

## ARTHUR J. SWERSEY

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### **Professional Experience**

Yale School of Management, New Haven, CT.

1982 – present    Professor of Operations Research. Teaching courses in quality management, operations management, and probability and statistics.

1986 - 1988        Associate Dean for Professional Studies

1978 - 1981        Associate Professor.

1976 - 1977        Visiting Lecturer.

1976                The Rand Corporation, Washington, D.C.

Senior Operations Research Analyst. Analyzed criminal arrest patterns as part of an LEAA-sponsored study of the habitual offender.

1968 - 1975        The New York City-Rand Institute, New York, NY.

Director of Criminal Justice Research and Coordinator of Operations Research (May 1974-October 1975). Held one of the two highest positions on the research staff and served on the Management Committee. Major responsibility was project leader of the New York City police project, directing and participating in a number of studies including an operational analysis in one police precinct aimed at reducing crime and improving police performance, a study of the Detective Bureau seeking to identify those factors which lead to case solutions, and an analysis of the changing homicide pattern in New York City over the last ten years. Also performed analysis of the distribution of fire protection in Washington, D.C. as court-appointed expert in equity case.

Director of Research, Delivery of Urban Services (May 1973-May 1974). Led one of the three major research groups at the Institute. Responsible for directing work of about fifteen professionals in the areas of fire protection, transportation, and sanitation. Major duties included leader of New York City fire project and principal investigator for \$125,000 NSF sponsored study to evaluate policy-related fire research.

Fire Project Leader (May 1972-May 1973). As project leader, responsible for research with a budget of about \$600,000 per year.

Operations Research Specialist. (June 1968-May 1972). Analyzed and helped implement ways for reducing dispatching delays; developed methods for relocating fire engines; co-authored a functional definition of a computer-aided Management Information and Control System; developed an algorithm for deciding how many fire engines to dispatch to an incoming alarm; and led the effort which resulted in the Fire Department's new adaptive response policy.

Columbia University, New York, N.Y.

1966 -1967      Instructor in Engineering Probability.

Summer 1966    Mathematica, Princeton, New Jersey, Operations Research Analyst.

1965 (summer) Johnson & Johnson, New Brunswick, New Jersey, Operations Research  
1964 (summer) Analyst.

1960 –1961      Stop & Shop, Boston, Massachusetts, Operations Research Analyst.

1959 (summer) Sylvania Electronic Systems, Waltham, Mass.

## **Education**

Columbia University

Received Doctor of Engineering Science degree in Operations Research in 1972.  
Dissertation: "Models for Reducing Fire Engine Response Times."

Received Master of Science degree from same department in 1964.

Studies supported by a Fellowship Grant from the National Science Foundation.

Massachusetts Institute of Technology

Received Bachelor of Science degree in Industrial Management in 1961.

## **Personal**

Born May 26, 1939. Married to Jane Swersey

## **Awards**

"Improving the Deployment of New York City Fire Companies," E. Ignall, P. Kolesar, A. Swersey, W. Walker, E. Blum, G. Carter and H. Bishop, Interfaces, February 1975, was awarded the 1976 NATO Systems Science Prize of 100,000 Belgian francs. This is an international competition for applications oriented papers sponsored by the NATO special program panel on systems science. The 1976 competition was open to papers published during the three-year period 1973-1975. This paper was awarded second prize in the annual Edelman Prize competition sponsored by the TIMS College on the Practice of Management Science. It was awarded second prize in that competition.

"An Application of the Monte Carlo Technique to the Supermarket Checkout Problem," was judged second best in competition for best undergraduate thesis in Industrial Management at M.I.T. in 1961.

Yale School of Management Alumni Teaching Award 1989

1991 Elm and Ivy Award for work with the New Haven Fire Department.

Finalist in 1992 Edelman Prize Competition for Management Science Achievement.

Yale School of Management Alumni Association Faculty Recognition Award, 2002.

Yale School of Management Alumni Teaching Award 2005

Annual Teaching Award, Yale School of Management Executive MBA Program, Class of 2010

Annual Teaching Award, Yale School of Management Executive MBA Program, Class of 2012

Named one of 50 Best Business School Professors by Poets and Quants business school website, 2012

Annual Teaching Award, Yale School of Management Executive MBA Program, Class of 2015

Annual Teaching Award, Yale School of Management Executive MBA Program, Class of 2016

Yale School of Management Alumni Teaching Award 2016 (core course instructors)

Voted by SOM students to give TED type talk at Inspiring Yale 2016, gathering of faculty speakers from Graduate and Professional Schools

2019 Yale SOM Alumni Engagement Award

## **Professional Societies and Other Activities**

Member of Institute for Operations Research and the Management Sciences (INFORMS),

American Society for Quality (ASQ).

