Unmanned Aerial Systems (UASs) Risk Management Best Practices

Version June 6, 2018

Drone Safety Tips

- Register your drone
- Fly your drone at or below 400 feet
- Keep your drone within your line of sight
- Be aware of FAA Airspace Restrictions
- Respect privacy
- Never fly near other aircraft, especially near airports
- Never fly over groups of people, public events, or stadiums full of people
- Never fly near emergencies such as fires or other types of disasters
- Never fly under the influence of drugs or alcohol
- Be aware of local ordinances and regulations, including signage (If a district requires a permit for use of drones on district property, the signs should be displayed on campuses notifying potential drone pilots)

Background

An unmanned aerial system (UAS) is the unmanned aircraft (UA or drone) and all of the associated support equipment, control station, data links, telemetry, communications, and navigation equipment necessary to operate the unmanned aircraft.[1] The UA is the flying portion of the system, directed by a pilot or operator via a ground control system, or autonomously through use of an on-board computer, communication links, and any additional equipment that is necessary for the UA to operate safely.[2] Small UASs (sUASs) are generally classified as drones with a total takeoff weight of less than 55 pounds. These drone guidelines are generally limited to discussing the subject of small UASs.

Small UASs pose risk considerations that are different from the risk considerations typically associated with manned-aircraft operations. The typical total takeoff weight of a small UAS is less than 55 pounds. Consequently, because of the reduced weight, the small UAS poses significantly less risk to other aircraft or persons and property on the ground in the event of a mishap or pilot error. As such, small UASs pose a smaller overall public risk or threat to national security than the operation of manned aircraft.

The unmanned nature of small UASs raises two unique safety concerns that are not present in manned-aircraft operations. The first safety concern is whether the person operating the small unmanned aircraft, who is physically separated from that aircraft during flight, would have the ability to see manned aircraft in the air in time to prevent a mid-air collision with that manned aircraft. Federal Aviation Administration (FAA) regulations currently require each person operating an aircraft to maintain vigilance "*so as to see and avoid other aircraft*." This is one of the fundamental principles for collision avoidance.

For manned-aircraft operations, "*see and avoid*" is the responsibility of pilots on board an aircraft. Because the remote pilot in an unmanned aircraft operation is not physically on the unmanned aircraft, that remote pilot does not have the same visual perspective and ability to see other aircraft as a manned-aircraft pilot. Thus, the challenge for small UASs is to ensure that the person operating the small unmanned aircraft is able to see and avoid other aircraft.

The second safety concern with small UAS operations is the possibility that, during flight, the person piloting the small unmanned aircraft may lose control of the aircraft due to a failure of the control link between the aircraft and the remote pilot's control station. This is known as a loss of positive control and may result from a system failure or because the aircraft has been flown beyond the signal range or in an area where control link communication between the aircraft and the control station is interrupted. A small

[1] What should you know before you fly a drone? For a good primer, please refer to http://www.fly-robotics.com/amaflightschool/course/view.php?id=6 .

[2] The airworthiness certification of a UAS applies to the entire system, not just the flying portion of the system.

unmanned aircraft whose flight is unable to be directly controlled could pose a significant risk to persons, property, or other aircraft.

Since small UASs present a different risk profile than other aircraft, the FAA has promulgated Small UAS Rule (Part 107), including all pilot and operating rules. If a District wants to operate a UAS, it has two options:

1. Follow the FAA's Small UAS rule (this includes two options: Part 107 and Section 336)

   OR:

2. If the District wishes to operate UASs outside of these rules, apply for a blanket public Certificate of Authorization (COA) which allows flights at or below 400 feet in Class G airspace nationwide, self-certification of the UAS pilot, and the ability to obtain emergency COAs under special circumstances.

The FAA requires all owners of small UASs weighing between 0.55 and 55 pounds to register online before flying their UASs.[3] Districts must use the paper (N-number) registration process if their UASs are 55 pounds or greater (i.e., traditional aircraft registration under 14 CFR Part 47).

IMPORTANTLY, check with the Federal Aviation Administration often if you use UASs. Drone use is a quickly changing area, and the rules and regulations governing drone operations are evolving.

[3] Failure to register an aircraft can result in civil penalties up to $27,500. Criminal penalties for failure to register can include fines of up to $250,000 under 18 U.S.C. 3571 and/or imprisonment up to three years.

