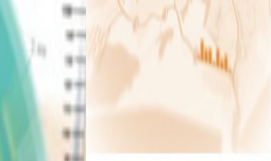
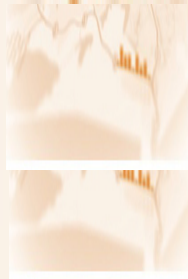


7<sup>th</sup>

# International Symposium on Visualization in Transportation

**October 23-25, 2013**

Beckman Center  
Irvine, California



*Cosponsored by*  
**Federal Highway Administration**

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**Freda Morgan**, Senior Program Associate

## AGENDA AT A GLANCE

Wednesday, October 23		
7:00 a.m. – 5:00 p.m.	Registration	Atrium
8:00 a.m. – 9:00 a.m.	Breakfast	Dining Room
9:00 a.m. – 10:45 a.m.	Opening Plenary Session & Keynote Addresses	Auditorium
10:45 a.m. – 11:00 a.m.	Networking Break	Atrium
11:00 a.m. – Noon	Breakout Sessions:	
	• Building Blocks for CIM Success	Auditorium
	• Transit, Bike and Car Sharing Operations & Data Analysis, <b>Part 1</b>	Huntington
	• Signal Operations & Transit	Board Room
Noon – 1:15 p.m.	Lunch	Dining Room
1:15 p.m. – 2:45 p.m.	Breakout Sessions	
	• Digital Cities Workshop	Auditorium
	• Asset Management, Roads & utilities	Board Room
	• Transit, Bike and Car Sharing Operations & Data Analysis, <b>Part 2</b>	Huntington
2:45 p.m. – 4:00 p.m.	Exhibitor Networking	Atrium
4:00 p.m. – 5:30 p.m.	Breakout Sessions	
	• VDC Case Studies	Auditorium
	• Mobile / Probe Data Collection & Analysis	Huntington
	• Work Zone Management	Board Room
5:30 p.m. – 7:00 p.m.	Exhibitor Reception	Atrium
Thursday, October 24		
7:30 a.m. – 4:00 p.m.	Registration	Atrium
8:00 a.m. – 9:00 a.m.	Breakfast	Dining Room
9:00 a.m. – 10:30 a.m.	Breakout Sessions	
	• Design and Visualization of Infrastructure for Safety	Auditorium
	• TMC Evaluation & Decision Support	Huntington
	• Modeling and Simulation	Board Room
10:30 a.m. – 11:00 a.m.	Networking Break	Atrium
11:00 a.m. – Noon	Keynote Address	Auditorium
Noon – 1:15 p.m.	Lunch	Dining Room

1:15 p.m. – 2:45 p.m.	Breakout Sessions	
	<ul style="list-style-type: none"> <li>Data Integration &amp; Collaboration</li> </ul>	Auditorium
	<ul style="list-style-type: none"> <li>Virtual Design and Construction</li> <li>Civil Information Management Innovations</li> </ul>	Board Room
	<ul style="list-style-type: none"> <li>Mobile Distribution of Traveler Information &amp; Alerts</li> </ul>	Huntington
2:45 p.m. – 3:15 p.m.	Networking Break	Atrium
3:15 p.m. – 4:45 p.m.	Breakout Sessions	
	<ul style="list-style-type: none"> <li>Workshop on 3D GIS Data Integration</li> </ul>	Auditorium
	Interactive Electronic Poster Session	
	<ul style="list-style-type: none"> <li>Archived ITS &amp; Highway Infrastructure</li> </ul>	Atrium
	<ul style="list-style-type: none"> <li>Right of Way</li> </ul>	
<ul style="list-style-type: none"> <li>Performance Measures &amp; MAP-21</li> </ul>		
4:45 p.m. – 6:15 p.m.	CIM Subcommittee Meeting	Board Room
<b>Friday, October 25</b>		
7:30 a.m. – 11:00 a.m.	Registration	Atrium
8:00 a.m. – 9:00 a.m.	Breakfast	Dining Room
9:00 a.m. – 10:30 a.m.	Breakout Sessions	
	<ul style="list-style-type: none"> <li>ROI for VDC: Presentation &amp; Discussion</li> </ul>	Huntington
	<ul style="list-style-type: none"> <li>Driver Simulation for Safety Studies</li> </ul>	Board Room
	<ul style="list-style-type: none"> <li>Congestion Performance Measurement and MAP-21</li> </ul>	Auditorium
10:30 a.m. – 11:00 a.m.	Networking Break	Atrium
11:00 a.m. – 12:15 p.m.	Breakout Sessions	
	<ul style="list-style-type: none"> <li>The Role of Visualization in Entertainment and Engineering</li> </ul>	Huntington
	<ul style="list-style-type: none"> <li>Freight Operations</li> </ul>	Board Room
12:15 p.m.	Adjourn	



