

The Detroit Pilot Project:  
Testing An Approach for Integrated Air Quality  
Planning

Amy Vasu  
U.S. EPA, OAQPS

EPA Air Innovations Conference  
September 7, 2006

# Background

- NAS Committee on Air Quality Management in the United States recommended that:
  - the SIP be transformed into a comprehensive air quality management plan (AQMP) that would: (1) encompass all criteria pollutants for which a State has not attained the NAAQS; (2) include key HAPs; and, (3) identify and propose control strategies for air pollution hot spots.
- CAAAC Air Quality Management Work Group Recommendation 4.1 stated that:
  - “... for the SIPs States are required to submit over the next several years, EPA and States, locals, and Tribes should promote the consideration of multipollutant impacts, including the impacts of air toxics, and where there is discretion, select regulatory approaches that maximize benefits from controlling key air toxics, as well as ozone, PM<sub>2.5</sub> and regional haze.”

# "One Atmosphere" Approach to Air Quality Management



## Mobile Sources

NO<sub>x</sub>, VOC,  
PM, Toxics

(Cars, trucks, planes,  
boats, etc.)



## Industrial Sources

NO<sub>x</sub>, VOC,  
SO<sub>x</sub>, PM,  
Toxics

(Power plants, refineries/  
chemical plants, etc.)



## Area Sources

NO<sub>x</sub>, VOC,  
PM, Toxics

(Residential, farming  
commercial, biogenic, etc.)

Chemistry

Meteorology

Ozone

PM

Acid Rain

Visibility

Air Toxics

Atmospheric  
Deposition

Climate  
Change



# Plan for Addressing Recommendation

- Provide early support for development of multi-pollutant control strategies
  - EPA memo to Regions in August 2005 that included:
    - Working definition of a multi-pollutant control strategy
    - Tiered approach for identifying toxic air pollutants
- Provide guidance for State, local, and Tribal entities on developing multi-pollutant control strategies
- Undertake a multi-pollutant pilot project in an urban area

## Guidance for S/L/Ts

Guidance will address development of a multi-pollutant control strategy, including:

- Rationale for pursuing a multi-pollutant control strategy
- A possible approach for overall control strategy development
- Possible approaches for the components of the assessment
- Elements needed (i.e., data, tools,... )
- Issues to address as part of development process
- Resources (i.e., where to obtain data, tools,...)

# Goals of the Multi-Pollutant Pilot Project

- Develop and test methods, tools, and framework for developing a multi-pollutant control strategy; identify where further work is needed
- Provide real world, illustrative example of multi-pollutant control strategy development
- Serve as foundation for guidance for S/L/Ts on development of a multi-pollutant control strategy

# Why Detroit Was Selected

- Detroit area was designated non-attainment for ozone and PM<sub>2.5</sub> NAAQS
- Detroit monitoring study had identified HAPs of concern, including manganese
- EPA ORD has ongoing exposure studies
- PM<sub>2.5</sub> sources of interest, such as steel mills and diesel PM sources, are present
- Michigan DEQ and EPA Reg. V were interested in participating in the pilot



Source: [www.flickr.com](http://www.flickr.com), "Metropolis"



Source: maps.google.com



Source: [maps.google.com](https://maps.google.com)

## Severstal – Blast Furnaces



Source: [www.flickr.com](http://www.flickr.com), "Blast Furnaces," Phil Ross, photo taken April 22, 2006.

