

RESUME

L. Douglas Smith
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Born: Toronto, Canada, 1944
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Education

Ph.D., Management Sciences, University of Minnesota, July 1972; Major- Quantitative Analysis, Related Field-Finance, Outside minors - Mathematics and Economics.

Dissertation: "A Short-Term Planning Model for Manufacturing Firms," under Norman L. Chervany.

M.B.A., McMaster University, Hamilton, Canada, 1968.

B.Sc., Physics, McMaster University, 1966.

Employment History

- 2016- Present **Founders Professor of Management Science (Quantitative Business Analytics),** University of Missouri-St. Louis (UMSL).
- 1986-2016 **Professor of Management Science and Information Systems,** University of Missouri-St. Louis; conducting courses in operations research, applied statistics and international logistics at undergraduate and graduate levels; member of the University of Missouri Doctoral Faculty.
- 1983- Present **Director of the Center for Business and Industrial Studies,** (Business Research Center), UMSL.
- 2003- Present **Fellow, International Business Institute,** UMSL.
- 2009 **Visiting Professor of Management Science,** Braunschweig Technical Institute, Braunschweig, Germany (summer session).
- 1978-1986 Associate Professor, University of Missouri St. Louis.
- 1979 Visiting Associate Professor of Management Science, University of South Carolina (on leave from UMSL for spring semester).
- 1974-1978 Assistant Professor, University of Missouri-St. Louis
- 1973-1973 Associate Professor of Management Science, University of Saskatchewan, Saskatoon, Canada; conducted courses at undergraduate and graduate levels: operations research, advanced projects in operations research, applied statistics, production management, introduction to computer data processing, honors undergraduate research seminar.
- 1971-1973 Assistant Professor of Management Science, University of Saskatchewan.
- 1968-1971 Teaching Associate, University of Minnesota; conducted classes for undergraduate course sequence in applied statistics and operations research.
- 1968-1968 Research Officer, Management Research, Ontario Department of Highways, Toronto, Canada.

1966-1967 Production Manager, Hartline (Toronto) Ltd., Toronto, Canada; manufacturer of metal dinette furniture (25 plant employees) responsible for all aspects of the production operation, customer service, and some sales activity for general accounts.

Academic Administration

Chairman, Management Science area, College of Commerce, University of Saskatchewan, Fall, 1973; Acting Area Coordinator, Finance, School of Business Administration, UM-St. Louis, Fall, 1978; Area Coordinator, Management Sciences, UM-St. Louis, 1975 and 1979-1980, Director UM-St. Louis Center for Business and Industrial Studies 1983-present.

Professional Affiliations and Offices

The Institute of Management Sciences

Secretary, St. Louis Gateway Chapter, 1975-1976

Chairman, St. Louis Gateway, Chapter 1976-1977

Director TIMS Academic Network 1991-1993

Operations Research Society of America

Administration Chairman of Joint National Meeting, St. Louis, 1991-1993

Canadian Operational Research Society

Decision Sciences Institute

Program Track Chair for Statistics/Decision Theory, National Meeting of the American Institute for Decision Sciences, Boston, Massachusetts, 1981; for Developments in Decision Science Methods Midwest DSI, Minneapolis, MN, 1990; for Quantitative Techniques and Methodology, National DSI meeting, San Francisco, 1992; for Practitioners' Forum, DSI International meeting, Athens, Greece, 1999.

Associate Editor for *Decision Sciences*, 1984-1989

Member, DSI Publications Committee, 1991-1993

Frequent Session Chair and Paper Discussant

Associate Editor, *International Journal of Revenue Management* (since 2008)

Associate Editor, *International Journal of Strategic Decision Sciences* (since 2009)

Awards for Work Performed

Management Innovation Award from the American Public Transit Association to the Bi-State St. Louis Metropolitan Transit Agency for development and implementation of the "Bus-to-Block System" for bus operations, 1987 (L.D. Smith, R. Nauss and D. Bird).

Best Application Paper Award, Decision Sciences Institute, 1994 annual meeting (L.D. Smith, S. Sanchez and E. Lawrence).

Honorable Mention for the Best Theoretical/Empirical Paper Award, Decision Sciences Institute, 1997 annual meeting (L.D. Smith, D. Matthew and Y. Wu).

Best Paper Award for Management Science and Quantitative Methods, Western Decision Sciences Institute, 2001 annual meeting (L.D. Smith, R. Nauss, R. Banis and R. Beck).

Best Paper Award in Decision Technologies for Management, 40th Annual Hawaii International Conference on System Sciences, 2007 (J.F. Campbell, L.D. Smith, D. Sweeney, R. Nauss, R. Mundy).

Consulting Experience

The Jewish Hospital of St. Louis: Developed and implemented a comprehensive computer-based scheduling system for nursing personnel. Designed and programmed the solution algorithms; directed the design of file maintenance and editing programs for the scheduling system, 1975-1976.

Southwestern Bell Telephone Company: Statistical modeling, 1976-1977. The statistical models and methodology from this study were selected (from numerous alternatives developed in the Bell system) to be used by AT&T operating companies to measure effectiveness of their advertising campaigns. In 1987-88 helped SWB develop a statistical tool for predicting and analyzing marketing clusters into which their customers are classified for network planning and target marketing.

Continental Telephone Company: Review of statistical testimony for rate hearings 1977.

V.N.A. of St. Louis: Design of a comprehensive computer-based information system for a home health care agency, 1977-78.

Wagner Electric Co.: Helped outline the design of a comprehensive sales and marketing information system for the company, 1978.

Williams Pipe Line Co.: Design and execution of a study of business risk in the pipeline industry and development of comparative risk measures for industrial and utility companies, 1979. At the request of the company, testified as an expert witness before the Federal Energy Regulatory Commission, Washington, DC (Docket OR 79-1) in a generic hearing investigating alternative forms of regulation for the oil pipeline industry. In 1980-81 performed studies of market share and competitive environment for the company, developed and installed a system utilizing computer graphics and mathematical models for studying distribution economies for petroleum products in the Midwestern U.S.; also developed forecasting models for multicommodity product flows in the petroleum products pipeline system. Occasional analytical assignments 1982-93 to enhance mathematical models for distribution of petroleum products in the Midwestern U.S. Testified in 1992 before the Federal Energy Regulatory Commission in Washington, D.C., as an expert witness on analytical models used for analyzing competition in distributing petroleum products.

Interprovincial Pipe Line Ltd.: Design and execution of a comparative study of business risk in Canadian industries, 1979-80. At the request of the company, testified as an expert witness on business risk before the National Energy Board, Ottawa, Canada, in a hearing to determine a fair rate of return for IPL, Canada's major petroleum pipeline.

Laclede Gas Co.: Review of statistical testimony and forecasting procedures for estimating effects of weather upon gas consumption for rate hearings, 1981.

Shelter Insurance Co.: Establishment of computer-based systems for planning and marketing research and development of statistical models for marketing management, 1982-84.

Northwest Energy Co.: Analysis of factors explaining rates of return allowed natural gas transmission companies by the Federal Energy Regulatory Commission and construction of statistical models for corporate planning by gas transmission companies, 1984, 1985.

Santa-Fe Southern Pacific Pipe Lines: Studies of business risk and rates of return, 1986.

Santa-Fe, Topeka, and Atchison Railroad: Financial analysis of returns on a proposed oil slurry pipeline in conjunction with an antitrust case, 1989.

Citicorp National Services: Development and implementation of forecasting models for risk management on

portfolios of mortgages on manufactured homes and residential first mortgages, 1989-1994.

Wells Fargo Bank: Development and implementation of forecasting models for risk management on portfolios of first residential mortgages, second residential mortgages, and home equity credit lines, 1993-1997.

GE Capital: Development and implementation of forecasting models for risk management on portfolios of automobile leases and on portfolio of sub-prime automobile loans, 1996-1998.