## Wednesday, October 23

7:00 a.m. – 5:00 p.m., Atrium

### Registration

8:00 a.m. – 9:00 a.m., Dining Room

### Breakfast

9:00 a.m. – 10:45 a.m.; Auditorium

### Opening Plenary Session

#### Welcome & Opening Remarks

*Patricia Hu*, Director, Bureau of Transportation Statistics, Research and Innovation Technology Administration, US Department of Transportation

*Michael L. Pack*, Director, Center for Applied Transportation Technology Laboratory, University of Maryland

*Visualization in Transportation Committee Co-chairs*

#### Introductory Keynotes

*Jonathan Porter*, Chief Scientist, Federal Highway Administration, US Department of Transportation

#### Keynote Speaker

*Eddie Moreno*, Senior Engineer, Walt Disney Imagineering Environmental Design and Engineering

10:45 a.m. – 11:00 a.m., Atrium

### Networking Break

11:00 a.m. – Noon

### Breakout Sessions

#### Building Blocks for CIM Success

*Moderator: Christopher Johnson, CH2M Hill*

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

- Danny Kahler, Kahler Engineering, *Digital Project Delivery*
- Philip J. Meis, Utility Mapping Services Inc., *ASCE Standard Consensus Activity for Utility As-Built Records*
- 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.

#### **Presenter**

- Jorge A. Barrios, UC Berkeley, *Flexible Car Sharing: Visualizing Vehicle Flow and Accessibility*

### **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**

- Douglas Gettman, Kimley-Horn & Associates, *Visualization and Analysis of Big Data in Traffic Signal Systems*
- Mark Yedlin, Greenman-Pedersen, *Use of Visualization to Optimize Transit Signal Priority in New York City*

Noon – 1:15 p.m., Dining Room

### **Lunch**

1:15 p.m – 2:45 p.m.

### **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, and 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**

- Nicole Foletta, Fehr & Peers, *Visualizing Transit Reliability*
- Ellyn Shannon, Permanent Citizens Advisory Committee to the MTA and & Angela Bellisio, Metropolitan Transportation Authority, *MTA in the Age of Big Data: Transforming the Wealth of MTA Data into Accessible, Meaningful, Visual Interactive Information*

2:45 p.m. – 4:00 p.m., Atrium

#### **Exhibitor Networking**

4:00 p.m. – 5:30 p.m.

#### **Breakout Sessions**

### **VDC Case Studies**

*Moderator: Lance Parve, Wisconsin DOT*

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**

- Jesse Kadekawa Miguel, HNTB Corporation, *VDC in Construction Sequencing: Huey P. Long Bridge Widening*
- Alfred Mata, City of Los Angeles, *Sixth Street Viaduct Replacement: Visualization Journey from Preliminary Proposal to Winning the Design Competition*
- Nabeel Khwaja, University of Texas, *3-D and 4-D Visualization Technology for Two Major Urban Highway Projects in Dallas-Fort Worth, Texas*
- Martin Innus, University of Buffalo, *Case Study of the Buffalo Inner and Outer Harbor: Urban Development through Visualization*

## 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, University of Buffalo, *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

- Roma Stevens, Texas A&M Transportation Institute, *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 p.m. – 7:00 p.m., Atrium

## Exhibitor Reception





**Thursday, October 24**

7:30 a.m. – 4:00 p.m., Atrium

**Registration**

8:00 a.m. – 9:00 a.m., Dining Room

**Breakfast**

9:00 a.m. – 10:30 a.m.