U.S. Steel



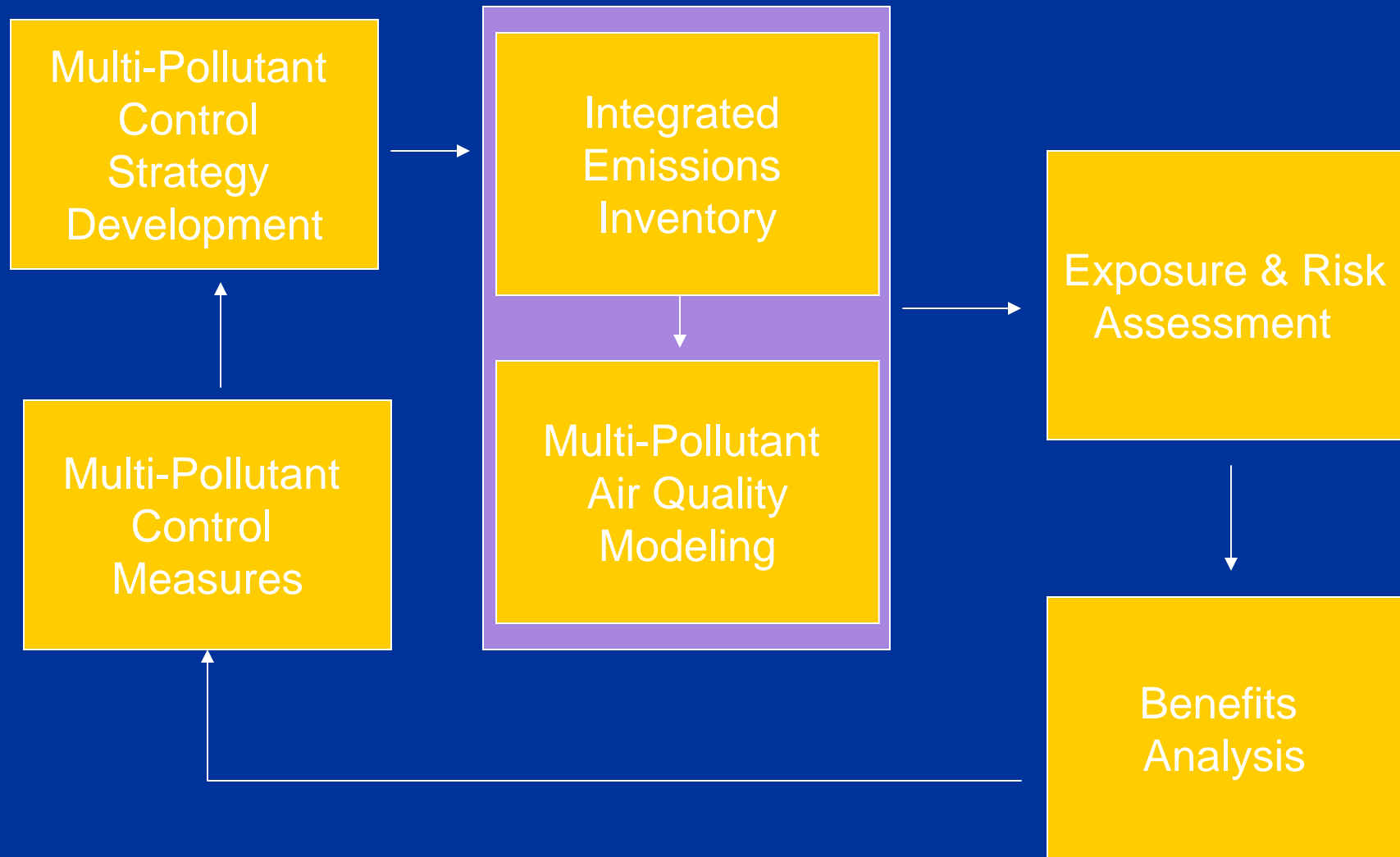
Source: [www.flickr.com](http://www.flickr.com), "Zug Island".

