



@HelicoptersofDC

Tracking the military ghost helicopters of D.C.

Andrew Logan, HelicoptersofDC@ProtonMail.com

Welcome to Washington, D.C.

D.C. Guard misused helicopters in low-flying confrontation with George Floyd protesters, Army concludes



VERIFY: Yes, U.S. Park Police used a helicopter to chase ice hockey players off a frozen over Reflecting Pool

An internal investigation of the pilot's actions is underway



Search



doorgunnersinc • Follow

doorgunnersinc Bruh capitol police serious af about people skating on the reflecting pool. These tried to say they were gonna arrest us. the po-lice

Load more comments

olafurnikaelsen @doorgunnersinc I mean you could drown in that

doorgunnersinc @texasbladerunner disrespectful how?

texasbladerunner @doorgunnersinc Easy there champ. lol. The reflecting pool is part of the national monument not a playground for third graders. Besides the fact that it's there in conjunction with the Washington Monument, Lincoln Memorial and Memorial of WW2 there are signs posted everywhere for dumb people who don't have any common sense.





John

· Nov 2, 2020

@HelicoptersofDC 🚁 B412 #N412DE Department of Energy



2

1

5



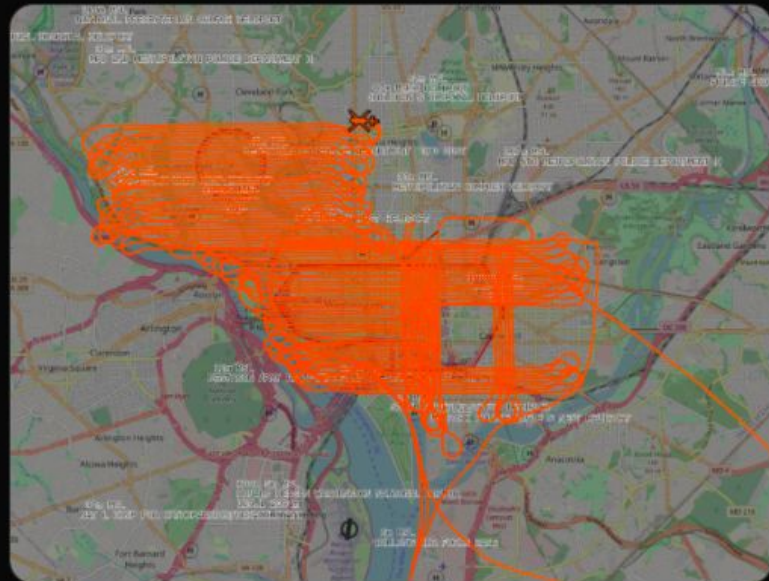
IMG↓



Jason

· Nov 2, 2020

Department of @ENERGY nuke sniffing helicopter #N412DE has been putting in work today. You can follow it here: [@DCist @PoPville](https://globe.adsbexchange.com/?icao=a4dbde)



ADS-B Exchange

12

38

54



IMG↓

THE WARZONE

What's The Deal With Army Helicopters Flying A Secret New Mission Over The Capital?

Army aviators already provide vital support in the region, including being prepared to spirit senior government officials to safety in a crisis.

BY JOSEPH TREVITHICK JUL 22, 2019 5:01 PM

THE WAR ZONE



DEVCOM
COMBAT CAPABILITIES DEVELOPMENT COMMAND

C5ISR CENTER

C5ISR Center Home

Inside C5ISR Center

Core Technology

Opportunities & Services

Student Programs

News & Media

Request a TEM

Contact C5ISR Center

HOME > INSIDE C5ISR CENTER > NVESD



C5ISR Center's Night Vision and Electronic Sensors Directorate researches and develops sensor and sensor suite technologies for air and ground intelligence, surveillance, reconnaissance and target acquisition under adverse battlefield conditions in day and night-time environments.

NIGHT VISION AND ELECTRONIC SENSORS DIRECTORATE

C5ISR Center's Night Vision and Electronic Sensors Directorate, located at **Fort Belvoir, Va.**, is "The Army's Sensor Developer," conducting research and development that provides U.S. Soldiers with advanced sensor technology to dominate the 21st-century digital battlefield.

NVESD exploits sensor and sensor suite technologies to:

- See, acquire, and target opposing forces, day or night, under adverse battlefield environments
- Deny the enemy the same capabilities through electro-optic means and/or camouflage, concealment and deception
- Provide capabilities for night driving and pilotage
- Detect, neutralize, clear and mark explosive hazards including minefields and unexploded ordnance
- Protect forward troops, fixed installations and rear echelons from enemy intrusion

C5ISR Center NVESD leverages its explosive hazard expertise in support of the critical U.S. Humanitarian Demining R&D Program.

The Beginning of My Helicopter Obsession

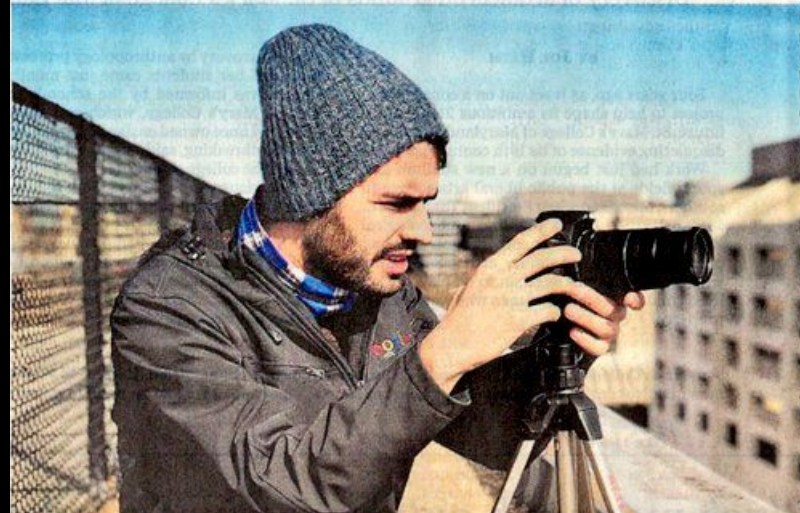
THE DISTRICT

Shaw resident keeps eye on city's 'helicopter highway'

Kept up late at night by helicopters

Flight tracking sites don't offer historical for finding out what was over you a few hours ago

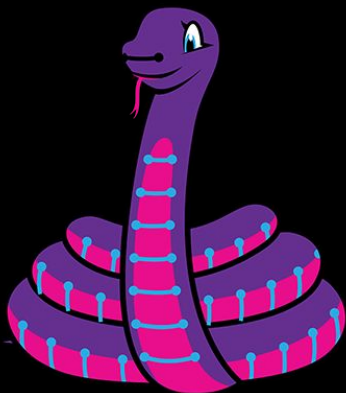
Large number of residents are on Twitter asking, very few people can identify



Pythons of The World



IronPython



proudly made



with

bad python

Tenets of Bad Python

```
def tweet(file, call, loc):
    try:
        # Authenticate to Twitter
        auth = tweepy.OAuthHandler(api_key, api_secret)
        auth.set_access_token(access_token, access_secret)
        # Create API object
        api = tweepy.API(auth)
        # FindOps(call)
        o, u = FindOps(call)
        # altft=alt*3
        if alt != 0:
            statustxt="#" + call + " " + str(alt)
        else:
            statustxt="#" + call + " "
        # print(statustxt)
        # post status
        api.update_status(statustxt)
    except tweepy.error.TweepyException as e:
        print(e)
    else:
        # print("Sent Tweet: " + statustxt)
        with open("log.txt", "a") as f:
            f.write("Sent Tweet: " + statustxt + "\n")

def FindOps(callsn):
    with open("operators.csv") as f:
        opsread = csv.DictReader(f)
        owner = ""
        url = ""
        for row in opsread:
            if callsn == row["callsn"]:
                owner = row["owner"]
                url = row["url"]
        return owner, url
```

Use outdated version (2.7)

Painstakingly edit in your choice of nano, vim, emacs, etc...

Leave old commented code strewn about

No consistent naming convention for functions and variables

API keys referenced in each file

Absolute minimum whitespace...

