

SARAH E. SCHAFER
Department of Information, Operations and Technology Management
College of Business and Innovation
University of Toledo
Toledo, Ohio 43606-3390

voice: (419) 574-2213 email: sarah.schafer@utoledo.edu

EDUCATION

Doctor of Philosophy (Candidate), Manufacturing and Technology Management
Department of Information, Operations and Technology Management
College of Business and Innovation
University of Toledo
Focus on Supply Chain Management
Expected Graduation: May, 2015

Dissertation Title: Technology Systems and Practices in Transportation and Logistics: Exploring the Links toward Competitive Advantage in Supply Chains

Master of Arts and Science, Geography (GIS, Transportation, Operations Research)
Department of Geography and Planning
College of Arts and Science
University of Toledo
December, 2011

Bachelor of Business Administration
College of Business Administration
University of Toledo
Major: Finance
May, 1998

JOURNAL PUBLICATIONS

Dhar, S.K., S.E. Schafer, and P.S. Lindquist. 2011. A Dock Information System for the Great Lakes: Part 2, *Port Technology International*, 49:36-41.

PUBLISHED PROCEEDINGS (Peer Reviewed)

Schafer, S.E., S. Callaway and Y. Zhang. 2014. One-Way Car Sharing: Antecedents, Inventory Management and Vehicle Utilization Concepts of a New Paradigm, *DSI 45th Annual Meeting Proceedings*, November, 2014. (Accepted)

Schafer, S.E. and P.S. Lindquist. 2014. Moving Toward the IT Highway: Linking Public and Private Investments in Intelligent Transportation Systems to Supply Chain Performance and Livability, *TRB 93rd Annual Meeting Proceedings*, January, 2014.

Schafer, S.E., and P.S. Lindquist. 2013. A Decision Support System for Smart Growth Innovation in the Urban Midwest: A GIS Connection between Brownfield Site Redevelopment and Transportation, *TRB 92nd Annual Meeting Proceedings*, January, 2013.

Schafer, S.E., and P.S. Lindquist. 2010. The Great Lakes Maritime Information Delivery System: A Resource for Intermodal Freight Transportation Planning and Analysis in the Upper Midwest, *TRB 89th Annual Meeting Proceedings*, January, 2010.

RESEARCH REPORTS

Lindquist, P.S., and S.E. Schafer. 2012. *Development of Methodology for Simulating Cargo Movements through Intermodal Connections in the Great Lakes Basin*. Final Report, U.S. Army Corps of Engineers Huntington District Navigation Planning Center.

Lindquist, P.S., S.K. Dhar, and S.E. Schafer. 2009. *Development of a New Process for Collecting Information on Piers, Wharves, Docks and Facilities in the Great Lakes*, Final Report, U.S. Army Corps of Engineers Navigation Data Center Alexandria, Virginia.

CONFERENCE PRESENTATIONS, WORKSHOPS, PANEL PRESENTATIONS

Schafer, S.E. 2014. "Technology Systems and Practices in Transportation and Logistics: Exploring the Links toward Competitive Advantage in Supply Chains," accepted for presentation at the *DSI 45th Annual Meeting Proceedings*, November, 2014.

Schafer, S.E., S. Callaway and Y. Zhang. 2014. "One-Way Car Sharing: Antecedents, Inventory Management and Vehicle Utilization Concepts of a New Paradigm," accepted for presentation at the *DSI 45th Annual Meeting Proceedings*, November, 2014.

Schafer, S.E. 2014. "Advanced Technologies for Transportation & Supply Chain Management," Ohio Society of Professional Engineers Spring Continuing Professional Development Conference and Annual Member Meeting, Toledo, OH, June, 13, 2014. (Invited)

Schafer, S.E. and P.S. Lindquist. 2014. "Moving Toward the IT Highway: Linking Public and Private Investments in Intelligent Transportation Systems to Supply Chain Performance and Livability," Logistics, Trade and Transportation Symposium, Gulfport, MS, February, 2014.

Schafer, S.E. and P.S. Lindquist. 2014. "Moving Toward the IT Highway: Linking Public and Private Investments in Intelligent Transportation Systems to Supply Chain Performance and Livability," Transportation Research Board 93rd Annual Meeting, Washington D.C., January, 2014.

Schafer, S.E. 2013. "Latest uses of GIS in Transportation Sector Research," Canadian Transportation Research Forum Semi-Annual Conference, Ottawa, ON, November, 20, 2013. (Invited)

Schafer, S.E. 2013. "The IT Highway: Relating Public and Private Investments in Intelligent Transportation Systems to Supply Chain Performance and Livability," Sixth Annual Global Supply Chain Conference, Dearborn, MI, September, 2013.

