UAS Case Study

Systems Synthesis | Fall 2015

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City of Pittsburgh Department of Innovation & Performance | Client

This study should provide a comprehensive look at the types of drones that are currently available for implementation into city operations, specifically the area of the public safety management. There will be a review of current emergency operations and how UAS can support or enhance those plans. At the conclusion of this study, the city should have detailed information on UAS usage in at least three cities that are similar to Pittsburgh, thus allowing the establishment of a benchmark and to develop an understanding of practices regarding proposed legislation and governing laws.

UAS Advisory Board

Brendan Carroll | Founder and CEO of Skycision

Raymond DeMichiei | Deputy Director of Pittsburgh's Office of Emergency Management and Homeland Security

Geetesh Dubey | CMU Robotics Institute Research Associate

Eric Holmes | Pittsburgh Bureau of Police, Executive Commander

Darryl Jones | City of Pittsburgh Fire Chief

Daniel Lavelle | Pittsburgh City Councilman, Chair of Public Safety Committee

Sanjiv Singh | CMU Robotics Institute Research Professor & CEO of Near Earth Autonomy

Richard Stafford | CMU Distinguished Service Professor

Saunteé Turner | City of Pittsburgh Public Safety Manager

Recommendations

Primary Recommendations

Potential uses & suggested models

- **Bureau of Fire & OEHMS**
- **Bureau of Police**

Secondary Recommendations

City policy for general use of UAS in the city

- **City code**
- **Registration**
- **Geo-fencing**

Bureau of Fire and OEMHS

Potential Uses and UAS Models

- **Winter windshield surveys**
  Or
- **Coordination of citywide emergencies**
  - **DJI Inspire 1 Pro**

Inspire 1 Pro

Company	Model	Weight (lbs)	Speed (MPH)	Operating Temp.	Flight Time (Minutes)	Total Cost
DJI	Inspire 1 Pro	6.3	40	14° F - 104° F	15	$4,189
DJI	Phantom 3 Advanced	2.8	35	32° F - 104° F	23	$1,678

Bureau of Police

Potential Uses and UAS Models

- **Crime scene documentation**
  - **3DRobotics Iris+**
- **Crash scene documentation**
  - **Yuneec Q500 Typhoon 4K**
- **Live monitoring of critical incidents**
  - **DJI Phantom 3 Advanced**

Iris+

Company	Model	Weight (lbs)	Speed (MPH)	Operating Temp.	Flight Time (Minutes)	Total Cost
3DRobotics	Iris+	2.8	51	*	23	$1,000
Yuneec	Q500 Typhoon 4K	3.7	22	23° F - 176° F	25	$1,178
DJI	Phantom 3 Advanced	2.8	35	32° F - 104° F	23	$1,678

Secondary Recommendations

Expansion of geo-fencing technology

UAS registration

Addendum for city code

Registration

Category: Open

- **Civil use**
- **MTOM: < 4.4lbs**
- **Vehicle registration**
- **No permit required**
- **Flown within line of sight**
- **Requires geo-fencing technology**

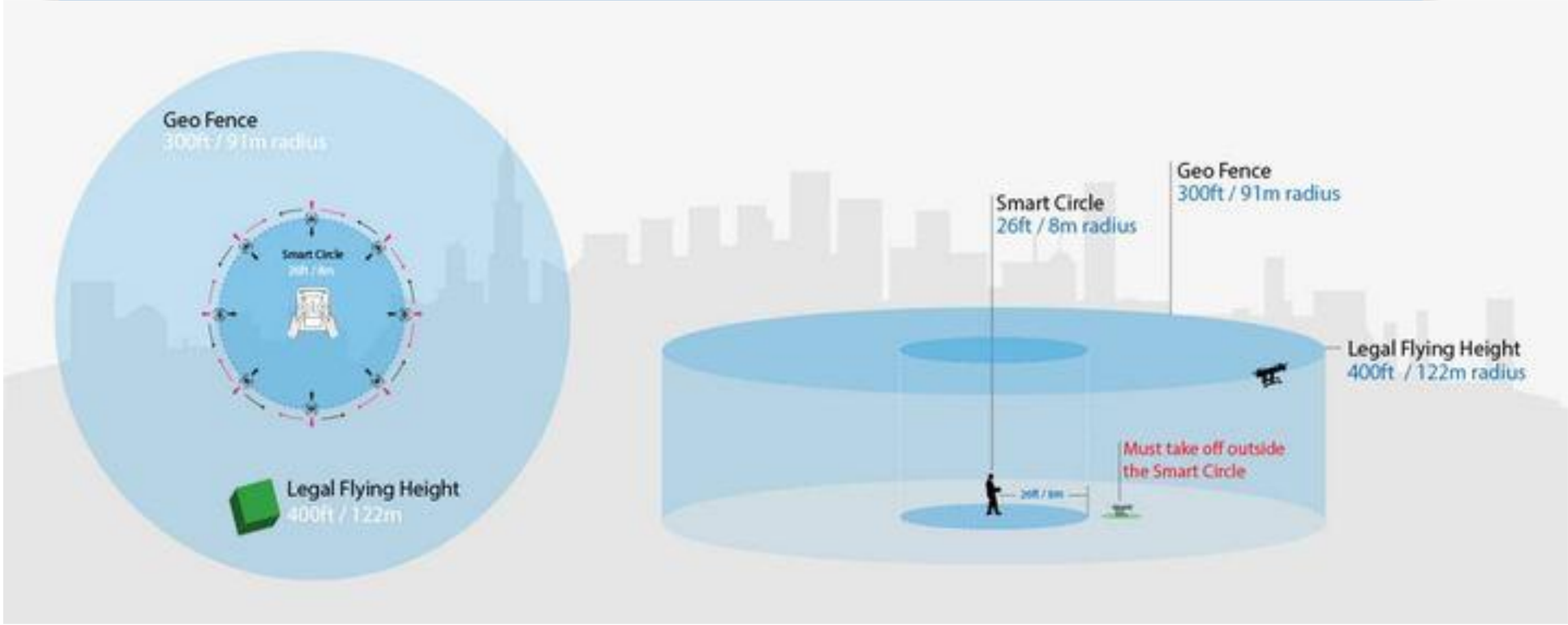
Category: Specific

- **Commercial use**
- **MTOM: > 4.4lbs and < 55lbs**
- **Insurance**
- **Develop risk assessment**
- **Permit required**
- **Reason for use**
- **Requires geo-fencing technology**

