

# AIR QUALITY STUDY

Kick Off Meeting  
October 7, 2019



- CHEKPEDS is a non profit founded in 2005 to advocate for pedestrian safety and quality of life in Chelsea and Hell's Kitchen
- CHEKPEDS is a member of the Hell's Kitchen South Coalition
- WCSF is a non profit founded in 2018 to encourage Hudson Yards' landlords and corporate tenants to enhance the life of the youth and underserved populations in Chelsea and Hell's Kitchen South
- WCSF funds programs that improve the environment, health and well being of local residents from 14<sup>th</sup> to 38<sup>th</sup> Streets, west of 7<sup>th</sup> Avenue



# Walk Lane

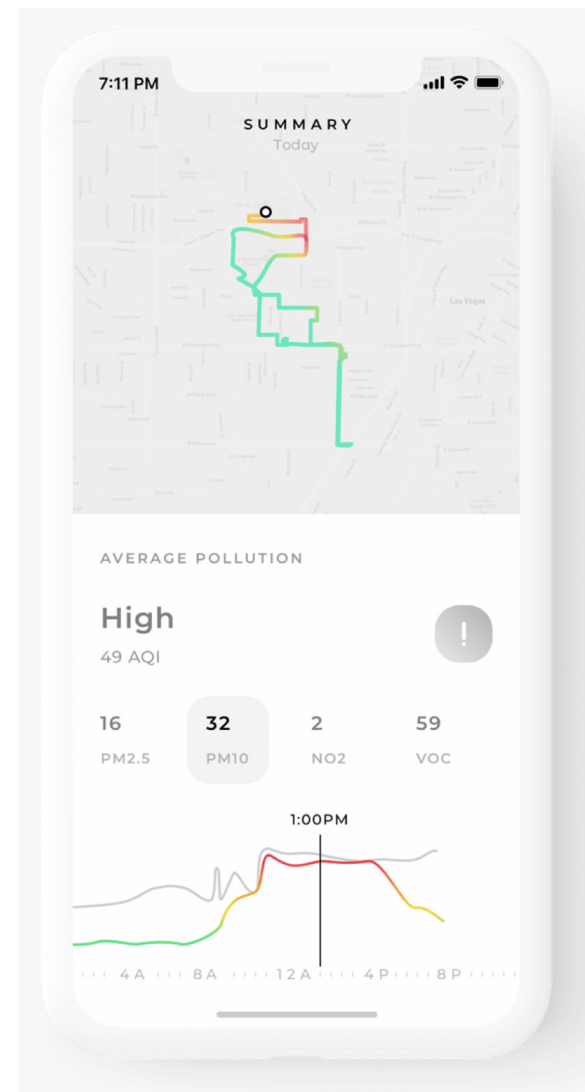


Safe  
Spacious  
Healthy

# Today's Agenda

- Introduction to the FLOW device
- Air quality problems in our neighborhood and action plan
- Break
- Air quality study overview
- Air Quality Study design
  - Who, What, When , How , Where
- How to present the study results
- Q & A

# Introducing the Flow device from Plume Labs



# Introducing the Flow device from Plume Labs

- 4 years in development with testing by Imperial College London's Center for Environmental Policy and France's CNRS-LISA to stress-test Flow's custom-built sensing technology.
- 360 degrees intake , smallest fan technology, miniature light scattering for particulates and metal oxide reactions.
- Very large database using neural networks to learn and extract patterns from the measurements

# Getting Started with the FLOW device

1. Open the box – follow instructions

1. Push from bottom
2. Open flap
3. Pull the unit out by the leather band

2. Set up the Flow in its base

1. Connect the wire to the FLOW and to the USB charger on the power bar

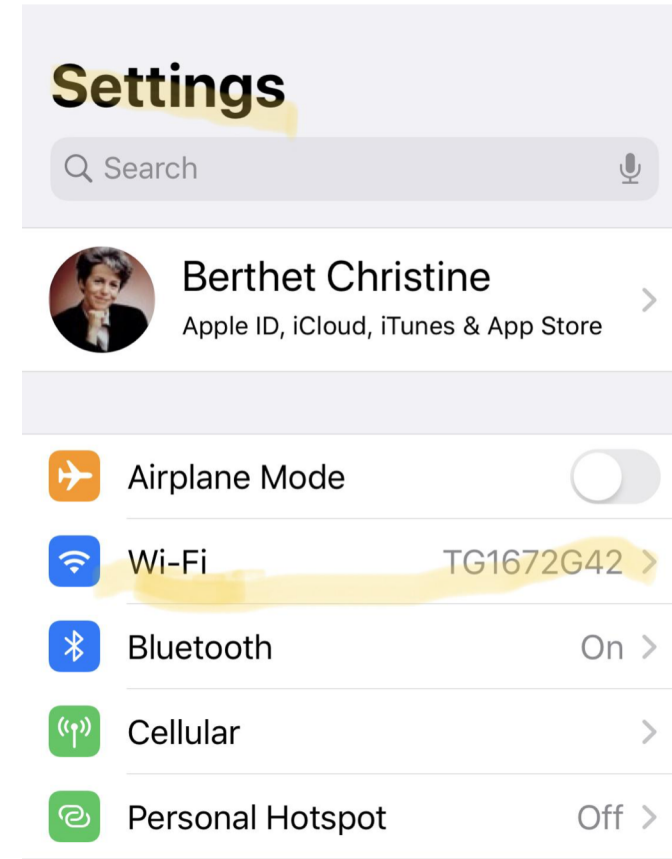
1. Check that the red light is steady on the front

