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Capabilities: Over 36 years of experience in modeling, technology and policy assessment, transportation demand analysis, urban transportation planning, and environmental analysis.

Professional Experience:

Argonne National Laboratory (1980 – Present)

Transportation Systems Engineer, Center for Transportation Research (1980-Present)

Conducted research on transportation demand, market potentials of transportation technologies and materials, and environmental impacts of new technologies. Developed and exercised mathematical and simulation models for evaluation of technologies, alternative fuels, policies, and regulations. Analyzed energy and petroleum saving potentials of alternative vehicle engine and fuel technologies including electric and hybrid electric vehicles. Evaluated the impacts of the 1970 Clean Air Act on mobile source emissions. Participated as one of the two mobile source modelers in a five-year project assessing the impacts of mobile source emissions on acid precipitation in the United States. Developed a modeling system for projecting transportation energy demand and emissions. Developed behavioral models for consumer vehicle choice and travel. Conducted technological and economic assessments of lightweight materials, structural ceramics, and alternative fuels. Evaluated the market potential for magnetically levitated vehicles and high-speed trains in key corridors.

Chicago Area Transportation Study (1971 – 1980)

Director, Systems Simulation

Managed all modeling, systems analysis, simulation, and software development activities. Directed the development of a set of travel demand and environmental impacts estimation procedures encompassing all steps of urban transportation planning. Managed the development of a unique two-stage mode choice model. Supervised the analysis of two home interview surveys, a commercial vehicle survey, and a cordon-line survey. Participated in the development of environmental implementation plans.

Associated Cement Companies and Gujarat Electricity Board, India (1962 – 1969)

Systems Analyst (1967-1969), Electrical Engineer (1962-1967)

Worked for a cement manufacturer as systems analyst conducting analysis of inventory and optimal use of manufacturing capacity. Supervised maintenance function as an electrical engineer. Worked for the Gujarat State Electricity Board as a rural electrification engineer.

International Experience:

Very familiar with the Indian Subcontinent and south Asia. Worked on an international project relating to the production of biomass energy in Nepal.

Professional Activities

Author or co-author of over 100 publications or presentations. Member of the Transportation Research Board and its Freight Data Committee. Registered Professional Engineer of Illinois since 1975.

Education

M.S., Industrial Engineering (Operations Research), West Virginia University (1971)

B.S., Electrical Engineering, Gujarat University, India (1962)

Selected Publications

Gaines, L, A. Vyas, and J.L. Anderson, *Estimation of Fuel Use by Idling Commercial Trucks*, Transportation Research Record 1983, pp. 91-98, National Academy of Sciences, Washington, D.C. (December 2006).

Wu, Y., M.Q. Wang, A.D. Vyas, D.C. Wade, and T.A. Taiwo, *Well-to-Wheels Analysis of Energy Use and Greenhouse Gas Emissions of Hydrogen Produced With Nuclear Energy*, Nuclear Technology, V 135, pp 192-207 (Aug 2006).

Santini, D.J. and A.D. Vyas, *Hybrid and Diesel Powertrains: Further Analysis of Their Status in the Technology Adoption Life Cycle*, Eighty-fifth Annual Meeting of the Transportation Research Board Paper 06-2590, Washington, D.C. (Jan 2006).

Santini, D.J. and A.D. Vyas, *Introduction of Hybrid and Diesel Vehicle: Status Within the Life Cycle of Technology Adoption*, Transportation Research Record 1941, pp 18-25, National Academy of Sciences, Washington, D.C. (Nov 2005).

Santini, D.J. and A.D. Vyas, *Suggestions for a New Vehicle Choice Model Simulating Advanced vehicle Introduction Decisions (AVID): Structure and Coefficients*, Argonne National Laboratory Report ANL/ESD/05-1 (Jan 2005).

Santini, D.J. and A.D. Vyas, *Hybrid Electric Powertrain Fuel Consumption Reduction Cost Effectiveness Trade-Offs*, Presented at the 24th USAEE/IAEE North American Conference, Energy, Environment and Economics in a New Era, Washington, D.C. (July 2004).

