



Homeland  
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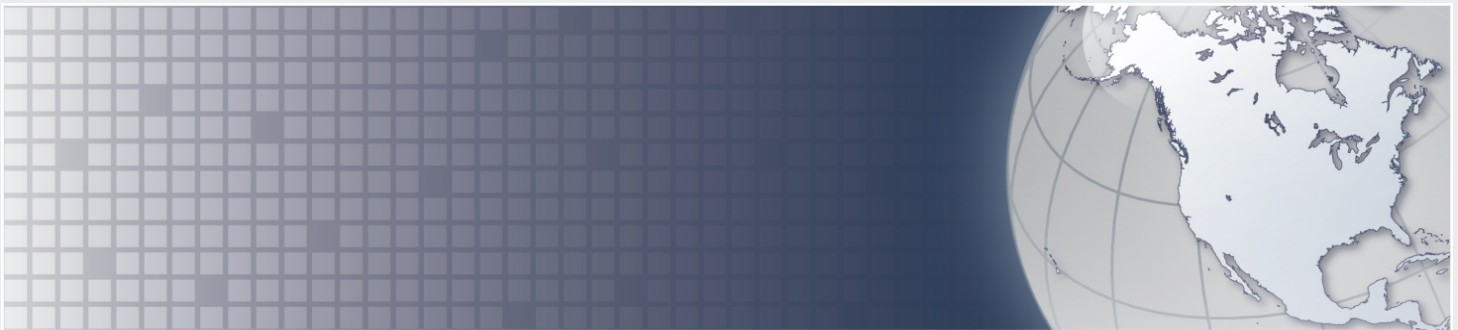


CIAC

Colorado Information  
Analysis Center

Department of Public Safety

# INTELLIGENCE ASSESSMENT



## (U//FOUO) Adversaries Exploiting Unmanned Aircraft Systems to Advance Operations; Homeland Encounters Expected to Rise

31 July 2015

Office of Intelligence and Analysis

IA-0244-I5

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INTELLIGENCE ASSESSMENT

31 July 2015

## (U//FOUO) **Emerging Adversary Use of Unmanned Aircraft Systems Present Detection and Disruption Challenges**

(U//FOUO) Prepared by DHS Office of Intelligence & Analysis (I&A), DHS Office of Cyber and Infrastructure Analysis, the Colorado Information Analysis Center, the Northern California Regional Intelligence Center, the Ohio Strategic Analysis and Information Center, the Northern Virginia Regional Intelligence Center, the Washington Regional Threat Analysis Center, and the US Army Asymmetric Warfare Group. Coordinated with the Department of Energy, Federal Aviation Administration (FAA), NCTC, FBI Counterterrorism Division, DHS Domestic Nuclear Detection Office, the Department of Defense Joint Improvised-Threat Defeat Agency, and the Commercial Facilities Sector-Sector Coordinating Council.

### (U) **Scope**

(U) This Assessment provides a baseline and near-term outlook on the evolving capabilities of unmanned aircraft systems (UAS) and their implications for the Homeland Security Environment. This Assessment provides additional threat context, refines UAS related indicators, protective measures, and planning guidance that appear in UAS related assessments produced with Interagency partners, or by the DHS Intelligence Enterprise over the past 24 months. It is intended to assist state, local, tribal, territorial, private sector (SLTT/P) and US government audiences in risk mitigation efforts. In this Assessment the term UAS focuses specifically on light-weight systems available for retail sale, generally marketed to recreational users—generally limited to line-of-sight operations—with potential commercial applications. Nation-state UAS are outside the scope of this Assessment.

(U) This Assessment uses the term adversary to encompass the range of non-state violent or malicious entities or organizations. This includes transnational terrorist organizations, domestic terrorists, violent extremists, homegrown violent extremists, lone operatives, drug trafficking organizations, criminals, and transnational criminal organizations.

### (U) **Key Judgments**

(U//FOUO) **I&A assesses adversaries are likely to continue subverting legitimate, commercially available UAS to advance terrorist and criminal activities because of the wide availability and relatively inexpensive cost in commercial retail market, general ease of use by novice operators, and the difficulty in differentiating between legitimate and malicious use of UAS.**

(U//FOUO) **I&A assesses that the rising trend in UAS incidents within the National Airspace System (NAS) will continue, as UAS gain wider appeal with recreational users and commercial applications of these systems expand. Since 2012, we have seen an increase in the number of UAS reports within the Homeland. A review of available UAS reporting revealed the majority of UAS encounters were not malicious in nature and generally the result of a lack of operator familiarity with regulations that restrict the use of UAS within the NAS.**

(U//FOUO) **I&A assesses that increased encounters of UAS across multiple critical infrastructure domains, coupled with clear demonstrations of adversary integration of UAS into their operations will continue to present detection and disruption challenges across most critical infrastructure sectors. While many of these encounters are not malicious in nature, they underscore potential security vulnerabilities in these domains that could be used by adversaries to leverage UAS as part of an attack.**

### (U) **Adversaries Leveraging UAS to Advance Operations**

(U//FOUO) I&A assesses adversaries are likely to continue subverting legitimate, commercially available UAS to advance terrorist and criminal activities based off the wide retail availability of UAS and general ease of use by novice operators. These factors will likely limit opportunities for disruption of adversaries intending to use a UAS to advance their operations. A comprehensive review of UAS reporting since 2012 from state and local incidents, Intelligence Community reporting, and open-source accounts identified four broad categories of adversary UAS tactics of concern to SLTT/P security officials have emerged—surveillance in support of operations or activities; smuggling of contraband; disruption of events such as protests but with no intent to cause harm; and use of the system as a weapon. See “Appendix E: Adversary UAS Use Lexicon.”

**(U) Unmanned Aircraft System Statutory Definition**

(U) Within the United States, UAS are classified as aircraft and regulated accordingly. The FAA Modernization and Reform Act of 2012 defines a UAS as an unmanned aircraft and associated elements (including communication links and the components that control the unmanned aircraft) that are required for the pilot in command to operate safely and efficiently in the national airspace system.<sup>1</sup>

(U) UAS are further categorized within the 2012 Act by intended use, although these categories are not indicative of capabilities such as range, weight, and payload:

- » (U) Model Aircraft: recreational or hobbyist use UAS for personal enjoyment.
- » (U) Civil: UAS used for or in support of commerce, or for research purposes.
- » (U) Public: UAS used by or in support of federal, state, local government functions, including law enforcement or emergency response.

