

Information Systems and Technology Committee (ABJ50) Meeting at TRB Annual Meeting 2016

Tuesday, January 12, 2016, 8:00 PM to 12:00 PM Eastern Time
Marriot, Marquis Liberty N (M4)

Frances Harrison (Chair), Spy Pond Partners, LLC
Shannon Barnes, (Member) CSG Consulting
Mike Bousliman (Member), Montana DOT
Ioannis Brilakis (Member), University of
Cambridge
Colin Brooks (Member), Michigan Tech
Research Institute
James Hall (Member), University of Illinois-
Springfield
Yinhai Wang (Member), University of
Washington
Jim Yarsky, (Member), Maryland State Highway
Shawn Blaesing (Member) Iowa DOT
Zhixia (Richard) Li (Member), University of
Wisconsin
Rob Zilay (Member), Dye Management Group
Terry Bills (Member), ESRI
Robert Schultz (Member) UMTRI
Tylor Husske (Member) Iowa DOT
Tom Palmerlee, TRB
Doug Couto (Member) Center for Digital
Government
Eric Nutt, Mandli Communications
Richard McKinney, USDOT
Nancy Lefler, VHB
Onur Pekun, Middle East Technical University
Amlan Mvkherjee, Michigan Tech
Mark Sarmiento, FHWA
Joseph Schofer, Northwestern University
Steven Parker, University of Wisconsin-Madison

Murali Rao (Member), Virginia DOT
Joe Garvey (Member), AgileAssets, Inc.
Guohui Zhang (Member), University of New
Mexico
Nora El-Gohary (Member), University of Illinois
Tim Schmidt, (Member) USDOT-Turner
Fairbanks
Richard Brown, VHB
Charles Engelke, Info Tech
Brian Korschgon, AASHTO
Rateen Roy, Regional Municipality of York,
Toronto, Canada
Jose Colon, District of Columbia DOT
Kristen Baldwin, US DOT
Sylvain Haon, UITP
Tuyen Le, Iowa State University
Steven Parker, University of Wisconsin-Madison
Srinivas Pulugurtha, University of North
Carolina-Charlotte
Brian Alula, MDOT
Jeff Western, Western Management
Consultants
Garreth Rempel, Morr Transportation
Consulting
Robert Dingess, GTIMA
Katy Salamati, SAS Institute NC State University
Jennifer McNeil, Oracle
Kevin Greene, eVision partner Inc.
Yelda Turkan, Iowa State University

1. **Committee Meeting Agenda** – See Appendix 1
2. **Committee Business**
 - a) **Sensing Technologies Sub-Committee Report** - Provided by Colin Brooks. See Appendix 2 for the full report
 - b) **Construction Information Technology Sub-Committee Report** - Provided by Nora El-Gohari. See Appendix 3 for the full report

- c) **Cyber Security Committee** - Michael Dinning is the chair of this committee; Doug Couto is ABJ50's liaison. Doug reported that a major focus for the committee will be ITS security threats and that the auto industry has set up a Center for Cyber Security to do research on connected vehicles. The committee has bi-monthly conference calls. Members interested in getting involved in this committee should get in touch with Doug or Michael.
- d) **Research Papers for 2015** - The ABJ50 Committee received 20 papers this year. Thanks to Guohui Zhang for managing the paper review process and to all of the paper reviewers for a job well done. Thirteen papers were accepted for presentation or poster sessions and three were accepted for publication.
- e) **ABJ50 Research** – Tim Schmidt (Turner- Fairbanks) reported on the results of the Research Committee meeting that discussed the topic of future standards development generated two possible research statements related to common frameworks and reusable patterns that people can plug into. Further details forthcoming once they are further fleshed out.
- f) **Data Section Committee Report** – Tom Palmerlee (TRB), Professor Joseph Schofer (NW University) and Jack Stickel (Alaska DOT) reported the following:
 - Jack will be taking over the chair of ABJ00 the Data and Information Committee from Joe Schofer
 - Tom, Joe and Jack expressed thanks to Frances for her many years of service as Chair of ABJ50.
- g) **TRB Update**– Tom Palmerlee provided the following information:
 - The spotlight theme for TRB 2017 will be “Transportation Leading the Way in an Era of Change”
 - TRB will increase focus on Big Data, Public Health and UAVs.
 - Record number of research papers submitted for review as well as a record number of attendees at the 2016 Annual meeting
 - New process is being implemented for the upcoming year: TRB papers that are formerly accepted without requiring revision will be made available electronically prior to waiting for all papers to be finalized.
 - A new task force on Privacy is being set up and Tom recommended that a representative from ABJ50 request to be a member. Johanna Zmud of TTI is the task force chair. Richard Schultz indicated an interest in participating.
- h. Committee **Rotations** – Frances Harrison reported that ABJ50 will be rotating one-third of its committee membership this year as required by TRB. Committee membership recommendations must be to TRB by January 31, 2016.
- g. 2016 **Committee Action Plan** – Frances reviewed the ABJ50 Committee Action Plan. Comments and suggestions were requested to be sent to Frances. See Appendix 4 for the draft plan.

