GIS-T 2012 Final Program

GEOSPATIAL INFORMATION SYSTEMS FOR TRANSPORTATION SYMPOSIUM

To provide a forum for transportation officials from State, Province, Federal, and Municipal Agencies to discuss GIS and transportation issues

April 16 – 18, 2012

Workshops – April 15, 2012

Embassy Suites
Loveland, Colorado

Sponsored by:

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
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For the most current news about this symposium, and links to social network sites, click on **www.GIS-T.org**

AASHTO GIS-T Task Force Chair

Jay Adams
Oklahoma Dept of Transportation
200 N.E. 21st Street, Rm. 3A-7
Oklahoma City, OK 73105
(405) 521-2175
FAX: (405) 521-6917
jadams@odot.org

Program Chair

Lou Henefeld
Colorado Dept of Transportation
4201 E. Arkansas Ave.
Shumate Bldg.
Denver, CO 80222
(303) 757-9809
FAX: (303) 757-9727
louis.henefeld@dot.state.co.us

Workshop Chair

Ben Williams
FHWA - Resource Center
61 Forsyth St. Suite 17T26
Atlanta, GA 30303-3104
(404) 562-3671
ben.williams@dot.gov

Local Arrangements

William Johnson
Colorado Dept of Transportation
(303) 512-4808
william.g.johnson@dot.state.co.us

Drew Davis
Larimer County Public Works Div.
(970) 498-5742
ddavis@larimer.org

Exhibits Chair

Hussein El Khansa
West Virginia DOT
Building 5, 8th Floor
1900 Kanawha Blvd., E
Charleston, WV 25305
(304) 558-9588
FAX: (304) 558-3783
hussein.s.elkhansa@wv.gov

Moderator Chair

Joe Hausman
HSP Coordination Manager
Federal Highway Administration
HPPI-20
East Building, Room E83-447
1200 New Jersey Ave., SE
Washington, DC 20590
(202) 366-5047
joseph.hausman@dot.gov

The twenty-fifth annual GIS-T Symposium - *GIS-T 2012 Mainframe to Mainstream: 25 Years of Progress* – provides a forum for professionals interested in the design and use of GeoSpatial Information Systems for Transportation. It brings together individuals from education, the private sector, and all levels of government for a full day of workshops April 15, 2012, and three full days of conference activity, April 16 - 18, 2012.

Check www.gis-t.org for the most current information

GIS-T 2012 PLANNING COMMITTEE

Debra Alfonso Michigan DOT	Dave Blackstone Ohio DOT
Shawn Blaesing-Thompson Iowa DOT	Mark Bradford USDOT/BTS
James Brown Intergraph	Rose Braun Nebraska DOR
Teague Buchanan Georgia DOT	Van Colebank Tennessee DOT
Frank DeSendi Pennsylvania DOT	Michelle Frame West Virginia DOT
Connie Gurchiek Transcend Spatial Solutions	Raquel Hunt USDOT/FRA
Tammy Lang Colorado DOT	Steph Magnan Vermont DOT
James Meyer Arizona DOT	James Mitchell Louisiana DOT
Daris Ormesher South Dakota DOT	Diane Pierzinski Retiree
Jim Ramsey AASHTO Liaison	Mark Sarmiento USDOT/FHWA

GIS-T 2012 Mainframe to Mainstream 25 Years of Progress

GIS-T 2012 General Schedule

Sunday — April 15, 2012

Registration and Breakfast in the Atrium

Morning Workshops

1. **GIS Technology: Return on Investment** (see pg. 4)

2. Post 2010 Changes, New Census Boundaries, MPOs, and Functional Classifications (see pg. 4)

3. The Use of 3D-GIS Applications for Planning and Design (see pg. 4)

4. Navigate the Mobile World (see pg. 4)

Lunch - Workshop Attendees Only

Afternoon Workshops

5. **The Latest in GPS Technology and Field Data Collection** (see pg. 4)

6. Asset Management: Planning, Strategy, and Implementation (see pg. 4)

7. Google - Adventures in Geospatial (see pg. 4)

8. LiDAR Data Management and Exploitation (see pg. 4)

Break

Technology Hall Reception (see pg. 5)

Technology Hall Open

Monday — April 16, 2012

Registration and Breakfast in the Atrium

Opening Session
Welcome To Colorado

Keynote Speaker
Jack Dangermond
(see pg. 5)

Break

State Summary & Roll Call of States (see pg. 5)

Lunch

Pinyon Pine Room

Session 1 (see pg. 11)

1. GPS & GIS
2. Interesting Talks
3. ITS & Traffic
4. Safety

Break

Session 2 (see pg. 12)

1. Cloud
2. State DOT Portals
3. Roadway Data Collaboration
4. LRS Examples

Mapping Gallery
Voting ends at 6:30
(see pg. 5)

Technology Hall Reception

Technology Hall Open

Tuesday — April 17, 2012

Registration and Breakfast in the Atrium

Roll Call Round Tables
NEW
Share best practices and experiences with each other on Field Data Collection or on GIS-CAD Interoperability / Integration (see pg. 6)

Break

Session 3 (see pg. 13)
1.Rail and Centerlines
2.Integrating Data with GIS
3.Integration Tools
4.Transportation Planning Tools

Lunch

Mountain Holly & Pinyon Pine Rooms

Session 4 (see pg. 14)
1. Mobile & Mapping GIS
2. Visualization & 3D
3. LRS - Broad Views
4. Transportation Networks

GIS for Transportation - 25 Years of Change (see pg. 6)

Prepare for Social

Tuesday Night Social

Terry Bison Ranch

4:30pm to 10:30pm
(see pg. 6)

Trivia

Technology Hall Open

Wednesday — April 18, 2012

(Sleep In!!!)

Registration and Breakfast in the Atrium

Session 5 (see pg. 15)

1. Asset Challenges
2. Enterprise Programs
3. HPMS
4. Planning & Mapping Projects

Break

Session 6 (see pg. 16)

1. Asset Systems
2. Data Integration
3. Crashes
4. Transportation Environment and Mapping

Box Lunch
River Birch Rooms

Awards/Drawings/Raffle
Next Host State Presentation
(see pg. 7)

Virtual Tour

Digital Globe
River Birch Rooms
(see pg. 7)

Symposium Wrap-Up
Come join us for a debriefing of this year's symposium and planning for the next year.
Refreshments Provided!
(see pg. 7)

Technology Hall Open

7:00 AM · 8:00 AM · 9:00 AM · 10:00 AM · 11:00 AM · 12:00 PM · 1:00 PM · 2:00 PM · 3:00 PM · 4:00 PM · 5:00 PM · 6:00 PM · 7:00 PM · 8:00 PM · 8:30 PM

GIS-T 2012 WORKSHOPS – SUNDAY, April 15

7:00 AM - 8:00 AM		
Workshop Registration		
8:00 AM - 12:00 PM		
Workshop Title	**Presenter**	**Room**
GIS Technology: Return on Investment	Terry Bills, Esri, Victoria Kouyoumjian, Esri, and Mark Ford, Mark Ford Associates, and James Hall of the University of Illinois, Springfield	Aspen Daisy
Post 2010 Changes, New Census Boundaries, MPOs, and Functional Classifications	Chris Henrie, US Census Bureau Ben Williams, FHWA Resource Center Joe Hausman, FHWA Office of Policy	Elderberry
The Use of 3D-GIS Applications for Planning and Design	Charles Hixon, Bergmann Associates Jeff Volpe, Bergmann Associates	Goldenglow
Navigate the Mobile World	Bud Luo, Michael Baker Corp.	Snowberry
12:00 PM - 1:00 PM		
Lunch (Workshop Attendees only)		
1:00 PM - 5:00 PM		
Workshop Title	**Presenter**	**Room**
The Latest in GPS Technology and Field Data Collection	Bill Schuman, Transcend Spatial Solutions, and Robert Boehm, Jacobs Engineering	Aspen Daisy
URISA Workshop - Asset Management: Planning, Strategy, and Implementation	Allen Ibaugh, Data Transfer Solutions	Elderberry
Google - Adventures in Geospatial	Sean Maday, Google	Goldenglow
LiDAR Data Management and Exploitation	Steve du Plessis and Joe Mostowy, Intergraph / ERDAS	Snowberry

SUNDAY, April 15

TECHNOLOGY HALL RECEPTIONS – TECHNOLOGY EXHIBITS OPEN – CANYON MAPLE, MOUNTAIN HOLLY AND PINYON PINE

(Sunday 5:30 PM to 8:30 PM)
(Monday 6:30 PM to 8:30 PM)

The Technology Hall opens on Sunday evening at 5:30 PM with a reception for all Symposium attendees and guests. On Monday, Symposium participants are welcome to attend another reception starting at 6:30 PM. The Technology Hall will open at 12:00 Noon and close at 8:30 PM on Monday. The Technology Hall will also be open from 7:00 AM to 4:00 PM on Tuesday and from 7:30 AM to 12:00 Noon on Wednesday.

GENERAL SESSIONS

MONDAY, April 16

OPENING SESSION / KEYNOTE SPEAKER – RIVER BIRCH

(Monday 8:30 AM to 10:00 AM)
Jack Dangermond

A landscape architect by training, Jack Dangermond founded Esri in 1969 with a vision that a mapping and analysis framework could provide a deeper understanding of our world and help us design a better future. As founder and president of Esri, Dangermond's leadership and vision stimulates the ongoing innovation of GIS technologies that enable people to make insightful decisions and improve the quality of life everywhere. Jack was an important part of starting the first GIS for Transportation Meetings and will give his perspective on the evolution of GIS for Transportation over the last 25 Years.

STATE SUMMARY AND ROLL CALL OF STATES – RIVER BIRCH

(Monday 10:30 AM to 12:00 NOON)

Summary results from a survey sent to GIS representatives from each state will be presented. The Roll Call of States encourages one representative from each country, state, province, or local agency to briefly mention the status of their GIS implementations and challenges that they face.

MAPPING GALLERY - MOUNTAIN HOLLY

(Monday 5:00 PM to 6:30 PM)

GIS-T 2012 invited registered attendees to participate in the GIS-T's new Mapping Gallery. The GIS-T Symposium provides a showcase for attendees to display GIS generated mapping and poster products. Starting this year, attendees submitted their web mapping applications that provided a new and creative way to display and communicate their work. This is an opportunity to share techniques and applications with peers in the transportation GIS community. Come and see how states are using GIS to advance their work. A panel of judges will evaluate each map and mapping application. The Symposium will present awards during the Wednesday Box Lunch. The awards for the maps displayed will be given within each of these categories [Transportation Publication, Information Usage, Public Presentation, and Effective Cartography]. Winners in the Savvy Web Mapping category will also receive awards.

TUESDAY, April 17th

ROLL CALL ROUND TABLES - RIVER BIRCH

New for GIS-T 2012

(Tuesday 8:00 AM to 10:00 AM – TRIVIA 8:00AM)

Round Table Discussion - Field Data Collection – Lou Henefeld, Facilitator

The GIS-T Planning Committee has scheduled a "Round Table Discussion" addressing the topic of **Field Data Collection.** This session's format will allow participants to share best practices, as well as, discuss issues/experiences/needs regarding the use of available Field Data Collection solutions and equipment as pertaining to transportation related collection activities. Attendees from the GIS and GPS industries are invited and encouraged to attend and participate.

Round Table Discussion – GIS-CAD Interoperability/Integration – William Johnson, Facilitator

The GIS-T Planning Committee has scheduled a "Round Table Discussion" addressing the topic of **GIS-CAD Interoperability/Integration**. This session's format will allow participants to share best practices, as well as, discuss experiences/needs regarding issues when trying to share data/files between their GIS and CAD environments. In addition to issues dealing with format, other potential topics will include "ground to grid" issues, incorporation of survey data, LiDAR, etc. Attendees from the GIS and CAD industries are invited and encouraged to attend and participate.

GIS FOR TRANSPORTATION - 25 YEARS OF CHANGE - RIVER BIRCH

(Tuesday 2:45 PM to 4:00 PM – BREAK REFRESHMENTS SERVED IN THIS ROOM)

Simon Lewis and David Fletcher, Jay Adams, Moderator

Since 1987 Simon Lewis and David Fletcher have played prominent roles in the GIS for Transportation Symposium. They were among the earliest of pioneers of GIS-T and are still active in this field of work. Simon and David will provide their insights into the early days of GIS-T, the evolution of GIS-T over the last 25 years and how the future might look for the next generation of GIS-T researchers and practitioners.

TUESDAY NIGHT SOCIAL

Terry Bison Ranch

(Tuesday 4:30 PM to 10:30 PM)

Join us for an entertaining evening at the Terry Bison Ranch which will include a custom built train ride that will take you into the heart of the Ranch for an up close view of a buffalo herd. Appetizers and a buffet dinner will be served in the Senators Restaurant and for your enjoyment Harley and the V-Twins will be playing old school and modern country with a mix of rock music. In addition to seeing the buffalo herd the Ranch houses a variety of animals including a chicken bus for egg laying hens, camels, ostriches and adorable alpacas.

WEDNESDAY BOX LUNCH RIVER BIRCH

(Wednesday 12:00 NOON to 1:30 PM)

In addition to lunch, this final Symposium meal features Mapping Gallery awards presentations, raffles and drawings for gifts to lucky attendees, plus a trivia contest! We will also have a presentation by the state hosting the 2013 GIS-T Symposium. Don't miss it!

VIRTUAL TOUR – DIGITALGLOBE – RIVER BIRCH

(Wednesday 1:30 PM to 3:00 PM)
Kevin Bullock, DigitalGlobe
William Johnson, Moderator

This virtual tour features an interactive demonstration of DigitalGlobe's products, services, and technology for acquiring its high resolution satellite images. DigitalGlobe is a leading global provider of commercial high resolution earth imagery products and services. The imagery that forms the foundation of our products and services is collected daily via our high resolution imagery satellite constellation and managed in our content archive. Our products and services provide customers and end users with up-to-date and historical earth imagery, enabling them to more efficiently map, monitor, analyze, and navigate the physical world.

SYMPOSIUM WRAP-UP - SNOWBERRY

(Wednesday 3:00 PM to 5:00 PM - Refreshments Provided!)
GIS-T Task Force Chair: Jay Adams

Come join us for a debriefing of this year's Symposium and planning for the 2013 Symposium.

GUEST TOURS

Monday, April 16
(8:30 AM to 5:30 PM)

Guided Tour of beautiful Estes Park & Rocky Mountain National Park

You will leave Loveland and head to Estes Park, home to the majestic scenery of Rocky Mountain National Park, for a few hours of sightseeing and shopping. After a delightful lunch you will enjoy a guided interpretive tour of the Rocky Mountain National Park before returning to the hotel for a full evening of GIS-T activities.

Tuesday, April 17
(9:30 AM to 3:30 PM)

Celestial Seasonings & Boulder's Pearl Street Mall

Join us for a visit to an amazing tea factory in Boulder. See how teas are blended, packaged and shipped, then enjoy tasting free samples of every tea they make and discover their gallery of original artwork from their famous tea boxes. Browse the extensive selection of Celestial Seasonings teas and gift items, along with healthful foods and personal care products. Lunch will be at the Celestial Café where you will enjoy a fresh, nutritious, home-cooked meal in a warm and inviting atmosphere filled with beautiful Celestial Seasonings artwork.

After lunch you will be driven to Boulder's Pearl Street Mall which is a 4-block tree-lined pedestrian mall marking Boulder's downtown core for shopping, strolling and people-watching. Musicians, mimes, jugglers and other street entertainers landscape the mall.

Wednesday, April 18
(9:00 AM to 12:30 PM)

Loveland is a thriving arts community uniquely decorated with an enormous variety of wonderful bronze sculptures throughout the city providing the ideal creative environment for artists. After touring the Art Castings Foundry you will take a guided tour of the Benson Sculpture Garden where you will see more than 100 sculptures including gorillas, giraffes, big pigs and sledding kids that are permanently displayed among trees, plants and ponds. After the tour you will return to the hotel for a box lunch and you are welcome to conference attendees at the award ceremony and DigitalGlobe Virtual Tour.

Embassy Suites Spa Coupons are available at the GIS-T Registration Desk

GIS-T FITNESS CLUB

New for GIS-T 2012

GIS-T is guaranteed to be full of new ideas and concepts! Why not give your mind the chance to soak up all that information? Exercise is proven to aid cognitive abilities and attentiveness.

Monday through Wednesday mornings, a walking/running path will be available for you to enjoy with your fellow conference attendees. This approximately one-mile loop is self-paced so you can stroll and chat or run to burn off the extra buffet calories. Monitors will be patrolling the course to ensure your safety. Water will be available near the course.

The path will open at 5:00 am and will be available until 7:30 am. Walk or run as much as you like but remember to leave enough time to get to conference events.

What you need to bring…

- Your favorite pair of walking/ running shoes
- Exercise clothes for balmy and/or chilly weather (think layers)
- A water bottle, if you are feeling green (cups will also be provided)
- Words of encouragement for your fellow walkers and runners

Springtime in Colorado always offers the possibility of rain or snow. If the weather proves uncooperative these outdoor exercise events will be cancelled. However, Embassy Suites Loveland offers other options such as a swimming pool and fitness center.

START PLANNING NOW TO ATTEND

The Twenty-Sixth Annual
GIS for Transportation Symposium
May 2013

BOISE, IDAHO

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GEOSPATIAL INFORMATION SYSTEMS FOR TRANSPORTATION SYMPOSIUM

To provide a forum for transportation officials from State, Province, Federal, and Municipal Agencies to discuss GIS and transportation issues

CONCURRENT SESSION 1

1:30 PM MONDAY, APRIL 16

1.1	**GPS & GIS**		**Snowberry**
	Moderator: Tom Clemons		
1.1.1	Mobile GIS Apps for ITS	John Diruggiero New Mexico DOT Santa Fe, NM	Lee Jensen RealTime Solutions Albuquerque, NM
1.1.2	Mobile Application Technology	Scott Sandusky ERSI Redlands, CA	
1.1.3	Development of a GPS Technology Management Plan for LADOTD	Jeff Barnett Inner Corridor Technologies, Inc. Houston, TX	
1.2	**Interesting Talks**		**Goldenglow**
	Moderator: Connie Gurchiek		
1.2.1	Maintaining an Enterprise Vision: History of GIS at the Illinois Department of Transportation	James Hall Univ. of Ill., Springfield Springfield, IL	
1.2.2	Advanced Partnering with Civil Integrated Management (CIM) in the Highway Industry	Bryan Cawley Federal Highway Administration Washington, D.C.	
1.2.3	GIS Technology and Tools for Long Range Transportation Planning in the National Park Service	Nell Blodgett , Laura Pernice & Jordan Hoaglund NPS Denver Service Center Lakewood, CO	
1.3	**ITS & Traffic**		**Elderberry**
	Moderator: Gary Waters		
1.3.1	Delivering Important Traffic Data through GIS: Work Zone Traffic Analysis (WZTA)	Robert Kirkman HDR Government, OR	David Ringeisen Oregon DOT Salem, OR
1.3.2	Use of Geospatial Information Systems in the Intelligent Transportation Systems and Connected Vehicle Environment	Jim Arnold USDOT R&D Washington, D.C.	Rudy Persaud US DOT McLean, VA
1.3.3	Snow Plow Tracking from Start to Finish	Eric Abrams Iowa DOT Ames, IA	
1.4	**Safety**		**Aspen Daisy**
	Moderator: Jesse Jay		
1.4.1	TDOT's Answer to Evolving Highway Safety Emphasis	Jeff Murphy Tennessee DOT Nashville, TN	Tom Eldridge Intergraph Corp Nashville, TN
1.4.2	Driving Behavior Mapping and GIS	Ken Clay TomTom Lebanon, NH	
1.4.3	Northern Virginia Regional Routable Centerline Model	Brendan J Ford Fairfax County, VA GIS Fairfax, VA	

The  symbol indicates a session from Colorado, the Host State.

