

7th

International Symposium on Visualization in Transportation

October 23-25, 2013

Beckman Center of the
National Academies of Sciences
Irvine, California



PRELIMINARY PROGRAM

Cosponsored by
Federal Highway Administration

Patrons
Autodesk
CATT Laboratory
Iteris, Inc.
RDV Systems

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

AGENDA AT A GLANCE

Wednesday, October 23		
8:00 AM - 9:00 AM	Breakfast	<i>Dining Room</i>
9:00 AM – 10:45 AM	Opening Plenary Session & Keynote Addresses	<i>Auditorium</i>
10:45 AM – 11:00 AM	Networking Break	
11:00 AM – Noon	Breakout Sessions	
	Building Blocks for CIM Success	<i>Auditorium</i>
	Biking and Car Sharing	<i>Huntington</i>
	Signal and Arterial Operations	<i>Board Room</i>
Noon – 1:15 PM	Lunch	<i>Dining Room</i>
1:15 PM – 2:45 PM	Breakout Sessions	
	Digital Cities Workshop	<i>Auditorium</i>
	Asset Management, Roads & Utilities	<i>Board Room</i>
	Transit Operations & Data Analysis	<i>Huntington</i>
2:45 PM – 4:00 PM	Exhibitor Networking	<i>Atrium</i>
4:00 PM – 5:30 PM	Breakout Sessions	
	VDC Case Studies	<i>Auditorium</i>
	Mobile/Probe Data Collection & Analysis	<i>Huntington</i>
	Work Zone Management	<i>Board Room</i>
5:30 PM – 7:00 PM	Exhibitor Reception	<i>Atrium</i>
Thursday, October 24		
8:00 AM - 9:00 AM	Breakfast	<i>Dining Room</i>
9:00 AM – 10:30 AM	Breakout Sessions	
	Design and Visualization of Infrastructure for Safety	<i>Auditorium</i>
	Evaluation & Decision Support	<i>Huntington</i>
	Modeling and Simulation	<i>Board Room</i>
10:30 AM – 11:00 AM	Networking Break	
11:00 AM – Noon	Keynote Address	<i>Auditorium</i>
Noon – 1:15 PM	Lunch	<i>Dining Room</i>
1:15 PM – 2:45 PM	Breakout Sessions	
	Data Integration & Collaboration	<i>Auditorium</i>
	VDC-CIM Innovations	<i>Board Room</i>
	Mobile Distribution of Traveler Information	<i>Huntington</i>
2:45 PM – 3:15 PM	Networking Break	
3:15 PM – 4:45 PM	Breakout Sessions	
	Workshop on 3D GIS Data Integration	<i>Auditorium</i>
	Archived ITS & Highway Infrastructure	<i>Huntington</i>
4:45 PM – 6:30 PM	Electronic Poster Session	<i>Atrium</i>
	Reception	<i>Atrium</i>

8/30/13 DRAFT Preliminary Program

Friday, October 25		
8:00 AM - 9:00 AM	Breakfast	<i>Dining Room</i>
9:00 AM – 10:30 AM	Breakout Sessions	
	ROI for VDC: Presentation & Discussion	<i>Huntington</i>
	Driver Simulation for Safety Studies	<i>Board Room</i>
	Congestion Performance Measurement & MAP-21	<i>Auditorium</i>
10:30 AM – 11:00 AM	Networking Break	
11:00 AM – 12:15 PM	Breakout Sessions	
	The Role of Visualization in Entertainment & Engineering	<i>Auditorium</i>
	Freight Operations	<i>Huntington</i>
	Right of Way	<i>Board Room</i>
12:15 PM	Adjourn	

Preliminary Symposium Agenda

Wednesday, October 23

8:00 AM – 9:00 AM

Breakfast

9:00 AM – 10:45 AM

Opening Plenary Session, auditorium

Welcome & Opening Remarks

Patricia Hu, US DOT & Michael L. Pack, UMD CATT Laboratory, Visualization in Transportation Committee Co-chairs

Introductory Keynotes

Greg Winfrey, RITA Deputy Administrator, US Department of Transportation

Jonathan Porter, Chief Scientist, Office of Research, Development, and Technology, Federal Highway Administration

Keynote Speaker

Eddie Moreno, Walt Disney Imagineering Environmental Design and Engineering

10:45 AM – 11:00 AM

Networking Break

11:00 AM – Noon

Breakout Sessions

Building Blocks for CIM Success Chris Johnson, Moderator

This session is for owners, consultants, contractors, and stakeholders who are interested in the conversations and practices of the early adapters of Civil Integrated Management (CIM). Speakers will address challenges and solutions for digital project delivery, standards for utility as-builts, and opportunities for leveraging automation. These topics are some of the building blocks that have been identified, through experience, as necessary for successfully integrating CIM into transportation projects

