

Curriculum Vita
CHARLES EDWARD NOON

Principal Interests:

Improvement of Healthcare Operations Supply Chain Visualization and Optimization
Computer-Based Business Modeling Discrete Optimization Models

Academic Experience:

University of Tennessee, Department of Statistics, Operations, and Management Science,
August 1999 to present. **Professor.**

University of Tennessee, Department of Management, August 1993 to August 1999.
Associate Professor. Served as **Management Science Program chair** (1993-95).

University of Hawaii, Hilo, Division of Business Administration and Economics, August 1995
through December 1995. Visiting faculty appointment.

University of Tennessee, Department of Management, September 1987 through July 1993.
Assistant Professor.

Education:

University of Michigan, **Ph.D., Industrial and Operations Engineering**, 1987, dissertation
entitled, "The Generalized Traveling Salesman Problem."

University of Louisville, **Masters of Engineering, Industrial Engineering**, 1982, master's
thesis entitled, "Inventory System Analysis using Computer Simulation."

University of Louisville, **B.S., Industrial Engineering**, 1981.

Professional Experience:

University of Tennessee Center for Executive Education, currently course owner and instructor
for one-week **executive program** entitled, "**Lean for Healthcare**". Improvement
project leader/facilitator for supporting Rapid Improvement Events at Mary Washington
Hospital (Fredericksburg, VA) and Montreal General Hospital (Quebec, Canada). In
addition to the public offerings at UT, the program has been offered on-site for the U.S. Air
Force at several bases and in Dusseldorf, Germany for Stryker Incorporated.

Institute for Healthcare Improvement, January 2008 through present, adjunct faculty member
for Emergency Department collaborative. Involves facilitating simulations, on-line
webinars, and providing lectures at collaborative conferences.

ACN, Jewelry Television (Jtv), calendar year 2002, interim **Director of Modeling and
Research**. Responsibilities included organizational design, airtime portfolio management,
customer analysis, brand identification, and show performance improvement. Oversaw
numerous projects involving decision support development and implementation, process
improvement, customer surveys, brand development, and customer buying pattern
analysis. The company employed five UTK graduate students (MBA and Management
Science) a total of eight semester equivalents over the course of the year.

University of Tennessee Department of Marketing, Logistics and Transportation, academic
years 1998-99, 1999-2000, 2000-01, and 2001-02, **project director** for Supply Chain
Forum project in the area of strategic re-design of a finished goods distribution network.
The project involved the **modeling and optimization of a \$100 million logistics
network** with respect to decisions of facility location, size, handled product, and service

region. The project team was awarded the North American region *Team Excellence Award* from the host company.

Innovative Logistics, Lean Analytics, 1996 to present, provide **teaching and consulting services** to clients including Science Applications International Corporation, Consumer Value Stores, America's Collectibles Network, Philips Consumer Electronics, Dell Computer, Methodist Healthcare System, Morristown Hamblen Healthcare, Maury Regional Healthcare System, Providence Healthcare System, Carondelet Healthcare System. Projects include GIS support for market analysis, logistics system optimization modeling, and process flow analysis & training.

University of Tennessee Center for Executive Education, course owner for three-day **executive program** entitled, "**Geographic Information Systems (GIS) for Business and Logistic**,". Experience as instructor for the three-week Institute for Productivity Through Quality, the one-week Global Logistics program, four-week Executive Development Program, Supply Chain Certification Program, and customer programs (Norfolk Southern).

Homart Development Company, Chicago, Illinois, May 1985 to August 1985. Development and implementation of optimization models.

The Steiner Company, Ann Arbor, Michigan, October 1981 to September 1982. Consulting on hospital ancillary service processes and productivity.

The Procter and Gamble Company, Cincinnati, Ohio, May 1979 to January 1981. First-line supervisor and warehousing operations staff.

Awards:

Recipient of the **2007, 2006, 2004, 2002, 2001** and **1999 Outstanding Teacher Awards**, Physician's Executive MBA program, College of Business Administration, University of Tennessee.

Recipient of the 2006 **Keally Outstanding Teacher Award**, College of Business Administration, University of Tennessee.