So I Can Debug on My Phone



Evolution of an ADS-B Bot



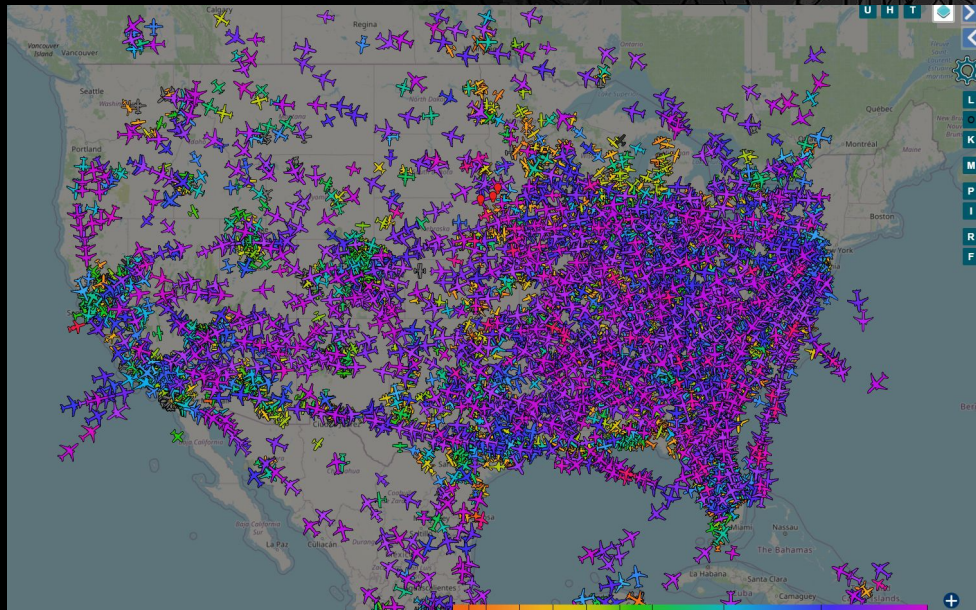
data from free OpenSky API, maps with Matplotlib



ADSExchange API, Google Maps-Static API, custom icons

About ADSBExchange

- Does not filter military that happen to have transponders on
- Does not filter private operators like Elon Musk for a fee/profit
- Globe.ADSBExchange.com on desktop or mobile



ADS-B Background

Required as of January 2020 In Class A, Class B, or Class C airspace areas;

Automatic - does not require pilot intervention

Dependent - relies on other sensors like GPS for geometry

Surveillance - Reports location

Broadcast -Transmits unencrypted over 978 or 1090Mhz

Received by “ground stations” **like us**
with Raspberry Pi and RTL-SDR

Table 1: Key Data Fields for Aircraft Identification and Tracking in Aircraft Broadcast Systems

Key Data Fields for Aircraft Identification and Tracking in Aircraft Broadcast Systems			
System	Modes 3/A ^a and Mode C	Mode S ^b	ADS-B Out
Era used	1963 to present	1984 to present	Mandated by Jan 1, 2020
Squawk code ^c	✓	✓	✓
Barometric altitude	Mode C only	✓	✓
Fixed address	X	✓	✓
Registration number	X	X	✓
Latitude / longitude	X	X	✓
Geometric altitude	X	X	✓
Aircraft dimensions	X	X	✓

Legend:

ADS-B Out = Automatic Dependent Surveillance-Broadcast Out technology

✓ = Information that is made publicly available by the aircraft broadcast system

x = Information that either is not transmitted or is not made publicly available by the aircraft broadcast system

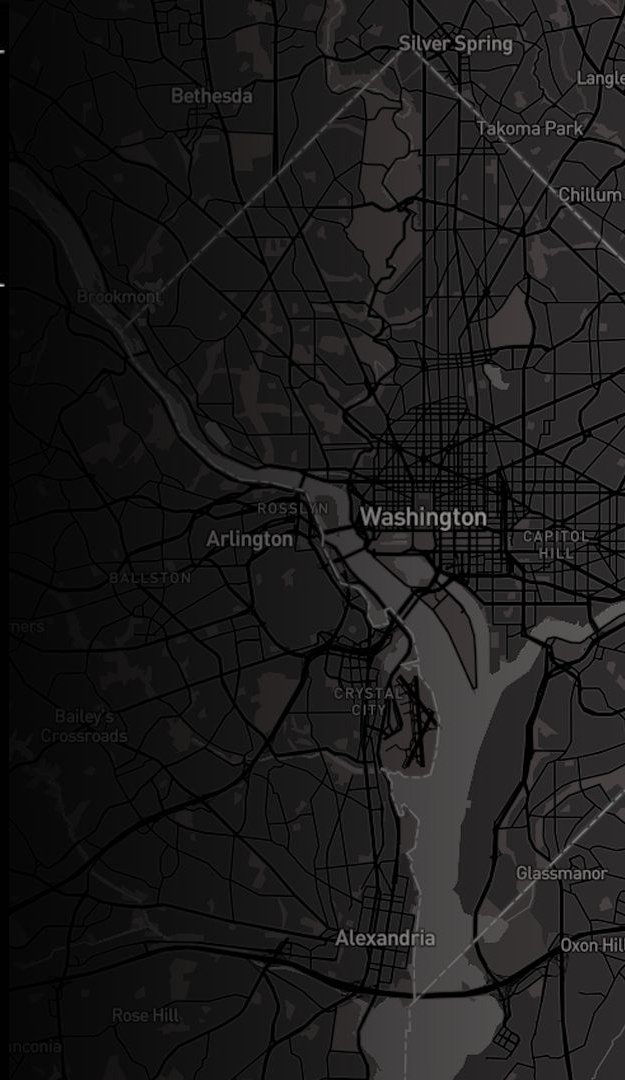
Source: Federal Aviation Administration | GAO-18-177



January 2018

HOMELAND DEFENSE

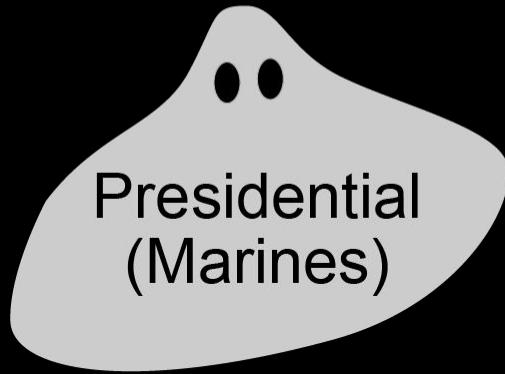
Urgent Need for DOD and FAA to Address Risks and Improve Planning for Technology That Tracks Military Aircraft