Editorial Board, *International Journal of Strategic Sciences* (IJADS)

Member of National Fire Protection Association Committee on Fire Department Organization, 1974-1984.

Consultant to United States Fire Administration on study concerning fire protection policy issues and fire data needs, 1977.

Consultant to City of Hartford on Fire/Police study, 1980.

Consultant to Department of Transportation, State of Pennsylvania on siting of emissions testing stations

Consultant to Circuit-Wise, U.S. Repeating Arms Corp., Uniroyal Chemical, McKinsey and Co., Turbo Products International, Xerox, Sun Healthcare, Oxford Health Plans, Pfizer, American Express, Mother Jones Magazine, Howmedica, and Alvarez and Marsal on quality management, statistical process control, experimental design, and supply chain management

Member of Advisory Committee on Management Education, Yale China Association.

Lecturer on Systems Analysis and Statistics, New York City Police Management Institute, 1989-1997.

One of four faculty organizers for First Conference of the Production & Operations Management Society (POMS) College of Service Operations—"Operations Management in Services: Theory and Practice." The conference was sponsored by Yale SOM, NYU Stern, Wharton, and Columbia Business School and held at Columbia, December 3 & 4, 2004.

Consultant to Attorney General's Office, State of California, law suit against Mattel regarding lead paint in toys

### **Military Service**

Entered active duty as 2/Lt. in February 1962. Completed two-year tour at Fort Slocum, New York.

### **Publications**

#### Books

Delivery of Urban Services, TIMS Studies in the Management Sciences Series, North-Holland/American Elsevier, 1986 (co-edited with E. Ignall).

Testing 1-2-3: Experimental Design with Applications in Marketing and Service Operations, Design of Experiments: with J. Ledolter), Stanford University Press, 2007

## **Articles and Book Chapters**

"Improving the Deployment of New York City Fire Companies" (with E. Ignall, P. Kolesar, W. Walker, E. Blum, G. Carter and H. Bishop), Interfaces, February 1975, pp. 48-61. This paper was awarded the 1976 NATO Systems Science prize. It also won second prize in the 1974 competition for applications-oriented papers sponsored by the TIMS College on the Practice of Management.

"Fire Department Communications: Reducing Dispatching Delays," chapter 19 of E. S. Quade, Analysis for Public Decisions, Elsevier, 1974, pp. 270-297. Also this work is discussed in Paul Dickson's Think Tanks, Atheneum, 1971 and in Greenberger, M. et al., Models in the Policy Process, Russell Sage Foundation, 1976.

"Fire Department Deployment Analysis," The Rand Fire Project (W. Walker, J. Chaiken, and E. Ignall (eds.), Elsevier North-Holland, 1979. I am a contributing author having written chapter 2, "Fire Department Organization and Firefighting Operations," pp. 47-67, and chapter 14, "Deployment Case Studies," pp. 549-628. In addition, my work is described throughout the book.

"Quantitative Methods," chapter 4 of the New Educational Programs in Public Policy, JAI Press, 1981, pp. 77-100, co-authored with four others.

"What Does Fire Research Have to Do with Fire Protection" (with E. Ignall), Fire Journal, January 1980, pp. 63-74.

"A Markovian Decision Model for Deciding How Many Fire Companies to Dispatch," Management Science, 28(4), 352-365 (1982).

"Scheduling School Buses" (with W. Ballard), Management Science, 30(7), 844-853 (1984).

"Introduction," Chapter 1 of Delivery of Urban Services, TIMS Studies in the Management Sciences Series, North Holland/American Elsevier, 1986, pp. 1-8.

"The Deployment of Urban Emergency Unit: A Survey," (with P. Kolesar) in Delivery of Urban Services, TIMS Studies in the Management Sciences Series, North Holland/American Elsevier, 1986, pp. 87-119.

"A Transportation Problem in Which the Costs Depend on the Order of Arrival," (with E. Denardo and U. Rothblum), Management Science, 34(6), 774-783 (1988).

"Firefighters' Union Undermines Reorganization Plan" Forum, New Haven Register, June 7, 1992.