Recipient of the 2003 **TOMBA Outstanding Second Year MBA Teacher Award**, College of Business Administration, University of Tennessee.

Recipient of the 2000 **Gregory Dobbins Outstanding Teaching and Research Award**, College of Business Administration, University of Tennessee.

Appointed as **Stokely Scholar** for the period 1995-97, College of Business Administration, University of Tennessee.

Recipient of the 1992 **Outstanding Young Engineer Award**, Speed Scientific School, University of Louisville.

Recipient of the 1991 **Allen H. Keally Outstanding Teaching Award**, College of Business Administration, University of Tennessee.

Finalist, 1986 Franz Edelman Award for Application of Management Science; with J.C. Bean, C.E. Noon, G.J. Salton, "Asset Divestiture at Homart Development Company," ORSA/TIMS in Los Angeles, April 1986.

Published Works:***Refereed Journal Publications:***

- F.B. Zhan, X. Chen, C.E. Noon, and G. Wu, "**A GIS-Enabled Comparison of Fixed and Discriminatory Pricing Strategies for Potential Switchgrass-to-Ethanol Conversion Facilities in Alabama,**" *Biomass & Bioenergy*, Vol. 28, No. 3, 2005.
- C.E. Noon, C. Hankins and M. Cote, "**Understanding the Impact of Variation in the Delivery of Healthcare Services,**" *Journal of Healthcare Management*, Vol. 48, No. 2, 2003.
- C.E. Noon, F.B. Zhan and R.L. Graham, "**GIS-Based Analysis of Marginal Price Variation with an Application in the Identification of Candidate Ethanol Conversion Plant Locations,**" *Networks and Spatial Economics*, Vol. 2, Issue 1, 2002.
- F.B. Zhan and C.E. Noon, "**A Comparison Between Label-Correcting and Label-Setting Algorithms for Computing One-to-One Shortest Paths,**" *Journal of Geographic Information and Decision Analysis*, Vol. 4, No. 2, 2000.
- R. Graham, B. English and C.E. Noon "**A GIS-based modeling system for evaluating the cost of delivered energy crop feedstock,**" *Biomass & Bioenergy*, Vol. 16, No. 1, 2000.
- F.B. Zhan and C.E. Noon, "**Shortest Path Algorithms: An Evaluation Using Real Road Networks,**" *Transportation Science*, Vol. 32, No. 1, 1998.
- R. Graham, W. Liu, M. Downing, M. Daly, C.E. Noon, and A. Moore, "**The Effect of Location and Facility Demand on the Marginal Cost of Delivered Wood Chips from Energy Crops: A Case Study of the State of Tennessee,**" *Biomass & Bioenergy*, Vol. 13, No. 3, 1997.
- R. Garfinkel, P. Sundararaghavan, C.E. Noon, and D. Smith, "**Optimal Use of Hub Facilities: A Two-Hub Model with Fixed Arc Costs,**" *TOP*, Vol. 4, No. 2, 1996.
- M. Bowers, C.E. Noon and B. Thomas, "**A Parallel Implementation of the TSSP+1 Decomposition for the Capacity-Constrained Vehicle Routing Problem,**" *Computers and Operations Research*. Vol. 23, No. 7, 1996.
- C.E. Noon and M.J. Daly, "**GIS-Based Biomass Resource Assessment with BRAVO,**" *Biomass & Bioenergy*, Vol. 10, Nos 2-3, 1996.
- C.E. Noon, J. Mittenthal, and R. Pillai, "**A TSSP+1 Decomposition Strategy for the Vehicle Routing Problem,**" *European Journal of Operational Research*, Vol. 79, 1994.
- C.E. Noon, T. Chan, and G.M. You, "**A Fast Lower Bound for the Minimum Cost Perfect 2-Matching Linear Program,**" *American Journal of Mathematical and Management Sciences*, Vol. 13 No. 3, 1993.
- C.E. Noon and J.C. Bean, "**An Efficient Transformation of the Generalized Traveling Salesman Problem,**" *Information Systems and Operational Research*, Vol. 31 No. 1, 1993.
- J. Mittenthal and C.E. Noon, "**An Insert/Delete Heuristic for the Traveling Salesman Subset-Tour Problem with One Additional Constraint,**" *Journal of the Operational Research Society*, Vol. 43 No. 3, 1992.

