

Cristiano Façanha

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EDUCATION

- 2006** | Ph.D. in **Civil and Environmental Engineering**, University of California, Berkeley (Berkeley – USA)
- 1997** | M.Sc. in **Management of Transportation**, Chalmers University of Technology (Gothenburg – Sweden)
- 1995** | B.Sc. in **Industrial Engineering**, Federal University of Rio de Janeiro (Rio de Janeiro – Brazil)

EXPERIENCE OVERVIEW

Dr. Facanha is a transportation engineer with 10 years of experience in the transportation industry. At his current position at the International Council on Clean Transportation, he is currently developing a Climate and Health Roadmap to assist nations in achieving a 50-85% reduction in transportation emissions. Dr. Facanha focuses on traffic and mobile source emissions modeling, and on the evaluation of emissions models to better quantify emissions from transportation. He has completed numerous evaluations of transportation emissions at the national, regional, and local/project levels. Dr. Facanha has been responsible for the development of operational and technological strategies to prevent and mitigate environmental impacts of transportation. Dr. Facanha has also completed several assessments of road delay and level of service from additional road traffic, with the aim of quantifying emissions associated with different congestion scenarios. He has extensive experience with data analysis of transportation, including both public and private data sources. His expertise also includes life-cycle assessments of transportation systems, including fuels, vehicles, and transportation infrastructure. Dr. Facanha holds a PhD in Civil and Environmental Engineering from the University of California at Berkeley, and a Masters of Science in Transportation Management from Chalmers University of Technology in Gothenburg, Sweden. Dr. Facanha was raised in Brazil and is fluent in English, Portuguese and Spanish.

PROFESSIONAL EXPERIENCE

- 2010 - Present** | **Program Lead**, International Council on Clean Transportation (San Francisco, CA – USA)
- 2006 - 2009** | **Technical Specialist**, ICF International (San Francisco, CA – USA)
- 1999 - 2002** | **Manager of Logistics Analysis**, American President Lines (Oakland, CA – USA)
- 1998 - 1999** | **Logistics Analyst**, Emery Worldwide (Redwood Shores, CA – USA)
- 1997** | **Research Analyst**, Stora Purchasing and Transport (Gothenburg, Sweden)

LANGUAGES

- Fluent in English, Portuguese and Spanish.

COMPUTER SKILLS

- **Advanced:** Windows and Mac environments, Microsoft Office (Word, Excel, PowerPoint and Access), Visio (flowcharts), EPA's MOVES and MOBILE6, UC Riverside's CMEM.
- **Intermediate:** Microsoft Project, CAPS TransPro (Transportation Planner and Optimizer).

SELECTED PROJECT EXPERIENCE

Environmental Analysis in Transportation

Representing Freight in Air Quality and Greenhouse Gas Models, TRB, 2008-2009. Dr. Facanha is currently analyzing air quality and greenhouse gas models that can be used to represent freight transportation emissions. The study will document the strengths and weaknesses of current models and other analytical procedures. It will identify opportunities to improve or validate emissions estimates, including better ways to make use of existing data and new data sources available through emerging technologies. Finally, the study will develop a conceptual model of freight transportation activity as it relates to emissions, reflecting both current and anticipated data and analytical methods.

Evaluation of Energy Efficiency of Rail and Trucking, FRA, 2007-2008. Dr. Facanha led and conducted a technical analysis of rail and trucking energy efficiency. The analysis quantifies and compares rail and trucking energy efficiency on corridors where both modes compete. The analysis is based on scenarios characterized by a specific route, serving offering, and commodity. The study, which includes an analysis of past and future improvements of

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rail and trucking energy efficiency, also includes recommendations for energy efficiency improvements on both modes.

Development of a GHG Protocol for Roadway Projects, Caltrans, 2008-2009. Dr. Façanha participated in the development of a GHG Protocol for roadway projects, which provides guidelines to estimate greenhouse gas (GHG) emissions from roadway projects for the purpose of analyzing environmental impacts under the California Environmental Quality Act (CEQA) and NEPA. The GHG Protocol, which includes all life-cycle phases of a roadway, focuses on road/bridge/tunnel/lane construction and rehabilitation, lane conversion (e.g., regular to HOV or bus-only), ramp metering, changes in road transportation costs, incentives for alternative vehicles, and changes in bus frequency. Dr. Façanha's role involved the analysis of how different emission models capture GHG emissions from road operations, including the effects of congestion on vehicle emissions.

Fuel Switching Feasibility and Cost Effectiveness Study, EPA, 2008-2009. Dr. Façanha is currently studying the efficacy of using low sulfur distillate fuels when entering a port in reducing air emissions and potential fuel consumption from ocean going vessels that call on the Port of Houston and another selected port in the Western Hemisphere.

SR 520 Greenhouse Gas Emissions Study, PSCAA, 2008. Dr. Façanha analyzed GHG emissions associated with different alternatives and operating scenarios for the State Route 520 Bridge Replacement and High Occupancy Vehicle Project in the Seattle metropolitan area. The analysis includes the use of a modal emissions model to differentiate emissions from different congestion levels.

