





Status of the Warwick Air Quality Monitoring Program

February 28, 2019
Pilgrim Senior Center
Warwick, RI

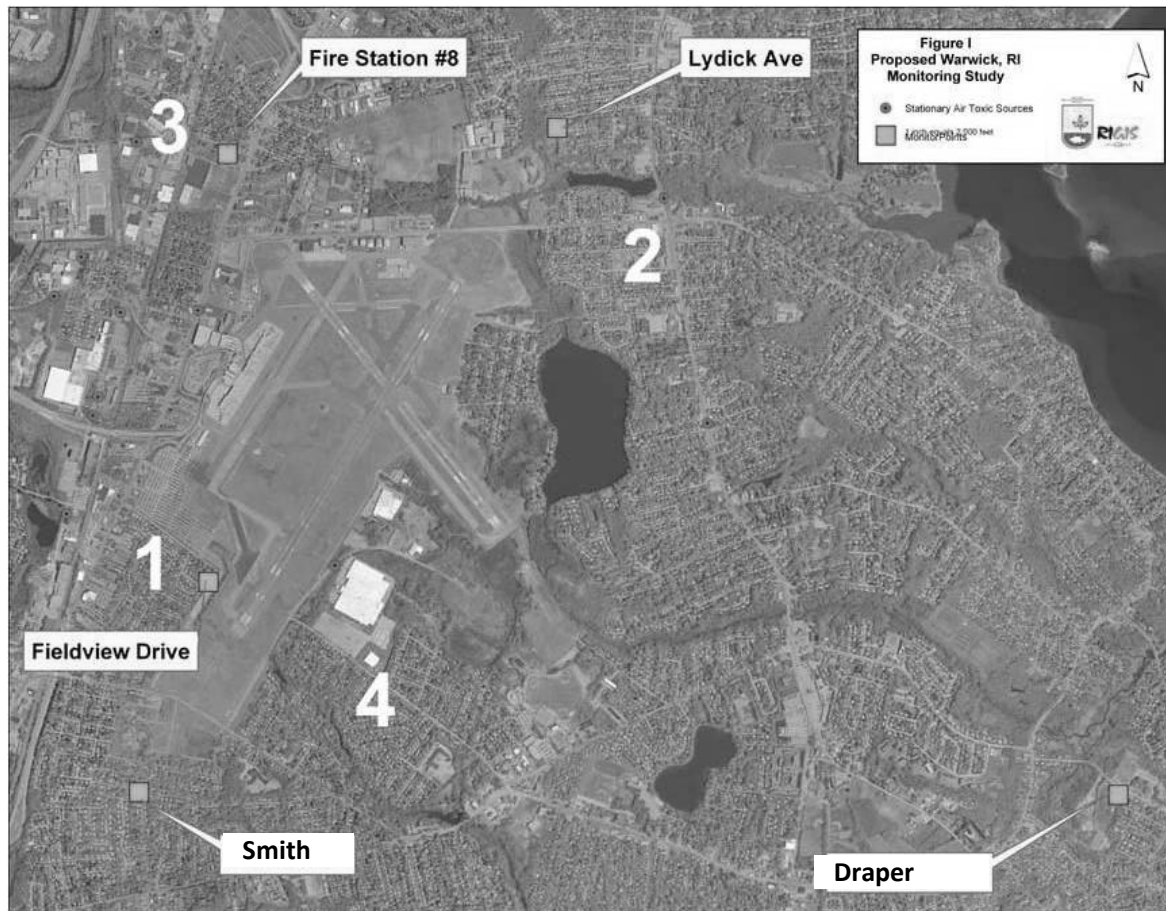
Agenda



- Provide a history of the program and its results
 - 2005-2006 study by DEM
 - Summary of 2017 report
 - Summary of 2018 report
- Discuss the future of the program

2005-2006 DEM study

DEM monitored air quality levels around the airport from 2005-2006 under an EPA grant



Results of DEM study

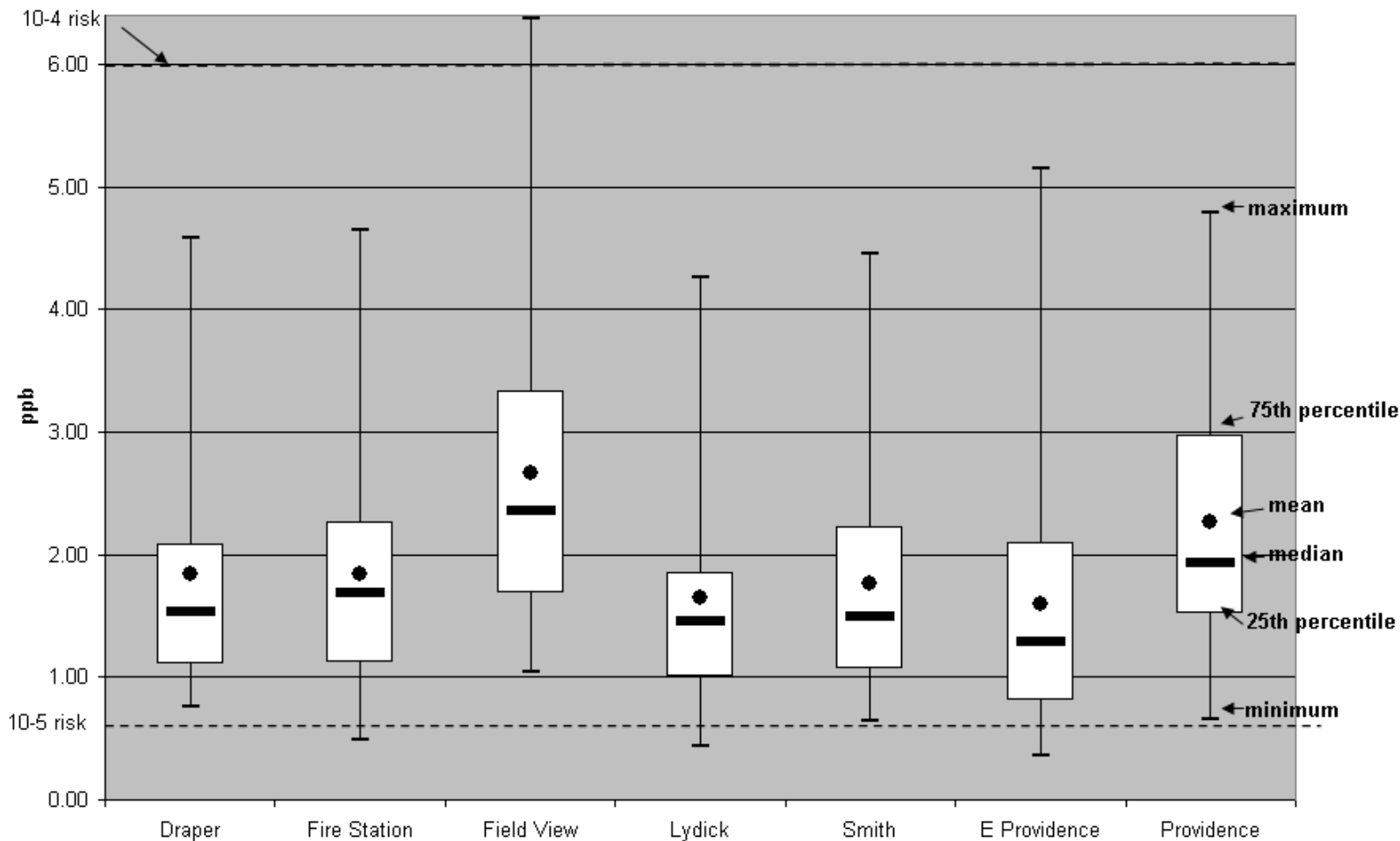


- Air quality results were consistently similar to comparison sites in Providence, East Providence, or other locations.
 - A few extra cancer cases are expected for every 100,000 residents living in an affected area for their entire life.
 - Highest levels tended to be at the Field View or Fire Station locations that were closer to major roads.