CONCURRENT SESSION 2

3:30 PM MONDAY, APRIL 16

2.1	**Cloud**		**Snowberry**
	Moderator: Terry Bills		
2.1.1	Can Cloud Technology Help You to Improve Performance, Scalability, and Cost of Geo-Spatial Applications When Your Budget is shrinking?	Chris Zajac NJDOT Trenton, NJ	Yu Luo Michael Baker Corp Horsham, PA
2.1.2	GIS-T Solutions via the Cloud	Jesse Jay Transcend Spatial Solutions, LLC Bradenton, FL	
2.1.3	TxDOT's Cloud Solution to reporting Highway Conditions	Darryl Zercher TxDOT Austin, TX	
2.2	**State DOT Portals**		**Goldenglow**
	Moderator: Tony Pietropola		
2.2.1	Iowa DOT Geospatial Portal	Shawn Blaesing-T Iowa DOT Ames, IA	Aaron Ford HNTB Chicago, IL
2.2.2	GeoTRAQS Enterprise Mapping Portal	Teague Buchanan Georgia DOT Atlanta, GA	
2.2.3	GIS Web Portal and Enterprise-Wide Data Warehouse Collaboration	Mary Beth Pfrang Kansas DOT Topeka, KS	
2.3	**Roadway Data Collaboration**		**Elderberry**
	Moderator: Rachel King		
2.3.1	GPS Mapping 70k Miles of TN Local Roads in 5 Years	John Hicks Tennessee DOT Nashville, TN	Thomas G. Miller Navstar Mapping Corp Austin, TX
2.3.2	Building a Highway Users Tax Fund Web Application	Allison Bejarano Colorado DOT Denver , CO	Mike Juniper DTSAgile Fort Collins, CO
2.3.3	The Central Ohio LBRS Cooperative Maintenance Project: Integrating Disparate Users, Centerline Files, and Attribute Data for Regional Updates	Don Kiel Transcend Spatial Sol. Port Matilda, PA	
2.4	**LRS Examples**		**Aspen Daisy**
	Moderator: James Meyer		
2.4.1	Building and Maintaining a Roads & Highways Data Model for Local Government	Paul A. Tessar City/County of Denver Denver, CO	Adrien Litton Esri, Inc. Redlands, CA
2.4.2	Project-based LRS maintenance at Idaho Transportation Department	Phil Hardy AgileAssets San Clemente, CA	
2.4.3	The Georgia DOT LRS-Road Characteristics Solution to Increasing Demands and Shrinking Resources	Paul Tanner Georgia DOT Chamblee, GA	Tom Ries GeoDecisions, Inc. Madison, WI

The symbol indicates a session from Colorado, the Host State.

CONCURRENT SESSION 3

10:30 AM TUESDAY, APRIL 17

3.1	**Rail and Centerlines**		**Snowberry**
	Moderator: Glenn Locke		
3.1.1	NJOIT Centerline Enhancement Project	Thomas W. Tiner Michael Baker, Jr., Inc Hamilton, NJ	
3.1.2	Modeling Current and Future Rail Network Level of Service (LOS) Conditions Using GIS: A Case Study from the Minnesota DOT Comprehensive Statewide Freight and Rail Plan	Kevin Ebright-McKeehan Cambridge Systematics, Inc. Chicago, IL	
3.1.3	Sophisticated Mapping for Increasing Railway Capacity	Bill Emison Merrick & Company Aurora, CO	Troy Kelts Merrick & Company Aurora, CO
3.2	**Integrating Data with GIS**		**Goldenglow**
	Moderator: Jesse Day		
3.2.1	Migrating Delaware's Official Transportation Map from CADD to GIS	Josh Thomas Delaware DOT Dover, DE	Jay Gerner Delaware DOT Dover, DE
3.2.2	Centerline and Urban Data Conflation at VDOT	Joe Pugh Virginia DOT Richmond, VA	Connie Gurchiek Transcend Spatial Sol. Sarasota, FL
3.2.3	Driving Efficiency Through Better Integration of Spatially Enabled Linear Networks and Design Drawings.	Jesse M. Day Bentley Systems Sunrise, FL	Russell Page Bentley Systems Englewood, CO
3.3	**Integration Tools**		**Elderberry**
	Moderator: Eric Floss		
3.3.1	Adopting the Appropriate GIS/IT Technologies for GIS-T Integration	Bo Guo Gistic Research, Inc. Tempe, AZ	Jake Payne & Frank Pisani Utah DOT Salt Lake City, UT
3.3.2	Implementing a GIS-Based Pavement Assessment and Management System Challenges and Successes	Candice Ottley-Francois, JMT Technology Group Sparks, MD	
3.3.3	GIS-Based Geotechnical Engineering Document Management System	Andrew J. Graettinger University of Alabama Tuscaloosa, AL	Randy K. Smith University of Alabama Tuscaloosa, AL
3.4	**Transportation Planning Tools**		**Aspen Daisy**
	Moderator: Pat Broussard		
3.4.1	FHWA GIS Outreach Activities	Mark Sarmiento Federal Highway Administration Washington, D.C.	
3.4.2	Project Impact Assessment	Bruce Aquila Intergraph Corporation Huntsville, AL	
3.4.3	National Transportation Atlas Database (NATD)	Mark Bradford USDOT/Bureau of Transportation Statistics Washington D.C.	


The symbol indicates a session from Colorado, the Host State.

CONCURRENT SESSION 4

1:00 PM TUESDAY, APRIL 17

4.1	**Mobile and Mapping GIS**		**Snowberry**
	Moderator: Marie Paulimene Louis		
4.1.1	Development of Appalachian Regional Transportation and Export Data System with GIS in Mind	Sanghong Yoo Rahall Tran. Institute Huntington, WV	Jason Wang Appalachian Reg. Com. Washington, D. C.
4.1.2	Datums and tools to connect geospatial data accurately	Pamela Fromhertz National Geodetic Survey/NOAA Denver, CO	
4.1.3	A Faster Approach to Mobile Data Collection	Paul Weinberger Minnesota Department of Transportation St. Paul, MN	
4.2	**Visualization & 3D**		**Goldenglow**
	Moderator: Frank Desendi		
4.2.1	Exploring New Dimensions with Hawaii DOT's Linear Referencing System	Jennifer Arinaga Hawaii DOT Honolulu, HI	Bruce Aquila Intergraph Corporation Huntsville, AL
4.2.2	The Use of 3D-GIS Applications for Planning and Design	Charles Hixon Bergmann Associates Rochester, NY	Jeff Volpe Bergmann Associates Rochester, NY
4.2.3	FHWA Activities in GIS and Visualization	Ben Williams, P.E. FHWA Resource Center Atlanta, GA	
4.3	**LRS - Broad Views**		**Elderberry**
	Moderator: Tom Ries		
4.3.1	Spatial Database Architecture: Designing your Spatial Database for Flexibility	Jerry Mohnhaupt Arcadis, Inc. Boulder, CO	
4.3.2	NCHRP 20-27 to ISO 19148 18 Years of Progress in Linear Referencing	Paul Scarponcini, PE, PhD Independent Consultant Littleton, CO	
4.3.3	Multi-Level Linear Referencing System (MLLRS) Coast/Benefit Value Analysis Study	Eric Abrams Iowa DOT Ames, IA	Thomas Martin Minnesota DOT St. Paul, MN
4.4	**Transportation Networks**		**Aspen Daisy**
	Moderator: Nate Reck		
4.4.1	Using Linear Referencing Systems (LRS) to Evaluate Transit Operations: Case Studies from Madison, Kansas City, and Indianapolis	Kevin Ebright-McKeehan Cambridge Systematics, Inc. Chicago, IL	
4.4.2	Spatially Integrated Street Surface Assessment Case Study	Chris McConn, Brady Hustad , & Natalie Cutsforth Idea Integration Houston, TX	
4.4.3	Using web-based GIS as a collaboration tool for multi-disciplinary transportation teams	Rachel King HDR Engineering, Inc Edmonds, WA	

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CONCURRENT SESSION 5

8:30 AM WEDNESDAY, APRIL 18

5.1	**Asset Challenges**		**Snowberry**
	Moderator: Don Kiel		
5.1.1	Local Road and Bridge Data Collection	John Parker PENNDOT Harrisburg, PA	Matt Long PENNDOT Harrisburg, PA
5.1.2	Mapping Storm Damage to Infrastructure in the Wake of Tropical Storm Irene The Vermont Experience	Johnathan Croft Vermont Agency of Transportation Montpelier, VT	Steph Magnan Montpelier, VT
5.1.3	Overcoming Challenges for Field-Based Asset Management	Shawn Blaesing-T. Iowa DOT Ames, IA	Bill Schumann Transcend Spatial Nevada, IA
5.2	**Data Integration**		**Goldenglow**
	Moderator: Tom Tiner		
5.2.1	Oracle Spatial at Iowa DOT	Eric Abrams Iowa DOT Ames, IA	
5.2.2	Louisiana DOTD's Maintenance and Management of a Public Roadway Feature	Darryl W. Mack Louisiana Department of Transportation and Development Baton Rouge, LA	
5.2.3	UGate UDOT's Gateway to GIS-T Integration	Jake Payne & Frank Pisani Utah DOT Salt Lake City, UT	Bo Guo Gistic Research, Inc. Tempe, AZ
5.3	**HPMS**		**Elderberry**
	Moderator: Jay Mahajan		
5.3.1	Deconstructing Stovepipes: FHWA's Data Integration Initiative	Ronald Vaughn U.S. DOT / Federal Highway Administration (FHWA) Washington, D.C.	
5.3.2	The District Department of Transportation (DDOT) HPMS Console Solution for an Easier, Time Saving Submittal	José Colón D. C DOT Washington, D.C.	Nate Reck GeoDecisions Camp Hill, PA
5.3.3	Navigating the Potholes of Implementing and Integrating Virginia DOT's Roadway Network System Program	Bryan Kelley Virginia DOT Richmond, VA	Archer Carr Virginia DOT Richmond, VA
5.4	**Planning & Mapping Projects**		**Aspen Daisy**
	Moderator: Mitch Stephens		
5.4.1	GIS and Project Programming: How SCDOT is Enhancing Their Ability to Program Projects	Mary Gail Broussard PMG Software Prof. Madison, AL	Lynsee Gibson South Carolina DOT Columbia, SC
5.4.2	Putting Road Projects on the Map	Michael Cresap Mississippi DOT Jackson, MS	Bruce Aquila Intergraph Corporation Huntsville, AL
5.4.3	Fostering Collaboration and Coordination Through an Innovative GIS Application	Jeff Roberts, PMP JMT Technology Group Sparks, MD	

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CONCURRENT SESSION 6 10:30 AM WEDNESDAY, APRIL 18

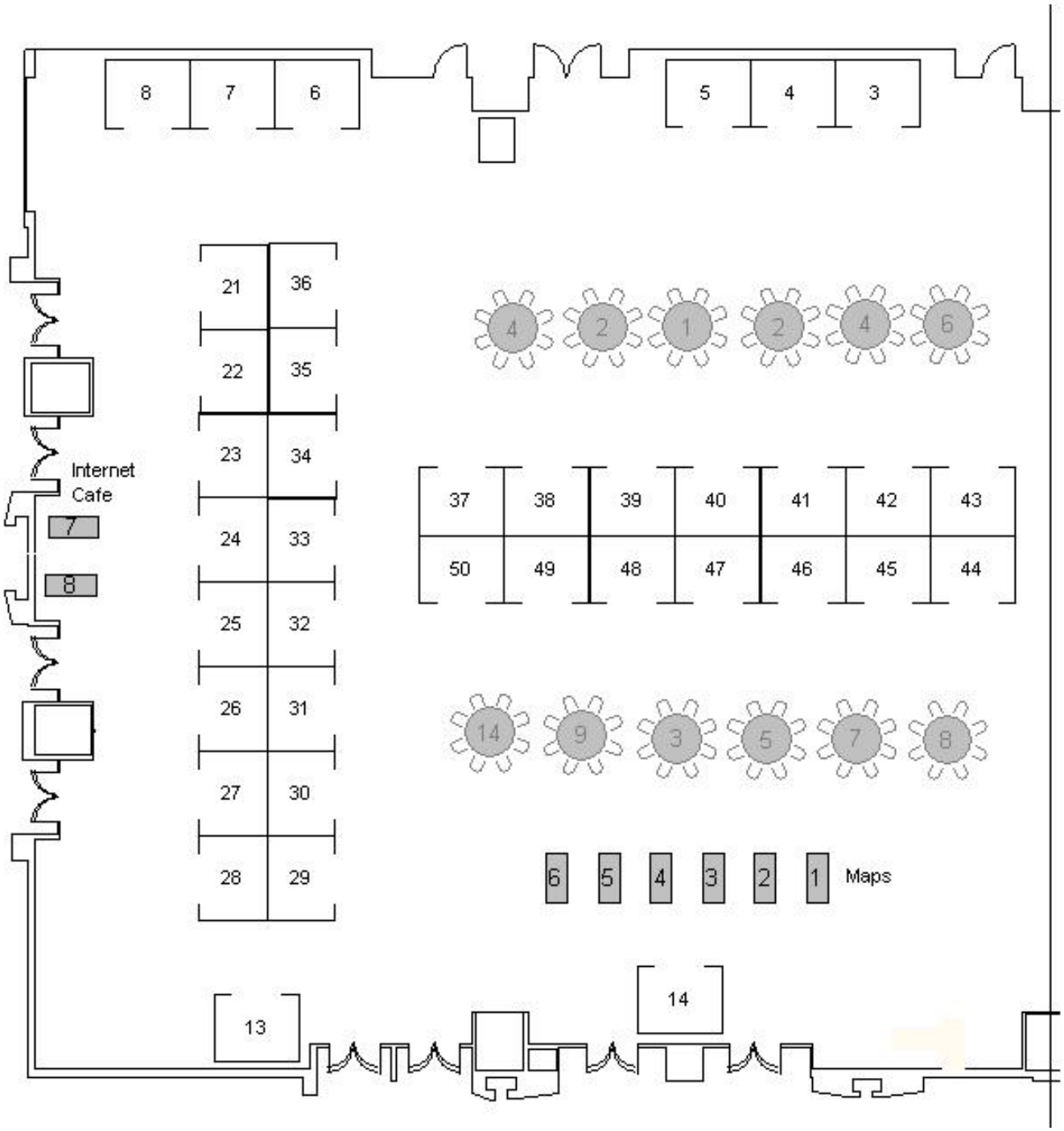
6.1	**Asset Systems**		**Snowberry**
	Moderator: Brian Logan		
6.1.1	Cook County Asset & Pavement Management System	Scott Stocking Woolpert Oakbrook, IL	Daniel Szwaya Cook County Highway Dept. Chicago, IL
6.1.2	Activity-Centric Asset Management for Bridges, Paradigm Devolution	Thomas Martin Minnesota Department of Transportation Oakdale, MN	
6.1.3	Transportation Asset Data at the Colorado Dept. of Transportation	Lou Henefeld Colorado Dept. of Transportation Denver, CO	
6.2	**Enterprise Programs**		**Goldenglow**
	Moderator: Johnathan Croft		
6.2.1	Enabling Enterprise Geospatial Workflows	Dave Holmes Intergraph Corporation Huntsville, AL	
6.2.2	The Georgia DOT Enterprise GIS Program	Teague Buchanan Georgia DOT Atlanta, GA	
6.2.3	Plug-and-Play GIS Applications: Making Maps Easy	Kim Hubble Colorado DOT Denver, CO	Dave Bouwman DTSAgile Fort Collins, CO
6.3	**Crashes**		**Elderberry**
	Moderator: Richard Paddock		
6.3.1	Crash Locating in the State of Alabama: Improving Safety on Rural Roads	Randy K. Smith The University of Alabama Tuscaloosa, AL	Andrew Graettinger University of Alabama Tuscaloosa, AL
6.3.2	AHTD's LRS Crash Location Tool and Utilizing Incident Analyst for Crash Event Analysis	Sharon Hawkins Arkansas DOT Little Rock, AR	Bruce Aquila Intergraph Corporation Huntsville, AL
6.3.3	Expediting Nevada DOTs Crash Analysis through a Multilevel Linear Referencing System	Grahame Ross Nevada DOT Carson City, NV	Bruce Aquila Intergraph Corporation Huntsville, AL
6.4	**Transportation Environment and Mapping**		**Aspen Daisy**
	Moderator: Greg Yarbrough		
6.4.1	Automating Environmental Screening	Frank DeSendi PennDOT Harrisburg, PA	
6.4.2	Noxious Weeds Web Application and Data Management for the Colorado DOT (CDOT)	Gary Aucott Colorado Department of Transportation Denver, CO	
6.4.3	Highway Map Reproduction in GIS: West Virginia's Experience	Dr. Yueming Wu West Virginia Department of Transportation Charleston, WV	

The symbol indicates a session from Colorado, the Host State.

