Center for Business and Industrial Studies
Brief Self-Study
Submitted to the Program Audit Committee April 11, 2008
by L. Douglas Smith, Director

Center History and Mission

The Center for Business and Industrial Studies (CBIS) was formed in 1984 to encourage a program of applied research appropriate for a university located in the heart of a major metropolitan area. Its mission is: (1) to promote research on topics of direct interest to the business and professional community, (3) to undertake interdisciplinary studies in response to requests for proposals from the public and private sectors, (3) to involve students with faculty in applied research and consultation, and (3) to disseminate findings through reports to sponsoring organizations and publications in academic and professional journals.

The Center engages faculty, staff, students and other associates only as needed on a project basis, and specializes in work that requires creative analysis or unique blends of skills and knowledge not typically found in a single organization. A prominent thrust is the use of information technology and analytical models for organizational planning and management.

In the private sector, we have served firms in financial services, transportation, retailing, manufacturing, and communications. In the public sector, we have served municipal governments, school districts and various service agencies. Projects have included the development and implementation of computerized systems for bus operations in the metropolitan transit agencies of St. Louis and Cincinnati; simulation of operations in the Upper Mississippi River navigation system (in collaboration with the Center for Transportation Studies); the development of statistical models for risk management and setting loss reserves for various loan portfolios in three of the nation's largest financial institutions, and the development of a strategic plan for municipal information systems in the City of St. Louis. A more complete description of center activities is available at http://www.umsl.edu/~cbis/cbis.html.

Dissemination of research results takes place in reports of studies to sponsoring organizations and (ensuring confidentiality where warranted) in the publication of research findings in academic and professional journals. Innovations in analytical methodology and research findings from Center projects have been reported in articles published in *MIS Quarterly* (1985), *Information and Management* (1985, 1993, 1997), *Journal of Management Information Systems* (1986), *Journal of Environmental Health* (1985), *Mass Transit* (1987), *Transportation Research* (1988, 2006), *Journal of Transportation Management (*2002*), Decision Sciences* (1990, 1996), *European Journal of Operational Research* (1996), *Behavior and Information Technology* (1990), *The Bankers Magazine* (1996), *Journal of Banking and Finance* (1992, 1995), *American Review of Public Administration (*2001, 2007*), Journal of the Operational Research Society (**2008**), Computers and Operations Research* (2002), *International Review of Retail, Distribution and Consumer Research* (2003), *Information Systems and Operational Research* (2004), *Interfaces* (2005), *Review of Quantitative Finance and Accounting* (2007), and in numerous conference *Proceedings*.

University Involvement

The Center director is a Professor of Management Science in the College of Business Administration. He holds a Ph.D. in Management Sciences from the University of Minnesota (1972), an MBA from McMaster University, Canada (1968), and a BSc in Physics also from McMaster (1966). He teaches applied statistics, operations research, simulation for managerial decisions and international logistics in the College of Business Administration. With over 30 years of academic and professional experience, he has served as principal investigator and project director for many sponsored studies in corporate and governmental settings, and as a consultant to major corporations in the United States, Canada and abroad.

Over the years, approximately 50 faculty associates and 80 student research assistants have been engaged on Center projects.

The Center is accountable to the dean of the College of Business Administration. It files an annual report with the Provost. (The 2007 annual report is attached as an Appendix for reference.)

Budget

The Center receives no line-item funding from the university. All our projects are supported from external funds (including any release from teaching for the Director under the four-course research-intensive teaching load of the College).

We have $256K of external funds supporting our operation this academic year ($170K from the Federal Trade Commission for a study of accuracy of national credit-bureau data; $71K from the St,. Louis IBEW/NECA chapter for a study of employment prospects, services and labor relations in the electrical contracting industry; and $15K as a gift from State Farm Insurance to support a service-learning project on household financial planning with a related research component).

Four College faculty and a half-dozen graduate research assistants are currently engaged to various degrees on these studies.

Outcomes

Emanating from Center projects are services to the broader community and a steady stream of published research in leading journals in the Decision Sciences, Information Systems and Finance. Graduate research assistants qualify for excellent positions on graduation.

Work performed on Center projects has been recognized with several awards:

- 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).

Center Advantage

The Center has produced a creditable track record in the successful completion of a wide variety of externally funded research projects and subsequent publication of related articles in rigorously reviewed academic journals.

It helps to focus the intellectual resources of a strong faculty on highly relevant research topics and to engage our graduate students in the conduct of high-quality research.