Schafer, S.E., and P.S. Lindquist. 2013. "Decision Support System for Smart Growth Innovation in Urban Midwest: GIS Connection Between Brownfield Site Redevelopment and Transportation," Transportation Research Board 92nd Annual Meeting, Washington D.C., January, 2013.

Schafer, S.E. 2012. "Freight Data Resources Overcoming Barriers: NCFRP-35," Ohio Conference on Freight, Sandusky, OH, September 13, 2012. (Invited)

Schafer, S.E., and P.S. Lindquist. 2012. "A GIS Connection Between Brownfield Sites, Transportation and Economic Development in Toledo-Lucas County, Ohio," Association of American Geographers Annual Meeting, New York, February, 2012.

Lindquist, P.S. and S.E. Schafer. 2011. "New Developments in Freight Data Resources for the Great Lakes Region," GLMRI Affiliates Meeting, Great Lakes Maritime Research Institute, Duluth, MN, September 22, 2011.

Schafer, S.E. and P.S. Lindquist. 2011. "A GIS Connection between Brownfield Sites, Transportation and Infrastructure: An Economic Redevelopment Tool for Lucas County, Ohio," Association of American Geographers Annual Meeting, Seattle, April, 2011.

Schafer, S.E. and P.S. Lindquist. 2011. "Promoting Redevelopment of Brownfield Sites using a GIS Information Delivery System," Urban Affairs Association 41st Annual Meeting, New Orleans, March, 2011.

Schafer, S.E. and P.S. Lindquist. 2010. "The Development of a New Automated Process for Collecting Information on Piers, Wharves, Docks, and Facilities in the Great Lakes Region: Part II: Evaluation, Refinement and Application of the System," Mid Continent Transportation Research Forum, Madison, WI, August 20, 2010.

Schafer, S.E. and P.S. Lindquist. 2010. "The Atlas of Great Lakes Maritime Commerce," Association of American Geographers Annual Meeting, Washington, D.C., April, 2010.

Schafer, S.E. and P.S. Lindquist. 2010. "The Great Lakes Maritime Information Delivery System: A Resource for Intermodal Freight Transportation Planning and Analysis in the Upper Midwest," TRB 89th Annual Meeting, January 11, 2010.

GRANTS ACTIVITY

Co-Investigator, *Collaborating Toward the IT Highway: Linking Public and Private Investments in Intelligent Transportation Systems to Freight Flows and Supply Chain Performance*, **National Center for Freight Infrastructure Research and Education** through **US DOT**, \$90,000. 2014-2015. (with R. Martinko, PI; P.S. Lindquist, Co-I; and P. Sundararaghavan, Co-I).

Also, managed over 20 directed research projects with over \$1.7 million in funding as Sr. Research Project Manager for Dr. Peter Lindquist. Co-Investigators for various projects included Dr. Mark Vonderembse, Dr. Oleg Smirnov, Dr. Teresa Adams, Dr. Richard Stewart, Dr. P. Sundararaghavan. Sponsors included the U.S. Army Corps of Engineers, National Center for Freight Infrastructure Research and Education (CFIRE, at the University of Wisconsin Madison through US DOT), Great Lakes Maritime Research Institute, Parsons Brinkerhoff, CPCS Transcom, and the University of Toledo Intermodal Transportation Institute. Many of the projects were related to data collection of freight movements for transportation and supply chain studies in the Great Lakes Region and the development of decision support systems.

Research Analyst, *Making Freight-Centric Communities more Livable*, Joint project between the University of Toledo, University of Memphis, and the University of Wisconsin-Madison, **National Center for Freight Infrastructure Research and Education** through **US DOT**, \$60,000. 2012-2013. (P.S. Lindquist, PI).

Research Analyst, *Development of Methodology for Generating Distance and Commodity Flow Tables into and through the Great Lakes Basin*, **U.S. Army Corps of Engineers (Buffalo District)**, \$120,000. 2012-2013. (P.S. Lindquist, PI).

Research Analyst, Academic Partnership Under CFIRE for Transportation Research II (CFIRE 2 Base), *National Center for Freight Infrastructure Research and Education* UT Portion: \$100,000, 2012-2013. (R. Martinko, PI; P.S. Lindquist, Co-I).

Research Analyst. *Ohio Statewide Freight Plan*, (Contract in partnership with UT ITI & Parsons-Brinckerhoff Consultants), *Ohio Department of Transportation* UT Portion: \$26,000. 2011-2012. (R. Martinko, PI; P.S. Lindquist, Co-I).

Research Analyst, *Development of Methodology for Simulating Cargo Movements through Intermodal Connections in the Great Lakes Basin, US Army Corps of Engineers—Huntington District* \$40,000. 2011-2012. (P.S. Lindquist, PI).