Larsen, R., M. Wang, D. Santini, M. Mintz, Y. Wu, and A. Vyas, *Might Canadian Oil Sands Promote Hydrogen Production Technologies for Transportation?*, Presented at the 15th Global Warming Conference and Expo Held at San Francisco, CA, Global Warming International Center, Woodridge, IL (Apr 2004).

Saricks, C, A.D. Vyas, F. Stodolsky, and J.D. Maples, *Fuel Consumption of Heavy-Duty Trucks: Future Technologies for Improving Energy Efficiency and Emissions*, Transportation Research Record 1842, pp. 9-19, National Academy of Sciences, Washington, D.C. (Oct 2003).

Santini, D.J., A.D. Vyas, R. Kumar, and J.L. Anderson, *Comparing Estimates of Fuel Economy Improvement via Fuel-Cell Powertrains*, SAE Transactions, Journal of Engines, Vol. 111-3, pp 2395-2404, SAE International, Warrendale, PA (Sep 2003).

Santini, D.J., A.D. Vyas, J.L. Anderson, and F. An, *Hybridizing with Engine Power Reduction*, Transportation Research Record 1815, pp. 19-26, National Academy of Sciences, Washington, D.C. (Nov 2002).

Santini, D.J., A.D. Vyas, J. Moore, and F. An, *Comparing Cost Estimates for U.S. Fuel Economy Improvement by Advanced Electric Drive Vehicles*, Presented at the EVS-19 Conference: The Answer for the Clean Mobility, Held at Busan, Korea (Oct 2002).

An, F., A. Vyas, J.L. Anderson, and D. Santini, *Evaluating Commercial and Prototype HEVs*, SAE 2001 Transactions, Vol. 110, Journal of Engines, Section 3, pp. 769-780, Warrendale, PA (Sept 2002).