# Detroit Pilot is a Collaborative Effort

Collaborators include:

- Michigan DEQ
- Lake Michigan Air Directors Consortium (LADCO)
- Southeast Michigan COG (SEMCOG)
- EPA
  - OAR – OAQPS & OTAQ
  - ORD
  - Region V

# Detroit Multi-Pollutant Pilot Project: Analytical Framework



# Control Measure Data

- Control measure data have been collected and compiled from multiple sources, including:
  - AirControlNet
  - PM NAAQS RIA control measure data
  - LADCO white papers
  - EPA source category engineers
- These data should provide:
  - Refined “on the books” control measure data that is multi-pollutant
  - Expanded data on additional potential control measures and costs

# Control Strategies

- Pilot project will evaluate 2 control strategy scenarios
- Control Strategy Scenario 1
  - Reflect existing PM2.5 NAAQS 15/65 controls & draft Ozone SIP strategy for Detroit, as well as HAP reductions
  - This strategy will illustrate ability to assess “co-benefits”
- Control Strategy Scenario 2
  - Purpose is to illustrate how to potentially evaluate and make decisions in a multi-pollutant context (e.g., PM2.5 and Ozone controls that maximize toxic risk reductions)
  - Currently working on defining this strategy

# Emissions Inventory

- 2002 National Emissions Inventory (NEI) as starting point
  - Develop/ demonstrate an approach to optimize emissions characterization for local scale modeling
  - Seek sources of more locally representative data
- Refinements to be demonstrated include:
  - Verify data for significant plants
  - Link-based on-road mobile emissions
  - Non-road mobile local adjustments (LADCO/ Michigan DEQ)
  - GIS-based characterization for non-point source emissions

# Air Quality Modeling

- Multi-pollutant (PM, Ozone, ~ 40 toxics) & varying resolution
  - CMAQ-tox
  - AERMOD
- Hybrid approach
  - Preserves better resolution offered by dispersion modeling while properly treating chemistry/transport through use of photochemical models
- Model Runs
  - 2002 base case
  - Future year base case
  - Future year PM<sub>2.5</sub> 15/65 & O<sub>3</sub> SIP controls (Control Strategy Scen. 1)
  - Future year “optimized” control strategy (Control Strategy Scen. 2)

# Exposure/Risk/Benefits Analysis

- An approach is needed to try to quantify “co-benefits” and make decisions in a multi-pollutant context
- In order to aggregate and/or compare air quality changes in Ozone, PM, and HAPs, a common metric is needed
- Tools will be identified for evaluating benefits from criteria pollutant reductions and risk reductions from air toxics
- Approaches for assessing ‘trade-offs’ will be investigated

## Current Schedule

- Air Quality Modeling – Nov. 2006-March 2007
- Benefits Analyses – May 2007
- Report on Detroit Pilot Project – Summer 2007
- Draft Guidance on Multi-Pollutant Control Strategy Development – Summer 2007

# OAQPS Detroit Pilot Project Contacts

- Policy & Guidance
  - Amy Vasu, (919) 541-0107, [vasu.amy@epa.gov](mailto:vasu.amy@epa.gov)
- Modeling / Technical Approach
  - Karen Wesson, (919) 541-3515, [wesson.karen@epa.gov](mailto:wesson.karen@epa.gov)
- Emissions Inventory
  - Lee Tooly, [tooly.lee@epa.gov](mailto:tooly.lee@epa.gov)
- Control measures
  - Robin Langdon, [langdon.robin@epa.gov](mailto:langdon.robin@epa.gov),
  - Elineth Torres, [torres.elineth@epa.gov](mailto:torres.elineth@epa.gov),
- Control Strategies
  - Larry Sorrels, [sorrels.larry@epa.gov](mailto:sorrels.larry@epa.gov),
- Exposure & Risk Analysis
  - Mark Morris, [morris.mark@epa.gov](mailto:morris.mark@epa.gov),
- Benefits Analysis
  - Margie Jones, [jones.margie@epa.gov](mailto:jones.margie@epa.gov),

## For additional information on the Detroit Pilot Project:

- <http://www.epa.gov/air/caaac/aqm.html#library>
  - August 2005 memo & attachment
  - Detroit Steel Mill and Coke Battery Assessment, February 2006
  - Future final reports
- <http://www.epa.gov/ttn/scram/>
  - Future documentation on modeling