# Setting up the FLOW app

In SETTINGS on your phone



Turn on Wi-Fi  
address is on the  
table

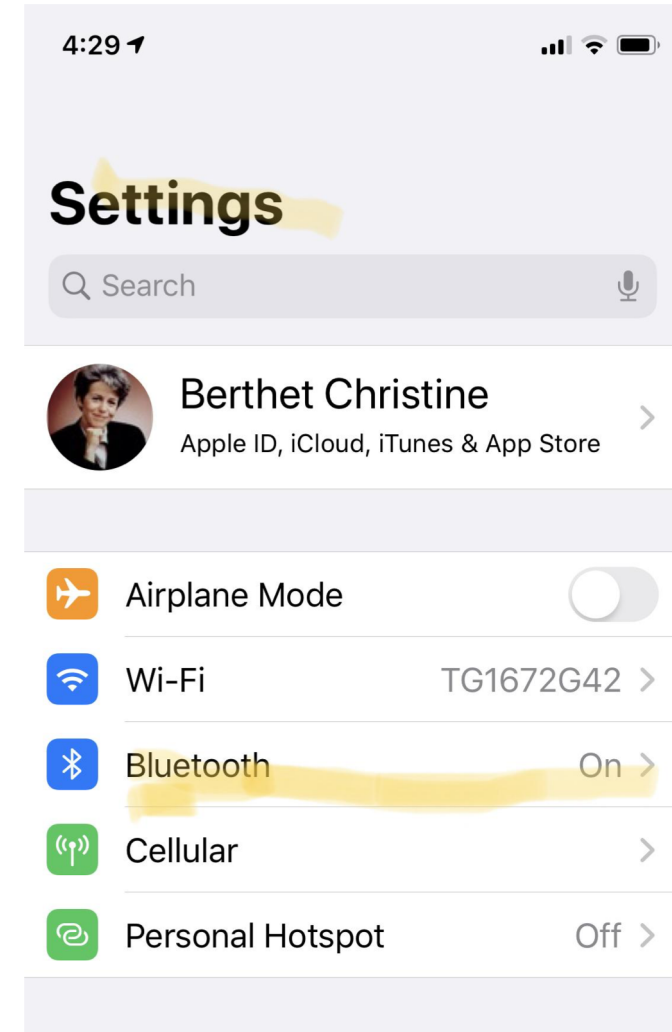


# Setting up the FLOW app

In SETTINGS on your phone

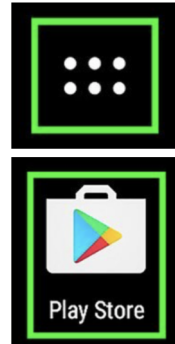


Turn on Bluetooth

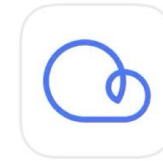


# Setting up the FLOW app

In APP STORE



1. Search for “ FLOW Air pollution”
2. Download Flow (free ) to your phone
3. Follow on-screen instructions

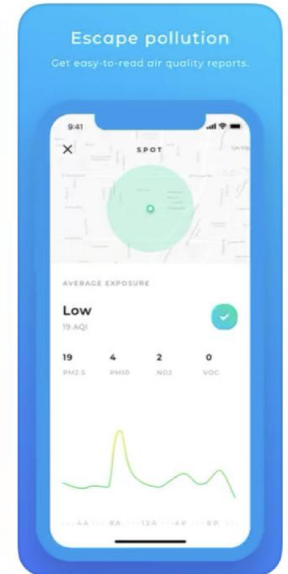
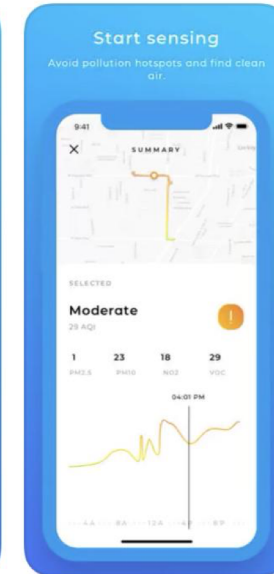
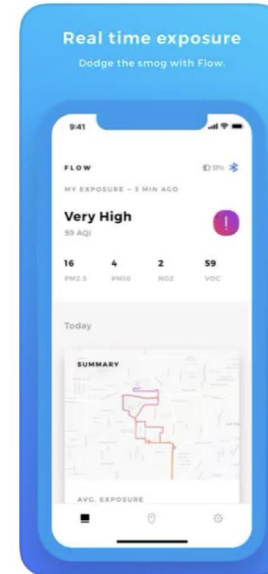


Flow – Air Pollution...

Connect Flow, Dodge th...