Summary of Drone Operating Rules and Regulations

There are two main FAA-regulated options to fly drones legally. In addition, there may be local rules and regulations. It is recommended that districts consider drone permit procedures that apply to drone use on their properties. Each option below has different requirements depending on how you want to fly as follows:

	If You Fly Only for Fun	*If You Fly for Work or Fun*
Pilot Requirements	No pilot requirements For schools, this would include students only in classes not intended as UAS flight training	Must have Remote Pilot Airman Certificate Must be 16 years old Must pass TSA vetting For schools, this would include all paid instructors
Aircraft Requirements	Must be less than 55 lbs. Must be registered if over 0.55 lbs. (online)	Must be less than 55 lbs. Must be registered if over 0.55 lbs. (online) Must undergo pre-flight check to ensure UAS is in condition for safe operation
Location Requirements	Not within 5 miles from airports without prior notification to airport and air traffic control	Class G (uncontrolled) airspace (subject to certain waivers)
Operating Rules	Must ALWAYS yield right of way to manned aircraft Must keep the aircraft in sight (visual line-of-sight) UAS must be under 55 lbs. Must follow community-based safety guidelines and ***Fly for Work*** rules, whichever is more stringent Must notify airport and air traffic	Must keep the aircraft in sight (visual line-of-sight)* Must fly under 400 feet* Must fly during the day* Must fly at or below 100 mph* Must yield right of way to manned aircraft* Must NOT fly over people* Must NOT fly from a moving

	If You Fly Only for Fun	*If You Fly for Work or Fun*
	control tower before flying within 5 miles of an airport Never fly near emergency response efforts	vehicle* * Subject to waiver
Example Applications	Hobby or recreational flying only	Flying for commercial use (e.g. providing aerial surveying or photography services) Flying incidental to a business (e.g. doing roof inspections or real estate photography) Recreational flying
Legal or Regulatory Basis	Public Law 112-95, Section 336 – Special Rule for Model Aircraft FAA Interpretation of the Special Rule for Model Aircraft	Title 14 of the Code of Federal Regulation (14 CFR) Part 107

Obtaining Remote Pilot in Command ("RPIC") Licensing

To qualify for a remote pilot certificate, a person must:

- Demonstrate aeronautical knowledge by either:
  - Passing an initial aeronautical knowledge test at an FAA-approved knowledge testing center (the testing center charges $150 to complete the test); or
  - Hold a part 61 pilot certificate other than student pilot, complete a flight review within the previous 24 months, and complete a small UAS online training course provided by the FAA,
- Be vetted by the Transportation Security Administration (TSA), and
- Be at least sixteen (16) years old

The following licensing guidance on becoming an RPIC is offered:

a. Becoming a Pilot
b. Study Materials: Advisory Circular, Remote Pilot Airman Certification Standards
c. Sample Knowledge Test

A remote pilot in command must:

- Make available to the FAA & the District, upon request, the small UAS for inspection or testing, and any associated documents/records required to be kept under FAA rules
- Report immediately to the District and to the FAA within 10 days of any operation that results in serious injury, loss of consciousness, or property damage of at least $500 (See section under Sanctions, item 5)
- Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is in a condition for safe operation

Additional Guidelines for Drone Operations

Following are some additional guidelines for safe drone operation:

- Follow community-based safety guidelines, as developed by organizations such as the Academy of Model Aeronautics (AMA).
- Fly no higher than 400 feet and remain below any surrounding obstacles when possible.
- Be kept within the eyesight of the remote pilot in command and the person manipulating the flight controls of the small UAS at all times (visual line-of-sight (VSOL)) and only during daylight hours (30 minutes before official sunrise to 30 minutes after official sunset, local time), and use an observer to assist if needed.
- Remain well clear of and not interfere with manned aircraft operations, and avoid other aircraft and obstacles at all times.
- Do not operate over unprotected persons, any persons not directly participating in the operation, under a covered structure, and/or inside a covered stationary vehicle.
- Not fly in adverse weather conditions such as in high winds or reduced visibility.
- Not fly under the influence of alcohol or drugs.
- Ensure the operating environment is safe and that the operator is competent and proficient in the operation of the UAS.
- Not fly near or over sensitive infrastructure or property such as power stations, water treatment facilities, correctional facilities, heavily traveled roadways, government facilities, etc.
- Check and follow all local laws and ordinances before flying over private property.
    - Do not conduct surveillance or photograph persons in areas where there is an expectation of privacy without the individual's permission.
    - Districts should consider the development of drone permit policies that are applicable to their properties.