3. **Announcement and Research Updates**

- a) **New Safety Data Subcommittee** – Nancy Lefler (VHB) reported on the new scope and plan for a new subcommittee that will focus on roadway, traffic and crash data improvement and utilization. This subcommittee is being cosponsored by committees from both the Safety and Data Sections. See Nancy if interested in participating.
- b) **Michigan UAV's** - Colin Brooks reported on the completion of the first phase of Michigan's UAV research project and the uses of UAV's in agriculture and emergency services. Phase 2 of the research grant will be awarded soon.
- c) **NCHRP Information Management Guide** – Frances Harrison reported that NCHRP Report 829: Leadership Guide for Strategic Information Management for State Departments of Transportation is nearing completion and will be published later this year.

4. **Committee Program**

a. CIO Roundtable - Doug Couto facilitated a CIO roundtable titled State DOT CIO Roundtable: Issues facing DOTs and the role of the CIO in a data driven organization Roundtable participants were Mike Bousliman (Montana DOT) Jeff Neal (Kansas DOT) Shannon Barnes (Idaho DOT), Murali Rao (Virginia DOT), Jim Yarsky (Maryland DOT) and Shawn Blaesing- Thompson (Iowa DOT). The roundtable's primary focus was on the issues facing DOT's in the area of cyber security. Mike talked about the importance on raising awareness of the issues within the agency, and getting clarity on how to treat different information classes (PII versus information subject to FOIA). Shannon spoke about the value of the NIST framework. Murali stressed the importance of working collaboratively to enable business in the most secure way possible.

b. Industry Roundtable – Shannon Barnes facilitated a roundtable discussion with industry partners on the topic “What are the biggest challenges facing DOT's in the future. Discussion focused on enterprise information governance, business/IT collaboration within DOTs, big data/predictive analytics, use of private data, transparency and security.

c. Richard McKinney, CIO of USDOT spoke about Strategic Directions for USDOT. His remarks emphasized work towards an enterprise-wide, shared services model for IT across the modal administrations, allowing each administration more time and resources to focus on their core mission. He spoke about the critical importance of attention to cybersecurity, and pointed out that needless complexity in system architecture and configuration increases risk exposure.

5. **Future Plans and Assignments**

- a) Frances Harrison has taken on a new assignment as research coordinator for the data section – in this role she will facilitate communication across the different committees and look for collaboration opportunities.
- b) Shannon Barnes (CSG Consulting) will take over as Chair for ABJ50 in April 2016.
- c) Shawn Blaesing-Thompson (Iowa DOT) will be the new Committee Communications Coordinator (CCC) for ABJ50

Notes prepared by: Frances Harrison and Shannon Barnes

Please submit corrections or additions to: fharrison@spypondpartners.com.

Appendix 1

AGENDA - Information Systems and Technology Committee (ABJ50) – 95th Annual TRB Annual Meeting at the Washington DC Convention Center

Committee Meeting Information

Tuesday, January 12th, 2015, 8:00 AM to 12:00 NOON Eastern Time

Marriott Marquis Hotel, 901 Massachusetts Avenue NW Washington District of Columbia 20001 Room: Liberty

8:00 Welcome and Agenda Overview - Frances Harrison, Chair of ABJ50

8:15 Committee Business

Sensing Technologies – Colin Brooks

Paper Review – Guohui Zhang

Construction Information Technology – Nora El-Gohari

Research – Tim Schmidt

Cyber-Security – Michael Dinning/Doug Couto

Committee Rotations – Frances Harrison

2016 Committee Action Plan

8:45 Announcements and Research Updates

New Safety Data Subcommittee - Nancy Lefler

Michigan DOT's unmanned aerial vehicle (UAV) research – Colin Brooks

NCHRP Information Management Guides – Frances Harrison

9:30 Industry Roundtable - Moderator: Shannon Barnes, Idaho Transportation Department

Opportunity for participants from private industry to offer their perspectives on top DOT information technology challenges and opportunities for 2016

Q&A

10:00 USDOT Perspectives and Strategic Directions, Richard McKinney, USDOT CIO

10:30 Break

10:45 State DOT CIO Roundtable: Issues facing DOTs and the role of the CIO in a data driven organization

Moderator: Doug Couto, Center for Digital Government

Open Forum: DOT CIOs (and staff) are invited to provide their views on balancing need to ensure information security and privacy with need to facilitate information access for staff, partners and stakeholders.

11:30 Update to 2016 Committee Action Plan Today's Discussion (call for volunteers) – Frances Harrison

11:45 Other Business

12:00 Adjourn

Appendix 2

ABJ50 (1) Sensing Technologies Subcommittee Meeting Minutes –

Monday, Jan. 11th, 2016, 1:30 – 3:15 pm

Marriott Marquis, Liberty P (M4)

Co-sponsored by ABJ50, Information Systems and Technology and ABJ60, Geographic Information Science and Applications.