NOTES

TECHNOLOGY HALL EXHIBIT AREA

GIS-T Technology Hall – Canyon Maple & Mountain Holly



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ARCADIS	www.arcadis-us.com	33
Bentley Systems	www.bentley.com	43
Bohannan Huston, Inc.	www.bhinc.com	49
CDM Smith	http://cdmsmith.com	24
National Geodetic Advisor	www.ngs.noaa.gov	9
Data Transfer Solutions	www.dtsgis.com	48
CompassCom	www.compasscom.com	3
Delasoft Inc	www.delasoft.com	50
ESEA	www.esea.com	41
ESM Consulting Engineers	www.esmcivil.com/	6
ESRI	www.esri.com	21-23, 34-36
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Infogroup – Govt. Division	www.referenceusagov.com	7
Inner Corridor Technologies	www.TeachMeGIS.com	38
Intergraph	www.intergraph.com	27-30
Mandli Communications, Inc.	www.mandli.com	25
Michael Baker Jr., Inc.	www.mbakercorp.com	45
Prime Source Technologies	http://primesource.com	40
Safe Software Inc.	www.safe.com	4
TerraGo Technologies	www.terragotech.com	13
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World View Solutions	www.worldviewsolutions.com	46

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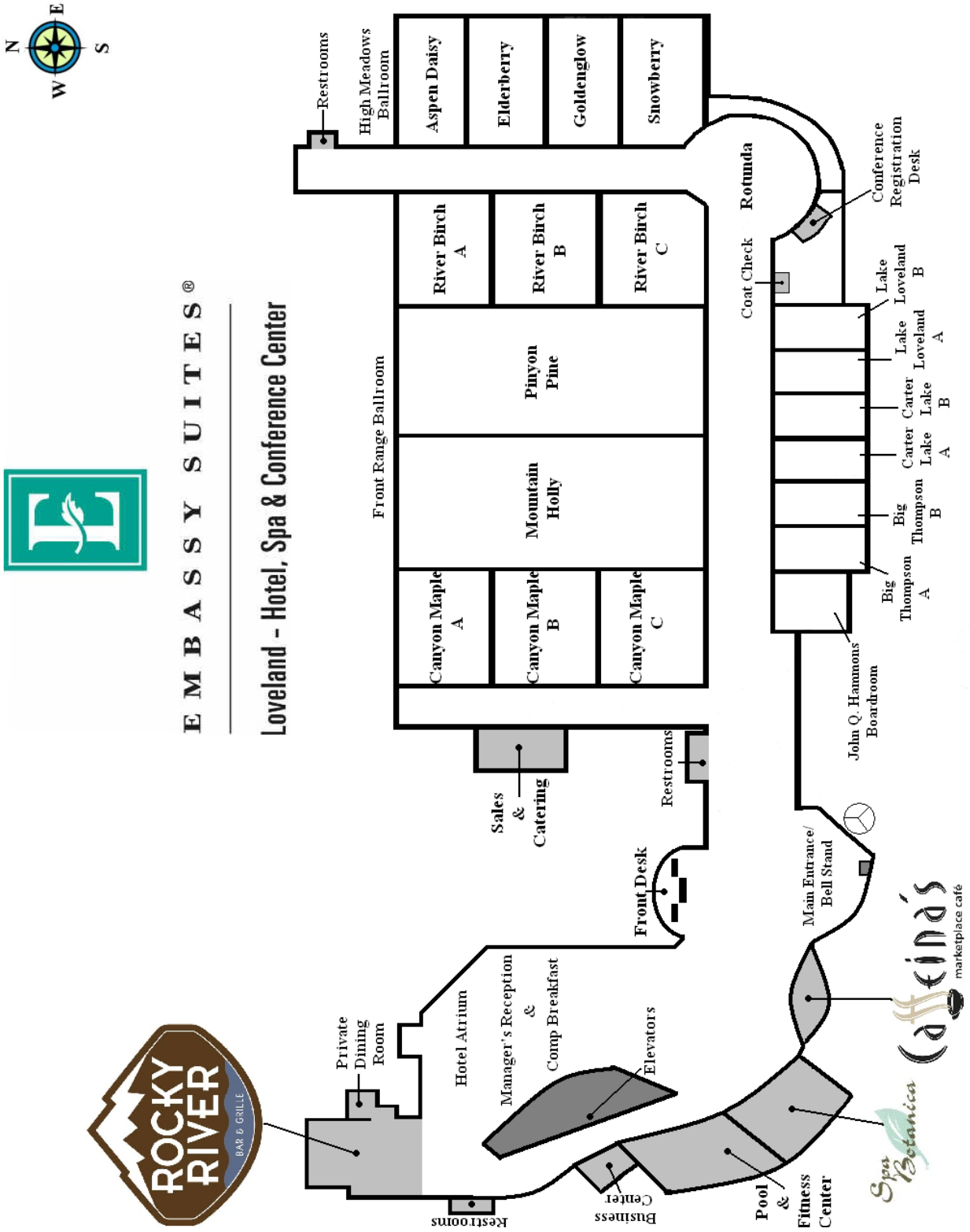

GIS-T 2012 Mainframe to Mainstream 25 Years of Progress

1987	Tempe, Arizona
1989	Orlando, Florida
1990	San Antonio, Texas
1991	Orlando, Florida
1992	Portland, Oregon
1993	Albuquerque, New Mexico
1994	Norfolk, Virginia
1995	Sparks, Nevada
1996	Kansas City, Missouri
1997	Greensboro, North Carolina
1998	Salt Lake City, Utah
1999	San Diego, California
2000	Minneapolis, Minnesota
2001	Arlington, Virginia
2002	Atlanta, Georgia
2003	Colorado Springs, Colorado
2004	Rapid City, South Dakota
2005	Lincoln, Nebraska
2006	Columbus, Ohio
2007	Nashville, Tennessee
2008	Houston, Texas
2009	Oklahoma City, Oklahoma
2010	Charleston, West Virginia
2011	Hershey, Pennsylvania
2012	Loveland, Colorado
2013	Boise, Idaho

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GIS-T 2012 Abstracts and Bios

Session

1.1.1 Mobile GIS Apps for ITS

Presenter
John Diruggiero
Technical Project Manager ITS Bureau
New Mexico DOT
John.DiRuggiero@state.nm.us

Co-Presenter
Lee Jensen
RealTimeSolutions, CTO
Albuquerque, MN
lee@realtimesites.com

Remarkable recent advances in mobile hardware and software have made it possible to develop powerful spatially aware mobile ITS applications. We will demonstrate the technology as well as the mobile application for nmroads.com. We will discuss issues and concerns that need to be considered and lessons learned.

Bio(s):
John DiRuggiero, Board member the Intelligent Transportation Society of New Mexico, a state chapter of ITS America; First president of the Intelligent Transportation Society of New Mexico and one of the founding members of ITS New Mexico. Recipient of the 10th ITS Champion Award 2008; FHWA, ITS New Mexico Award 2009; ESRI 2009, Special Achievement Award in GIS; Committee member of ITS America 2010 for Business Development; New Mexico Department of Transportation ITS Bureau, Web Manager/ATIS technical project manager; MRCOG ITS Subcommittee member and technical lead for ITS GIS user group; New Mexico Department of Transportation with 12 years' experience and graduate of Ohio University.

Lee Jensen has broad experience developing commercial, aerospace and scientific software applications. Prior to becoming the CTO of RealTimeSites, Lee was a member of the technical staff at Sandia National Laboratories.

1.1.2 Mobile Application Technology

Presenter
Scott Sandusky
Transportation Technology Specialist ESRI
ssandusky@esri.com

Co-Presenter

Advancements in mobile technology and GIS software now make field workforce automation easier than ever. Spatial data can seamlessly be shared in and out of the field on any device. Asset collection and inspection workflows are now timelier and more accurate. ArcGIS Online and ArcGIS Runtime allow these GPS workflows to be configured with little or no development.

Bio(s):
Scott Sandusky has over 10 years of experience in the GIS industry. As a Transportation Technology Specialist, he applies GIS technology directly to industry-specific use cases and business problems.

1.1.3 Development of a GPS Technology Management Plan for LADOTD

Presenter
Jeff Barnett
Senior Consultant / Trainer
Inner Corridor Technologies, Inc
jeff.barnett@innercorridor.net

Co-Presenter

GPS technology has been adopted by different sections within the Louisiana Department of Transportation and Development (LADOTD) over the last decade with no uniform standards. It was unknown who was using GPS, what kinds of units were being used, and for what purposes. The current

state of GPS within the Department needed to be assessed and compared with current best practices as defined by use within the Department, other large agencies, and the GPS industry.

The goal was to create a management plan to guide LADOTD's use of GPS technology into the future based on best practices derived from surveys of LADOTD personnel, other state and federal agencies, and the GPS industry. The plan proposes at least one high quality GPS receiver at each district office and several at the headquarters distributed to all GPS user groups. Receivers are to have laser range finders so points can be collected faster and at safe distances.

GPS management improvements will come in the form of a GPS committee within LADOTD made up of users and support staff. The committee will drive the overall vision of GPS usage and set standards for databases, operating procedures, coordinate accuracy, and training. Executing the plans will be a GPS coordinator (either a new position or modification to an existing position). The coordinator will also maintain the inventory of GPS units and coordinate device maintenance and upgrades.

Bio(s):
Jeff Barnett has a Masters Degree in Geography from Texas State University and has worked in the geospatial industry since 1984. He is currently an instructor at TeachMeGIS.com and is an ESRI Certified Trainer and an ESRI Certified Desktop Associate.

1.2.1 Maintaining an Enterprise Vision: History of GIS at the Illinois Department of Transportation

Presenter
James Hall
Associate Professor, MIS
University of Illinois Springfield
jhall1@uis.edu

Co-Presenter

Building on the theme of this year's conference, "Mainframe to Mainstream - 25 Years of Progress", this presentation will trace the development and implementation of GIS technologies in the Illinois Department of Transportation (IDOT) from the early days of link/node base map development to an enterprise resource enabling a wide variety of knowledge application and decision support products. IDOT started development of their base GIS in 1983 with the mission to enable the integration of information from stovepipe systems across multiple asset classes.

This vision of enterprise GIS deployment for decision support has held firm over the years despite bumps in the road with changes in administrations, personnel and limited budgetary resources. Key elements of IDOT's vision were an enterprise focus, high benefit product selection, and the development of architecture to enable integration despite multiple referencing schemes for different legacy systems.

The presentation will highlight IDOT's GIS governance processes, technical architecture and the primary products developed for internal and external use. In addition to the GIS vision and strategy, IDOT has been aggressively modernizing older mainframe systems. The presentation will describe how the two visions of GIS and Mainframe Modernization are being successfully integrated. They will describe the future direction of GIS application development with a focus on business process reengineering, business intelligence and decision support systems.

Bio(s):
Since 2000, James Hall has been a professor in Management Information Systems at the University of Illinois Springfield. His previous 25 year career at IDOT included managing the initial GIS deployment. He holds an MBA and a Ph.D. in Civil Engineering.

1.2.2 Advanced Partnering with Civil Integrated Management (CIM) in the Highway Industry

Presenter
Bryan Cawley
Construction and Preservation Team Leader
Federal Highway Administration
bryan.cawley@dot.gov

Co-Presenter

Advanced Partnering with CIM takes us to a new level of administering highway construction projects. The key principles of CIM consist in a total project management with the use of technology to accelerate construction, improve safety, while being on budget and an atmosphere of success. A key component to the success of CIM is GIS to assist in surveying, automated machine guidance, and overall fleet maintenance. The purpose of this presentation is to present what AASHTO, AGC, ARTBA, and FHWA are doing to advance CIM with its reliance on GPS and GIS.

Bio(s):
Bryan Cawley currently serves as the Construction and System Preservation Team Leader for the Federal Highway Administration (FHWA). Since joining FHWA in the fall of 1997, Bryan has held a variety of positions in Utah, Nebraska, Chicago, North Dakota, Florida, Washington, and Colorado. Prior to working with FHWA, Bryan worked with Staker Paving and Construction and the Utah Department of Transportation. Bryan holds a Masters in Business Administration from the University of Nebraska, Masters Degree in Construction Management from Iowa State University and a Bachelor Degree in Civil Engineering from the University of Utah. Bryan is also a licensed Professional Engineer in the state of North Dakota.

1.2.3 GIS Technology and Tools for Long Range Transportation Planning in the National Park Service

Presenter
Nell Blodgett
GIS Program Lead
NPS Denver Service Center Planning Division
nell_j_blodgett@nps.gov

Co-Presenter
Laura Pernice and Jordan Hoaglund
GIS Specialist; Student Intern
NPS Denver Service Center Planning Division
laura_pernice@nps.gov
Jordan_Hoaglund@nps.gov

Analyzing National Park Service transportation networks for long range transportation planning presents many challenges. A variety of needs must be met including alleviating congestion, addressing safety concerns, and providing for a variety of modal options, while protecting natural and cultural resources. Because planning is often completed from afar, collaboration with on-site park staff and other internal and external partners is crucial to plan success and implementation. GIS technology provides an avenue to facilitate that collaboration as well as a means to spatially analyze systems in relation to congestion, safety, alternative transportation, visitor use, sensitive habitats, cultural sites, and climate change variables. The Golden Gate National Recreation Area (NRA) Long Range Transportation Plan (LRTP) is utilizing a variety of GIS tools to facilitate and enhance this planning process. We will demonstrate web mapping applications that are being used to encourage collaboration and provide QA/QC of geographic data from project team members and park staff experts. The Golden Gate NRA LRTP also presents a variety of challenges in terms of its urban setting, natural and cultural resources, visitor experience, and vulnerability to sea level rise. Using spatial representations of these variables overlay and network analysis techniques are being used to determine areas of concern and facilitate scenario planning in relation to Golden Gate NRA's transportation network. Discovering these areas of concern also enables planners to identify and visualize transportation “hot spots” to help focus planning efforts and resources.

Bio(s):
Nell Blodgett is a GIS Specialist and GIS program lead for the National Park Service Denver Service Center Planning Division. She holds a M.S. in GIS Science from San Diego State University and has over 10 years of GIS experience.

Laura Penrice has a B.A. in Geography and a GIS Certificate from University of Colorado at Denver. She works at the National Park Service in the Denver Service Center Planning Division as a GIS Specialist.

Jordan Hoaglund holds a Bachelor of Arts in Environmental Studies from Saint John's University, as well as a Masters of Urban and Regional Planning and a graduate certificate in geospatial information science from the University of Colorado-Denver. Jordan has worked as a GIS Analyst for the National Park Service's Intermountain region and currently works as a community planner, and GIS specialist for the National Park Service's Denver Service Center Planning Division.

1.3.1 Delivering Important Traffic Data through GIS: Work Zone Traffic Analysis (WZTA)

Presenter
Robert Kirkman
GIS Services Manager
HDR
robert.kirkman@hdrinc.com

Co-Presenter
David Ringeisen
Transportation Data Development Director
Oregon Department of Transportation
david.w.ringeisen@odot.state.or.us

Work Zone Traffic Analysis (WZTA) methodology is designed to predict the hours during which lanes or shoulders can be safely closed, and the approximate traffic queue length and resulting delays that would develop during such closures. HDR Traffic Engineers developed a new methodology based on ODOT's established work zone traffic analysis practices and existing data sources for traffic characteristics. Converted into a web-based application, this common methodology led to additional contracts for development, training, and traffic support.

The design, development, and use of this application have yielded a Return on Investment (ROI) of 3.6, and have changed the way that ODOT delivers traffic information. The project links the Agency's SQL databases, and includes ArcGIS Server. The methods from this project may help agencies with the design and delivery of core services using web GIS by leveraging their enterprise components.

Bio(s):
Robert is on HDR's GIS Leadership Team, and runs a development team. He has 17 years of experience in geospatial sciences, focusing on delivery of large projects.

Dave Ringeisen is the manager of the Transportation Data Section which includes the Geographic Information Services (GIS), Roadway Inventory and Classifications Services (RICS), Traffic Monitoring Systems (TMS), Automation and Crash Analysis and Reporting (CAR) units. Dave's career with ODOT has spanned 32 years, starting in Portland on a bridge survey and inspection crew working on the I-205 Glen Jackson Bridge construction and a Fremont Bridge inspection project. In the early 80's he accepted a position in the Planning Section in Salem working on a team whose responsibility was to select and implement ODOT's Computer Aided Drafting System. In the early 90's Dave accepted the Transportation Data Section Manager position which then included the Oregon Transportation Management Systems (OTMS) and later was a major contributor to the development and implementation of ODOT's asset management systems. Dave also serves as chair of ODOT's GIS Steering Committee and is a member of the Oregon Geographic Information Council's Policy Advisory Committee. Dave has a Bachelor of Science degree in the Social Sciences majoring in geography from Oregon College of Education.

1.3.2 Use of Geospatial Information Systems in the Intelligent Transportation Systems and Connected Vehicle Environment

Presenter
Jim Arnold
Electronics Engineer
Highway Administration's Office of Operations R&D
James.a.arnold@fhwa.dot.gov

Co-Presenter
Rudy Persaud
Transportation Research Specialist
US DOT
rudy.persaud@fhwa.dot.gov

The key technologies that are needed to support Intelligent Transportation Systems (ITS) are Wireless Communications, Positioning, and Mapping. This paper will focus on Mapping technologies and describe how ITS applications will utilize Mapping technologies and what the requisite performance characteristics are needed from Mapping solutions. This paper will briefly outline the various Mapping technologies that can be utilized for Map creation and describe how the various technologies align against the needs of the ITS applications.

Bio(s):
James A. Arnold is an electronics engineer in the Federal Highway Administration's Office of Operations Research and Development On the Transportation Enabling Technologies Team at the Turner-Fairbank Highway Research Center in McLean, Va. Currently, Jim is conducting research utilizing global positioning system. He has also conducted research on dedicated short-range communication and provides spectrum management and on the nationwide differential global positioning system and high-accuracy nationwide differential global positioning system as well as technical support to intelligent

transportation systems communications systems He has written a number of articles on GPS including "Navigating the Future," that appeared in FHWA's Public Roads. Jim received a bachelor's degree in electrical engineering from the University of Delaware and a master's degree in electrical engineering from the Florida Institute of Technology.

Mr.Persaud is a Transportation Research Specialist for the U.S. Department of Transportation Federal Highway Administration, Office of Operations Research & Development. Persaud is a graduate from the University of South Dakota with a Bachelor of Science in Highway Construction Engineer and Associate of Applied Science in Civil Technology. He has over 32 years of experience in the areas of transportation research and strategic planning. He works in the area on Intelligent Transportation System (ITS) for connected Vehicle Highway Network Applications V21, GPS Augmentation systems, Rural IT'S, Environmental Investigations for the Nationwide Differential Global Positioning System, Road Weather Management System and Chair the Department of Transportation's U.S. States and Local Government Subcommittee (USSLS) of the Civil GPS Service Interface Committee (CGSIC).

Prior joining the DOT/FHWA, Mr. Persaud worked 22 years for the South Dakota Department of Transportation, Office of Planning and Engineering. He developed and implemented a comprehensive GPS/GIS automated transportation management system. In 1998 Mr. Persaud was assigned to FHWA on an Intergovernmental Personal Act (IPA) conduct research for GPS/GIS applications for surface transportation nationwide.

1.3.3 Snow Plow Tracking from Start to Finish

Presenter
Eric Abrams
Iowa DOT Geospatial Coordinator
Iowa DOT
eric.abrams@dot.iowa.gov

Co-Presenter

Iowa DOT is implementing a snow plow tracking system capable of collecting locations, quantities and environmental conditions. During the presentation we will review the initial project concept, how the concept moved forward and lessons learned. Also information about how Iowa's LRS made tracking easier, truck hardware and leveraging web services to disseminate information.

Bio(s):
Eric Abrams is Iowa DOT's Geospatial Coordinator. He developed many geospatial systems and engineered DOT's current geospatial infrastructure. Eric also helped implement Iowa DOT's LRS. He has been with the department for 22 years.

1.4.1 TDOT's Answer to Evolving Highway Safety Emphasis

Presenter
Jeff Murphy
Information Systems Manager
Tennessee DOT
Jeff.Murphy@tn.gov

Co-Presenter
Tom Eldridge
Software Consultant
Intergraph Corporation
Tom.Eldridge@tn.gov

The Tennessee Department of Transportation has been analyzing highway crash data for over forty years. This data is used to identify highway locations that have safety issues that can be addressed in many ways. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU) created several new emphasis areas for highway safety. The existing tools available to Tennessee Department of Transportation Safety Planners were not adequate to address all of these areas. TDOT needed a comprehensive, flexible tool for analysis of highway safety data.

TDOT planners determined that they needed a program that could use the existing highway inventory database to find problem areas that would address the changing areas of emphasis. SAFETEA-LU emphasized Intersection Safety, Local & Rural Road Safety, Pedestrian & Bicycle Safety, Roadway Departure Safety, and Speed Management Safety. Existing tools could not address all of these concerns.

This led to the development of a program that could create a base data set that combined highway data and crash history. Instead of just adding up the number of crashes for each location, crash attribute data is stored on these records. This allows planners to query this data for specific data both singularly or in combination with other attributes. This flexibility of being able to change the way locations are queried lets potential projects evolve as criteria changes.