**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*
- Wei Zhang, Federal Highway Administration, *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, University of Maryland, *Real-time Operations Performance Dashboard and Interactive Visual Analytics*
- Mort Fahrtash, Caltrans District 12, *Transportation Management Center Performance Evaluation*
- Michael L. Pack, CATT Laboratory, *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, Institute of Transportation Studies, UCI, *Visualizing and Understanding Lane Changing Maneuvers in the Vicinity of Freeway-to-Freeway Connectors*
- Zhe Sun, University of California, Irvine, *Visualization of Simulated Traffic Data on Online Interactive Maps*
- Joshua Miller, International Council on Clean Transportation, *Visualizing the Effects of Policies: ICCT's Global Transportation Roadmap Model*

10:30 a.m. – 11:00 a.m., Atrium

### **Networking Break**

11:00 a.m. – Noon., Auditorium

### **Keynote Address**

Shawn Allen, Partner, Stamen Design

*Shawn Allen is a Stamen partner, designer, and programmer. As Interaction Director, he both facilitates communication between Stamen's design and technology teams and directs the design and implementation of interactive projects. He also teaches and consults journalists, policymakers, and the public sector on strategies for making information available to the public.*

Noon – 1:15 p.m., Dining Room

### **Lunch**

1:15 p.m. – 2:45 p.m.

### **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**

- Wesley Rutland-Brown, Federal Highway Administration, *Deconstructing Stovepipes: FHWA's Data Integration Initiative*
- Amanda Klepper, City of Durham, *Web-Based Geospatial Collaboration Tools for Metropolitan Planning Organizations*
- Nikola Ivanov, University of Maryland, *Massive Data Integration, Management, & Visualization to Enhance National Research*

#### **Virtual Design and Construction - Civil Information Management 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 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

- Julian Kang, Texas A&M University, College of Architecture, *4D BIM/CAVE for Transportation Planning and Construction*
- Kevin Stewart, RDV Systems, *3D Visualization – A Tool for Addressing Infrastructure Business Issues*
- Craig Sanders, Autodesk, *Project Marketing and Communication Made Easy*

## 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*

2:45 p.m. – 3:15 p.m., Atrium

## Networking Break

3:15 p.m. – 4:45 p.m.

## 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

## Interactive Electronic Poster Sessions

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

- **Archived ITS & Highway Infrastructure [Posters]**

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.

- Angshuman Guin, Georgia Tech, *Georgia ITS Data Warehouse: Visualization and Performance Measurement*
- Michael VanDaniker, University of Maryland, *Florida ITS Sensor Health and Travel Time Visualizations*
- Frederic Roulland, Xerox Research Centre Europe, *City Dashboard: A Framework for Spatiotemporal Analytics of Transportation Data*
- **Right of Way [Posters]**

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).

  - Frank Broen, Teach America, *The Visual Education of Right of Way Benefits and Costs*
- **Performance Measures & MAP-21 [Posters]**

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).

  - Michael L. Pack, CATT Laboratory, *Visualizing Changes In Congestion Over Time*
  - Evan Enarson-Hering, Cambridge Systematics, *Visualization to Support Resource Allocation*

4:45 PM – 6:15 PM., Board Room

### **CIM Subcommittee Meeting**

**Friday, October 25**

7:30 a.m. – 11:00 a.m., Atrium

### **Registration**

8:00 a.m. – 9:00 a.m., Dining Room

### **Breakfast**

9:00 a.m. – 10:30 a.m.

### **Breakout Sessions**

#### **ROI for VDC: Presentation & Discussion**

*Moderator: Maria Chau, Federal Highway Administration, New York Division*

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.

**Presenter**

- Forest Peterson, Stanford University CIFE, *Civil Virtual Design and Construction: A Field Trial with a Vertically Integrated Contractor*

**Driver Simulation for Safety Studies**

*Moderator: Joseph Moyer, Federal Highway Administration*

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

**Presenters**

- Wei Zhang, Federal Highway Administration, *Pinpoint Sources of Driver Attention/Distraction in the Context of Safety*
- Nahom Beyene, University of Pittsburg, *Visualizing Driving Capability Among Medically-Impaired Drivers*
- Jason R Williams, AAI Engineering Support, Inc., *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**

- Seri Park, Villanova University, *Identification of Congestion Factors: A Case Study of the DVRPC Regional Operations Data*
- Michael VanDaniker, University of Maryland, *Temporal and Geospatial Bottleneck Visualizations*
- Evan Enarson-Hering, Cambridge Systematics, *Visualization to Support Resource Allocation*
- Michael L. Pack, CATT Laboratory, *Visualizing Changes In Congestion Over Time: TreeVersity 2.0*

10:30 a.m. – 11:00 a.m., Atrium

**Networking Break**

11:00 a.m. – 12:15 p.m.