Results of preliminary DEM study



Formaldehyde

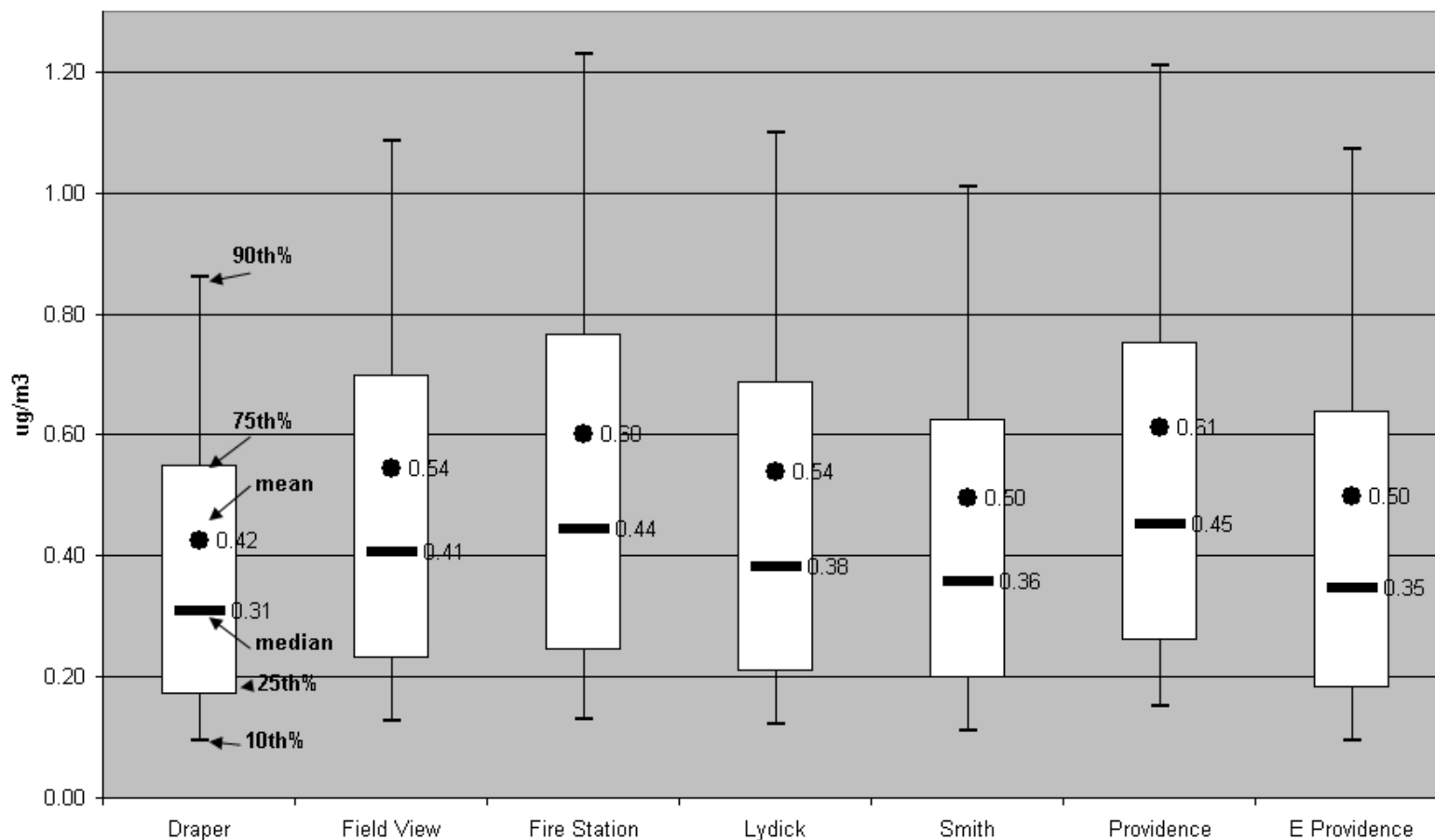


Hours with data at all Warwick and comparison sites May 2005 –August 2006

Results of preliminary DEM study



Black Carbon Concentrations



The Permanent Air Quality Monitoring Act (2007)



Legislature required air quality monitoring in Warwick starting in 2008

- RIAC operates the monitors
- RIDOH and DEM interpret the results
- Changes to the monitoring plan need to be available for public review and comment

Amendments in 2017 reduced the number of pollutants to monitor and requested moving a monitor

Why limit monitoring to black carbon and ultrafine particles?



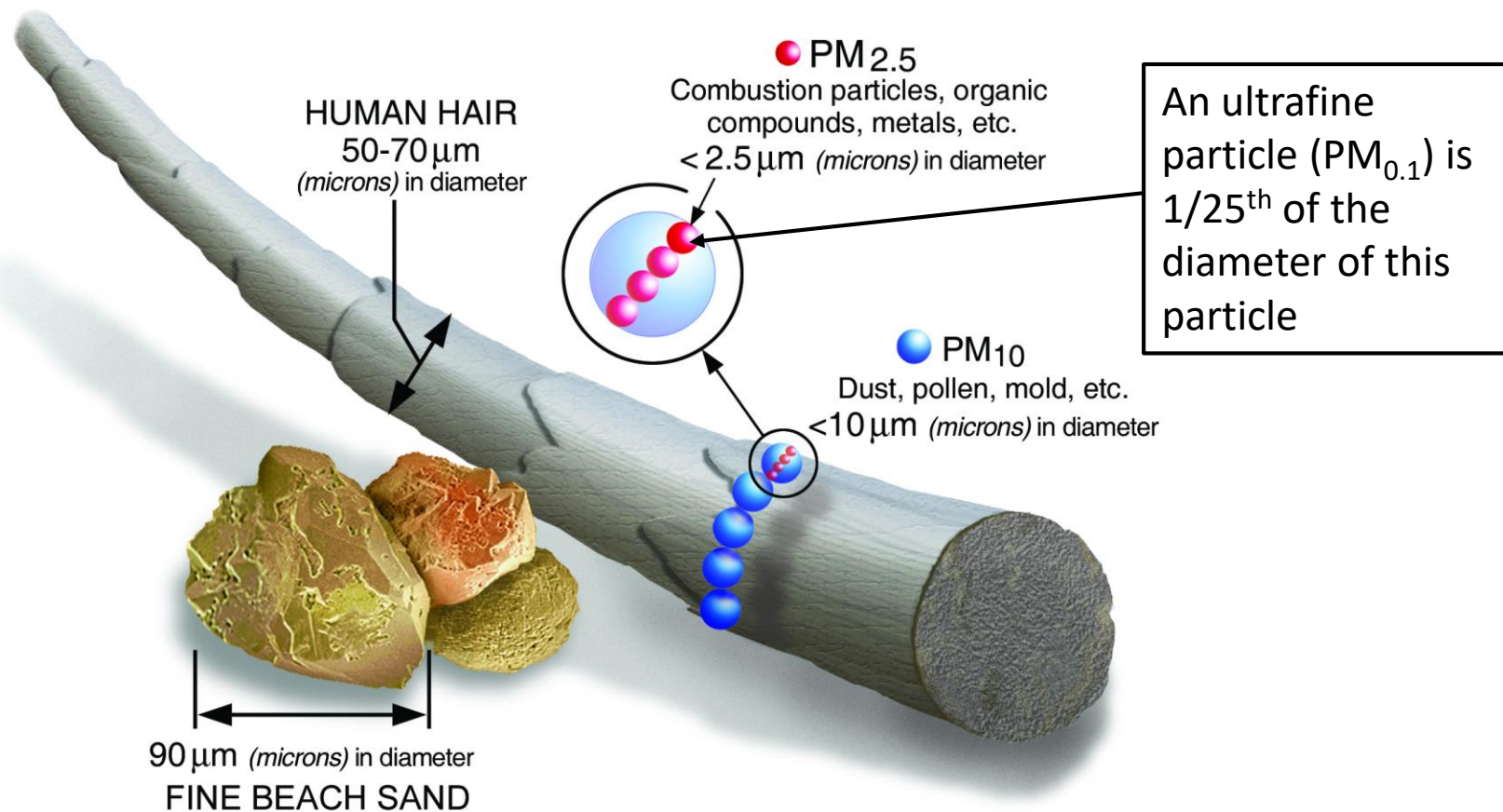
- Other pollutants in the original monitoring program are less heavily affected by airport activities
- Black carbon is closely related to fine particle levels, but is monitored continuously
 - Can look at variation during the day
 - Results can be compared to monitors elsewhere in the state

Why ultrafine particles?