"Improving Fire Department Productivity: Merging Fire and Emergency Medical Units in New Haven," (with L. Goldring and E. Geyer). Finalist in \$15,000 Edelman Prize competition, Interfaces, 23(1), January-February 1993.

"Quality Practices and Results of Japanese and U.S. Firms in the Printed Circuit Industry"

Invited paper, 4th International Symposium on Printed Circuits, Tokyo, Japan, June 7, 1993, published in conference proceedings.

"The Deployment of Police, Fire and Emergency Medical Units," in A. Barnett, S.M. Pollock and M. Rothkopf, eds., *Operations Research and the Public Sector*, Handbooks in OR & MS, Vol. 6, 1994, Elsevier, 49 pages.

"An Integer Programming Model for Locating Vehicle Emissions Inspection Stations (with L. Thakur), *Management Science*, 41(3), March 1995.

"Quality Activities and Quality Performance of Japanese and U.S. Firms in the Printed Circuit Board Industry," (with S. Ishii and H. Takamori) in P. Lederer and U. Karmarkar, eds. *The Practice of Quality Management*, Kluwer Academic Publishers, 1997. (Also, translated into Japanese and published by the Japan Printed Circuit Association (JPCA)).

"An Evaluation of Pre-Control" (with J. Ledolter), *Journal of Quality Technology*, Vol. 29, No. 2, April 1997.

"Dorian Shainin's Variables Search Procedure: A Critical Assessment" (with J. Ledolter), *Journal of Quality Technology*, Vol. 29, No. 3, July 1997.

"Experimental Design on the Front Lines of Marketing: Testing New Ideas to Increase Direct Mail Sales," (with Gordon Bell and Johannes Ledolter), *International Journal of Research in Marketing*, September 2006, Vol. 23 Issue 3, pages 309 – 319.

"Using a Fractional Factorial Design to Increase Direct Mail Responses at Mother Jones Magazine," (with Johannes Ledolter), *Quality Engineering*, October 2006, Vol. 18, Issue 4, pages 469 – 475.

"A Placket-Burman Experiment to Increase Supermarket Sales of a National Magazine," (with Gordon Bell and Johannes Ledolter), *Interfaces*, March 2009, Vol. 39, Issue 2, pages 145-158.

"The Service Quality Platform," *Quality Progress*, December, 2013

"A Novel Approach for Distinguishing Minimal from Significant Prostate Cancer," (with John Colberg, Ronald Evans, Michael Johannes Ledolter, and Rodney Parker), working paper January 2016.

Review of the book, "Applied Probability: Models and Intuition," by Arnold Barnett, *Interfaces*, Volume 46, Issue 4, July-August 2016.

Rabinowitz, PM, Cantley L, Galusha D, Trufan S, Swersey A, Dixon-Ernst C, Ramirez V, Neitzel N: Assessing Hearing Conservation Program Effectiveness: Results of a Multisite Assessment," *Journal of Occupational and Environmental Medicine (JOEM)* 2018; 60 (1) 29 -35.

Arthur J. Swersey, John Colberg, Ronald Evans, Michael Kattan, Johannes Ledolter, and Rodney Parker, "Decision Models for Distinguishing Between Clinically Insignificant and Significant Tumors in Prostate Biopsies: An Application of Bayes' Theorem to Reduce Costs and Improve Outcomes," *Health Care*

*Management Science*, 2020.

Neel Butala, Katrina Armstrong, Arthur Swersey, Michael Hidrue, Jagmeet Singh, Jeffrey Weilburg, Jason Wasfy, and Timothy Ferris, "Measuring Individual Physician Clinical Productivity in an Era of Consolidated Group Practices." *H Healthcare: The Journal of Delivery Science and Innovation*, Volume 7, Issue 4, December 2019.

Peter Rabinowitz, Linda Cantley, Arthur J. Swersey, and Richard Neitzel, "Evaluating Haring Conservation Program Effectiveness," chapter in Noise Manual, 6<sup>th</sup> Edition, 2022.

Cheng Hua and Arthur J. Swersey, "Cross-Trained Fire-Medics Respond to Medical Calls and Fire Incidents: Algorithms for a Three-State Spatial Queuing Problem," under review at *Manufacturing and Service Operations Management*.

Cheng Hua and Arthur J. Swersey, "A Novel Birth and Death Chain Formulation and Solution to a Spatial Queuing Problem." Working paper.

### **Published Reports**

Reducing Fire Engine Dispatching Delays, report R-1458-NYC, The Rand Corporation, Santa Monica, December 1973, 43 pages.