**(U//FOUO) UAS Supporting Adversary Surveillance**

(U//FOUO) Terrorists groups and associates continue to leverage the aerial video capabilities of UAS for surveillance in support of operations overseas. We cannot rule out that adversaries in the Homeland would be able to use these same UAS to support illicit or violent activities.



(U) December 2014: Two four-rotor UAS (or quadcopters) captured by Kurdish forces and reportedly used by Islamic State of Iraq and the Levant (ISIL) to conduct surveillance and mission planning.<sup>2</sup>

- » (U//FOUO) A late-December 2014 open source reporting claimed that Kurdish fighters in Iraq had captured two UAS used by the ISIL.<sup>3</sup> The two, four-rotor UAS (or quadcopters) are similar to those used by ISIL to acquire film footage for videos released in April 2014, based off visual identification of the platforms, audible signature, and camera resolution.

- » (U//FOUO) An online video attributed to ISIL media affiliates posted on the Internet showed aerial footage of the Baji oil refinery in Iraq.<sup>4</sup> The same video showed ISIL commanders using this footage to support an assault on the facility during the same time period.<sup>5</sup>



(U) April 2015: Screen capture from an ISIL video over the Baji Oil Refinery in Iraq.<sup>6</sup>

**(U//FOUO) Sufficient Payload Capabilities of UAS to Support Smuggling**

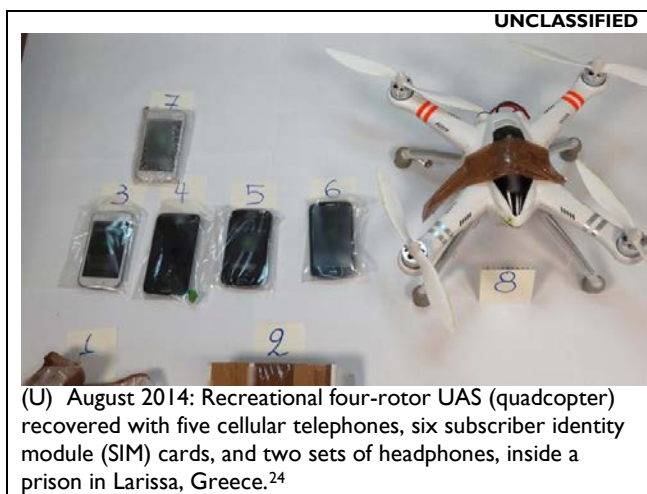
(U//FOUO) Drug trafficking organizations continue to leverage UAS capabilities to transport illicit payloads and may use UAS to conduct route surveillance and monitor law enforcement operations along the land and maritime borders of the United States. Criminal organizations and elements have also used UAS to deliver materials into restricted areas, such as prisons. For the purposes of this Assessment, smuggling encompasses adversary use of UAS to conduct cross-border contraband trafficking or attempts to deliver illicit payloads by evading physical barriers.



(U) January 2015: Wreckage of a six-rotor UAS (hexacopter) carrying methamphetamine recovered in Mexico.<sup>7</sup>



- » (U) In January 2015, a UAS with six-pounds (2.5 kilograms) of methamphetamines was recovered in Tijuana, Mexico, according to statements provided to the media by Mexican authorities.<sup>8</sup> The manufacturer specifications state that this system weighs 7.4 pounds (3.7 kilograms) and has a maximum takeoff weight of 17.6 pounds (7.9 kilograms).<sup>9</sup>
- » (U//FOUO) Since November 2013, there have been at least 16 attempts to deliver contraband inside of prisons using UAS, according to statements from law enforcement officials through multiple open source media outlets. Two of these attempts took place within the United States (Georgia and South Carolina), but were unsuccessful in delivering their payload according to prison officials. A review of these open source reports found that contraband payloads typically were less than 1.1 pounds (500 grams), and included narcotics and cellular telephones.<sup>10- 23</sup>



(U) August 2014: Recreational four-rotor UAS (quadcopter) recovered with five cellular telephones, six subscriber identity module (SIM) cards, and two sets of headphones, inside a prison in Larissa, Greece.<sup>24</sup>

#### (U//FOUO) Disruption and Harassment Emerge as Adversary Tactics

(U//FOUO) I&A assesses that malicious groups or individuals could use a modified or unmodified UAS as a disruption tactic, for the purpose of harassing, or hindering normal infrastructure operations or special events. The distinction between UAS disruption tactics and UAS use as a weapon is the lack of adversary intent to deliberately produce casualties or physical damage to facilities.

- » (U//FOUO) A four-rotor UAS (quadcopter), carrying a 100 gram container of low-level radioactive sand, was discovered on the roof of the offices of the Japanese Prime Minister in Tokyo on 22 April 2015. A suspect arrested and charged

with disruption of official business in connection, with this incident claimed, on an online blog posting, his intent was to protest Japanese nuclear policy.<sup>25,26</sup>



(U) April 2015: Photo of the four-rotor UAS (quadcopter) recovered from the roof of the Japanese Prime Minister, posted on the blog of the suspect of this incident. The suspect stated he painted this platform black to avoid visual detection by security.<sup>27</sup>

#### (U//FOUO) Terrorists Demonstrate Intent to Use a UAS as a Weapon

(U//FOUO) Although adversaries within the Homeland have expressed or demonstrated interest in pursuing UAS for use as a weapon, we have not encountered an incident in the Homeland where a violent adversary successfully used a UAS as a weapon. We cannot rule the ability of future adversaries to acquire and use a commercially available UAS as part of an attack within the Homeland.

