

Monitoring Updates

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Background on IG Issues

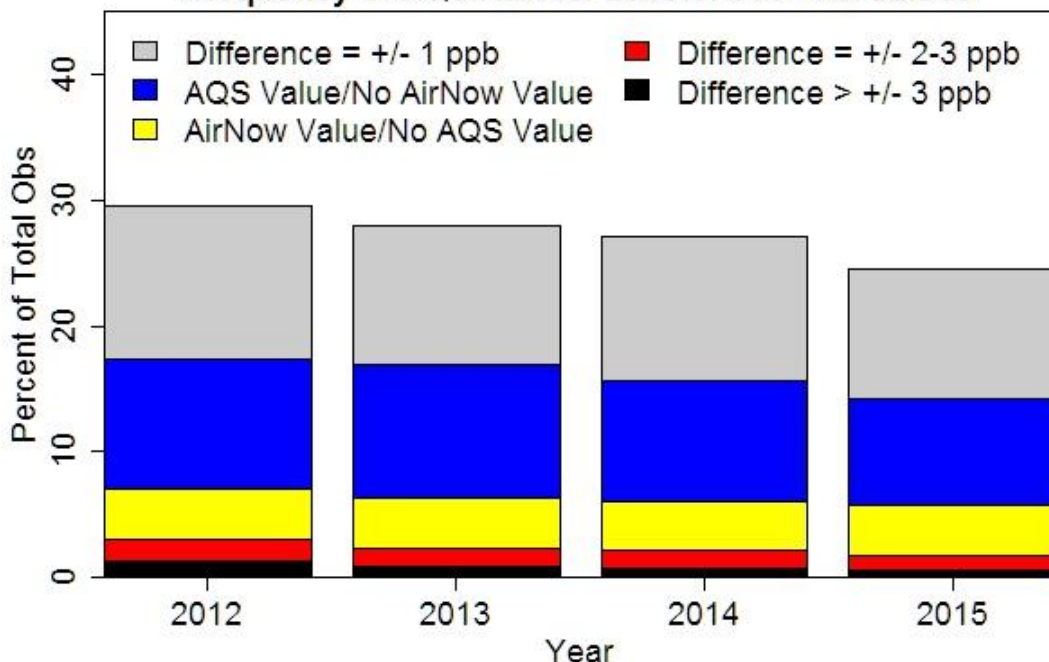
The EPA IG issued a Management Alert on February 6, 2017 with these key issues: [<https://www.epa.gov/office-inspector-general/report-certain-state-local-and-tribal-data-processing-practices-could>]

1. Two states did not process ozone data according to recommended practices in EPA's 2013 Quality Assurance Handbook by zero adjusting their raw ozone data based on the results of quality control checks known as zero checks. As a result, data reported by AirNow and the Air Quality System (AQS) indicate that nationally about 26 percent of the raw data reported to AirNow were different than what was reported to AQS.
2. These states were not validating data in accordance with recommended critical criteria in EPA's 2013 Quality Assurance Handbook.
3. There is a risk that state and local air monitoring agencies' Quality Assurance Project Plans (QAPPs) that have not been approved in the last five years have not been updated to include EPA's revised criteria.

Issue #1- Zero Checks

- OAQPS has conducted an independent analysis of the AQS/AirNow data in order to check the IG's conclusions that 26% of ozone data were different between AQS and AirNow for 2012-2014
- EPA's reanalysis examined the following for 2012-2015:
 - All hourly concentration data in AQS and AirNow, with additional focus on values over 60 ppb
 - Developed state-level summaries to identify any potential QA concerns

Frequency of AQS/AirNow Differences - All Values



Based on this preliminary analysis, only **2 percent of the data** show differences which may represent a legitimate concern in terms of quality assurance practices. **An OAQPS look at 2013-2015 design values showed no impact on designations for the 2015 standard.**

EPA is also developing language to provide cautionary statements about performing zero adjustments. The revised Quality Assurance Handbook will also note that agencies may still perform this adjustment if done properly.

Issue #1 – Next Steps

- EPA response to Management Alert was released on February 10, 2017. Available on OIG web site.
- OAQPS will update the analysis to include 2016 data once the data is certified.
- We will continue to work with the Regional Offices to ensure that all States are meeting the established QA criteria on zero checks.

