

## MARGARET K. SINGH

Transportation Systems Planner/Environmental Scientist  
Center for Transportation Research  
Energy Systems Division  
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### Professional Experience

- 1978-Present                      Transportation Systems Planner/Environmental Scientist, Center for Transportation Research, Energy Systems Division, Argonne National Laboratory, Chicago, Illinois and Washington, D.C.
- Evaluate the costs and benefits of advanced transportation technologies, both vehicles and fuels. Vehicles include fuel cell vehicles, electric vehicles, natural gas vehicles, and flex-fuel and dual-fuel vehicles. Fuels include hydrogen, natural gas, propane and reformulated gasoline and diesel fuels. Evaluation includes evaluation of a) their oil savings potential; b) their environmental (including greenhouse gas) benefits and costs; c) the physical infrastructures (distribution systems and refueling facilities) required to support them and their costs; d) their potential use in various markets; and e) transition issues (i.e., how to address barriers to their use).
  - Run the VISION model which has been developed for DOE to provide estimates of the oil savings and greenhouse gas benefits of alternative light and heavy vehicle technologies to 2050.
  - Currently developing a spreadsheet model which regionalizes future H2 production.
  - Evaluated state and local evacuation plans and evacuation time studies for numerous nuclear power plants for the Federal Emergency Management Agency (FEMA). Also for DOE co-developed a plan for data collection on the transportation infrastructure surrounding nuclear power plants for purposes of spent-fuel shipments.
- 1975-1978                      Transportation Planner/Environmental Specialist, Development Planning Department, Regional Transportation Authority, Chicago, Illinois
- 1974-1975                      Research Coordinator, Planning Development Department, Chicago Transit Authority, Chicago, Illinois
- 1972-1974                      Campus Planner, Richardson, Scheeler, Severns, Greene and Associates, Champaign, Illinois
- 1971-1972                      Teaching and Research Assistant, Department of Urban Planning, University of Illinois, Champaign, Illinois
- 1969-1970                      Research Assistant, Morton Hoffman & Co., Economic Consultants, Baltimore, Maryland

## Professional Societies

Transportation Research Board (TRB): Member, Alternative Fuels Committee  
Society of Automotive Engineers (SAE)

## Educational Background

Ph.D. Studies, Public Policy Analysis, University of Illinois, Chicago, Illinois 1985-1988  
M.U.P., 1972, Master of Urban Planning, University of Illinois, Urbana-Champaign, Illinois  
B.A., 1969, Psychology, Northwestern University, Evanston, Illinois

## Publications: Journal Articles and Book Contributions

Greene, D.L, P.D. Patterson, M.K. Singh, and J. Li, *Feebates, rebates and gas-guzzler taxes: a study of incentives for increased fuel economy*, Energy Policy 33 (2005).

Singh, M., *Total Energy Cycle Energy Use and Emissions of Electric Vehicles*, Energy, Air Quality and Fuels 1999, Transportation Research Record No. 1664, Transportation Research Board (Jan. 1999).

Stork, K., M. Singh, M. Wang and A. Vyas, *Assessment of Capital Requirements for Alternative Fuels Infrastructure Under the PNGV Program*, Energy, Air Quality and Fuels 1998, Transportation Research Record 1641, Transportation Research Board (September 1998).

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Mintz, M. And M.K. Singh, *Issues and Costs Associated with a Transition to Alternative Transportation Fuels and Vehicles*, Transportation-Related Air Quality and Energy, Transportation Research Record 1520, Transportation Research Board (1996).

Gaines, L. and M. Singh, *Energy Impacts In Producing and Recycling EV Batteries*, Automotive Engineering (Feb. 1996).

Singh, M. and B. McNutt, *Energy and Oil Input Requirements for Producing Reformulated Gasolines*, Fuel Reformulation, 3(5): 60-67 (1993).

Singh, M.K., C.L. Saricks, S.J. LaBelle, and D.O. Moses, *Emerging Environmental Constraints on the Use of Gasoline and Diesel Fuel and Tradeoffs Associated With the Use of Alternative Fuels*, in Mobile Sources: Emerging Issues, Air and Waste Management Association TR-11 (1988).

Millar, M., M. Singh, A. Vyas, and L. Johnson, *Transportation Energy Outlook Under Conditions of Persistently Low Petroleum Prices*, Transportation Energy, Transportation Research Record 1155, Transportation Research Board (1987).

Singh, M.K., *Environmental Concerns of Natural Gas Vehicles: Do We Know Enough?*, Energy Analysis and Alternative Fuels and Vehicles, Transportation Research Record 1049, Transportation Research Board (1985).

Saricks, C., and M.K. Singh, *Are Stringent Emission Standards for Heavy-Duty Trucks Worth the Cost?*, Issues in Transportation-Related Environmental Quality, Transportation Research Record 1033, Transportation Research Board (1985).