Citibank Taiwan: Development and implementation of forecasting models for risk management on residential mortgage portfolios in Taiwan, 2002-2003.

Nanjing Lukou International Airport: Development and implementation of simulation models for maximizing airside performance (2016-2017)

Seminars and Workshops

Inventory Management and Control (with John Kottas) at Marquette University, Milwaukee WI; Wake Forest University, Winston-Salem, N.C. ; George Washington University, Washington, D.C.; Southern Methodist University, Dallas TX; California Institute of Technology, Pasadena, CA; and also in Toronto, Ont.; Newark, N.J.; Akron, OH; Moorhead, MN; Houston, TX; Tulsa, OK; San Francisco, CA; Seattle, WA; and several other locations, 1976-1978.

Doctoral seminars on simulation modeling, Braunschweig Technical University, Germany, 2014, 2017.

Other Experience

Instruction in special programs for professional organizations; The Canadian Inst. of Chartered Accountants, (Saskatoon, Canada, 1972, 1973), and Certified Managerial Accountants (St. Louis, 1975-1978).

Supervised student project involving the development of a flexible matrix generator for feed mix formulations by linear programming at Federated Cooperatives Ltd., Saskatoon, Canada, 1972.

Senior Research Associate, U.S. Department of the Interior Grant #14-31-001-422, mathematical modeling for wastewater facilities planning, 1974.

Recipient of University of Missouri Summer Research Fellowships, 1976, 1979, and 1982.

Senior Research Associate, Missouri Division of Health Research, Contract # C4415, statistical modeling for infant immunization study, 1976.

Assessment Visitor to Management Sciences Department, College of Business Administration, University of South Carolina, May, 1982.

Referee for *Management Science*, *Journal of Operations Management*, *IIE Transactions*, *International Journal of Policy and Information*, *European Journal of Operational Research*, *Naval Research Logistics*, *American Review of Public Administration*, *Decision Sciences*, *Computers and Industrial Engineering*, *International Transactions in Operational Research*, *Journal of Economics and Finance*, *Mathematical and Computer Modelling*, etc. Reviewer for Natural Sciences and Engineering Research Council of Canada and Research Council, K.U.Leuven, Belgium.

External Reader and Examiner for Ph.D. thesis of R. Narasimhan, "Optimal Workforce Shift Scheduling",

Queen's University, 1993.

External reader and examiner for Ph.D. thesis of Colin Selkirk, "Optimal Algorithms for Single Shift Workforce Scheduling to Avoid One Day Work Stretches in a Cyclic Schedule", Queen's University, 1999.

Academic Director for Business Internship Program and Professor for International Business seminar, Missouri London Program (study-abroad program based at Imperial College, London England), Spring semester, 1999, 2002, 2005.

Private pilot (U.S. and Canada), instrument rating.

University Committees (partial list)

University Senate (multiple years); University Doctoral Council (Chairman, 1983); U-wide Tenure and Promotion Committee (1993,1994); Fiscal Resources and Long-Range Planning Committee (multiple years); Senate Budgeting and Planning Committee (multiple years); Chancellor's Committee for Review of Academic Programs; *Ad Personam* committees for tenure and promotion (served on 27, chaired seven); Faculty Council; Research Task Force; Planning Committee for University Research Park; Planning Committee for Library Addition; Student Recruitment and Retention Committee; Research Grants and Incentives Committee; Review Committees for Research Fellowships; Research Planning Committee; Doctoral Thesis Committees (M. Boyer, ED.D., 1989, R. Yonker, Ph.D. 2003; M. Burton, Ph.D., 2005; J. Harkey, Ph.D., 2006); numerous search committees; Honorary Awards Committee (multiple years); Senate *Ad hoc* Committee for Assessment of Educational Outcomes; College of Business Admin. Advisory Board (1995-2008); School of Business Admin. Policy Committee (1995-97, 2002-2004); University Strategic Planning Task Force (1999-2001); International Business Committee (since 2000); Chair, Program Viability Audit Committee (2003); Chair, College of Business Administration Faculty Planning Task Force (2003-2004), Chair, Chancellor Search Committee (2003), Graduate Studies Committee (2015), Dean's Advisory Committee (2015).

PUBLICATIONS AND CREATIVE WORKS

Books and Journal Articles

Robert E. Markland, L. Douglas Smith, Jack D. Becker, **A Benefit-Cost Analysis of Alternative Land Disposal Wastewater Methods in an Urban Environment**, School of Business Administration, University of Missouri-St.Louis and U.S. Department of the Interior (1974), 234 pp.

L.D. Smith, "The Application of an Interactive Algorithm to Develop Cyclical Rotational Schedules for Nursing Personnel," *INFOR. The Canadian Journal of Operational Research and Information Processing*, Vol. 14, No. 1 (Feb. 1976, pp. 53-70.

Robert E. Markland, L. Douglas Smith, Jack D. Becker, "Regional Planning for Land Disposal of Wastewater," *Water Resources Bulletin*, Vol.12, No. 3 (June 1976), pp. 577-599.

L.D. Smith, G.J. Murphy, "Earnings Forecasting - Investment Analysts versus Exponential Smoothing Models," *Journal of Business Administration*, Vol. 8, No.1 (Fall 1976), pp. 11-12.

_____, reprinted in **Financial Analysis of the Canadian Environment**, The Institute of Chartered Financial Analysts, Charlottesville, VA (1978), pp. 125-135.

L.D. Smith, D. Bird, A. Wiggins, "Scheduling Personnel: Interactive versus Batch Processing, *Journal of Systems Management*, Vol. 28, No. 8 (August 1977).

L.D. Smith, P. Brumbaugh, "Allocating Inter-station Inventory Capacity in Unpaced Production Lines with Heteroscedastic Processing Times," *International Journal of Production Research*, Vol. 15, No. 2 (1977), pp.163-172

R.E. Markland, L.D. Smith, J.D. Becker, "Computerized Regional Planning for Land Disposal of Waste Water," *International Journal of Urban Systems*, Vol. 2, No. 1 (1977), pp. 1-14.

L.D. Smith, A. Wiggins, "A Computer-Based Nurse Scheduling System," *Computers and Operations Research*, Vol. 4 (1977), pp. 195-242.

L.D. Smith, "Planning Models for Budgeting Teaching Resources," *OMEGA, The International Journal of Management Science*, Vol. 6, No.1 (1978), pp. 83-88.

H. Mack, L.D. Smith, "Scheduling with List Processing and Problem Oriented Data Structures: An Itinerant Teacher Example," *European Journal of Operational Research*, Vol. 2(1978), pp. 175-184.

L.D. Smith, D. Bird, and A. Wiggins, "A Computerized System to Schedule Nurses that Recognizes Staff Preferences," *Hospital and Health Services Administration*, Vol. 24, No. 4 (Fall 1979), pp. 19-35.

L.D. Smith, D. Bird, "Designing Computer Support for Daily Hospital Staffing Decisions," *International Journal of Medical Informatics*, (Fall 1979), pp. 69-78.

L.D. Smith, D. Bird, A. Wiggins, "Computerized Scheduling of Hospital Nursing Personnel: Dissaggregation to Accomodate Individual Preferences and Nonroutine Constraints," **Disaggregation Problems in Manufacturing and Service Organizations**. Ritzman et. al. (ed.), Martinus Nijhoff Social Sciences Division at Leiden, The Netherlands (1979), pp. 623-637.

L.D. Smith, A. Wiggins, D. Bird, "Post-Implementation Experience with Computer Assisted Nurse Scheduling in a Large Hospital," *INFOR, Canadian Journal of Operational Research and Information Processing: Special Issue on Practice and Implementation*, Vol. 17, No. 4 (1979), pp. 309-321.

R.E. Markland, L.D. Smith, "The Wagner Electric Corporation Case." Case study in **MIS Concepts and Design**, by R. Murdick, Prentice-Hall (1980), pp. 541-556.

