Data for Goods Movement
Impacts on Air Quality

March 17–18, 2008

Arnold and Mabel Beckman Center of the National Academies
Irvine, California

Organized by
Transportation Research Board

Supported by
California Department of Transportation

Cosponsored by
California Air Resources Board

www.TRB.org/conferences/2008/GoodsMovement
The Transportation Research Board is one of six major divisions of the National Research Council, which serves as an independent adviser to the federal government and others on scientific and technical questions of national importance. The National Research Council is jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The mission of the Transportation Research Board is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board’s varied activities annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. www.TRB.org
A Dialogue on the Impact of Freight Flows on Air Quality

The Transportation Research Board (TRB) has organized this two-day workshop with support from the California Department of Transportation and the cosponsorship of the California Air Resources Board. The program brings together leading researchers and practitioners to identify data sources needed to measure the impact of freight flows on air quality. The workshop focuses on California as an example setting, but the findings will have widespread applicability. The workshop objectives include the following:

- Establish the context:
  - Review the relationships between freight flows and air quality across the modes.
  - Identify the key air quality problems to be illuminated with enhanced freight data.
- Assess the current state of freight data for air quality management:
  - Identify relevant data currently available and their characteristics, architecture, and organization.
  - Define core data needed to support decisions to manage the air quality impacts of freight operations. What are the data elements and their granularity and architecture?
- Identify promising actions for securing necessary freight data for air quality management:
  - Discuss new methods—technologies, incentives, agreements—for collecting essential freight data.
  - Explore data-sharing partnerships, including public–private and public–public or interagency exchanges.
  - Suggest mechanisms to combine data from different sources to enhance their value and accessibility.
- Define future research and action needs to secure the data necessary to support planning and decision making with regard to freight impacts on air quality.

The workshop focuses on dialogue and discussion to identify actions to improve data resources and to inform critical policies and programs. Please contribute freely to our dialogue on this important topic.

—Matthew J. Barth
Workshop Planning Team Chair
Professor and Director, Center for Environmental Research and Technology
University of California, Riverside
SUNDAY, MARCH 16

7:00–8:00 p.m., Lido Room
Planning Team Meeting (by invitation)
Hyatt Regency Newport Beach

MONDAY, MARCH 17

7:00–8:20 a.m.
Buses from Hyatt Regency Newport Beach to Beckman Center
(Shuttle leaves at 7:00 a.m. and returns approximately 40 minutes later.)

7:30–8:15 a.m., Dining Room
Breakfast at Beckman Center

8:15–9:00 a.m., Auditorium
Setting the Context
Matthew J. Barth, University of California, Riverside, presiding

Keynote
David L. Greene, Corporate Fellow, Oak Ridge National Laboratory

9:00–10:30 a.m., Auditorium
Decisions Driving Data Requirements: Goods Movement,
Transportation Infrastructure, and Air Quality
Matthew J. Barth, presiding

This panel will establish the context for workshop discussions on improved goods movement data. It will review the relationships between freight flows and air quality across the modes and identify the key air quality problems to be illuminated with enhanced freight data.

Health Issues
Peter Greenwald, Senior Policy Advisor, South Coast Air Management District

Policy and Rules
Lynn Terry, Deputy Executive Officer, California Air Resources Board

Infrastructure Issues
Rich Macias, Interim Director of Planning and Policy, Southern California Association of Governments

Industry Perspective
Ginny Hessenauer, Director, Environmental Affairs, APL
10:30–11:00 a.m., Dining Room
Break

11:00 a.m.–12:30 p.m., Auditorium
Data Issues Overview
Rolf Schmitt, Federal Highway Administration, presiding

Freight Transportation Data Types
Michael J. Fischer, Cambridge Systematics, Inc.

Commodity Flow Data
Paul Bingham, Global Insight, Inc.

Economic/Land Use Data
Mike McCoy, University of California, Davis

Supply Chain Data
Rob Leachman, University of California, Berkeley

New Technology for Data Collection
Rob Tardif, Ontario Ministry of Transport

Infrastructure/Vehicle Inventory and Use
John Douglas Hunt, University of Calgary

12:30–1:30 p.m., Dining Room
Lunch

1:30–3:30 p.m.
Breakouts: Current Status of Data and Data Needs

Groups for each of the data types will address the following questions and prepare for breakout discussions on Tuesday on strategies for improvement:

- What additional data sources should be added to those discussed in the background paper and presentation?
- What strengths and limitations of existing data should be added to those discussed in the background paper and presentation?
- What are the significant gaps and limitations in existing data, and how critical are these gaps and limitations to guiding decisions concerning air quality and greenhouse gas emissions?
- Which gaps and limitations can be ameliorated with improved use of existing data, and which need new data sources?
- What types of new data show promise in meeting the needs?