Singh, M.K., and S.J. LaBelle, *Analysis of Total Energy Use of Urban Transportation Energy Conservation Strategies*, Analysis of Issues in Energy Planning and Energy Modeling, Transportation Research Record 935, Transportation Research Board (1983).

LaBelle, S.J., M.K. Singh, and M.J. Bernard, *Environmental Assessment of DOE Transportation Technology Research and Development*, The Environmental Professional, 1(4):270-284 (1979).

### **Publications: Reports**

Singh, M.; A. Vyas, and E. Steiner, *VISION Model: Description of Model Used to Estimate the Impact of Highway Vehicle Technologies and Fuels on Energy Use and Carbon Emissions to 2050*, ANL/ESD/04-1 (Dec. 2003).

Patterson, P., J. Moore, M. Singh, E. Steiner, *Program analysis methodology Office of Transportation Technologies 2003 quality metrics final report*, ANL/ES/RP-108642 (March 2002)

Wang, M., M. Mintz, M. Singh, K. Stork, A. Vyas, and L. Johnson, *Assessment of PNGV Fuels Infrastructure, Phase 2 Report: Additional Capital Needs and Fuel-Cycle Energy and Emissions Impacts*, ANL/ESD-37 (Aug. 1998).

Singh, M., et. al., *Total Energy Cycle Assessment of Electric and Conventional Vehicles: An Energy and Environmental Analysis*, ANL/ES/RP-96387, Vols. I-IV (Jan. 1998).

Wang, M. Q., K. Stork, A. Vyas, M. Mintz, M. Singh, L. Johnson, *Assessment of PNGV Fuels Infrastructure - Phase I Report: Additional Capital Needs and Fuel-Cycle Energy and Emissions Impacts*, ANL/ESD/TM-140 (Jan. 1997).

*Assessment of Costs and Benefits of Flexible and Alternative Fuel Use in the U.S. Transportation Sector, Technical Report Fourteen: Market Potential and Impacts of Alternative Fuel Use in Light-Duty Vehicles: A 2000/2010 Analysis*, DOE/PO-0042 (Jan. 1996).

Stork, K.C. and M.K. Singh, *Impact of the Renewable Oxygenate Standard for Reformulated Gasoline on Ethanol Demand, Energy Use and Greenhouse Gas Emissions*, ANL/ESD-28 (April 1995).

Singh, M. and B. McNutt, *Energy and Crude Oil Input Requirements for the Production of Reformulated Gasolines*, ANL/ESD-19 (Oct. 1993).

*Utility Emissions Associated with Electric and Hybrid Vehicle Charging: Interim Report*, DOE/CE-0395 (April 1993).

*Final Report of the Interagency Commission on Alternative Motor Fuels*, DOE/EP-0002P (Sept. 1992).

*Assessment of the Costs and Benefits of Flexible and Alternative Fuel Use in the U.S. Transportation Sector, Technical Report Ten: Analysis of Alternative-Fuel Fleet Requirements*, DOE/PE-0103-P (May 1992).

*Environmental Research Needs in Transportation*, Transportation Research Board Transportation Research Circular Number 389, Washington, D.C. (March 1992).

*Assessment of the Costs and Benefits of Flexible and Alternative Fuel Use in the U.S. Transportation Sector, Technical Report Seven: Environmental, Health, and Safety Concerns Associated with Nonpetroleum Fuel Use in U.S. Transportation*, DOE/PE-0100P (Oct. 1991).

*Second Interim Report of the Interagency Commission on Alternative Motor Fuels*, Washington, D.C. (Sept. 1991).

Bernard, M.J., M.K. Singh, and K. Heitner, *Three Scenarios for Electric and Hybrid Vehicle Commercialization*, ANL/ESD/TM-13 (Jan. 1991).

*First Interim Report of the Interagency Commission on Alternative Motor Fuels*, Washington, D.C. (Sept. 1990).

*Assessment of the Costs and Benefits of Flexible and Alternative Fuel Use in the U.S. Transportation Sector, Technical Report Four: Vehicle and Fuel Distribution Requirements*, DOE/PE-0095P (Aug. 1990).

Rajan, J.B., C.L. Saricks, M.K. Singh, and W.J. Walsh, *Environmental, Health, and Safety Concerns Associated with Nonpetroleum Fuel Use in U.S. Transportation, Progress Report 1*, ANL/ES-163 (June 1989).

Singh, M.K. and R.R. Sekar, *Emission-Reduction Effects of Methanol Vehicles: State of Knowledge*, ANL/EES-TM-352 (July 1988).

