TRB PRELIMINARY PROGRAM

NATMEC 2014
Improving Traffic Data Collection, Analysis, and Use

June 29–July 2, 2014

Chicago, Illinois

Organized by
Transportation Research Board

Supported by
Federal Highway Administration, Office of Highway Policy Information

Cosponsored by
Active Transportation Alliance
American Association of State Highway and Transportation Officials
Chicago Metropolitan Agency for Planning
Illinois Department of Transportation
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WELCOME

Heltebridle

NATMEC 2014—the North American Travel Monitoring Exposition and Conference 2014—provides an opportunity for traffic monitoring professionals to exchange and share information related to the collection, management, and use of monitored traffic data in all applications. Attendees will be able to network with local, state, and federal representatives, industry representatives, and vendors of equipment and software. If you are a state or regional traffic data collector, traffic data user, manager of data programs, or vendor, your participation is encouraged at NATMEC 2014. Whether for operational decision making, planning, or program or performance management, NATMEC 2014 is the premier venue for sharing experiences on effectively monitoring traffic flow. More than one hundred presentations will be presented in sessions in following five tracks:

- Policy, Management, Administration, Funding, and Federal Requirements;
- Data Requirements and Data Quality;
- Performance Measures and Reporting Results to Stakeholders;
- Performance and Capabilities of Traffic Data Collection Equipment; and
- Research, Innovation, and New Technologies; Technology Transfer.

For active transportation professionals interested in bicycle and pedestrian travel information, special sessions are planned that explore traffic data collection and monitoring of network and specific site locations on roadways, trails, and multiuse pathways. NATMEC 2014 has become the premier venue to learn more about effective methods and strategies for monitoring bicycle and pedestrian travel volumes and use of this data in operational decision making, planning, and program performance measure attainment.

—Laine Heltebridle
Chair, NATMEC 2014 Planning Committee
Director of the Bureau of Planning and Research,
Pennsylvania Department of Transportation

The City That Works

Photo: David E. Kosnik

Situated on the southwestern shore of Lake Michigan—the largest body of fresh water located entirely within the United States—Chicago historically has been an important crossroads. From its incorporation as a city in the age of canals, to its railroad heyday as the freight and passenger hub of North America, to the construction of modern urban expressways and development into some of the busiest airspace on the planet, the City That Works is focused on moving people and goods locally, regionally, and globally. NATMEC 2014 will be held at the Swissotel Chicago in the city center, walking distance from such attractions as Navy Pier; the Magnificent Mile shopping district, anchored by the Chicago Water Tower, which survived of the great fire of 1871, and the famously X-braced John Hancock skyscraper; Millennium Park, home of the Cloud Gate sculpture, better known as “the Bean;” the Art Institute of Chicago; and the Chicago Riverwalk and architectural boat tours of the city’s riverscape and lakefront. Other museums are a short ride away by transit, cab, or water taxi, and both ballparks are accessible by elevated train. More than 20 miles of lakefront paths—and a new bike-sharing program—await visitors seeking a two-wheeled perspective of the Windy City. Never shy about self-promotion, Chicagoans gladly invite visitors from around the world to experience their city.

CONFERENCE AT A GLANCE

	Sunday, June 29			Monday, June 30			Tuesday, July 1			Wednesday, July 2
7:00 a.m.						TRB Info Tech Committee		TRB Data Section Committee Chairs	TRB WIM Subcom-mittee	
8:00 a.m.				Plenary Session			Breakout Sessions			Breakout Sessions
9:00 a.m.	Classifica-tion Expert Panel	Workshop on Prep-ME for WIM Data Collection and Analysis								
10:00 a.m.				Breakout Sessions		Exhibits and Posters	Breakout Sessions		Exhibits and Posters	Closing Session
11:00 a.m.			TRB Bicycle and Pedestrian Data Subcom-mittee							
Noon				Lunch in Exhibit Hall	TRB Urban Data Committee		Lunch in Exhibit Hall	TRB Traffic Monitoring Committee		Planning Committee Debriefing
1:00 p.m.										
2:00 p.m.	Visualiza-tion Pool Fund	Workshop on Arterial Data and Perfor-mance Monitoring	Pedestrian and Bicycle Counting Workshop	Breakout Sessions			Breakout Sessions			
3:00 p.m.										
4:00 p.m.				Breakout Sessions			Breakout Sessions			
5:00 p.m.										
6:00 p.m.			Posters, Reception, Exhibits Opening	AADT Pooled Fund				ASTM		
7:00 p.m.										

PLANNING COMMITTEE TEAMS AND TRACK SUMMARIES

Laine Heltebridle, Pennsylvania Department of Transportation, *Chair*

Traffic Data Collection Equipment Performance and Capabilities

Scott Brady, Delaware Valley Regional Planning Commission; Benjamin Timerson, Minnesota Department of Transportation; Randy Travis, Nevada Department of Transportation

Track Sessions

- Bicycle and Pedestrian Detection Technologies Used for Counting and Collecting Trip Attributes (Tuesday 2:00 p.m.–3:30 p.m.)
- Bicycle and Pedestrian Detection (Tuesday 4:00 p.m.–5:30 p.m.)
- Ensuring Value is Obtained from Data Collection Budgets (Tuesday 4:00 p.m.–5:30 p.m.)
- New Technologies for Traffic Detection and New Applications to Present Traffic Data (Wednesday 8:30 a.m.–10:00 a.m.)

Data Requirements and Data Quality

Jeannette Montufar, University of Manitoba; Mark Hallenbeck, University of Washington; Steven Jessberger, Federal Highway Administration

Track Sessions

- How Good Are My Data? Data Accuracy and Reliability (Monday 10:30 a.m.–noon)
- Data Integration for Improved Decision Making (Monday 2:00 p.m.–3:30 p.m.)
- Working Together for Improved Travel Monitoring (Monday 4:00 p.m.–5:30 p.m.)
- Show Me the Data: Lessons in Traffic Monitoring (Tuesday 8:30 a.m.–10:00 a.m.)
- Improving Data from WIM Devices (Tuesday 2:00 p.m.–3:30 p.m.)