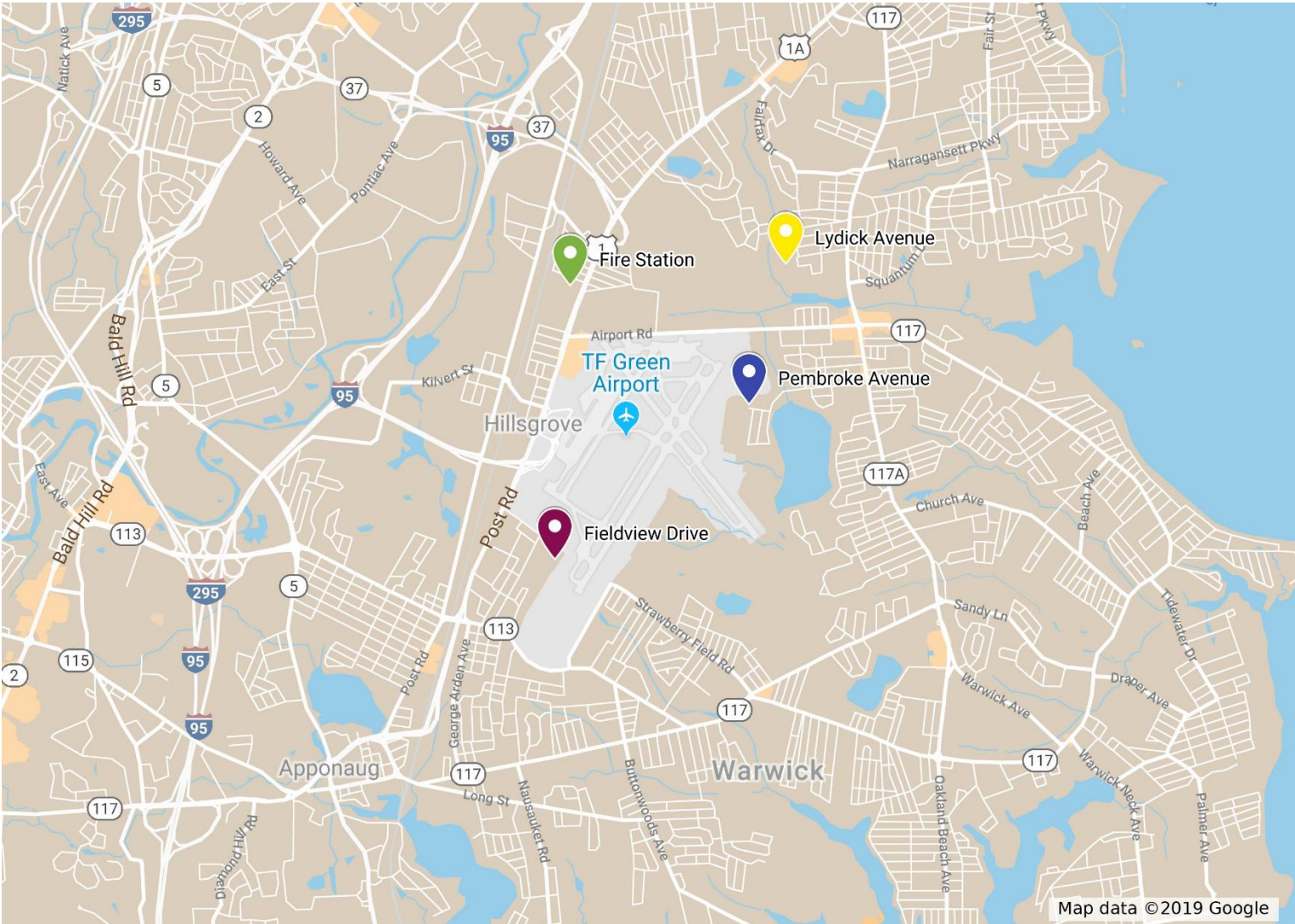
- EPA hasn't set standards for ultrafine particles.
 - Science is poorly understood
- Ultrafine particles are local, not regional
 - Formed from burning fuels
 - Combine into fine particles over time
- Ultrafine particles can easily cross into the bloodstream or into cells
- Exposure to ultrafine particles causes inflammation and is associated with increased risk of cardiovascular disease

What are ultrafine particles?