- » (U//FOUO) El Mehdi Semlali Fathi, a Moroccan citizen residing in Connecticut, who was sentenced to 24 months in prison in October 2014 for fabricating a refugee application to remain in the United States, discussed conducting attacks against an educational institution and a federal building using an explosive laden recreational UAS, according to court documents based on the testimony of federal agents.<sup>28,29</sup>
- » (U//FOUO) A Massachusetts-based homegrown violent extremist, Rezwana Ferdous<sup>USPER</sup> received a 17-year prison sentence in 2012 for plotting to damage or destroy a federal building with a UAS.<sup>30</sup> According to court documents and testimony of federal agents, he intended to use three recreational UAS as part of an attack targeting the US Capitol and the Pentagon. At the time of his arrest, he had acquired one UAS but had not yet made modifications to accommodate an explosive payload.<sup>31,32</sup>

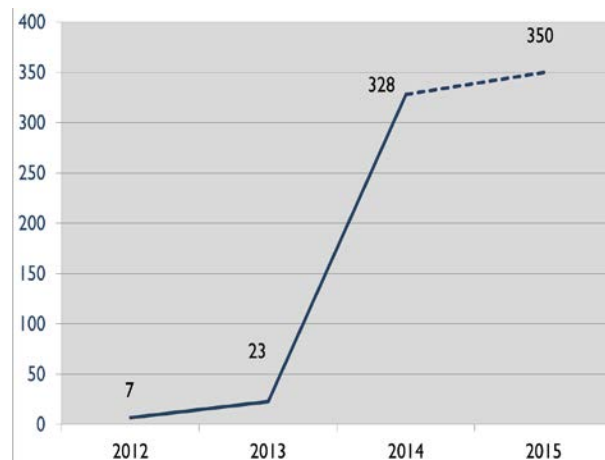
## (U//FOUO) Broad Legitimate Appeal of UAS a Factor in Increased UAS Encounters

(U//FOUO) I&A assesses that the rising trend in UAS incidents within the NAS will continue, as UAS gain wider appeal with recreational users and commercial applications of these systems expand. Since 2012, we have seen an increase in the number of reports from federal, state, and local officials involving UAS within the Homeland. A review of available UAS reporting, as well as traditional media reports, revealed the majority of UAS encounters were not malicious in nature and generally were the result of lack of operator familiarity with the requirements of operating UAS within the NAS.

- » (U//FOUO) UAS introduced within the past three years, and generally available through retail outlets to both recreational and commercial users, are relatively inexpensive, require less training to fly, offer high-resolution image recording capabilities, allow for real-time video sharing, and integrate functions such as global positioning system (GPS) waypoint guidance and first-person view. Pending legalization and expansion of commercial UAS applications—coupled with broader market demand—will likely drive the development of longer-range systems, capable of semi-autonomous, beyond-line-of-sight operations.
- » (U) The wide-ranging interest in and uses of commercial UAS for legitimate operations are highlighted by the number of applications and approvals for use. The FAA has granted 835 total waivers for commercial UAS through mid-July 2015. Since January 2015, the FAA approvals for commercial-use waivers have averaged over 110 per month. At this pace, over 1300 companies and individuals will have authorization to operate UAS for commercial purposes within the NAS by the end of 2015.<sup>33</sup>

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(U) Table I: UAS Incident and Encounter Reporting, 2012-2015 (projected)\*,†



(U//FOUO) Review of available reporting from federal, state, local, and private entities; show a significant increase in UAS incidents and encounters between 2012 and 2014. Projections for 2015 are based on available reporting through mid-July 2015.

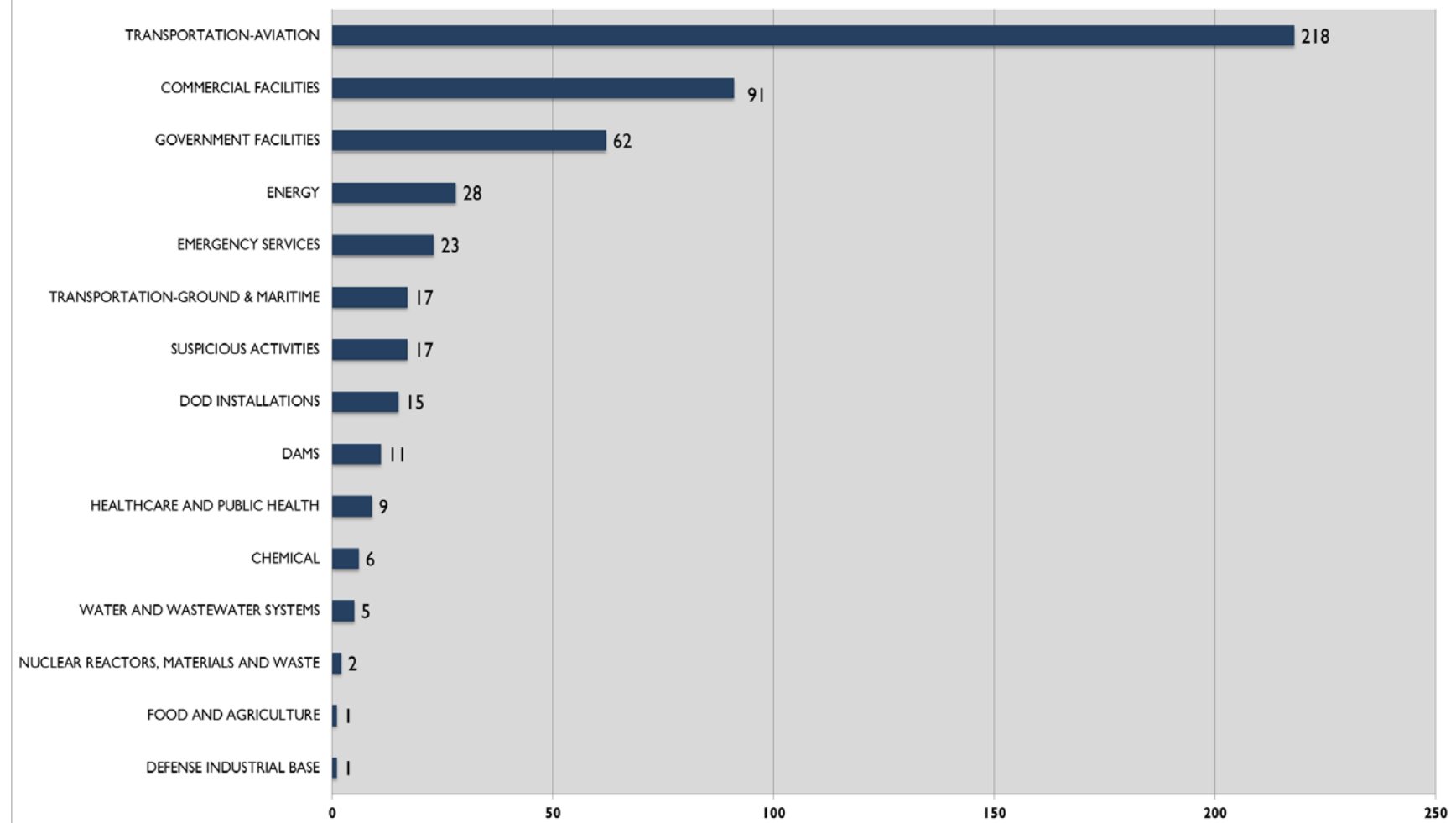
\* (U//FOUO) This data set is primarily drawn from suspicious activity reports, and includes data provided by state, local and private partners.