- Vyas, A., C. Saricks, and F. Stodolsky, *The Potential Effect of Future Energy-Efficiency and Emissions-Improving Technologies on Fuel Consumption of Heavy Trucks*, Argonne National Laboratory Report ANL/ESD/02-4 (Aug 2002).
- Duvall, M. et al., *Comparing the Benefits and Impacts of Hybrid Electric Vehicle Options for Compact Sedan and Sport Utility Vehicles*, Electric Power Research Institute Report 1006892, Palo Alto, CA (July 2002).
- Plotkin, S, D. Santini, A. Vyas, J.L. Anderson, M. Wang, J. He, and D. Bharathan, *Hybrid Electric Vehicle Technology Assessment: Methodology, Analytical Issues, and Interim Results*, Argonne National Laboratory Report ANL/ESD/02-2 (Oct 2001).
- Santini, D.J., A.D. Vyas, J.L. Anderson, and F. An, *Partnership for a New Generation of Vehicles' Goal: Evaluation of Trade-Offs Along the Path*, Transportation Research Record 1750, pp. 3-12, National Academy of Sciences, Washington, D.C. (Oct 2001).
- An, F., F. Stodolsky, A. Vyas, R. Cuenca, and J.J. Eberhardt, *Scenario Analysis of Hybrid Class 3-7 Heavy Vehicles*, SAE 2000 Transactions, Journal of Engines, pp. 109-123, Warrendale, PA. (Sept 2001).
- Teotia, A.P., A.D. Vyas, and R.M. Cuenca, *Macroeconomic Impacts of Clean Diesel Engines, Phase 2 Report: U.S.-Produced Clean Diesel Engines and SIDI Engines for Selected Light Trucks*, Argonne National Laboratory Report ANL/ESD/TM-164 (Sept 2001).
- Graham, R. et al., *Comparing the Benefits and Impacts of Hybrid Electric Vehicle Options*, Electric Power Research Institute Report 1000349, Palo Alto, CA (July 2001).
- Mintz, M., A. Vyas, M. Wang, F. Stodolsky, R. Cuenca, and L. Gaines, *From Here to Efficiency: Time Lags Between the Introduction of New Technology and the Achievement of Fuel Savings*, Transportation Research Record 1738, pp. 100-105, National Academy of Sciences, Washington, D.C. (Nov 2000).
- Santini, D.J., P.D. Patterson, and A.D. Vyas, *The Importance of Vehicle Costs, Fuel Prices, and Fuel Efficiency in HEV Market Success*, Transportation Research Record 1738, pp. 11-19, National Academy of Sciences, Washington, D.C. (Nov 2000).
- Stodolsky, F., L. Gaines, and A. Vyas, *Analysis of Technology Options to Reduce the Fuel Consumption of Idling Trucks*, Argonne National Laboratory Report ANL/ESD-43 (June 2000).
- Vyas, A., D. Santini, and R. Cuenca, *Comparison of Indirect Cost Multipliers for Vehicle Manufacturing*, Argonne National Laboratory Special Report ANL/ES/RP-101898 (Apr 2000).
- Teotia, A., A. Vyas, R. Cuenca, F. Stodolsky, and J. Eberhardt, *CAFÉ Compliance by Light Trucks: Economic Impacts of Clean Diesel Engine*, Energy Policy 27 (1999) 889-900.
- Cuenca, R.M., L.L. Gaines, and A.D. Vyas, *Evaluation of Electric Vehicle Production and Operating Costs*, Argonne National Laboratory Report ANL/ESD-41 (Dec 1999).
- Teotia, A.P., A.D. Vyas, and R.M. Cuenca, *Assessing Economic Impacts of Clean Diesel Engines, Phase I Report: U.S.- or Foreign-Produced Clean Diesel Engines for Selected Light Trucks*, Argonne National Laboratory Report ANL/ESD/TM-155 (May 1999).
- Vyas, A., R. Cuenca, and L. Gaines, *An Assessment of Electric Vehicle Life Cycle Costs to Consumers*, Proceedings of the 1998 Total Life Cycle Conference in Graz, Austria, SAE International report P-309, pp. 161-172, Warrendale, PA (Dec 1998).
- Mintz, M.M., M.Q. Wang, and A.D. Vyas, *Fuel-Cycle Energy and Emissions Effects of Tripled Fuel-Economy Vehicles*, Transportation Research Record 1641, pp. 115-122, National Academy of Sciences, Washington, D.C. (Sept 1998).
- Stork, K., M. Singh, M. Wang, and A. Vyas, *Assessment of Capital Requirements for Alternative Fuels Infrastructure Under the Partnership for a New Generation of Vehicles Program*, Transportation Research Record 1641, pp. 123-129, National Academy of Sciences, Washington, D.C. (Sept 1998).

Tompkins, M., D. Bunch, D. Santini, M. Bradley, A. Vyas, and D. Poyer, *Determinants of Alternative Fuel Vehicle Choice in the Continental United States*, Transportation Research Record 1641, pp. 130-138, National Academy of Sciences, Washington, D.C. (Sept. 1998).

Vyas, A. D., H. K. Ng, D. J. Santini, and J. L. Anderson, *Electric and Hybrid Electric Vehicles: A technology Assessment Based on a Two-Stage Delphi Study*, Argonne National Laboratory Report ANL/ESD-36 (December 1997).

Vyas, A. and D. Santini, *Final Report to Congress on Benefit and Costs of the Clean Air Act, 1970 to 1990*, United States Environmental Protection Agency Report EPA 410-R-97-002, Contributed to On-Highway Emissions Modeling and Analysis, Appendix B, Washington, D.C. (Oct. 1997)

Stork, K., M. M. Mintz, A. D. Vyas, F. Stodolsky, and R. Cuenca, *Another Way to Go? Some Implications of a Light-Duty Diesel Strategy*, in "Effects of Transportation on Energy and Air Quality", Transportation Research Record 1587, pp. 27-34, Transportation Research Board, Washington, D.C., (September 1997).

Vyas, A. D., H. K. Ng, D. J. Santini, and J. L. Anderson, *Batteries for Electric Drive Vehicles: Evaluation of Future Characteristics and Costs Through a Delphi Study*, in "State of Alternative Fuel Technologies-1997", SAE International Report SP-1274, pp. 13-34, Warrendale, PA (May 1997)