- C.E. Noon and J.C. Bean, "**A Lagrangian Based Approach to the Asymmetric Generalized Traveling Salesman Problem,**" *Operations Research*, Vol. 39 No. 4, 1991.
- J.C. Bean, J.R. Birge, J. Mittenenthal, and C.E. Noon, "**Match-Up Scheduling with Multiple Resources, Release Dates and Disruptions,**" *Operations Research*, Vol. 39 No. 3, 1991.
- J.C. Bean, S. Ryan, and C.E. Noon, "**Selecting Tenants in a Shopping Mall,**" lead article in *Interfaces*, Vol. 18 No. 2, 1988.
- J.C. Bean, C.E. Noon and G.J. Salton, "**Asset Divestiture at Homart Development Company,**" *Interfaces*, Vol. 17 No. 1, 1987, issue devoted to 1986 Edelman Award Finalists.

Published Refereed Conference Proceedings:

- "**Spatial Data Visualization in Healthcare: Supporting a Facility Location Decision via GIS-based Market Analysis,**" *34th Annual Hawaii International Conference on System Sciences*, Maui, Hawaii, January 2001.
- "**Poisson's Revenge and How Other Types of Variation Affect Healthcare Operations,**" *11th Quest for Quality & Productivity in Health Services Conference*, Washington D.C., September 1999.
- "**Lower Bounds for the Vehicle Routing Problem (VRP),**" *International Federation of Operational Research Societies 14th Triennial Conference*, Vancouver, July 1996.
- "**Lower Bounds for the VRP via TSSP-based Decomposition,**" *TRISTAN II*, Capri, Italy June 1994.
- "**TVA GIS-Based Biomass Resource Assessment,**" *Strategic Benefits of Biomass and Waste Fuels*, Washington, D.C., March 1993.
- "**A TSSP+1 Decomposition Approach for the Capacity-Constrained VRP,**" and "**A Cutting Plane Procedure for the Symmetric Generalized Traveling Salesman Problem,**" *TRISTAN I*, Montreal, Canada, June 1991.

Book Chapters:

- C.E. Noon, **Health Service Operations, Operations Management, Service Operations, Queuing, Waiting Time, Geographic Information System (GIS)**, entries in *Encyclopedia of Health Care Management*, editor M. Stahl (2004, Sage Publications).
- C.E. Noon, "**Designing, Managing and Improving Healthcare Operations,**" chapter in *The Physician's Essential MBA: What Every Physician Leader Needs to Know*, editors M. Stahl and P. Dean (1999, Aspen Publishers).
- J.C. Bean, S. Ryan, and C.E. Noon, "**Selecting Tenants in a Shopping Mall,**" lead article in *Interfaces*, Vol. 18 No. 2, 1988. This article was selected for inclusion in the text *Cases and Readings in Management Science*, Second Edition, by Barry Render and Ralph Stair (1990, Allyn and Bacon).

Other Publications and Reports:

C.E. Noon, "**Healthcare Can Take Some Cues from Queuing Theory,**" *Immediate Care Business* and *Today's Surgicenter*, March/April 2008.

C.E. Noon, "**Service Operations at Tennessee Department of Human Services,**" Center for Business and Economic Research, June 2002.

Funded Research, Grants and Fellowships:***Externally Funded (cumulative total over \$800,000):***

"Lean Healthcare Simulation Development," United States Air Force, \$58,400, May 2007 through October 2007. This project involved the development and testing of a hands-on, multi-stage clinical healthcare simulation. The simulation was tested during a 1-week program at Lackland Air Force base in San Antonio, Texas and has been fully adopted within the Lean for Healthcare programs.

"Airtime and Market Modeling," sole principal investigator, America's Collectibles Network, \$54,500 January 2002 through May 2003. This project involved innovative computer-based modeling of strategic business decisions including pricing models, performance measures, and airtime demographics analysis. This research supports two Management Science masters students.