DISTRICTS AND DRONES

Unmanned Aerial Systems (UASs) are everywhere, and they are being used for a variety of purposes (see **Exhibit 3**). Airspace and aircraft historically have been the domain of the federal government. As a result, the doctrine of "field preemption" comes into play. Field preemption prohibits state or local governmental regulation in an area if the federal government's regulatory scheme is sufficiently comprehensive that it evidences the intent for federal law to occupy the entire field. As a result, it is important to consider the current federal regulatory system governing UAS's (largely, the FAA) to determine what rights a District may have to regulate UAS usage.

UAS regulation within certain airspace is probably not solely within the authority of the federal government and may also be controlled by property owners and regulated by other governmental entities with specific limitations in accordance with the 1946 United States Supreme Court decision that held that landowners have property rights in the portion of the airspace above the ground that is not within the navigable airspace. The height of the ownership right has not been precisely defined, but case law supports ownership rights in airspace up to at least 500 and perhaps up to 1,000 feet above ground. While the ownership right belongs to all property owners per the *Causby* decision, a District, as a governmental entity, is uniquely situated to implement policy to regulate its airspace.

If a District chooses to ban UAS from its District grounds to the fullest extent allowable by law, ***Exhibit 1*** is included as a sample for guidance purposes.

If a District wishes to adopt a UAS policy, ***Exhibit 2*** is included as a sample for guidance purposes.

Educational Use of UASs

The Federal Aviation Administration (FAA) permits students to use UASs, with restrictions, for educational purposes. The FAA issued a memorandum on May 4, 2016 explaining that it will now consider certain educational operations as "hobby or recreational" use that will not require FAA authorization.

Student Use

In Section 336 of the FAA Modernization and Reform Act of 2012, "strictly for hobby or recreational use" exception to regulation applies to UAS operations at educational institutions and community-sponsored events. A student may operate a UAS under this provision to further his or her aviation-related education at an accredited educational institution, provided that the student is (1) not compensated, or (2) any compensation received is neither directly nor incidentally related to that person's operation of the aircraft at such events.

Faculty Use

The FAA allows "de minimis" UAS use by faculty during student coursework, but only when the faculty member's hands-on use of the drone would be "secondary" to the lessons taught. An FAA provided example of when a faculty member can operate a UAS in class follows:

This limited circumstance would apply to courses at accredited institutions where the operation of the unmanned aircraft is secondary to the design and construction of the aircraft, such that the primary purpose of the course is not operating an unmanned aircraft. For example, an instructor teaching an engineering course in which construction and operation of UAS are one part of the curriculum would be able to conduct limited UAS operations. In that case students would fly UAS to test the validity of design or construction methods to show mastery of the principles of the course. The faculty member's UAS operation would be secondary to the purpose of instructing engineering courses.

An FAA provided example of when a faculty member cannot operate a UAS follows:

In contrast, this limited circumstance would not apply to a course related to UAS flight instruction. In that case, the student's primary purpose for taking the course is to learn to fly a UAS and flight would be expected to be demonstrated on a regular basis. In that case, the faculty member's UAS operation is closely tied to his or her purpose of instructing how to fly a UAS.

Enforcement

Enforcement is a problematic issue. Communicating with local law enforcement and the pertinent municipality or county is critical to determine whether there are any supporting laws that may also control drone use and provide assistance from local law enforcement. Also, the district's drone policy should mandate compliance with the policy by students, employees and visitors, which will allow enforcement of appropriate disciplinary action for any violation by such a person under the district's normal disciplinary processes.

Any board policy should be carefully crafted to address the District's specific needs and intentions after consultation with the District's attorney.

Current UAS Operating Options

Part 107 and Section 336 rules would apply to most Districts. For Public Aircraft operations under a blanket COA, the aircraft must be owned and operated by the District or leased for a statutory minimum lease length of 90 continuous days and the District may obtain a Certificate of Authorization or Waiver (COA) for any airspace. This requires more effort and cost up front and may be worthwhile only if a school has significant UAS and/or other aircraft operation (e.g., a community college with a large flight school).