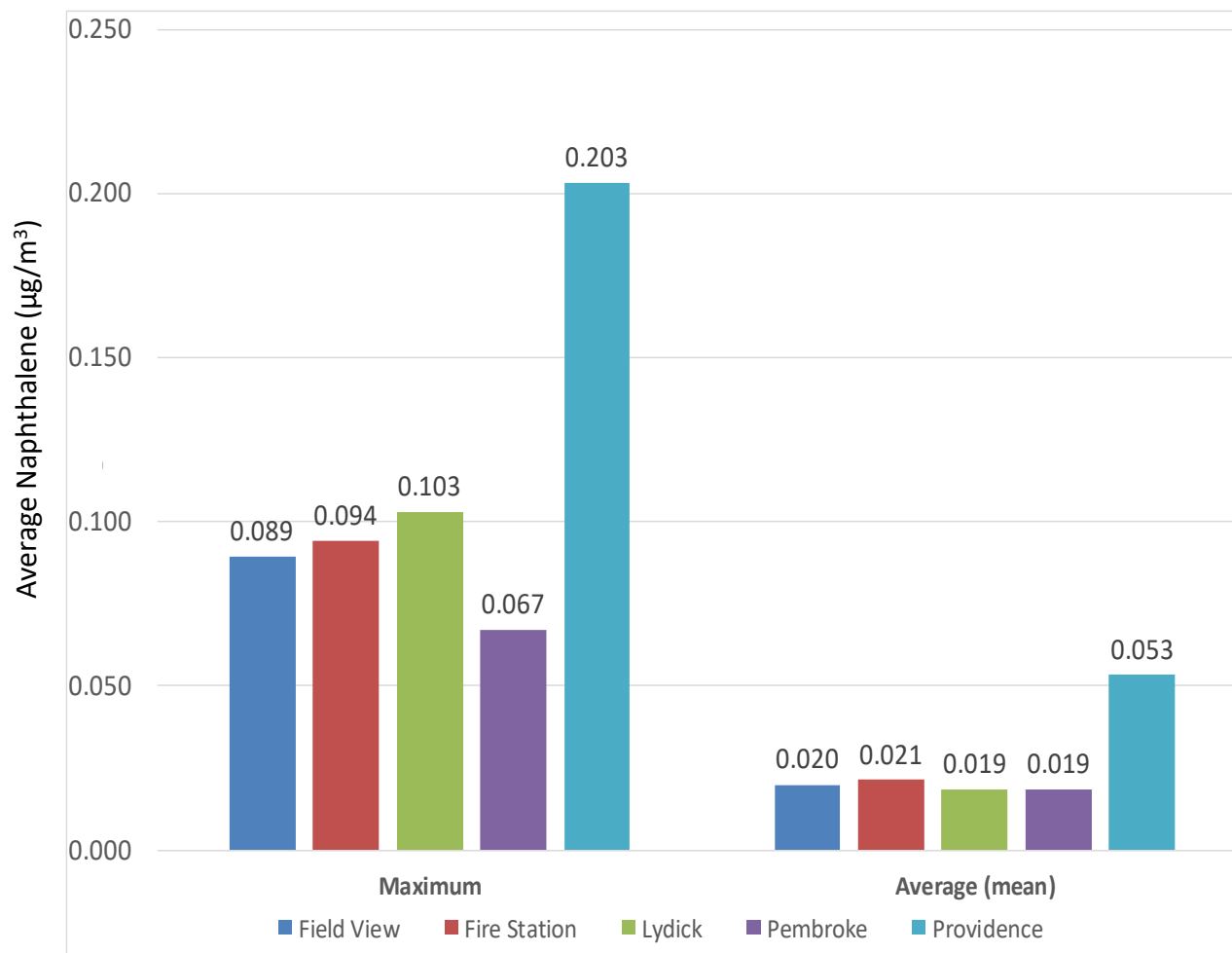
Source: EPA

Locations of the air quality monitors



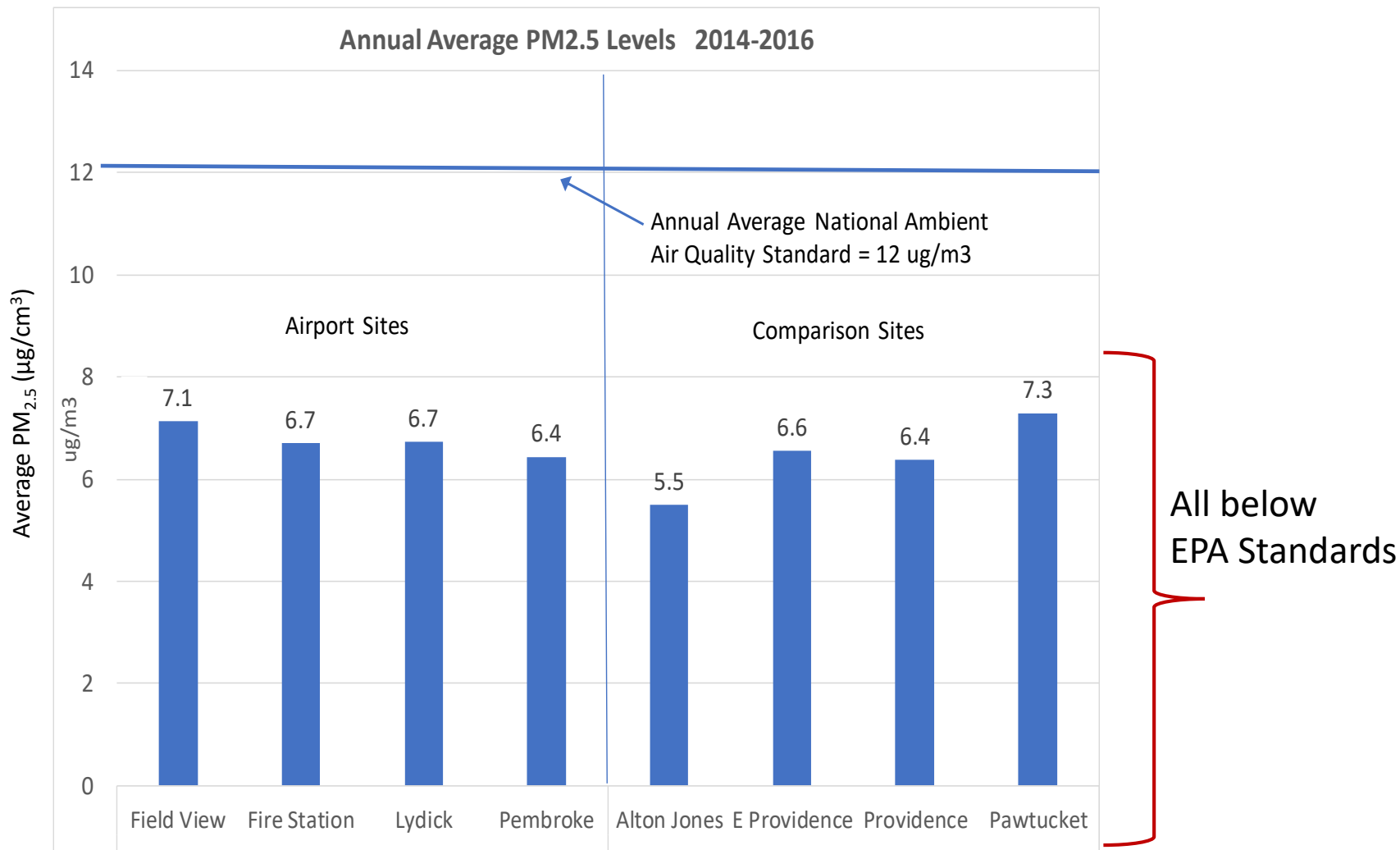
- Average daily results for naphthalene and fine particle ($PM_{2.5}$) levels
 - Naphthalene levels well below downtown Providence
 - Fine particle levels well below EPA standards and similar to Providence
- Daily patterns of ultrafine particle levels
 - Increase in early morning
 - Spikes from airplanes could be observed
 - Overall averages similar to Providence, much less than I-95

Warwick naphthalene results were lower than Providence



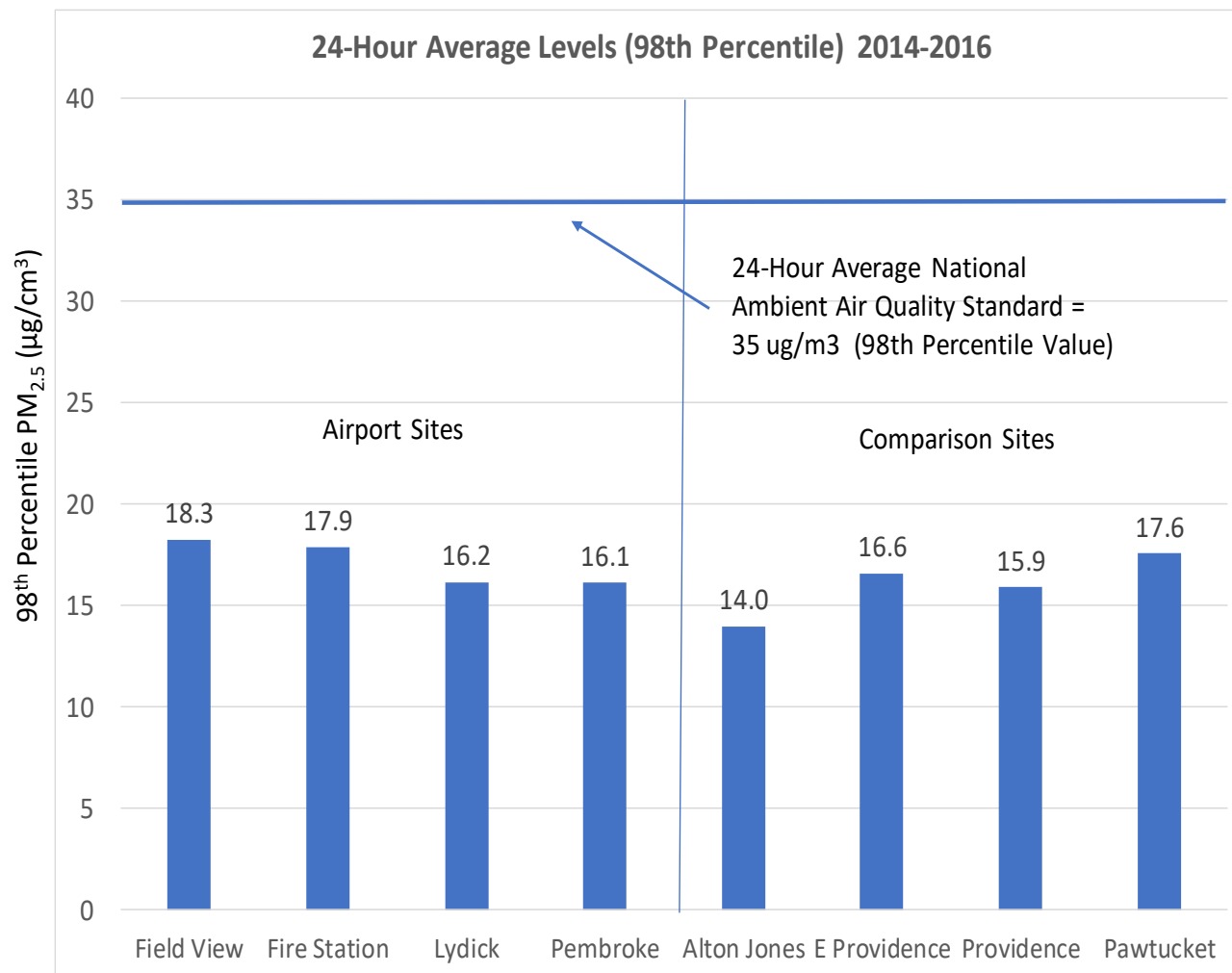
Source: RIDOH, 2017 Air Quality Monitoring Report