L.D. Smith, R.E. Markland, "Measurement of Business Risk for Inter-Industry Comparisons," *Financial Management* (Summer 1981), pp. 49-63.

G.L. Griepentrog, J.M. Ryan, L.D. Smith, "Linear Transformations of Polynomial Regression Models," *The American Statistician*, Vol. 36, No.3, Part 1 (Aug. 1982), pp. 171-174.

L.D. Smith, J. Blodgett, C. Cole, M. Watters, "A System for Analyzing Competition in the Distribution of Petroleum Products," **Studies in Management Science and Systems 9: Energy Models and Studies**, Benjamin Lev, (ed.), North Holland Publishing Co., Amsterdam, 1983, pp. 309-324.

L.D. Smith, "Quantifying Risk for Establishing Rates of Return in Regulated Industries," *The Engineering Economist*, Vol. 28, No. 4 (Summer 1983), pp. 267- 292.

R.S. Stich, L.D. Smith, "Federal Regulation of Gas Pipeline Rates, 1973-82," *Public Utilities Fortnightly*, Vol. 113, No. 2, (Jan. 1984), pp. 34-38.

L.D. Smith, J. Blodgett, M. Janson, V. Bartle, "Decision Support for Marketing Research and Corporate

Planning," *Information and Management*, Vol. 8, No. 3 (March 1985), pp. 133-145.

M.A. Janson, L.D. Smith, "Prototyping for System Development: A Critical Appraisal," *MIS Quarterly*, (December 1985), pp. 305-316.

L.D. Smith, J. Anderson, "Inflation Accounting and Comparisons of Corporate Returns on Equity," *Accounting and Business Research*, (Spring,1986), pp.107-115.

L.D. Smith, P. Marlin, and C. Kuehl, "Determination of Requirements for Sanitation Facilities at Large Gatherings," *Journal of Environmental Health*, Vol. 48, No. 5 (March/April 1986), pp. 250-258.

L. D. Smith, M.A. Janson, "Integration of Computer Graphics and Statistical Procedures for Decision Support Systems," *Journal of Management Information Systems*, Vol. III, No 2 (Fall 1986), pp. 63-82

P. Marlin, R. Nauss, L.D. Smith, and M. Rhoades, "Computer Support for Operator Assignment and Dispatching in an Urban Transit System," *Transportation Research*, Vol. 22A, No. 1, (Spring 1988), pp. 13-26

L.D. Smith, R. Nauss, D. Bird, "Decision Support for Bus Operations in a Mass Transit System," *Decision Sciences*, Vol. 21, No.1, (Winter 1990), pp. 183- 203.

M. Janson, L.D. Smith, "Communicative Action and Decision Support System Development," *Behavior and Information Technology*, Vol. 9, No.6, (Fall, 1990), pp. 503-516.

L.D. Smith and S.W. Moses, "Modeling the Distribution of Petroleum Products to Markets via Oil Pipelines", **Maritime and Pipeline Transportation of Oil and Gas: Problems and Outlook**, A. Poirier and G. Zaccour (ed.), Editions Technip, Paris, 1990, pp. 267-289.

L.D. Smith and S.W. Moses, "Integrating Market Share Models with Network Optimizing Models for Strategic Planning in an Oil Pipeline Company", **Advances in Operations Research in the Oil and Gas Industry**, M. Breton and G. Zaccour (eds.), Editions Technip, Paris, 1991, pp. 163-179.

L.D. Smith, "Incorporating Information from Rate Case Decisions into Corporate Planning of Regulated Companies", *Akron Business and Economic Review*, Winter (1991), pp. 62-77.

E.C. Lawrence, L.D. Smith and M. Rhoades, "An Analysis of Default Risk in Mobile Home Credit", *Journal of Banking and Finance*, Vol. 16 (1992), pp. 299-312.

M. Janson, C. Woo, L.D. Smith "Information System Development and Communicative Action Theory", *Information and Management*, Vol. 25 (1993), pp. 59-72.

L.D. Smith and E.C. Lawrence, "Forecasting Losses on a Liquidating Long-Term Loan Portfolio", *Journal of Banking and Finance*, Vol. 19 (1995), pp. 959-985.

L.D. Smith and S. Moses, "Strategic Planning of Transportation Services for Petroleum Products: An Application of Capacitated Gravity Models", *European Journal of Operational Research*, Vol. 88 (1995), pp. 215-230.

L. D. Smith, S. Sanchez, and E.C. Lawrence, "A Comprehensive Model for Managing Credit Risk on Home Mortgage Portfolios", *Decision Sciences*, Vol. 27, No. 2 (1996), pp. 291-317.

A. Subramanian, L.D. Smith, A. Nelson, J. Campbell, D. Bird, "Strategic Planning for Data Warehousing",

Information and Management, Vol. 33 (1997), pp. 99-113.

R.N. Burns, R. Narasihman, L.D. Smith, "A Set-Processing Algorithm for Scheduling Staff on Four-Day or Three-Day Work Weeks", *Naval Research Logistics*, Vol. 35 (1998), pp. 839-853.

Smith, L.D., Y. Wu, D. Mathew, "Application of Nonstationary Markovian Models to Risk Management in Automobile Leasing", **Decision Making: Recent Developments and Worldwide Applications**, S.H. Zanakis, G. Doukidis, C. Zopounidis (eds.), Kluwer Academic Publishers, 2000.

Smith, L.D., J.F. Campbell, A. Subramanian, D.A. Bird, A.C. Nelson, "Strategic Planning for Municipal Information Systems: Some Lessons from a Large U.S. City", *American Review of Public Administration*, Vol 31. No 2 (2001), pp. 139-157.

Smith, L.D., R.M. Nauss, R.J. Banis, R. Beck, "Staffing Geographically Distributed Service Facilities with Itinerant Personnel", *Computers and Operations Research*, Vol. 29 (2002), pp. 2023-2041.

Smith, L.D. and S. M. Sanchez, "Assessment of Business Potential at Retail Sites: Empirical Findings from a U.S. Supermarket Chain", *International Review of Retail, Distribution and Consumer Research*, Vol. 13, No. 1, (2003), pp. 37-58.

Smith, L.D., R.M. Nauss, A. Subramanian and Ron Beck, "Decision Support for Staffing, Outsourcing and Project Scheduling in MIS Strategic Plans", *Information Systems and Operational Research (INFOR)*, Vol 42. No. 1, (2004), pp. 79-100.

Smith, L.D., J.F. Campbell and R. Mundy, "Basing Rate Adjustments for Motor Carriers on Statistical Evidence", *Journal of Transportation Management*, Vol. 15, No. 1 (2004), pp. 1-13.

Smith L.D., C. Bilir, V.W. Huang, K. Hung, M. Kaplan, "Citibank Models Credit Risk on Hybrid Mortgage Loans in Taiwan", *Interfaces*, 35(3), May-June, 2005, 215-229.

Smith, L.D., J.F. Campbell, R. Mundy, "Modeling Net Rates for Expedited Freight Services", *Transportation Research Part E*, Volume 43 (2007), pp 192-207.

Rottman, J.W., L.D. Smith, D.A. Long, and C. Crofts, "Implementing Judicial Management Systems within an Integrated Justice Information Framework: A Case Study on IS Development in the Public Sector", *American Review of Public Administration*, 37(4), (2007), 436-457.

Smith, L.D. and B. Jin, "Modeling Exposure to Losses on Automobile Leases", *Review of Quantitative Finance and Accounting*, 29 (2007), 241-266.

Smith, L.D., D.C. Sweeney II, J.F. Campbell, "Simulation of Alternative Approaches to Relieving Congestion at Locks in a River Transportation System", *Journal of the Operational Research Society*, 60 (2009) 519-533.