The new program does not stop at just finding potential safety projects. As candidate projects are put on lists for further investigation, each list can be managed to allow tracking of the disposition of the potential projects. As the status of potential projects changes throughout the analysis and evaluation process, status codes and comments can change to reflect these developments.

This has been a valuable tool in the Highway Safety Planning area of TDOT. Flexibility is the key to its success. Because of this flexibility, TDOT is making better choices for how its safety funds are spent to get the best results for the safety of its drivers.

Bio(s):
Jeff Murphy is an Information Systems Manager in the GIS Mapping and Facilities Data Office TDOT. He manages the Tennessee Roadway Information Management System. Jeff has over 25 years of information systems experience. He has a B.S. in Information Systems.

Tom Eldridge is a Software Consultant with Intergraph Corporation. He is presently working with the TDOT, where he was employed for 31 years. He assisted TDOT in developing Highway Safety software and has been involved with since its inception.

1.4.2 Driving Behavior mapping and GIS

Presenter
Ken Clay
Global Account Manager
TomTom
ken.clay@tomtom.com

Co-Presenter

Traditional GIS data sets have emphasized the physical configuration of roads based on repeatable measurements of the locations of physical objects, such as painted road centerlines or stop bars. Collection has been based on survey techniques and 'mapping vans'. Probe data can be used to derive a complementary data set that describes, say, the average path of drivers, or the 90th percentile stopping location. These data sets are clearly related; however; deriving one from the other can be very difficult since many factors contribute to human driving behavior, some of which are not addressed by roadway design. Simple behaviors are traffic, but more complex behaviors include turn delays by time of day or curvature induced speed changes.

TomTom has long experience in the traditional mapping business through the acquisition of Tele Atlas, and also has the most extensive collection of anonymous probe data collected from TomTom devices globally and other devices. TomTom has been using probe data to enhance traditional maps, and is also exploring data sets and applications that describe behavior patterns.

This presentation will examine three specific applications, 1) stop sign warnings, 2) emissions assessment, and 3) signal throughput optimization, to highlight differences between physical maps and behavioral maps and examine the strengths and weaknesses of each for implementing these applications.

Bio(s):
Mr. Clay is a Global Account Manager within the TomTom AEG Business Unit. His background includes a Bachelor's degree in Electronic Engineering Technology at the University of New Hampshire and 10 years of experience in geospatial technology. At TomTom he manages real-time and historical traffic data accounts for East Coast States and the Federal Government. Previously Mr. Clay managed the largest revenue generating B2B account in TomTom's portfolio**.**

1.4.3 Northern Virginia Regional Routable Centerline Model

Presenter
Brendan J Ford
GIS Applications & Systems Administrator
Fairfax County, VA GIS
brendan.ford@fairfaxcounty.gov

Co-Presenter

Sharing centerline and roadway data is critical for Emergency Response organizations. This is especially important where jurisdictions pool resources in automatic aid and mutual aid systems.
The 5 Public Safety Answering Points (PSAPs) in Northern Virginia have worked together over the last 2 years to create a Regional Routable Centerline Data Model capable of supporting 911 and other operations. The data model has been integrated as part of a data work flow with the Virginia Geographic Information Network (VGIN) statewide centerline data model. As a result of this project, the jurisdictions of Northern Virginia have a seamless, integrated centerline database that supports routing in each individual CAD system.

This presentation will focus on the development of the data model, the workflows between state and local governments, and the final data model produced. During the presentation we will also demonstrate an application developed to report data errors across jurisdictional boundaries. This application was developed using ESRI's Flex application kit.

Bio(s):
Brendan Ford is the Applications Manager for Fairfax County. He has worked for Fairfax County GIS for 23 years and is a graduate of Virginia Tech. He helped develop a multi-modal transportation data model for Fairfax County and a regional centerline model.

2.1.1 Can Cloud Technology Help You to Improve Performance, Scalability, and Cost of Geo-Spatial Applications When Your Budget is shrinking?

Presenter
Chris Zajac
Principal Engineer
NJDOT
Chris.Zajac@dot.state.nj.us

Co-Presenter
Yu Luo
System Architect
Michael Baker Corporation
yluo@mbakercorp.com

Traditionally Information Technology (IT) Departments have been the major stakeholders of corporate (public and private) technological infrastructures. They have been the major providers for hosting, delivering, and providing technical assistance of geospatial databases and solutions. Their infrastructures (hardware and software included) have evolved from mainframe computers to modern day's powerful server farms. Over time, they have tried to continuously upgrade their systems to be up to date and to respond to challenges of customers whose primary demands are performance, reliability, scalability, and low cost services. IT departments have made strategic moves such as renting the hardware instead of owning them, upgrading to mature technology frameworks and software releases, and creating shared environments with local IT governance rules.

Despite these measures there are still reoccurring issues regarding hosting of Geo-Spatial data and applications. These applications are built on different frameworks or software versions and a simple framework upgrade may require older applications to be re-compiled or in some case re-designed and redeployed. Geo-spatial software license maintenance and hardware upgrade is also becoming more expensive with applications requesting more computing power. In light of these issues, IT departments and their customers are constantly trying to find a solution for making the deployment and maintenance of geo-spatial applications cheaper, scalable and highly responsive.

One innovative approach is to create a technology stack and deployment package that can benefit from recent improvement in software/hardware virtualization and cloud computing. The challenge is that most ISP/Cloud service vendors do not offer some key technologies traditionally used in GIS and geo-spatial applications. This presentation will discuss the design of a spatial system architecture that utilized a technology stack capable of economically addressing the issues of deployment cost, scalability and performance in cloud computing environment.

Bio(s):
Mr. Zajac's primary responsibility involves the Traffic Monitoring Systems (TMS) data processing, management, and publications. He also works with other DOT database managements and supervises contractors in database and system development.

Dr. Luo has more than 18 years of experience in providing innovative geospatial solutions in the transportation, safety, and emergency management sectors. His recent work focuses on achieving good application scalability and performance economically.

2.1.2 GIS-T Solutions via the Cloud

Presenter
Jesse Jay
Program Manager
Transcend Spatial Solutions, LLC
jjay@tssgis.com

Co-Presenter

This presentation will share experiences from current and ongoing transportation agency projects where GIS-Transportation solutions are being built, tested, deployed, hosted and maintained in the Cloud. An overview on cloud computing will be included that covers what the cloud is, how it works and typical cost scenarios. Additionally we will explain some of the pros and cons of GIS in the cloud, discuss experiences with products from major GIS vendors, and we will definitely cover performance and security. Finally some GIS-T cloud based solutions will be demonstrated.

Bio(s):
Jesse Jay is the Program Manager of Business Development for Transcend Spatial Solutions. He has provided geospatial services to the transportation industries for over 20 years. His experiences have led him to project management successes with many DOTs

2.1.3 TxDOT's Cloud Solution to reporting Highway Conditions

Presenter
Darryl Zercher
Branch Manager
TxDOT
darryl.zercher@txdot.gov

Co-Presenter

In the winter of 2011 Texas was hit with the worst ice and snow weather events that they had seen in many years. The DOT is responsible for providing information concerning the conditions of our 80,000 centerline miles of highways. Our legacy system was based on ESRI ArcIMS technology and a single server approaching 7 years old. The system was not able to support the demand of the public.
The Technology Services Division was tasked with finding a solution to provide a system that could sustain the impact of thousands of users and remain in a stable usable state throughout the weather events.

The solution is hosting the redesigned ArcGIS server/BING application in the AmazonEC2 Cloud. This solution offers the ability to host the application and then add additional computing resources as the demand increases. As the demand declines, the additional resources decline also. The pricing model is based on the actual usage, similar to the pricing model an electric company uses, of the computing resource.

The AmazonEC2 cloud service is unique in this case since they are partnered with Esri, the GIS software vendor currently used by TxDOT. Esri offers preconfigured ArcGIS for Server software in the Amazon Cloud that is ready to use in minutes. Currently no other cloud provider offers this partnership or method of providing the same service. This presentation would cover the design of the application, the testing that was done to prove the stability/scalability of the Amazon Cloud, the use of the system and the costs involved to host the application.

Bio(s):
Mr. Zercher is the Branch Manager for the Surveying, GPS and GIS Departments in TxDOT's Technology Services Division. These units are responsible for support services and recommending technology directions for the Agency.

2.2.1 Iowa DOT Geospatial Portal

Presenter
Shawn Blaesing-Thompson
Maintenance GIS Coordinator
Iowa Department of Transportation
shawn.blaesing-thompson@dot.iowa.gov

Co-Presenter
Aaron Ford
Project Manager
HNTB
aford@hntb.com

Successfully implementing an agency-wide enterprise GIS for any organization is no small feat. Careful planning, stakeholder involvement, and technology resourcing must be considered and constantly sought. The Iowa DOT sought after this goal nearly 10 years ago, using a combination of industry leading software and standards, all with a focus toward desktop client neutrality. Users from within the DOT now have the ability to manage and maintain numerous layers of geospatial data, publish as services, and develop focused geospatial web applications with minimal technical knowledge, to both internal and external client. This presentation will explore the path taken toward this end, and provide a view of the fully realized Geospatial environment at Iowa DOT which takes advantage of technologies from Oracle, Esri, Safe Software, and Latitude Geographics.

Bio(s):
Shawn Blaesing-Thompson is GIS Coordinator in the Office of Maintenance at Iowa DOT. She is responsible for project management, data development/maintenance, ArcGIS Server web applications & integration with enterprise business systems. Before that she worked as a DBA for the USDA-Agricultural Research Service. She also spent 6 years with WSDOT doing custom cartography, working as the GIS Training coordinator and doing GIS Project management. She holds a B.S. in Earth Science from Iowa State, a M.S. in Soil Science from Washington State, and IT Project Management Certificate from University of Washington. In her spare time she is a Girl Scout troop leader, triathlete and custom jewelry designer.

Aaron Ford has more than twelve years of management, consulting, and technical expertise in the information and geospatial (GIS) technology industry. He is currently employed with HNTB where he serves as Project Manager and Technology Lead on numerous transportation related projects. He has worked in cooperation with the Iowa Department of Transportation for two years on the growth ad maturation of the Highway GIS Portal. When he is not tethered to his computer working, he is busy with his wife and two young boys or refining his home brewing skills.

2.2.2 GeoTRAQS Enterprise Mapping Portal

Presenter
Teague Buchanan
Enterprise GIS Mgr
Georgia Department of Transportation
tebuchanan@dot.ga.gov

Co-Presenter

The Georgia DOT (GDOT) is finalizing development on GeoTRAQS, an enterprise mapping portal. The SharePoint/ArcGIS Server Silverlight .NET API solution incorporates enterprise data resources, mapping dashboards, web services, and user interaction driven by geographic extent. Map extents return results from enterprise data resources. Hyperlinks land on SharePoint dashboard pages where users can drill into Business Object reports, documents, and photos. The system design, enterprise integration, challenges, and results will be presented. GDOT expects to have the GeoTRAQS application accessible to the public prior to the conference. Work in progress during the conference for incorporating the TerraGo Publisher for ArcGIS Server and ArcGIS Server Geoportal extension will also be presented.

Bio(s):
Teague Buchanan is the Enterprise GIS Manager for the Georgia Department of Transportation. He manages the accessibility, representation, and framework of GIS resources through the delivery of support, development, and quality assurance services.

2.2.3 GIS Web Portal and Enterprise-Wide Data Warehouse Collaboration

Presenter
Mary Beth Pfrang
GIS Project Manager
Kansas Department of Transportation
marybeth@ksdot.org

Co-Presenter

Kansas Department of Transportation Bureaus of Transportation Planning and Computer Services has collaborated to align KDOT data for stabilization of the GIS Web Portal. This effort has been a benefit for Internal KDOT Staff, State Agencies and Consultants to access KDOT data for key decision making. KDOT's spatial data enablement project has resulted in effective and efficient utilization of such data. Tammy and Mary Beth will share benefits, architecture, lessons learned, types of data, geospatial enablement, development life cycle and communication tools.

Bio(s):
Mary Beth is a GIS Project Manager for the Kansas Department of Transportation in the Division of Planning. She has 26 years experience in the IT field including Database Administrator in Computer Assisted Mass Appraisal. She has worked at KDOT for 12 ½ years. Her current projects include GIS Web Development for Road Condition Reporting, an Enterprise GIS Web Portal, and a Metropolitan Area Traffic Management website. She works closely with the Data Warehouse team in the Office of Information Technology and the Intelligent Transportation System team in the Bureau of Traffic Safety. The Enterprise GIS Portal takes her to users over the entire agency adding any and all KDOT data to display spatially. She graduated from Kansas State University, with a BS in Management Information Systems. Mary Beth is a Kansas Certified Project Manager and a Kansas Certified Public Manager.

2.3.1 GPS Mapping 70k Miles of TN Local Roads in 5 Years

Presenter
John Hicks
GIS Tech. Mgr. 1
Tennessee Dept. of Transportation
John.H.Hicks@tn.gov

Co-Presenter
Thomas G. Miller
GIS Resource Specialist
Navstar Mapping Corporation
thomas_miller@navstarmapping.com

Tennessee DOT began development of GPS-based technology in 1994 to produce digital data to replace and automate the maintenance of their manually generated GIS network. This development work was completed in 1997 and the technology was used by TDOT inventory personnel during the 1998-2000 time period to collect new GPS-based data and expand the GIS control network to include the complete road network for the Department's 30,000 miles of State-Maintained and Functional Class Highways. Additional effort was funded by TDOT in 2001-2004 to develop and demonstrate an automated inventory update process that could be used for local roads. The resulting process provided simultaneous collection and processing of GPS data for the GIS network and logmile inventory update data for four database tables. Over a 2 to 1 improvement in productivity was demonstrated as compared to previous manual methods.

TDOT contracted with Navstar Mapping Corporation (NMC) in 2007 to implement this process using their automated data collection and data processing system. The contract period for updating the 70,000 + mile local road network spans five years utilizing two vehicles with a two person crew per vehicle. We are currently in the 5th and final year of the contract, and this presentation will describe the automated data collection system, processing steps used, and lessons learned. The transition from TDOT's manual method of data collection to the automated systems will be highlighted. The problems encountered and solutions that were implemented during the term of the contract will be summarized.

Bio(s):
John has been with TDOT for 25 years. He is a GIS Mgr in the Long Range Planning Division. They maintain the LRS spatial network, the TRIMS Database, and produce county, city, special GIS maps, including the Official Map of TN. .He graduated APSU in Geology B.S.

Thomas graduated Magna Cum Laude from Texas State University in 2006 with a B.S. in GIS. Prior to joining NMC, he worked for HomeCity, Inc., using GIS to spatially analyze and value different neighborhoods/areas based on amenities. GIS/LRS/GPS Specialist.

2.3.2 Building a Highway Users Tax Fund Web Application

Presenter
Allison Bejarano
GIS Analyst
Colorado Department of Transportation
allison.bejarano@dot.state.co.us

Co-Presenter
Mike Juniper
Senior Web Developer
DTSAgile
mjuniper@dtsagile.com

CDOT created an integrated web environment to allow jurisdictions to edit local road segment characteristics as part of the Highway User Tax Fund program. This data is in turn used to distribute HUTF funds to 332 local governments for the maintenance of roads. This talk will review the web application and the internal business processes which update the GIS layers at CDOT. "

Bio(s):
Allison has been with CDOT for four years. During this time she has worked with the HUTF program. Before coming to CDOT Allison worked at Intermap. There she was part of the data ingest team. Allison graduated from the University of Northern Colorado.

Mike has been developing geospatial web applications for the transportation industry for the last 5 years. Prior to that he developed desktop GIS applications.

2.3.3 The Central Ohio LBRS Cooperative Maintenance Project: Integrating Disparate Users, Centerline Files, and Attribute Data for Regional Updates

Presenter
Don Kiel
Program Manager
Transcend Spatial Solutions
dkiel@tssgis.com

Co-Presenter

Transcend Spatial Solutions partnered with Mid-Ohio Regional Planning Commission (MORPC) to develop a GIS-based Web map editing application. This is an extension of the existing system to provide regionally based, but locally edited mapping functionality to local communities who do not have extensive GIS capabilities. While the current system allowed “power user” communities to update and maintain address attributes through file replication, map layers are now combined into a regional base map so that users can directly access the files from the MORPC server, and perform attribute edits and generate reports.

This project involved collecting needs and requirements from a variety of users, design, development, and implementation of integrated components based upon a centrally accessible regional base map layer and database. The components include a data aggregation toolset, Web viewer, and Web editor. This project is a Phase 2 initiative of the original Ohio Location Based Response System (LBRS) project implemented throughout the state. Phase 1 resulted in the ability to share and coordinate highly precise road centerline layers and address attributes among counties and the Ohio Department of Transportation (ODOT). The Phase 2 project will be discussed especially with respect to how data sharing and coordination is being improved through the application, and present prospects for expansion of functionality on a statewide basis and with ODOT.

Bio(s):

Don has been involved in the GIS-T field for over 25 years. He has worked with numerous state DOTs and specializes in strategic planning and application development projects. He has degrees from Virginia Tech and the University of Akron.

2.4.1 Building and Maintaining a Roads & Highways Data Model for Local Government

Presenter
Paul A. Tessar
GIS Data Administrator
City and County of Denver, CO
paul.tessar@denvergov.org

Co-Presenter
Adrien Litton
Manager, DBS Transportation Group
Esri, Inc.
alitton@esri.com

The City and County of Denver, Colorado has been working with regional local governments to improve the management of roadway data so that data holdings can better serve the needs of the City as well as the Denver regional community. Participants in this project include Boulder County and the Cities of Boulder, Longmont and Erie, as well as the Boulder Regional Emergency Telephone Service Agency. J. Al Butler has served as the Data Architect for the customized development of a Regional Transportation Geodatabase Model built upon the foundation of the Esri Roads and Highways (R&H) solution.

A key area for improvement has been the management of roads and their associated assets using linear referencing to better integrate and support the wide variety of business systems that leverage roadway information. Following extensive research and analysis, the City determined that the best starting point was to pattern their data model after the best practices outlined in Designing Geodatabases for Transportation by J. Allison Butler (ESRI Press, 2008, ISBN 978-1-58948-164-0). The data modeling and database maintenance paradigms were then validated by participating in the Esri R&H solution beta release program. This product, an LRS-based highway data management solution from Esri, provided tools to help test the data model while refining the data maintenance rules. Participation in the software product's beta program gave the City and Boulder County valuable insight into the software capabilities while simultaneously providing Esri with critical feedback to improve the product.

This presentation will discuss the design of the R&H data model, including custom components built upon the R&H extensible architecture, as it has been completed in the Denver metro area. We will also discuss the current status of the ongoing project to implement the model utilizing COTS, custom tools that are being employed or are in development and integration with a variety of COTS business systems including:

- Accela - Permitting System
- CityWorks - Asset Management
- CrashMagic - Traffic Safety
- CDOT HUTF - Highway Users Tax Fund
- Pontis - Bridge Information System
- TriTech - Computer Aided Dispatch

Bio(s):
At DenverGIS Paul manages GIS data development and maintenance; GIS application project support; and, Custom map production. Previously Paul was the GIS Data Management Unit Supervisor for the Colorado DOT and the Boulder County GIS Coordinator.

