 feet.<sup>135</sup> As such, the new requirement that operators must keep UAS in visual line of sight effectively prevents the usage of drones in deliveries, which require drones to be remotely operated. The new rules will thus govern the operation of drones in simpler tasks that are perceivably lower in safety and privacy risks such as land surveying, real estate photography, and site inspections.

The FAA further notes that the new regulations could generate more than \$82 billion for the U.S. economy and create more than 100,000 new jobs over the next decade.<sup>136</sup> With the small UAS rules now in effect, the commercial drones industry can take flight in developing more innovative applications for usage in search and rescue missions, precision-based agriculture, surveying, conservation, and many other fields that will benefit from aerial perspectives.

The FAA seems to have adopted a risk-based incremental approach similar to what I have previously suggested in my Note in rolling out the new regulations. The small UAS rules appear to suggest that drones weighing less than 55 pounds belong to a category with the least amount of safety and privacy risks. The categorical exemptions given to commercial drones under 55 pounds appear to be made after considering the logistics of the drones' operations using factors such as weight, usage priority, point of origin or destination, and distance, placed on a spectrum of safety and privacy risks. The new regulations as defined by the drones' weight may suggest future rulemaking by the FAA will be in increments or stages, categorized by factors such as the drones' weight, usage priority, and safety risks.

Though the tasks and operations permitted under the new small UAS rules—such as surveying, site inspections, and real estate photography—may sound far less interesting than tasks such as package or food delivery, the new regulations nevertheless give the U.S. commercial drones industry the much-needed green light to further innovate and to compete globally by building up the domestic drones industry.

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<sup>135</sup> FED. AVIATION ADMIN., *Summary of Small Unmanned Aircraft Rule (Part 107)*, FAA News (June 21, 2016), [https://www.faa.gov/uas/media/Part\\_107\\_Summary.pdf](https://www.faa.gov/uas/media/Part_107_Summary.pdf).

<sup>136</sup> Press Release, Fed. Aviation Admin., DOT and FAA Finalize Rules for Small Unmanned Aircraft Systems (June 21, 2016), [https://www.faa.gov/news/press\\_releases/news\\_story.cfm?newsId=20515](https://www.faa.gov/news/press_releases/news_story.cfm?newsId=20515).