ATD Research Needs and Priorities
Panelists

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Research Needs and Priorities

- Most pressing needs
- Needs easily reached
- Understanding requirements to prioritize research needs
- Coordination and collaboration of efforts

Research Needs

(OFCM Report)

- Source Characterization
- Chemical Mixtures
- Collaboration and Coordination
- Limits of Predictability
- Measurement Strategies
- Characterization of Urban Canopy
- Urban Dispersion
- The Planetary Boundary Layer
- PBL Modeling Errors
- Coastal Influences
- Concentration Variability
- Deposition Rates
- Resuspension Rates
- Cross-Media Interactions
- Chronic Health Effects
- Complex Terrain
- Indoor-Outdoor Interactions
- Nocturnal Boundary Layer
- Land Surface Models

NRC Study
National Coordinated Effort

- New dispersion model constructs (computational)
- Techniques for ensembles at urban scale-probabilistic information to user
- Effective real time assimilation of meteorological and CBN sensor data
- Urban field studies for meteorological and dispersion modeling
- Bulk effects of urban area on surface energy, moisture, and momentum
- Establish an operational urban forecasting and dispersion system; use as test bed for instrumentation and model evaluation and development
- Develop measurement systems

Research Needs and Priorities (Panel Abstracts)

- Urban wind, turbulence, dispersion
- Urban validation data
- Integrate agent sensors into modeling systems
- Characterize scales at, below, and above T&D scales
- Observations – minimal set of obs required; *in situ* obs of thermal effects in cities
- Acquire knowledge and develop models to evaluate local effects
- Accuracy of PBL flows – daytime and other
- Meteorological & tracer data in 3 dimensions
- Uncertainty in models & inputs

Research Needs and Priorities
(Panel Abstracts)

- Conveyance of the threat
- Study local to regional scales
- Coupling of mesoscale and dispersion modeling – on scene data

Research Needs
(Consolidated?)

- **Diurnal PBL**
  - Land surface models / heterogeneous lower BC
  - Initial and Lateral BC
  - Parameterizations at smaller grid sizes (horizontal & vertical)
  - 4-D Measurements at high resolution
  - Quantifying Errors and Uncertainty

- **Urban Dispersion**
  - Field and wind tunnel studies for validation data sets
  - New model constructs
  - Probabilistic information to user
  - Effects on thermal, moisture, radiative, momentum at different scales
  - Urban morphology

Priorities

- **$$$$$**
- **Collaboration / Cooperation**
- **Full Time Operational Urban Network**
  - Forecasting
  - Dispersion modeling
  - Real-time data assimilation into forecast & dispersion models
  - Test bed
    - Instrument development and evaluation
    - Model performance evaluation
    - Measurement strategies