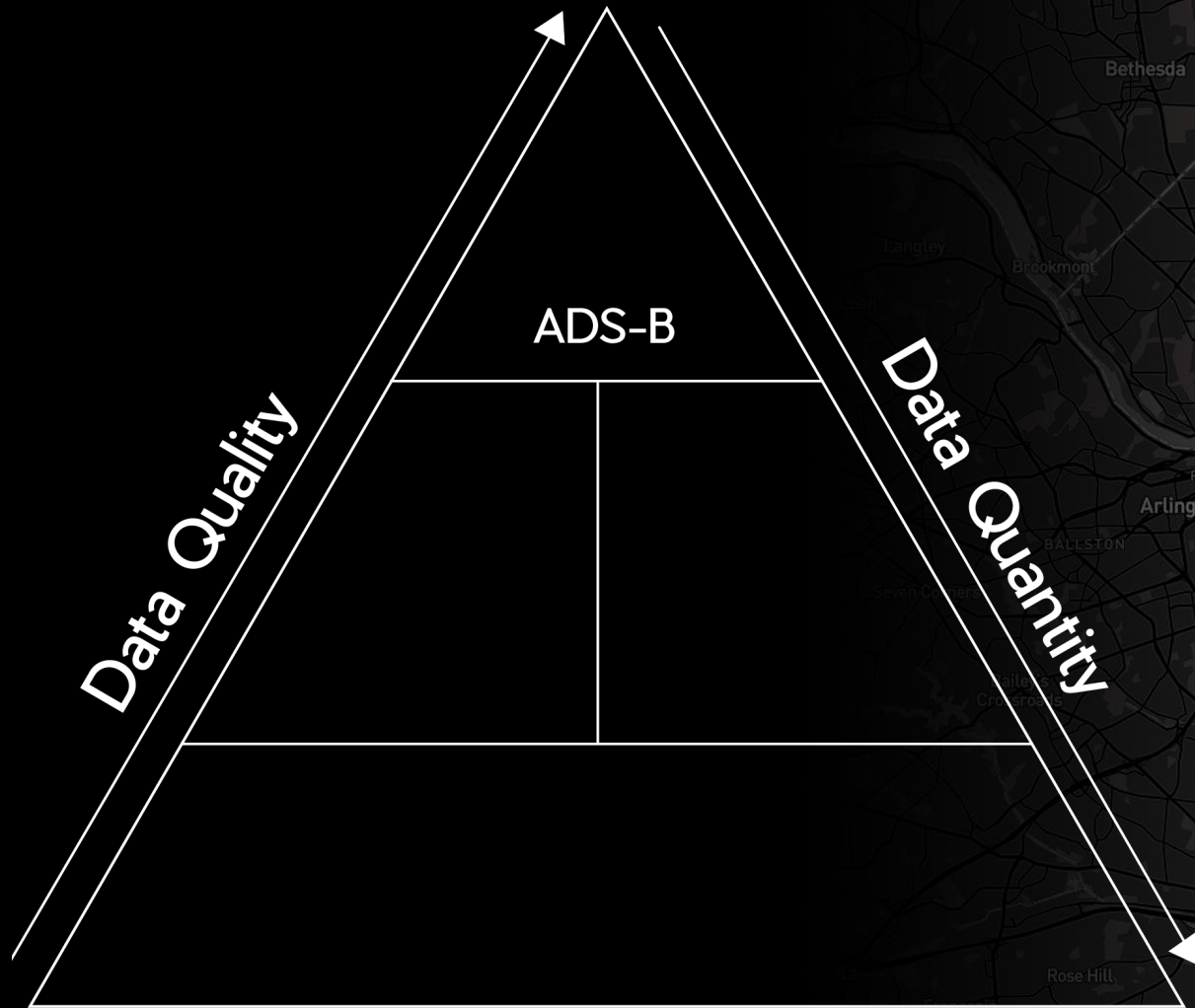


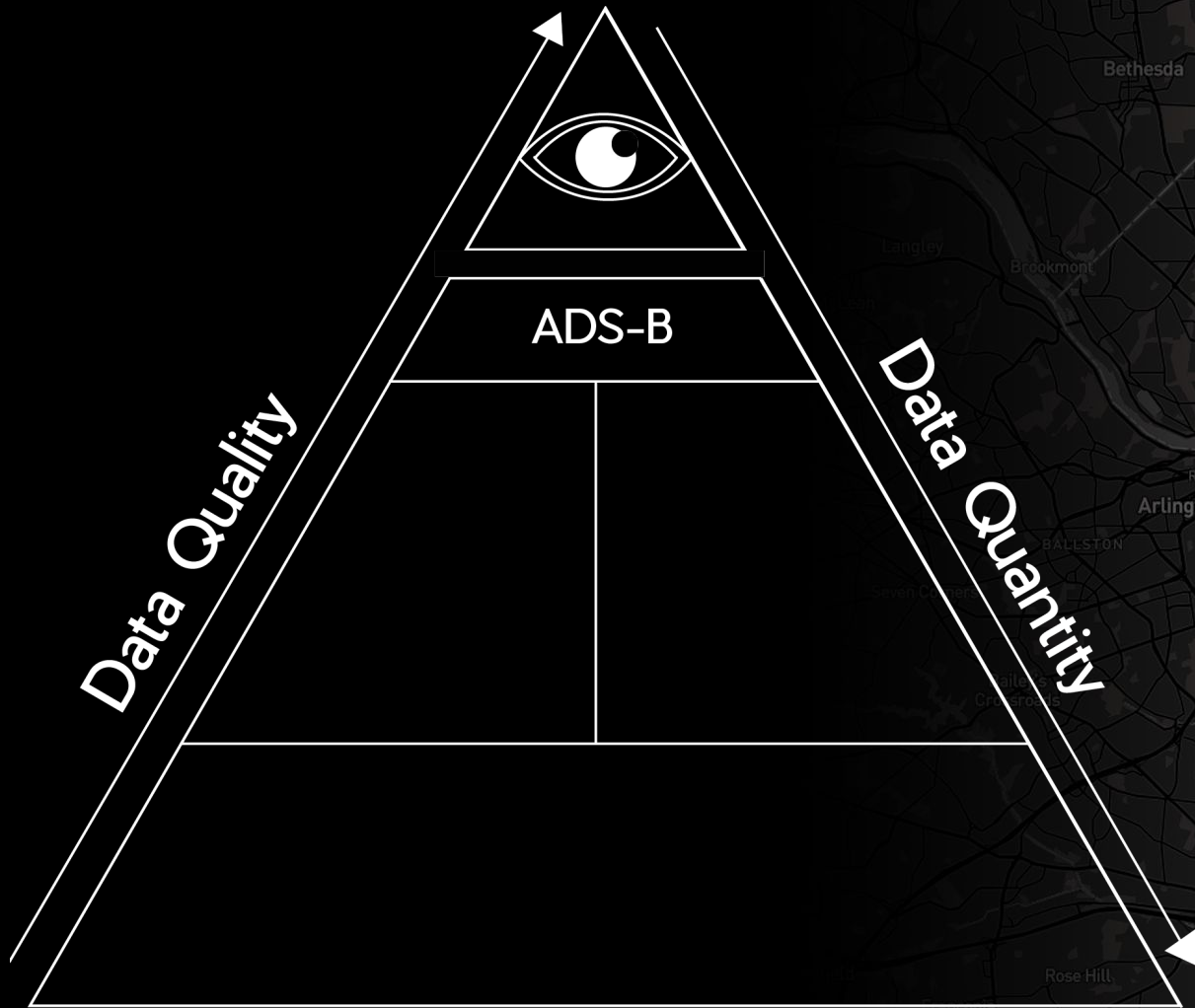
FAA Rule 14 CFR Section 91.225(f)

“ADS-B Out must operate this equipment in the transmit mode at all times unless otherwise authorized by the FAA when that aircraft is **performing a sensitive government mission for national defense, homeland security, intelligence or law enforcement purposes**, and transmitting would compromise the operations security of the mission or pose a safety risk to the aircraft, crew, or people and property in the air or on the ground.”

“In the rulemaking, **FAA defers to the agency for the determination as to whether an operation is sensitive and requires exemption** from the ADS-B requirements. As part of providing these exemptions, FAA has said it does not intend to coordinate ADS-B Out off authorizations on a dynamic, per flight, per mission, or per unit basis. Rather, FAA expects coordination for ADS-B Out off authorization to be handled at the highest possible agency organization level (such as the Army, Navy, or Air Force).” - **U.S. GAO**







JOE BIDEN - PRESIDENT'S PUBLIC SCHEDULE

Schedule updates at midnight Eastern Time, or when pushed out via social media, whichever is earlier. Available as a Google Calendar
Calendar maintained in U.S. Eastern Time and may publish earlier when the President is overseas.

Calendar

Coronavirus

Local POTUS Time: Wednesday @ 7:01:29 PM PDT (Los Angeles, CA) Next Meeting: 1 hour, 58 minutes and 37 seconds

CORONAVIRUS STATS

Get the data: [JSON](#) | [CSV](#) | [Map It / Chart It: JHU](#) | [UVA](#) | [WHO](#) | [PAHO](#)

Last Updated: Jun 8 @ 8:22 pm ET

World	537,134,143 cases	6,325,419 deaths	508,033,349 recovered
U.S.	86,943,272 cases	1,034,951 deaths	82,813,192 recovered

Key (Hover or Tap):

Actual

Blinking Schedule

Official Schedule

Pool Call Time

Pool Report

POTUS Schedule

Date

Time (ET)

Item

June, 2022

[+ Monthly Stats](#)

8 Wednesday June, 2022 * New Cases: 160,868 Total Cases: 86,943,272 * New Deaths: 667 Total Deaths: 1,034,951 2-Wk Trend Cases: -19.3% 2-Wk Trend Deaths: -25.1% Day • Week • 2-Week • Month	9:45 AM	Out-of-Town Travel Pool Call Time Joint Base Andrews Visitor Control Center Overhang	Out-of-Town Travel Pool
	10:45 AM	In-Town Pool Call Time The White House	In-Town Pool
	11:15 AM	The President departs the White House en route Joint Base Andrews South Lawn	Open Press
	11:45 AM	The President departs Joint Base Andrews en route Los Angeles, California Full Text and Analysis	

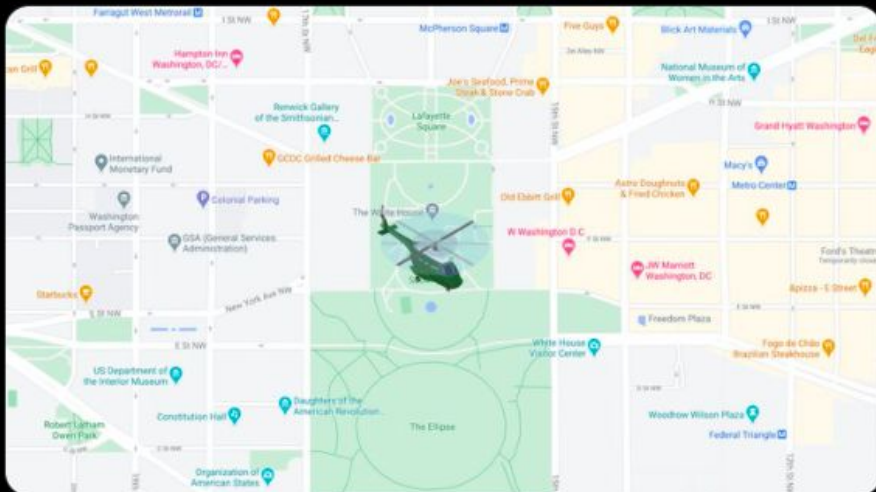
```
def potus_check():
    currentday=date.today()
    currentdstr=currentday.strftime("%Y-%m-%d")
    #print(currentdstr)
    #est_dt = Eastern.localize(loc_dt, is_dst=True)
    tz = timezone("America/New_York")
    now = datetime.now(tz)
    currenttstr=now.strftime("%X")
    http = urllib3.PoolManager()
    calendar = http.request('GET', 'https://media-cdn.factba.se/rss/csv/calendar.csv')
    f = open('calendar.csv','wb')
    f.write(calendar.data)
    f.close()
    savings=0 #1 or 0 depending on time of year 2 was 1 hr late 3/4, 0 was 1 hour early 3/8
    with open("calendar.csv") as csvfile:
        calread=csv.DictReader(csvfile)
        for row in calread:
            if currentdstr==row["Date"]:
                if row["Details"].find("departs the White House en route") != -1:
                    print(row["Time"])
                    cron = CronTab(user='andrew')
                    job = cron.new(command='python potus_tweet.py >> cron.log 2>&1', comment='potus')
                    hour = int(row["Time"][0:2]) + 4 + savings
                    if hour >= 24:
                        hour = hour - 24
                    min = int(row["Time"][3:5])
                    job.hour.on(hour)
                    job.minute.on(min)
                    cron.write()
                if row["Details"].find("President arrives at the White House") != -1:
                    print(row["Time"])
                    print(row["Details"])
                    cron = CronTab(user='andrew')
                    job = cron.new(command='python potus_tweet.py >> cron.log 2>&1', comment='potus')
                    hour = int(row["Time"][0:2]) + 4
                    print(hour)
                    if hour >= 24:
                        hour = hour - 24
```



