

# TRB ABJ80 Statistical Methods

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Tuesday, Jan 10, 2017, 10:15-12:00 pm  
Marriott Marquis Ballroom Salon 10

*All sessions are led by Linda Boyle unless otherwise noted.*

10:15 to 10:20 am	Introductions
10:20 to 10:25 am	Approval of 2016 Meeting Minutes ( <i>Bob Scopatz</i> )
10:25 to 10:30 am	Committee Rotation Requirements and Membership
10:30 to 10:40 am	Workshops/Sessions Sponsored and Co-Sponsored by ABJ80 for 2017
10:40 to 10:45 am	TRB Data Contest for 2018 (Spatial Data)
10:45 to 10:55 am	Paper review process, statistics, and identification of issues ( <i>Panogiotis Anastasopoulos</i> )
10:55 to 11:05 am	Discussion of Best Paper Award Process and Qualifications ( <i>Peter Savolainen</i> ) including picture taking.
11:05 to 11:10 am	Website updates ( <i>Mazharul Haque [Shimul]</i> )
11:10 to 11:20 am	TRB Circular on Analytical Tools for Transportation Researchers and Practitioners
11:20 to 11:30 am	(floating): TRB initiatives and Data Section News ( <i>Bernardo Kleiner</i> )
11:30 to 11:40 am	Future Committee Activities and Sessions ( <i>Linda Boyle, TBD</i> )
11:40 to 11:55 am	TSIG update ( <i>Feng Guo</i> )
11:55 to 11:57 am	PICTURE TAKING
11:57 to 12:00 am	Call to Audience/relevant activities of other committees, conferences, etc.
12:00 pm	Adjourn

# Agenda

- 10:15 to 10:20 am: Introductions
- 10:20 to 10:25 am: Approval of 2016 Meeting Minutes  
(*Bob Scopatz*)
- 10:25 to 10:30 am: Committee Rotations

# Committee Membership

- Membership rotation
  - Rotate 1/3 of the committee (or 9 members)
  - Appoint new members
  - Chair needs to submit to TRB by Jan 31, 2017
  - If rotation is not completed on time, ALL members will be dropped from TRB mailing list and STOP receiving TRB pubs
- Goal
  - 25 Main members (chair included)
  - 5 additional slots for non-US members
  - 4 additional slots for “young” members (< 35)
  - 2 additional slots for state DOTs

# Committee Membership

- 9-year limit for an individual to serve as a committee member (we have 6 to be rotated)
- Balance of disciplines & geographic region
- Appropriate balance of employer types, affiliations
- Appropriate representation of the various modes
- Proper consideration of women and minorities
- No more than one member from any single organization
- No more than two committee membership

# Membership Roster

- 28 members (chair included)
  - 6 international members
- 4 “young” members (35 years or younger)
- 2 state DOTs

# Membership Expectations

- ACTIVE participation, which includes:
  - Attending committee meetings
  - Paper reviews
  - Chairing and/or being actively involved subcommittees
  - Helping with sessions/workshops

# Activities

- Secretary: *Bob Scopatz*
- Committee Research Coordinators:
- Paper Review Chair: *Panos Anastasopoulos*
- Best Paper Review: *Peter Savolainen (Chair)*,
- TRB Data Contest: *Naveen Eluru*
- Triennial Strategic Plan: *David Reinke*
- Social Media: *Mazharul [Shimul] Haque*
- Coordination of Future Sessions/Workshops: *TBD*
- TRB Circular: *Danny Xiao*



# Sponsored Workshops/Sessions

- 10:30 to 10:40 am:  
Workshops/Sessions Sponsored and co-sponsored by  
ABJ80 for 2017

# Sponsored Workshops/Sessions

1. Are we too comfortable? Changing the culture of transportation research (Tuesday, 6:00 pm)
2. Poster session (Monday, 10:15-noon) (13 posters)
3. Doctoral student research in transportation (Monday, 3:45-5:30 pm), 12 student presentations
4. Workshop: Spatial analysis (Sunday, 9:00-12:30 pm) (49 people attended)