Performance Measures and Reporting Results to Stakeholders

Mena Lockwood, Virginia Department of Transportation; Daniel Jenkins, Federal Highway Administration; Todd Schmidt, Chicago Metropolitan Agency for Planning; Eileen Singleton, Baltimore Metropolitan Council

Track Sessions

- Data Collection Methodologies and Efficiencies (Monday 10:30 a.m.–noon)
- Calculation of Performance Measures for MAP-21 (Monday 2:00 p.m.–3:30 p.m.)
- Performance Measures to Improve Safety (Monday 4:00 p.m.–5:30 p.m.)
- Bicycle and Pedestrian Data Collection (Tuesday 8:30 a.m.–10:00 a.m.)
- Freight Data and Performance Measures (Tuesday 10:30 a.m.–noon)
- Multimodal Performance Management (Tuesday 2:00 p.m.–3:30 p.m.)
- Data in Action: Using Traffic Data to Resolve Problems and Answer Questions (Tuesday 4:00 p.m.–5:30 p.m.)
- Using Analysis And Visualization to Get Your Point Across (Wednesday 8:30 a.m.–10:00 a.m.)

Policy, Management, Administration, Funding, and Federal Requirements

Natalie Bettger, North Central Texas Council of Governments; Edward Christopher, Federal Highway Administration Resource Center; William E. Knowles, Texas Department of Transportation; Nancy Lefler, Vanasse, Hangen, Brustlin, Inc.

Track Sessions

- MAP-21, the Future, and Opportunities (Monday 10:30 a.m.–noon)
- Creating Bicycle and Pedestrian Programs and Policies (Tuesday 10:30 a.m.–noon)

Research, Innovation, and New Technologies; Technology Transfer

William Morgan, Illinois Department of Transportation; Michael Fontaine, University of Virginia; David Kosnik, CTLGroup; Penelope Weinberger, American Association of State Highway and Transportation Officials; Luann Hamilton, City of Chicago Department of Transportation

Track Sessions

- Use of Wireless Technology in Traffic Data Collection (Monday 2:00 p.m.– 3:30 p.m.)
- Traffic Data Presentation and Visualization (Monday 4:00 p.m.–5:30 p.m.)
- New Developments in WIM Collection and Use (Tuesday 8:30 a.m.–10:00 a.m.)
- Innovative Procedures and Equipment Usage for Traffic Data (Tuesday 10:30 a.m.–noon)
- Traffic and WIM Data for Bridge Management (Wednesday 8:30 a.m.–10:00 a.m.)

Sunday, June 29

Open to all registrants; advance registration required. Subject to capacity limits.

Advance Workshops

9:00 a.m.–noon
Prep-ME for Weigh-in-Motion Data Collection and Analysis Workshop
Kelvin C. P. Wang, Oklahoma State University; Michael M. Moravec, Federal Highway Administration (FHWA), *presiding*

This workshop introduces a pooled-fund study, TPF-5(242), to assist state departments of transportation (DOTs) in data preparation and to improve the management of pavement mechanistic–empirical (ME) design input data. The Prep-ME software includes comprehensive database features to store and process climate, traffic, and materials data. This tool is capable of preprocessing, importing, and checking the quality of raw weigh-in-motion (WIM) traffic data and of generating the required traffic data inputs by recognizing the differences in loading patterns or traffic groups.

1:30 p.m.–5:00 p.m.
Arterial Data and Performance Monitoring Workshop
Shawn M. Turner, Texas A&M Transportation Institute (TTI), *presiding*

Participants will:

- Better understand most feasible near-term approaches and technologies—such as global positioning system (GPS) probe, Bluetooth, or signal system–based—for gathering data for arterial performance monitoring;
- Become familiar with current quality levels of GPS probe data;
- Better understand uses of performance data on arterial streets—e.g., traffic engineering vs. planning vs. operations; and
- Learn about probabilistic (travel time distribution) versus deterministic (average travel time) performance approaches.

Accuracy and Implementation of Pedestrian and Bicycle Counting Technologies: Lessons from NCHRP 07-19 Workshop
Kelly Laustsen, Kittelson and Associates; Tony Hull, Toole Design Group; Robert J. Schneider, University of Wisconsin, Milwaukee; Frank Roland Proulx, University of California, Berkeley, *presiding*

This workshop will present the practitioner's guidebook produced by National Cooperative Highway Research Program (NCHRP) Project 07-19, which provides insights into establishing or growing bicycle and pedestrian counting programs. The background research comprised tests of six classes of automated counting devices under various operating conditions. This workshop will focus on the relative advantages and disadvantages of the tested sensor technologies and on methods of adjusting automated volume data to correct for systematic errors.

COMMITTEE MEETINGS

Meetings are open to all attendees, except when noted.