Presenters

- Kahler, *Digital Project Delivery*

- Meis, *ASCE Standard Consensus Activity for Utility As-Built Records*
- Stewart, *A Tool for Addressing Infrastructure Business Issues*
- Chris Johnson, CH2M Hill, *Leveraging Automation within the VDC-CIM Workflow*

Transit, Bike, & Car Sharing Operations & Data Analysis Part 1

Effectively managing transit systems and ride-sharing services is complex, but the ever increasing amount of data collected by transit agencies—often made available to the public—can be a major tool for more effective daily management, planning, and public outreach. Making sense of these vast data sources, including AVL, fare collection, schedules, ridership, etc. can be a challenge. This session will explore various tools and techniques being used to turn this wealth of data into information that can better serve the transit community.

Presenters

- Jorge A. Barrios, UC Berkeley, *Flexible Car Sharing: Visualizing Vehicle Flow and Accessibility*
- Wang, *An In-depth Look into Transit GPS Feed Data for CMP Monitoring Study*

Signals Operations & Transit

This session will cover two visualization projects that are being used to analyze signal systems data from large metropolitan areas, and how visualization has been used to help optimize signal priority for transit in New York City.

Presenters

- Gettman, *Visualization and Analysis of Big Data in Traffic Signal Systems*
- Mark Yedlin, *Use of Visualization to Optimize Transit Signal Priority in New York City*

Noon – 1:15 PM

Lunch

1:15 PM – 2:45 PM

Breakout Sessions

Digital Cities Workshop

As the ever increasing need for “big data” evolves, so must cities in how they manage and implement information. The advent of Smart Digital Cities is being brought forth by exponentially growing data streams from all kinds of infrastructure. This is creating opportunities for analysis and management that can lead to better design, performance, service and sustainability. The framework for this urban intelligence is the 3D digital model of the built world, which is being authored by planners, designers, builders and cities themselves.

This workshop will focus on how 3D planning and design technologies are being applied to the management and operations of cities today. It will detail how the physical world is keeping pace with the virtual, and simulation and computational approaches for analysis and aesthetics.

Workshop Instructors

Kevin Gilson, Parsons Brinckerhoff
Charles Hixon, Bergmann Associates

Asset Management, Roads & Utilities

Transportation professionals must closely manage their investments like bridges, tunnels, roadside features, pavement, utilities, etc. Effective asset management programs and systems can afford better decision making about how and where to spend limited funds; however, creating and managing large databases of agency assets can be a significant challenge. This session will discuss a number of visualization tools and strategies that are helping agencies address the challenges of asset management, understand the state of their existing assets, and make better decisions regarding installation and management of utilities.

Presenters

- Cesar Quiroga, Texas A&M Transportation Institute, *Using 3Dj for Visualization and Management of Utility Installations*
- James H. Anspach, Cardno, *3D Utility Mapping Challenges*
- Vahid Balali, Virginia Tech, *Rapid and Automated Image-based 3D Reconstruction and Recognition for Recording and Reporting of Existing Highway Low-cost Assets*

Transit, Bike, & Car Sharing Operations & Data Analysis Part 2

Effectively managing transit systems and car-sharing services is complex, but the ever increasing amount of data collected by transit agencies—often made available to the public—can be a major tool for more effective daily management, planning, and public outreach. Making sense of these vast data sources, including AVL, fare collection, schedules, ridership, etc. can be a challenge. This session will explore various tools and techniques being used to turn this wealth of data into information that can better serve the transit community.

Presenters

- Foletta, *Visualizing Transit Reliability*
- Ellyn Shannon & Angela Bellisio, Permanent Citizens Advisory Committee to the MTA, *MTA in the Age of Big Data: Transforming the Wealth of MTA Data into Accessible, Meaningful, Visual Interactive Information*
- Lee, *Transtat: Visualizing Data to Improve Transit in San Francisco*

2:45 PM – 4:00 PM

Exhibitor Networking

4:00 PM – 5:30 PM

Breakout Sessions

VDC Case Studies

The benefits, challenges, and opportunities of virtual design and construction (VDC) civil information modeling are highlighted involving case studies for civil infrastructure transportation projects. This breakout session will explore how 3D-4D models play a significant role in accelerating technology and delivery of these highway, rail, airport, or harbor projects for transportation managers, planners, designers, contractors, and facilities managers throughout the project lifecycle. The case studies will also discuss lessons learned and reflect on the “big data” issues involving VDC in their transportation projects for broader application. The VDC 3D-model data centric approach involving the 3D engineered model is one of the many key innovation initiatives being forwarded nation-wide for application in FHWA’s Every Day Counts initiatives.