	Aircraft Requirements*	Pilot Requirements	Airspace Requirements	Types of Operation
Part 107	UAS < 55 lbs.	Part 107 remote pilot certificate with small UAS rating	Airspace waiver or authorization for Class B, C, D, E airspace	VLOS, daytime, Class G, 400 ft., not over people OR waiver provisions
Model Aircraft (Section 336)	UAS < 55 lbs.	Community-based organization (CBO) standards	Notification requirement within 5 miles of an airport	Hobby or recreational, VLOS, Part 101 operating rules, CBO standards
Public Aircraft (49 USC §40102(a)(41)	Self-certification by public agency	Self-certification by public agency	Blanket COA or Standard COA for specific airspace	Public Aircraft Operations (AC 00- 1.1A); UAS Test Site operations
Experimental Aircraft	Experimental Special Airworthiness Certificate	Part 61 airman certificate	Standard COA for specific airspace	Research and development, crew training, and market survey
Type Certificated Aircraft	Restricted type or special class certification	Part 61 airman certificate	Part 91 airspace requirements	Specified in operating authorization
Section 333	As specified in exemption.	Part 61 airman certificate.	Blanket COA or Standard COA for specific airspace	UAS > 55 lbs.

- Note: All UAS's greater than 0.55 pounds must be registered (see part 47 and part 48 requirements)

EXHIBIT 1: SAMPLE BOARD POLICY

BP_____

UNMANNED AERIAL SYSTEM (UAS or DRONE) USE PROHIBITED ON DISTRICT GROUNDS

Except to the extent allowed under federal and state law, the use of unmanned aerial systems (UASs or drones) for any purpose is prohibited on District grounds.

For purposes of this Board Policy, "*District grounds*" is defined as "*on or inside District buildings and facilities, on District fields, parking lots, or landscaping, or in the air above District buildings, facilities, fields, parking lots, or landscaping up to an elevation 500 feet above local ground level*."

District security or others so designated shall refuse admission to any individual or group attempting or intending to use a UAS on District grounds. District security or others so designated may suspend play of athletic or other competitions, if necessary, to remove and confiscate any use of a UAS in prohibited areas.

Compliance with this policy is mandatory for District students, employees and visitors. Appropriate disciplinary action for any violation of this policy by such a person shall be undertaken in accordance with the District's normal disciplinary processes. In addition, failure to follow this policy may result in local, state and federal penalties as applicable.

Definitions

Drone - See "Unmanned Aerial System" or "UAS"

FAA Part 107 (107 or Small UAS Business Use Rule) - This rule establishes the operating and certification requirements to allow small UASs, those between .5 and 55 pounds, to operate for non-hobby and non-recreational purposes.

FAA Section 336 of Public Law 112-95 (336 or Hobbyist Rule) - This rule establishes non-commercial use of small UASs to be flown by pure hobbyists for recreational purposes.

Pilot in Command - The person who has final authority and responsibility for the operation and safety of the drone flight.

Operator - The person manipulating the flight controls of the drone. In many, but not all instances, the operator will be the Pilot in Command.

Adopted: _____

EXHIBIT 2: SAMPLE BOARD POLICY

BP_____

USE OF UMANNED AERIAL SYSTEMS (UASs or DRONES) ON DISTRICT GROUNDS

The use of unmanned aerial systems (UASs or drones) for any purpose on District grounds is prohibited without the written permission of the District. Use of UASs may be permitted, provided the following conditions and requirements are satisfied, at the sole discretion of the District's risk manager or designee:

A. UAS operation requires Certificate of Authorization (COA) and/or evidence of full compliance (i.e., waiver or authorization) with the most current FAA regulations in effect at the date of permit issuance and for the permit duration as required by law.
B. If a person wishes to operate a drone in or over District property, UAS operation requires written consent from and issuance of a permit by the District risk manager or designee at least 24 hours in advance of said operation.
C. UAS operation on or over District property requires a minimum operator age of 18 (this may be modified for supervised student usage, if noted in the permit to operate) and a maximum UAS weight of 55 pounds.
D. UAS operation on or over District property is limited to UASs which are incapable of flying over 400 feet (this may be modified for longer ranges if noted in the permit to operate) and to operation during daylight hours.
E. A signed permit to operate holding the District harmless from any claims of harm to individuals (including, but not limited to, the operator and third parties) or damage to property (including, but not limited to, the UAS or other property of the operator and the property of others). In addition, UAS operators must provide proof on liability insurance covering the UAS's flight and operations with limits of not less than $5 million that names the District as a designated additional insured as a condition of the permit.
F. UAS operators must maintain line of sight at all times during operation and are prohibited from flying UASs over playing surfaces, seating, spectator areas, or any other area where and when people are present, as well as parking areas where and when people or vehicles are present.
G. UAS controllers and their employers are responsible for ensuring operators are trained in the use of the specific drone that they operate. UAS operators must be aware of the risks that include, but not limited to, personal injury and property damage caused by the UAS as a result of weather, operator error or judgment, and failure of device systems and equipment.
H. Image or audio capturing capabilities on the UAS are prohibited unless specific permission for specific purposes is authorized in the permit to operate. Any unauthorized use of any transmission, internet stream, photographic image, film, video, audio, play-by-play depiction or description of any competition and/or game action is prohibited and may be a violation of Civil Code Section 1708.8. With written permission of the District as part of the permit, real-time or tape-delayed audio, video or textual transmission of play-by-play is allowable, but it remains the exclusive property of the District. Any account/transmission of real-time video, audio or textual