1. Past year activities:
 - a. 10th Sensing Technologies for Transportation Sunday workshop – 10 presentations – 1/10/2016 (data fusion, frozen debris lobes, bridge sensing with UAVs, post-disaster access, LiDAR advancements, wireless sensing, geotechnical asset management, unpaved road assessment, UAS applications, smart rocks) – 49 attendees at peak
 - b. Held meeting at 2015 TRB, discussed call for papers, poster/lectern session, webinar, research needs, holding future workshops, new AV060(1) UAS Subcommittee.
 - c. 2016 subcommittee meeting – 13 attendees
 - d. Developed a new Research Needs Statement on UAS capabilities.
 - e. 62 members now in Google Group (up from 47 in Jan. 2015 and 32 in Jan. 2014)
 - f. Web page updated at <http://www.abj50.org/subcommittees/sensing-technologies/>
2. Research Needs Statement (RNS) generation
 - a. “guidance on developing research statements for funding consideration” - <http://www.trb.org/ResearchFunding/AppendixAWritingaResearchStatement.aspx> & <http://rns.trb.org/>
 - b. C. Brooks, D. Banach (MTRI) developed one, in final stages: “Increasing Understanding of Unmanned Aerial System (UAS) Capabilities to Address Transportation Infrastructure Issues”
 - i. 4 tasks – Lit review, regulatory environment detailing, review upcoming / current platforms & sensors, regional outreach efforts, field case studies; implementation activities. \$500k over 24 months?
 - c. Looking to move forward with ~4 new ideas over the next few months
 - i. Guide to intrusive & non-intrusive traffic counting technologies (Richard Li, U. of Louisville)
 - ii. Monitoring rock slopes; remote sensing for incident management (Cristian Druta, Virginia Tech)
 - iii. Synthesis of best practices for Bluetooth-based traffic monitoring (Rebecca Taylor, Diamond Traffic)
 - iv. Synthesis of road roughness assessment from mobile systems (phones, etc. – six presented at TRB this year) – David Lowe, Fugro
3. Presentation: “Incident management using UAV and buried cable sensor for animal detection” – Cristian Druta, Virginia Tech
4. Focus for 2016:
 - a. 11th workshop at TRB 2017 – still appears to be lots of demand for this from presenters
 - b. Get out 4-5 research needs statements based on updated list

Colin Brooks, Committee Co-Chair, 734-604-4196, cnbrooks@mtu.edu, www.mtri.org

Appendix 3

AFH10 (1) Information Systems in Construction Management Joint Subcommittee of AFH10, ABJ50

Brief Report on Activities

Activities in the Past Year (February 2015-January 2016)

- The Subcommittee sponsored its 13th Annual Workshop during the 2016 TRB Annual Meeting.
 - The title of the 3-hour workshop was: “Toward Cyber-Physical Systems in Construction”
 - The workshop included five presentations, followed by a panel discussion.
 - 5 speakers participated in the workshop:
 - Title: Application of Cyber-Physical Systems in the Development and Management of Constructed Facilities; Speaker: Chimay Anumba, Penn State University
 - Title: Will the New Connected and Autonomous Vehicle Technologies Impact Transportation Safety and Mobility?; Speaker: Robert Arnold, Federal Highway Administration (FHWA)
 - Title: A Multi-Layer Framework for Cyber Physical Systems in Construction Projects; Speaker: Saiedeh Razavi, McMaster University
 - Title: A Simple Solution to Access Geospatial Data and Collect Field Data in the Field; Speaker: Xin Chen, Johns Hopkins University
 - Title: Caterpillar's technology journey; Speaker: Shailendra Singh, Caterpillar
 - The workshop was well-attended (about 35-40 attendees) and had strong participation from the audience.
 - Some of the points/themes discussed included:
 - For cyber physical systems (CPSs) in construction, what are the applications that we should focus on? Discussed applications included equipment safety, smart work zone, and e-construction and asset management.
 - How to let industry buy in for use of CPSs in construction?
 - Education and culture for CPSs is not there yet.
 - Need for benefit cost analysis for implementing CPSs in construction.
 - Need for data analytics; we collect a lot of data, but we are not analyzing the data to support decision making.
 - Need for data analytics to support proactive, not reactive, decision making.
 - Need for greater interactions between researchers and practitioners; it takes a lot of time of proof of concepts to go into the industry.
- The Subcommittee Sponsored its 1st Webinar
 - Title of the webinar was: “Information Standardization Practices for Digital Project Delivery”
 - The webinar was well-attended: 255 attendees.
 - The webinar received very positive feedback from the participants (as per TRB’s survey).
 - The webinar included 3 speakers, with industry focus, including:

- Speaker: Gene V. Roe, Ph.D., P.E., PLS
Title: ASTM E57.04 3D Data Exchange Standard
Summary: With the 2D paper to 3D digital transformation beginning to take place there is a unique opportunity to establish a set of data models and standards that will support the efficient management of transportation assets across their entire lifecycle. As found conditions are now being documented in 3D using static and mobile laser scanning as well as airborne LIDAR. This session introduced the ASTM E57.04 3D data exchange standard that is in the process of being adopted by all of the major hardware and software vendors. In addition, it introduced the concept of a unified 3D transportation data model that will seek to address the issue of legacy stovepipe applications.
 - Speaker: John P. Lobbestael, P.S., Manager, Survey Support Unit
Title: Data Streamlining, Optimization and CIM Implementation at Michigan Department of Transportation
Summary: The Michigan Department of Transportation is striving towards mature utilization of lifecycle data. This presentation discussed the CIM implementation philosophies being entertained by MDOT, progress to date with data streamlining from Design to Construction and other data optimization concepts.
 - Speaker: Christopher Johnson, Technologist/Visualization Specialist, CH2M HILL
Title: Strategizing for Data Asset Management: A Review of Current Practices and What History Forecasts
Summary: This presentation covered current data exchange practices between design and construction in Wisconsin, and addressed strategies for improvement by considering the trajectory of data usage over the last 30 years. Examples of data exchange practices from several Wisconsin transportation mega projects were reviewed, as well as a timeline of the information formats and applications used. Consideration of various strategies for responding to the diversity of information standards and practices were concluded by highlighting several key approaches towards increasing project efficiencies while addressing the importance of data asset management.
- The Subcommittee conducted a Mini-workshop (breakout session) on “Big Data Analytics for Transportation Systems” during the 2015 Subcommittee meeting and a follow-up during the 2016 Subcommittee meeting.
 - The Subcommittee meeting attendees did breakout into three sessions, as follows:
 - Group A: Big data analytics for supporting the planning and design of transportation systems
 - Group B: Big data analytics for supporting the construction of transportation systems
 - Group C: Big data analytics for supporting the operation and maintenance of transportation systems
 - Each group discussed the following questions for each theme and provided a briefing presentation on the outcomes of their breakout session:
 - What practical needs/questions do we have?
 - What data do we have/need to answer those practical needs/questions?
 - What data do we have to answer those practical needs/questions and what are the types of these data?
 - Which of these data are not publicly/easily available and how to get these data?
 - What data do we need, but do not currently have, to answer those practical needs/questions?
 - What data analytics tools do we have/need to answer those practical needs/questions?
 - What analytics/services do we currently have, and what are their strengths and weaknesses?
 - What analytics/services do we need?
 - What data integration/synthesis/fusion do we need?
 - What data analysis do we need?

- The Subcommittee worked on 4 Research Need Statements (RNSs) during the past year.
 - The four RNSs are:
 - RNS-1: The Application of Information Technology in Work Zone Safety.
 - RNS-2: Streamlining the Data Management Process across Entities, Phases, Locations, and Time.
 - RNS-3: Information Systems and Training in Transportation Construction Management.
 - RNS-4: Alleviating Staff Shortages and Increased Workloads through Centralized PM and Data Fusion Methods.
 - The Subcommittee presented the statements to AASHTO SLC to gauge their interest, and received feedback.
 - Two RNSs had overlaps with other RNSs and were absorbed by other committees.
 - Based on this feedback, the Subcommittee is going forward with two RNSs:
 - RNS-1: The Application of Information Technology in Work Zone Safety.
 - RNS-2: Streamlining the Data Management Process across Entities, Phases, Locations, and Time.

Planned Activities This Upcoming Year (February 2016-January 2017)

- The Subcommittee is planning to sponsor its 14th Annual Workshop during the 2017 TRB Annual Meeting.
 - Tentative title of the workshop: “Best Practices for Big Data for e-Project Delivery”.
- The Subcommittee is planning to sponsor its 2nd Webinar
 - Title of the webinar: “Toward Cyber-Physical Systems in Construction”
 - The plan is to invite 2 or 3 speakers who presented at this year’s Annual Workshop
- The Subcommittee is planning to work on 5 Research Need Statements (RNSs), 2 from last year, plus 3 new RNSs that were identified during the 2016 Subcommittee Meeting:
 - RNS-1: The Application of Information Technology in Work Zone Safety.
 - RNS-2: Streamlining the Data Management Process across Entities, Phases, Locations, and Time.
 - RNS-3: How Can DOTs Pay Contractors by Leveraging Digital Data.
 - RNS-4: How to Use AASHTO’s Site Manager for Design-Build.
 - RNS-5: Tracking Materials over its Life Cycle.
- The Subcommittee is planning to work on the following Synthesis Statement: “State of Practice in e-Construction among DOTs”.
 - Different DOTs are at different phases/levels of e-Construction. The aim of this synthesis statement is to provide a survey and analysis of the states of practice.
- The Subcommittee is planning to work on a study and report about: “Grand Challenges for Data Management and Information Systems in Construction”.
 - The idea is to develop a report/publication similar to the Engineering Grand Challenges by NAE.
 - The plan is to conduct a survey of DOTs, identify the top grand challenges and pain points, and then develop a report/publication.
- Starting this year, the Subcommittee is planning to meet twice annually. This year, the plan is to do a WebEx meeting in June, in addition to the January’s meeting.