Smith, L.D. and R.M. Nauss, "Investigating Strategic Alternatives for Improving Service in an Inland Waterway Transportation System", *International Journal of Strategic Decision Sciences*, 1 (2010),63-81.

Smith, L.D., R.M. Nauss, D.C. Mattfeld, J. Li, and J.F. Ehmke, "Scheduling Operations at System Choke Points with Sequence-dependent Delays and Processing Times", *Transportation Research Part E*, 47.5 (2011), 669-691.

Ehmke, J.F., D. Großhans, D.C. Mattfeld, L.D. Smith, "Interactive Analysis of Discrete-Event Logistics

Systems with Support of a Data Warehouse”, *Computers in Industry*, 62 (2011) 578-586.

Smith, L.D. and J.F. Campbell (eds.), “New Perspectives on Revenue Management in Transportation Services”, Special Issue of the *International Journal of Revenue Management*”, 6.1/2 (2012), 143 pp.

Smith, L.D., R.M. Nauss, J.F. Ehmke, and D.C. Mattfeld, “Analytical Modeling for the Strategic Design of Service Systems”, *International Journal of Strategic Information Technology and Applications*, 3.4 (2012)

Smith, L.D., M. Staten, T. Eyssell, M. Karig, B. Freeborn, and A. Golden, “Accuracy of Information Maintained by U.S. Credit Bureaus: Frequency of Errors and Effects on Consumers’ Credit Scores”, *The Journal of Consumer Affairs*, 47.3 (2013), 588-601.

Smith, L.D., J.F. Ehmke, D.C. Mattfeld, R. Waning and L. Hellman, “Strategic Decision Support for Airside Operations at Commercial Airports”, *Lecture Notes in Computer Science*, Selected Papers from ICCL 2014, Valparaiso, Chile., Springer (2014), 132-150.

Kulkarni, P., L.D. Smith, K. Woeltje, “Assessing the Risk of Hospital Readmissions for Improving Medical Practice”, *Health Care Management Science*, 19(3), (2015), 291-299

Smith, L. D., & Ehmke, J. F.. “A mathematical programming technique for matching time-stamped records in logistics and transportation systems”. *Transportation Research Part C: Emerging Technologies*, 69 (2016), 375-385.

Smith, L.D., R.M. Nauss, L. XU, J. Zhang, J.F. Ehmke, L. Hellmann, “Information Technologies and Analytical Models for Strategic Design of Transportation Infrastructure”, *Strategic information systems and technologies in modern organizations* (Caroline Howard and Kathleen Hargiss, ed.), IGI Global (2017), 300-321.

Smith, L.D., M. Staten, T. Eyssell, M. Karig, J. Feinstein, C. Johnson, “Credit Usage, Payment Behavior and the Accuracy of Consumer Credit Files”, *Financial Services Review*, (2018), in press.

Xu, L. & L.D. Smith, “Combining Traditional Accounting and Value-Added Activity Measures to Maximize Supply Chain Performance”, *Journal of Accounting and Finance*, (2018), in press.

Refereed Proceedings Publications

L.D. Smith, "A Mixed Integer Linear Programming Model for Short Term Planning in Manufacturing Firms," *Proceedings of the S.E. Regional Meeting of the American Institute for Decision Sciences*, Atlanta, 1973.

L.D. Smith, G.J. Murphy, "Prediction of Earnings in Canadian Securities Markets," *Proceedings of the Annual Conference of the Canadian Association of Administrative Sciences*, Kingston, Canada, 1973.

L.D. Smith, "Integrated Algorithms for Analyzing Staff Requirements and Scheduling Hospital Nursing Personnel," *Proceedings of the Annual Conference of the Canadian Association of Administrative Sciences*, Edmonton, Canada, 1975.

P. Brumbaugh and L.D. Smith, "Effects of Inter-Station Inventory Capacity upon the Performance of Unpaced Production Lines with Heteroscedastic Processing Times," *Proceedings of Annual Conference of the Canadian Association of Administrative Sciences*, Quebec City, Canada, 1976.

L.D. Smith, D. Bird, and A. Wiggins, "Scheduling Hospital Nursing Personnel; Adaptation of an Interactive System to a Batch Environment," *Proceedings of the Annual Conference of the American Institute for Decision Sciences*, San Francisco, 1976.

L.D. Smith, D. Bird and A. Wiggins, "Scheduling Hospital Nursing Personnel: Disaggregation to Accommodate Individual Preferences and Nonroutine Constraints," *The Problems of Disaggregation in Manufacturing and Service Organizations Conference Proceedings*, Columbus, OH, 1977.

L.D. Smith and John Schwob, "Application of an Iterative Procedure to Cope with Multicollinearity and Autocorrelation in a Regression Model for Measuring Advertising Effectiveness," *Proceedings of the Annual Conference of the American Institute for Decision Sciences*, Chicago, 1977.

R.E. Markland, L.D. Smith, S. Vickery, "Comparison of Approaches to the Assessment of Business Risk for Selected American Industry Groups," *Proceedings of the American Institute for Decision Sciences*, Las Vegas, NE, 1980.

L.D. Smith, J. Blodgett, V. Bartle, M. Janson, "Applications of Computer Cartography for Marketing Research and Corporate Planning," *Proceedings of the Ninth Annual SAS Users Group International Conference*, (invited paper) Ft. Lauderdale, 1984, pp. 244-253.

L.D. Smith, E.R. Lawrence, M. Rhoades, "Forecasting Losses on a Liquidating Loan Portfolio," *Proceedings of the Decision Sciences Institute*, San Diego, 1990

M. Janson, L.D. Smith, R. Dattero, "The Role of Communicative Action in the Construction of Decision Support Systems," *Information Technology and Society*, Nivelles, Belgium, 1990.

L.D. Smith, S. Sanchez, E.C. Lawrence, "A Comprehensive Model for Managing Credit Risk and Forecasting Losses on Home Mortgage Portfolios", *Decision Sciences Institute Proceedings*, Honolulu, 1994. (winner of the DSI 1994 Best Application Paper Award).

L. D. Smith and S. Moses, "Strategic Planning for the Transportation of Petroleum Products: An Application of Capacitated Gravity Models", *Decision Sciences Institute Proceedings*, Boston, 1995.

A. Subramanian, L.D. Smith, A. C. Nelson, J.F. Campbell, D.A. Bird, "Strategic Planning for Data Warehousing in the Public Sector", *Proceedings of the Twenty-Ninth Hawaii International Conference on Systems Sciences*, Vol IV, pp. 54-61, 1996.

L. D. Smith, E.C. Lawrence and S. Sanchez, "Nonstationary Markovian Models for Analyzing Risk, Forecasting Losses, and Establishing Reserve Levels for Home Equity Lines of Credit", *NE Decision Sciences Institute Proceedings*, St. Croix, VI 1996.

S.M. Sanchez, L.D. Smith, E.C. Lawrence, "Sensitivity and Scenario Analysis for Simulation Metamodels", *Winter Simulation Conference Proceedings*, San Diego, 1996.

L.D. Smith, J. Campbell, A. Subramanian, D. Bird, A. Nelson, "Strategic Planning for Municipal Information Systems: Methodology, Application and Results", *Western Decision Sciences Institute Proceedings*, Kamuela, HI, 1997.

L.D. Smith, D. Matthew, Ya-Jung Wu, "Disaggregation Strategies in Building Forecasting Models for Portfolios of Secured Loans", *Decision Sciences Institute Proceedings*, San Diego, CA 1997.

L.D. Smith, A. Subramanian, R. Beck, "A Mathematical Programming Model for Implementation of MIS Strategic Plans", *Decision Sciences Institute Proceedings*, Orlando, FL 2000.

L.D. Smith, A. Subramanian, R.M. Nauss, R. Beck, "Developing Outsourcing Strategies for MIS: A Mathematical Programming Approach", *Proceedings of the 34th Annual Hawaii International Conference on System Sciences*, IEEE Computer Society, Los Alamitos, CA 2001.