play-by-play is prohibited on-site without the written permission of the District. When recording or transmitting permitted visual images, UAS controllers must avoid areas considered private in accordance with social norms such that an invasion of privacy would be considered offensive to a reasonable person and Civil Code Section 17808.8. These areas include, but are not limited to, restrooms, locker rooms, pool and spa areas, residences, and health treatment rooms.

For purposes of this Board Policy, "*District grounds*" is defined as "*on or inside District buildings and facilities, on District fields, parking lots, or landscaping, or in the air above District buildings, facilities, fields, parking lots, or landscaping up to an elevation 500 feet above local ground level*."

The District risk manager or designee shall refuse admission to any individual or group attempting or intending to use a UAS without authorization. The District risk manager or designee may suspend play of athletic or other competitions, if necessary, to remove and confiscate any authorized or unauthorized use of a UAS in prohibited areas.

Compliance with this policy is mandatory for District students, employees, and visitors. Appropriate disciplinary action for any violation of this policy by such a person shall be undertaken in accordance with the District's normal disciplinary processes. In addition, failure to follow this policy may result in local, state, and federal penalties as applicable.

Definitions

Drone - See "Unmanned Aerial System" or "UAS"

FAA Part 107 (107 or Small UAS Business Use Rule) - This rule establishes the operating and certification requirements to allow small UASs, those between .5 and 55 pounds, to operate for non-hobby and non-recreational purposes.

FAA Section 336 of Public Law 112-95 (336 or Hobbyist Rule) - This rule establishes non-commercial use of small UASs to be flown by pure hobbyists for recreational purposes.

FAA Section 333 or **FAA Public Aircraft (49 USC §40102(a)(41) Rules** – These rules involve the use of standard or blanket Certificates of Authorization (COAs) for drone operations.

Pilot in Command - The person who has final authority and responsibility for the operation and safety of the drone flight.

Operator - The person manipulating the flight controls of the drone. In many, but not all instances, the operator will be the Pilot in Command.

Adopted: _____

Exhibit 3: Uses for Drones

In Districts, UASs are currently used mainly for hobbyist or recreational/educational purposes. However, theoretically, UASs can be used for a wide variety of non-military purposes. Some of these uses follow:

Law Enforcement

Law enforcement can use UASs in urban and civilian areas to help manage situations involving narcotics investigations, hostage situations, accident investigations, bomb disposal, crime scene investigations, crowd management, and search and rescue operations. UASs are useful in rapid deployment and in challenging situations, day or night. UASs can deploy in less than 5 minutes. Combined with video cameras, UASs provide law enforcement with seamless incident situational awareness, tactical support, or accident photography and videography. Using UASs, police can assess potential threats; take HD photos of a crime scene or FLIR video of an area to find hidden threats.

Emergency Response

First responders can use UASs to help manage disasters, such as floods, hurricanes, earthquakes or terrorist attacks. UASs can help with search and rescue operations. UASs rapidly deploy, take HD photos or FLIR video of a scene, and can help locate victims in real time. Combined with software tools, first responders can also produce detailed 3D reconstructions for post-disaster evaluation and assessment from UAS-acquired photos and video.

Fire Service

Firefighters can use UAS to place personnel and equipment in the right places in fire scenarios, and, with modern FLIR cameras, to identify potential 'hot spots' without putting personal at risk.

Traffic Patrol and Accident Assistance

Traffic engineers and the highway patrol can use UASs to provide timely information on highway traffic flow and incidents. UASs equipped with HD video cameras and/or other sensors can provide real time information regarding traffic incidents and improve the public's safety. UASs can also cover preprogrammed sectors of a metropolitan area to collect data to aid in managing peak period traffic.

