



Transportation Science and Logistics Society

President's Note

Karen Smilowitz

Happy Fall TSL members!

It's been a busy summer for our society. I am looking forward to seeing you all in Houston in October to report on our activities at the TSL business meeting. As always, **Monday evening from 6:15 to 7:15** with wine and cheese. At the business meeting, we will announce our TSL award winners, including an exciting surprise award. I would like to thank Chairs Samer Madanat, Andres Medaglia, and Halit Uster, and their hard-working committees for reading nominations, papers and dissertations over the summer to arrive at our excellent set of winners. The *Lifetime Achievement Award* committee members were Cindy Barnhart, Ann Campbell, Amy Cohn, and Louis-Martin Rousseau. The Dissertation Award committee members were Sandra Eksioğlu, Niels Agatz, Marco Nie, and Fernando Ordonez. The *Best Paper Award* committee members were Tom Van Woensel, Carolina Osorio, Guglielmo Lulli, and Thibaut Vidal. On behalf of the chairs and committee members, we hope you can join us on Tuesday of INFORMS (October 24th), when the winners take the stage to present their work. The *TSL Plenary* will be given by the recipient of the 2017 Robert Herman Lifetime Achievement Award on Tuesday at 10:30 am. Later that day, you can attend the *paper award session* from 12:05 to 1:35 pm and the dissertation award session from 2 to 3:30 pm. Overall, we have a fantastic program of talks scheduled for INFORMS, thanks to the great efforts of Cluster Chair Lavanya Marla and Vice-Chair Samitha Samaranyake and all the SIG chairs:

Kevin Furman and Justin Goodson (Freight Transportation and Logistics); Song Gao and Joseph Chow (Urban Transportation Planning and Modeling); Max Shen, Pratik Parikh, and special guest



co-chair Sadan Kulturel (Facility logistics); Andrew Churchill and Vikrant Vaze (Air Transportation); and Yingyan Lou and Alireza Khani (ITS).

I would also like to take this opportunity to thank the remaining board members for their efforts this year: Maciek Nowak (Past president); Tom Van Woensel (Vice President); Lei Zhao (Secretary/Treasurer); Mike Hewitt (Communications Chair). The international liaisons have helped us expand the reach of TSL, thanks to Harilaos Psaraftis, Debjit Roy, and Andres Medaglia. Jan Ehmke has done a great job as newsletter editor, producing this fine publication. Speaking of fine publications, thank you to Martin Savelsbergh, Fran Moskwa, and the editorial board and reviewers of *Transportation Science* for keeping our flagship journal going strong and our lead times acceptable.

Of course, the highlight of the summer was the first *Triennial TSL Conference* in Chicago (well, that and the solar eclipse which was also exceptional). Conference Chairs Pitu Mirchandani and Maciek Nowak, along with committee members Mike Ball, Mike Hewitt, Warren Powell, and Barry Thomas,

organized a terrific inaugural TSL conference, and I have the survey results to prove it. From the wonderful setting in our great city of Chicago, to the high-quality program and valuable networking opportunities, the first conference set an impressive standard for future conferences. We had 206 attendees from twenty-six different countries, and around 140 talks, with excellent plenaries from Kimberly Ross of Manhattan Associates and Peter Frazier of Uber. On a personal note, one of my favorite parts of the conference was the joint session and reception with attendees of the ISTTT Symposium. It was wonderful to see the two transportation communities come together.

Moving forward, the TSL Board is now drafting policies and procedures for the triennial TSL Conference, integrating your feedback from the survey. We will update you on this process at the business meeting. I am confident that the TSL Conference series will be as successful as the TSL Workshops. On that note, I hope many of you will be attending the 6th TSL Workshop as we head to Hong Kong this January for a workshop around the theme of “E-Commerce and Urban Logistics”. Thank you to Stein Wallace for chairing the workshop, along with Teo Cranic, Lei Zhao, Barry Thomas, Lawrence

Leung, and Janny Leung, and the entire local organizing committee in Hong Kong. To all of our TSL members, **please consider submitting a proposal for the next workshop**, to be held in 2019. Solicitations for workshop proposals will be coming later this year, but it is never too early to start thinking about hosting a workshop. The workshops are a great new tradition of the society, bringing together researchers around a common TSL theme.