L.D. Smith, R.M. Nauss, R.J. Banis, R. Beck, "Staffing Geographically Distributed Service Facilities with Itinerant Personnel", *Western Decision Sciences Institute Proceedings*, Vancouver, Canada, 2001. (winner of best paper award for management science and quantitative methods).

L.D. Smith, S. Sanchez, "Estimating Business Potential for Supermarkets: A Statistical Approach for Site Selection and Performance Review", *Decision Sciences Institute 2002 Annual Meeting Proceedings*, San Diego, CA 2002.

Smith, L.D., J.F. Campbell, R. Mundy, "Modeling Charges for Expedited Freight Services", *Western Decision Sciences Institute Proceedings*, Kona, HI, April 2006.

Smith, L.D., D.C. Sweeney II, and J.F. Campbell, "A Simulation Model to evaluate Decision Rules for Lock Operations on the Upper Mississippi River", *Proceedings of the 2007 Conference of the Hawaiian International Conference on System Sciences*, in press.

Campbell, J.F., L.D. Smith, D.C. Sweeney II, R. Mundy, R.M. Nauss, "Decision Tools for Reducing Congestion at Locks on the Upper Mississippi River", *Proceedings of the 2007 Conference of the Hawaiian International Conference on System Sciences*, in press.

Smith, L.D., D. C. Sweeney II, J.F. Campbell, R.M. Nauss, "Simulation of Operating Procedures and Infrastructure Changes in the Upper Mississippi Navigation System", *Proceedings of the 2008 Spring Simulation Multiconference*, Ottawa, Canada 231-238.

Smith, L.D., R. M. Nauss, J.F. Campbell, D.C. Sweeney, "Triangulation of Modeling Methodologies for Strategic Decisions in an Inland Waterway Transportation System", *Proceedings of the 42nd Hawaii International Conference on Systems Sciences*, 2009, 10pp.

Campbell, J.F., L.D. Smith, D.C. Sweeney II, "A Robust Strategy for Managing Congestion at Locks on the Upper Mississippi River", *Proceedings of the 42nd Hawaii International Conference on Systems Sciences*, 2009, 10pp.

Smith, L.D., R. M. Nauss, D.K. Mattfeld, J.F. Ehmke, F. Bahr, "Scheduling Logistics Activities in Staged Queues with Sequence-Dependent Changeover and Processing Times", *Proceedings of the 45th Hawaii International Conference on System Sciences*, 2012, 10pp.

Smith, L.D., "Intelligent Decision Support for Aircraft Logistics at Commercial Airports" *Proceedings of the 47th Hawaii International Conference on System Sciences*, 2014, 10pp.

Kulkarni, P., L.D.Smith, "Optimizing Strategic Sourcing Models in Presence of Vendor Diversification and Physician Preference in a Healthcare Supply Chain", *Decision Sciences Institute Proceedings*, Washington, D.C., (2017), 17pp.

Xu, Liang, L.D. Smith, L. Bearzotti, "Impacts of Multi-Period Planning Methods on Supply Chain Financial Performance", *Decision Sciences Institute Proceedings*, Washington, D.C., (2017), 18pp.

Other Publications

L.D. Smith, R. Nauss, D. Bird, "St. Louis Adopts Bus-to-Block System," *Mass Transit*, Volume XIV, December 1987.

L.D. Smith, "A Note on Forecasting Allowable Rates of Return for Regulated Companies," *Financial Management*, Winter 1991, p.15.

E.C. Lawrence, L.D. Smith, S. Sanchez, "Managing Credit Risk in a Changing Economy", *The Bankers Magazine*, Jan./Feb., 1996.

Technical Reports

P. Marlin, R. Nauss, L.D. Smith "Bus-to-Run Feasibility Study" (study for the Bi-State Transit Agency), June, 1985, 132 pp.

Smith, L.D., P. DePaulo, "Study of Characteristics of Short-term Automobile Policyholders" (prepared for Shelter Insurance Company), June, 1985. 99 pp.

Smith, L. D., J. Breaugh, S. Decker, D. Dossett, V. Sauter, R. Wright, "Greater St. Louis Police Academy Study," July, 1985, 101 pp.

Smith, L.D., "Prediction of Responses to Direct Mail Promotions of Levitz Furniture Stores in New Jersey and Minnesota" (study for Direct Mail Corporation), June 1987, 62 pp.

Smith, L.D., S. Bruce, R. Nauss, D. Bird, T. Parr, **Bus-to-Block Manual** (revision prepared for Bi-State Transit Agency), October 1987, 36 pp.

Smith, L.D., S. Bruce, R. Nauss, D. Bird, T. Parr, **Bus-to-Block System Documentation** (revision for Bi-State Transit Agency), October 1987, 22 pp.

Smith, L. D., R. Calsyn, A. Biggs, J. Hashimi J. Musick, R. Agar, "Assessment of the Needs of Elderly Residents of the City of St. Louis", (study for the St. Louis Area Agency on Aging), April, 1988, 210 pp.

Smith, L.D., P. DePaulo, G. Burger, "Prediction of Membership in Link Marketing Clusters (study for Southwestern Bell Telephone), October, 1988, 90pp.

Smith, L.D., E.R. Lawrence, "A Statistical Model for Forecasting Net Credit Losses from CAC Loans on Mobile Homes", (study for Citicorp Acceptance Corporation) November, 1989, 16pp. plus appendices.

Campbell, J.F., L.D. Smith, J.F. Walter et al., "Impact of the Proposed Expansion of Lambert Airport upon Instructional Processes and Finances of the Pattonville School District" (study for Pattonville School District), July, 1990, 81 pp. plus appendices.

Smith, L.D. et al., "Strategic Plan for Municipal Information Systems" (Study for City of St. Louis), June, 1996, 69 pp. plus executive summary and appendices.

Smith, L.D. J.W. Rottman, D. Long, "A Study of Alternative Criminal Case Management Systems for an Integrated Justice Information System", (study for 22nd Judicial Court of Missouri), June, 2004, 24 pp. plus appendices.

Smith, L.D., E.C. Lawrence, T.H. Eyssell, A. Dinesh, A. Supriadi, M.E. Staten, G. Elliehaussen, J. Feinstein, "Processes for Determining Accuracy of Credit Bureau Information" (Study for the Federal Trade Commission) , September, 2006, 35 pp. plus appendices.

Smith, L.D. and D. Sweeney, "Scheduling to Relieve Congestion on the Upper Mississippi River", (study for the U.S. Army Corps of Engineers) September, 2006, 33 pp.

Smith, L.D., T.H. Eyssell, C. Gray-LeCoz, L. Wewege, M.E. Staten, J. Feinstein, "Pilot Study 2 on Processes for Determining the Accuracy of Credit Bureau Information", Report to the U.S. Federal Trade Commission, October, 2008., 85pp.

Smith, L.D., T. Eyssell, M. Karig, P. Pratte, M. Staten, C. Johnson, M. Staten, R. Barry, G. Stovall III, A. Golden, "FACTA 319 National Study on the Accuracy of Credit-Bureau Information, Final Report", Report to the U.S. Federal Trade Commission, April 2012. 365 pp (incl tables).

Smith, L.D., M. Karig, M. Staten, A. Golden, "FACTA 319 Follow-up Study on the Accuracy of Credit Bureau Information, Report to the U.S. Federal Trade Commission, April 2013, 27 pp. (incl tables)

Karig, M., S. Nayak, L.D. Smith, Z.Liu, H Luvai, "Customer Satisfaction and Customer Service in Large Midwestern Electric Utilities" Report to Ameren Missouri, May 2014, 425 pp.

Smith, L.D. and Joe Rottman, "Report of Findings from an Investigation of the JMS System for the 22nd Circuit Court of St. Louis", July 2014, 38 pp.