Homeland Security

Border patrol personnel can use UASs to help in investigating narcotics trafficking, illegal immigration, human trafficking, terrorism, and crime scenes and to participate in bomb disposal, crowd management, hostage situations, and search and rescue.

Corrections Facility Security

Prison officials can better manage inmates by utilizing UASs for surveillance and data gathering. This could include reviewing perimeters, identifying potential threats, and monitoring crowds. UASs offer prison personnel the ability to quickly assess perimeters and take HD photos or FLIR video to identify heat signatures of inmates – all from a distance during a crisis.

Agriculture and Conservation

UASs can assist commercial agriculture, land management, and conservation efforts by assessing crops, mapping flood zones, and measuring snow pack. UASs can fly programmed missions via the fully automated ground stations and convey time-lapse photos of fields and crops. They also can accurately recreate patterns during all seasons, providing invaluable data for land and soil management. Using HD video, HD photos and IR cameras allow for detailed analysis and recording. With appropriate software, 3D maps and topography can also be used in conjunction with time-lapse photos to create highly detailed maps of erosion, flood mapping, and other critical aspects of land management.

Construction

All aspects of construction – from design to final product – depend on highly accurate site data, whether it's a road, bridge, commercial housing project, industrial development or resort or planned community. The UAS's simple platform allows for multiple angles of HD photos and videos of construction sites. 3D maps and topography can also be created in conjunction with standard photos to provide highly detailed elevation views, detailed and exact distances with CAD quality drawings for any photographed structure.

Facilities Protection: Electrical, Nuclear, and Water Sites

Electricity, water, oil and gas, and nuclear facilities are require constant data gathering and monitoring functionality, including review of perimeters, evaluation of spills or hazardous leaks, identification of potential threats and quick response if an emergency occurs. UAS's ability to fly programmed missions via fully automated ground stations allows for time-lapse photos of perimeters and large spaces. Using UASs, facilities personnel can take HD photos, HD video, or FLIR video to identify heat signatures or problems. UASs can also be used for training, perimeter management, and surveillance operations.

Maritime and Shipping

UASs can be used in the context of defense and protection. With their simple-to-use autopilot and camera systems, UASs allow for accurate maritime surveillance and threat assessment. These systems allow operators to cover a large view of a ship, including the hard-to-view areas over the sides of a large super tanker. In addition, viewing a 2-mile perimeter at sea offers crucial time in a hostile situation when assistance is not available. With the UAS's optional IR cameras and sensing payloads, leaks and other dangerous conditions are easily accessed and viewed from a safe distance.

Pipeline/Hydro-Transmission Line Inspection

Utilities, including gas, coal, power, and refineries, undergo almost continual repair and maintenance. UASs can dramatically reduce the manpower needed to monitor and maintain pipelines and lines by allowing operators to cover vast expanses of pipelines and transmission lines in a fraction of the time using HD photos and HD video. In addition, viewing and cataloging difficult to access areas of refineries and production facilities using UASs is easy and inexpensive compared to traditional aircraft and personnel costs.

Railroad and Highway Maintenance

Railroads and highways span a large and diverse landscape and are in constant need of maintenance. Using detailed HD photos and HD video, UASs can save time and money by allowing operators to cover expanses of track and crossings or roads in a fraction of the time. With IR cameras and sensing payloads, UASs can access and view dangerous conditions from a safe distance in harsh weather and under extreme temperature ranges.

Archaeology and Geology Exploration

Archaeology and geology rely heavily on visual reproduction. UASs can capture accurate HD photos and HD videos at extreme altitudes or over large expanses. The autopilot feature, with programmed mission management, allows the pilot to create detailed flight plans from digitized maps with exact way points and automated photo management. 3D maps and topography are created in conjunction with the time lapse photos to produce detailed maps for elevation, structures, measurements, volumes, and other scientific analysis.

Parks and Recreation

Managing large areas of remote and isolated land, wild animals, and tourists is a complex problem. Park personnel need to monitor animals, land, and weather conditions to ensure visitor safety. UASs can allow park personnel the ability to assess wildlife, changing conditions, perform conservation monitoring, and aid law enforcement in monitoring poaching and other illegal activity on park grounds. With FLIR systems, UASs can be used in search and rescue missions by offering heat signatures of lost individuals.

Movies and Videography

UASs can easily create panoramic and dramatic shots with HD video or HD still photos.

