

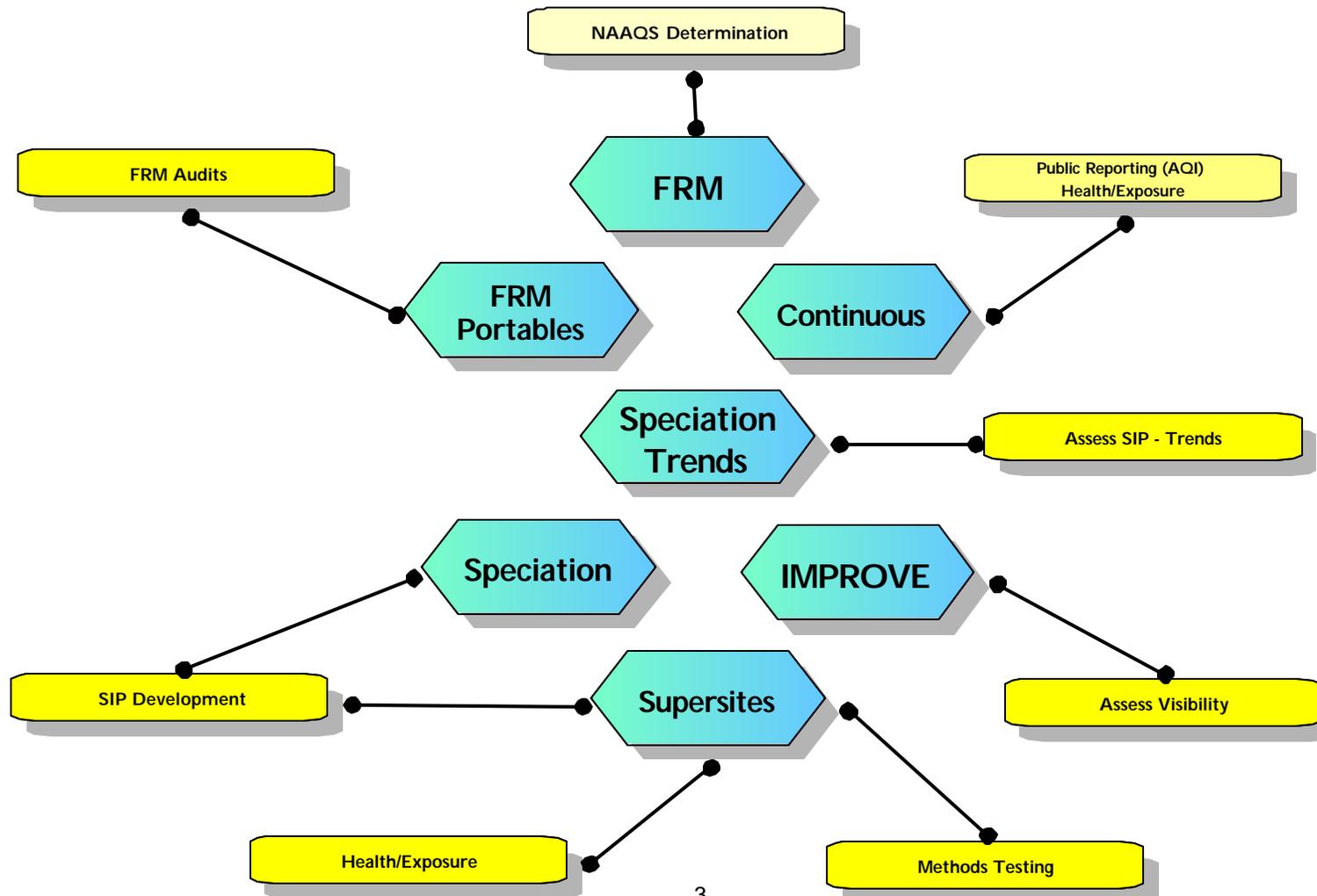
**Particulate Matter
Monitoring Technology:
Revisiting method equivalency
and accommodating
continuous and other
advanced methods**