It is structured with no fixed overhead and thus poses no risk of being a financial drain on the College or the university.

APPENDIX - Center for Business and Industrial Studies
Annual Report 2006-2007

I. Center Background and Goals for 2006-2007

The Center for Business and Industrial Studies (CBIS) was formed in 1984 to encourage a program of applied research appropriate for a university located in the heart of a major metropolitan area. Its mission is: (1) to promote research on topics of direct interest to the business and professional community, (2) to undertake interdisciplinary studies in response to requests for proposals from the public and private sectors, (3) to involve students with faculty in applied research and consultation, and (4) to disseminate findings through reports to sponsoring organizations and publications in academic and professional journals.

The Center specializes in work that requires creative analysis or unique blends of skills and knowledge not typically found in a single organization. Its program is summarized in Appendix A. A prominent thrust is the use of information technology and analytical models for organizational planning and management. In the private sector, we have served firms in financial services, transportation, retailing, manufacturing, and communications. In the public sector, we have served municipal governments, school districts and various service agencies. Projects have included the development and implementation of computerized systems for bus operations in the metropolitan transit agencies of St. Louis and Cincinnati (still in use in St. Louis after 20 years), the development of statistical models for risk management and setting loss reserves for various loan portfolios for major financial institutions in the U.S. and abroad, and the development of a strategic plan for municipal information systems in the City of St. Louis. Since the establishment of the UMSL Center for Transportation Studies (CTS) in 2000, the CBIS has also collaborated with the CTS on transportation-related research projects.

Goals for 2006-2007. Goals for the past year included (1) further collaboration with research partners at George Washington University and Fair Isaac, Corp. to position the research team as best qualified to undertake a major federally mandated study on the accuracy of credit-bureau data, (2) further work to capitalize on the development of a simulation model for the upper Mississippi River navigation system, and (3) exploration of opportunities in the international business realm.

II. Accomplishment of 2005-2006 Objectives

A final report on the research methodology for assessing the accuracy of credit-bureau information was delivered to the Federal Trade Commission and published in the FTC Report to Congress (December, 2006). Following our recommendations from the completed pilot study, the FTC has announced in the Federal Register that a second pilot study will be undertaken to experiment with additional methods of engaging consumers and additional support in resolving disputes. The RFP for the second pilot study is scheduled for release in July, 2007 with study to be completed by July, 2008. Our research team is well positioned to compete for this work.

The UMSL Development Office helped the Center secure a $15,000 gift from State Farm Insurance for a service learning project that includes a comprehensive credit audit. Services will be offered to clients of the College of Business Administration's Voluntary Income Tax Preparation (VITA) program. This program can also provide data for the second FTC pilot study.

Further work was done for the U.S. Army Corps of Engineers and the UMSL Center for Transportation Studies (CTS). We enhanced the simulation model of the Upper Mississippi River navigation system and experimented further with alternative scheduling rules and infrastructural investments, under a range of traffic scenarios. The development and application of the simulation model for the Mississippi River navigation system resulted in a best paper award at the 2007 Hawaiian International Conference in System Sciences and was featured as a "select presentation" at the 2007 INFORMS Conference on OR Practice.

Work on the UMR simulation model also helped to qualify UMSL, as a partner with SAS institute, in a short list of invited bidders for the development of an automated scheduling system for all traffic movements and lockage operations in the waters of the Panama Canal. The CBIS and SAS have collaborated intensively to produce a comprehensive design for this showcase project (affecting about one-fourth of world ocean shipping). Announcement of the successful bidder is expected by August 1, 2008. The waterway research and international business thrusts thus converged in the Panama project.

Proposed research on issues of unionization and economic development in the St.. Louis region were placed on hold pending completion of bargaining between the International Brotherhood of Electrical Workers and the National Electrical Contractors Association. A program of research has been revised and proposed for funding in 2007-2008

Academic Productivity based on Center Activity

Smith, L.D., J.F. Campbell, R. Mundy, "Modeling Net Rates for Expedited Freight Services", *Transportation Research Part E*, Vol. 43, 192-207, 2006.

Smith, L.D., B. Jin, "Modeling Exposure to Losses on Automobile Leases", *Review of Quantitative Finance and Accounting*, in press.

Rottman, J., L.D. Smith, 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*, in press.

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*.

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 (recipient of best

paper award in Decision Technologies for Management).