Presenters

- Miguel, *VDC in Construction Sequencing: Huey P. Long Bridge Widening*
- Moore, *Sixth Street Viaduct Replacement: Visualization Journey from Preliminary Proposal to Winning the Design Competition*
- Nabeel Khwaja, *3-D and 4-D visualization technology for two major urban highway projects in Dallas-Fort Worth, Texas*
- Martin Innus, *Case study of the Buffalo inner and outer harbor: Urban Development through Visualization*

Moderator – Lance Parve, Wisconsin DOT

Mobile/Probe Data Collection & Analysis

Given the rising cost of installing and maintaining traditional roadside sensing equipment, more and more transportation agencies are beginning to rely on probe-based data collection. Probe-based data can cover larger geographic areas at often lower costs. They can also provide certain types of information that was previously difficult to collect, like origin and destination data, trajectory data, etc. These presentations will discuss various probe-based data collection strategies, their impacts, and analytics that become possible as a result.

Presenters

- Brian Derstine, Iteris, Inc., *Crowdsourcing Transportation Incident Data from Twitter and Waze*
- Adrian Levesque, *Deploying Urban Visualization to a Mobile Environment*
- Chien-Hsin Hsueh, UC Davis, *Storytelling Visualization of Electric Vehicle Trajectory Data*
- Zhonghua Xi, George Mason University, *Identify and Visualize Differences in Vehicle Trajectory Data*

Work Zone Management

Managing traffic during construction is necessary for worker and motorist safety, but also for minimizing congestion, user delay costs, and conflicting lane closures that can be overly burdensome on the traveling public. There are many work zone traffic management strategies,

but once implemented, the work zone must be monitored to ensure they are effective and aren't contributing to additional delays or safety issues. This session will explore several visualizations, management, and analytics strategies for work zones and their overall impact on the DOT and travelers.

Presenters

- Stevens, *Use of Google Earth to Support Work Zone Mobility Planning and Operations in I-35 Corridor in Texas*
- Michael R. VanDaniker, CATT Laboratory, *Work Zone Management Dashboard and Real-time Performance Visualizations*
- Rob Hranac, Iteris, Inc., *Smart Work Zone Analytics*

5:30 PM – 7:00 PM

Exhibitor Reception, atrium

Thursday, October 24

8:00 AM – 9:00 AM

Breakfast

9:00 AM – 10:30 AM

Breakout Sessions

Design and Visualization of Infrastructure for Safety

With over 35,000 fatalities occurring on the Nation's highways each year, roadway safety remains one of the most challenging issues facing America. Although many highway safety stakeholder organizations have stepped forward to address these needs, there is no singular strategy that unites these common efforts. This session focuses on visual design strategies, tools, and design choice evaluation methodologies that aim to make roads safer.

Presenters

- Daniel Nabors, VHB, *The Use of Three-Dimensional Visualization in the Road Safety Audit Process*
- Khanal, *A Visualization Tool for Safety Analyst*
- Joe Moyer, FHWA, *Visualizing the Benefits of Restricted Crossing U-Turn Intersection Design at High Speed Two-Way Stop Controlled Intersections*

TMC Evaluation & Decision Support

This session will showcase new visualization-based decision support tools that are enabling operations personnel to make better informed decisions more quickly. The session then explores the ways visualization is being used to help understand and communicate the benefits and value of operations and traffic management centers.

Presenters

- Nikola Ivanov, *Real-time Operations Performance Dashboard and Interactive Visual Analytics*
- Mort Fahrtash, Caltrans District 12 TMC Manager, *Transportation Management Center Performance Evaluation*
- Murthy, *Development and Application of ITS Operations Evaluation Models*
- Michael L. Pack, *Collaborative Decision & Consensus Building Tools for Operations: winter weather, hurricanes, and evacuations.*
- Scott Parr, Louisiana State University, *Performance Characteristics of Megaregion Traffic Networks During Mass Evacuations*

Modeling and Simulation

This session will explore new visualization and modeling strategies for working with large, simulated traffic networks, understanding driver behavior, the effects of policies and trends on emissions, and other technologies related to modeling and simulation.