**Presentation to SAMWG
April 21, 2001**

Summary

- PM Monitoring Objectives
- Current Network Status
- Current Regulatory Framework
- Options for acceptance of PM continuous methods
- Data Quality Objective Process
- Next Steps

PM Primary Monitoring Objectives

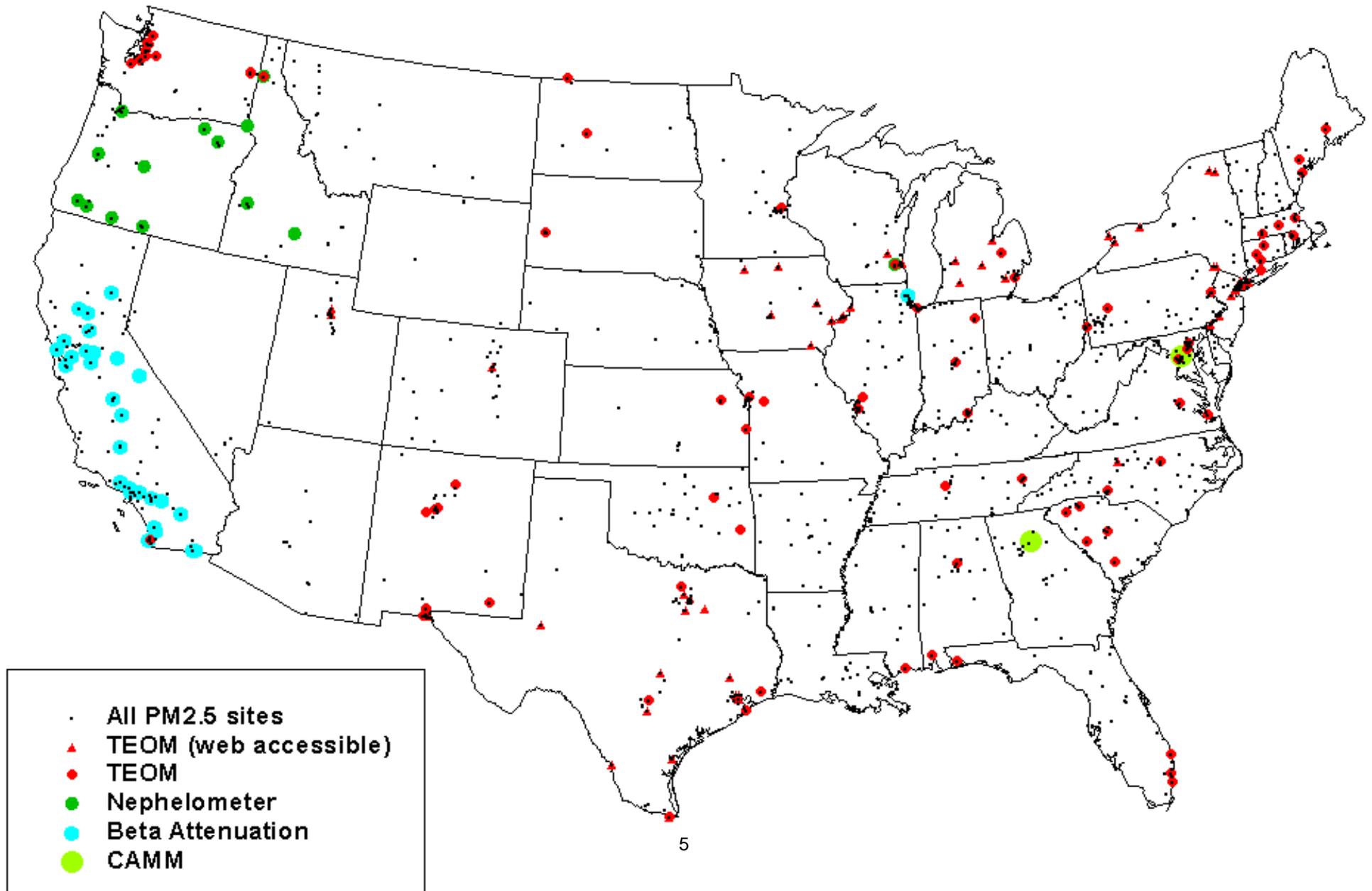


Data Utility

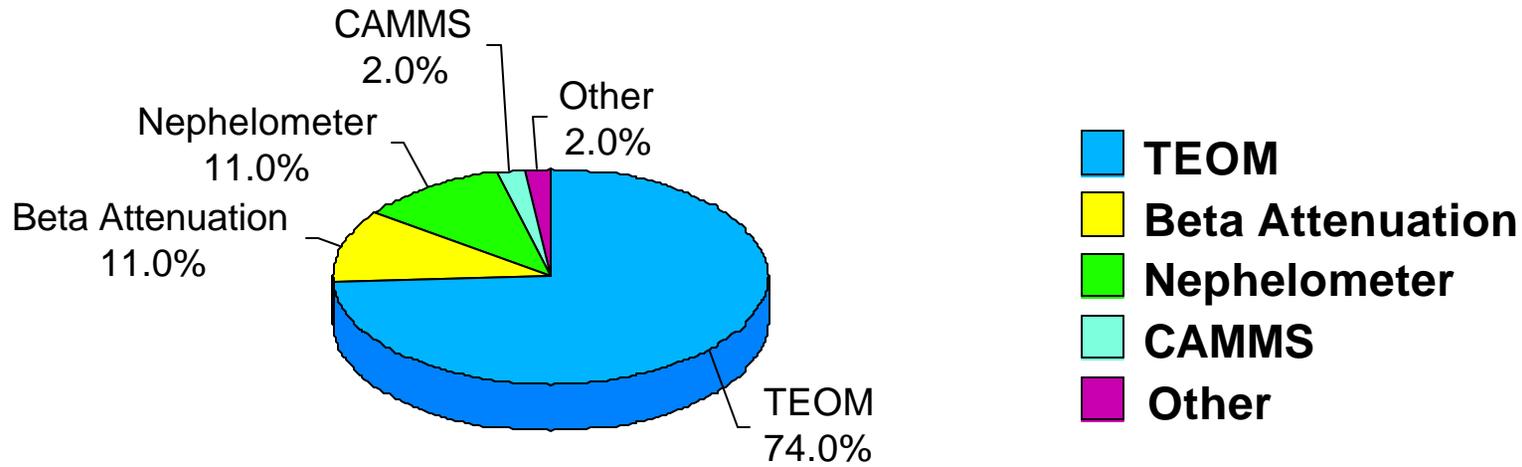
PM2.5 FRM vs. Continuous