# TRB Data Contest

10:30 to 10:40 am:

TRB Data Contest for 2018

# 2018 TRB Data Contest

- Spatial data for 2018 Data Contest
  - Develop a research question(s)
  - Create or have a data dictionary
  - “Call Center”: someone to answer questions from contestants
  - Data needs to be POSTED before Fall 2017
  - Submissions (with short paper) due November 30, 2017
  - Need reviewer

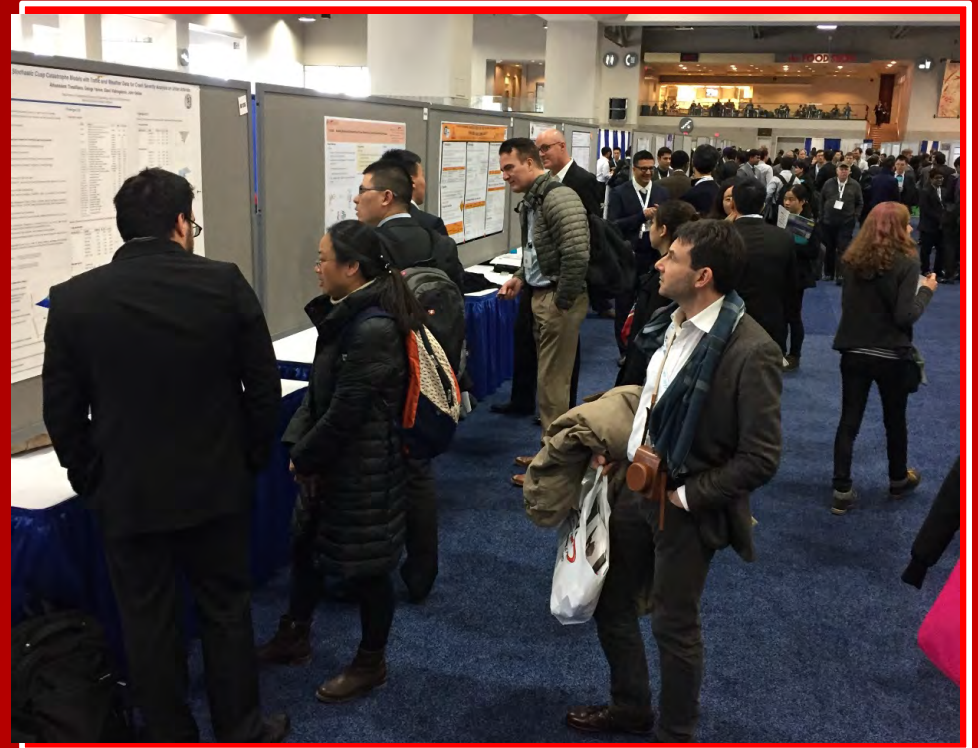
# Paper Review Process

*Panos Anastasopoulos*

10:45 to 10:55 am: Paper review process, statistics, and identification of issues