OPEN

★★★★☆ 16



Today



Games



Apps



Arcade



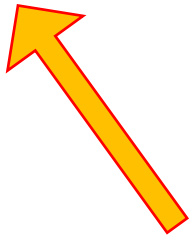
Search





ACCOUNT

Email



SAME EMAIL ADDRESS  
AS IN THE SURVEY

NEXT

CANCEL

SELECT SAME FLOW  
NUMBER AS ONE ON  
YOUR BOX



Select your Flow

FLOW-00:28:DD

Flow detected

NEXT



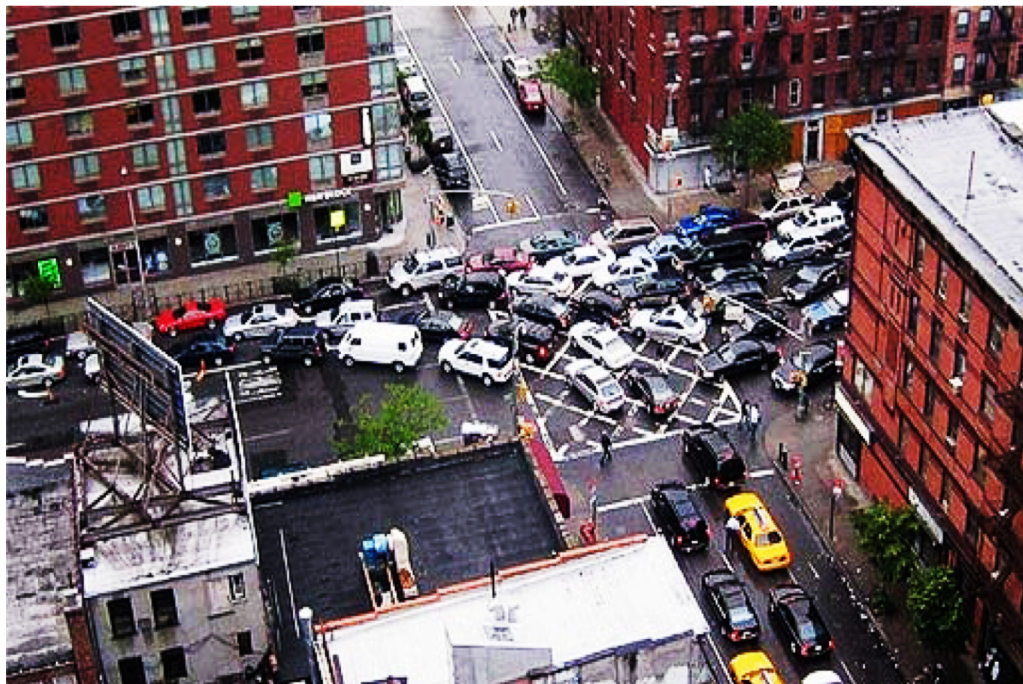
Updating your Flow...

6%

MULTIPLE PHASES  
TAKE AT LEAST 15  
MINUTES

ENSURE STEADY RED  
LIGHT





## Our District





# NYC Health Department Report

# Neighborhood Air Quality 2008- 2015

**Hell's Kitchen - Chelsea has the 3<sup>rd</sup> WORST air quality in New York City**

## Outdoor Air Pollutants

Estimated annual average concentrations calculated from a model that used NYC Community Air Survey measurements, 2008-2013.

Chelsea - Clinton

	Chelsea - Clinton	Manhattan	NYC	Compared with other NYC neighborhoods*	Trend over time
Nitrogen Dioxide (NO2)(Mean ppb) Annual Average 2014	31.9	26.7	18.9	Worse	Annual Average 2009-Annual Average 2014
Fine Particulate Matter (PM2.5)(Mean mcg per cubic meter) Annual Average 2014	12.5	10.8	8.9	Worse	Annual Average 2009-Annual Average 2014
Ozone (O3)(Mean ppb) Summer 2014	24.6	27.0	31.4	Better	Not Available
Sulfur Dioxide (SO2)(Mean ppb) Winter 2013 -14	2.7	2.9	1.4	Worse	Winter 2008-09-Winter 2013-14