Monitoring Objective	FRM	Continuous
NAAQS Attainment Decisions	Yes	<i>No</i>
Public Reporting (Air Quality Index)	No	Yes
Assess SIP Trends	Yes	Yes, if a consistent method is applied.
Diurnal Variation	No	Yes
Peak short term exposure	No	Yes
Model Evaluation	Limited	Robust
Sector Sampling	Extremely limited	Yes

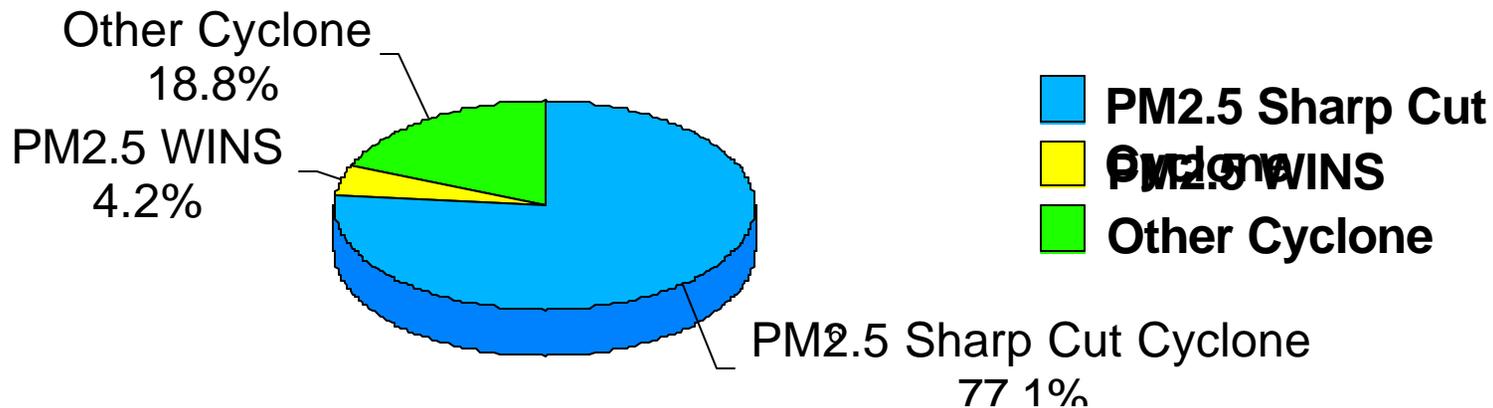
All PM2.5 Monitoring Sites with continuous sites by monitor type



