Eil Kwon, Ph.D., P.E., P.T.O.E
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CURRENT POSITION

Professor, Department of Civil Engineering/Director, Northland Advanced Transportation Systems Research Laboratory, University of Minnesota Duluth
Professional Engineer in Civil Engineering: Registered in Minnesota
Professional Traffic Operations Engineer

Areas of Research/Teaching: Transportation System Planning, Design and Operations, Optimal Control/Safety of Traffic Systems, Roadway Design, Traffic Flow Modeling/Simulation, Advanced Sensing Technologies, Research Management Systems

EDUCATION

Ph.D. Transportation, University of Minnesota Twin Cities, 1990
M.S. Civil Engineering (Transportation), University of Minnesota Twin Cities, 1986
B.S. Civil Engineering, Sungkyunkwan University, Seoul, Korea, 1978

PROFESSOIONAL CAREER

Professor of Civil Engineering/Director, Northland Advanced Transportation Systems Research Laboratory (2006-present), University of Minnesota Duluth
Traffic Research Director (2001-2003, 2004-2006), Minnesota Department of Transportation
Associate Professor (2003-2004), Department of Mechanical and Civil Engineering, Minnesota State University, Mankato
Advanced Traffic Systems Director (1991-2001), Center for Transportation Studies, University of Minnesota, Twin Cities
Post Doctoral Associate (1990-1991), Department of Civil Engineering, University of Minnesota Twin Cities
Assistant Director (1980-1984**)**, Ministry of Transportation, Republic of Korea, Seoul, Korea
Assistant Director (1979-1980), Ministry of Science and Technology, Republic of Korea, Seoul, Korea

CURRENT/RECENT TRANSPORTATION RESEARCH PROJECTS

Development of Freeway Management and Operational Strategies with IRIS-In-Loop Simulation, Minnesota Department of Transportation, Principle Investigator (ongoing)

Assessment of Capacity Estimation Methods for Multi-lane Roundabout, Minnesota Department of Transportation, Principle Investigator (ongoing)

Self-sensing Pavement Concrete, National Science Foundation, Co-Principle Investigator (ongoing)

Research Management System: Conceptual Design, Minnesota Department of Transportation, Principle Investigator (2007-2008)

Development of Operational Strategies for Travel Time Information and Emergency Evacuation on a Freeway Network, FHWA and Minnesota Department of Transportation, Principle Investigator (2003-2004)

Dynamic Route Clearance Strategies for Emergency Vehicle Operations, Phase 1, Minnesota Department of Transportation, Principle Investigator (2002-2003)

Estimation of the Capacity in the Freeway Weaving Areas for Traffic Management, Phase 2, Minnesota Department of Transportation, , Principle Investigator (2001-2003)

Development of Signal Operations Research Laboratory, Phase 2, Minnesota Department of Transportation, Principle Investigator (2002-2003)

Alternative Concepts for Coordinated Ramp Metering and Capacity Analysis for Dynamic Bottlenecks, Minnesota Department of Transportation, Principle Investigator (1999-2001)

Development of Signal Operations Research Laboratory, Phase 1, ITS Institute, University of Minnesota, Principle Investigator (1999-2001)

Estimation of the Capacity in the Freeway Weaving Areas for Traffic Management, Minnesota Department of Transportation, Principle Investigator (1998-1999)

Technical Support for Freeway Network Simulation Software, Minnesota Department of Transportation and Center for Transportation Studies, University of Minnesota, Principle Investigator (1998-2000)

Preliminary Study for Developing Computer-Based Decision Support Environment for Congestion Pricing, FHWA and Minnesota Department of Transportation, Principle Investigator (1996-1998)

Development of a Parallel Simulation Algorithm for Freeway Traffic Flows on a Distributed Personal Computer System, ITS Institute, University of Minnesota, Principle Investigator (1995- 1997)

PUBLICATIONS

Kwon, E., Johnson, C., Moe, C. and Lodahl**,** S**., "A Dynamic Management Process for Innovative Research Products at State DOTs"**, Compendium of papers, 2009 Annual Transportation Research Board Meeting, Washington, D.C., January, 2009

Yu, X. and Kwon, E., "**Carbon-Nanotube/Cement Composite with Piezoresistive Property**," Smart Materials and Structures, vol. 18, 055010 (5pp), 2009.