69%  
worse

40%  
worse

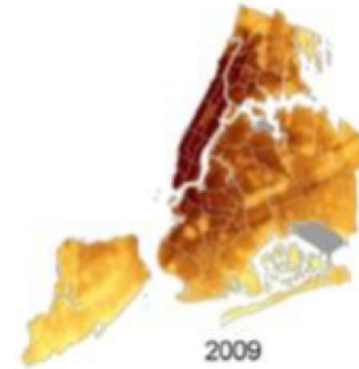
92%  
worse

NYC Health Department Report

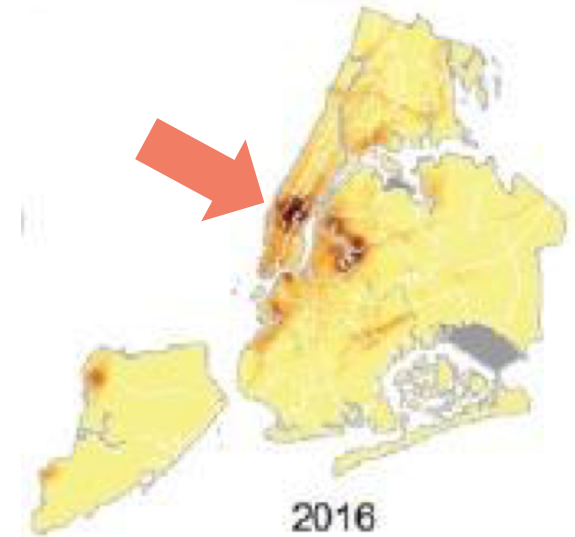
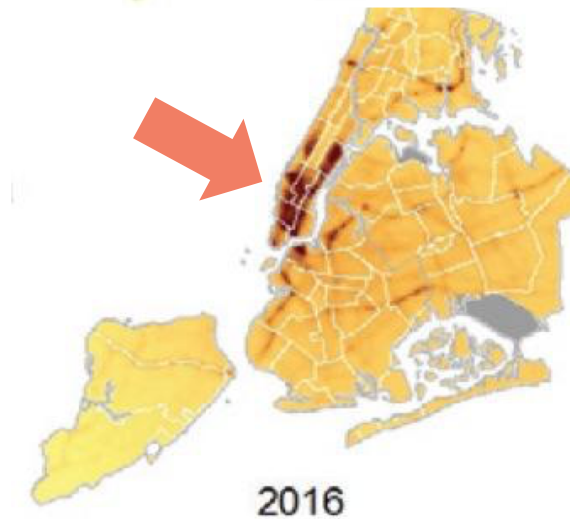
# Neighborhood Air Quality 2008- 2016

Air Quality is not improving

2009



2016



Nitrogen Dioxide

Fine Particulate Matter

# Neighborhood Air Quality 2008- 2016

NYC Clean Air Survey data have consistently shown that areas of the city with higher traffic density suffer from higher levels of air pollutants.

Traffic Density Estimated millions of annual vehicle miles traveled per km2 in 2005. Vehicle miles traveled is an indicator of emissions from automobile exhaust, brake wear and tire wear.	Chelsea - Clinton				
	Chelsea - Clinton	Manhattan	NYC	Compared with other NYC neighborhoods*	Trend over time
All vehicles 2005	46.1	24.9	24.0	Worse	Not Available
Cars 2005	42.0	23.5	22.6	Worse	Not Available
Trucks 2005	3.4	1.2	1.3	Worse	Not Available

92% worse

86% worse

162% worse

# What to do ?

- Complement the city measurements with more granular information
- Request additional monitoring stations
- Insist on air quality improvements from the Port Authority as part of their terminal replacement project
- Insist on air quality improvements from the City as part of their ONE NYC Plan

# AIR QUALITY STUDY

SHORT BREAK  
October 7, 2019

# Air Quality Study

- 2004: "urgently needed are studies using personal monitors carried by individuals: the "gold standard" approach for understanding what people are being exposed to via the inhalation pathway."  
(<https://www.ideo.columbia.edu/~chilli/airexp.html>)
- 2017 technology caught up : Flow using state of the art truly mobile – easy to use technology (Columbia University study)
- 2019 – we will do measurements with 35 citizens who are familiar with local sources



# Study Design - What will you measure?

## Plume AQI -Air quality index

Higher = more pollution

Guidelines - World Health Organization

International Standards – US EPA

40% worse

### PM10 and PM2.5 (Particulate Matter)

Small solid particles penetrate lungs and blood – from road traffic and energy transformation

69% worse

### NO2 (Nitrogen dioxide)

Suffocating and irritating gas with a red brown color – cause bronchitis and asthma especially in children - 50% are from road traffic