# 2017 ABJ80 Poster Session

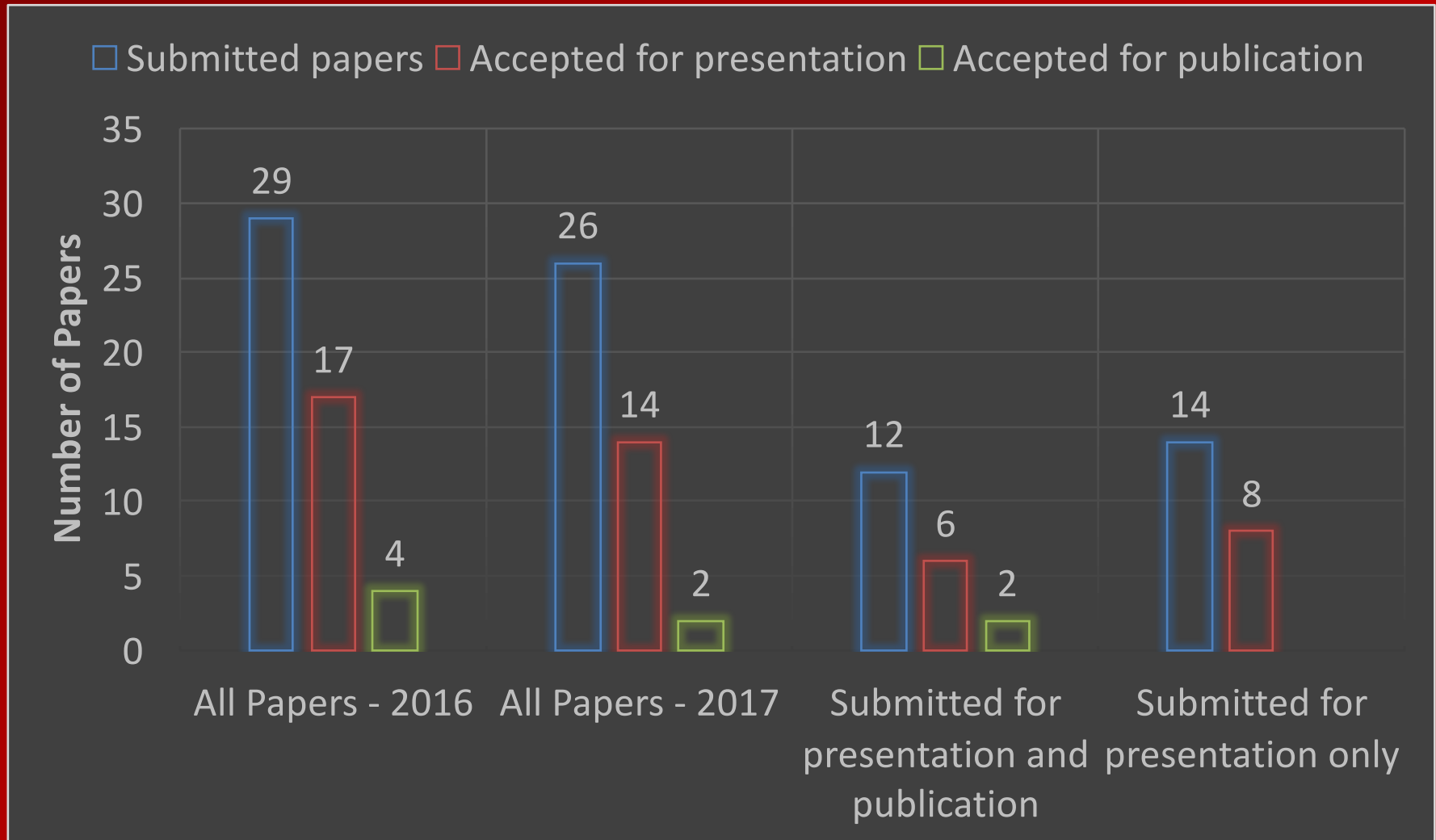
- ABJ80 Statistical Methods in Transportation Session (Monday, 1/9/2017)
- 14 papers
- Attendance: 300