Research Analyst, *Multimodal Freight Transportation Within the Great Lakes-Saint Lawrence Basin, Transportation Research Board NAS_NRC NCFRP Project 35*. Joint project between CPCS Transcom Limited, Great Lakes Maritime Research Institute, University of Toledo, Economic Development Research Group, Prime Focus LLC, and Sustainable Ports, \$300,000 (UT Portion \$31,000) (M.A. Roy, PI; R.D. Stewart, Co-I; G. Weisbrod, Co-I; L. Ogard, Co-I; P.S. Lindquist, Co-I), 2010-2011.

Research Analyst, *A GIS Connection Between Brownfield Sites, Transportation and Economic Development, University of Toledo University Transportation Center / Intermodal Transportation Institute*, \$50,000, 2010-2011. (P.S. Lindquist, PI). *Master's thesis work on this project.

Research Analyst, *A Data Library Management System for Midwest FreightView and its Data Repository, University of Toledo University Transportation Center / Intermodal Transportation Institute*, \$46,588, 2009-2010. (P.S. Lindquist, PI).

Research Analyst, *Developing a New Process for Collecting Information on Piers, Wharves, Docks and facilities in the Great Lakes Region: Phase II, U.S. Army Corps of Engineers Navigation Data Center*, \$99,000, January, 2009. (P.S. Lindquist, PI).

Research Analyst, Academic Partnership Under CFIRE for Transportation Research, *National Center for Freight Infrastructure Research and Education* \$500,000, 2007-2012. (P.S. Lindquist, PI; M.A. Vonderembse, Co-I; O. Smirnov, Co-I).

Research Analyst, *Developing a New Process for Collecting Information on Piers, Wharves, Docks and facilities in the Great Lakes Region: Phase I, U.S. Army Corps of Engineers Navigation Data Center*, \$75,000, January, 2008. (P.S. Lindquist, PI).

GRADUATE COURSES

Major Field Courses

- Management of Technology
- Innovation and Technology Commercialization
- Organizational Issues in Implementation of Technologies
- Advanced Manufacturing Systems
- Supply Chain and E-Business Issues in Manufacturing
- Special Topics Seminar
- Seminar/Colloquia

Quantitative and Research Methods:

- Management Science
- Advanced Statistics
- Research Methods and Theory Building
- Seminar in Special Topic: GeoComputing

Minor Courses (Supply Chain and Operations Research):

- Total Quality Management and Statistical Process Control
- Simulation
- Manufacturing Resources Management
- Contemporary Topic Seminar: Supply Chain Analytics

Relevant Graduate Courses from Master's Work:

- Supply Chain Management
- Spatial Statistics
- Geographic Information Systems
- Location Analysis
- Seminar in special topic: Advanced Location Analysis

TEACHING INTERESTS AND EXPERIENCE

Experience: Accounting for Business Decision Making

Teaching evaluations: 4.1/5.0

- A managerial accounting course taught Spring /Fall 2013 and Spring /Fall 2014.
- Required course for all business majors; major source of material for undergraduates. Instructional assignment based on experience in accounting and finance; ownership of accounting firm. Course strongly oriented toward accounting decisions in a manufacturing setting, thus an operations management background was essential.

Additional Interests: Supply chain management, logistics, operations management, decision science, business statistics, and other related courses at the graduate or undergraduate levels.

AWARDS, ACADEMIC HONORS AND SERVICE

- ◆ 2008 Student of the Year - University of Toledo - Regional University Transportation Center
Received award January 2009 at the Center for University Transportation Centers (CUTC) annual awards banquet in Washington, D.C.
- ◆ 2012-2013 Selected as the College of Business and Innovation Graduate Student Association Representative
- ◆ 2012-2013 President of the Manufacturing and Technology Management Research Forum
- ◆ 2014 Session Chair for the DSI annual meeting, Tampa

PROFESSIONAL AFFILIATIONS

American Production and Inventory Control Society (APICS)
Transportation Research Board (TRB)

EMPLOYMENT HISTORY

3/07 – Present The University of Toledo Toledo, Ohio
Sr. Research Project Manager - Geography and Planning Department

- Manage and oversee directed research projects related to transportation and freight flows, over \$2 million in funded projects. Manage graduate student research assistants, prepare grant proposals and reports, conduct research through literature reviews, data collection and analysis, and development of decision support system tools.
- Conduct outreach by attending and presenting at meetings or technical conferences with affiliate organizations and representatives.

4/02 – 12/09 Advanced Accounting, LLC Lambertville, Michigan
Managing Member – Owner and entrepreneur of this fast paced tax and accounting firm, sold company in 2009 to continue graduate school

- Perform management functions and decision making for the company including: operating and marketing strategies, purchasing, check signing, incorporation and LLC filings, and corporate tax return preparation.
- Maintained a client base of over 600 small businesses and individuals with the help of 2-3 staff to perform accounting and financial functions, including: business start-up consulting, payroll and employment taxes, business plans, obtaining a line of credit, tax preparation and assistance with the Internal Revenue Service.