Breakout Group Leaders:

Commodity Flow Data
Michael J. Fischer, Cambridge Systematics, Inc., and Ronald J. Duych, Research and Innovative Technology Administration

Economic/Land Use Data
Scott Drumm, Port of Portland, and Mike McCoy, University of California, Davis
Supply Chain Data
Christina Casgar, San Diego Association of Governments, and Thomas H. Wakeman III, Stevens Institute of Technology

Infrastructure/Vehicle Inventory and Use
John Douglas Hunt, University of Calgary, and Rolf Schmitt, Federal Highway Administration

3:30–4:00 p.m., Dining Room
Break

4:00–5:00 p.m., Auditorium
Reports from the Breakouts:
Where We Are and What We Need
Matthew J. Barth, presiding

Commodity Flow Data
Michael J. Fischer, Cambridge Systematics, Inc., and Ronald J. Duych, Research and Innovative Technology Administration

Economic/Land Use Data
Scott Drumm, Port of Portland, and Mike McCoy, University of California, Davis

Supply Chain Data
Christina Casgar, San Diego Association of Governments, and Thomas H. Wakeman III, Stevens Institute of Technology

Infrastructure/Vehicle Inventory and Use
John Douglas Hunt, University of Calgary, and Rolf Schmitt, Federal Highway Administration

5:00–5:30 p.m., Auditorium
Charge to Tuesday’s Breakout Groups:
Challenges of Integrating Data to Support Decision Making
Michael J. Fischer, Cambridge Systematics, Inc.

National Cooperative Freight Research Program:
Funding Opportunities and Procedures
William C. Rogers, TRB

5:30–7:00 p.m., Atrium
Posters and Reception

My “Trucker” Space: Making Owner-Operators Part of the Solution, Instead of the Problem
Sharon Banks, Cascade Sierra Solutions

Current Methodologies and Best Practices for Preparing Oceangoing Vessel Emission Inventories
Louis Browning, ICF International

Assessing the Uncertainty from Source Selection and Representation for Mobile Emission Source Activities in Air Dispersion Modeling Assessments of Goods Movement Facilities
Douglas Daugherty, ENVIRON Corporation
Midwest Regional Inventory of Heavy-Duty Diesel Emissions  
Chris Dresser, Midwest Regional University Transportation Center

Data Challenges in the Development of a Nationwide Inventory of Emissions from Port-Serving Trucks and Locomotives  
Cristiano Facanha, ICF International

Methodology for Quantifying the Emissions of Mexican Trucks in Nonattainment Areas  
Mohamadreza Farzaneh, Texas Transportation Institute

Using TRANSEARCH Data to Estimate Environmental Footprint of Freight Transportation  
Michael Filippov, Global Insight, Inc.

Using WIM Data to Study Heavy-Duty Truck Traffic Patterns for Emissions and Air Quality Impacts  
Oliver Gao, Cornell University

A Cart Before the Horse: Disaggregate Locomotive Emission Models and Data Constraints  
Gregory Gould, University of California, Davis

Reducing Emissions Through Cargo Insulation: Shifting Refrigerated Freight to Dry Containers  
Randall Guensler, Georgia Institute of Technology

Global Trade Comes Home: Community Impacts of Goods Movement  
Andrea Hricko, Keck School of Medicine, University of Southern California

Identifying and Processing Available and Appropriate Data for Rail Yard, Line-Haul, and Port Locomotive Emissions  
Robert Ireson, Air Quality Management Consulting

Port of Los Angeles Environmental Database System: Air Quality Module  
Paul Johansen, Port of Los Angeles

Value Analysis of Truck Toll Lanes in Southern California  
Keith Killough, Southern California Association of Governments

Data for Air Quality Impact Analysis from Urban Area Freight Data Collection Programs: Case Study of Portland, Oregon  
Akshay Mani, Cambridge Systematics, Inc., and Derek Jaeger, Port of Portland

Air Quality Benefits from Short-Haul Rail Intermodal Service Implementation Between the Central Valley and the Port of Oakland  
Akshay Mani, Cambridge Systematics, Inc.