# 2017 ABJ80 Poster Session [cont.]

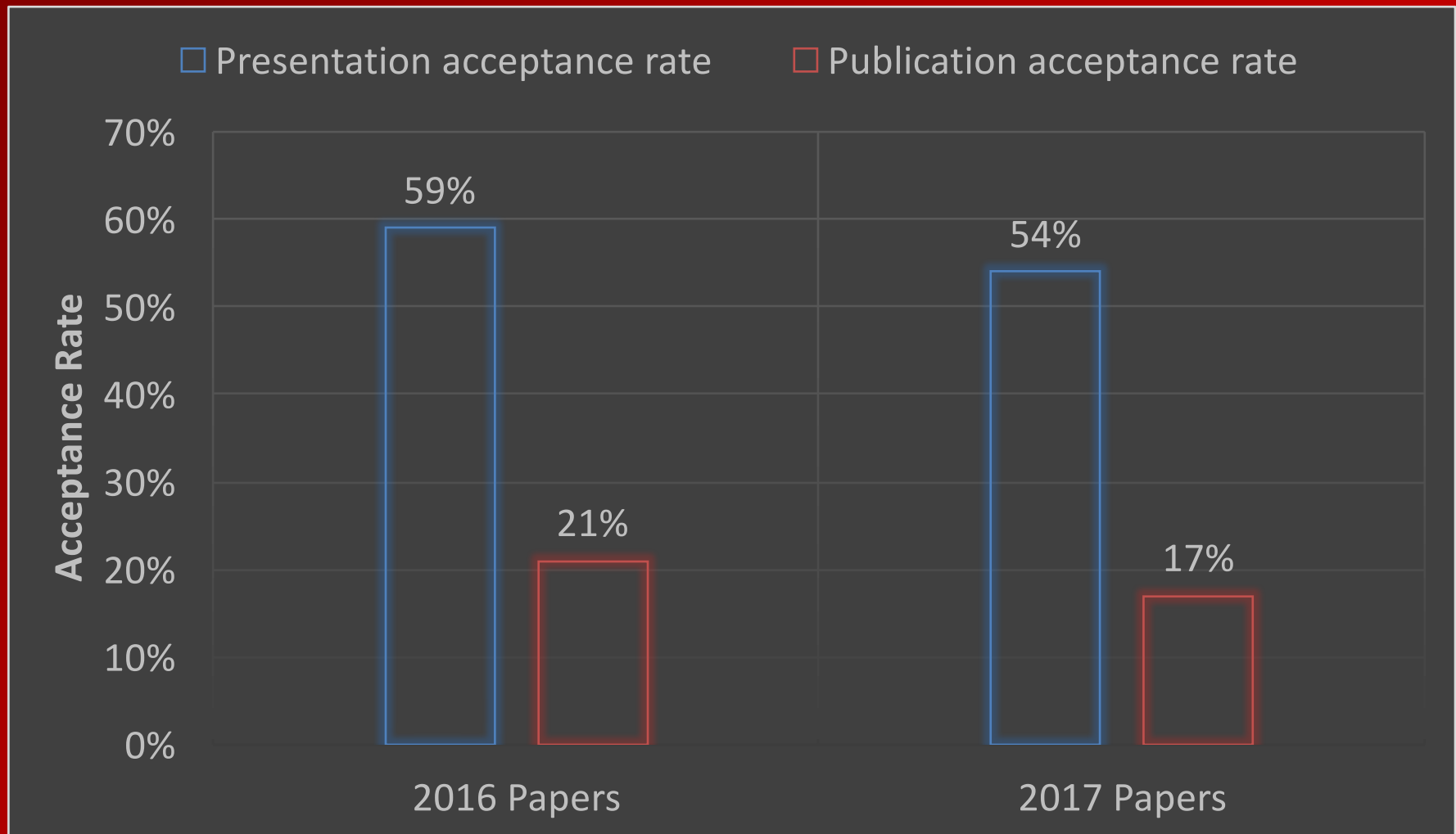


# 2017 Paper Review

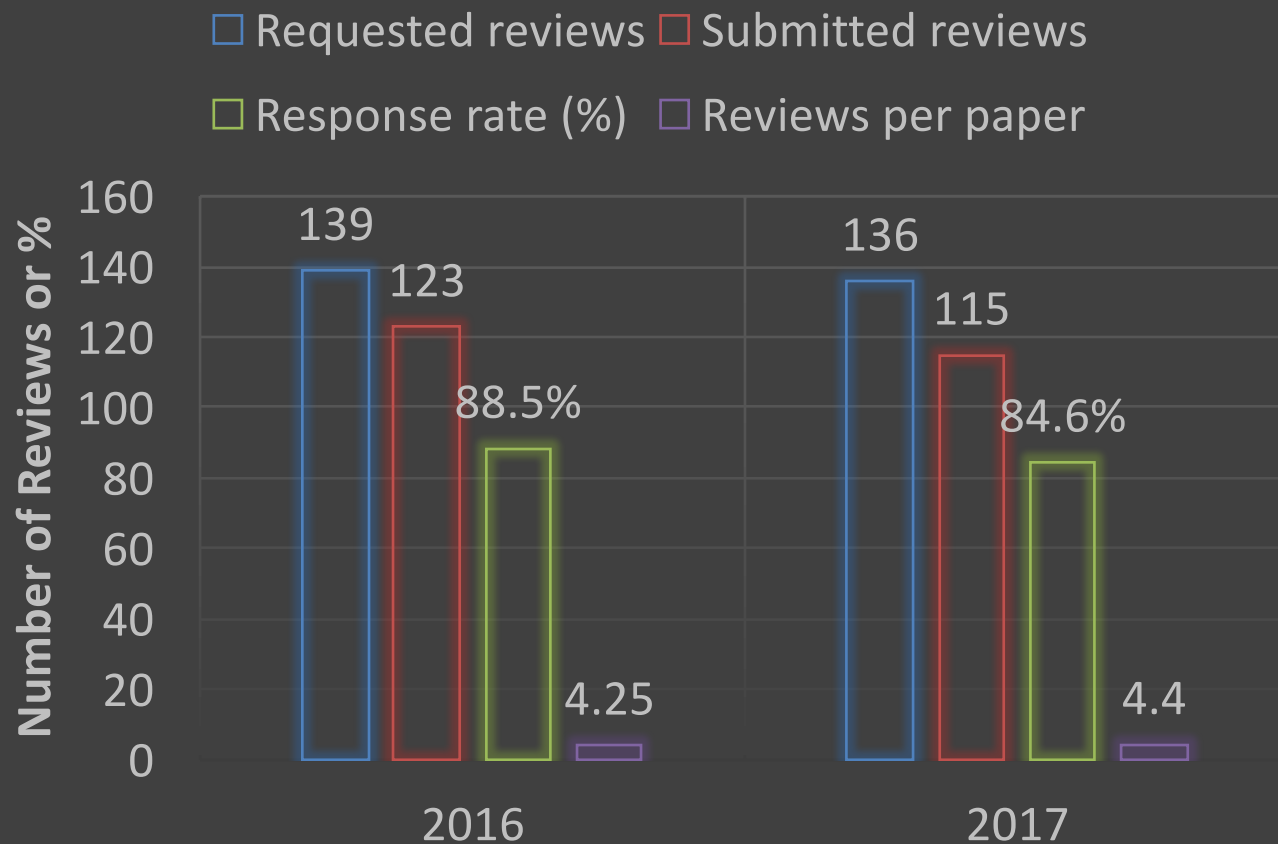




# 2017 Paper Review [cont.]



# 2017 Paper Review [cont.]



- **Thank You!**
- Reviews for other Committees (about **10 Committees** – same as in 2016):
  - ✓ Contributed **27 reviewers** (53 in 2016) for **22 papers** (24 in 2016)