5/04 – 6/06 The University of Toledo Toledo, Ohio
Grants Manager - Geography and Planning Department

- In charge of all department grant accounts which hold approximately \$3.5 million in directed research funding. Financial performance includes all budget preparations and analysis, reconciliations, and expenditure tracking. Responsible for all purchases and contracts for purchases of scientific equipment and supplies for department grants.
- Perform all personnel action items required for research faculty, staff and students employed from grants.

6/98 – 7/00 TWB Company Monroe, Michigan
Financial Analyst – a tier 1 automotive supplier specializing in laser welding steel.

- In charge of cash management including placing and managing all LIBOR and Forward contracts.
- Did the analysis and wrote the business plan for a new satellite facility in Mexico.
- In charge of monthly cash flow projections and worked on the development of the annual forecast. Prepared the company's financial statements.
- Prepared Property Taxes and Abatements and presented to the township for approval.
- Worked closely with all departments to gain a general understanding of material flows for costing.

REFERENCES

Dr. Mark Vonderembse

Professor
Information Operations and Technology Management
The University of Toledo
Mark.vonderembse@utoledo.edu
Office: 419-530-4319

Dr. Peter Lindquist

Associate Professor
Geography and Planning Department
The University of Toledo
Peter.lindquist@utoledo.edu
Office: 419-530-4287

Dr. P. Sundararaghavan

Professor and Chair
Information Operations and Technology Management
The University of Toledo
p.sundararaghavan@utoledo.edu
Office: 419-530-2456

Richard Martinko, P.E.

Director
Intermodal Transportation Institute
Transportation Research Center
The University of Toledo
Richard.martinko@utoledo.edu
Office: 419-530-2541

DISSERTATION

Technology Systems and Practices in Transportation and Logistics: Exploring the Links toward Competitive Advantage in Supply Chains

ABSTRACT

Companies continuously look for innovative ways to evolve and compete within their dynamic environments. One untapped area that can provide a significant source of competitive advantage is within the complex supplier network and distribution channels; specifically, within the logistics and transportation functions. In an era of increasingly complex supplier network relationships, there is a growing need to connect and automate the extended supply chain between organizations. Higher demands for a variety of products add not only to the complexity of coordinating a supply chain, but also to the number of freight movements to support those demands. What's more, the higher demand for moving materials and goods contributes to higher levels of congestion and pollution during a time when businesses, customers and governments are increasingly concerned with reducing carbon footprints. To this end, new technologies and data capabilities are emerging that can add integrated visibility

(monitoring and tracing), efficiency and even sustainability within the supply chain in order to mitigate these issues and cultivate an ever desired competitive advantage.

Application of information technologies (IT) is seen as key enablers to mitigate these issues, yet widespread use is not evident between trade partners and transportation providers. Applications of IT enabled systems and practices can be used to improve efficiencies, reliability, and reduce carbon effects of freight movements. Benefits derived from the movement of freight can, in turn, benefit the wider supply chain through faster response times and lower holding costs realized from reduced inventories. Drawing on contingency theory and organizational information processing theory, this research conceptualizes a model to study the relationships between the major constructs (1) External Environmental Pressures, (2) Internal Organizational Environment, (3) IT Enabled Systems and Practices, and (4) Transportation Outcomes for efficiency, reliability, responsiveness, quality and carbon emission reduction.

Examining transportation as the link between enterprises in the supply chain is not well understood. This work is expected to open a new area for examining the interfaces between organizations in order to improve overall performance for supply and distribution networks. The development of a reliable instrument to test these relationships will contribute to research and practice. Hypothesized relationships will be tested through a combined statistical analysis of primary and secondary data collected from transportation providers. By providing researchers with a better understanding of contextual factors that drive organizational technology adoption, it will become easier to identify factors of success for future innovative technology initiatives, particularly pertaining to the transportation and logistics industry. Moreover, managers are expected to find results from evaluating specific types of IT enabled systems and practices particularly useful as they will provide metrics for evaluating investments in those systems and practices based on performance outcomes for efficiency, reliability, responsiveness, quality, and carbon reduction.

The committee members are:

- Dr. Mark VonderembseChair (Col. of Business, Univ. of Toledo)
- Dr. P. SundararaghavanCommittee Member (Col. of Business, Univ. of Toledo)
- Dr. Thomas SharkeyCommittee Member (Col. of Business, Univ. of Toledo)
- Dr. Peter Lindquist Committee Member (Col. of LLSS, Univ. of Toledo)

Status: Proposal defended, currently working on data collection, will defend by May 2015.