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" (Report to the Federal Trade Commission published in the December 2006 FTC Report to Congress under Section 319 of the Fair and accurate Credit Transactions Act), September, 2006

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

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

Smith, L.D., "Modeling an Inland Waterway Navigation System for Testing Effects of Scheduling Rules and Infrastructural Improvements", invited research lecture delivered at Braunschweig Technical University, Braunschweig, Germany, March, 2007.

Grants and Contracts

The gift of $15,000 for the financial planning and credit auditing project will have been registered through the Development Office. The $20,000 grant under which waterway simulation work was continued will have been registered through the CTS. The SAS/UMSL proposal for the Panama Canal is under revision, as all quotations in the first round of bids exceeded the ACP budget for the project. The revised budget will be approximately $2m, with UMSL budgeted at approximately 50% and bearing primary responsibility for systems analysis and development, while SAS Institute bears primary responsibility for user interfaces and software integration. A $71,000 proposal to IBEW/NECA Electrical Connection is pending approval.

III. Continuous Improvement

We continue to intensify work in the application of simulation modeling to managerial decision making. In the coming year, we are blending simulation modeling and mathematical optimization for networked service systems. SAS Institute, in recognition of our joint work on the Panama project, will provide the university with early releases of its new simulation studio and it has offered to provide its web-based software via internet access under beta test without charge. With this research thrust and software support, we intend to forge international research partnerships, attract external support and provide stimulating research projects for students in the new doctoral program in logistics and supply chain management.

IV. Resources Assigned to the Unit

The Center operates on a self-supporting basis. The Center director carries a normal teaching load for research-intensive faculty in the College of Business Administration (five semester courses per year in 2000-2004, reduced to four semester courses per year with the variable-load teaching policy introduced in 2005-2006). Faculty , staff, students and other associates are engaged on a project basis only as external funding is acquired for the projects.

Related costs are
covered by direct revenues from external grants and by the return of the portion of F&E that occurs on external grants under prevailing campus practice.

In addition to the faculty office of the Center director, the Center is allocated a 100 square-foot office with telephone and computer connection for temporary research staff and another 100-square-foot office/storage space with telephone and computer connection.

The departmental secretary on the 2nd floor of the CCB provides occasional services in preparing printed reports and supporting the teaching and research activities of the Center director.

V. Opportunities

Development and implementation of a new system to create optimal schedules for operations in the Panama Canal is an extremely challenging project. There is a small group of selected bidders for this work. SAS and UMSL are determined to offer the best proposal for this work, with hopes of securing funding for this major study.

The Federal Trade Commission is planning to request $1m for the study of credit-bureau accuracy in the 2009 fiscal year (beginning October 2008). We are seeking additional funding to experiment with different ways to engage consumers for that purpose -- again trying to position ourselves to be best qualified to conduct the national study.

VI. Immediate Challenges

Projects are undertaken by the CBIS with a dual mission – service to the community and performance of high-quality applied research, with publication of analytical innovations and research findings in highly respected academic journals. Faculty are already heavily involved with their normal commitments to teaching and their independent research programs. There is the perennial risk of dilution of productivity in the traditional areas of research, teaching and service with each new externally funded venture that is undertaken. Fortunately, the CBIS has no budgetary line; so it can gear up to undertake work when contracts are in place, deliver relevant information to the sponsoring organizations, and then take time to perform additional

analysis to meet rigorous academic standards without being a financial drain on the college or the university.

In striving to fulfill the dual mission, however, there are inevitably lost opportunities -- on one hand to generate external revenue, and on the other hand, to capitalize on academic research opportunities with data and experience acquired from past studies.

VII. Relationship to UMSL Action Plan

The CBIS provides opportunities for faculty and students to be engaged in applied research of significance to external organizations at the local, state, national and international level. It

successfully meets the needs of the sponsoring organizations while producing work that is publishable in highly respected academic outlets.

VIII. Plans for 2007-2008

A somewhat broader program of research is planned for 2007-2008 (comprising projects for previous sponsors and new sponsors, and involving faculty in the marketing and management areas). We shall, however, continue to perform intensive research with existing analytical and simulation models and submit additional papers to respected academic and professional journals as we undertake new sponsored projects.

The Center has agreed to support the Missouri State Highway Patrol in developing analytical and simulation models for design and staffing of commercial driver-examination centers throughout the state. These will complement models we developed in 2002 for noncommercial driver-examination services.