Smith, L.D., L Xu, J. Zhang, D. Peng, "Modeling Airside Operations at Major Airports for Strategic Decision Support", Report to U.S. Department of Transportation for UTC Study Grant DTRT13-G-UTC37, October, 2015, 20 pp.

Smith, L.D. and J. Zhang, "Maximizing Airside Performance at Nanjing Lukou International Airport: An Application of Discrete Event Simulation in a Staged Queueing Framework for Airside Operations", (in English and Chinese), May, 2017, 73 pp.

Smith, L.D. and J. Zhang, "Strategic Decision Support for Airport Capacity Planning", Report to U.S. Department of Transportation for UTC Study Grant DTRT13-G-UTC37, September, 2017, 56 pp.

Numerous other reports for applied research projects performed by the Center for Business and Industrial Studies.

Other Presentations at Professional Meetings

"The Application of Integrated Planning Models to Determine Teaching Resource Requirements under Different Program Priorities," paper presented at TIMS/ORSA Joint National Meeting, Boston, 1974.

"The Application of an Interactive Algorithm to Develop Shift Schedules for Nursing Personnel," paper presented at the Annual Conference of the Canadian Operational Research Society, Ottawa, Canada, 1974.
"A Site Selection Model for Land Disposal of Wastewater," (with R.E. Markland, J. Becker, and P. Haack), paper presented at TIMS/ORSA Joint National Meeting, Chicago, 1975.

"An Example of the Utility of List Processing and Problem-Oriented Data Structures to Facilitate Construction of Computerized Scheduling Algorithms," (with H.L. Mack), paper presented at the Annual Conference of the Canadian Operational Research Society, Waterloo, Canada, 1975.

"Utilization of Regional Planning Models in Designing a Land Application System for Disposal of Sewage Effluent," (with R.E. Markland and J. Becker), paper presented at the Annual Conference of the Canadian Operational Research Society, Waterloo, Canada, 1975.

"Allocation of In-Process Inventory Capacity in Unpaced Production Lines with Heteroscedastic Processing Times," (with P. Brumbaugh), paper presented to the National Meeting of the American Institute for Decision Sciences, Cincinnati, 1975.

"Regional Planning for Land Disposal of Wastewater Using Mixed Integer Programming," (with R.E. Markland and J. Becker), paper presented at TIMS/ORSA Joint National Meeting, Las Vegas, 1975.

"Scheduling Nursing Personnel: Application of List Processing and Problem Oriented Data Structures," paper presented at TIMS/ORSA Joint National Meeting, Las Vegas, 1975.

"Allocation of In-Process Inventory Capacity for Perishable Goods in Unpaced Production Lines," (with P. Brumbaugh), paper presented to the TIMS/ORSA Joint National Meeting, Philadelphia, PA, 1976.

"A Computer-Based Nurse Scheduling System," (with A. Wiggins), paper presented to TIMS/ORSA Joint National Meeting, Philadelphia, PA, 1976.

"Scheduling Nursing Personnel: Design and Implementation of a Computer-Based System," (with A. Wiggins), paper presented to the Annual Conference of the Canadian Operational Research Society, Toronto, Canada, 1976.

"Scheduling Hospital Nursing Personnel: A Comparison of Interactive versus Batch Processing," (with D. Bird, A. Wiggins and P. Stangler), paper presented at TIMS/ORSA Joint National Meeting, Miami, FL, 1976.

"Managing Hospital Nursing Staff with Computer Support," (with D. Bird), paper presented to the TIMS/ORSA Joint National Meeting, Atlanta, Georgia, 1977.

"An Integrated Application of M.I.S. and O.R. to Marketing and Sales Management," (with R. Markland and E. Wims), paper presented to the Annual Conference of the Canadian Operational Research Society, Vancouver, B.C., 1978.

"Development of Statistically Based Early-Warning System for Infant Immunization," (with R.E. Markland),

paper presented at TIMS/ORSA Joint National Meeting, Miami, FL, 1976.

Organized and chaired session entitled, "Material Requirements Planning in Practice," National Meeting of the American Institute for Decision Sciences, St. Louis, MO, 1978.

Presented comparison of interactive regression and Box-Tiao procedures for measuring advertising effectiveness, "Applied Time Series Analysis" workshop, National Meeting of the American Institute for Decision Sciences, St. Louis, MO, 1978.

"Measuring Advertising Effectiveness at Southwestern Bell" (with J. Schwob and V. Kettenbach), paper presented at the TIMS/ORSA Joint National Meeting, New Orleans, May, 1979.

"Experience with Computer-Assisted Nurse Scheduling in a Large Hospital," (with A. Wiggins and D. Bird), paper presented at the annual conference of the Canadian Operational Research Society, Montebello, Quebec, May 1979, (paper read by R.N. Burns in my absence).

"Estimation and Comparison of the Relative Riskiness of Operations in Regulated Companies," (with R.E. Markland), paper presented at TIMS/ORSA joint national meeting, Milwaukee, WI, 1979.

"Design of a Comprehensive Information System for Home Health Care Agencies," paper presented at the TIMS/ORSA joint national meeting, Washington, D.C., May, 1980.

"Assessment of Business Risk in Canadian Industries," paper presented at the Annual Conference of the Canadian Operational Research Society, Quebec City, Canada, 1980.

"Quantifying Risk for Establishing Rates of Return in Regulated Industries," paper presented at the TIMS/ORSA joint national meeting, Colorado Springs, CO, November, 1980.

"Forecasting Commodity Flows for a Multi-Product Petroleum Pipeline Network," (with C. Cole), paper presented at CORS/TIMS/ORSA joint meeting, Toronto, Canada, May, 1981.

"A System for Analyzing Competition in the Distribution of Petroleum Products," (with J. Blodgett, C. Cole and M. Watters), paper presented at the Annual Conference of the Canadian Operational Research Society, Montreal, Canada, 1982.

"Design of Information Systems for Marketing and Corporate Planning in an Insurance Company," (with J. Blodgett and V. Bartle), paper presented at the TIMS/ORSA joint national meeting, Chicago, 1983.

"Decision Support for Marketing Research and Corporate Planning," (with J. Blodgett and M. Janson), paper presented at the Annual conference of the Canadian Operational Research Society, Ottawa, Canada, 1984.

"Impact of Inflation Accounting on Corporate Rates of Return on Investment," (with J. Anderson), paper presented at annual meeting of the American Accounting Association, Toronto, Canada, 1984 (read by Anderson).

"Prototyping: A Method for System Development" (with M. Janson), paper presented the National Meeting of the American Institute for Decision Sciences, Toronto, Canada, 1984.

"Capacitated Gravity Models in Facility Location" (with R.M. Nauss), paper presented at the TIMS/ORSA meeting, Dallas, 1984 (read by Nauss).

"A System of Assigning Operators to Buses and Directing Traffic Movements in a Bus Station Garage", (with

P. Marlin and R. Nauss), paper presented at annual conference of the Canadian Operational Research Society, Halifax, Canada 1985.

"On the Use of Capacitated Gravity Models for the Solution of Facility Location Problems" (with R. Nauss), invited paper presented at the ORSA/TIMS joint national meeting, Atlanta 1985 (read by Nauss).

"A Computer System to Support Assignment, Dispatching and Parking of Buses in a Transit System" (with R. Nauss, and D. Bird) paper presentation at the ORSA/TIMS joint national meeting, Miami, 1986.

"Operation of a Bus-to-Block System in Mass Transit Agencies" (with D. Bird) Illinois Public Transit Association annual conference, Belleville, IL., 1987.

"Incorporating FERC Rate of Return Decisions into Corporate Planning for Gas Pipelines," paper delivered at the ORSA/TIMS joint National Meeting, St. Louis, MO 1987.