† (U//FOUO) For the purpose of this Assessment, UAS reports where there was a violation of law were considered incidents. UAS encounters were suspicious activities involving operation at/near sensitive sites or critical infrastructure.

**(U) Table 2: UAS Encounters at Sensitive Sites and Critical Infrastructure, 2012 to July 2015.**

(U//FOUO) Multiple datasets from federal, state, local, and private partners were used to produce the metrics contained in this Assessment. No single department or agency captures the complete number of UAS encounters. Actual UAS incidents and encounters are likely higher, as many incidents are handled through local enforcement mechanisms and are not typically discoverable through federal-level databases. We encourage security partners to continue to report on UAS through the FAA as well as the state/local suspicious activity mechanisms.<sup>34</sup>

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**(U) Legitimate Use UAS by Private Sector for Search and Rescue and Disaster Relief Operations**



(U) May 2015, Footage of Flooding in Houston Texas, posted on the Internet.<sup>35</sup>

(U//FOUO) Use of UAS by private companies for damage assessments and surveys has been authorized for five companies that have obtained FAA approval.<sup>36</sup> These activities may include supporting search and rescue operations, assisting with disaster relief operations, and providing structural damage assessments by private insurance companies, and industrial facility inspections (e.g., gas and oil lines, flare stack structural assessments, line/cable inspection, and repair).<sup>37</sup>

(U//FOUO) UAS systems offer an additional capability to augment ongoing emergency or disaster relief operations. The integration of UAS and airspace de-confliction between manned and unmanned aircraft may arise as a planning consideration for incident site commanders during future emergency response or disaster relief operations.

**(U//FOUO) UAS Incidents Will Continue to Occur Across Critical Infrastructure**

(U//FOUO) I&A assesses there will be increased encounters of UAS across multiple critical infrastructure domains, coupled with clear demonstrations of adversary integration of UAS into their operations. While many of these encounters may not be malicious in nature, they underscore potential security vulnerabilities in these domains that could be used by adversaries to leverage UAS as part of an attack. A review of available UAS related reporting shows a majority of encounters were reported within the aviation domain, followed by outdoor gatherings, and government facilities. (See Appendix C: Protective Measures for Unmanned Aircraft System Encounters. Selected critical infrastructure and key resources sectors below highlight examples of UAS encounters.)

**(U) Transportation Section, Aviation Subsector**

(U//FOUO) The threat posed by use of a single—or multiple—UAS to cause a deliberate or inadvertent aircraft collision or disruption of airspace and airport

operations has been highlighted by 213 reports of UAS encounters since 2012. Aviation accounts for 41 percent of available UAS reporting and we judge the risk of a collision between a manned and unmanned aircraft, or disruption of airport operations, will rise within the aviation sector. At this time, there are no known incidents of deliberate attempts to attack or disrupt aircraft or airport operations by violent adversaries using UAS.

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(U//FOUO) In January 2015, an 11-minute video was posted on the Internet showing a UAS flying directly over Istanbul International Airport in Turkey. The operator had covered the running lights on the UAS, likely to avoid alerting airport security.<sup>38</sup>

**(U) Information Technology Sector**

(U//FOUO) There have been no known reported attempts by adversaries to use UAS to conduct cyber-attacks. However, online videos have demonstrated the ability to leverage UAS as either an Internet attack platform or to attack other UAS operating on unsecured frequencies.

- » (U) A one-hour video posted on the Internet featured a presenter at a cyber-security conference in March 2014 demonstrating the ability to collect personal data on exposed Wi-Fi networks. The presenter showed a hacking system mounted on a UAS that could collect personal information over a wide area, bypassing physical security barriers.<sup>39</sup>
- » (U) A seven-minute online video posted on the Internet in December 2013 provided instructions for designing hardware and software that enables a UAS to actively seek and take control of other UAS operating on unsecured wireless networks. According to the system designer, the total cost for materials was \$400, including the cost of the UAS.<sup>40</sup>





(U) Photograph of a four-rotor UAS (quadcopter) with an onboard camera and Wi-Fi monitoring capability, presented during a March 2014 cyber security conference.<sup>41</sup>

### (U) Commercial Facilities Sector

(U//FOUO) According to consolidated reporting from multiple federal, state, and local agencies, there were 90 UAS incidents or encounters since 2012 in the US commercial facilities sector.<sup>43</sup> UAS incidents in this sector typically garner wide public attention as they occur during sporting events or other large outdoor gatherings. Countermeasures within the commercial facilities sector are challenging because the sector promotes public access and incorporates 80 percent of all critical infrastructure in the Homeland.