Appendix 4

Triennial Strategic Plan - TRB Information Systems and Technology Committee (ABJ50) - DRAFT December 19, 2014

Committee Name and Number:	ABJ50, Information Systems and Technology
Committee Chairperson:	Frances D. Harrison, Spy Pond Partners, LLC
TSP Three-Year Period:	April 2015 to April 2017
Date Prepared:	December 19, 2014

1. Committee Future Outlook Statement

Committee Scope

This committee is concerned with (1) identifying opportunities, challenges and risks for transportation agencies associated with emerging information technology developments, and (2) advancing the state of the practice in the development and application of information systems and technologies in transportation for greater productivity and efficiency.

Specific *technologies* of interest include: sensors (broadly defined to include infrastructure sensors, probe vehicles, unmanned aerial vehicles and remote sensing technologies); mobile computing platforms and applications; digital communications technologies (including 4G LTE); cloud computing; virtualization; “big data” storage and analytics/data mining; social media; data integration platforms; and application architectures (e.g. Service Oriented Architectures).

Specific *applications* of interest include: (1) deployment of connected vehicles and autonomous vehicles; (2) smart infrastructure – using sensor technology to enhance safety and monitor infrastructure condition; (3) eConstruction techniques including use of 3D/4D design models to enhance construction efficiencies; (4) data integration/fusion, mining and presentation tools that support transportation agency decision making as well as traveler selection of mode/route/time of travel; and (5) use of social media and crowd-sourced information to supplement other data sources for asset management and traffic operations.

Specific *concerns* of interest include: (1) responsiveness and agility of transportation agency IT service delivery, (2) integrating, managing and processing large and diverse streams of data; (3) addressing expectations for open data

available everywhere; (4) cybersecurity and data privacy and (5) coordination across federal, state, local and private sector organizations to support efficient and productive technology deployment in transportation.

(Note – this scope statement is an edited version of the current committee scope. We are not proposing any fundamental changes to the committee’s scope; edits were made to better distinguish interest areas based on technology, application and concerns.)

Factors and influences that will shape the committees activities

Over the next seven years, the committee’s activities and areas of focus will be influenced by the following key trends:

- *Rapidly developing technologies for connected vehicles and autonomous vehicles*
- *Explosion of data from multiple sources – including cell-phones, mobile LiDAR, infrastructure sensors, and connected vehicles, creating both challenges and opportunities related to “big data” storage, integration, mining, analytics and access.*
- *Growing use of mobile computing devices and social media, enabling new modes of communication and information sharing within transportation agencies; and between transportation agencies and their customers.*
- *Maturation of next generation high speed data communications technologies, providing new opportunities for mobile technology applications.*
- *Increased private sector involvement in provision of transportation, and in collection of data – commercialized data providers, outsourced maintenance and operations services and use of public/private partnerships for infrastructure development and operations has significant implications for data sharing, integration and use for management decision making.*
- *Growing cybersecurity and data privacy concerns, and the need to balance these concerns with expectations for open data – from anywhere, at any time.*
- *Increasingly constrained transportation agency resources, which motivates organizations to seek opportunities for efficiency gains through technology deployment. At the same time, transportation agency information technology leaders are challenged to deliver on growing expectations for agile deployment of new systems and technologies in response to business unit needs.*
- *Emergence of new information technology service delivery approaches, including cloud-based infrastructure-as-a-service and software-as-a-service models, statewide information technology consolidation, and shared service models.*
- *Continued shifts to enterprise-wide, business-centric approaches for data management and software architecture, which requires new skill sets and new working relationships between information technology and business units, and execution of deliberate strategies for integrating data across existing application silos.*
- *Increased adoption of open data policies, in which agencies make data sets freely available to the public, enabling development of independent 3rd party applications for making use of the data.*
- *Emergence of low or no-cost web-based applications for mapping, location-based services and office productivity – for mobile and desktop platforms.*
- *Continued development and adoption of semantic technologies and data models.*

Critical Issues in Transportation

The committee’s focus on making more effective use of information technology helps transportation agencies achieve their missions in a more efficient manner; thus the work of this committee *indirectly* supports each of the

critical issues that have been identified by TRB. Specific committee research interests that *directly* pertain to the TRB critical issues are listed in Table 1 below.

Table 1. Information Systems and Technology Research for Critical Transportation Issues

Critical Issue	Committee Research Areas
System Performance: reliability and resilience	<ul style="list-style-type: none"> - Deployment of connected and autonomous vehicles - Leveraging crowd-sourced information on congestion and incidents - Information technologies supporting fusion, archiving and retrieval/display across multiple data sources - Data and application architectures for ITS – traveler information, incident management, active traffic management; including open source, cloud computing, semantic models
Safety	<ul style="list-style-type: none"> - Use of smart infrastructure technology to improve safety - Best management practices for cybersecurity risk assessment and mitigation (In collaboration with the Critical Infrastructure Protection Committee) - Data exchange standards
Energy, Climate and Environment	<ul style="list-style-type: none"> - Applications of sensor technology for monitoring of environmentally sensitive areas, and for acquisition of 3D geospatial data and asset inventories in support of climate change adaptation - Use of information technology to manage and mitigate environmental impacts of construction projects
Funding for Public Infrastructure	<ul style="list-style-type: none"> - Sensor technologies for tolling that support moving from the gas tax to a travel/VMT-based tax.
Institutions: 20 th century institutions mismatched to 21 st century missions	<ul style="list-style-type: none"> - Data sharing in the context of outsourced services and public/private partnerships - Cloud computing and shared IT service models for greater agility and efficiency
Innovation	<ul style="list-style-type: none"> - Meeting new information technology workforce needs

2. Committee Plan

The committee’s plan for the next three years is presented below, organized into six goal areas.