Another notable new TSL tradition is the annual competition for *Cross Regional Collaboration Grants*, fostering collaboration among TSL members internationally. We have received nine submissions for this year’s competition. Maciek will announce the winners in Houston. While I would like to thank Maciek for heading the collaboration grant competition, there are so many other reasons to thank Maciek for his tireless service to the TSL society. It has been a true pleasure to work with Maciek on the board, and I am sure that you are all nodding in agreement as you read this, thinking of all of the ways in which Maciek has left his mark on the society.

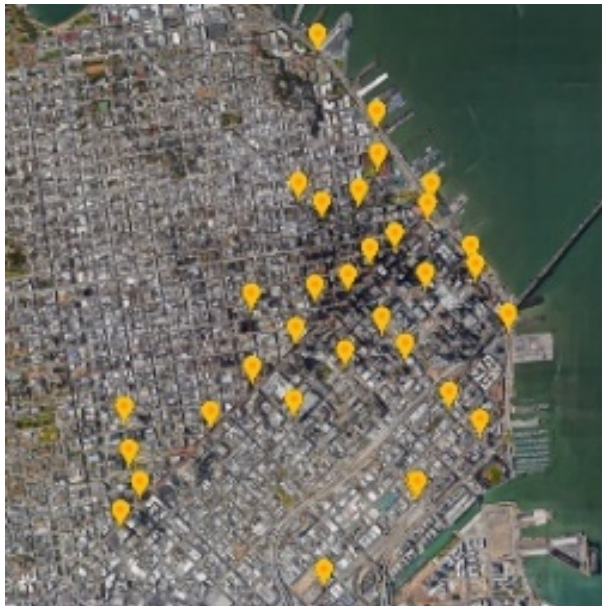
See you in Houston,

Karen

2016 TSL Cross Region Doctoral Grant Winner

Rossana Cavagnini, Mike Hewitt

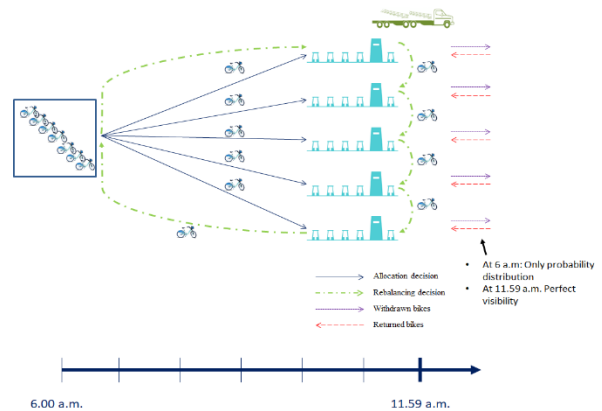
Our research project deals with a phenomenon which has recently developed all over the world: bike-sharing systems. Their number has doubled from 550 in 2012, to more than 1,000 in 2016, due to an increasing interest in reducing traffic and pollution, as well as promoting healthy lifestyles (more details [here](#)).



Our work is based on an analysis of the San Francisco bike sharing system. Our analysis showed that stations were often either full (20% of the time) or empty (40% of the time). Both negatively impact the user's experience, since they both force the user to travel to another station or to abandon the system. Thus, service providers that manage these systems seek to avoid these two situations with a limited number of bikes by appropriately allocating them to stations and then periodically moving bikes between stations on a daily basis. One of the challenges faced by a service provider when making these decisions is not knowing how bikes will be used each day. Specifically, how many people will check a bike out at each station and the station to which they will ride that bike. To handle this uncertainty, in this re-

search project, we have developed a two-stage stochastic programming model to help service providers make these decisions.