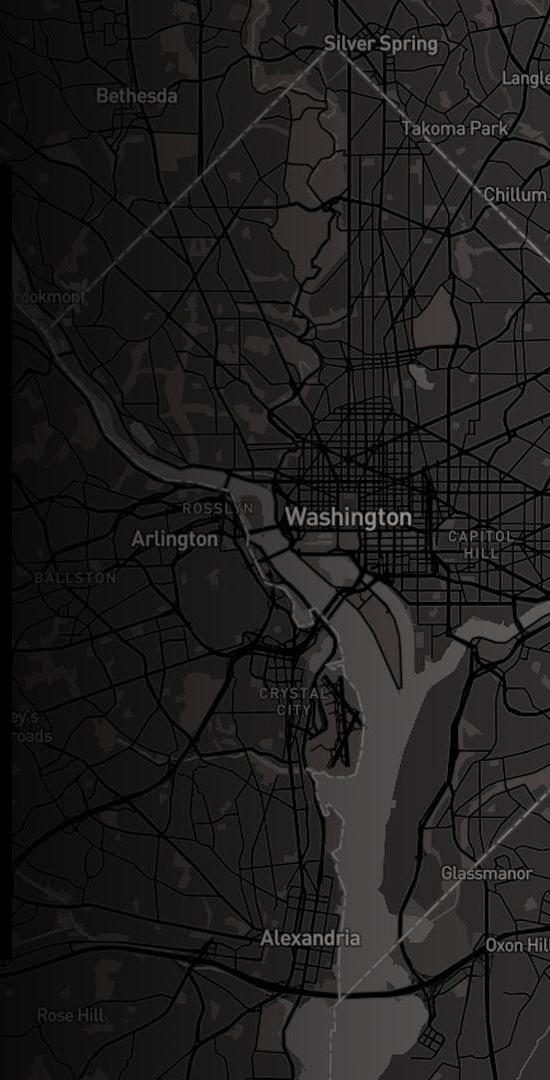
Helicopters of DC

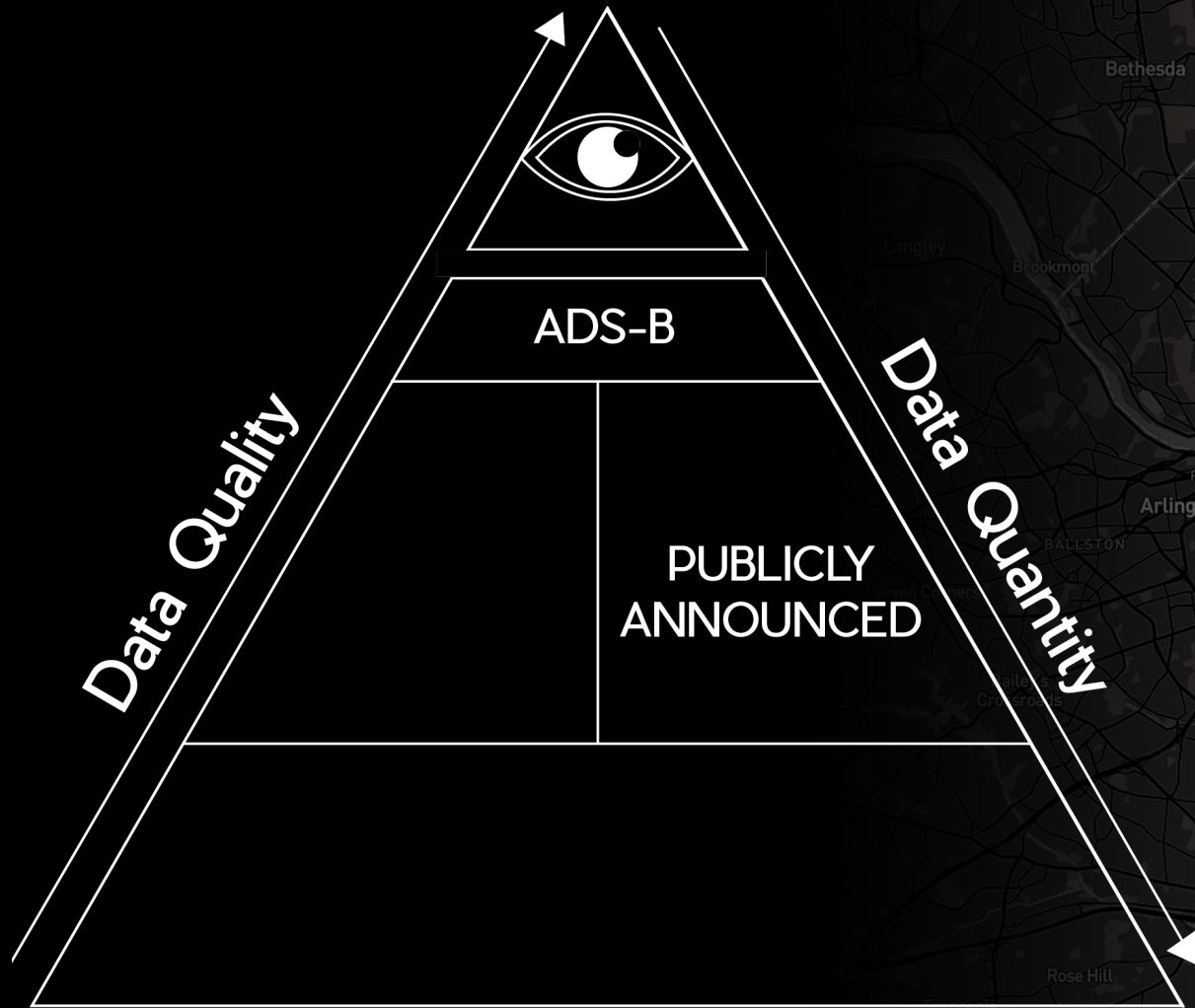
@HelicoptersofDC

#MarineOne is an VH-3D Sea King expected at The White House shortly. factba.se/topic/calendar

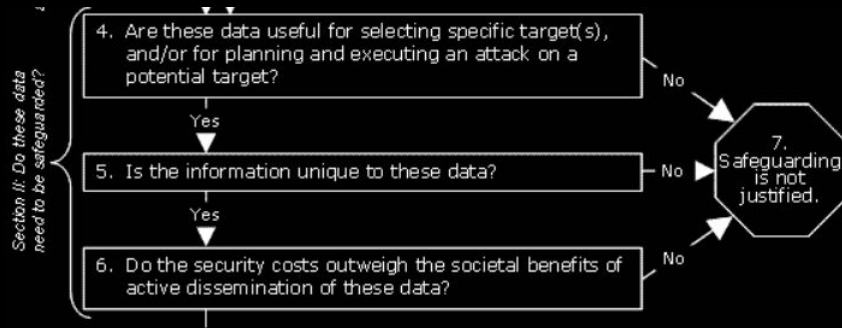


6:35 PM · Mar 4, 2022 · HelicoptersofDC





Quality Data in The Public Interest



“Efforts to safeguard useful information that is readily available through open sources or observation are unlikely to reduce vulnerabilities.”

Domaratz, M. (2005, November 16). GIS Day Special Event: Making Decisions About 'Sensitive' Geospatial Data. Retrieved June 13, 2022, from <https://web.archive.org/web/20101122205653/http://www.emforum.org/vforum/lc051116.htm>

Don't do things automatically

Provide proof of users specific interest

Source good data and link to primary sources

1997: Titan Sports, Inc. v. Turner Broadcasting Systems, Inc.

a person qualifies as a journalist for purposes of the qualified federal privilege: **the intent to use material sought, gathered or received to disseminate information to the public and that such intent existed at the inception of the newsgathering process.**"

Reporting: What, When, Where and Why



Helicopters of DC
@HelicoptersofDC

Got up close to the Air Force UH-1N and DC Air National Guard UH-72 Saturday at @HowardU's #WeFlyToo event promoting diversity in military aviation. As of 2019 86.4% of U.S. aircraft pilots & flight engineers are white, 94.2% male. datausa.io/profile/soc/ai...

