

Joseph M. Sussman, Professor

JR East Professor

Professor of Civil and Environmental Engineering and
Engineering Systems

Educational History

- Ph.D. 1967, MIT
- M.S.C.E. 1963, University of New Hampshire
- B.C.E. 1961, City College of New York

Areas of Specialization

- Transportation systems and institutions; regional strategic transportation planning; intercity freight and passenger rail; intelligent transportation systems; simulation and risk assessment methods; complex, large-scale, interconnected, open, sociotechnical (CLIOS) systems and the CLIOS Process

Teaching Interests

- Technology, Systems, Institutional and Management Issues in Transportation Systems, Engineering Systems Design, Intelligent Transportation Systems (ITS)
- Transportation Systems (OpenCourseWare)
- An Introduction to Intelligent Transportation Systems (OpenCourseWare)

Selected Publications

Books

2005. *Perspectives on Intelligent Transportation Systems*, Springer, New York, NY.

2000. *Introduction to Transportation Systems*, Artech House, Boston, MA.

Selected Papers

2006, November. "The Organization of the Transportation Systems Focus Area of the MIT-Portugal Program: An Evolving Story," MPP Transportation Systems Focus Area Working Paper Series, MIT, Cambridge, MA.

2006, November. With M. Abou Zeid. "An International Master's in Transportation Program for Portugal: Design Considerations, Development Options and Issues," MPP Transportation Systems Focus Area Working Paper Series, MIT, Cambridge,

MA.

- 2006, April. "Mega-Cities in Developing Countries—A Major ITS Market for the Future," IIT Delhi Civil Engineering Publication, Inaugural Issue, Civil Engineering Society, Department of Civil Engineering, IIT Delhi.
2006. With T. Dunn. "Using Design Structure Matrices to Improve Decentralized Urban Transportation Systems," *Transportation Research Record: Journal of the Transportation Research Board* 1960, Transportation Research Board, Washington, DC.
2006. With J. Ward. "Malaysian Toll Road Public-Private Partnership Program: Analysis and Recommendations for Policy Improvements," *Transportation Research Record: Journal of the Transportation Research Board* 1960, Transportation Research Board, Washington, DC.
2006. Contributor. "Going the Distance? The Safe Transport of Spent Nuclear Fuel and High-Level Radioactive Waste in the United States," National Research Council of the National Academies, National Academies Press, Washington, DC.
2006. "Intelligent Transportation Systems: Can They Cure Congestion?" *Connected Transportation* (110-118), Cisco Systems.
2005. "New Approach to Transportation Planning for the 21st Century: Regional Strategic Transportation Planning as a CLIOS Process," *Transportation Research Record* 1931, National Academy Press, Washington, DC (with Sgouris Sgouridis and John Ward).
2005. "Characterizing Three Engineering Systems Methods for Supporting Regional Strategic Transportation Planning Applied to Freight Systems," *ESD-WP-2005-7* (with Sgouris Sgouridis and Christopher Glazner).
- 2005, September. "Stakeholder Assisted Modeling and Policy Design Process for Environmental Decision-making," *Journal of Environmental Assessment Policy and Management*, Volume 7, Number 3 (with Ali Mostashari).
- 2004, September. "Undergraduate Initiatives for the Engineering Systems Division: Report of the Task Force," (with D. Frey, P. Lagace, C. Magee, J. Sussman [chair]).
- 2004, March. "Sustainability as an Organizing Design Principle for Large-Scale Engineering Systems," *ESD Monograph*, (Coordinator and co-author with six colleagues).
- 2004, March. "The Concept of the 'CLIOS Process': Integrating the Study of Physical

and Policy Systems Using Mexico City as an Example," (with R. Dodder, J. McConnell), ESD Symposium, MIT.