Issue #2 - Validation

- The IG report indicated that several states were not validating ozone data according to established critical criteria in the QA Handbook. Specifically, EPA has established the following:
 - Several states were not using the plus or minus 7% critical criteria for validating data based on required periodic QC checks
 - Additional states were not necessarily invalidating ambient data (and the QC checks) that failed the 7% criteria
- OAQPS is currently working with the regions to further investigate the extent of this issue
- OAQPS is working closely with the Regions to also ensure that all QAPPs and monitoring agency practices are aligned with critical criteria
- Regions and states will also be asked to work together to invalidate data affected by the failed QC checks

Issue #3 - QAPPs

- Risk that state and local air monitoring agencies' Quality Assurance Project Plans (QAPPs) have not been approved in the last five years.
- EPA Steps:
 - Required that monitoring organizations and the EPA Regions record QAPP submittals and approvals in AQS in the 2016 ambient monitoring rule finalized in March 2016.
 - Revised the data certification report to flag any PQAQO whose QAPP approval is more than five years ago.
 - Developing a report by PQAQO of air monitoring agencies whose QAPPs are more than five years old and request that they correct this situation prior to the 2017 data certification process.

Going Forward – Advice for States

- Essential that SOPs and QAPPs be reviewed for consistency with CFR and QA Handbook
- Ensure that QA positions are filled and that training takes place. Resources include:
 - APTI QA 470 course (being revised)
 - QA 101 slides from Monitoring Conferences
 - <https://www.epa.gov/amtic/quality-assurance-training-2016-naamc>
 - Regional workshops
 - QA Eye from national QA Workgroup
 - <https://www3.epa.gov/ttn/amtic/qanews.html>
- Work with Regions to follow up on recommendations from TSA's
- Use available analytical tools to proactively review data and results from QC checks and audits



Near-road Monitoring

- There are now 71 near-road sites operational
- In addition to NO₂ at all Near-road sites, we currently estimate:
 - 46 sites with PM_{2.5} instrumentation
 - 48 sites with CO instrumentation
 - 20 sites with black carbon instruments
- For a complete listing of current near-road site metadata, visit <http://www.epa.gov/ttnamti1/nearroad.html>
- Effective December 30, 2016, the EPA removed the requirement for Phase 3 of the near-road NO₂ network (~54 sites), while maintaining requirements for CBSAs having +1 million persons and the requirements for a second site (81 FR 96381)