Presenters

- Robert Tung, RST International, *Effective visualization of large scale dynamic traffic information from a traffic simulation model*
- Natalia Juri, UT Austin, *Visualization Tools to Improve our Understanding of Transportation Network Models and Data*
- Ming-Hsun Yang, *Visualizing and Understanding Lane Changing Maneuvers in the Vicinity of Freeway-to-Freeway Connectors*
- Wenlong Jin, *Visualization of Simulated Traffic Data on Online Interactive Maps*
- Miller, *Visualizing the Effects of Policies: ICCT's Global Transportation Roadmap Model*

10:30 AM – 11:00 AM

Networking Break

11:00 AM – Noon

Keynote Address

Ben Fry, Principal of Fathom and author of “Visualizing Data” (*invited*)

Ben Fry is an expert in data visualization and a principal of Fathom. He is a co-developer of a “Processing.”, an open source programming language and integrated development environment built for the electronic arts and visual design communities with the purpose of teaching the basics of computer programming in a visual context.

Noon – 1:15 PM

Lunch

1:15 PM – 2:45 PM

Breakout Sessions

Data Integration & Collaboration

This session will focus on large-scale data integration efforts throughout the country and the various visualization tools that are being developed to help explore these data sets, maintain situational awareness, and collaborate on research and analysis.

Presenters

- Van Gilder, *Federal Highway Administration – Visualizing Federal Lands Management Agency Management System Data*
- Klepper, *Web-Based Geospatial Collaboration Tools for Metropolitan Planning Organizations*
- Nikola Ivanov, CATT Lab, *Massive Data Integration, Management, & Visualization to Enhance National Research*

Mobile Distribution of Traveler Information & Alerts

This session explores advances and trends in the dissemination of emergency alerts and traveler information to the public. Both state and private sector roles and strategies will be explored along with new rewards-based and social media strategies for providing and receiving information.

Presenters

- Rob Hranac, Iteris, Inc. *Multi-modal Traveler Information and Trip Planning Application for the Virginia Department of Transportation – the State Perspective*
- Ted Trepanier, INRIX, *Private Sector Distribution of Traveler Information to Mobile End-users:*
- Michael L. Pack, CATT Lab, *The Gamification of Traveler Information Distribution – an Overview of Waze and Other Crowd-Sourced Traveler Information and Alert Redistribution Methods*

VDC-CIM Innovations

Innovation within the VDC-CIM arena is occurring in quantum leaps. Technological, process and user capabilities are all advancing, being driven by customer needs, expectations and value. As new innovations emerge, others quickly follow, making this dynamic field both highly challenging as well as filled with opportunity. Attendees at this session will learn state-of-the-art, cutting edge and emerging technological, process and user innovation in VDC-CIM. Share in and benefit from this highly informative, dynamic session as presenters demonstrate their latest advancements, insights and innovative applications in VDC-CIM.

Presenters

- Kang, *4D BIM/CAVE for Transportation Planning and Construction*
- TBA
- TBA

2:45 PM – 3:15 PM

Networking Break

3:15 PM – 4:45 PM

Breakout Sessions

Workshop on 3D GIS Data Integration

In this workshop; planners, designers, facility managers and project management personnel can learn how 3D-GIS applications are being developed to integrate multiple data sources into one centric 3D database. This 3D-GIS-centric approach has the capability to become a comprehensive information source that can support day-to-day operations and decision making. Integrating data sources such as GIS and BIM systems offers a single entry point to a rich library of planning, design, construction and operations & management information. The session will feature the functionality of two 3D-GIS applications; Autodesk's InfraWorks & Esri's CityEngine.

Workshop Instructors

- Charles Hixon, Bergmann Associates
- Kevin Gilson, Parsons Brinckerhoff

Archived ITS & Highway Infrastructure

Even as probe data sources continue to gain momentum in the United States, many agencies continue to deploy, and maintain traditional ITS devices to collect volume and speed counts. This data, along with accident and event information continues to be archived at impressive rates for use in research, planning, and even operational endeavors. This session will explore some of the latest analytics and visualization techniques for archived ITS and highway infrastructure data.

Presenters

- Guin, *Georgia ITS Data Warehouse: Visualization and Performance Measurement*
- Michael VanDaniker, CATT Lab, *Florida ITS Sensor Health and Travel Time Visualizations*
- Roulland, *City Dashboard: A Framework for Spatiotemporal Analytics of Transportation Data*

4:45 PM – 6:30 PM

Electronic Poster Session & Evening Reception

Select presenters will have their interactive research on display with their laptops and large-screen monitors. Attendees are encourage interact with the presenters, explore their research, software, and systems, and engage in discussions with other symposium attendees.