Kwon, E. , Brannan, D., Shouman, K., Isackson, C., and Arseneau, B. "**Development and Field Evaluation of a Variable Advisory Speed Limit System for Work Zones**", Transportation Research Record: Journal of Transportation Research Board, No. 2015, pp. 12-18, National Academies, Washington, D.C., 2007.

Kwon, E., "**Development of a practical on-line coordinated variable speed advisory system for work zones**", Compendium of Papers, 2007 ITS World Congress, Beijing, China, October, 2007.

Kwon, E. and Pitt, S. "**Evaluation of Emergency Evacuation Strategies for Downtown Event Traffic using a Dynamic Network Model"**, Journal of Transportation Research Board: Transportation Research Record 1922, pp. 149-155, National Academy of Science, Washington, D.C., 2005.

Kwon, E., Ambadipudi, R. and Bieniek, J. "**Adaptive Coordination of Ramp Meter and Intersection Signal for Balanced Management of a Freeway Corridor**", Compendium of Papers, *2005 Annual Transportation Research Board Meeting*, Washington, D.C., January 2005.

Kwon, E., Kim, S. and Betts, R. "**Evaluation of Route-based Signal Preemption Strategies for Emergency Vehicle Operations",** Compendium of papers, 2003 Intelligent Transportation Systems America Conference, Minneapolis, Minnesota, May 2003.

Kwon, E., Kim, S. and Betts, R. "**Route-based dynamic preemption of traffic signals for emergency vehicles**", Compendium of papers, *2003 Transportation Research Board (TRB) Meeting*, Washington, D.C., January, 2003.

Kwon, T., Dhruv, N., Patwardhan, S. and Kwon, E. "**CDF archival of large-scaled ITS data for efficient archival, retrieval and portability**", Journal of Transportation Research Board: Transportation Research Record 1836, pp. 111-117, National Academy of Science, Washington, D.C., January, 2003.

Kwon, E., Kim, S. and Kwon, T. "**Pseudo real-time evaluation of adaptive traffic control strategies using Hardware-in-Loop simulation**", Proceedings, IEEE Industrial Electronics Society 27th Annual Conference, pp. 1910-1914, IECON 2001, Denver, Colorado, November 2001.

Masoud, O., Papanikolopoulos, N. and Kwon, E. "**Use of computer vision in monitoring weaving sections**," IEEE Transactions on Intelligent Transportation Systems, Vol 2, no. 1, pp 18-25, March 2001.

Kwon, E., Nanduri, S., Lau, R. and Aswegan, J., "**Comparative analysis of operational algorithms for coordinated ramp metering**", Transportation Research Record, 1748, pp. 144-152, Washington, D.C., 2001.

Kwon, E. and Nanduri, S., "**Zone-wide adaptive metering with fuzzy coordination**", Compendium of papers, 2001 Annual TRB Meeting, National Academic Science , Washington, D.C., January 2001.

Kwon, E., Lau, R. and Aswegan, J., "**On-line estimation of maximum possible weaving volume for effective operations of ramp-weave areas**", Transportation Research Record, 1727, pp. 132-141, 2000.

Kwon, E., Kelen, C., Ran, B. and He, R. "**Hierarchical evaluation of HOT lane operations using dynamic network models**", Compendium of papers, the TRB 2000 Annual Meeting, Washington, D.C., January 2000.

Kwon, E., Kota, R. and Michalopoulos, P. "**Macroscopic approach for evaluating diamond HOV lane operations"**, Compendium of papers, 2000 TRB Annual Meeting, Washington, D.C., January 2000.

Kwon, E., Choi, B. and Park, H., "**Distributed simulation of freeway traffic flows using personal computers**," Computer-Aided Civil and Infrastructure Engineering, Vol. 15, pp. 167-175, 2000.

Masoud, O., Papanikolopoulos, N. and Kwon, E. "**Vision-based monitoring of weaving sections**", Proceedings IEEE/IEEJ/JSAI Conference on Intelligent Transportation Systems, Tokyo, Japan, October 5-8, 1999.