2016 Near-road Data Snap-shot

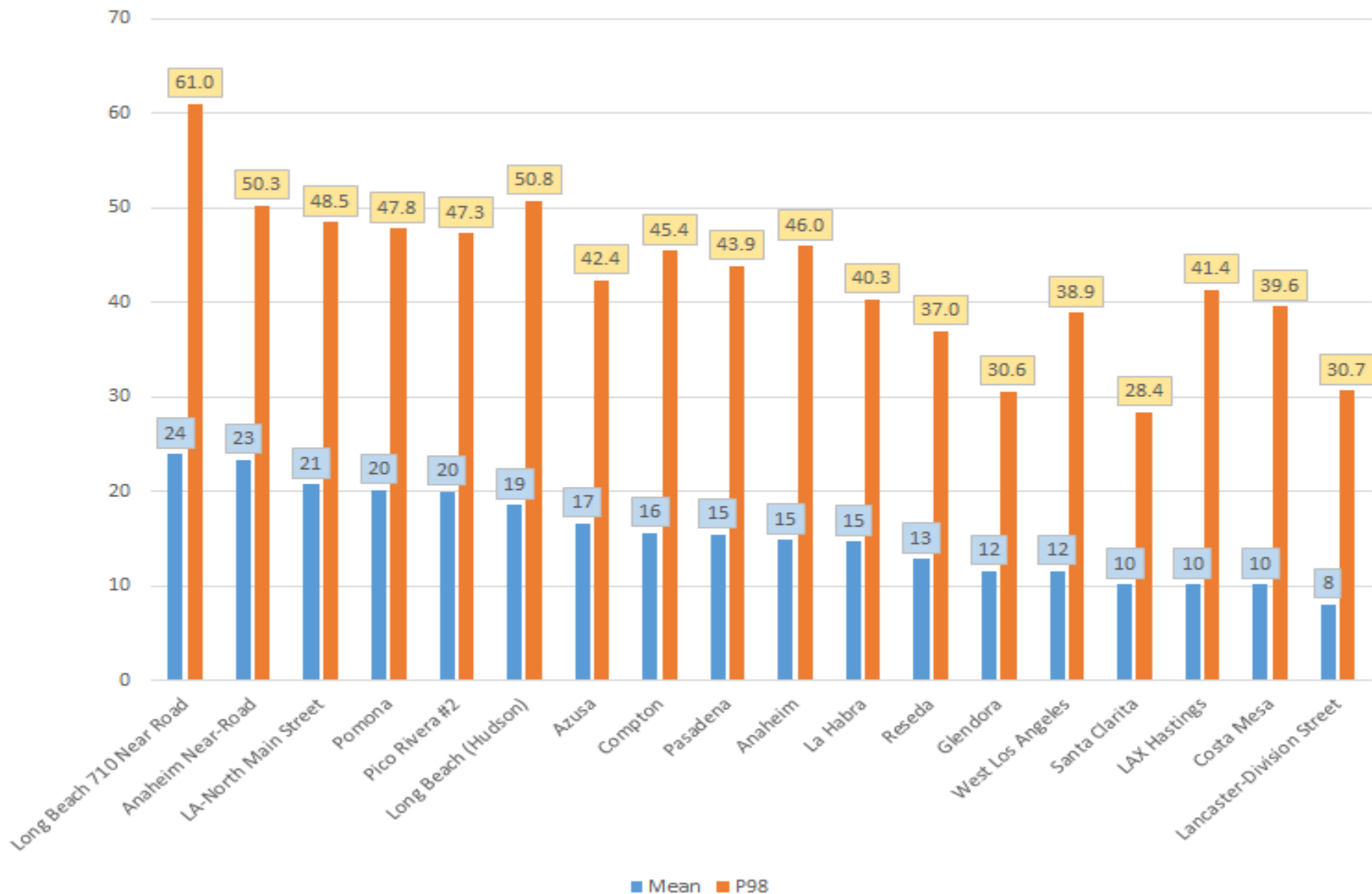
NO₂

- 48 CBSAs with near-road data
- In CBSAs with both near-road and non-NR monitors:
 - The near-road NO₂ monitors have the highest annual mean of all monitors in the CBSA 88% of the time
 - Highest NR monitor is Riverside – Ontario with 31 ppb
 - The near-road NO₂ monitors have the highest 98th percentile value of all monitors in the CBSA 69% of the time
 - Highest NR monitor is Denver – Globeville with 61.4 ppb