News Gathering

News assignment may require different shots or views of a scene. UASs offer a low-cost solution to allow for easy news gathering.

Real Estate

UASs can be used in real estate, including commercial, residential and industrial properties. Real estate professionals can create promotional videos, photos, and unique shots that normal camera aspects cannot capture. The easy-to-use video and photo platform enables properties to stand out. UASs can also be used in planning, zoning, and large developments.

Among these many purposes, Districts could use currently UASs for facility protection, news gathering, photography, moviemaking, videography, archeology, and geology information gathering purposes.

EXHIBIT 4: SAMPLE UAS PERMIT

PERMIT FOR USE OF UMANNED AERIAL SYSTEMS (UASs or DRONES) ON DISTRICT GROUNDS
PAGE 1 OF 5

Contact Information	
Name of Applicant/Requestor:	
If applicable, Department or Company:	
Contact Phone #:	
E-Mail Address:	
Flight Details/Plan of Activities	
Purpose of drone flight:	
Proposed Dates of Flight:	
Proposed Time of Flight:	
Estimated Flight Duration:	
Estimated Flight Altitude:	
Where Do You Propose To Fly the Drone:	
Drone Information	
Drone Description:	
Make / Model/ID #l	
FAA Registration #:	
Approximate Weight:	
Aircraft Owner (If other than RSCCD):	
Pilot Information	
Pilot Name:	
Attach Copy of Remote Pilot Certificate	

In order to be considered for a permit involving a UAS, the following documentation and terms are required:

1. For standard permits, proof that the UAS operator complies with Part 107 or Section 336 rules. For special permits *if operator complies with under 49 USC §40102(a)(41), Experimental Aircraft, Type Certificated Aircraft, or Section 333*, obtain FAA documentation, and require limits of $5,000,000 under 3.

    ☐ Standard permit

    ☐ Special permit

2. A copy of the operator's written Plan of Activities (POA).

    ☐ On file

3. Proof of insurance coverage as follows:

    Evidence of coverage for the use of Unmanned Aerial Systems (UASs) must be provided by the UAS operator. UAS operating entity must submit proof of Unmanned Aerial Systems (UAS) insurance with a limit of at least $1,000,000. The certificate of insurance must include a separate policy endorsement showing proof of UAS coverage. An endorsement must be submitted naming the District, its trustees, officers, agents, and employees as Additional Insureds.

    ☐ On file

    ☐ Waived (for student project deemed low risk by Risk Management only) __ Initials

IMPORTANT NOTES

1. Other government agencies may have additional requirements regarding the use of UAS in their jurisdictions. Please check with all relevant agencies or with the District before submitting your permit application.
2. UAS operators must have all pertinent documentation on set with them at all times. This includes their Certificate of Authorization (COA), Plan of Activities (POA), pilot certificate and third-class medical certificate.
3. The use of a UAS is permitted only when all qualifications have been met, all necessary approvals have been obtained, and use of a UAS is noted on the permit. If someone is found to be operating a UAS without the proper permit, ANY District representative may immediately suspend the UAS activities.
4. The FAA does not regulate the use of UAS indoors (their jurisdiction covers U.S. airspace, not under the roofs of private structures). Be advised that approval for the use of UAS in a stage or building fall under the authority of the District permitting process. Also note that whether it's exterior or interior filming, the District will not approve permits when UAS are involved, unless they are flown by FAA-exempted operators.
5. Also be aware that new regulations for the commercial use of small UAS have been introduced by the FAA. These laws, if passed, would supersede current guidelines.

The following are 15 of the most pertinent TERMS & CONDITIONS required of (FAA-exempted) UAS operators.