Goal #1: Research

Engage a diverse mix of researchers and transportation agency staff to identify critical research questions, develop research agendas, issue calls for papers and pursue avenues for advancing research projects.

Strategies include:

- Appoint a new research coordinator for the committee, to be responsible for working with committee members to identify research needs and draft research needs statements.
- Identify priority research needs for advancing the state of the practice in the following focus areas:
 - Applications of Sensing Technologies for Traffic Operations, Safety and Asset Management
 - Improving Construction Site Efficiencies
 - Developing and Implementing Effective Cybersecurity and Data Privacy Strategies
 - Capturing and Integrating data from heterogeneous sources to support agency decision making and traveler information
 - Adapting IT management and service strategies to leverage new technologies and address customer expectations
- Utilize conference calls and emailed “call for research needs” solicitations to identify research needs and priorities.
- Work with the committee communications coordinator to update the committee website with a “research watch list” containing links to active research projects of interest to the committee

Goal #2: Collaboration

Work with other TRB committees and Task Forces on cross cutting issues to provide a broad perspective, avoid duplicative efforts and maximize involvement of interested parties. Strategies include:

- Continue the joint subcommittee on Sensing Technologies with the Geographic Information Science and Applications Committee (ABJ60). Pursue continued opportunities for collaboration with the Transportation Asset Management Committee (ABC40), and the Soils and Rock Instrumentation Committee (AFS20)
- Continue the joint subcommittee on Construction Information Technology with the Construction Management Committee (AFH10). This subcommittee also maintains a liaison with the Geospatial Data Acquisition Technologies in Design and Construction Committee (AFB80). Coordinate with the AFH30 committee – Application of Emerging Technologies to Design and Construction, which also has similar interests.
- Continue the joint subcommittee on Cybersecurity with the Critical Infrastructure Committee (ABE40) – and pursue expanding the scope of this subcommittee to address data privacy issues.
- Explore potential liaisons with the Emerging Technology Law (AL040) Committee, the Standing Committee on Vehicle-Highway Automation (AHB30), and the Joint Subcommittee on Data Privacy and Protection Policy (AB000, AHB15, ABE25, AL040)
- Coordinate with the Management and Leadership Section committees – specifically, the Asset Management Committee (ABC40), the Strategic Management Committee (ABC10) and the Performance Measurement Committee (ABC30) on opportunities for collaboration and information sharing related to strategic information technology issues of concern to DOT executives.
- Identify/maintain committee liaisons with the following other TRB committees:
 - ABJ20 Statewide Data – collaborate on the transition from independent, business-focused applications to an enterprise approach to system architecture and service delivery
 - ABJ30 Urban Data
 - ABJ35 Highway Traffic Monitoring
 - AFB80 Geospatial Data Acquisition Technologies in Design and Construction
 - AHB15 ITS
 - AB010T Knowledge Management
- Through section meetings, keep abreast of research topics of interest to other committees in the Data Section and pursue opportunities for joint sponsorship of sessions and workshops.

Goal #3: Information Sharing

Provide opportunities – in person, by phone and online - for exchange of best practices, research findings and ideas among researchers and practitioners. Strategies include:

- Annual Meeting Sessions – continue to sponsor a committee “flagship” session covering information technology advances in transportation, as well as a poster or podium session highlighting the top papers received.
- Annual Meeting Workshops – continue to co-sponsor workshops on Sensing Technologies and Construction Information Technology each year.
- Mid-Year Meeting – hold a committee meeting and sponsor one or more sessions at a mid-year meeting - either at NATMEC, the AASHTO Information Systems Subcommittee Meeting, or the Joint Summer TRB meeting with the planning or asset management committees. Include a dial-in option for this meeting.
- Webinars – plan and carry out at least one webinar per year to share information on particular topics of interest to a wider community than can be reached at annual and midyear meetings.
- Build a “research watch list” through a bi-annual request to committee members and friends, and post this on the committee web site with links to relevant project information.

Goal #4: Agency and Industry Liaisons

Maintain strong liaisons with both transportation agency information technology executives and information technology industry leaders to ensure that the committee stays current on key issues of concern and to maximize opportunities for technology transfer across agencies, and from research into practice. Strategies include:

- Include members of the AASHTO Information Systems (IS) Subcommittee on committee emails, and periodically solicit their opinions on research needs.
- Continue the current practice of including one or more members of AASHTO IS as committee members.
- Ensure that at least one ABJ50 committee member attends the AASHTO IS meeting each year, shares information about committee activities with the Subcommittee, and briefs the committee on the meeting.
- Maintain liaison with the USDOT CIO and periodically invite him (and staff members) to committee meetings to share information about USDOT IT activities and discuss opportunities of mutual interest
- Use a portion of each committee meeting to involve transportation agency information technology executives in a discussion of key issues and concerns and related research needs.
- Identify representatives of key information technology companies that serve or impact the transportation agency market to serve as committee members or friends. Invite these individuals to speak at committee meetings or sponsored sessions and workshops.
- Maintain a liaison with the ITS America CTO

Goal #5: Communication

Keep committee members and friends informed about committee activities and opportunities for participation. Strategies include:

- Maintain an active TRB Communications Coordinator, responsible for the committee web site and information sharing with other communications coordinators
- Maintain and improve the current committee web site - include information about the committee scope, subcommittee scopes and contacts, research agendas, research watch lists, upcoming activities, meeting minutes, and presentations
- Add a help wanted section to the website with “job descriptions” for committee roles that need to be filled.