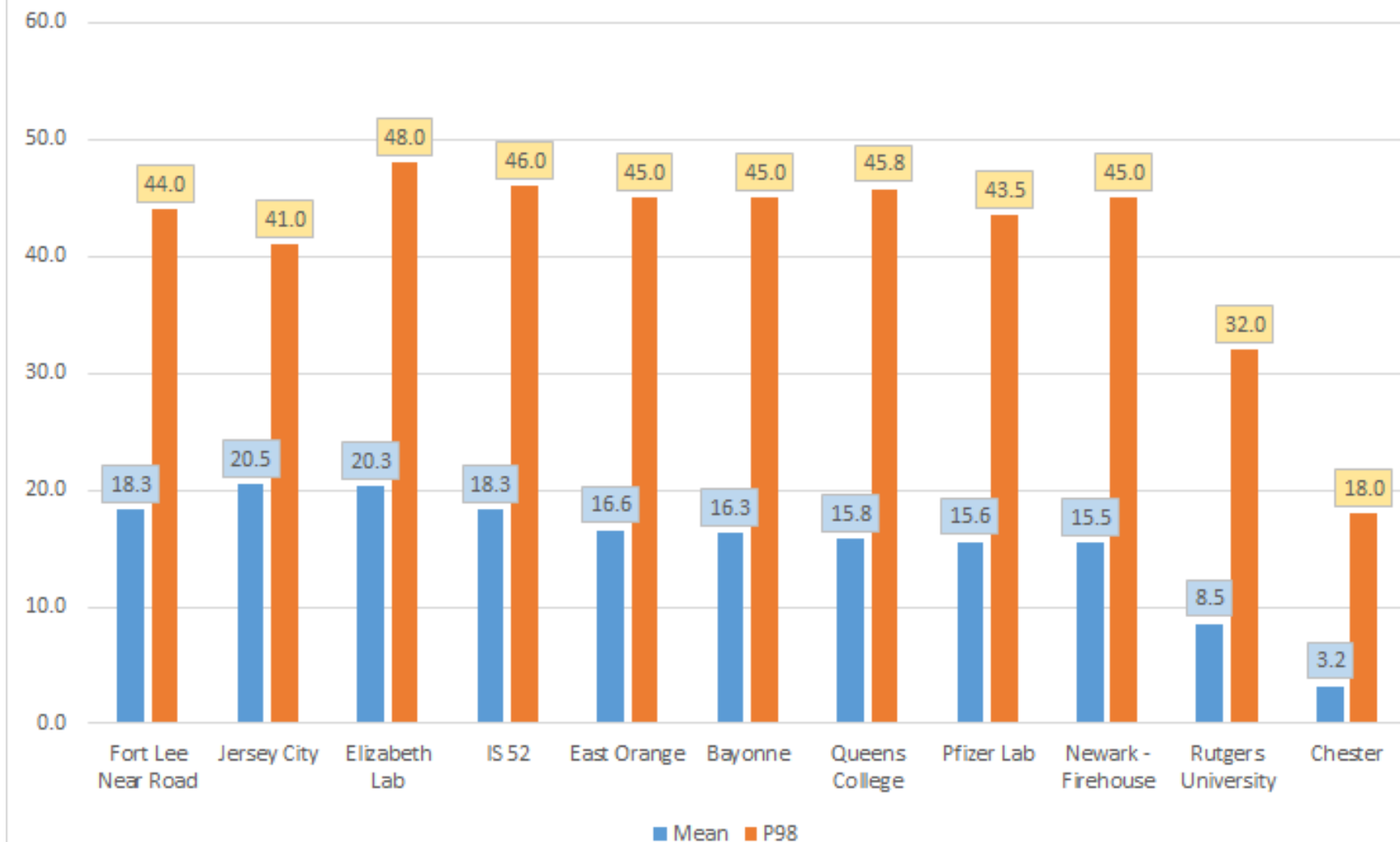
PM_{2.5}

- 25 CBSAs with near-road data
- In CBSAs with both near-road and non-NR monitors:
 - The near-road PM monitors have the highest annual mean of all monitors in the CBSA 60% of the time
 - Highest NR monitor is Riverside – Ontario with 14.8 ug/m³*
 - The near-road PM monitors have the highest 98th percentile value of all monitors in the CBSA 40% of the time
 - Highest NR monitor is Riverside – Ontario with 36.3 ug/m³*