### VOC (Volatile Organic Compounds)

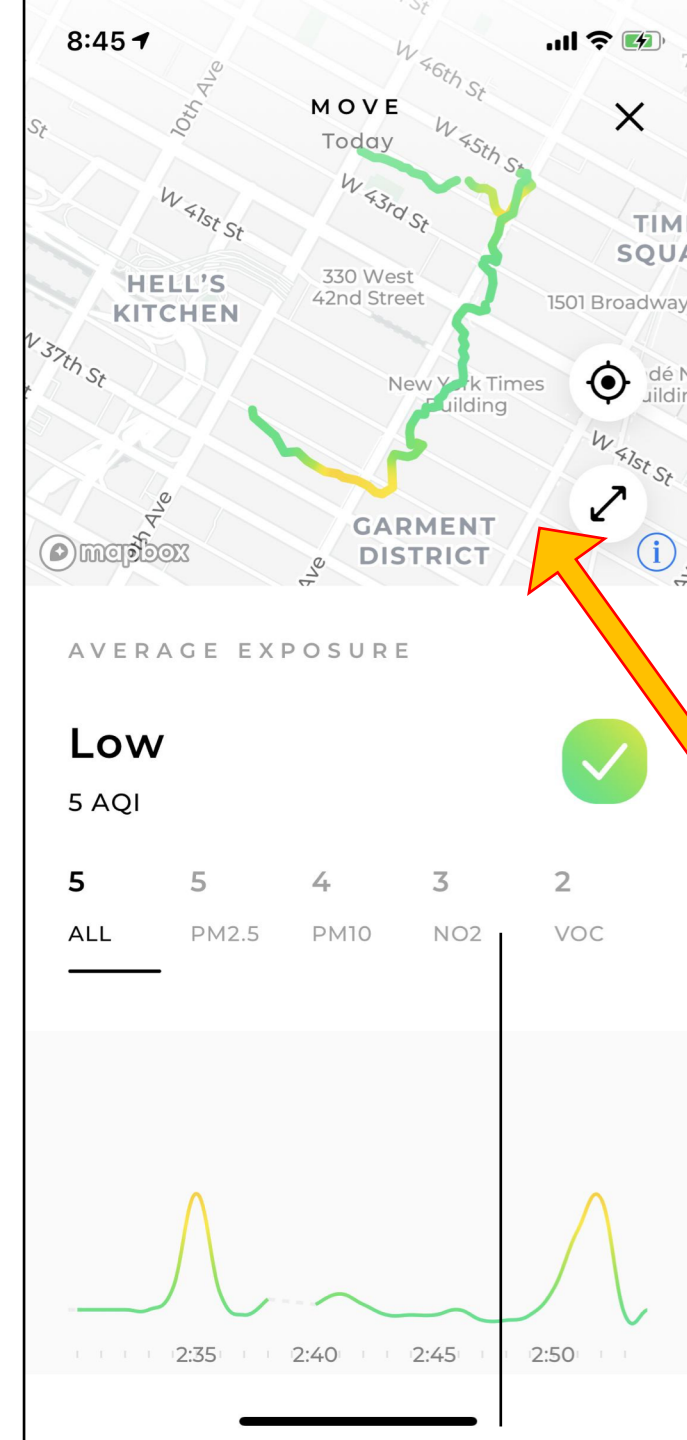
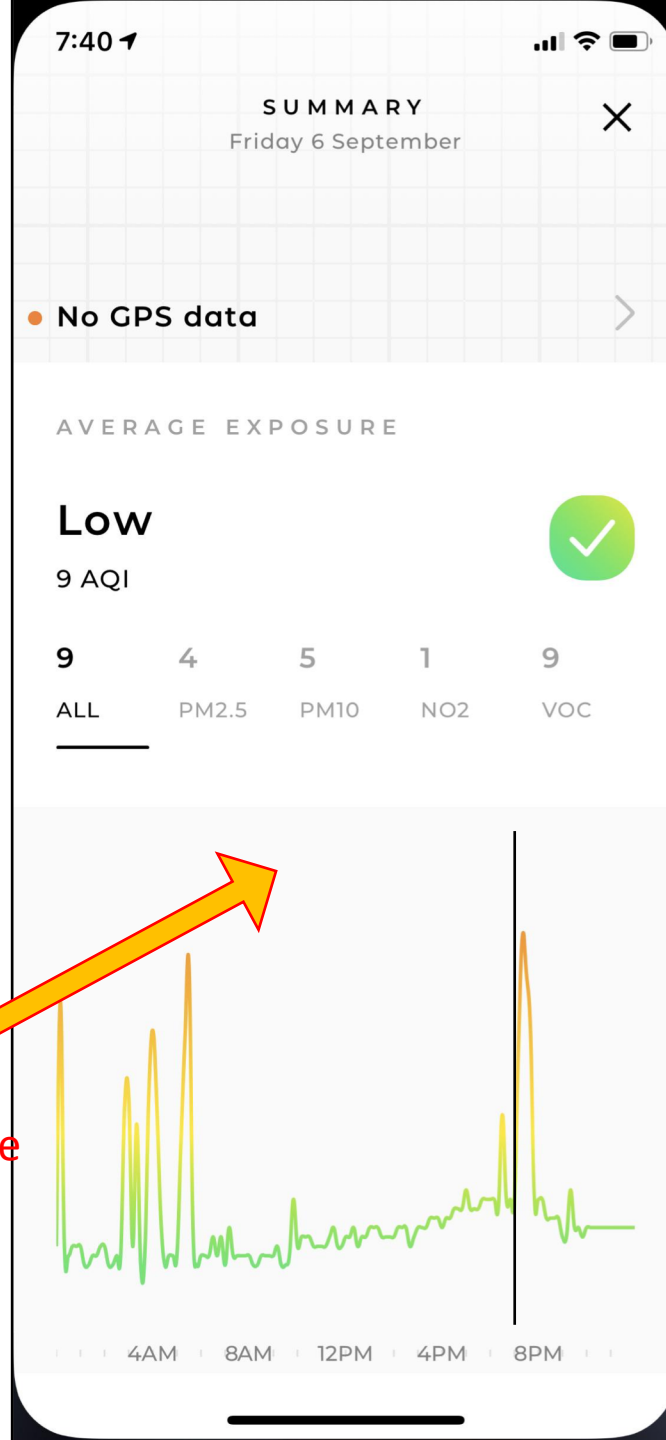
Molecules from carbon – from road traffic and industry – decrease breathing . Some are carcinogenic