Adrien Litton has been with Esri for more than 20 years focusing mainly on transportation. He has worked with numerous highway agencies, supported the FHWA's 2010+ Reassessment, and served as the primary designer of the Esri Roads and Highways solution.

2.4.2 Project-based LRS maintenance at Idaho Transportation Department

Presenter
Phil Hardy
LRS Product Manager
AgileAssets
phardy@agileassets.com

Co-Presenter

Idaho Transportation Department (ITD), an early adapter of automated LRS, continues to be an innovator in this field. This session reviews the multi-LRM, temporal linear referencing system that ITD is currently implementing. Some of ITD's design goals for this project were:

- Custom, task-specific interface built on top of ESRI's ArcEngine framework
- Ability to handle concurrency, gaps, roundabouts, multiple LRMs, etc.
- Extensive quality control
- Project-based LRS editing with temporality
- Event location stability throughout the enterprise

The challenges faced and the approaches used will be discussed.

Bio(s):
Phil, a Civil Engineer out of Georgia Tech, has worked in the transportation industry for 25 years and has been designing LRS data maintenance software for over a decade. He is currently responsible for shaping AgileAssets' LRS product offerings.

2.4.3 The Georgia DOT LRS-Road Characteristics Solution to Increasing Demands and Shrinking Resources

Presenter
Paul Tanner
Assistant State Transportation Data Administrator
Georgia DOT, Office of Transportation Data
ptanner@dot.ga.gov

Co-Presenter
Tom Ries
Senior Consultant / Project Manager
GeoDecisions, Inc.
tries@geodecisions.com

The Office of Transportation Data (OTD) at Georgia DOT is improving and changing business processes and related information systems due to increasing data consumer demands and shrinking data management resources. As part of an overall geospatial improvement program, OTD is completing the implementation of new linear reference system (LRS) and road characteristics (RC) data maintenance systems. These new systems address key challenges such as: streamlining LRS geometry and linear datum data maintenance; offering both roadway (carriage way) level data detail and roll up data for divided highways, more efficient data change propagation, supporting over-time analysis; more effective data maintenance processes; and improved data quality. This presentation will describe how these challenges were overcome and the lessons learned from system implementation.

Bio(s):
Paul Tanner has been employed by Georgia DOT for 19 years including the last 7 years as the Assistant State Trans Data Administrator in the Office of Transportation Data. He has a BS in Civil Engineering Technology from Georgia Southern University.

Tom Ries has 25 years experience in planning, design, and implementation of enterprise-class location reference systems, primarily for DOT agencies. Tom has an MS in Cartography/GIS from the UW Madison and a BS in Math from Illinois State University.

3.1.1 NJOIT Centerline Enhancement Project

Presenter
Thomas W. Tiner
GIT Manager
Michael Baker, Jr., Inc
ttiner@mbakercorp.com

Co-Presenter

The New Jersey Office of Information Technology has embarked on a project to enhance the New Jersey Department of Transportation (NJDOT) New Jersey Roadway Network Geographic Information Systems (GIS) dataset. This project will establish geocoding capabilities within the centerline data structure, as well as provide provisions for future routing functionality. The enhanced and standardized GIS roads (routes) dataset is intended to be a framework essential for national, statewide, regional, county and municipal use. New Jersey will own and maintain the data and therefore relieve themselves of the current commercial licensing fees and restrictions.

The primary purpose for this project is to take the highly spatially accurate, linear-referenced centerlines that were developed and maintained for NJDOT, and add more spatial and attribute content to this framework layer to provide value to a variety of transportation data users. This presentation will provide attendees with an overview of the production methodology implemented, discussion of challenges and solutions, as well as anticipated data maintenance strategies. Topics will include a cursory review of the data model, TIGER address range conflation, establishment of new public and private roads into the NJDOT Roadway Network, M-values, data validation procedures, cartographic and geocoding reporting tables.

Bio(s):
Mr. Tiner is the GIT Department Manager at Michael Baker Jr., Inc and responsible for the overall management, scheduling, resource allocation and technical methodologies employed for successful delivery of products and services within this Department. He has over 20 years of professional experience in the design and maintenance of Geographic Information Systems; development and deployment of relational database systems; software application development, asset inventory collection techniques; and technology training.

3.1.2 Modeling Current and Future Rail Network Level of Service (LOS) Conditions Using GIS: A Case Study from the Minnesota DOT Comprehensive Statewide Freight and Rail Plan

Presenter
Kevin Ebright-McKeehan
GIS Associate
Cambridge Systematics, Inc.
kebrightmckeehan@camsys.com

Co-Presenter

For the Minnesota Department of Transportation, analysts were tasked with creating a statewide plan for the state's freight and passenger rail service. As part of the plan, MnDOT directed analysts to evaluate current railroad network conditions, identify operational chokepoints, determine future conditions, and model infrastructure improvements. To achieve this, analysts built a Linear Referencing System (LRS) atop the state's rail network, undertook a robust data collection effort, interviewed stakeholders, developed performance measures, and modeled through ESRI ArcGIS products current and future rail traffic conditions, and a number of infrastructure investment proposals. Analysts utilized a number of variables for this process, including track ratio, rail line volume, signaling control system, and track condition. Volume-to-capacity (V/C) ratios and level of service (LOS) calculations were computed for both the freight and passenger networks under current conditions and under a series of network scenarios, from a full-build-out of all identified improvements to a no-build scenario. Prevailing costs were attached to the improvements, which included modernizing signaling control systems, adding more track to the network, and upgrading deficient bridges.

Bio(s):
Kevin Ebright-McKeehan is a GIS Associate with Cambridge Systematics with six years of experience in Geographic Information Systems (GIS), transportation planning, and network and spatial analysis. He is based in Chicago and married with three boys.

3.1.3 Sophisticated Mapping for Increasing Railway Capacity

Presenter
Bill Emison
Sr. Account Manager
Merrick & Company
bill.emison@merrick.com

Co-Presenter
Troy Kelts
Project Engineer
Merrick & Company
troy.kelts@merrick.com

When the Burlington Northern Santa Fe Railway Company (BNSF) wanted to increase the capacity of its rail network in California, they required an accurate survey of the existing rail infrastructure along the 453-mile route from Barstow to Oakland. BNSF hoped to expand the existing rail line with additional main-line tracks within its right-of-way (ROW), so Merrick & Company was contracted to provide all of the necessary geospatial data products to support this analysis.

BNSF's analysis required advanced topographical evaluation of the ROW boundary, which called for the acquisition of LiDAR elevation data suitable for generating one (1) foot contours. In addition, digital orthophotography was simultaneously collected with the LiDAR at a 0.25 foot ground resolution to support 1'=100' planimetric mapping.

Due to numerous curves, elevation and terrain changes along this rail corridor, various innovative geospatial techniques were developed and utilized. Survey ground control was established every 5th mile along the rail line. As ground control was being established, survey crews dealt with the issue of crossing three (3) state plane zones. Working closely with BNSF, the decision was made to divide the 453-mile corridor into segments determined by combined factors that would yield less than 0.1â€˜ error along its length. In addition, Merrick developed projection files to allow all railway segments to accurately line up across the entire length of the rail line. Upon completion of the air and ground mapping, a comprehensive desktop GIS viewing application was developed by Merrick to view all of the project data including orthophotos, contours and railway planimetric features.

While mapping the BNSF right-of-way presented many challenges unique to railways, the combined geospatial techniques developed in this project can be directly translated to similar corridor projects, including interstate highways, pipelines and high-voltage electric transmission lines.

Bio(s):
Bill Emison currently serves as a Senior Account Manager for the GeoSpatial Solutions division of Merrick & Company, a professional engineering services firm based in Aurora, Colorado. Bill is responsible for sales to private commercial firms in the USA.

Troy Kelts currently serves as a Project Engineer for the Civil Engineering Solutions division of Merrick & Company, a professional engineering services firm based in Aurora, Colorado (USA). In this position, Troy is responsible for the site civil engineering for public and private infrastructure projects. Troy earned a Bachelor of Science degree in Civil Engineering from Michigan State University, and is a registered Professional Engineer in Colorado, Louisiana, and Alaska.

3.2.1 Migrating Delaware's Official Transportation Map from CADD to GIS

Presenter
Josh Thomas
Project Planner
Delaware DOT
joshua.thomas@state.de.us

Co-Presenter
Jay Gerner
Project Planner
Delaware DOT
jay.gerner@state.de.us

The Delaware Department of Transportation (DelDOT) provides an Official Transportation Map for the benefit of citizens and tourists. This paper map is a true cartographic product that is maintained using CADD software. DelDOT is currently working on a project to build a similar product in GIS (a parallel process) to prepare for the future. Like other states, the challenge is to take advantage of GIS to better manage transportation data yet still produce a reference map with cartographic integrity.

The project team identified an enterprise GIS strategy to organize the data and selected some specialty software to help construct the map layout(s), including ArcGIS Production Mapping. The project has yielded a new map that is easier to maintain, which contains dynamic links to data from multiple authoritative sources. As an added bonus, new enterprise data has been created and quality control measures are planned. It is the Department's vision that this new base map eventually forms the basis for optimized web map services. DelDOT wishes to use the GIS-T Symposium as a forum to discuss Delaware's progress on this project, to present some technical methods, and to hear feedback from colleagues.

Bio(s):
Josh Thomas is a Planner with the Statewide & Regional Planning section at the Delaware DOT. He specializes in GIS and modeling for transportation projects.

Jay Gerner is a Planner with the Statewide & Regional Planning section at the Delaware DOT. He specializes in GIS and modeling for transportation projects.

3.2.2 Centerline and Urban Data Conflation at VDOT

Presenter
Joe Pugh
Enterprise Data Management Manager
Virginia Department of Transportation
Joe.Pugh@vdot.virginia.gov

Co-Presenter
Connie Gurchiek
President
Transcend Spatial Solutions
cgurchiek@tssgis.com

The Virginia Department of Transportation (VDOT) and a team led by Transcend Spatial Solutions are working on a project that will provide the agency with a consolidated road centerline network of all public roads in Virginia and a new street based linear referencing system for all roads in the Commonwealth. The main project tasks include:
*Data standardization effort to normalize statewide street centerline road names and VDOT's existing urban street name databases into a NENA-compliant format. The resulting output will provide a single source of street names for VDOT and a reliable database for maintaining street names across the agency.

- Conflation of the Virginia Geographic Information Network (VGIN) statewide E-911 road centerline network to a common VDOT GIS data model. The resulting network will use VGIN's geometry, conformed to VDOTs business rules, and will include attributes from both input sources. Using automated conflation tools and data replication between the two organizations, the Transcend team will conflate 135 localities and over 650,000 road edges into the common data model.
- Conflation of locality urban street event data currently managed in the Urban Maintenance Inventory System (UMIS) against the results of the road centerline conversion. The result of this effort will be UMIS segments referenced to the road network that preserves the integrity of the route measures from UMIS.

This presentation will discuss the overall project goals and objectives, parallel and dependent projects, the project status and lessons learned.

Bio(s):
Joe Pugh is the Enterprise Data Management Manager at VDOT. He has lead several major programs including Asset Management, Comprehensive Environmental Data and Reporting System, AASHTO's Transport, and more recently the Roadway Network System.

Connie Gurchiek is the President of Transcend. Her responsibilities include business development, project oversight and business analysis, and guiding the company's strategic direction. She has over 25 years of transportation and GIS experience

3.2.3 Driving Efficiency Through Better Integration of Spatially Enabled Linear Networks and Design Drawings.

Presenter
Jesse M. Day
Application Engineer
Bentley Systems
Jesse.day@bentley.com

Co-Presenter
Russell Page
Solutions Architect
Bentley Systems
Russell.Page@Bentley.com

In the current economic environment, agencies need to find more creative ways to achieve efficiencies. Managing our data spatially is one way of achieving these goals as this enables data to be shared more easily across the enterprise, but how can we push the drive for efficiencies even further? In this presentation we will discuss how spatial linear networks, which have primarily been used for maintaining our asset registers, are now being integrated so they can be used as routing networks for applications such as Oversize Overweight permitting also for analytical functions. The presentation will also look at the next stages of this use of spatially enabled linear networks to integrate the design and build processes, allowing the network to be viewed in 3D combining video log and design drawings such as new bridges.

Bio(s):
Mr. Day has more than 29 years of combined experience in cartography, remote sensing, GIS and Asset Management. This experience has provided expertise in: satellite image processing; cartographic data conversion; relational database design/implementation

Russell entered into the field of Highway Maintenance at the age of 16 direct from school and worked his way up to become a Principal Engineer in UK local Government. He taught himself how to program computers and soon realized that he could put his Engineering and programming skills together to create a valuable skill set. In 1985 he left local government and joined his first commercial software company in England providing a valuable bridge between user requirements and the developers building those requirements. In 2001 Russell moved to the USA with Exor Corporation initially focusing on linear referencing solutions. Since then Russell has taken an interest in additional business areas that he believes computerized solutions can offer unique benefits on including economic prioritization and safety. In 2010 Russell transferred to Bentley solutions as part of the Bentley acquisition of Exor. Today Russell is a solutions architect providing guidance on how solutions can be effectively delivered to meet user requirements.

3.3.1 Adopting the Appropriate GIS/IT Technologies for GIS-T Integration

Presenter
Bo Guo
GIS-IT Integration Consultant
Gistic Research, Inc.
bo.guo@gisticinc.com

Co-Presenter
Jake Payne
DBA and IT Architect
Utah Dept. of Transportation
jakepayne@utah.gov

Frank Pisani
GIS Manager
UDOT
fpisani@utah.gov

In recent years we have seen a growing number of available GIS technologies, and increased adoption of these technologies. However, one of the challenges GIS-T professionals face is to identify the technologies that are most suitable to their specific GIS-T enterprises. The presenters will share UDOT's experience researching and eventual adoption of various technologies, including open source tools, in its department wide GIS-T integration effort. The adoption strategies will be explained and demonstrated through several applications in production.

Bio(s):
Mr. Guo has 20 years of experience in the field of IT and GIS. He holds doctoral degree in civil engineering and is a registered PE in Arizona. Gistic Research, Inc. he founded specializes in GIS & IT integration for DOTs.

Jake Payne is a system architect and database administrator at the Utah Department of Transportation. He is currently responsible for the overall GIS architecture at UDOT, as he works to integrate the business and spatial components of various applications. This architecture includes software from Oracle, ESRI, and various other commercial and open source vendors. He has over 15 years of

experience in System analysis, software development, database design, and statistical analysis. He has worked for DTS and UDOT for the last 5 years.

Frank Pisani is currently the GIS Manager for the Utah Department of Transportation. He has ten years of experience in GIS management and analysis. Frank has previously held GIS positions supporting utility planning, public lands management, and transportation planning. Mr. Pisani grew up in Delaware where he earned a BS from The University of Delaware in Natural Resource Management and GIS.

3.3.2 Implementing a GIS-Based Pavement Assessment and Management System Challenges and Successes

Presenter
Candice Ottley-Francois, GISP, CAPM
GIS Analyst/Project Manager
JMT Technology Group
cottley@jmttg.com

Co-Presenter

Prince George's County, Maryland's Department of Public Works and Transportation (DPW&T) has partnered with the JMT Technology Group to implement a countywide pavement assessment and management system (PAMS) for all County maintained roadways. The project has several goals, including the development of an ongoing and cost effective maintenance program to provide the largest overall improvement to the road network given available funding levels. PAMS includes the MicroPAVER pavement management system, a custom web application and an ArcGIS Desktop solution for managing and analyzing pavement condition data and formulating roadway improvement projects. MicroPAVER, a single user desktop application, was implemented to analyze pavement distress data, develop pavement deterioration curves and assign pavement condition index (PCI) scores to inspected County maintained roadways. JMT then designed, developed and deployed a custom ArcGIS Server/Silverlight API solution that provides all DPW&T employees with broad access to the pavement data collected during the condition survey and MicroPAVER implementation, including PCI scores and high resolution digital photos of pavement surfaces and right of ways along inspected roadways. An ArcGIS Desktop solution was also developed to maintain ownership and work history records for the pavement network, and track changes to be imported into MicroPAVER. The desktop solution is now being expanded to support the County's work planning efforts by recommending and prioritizing roadways for improvement based on deteriorated pavement condition, citizen complaints, work history records, estimated improvement costs and fiscal year budget constraints.

Bio(s):
Ms. Ottley has 6 years of experience in the field of GIS. She is a Certified Associate in Project Management as well as a Geographic Information Systems Professional.

3.3.3 GIS-Based Geotechnical Engineering Document Management System

Presenter
Andrew J. Graettinger
Associate Professor
University of Alabama
andrewg@eng.ua.edu

Co-Presenter
Randy K. Smith
Associate Professor
University of Alabama
rsmith@cs.ua.edu

A web-based Geotechnical Geographic Information System (GeoGIS) was developed and tested for the Alabama Department of Transportation. This web-based system stores geotechnical information about transportation projects, such as subsurface data, construction drawings, and design information. Typically, this information is in a report or plan sheet format, but raw geotechnical data can also be accommodated in the GeoGIS. The goal of this system is to provide easy access and storage for all geotechnical and subsurface structural information from across a state. Access through a secure web interface allows consultants and DOT engineers to upload documents and access information by keyword searches and interactive map selection. The web-based GeoGIS has four geotechnical layers (project, bridge, foundation, and soil boring) that can be displayed on a road map, aerial photos, or USGS 7.5 minute quadrangles. The GeoGIS is currently being populated with hundreds of historic projects consisting of multiple document types, formats, and sizes. The system is performing above expectations.

Bio(s):
Dr. Andrew Graettinger is an Associate Professor in the Civil, Construction, and Environmental Engineering Department at The University of Alabama. Dr. Graettinger received his Ph.D. from Northwestern University and his bachelor and master degrees from the University of Wisconsin at Milwaukee. Since joining the faculty at UA in 1998, Dr. Graettinger has focused on research projects that employed Geographic Information System technology to solve complex spatially-related civil engineering problems.

Dr. Randy K. Smith is an Associate Professor in the Department of Computer Science at The University of Alabama. Dr. Smith received degrees from The University of Alabama in Huntsville, and The University of Alabama. He is a Senior Member of the IEEE and a Senior Member of the ACM. Dr. Smith is published in numerous journals and conference proceedings. The National Science Foundation, NASA, the US Department of Homeland Security, the US Department of Education, and various state agencies fund Dr. Smith¹s research. His current interests include data mining and information retrieval techniques applied to large software systems, and applications of data mining to improve software requirements engineering.

3.4.1 FHWA GIS Outreach Activities

Presenter
Mark Sarmiento
GIS Planning Analyst
Federal Highway Administration
mark.sarmiento@dot.gov

Co-Presenter

An overview and summary of recent FHWA GIS Outreach activities, which include GIS peer exchanges focused on Livability, Climate Change, and Safety. This would also be an opportunity to gather from GIS professionals input for possible future peer exchange case study topics of interest

Bio(s):
Mark has been at FHWA for 17 years as a GIS Planning Analyst with their Office of Planning. He has a B.S. in Civil Eng. from Worcester Polytechnic Institute and a Masters Deg. from the Univ. of VA. He has recovered from writing AML scripts in ARC/INFO 6.1

3.4.2 Project Impact Assessment

Presenter
Bruce Aquila
Sr. Transportation Consultant
Intergraph Corporation
bruce.aquila@intergraph.com

Co-Presenter

South Carolina DOT needed a method to expedite the project planning process. Included in this was an effective way to present project planning information and gather inputs from agencies. The needs drove SC DOT to devise the Project Screening Tool (PST). The PST web site provides pre-construction information about proposed transportation projects in the early stages of planning. PST provides a way to add and update information about projects, gather comments and other needed documentation from outside agencies about potential impacts the project can have on resources. During project screening agencies provide specific information to identify issues early in the planning process. Identifying these potential effects early can result in modification of project proposals or removal of projects from consideration, ultimately resulting in time and cost savings to the SCDOT project planning process.