New Tools and Methodology for Estimating the Air Quality Impacts of Oceangoing Vessels and Cargo-Handling Equipment  
Wayne Miller, University of California, Riverside

(continued)
Particulate Matter Reduction Through In-Use Testing  
Antonio Multari, MAHA Maschinenbau Haldenwang GmbH & Co., KG

Tracking Drayage Trucks and Modeling Freight Trips in the Los Angeles Basin  
Val Noronha, Digital Geographic Research Corporation

Air Quality Impacts of Domestic Freight Transportation: A Modal Comparison  
Annie Protopapas, Texas Transportation Institute

Representing Freight in Air Quality and Greenhouse Gas Models  
William C. Rogers, National Cooperative Freight Research Program

Port Drayage Environment and Energy Model  
Daniel Smith, Tioga Group, Inc.

Development of a Voluntary Clean Air Program at the Port of San Diego  
Michelle White, San Diego Unified Port District

Next Generation Intermodal Terminals  
John Zumerchik, Mi-Jack Products, Inc.

6:30–7:50 p.m.  
Buses return to Hyatt Regency Newport Beach  
(Shuttle leaves at 6:30 p.m. and returns approximately 40 minutes later.)

7:00–8:00 p.m., Huntington Room, Beckman Center  
Planning Team Meeting (by invitation)
TUESDAY, MARCH 18

7:00–8:20 a.m.
Buses from Hyatt Regency Newport Beach to Beckman Center
(Shuttle leaves at 7:00 a.m. and returns approximately 40 minutes later.)

7:30–8:30 a.m., Dining Room
Breakfast at Beckman Center

8:30–10:30 a.m.
Breakouts: Priorities for Improving Data Resources

Each breakout group will build on Monday’s discussion and develop proposals to improve data resources in order to meet upcoming decisions, addressing the following topics:

• Revisit and modify as necessary the assessment of gaps and limitations that can be ameliorated with improved use of existing data and those that require new data sources in light of Monday’s breakout reports and applications displayed in posters.
• Revisit and modify as necessary the types of new data that show promise in meeting the needs in light of Monday’s breakout reports and applications displayed in posters.
• Identify specific data that should be supplemented or created to meet the key gaps and limitations through new or modified data collection, new or modified forms of data access and sharing, or modeling.
• Identify cost, privacy, and institutional barriers to be overcome and ways in which they may be overcome.
• Identify special considerations concerning privacy, coverage, and so forth that need to be addressed if new data are sought from shippers and carriers or through new technology.
• Identify the most important steps that could be taken in the next 2 years and what can be done in a longer time frame.

Breakout Groups
Commodity Flow Data
Economic/Land Use Data
Supply Chain Data
Infrastructure/Vehicle Inventory and Use

10:30–11:00 a.m., Dining Room
Break

11:00 a.m.–noon, Auditorium
Reports from the Breakouts:
Priorities for Improving Data Resources
Matthew J. Barth, presiding

Commodity Flow Data
Michael J. Fischer, Cambridge Systematics, Inc., and Ronald J. Duych, Research and Innovative Technology Administration

Economic/Land Use Data
Scott Drumm, Port of Portland, and Mike McCoy, University of California, Davis

Supply Chain Data
Christina Casgar, San Diego Association of Governments, and Thomas H. Wakeman III, Stevens Institute of Technology

Infrastructure/Vehicle Inventory and Use
John Douglas Hunt, University of Calgary, and Rolf Schmitt, Federal Highway Administration
Noon–1:00 p.m., Dining Room
Lunch

1:00–3:00 p.m., Auditorium
Perspectives on the Workshop and Next Steps: What Exists and What Is Needed for Data Sources, Applications, Collaborations, Funding, New Methods
Matthew J. Barth, presiding

Perspectives on the Workshop and Next Steps
Joseph L. Schofer, Northwestern University
Anne Goodchild, University of Washington

Workshop Sponsor Reactions
Doug MacIvor, California Department of Transportation
Todd Sax, California Air Resources Board

Next Steps, Responsibilities, and Resources:
Setting Priorities for Future Actions, Policies, and Research
Matthew J. Barth

2:00–4:10 p.m.
Buses to Orange County–John Wayne Airport and to Hyatt Regency Newport Beach
(Shuttle leaves at 2:00 p.m. and returns approximately 1 hour later.)

3:30–5:00 p.m., Huntington Room, Beckman Center
Planning Team Meeting (by invitation)
**Hotel Information**

Hyatt Regency Newport Beach  
Newport Beach, CA 92660  
Phone: 949-729-1234

**Hotel–Airport Shuttle**

A complimentary shuttle bus runs to and from John Wayne–Orange County Airport, 6:00 a.m.–10:00 p.m. The shuttle leaves the hotel every hour on the hour and picks up at the airport at approximately 15 minutes past the hour, outside the baggage claim in the ground transportation area.