An Analysis of the Deployment of Fire-Fighting Resources in Yonkers, New York, (with J. Hausner and W. Walker), report R-1566/2, The Rand Corporation, Santa Monica, October 1974, 60 pages.

Fire Protection and Local Government: An Evaluation of Policy-Related Research (with E. Ignall, P. Armstrong, H. Corman and J. Weindling), report R-1813, The Rand Corporation, Santa Monica, October 1975, 268 pages. This report was sponsored by NSF. A. Swersey and E. Ignall are the principal authors.

### **Conference Proceedings**

"Applications of Systems Analysis to Urban Fire Protection," Proceedings of the Third Annual Meeting of the American Institute for Decision Sciences, 1971. Also published as P-4741, The New York City-Rand Institute, November 1971, 8 pages.

"Research for the New York City Fire Department," Colloquia on Fire Problems, the Johns Hopkins University, Applied Physics Laboratory, Silver Springs, Maryland, October 1972.

"Fire Research Needs and Priorities," Proceedings of Conference on Fire Safety for Buildings: Research/Practice Needs, Airlie House, Warrenton, Virginia, July 1973, pp. 287-291.

"The Deployment Problem: Allocating Fire-Fighting Resources to Meet Demands for Service," Proceedings of a Conference and Workshop on Fireground Command, Control, and Communications, the Johns Hopkins University, Applied Physics Laboratory, December 1974, pp. 36-51.

### **Papers Presented at Professional Meetings and Unpublished Reports**

A Functional Definition of a Computer-based Command and Control System for the New York Fire Department (with R. Archibald, D. Brown and R. Watson), The New York City-Rand Institute, June 1969, 123 pages.

"Dispatching, Deployment and Relocation of Fire Engines," presented to the 37th National Meeting of the Operations Research Society of America, Washington, D. C., 1970.

"Evaluating Fire Department Deployment Options" (with G. Carter, E. Ignall, P. Kolesar and W. Walker), presented to the joint National Meeting of ORSA/TIMS/AIIE, Atlantic City, New Jersey, November 1972, 25 pages.

"Determining Municipal Fire Resource Needs," paper presented at the Fall meeting of the National Fire Protection Association, Seattle, Washington, November 1974.

The Investigation of Commercial Robbery in Manhattan (with I. Rudowsky), The New York City-Rand Institute, October 1975, 92 pages.

Crime in New York City's 20th Precinct (with E. Enloe and T. Crabill), The New York City-Rand Institute, October 1975, 92 pages.

"A Greater Intent to Kill: The Changing Pattern of Homicide in Harlem and New York City," original 1975, revised 1981, 1982, 52 pages. Also, presented at the joint ORSA/TIMS meeting in Miami Beach, November 1976. This study was the subject of a New York Times story: S. Raab, "Deliberate Slayings on Increase Here," February 27, 1976, page 1.

Fire Protection Issues and Fire Data Needs (with E. Ignall), report to the United States Fire Administration, February 1978, 79 pages.

"Reducing Waiting Times in a Hospital Emergency Room" (with C. McLeod), paper presented at the XXIV International Meeting of TIMS, Hawaii, June 1979.

"Equity and the Distribution of Fire Protection: The Washington D. C. Court Case," paper presented at the TIMS/ORSA meeting, Washington, D. C., May 1980.

"An Algorithm for Scheduling School Buses" (with W. Ballard and T. Rutherford), paper presented at the CORS/TIMS/ORSA meeting in Toronto, May 1981.

"Linear Programming Models for Scheduling School Buses" (with W. Ballard), paper presented at TIMS International Meeting, Copenhagen, Denmark, June 1984.

"The Deployment of Urban Emergency Units: A Survey" (with P. Kolesar), paper presented at ORSA/TIMS Conference, Miami, October 1986.

"Implementing a Prevention Program: What's Needed," paper presented at 41st Annual North East Quality Control Conference, West Springfield, Massachusetts, October 1987.

"Management Education in the U.S." and "Statistical Process Control," lectures given at Peoples University and Fudan University, Peoples Republic of China, June, 1988.



"An Integer Programming Model for Locating Vehicle Emissions Inspection Stations" (with L. Thakur), paper presented at ORSA/TIMS Conference, New York City, October 1989.

"A Simulation Model of an Equipment Repair System," (with T. Cole) paper presented at ORSA/TIMS Conference, Nashville, May 1991.