PM_{2.5} levels were well below EPA standards



Source: RIDOH, 2017 Air Quality Monitoring Report

PM_{2.5} levels were well below EPA standards



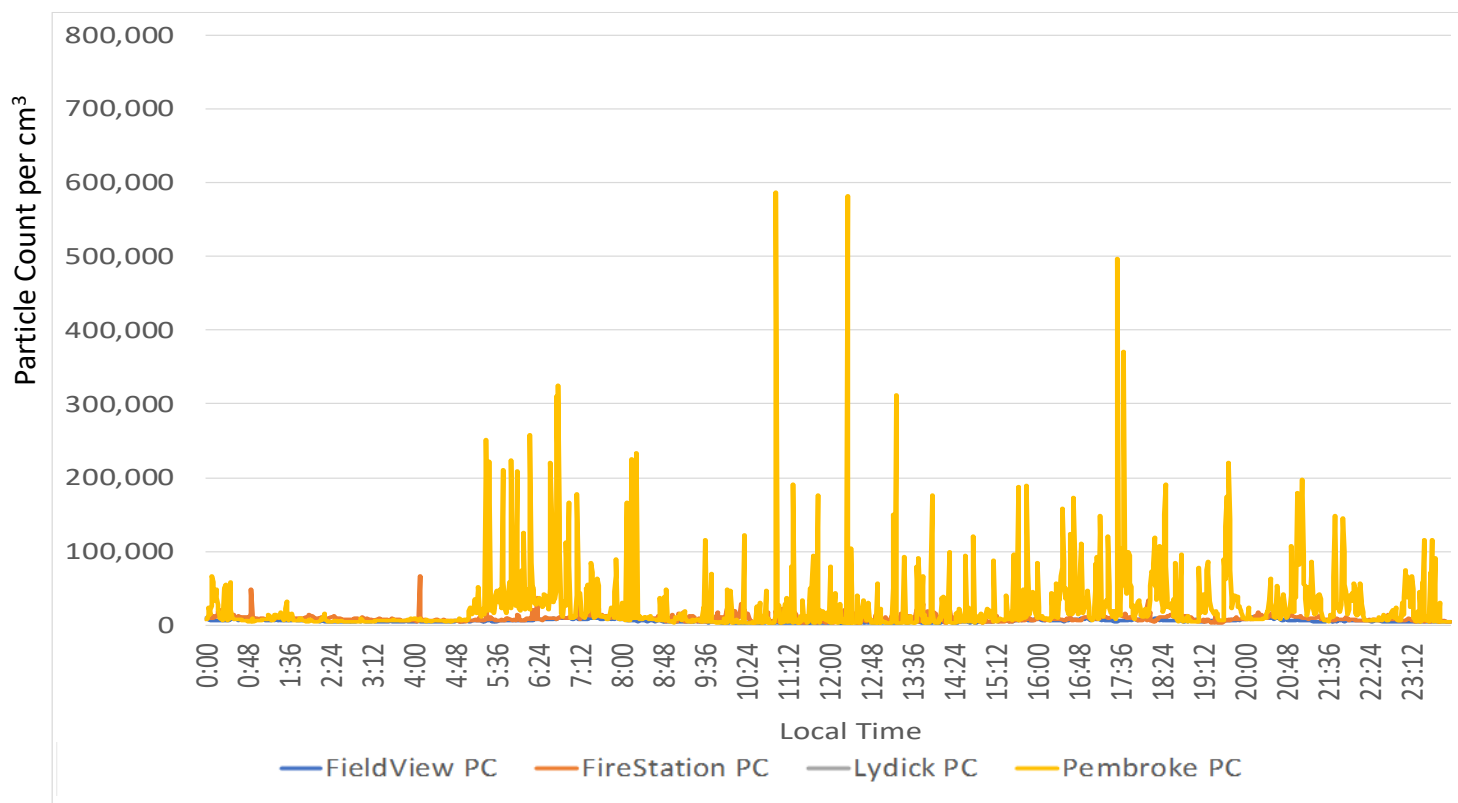
All below EPA Standards

Source: RIDOH, 2017 Air Quality Monitoring Report

Individual aircraft could be seen by particle count



Particle Count on 12/2/16- Pembroke Downwind of Airport, Runways 23 and 34 in Use