"Bus-to-Block System for Dispatch Buses in a Metropolitan Transit System," (with Roger Sulzer), Eastern Technical Conference of the American Public Transit Association, St. Louis, MO, 1988.

"Assigning Buses to Runs in a Metropolitan Transit System," (with R. Nauss, D. Bird) paper presented at TIMS/ORSAs meeting, Washington, D.C., 1988.

"Computer Support for Assigning, Parking and Dispatching Buses in a Mass Transit System," (with R. Nauss, D. Bird), paper presented to the annual conference of Canadian Operational Research Society, Montreal, Quebec, 1988.

"Bus Assignment Techniques to Improve Maintenance of a Mass Transit Fleet" (with R. Nauss, D. Bird), paper presented at the ORSA/TIMS meeting, Denver, CO, 1988.

"Prediction of Marketing Clusters from Customer Billings and Demography," (with G. Burger, P. DePaulo, K. Burns), paper presented at CORS/TIMS/ORSAs meeting, Vancouver, B.C., 1989.

"Assigning Buses to Runs in a Metropolitan Transit System," (with R. Nauss), paper presented at the annual conference of the Canadian Operational Research Society, Ottawa, Canada, 1990.

"Forecasting Market Share and Minimizing Distribution Cost for Petroleum Products," (with S. Moses), paper presented at the Annual Conference of the Canadian Operational Research Society, Quebec, Quebec, 1991

"A Microcomputer System for Managing Bus Operations in Mass Transit Agencies" (with D. Bird), paper presented at the annual conference of the Canadian Operational Research Society, Halifax, N.S., 1993

"Demonstration of a Microcomputer System for Managing Bus Operations in Mass Transit Agencies", presentation in an invited workshop at the annual conference of the Decision Sciences Institute, Washington, D.C. 1993.

"Modeling the Transportation of Petroleum Products by Pipelines and Trucks" (with S. Moses), invited paper presented at the TIMS XXXII International Meeting, Anchorage, AK, 1994.

"Markovian Models and Robust Estimation Procedures for Residential Mortgage Portfolios" (with S. Sanchez and E. Lawrence), paper presented at the ORSA/TIMS Joint National Meeting, Detroit, MI, 1994.

"Models for Risk Management and Establishing Loss Reserves for Loans Secured by Residential Real Estate" (with E. Lawrence and S. Sanchez), INFORMS national meeting, Atlanta, Fall 1996.

"Best Practices in Reserve Methodology: Integrated Models for Predicting Lifetime Losses", Invited presentation to Statistical Decisions Annual Credit-Scoring Conference, Chernobbio, Italy, October 1997.

"Integrated Models for Risk Management on Portfolios of Automobile Leases" (with Y. Wu and D. Matthew), INFORMS national meeting, Montreal, Spring 1998.

"Integrated Models for Risk Management and Forecasting Performance on Portfolios of Automobile Leases", Invited presentation to Statistical Decisions Consumer Lending Conference, Mallorca, Spain, 1998.

"A General Manpower Planning System at the Missouri State Highway Patrol" (with R. Nauss, R. Banis and R Beck), INFORMS national meeting, Salt Lake City, Spring 2000.

"Integrated Nonstationary Markovian Models for Risk Management of Hybrid Mortgages Secured by Taiwanese Real Estate" (with C. Bilir, V.W. Huang, K Hung and M Kaplan), CORS Annual Conference, Vancouver, 2003.

"Models for Managing Effective Rates for Time-Definite Trucking" (with J.F. Campbell and R. Mundy), INFORMS/CORS annual conference, Banff, Alberta, 2004.

"Modeling Alternative Operating Procedures and Infrastructural Improvements in the Upper Mississippi River Navigation System" (with D.C. Sweeney II and J. F. Campbell), select presentation at the 2007 INFORMS Conference on O.R. Practice, Vancouver, B.C, April 29-May 1, 2007.

"Modeling and Managing Congestion at Locks on the Upper Mississippi River" (with J. F. Campbell (presenter), and D.C. Sweeney II), Auckland University of Technology, Auckland, New Zealand, July 2007.

"Modeling and Managing Congestion at Locks on the Upper Mississippi River (UMR)" (with J. F. Campbell (presenter), and D.C. Sweeney II), INFORMS Midwest Regional Conference, Northwestern University, Evanston, IL, August 2007.

"Managing Congestion at Locks on the Upper Mississippi River (UMR)" (with J. F. Campbell (presenter), and D.C. Sweeney II), 5th Workshop on Logistics and Supply Chain Management, Berkeley, California, September 2007.

"Scheduling to Improve System Performance in a Series of River Locks" (with R.M. Nauss and D.C Mattfeld), INFORMS Annual Conference, Seattle, WA, November, 2007.

"Optimization and Simulation to Reduce Congestion at Locks in a River Transportation System" (with M. Reindl, J.F. Ehmke, and D.C. Mattfeld), Odysseus International Workshop on Freight Transportation and Logistics, Izmir, Turkey, May, 2009.

"Blending Optimization and Simulation for Analysis of an Inland Waterway Transportation System", invited lecture, INFORMS Roundtable, San Diego, October 2009.

"An Optimizing Heuristic for Managing Traffic Flow at Choke Points in River Transportation Systems" (with R.M. Nauss, D.C. Mattfeld, and J. Li", Tristan VII Seventh Triennial Symposium of Transportation Analysis, Tromso, Norway, June 2010.

"Scheduling Transportation and Logistics Events in Staged Queues", (with R.M. Nauss, J.F. Ehmke, F. Bahr, and D.C. Mattfeld), Odysseus International Workshop on Freight Transportation and Logistics, Mykonos, Greece, May, 2012.

“A Discrete Event Simulation Model for Airport Capacity Planning”, (with L. Xu and J Zhang), AGIFORS (Aviation Group of the International Federation of Operational Research Societies) Seattle, WA, 2016

“Optimizing Procurement of High-value Medical Products in a Health-care Network”, (P. Kulkarni and L.D. Smith), INFORMS, Nashville, TN, Fall 2016.

“Airport and Airline Capacity Planning with Discrete Event Simulation”, (L. XU and L.D. Smith), INFORMS, Nashville, TN, Fall 2016.

“Modeling Supply Chain Risk and Risk Mitigation Strategies”, (H. Luvai and L.D. Smith), INFORMS, Nashville, TN, Fall 2016.

RESEARCH GRANTS AND CONTRACTS

Projects Directed Over \$10,000

(Except where noted otherwise, served on the following projects as principal author of proposal and as principal investigator or project director).

Federal Trade Commission, “FACTA 319 National Study on the Accuracy of Credit Bureau Information”, 2010-2013, \$1,238,679 (with M. Staten, T. Eysell, M. Karig, and others at UMSL, University of Arizona and Fair Isaac Corporation).

U.S. Department of Defense (Office of Inspector General), "Development and Application of EDP Auditing Tools for Financial Investigations", \$298,530, 1989-92. (wrote proposal and negotiated contract but provided only general coordination for the research effort on this project. John Anderson, Larry Madeo, Dave Bird, P. Pratte, and N. Ragsdale served as investigators).

Federal Trade Commission, “Extended Pilot Study on Processes for Determining the Accuracy of Credit Bureau Information”, (with M. Staten, J. Feinstein, T. Eysell, E. Lawrence), 2007-08, \$170,000.

City of St. Louis, "Preparation of a Multi-Year Strategic Plan for Municipal Information Systems", (led 25-person project team) 1995, \$106,668.

Save-a-Lot Stores, Ltd. "Development of Analytical Models for Estimating Market Potential in Urban Areas", (with S. Sanchez) 1997-98, \$105,000.

Missouri State Highway Patrol, "Development of Computerized Manpower Planning Models for Law Enforcement Agencies", (with R. Nauss and B. Banis) 1997-98, \$102,450.