- » (U//FOUO) According to SARs received through private sector partners, in early April 2015, tenants of an iconic San Francisco, California office building noticed a camera-equipped UAS hovering near their boardroom and flying along the west side of the building. The UAS was piloted to a nearby alley, and loaded into a car by an unknown individual.<sup>44</sup>
- » (U//FOUO) According to a SAR received from law enforcement, in early June 2014 a four-rotor UAS (quadcopter) flew over a live concert in East Rutherford, New Jersey. The UAS was operated by two individuals who were questioned on site by law enforcement.<sup>45</sup>



(U) A four-rotor UAS (quadcopter), (top right corner), carrying a banner during a European Football Association qualifying match in October 2014.<sup>42</sup>

- » (U//FOUO) The appearance of a recreational model, four-rotor UAS (quadcopter) carrying a banner disrupted an October 2014 Union of European Football Association match between Albania and Serbia, according to open source reporting.<sup>46</sup> I&A assesses, based on a review of the video footage, the UAS used in this incident was likely operated from inside the stadium, as the camera system was removed, likely to accommodate the weight of the banner. No individual or group has claimed responsibility or been arrested in connection with this incident.<sup>47</sup>
- » (U//FOUO) An individual was arrested and charged with reckless endangerment for operating a four-rotor UAS (quadcopter) near an outdoor professional sports competition in Aspen, Colorado on 22 January 2015.<sup>48</sup> Additionally, the UAS was operated within five miles of an airport, which is prohibited by FAA regulations for recreational UAS operators.

### (U) Government Facilities Sector

(U//FOUO) Since 2012, at least 62 UAS encounters were reported for this sector, according to consolidated federal, state, and local and private sector reporting. This includes both federally-owned buildings and spaces in commercial facilities.

- » (U//FOUO) According to reporting from DHS Federal Protective Service, janitorial personnel at the AM Smith Federal Building in Dallas, Texas in March 2015 noticed a recreational model, four-rotor UAS (quadcopter) fall from the sky and hit the ground in a patio area of the federal building. The quadcopter broke into multiple pieces.<sup>49</sup>



## (U) Energy, Dams, Nuclear Reactors, Materials and Waste Sectors

(U//FOUO) There were a total of 41 UAS encounters across these three sectors through 2015, according to consolidated federal, state, local and private sector reporting. Above-ground power transmission lines, above-ground pipelines, and transmission substations are particular elements within these sectors that may be vulnerable to damage by intentional or unintentional UAS encounters.

- » (U//FOUO) According to a SAR received through federal partners, a small UAS was observed flying over the West Fork Dam, north of Cincinnati, Ohio in mid-January 2015. The platform was observed flying approximately 75-100 feet over the dam and nearby office buildings. The description provided in the report described the UAS as approximately four feet in diameter, equipped with four engines, and possibly carrying a camera, which is consistent with a recreational use quadcopter. The operator of the UAS was not identified.<sup>50</sup>

## (U) Law Enforcement, Emergency Services, and Healthcare Sectors

(U//FOUO) There were 34 available reports on UAS incidents or encounters specifically applicable to these sectors through mid-July 2015, the actual number of reports is likely much higher, due to many of these incidents being addressed by local level security officials and requiring no additional reporting to federal-level databases. UAS encounters by law enforcement, firefighters or emergency medical services during an incident could complicate or delay emergency response.

- » (U) On 17 July 2015, five separate, small UAS appeared over a wildfire that had closed portions of Interstate-15 in California, delaying aerial fire suppression efforts by at least 20-minutes. According to the US Forest Service report on this incident, the delay caused by these UAS incursions was a critical factor in hindering fire suppression efforts and likely resulted in a greater loss of property.<sup>51</sup>
- » (U) Aircraft supporting firefighting operations in Oregon, California, Colorado, Utah, and Washington have experienced at least 18 encounters with UAS since 2014, according to consolidated reporting from the US Forest Service. UAS incidents during firefighting operation typically require the temporary grounding of all aircraft supporting firefighting operations until the unknown UAS are cleared from the area.<sup>52,53</sup>

- » (U) According to FAA reporting, in late August 2014 a medical evacuation helicopter departing a hospital in Las Vegas, Nevada, experienced a near-collision with an unknown UAS operating at 200 feet above ground level. The UAS operator was not identified.<sup>54</sup>

## (U) Collaboration and Information Sharing

(U//FOUO) Successful critical infrastructure protection requires coordination and collaboration. DHS has designated the Homeland Security Information Network (HSIN) to be its primary information-sharing platform. The Critical Infrastructure (CI) portal enables DHS and the critical sector stakeholders to communicate, coordinate, and share information in support of the Sector Partnership Framework. Available resources include HIRAC risk Assessments and I&A Threat Assessments. To apply for access to the HSIN-CI portal, please email your name, work email, and address, along with the name of your sector(s) of interest, to [CIKRISEAccess@dhs.gov](mailto:CIKRISEAccess@dhs.gov). Once the application is approved, HSIN-CS can be accessed at <https://cs.hsin.gov>.

## (U) Outlook

(U//FOUO) Detection and disruption of plotting by violent adversaries determined to use UAS as a weapon will likely remain a challenge for security officials for the near-term. This underscores reliance on suspicious activity reporting, local enforcement statutes, public awareness campaigns, threat assessments, and other protective measures, as tools to deter and mitigate adversary use of UAS.

(U//FOUO) Market demand will drive innovation in UAS technology and result in wide retail access to easier-to-use, highly capable, semi-autonomous systems. A review of FAA approvals for commercial systems shows that current UAS operations are generally limited to line-of-sight operation, typically in daylight hours and away from heavily populated areas. We expect that long-term commercial UAS operations will allow for beyond-line-of-sight operations, incorporate collision and geo-fencing capabilities, carry increased payloads, and use secure radio-frequency communications to support future applications.

## (U) **Appendix A: Definitions**

(U) When available, the department, agency, or entity source document for a definition is indicated by name in parenthesis. Definitions specific to this *Assessment* are indicated with an asterisk (\*).

(U) **Adversary:** The term used in this *Assessment* encompasses the range of violent or malicious entities or organizations. This includes transnational terrorist organizations, domestic terrorists, violent extremists, homegrown violent extremists, lone offenders, drug trafficking organizations, criminals, and transnational criminal organizations, but excludes nation states.