Geo-Fencing

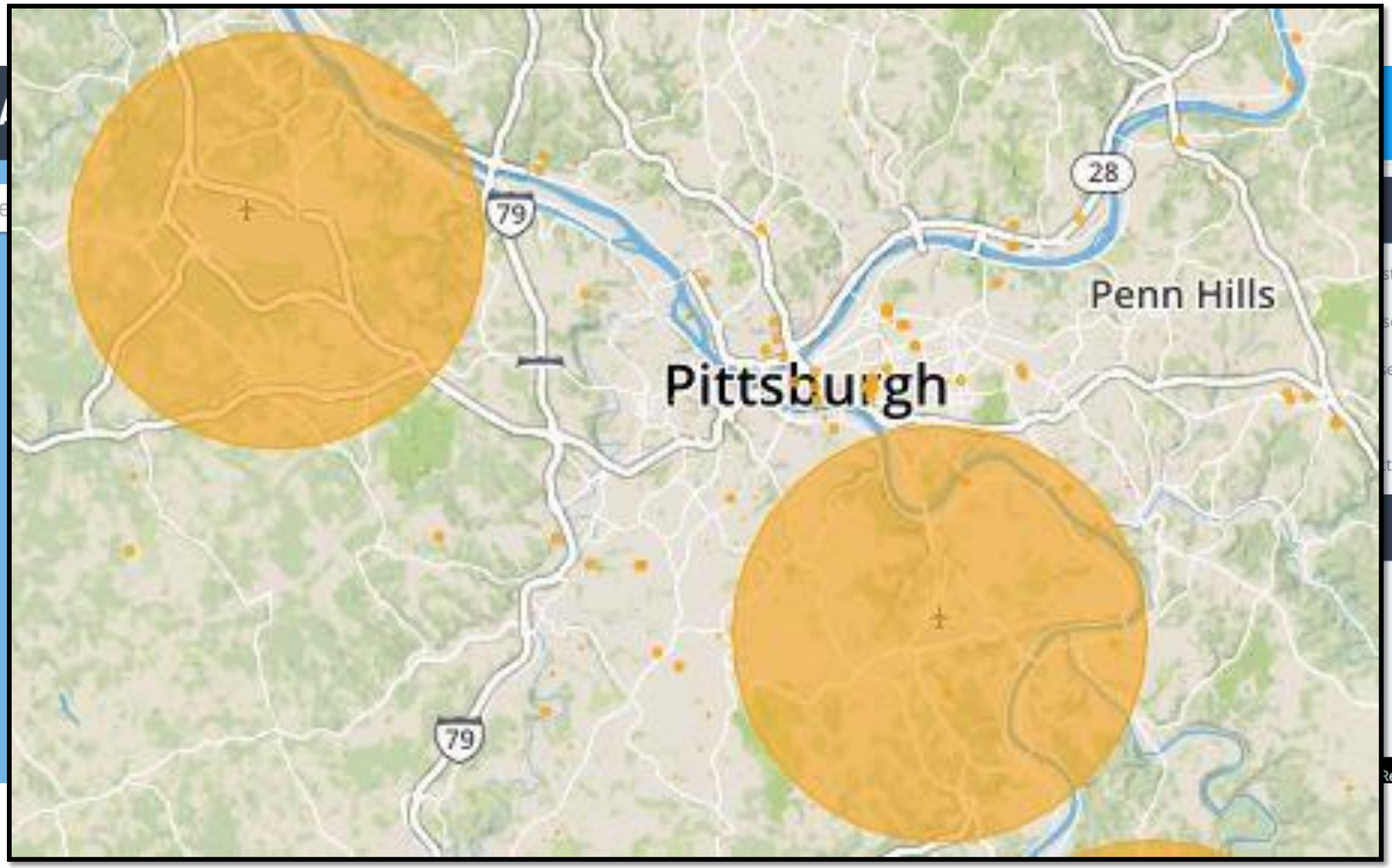
Defining No Fly Zones

- **Airports**
- **Hospitals**
- **Schools**
- **Power plants**
- **Heavily populated areas**
- **Temporary flight restrictions**



Source: Yuneec website

Geo-Fencing



Source: AirMap

City Code

Article outlining official policy on general UAS usage

Registration

Geo-fencing

City parks

2015 Reuters Poll

Respondents

73%	**Said consumer “drones” should be regulated**
71%	**Should not be permitted to operate over the property of others**
64%	**Wouldn’t want their next-door neighbor to have a “drone”**
42%	**Disapprove of the ownership of “drones” by private citizens**

Source: Reuters Polling, January 25, 2015.

Research Process

Policy review:
Federal, State, Local

Technology review:
Models, Capabilities, Costs,
Training, Geo-fencing

Benchmarking research:
Asia, Europe, United States

Insurance and Liability

Funding Opportunities

Recommendations & Database

Thank You!