Sunday, June 29

11:00 a.m.–12:30 p.m.
TRB Bicycle and Pedestrian Data Subcommittee [ABJ35(3)]
Elizabeth Stolz, Sprinkle Consulting, Inc.; Scott Brady, Delaware Valley Regional Planning Commission, *presiding*

Monday, June 30

7:00 a.m.–8:15 a.m.
American Association of State Highway and Transportation Officials (AASHTO) SCOP Data Subcommittee
Gregory Ian Slater, Maryland State Highway Administration; Penelope Weinberger, AASHTO, *presiding*

TRB Information Systems and Technology Committee (ABJ50)
Frances D. Harrison, Spy Pond Partners, *presiding*

12:15 p.m.–1:45 p.m.
TRB Urban Transportation Data and Information Systems Committee (ABJ30)
Stacey Bricka, TTI, *presiding*

Tuesday, July 1

7:00 a.m.–8:15 a.m.
TRB Data and Information Systems Section Committee Chairs (ABJ00)
Joseph L. Schofer, Northwestern University, *presiding*

TRB WIM Subcommittee [ABJ35(2)]
Anne-Marie H. McDonnell, Connecticut DOT, *presiding*

12:15 p.m.–1:45 p.m.
TRB Highway Traffic Monitoring Committee (ABJ35)
Peter Keen, Digital Traffic Systems, Inc.; Elizabeth Stolz, Sprinkle Consulting Inc, *presiding*

OTHER MEETINGS

Sunday, June 29

9:00 a.m.–12:30 p.m.
Classification Expert Panel Meeting
Steven Jessberger, FHWA, *presiding*

1:30 p.m.–5:00 p.m.
Pooled Fund: Web-Based Traffic Data Visualization and Analysis Tools
David L. Jones, FHWA, *presiding*

Monday, June 30

5:30 p.m.–7:30 p.m.
AADT Pooled Fund Study TPF-5 (292)
Steven Jessberger, FHWA, *presiding*

Tuesday, July 1

5:30 p.m.–7:30 p.m.
ASTM Meeting
Steven Jessberger, FHWA, *presiding*

SESSIONS

Sunday, June 29

5:30 p.m.–7:30 p.m.
Exhibit Opening and Reception
See page 17 or visit www.NATMEC.org for exhibitor information. For questions, e-mail TRBExhibits@NAS.edu or contact Julie Miller at JMiller@NAS.edu.

5:30 p.m.–7:30 p.m.
Poster Session: Policy, Management, Administration, Funding, and Federal Requirements
Natalie Bettger, North Central Texas Council of Governments, *presiding*

Geoprocessing Using Python Script in Traffic Collision Analysis in City of Calgary
Wendy Pan, City of Calgary, Canada

Local Road Data to a Linear Referencing System—Pennsylvania DOT's Process
Joseph Piper, Pennsylvania DOT

Average Daily Traffic and User Miles Traveled: Performance Measures for Urban Multiuse Trails
Greg Lindsey, Steve Hankey, and Julian Marshall, University of Minnesota

A Data-Driven Approach to Modeling Work and Recreational Bicycle Trips in Los Angeles County
Monique Stinson Urban, Feng Liu, and Michael Snavely, Cambridge Systematics, Inc.

Selecting Permanent Count Locations for Bicyclist Monitoring in Winnipeg, Canada
Adam Richard Budowski and Jeannette Montufar, University of Manitoba, Canada

Leveraging Public–Private Partnerships for Data Management in Florida
Anita Vandervalk-Ostrander, Cambridge Systematics, Inc.

Poster Session: Traffic Data for Operations

Prediction of Incident Duration from Report History
Andrew Moylan and Joerg Rings, Iteris, Inc.

Variability: The Effect of Weather on Travel Time Across the United States as Seen Through Parameters of Prediction Models
Joerg Rings and Jaimyoung Kwon, Iteris, Inc.

Toward Route Planning with Weather Conditions
Joerg Rings, Iteris, Inc.

Real-Time Road Traffic and Weather Monitoring Over Wireless Cellular Networks
Hazem H. Refai, University of Oklahoma

Monday, June 30

8:30 a.m.–10:00 a.m.
Opening Session
Laine Heltebridle, Pennsylvania DOT, *presiding*

Welcome and Conference Objectives
Laine Heltebridle, Pennsylvania DOT
City of Chicago DOT
Luann Hamilton, Chicago DOT
Using Traffic Information to Support Decisions at the Chicago Metropolitan Agency for Planning
Kermit W. Wies, Chicago Metropolitan Agency for Planning
Meeting Critical Data Needs for the Federal-Aid Highway Program
David R. Winter, FHWA
A Traffic Data View from the Executive Office
Jeffrey M. South, Illinois DOT

10:30 a.m.–noon
MAP-21, the Future, and Opportunities (Policy and Management)

The Moving Ahead for Progress in the 21st Century Act (MAP-21) requires implementation of performance-based transportation programs. At this session, MAP-21 performance measures, as well as individual agencies' approaches to tracking, monitoring, and using these performance measures, will be discussed.

MAP-21 System Performance Measures Notice of Proposed Rulemaking
Richard V. Taylor, FHWA
Implementing a Traffic Monitoring Program for the 21st Century
Kevin Barron and Peter Keen, Digital Traffic Systems, Inc.
Florida Mobility Performance Measures Program and Data Initiatives—Transitioning to Real-Time Data
Anita Vandervalk-Ostrander, Cambridge Systematics, Inc.
Mobility and Reliability Measures from Statewide Probe Vehicle Travel Time Data in Virginia
Jungwook Jun, Virginia DOT

10:30 a.m.–noon
Data Collection Methodologies and Efficiencies (Performance Measures)

Vehicle speed and volume estimates are critical components of roadway performance analyses. These data can be difficult and expensive to collect. This session explores several methods of estimating and inferring information from the traffic data already collected or available.

An Approach to Estimate Speeds on Road Networks for Mobility Monitoring
David Lynn Schrank and Salar Zabihi Siabil, TTI
Use of Spatial Interpolation to Estimate Interurban Traffic Flows from Traffic Counts
Sergio A. Lugo Serrato and Laure Lucille Cochet, Avanti Engineering Group, Mexico
Estimating Traffic Flows from Annual Average Daily Traffic (AADT) and Third-Party Speed Data
Jaimyoung Kwon, Iteris, Inc.