# A Cordial Thank You to ABJ80 Reviewers!

<b>Bidisha Ghosh</b>	<b>Fred Mannering</b>	<b>Kara Kockelman</b>	<b>Panos Anastasopoulos</b>
<b>Billy Williams</b>	<b>Gary Davis</b>	<b>Karl Kim</b>	<b>Paul Jovanis</b>
<b>Birsen Donmez</b>	<b>Ghazan Khan</b>	<b>Konstantina Gkritza</b>	<b>Peter Savolainen</b>
<b>Bo Lan</b>	<b>Gordon Lovegrove</b>	<b>Kun-Feng Wu</b>	<b>Priyanka Alluri</b>
<b>Carol Flannagan</b>	<b>Grigorios Fountas</b>	<b>Linda Boyle</b>	<b>Ram Pendyala</b>
<b>Chandra Bhat</b>	<b>Gudmundur Ulfarsson</b>	<b>Md Tawfiq Sarwar</b>	<b>Robert Scopatz</b>
<b>Cong Chen</b>	<b>Helai Huang</b>	<b>Md. Mazharul Haque</b>	<b>Tony Sze</b>
<b>Danny Xiao</b>	<b>Jenny Guarino</b>	<b>Michael Pawlovich</b>	<b>Venkataraman Shankar</b>
<b>David Reinke</b>	<b>John Ivan</b>	<b>Mohamed Abdel-Aty</b>	<b>Yiwei Ma</b>
<b>Deogratias Eustace</b>	<b>John Milton</b>	<b>Mohammed Quddus</b>	<b>Yiyi Wang</b>
<b>Eleni Vlahogianni</b>	<b>Jonathan Agüero-Valverde</b>	<b>Mokbul A. Khan</b>	
<b>Feng Guo</b>	<b>Jonathan Wood</b>	<b>Naveen Eluru</b>	

# ABJ80 Best Paper Award

*Peter Savolainen*

10:55 to 11:05 am: Discussion of Best Paper  
Award Process and Qualifications

# ABJ80 Best Paper Award

Best Paper Award Committee (2015, 2016):

- Chair: Peter Savolainen, Iowa State U.
  - Jonathan Aquero-Valverde, Universidad de Costa Rica
  - Bo Lan, UNC

Thank You, Best Paper Award Committee!

# ABJ80 Best Paper Award Criteria

- Overall Top Contender
- Novelty of approach
- Contribution to the existing/current body of knowledge
- Potential impact



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*TRB ABJ80 Statistical Methods*

# *2017 Best Paper Award*

*Presented to*

*Shamsunnahar Yasmin, Naveen Eluru, Jaeyoung Lee,  
and Mohamed A. Abdel-Aty*

*Paper Title: An Ordered Fractional Split Approach for Aggregate Injury  
Severity Modeling*

# Social Media

*Mazharul [Shimul] Haque*

- Website: <http://trbstats.weebly.com/>
- ABJ80 LinkedIn Site
- Twitter site





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## Secretary

**Bob Scopatz**

Senior Transportation Analyst

[VHB](#)

[BScopatz@VHB.com](mailto:BScopatz@VHB.com)

## TRB Staff Representative

**Mr. Bernardo B. Kleiner**

Senior Program Officer - Transportation Safety Specialist

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[bkleiner@nas.edu](mailto:bkleiner@nas.edu)

## Members

**Bidisha Ghosh**

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## Members (Contd.)

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**John C. Milton**

Director of Enterprise Risk Management

[Washington State Department of Transportation](#)

**Karl E. Kim**

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**Ghazan Khan**

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**[WRI Global Research Institute](#)****Kun-Feng Wu**

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**Michael Pawlovich**

Safety Engineer  
[Iowa Department of Transportation](#)

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Associate Professor  
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**Priyanka Alluri**

Assistant Professor  
[Florida International University](#)  
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**Thomas Jonsson**

Professor  
[Norwegian University of Science and Technology](#)

**Young Members:****Yiyi Wang**

Assistant Professor  
[Montana State University](#)  
[Google Scholar Profile](#)

# TRB Circular

11:10 to 11:20 am

TRB Circular on Analytical Tools for Transportation  
Researchers and Practitioner

# TRB Circular: Statistics for Transportation Practitioners

## Background

**Objective:** This TRB circular is a compilation of papers based on past EDUCATIONAL workshops sponsored by the Statistical Methods committee (ABJ80). It is intended to provide transportation state agencies, graduate students, and researchers insights on commonly asked statistics questions.