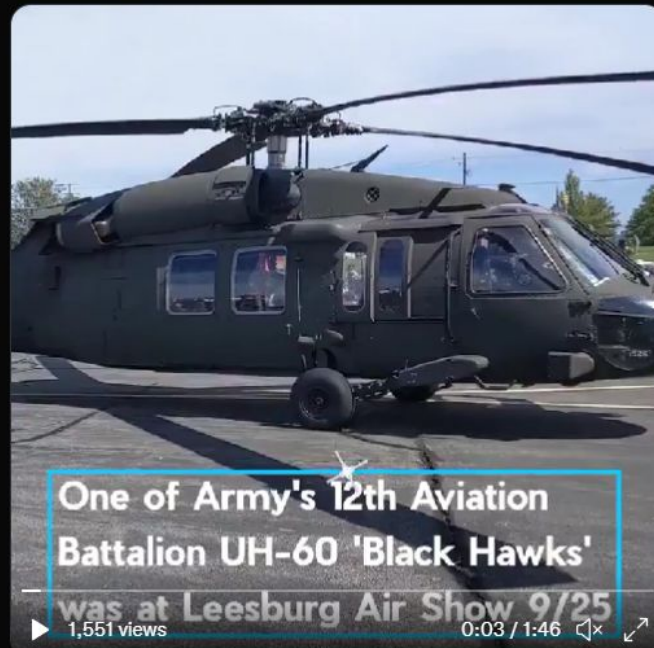


Howard University's #WeFlyToo Promotes Diversity in Military Aviation
Saturday @HowardU hoster #WeFlyToo, a one-day event focused on diversity in military aviation. Air Force UH-1N and DC National Guard UH-72 helicopters landed on the field of Howard's Greene Stadium.



Helicopters of DC @HelicoptersofDC · Oct 4, 2021

Last weekend I got a look inside Army's 12th Aviation Battalion UH-60 helicopter, callsign "PAT" at #LeesburgAirShow #avgeek citations for this video can be found at: hypothes.is/search?q=tag%3...



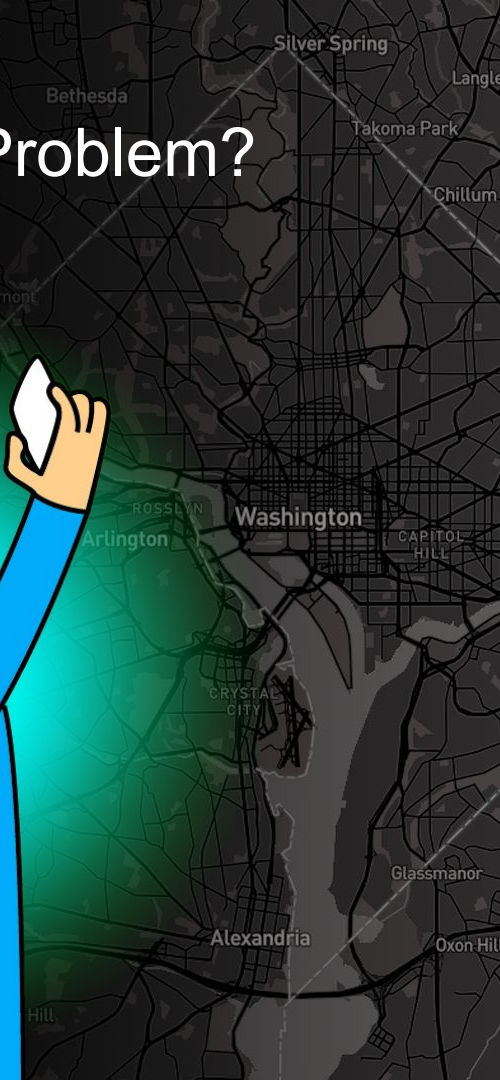
Data Problem?



Data Problem?



or Ergonomics Problem?



October '20: Started #CopterSpotter




Helicopters of DC
@HelicoptersofDC

Here are the official rules for [#CopterSpotter](#), our helicopter spotting game! If you do all 3 we will respond with a map and give you 1 point for the image and a bonus point for the type. There will be prizes! Share this with a friend who's looking up! Happy Spotting!

How to play [#CopterSpotter](#)


- Send a picture or video to [@HelicoptersofDC](#)
- Tag a specific location using Twitter's location pin (like a park or restaurant, not a neighborhood or city)
- use the  emoji in your message followed by the type if you know it



3:28 PM · Oct 16, 2020 · Twitter Web App 



Bill

[@HelicoptersofDC](#)  H60 with fuel tanks NE to land at Eagle's Nest



12:20 PM · May 9, 2022 from US Park Police · Twitter for iPhone

1 Quote Tweet

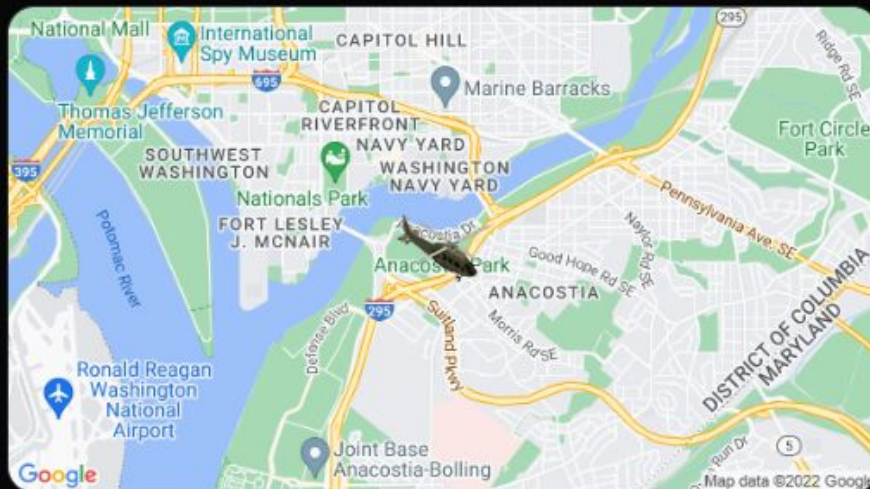


Helicopters of DC @HelicoptersofDC · May 9

spotted an H60 and has 1735 points 🚁🔥 #CopterSpotter

Probable operators: Army/National Guard/FBI/Possibly Presidential

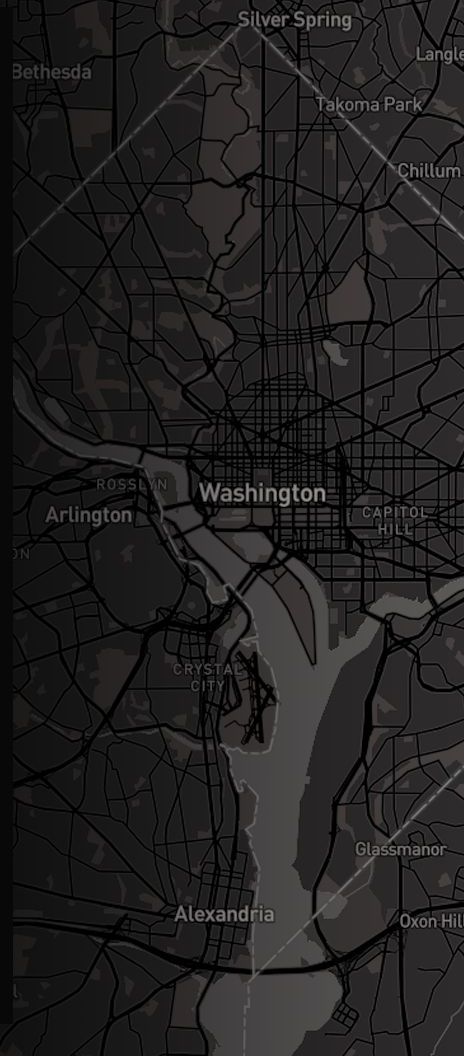
twitter.com/a/status/15236...



· May 9

@HelicoptersofDC 🚁 H60 with fuel tanks NE to land at Eagle's Nest

[Show this thread](#)





Helicopters of DC @HelicoptersofDC · Jul 15

alltime:

- မြို့သူမြို့သား 2695
- မိုးကြိုးမင်းသား 2600
- မြို့သူမြို့သား 2028
- မြို့သူမြို့သား 1855
- မြို့သူမြို့သား 1822
- မြို့သူမြို့သား 1724
- မြို့သူမြို့သား 1652
- မြို့သူမြို့သား 1207
- မြို့သူမြို့သား 1136
- မြို့သူမြို့သား 1101
- မြို့သူမြို့သား 758
- မြို့သူမြို့သား 755
- မြို့သူမြို့သား 693
- မြို့သူမြို့သား 666
- မြို့သူမြို့သား 561



How Twitter handles location tags now



Most people don't tag their precise location in Tweets, so we're removing this ability to simplify your Tweeting experience. You'll still be able to tag your precise location in Tweets through our updated camera. It's helpful when sharing on-the-ground moments.

1:47 PM · Jun 18, 2019 · Twitter Web Client

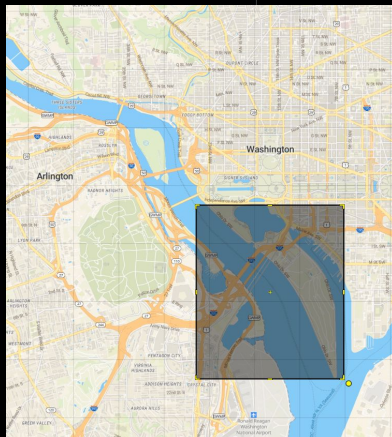
568 Retweets 1,642 Quote Tweets 1,698 Likes



@HelicoptersofDC 🚁 AS350, N911AS, MPD Air Support Unit.