Wells Fargo Bank (California), "Development of Models for Forecasting Credit Losses on Portfolios of Home Mortgages", (with E. Lawrence and S. Sanchez) 1993-94, \$95,000.

Ameren UE, “Service Delivery and Customer Relations Management at Midwestern Electric Utilities”, (With S. Nayak and M. Karig), 2013-2014, \$75,500.

22nd Judicial Circuit Court Missouri, “Study of Alternative Criminal Case Management Systems” (with Joe Rottman), 2004, \$75,000.

International Brotherhood of Electrical Workers and National Electrical Contractors Association, "Research on Business Trends, Marketing and Employee Relations in the Electrical Contracting Industry", (with D. Balser and M. Elliott) 2007-2008, \$71,000.

GE Capital, "Development of Analytical Models for Analyzing Risk and Forecasting Financial Performance of Automobile Leasing Portfolios", 1997, \$65,000.

Missouri State Highway Patrol, "Development of Computerized Manpower Planning Models for Information Services", (with A. Subramanian and R. Nauss) 1998-99, \$62,500.

Citibank, NA, Taipei Branch, Taiwan, R.O.C, "Development of a Risk Management Modeling System for Residential Mortgages in Taiwan", 2002-2003, \$55,000.

Jiangsu MasterTech Ltd., Optimizing Airside Performance at Nanjing Lukou International Airport (with Long Ping, visiting scholar), Nanjing MasterTech Ltd., (2016-17), \$55,600.

Wells Fargo Bank, "Development of Models for Risk Analysis and Forecasting Performance of Home Equity Lines of Credit", (with E. Lawrence) 1994-95, \$50,000.

Missouri Research Assistant Act, "Establishment of the UMSL Business Database and Information Service," 1984, \$49,500.

St. Louis Area Agency on Aging, "Assessment of the Needs of Elderly Residents of the City of St. Louis", (with R. Calsyn, A. Biggs, and J. Hashimi), 1988, \$47,616.

Bi-State Development Agency, "Enhancement and Implementation of the Computerized Bus-to-Block System at each of the St. Louis Metropolitan Transit Authority's Garages," (with R. Nauss, D. Bird). Largely for our successful work in designing and implementing the "Bus-to-Block" system for parking and dispatching buses in Metropolitan St. Louis, the Bi-State transit agency received the 1987 Management Innovation Award from the American Public Transit Association. 1987, \$47,000.

Bi-State Development Agency, "Bus-to-Block" for Metropolitan Transit Operations," grant received to place software in the public domain through the U.S. Urban Mass Transit Association, 1989, \$40,000.

Bi-State Development Agency, "Development of a Computerized Bus-to-Block System," (with R. Nauss, D. Bird) 1986, \$32,130.

Pattonville School District, "Impact of the Proposed Expansion of Lambert Airport upon Instructional Processes and Finances of the Pattonville School District," (with J. Campbell and J. Walter) 1990, \$30,500.

Citicorp Acceptance Corporation, "Development of Forecasting Models for Losses on Mobile Home Loans," (with E.C. Lawrence) 1989-95, \$30,500.

Citicorp Mortgage Inc., "Development of Models for Risk Management and Forecasting Performance of First Mortgage Loans", 1995, \$30,000.

GE Capital, "Development of Analytical Models for Analyzing Risk and Forecasting Financial Performance of Subprime Automobile Loans", 1998, \$30,000.

State Farm Insurance, "Service Learning Program on Individual Financial Planning and Personal Credit Management" (with T. Eyssell), \$30,000, 2006-2008.

22nd Judicial Circuit Court Missouri, "Study of Jury Management Systems" (with Joe Rottman), 2014, \$26,964.

Federal Trade Commission, "Processes for Determining Accuracy of Credit Bureau Information" (with colleagues from UMSL, Georgetown University Credit Research Center, and Fair Isaac Corporation", 2005, \$25,000.

Bi-State Development Agency, "Enhancement of Bus-to-Block System and Implementation on a Microcomputer Platform," (with D. Bird) 1997-98, \$25,000.

Wells Fargo Bank, "Quarterly Refinement and Updating of Models for Risk Management of Home Mortgage Portfolios", 1995-96, \$25,000.

University Transportation Studies Grant, "Modeling Airside Operations at Major Airports for Strategic Decision Support" 2015, \$25,000.

Weldon Springs Research Fellowship (with R. Nauss), "Development of Capacitated Gravity Models for the Solution of Facility Location Problems," 1985, \$21,000.

Bi-State Development Agency, "Design of Methods for Assigning Buses to Runs and Procedures for Controlling Traffic in Bus Station Garages," (with P. Marlin and R. Nauss) 1985, \$19,500.

St. Louis County, "Programs, Facilities and Site for the Greater St. Louis Police Academy," (with S. Decker, J. Breaugh, R. Wright, D. Dossett, V. Sauter) 1985, \$18,200.

Southwest Ohio Regional Transit Authority, "Adaptation and Implementation of a Microcomputer Version of the Bus-to-Block System," (with D. Bird) \$16,370, 1992-1993.

St. Charles County Government, "Study of Data Processing in County Government and Design of a Program for Development of Computer Systems," (with J. Anderson and D. Bird) 1985, \$15,000.

Shelter Insurance Companies, "Development and Implementation of a Computer- Based System for Marketing Research and Planning," (with J. Blodgett and M. Jansen) 1983, \$15,000.

U.S. Department of Transportation, "Simulation Modeling for Airport Asset Management" (UTC grant in collaboration with UMSL Center for Transportation Studies, 2016-17) \$12,500.

Portable Sanitation Association International, "Study of Sanitation Needs at Large Public Events and Development of Analytical Models for Site Planning," (with P. Marlin and C. Kuehl) 1983, \$10,500.

Direction of Contract Research Projects Under \$10,000

As director of the UMSL Center for Business and Industrial Studies, have also written proposals, acquired contracts, and directed work on numerous projects with contracts under \$10,000 each. Projects have included marketing research surveys, studies of competition, facility location analysis, demographic studies, and development of computer software.

Instructional Innovation

Established and offered a masters-level course "Advanced Operations Research Projects" in which students undertake actual projects in St. Louis companies. Students work under faculty direction in cooperation with managerial personnel from the host organizations. Generally students receive a semester's tuition

reimbursement when the resulting analytical models or computer system are adopted by the host organization.

Designed SIMSCRIPT-based and ARENA-based courses on computer simulation for managerial problems. Have offered the course to masters students in the School of Business Administration and to undergraduate students in computer science. A major part of the course involves the analysis and simulation of an actual system with a view toward solving managerial problems. Student projects are diverse in nature and have included simulation of aircraft patrols, inventory systems, production facilities, hospital treatment facilities, street traffic, trading activity in financial markets, airport flight and ground operations, etc.

Synopsis of Professional Activity

Professorial responsibilities include teaching, research, and consulting in applications of quantitative business analytics. Research endeavor has emphasized the development of implementable tools which use information technology and analytical models for the solution of managerial problems. Various projects have involved the development of heuristics for solution of complex scheduling problems; simulation of systems for transportation and logistics (inland waterways and airports); construction of simulation models (optimizing and nonoptimizing) for strategic planning; design and implementation of management information systems; statistical analysis and predictive analytics for marketing and customer-relations management; design of information systems for health care delivery; inter-industry assessments of business risk; studies of industrial competition; development of models and systems for management of credit risk in financial institutions; research on the integrity of “big data” in national credit-bureau files; integration of mathematical optimization and simulation for managing risk in supply chains.

Administrative responsibilities have included the promotion of applied research, acquisition of research grants and contracts, direction of projects, writing and editing of reports, and supervision of the development and implementation of computer based systems for planning and operational control under research contracts with sponsoring organizations. Occasional institutional research projects were undertaken for the UM-St. Louis central administration. Past administrative responsibilities have also included departmental coordination, recruiting, scheduling, and annual reviews of faculty performance.