- Maintain an up to date committee friends list
- Use email to the full committee members and friends lists to provide advance announcements of annual and mid-year meeting events

Goal #6: Member Involvement

Attract a diverse and active membership representing key areas of interest and provide opportunities for committee members to take on leadership roles to strengthen the capabilities and reach of the committee.

Strategies include:

- Annual review of the membership list and recruitment of new members to meet the following objectives:
 - Critical mass and depth of expertise for each of the major committee focus areas
 - Mix of public sector (state DOT and other transportation agency), private sector (industry) and academic representation
 - Geographic, racial, age, and gender diversity
- Recruit additional regular members, new young members and international members to bring the committee membership level up to 25 regular members, 5 international members and 4 young members.
- Maintain the following leadership positions: subcommittee chairs, communications coordinator, paper review chair, research committee liaison. Provide recognition and support for individuals serving in these roles and actively recruit members to fill open slots.

Action Plan for 2015-16

Goal	Action (Owner)
Research	<ul style="list-style-type: none"> - Appoint new research coordinator (Committee Chair) - Review and update current research needs statements - via conference call(s) (Research Coordinator) - Issue Request for Research Needs (Sensing Subcommittee Chair) - Add Research Watch list to Committee Website (TBD)
Collaboration	<ul style="list-style-type: none"> - Hold subcommittee meeting for Sensing at TRB Annual – identify new co-chair from ABJ60 and recruit additional members - Attend subcommittee meeting for Construction Information Technology at TRB Annual – continue discussion of this subcommittee’s relationship to AFH30 - Attend Cybersecurity subcommittee meeting at TRB Annual – pursue development of a new research needs statement on guidance for DOT CIOs on developing and implementing effective cybersecurity and data privacy strategies
Information Sharing	<ul style="list-style-type: none"> - Plan the flagship session for TRB 2016 Annual (TBD) - Finalize selection of the mid-year meeting location (Committee Chair) - Plan and conduct a sensing technologies webinar (Sensing Subcommittee Chair) - Plan and conduct a DOT CIO webinar (Doug Couto) - Issue “research watch list” solicitation in Q1 2015 (volunteer TBD)
Agency and Industry Liaisons	<ul style="list-style-type: none"> - Identify committee member or friend to attend and report back on the AASHTO IS meeting (Jim Ramsey?) - Add a liaison from Oracle (Committee Chair) - Extend invitation to USDOT CIO for the ABJ50 meeting at the 2016 TRB Annual Meeting - Organize the 3rd annual CIO roundtable for the ABJ50 meeting at the 2016 TRB Annual Meeting
Communication	<ul style="list-style-type: none"> - Appoint a new committee communications chair - volunteer has been identified; to be confirmed (Committee Chair)

Goal	Action (Owner)
	<ul style="list-style-type: none"> - Form a website working group and identify a manageable set of updates to pursue for 2015 (Committee Communications Chair) - Review opportunities to maintain the committee friends list on the TRB website
Member Involvement	<ul style="list-style-type: none"> - Review membership roster and recruit additional members based on committee areas of interest (Committee Chair)

3. Committee History (2013 – 2015)

Paper Review

- 2013: 11 papers reviewed; 6 recommended for presentation, 3 recommended for publication
- 2014: 31 papers reviewed; 19 recommended for presentation, 2 recommended for publication
- 2015: 49 papers reviewed; 23 recommended for presentation, 6 recommended for publication

Meetings, Sessions and Workshops

Event & Date	Workshop/Session
TRB Annual Meeting – January, 2013 (Washington, DC)	<ul style="list-style-type: none"> - Committee Meeting – presentations on cloud computing, big data, multi-state IT initiatives - Workshop 132 (with ABJ60): integrating spatial and business data for improved decisions - Workshop 135 (with ABJ60): Sensing Technologies for Transportation Applications - Workshop 156 (with AFH10): Getting Information to Construction: Smarter, Better, and Faster - Workshop 192 (with ABJ00): Transportation Data Forecasting Competition - Session 283: Transportation Data Interoperability: Recent Research - Meeting with ABG40: Transportation Data Citation: Current Practice and Future Opportunities - Session 325 (with A0030T): Data Privacy Issues in a World Where Technology Is Way Ahead of Policy - Session 388 (with ABC10): Doing Business Better with Less: Redefining "Great" - Poster Session 614 (with ABJ00): Effectiveness of Safety Data and IT Investments - Poster Session 618: Transportation Information Technology Applications - Session 635 (with ABE40): Increasingly Connected, Increasingly Vulnerable? Strategies to Reduce Transportation Cybersecurity Risks - Session 716: Imagining a New Future for Information Management - Session 789 (with ABG40): Data Stewardship for Sharing and Long-Term Access: What to Expect