10:30 a.m.–noon
How Good Are My Data? Data Accuracy and Reliability (Data Requirements)

Performance reports are only as good as the data they use. In this session, speakers will share their experiences and techniques for improving the accuracy of their data and reducing the cost of data collection programs. Attendees will learn techniques to help them optimize the outcomes from their data collection programs.

Wisconsin DOT Case Study and Findings: Understanding the Significance of Class versus Length on Axle Factors and Its Effect on AADT to Ensure Reliable Traffic Data
Susie Forde, Wisconsin DOT
Statistical Analysis of 24-Hour and 48-Hour Traffic Counts for Illinois DOT
James P. Hall, University of Illinois, Springfield
Utilizing Video Data Collection for Improved Traffic Analysis
Michael C. Hutchinson and Scott Presslak, TERRA Engineering
Visualization and Application of V-SPOC (Volume, Speed, and Occupancy) Data Quality Information
Xuan Shi, Steven Parker, and Yang Cheng, University of Wisconsin–Madison
Data Collection Accuracy
Dana Mutlow and Lindsay O'Reilly, City of Calgary, Canada

10:00 a.m.-4:00 p.m.
Exhibits

2:00 p.m.–3:30 p.m.
Calculation of Performance Measures for MAP-21 (Performance Measures)

To help meet the MAP-21 performance measures mandate, local and state agencies will benefit from learning about the experiences of others as they initiate or improve their own performance measurement programs. In this session, presenters will discuss a range of performance measurement program activities, including selecting and standardizing measures and targets, using and combining data from multiple sources, and combining road segments to meet reporting requirements.

The Impacts of Performance Measures Methodologies on Meaning and Interpretation
Michael L. Pack, University of Maryland, College Park
Preparing for Anticipated MAP-21 Mobility Performance Management Requirements: Experiences from Virginia DOT
William L. Eisele and David Lynn Schrank, TTI; Michael Daniel Fontaine, Virginia Center for Transportation Innovation and Research
Conflation Procedure to Combine Speed and Volume Datasets for MAP-21 Performance Measurement
David Lynn Schrank and Tao Geng, TTI
Pilot Study of AASHTO's Recommended MAP-21 Performance Measures
John C. Allen, New Jersey DOT; Keith Miller, North Jersey Transportation Planning Authority, Inc.

2:00 p.m.–3:30 p.m.
Data Integration for Improved Decision Making (Data Requirements)

Fusing data from multiple sources is crucial to deploying modern data systems, but merging diverse datasets requires matching location referencing systems and time aggregations and working with multiple organizations and information technology offices. This session presents multiple examples of how different agencies have successfully performed this task, developing new capabilities and providing more effective decision support tools for users.

Integrating State DOT Traffic Volume Data with Private Vendor–Archived Travel Time Data: Moving Toward a More Precise Approach
Sutapa Bhattacharjee, Keith Miller, and Brian J. Fineman, North Jersey Transportation Planning Authority, Inc.

Innovative Techniques for Sharing Traffic Count Data
John-Paul Hopman and Greg Slater, Michiana Area Council of Governments
Road Weather Information System, Incidents, and Speed–Volume Data Integration
Nikola Ivanov, University of Maryland, College Park
Pennsylvania's Highway Performance Monitoring System Web Application (iHPMS-PA)
Laine Heltebridle, Pennsylvania DOT
Methodology for Integrating Large Scale ITS Traffic Data with Lane Closure Data
Tao Qu, Steven Parker, and Yang Cheng, University of Wisconsin–Madison

2:00 p.m.–3:30 p.m.
Use of Wireless Technology in Traffic Data Collection (Research, Technology Transfer)

As more vehicles carry wireless devices and wireless communications expand at permanent traffic locations, Wi-Fi and Bluetooth technologies can be used to collect traffic information. This session will examine Wi-Fi address matching, Bluetooth readers, and power issues caused by the use of wireless communications at continuous-count locations.

Massachusetts DOT's Solar Power Analysis and Design at Continuous Count Stations
Sudhir Murthy, TrafInfo Communications, Inc.; James Dean, Massachusetts DOT
Traffic Data Collection Using Wi-Fi Address Matching
Darryl Puckett, TTI
Travel Time Studies Utilizing Portable Bluetooth Readers
Robert Joseph Benz, TTI

4:00 p.m.–5:30 p.m.
Performance Measures to Improve Safety (Performance Measures)

Tracking and improving the safety of the transportation network is a critical task for all agencies. The presenters will discuss how to design safety evaluation programs and will survey the data and tools used to track and improve traveler and work zone safety.

Exploring Potential Work Zone Safety Performance Measures Using Integrated Traffic Management Data Platform in Virginia
In-Kyu Lim and Young-Jun Kweon, Virginia DOT
Business Intelligence System for Traffic Data Integration: Linking Roadway, Collision, and Traffic Flow Data to Improve Traffic Safety
Stevanus Tjandra, City of Edmonton, Canada
A Systematic Approach to Identifying Traffic Safety Needs and Intervention Programs
Andrew P. Tarko, Jose Thomaz, and Mario Romero, Purdue University

4:00 p.m.–5:30 p.m.
Working Together for Improved Travel Monitoring (Data Requirements)

Travelers frequently cross jurisdictional boundaries as part of their travels and rarely care about boundaries, whether jurisdictional or modal. Unfortunately, the data collection process cares. This session explores innovative ways for agencies to work together to support data collection that meets the needs of multiple agencies and types of users.

Valuing and Improving Transportation-Related Data Programs: Report from 2013 TRB Sessions
Todd Alexander Litman, Victoria Transport Policy Institute, Canada
Interoperability of Traffic Data Between Local and State Agencies
Nancy X. Lefler, Vanasse Hangen Brustlin, Inc.
Local Agency Data Collection
Scott Petersen, SRF Consulting Group, Inc.