Source: RIDOH, 2017 Air Quality Monitoring Report

Location of Pembroke monitor affected particle counts

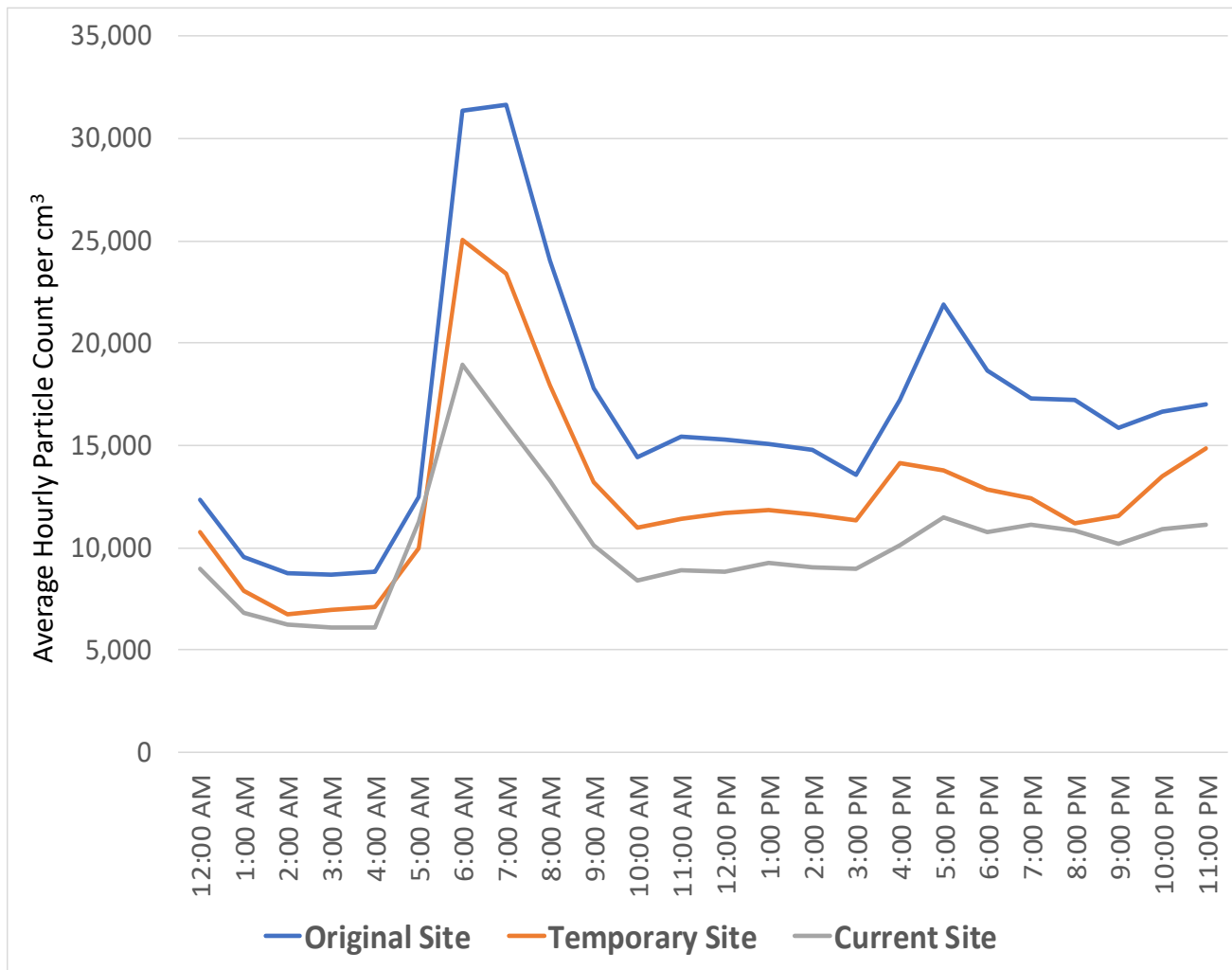


Original:
2008-2014
Higher levels
recorded

Current:
2015-present
Lower levels
recorded

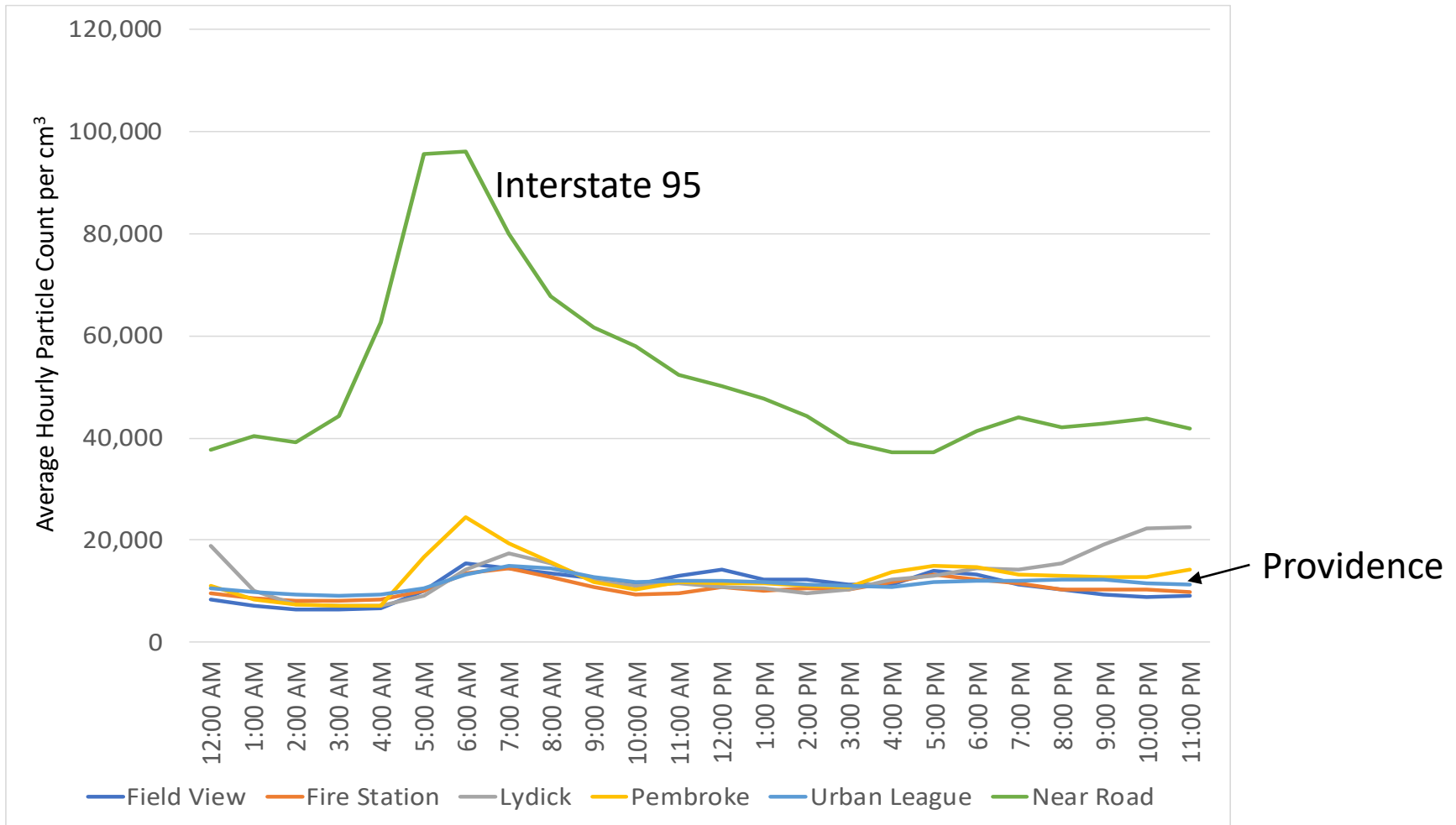
Second:
2014-2015
Intermediary
levels recorded

Pembroke monitor results differed by location



Source: RIDOH, 2017 Air Quality Monitoring Report

Ultrafine particle results similar to Providence and better than I95



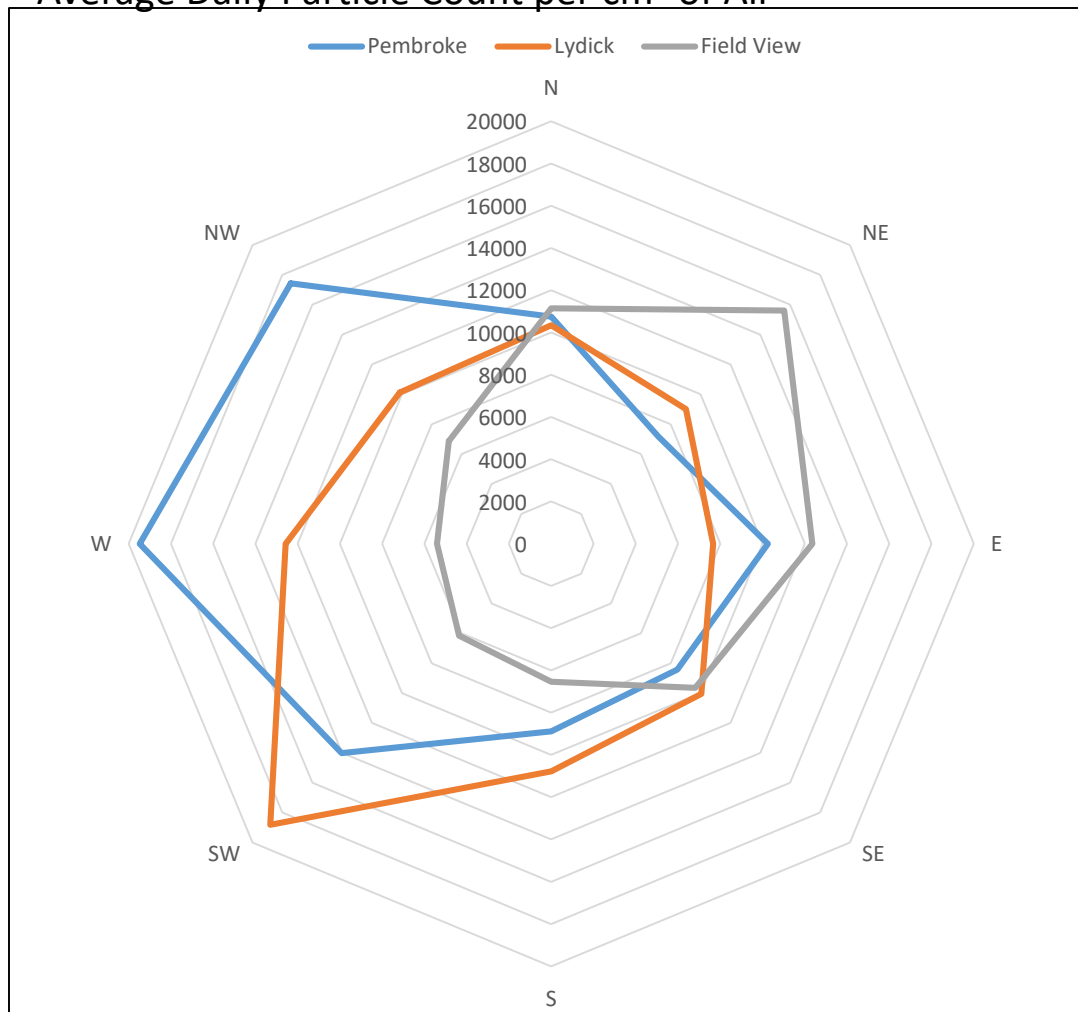
Source: RIDOH, 2017 Air Quality Monitoring Report

- Focused on daily averages
 - Determine which factors contribute to better or worse air quality at a monitor
 - Allows for comparison to health records in future study
- Weather influences daily air quality levels
 - Wind direction
 - Temperature
 - Wind speed

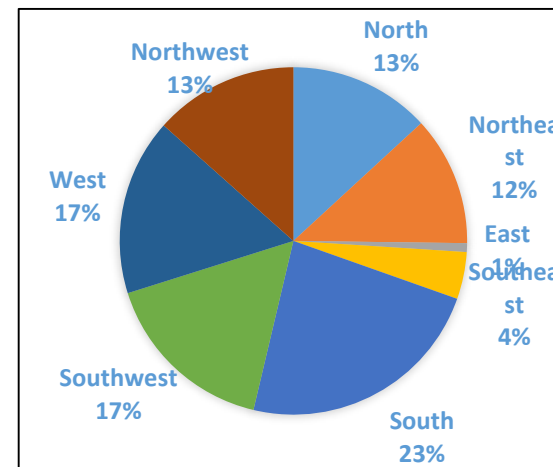
Wind direction influenced particle count