- 2004, March. "Scenario Planning for Strategic Regional Transportation Planning," *Journal of Urban Planning and Development*, Special Issue on Emerging Techniques for Urban Transportation Planning, 130(1), ASCE, Reston, VA (with C. Zegras, C. Conklin).
2004. "What We Know Now That We Wish We Knew Then About Intelligent Transportation Systems: A Retrospective on the ITS 1992 Strategic Plan," *Transportation Research Record*, National Academy Press, Washington, DC.
2003. "Coordinated Transportation and Land Use Planning in the Developing World: Case of Mexico City," *Transportation Research Record* 1859, National Academy Press, Washington, DC (with M. Gilat).
2002. "Transitions in the World of Transportation," *Transportation Quarterly*, Vol. 56, No. 1, Winter 2002, Eno Transportation Foundation, Washington, DC.
- 2002, January-February. "Intelligent Transportation Systems at the Turning Point: Preparing for Integrated, Regional, and Market-Driven Deployment," *TR News* 218, Transportation Research Board, National Research Council, Washington, DC.
2001. "Regional Strategies for the Sustainable Intermodal Transportation Enterprise (ReS/SITE): Five Years of Research," *Transportation Research Record* 1747, National Academy Press, Washington, DC.
- 2001, December. "Transportation Operations: An Organizational and Institutional Perspective," *Report for National Special Steering Committee for Transportation Operations and FHWA/USDOT*.
- 2001, October. "Earthquake Loss Estimation Including Transportation Network Damage," Mid-Continent Earthquake Hazards Symposium, Joint National AEG/AIPG National Meeting, St. Louis, MO, October 2001 (with S. Kunnumkal, U. Gupta, D. Veneziano).
2000. "What Have We Learned About Intelligent Transportation Systems (ITS)?" Chapters 1 and 9, Synthesis report for the series of papers, *EDL* 13316, http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/@5901!.pdf, U. S. Department of Transportation, Washington, DC.
- 2000, October. "Mexico City: Transport and Air Pollution," Chapter 6 in *Report Integrated Strategy for Air Quality Management in the Mexico City Metropolitan Area*, Massachusetts Institute of Technology, Cambridge, MA (with A. Howitt, R. Gakenheimer, R. Slott).

- 2000, May. "Regional Architectures, Regional Strategic Transportation Planning and Organizational Strategies," ITS America 2000 Annual Meeting, Boston, MA (with C. Conklin).
1999. "Efficacy of Safety-Related Investments to Reduce Fatalities on the East Japan Railway (JR East)," *Transportation Research Record* 1691, National Academy Press, Washington, DC (with A. Barnett, C. Martland and A. Odoni).
1999. "Scenarios and Regional Strategic Transportation Planning," *Transportation Research Record* 1685, National Academy Press, Washington, DC (with A. Muñoz-Loustaunau).
1999. "Regional Architectures: Strengthening the Transportation Planning Process," *Transportation Research Record* 1679, National Academy Press, Washington, DC (with T. Pendleton).
- 1999, summer. "The New Transportation Faculty: The Evolution to Engineering Systems," *Transportation Quarterly*, Eno Transportation Foundation, Washington, DC.
- 1999, June. "Mobility Scenarios for Houston in the Year 2020," The Cooperative Mobility Program (CMP), MIT, Cambridge, MA (with R. Gakenheimer, et al.).
1998. "Routing and Scheduling Temporal and Heterogeneous Freight Car Traffic on Rail Networks," *Transportation Research E*, Vol. 34, No. 2, pp. 101-115 (with O. K. Kwon and C. Martland).
- 1996, December. "ITS: A Short History and a Perspective on the Future," *Transportation Quarterly 75th Anniversary Special Issue*, ENO Transportation Foundation, Inc., Lansdowne, VA, p. 115-125.
1995. "Origin-to-Destination Trip Times and Reliability of Rail Freight Services in North American Railroads," *Transportation Research Record* 1489, National Academy Press, Washington, DC (with O.K. Kwon, C. Martland and P. Little).
- 1995, summer. "Educating the 'New Transportation Professional'," *ITS Quarterly*.

Selected Lectures

- 2006, October. "System Architecture and Regional Strategic Transportation Planning: Relationships and Extensions," Industrial Liaison Program BAE Systems Symposium, MIT, Cambridge, MA.
- 2006, October. "The Transportation Systems Focus Area of the MIT-Portugal Program (MPP), IST, Lisbon, Portugal.