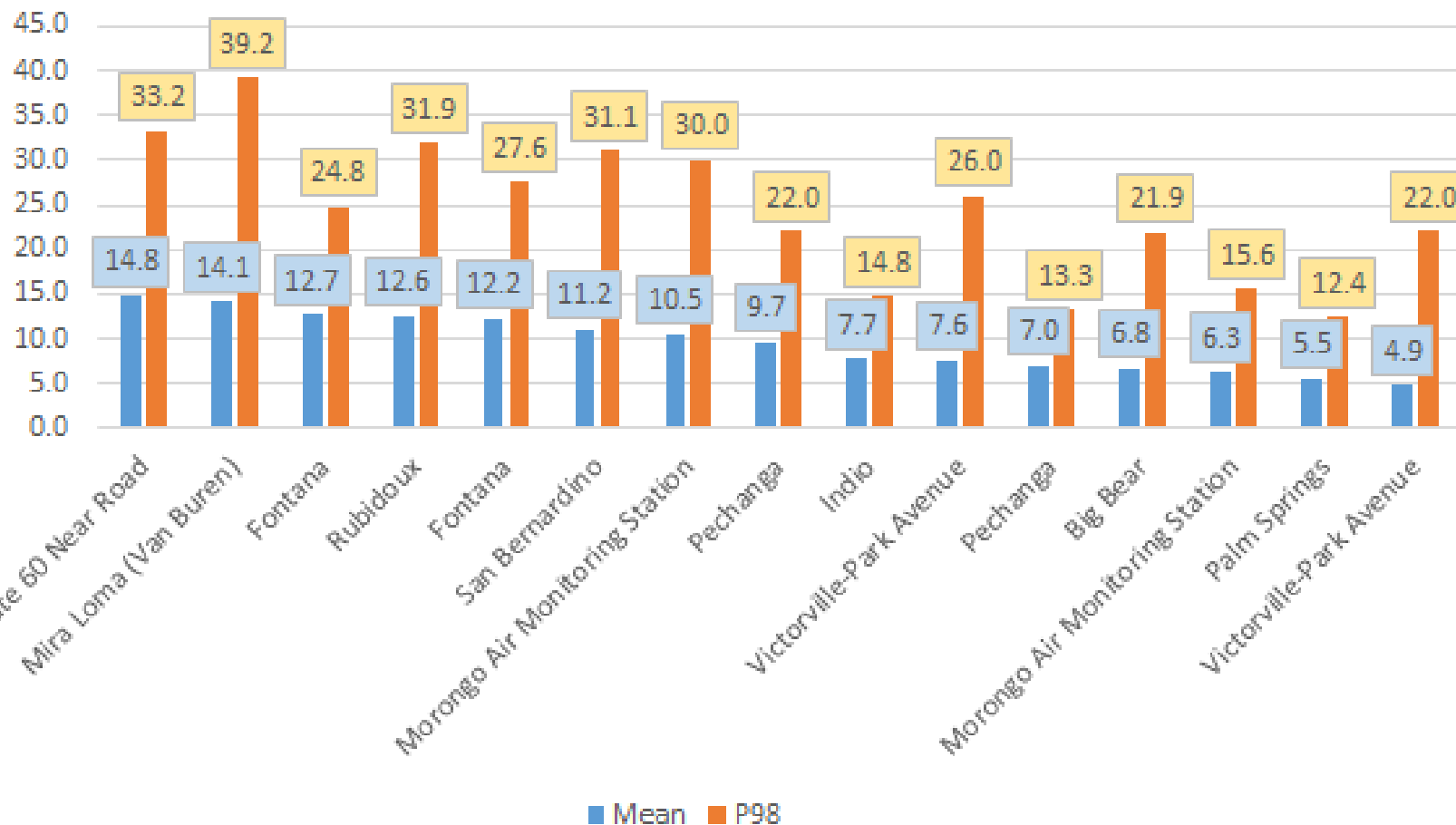
2016 Los Angeles CBSA-wide NO2 Values



2016 New York CBSA-wide NO₂ Values



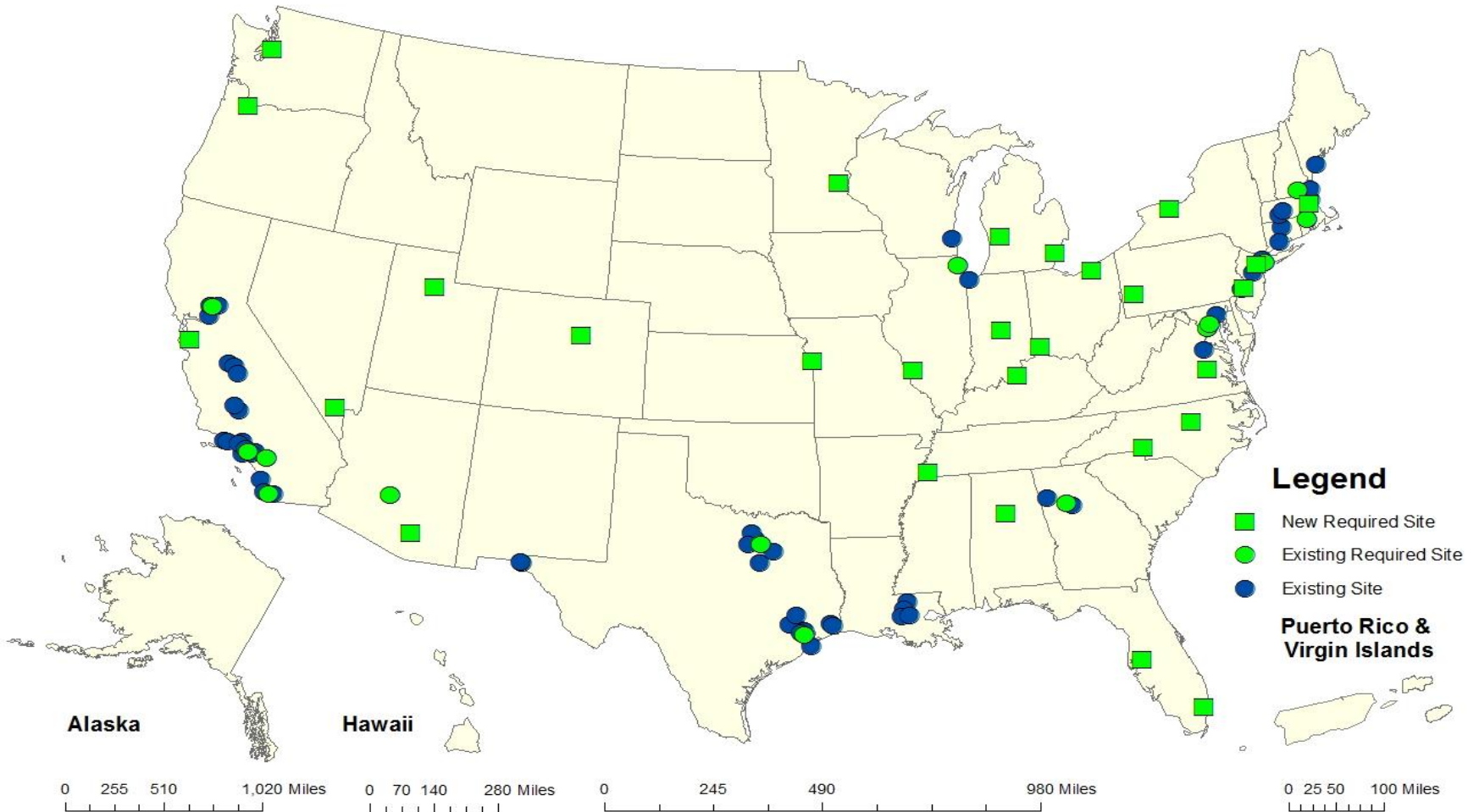
2016 Riverside CBSA-wide PM2.5 Values



Updates to PAMS Network Design

- Major changes to the PAMS requirements were finalized in October 2015 as part of the ozone NAAQS review
- Replaced the existing 20 year-old multi-site, enhanced ozone network design with an updated 2-part network design
 - Requiring PAMS measurements to be collocated with existing NCore sites in areas with population of 1 million or more irrespective of Ozone NAAQS attainment status
 - Results in a stable network of approximately 40 required sites with improved spatial distribution and reduced redundancy
 - Includes a waiver for historically low ozone areas
 - Includes an option to make PAMS measurements at an alternative location (e.g., an existing PAMS site) which may cross CBSA or even state boundaries
 - Require states with moderate or above ozone non-attainment areas and states in the Ozone Transport Region to develop and implement an Enhanced Monitoring Plan (EMP)
 - Provides support for flexible approaches for collecting data to understand ozone issues in new and existing high ozone areas

New and Existing PAMS Sites



PAMS Timeline and Milestones

- PAMS plan due July 1, 2018 as part of Annual Network Plan
 - Consider moving this up to July 1, 2017 if waivers are needed!
- PAMS monitoring at NCore sites will need to start by June 1, 2019
 - We have 12 early implementing programs who will receive funding this fiscal year to buy equipment
- EMPs submitted within two years of designations or by October 1, 2019, whichever is later
 - Some areas may want to move this up to 2018 where non-required existing sites may be involved