Saricks, C.L., M.K. Singh, and R.E. Stammer, *Transportation Infrastructure Between Nuclear Power Plant Gates and Nearest Line-haul Networks: Plan and Procedure for Data Development*, ANL/EES-TM-360 (June 1988).

Singh, M.K., C.L. Saricks, and S.J. LaBelle, *Motor Vehicles in the 1990s: Emerging Environmental Constraints on Current Fuels, and Emissions and Energy Trade-Offs Related to Nonpetroleum Alternatives*, ANL/ES-155 (Jan. 1988).

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Rajan, J., and M.K. Singh, *Cost Analysis of Particulate Emission Control Technology for Heavy-Duty Diesel Vehicles*, ANL/EES-TM-310 (May 1986).

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Singh, M.K., and C.L. Saricks, *Effectiveness, Benefits and Costs of More Stringent Nitrogen Oxide and Particulate Emission Controls for Heavy Duty Trucks*, ANL/EES-TM-273 (Nov. 1984).

Monarch, M., T. Alston, K. Macal, C. Macal, J. Tatar, H. Hersh, C. Blomquist, M. Singh and R. Larsen, *Energy Conserving Technologies for Industry: A Summary of Recent Progress in Research and Development*, ANL/CNSV-TM-129 (Jan. 1984).

Asbury, J.G., J.R. Ball, J. Cummings-Saxton, L.L. Gaines, R.F. Giese, R.O. Mueller, C.L. Saricks and M.K. Singh, *Meeting Our Need for Electric Energy: The Role of Nuclear Power*, prepared for U.S. DOE, DOE/NE-0054 (July 1984).

Singh, M.K., *State of Knowledge of Environmental Concerns Related to Natural Gas-Fueled Vehicles*, ANL/CNSV-TM-138 (April 1984).

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Singh, M.K., *Energy Consumption Due to Local Travel by Urban Households Under Three Alternatives Policies: 1980-2000*, ANL/EES-TM-172 (Nov. 1981).

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Singh, M.K., M.J. Bernard, and D.P. Maxfield, *Environmental Impact of EHV's*, U.S. Department of Energy, DOE EHV Program Quarterly Report, DOE/CS-0026-12 (Nov. 1980).

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Singh, M.K. and M.J. Bernard, *Environmental Development Plan for Transportation Energy Conservation: FY1979*, ANL/EES-TM-33 (Dec. 1978).

### **Publications: Conference Papers**

Singh, M. K., J.S. Moore, Jr., W.J. Shadis, *Hydrogen demand, production and costs by region to 2050*, presented at the 84<sup>th</sup> Annual Meeting of the Transportation Research Board, Washington, DC (Jan 2005).

Singh, M. K., J.S. Moore, Jr., W.J. Shadis, *Hydrogen production and prices by region to 2050*, U.S. Department of Energy World Renewable Energy Congress VIII & Expo, Denver, CO (August 2004).

Greene, D.L, P.D. Patterson, M.K. Singh, and J. Li, *Feebates, Rebates and Gas-guzzler Taxes: A Study of Incentives for Increased Fuel Economy*, presented at the 83<sup>rd</sup> Annual Meeting of the Transportation Research Board, Washington D.C. (Jan. 2004).

Gaines, L.L.; D. Elcock and M.K. Singh, *Nickel-metal hydride batteries: energy use and emissions from production and recycling*, 2002 Future Car Congress; Arlington, VA (June 2002).

Patterson, P., E. Steiner, and M. Singh, *What future car MPG levels and technology will be necessary?*, 2002 Future Car Congress; Arlington, VA (June 2002)

Singh , M.K. and J.S. Moore, *Preliminary assessment of the availability of U.S. natural gas resources to meet U.S. transportation energy demand*, 2002 Future Car Congress; Arlington, VA; (June 2002)

Patterson, P., T. Bohn, N. Hazard, M. Singh, M. Wang, *Quantifying the Fuel Use and Greenhouse Gas Reduction Potential of Electric and Hybrid Vehicles*, Proceedings, Electric Vehicle Symposium 17, Montreal, Canada (October 2000).

Singh, M., M. Wang, N. Hazard, G. Lewis, *Quantifying the Fuel Use and Greenhouse Gas Reduction Potential of Electric and Hybrid Vehicles*, 2000 Future Car Congress, Washington, DC (April 2000)

Wang, M., M. Mintz, M. Singh, K. Stork, A. Vyas, and L. Johnson, *Capital Requirements and Fuel-Cycle Energy and Emissions Impacts of Potential PNGV Fuels*, ISATA 1999, 99CPE014 (June 1999).

Humphreys, K., M. Placet and M. Singh, *Life-Cycle Assessment of Electric Vehicles in the United States*, Proceedings, 31st Intersociety Energy Conversion Engineering Conference, Washington, D.C. (IECEC-96 96530) (Aug. 1996).