(U) **Drone:** Is commonly used as an informal/shorthand term synonymous for unmanned aircraft system. Strictly speaking, a drone is a vehicle that is capable of operating autonomously without a human control element.(\*)

(U//FOUO) **Domestic Terrorism:** Any act of violence that is dangerous to human life or potentially destructive of critical infrastructure or key resources committed by a group or individual based and operating entirely within the United States or its territories without direction or inspiration from a foreign terrorist group. The act is a violation of the criminal laws of the United States or of any state or other subdivision of the United States and appears to be intended to intimidate or coerce a civilian population, to influence the policy of a government by intimidation or coercion, or to affect the conduct of a government by mass destruction, assassination, or kidnapping. A domestic terrorist differs from a homegrown violent extremist in that the former is not inspired by and does not take direction from a foreign terrorist group or other foreign power. (DHS)

(U//FOUO) **Homegrown Violent Extremists (HVE):** DHS defines HVE as a person of any citizenship who has lived or operated primarily in the United States or its territories who advocates, is engaged in, or is preparing to engage in ideologically-motivated terrorist activities (including providing support to terrorism) in furtherance of political or social objectives promoted by a foreign terrorist organization, but is acting independently of direction by a foreign terrorist organization. HVEs are distinct from traditional domestic terrorists who engage in unlawful acts of violence or to intimidate civilian populations or attempt to influence domestic policy without direction from or influence from a foreign actor.

(U//FOUO) **Lone Offender:** DHS defines lone offenders as an individual motivated by one or more violent extremist ideologies who, operating alone, supports or engages in acts of unlawful violence in furtherance of that ideology or ideologies that may involve influence from a larger terrorist organization or a foreign actor. (DHS)

(U) **National Preparedness:** Refers to the actions taken to plan, organize, equip, train, and exercise to build and sustain the capabilities necessary to prevent, protect against, mitigate the effects of, respond to, and recover from threats that pose the greatest risks to the security of the Nation.<sup>55</sup> (Presidential Policy Directive-8)

(U) **Unmanned Aircraft:** A device used or intended to be used for flight in the air that has no onboard pilot. This includes all classes of airplanes, helicopters, airships, and translational lift aircraft that have no onboard pilot. Unmanned aircraft are understood to include only those aircraft controllable in three axes and therefore exclude traditional balloons. (FAA)

## (U) **Appendix A: Definitions-Continued**

(U) **Unmanned Aircraft System:** According to the Federal Aviation Administration, and the statutory language, 2012 FAA Modernization and Reform Act, the term “unmanned aircraft system” means an unmanned aircraft and associated elements (including communication links and the components that control the unmanned aircraft) that are required for the pilot in command to operate safely and efficiently in the national airspace system.<sup>56</sup> (FAA)

(U) **Unmanned Aircraft System Encounter:** A reported interaction with a UAS where there is no obvious malicious intent, but based on particular circumstance is sufficient to generate suspicious activity reporting. (i.e., reasonably indicative of pre-operational planning associated with terrorism or other criminal activity—such as flights that are beyond line of sight near sensitive sites).

(U) **Unmanned Aircraft System Incident:** An interaction with a UAS where: 1) there is an inadvertent or intentional incursion of restricted airspace; or 2) operation by a hobbyist operator which is not in compliance with FAA guidelines; or 3) operation by a civil or commercial operator which is outside the limitations of a FAA issued certificate of waiver/authorization; or 4) use of a UAS in furtherance of a criminal enterprise or violent activity.(\*)

(U) **Unmanned Aircraft System Sighting:** A reported visual observation of a UAS by security officials that do not meet the criteria for either an encounter or an incident. Sightings are typically the result of an encounter by either concerned citizens or security personnel, however the operations of the UAS are not known to be in violation of state, local and federal requirements.(\*)

## (U) **Appendix B: Potential Indicators of Adversary Acquisition or Development of UAS to Advance Operations**

(U//FOUO) Operation of UAS by private recreational and permitted commercial entities is a legal activity. Operators must comply with regulations and restrictions pertaining to airspace promulgated by the FAA, as well as state and local ordinances pertaining to operation of an aircraft. UAS encounters and associated activities are generally benign. When the indicators below are observed in concert with other indicators of potential nefarious activity, they may suggest an attempt to acquire or employ UAS or components for criminal or violent purposes.

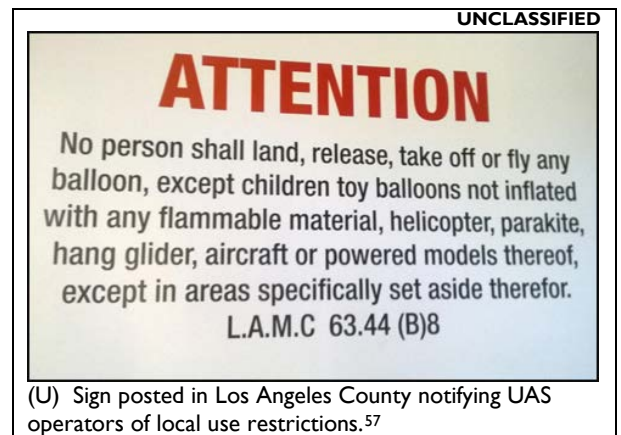
- » (U) Beginner-level hobbyists attempting to inexplicably purchase expensive, difficult to fly UAS platforms in a manner that would arouse suspicion of terrorism or other criminality in a reasonable person;
- » (U) Unusual attempts by beginner-level hobbyists to purchase a UAS based on payload capacity to the exclusion of ease of use in a manner that would arouse suspicion of terrorism or other criminality in a reasonable person;
- » (U) Unusual inquires on methods to exceed unreasonably the manufacturer's specified lift capacity, specified range, or altitude limitations that would arouse suspicion of terrorism or other criminality in a reasonable person;
- » (U) Eliciting information on hobbyist Internet forums on how to incorporate harmful payloads onto a UAS in a manner that would arouse suspicion of terrorism or other criminality in a reasonable person;
- » (U) Attempts to ship a UAS to an overseas address that would arouse suspicion of terrorism or other criminality in a reasonable person;
- » (U) Unusual inquires about flight stabilization techniques to control an aircraft buffeted by unusually violent forces that would arouse suspicion of terrorism or other criminality in a reasonable person;
- » (U) Unusual inquires about global position systems or first-person-view equipped UAS to illegally extend range for beyond line-of-sight operations;
- » (U) Attempts to incorporate unusual equipment into a ready-to-fly UAS that would arouse suspicion of terrorism or other criminality in a reasonable person;
- » (U) Attempt to disable or cover the running lights of a UAS for the purpose of evading visual detection by security personnel;
- » (U) Repeated encounters using a UAS in or near restricted spaces, during low-light, evening or weather conditions that would arouse suspicion of terrorism or other criminality in a reasonable person;
- » (U) Operation of a video-equipped UAS near sensitive locations or ongoing law enforcement operations that would arouse suspicion of terrorism or other criminality in a reasonable person; and
- » (U) Discovery by security personnel of attempts to modify a UAS along with explosives or chemical agent research; or reports of UAS testing to incorporate weapons delivery mechanisms.