4:00 p.m.–5:30 p.m.
Traffic Data Presentation and Visualization (Research, Technology Transfer)

As traffic data collected from multiple sources continue to increase, sharing and analyzing the vast amount of data grows more challenging. Converting that data into information that supports decision making is key to the sustainability of performance measurement. This session will examine methods for effective sharing and visualization of data, along with other strategies that improve the use and sustainability of data collection programs.

Why Nobody Cares: How Investment in Data Visualization and Open Access Can Reinvigorate Dying Programs
Michael L. Pack, University of Maryland, College Park
A Virtual Data Sharing Framework: FHWA Prototype Project
Anita Vandervalk-Ostrander, Cambridge Systematics, Inc.
Cloud-Based Visualizations: A Conduit for Sharing Traffic Data
Catherine Theresa Lawson and Alex Muro, University at Albany, State University of New York

Tuesday, July 1

8:30 a.m.–10:00 a.m.
Pedestrian and Bicycle Data Collection (Performance Measures) 

With bike use growing, bike-sharing systems popping up across the United States, and new technologies to collect data, agencies increasingly are becoming familiar with effective methods to collect, analyze, and use pedestrian and bicycle data. This session presents innovative ways to collect bike and pedestrian data and how to share that data widely to improve planning for bike share systems and other nonmotorized facility improvements.

Performance-Based Planning and Analysis for Bicycle Share Systems
Jacob Mason, Institute for Transportation and Development Policy; Colin K. Hughes, Institute for Transportation and Development Policy, China
Creating the Bicycle Count Data Clearinghouse for Los Angeles County, California
Kristen Huff and Madeline Brozen, University of California, Los Angeles
Cycle Atlanta: Facilitating GPS-Based Data Collection for Bicyclists in Atlanta
Aditi Misra, Kari Edison Watkins, and Christopher A. Le Dantec, Georgia Institute of Technology
Mining Pedestrian Push Button Actuations: Validations, Trends, and Performance Measurement at Signalized Intersections
Sirisha Murthy Kothuri, Christopher M. Monsere, and Miguel Figliozzi, Portland State University

8:30 a.m.–10:00 a.m.
Show Me the Data: Lessons in Traffic Monitoring (Data Requirements)

This session describes real-world lessons that help agencies get the most out of their travel monitoring programs. It explores ways to improve the cost effectiveness, utility, and accuracy of data collected and summary statistics for reporting and use.

Improving the Value of Road Tube–Based Temporary Studies
Mike Alexy, Peek Traffic
Automatic Traffic Recorder Data Collection Process
William Morgan, Illinois DOT
Creating Seasonal and Daily Adjustment Factors for Nonmotorized Traffic in Colorado
Krista Nordback, Portland State University; Bruce N. Janson, University of Colorado, Denver

8:30 a.m.–10:00 a.m.
New Developments in WIM Collection and Use (Research, Technology Transfer)

The installation and maintenance costs of fixed WIM stations is a major issue for states, especially when located on lower-volume and rural roads. This session will examine two states' use of portable WIM systems as alternatives to permanent equipment, along with research on reducing the cost of WIM calibration by using vehicle reidentification techniques.

Enhancing a Vehicle Reidentification Methodology Based on WIM Data to Minimize the Need for Ground Truth Data
Andrew P. Nichols, Marshall University; Mecit Cetin, Old Dominion University, Norfolk; Chih-Sheng Chou, Rahall Transportation Institute
Recent Development of Portable WIM System Studies at Minnesota DOT
Taek Mu Kwon, University of Minnesota, Duluth; Benjamin Jay Timerson, Minnesota DOT; Scott Petersen, SRF Consulting Group, Inc.
Kansas Portable WIM
Mark Maddux, Kansas DOT

10:00 a.m.–2:00 p.m.
Exhibits

10:30 a.m.–noon
Creating Bicycle and Pedestrian Programs and Policies (Policy and Management)

Bicycle and pedestrian data collection play a critical role in programming and building multimodal transportation systems that provide options for all users. This session will discuss initiatives to plan, fund, and implement bike and pedestrian data collection programs and other resources that support these efforts.

Developing a Statewide Data Nonmotorized Collection Program: A North Carolina DOT Research Project
Elizabeth Stolz, Sprinkle Consulting Inc; Sarah Worth O'Brien, North Carolina State University, Raleigh
Delaware Valley Regional Planning Commission (DVRPC) Permanent Bicyclist and Pedestrian Counting Program
Christopher Linn, DVRPC
2013 Chicagoland Bike Map
Paul Lippens and Marissa Dolin, Active Transportation Alliance
Overview of Bicycle and Pedestrian Chapter of the Traffic Monitoring Guidebook
Shawn M. Turner, TTI

10:30 a.m.–noon
Freight Data and Performance Measures (Performance Measures)

With the implementation of MAP-21, states have the capability to receive an increased federal share for projects targeted for freight movement. States will need to have freight plans and this session will provide insight on truck data that can be used to develop these plans.

Freight Performance Measures Using Truck GPS Data and the Application of National Performance Measure Research Data Set
Chen-Fu Liao, University of Minnesota
Benchmarking and Trending Analyses of Truck Traffic Classification and Body-Type Characteristics
Kristopher Maranchuk, Manitoba Infrastructure and Transportation, Canada; Jonathan D. Regehr, University of Manitoba, Canada
Freight Performance Measures Using Truck GPS Data: History and Latest Trends
Jeffrey Bradford Short, American Transportation Research Institute

10:30 a.m.–noon

Innovative Procedures and Equipment Usage for Traffic Data (Research, Technology Transfer)

New technologies, along with innovative uses for existing technologies, frequently are introduced as options for traffic data collection. This session presents different examples of technologies, from the conceptual stage to deployment: LIDAR, multielement piezoelectric sensors, and the use of intersection video data as part of a state's traffic program.