1:43 PM · Apr 17, 2021 from East Potomac Park, Washington · Twitter for iPhone



```
{u'full_name': u'East Potomac Park, Washington', u'url': u'https://api.twitter.com/1.1/geo/id/30de3b6973cc6472.json', u'country': u'United States', u'place_type': u'neighborhood', u'bounding_box': {u'type': u'Polygon', u'coordinates': [[[[-77.0529382, 38.856208], [-77.020218, 38.856208], [-77.020218, 38.8877594], [-77.0529382, 38.8877594]]]], u'contained_within': [], u'country_code': u'US', u'attributes': {}, u'id': u'30de3b6973cc6472', u'name': u'East Potomac Park'}
```


The CopterSpotter Map

A project by @SamuelCrees and @HelicoptersofDC

Enable Date Range ☒

start date: 06 / 27 / 2022

end date: 07 / 17 / 2022

Common Operators by Type:

- ☒ Air Force - UH1(N/H)
- ☒ Army/Navy/Nat'l Guard - H60 / UH72(A) / SH60(m)
- ☒ Coast Guard - MH65
- ☒ POTUS - V22 / VH60(N) / VH3D / VH92(A)
- ☒ Medical - EC35 / EC45 / A109(e)
- ☒ Local PDs and Federal Law Enforcement - AS50 / MD52 / A139 / B429
- ☒ Park Police - B412 / B06
- ☒ News - B06 / R66
- ☒ News / Park Police - B06
- ☒ Other

CopterSpotter data is voluntarily submitted and is not a measured random sample of the full population of like events.

2022-07-07

1:03pm ET

Type:

B06

Heading:

West

Operators:

N86CL is NBC4

flown by

@Chopper4Brad

User:

@samuelcreees

06/27/2022 to 07/17/2022



© Mapbox © OpenStreetMap Improve this map

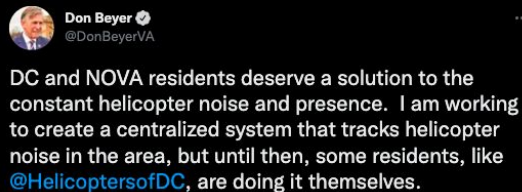
Map.CopterSpotter.com by @samuelcreees

Resident, lawmaker, even helicopter crew approved?



When u sent out that tweet regarding our standings....I felt included in some group that I didn't even know existed. 🙄🙄🙄

4:56 PM · 02 Nov 20 from Washington, DC · Twitter for iPhone



washingtonpost.com
In D.C., a resident tracks the flying machines hovering above on the city's 'heli...
The Twitter account @HelicoptersofDC tries to identify the things above us.

11:00 AM · Nov 28, 2020 · Twitter for iPhone

5 Retweets 1 Quote Tweet 28 Likes

@HelicoptersofDC Uh 60 spotted in DC. Im in it 😂



Not everyone was so psyched



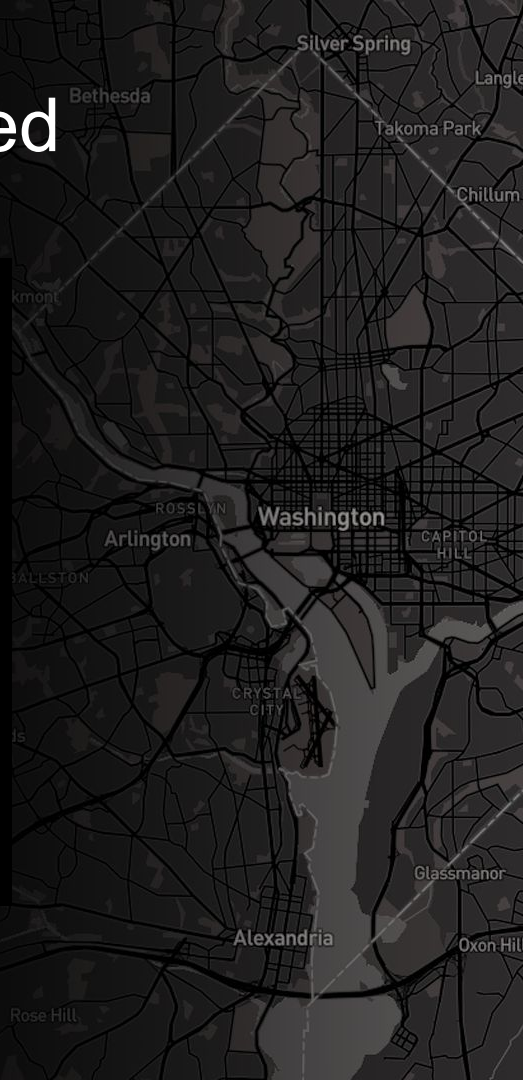
Washingtonian 4 Trump

@Justice4Matty

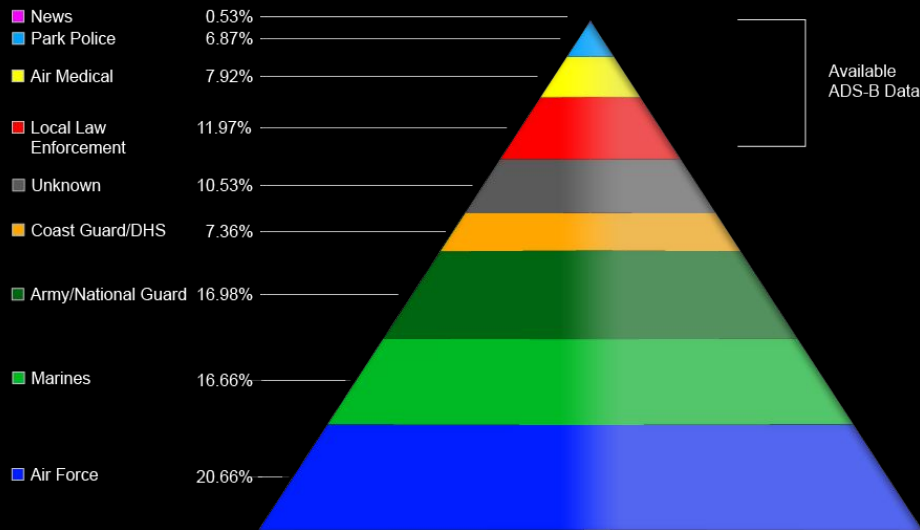
@HelicoptersofDC

This is some scary stuff the
anarchists are using to track both the
police in DC and flight movements.
We need the real FBI to take note.

2:59 PM · 20 Oct 20 · [Twitter Web App](#)

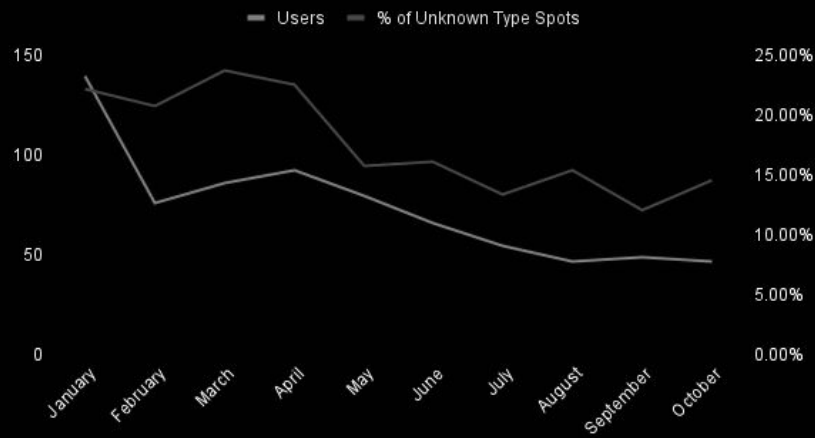


Over 10,000 spots in 2021



2021.Copterspotter.com

Unique Monthly Users and % of Unknown Type Spots



As borrowed from the NASA Aviation Safety Reporting System:

All CopterSpotter reports are voluntarily submitted, and thus cannot be considered a measured random sample of the full population of like events. One thing that can be reasonably expected from Copterspotter data is that the number of reports received represents the lower measure of the true number of such events that are occurring.

Human Vision Meets Computer Vision



Mark

These are new. [@HelicoptersofDC](#)



Helicopters of DC @HelicoptersofDC · 6h

Replying to

V22 (73.9% [vision.CopterSpotter.com](#)) Probable operators:
Presidential fleet [#GoodBots](#)

"#CopterSpotterVision uses computer vision to programmatically identify the helicopters of DC. The last year and a half we have been logging a..."