# What will you see ?



# What will you see ?

Move your finger over the summary to see the different readings



Turn on localization services

# Setting up the GPS for the FLOW app

In SETTINGS on your phone



Turn localization services to always on

Depending on your phone

GO-TO Settings – location –  
app permission – Flow

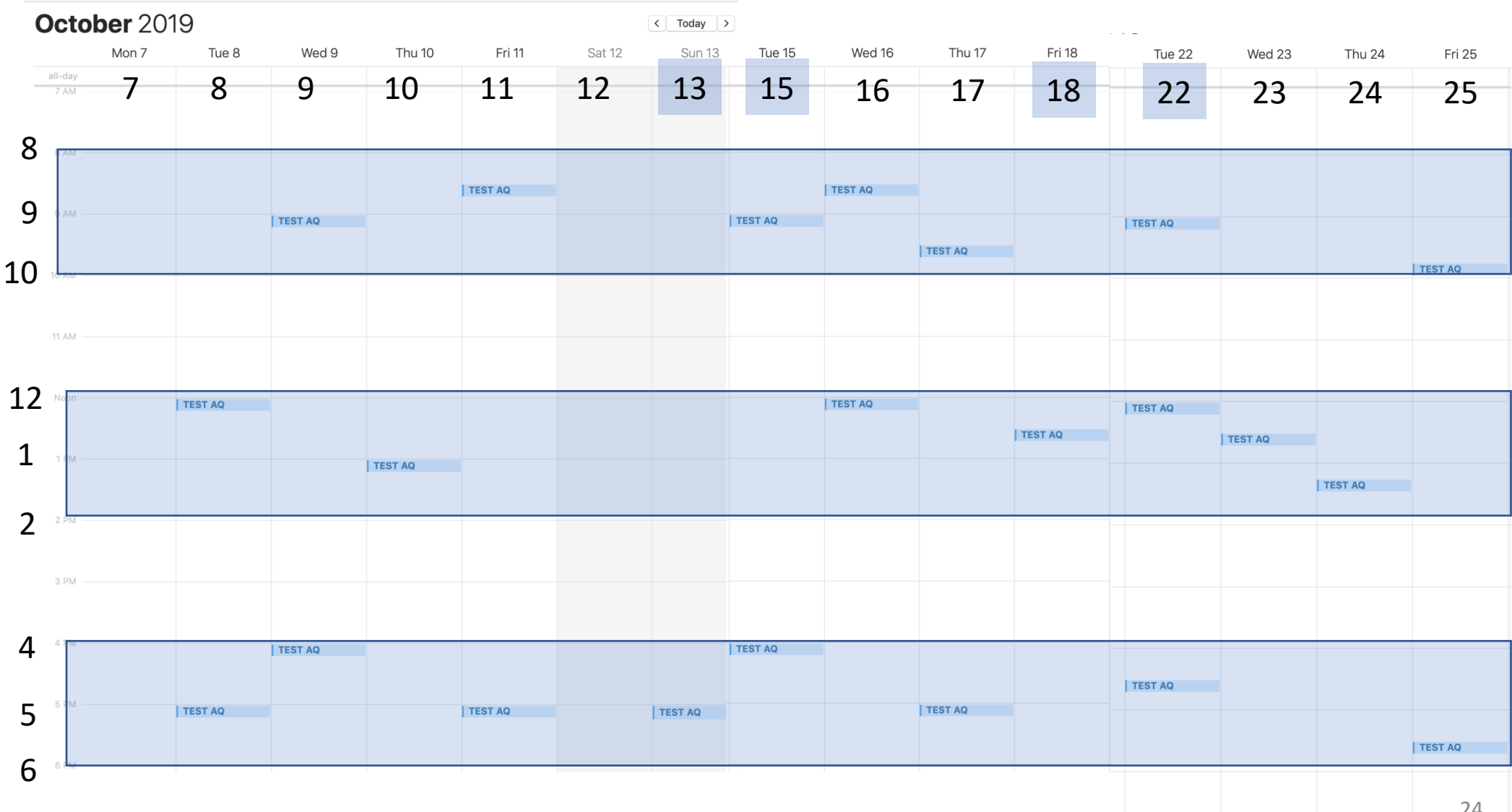
or

GO-TO Settings - Flow

# Study design – When

- Between October 8<sup>th</sup> and October 25<sup>th</sup> 2019
- Take 21 measurements – 10 minutes each minimum
  - 7 measurements between 8 and 10 a.m.
  - 7 measurements between 12 noon and 2 p.m.
  - 7 measurements between 4 and 6 p.m.
  - At least one measurement on a Friday afternoon
- Morning noon and evening measurements can be taken on different days at different times

# Study design – When





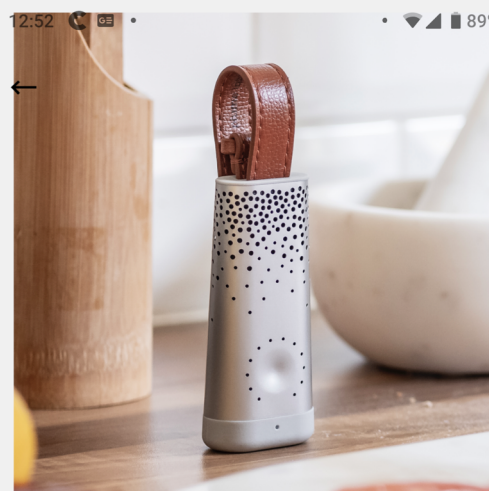
# Study Design – How

## Tips for proper use of Plume device



### How to wear your Flow

Use Flow's strap to hang it on your bag, bike, or baby (stroller)—Flow goes where you go, breathes what you breathe.