**Beckman Center**

Owned and operated by the National Academies, the award-winning Beckman Conference Center is a first-class facility sited on 7 acres bordering the cities of Irvine and Newport Beach. For information about the center, directions, and parking, go to [http://www7.nationalacademies.org/beckman/](http://www7.nationalacademies.org/beckman/).
The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users authorized the new National Cooperative Freight Research Program (NCFRP) with $3.75 million per year over a four-year period. The National Research Council of the National Academies has appointed an Oversight Committee for NCFRP with representatives from freight stakeholders to select projects and to allocate funds. The Oversight Committee has established a national research agenda for freight transportation and has selected 20 projects as part of a multiyear strategic plan.

NCFRP will conduct research and disseminate timely findings to inform investment and operations decisions affecting the performance of the freight transportation system. Policy makers will apply the information to make the nation’s multimodal freight transportation system more efficient, reliable, safe, and secure.

**NCFRP Projects**

**FY 2006–2007**

1. Review and Analysis of Freight Transportation Markets and Relationships ($250,000)
2. Impacts of Public Policy on the Freight Transportation System ($450,000)
3. Performance Metrics for Freight Transportation Productivity ($300,000)
4. Operational and Low-Cost Improvements to Freight Transportation System Performance ($500,000)
5. Review of Freight Investment Decision-Making Processes in the Public Sector ($400,000)
6. Freight Demand Modeling to Support Public-Sector Decision Making ($600,000)
7. Private-Sector Responses to Freight Transportation Capacity Constraints ($300,000)—combined with Project 4
8. Analytical Tools for Freight Infrastructure Investments ($600,000)—combined with Project 5
9. Institutional Mechanisms in the Freight Transportation System ($300,000)
10. Success Factors for Truck-Only Lane Projects ($50,000)—added to National Cooperative Highway Research Program Project 3-73

**FY 2008**

11. Current and Future Contributions to Freight Demand ($400,000)
12. Specifications for Freight Transportation Data Architecture ($300,000)
13. Developing High-Productivity Truck Corridors ($400,000)
14. Truck Drayage Practices ($400,000)
15. Understanding Urban Goods Movements ($500,000)
16. Representing Freight in Air Quality and Greenhouse Gas Models ($200,000)
17. Synthesis of Short Sea Shipping in North America ($100,000)
18. Synthesis of International Freight Scans ($30,000)
5A. Strategies for Investing in Priority Categories of Freight Projects ($100,000)—added to Project 5
6A. New Approaches to Freight Demand Modeling ($50,000)—added to Project 6

**NCFRP Oversight Committee**

- Michael Huerta, ACS Transportation Solutions, Chair
- Randal Mullett, Con-way, Inc., Vice Chair
- Lillian Borrone, Consultant
- Larry (Butch) Brown, Mississippi Department of Transportation
- Paul Brubaker, Research and Innovative Technology Administration
- Richard Capka, Federal Highway Administration
- Thomas Corsi, University of Maryland
- Coty (Reggie) Dupré, Dupré Transport LLC
- Tyler Duvall, U.S. Department of Transportation
- Emil Frankel, PB World
- John Gray, Union Pacific Railroad
- Rodney Gregory, IBM Global Business Services
- Jeffrey Holt, Goldman Sachs
- John Isbell, Nike, Inc.
- Gloria Jeff, Los Angeles Department of Transportation
- Thomas Jensen, United Parcel Service
- Michael Meyer, Georgia Institute of Technology
- Paul Nowicki, Burlington Northern Santa Fe Railway
- Craig Philip, Ingram Barge Line

**Tentative Schedule**

- **January 2008**: Announce projects and solicit panel nominations
- **March 2008**: Receive panel nominations
- **April 2008**: Panel meetings; begin issuing requests for proposals
- **June 2008**: Begin receiving proposals
- **July 2008**: Begin selection panel meetings
- **August 2008**: Begin executing contracts
- **September 2008**: Oversight Committee meets

**Contact**: Crawford Jencks, Program Manager, cjenks@nas.edu, 202-334-3233; or Bill Rogers, Project Manager, wrogers@nas.edu, 202-334-1621

[www.TRB.org/CRP/NCFRP/NCFRP.asp](http://www.TRB.org/CRP/NCFRP/NCFRP.asp)