McNutt, B., P. Bergeron, M. Singh and K. Stork, *Making the Transition to Large Scale Ethanol Use in the U.S. Transportation Sector*, Proceedings, Eleventh International Symposium on Alcohol Fuels, Sun City, South Africa (April 1996).

Gaines, L. and M. Singh, *Impacts of EV Battery Production and Recycling*, presented at Technical Women's Symposium, Argonne National Laboratory, Argonne, Illinois (April 1996).

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Santini, D., M. Krinke, M. Mintz, and M. Singh, *Assessing the Displacement Goals in the Energy Policy Act*, Proceedings of the 1994 Automotive Technology Development CCM, Dearborn, MI (Oct. 1994)

Singh, M. and B. McNutt, *Energy and Crude Oil Input Requirements for the Production of Reformulated Gasolines*, Proceedings, Tenth International Symposium on Alcohol Fuels, Colorado Springs, CO (Nov. 1993).

Stodolsky, Frank and M.K. Singh, *Energy Use Impacts of the Mobile Source Provisions of the Clean Air Act Amendments of 1990*, presented at the 84th Annual Meeting of the Air & Waste Management Association, Vancouver, Canada (June 1991).

Singh, M.K., *A Comparative Analysis of Alternative Fuel Infrastructure Requirements*, SAE Paper 892065, Society of Automotive Engineers International Fuels and Lubricants Conference, Baltimore, MD (Sept. 1989).

Saricks, C.L., J. Rajan, and M.K. Singh, *Environmental Quality and the Shift to Alternative Fuels: Progress and Interim Findings of a Department of Energy Study of Transition in Vehicular Power Systems*, presented at the 1989 Summer National Meeting of the American Institute of Chemical Engineers, Philadelphia, PA (Aug. 1989).

Hira, A.U., T.J. Timbario, R.L. Bechtold, M.K. Singh, and R.R. Sekar, *A State-of-Knowledge Review of the Emissions Effects of Methanol Vehicles*, Proceedings, 8th International Symposium on Alcohol Fuels, Tokyo, Japan (Nov. 1988).

Rajan, J., M.K. Singh, and D.O. Moses, *An Analysis of the Costs of Particulate Trap-Oxidizer Systems for Heavy-Duty Diesel Vehicles*, presented at the 79th Annual Meeting of the Air Pollution Control Assn., Minneapolis, MN (June 1986).

Singh, M.K., and D.O. Moses, *Environmental Concerns Related to Natural Gas Vehicles*, in *Nonpetroleum Vehicular Fuels V: CNG Fuel Symposium Papers*, Institute of Gas Technology, Chicago, IL (Oct. 1985).

Singh, M.K., M. Millar, and D.J. Santini, *Dominant Trends in World Petroleum Supply and Demand: A Review of Recent Estimates and Projections into the 21st Century*, Proc. IASTED International Conference on Energy, Power and Environmental Systems, Santa Barbara, CA (May 1985).

Singh, M.K., and D.O. Moses, *State of Knowledge of Environmental Concerns Related to Natural-Gas-Fueled Vehicles*, Proceedings, 12th Energy Technology Conference, Washington, D.C. (March 1985).

Giese, R.F., M.K. Singh and M.J. Bernard, *Regional Analysis of Potential Impacts of Electric and Hybrid Vehicles on Electric Utilities*, SAE 820453, Society of Automotive Engineering Congress and Exposition, Detroit, MI (Feb. 1982).

Singh, M.K., *Social, Institutional, and Public Safety Impacts of Electric and Hybrid Vehicles*, presented at the 60th Annual Meeting of the Transportation Research Board, Washington, D.C. (Jan. 1981).

Bernard, M.J., and M.K. Singh, *Environmental Assessment of DOE Transportation Program*, Proc. 2nd DOE Environmental Control Symposium, Reston, VA (March 1980).

Singh, M.K., and M.J. Bernard, *Electric and Hybrid Vehicles in the Urban Future*, Proc. 2nd International Energy Use Management Conf., Los Angeles, CA (Oct. 1979).

Bernard, M.J., S.J. LaBelle, and M.K. Singh, *Environmental Planning and Assessment for Electric Vehicles*, 154th Meeting of Electrochemical Society, Inc., Pittsburgh, PA (Oct. 1978).

## **Talk**

P. Patterson, D. Greene, E. Steiner, S. Plotkin, M. Singh, A. Vyas; M. Mintz, D. Santini, S. Folga, J. Moore, P. Reilly-Roe, K. Cliffe, R. Talbot, P. Khanna, and V. Stanciulescu, *Joint DOE/NRCan study of North American transportation energy futures : discussion of the study, presentation of phase 2 results (May 2003)*, presentation prepared for US DOE ; Washington, D.C. ( April 2003).