### Take care of your Flow

Just like with your phone—avoid water, dust, and shocks!



### Docked

Rest Flow in its dock when you are home. Look for the green charging light that shows you've got power.



No data

[LEARN MORE](#)

Today

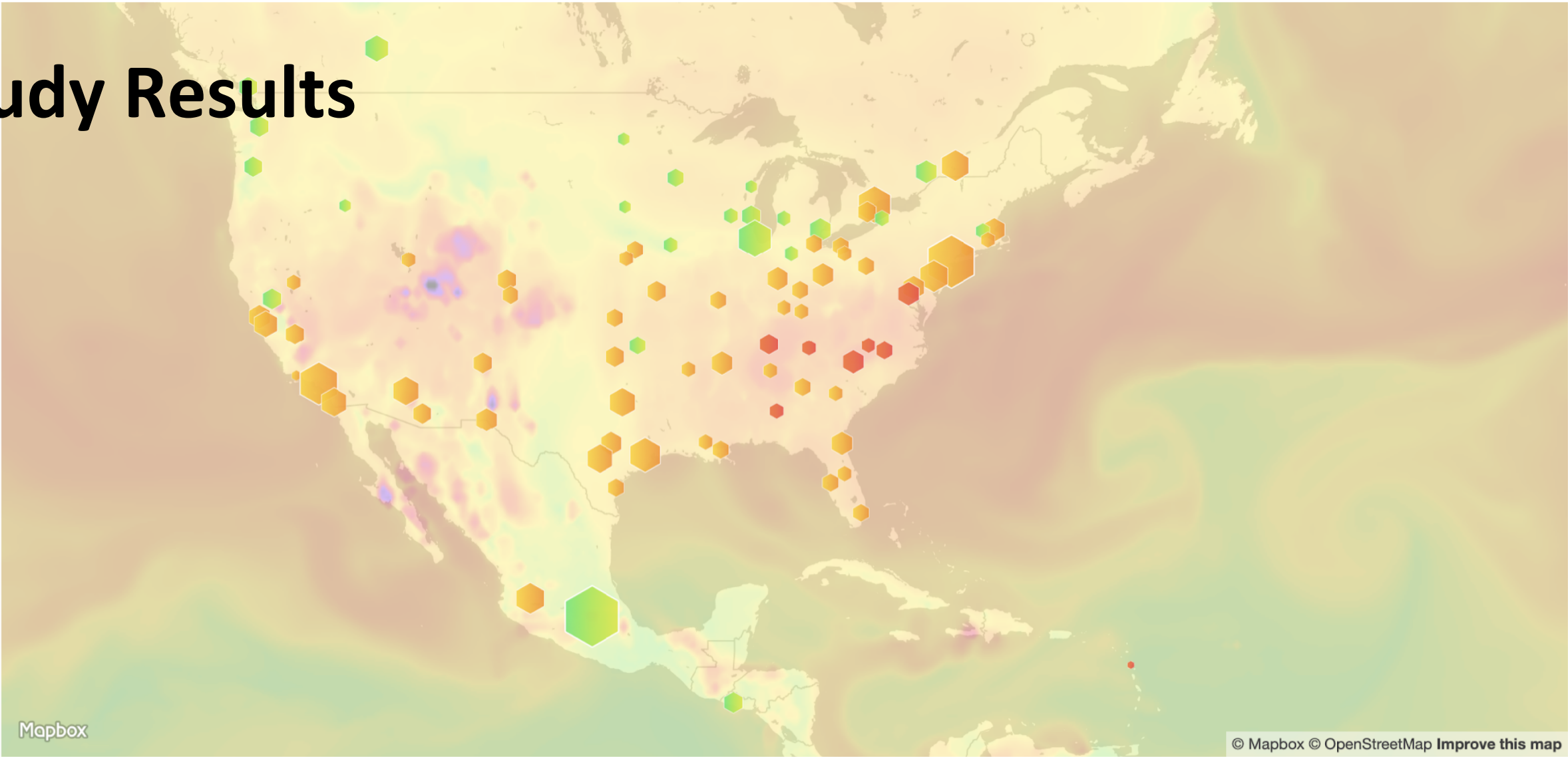
- Keep the application open so that data transfers
- Turn on localization services all the time (Settings – plume application setting)
- The device and the phone work together. Do not lend your device to be paired with a different phone.