Average Daily Particle Count per cm³ of Air

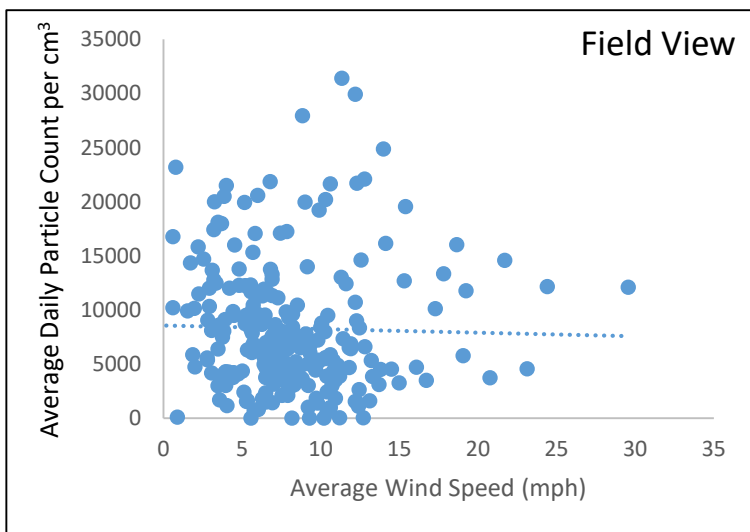
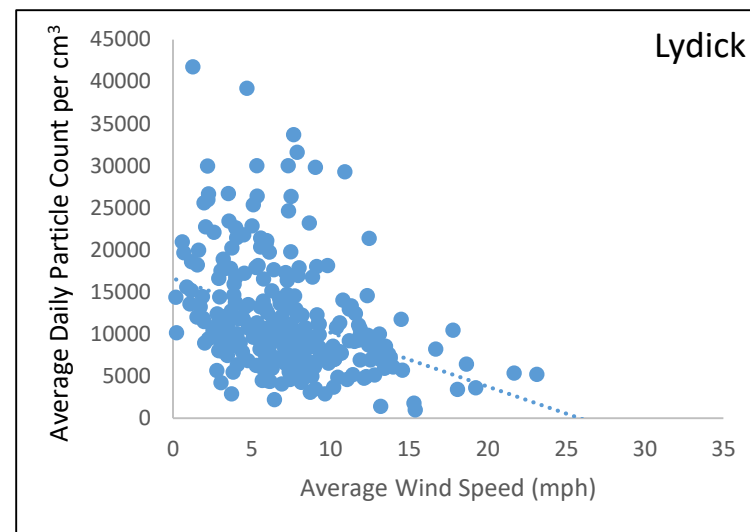
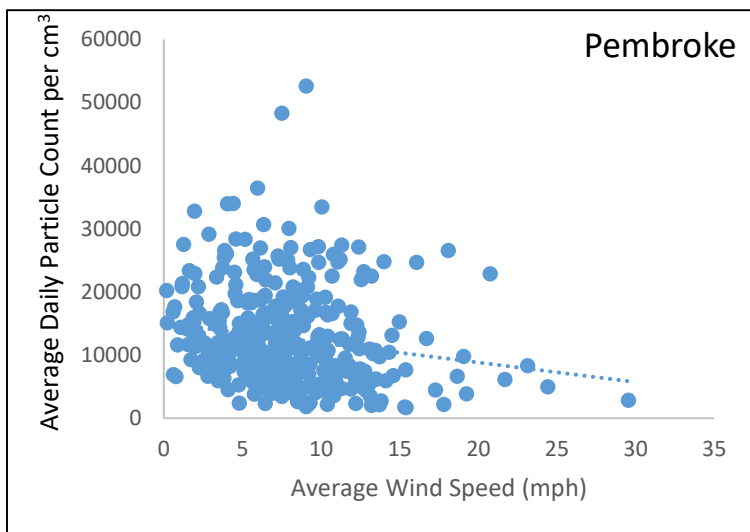


Percent of Days with each Prevailing Wind Direction



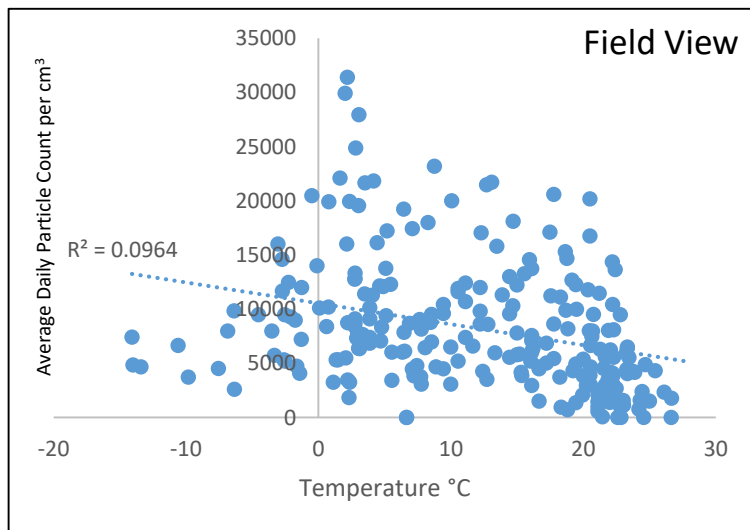
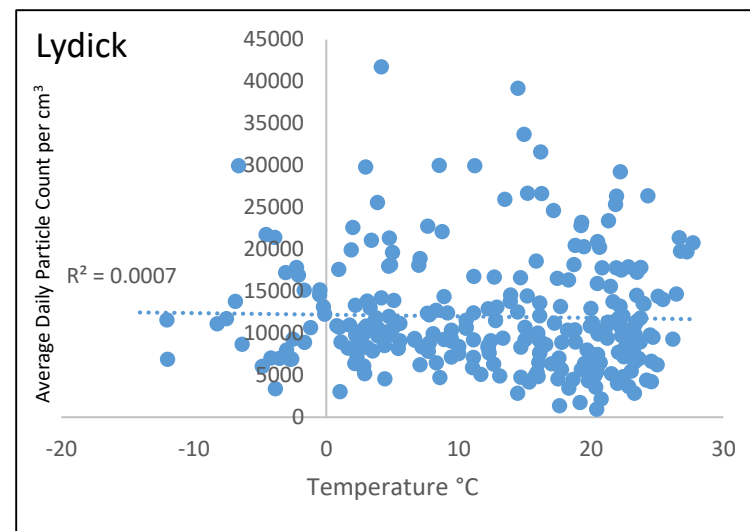
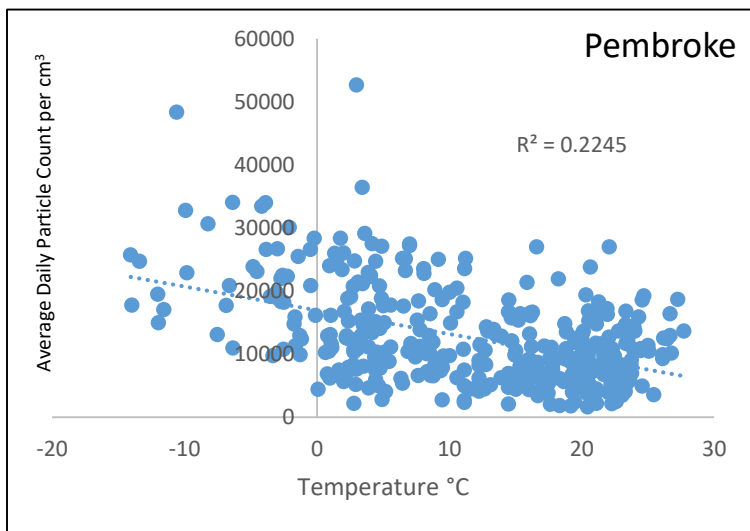
Source: RIDOH, 2018 Air Quality Monitoring Report