Bio(s):
Bruce has been with Intergraph for 27 years. He is currently serving as a Senior Transportation consultant in the Government and Transportation Business Unit. Among his responsibilities are business development and consulting.

3.4.3 National Transportation Atlas Database (NATD)

Presenter
Mark Bradford
Geospatial Transportation Planner
USDOT/Bureau of Transportation Statistics
mark.bradford@dot.gov

Co-Presenter

The National Transportation Atlas Databases is a set of nationwide geographic databases of transportation facilities, transportation networks, and associated infrastructure. These datasets include spatial information for transportation modal networks and intermodal terminals, as well as the related attribute information for these features. This presentation will discuss the NTAD process and latest data set additions as well as planned activities.

Bio(s):
Mark Bradford is a Geospatial Transportation Specialist, Bureau of Transportation Statistics/USDOT Manager of the NTAD program.

4.1.1 Development of Appalachian Regional Transportation and Export Data System with GIS in Mind

Presenter
Sanghong Yoo
Research Associate and Project Manager
Rahall Transportation Institute
syoo@njrati.org

Co-Presenter
Jason Wang
Senior Transportation Specialist
Appalachian Regional Commission
jwang@arc.gov

The Appalachian Regional Commission (ARC) has played a key role in helping the people of Appalachia build a better future: creating jobs and building infrastructure to foster business and community growth and to connect the Region with national and international markets. Promoting export trade opportunities is an important strategy for economic development and employment success in the Appalachian Region. Recently ARC, on behalf of 10 Appalachian States, acquired PIERS Data, the comprehensive database of US waterborne trade activities, to ensure that Appalachia's leaders and citizens have the capacity, capability, and resources they need to build and strengthen their local economies.

ARC will be using this data to develop the Appalachian Regional Transportation and Export Data System (ARTEDS) in partnership with the Rahall Transportation Institute, as part of the long-standing program with the Institute for the Appalachian Development Highway System (ADHS) GIS project. The system will be an interactive web-based GIS mapping system and the Institute will geocode the companies and businesses with exporting products in Appalachian region for users to search and query. The system will also help users to identify potential exporter, transportation route, inland transportation nodes, and U.S. export ports.

Bio(s):
Mr. Yoo is a Research Associate and Project Manager at the Rahall Transportation Institute. His responsibilities are GIS deployment, data collection, data analysis, data warehouse, application development, web-based GIS, and training.

Mr. Wang is senior transportation specialist at the Appalachian Regional Commission. He works with Federal Highway Administration to administer the Appalachian Development Highway System (ADHS) program.

4.1.2 Datums and tools to connect geospatial data accurately

Presenter
Pamela Fromhertz
NGS CO State Geodetic Advisor
NOAA National Geodetic Survey
pamela.fromhertz@noaa.gov

Co-Presenter

Geospatial technology has changed the face of mapping and surveying, and the National Geodetic Survey (NGS) is at the forefront in the implementation of many of these technologies in providing the Nation with a consistent and accurate geospatial reference system. NGS produces the National Spatial Reference System (NSRS) ensuring projects have the consistency and accuracy desired. There are many tools available to access the NSRS and these will be highlighted during this session. In particular, DS-World, CORS and the Online Positioning User Service (OPUS) will be discussed.

Using Google Earth, DS-World, makes it possible for users to display the million-plus geodetic survey marks and the GPS Continuously Operating Reference Stations (CORS) that make up the NSRS. This useful tool can display all the survey marks available in a particular geographic area and the associated information about each point, including its description, position, and other information gathered when the mark was set. You as a user can access, locate and survey these marks and tie your data layers directly to the NSRS and the most recent datums.

NGS' OPUS program is highly automated and requires minimal user input accessing the network of CORS for determining ones position. With OPUS, users can obtain high-accuracy NSRS coordinates, using only a clear view of the sky and a survey-grade GPS receiver. OPUS processes GPS data files along with CORS coordinates to provide results consistent with those of other users in the NSRS.

There are many other developments occurring in NGS that will be presented. These include: NGS role with the development of real time GPS; Modernization of the NSRS; the new adjustment and the GRAV-D program and how it may change the way we obtain vertical heights.

Bio(s):
Pamela Fromhertz is NOAA's National Geodetic Survey Colorado State Geodetic Advisor, interacting with the geospatial community at the local, state, and Federal levels, as well as with private industry, to educate and advise on the benefits of the National Spatial Reference System (NSRS) and how its datums, models, and tools may be utilized for their programs and projects. Most recently, she has worked on developing a leveling training program for CDOT.

She has her M.S. in geodesy, photogrammetry and GIS from the Ohio State University and a B.S. in geology from Long Island University along with a math minor. She has worked for the federal government for over 25 years and moved to Denver in January 2004 to become the Colorado State Geodetic Advisor and the NOAA representative to NORTHCOM's Joint Interagency Coordination Group (until 2007). She now proudly calls Colorado home.

4.1.3 A Faster Approach to Mobile Data Collection

Presenter
Paul Weinberger
Systems Analysis Unit Supervisor
Minnesota Department of Transportation
paul.weinberger@state.mn.us

Co-Presenter

The need for mobile applications and data to support the mobile workforce is growing exponentially. Learn how the Minnesota Department of Transportation (MnDOT) is making it easier to rapidly set up and use field mobile data collection applications by establishing mobile standards and best practices, and a supporting application and data framework. The best practices provide guidance in selecting the best mobile device based on business needs and include practices for supporting iOS, Android, and Windows

Mobile. The standards and framework provide a common data structure and a flexible, reusable mobile web application environment with plans for adding reusable client and hybrid client applications. In addition, a mobile application security policy is incorporated with the enterprise architecture, providing mobile device security and management, including standard device configurations.

Attendees to this session will learn the following:

- Learn a method for providing mobile development standards and best practices that include business/technical requirements based decision matrix for device selection, a common data structure, and a flexible, reusable mobile web application that allows users to author applications and begin data collection on-the-fly.
- Understand how to develop and implement a mobile application security policy that integrates with enterprise IT architecture.
- Learn about MnDOT's strategies related to mobile device security and management, including standard device configurations.

Bio(s):
Paul Weinberger is the Systems Analysis Unit Supervisor for the Minnesota Department of Transportation.

4.2.1 Exploring New Dimensions with Hawaii DOT's Linear Referencing System

Presenter
Jennifer Arinaga
Planning Survey Engineer/GIS-LRS Specialist
Hawaii Department of Transportation
Jennifer.Arinaga@hawaii.gov

Co-Presenter
Bruce Aquila
Sr. Transportation Consultant
Intergraph Corporation
bruce.aquila@intergraph.com

The Hawaii DOT vision involves leveraging the Linear Referencing System (MLRS) in progressive ways. During the last GIS-T we reviewed the varied steps involved with taking the Linear Referencing System from concept to production. Now we examine how we are taking this two-dimensional LRS foundation into the future. Current trends reveal that technology is moving in the direction of 3-D. We see this with the everyday use of field GPS units, LiDAR and even personal cell phones. As an Engineering-oriented organization the LRS should fully support 3-D, thus the decision was made to add the third dimension to all LRS-related objects.

This is a substantial modification to current workflows including the manner in which the data is captured and maintained. The immediate benefit realized is the ability to QC route alignments captured in the field to their LRS resident counterparts. In the short term, we expect to improve modeling and visualization of our route structure. Long term goals include integrating the LRS with the LiDAR-derived DTMs, and improved workflows using various HDOT products (GeoMedia, MicroStation, InRoads, etc.).

Bio(s):
Jen has worked for Hawaii DOT for 5 years. She has been involved in the implementation and administration of HDOT's LRS. She received her BSCE in 1999 and an MSCE in 2003 from the University of Hawaii-Manoa. She received her PE in 2004.

Bruce has worked for Intergraph for 27 years. He works exclusively with state DOT's and transit agencies. His primary responsibilities include technical business development and consulting.

4.2.2 The Use of 3D-GIS Applications for Planning and Design

Presenter
Charles Hixon
Business Development Manager
Bergmann Associates
chixon@bergmannpc.com

Co-Presenter
Jeff Volpe
GIS Business Segment Leader
Bergmann Associates
jvolpe@bergmannpc.com

With the advent of applications such as Google Earth; transportation agencies, governmental organizations and municipalities are striving for ways to convey information in an interactive 3D environment.

While 3D planning and design technologies have been around for several years, only recently have more robust 3D applications and processes been made available. The result of these recent technology advances has been the lack of standardization and guidance in selecting and implementing 3D applications and processes.

With an eye on the future, the City of Rochester has initiated a 3D GIS Spatial Model project, which will catalog GIS based data in a 3D environment. Information such as way finding, signage placement, asset management, infrastructure improvements such as a proposed intermodal station and permitting information will now be analyzed and presented in an interactive 3D environment.

This presentation will focus on

- How 3D-GIS applications were implemented
- Esri 3D GIS software utilized for implementation
- Planned enterprise implementation of the 3D environment
- The tools and techniques used to create the 3D environment
- Barriers toward Investment Costs
- Benefits of the technology

Integrated Design + Management (IDM) can be used as a key TOOL when striving for an innovative approach to master planning and design issues to save time, money and consensus on many projects.

Key aspects of IDM that will be featured during the presentation are:

1. A 3D graphical database used from conception to operations and management. Databases include;
    a. BIM applications such as Revit
    b. 3D-GIS applications
    c. Traffic micro-simulation - Corsim, Synchro and VISSIM
    d. Scheduling (4D)
    e. Cost Estimating and Tracking (5D)
2. Unlimited viewing time from an infinite amount of viewpoints
    a. Improved campus recruiting by reaching perspective students with technology that they embrace.
    b. Greater understanding, which leads to Stakeholder consensus
    c. Enhances public involvement and community awareness
    d. Manage Multiple Databases from one application.
3. Improved Facilities Management
    a. Simplifies Project Pre-Planning reduce Silos of Data
    b. Review conceptual plan scenarios in 3D
    c. Streamline environmental impact statement process
    d. Manage asset inventories and utility data in 3D
    e. Improve Space Utilization Analysis
    f. Collision Detection
    g. Construction Sequencing
4. Featured Case Study The 3D GIS Spatial Model project for the City of Rochester, New York.

Bio(s):

Mr. Hixon is the founder and administrator of Bergmann Associates' Virtual Design and Construction group; a digital graphics division that specializes in virtual reality based 3D-Design applications. He has over 18-years of experience in the planning, development and project management of the VDC business unit. Mr. Hixon has project managed several award winning projects including a Smithsonian Institution Laureate for digital animation work on the nationally aired Public Broadcasting Corporation (PBS) documentary “Echoes from the Ancients”.

Considered an expert on virtual reality applications for planning and design, Mr. Hixon authored a Synthesis Study titled “Visualization for Project Development” for the National Cooperative Highway Research Program (NCHRP). He is also a founding Board Member for the Transportation Research Board (TRB) Committee on Visualization and Co-Chairs the Virtual Design & Construction Sub-committee.

Mr. Volpe has over 18 years experience with Geographic Information Systems (GIS) and is responsible for conducting and developing Needs Assessments, Business Plans, Return on Investment strategies and implementation planning strategies, GIS database design and development, data conversion and integration, spatial analysis and GIS programming/application development. He is experienced in a

variety of GIS software packages including ArcGIS, ArcInfo, ArcView, Atlas GIS, Maptitude and MapInfo. Mr. Volpe is also responsible for integrating Geospatial services into other disciplines within Bergmann Associates including transportation planning, environmental and site development projects and developing GIS applications and databases for utilities, environmental, and water resource projects. Mr. Volpe is technically proficient with: ArcSDE, ArcGIS, ArcIMS, ArcInfo, ArcView, MapInfo, Atlas GIS, AML, SML, Avenue, Microsoft Access, Visual Basic, VB.Net, C++ and HTML.

4.2.3 FHWA Activities in GIS and Visualization

Presenter
Ben Williams, P.E.
Metropolitan Planning Specialist
FHWA Resource Center
ben.williams@dot.gov

Co-Presenter

One of the strong attributes of GIS software has always been its capability to help visualize complex data, transportation facilities and environments. This presentation will update the audience on the FHWA Visualization Working Group and a number of the projects funded by them over the last year such as building GIS interfaces for the for the National Household Travel Survey data and the new management systems for the Federal Lands Transportation Program.

After the 2010 Census, there are several important activities from the Federal Agencies that affect the transportation program in each of the States, such as defining changes in small urban and urbanized areas, designating new MPOs and requiring the States update the functional classification of highway systems. One of the Sunday Workshops talked about this in depth. For those who didn't attend the workshop, we will include a summary of the changes that will affect State GIS and planning programs.

Bio(s):
Ben Williams has Bachelors and Masters Degrees in Civil Engineering from the Ohio State University and is a licensed Engineer in Ohio. He has worked for FHWA for 32 years and has been involved with planning for 30 of those years. During his tenure with FHWA, he has served in the Ohio Division and Georgia Division Offices, the Region 4 Office and is now assigned to the Planning Technical Service Team of the Resource Center, stationed in Atlanta. In his job as a Metropolitan Planning Specialist he is charged with helping States and MPOs, nationwide, with technical assistance and training within planning.

He has been the Workshop Chair for the AASHTO GIS-T Symposium for 12 years and a past instructor for the National Highway Institute's Spatial Technologies Class. Currently he is teaching the FHWA Resource Center and FHWA Office of Environmental Reviews' workshop on “GIS for Environmental Streamlining and Stewardship”, the Resource Center's workshops on the Congestion Management Process and the Use of Visualization Technology in Planning.

Ben works on projects related to :

* GIS and Transportation Planning
* Metropolitan Planning
* Visualization and Transportation Planning
* Congestion Management Process
* Planning and Operations

Professional Associations
* ITE, Member
* ASCE, Member

4.3.1 Spatial Database Architecture: Designing your Spatial Database for Flexibility

Presenter
Jerry Mohnhaupt
Geospatial Solutions Architect
Arcadis, Inc.
jerry.mohnhaupt@arcadis-us.com

Co-Presenter

This presentation will cover the various components of a enterprise spatial database. The benefits of separate editing and publishing environments will be discussed. Users, permissions, and security in the publishing environment, using editing environments to support departmental workflows, leveraging geoprocessing and python to automate data integration and publishing, and planning for editing and workflow changes within the spatial database will be discussed.

Bio(s):
Mr. Mohnhaupt is a consultant with Arcadis Inc. He has 19 years of experience providing geospatial services throughout the United States.

4.3.2 NCHRP 20-27 to ISO 19148 18 Years of Progress in Linear Referencing

Presenter
Paul Scarponcini, PE, PhD
Consultant
Independent Consultant
paul.scarponcini@live.com

Co-Presenter

On August 6, 1994, forty-two transportation professionals, systems developers, and academics came together in a workshop in Milwaukee, Wisconsin with the objective of preparing a draft consensus conceptual data model, at the entity-relationship level, for linear referencing systems. So reads the report from NCHRP 20-27.

Since then, further discussion has ensued in various software standards organizations, both nationally and internationally. Now, some 18 years later, the international community has officially adopted the Generalized Model for Linear Referencing as the basis of ISO IS 19148 Linear Referencing. As the dust settles, that brings to ten the number of software standards which have adopted or are in the process of adopting this approach.

Developed in open public forums across the globe, the Generalized Model grew out of the need to support, yet simplify the NCHRP model. It was originally motivated by the need to develop a COTS solution to a problem being solved differently in every organization with each organization having multiple solutions of their own.

By generalizing the NCHRP Model into a few basic concepts, translation between various Linear Referencing Methods (LRM) and the types of linear elements being measured has been reduced to a single, reflexive, transitive, closed and deterministic algorithm. So existing systems and databases using disparate LRMs no longer have to be migrated to a single LRM, sacrificing the advantage of the LRM originally selected for that problem and the subsequent investment in systems and expertise.

Instead of mandating that a single LRM be used by an organization (there simply is no single best LRM for all applications and databases), each database can keep whatever LRM works best for its applications, including external ones beyond the control of the organization. Yet data can still be combined using run-time LRM translation or GIS projection.

Bio(s):
Dr. Scarponcini has over thirty years experience in applying computer technologies to the engineering industry following five years of civil engineering practice. As a consultant, he currently represents Bentley Systems at various US software standards committees and is a US Delegate to the ISO SQL/MM Spatial and TC211 GIS international standards committees. He has presented numerous papers and conducted several workshops at previous GIS-T meetings. He was co-PI and technical lead on NCHRP 20-64,

TransXML and was a member of the TRB Geographic Information Science and Applications Committee ABJ60. Dr. Scarponcini has degrees in Civil and Architectural Engineering and Computer Science.

4.3.3 Multi-Level Linear Referencing System (MLLRS) Cost/Benefit Value Analysis Study

Presenter
Eric Abrams
Iowa DOT Geospatial Coordinator
Iowa Department of Transportation
eric.abrams@dot.iowa.gov

Co-Presenter
Thomas Martin
Bridge Asset Coordinator
Minnesota Department of Transportation
thomas.martin@state.mn.us

This report documents the outcome of the Value Analysis (VA) Study which was conducted for the AASHTO Standing Committee on Planning under NCHRP funding. The study took place at the Iowa Department of Transportation in Ames Iowa on April 6-8, 2011. Participants came from AZ, CA, IA, MD, MN, NC, ESRI and Intergraph.

The purpose of the VA Study was to identify the costs and benefits of implementing and maintaining a statewide Multi-Level Linear Referencing System (MLLRS). The VA Study followed the SAVE International 6-step job plan which helped to identify the various aspects of a statewide MLLRS including; System Needs, Constraints, Performance Attributes, Qualitative and Quantitative Benefits, Defined Users/Business Units, System Functions, Alignment with the 10 Functional Requirements of Report 20-27, Costs for Developing and Maintaining a Baseline MLLRS and Implementation Considerations. The findings of the study represent a 5-year breakeven point for the baseline and the optional functional elements with potential overall cost/benefit savings of $12.6 million for a state with 25,000 miles of road network.

Bio(s):
Eric Abrams is Iowa DOT's Geospatial Coordinator. He developed many geospatial systems and engineered DOT's current geospatial infrastructure. Eric also helped implement Iowa DOT's LRS. He has been with the department for 22 years.

Thomas has worked for the Minnesota Department of Transportation for eighteen years in a variety of capacities. His initial work for the state was to manage, analyze and report on agricultural pest movement for MDA (MN Department of Agriculture) followed by a post scoping, developing and implementing a state-wide hydraulic infrastructure application called HYDINFRA. The focus of his most recent positions within the DOT involve large system management of both Physical and Data assets.

Thomas is an avid bird watcher and recently added Wood Stork and Whooping Crane to his life-list; he enjoys growing perennials and fostering a small mixed forest on the shores of an eighteen acre plot on the Rum River in central Minnesota.