Road Traffic Scanner (TScan) for Collecting High-Resolution Data for Traffic and Safety Analysis
Andrew P. Tarko and Mario Romero, Purdue University

A Novel Technique for Measuring Vehicle Speed and Classifying Vehicles Using Multielement Piezoelectric Sensor
Samer Rajab, Ahmad Mayeli, and Hazem H. Refai, University of Oklahoma

IRD VECTORSENSE: Introduction of a New Sensing Technology
Randy Hanson and Roy Czinku, International Road Dynamics, Inc., Canada; Terry Bergan, International Road Dynamics

2:00 p.m.–3:30 p.m.

Multimodal Performance Management (Performance Measures)

Multimodal performance management provides a more complete picture of the transportation system because it considers all modes of transportation. This session will demonstrate examples of how to archive multimodal data, how to perform multimodal performance evaluation, and how to communicate multimodal performance measures with decision makers.

Toward More Comprehensive and Multimodal Transportation Performance Evaluation
Todd Alexander Litman, Victoria Transport Policy Institute, Canada

Multimodal System Performance Analysis and Reporting: Washington State DOT's Effort to Meet Changing Decision and Information Needs
Daniela Bremmer, Washington State DOT

Portal: Applications of New Technology to Transportation Data Archiving
Kristin A. Tufte and Morgan Harvey, Portland State University; Jonathan Makler, Oregon Transportation Research and Education Consortium

2:00 p.m.–3:30 p.m.

Improving Data from WIM Devices (Data Requirements)

This session will help users of WIM data understand the strengths and limitations of their data, how to improve the collected data and the summary statistics, and how to select the best data for their analysis needs.

Investigation of Accuracy Metrics from National WIM Dataset
Andrew P. Nichols, Marshall University; Chih-Sheng Chou, Rahall Transportation Institute; Tiantian Chen, University of Minnesota, Twin Cities

Inferring Bias of Axle Weights from Measured Gross Vehicle Weight Bias
Barbara Katherine Ostrom, AMEC Environment and Infrastructure, Inc.

Classification Accuracy Study for Automatic Vehicle Classification and WIM Sites Using Video Validation Tool
Omar Qalaa and Hazem H. Refai, University of Oklahoma; Daryl Johnson, Oklahoma DOT

Using National and Local Resources to Meet Pavement Designers' Needs for WIM Data: Georgia DOT's Experience with *Mechanistic–Empirical Pavement Design Guide* Implementation
Olga I. Selezneva, Applied Research Associates, Inc.

2:00 p.m.–3:30 p.m.

Bicycle and Pedestrian Detection Technologies Used for Counting and Collecting Trip Attributes (Data Collection)

The growth of bicycle and pedestrian monitoring programs, together with travel behavior characteristics that complicate the transferring of traditional travel monitoring methods, have led to fertile ground for development of technology to address the need for better nonmotorized travel estimates. Presentations focus on technologies in use for bike and pedestrian detection as well as collecting a range of trip characteristics for nonmotorized travel.

Automatic Cycle and Pedestrian Monitoring in the United Kingdom
Andy Lees, TDC Systems Ltd.

Monitoring Nonmotorized Traffic in Minnesota: The Minnesota Bicycle and Pedestrian Counting Initiative
Erik Minge, SRF Consulting Group, Inc.; Greg Lindsey, University of Minnesota; Lisa Austin, Minnesota DOT

Opportunistic GPS Location and MAC Address Sensing for Pedestrian Data Collection
Yinhai Wang and Kristian Henrickson, University of Washington

The Trail Monitoring and Assessment Platform (T-MAP)
Tracy Loh, Rails to Trails; Greg Lindsey, University of Minnesota

4:00 p.m.–5:30 p.m.

Data in Action: Using Traffic Data to Resolve Problems and Answer Questions (Performance Measures)

How can traffic data be better used to answer operational questions and resolve problems? This session provides several real-world examples of data analytics and data integration in action to provide useful information and lend insights that can improve the way traffic is managed.

Before-and-After Study of the I-495 Express Lanes Construction in Virginia
Ramkumar Venkatanarayana, Virginia DOT; Benjamin H. Cottrell, Virginia Center for Transportation Innovation and Research

Correlation Between Freeway Bottlenecks and Arterial Congestion
Andrew Moylan and Karl Petty, Iteris, Inc.

Finding Hidden Bottlenecks Using Correlations Between Bottleneck Activation Times
Andrew Moylan and Karl Petty, Iteris, Inc.

Decomposition of Congestion and Travel Time Reliability into Various Sources Using Link Speed Data
Jaimyoung Kwon and Karl Petty, Iteris, Inc.

Augmenting Short-Term Travel Time Prediction Models with Radar-Based Rainfall Predictions
Joerg Rings, Iteris, Inc.

4:00 p.m.–5:30 p.m.

Bike and Pedestrian Detection (Data Collection)

Demand has increased for bicycle and pedestrian traffic counts on sidewalks, roadways, and bike trails. This session will cover several ways to collect these counts, including limiting factors based on cost and obstacles to accurate counts.

Unsupervised Framework for Pedestrian Detection and Counting
Evangelos Palinginis, Alice Grossman, and Randall Guensler, Georgia Institute of Technology

Kinect-Based Pedestrian Detection for Crowded Scenes
Yinhai Wang and Kristian Henrickson, University of Washington; Xiaofeng Chen, Northwestern Polytechnical University

Using Signal Controllers to Count Bicycles
Krista Nordback and Pamela Johnson, Portland State University; Peter J. V. Koonce, City of Portland, Oregon

4:00 p.m.–5:30 p.m.
Ensuring Value Is Obtained from Data Collection Budgets (Data Collection)

Travel monitoring equipment currently in operation is assumed to be adequately vetted and to perform to specification. Presentations describe ways to make sure a data collection program is delivering the expected data. The presentations analyze equipment accuracy; temporal intervals between WIM equipment validation efforts; and determining the value, strengths, and weaknesses of purchased, probe-based, travel-time data.