Friday, October 25

8:00 AM – 9:00 AM

Breakfast

9:00 AM – 10:30 AM

Breakout Sessions

ROI for VDC: Presentation & Discussion *Maria Chau, FHWA NY Division, Moderator*

Return on Investment is frequently a question that comes up when DOTs and private firms consider investing in CIM technology for use in their project design and construction management. Often the examples in illustrating CIM, the ROI is anecdotal without the research to back their probable benefits. In this session; learn about two projects that account for the *Return on Investment* using CIM technology. In California, a side by side comparison is examined on a highway overpass project using CIM technology and the traditional CAD method to illustrate the benefits and drawbacks of both approaches. In the second project, the Rhode Island DOT examines the ROI in the use of 4D scheduling in their \$80 million dollar I-95 Providence Viaduct Bridge Replacement project.

Presenters

- Peterson, *Civil Virtual Design and Construction: A Field Trial with a Vertically Integrated Contractor*
- Giardino, *4D Scheduling of RIDOT Projects – A cost effective implementation of 3D models for 4D Schedules at RI Department of Transportation*

Driver Simulation for Safety Studies *Joseph Moyer, FHWA Moderator*

This session will focus on various safety studies that have involved driver simulation technologies, eye tracking, and other human factors within the vehicle.

Presenters

- Joe Moyer, FHWA R&D, *Pinpoint Sources of Driver Attention/Distraction in the Context of Safety*
- Beyene, *Visualizing Driving Capability Among Medically-Impaired Drivers*
- Jason R Williams, FHWA, *Challenges and Lessons Learned in Creating Scenarios for the FHWA Highway Driving Simulator*

Congestion Performance Measurement and MAP-21

This collection of presentations will look at the process of deriving and communicating congestion performance measures to various stakeholder groups (engineers, decision makers, and the public), and the impact that various visualization strategies can have on both identifying the congestion and reporting on the congestion. The panelists will discuss the impacts their research is going to have on proposed MAP-21 rulemaking regarding performance measure reporting.

Presenters

- Park, *Identification of Congestion Factors: A Case Study of the DVRPC Regional Operations Data*
- Michael VanDaniker, *Temporal and Geospatial Bottleneck Visualizations*
- Higgins, *Visualization to Support Resource Allocation*
- Michael L. Pack, *Visualizing Changes In Congestion Over Time: TreeVersity 2.0*

10:30 AM – 11:00 AM

Networking Break

11:00 AM – 12:15 PM

Breakout Session

The Role of Visualization in Entertainment and Engineering

Panel members will include professionals from the visualization for transportation community and from the entertainment special effects community. Discussion will be centered on similarities and differences in the tools, processes, challenges, audiences and end goals for each of these communities and their workflows. The audience will learn more about how each of these industries approaches issues such as level of detail, realism, and a shared goal of 'storytelling' around their respective projects.

Presenters

- Bart Ney, Public Involvement Officer for Caltrans on the San Francisco Oakland Bay Bridge East Span Replacement.
- Phil Tippet, Tippet Studios
- Craig Barron, Matte World Studios

Freight Operations

These presentations will focus on how various sensing technologies and visual analytics tools are aiding researchers and freight specialists in better decision making and enforcement decisions. Examples include using data visualization to analyze load factors, weigh-in-motion sensors, freight movements, rate comparisons and plant siting and carbon footprint analysis. The presentations will include demonstrations of freight visualization dashboards and enforcement tools.

Presenters

- Ferrara, *A Performance-Based Visual Analytics Platform for Improving Motor Carrier Enforcement Operational Effectiveness*
- Michael VanDaniker, *Visualizing Real-Time Virtual Weigh Station Information for Motor Carrier Safety Enforcement*
- Hoover, *Data Visualization for the Transportation Industry*

Right of Way

How can visualization be used to plan for transportation corridor improvements? The Corridor Visualization Explorer is one tool that has great potential to visualize the broad safety and capacity effects from alternatives (e.g., to widen a road or make it multimodal). FHWA will report on the potential benefits for visualization to be used to enhance the right-of-way (ROW) acquisition process of transportation project delivery.

Presenters

- Frank Broen, Teach America, *The Visual Education of Right of Way Benefits and Costs*

Symposium Steering Committee

Rob Hranac, Iteris, Inc. Co-Chair

Kevin Stewart, RDV Systems, Co-Chair

Frank Broen, Teach America

Stephanie Camay, Parsons Brinckerhoff

Patricia Hu, US DOT, Bureau of Transportation Statistics

Joseph Moyer, FHWA

Michael L. Pack, CATT Laboratory, University of Maryland

TRB Staff

Bernardo Kleiner, Transportation Safety Specialist

Tom Palmerlee, Associate Division Director

Beckman Center Map