4.4.1 Using Linear Referencing Systems (LRS) to Evaluate Transit Operations: Case Studies from Madison, Kansas City, and Indianapolis

Presenter
Kevin Ebright-McKeehan
GIS Associate
Cambridge Systematics, Inc.
kebrightmckeehan@camsys.com

Co-Presenter

One of the most powerful GIS tools available to analysts is the Linear Referencing System (LRS), with its ability to dynamically segment spatial and temporal data. Most commonly, a LRS is employed in conjunction with mile posting or measure (M) data. However, it is possible deploy LRS tools for data where distance measures are unavailable or do not exist. Out-of-the-box ESRI ArcGIS tools were used to evaluate aspects of existing transit operations for clients in three Midwestern cities: Madison, Kansas City, and Indianapolis. Through the implementation of a LRS, analysts were able to demonstrate bus loads, ridership flows, and the temporal performance of bus routes. The corresponding Linear Referencing Methods (LRMs), which comprise part of a LRS, were developed from ridership survey data and other sources. Bus stop sequencing and automated time stamps created the backbone on which to

build LRMs and, eventually, show how bus routes build and shed ridership as they travel across their cities.

Bio(s):
Kevin Ebright-McKeehan is a GIS Associate with Cambridge Systematics with six years of experience in Geographic Information Systems (GIS), transportation planning, and network and spatial analysis. He is based in Chicago and married with three boys.

4.4.2 Spatially Integrated Street Surface Assessment Case Study

Presenter
Chris McConn
Client Solutions Executive
Idea Integration
natalie.cutsforth@idea.com

Co-Presenters
Brady Hustad
Practice Executive
Idea Integration
brady.hustad@idea.com

Natalie Cutsforth
Client Solutions Executive
Idea Integration
natalie.cutsforth@idea.com

Idea will present a case study of improvements to a manual, "windshield-survey" based Pavement Condition Assessment program at a major US City in Texas, envisioning a fully-automated solution, then designing and successfully implementing it. The solution hardware includes a van with laser profilers, GPS equipment, automatic crack detection, immersive video cameras, and more. The solution software allows the City to quickly find a street rating by segment, see condition history, view immersive video of all street segments for context and asset identification, generate reports, and soon, identify sub-surface pavement condition to identify sinkhole risks. The new SSAV (Street Surface Assessment Vehicle) owned by the City allows for efficient, non-subjective, timely assessment of roadways. Data is now accessible to the public. GIS integration and customizable pavement rating scoring improves decision-making. With this innovative new solution, the City controls its own roadway assessments, performs them faster, and saves money by not having to contract with services firms to drive the roads. They own the data visualization software Idea built for them and continue to add more functionality to it.

Bio(s):
Chris has led new business development and public sector business at Idea since joining the company in 1999. Chris works with prospective and existing Idea clients to improve their efficiency through technology. He represents all Idea practices, including GIS, Application Development, Mobile, Business Intelligence, IT Infrastructure, Legacy Modernization, and Digital/Interactive. A recent flagship project he oversaw is the Street Surface Assessment Vehicle at a major city here in the U.S. Chris is an avid golfer and a native of Houston, Texas.

Brady joined Idea Integration in 2000 as a developer in the geospatial practice. In 2007 he returned to Idea after running his own business to manage the geospatial development practice. Brady contributes a decade of technical architecture leadership.

Natalie joined Idea in 2007 and has over 16 years of experience in the GIS industry. Her technical expertise ranges from software to data requirements, with a vision for application of location based technologies in Public Sector and commercial business.

4.4.3 Connectivity and Equality: Consequence of Emergency Medical Services

Presenter
Rachel King
GIS Project Manager
Edmonds, WA
rachel.king@hdrinc.com

Co-Presenter

HDR would like to present a case study in developing web technologies to facilitate teamwork and collaboration on transportation projects. Our technology team has designed a web-based project tracking system called iREALM(Interactive Reporting and Land Management) that HDR has been using to coordinate multidisciplinary teams on a variety of transportation projects nation-wide. We would like to discuss our approach, methodology, and lessons learned in this process and highlight some of the

benefits our teams have received in adopting this technology.

By combining a web-based GIS mapping application with a dynamic data entry interface, teams update project information linked to the geographic layers and easily share information, documents, and workflows to facilitate informed decisions in the areas of analysis & assessment, design, right-of-way acquisition, permitting, public involvement, utility relocation, and the multitude of issues and processes required for the successful completion projects.

Bio(s):
Rachel King has been the GIS Manager for Real Estate Services at HDR for the past 5 years, overseeing the design and development of HDR\'s iREALM web application and coordinating the research and development for future technical solutions.

5.1.1 Local Road and Bridge Data Collection

Presenter
John Parker
Transportation Planning Manager
PENNDOT
chparker@pa.gov

Co-Presenters
Matt Long
Trans. Planning Spec.
PENNDOT
matlong@pa.gov

PENNDOT is utilizing the ESRI ARC mobile application to collect locally owned bridges and data attributes for local roads. We are collecting the data in one county on a mobile device as partnership with ESRI. The collection process will be virtually paperless, improve data quality and increase productivity. PennDOT will then have the ability to collect and geographically represent the 15,000 potential local bridges in the state of Pennsylvania, along with bridge data features critical to local planning and asset management. For the local roads, PennDOT will not only establish a statewide local road network but also collect and store data attributes on each segment of road.

Bio(s):
John Parker is a Transportation Planning Manager for the Pennsylvania Department of Transportation' Bureau of Center for Program Development & Management. John has been with the PennDOT for over 13 years and has gained varies transportation work experience. John manages the Statewide Bridge Program and Special Initiatives for the Bureau. He is the lead project manager on MPMS IQ which is an interactive GIS query for highway and bridge projects and pulls from over 6 databases at PennDOT. John also developed a public friendly transportation projects website called TIP visualization. In his spare time, he is a varsity high school hockey coach for a local team in the local area. John lives in Harrisburg, PA and has an eight year old daughter.

Matthew Long (BS Geography '08 Millersville University) is a Transportation Planning Specialist for the Pennsylvania Department of Transportation' Bureau of Center for Program Development & Management. Matthew began college with the aspirations of being a teacher, but upon the completion of one geography course, he changed his major the very next semester. Since Matthews's graduation in 2008 he has been a part of Transportation oriented work experience when he was a Technician with Traffic Planning & Design immediately after graduation. His Transportation experience has continued with Matthew being a consultant to PennDOT thru McCormick Taylor Engineers & Planner and Pennoni Associates Inc. Matthew wanted to expand his knowledge in the world of Urban & Regional Planning, as well as the skill of understanding GIS software. To do this, Matthew enrolled in the Masters Program at West Chester University in the spring of 2010 and is still enrolled with an anticipated graduation in 2013. Matthew is a life-long resident of South Central Pennsylvania and currently lives in the town in which he was born Marysville, PA.

5.1.2 Mapping Storm Damage to Infrastructure in the Wake of Tropical Storm Irene: The Vermont Experience

Presenter
Johnathan Croft
AOT GIS Database Administrator
Vermont Agency of Transportation
johnathan.croft@state.vt.us

Co-Presenter
Stephanie Magnan
AOT Technician IV
Vermont Agency of Transportation
steph.magnan@state.vt.us

In the wake of Tropical Storm Irene, the Vermont Agency of Transportation (VTrans) was called to respond to extraordinary volume of damaged bridges and highways. Over the course of a weekend, August 27th and 28th, TS Irene delivered between 4 to 7 inches of rain which created a significant amount of run-off that destroyed or compromised a significant amount of the transportation system primarily throughout the southern half of Vermont. To assist in the initial evaluation of the damage, mapping was essential to assess what infrastructure was damaged and quantify the magnitude of the disaster. The mapping effort expanded to a public outreach vehicle, providing Agency personnel, Public Safety, FEMA, decisions makers, and the traveling public information regarding what highways were travelable and which were closed. Through the creation of enterprise GIS data and standard workflows, VTrans was able to collect, compile, and publish highway and bridge closure information efficiently and in a timely manner.

This presentation will provide insight to some of the steps that VTrans took to assess the extent of the damage, compile the high volume of dynamic data, create specific products to meet operational needs, and publish status information to meet the huge appetite from the Agency, media and the public.

Bio(s):
Johnathan Croft has been working in the field of GIS since 1989, after receiving a degree in geography from the University of Vermont. He has been overseeing the Mapping Unit at the Agency of Transportation since 1998.

Steph Magnan works in the Asset Management Unit for the Roadway, Safety and Design Section at VTrans. She is responsible for building and maintaining roadway assets inventories and integrating this data with other enterprise systems. She has worked at VTrans in numerous capacities for over 20 years.

5.1.3 Overcoming Challenges for Field-Based Asset Management

Presenter
Shawn Blaesing-Thompson, GISP
GIS Coordinator - Maintenance Office
Iowa Department of Transportation
shawn.blaesing-thompson@dot.iowa.gov

Co-Presenter
Bill Schuman
Program Manager
Transcend Spatial Solutions
bschuman@transcendspatial.com

Iowa DOT is currently engaged in research to streamline field inventory/inspection of highway assets while maximizing the use of new technologies. Currently field staff uses disparate methods for collecting and managing culvert inspection information as well as other assets. Often information is gathered using paper documents and redundant data entry. There lacks protocol within districts for how location information is collected and stored making it problematic to consistently map information using GIS or CAD software. It is difficult or impossible to use existing data in an enterprise spatial system to answer asset management questions. We will present what we are learning from the research project and how it can tie into an enterprise asset management system.

Bio(s):
Shawn Blaesing-Thompson is GIS Coordinator in the Office of Maintenance at Iowa DOT. She is responsible for project management, data development/maintenance, ArcGIS Server web applications & integration with enterprise business systems. Before that she worked as a DBA for the USDA-Agricultural Research Service. She also spent 6 years with WSDOT doing custom cartography, working as the GIS Training coordinator and doing GIS Project management. She holds a B.S. in Earth Science from Iowa State, a M.S. in Soil Science from Washington State, and IT Project Management Certificate from University of Washington. In her spare time she is a Girl Scout troop leader, triathlete and custom jewelry designer.

Bill Schuman is a Program Manager for Transcend Spatial Solutions. His responsibilities include business operations, project oversight, providing subject matter expertise for road inventory, asset management, linear referencing systems (LRS) and road data models, mobile data collection solutions, and guiding the company's strategic direction. He has over 25 years of transportation and GIS experience. He is a recognized LRS and transportation data expert and has worked with state and local governments on IT strategic plans, spatially enabled database and data warehousing projects, LRS

design and implementation projects, and many custom data maintenance and data presentation applications.

5.2.1 Oracle Spatial at Iowa DOT

Presenter
Eric Abrams
Iowa DOT Geospatial Coordinator
Iowa DOT
eric.abrams@dot.iowa.gov

Co-Presenter

Iowa DOT has used Oracle Spatial since its beginning. The presentation will review what Oracle Spatial and Locator are, how it is implemented and leveraged at Iowa DOT. Many software products at Iowa DOT use Oracle spatial from ArcGIS Server to GeoMedia to FME and each have their own way of leveraging Oracle Spatial. We will also review the pros and cons of Iowa's implementation and how standardizing on a spatial database standard advances a database central software neutral approach to GIS.

Bio(s):
Eric Abrams is Iowa DOT's Geospatial Coordinator. He developed many geospatial systems and engineered DOT's current geospatial infrastructure. Eric also helped implement Iowa DOT's LRS. He has been with the department for 22 years.

5.2.2 Louisiana DOTD's Maintenance and Management of a Public Roadway Feature

Presenter
Darryl W. Mack
I.T. Geographic Project Supervisor
Louisiana Department of Trans. & Dev.
Darryl.Mack@LA.GOV

Co-Presenter

In August 2010, the Louisiana Department of Transportation and Development began incorporating a statewide geographic roadway feature in the current mapping products. This feature was developed from several sources including sub-meter accurate GPS data, local GIS data, and TIGER Roads released in 2007. The task to maintain this feature is the responsibility of the cartographic mapping unit. The maintenance of the state system began immediately using data collection and management systems already in place. The process to maintain the local roadway systems will require the assistance of the local government agencies so that they might assist in maintaining their roadway systems. We are beginning to use the GeoPDF by TerraGo Technologies. Using the free Adobe Reader program with the free download TerraGo Toolbar, anyone can download, install and begin using the tool to redline the pdf providing on-the-ground intelligence and corrections. These comments can be exported and then imported into ArcGIS for use in making modifications to the GIS features. The goal is to maintain and distribute a GIS public road feature to all federal, state, and local agencies, as well as public entities. The plans of the cartographic mapping unit is to develop mapping tools and traditional printed maps displaying details of various data and to have many users across the Department managing and editing various databases using ArcGIS.

Bio(s):
Darryl worked his way from an Engineering Technician as a draftsman in the mapping unit to the position he now holds as supervisor of the Cartographic Mapping unit by using GIS technologies. He has enjoyed developing his career in the GIS environment.

5.2.3 UGate UDOT's Gateway to GIS-T Integration

Presenter
Jake Payne
DBA and IT Architect
Utah Dept. of Transportation
jakepayne@utah.gov

Co-Presenter
Bo Guo
GIS-IT Integration Consultant
Gistic Research, Inc.
bo.guo@gisticinc.com

Frank Pisani
GIS Manager
UDOT
fpisani@utah.gov

Surveys among DOT GIS-T professionals in recent years have highlighted increasing demands for GIS and IT integration. Like many other DOTs, the Utah Department of Transportation (UDOT) sees that GIS is an important part of its IT strategy and that GIS technologies present excellent opportunities for users to interact with the agency's enterprise transportation systems.

The presenters will review UDOT's GIS-T efforts over the years, and share its integration vision for UGate, the agency-wide spatial database warehouse. The presenters will discuss the challenges to the integration effort, from both the policy and technology perspectives, and success stories of overcoming the obstacles. Finally, the UGate application will be demonstrated.

Bio(s):
Jake Payne is a system architect and database administrator at the Utah Department of Transportation. He is currently responsible for the overall GIS architecture at UDOT, as he works to integrate the business and spatial components of various applications. This architecture includes software from Oracle, ESRI, and various other commercial and open source vendors. He has over 15 years of experience in System analysis, software development, database design, and statistical analysis. He has worked for DTS and UDOT for the last 5 years.

Mr. Guo has 20 years of experience in the field of IT and GIS. He holds doctoral degree in civil engineering and is a registered PE in Arizona. He founded Gistic Research, Inc. which specializes in GIS & IT integration for DOTs.

Frank Pisani is currently the GIS Manager for the Utah Department of Transportation. He has ten years of experience in GIS management and analysis. Frank has previously held GIS positions supporting utility planning, public lands management, and transportation planning. Mr. Pisani grew up in Delaware where he earned a BS from The University of Delaware in Natural Resource Management and GIS.

5.3.1 Deconstructing Stovepipes: FHWA's Data Integration Initiative

Presenter
Ronald Vaughn
Transportation Specialist
U.S. DOT / Federal Highway Administration (FHWA)
ronald.vaughn@dot.gov

Co-Presenter

The Federal Highway Administration (FHWA) manages several mission critical applications and database systems which are used to collect, analyze, and report various types of data that describe the condition and performance of the nation's transportation infrastructure. As FHWA looks to improve performance across its various programs and support new data transparency and reporting requirements, programmatic changes are required in order to improve the overall quality, usability, and effectiveness of these systems. In order to address these needs, FHWA is currently working to implement an enterprise data management system that will provide a ""one-stop shopping"" resource for the various infrastructure condition, performance, and project data that are maintained in four of the agency's core systems. This presentation will discuss the business and programmatic requirements for this new platform. In addition, the presentation will discuss the business intelligence solutions to be implemented, which include ArcGIS for spatial data analysis and visualization purposes.

NOTE: This project is currently in the Strategic Implementation Plan development phase w/ design/development slated to commence in March 2012.

Bio(s):
Ronald Vaughn is a Transportation Specialist in the FHWA, Office of Policy. He specializes in Highway System Performance. He has a B.S. in GIS and Geography, University of Maryland at College Park and a M.S. in Transportation & Urban Infrastructure Studies, Morgan State University.

5.3.2 The District Department of Transportation (DDOT) HPMS Console Solution for Easier, Time Saving Submittal

Presenter
José Colón
IT Application & GIS Manager
District Department of Transportation (DDOT)
jose.colon@dc.gov

Co-Presenter
Nate Reck
Technical Architect
GeoDecisions
nreck@geodecisions.com

The District DOT is improving and changing business processes to aid in the submission of FHWA required Highway Performance Monitoring System () data. At the core of these improvements, DDOT is completing the implementation of a new Console application. This new automated system is designed to enable DDOT staff and other stakeholders to process and analyze data items and catalogs effectively and efficiently. The Console will give staff the power to process, create, validate, and report data items to FHWA through a web-based application with little manipulation and human interaction. This presentation will describe the role of this new system in the maintenance and processing of DDOT's data and how it will save time and money each year during the submittal process.

Bio(s):
José Colón has 14 years of experience working for Municipal Government in several areas and is the IT Application & GIS Manager for DDOT. José has implemented several IT solutions at DDOT including the Work Order Management System and the Console.

Nate Reck has over 12 years of experience designing and implementing solutions in numerous of DOTs nationwide. He is the technical and lead of GeoDecisions Transportation Unit.

5.3.3 Navigating the Potholes of Implementing and Integrating Virginia DOT's Roadway Network System Program

Presenter
Bryan Kelley
RNS/GIS Program Manager
Virginia Department of Transportation, IT Div.
bryan.kelley@vdot.virginia.gov

Co-Presenter
Archer Carr
RNS Program Technical Manager
Virginia Department of Transportation, IT Div.
archer.carr@vdot.virginia.gov

It started as a relatively simple upgrade project in 2003: Take Virginia DOT's Highway Traffic Records Information System from an ADABAS mainframe to an Oracle database. This epic journey of replacing a 20 year old mainframe with a web-based and geo-enabled system is nearly complete. The 'upgrade project' morphed into the Roadway Network System Program, which now provides the means of maintaining and managing Virginia's road inventory and business event data in a tabular, linear, and geospatial context. With the completion of the Roadway Inventory Management System (RIMS), Highway Performance Monitoring System (HPMS), and Centerline Transition (VGIN CL) projects; this enterprise evolution has fundamentally changed how VDOT conducts and operates the business of managing the nation's 3rd largest state-maintained highway system from both a technological and business process perspective, which has been a journey full of adventure.

* Editors note: Three components referenced in the abstract (RIMS, and Centerline Transition projects) will be 'in-production' as of February 2012, before the GIS-T conference. The RNS Program has seven existing components already in production.

Bio(s):
Bryan served as VDOT's Cartography Manager & as Transportation Planning GIS Manager for several years. Bryan served as a geospatial project manager at a private consulting firm in Richmond, before coming back to VDOT in his current role.

Archer has been the technical lead for the development, implementation, and maintenance of VDOT's geospatial and Roadway Network System. Archer oversaw the database development and operations of the CEDAR system, & Transportation Planning GIS Manager at VDOT.