"GIS-Based Decision Support for Integrated Midwest Biomass Resource Analysis," sole principal investigator, Martin Marietta Energy Systems, \$310,000, October 1993 through September 1997. This project involved transportation modeling and evaluation within a Geographic Information System platform.

"Biomass Resource Assessment for Wood Cofiring," sole principal investigator, Electric Power Research Institute, \$240,000, August 1993 through December 1995. This project focused on the development of a GIS-based decision support system for evaluating the delivered costs of bulk raw materials.

"Biomass Resource Assessment Model Phase I: Analysis for Four TVA Power Plants," sole principal investigator, Tennessee Valley Authority, \$134,818, April 1992 through September 1993. This study involved the modeling of procurement and transportation costs for an array of alternative fuels for selected TVA coal-fired plants.

"Proposal Development for Phase I of Biomass Resource Assessment Model," sole principal investigator, Tennessee Valley Authority, \$6000, March 1992 through September 1992.

Internally Funded (cumulative total over \$125,000):

"Analyzing Service Operations Capacity at Tennessee Department of Human Services," project support, Center for Business and Economics Research, \$50,000, October 2000 through December 2001. This project involved studying workflow processes at the Tennessee DHS and recommending job improvements and strategies for staffing.

"A Website for the Distribution of Geographic Data and for Demonstration of Interactive Query," co-principal investigator with Bruce Ralston, Innovative Technology Development Fellowship, \$10,000, January 1997 through August 1997. The website enabled users to download selected Tiger data and a conversion engine in order to create usable data layers.

"Evaluation of Scrap Tire Processing and Transportation Strategies," sole principal investigator, Energy and Environment Research Center, \$48,400, August 1994 through June 1997. The focus of this project was the development of a spreadsheet-based state-wide transportation analysis tool for scrap tire strategy evaluation.

"LP-based Approaches for Complex Vehicle Routing Problems," sole principal investigator, College of Business Administration Summer Faculty Research Fellowship, \$7000, May 1990 through August 1990.

"European Collaboration in Stochastic Routing and Production Scheduling," sole principal investigator, College of Business Administration Summer Faculty Research Fellowship, \$9500, May 1989 through August 1989.

Courses and Degree Programs:

Professional Degree Programs: core development team and faculty member **Physician's Executive MBA program** (1998-2005), faculty member **Full-Time MBA program** (2001-07), provide several sessions in the **Senior Executive MBA program** (2006), faculty member **Taiwan Executive MBA program** (1999-2000), faculty member **Professional MBA program** (1999-2002).

Management Science: Leveraging Information through Descriptive & Prescriptive Modeling (Mgmt. Sci. 551), Integer Programming (Mgmt. Sci. 631), Network Flows (Mgmt. Sci. 621), Vehicle Routing and Scheduling (Mgmt. Sci. 681), Application of Management Science Methods (Mgmt. Sci. 534).

Professional Associations and Service:

Member: Institute for Operations Research and the Management Sciences, Institute of Industrial Engineers, Tau Beta Pi (engineering honor society).

Journal Referee: Operations Research, Transportation Science, Interfaces, Mathematical Programming, Management Science, Annals of Operations Research, Naval Research Logistics, Networks, EJOR, IIE Transactions, and numerous other journals.

Area Editor: Interfaces (healthcare) 2000-2005.

Selection Committees: Informs Prize, 2000-2001 (chair); Nicholson Prize for Operations Research, 1995.

UT Service: Faculty Senate 1994-97, CBA Dean Faculty Advisory Committee 1999-2001.

Directed Graduate Students:

Anurag Aggarwal, *"The Deterministic Repeatable Inventory Routing Problem,"* (director), **Ph.D. Management Science**, December 1999. Currently employed as Assistant Director of the UT Transportation Research Center.

Ben Thomas, *"Parallel Approaches for Vehicle Routing Problems,"* (co-director with Dr. Melissa Bowers), **Ph.D. Management Science**, 1995. Currently employed as Project Leader at Lockheed Martin.