#CopterSpotterVision

Posted by [@HelicoptersofDC](#)



[patreon.com](#)

#CopterSpotterVision | @HelicoptersofDC on Patreon

Official Post from [@HelicoptersofDC](#)



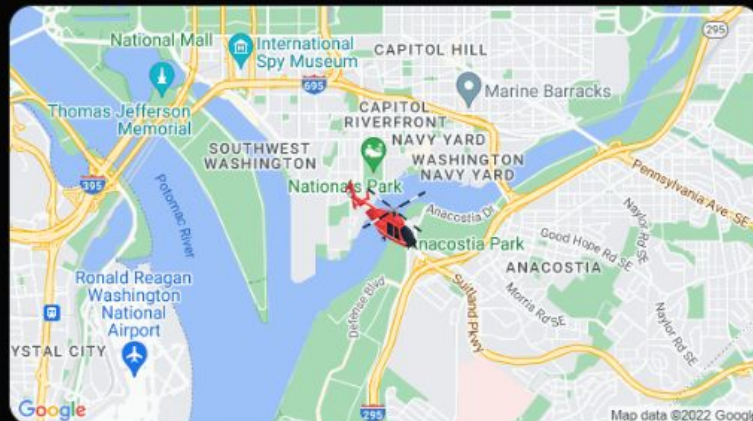
Jillian 🇺🇸 🍎

@HelicoptersofDC 🚁 USCG headed W



Helicopters of DC @HelicoptersofDC · Jul 13

spotted an MH65 (83.8% [vision.CopterSpotter.com](https://www.visioncopterspotter.com)) and has 1819 points 🚁 #CopterSpotter Probable operators: US Coast Guard twitter.com/a/status/15473...



Jul 13

@HelicoptersofDC 🚁 USCG headed W



Roboflow

Requires no prior experience with computer vision

Web based annotation tool better than desktop alternatives

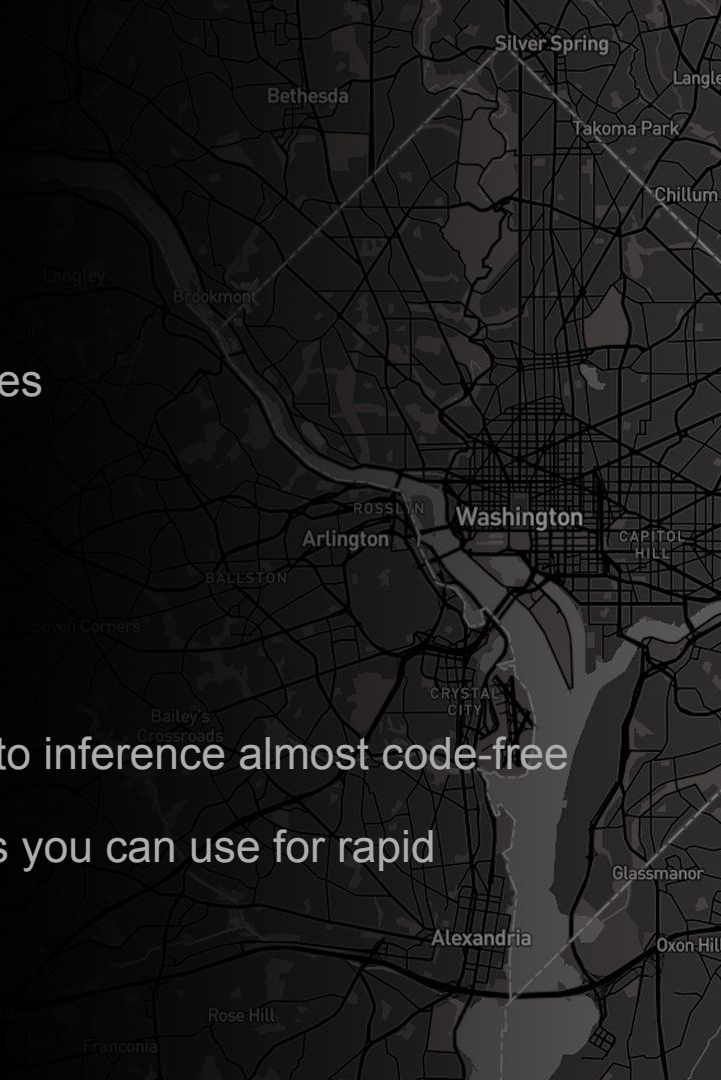
Can divide videos into frames

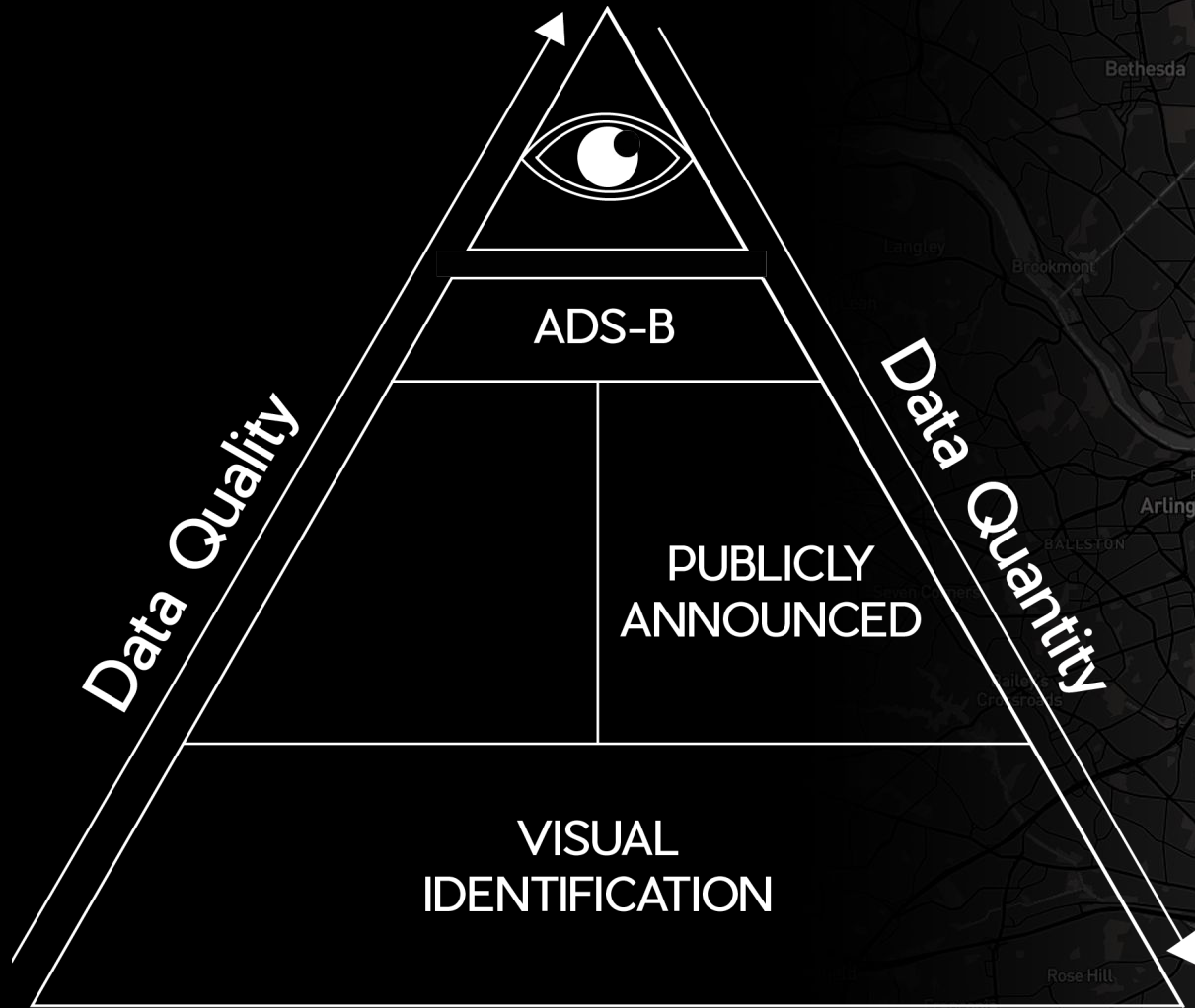
Allows for collaboration and division of labor

Automated augmentations, compiles into various formats

Can train and deploy your model, giving you API access to inference almost code-free

Roboflow Universe is a repository of open-source models you can use for rapid development, ours included





Data Quantity

Data Quality

ADS-B

PUBLICLY
ANNOUNCED

VISUAL
IDENTIFICATION



Capturing Helicopter Radio

Thought about pulling feed from LiveATC but separateby silence in ffmpeg isn't quite the same as squelch on a radio

Raspberry Pi + RTL-SDR

Audio via open source [RTLSDR-Airband](#)

screenshots ADSBExchange uploads audio to FTP and tweets

Publishes on a sub-account because there is an enormous amount of traffic

FCC.gov: What kinds of interception and divulgence of radio transmissions are legal?

The FCC and the Communications Act **do not forbid** certain types of interception and disclosure of radio communications, including:

- Mere interception of radio communications, such as overhearing your neighbor's conversation over a cordless telephone, or listening to emergency service reports on a radio scanner
- Divulgence of broadcasts related to ships, aircraft, vehicles or persons in distress.