Event & Date	Workshop/Session
Committee meeting (with ABJ60) at the joint GIS-T/AASHTO IS Meeting in Boise, ID - May 6, 2013	<ul style="list-style-type: none"> - Committee Meeting – topics included enterprise content management at state DOTs, integrating spatial and business data, Bring Your Own Device, and Big Data
TRB Joint Summer Meeting – June 11, 2013 (Washington, DC)	<ul style="list-style-type: none"> - Roundtable discussion on state DOT/MPO IT unit response to meeting new MAP-21 requirements and strengthening agency performance management functions
TRB Annual Meeting – January, 2014 (Washington, DC)	<ul style="list-style-type: none"> - Committee Meeting: USDOT CIO update, CIO roundtable, presentations on cloud, 4GLTE, social media and big data - Workshop 148 (with ABJ60): Sensing Technologies for Transportation Applications - Workshop 161 (with AFH10): Civil Integrated Management: Paradigm Shift, Our Legacy, and Our Future - Workshop 208 (with ABJ80) Transportation Data Competition - Poster Session 527: Emerging Information Technology Advances in Transportation - Session 542 (with ABE40): Anticipating Future Needs in Transportation Cybersecurity - Session 723: Leveraging New Technologies for Data Collection - Session 724 (with AB010T): Managing Information and Knowledge: Tools of the Trade - Session 754: Going Mobile: Applications and Implementation Options in Deployment of Mobile Devices
TRB Midyear Meeting – NATMEC – June 30, 2014 (Chicago, IL)	<ul style="list-style-type: none"> - Member updates and discussion of key issues for the committee’s TSP
TRB Annual Meeting – January, 2015	<ul style="list-style-type: none"> - Committee meeting including vendor presentations from ESRI and Oracle, a USDOT CIO update, and a repeat of the DOT CIO Roundtable - Workshop 110 (with ABJ60): Sensing Technologies for Transportation Applications - Workshop 169 (with AFH10): Digital Design Standards - Session 199 (with ABJ20, ABJ60, and ANB20): Improving Safety Programs Through Data Governance and Data Business Planning - Session 332: Extracting Information from Images: Technology Innovations in Sensing and Detection - Poster Session 377: Information Technology Applications in Transportation 2015 - Session 396: Fast-forward 10 Years: How Information Technology Is Changing Transportation Planning, Engineering, and Operations (Committee’s first annual “flagship” session) - Session 850 (with ABE40): Transportation Cybersecurity: Are We Hanging by a Thread?

Attachment A – Research Topics of Interest

Research Area	Research Topics
Sensing Technologies	<ul style="list-style-type: none"> - Applications of remote sensing (electro-optical- and RADAR-based systems, as well as satellite, airborne, and ground-based platforms) in transportation – opportunities and challenges - Integration of data from remote sensing with other geospatial data - Applications of sensor technology for infrastructure mapping and monitoring - Applications of sensor technologies for tolling that support moving from the gas tax to a travel/VMT-based fee
IT for Construction Management	<ul style="list-style-type: none"> - Information technologies for Improving efficiencies on the construction site - Use of 3D and 4D facility information models for life cycle infrastructure management - Use of information technology to manage and mitigate environmental impacts of construction projects - Speeding adoption of proven technologies by public sector organizations
IT for ITS/Connected Vehicles	<ul style="list-style-type: none"> - Data and application architectures for ITS – traveler information, incident management, active traffic management - Addressing exponential increases in the amount of data being collected – growing issues with managing and storing these data - Information technologies supporting fusion, archiving and retrieval/display across multiple data sources - Integrating and visualizing network wide traffic data - Roles and relationships between IT and ITS units
IT Technology Architectures and Service Models	<ul style="list-style-type: none"> - Opportunities for innovation and efficiency improvements in state DOT IT Management - Effective transportation agency IT organizational structures and partnerships given trends towards consolidation of state IT resources - Strategies for transitioning to service oriented architectures and software as a service - Strategies and technologies for enterprise data management - Use of mobile technologies for data collection and transmittal – policies, processes, technologies, and implications for data management and security - Moving Public IT Resources into the Cloud – opportunities and issues - Shared service models for IT and GIS - Benefits and challenges of using social media within transportation organizations, understanding how social networking technologies can support internal and external communication needs and potentially provide a data source for customer opinion - Understanding the challenges and opportunities associated with the open data movement

Research Area	Research Topics
Semantic Technologies and Data Exchange Standards	<ul style="list-style-type: none">- Data exchange standards for efficient infrastructure management throughout the life cycle- Data standards in the context of outsourcing and P3's – what models exist (within or external to transportation) for building data reporting standards into contracts?- Applications of semantic technologies for transportation information management and search