- 2006, October. "Where Transportation is Going: Transportation in the CLIOS System Era," Keynote Address, Transportation Systems, MIT-Portugal Program (MPP) Launch Event.
- 2006, September. "Regional Planning in the Boston Metro Area: Lessons from Mexico City," Seminar on MetroWest/495 Transportation Management Association.
- 2006, May. "New Ideas for Multi-Stakeholder System: Stakeholder Participation in CLIOS System Representation," Seminar at TU Delft, The Netherlands.
- 2006, April. "Transitions in the World of Transportation," Seminar at the University of Texas, Austin, TX.
- 2006, March. "Transportation and the Environment: The Mexico City Case," Capetown, South Africa Workshop on Urban Transportation, Cambridge University, Cambridge, England.
- 2006, January. "Vehicle-Highway Cooperation and Automation: A Historical Perspective and Some Current Ideas," TRB 2006 Annual Meeting, Washington, DC.
- 2006, January. "ITS Technologies and Institutional Issues: Some Ideas for Accelerating Deployment of Effective Systems," CALit2 Special Seminar, University of California, Irvine, CA.
- 2006, January. "Transportation Challenges in Mexico City," IAP Seminar, MIT, Cambridge, MA.
- 2006, January. "Research Collaboration: The View From Academia," TRB 2006 Annual Meeting, Washington, DC.
- 2006, January. "Vehicle-Highway Cooperation and Automation: A Historical Perspective and Some Current Ideas," TRB 2006 Annual Meeting, Washington, DC.
- 2006, January. "Service Reliability of Freight and Traveler Transportation Systems," TRB 2006 Annual Meeting, Washington, DC.
- 2005, November. "Technology in a Social Context: The Case of Transportation," luncheon speaker, Siemens Westinghouse High School Competition at MIT, Cambridge, MA.
- 2005, September. "A View of the Evolution of the Transportation Field: Transportation as a CLIOS System," dinner address at the Annual Meeting of the Massachusetts Chapter of the Institute of Transportation Engineers, Waltham, MA.
- 2005, August. "Complex Engineering Systems: The Changing World of Transportation

- and JR East's Future Role," Special Seminar, JR East R&D Center, Omiya, Japan.
- 2005, July. "The Evolution of Transportation: How Technology and Deployment Relate—The Case of ITS," FHWA Advanced Research Symposium, Boston, MA.
- 2005, June. "Academia as a Vital Change Agent for the Transportation Field," luncheon address, Council of University Transportation Centers Annual Meeting, Cambridge, MA.
- 2005, April. "Complex Sociotechnical Systems: The Concept of Nested Complexity," NSF Workshop on Time-Critical Information Services, Kennedy School of Government, Harvard University, Cambridge, MA.
- 2005, March. "Reflections on ITS: Where We Have Been and Where We Might Go," Keynote Address, 10th Annual Meeting of ITS Massachusetts, Boston.
- 2005, February. "Transportation Futures: A Look Ahead," Inaugural Bruce Podwal Lecture, Civil Engineering Department, The City College of New York, New York City.
- 2005, January. "Planning for Seamless Transportation Systems," TRB 2005 Annual Meeting, Washington, DC.
- 2004, October. "The Future of ITS," Keynote Talk, IEEE/ITS Annual Conference, Washington, DC.
- 2004, May. "Transportation as a Complex Socio-Technical System: the Mexico City Case," MUST Seminar Series on Transportation and Logistics, Malaysia University of Science and Technology, Kuala Lumpur, Malaysia.
- 2004, February. "CLIOS and Its Application to Yucca Mountain," Four lectures in the University of Cambridge Technology Policy Program, Cambridge, UK.
- 2004, January. "Toward a New Generation of Regional Strategic Transportation Plans," 7th Annual Workshop of the Integrated Program on Urban Regional and Global Air Pollution, Mexico City, Mexico.
- 2002, November. "Transitions in the World of Transportation," Keynote Speech on the Occasion of the 15th Anniversary of the Center for Transportation Studies, University of Minnesota, Minneapolis, MN.
- 2002, May. "A Technology Scan for the International Railroad Industry," Annual Meeting of the Union Internationale des Chemins de Fer, Berlin, Germany.
- 2002, January. "Representing the Transportation/Environmental System in Mexico City as a CLIOS (Complex, Large-Scale, Integrated, Open System)," Fifth Workshop on

Mexico City Air Quality, Ixtapán de la Sal, Estado de Mexico.

