Federal Highway Administration’s Particulate Matter Research Program

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Structure of the PM Research Strategy

Phase 1: Determine the highway/mobile source contribution to particulate matter pollution by evaluating previous studies, recommending needed research

Phase 2: Initiate projects identified in recommended research; determine cities to study correlation of traffic and emission concentrations of PM

Phase 3: Collect and analyze vehicle activity data and ambient air PM concentrations in selected cities
Process Used to Develop Strategy

- Existing Research
- Stakeholder Involvement
- Strategic Workplan for PM Research
Phase 1 : Develop Research Plan

- Literature review
- Workshop
- Recommendations
- Strategy Document
Strategic Workplan for Particulate Matter Research: 2000 to 2004
Recommendations

Fourteen projects covering five focus areas monitoring, characterization, sources, modeling, control strategies

First project is to collect both traffic and emission concentration data in close proximity to one another to attempt to correlate traffic activity and PM concentrations

Figure outlines projects needed to answer questions
Figure 3. Connection Between Transportation Issues and Research Agenda
Locations should be in areas anticipated to have PM Exceedances

Determine locations with the following data

Air Quality Data (PM10, PM2.5, Speciation, Other Pollutants, Meteorological)

Traffic Data (VMT, Peak Volumes, Local, Regional, Seasonal, Speed, Vehicle Type)

Phase 2: Determining Sampling Sites and Data Requirements
1999 Annual Mean PM$_{2.5}$ Concentrations (ug/m$^3$)

**Data Completeness**
- ○ < 4 quarters
- ○ one or more quarters with < 11 samples
- ○ All quarters with at least 11 samples
- ○ All quarters 75% or more complete

**Concentration (ug/m$^3$)**
- ○ > 20
- ○ 15 - 20
- ○ 10 - 15
- ○ 0 - 10

Source: US EPA AIRS Database as of 7/12/00 without data flagged as 1, 2, 3, 4, T, W, Y, or X
Location of the FHWA and EPA Monitoring Sites
New York City/Queens, New York

Legend

☆ PM Monitoring Supersite

Supplemental Traffic Counter

Regional Traffic Counter

Weigh-in-Motion Detector
Phase 3: Analyze the Data and Evaluate the Relationships

Study the effects and Influences of:

- Variations in Concentration during day
- Variations in Concentrations Seasonally
- Variations in Vehicle Classes
- Variations in Geographical Locations
- Atmospheric Transport
- Fugitive Dust
PM$_{2.5}$ Concentration versus Hour of Day  Winter of 1999
**PM$_{2.5}$ Concentration versus Hour of Day**  
*Winter of 2000*
PM$_{2.5}$ Concentration versus Hour of Day  
*Summer of 2000*
Time-Series Plot of PM$_{2.5}$, CO, and Black Carbon  

January 25-31, 2000
Average Weekday Vehicle Class Distributions on SR-167, Kent, Washington 2000
$\text{PM}_{2.5}$ Concentration versus SR-167 Volume, Kent, Washington \textit{June 27, 2000}
PM$_{2.5}$ Concentration versus SR-167 Speed, Kent, Washington  

*June 27, 2000*
PM$_{2.5}$ Concentrations in Relation to Traffic Volume  

*May 3, 2000*
PM$_{2.5}$ Concentrations in Relation to Traffic Speed  

May 3, 2000
PM$_{2.5}$ Concentrations in Relation to Traffic Volume  

*February 17, 2000*
PM$_{2.5}$ Concentrations in Relation to Traffic Speed  

*February 17, 2000*
Schedules for PM Research Projects

No definite schedule established for all projects

Project schedule will likely be influenced by implementation of new PM2.5 standard

Current schedule may change depending on legal challenges or rulings
PM monitors to be in place nationwide

PM monitoring data to be collected

EPA will designate nonattainment areas for PM

States will submit implementation plans for meeting the PM standard

States will have up to 10 years to submit meet PM standard, plus two one-year extensions

Figure A-1. Time Frame for Implementation of PM2.5 Standard
Related Issues

Air toxics

Mobile source air toxics (MSATs)
  acetaldehyde, acrolein, benzene, 1,3-butadiene,
  formaldehyde, MTBE, POM, toluene

Greenhouse Gases (GHG)
  carbon dioxide
Consideration of Other Pollutants and Atmospheric Processes

PM Precursors

Air Toxics  Particulate Matter  Ozone

Regional Haze  Climate Change
Conclusion

FHWA PM Research Program and Projects Defined

Traffic - Emission Analysis Project Underway

Analysis Reports Developed Quarterly

More information?

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