The problem we study is multi-objective, as we seek to minimize the likelihood of stations being full or empty, the number of bikes allocated, and the amount of rebalancing that occurs. As a result, the objective function of our stochastic program is a weighted combination of terms measuring each of these outcomes. We presume the model is solved early in the morning (e.g. 6 am) wherein an initial fleet of bikes is available for allocation to stations. However, at that time, only a probability distribution of the demand for bikes at stations is known. Moreover, in this setting, the demand is computed as the difference between the number of withdrawn and returned bikes, meaning that the demand assumes negative values if the number of returned bikes is greater than the number of withdrawn ones. However, in order to account for the dynamics of the system, we also imposed a minimum requirement for the initially allocated bikes. Finally, the second stage of our stochastic program represents the option to reposition bikes amongst stations at a later time in the day (e.g. noon), after demands have been observed.



With this stochastic program, we discovered the following findings. We established the value in explicitly modeling uncertainty by comparing it to the deterministic solution to the problem. Nevertheless, a solution to the deterministic problem could be used as a starting point to developing a high-quality solution to the stochastic program, and that doing so, reduced the solve time for the stochastic program by 10.31%. We also assessed the value of rebalancing, showing that it is fundamental to increase the service level and to reduce the inventory level at the end of the period.

We also recognized that the problem of allocating bikes could instead be viewed as an inventory problem, and thus approached with a Newsvendor-type analysis, given appropriately-defined overage and underage measures. We defined different methods for calculating both the overage and underage, but observed that the plans produced by the resulting Newsvendor heuristic were worse than the one produced by solving the stochastic program.

Finally, by comparing the solution of our model with the real system, we obtained a higher service

level, with fewer delivered bikes, proving the utility of our approach also for practitioners.



This was an amazing and inspiring year for me. As PhD student of the Universities of Bergamo and Brescia, I had the opportunity to spend several months working with Mike Hewitt (Loyola University Chicago) under the supervision of my advisors in Italy, Luca Bertazzi (University of Brescia) and Francesca Maggioni (University of Bergamo) on a research project. I am so grateful to the TSL society for having partially funded my research through the TSL Cross Region Doctoral Grant!

Good luck to the candidates of the current edition of the Cross Region TSL Grant and I hope the collaboration between the four TSL regions will become stronger and stronger.

First Triennial TSL Conference

Hosted at Loyola University Chicago
Chicago, Illinois, USA
July 26 – 29, 2017



The Transportation Science and Logistics Society Conference has been created to provide an opportunity for all members to gather on a triennial basis to present and to discuss the state-of-the-art in transportation science and logistics. The conference includes presentations on all transportation science and logistics topics including air transportation, facility logistics, freight transportation and logistics, intelligent transportation systems, and urban transportation planning and modeling. The conference theme is MOBILITY 2020: Traffic, Transportation and Logistics in a Cyber Connected World.

Dates of interest:

- Deadline for early registration: 4/15/2017
- Conference: 7/26/2017 – 7/29/2017

Registration:

Registration is now open! You may register [online](#). All attendees, including session chairs and speakers, must register and pay the registration fee. Each presentation must be accompanied by at least one regular (non-student) registration.

- Early Bird Registration (before 4/15/2017): \$375
- Regular Registration: \$425
- On-site Registration: \$500
- Student Registration (does not include welcome reception or conference dinner): \$150
- Guest Registration (welcome reception and conference dinner): \$200

Non-TSL members add \$25 to each registration above. Some registration scholarships will be available for PhD students.

The goal is to keep the conference small enough for deep interactions and large enough to accommodate the TSL Society's wide interests. With this in mind, there may be at most one paper presentation per registered presenter.

Program: The conference will be organized around a small number of parallel tracks. The conference will also include plenaries organized around the theme MOBILITY 2020: Traffic, Transportation and Logistics in a Cyber Connected World. The organizing committee plans plenaries from both industry and academic speakers.

Social agenda: In addition to a broad look at the future of transportation, this workshop will provide numerous opportunities to network with colleagues and establish new working relationships.

A welcome reception overlooking downtown Chicago will start the event on Wednesday evening. On Friday evening, we will adjourn for dinner at the Chicago Museum of Contemporary Art, with an opportunity to explore the collection prior to and after dinner.