Empirical Comparison of Accuracy of Road Tube Counter and Classifiers
Mike Alexy, Peek Traffic
Assessing WIM Equipment Validation Intervals
Barbara Katherine Ostrom, AMEC Environment and Infrastructure, Inc.
The Development of a Portable WIM System
Ahmad Othman and Hazem H. Refai, University of Oklahoma; Daryl Johnson, Oklahoma DOT
From Traditional Probe Survey Towards Purchased Data: Lessons Learned from the Transition of the Travel Time Study
Andrew Chun Kit Wong and Marc Tan, IBI Group, Canada; Goran Nikolic, Ontario Ministry of Transportation, Canada

Wednesday, July 2

8:30 a.m.–10:00 a.m.
Using Analysis and Visualization to Get Your Point Across (Performance Measures)

Ever-increasing amounts of data and analytical capability have greatly expanded the use of data and performance measures in decision making. How is the right data selected and converted into the right information for its intended audience? This session explores tools, processes, and techniques used for analysis and for making a point to various stakeholders.

Visualizing Traffic Monitoring Tree Structure Data Changes over Time
Michael L. Pack, University of Maryland, College Park
Real-World Problems, Real-World Answers: Probe Data Analytics in Action!
Michael L. Pack, University of Maryland, College Park
Data-Driven, Geospatial-Enabled Transportation Platform for Freeway Performance Analysis
Yinhai Wang and Sa Xiao, University of Washington
Computation and Visualization of Historic Congestion Trends on Virginia Interstates During Major Holiday Travel Periods
Sanhita Lahiri, Virginia DOT; Simona E. Babiceanu, University of Virginia

8:30 a.m.–10:00 a.m.
Traffic and WIM Data for Bridge Management (Research, Technology Transfer)

Innovative acquisition methods and applications of traffic data relevant to aspects of bridge management—such as weight enforcement, bridge design, and lifecycle analysis—will be discussed. Techniques include WIM using instrumented bridges and license plate recognition.

A Comparison of U.S. and European Bridge Loadings
Cathal Leahy and Eugene John O'Brien, University College Dublin, Ireland; Bernard Enright, Dublin Institute of Technology, Ireland
Improving Bridge WIM Technologies
Eugene John O'Brien, University College Dublin, Ireland; Peter Favai, Cestel
License Plate Recognition Accuracy and Data Integration
Scott Petersen, SRF Consulting Group, Inc.; Benjamin Jay Timerson, Minnesota DOT

8:30 a.m.–10:00 a.m.
New Technologies for Traffic Detection, and New Applications to Present Traffic Data (Data Collection)

Advanced technology is increasing the value of traffic data by facilitating of collection of greater detail in the data at the front end. In the same way, progress in data delivery provides value at the back end to decision makers, researchers, and the public. Presentations in this session address new data collection and presentation technologies.

Vehicle Detection and Classification on the Basis of Digital Image Processing: IP Camera as a Noninvasive Tool Used in Traffic Technology
Piotr Bardadyn and Dolega Cezary, Neurosoft
Traffic Detector Sensor Analytics and Visualization of Performance Measures
Nikola Ivanov, University of Maryland, College Park
Utilizing Video Intersection Turning Movement Counts to Obtain AADT
Mike Miller, Illinois DOT

10:30 a.m.–noon
Closing Session
Laine Heltebridle, Pennsylvania DOT, *presiding*

Traffic Data Initiatives at FHWA
Tianjia Tang, FHWA
Key Issues from the Conference and Next Steps to Move the Traffic Monitoring Community Forward
Mark E. Hallenbeck, University of Washington

12:30 p.m.–2:00 p.m.
Planning Committee Debriefing and Working Lunch (*members only*)
Laine Heltebridle, Pennsylvania DOT, *presiding*

EXHIBITORS

Diamond Traffic Products
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As a leading supplier of traffic data recording equipment, Diamond Traffic has been designing, manufacturing, and selling equipment for the industry since 1977 and is committed to providing value to customers through quality products and services that are proven and reliable.

Digital Traffic Systems, Inc.
www.dtsits.com

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Traffic monitoring and data hosting services.

ECM Inc.
www.ecmusa.com

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ECM Inc. is a global company that manufactures and supplies traffic data collection equipment, including advanced WIM systems and integrated systems such as unattended truck weight enforcement, rollover warning, and over-height protection systems. ECM's offices in the United States, France, and South Korea—along with numerous distributors—work together to provide customers with exceptional and responsive technical support.

Eco-Counter
www.eco-counter.com

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Phone: 866-518-4404

Eco-Counter is a world leader in providing specialized automatic pedestrian and cyclist counters. Using advanced sensor technologies, our solutions can classify users for both temporary and permanent count locations. Data can be accessed through the Web-based Eco-Visio software. Eco-Counter has more than 8,000 systems installed in more than 40 countries worldwide.

Federal Highway Administration
www.fhwa.dot.gov/policyinformation/

David Jones
Office of Highway Policy Information
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The FHWA Office of Highway Policy Information establishes data collection policy and guidelines, facilitates the application of technology, and collects and analyzes highway-related information from throughout the United States, including information about highway financing, motor fuel use, driver licensing, vehicle registration, traffic, and travel. *Highway Statistics* and other publications provide information on the current state of highway operation and historical perspectives on our highway system.