Other Key Monitoring Initiatives

- Elimination of Phase 3 monitoring requirement for near-road NO₂ network (does not affect other aspects of near-road requirements)
 - <https://www.gpo.gov/fdsys/pkg/FR-2016-12-30/html/2016-31645.htm>
- Solicitation for community scale air toxics proposals for projects designed to assist state, local and tribal communities (closed on March 22, 2017)
 - <https://www.epa.gov/grants/community-scale-air-toxics-ambient-monitoring-grant-fy-2017>
- Ongoing assistance for air toxics monitoring projects in Louisiana and Indiana, and upcoming in West Virginia and Pennsylvania (Pittsburgh)

Sensors Update

E-Enterprise Advanced Monitoring Team Recommendations

E-Enterprise Advanced Monitoring Scoping Team (EEAMT) Recommendations

- E-Enterprise Leadership **endorsed** five recommendations in April 2016
 - A Steering Committee and four separate sub-teams were initiated
 - All four teams moved into the implementation phase in summer 2016
 - Fifth recommendation was to be handled by individual EPA offices

Recommendations:

- 1) Perform a detailed options and feasibility analysis on the creation of an independent third-party evaluation/certification program for advanced monitoring technology
- 2) Develop and start executing technology scanning and screening procedures within EPA and the states, and provide support to our users
- 3) Develop messaging and tools to support the interpretation of short-term monitoring results
- 4) Develop data use tiers and data standards for advanced monitoring technologies; and
- 5) Lean the current technology approval process. (handled programmatically)

Team #1 Update

Charge: Develop an options and feasibility analysis for an independent third-party certification program, considering legal, policy, technical, financial, and operational factors.

Options will be presented to the leadership council in Spring 2017

Option 1: Branded program similar to Energy Star or Water Sense (most robust)

Option 2: Multi-level certification; no label; limited market surveillance

Option 3: EPA publishes test methods and performance standards (least robust)

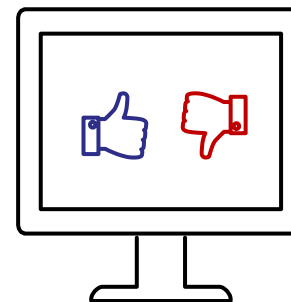
Option 1



Option 2



Option 3



Team #2 Update

Charge: Establish and implement a state and EPA Network of scientists and engineers to:

- 1) identify (i.e., scan) for agency use new technology that is available for purchase now or may be coming to the market soon.
- 2) Screen a subset of those technologies in greater detail; and
- 3) Share that information with EPA and state, tribes, local gov't (organizations with delegated programs) staff through a central clearinghouse, outreach, and other approaches.

Goal: The Network will help organizations use precious monitoring resources to purchase the equipment that will meet their needs.

Status: Over the course of a few months beginning in January, an expert team of EPA HQ/Regional and SLT staff will start prototyping a Network/Clearing House concept focusing on monitoring devices for PM_{2.5} in the air and nutrients in the water.

Team #3 Update

Charge: Provide context and interpretation of advanced monitoring data in formats that are relevant and understandable to users. Providing this context requires advancement in three areas:

- 1) statistical analysis to understand the relationship between continuous data and data collected over longer-term averaging times or via discrete (e.g. bi-weekly) sampling;
- 2) development of visualization tools (e.g. interactive maps) and websites with appropriate messaging; and
- 3) development of outreach and communication materials.

Team #4 Update

Charge: Evaluate existing data standards for communicating sensor data

Status: The Team has evaluated several existing approaches, including:

- Custom solutions for EPA Emergency Response (VIPER)
- EPA's ARS and AirNow system
- USGS's National Stream Information Program (NSIP)
- Open Geospatial Consortium Standards

Charge: Develop a metadata standard as well as a proposed data architecture for sensor data

Status: The team will leverage lessons learned from a companion E-Enterprise Project: The Interoperable Watershed Network Project which developed a common 'search index' for available sensors and used Open Geospatial Consortium standards to enable the sharing of data

EPA's Smart City Air Challenge

- A challenge that encourages communities to deploy hundreds (250-500) of air quality sensors and make the data open
- EPA awarded prizes of up to \$40,000 to two communities based on their strategies, including their plans to share data management methods so others can benefit
 - The prizes are intended to be seed money -partnerships are essential
- Lafayette, LA and Baltimore, MD selected as Challenge winners