Lunches will be provided on site each day of the conference.

Lodging: The conference hotel will be the [Cambria Chicago Magnificent Mile](#), located just off of Michigan Avenue in the heart of downtown Chicago. A special conference rate is available by using the following [link](#). Rooms are limited. If you would plan to arrive on Tuesday, July 25 and would like to book at the same rate at this hotel, please contact [Maciek Nowak](#).

Venue: The conference will be held on Loyola's Water Tower Campus, located along Pearson Street, just off North Michigan Avenue, Chicago's famed "Magnificent Mile". The Water Tower Campus derives its name from the famous Chicago Water Tower, which survived the Great Chicago Fire in 1871. The campus sits in the shadow of the iconic John Hancock Center. Other nearby architectural landmarks are the Tribune Tower, the Wrigley Building, the Trump Tower, and the site of Fort Dearborn, around which the city of Chicago was founded. Holy Name Cathedral and the Roman

Catholic Archdiocese of Chicago are located just south of campus, across Chicago Avenue. Cultural points of interest include the Museum of Contemporary Art, the Newberry Library, and Navy Pier. In addition to the unparalleled shopping on Michigan Avenue, the Water Tower Campus is also within a few minutes' walk of numerous dining and entertainment options.

Organizing Committee:

Pitu Mirchandani (Chair)
 Maciek Nowak (Local Chair)
 Mike Ball
 Mike Hewitt
 Warren Powell
 Barry Thomas

News and Notes

Jan Fabian Ehmke

Prof. Tolga Bektas has published the new book **Freight Transport and Distribution – Concepts and Optimisation Models** with CRC Press. More details are available through the [publisher's webpage](#).

Prof. Lawrence Snyder and **Prof. Martin Takac** were recently awarded an NSF GOALI grant on *Machine Learning Approaches for Supply Chain Decision-Making*. They partner with Siemens to study, among other things, the production and distribution of radiopharmaceuticals. Details about the award can be found [here](#).

Joseph Chow, an Assistant Professor at New York University, received an NSF CAREER award earlier

this year. In addition, NYU is now home to the first **Tier 1 University Transportation Center in New York City**, in which Kaan Ozbay is Director and Joseph Chow is Deputy Director, called C2SMART (<http://c2smart.engineering.nyu.edu/>). The center's themes involve Connected Cities for Smart Mobility toward Accessible and Resilient Transportation. It is funded by US DOT for \$1.4M per year over five years, and includes a consortium of other universities: University of Washington, University of Texas El Paso, Rutgers University, and City College of New York.

About Us

TSL Officers 2017

President	<u>Karen Smilowitz</u>	Past President	<u>Maciek Nowak</u>
Vice-President/President Elect	<u>Tom van Woensel</u>	Cluster Chair INFORMS 2017	<u>Lavanya Marla</u>
Secretary/Treasurer	<u>Lei Zhao</u>	Newsletter Editor	<u>Ian Fabian Ehmke</u>
Communications Chair	<u>Mike Hewitt</u>	INFORMS Subdivisions Council	<u>Maciek Nowak</u>

Special Interest Groups

Freight Transportation and Logistics	<u>Kevin Furman</u> (C), <u>Justin Goodson</u> (VC)
Urban Transportation Planning and Modeling	<u>Song Gao</u> (C), <u>Joseph Chow</u> (VC)
Facility Logistics	<u>Z. Max Shen</u> (C), <u>Pratik J. Parikh</u> (VC)
Intelligent Transportation Systems	<u>Yingyan Lou</u> (C), <u>Alireza Khani</u> (VC)
Air Transportation	<u>Vikrant Vaze</u> (C), <u>Andrew Churchill</u> (VC)

C – Chair, V – Vice Chair

International Liaisons

Europe and Africa	<u>Harilaos N. Psaraftis</u>
Americas	<u>Andres Medaglia</u>
Asia, Australia, and New Zealand	<u>Debjit Roy</u>



To suggest items for future newsletters, contact
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