High Desert Traffic, LLC
www.hdtraf.com

Joe Wilkinson
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505-438-7353 or 888-598-4267

High Desert Traffic specializes in software support for traffic analysis and warehousing programs. We combine decades of experience in the traffic industry with our new Jackalope Analysis Engine to assist with every step of your traffic data collection and analysis needs. Jackalope supports all federal reporting (e.g. TMAS and HPMS) with easy, map-based maintenance and sharing of collection sites, data, and statistics.

International Road Dynamics Inc.
www.irdinc.com

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International Road Dynamics (IRD) Inc. is a highway systems technology company producing a variety of integrated solutions to better manage the operations and improve the safety of highway facilities. These intelligent transportation systems are used worldwide by highway operators and highway users.

JAMAR Technologies, Inc.
www.jamartech.com

Kelly Cupps
kelly@jamartech.com
Phone: 800-776-0940

JAMAR Technologies has been providing quality equipment for traffic data collection for more than 30 years. The TRAX pneumatic data recorders, noninvasive Radar Recorders, and hand-held Ultra data recorders are well known for their accuracy, and JAMAR's analysis software is equally well-known for its ease of use.

Kistler Instrument Corporation
www.kistler.com

Christina Clark
christina.clark@kistler.com
Phone: 248-668-6900

Kistler manufactures the Lineas Quartz Weigh-in-Motion sensor: low cost, easy to install, and delivers consistently reliable results for prescreening weight enforcement that is used extensively around the world. The latest version of Lineas is available with charge or voltage output along with signal conditioning equipment to match.

M H Corbin Inc
www.mhcorbin.com

Mack Corbin
mhc@mhcorbin.com
Phone: 614-873-5216

Traffic counting and classification device (HiStar NC300) and Highway Advisory Radio (BlackMax).

Measurement Specialties Inc.
www.meas-spec.com

Donald Halvorsen
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Phone: 757-766-4405

Measurement Specialties manufactures the BL Piezoelectric Traffic Sensor. Used throughout the world, BL sensors are designed for WIM, vehicle counts and classification, and triggers for red-light and speed cameras. Simple to install and with high reliability, BL sensors are an integral part of your traffic management system.

MetroCount USA
www.metrocount.com

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Founded in 1987, and with offices in Maryland (USA), London, and Perth (Australia), MetroCount is an electronics design and manufacturing company. Our primary focus is equipment and software for road traffic monitoring.

Midwestern Software Solutions
www.ms2soft.com

Lev Wood
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Midwestern Software Solutions (MS2) is expert in the design and hosting of cloud-based transportation data management systems. Our database modules manage transportation data sets such as vehicle volume count data, turning movement and crash data, pavement condition data, travel time data, and more.

Mikros Systems (Pty) Ltd
www.mikros.co.za

Rob Sik
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On display will be the new range of the Mikros Systems RAKTEL traffic data logger range, showcasing the new HSWIM logger products. The TrafBase support software, with its powerful data-quality checking and comprehensive data base management and reporting modules, also will be exhibited.

Miovision Technologies
www.miovision.com

Roman Prikhodko
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Phone: 519-513-2407

Miovision creates an effective method for traffic data collection using a video-based system. We help data collectors, engineering firms, and government agencies reduce costs for reliable and accurate traffic data collection. Miovision also is developing an adaptive signal control solution to optimize traffic signals and reduce delays within a city.

Peek Traffic Corporation
www.peektraffic.com

Violet Szalkai
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Peek Traffic specializes in high-performance hardware and software for vehicle detection, counting, classification, weighing, and speed measurement. Applications range from temporary counts using road tubes to complex, multilane intelligent transportation system installations with high-speed communications. Peek is exhibiting multiple new hardware and software products, including its new Pulsar and Streetlink.

Southern Traffic Services, Inc.
www.southerntrafficservices.com

Jim Neidigh
jneidigh@southerntrafficservices.com
Phone: 512-818-3804

Southern Traffic Services, Inc., specializes in traffic data collection, analysis, and the construction of Permanent Traffic Monitoring Sites. We continue to be recognized as a leader in our industry by providing our customers with accurate, dependable, traffic data collection and analysis.

The Traffic Group, Inc.
www.trafficgroup.com

Renata Haberkam
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Phone: 410-931-6600

With more than 3,000 pieces of equipment, The Traffic Group conducts nearly 115,000 counts annually, including providing data for origin–destination studies using ALPR, Bluetooth, or Wi-Fi technologies; manual turning movement counts; parking lot occupancy and turnover studies; pedestrian–vehicle classification counts; queuing studies; and speed, travel time, and delay studies.

TimeMark Incorporated
www.TimeMarkInc.com

Daniel Gossack
danielg@timemarkinc.com
Phone: 503-363-2012

Traffic data collection systems using manual input or road tubes and VIAS 2, which uses the most sophisticated algorithm to process the time-stamped event data and is incredibly good at analysis of data from two lanes in the same direction.

TrafInfo Communications, Inc.
www.trafinfo.com

Sudhir Murthy
smurthy@trafinfo.com
Phone: 888-710-5380, ext. 101

TrafInfo Communication, Inc., wireless communication system for traffic data collection, including the Trafmate 7 wireless transceiver, the free online station status monitoring and maintenance management system

Transmetric America Inc
www.transmetric.com

Stephen Cropley
accounts@transmetric.com
Phone: 512-977-1822

Transmetric is a leader in traffic data cloud services, with Transmetric Traffic Server 7, Traffic Polling System, and now GEOCOUNTS, a low-cost cloud service for storing any count information. Visit us at the booth for more!

Visit www.NATMEC.org for exhibitor information. For questions, e-mail TRBExhibits@NAS.edu or contact Julie Miller at JMiller@NAS.edu.

Registration Fees

	Early Bird	Advance	Regular
General	$540	$615	$690
Speaker and TRB Sponsor	$430	$505	$580
Student	$195	$270	$345

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