## (U) Appendix C: Protective Measures for Unmanned Aircraft System Encounters

(U//FOUO) We note that UAS encounters are typically the result of a legitimate recreational and commercial activity. Unless there is a means to determine legitimate use, UAS encounters will typically be categorized as suspicious or a potential threat based mainly on visual sighting.

- » (U) Refer to FAA Guidance for Law Enforcement for an overview of recommendations for first responders, FAA authorities, and a summary of current airspace restrictions.
- » (U) Coordinate with the local FAA Terminal Radar Approach Control Facilities Office or Flight Service Station, as well as local law enforcement, to understand flight restrictions that are in place over event venues and discuss procedures for requesting flight restrictions if none are in place.
- » (U) Establish contact with local UAS flight instructors, vendors, suppliers, and clubs to message the local flight restrictions and the public safety factors linked to violations.
- » (U) Leverage the expertise of recreational use community-based-organizations to provide information to support pre-event threat assessments.
- » (U) Coordinate with event venue security staff to develop plans of actions for dealing with UAS encounters.
- » (U) Provide UAS awareness training to public safety representatives supporting an event.
- » (U) Notify the public of UAS use restrictions and consider the development of public safety awareness messaging pertaining to the restrictions on UAS use during special events or emergency response operations.
- » (U) Consider integrating standardized UAS encounter reporting criteria for SAR within existing SAR reporting mechanisms, or through Fusion Centers, Joint Terrorism Task Forces, and FAA regional operations centers.
- » (U) In certain circumstances and for significant high-profile events, localities and private venue owners should consider enacting no take-off, no-recovery, and no-possession restrictions on UAS operations. If this option is pursued there should be an accompanying public awareness campaign to explain the rationale, duration, and requirements of these restrictions.
- » (U) Fixed site threat assessments should include identification of sensitive or critical support infrastructure such as physical plants, power generation facilities, and secure ingress and egress points.



## (U) **Appendix D: Planning Considerations for Unmanned Aircraft System Encounters**

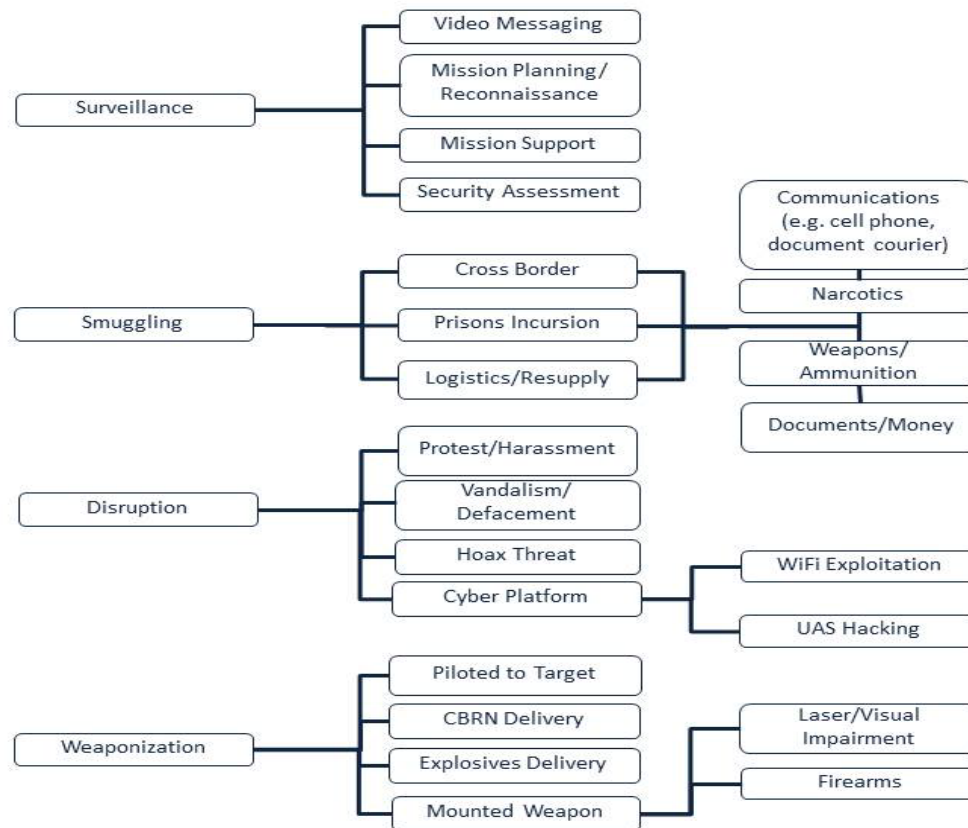
(U//FOUO) Security planning generally centers on the response to the scenario of weaponized UAS being used by a violent adversary. Depending on the activities of the protected facility or area, there is a potential for adversaries to use a UAS for surveillance, disruption or smuggling. Evolving UAS capabilities, demonstrated adversary use, and the emerging popularity of these systems with novice hobbyist users highlight the need to consider the broad range of UAS applications in security planning. Training, local enforcement statutes, public awareness campaigns, threat assessments, and other non-material protective measures can be used to mitigate UAS incidents and encounters.