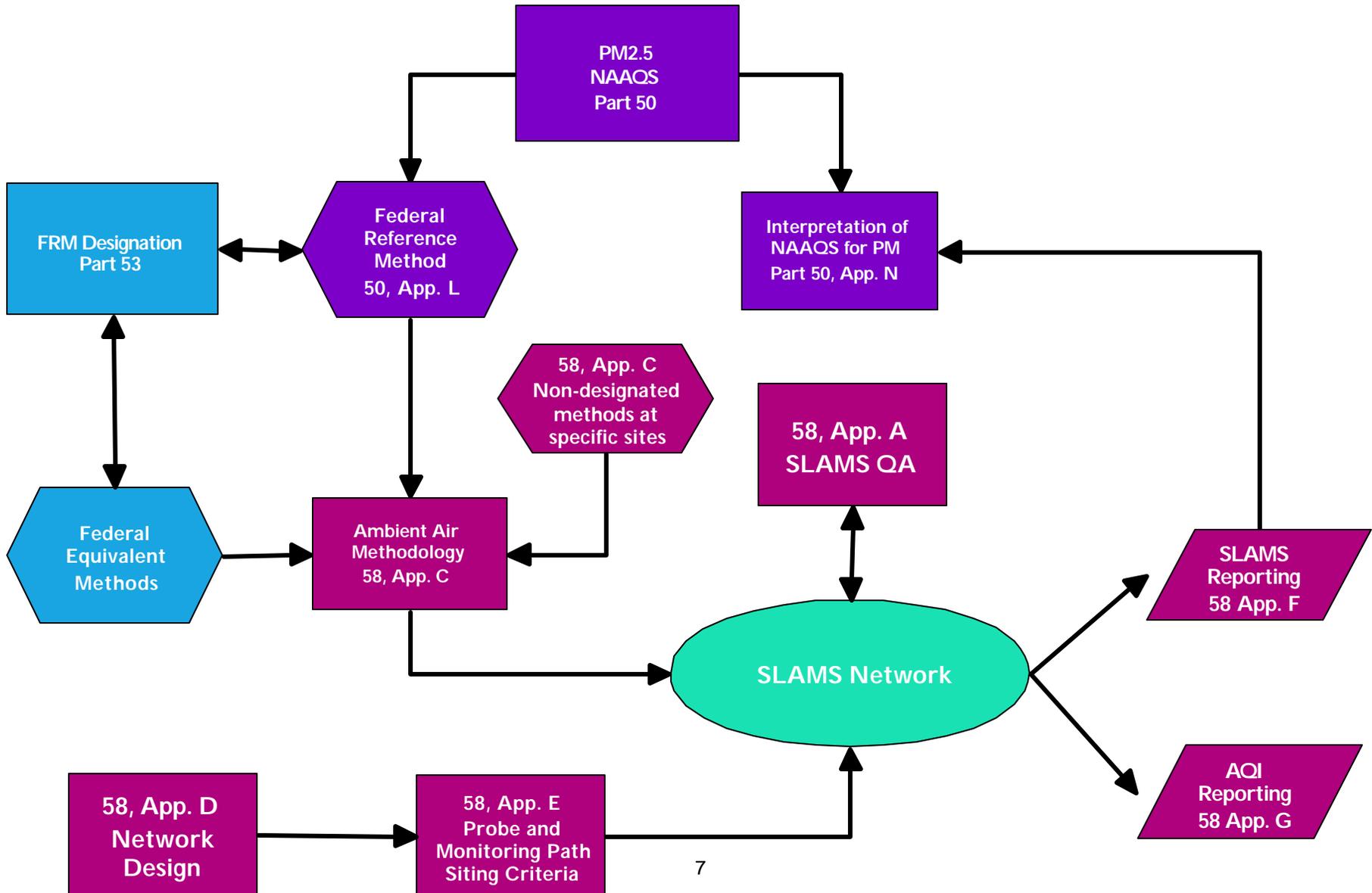
PM2.5 Continuous Monitor Selection by State and local Agencies in National Network