Vanditha Mukund, "*A Decomposition Approach to the Traveling Salesman Problem with Time Windows*," (director), **Ph.D. Management Science**, 1995. Self-employed as consultant in Rochester, NY.

Vickie Wester, "*A Genetic Algorithm for the Vehicle Routing Problem*," (director), **M.S. Management Science**, 1993. Systems developer at UT Transportation Research Center.

Rekha Pillai, "*The Traveling Salesman Subset-Tour Problem with One Additional Constraint*," (director), **Ph.D. Management Science**, 1992. This thesis was co-winner of the 1993 INFORMS Transportation Section dissertation award. Employed as research project leader at ORNL.

Mehdi Sepehri, "*A Cutting Plane Approach for the Symmetric Generalized Traveling Salesman Problem*," (director), **Ph.D. Management Science**, 1991. Faculty member at Tarbiat Modarres University, Tehran, Iran.

Graduate Student Committees:

Cameron Coates (expected 2009), "*Model Formulation of Nuclear Safeguards System Effectiveness*," **Ph.D. Industrial Engineering**.

Xin Zhang (2007), "*The Generalized DEA Model of Fundamental Analysis of Public Firms, with Application to Portfolio Selection*," **Ph.D. Management Science**.

Fahad Almutairi (2007), "*Algorithms for Multi-Sample Cluster Analysis*," **Ph.D. Management Science**.

Barbara Thibedeau (2006), "*Essays on Contingency Allocation under Uncertainty in Project Management*," **Ph.D. Management Science**.

Xinjie Shi (2006), "*Essays on Quantitative Analysis of Supply Chain Structures, Contracts, and Coordination*," **Ph.D. Management Science**.

Bychkov Maksym (2005), "*New Approaches to Risk Management and Scenario Approximation in Financial Optimization*," **Ph.D. Management Science**.

Donna Davis (2003), "*The Effect of Brand Equity in Supply Chain Relationships*," **Ph.D. Marketing and Logistics**.

Ike Patterson (2001), "*Decomposition Techniques for Large Scale Stochastic Linear Programs*," **Ph.D. Management Science**.

Gazi Shbikat (2000), "*The Money – Output Relationship: A Disaggregated Approach*," **Ph.D. Economics**.

Guey-Mei You (1998), "*New Solution Methodologies for Multi-period Stochastic Programming Decision Models*," **Ph.D. Management Science**.

Jose Velasquez (1997), "*Conservation Reserve Program Abandonment Impacts Under General Equilibrium Conditions*," **Ph.D. Agricultural Economics**.

Robin Lovgren (1996), "*Mixed-Model Assembly Line Sequencing Problems*," **Ph.D. Management Science**.

Stephanie Wolf (1996), "*Parallelization of the Set Partitioning Method for Optimally Solving the Vehicle Routing Problem*," **M.S. Computer Science**.

Laird Williams (1991), "*Analysis of Two Probabilistic Models of Fault Diagnosis*," **M.S. Computer Science**.

- Arup Mukherjee (1991), *"Active Resource Scheduling with Equivalent Tasks, Unary Demands and Hierarchical Structure Capacity Constraints," Ph.D. Management Science.*
- Ramaier Sriram (1991), *"Locating Interactive Hub Facilities," Ph.D. Management Science.*
- Julian Ray (1990), *"The Flow-Resource Facility Location Problem," Ph.D. Geography.*
- Tak Lee (1988), *"Distributed Optimization of Linear Programs Using Dantzig-Wolfe Decomposition," Ph.D. Management Science.*

National/International Presentations:

National Invited Presentations & Workshops (selected):