- » (U) Provide immediate notification of an incident, accident, or other suspected violation to one of the FAA Regional Operation Centers (ROC) located around the country is valuable to the timely initiation of the FAA's investigation. These centers are manned 24 hours a day, 7 days a week with personnel who are trained and know how to contact appropriate duty personnel during non-business hours when there has been an incident, accident, or other matter that requires timely response by FAA employees. The list of these centers and telephone numbers are found in the FAA Guidance to Law Enforcement.
- » (U//FOUO) Develop familiarity with restrictions on UAS use. The FAA may have imposed temporary or standing restrictions for certain events or areas. In addition, states and localities may impose restrictions on UAS take-off, recovery, or possession on public lands.
- » (U//FOUO) Consider event-specific or area specific UAS use restrictions. For example, Los Angeles, California, implemented a local municipal code in response to concerns over UAS encounters within their jurisdiction.
- » (U//FOUO) In conjunction with the implementation of local UAS use restrictions or requirements, consider implementing a public awareness campaign to explain UAS use restrictions during an event or over critical infrastructure.
- » (U//FOUO) Develop a field recognition guide for known manned aircraft in operation during a special event. This may be useful in limiting false notification of a UAS encounter, particularly during evening or low-visibility conditions.
- » (U//FOUO) Integration legitimate UAS use into preparedness planning. Civil UAS use by media or other commercial enterprises will likely become more common during live events as commercial UAS use in the NAS moves forward. Airspace management integrating manned and unmanned aircraft will likely be similar to those currently used for integrating multiple manned platforms during a special event.
- » (U//FOUO) Conduct a site *Assessment* based off of existing UAS platform capabilities likely to be encountered. This *Assessment* should determine potential locations that are likely UAS launch locations and will aid the dispatching of responders in the event of a UAS encounter. High-risk launch locations include open or elevated areas near protected facility or activity. Potential high-risk launch locations are generally within direct line-of-sight of the protected facility or activity.

**(U) Appendix E: Adversary UAS Use Lexicon**

(U//FOUO) Adversaries have integrated UAS intended for legitimate hobbyist use into their operations for a variety of purposes. Based off a review of available reporting, four categories of UAS tactical applications have emerged: surveillance, smuggling, disruptive use, and use as a weapon. The following graphic provides observed and potential adversary use models. The area of greatest concern for security officials remains the potential disruptive use and is subcategorized into active and passive techniques.

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(U//FOUO) Surveillance: Includes adversaries leveraging video capabilities of UAS for preoperational planning to monitor and assess security operations at sensitive sites, large scale events, and law enforcement and emergency response operations. Use of video captured by UAS for adversarial promotional efforts is also included in this category.

(U//FOUO) Smuggling: Smuggling encompasses adversary use of UAS payload capabilities to deliver illicit or contraband materials to bypass security barriers.

(U//FOUO) Disruption: The intentional or unintentional use of UAS by an adversary to harass, hinder, or inhibit security operation. This category includes use of a UAS to access, monitor, or attack computer networks and/or monitor or interfere with radio frequency communications.

(U//FOUO) Weaponization: Intentional adversary use of a modified or unmodified UAS as part of an attack intended to cause casualties or physical damage. This tactic includes attempts to disrupt air traffic, deliberate crashing, and hazardous payload delivery.

**(U) Source Summary Statement**

(U//FOUO) The judgments presented in this *Assessment* are based on open source reporting, court testimony, and information provided by the US government and SLTT/P partners. We have **high confidence** in our assessment that adversaries will continue subverting legitimate use of commercially available UAS as it is based primarily on reliable technical reporting and corroborated open-source information. We have **medium confidence** in our judgments related to the increase in UAS incidents in the NAS and the disruption challenges these encounters present because we lack reporting to corroborate details of many of the reported incidents. Cutoff date for information contained in this *Assessment* is 26 July 2015.

**(U) Report Suspicious Activity**

**(U) To report suspicious activity, law enforcement, Fire-EMS, private security personnel, and emergency managers should follow established protocols; all other personnel should call 911 or contact local law enforcement.** Suspicious activity reports (SARs) will be forwarded to the appropriate fusion center and FBI Joint Terrorism Task Force for further action. For more information on the Nationwide SAR Initiative, visit <http://nsi.ncirc.gov/resources.aspx>.

(U) **Tracked by:** HSEC-1.8, HSEC-5.8, HSEC-7.8, HSEC-8.1, HSEC-8.2, HSEC-8.3, HSEC-8.8, HSEC-8.10, HSEC-10.8, HSEC-10.9, HSEC-10.10



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# Homeland Security

Office of Intelligence and Analysis

## Customer Feedback Form

Product Title: 

1. Please select partner type:

and function:

2. What is the highest level of intelligence information that you receive?

3. Please complete the following sentence: "I focus most of my time on:"

4. Please rate your satisfaction with each of the following:

	Very Satisfied	Somewhat Satisfied	Neither Satisfied nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied	N/A
Product's overall usefulness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product's relevance to your mission	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product's timeliness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product's responsiveness to your intelligence needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. How do you plan to use this product in support of your mission? (Check all that apply.)

☐ Drive planning and preparedness efforts, training, and/or emergency response operations  
☐ Observe, identify, and/or disrupt threats  
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☐ Allocate resources (e.g. equipment and personnel)  
☐ Reprioritize organizational focus  
☐ Author or adjust policies and guidelines

☐ Initiate a law enforcement investigation  
☐ Initiate your own regional-specific analysis  
☐ Initiate your own topic-specific analysis  
☐ Develop long-term homeland security strategies  
☐ Do not plan to use  
 Other:

6. To further understand your response to question #5, please provide specific details about situations in which you might use this product.

7. What did this product not address that you anticipated it would?

8. To what extent do you agree with the following two statements?

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	N/A
This product will enable me to make better decisions regarding this topic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This product provided me with intelligence information I did not find elsewhere.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. How did you obtain this product?

10. Would you be willing to participate in a follow-up conversation about your feedback?

To help us understand more about your organization so we can better tailor future products, please provide:

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