Selection of Separation Device for PM2.5 Continuous Monitors



PM2.5 Monitoring Regulatory Framework



Options for Acceptance of PM Continuous Methods (not exclusive)

- Increase acceptable tolerances of Class III equivalency through application of the DQO process
- Approval of non-designated PM_{2.5} methods across an agencies network or across an entire Region or Regional Planning Area
- Reinvent Correlated Acceptable Continuous (CAC) monitors
- Allow for more flexibility in areas significantly above or below the NAAQS

Increase acceptable tolerances of Class III equivalency through application of the DQO process

- Pro's
 - ▶ May be able to provide less stringent requirements for approval of Federal Equivalent Methods (FEMs)
- Con's
 - ▶ May not be able to relax criteria for approval even with DQO process.
 - ▶ Even if less stringent requirements are approved, still not likely a continuous method will pass all the criteria for approval
 - 4 sites that include at least 1 with high volatiles
 - 4 season study

Approval of non-designated PM2.5 methods across an agencies network or across an entire Region or Regional Planning Area

- Pro's
 - ▶ Can match the use of a method across the spatial scale where it works well
 - ▶ States/Regions/Regional Organizations can plan the use of the method that best works for them.
 - ▶ Provision for site specific equivalency already exists - this would extend that to a larger spatial scale.
- Con's
 - ▶ May result in the use different methods when crossing a State or Regional boundary.
 - ▶ No guarantee for success

Reinvent the Correlated Acceptable Continuous (CAC) monitors

- Allow for use across an entire monitoring agencies network
- Define use of a subset of FRM's collocated with CAC's at core urban sites for attainment purposes.
- Allow use of CAC's without collocation to FRM's at:
 - ▶ Other core monitoring sites in MSA to determine boundary of attainment decision
 - ▶ Regional Transport sites
 - ▶ Background Sites
- QA Program would stay in place, (or whatever reinvented QA program as proposed in monitoring strategy)
 - ▶ Collocation with FRM and continuous methods at 25%
 - ▶ Performance Evaluation Program at 25% of sites, 4 times per year.
 - ▶ Flow rate audits at all sites 4 times per year.

Allow for more flexibility in areas significantly above or below the NAAQS

- Current regulation allows for flexibility when a site is <80% of the NAAQS for sample frequency
 - ▶ Areas that are >80% of the NAAQS are Priority 1 PM monitoring areas.
 - ▶ Areas that are <80% of the NAAQS are Priority 2 PM monitoring areas.
- Should regulation allow for flexibility when an area is substantially above the NAAQS?
 - ▶ 20% higher than annual NAAQS = 18 ug/M³
 - ▶ These areas could redirect their monitoring to help support other monitoring objectives:
 - SIPs, Health/exposure, public reporting