"SPC on the Shop Floor: Keys to Successful Implementation," presented at the Annual Meeting of Statistical Process Control Society, Hartford/Springfield Chapters, November 1991.

"Applications of Statistical Process Control and Experimental Design Methods," ORSA/TIMS Joint National Meeting, San Francisco, November 2-4, 1992.

Invited panel member, Teaching Quality Management to MBA's ORSA/TIMS Joint National Meeting, Phoenix, Oct. 30-Nov. 2, 1993.

"Politics and Policy Analysis: Merging Fire and Emergency Services in New Haven," ORSA/TIMS joint National Meeting, Boston, Apr. 24-27, 1994

"Quality Management in the US and Japan: A Comparison of Printed Circuit Board Manufacturers," ORSA/TIMS joint National Meeting, Detroit, October 23-26, 1994.

"A Spatial Queueing Model for the Deployment of Emergency Units on a Line,"(with A. Ha), Paper presented at INFORMS national meeting, May 5-8, 1996, Washington, D.C.

"Finding the Optimal Stocking Level for Video New Releases," (with A. Ha). Paper presented at INFORMS national meeting, May 4-7, 1997, San Diego, CA.

"A Simulation Model for Detecting Prostate Cancer,:( with Albert Ha), presented at the INFORMS Meeting, Seattle, October 1998.

"Models for Detecting and Assessing the Severity of Prostate Cancer," (with Albert Ha), presented at the INFORMS national meeting, Philadelphia, 1999

"Decision Models for Prostate Cancer Detection and Treatment," (with Albert Ha and Ron Evans), presented at the INFORMS national meeting, Miami Beach, 2001.

"Models for Predicting and Assessing the Severity of Prostate Cancer," (with Rod Parker), First Conference of the Production & Operations Management Society (POMS) College of Service Operations—"Operations Management in Services: Theory and Practice." Columbia University, December 3 & 4, 2004.

"Looking Back and Looking Forward: Peter Kolesar's Research on the Deployment of Emergency Service Units," invited talk at Peter Kolesar's retirement celebration at Columbia Business School, April 25, 2006

"An Experiment to Increase Magazine Sales in a Supermarket," (with Gordon Bell and Johannes Ledolter), presented at INFORMS national meeting, Seattle, November 2007

"An Effective Methodology for Predicting the Severity of Prostate Cancer Based on Biopsy

Results,” paper presented at INFORMS Annual Meeting, Phoenix, Arizona, October 2012

“A New Approach for Predicting the Severity of Prostate Cancer Based on Biopsy Results,”  
INFORMS Healthcare 2013 conference, Chicago, June 23- 26. 2013

“Improving Fire Department Productivity: Merging Fire and Emergency Medical Units,” INFORMS annual meeting, San Francisco, November 2014. I was also session chair.

"A Novel Approach for Distinguishing Minimal From Significant Prostate Cancer," Global Health and Innovation Conference, New Haven, April, 2016.

“Models for Merging Fire and Emergency Medical Units” (with Cheng Hua, Fernando Y. Chiyoshi, Ana Paula Iannoni), INFORMS Annual Meeting, Houston Texas. October 2017

“Improving Productivity: An Emergency Service System in which Cross-Trained Fire-Medics Respond to Medical Calls and Fire Incidents. INFORMS Annual Meeting, November 2019  
Improving Productivity: An Emergency Service System in which Cross-Trained Fire-Medics Respond to Medical Calls and Fire Incidents

## Cases

The National Energy Board of Canada.

New Haven Board of Education (A)

New Haven Board of Education (B)

Yale-New Haven Hospital Emergency Room

Xerox 9200 Service Strategys.

City of Trenton, 13 pages.

Regal Tire Company (with D. Luan). This case was judged best in its group at a Case Research Association Workshop, New Orleans, November 1980

Patrol Car Allocation Model

New York City Health and Hospitals Corporation

Flowbest Paint Company (written by Kay Snowden under my supervision)

Jones Foods

New York City Fire Department Communications Office.

Camden Steel and Aluminum (written by Kay Tousley under my supervision)

Waste Water Disposal in Nassau County

American Circuit Board Company

Mother Jones (A) and (B)

Peak Electronics: The Broken Tent Problem (A) and (B)

City Hospital Emergency Room

Dispatching Repair Teams at National Office Products

Cranberries!

Williamsport Rehabilitation Hospital (with Rod Parker)

American Greetings

Toyota 2010: Crisis at the World's Largest Car Maker

January, 2022