# AIR QUALITY STUDY

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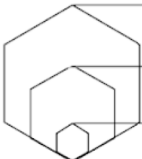


# Study Results



**AIR QUALITY  
STUDY**

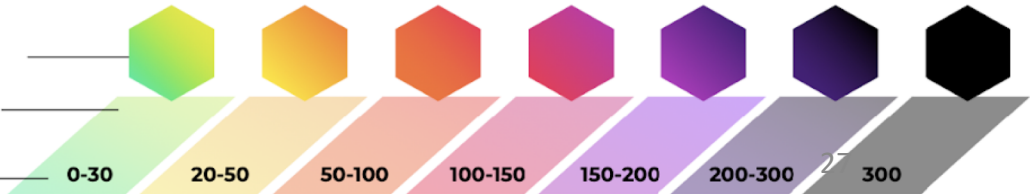
**Population size  
of the city**



**>10M**  
**5M**  
**<1M**

**City pollution**  
**Background pollution**

**Plume Index**



# Study Results

WORLD AIR MAP > UNITED STATES > NEW YORK > MANHATTAN

Air quality in  
Manhattan, NY

Live air quality report and air quality  
forecast in Manhattan

LIVE

24°C ☁ 3UV ☀

Average

38 AQI ⓘ

!

! OUTDOOR SPORTS ! BRING BABY OUT

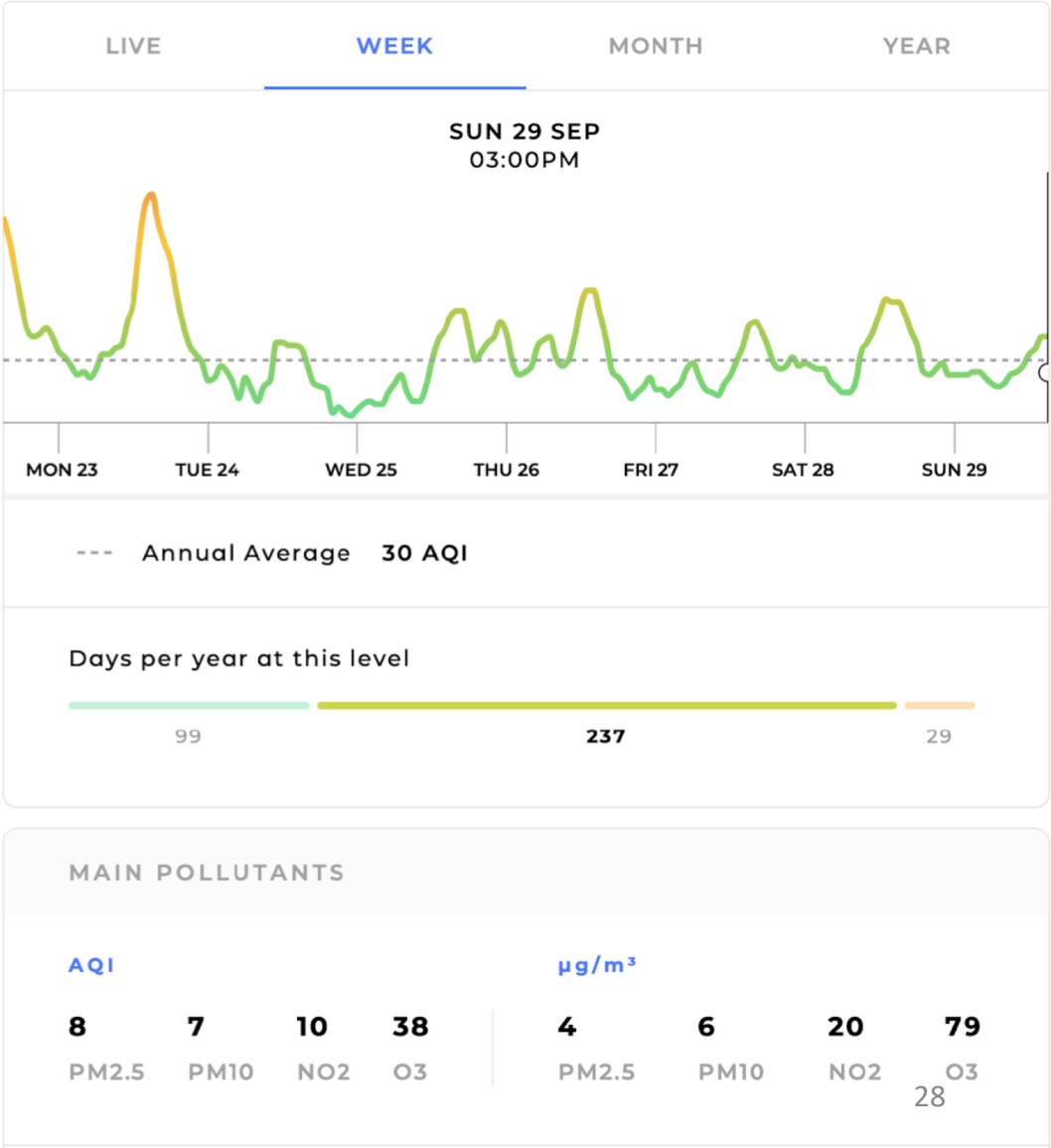
! EATING OUTSIDE

The air is moderately polluted. Greater than  
the maximum limit established for one year by  
WHO. A long-term exposure constitutes a  
health risk.

SHARE

f

🐦



# Study Results

- CHEKPEDS will download the data each participants data from the cloud
- Will compile the results and produce maps, trends and a report
- December 2019 : report published and closing meeting

# AIR QUALITY STUDY

Q & A