- "Interactive ED Simulation: Applying Lean Principles in Emergency Department and Other Health Care Settings,"* Institute for Healthcare Improvement National Forum, Nashville December 2008.
- "Achieving Lean Flow in Healthcare - What Works, What Doesn't, and Why,"* Innovations in Healthcare Delivery, University of Cincinnati, September 2008.
- "How to Lose Wait in the ED,"* Institute for Healthcare Improvement Emergency Department Collaborative, St. Louis, October 2007.
- "A Multi-Objective Inventory Location Problem with Redundant Coverage,"* University of Alabama Culverhouse School of Business, April 2006.
- "Spatial Data Visualization in Healthcare: Supporting a Facility Location Decision via GIS-based Market Analysis,"* Hawaii International Conference on System Sciences, Maui, January 2001.
- "An Inventory Routing Problem Model for the Construction of Oil Barge Pickup Routes,"* INFORMS National Meeting, Philadelphia, November 1999.
- "An Application of Market & Capacity Analysis for Locating & Sizing a Rural Neonatal Intensive Care Unit,"* INFORMS National Meeting, Philadelphia, November 1999.
- "GIS for Business and Logistics,"* Environmental Systems Research Institute (ESRI) Users Conference, San Diego, July, 1998.
- "Looking to the Future: GIS for Virtual Response in Logistics,"* Council of Logistics Management Annual Conference, Orlando, October, 1996.
- "Supply Chain Analysis Using GIS: Raw Material Sourcing,"* Council of Logistics Management Annual Conference, Orlando, October, 1996.
- "Transportation and Site Location Analysis for Regional Integrated Biomass Assessment,"* Bioenergy '96, Nashville, September 1996.
- "Beyond Assessment of Resources: Procurement of Woody Biomass Fuels,"* Bioenergy '96, Nashville, September, 1996.
- "A Study of Lower Bound Quality for the VRP Set Partitioning Linear Program,"* INFORMS National Meeting, Los Angeles, April 1995
- "Procurement Zoning for Biomass Resource Assessment,"* ORSA/TIMS Joint National Meeting, Detroit, Michigan, October 1994.

"TVA GIS-Based Biomass Resource Assessment," Strategic Benefits of Biomass and Waste Fuels, Washington, D.C., March 1993.

"A TSSP+1 Decomposition Strategy for the VRP," ORSA/TIMS Joint National Meeting, San Francisco, California, November 1992.

"The Generalized Traveling Salesman Problem for Routing and Scheduling," Rensselaer Polytechnic Institute, Troy, New York, March 1990.

International Invited Presentations and Programs (selected):

"Spreadsheet-based Simulation and Optimization Models for Staffing in Healthcare," Institute of Industrial Engineers Annual Conference, Vancouver, May 2008.

"Determining Shift Schedules for 24-hour Queueing Systems with Varying Arrivals Rates," Quantitative Modeling in the Management of Healthcare conference, The Institute of Mathematics and Its Application, London, April 2007.

"Lean Transformation in Healthcare," Montreal Children's Hospital and Royal Victoria Hospital, with Jody Crane and Keith Leitner, December 2006.

GIS-Transportation and Logistics Program for Executives, Chinese University of Hong Kong, with Bruce Ralston and Shih-Lung Shaw (Geography), March 2002.

"Lower Bounds for the Vehicle Routing Problem (VRP)," International Federation of Operational Research Societies 14th Triennial Conference, Vancouver, July 1996.

"Lower Bounds for the VRP via TSSP-based Decomposition" TRISTAN II, Capri, Italy June 1994.

"The Generalized Traveling Salesman Problem and Its Applications," Korean Advanced Institute of Science and Technology, Daejeon, and Pohang Institute of Science and Technology, Pohang, South Korea, March 1992.

"A TSSP+1 Decomposition Approach for the Capacity-Constrained VRP," and *"A Cutting Plane Procedure for the Symmetric Generalized Traveling Salesman Problem,"* TRISTAN I, Montreal, Canada, June 1991.

"Match-Up Scheduling with Multiple Resources, Release Dates and Disruptions," Laboratoire d'Automatique et d'Analyse des Systemes du CNRS, Toulouse, France, July 1989.

Contact Information:

Office Address:

Management Science Program
612 Stokely Management Center
The University of Tennessee
Knoxville, TN 37996-0562
(865) 974-1683
(865) 974-8636 (fax)
e-mail: cnoon@utk.edu

Home Address:

1305 Shadybrook Cove Lane
Knoxville, TN 37922
(865) 690-3393

Personal:

Married with three children (ages 16, 14, 11)
Hobbies include soccer, squash, cycling, camping, sailing, running
Coach elementary chess teams