Wind speed influenced particle counts at two monitors



Source: RIDOH, 2018 Air Quality Monitoring Report

Temperature influenced daily particle counts at two monitors



Source: RIDOH, 2018 Air Quality Monitoring Report

Conclusions



- Air quality in Warwick is generally similar to or better than other areas of the state
 - $PM_{2.5}$ well below EPA standards
- Air quality is affected by automobiles and aircraft
 - More pollution west of airport due to roads
 - Aircraft have a bigger influence on air quality to east
 - Individual planes can be seen at downwind monitors

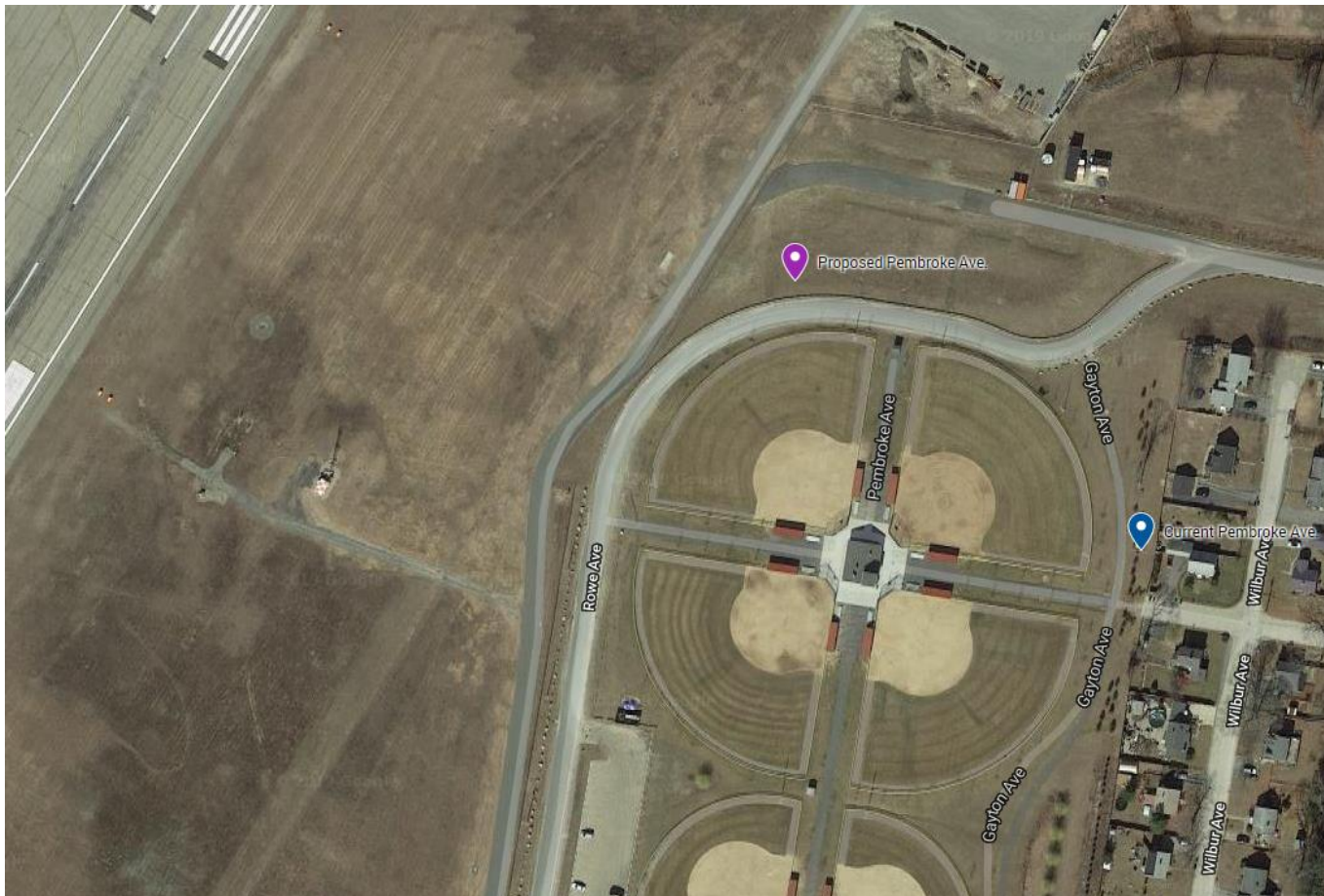
Conclusions



- Weather conditions affect particle levels
 - More particles downwind of airport than upwind
 - Higher winds disperse pollution
 - Cold temperatures aid particle formation

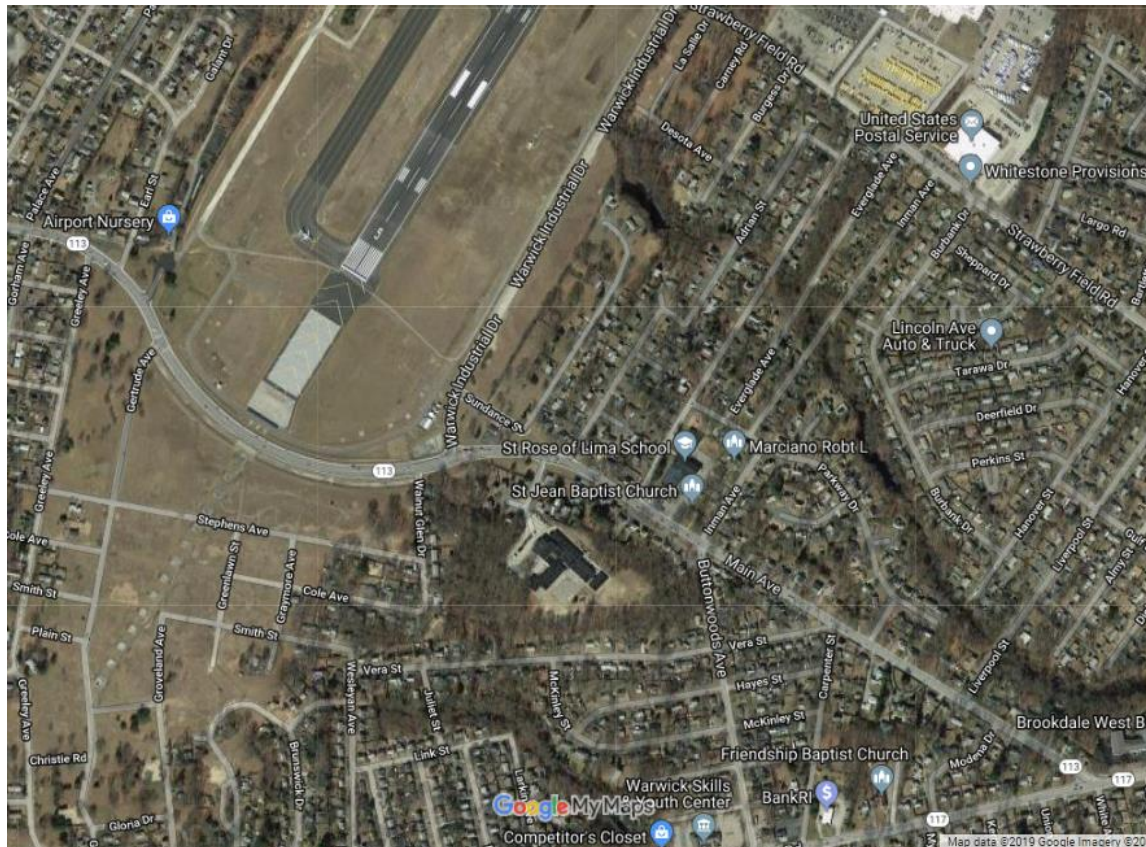
Recommendations

- Move Pembroke monitor closer to the runway



Recommendations

- Relocate the Fire Station monitor to a location east of the extended runway



Questions?



- If there is anything that was unclear, confusing, or you want to know more about
- We will have opportunity for comments about the plan afterwards

Next steps



- Should there be a Public Advisory Committee?
- Determine where we want monitors
 - Move Pembroke closer to runway?
 - Where do we want to monitor the extended runway?
- Assess long-term goals of the program
 - Data collected provides a good understanding of ultrafine levels
 - Want at least one year of black carbon data and data southeast of the airport

Comments



- Oral comments now (up to 5 minutes)
- More detailed written comments accepted through March 14 at:

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