Kwon, E., Choi, B. and Park, H. "**A personal computer-based parallel simulation system for on-line assessment of freeway operational strategies**", Compendium of papers, 1998 TRB Annual Meeting, Washington, D.C., Jan., 1998.

Kwon, E., and Stephanedes, Y., "**Development of an adaptive control strategy in a live intersection laboratory**", Transportation Research Record 1634, National Academy of Science, pp. 123-129, Washington, D.C., 1998.

Kwon, E. and Kelen, C., "**Drivers' perception survey for toll lane and carpool**", Compendium of technical papers for the 68th ITE Annual Meeting and TRB HOV Conference, Toronto, Canada, August, 1998.

Kwon, E., Liu, X and Stephanedes, Y. "**An intelligent intersection environment for field evaluation of advanced traffic management Strategies**", Compendium of Technical Papers for the 66th ITE Annual Meeting, September 1996.

Kwon, E. and Stephanedes, Y.J. "**Comparative evaluation of adaptive and neural-network exit demand prediction for freeway control**", Transportation Research Record 1446, National Research Council, National Academy of Science, pp. 66-76, Washington, D.C., 1994.

Stephanedes, Y. J. and Kwon, E. "**On-line demand-diversion prediction for integrated control of freeway corridors**.", Transportation Research Part C: Emerging Technologies, Vol. 1C, No. 1, pp. 23-42, Elsevier, 1993.

Stephanedes, Y. J., Kwon, E. and Chang, K. "**Control-Emulation method for evaluating and improving traffic-responsive ramp metering strategies",** Transportation Research Record 1360, National Research Council, National Academy of Science, pp. 42-45, 1992.

Kwon, E. "**A new approach for real-time prediction of traffic demand-diversion in freeway corridors**", Proceedings, 2nd International Conference on Applications of Advanced Technologies in Transportation Engineering, ASCE, Minneapolis, Minnesota, August 1991.

Michalopoulos, P. G., Kwon, E. and Kang, J. "**Enhancements and field testing of a dynamic freeway simulation program**", Transportation Research Record 1320, National Research Council, National Academy of Science, pp. 203-215, 1991.

Stephanedes, Y. J., Kwon, E. and Michalopoulos, P. G. "**On-line diversion prediction for dynamic control and vehicle guidance in freeway corridors**", Transportation Research Record, 1287, National Research Council, National Academy of Science, pp. 11-19, 1990.

Stephanedes, Y. J., Kwon, E., Tzafestas, S. G. and Botsaris, C. "**Optimal control of non-linear dynamic transportation systems**", Proceedings, 29th IEEE Conference on Decision and Control, Honolulu, December 1990.

Stephanedes, Y. J., Kwon, E. and Michalopoulos, P. G. "**Demand diversion for vehicle guidance, simulation and control in freeway corridors**", Transportation Research Record, 1220, National Research Council, National Academy of Science, pp. 12-20, 1989.

Stephanedes, Y. J. and Kwon, E. "**Optimization strategies for transit systems in urban corridors**", Transportation Research Record, 1165, National Research Council, National Academy of Science, pp. 75-85, 1988

Kwon, E. and Stephanedes, Y. J. "**Incremental optimization design of transit service**", ASCE, Journal of Transportation, pp. 437-449, July 1987.

HONORS AND AWARDS

3M McKnight Distinguished Visiting Professor (2000): Electrical and Computer Engineering, University of Minnesota, Duluth

CTS Merit Award (1998): Center for Transportation Studies, University of Minnesota

1997 Research Partnership Award (1997): Center for Transportation Studies, University of Minnesota.

Visiting Research Scholarship (1990 - 1991): Minnesota Supercomputer Institute, University of Minnesota.

NCITE Fellowship (1989): North Central Section, Institute of Transportation Engineers.

Matthew J. Huber Award (1988): Center for Transportation Studies, University of Minnesota.

Doctorate Dissertation Fellowship (1987-1988): Graduate School, University of Minnesota.

CME Fellowship (1984-1985): Department of Civil & Mineral Engineering, University of Minnesota.

Sungkyunkwan Foundation Award (1978): Sungkyunkwan University, Seoul, Korea.