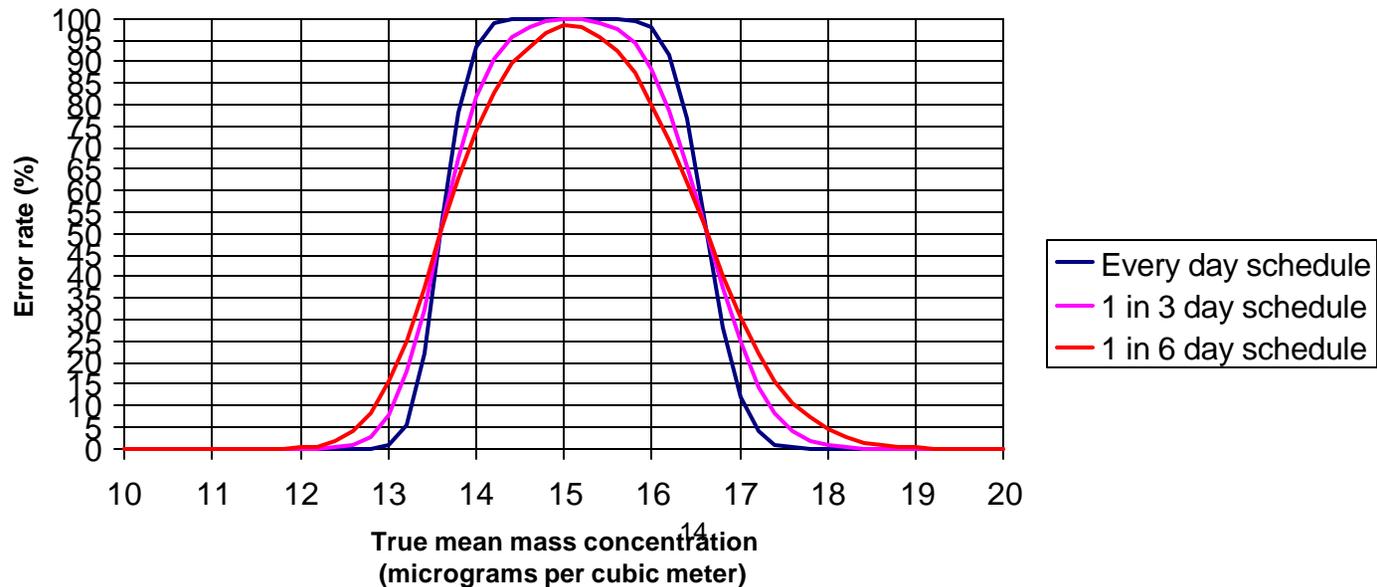
Data Quality Objectives (DQO's)

- DQO's are qualitative and quantitative statements that:
 - ▶ Clarify the intended use of the data
 - ▶ define the type of data needed to support the decision
 - ▶ identify the conditions under which the data should be collected, and
 - ▶ specify tolerable limits on the probability of making a decision error due to uncertainty in the data
- 3 DQO Tasks are being pursued:
 - ▶ Rerun the PM2.5 DQO
 - ▶ Comparison of Continuous Monitoring Uncertainty to the PM2.5 DQO
 - ▶ Development of a DQO for Coarse PM2.5
- Also, considering pursuit PM2.5 spatial DQO if resources become available.

DQO Example inputs and outputs

Input	FRM	Continuous
Goal for measurement uncertainty of automated and manual PM2.5 Methods (40 CFR Part 58, Appendix A, Section 3.5)	10% coefficient of variation for total precision +/- 10% for total bias	10 % coefficient of variation for total precision +/- 10% for total bias
Completeness Requirement	75%	75%
Minimum # of Valid Sample days in 3 years	821 for daily 274 for 1 in 3 137 for 1 in 6	821