- 2001, November. "Design Issues in Complex, Large-Scale, Integrated, Open Systems (CLIOS): Air Quality in Mexico City - The Transportation Connection," Anthony Bartolomeo Lecture Series on Creativity in Design, University of Pennsylvania, Philadelphia, PA.
- 2001, April. "ITS: Implications for the New York Transportation Program," Senior Executive Seminar, Port Authority of New York-New Jersey, New York City, NY.
- 2001, April. "Intelligent Transportation Systems: What We Have Learned and Where We Go from Here," National ITS Summit, Arlington, VA.
- 2000, March. "ITS: Theory and Applications," Two-Day Short Course given for the professional community by Hong Kong University of Science and Technology, Hong Kong.
- 2000, March. "Toward Engineering Systems as a Discipline," Santa Fe Institute Seminar, Santa Fe, NM.
- 1999, August. "Transportation Education in the 21st Century," Institute of Transportation Engineers Annual Meeting, Las Vegas, NV.
- 1999, February. "The New Transportation Faculty: The Evolution to Engineering Systems," Distinguished Lecture Series, University of Michigan, Ann Arbor, MI.
- 1999, January. "Challenges for the 21st Century Transportation System," MIT in Japan: A Symposium for Japanese Industry, ILP 50th Anniversary Celebration, Tokyo, Japan.
- 1998, July. "Review of Federal R&D Research Strategy," Special Briefing to the National Science and Technology Council Committee on Technology, Washington, DC.
- 1998, February. "Transportation Education and ITS Deployment," Keynote Speaker, Conference on ITS: Incorporating the Consumer, Texas Southern University, Houston, TX.
- 1997, November. "Railroads in the Information/Intermodal Era," Kent T. Healy Memorial Lecture, University of California at Berkeley.
- 1997, October. "ITS in the Information Society," Special Executive Session, 4th World Congress on ITS, Berlin, Germany.
- 1996, October. "A New Generation of Regional Strategic Plans," MIT Mobility Program, Endicott House, Dedham, MA.

- 1995, July. “Toward a Strategic Transportation Plan for the Province of Mendoza,” MIT/CIT workshop, Mendoza, Argentina.
- 1995, January. “An Intelligent Transportation Corridor for Bangkok,” Seminar, Bangkok Metropolitan Administration, Bangkok, Thailand.
- 1992, November. “Rail Research Activities at MIT: Current Problems,” Lecture for staff of Office of High Speed Rail, Ministry of Transport, Taipei, Taiwan.
- 1992, November. “MIT's Rail Research Program and Future Programs with JR East,” (lecture for JR East senior executives), Tokyo, Japan.
- 1992, April. Lecturer, The Paul Hollingsworth Distinguished Lecture in Engineering, University of Texas.

Selected Honors and Awards

- 2005, June, inducted. Boston Society of Civil Engineers Section—Life Member.
- 2004, January. Council of University Transportation Centers (CUTC), Award for Distinguished Contribution to University Transportation Education and Research.
- 2002, April. ITS Massachusetts instituted the Joseph M. Sussman Leadership Award to be given annually for leadership in the ITS field.
- 2002, January. Transportation Research Board’s 2001 Roy W. Crum Award for Distinguished Research, Washington, DC.
- 2001, December. Member of the initial class of inductees of “National Associates of the National Academies,” recognizing “extraordinary service to the National Academies,” Washington, DC.
- 1998, October. Move Massachusetts 2000, Technical Leadership Award on the Central Artery/Tunnel Project.
1997. Effective Teaching Award, Department of Civil and Environmental Engineering, MIT.
1996. Award from ITS Massachusetts for “Contributions to the Establishment of ITS Massachusetts.”