5.4.1 GIS and Project Programming: How SCDOT is Enhancing Their Ability to Program Projects

Presenter
Mary Gail Broussard
Owner and COO
PMG Software Professionals
marygail.broussard@pmgpro.com

Co-Presenter
Lynsee Gibson
Program Applications Administrator
South Carolina DOT
Gibsonlr@scdot.org

Abstract: SCDOT is currently building a Project Programming Solution (P2S) which will take advantage of the Department's Integrated Transportation Management System (ITMS). P2S is the next generation project programming solution which replaces a 20+ year old mainframe application. ITMS will provide the GIS/mapping and integration framework that will be used to enhance SCDOT's ability to program projects. This presentation will include an overview of both P2S and ITMS and will focus on how, through integration, project conflicts are minimized.

Bio(s):
Ms. Broussard is the Owner and COO of PMG Software Professionals. She has over 26 years experience developing software and providing solutions to many DOT clients. She has B.S. degrees in both Computer Science and Mathematics from Murray State University.

Lynsee Gibson serves as the Program Applications Administrator for the South Carolina Department of Transportation. She began her career with the Department in 1999 working on the framework for SCDOT's Plans Online and in the Program Controls office managing Primavera CPM schedules. Ms. Gibson is a 2003 graduate of the University of South Carolina.

5.4.2 Putting Road Projects on the Map

Presenter
Michael Cresap
Director of the Transportation Information Division
Mississippi Department of Transportation
mcresap@mdot.state.ms.us

Co-Presenter
Bruce Aquila
Sr. Transportation Consultant
Intergraph Corporation
bruce.aquila@intergraph.com

This presentation will discuss Mississippi DOT's need for locating projects spatially and their decision to create a web based tool for staff to capture the location of a project. The information collected drives the base LRS for asset management and gives the state the ability to graphically depict projects on a map. This is critical in decision support and gives the state the ability to evaluate environmental impacts of a project and more accurately estimate the project costs.

Bio(s):
Michael Cresap is a Professional Engineer with the Mississippi Department of Transportation. He currently serves as the Director of the Transportation Information Division which houses the Department's GIS functions. He worked 16 years in bridge design.

Bruce has been with Intergraph for 27 years. He is currently serving as a Senior Transportation consultant in the Government and Transportation Business Unit. Among his responsibilities are business development and consulting.

5.4.3 Fostering Collaboration and Coordination Through an Innovative GIS Application

Presenter
Jeff Roberts, PMP
Director of Geospatial Services
JMT Technology Group
JRoberts@jmttg.com

Co-Presenter

The Delaware Department of Transportation partnered with the JMT Technology Group to develop the Planning and Development Coordination Application (PDCA), an innovative GIS-enabled web application built on the ArcGIS Server 10 Flex platform, to support their mission to preserve the safety and efficiency of the State's transportation network. Specifically, the PDCA facilitates DelDOT's collaborative, multi-step process for reviewing and approving proposed residential and commercial land development with respect its impact on State maintained roadways. The introduction of the PDCA has improved the efficiency, accuracy, consistency and transparency of the Development Review process resulting in time and cost savings and an improved relationship between DelDOT and the State of Delaware's development community. This presentation will present the PDCA from a system development life-cycle perspective examining how unique and challenging requirements led to a modern and progressive GIS solution and will discuss the myriad of lessons learned along the way.

Bio(s):
Jeff Roberts has 15 years of experience providing GIS solutions to a wide variety of transportation industry clients. He is a Certified Project Management Professional (PMP) by the Project Management Institute.

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6.1.1 Cook County Asset & Pavement Management System

Presenter
Scott Stocking
Project Director
Woolpert
scott.stocking@woolpert.com

Co-Presenter
Daniel Szwaya
Pavement Geometrics Division
Cook County Highway Department
daniel.szwaya@cookcountyil.gov

Recently completed project on providing the Cook County Highway Department an integrated highway asset and pavement management system. The system using GIS for the location of assets and pavement condition rating and is a fully integrated solution for daily operations - include using hand held devices for field operations.

Bio(s):
Mr. Stocking is a Project Director in Woolpert Enterprise Information Management group with over 22 year of experience implementing enterprise IT/GIS projects in both the public and private sectors.

Mr. Szwaya is a graduate MS 1982 in Geotechnical Engineering and Transportation Systems from the University of Illinois-Champaign-Urbana. He has 29 years as a roadway and pavement designer at the Cook County Highway Department. He is on the evaluation/implementation team for the Asset Management project spearheading the Pavement Management portion of the project.

6.1.2 Activity-Centric Asset Management for Bridges, Paradigm Devolution

Presenter
Thomas Martin
Bridge Asset Coordinator
Minnesota Department of Transportation
thomas.martin@state.mn.us

Co-Presenter

MnDOT's implementation of an activity-based bridge management tool focused primarily on field data collection, audit-able processes for inspection review and response driven maintenance follow-up workflows has trudged through the initial season only to find the win and lose columns closely tied. The

overall user acceptance, ease of use, cost of operation and flexibility score highly while management of physical assets, reporting on historic and trend data, extraction of summary or system-wide reports and a finicky ETL needed to push data into a warehouse tool rank equally on the work outstanding side. This is a review of the lessons learned by MnDOT's Bridge Office during the initial implementation of their software as a service (SAS) for the Structure Information Management System (SIMS).
The system boosts a browser-based interface, checkout-able records for at-site inspections and Google Map based interface for inventory display and analysis.

Bio(s):
Thomas has worked for the Minnesota Department of Transportation for eighteen years in a variety of capacities. His initial work for the state was to manage, analyze and report on agricultural pest movement for MDA (MN Department of Agriculture) followed by a post scoping, developing and implementing a state-wide hydraulic infrastructure application called HYDINFRA. The focus of his most recent positions within the DOT involve large system management of both Physical and Data assets.

Thomas is an avid bird watcher and recently added Wood Stork and Whooping Crane to his life-list; he enjoys growing perennials and fostering a small mixed forest on the shores of an eighteen acre plot on the Rum River in central Minnesota.

6.1.3 Transportation Asset Data at the Colorado Dept. of Transportation

Presenter
Lou Henefeld
Data Applications Unit Manager
Colorado Dept. of Transportation
louis.henefeld@dot.state.co.us

Co-Presenter

Like most other departments of transportation, the Colorado Dept. of Transportation (CDOT) has strengthened its transportation asset program. This program extends from performance measures to collecting data about that describe physical transportation assets. CDOT's performance measures give the Transportation Commission, executive management, and the public an idea of how CDOT is doing.

This talk presents the web-based, desktop-based, and field-based physical transportation data collection tools and methods. It also presents an overview of the transportation asset program, from executive level reporting, thru the Transportation Asset Management Plan, to specific GIS and GPS tools and techniques used to collect data about individual assets.

Bio(s):
Lou Henefeld supervises the Data Applications Unit with the Colorado Dept. of Transportation (CDOT). This unit is responsible for web and desktop tool development and support, for supporting many of the Transportation Development division's web sites, and for transportation asset data collection and management. Lou has 20 years experience with GIS, and nearly 20 years with computer systems and database management.

6.2.1 Enabling Enterprise Geospatial Workflows

Presenter
Dave Holmes
Transportation Marketing Consultant
Intergraph Corporation
david.holmes@intergraph.com

Co-Presenter

Working in multi-disciplinary geospatial environments introduces complex requirements and challenges that many conventional geospatial systems can't manage without extensive customization. While users may need access to a common data theme, the records they should be able to see and what they can do with them will vary depending on their department, role, or geographic jurisdiction. Users' rights can also vary throughout the life cycle of a record as responsibilities change (e.g. from planning through to design and construction and lastly, operation). Server based applications providing these needs must enable enterprise organizations to implement life-cycle workflows including field data capture, feature-level access control, data editing with validation, and integration to other systems. In this session, the speaker

will present how organizations can implement complex geospatial workflows across their enterprise with a server-based approach, thus minimizing client administrative costs.

Bio(s):
Dave has been with Intergraph for 30 years. He currently is involved in strategic planning for the transportation and local government markets. Prior to this, he was the Director of Product Management for 12 years.

6.2.2 The Georgia DOT Enterprise GIS Program

Presenter
Teague Buchanan
Enterprise GIS Mgr
Georgia DOT
tebuchanan@dot.ga.gov

Co-Presenter

The Georgia DOT (GDOT) initiated an Enterprise GIS (EGIS) program in 2006. The program, strategy, results, and IT enterprise integration achieved will be presented. The application development solutions and framework implemented within SharePoint and ArcGIS Server will be presented. Scaled web solutions from simple mapping to online editing will be demonstrated. Approaches implemented to strengthen the agency GIS community and provide services externally to transportation partners will be demonstrated. The current state of implementing CADD interoperability and Asset Location initiatives will be discussed.

Bio(s):
Teague Buchanan is the Enterprise GIS Manager for the Georgia Department of Transportation. He manages the accessibility, representation, and framework of GIS resources through the delivery of support, development, and quality assurance services.

6.2.3 Plug-and-Play GIS Applications: Making Maps Easy

Presenter
Kim Hubble
GIS Support Unit Manager
Colorado Department of Transportation
Kim.Hubble@dot.state.co.us

Co-Presenter
Dave Bouwman
CTO & Senior Software Architect
DTSAgile
dbouwman@dtsagile.com

CDOT worked with DTS to create an easy to use GIS Data browser application called MapView2. MapView2 application provides CDOT users with Roadway, Environmental and Planning data along with Imagery. The application provides data queries, hot linking to images/documents, Linear Referencing Tools and link to video logger applications. Building on the ArcGIS Viewer for Flex platform, the core MapView2 application can be easily configured or extended by adding both custom and community widgets. This talk will review some of the custom Linear Referencing widgets created by DTS as well as the configuration process for adding other widgets.

Bio(s):
Kim Hubble has been with Colorado Department of Transportation for 7 years. For the last several years served as Project Manager for the Web Mapping applications deployed at CDOT.

Mr. Bouwman has been developing custom GIS applications for the last 15 years. Recently he has been focusing on building high-performance, user friendly web applications on the ArcGIS Server platform

6.3.1 Crash Locating in the State of Alabama: Improving Safety on Rural Roads

Presenter
Randy K. Smith
Associate Professor
The University of Alabama
rsmith@cs.ua.edu

Co-Presenter
Andrew Graettinger
Associate Professor
The University of Alabama
andrewg@eng.ua.edu

Additional Contributors: David Brown-The University of Alabama, Samuel Poole/Waymon Benifield-Alabama Department of Transportation, Dana A. Steil-Harding University

The Center for Advanced Public Safety (CAPS) at The University of Alabama is partnered with The Alabama Department of Transportation (ALDOT) in an effort to improve the quality of location data available for rural crashes on local roads. The state of Alabama has been recording crash location data since the mid 90's. A route-milepost linear referencing method is employed to locate crashes on state roads and Interstates, while a node-link-offset methodology is employed for local roads. CAPS and ALDOT have used the Critical Analysis Reporting Environment (CARE) software for more than six years to thematically map and analyze hotspots for state route crashes. The current partnership focuses on local road crashes, which when complete will enable complete statewide crash mapping and analysis.

Node-link maps are maintained centrally by ALDOT and provided in PDF format to officers. The node-link-offset methodology relies on officers using the PDF node-link maps to identify and hand enter the node-link information on electronic crash forms. The node-link maps do not provide a complete statewide linear referencing system nor are the nodes and links spatially aligned to a geographical coordinate system.

CAPs and ALDOT are in a partnership creating a complete geo-referenced and linear-referenced local road network. Initial work began in late 2009 geo-locating all nodes based on the node-link maps. A local road basemap was processed creating a node at every intersection and end point of every link. CAPS manually added node identification information to each point based on the node-link PDF maps. To date, 100% of the State Routes are geocoded while ~95% of local road nodes have been geocoded. A QA/QC procedure was employed to find potential errors. Results of the QA/QC process indicated that nodes identifiers are ~90% accurate. A set of procedures have been developed to correct the errors..

As node geocoding completes, a crash record data mining procedure is being employed using over 15 years of historical CARE data to add link information. Link crash data is recorded with node identifiers, a link identifier, and an offset. Knowing the node locations, a link can be produced and automatically populated with the link ID mined from the crash records.

CAPS, in partnership with the Alabama Department of Public Safety (DPS), created and maintains the State's electronic crash reporting environment (eCrash) used by law enforcement. The results of the node-link locating effort from ALDOT is utilized in eCrash to provide officers with nearest Nodes and Links roadside for verification at the crash scene. This process is being evaluated at this time. It is believed that the results are reducing officer risk at crash scene by reducing their time on the roadside while simultaneously improving the State's crash location consistency.

Through this partnership, Alabama will become one of the few states to have a complete statewide crash map containing both local road and state route crashes for both historic and current crashes.

Bio(s):
Dr. Randy K. Smith is an Associate Professor in the Department of Computer Science at The University of Alabama. Dr. Smith received degrees from The University of Alabama in Huntsville, and The University of Alabama. He is a Senior Member of the IEEE and a Senior Member of the ACM. Dr. Smith is published in numerous journals and conference proceedings. The National Science Foundation, NASA, the US Department of Homeland Security, the US Department of Education, and various state agencies fund Dr. Smith¹s research. His current interests include data mining and information retrieval techniques applied to large software systems, and applications of data mining to improve software requirements engineering.

Dr. Andrew Graettinger is an Associate Professor in the Civil, Construction, and Environmental Engineering Department at The University of Alabama. Dr. Graettinger received his Ph.D. from Northwestern University and his bachelor and master degrees from

6.3.2 AHTD's LRS Crash Location Tool and Utilizing Incident Analyst for Crash Event Analysis

Presenter
Sharon Hawkins
Section Head Mapping and Graphics
Arkansas State Highway and Transportation Dept.
Sharon.Baker@arkansashighways.com

Co-Presenter
Bruce Aquila
Sr. Transportation Consultant
Intergraph Corporation
bruce.aquila@intergraph.com

The Arkansas State Highway and Transportation Dept. (AHTD) has created a Crash Location Tool utilizing the Department's Linear Referencing System, Intergraph's GeoMedia /Transportation software and Google Earth. The tool provides a convenient way for law enforcement across the state to enter log mile locations and roadway information when recording crash information. The simple methodology and easy to use Google Earth format will make our crash location database more accurate and our safety analysis more precise as the crash event locations become more exact. In conjunction with the new Crash Location Tool, the AHTD is also using Intergraph's Incident Analyst within GeoMedia to locate crash event Hot Spots/Crash Densities, Repeat Incident locations and producing finished maps and graphs that can provide a quick, complete visual aid of the tabular crash data.

Bio(s):
Sharon graduated in 1999 from the University of Central Arkansas with a Bachelor's Degree in Geography. She started at the Arkansas State Highway Dept. in 1999 in the Mapping and Graphics Section. She currently is the section head of this division.

Bruce has been with Intergraph for 27 years. He is currently serving as a Senior Transportation consultant in the Government and Transportation Business Unit. Among his responsibilities are business development and consulting.

6.3.3 Expediting Nevada DOTs Crash Analysis through a Multilevel Linear Referencing System

Presenter
Grahame Ross
Transportation Analyst
Nevada DOT
ghross@dot.state.nv.us

Co-Presenter
Bruce Aquila
Sr. Transportation Consultant
Intergraph Corporation
bruce.aquila@intergraph.com

The Safety Division of Nevada DOT (NDOT) was faced with the challenge of having to locate crash data against multiple linear referencing methods (LRM's). Attempting to meet this objective was requiring NDOT to maintain multiple versions of the network built with different LRM's. This was time consuming and impractical. NDOT's response to this was to implement a multilevel linear referencing system that would support multiple LRM's and geometric representations of the network. In addition, NDOT has collaborative relationships with several of the counties in Nevada to incorporate changes they make to their local road systems into the LRS. As an example Clark County, the most populated county in Nevada, embarked on a data cleaning effort to align road centerlines with parcel data. This creates numerous changes needing to be rolled into NDOTs MLRS. NDOT uses a process that includes data fusion and conflation to identify and incorporate these changes into the LRS. Subsequently, this allows NDOT to still locate all the crashes against the multiple LRM's. In addition, the tools and process NDOT uses greatly reduces the amount of time spent maintaining the LRS.

Bio(s):
Graham is a GIS Transportation Analyst for the Safety Division. He has worked at NDOT since 2003. He has maintained NDOTs MLLRS deployment since 2007. Prior to this, he was in the surveying/engineering field for 10 years. He is GISP certified.

Bruce has been with Intergraph for 27 years. He is currently serving as a Senior Transportation consultant in the Government and Transportation Business Unit. Among his responsibilities are business development and consulting.

6.4.1 Automating Environmental Screening

Presenter
Frank DeSendi
Planning Division Manager
PennDOT
fdesendi@pa.gov

Co-Presenter

After numerous starts and stops trying to implement Linking Planning and NEPA, the Pennsylvania Department of Transportation committed to seeing it through. A team of Department personnel was assembled to interact internally and with the MPO's and RPO's to make it happen.

One objection dominated discussions, 'this will add to the workload and we have no one to do it.' Although the internal team disagreed with this assessment, the fear had to be overcome. The team overcame the concern by automating as much as possible.

This presentation will discuss PennDOT's Linking Planning and NEPA process with particular emphasis on the automation of environmental screening.

Bio(s):
Frank DeSendi is the manager of PennDOT's Geographic Information Division. Frank came to PennDOT in 1989 and became involved in GIS and Planning in 1995.

6.4.2 Noxious Weeds Web Application and Data Management for the Colorado DOT (CDOT)

Presenter
Gary Aucott
GIS Web Tools Technical Leader
Colorado Department of Transportation
gary.aucott@dot.state.co.us

Co-Presenter

The Colorado Dept. of Transportation (CDOT) recently deployed a Flex web application that simplifies access to noxious weed GIS data along state highways. CDOT has collected weed GIS data for many years but the perceived inaccessibility of the data kept it from being used by those who needed it most. A recent effort has made to make the data more accessible to staff who are involved with controlling weed infestations in the right-of-way. A major part of that effort is a new web application utilizing ArcGIS Server, ESRI base maps, and a simple user interface which provides a quick reference for CDOT weed coordinators and spray crews. An overview of CDOT's weed data collection and web GIS development will be presented.

Bio(s):
Gary Aucott is a GIS web tool specialist at the Colorado Department of Transportation. He has 16 years of GIS experience, including photogrammetry, ArcGIS, Lidar, and GPS surveying. He currently develops applications with ArcGIS Server and Flex.

6.4.3 Empowering Your Mobile Workforce with Mobile GIS: Ingredients for A Successful Enterprise Approach

Presenter
Dr Yueming Wu
GIS Manager, Ph.D., GISP
West Virginia Department of Transportation
yueming.wu@wv.gov

Co-Presenter

The demand for highway maps at the West Virginia Department of Transportation (WVDOT) is always high. In addition to meeting the public interest by putting the maps on its website, the WVDOT Geospatial Transportation Information (GTI) Section each year prints thousands of copies for the WVDOT community. These maps are currently maintained in MicroStation DGN format. After they were created in 2004, however, except for road centerline geometries other features have not been updated on time. Given the facts that GTI has been developing an enterprise GIS database and its staff expertise in GIS has been growing, GTI initiated a project to reproduce the maps in an Esri GIS environment in an attempt to produce more accurate and current maps. This presentation will share the workflow of the project and also lessons learned from the reproduction.

Bio(s):
Dr. Wu is a GIS Manager at the West Virginia Department of Transportation. Dr. Wu is a certified GIS Professional. He is also an adjunct professor at Marshall University. His major interest is in Geospatial Technology for Planning.