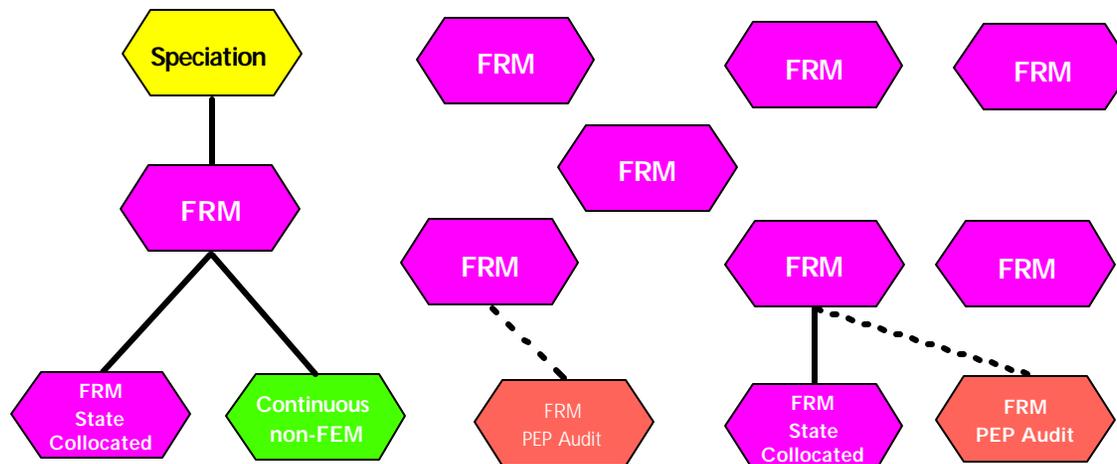
**Error rates:
For 3 years of daily samples at 75% completeness**



How to "Ground Truth" the network to filter based methods

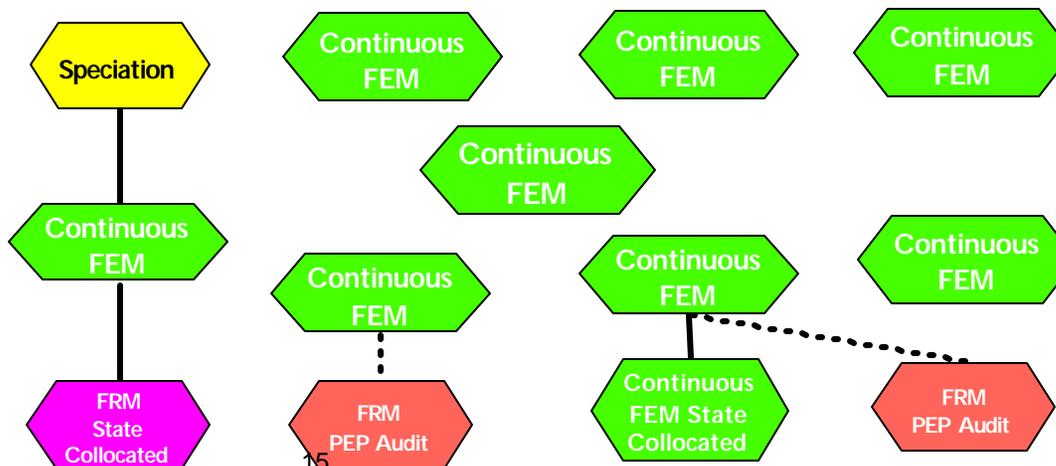
Current generic PM2.5 network:

- 8 Sites with FRM's
- 2 Sites have collocated FRM's operating on a 1-6 schedule
- 1 continuous non-FEM
- 1 site collocated with a speciation sampler
- Each year 2 sites have 4 PE audits (8 total)



Future generic PM2.5 network:

- 8 Sites with continuous FEM's
- 1 Site has a collocated FRM operating on a 1-6 schedule
- 1 site has a collocated continuous FEM
- 1 site collocated with a speciation sampler
- Each year 2 sites have 4 PE audits (8 total)



Next Steps

- Awaiting formal feedback from CASAC. Informal feedback has been positive
- Need States to provide feedback on identified options and/or suggest other ways to optimize PM network.
- Draft document to provide more details on options to be prepared for late summer review
- Data Quality Objective (DQO) work currently underway to answer a number of questions on PM continuous monitoring.
- National Network Assessment work to use first two years of PM_{2.5} data to look at estimation error, spatial coverage, concentration, closeness to NAAQS and population.
- Include details in monitoring strategy
- Continue communicating to all interested parties:
 - ▶ CASAC
 - ▶ Policy data users
 - ▶ Modeling data users
 - ▶ Keep States in the loop
 - SAMWG
 - STAPPA/ALAPCO