UFOs of DC
@UFOsofDC
Automated

DCA Tower 134.350 14:29 reply with
'[at]HelicoptersofDC aircraft, route, zone, etc...' to
report! 50.6'C

[radio.copterspotter.com/delta/2021/11/...](http://radio.copterspotter.com/delta/2021/11/)

How to play #CopterSpotter:
1. Be the first reply within 15 minutes
2. use format '@HelicoptersofDC callsign #, location, route #, zone #
3. each element should be separated by a "." do not use "to," "from," etc...
Some callsigns:
BLACKJACK NIGHTHAWK FALCON Memorial South Cap
MUSEL PAT GUARDIAN Andrews Greenbelt
WEDSTAR EAGLE TROOPER Anacostia Pentagon

2:29 PM · Nov 3, 2021 · UFOsofDCpost

View Tweet analytics

Tweet your reply

Reply

Henry · Nov 3, 2021
Replying to @UFOsofDC
@HelicoptersofDC TROY 218, Greenbelt, Route 3, Wilson, Clockwise



Helicopters of DC @HelicoptersofDC · Nov 3, 2021

spotted DHS helicopter at/to Greenbelt requesting Route 3
at Wilson bridge clockwise on DCA Tower & has 607 pts. Reply to
@UFOsofDC to join #CopterSpotter

Troy: Dept. of Homeland Security
H60, S76, AS350

Customs and Border Protection officials said they use helicopters to conduct missions related to law enforcement actions and security for special events, such as the State of the Union, state funerals, and presidential inaugurations. To conduct these flights, the agency uses various types of helicopters including Eurocopter AS350s based at Manassas Regional Airport in Manassas.

US GAO Report

- Route/Zone 1 / Memorial Br.
- Route/Zone 2 / Andrews AFB
- Route/Zone 3 / JB Bolling
- Route/Zone 4 / South Cap
- Route/Zone 5 / Pentagon
- Route/Zone 6 / 14th St Br.
- Route/Zone 7 / Wilson Br.
- Other (o) Tower

Henry

· Nov 3, 2021

Replying to @UFOsofDC

@HelicoptersofDC TROY 218, Greenbelt, Route 3, Wilson, Clockwise

1

1

3

1

1

Remote Raspberry Pi Deployment

Don't:

- Rely on Raspberry Pi Wifi, or even a dongle



Do:

- use a GLI.net router, GoodCloud allows you remote access a layer above the Pi

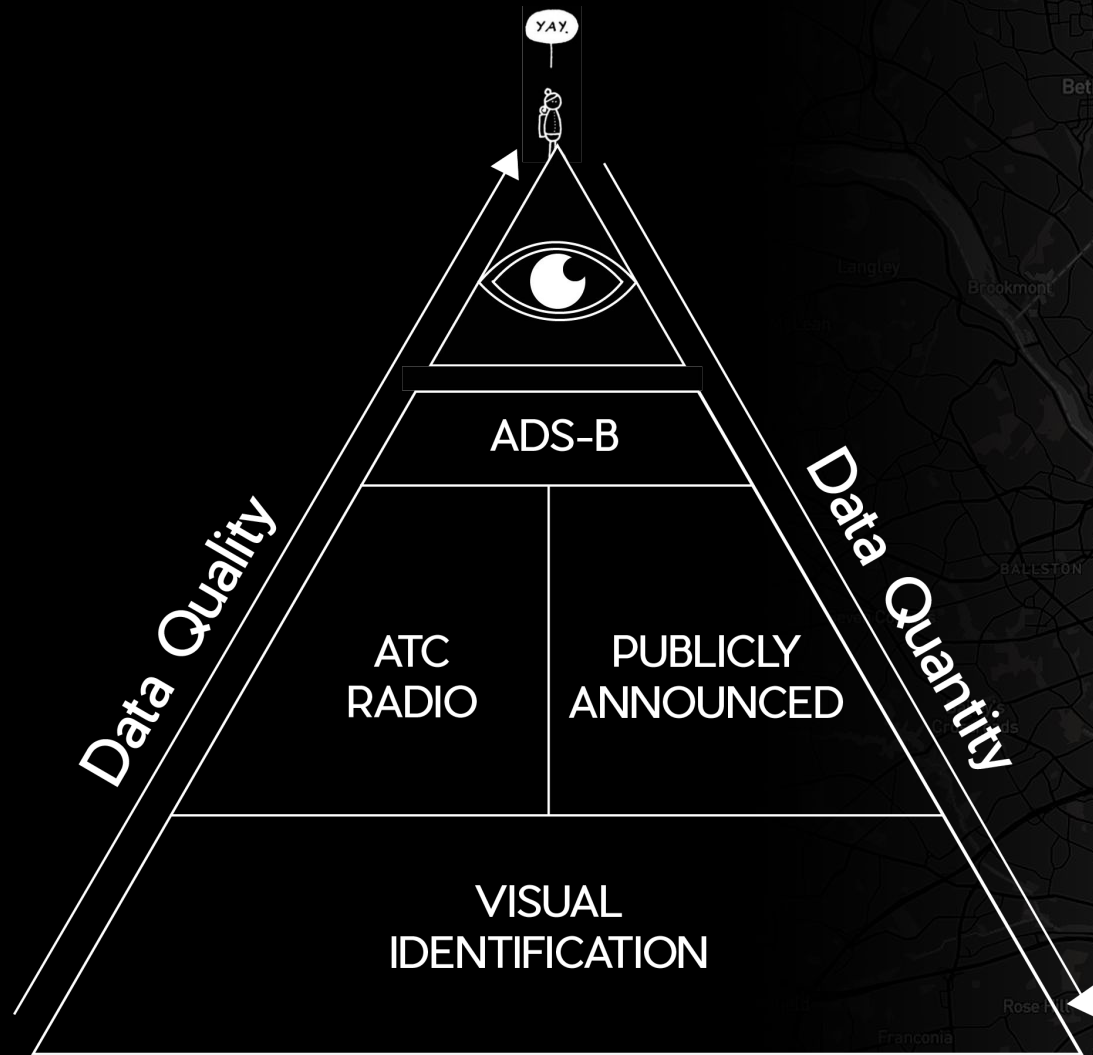
- Shelly switch can hard reset from router shell:



smileyantenna.com



Since upgraded
to an Airspy HF+



What's Next?

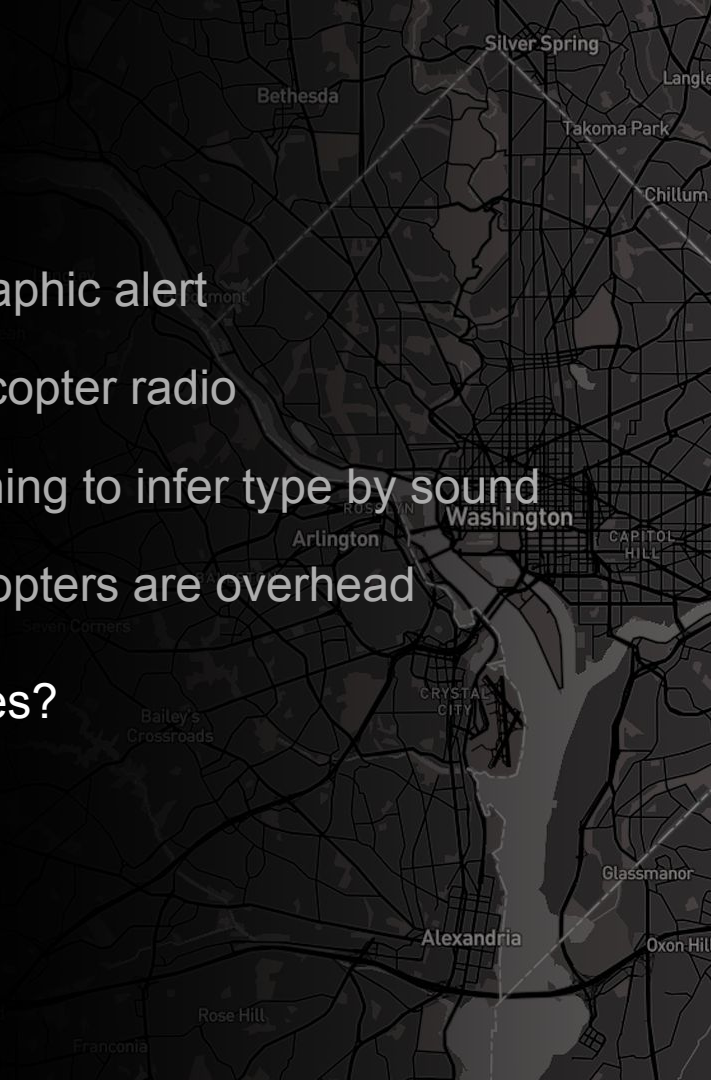
ADS-B DC Police helicopter after they tweet a geographic alert

Elevating various Police Helicopters on air-to-air helicopter radio

Interested in noise monitoring, or even machine learning to infer type by sound

Scrape news sites for aerial photos when news helicopters are overhead

How do we apply this to other public interest mysteries?



Demonstration

Go to [@HelicoptersofLV](#) this weekend

*videos include tower transmissions

Tweet your photos for automatic identification!

Twitter: [@HelicoptersofDC](#), [@UFOsofDC](#) for radio

Annual Report: [2021.CopterSpotter.com](#) has our 2021 user-redacted data set

[HelicoptersofDC@ProtonMail.com](#)

Our computer vision images and annotations are on [Roboflow Universe](#)