- Each chapter will use the TRB author guide.
- Each chapter will give full acknowledgment to all contributors/co-authors

# TRB Circular Outline

1. Handling Missing Data (*Danny Xiao, Gaurav Mehta, Promod*)
2. Sampling Weights (*Mehdi N., Promod, Priyanka*)
3. Ensuring Data Quality: What Are the Pitfalls and How Can We Overcome Them? (*Bob Scopatz, Thomas Jonsson*)
4. Bayesian Statistics (*Jonathan A, Gord L, Bo Lan*)
5. Time Series Modeling (*Bidisha, Birsen Donmez, Deo E.*)
6. Traditional Statistics vs Artificial Intelligence (*Naveen Eluru, Ramana Duddu, Anuj Sharma*)
7. Statistical Challenges with Naturalistic Data (*Ken Wu, Paul Jovanis, Feng G., Carol F., Karin B., Mohamed Ahmed*)
8. Spatial (*Yiyi Wang, Ghazan Khan, Matt Volovski, Lise Hensdill*)
  - *Appendix can include TRB Data Contest data sets, codes, etc.*
  - And relevant textbooks*
  - *Common Definitions/Glossary*

# Chapter 1: Handling Missing Data

- Introduction
  - Benefits beyond “deleting”
  - Missing-data patterns (MCAR, MAR, NMAR)
- Methods to deal with missing data
  - Complete case analysis
  - Imputation-based procedures
  - Model-based procedures
- Case Study
  - Traffic data in ITS
  - Pavement performance data
- Summary and Discussion

# Chapter 2: Sampling Weights



# Chapter 3: Data Quality

- What is Data Quality
  - In the news
  - Dimensions of data quality
- Establishing a Data Quality Improvement Process
  - Data vs Information vs Records
  - Information quality program
  - Practical example from crash reporting in a State
- Data Quality from the Users' Perspective
  - What do users care about?
  - What about data collectors' and managers' needs?
  - Formal, comprehensive data quality management
  - What makes a “good” data quality measurement good?



# Chapter 4: Bayesian Statistics

- Introduction
- Principles of Bayesian Inference
- Bayesian and frequentist statistical inference
- Bayesian data analysis
- Examples in transport
- Case Studies (Road Safety, Travel Behavior, Traffic engineering, Pavements, etc.)

# Chapter 5: Time-Series Analysis

- Why & when to use Time-Series (TS) analysis?
- Characteristics of TS datasets
- Popular Models for TS analysis & tips for choosing the appropriate models
- Software for TS modelling
- Case Study (Accident analysis, Traffic flow prediction, Air travel demand forecasting etc.)
- What is the Future?... Emerging models