1. The UAS must weigh less than 55 pounds, including energy source(s) and equipment.
2. The UAS may not be flown at a speed exceeding a ground speed of 50 knots.
3. Flights must be operated at an altitude of no more than 400 feet above ground level (AGL).
4. The UAS must be operated within visual line of sight (VLOS) of the pilot in command at all times.
5. All operations must utilize a visual observer (VO).
6. The pilot must possess at least a private pilot certificate and at least a current third-class medical certificate.
7. The UAS may not be operated directly over any person, except authorized and consenting production personnel, below an altitude that is hazardous to persons or property on the surface in the event of a UAS failure or emergency.
8. Regarding the distance from participating persons, the operator's manual has safety mitigations for authorized and consenting production personnel. At all times, those persons must be essential to the closed-set film operations.
9. Regarding distance from non-participating persons, the operator must ensure that no persons are allowed within 500 feet of the area except those consenting to be involved and necessary for the filming production. This provision may be reduced to no less than 200 feet if it would not adversely affect safety and the FAA Administrator has approved it. For example, an equivalent level of safety may be determined by an aviation safety inspector's evaluation of the filming production area to note terrain features, obstructions, buildings, safety barriers, etc. Such barriers may protect non-participating persons (observers, the public, news media, etc.) from debris in the event of an accident.
10. At least three days before the scheduled flight, the operator of the UAS affected by this exemption must submit a written Plan of Activities (POA) to the District. The 3-day notification may be waived with the concurrence of the District. The POA must include at least the following:
    a) Dates and times for all flights.
    b) Name and phone number of the person responsible for the operation of the UAS.
    c) Make, model and serial or N-number of UAS to be used.
    d) Name and certificate number of UAS pilots involved in the event.
    e) A statement that the operator has obtained permission from instructors, property owners and/or local officials to conduct the event; the list of those who gave permission must be made available to the District upon request.
    f) A description of the flight activity, including maps or diagrams of any area, city, town, county and/or state over which flying will be conducted and the altitudes essential to accomplish the operation.
11. UAS operations may NOT be conducted at night.

12. The UAS cannot be operated by the pilot from any moving device or vehicle. The UAS may not operate in Class B, C, or D airspace without written approval from the FAA. The UAS may not operate within 5 nautical miles of the geographic center of a non-towered airport as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airport's management is obtained, and the operation is conducted in accordance with a Notice to Airman as required by the operator's Certificate of Authorization. The letter of agreement with the airport management must be made available to the District upon request.
13. The documents required must be available to the pilot at the ground control station of the UAS any time the aircraft is operating. These documents must be made available to the any District representative upon request.

Permit.

Except as provided by the terms of this permit which has been specifically authorized by the District, no person shall conduct or cause to be conducted, participate or engage in, hold, manage, permit or allow another to conduct drone use, in, on or upon any District public property or public right-of-way which is owned or controlled by the District without first having obtained a written permit from the District. The Risk Manager is authorized to issue permits for drone use pursuant to the procedures established by the District. The Risk Manager may condition any permit issued with reasonable requirements concerning the time, place or manner of drone use as is necessary to coordinate multiple uses of public property, assure preservation of public property and public places, prevent dangerous, unlawful or impermissible uses, protect the safety of persons and property and to control vehicular and pedestrian traffic in and around the venue. Conditions may include, but are not limited to, the following: 1. The establishment of an assembly or disbanding area; 2. The accommodation of pedestrian and vehicular traffic; 3. Conditions designed to avoid or lessen interference with public safety functions and/or emergency service access; and 4. The inspection and approval by District personnel of equipment to be used or operated as part of the permit to conform to the requirements of all applicable codes.

Indemnification.

a. Permittee shall defend, indemnify, and hold harmless ("Indemnification") the District, its trustees, officials, directors, officers, employees, volunteers, and agents from and against all liabilities, losses, expenses, claims, actions, or judgments (including attorney fees) recovered or made against District for any damage, injury, or death to persons or damage to property caused by the negligent or intentional acts or omissions of Permittee, its officers, employees, agents, or subcontractors (of all tiers) related to Permittee's acts or omissions under this Permit. Permittee's Indemnification extends to conditions created by this Permit or based upon violation of any statute, ordinance, or regulation. This provision is in addition to any common law or statutory liability and indemnification rights available to District. Permittee's Indemnification of District shall not apply to damage, injury, or death caused by the sole negligence or willful misconduct of District, its officers, directors, employees, volunteers, or

agents. District will promptly notify Permittee in writing of any such claim or demand to indemnify and shall cooperate with Permittee in a reasonable manner to defend such claim.

☐ Agreed

b. Permittee shall defend, indemnify and hold harmless District, its officers, directors, agents, volunteers, and employees from and against all claims, liabilities, losses, expenses, actions, or judgments (including attorneys' fees) that the Work Product or that the District's use of the Work Product infringe or misappropriate the intellectual property rights of any third party. This provision requires, among other things, that Permittee defend the District in any such action. Permittee's Indemnification of District shall not apply to damage, injury, or death caused by the sole negligence or willful misconduct of District, its officers, directors, employees, volunteers, or agents.

☐ Agreed

Signed: _____

For Permittee: _____

Date: _____