**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 work-flows. 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, Mega Project Studio, *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**

- Greg Ferrara, Institute for Transportation Research and Education, *A Performance-Based Visual Analytics Platform for Improving Motor Carrier Enforcement Operational Effectiveness*
- Michael VanDaniker, University of Maryland, *Visualizing Real-Time Virtual Weigh Station Information for Motor Carrier Safety Enforcement*
- John Hoover, Norfolk Southern Corp., *Data Visualization for the Transportation Industry*

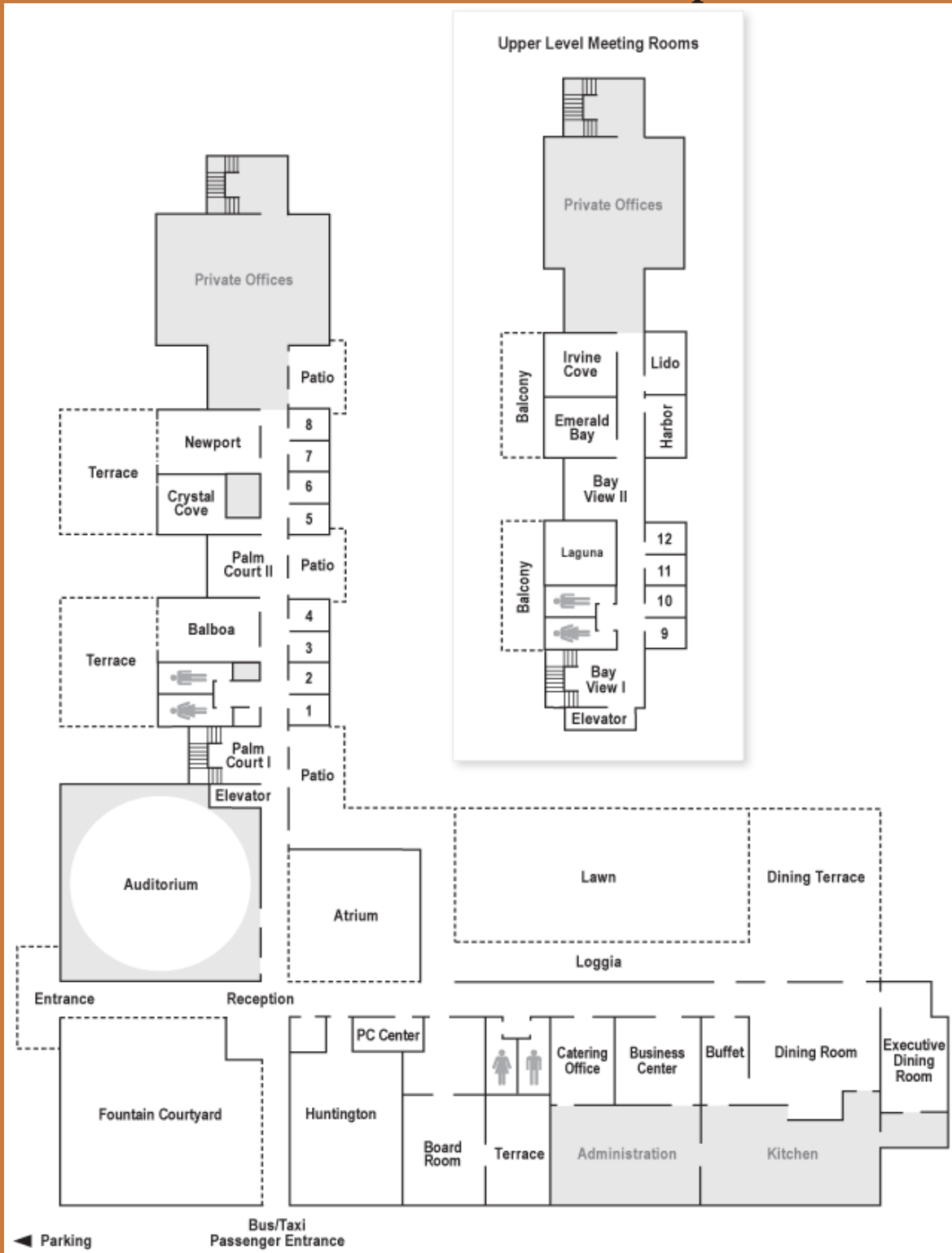
12:15 p.m.

**Adjourn**





# Beckman Center Floor Map



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