# Chapter 6 Tradition Statistics vs. Artificial Intelligence

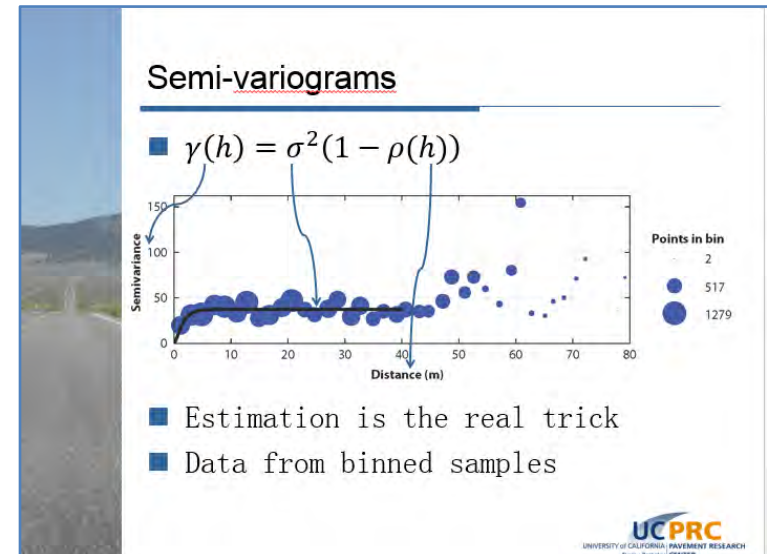
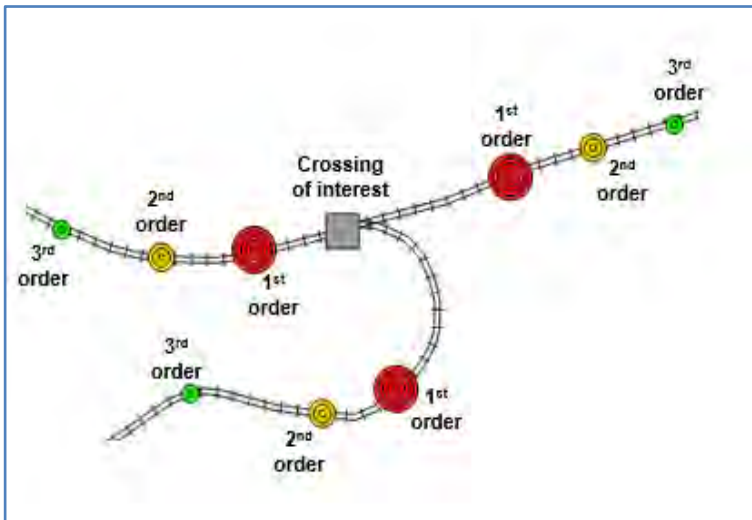
- Section 1: Traditional methods for statistical Analysis
  - ANOVA
  - Linear Regression
  - Discrete Choice Models
- Section 2: Artificial Intelligence approaches
  - Decision tree Approaches
  - ANN
  - Fuzzy set methods
- Section 3: Case Studies comparing the methods
  - Railway Way-Bill data
  - Distracted Drivers at Yellow Onset
  - Pavement Maintenance

# Chapter 7: Statistical Challenges in the Analysis of Naturalistic Driving Study (NDS) Data

1. An overview of NDS data for traffic safety analyses
  - Data elements, linkage, and event data reduction process
2. Statistical issues in analyzing NDS data
  - Designation of dependent variable and analysis unit
  - Crash surrogate
  - Sensitive data reduction process and its consequences
3. Recommendations/suggestions for NDS data analysis
4. Case Study: SHRP2 NDS Data

# Chapter 8. Spatial Analysis

- Motivations for spatial analysis
- Neighborhood structures
- Spatial models
- Applications



### In Summary...

- Land use **intensities** → **Ordered probit (OP)** models
- Crash **counts** by **severity** → **MCAR** models
- Land use **types** (or other **categorical** responses like mode choice) → **Spatial multinomial probit (SMNP)** models
- **Spatial extensions** emerge quite naturally from **SAR, SEM, & CAR** relationships across latent terms (e.g., severities, crash rates, or error terms).
- **Estimation** is typically achieved using **Bayesian** methods (but MACML also helpful).
- Useful **program packages** include **R, MATLAB, & WinBUGS**.

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# Agenda

*9:20 to 9:30 am (floating)*

*TRB initiatives and Data Section News  
(Bernardo Kleiner)*

# Future Committee Activities/Sessions

11:30 to 11:40 am: Future Committee Activities and Sessions

- Proposed sessions
  - Dealing with small samples
    - e.g., nonparametric, Full Bayes, bootstrapping
  - Quantifying risks associated with increasing vehicle automation (co-sponsor: Safety Section)
  - Data Fusion: How to work with disparate datasets
    - e.g., matching, linking issues
- Beyond 2018?

# TSIG updates

11:40 to 11:55 am: Feng Guo

- Joint Statistical Meeting, [Baltimore, MD](#)  
July 29-Aug 3, 2016
  - Online abstract submission: Feb 1, 2017, 11:59 pm
  - Online topic-contributed submissions: Jan 11, 2017 (tomorrow!)
  - ABJ80 Mid-year meeting?



# Picture Taking

2015



2016



**CALL TO AUDIENCE/  
OTHER ANNOUNCEMENTS**