Environmental Mitigation of Emissions Associated with Freight Transportation, SCAG, 2007. Dr. Façanha developed operational strategies to prevent and mitigate environmental impacts of freight transportation in Southern California. The next step of the project involves the development of an Action Plan that presents the costs, benefits, and implementation schedule for emission reduction measures, as well as an estimate of the net effect on air quality in the region. The products of this effort can serve as inputs to the region's 2007 Air Quality Management Plan and long-range Regional Transportation Plan.

National Marine Port Emissions Inventory, EPA, 2006-2007. Dr. Façanha evaluated and quantified air emissions associated with heavy-duty trucks and locomotives serving ocean and inland ports in the U.S. The study was the first to develop a nationwide emissions inventory of air pollutants associated with port operations in the U.S.

Identification and Recruitment of Mexican Shipping & Carrier Companies for Smartway Transport Partnership, EPA, 2006-2007. Dr. Façanha developed a truck fleet profile for border trucks involved in cross-border operations between the U.S. and Mexico. The underlying objective is to assess the feasibility of implementing the Smartway Transport Partnership, a voluntary program where shippers and carriers commit to cleaner transportation, in cross-border operations.

Life-cycle Analysis

Comparative Life-Cycle Analysis of Brazilian Sugarcane Ethanol and North American Ethanol, Canadian Renewable Fuels Association, 2007-2008. Dr. Façanha led this study, whose objective was to understand the environmental characteristics and in particular, the emissions of greenhouse gases (GHGs) of ethanol produced from sugarcane in Brazil on a life-cycle basis. The study also evaluated North American ethanol production and distribution from different types of feedstock including corn, cellulosic, and wheat. A life-cycle comparison between Brazilian sugarcane ethanol and North American ethanol was provided in terms of global warming potential (GWP) and net energy balance (NEB), ensuring that system boundaries were comparable. Because Brazilian ethanol would need to be imported, GHG emissions and energy associated with international logistics were also taken into account.

Life-cycle Analysis of Freight Transportation in the U.S., UC Berkeley, 2003-2006. Dr. Façanha's doctoral dissertation provided a life-cycle inventory of air emissions (CO₂, NO_x, PM₁₀, CO, SO₂, and Pb) associated with the transportation of goods by road, rail, and air in the U.S. It included the manufacturing, use, maintenance, and EOL phases of vehicles, construction, operation, maintenance, and EOL of transportation infrastructure, as well as oil exploration, refining, and fuel distribution.

Safety and Delay Analysis

Northern Rail Extension Environmental Impact Statement, SEA, 2007. Dr. Façanha was the lead author of the transportation safety and delay for the Alaska NRE EIS. He developed a safety and delay analysis associated with the construction and operations of the Northern Rail Extension in Alaska. The safety analysis accounted for road

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and rail accidents and fatalities associated with the construction and operations of the rail line and support facilities. The delay analysis accounted for road traffic impacts generated by additional construction and operations personnel and materials, as well as delay at rail-highway grade crossings.

Yucca Mountain Railroad Environmental Impact Statement, DOE, 2007. Dr. Facanha developed a safety and traffic analysis associated with the construction and operations of the Yucca Mountain Railroad in Nevada. The safety analysis accounted for both road and rail accidents and fatalities associated with the construction and operations of the rail line and support facilities. The traffic analysis accounts for road traffic impacts generated by additional construction and operations personnel and materials, as well as delay at rail-highway grade crossings.

Logistics and Supply Chain Management

End-to-end Logistics, General Motors, 1999-2002. End-to-end logistics entails the management of a company's supply chain from upstream suppliers to end customers. At APL Logistics, Dr. Facanha has planned end-to-end logistics operations, including transportation, warehousing, light assembly, freight forwarding, and customs brokerage. As an example, the operations of an automotive manufacturer in Northern China accounted for the inbound transportation of auto parts from suppliers in China to a manufacturing facility, as well as for the distribution of finished vehicles to dealers across China. The storage of auto parts in the manufacturing facility was also part of the solution.

Just-in-Time Operations, Toyota Motor Company, 1999-2002. While at APL Logistics, Dr. Facanha was involved in process improvements initiatives associated with just-in-time operations. In one program, the operations involved the transportation of auto parts from local suppliers to an automotive manufacturing facility in Kentucky. Since the facility operated on a just-in-time basis (i.e., no intermediate inventory), shipments were received every few hours on specialized trucks to facilitate loading and unloading. The operations were based on the Japanese kanban system. Due to the success of these operations, the company exported the model to Thailand. In that project, auto parts came from local suppliers in Thailand (with routes designed as milk-runs) as well as from suppliers in Europe via ocean shipping or air transportation for emergency shipments. Mr. Facanha was responsible for process optimization associated with air shipments.

Distribution Management in Brazil, General Motors, 1998-1999. While at Emery Global Logistics, Dr. Facanha participated in the implementation of an "Aftermarket Parts Distribution" program for an automotive manufacturer in Sao Paulo, Brazil. This program consisted in the distribution of auto parts from 2 warehouses to over 400 automotive dealers across Brazil.

SELECTED PUBLICATIONS AND PRESENTATIONS

- Facanha, Cristiano. "Effects of Congestion and Road Level of Service on Vehicle Fuel Economy". Presented at the Transportation Research Board (TRB) Conference in 2009.
- Facanha, Cristiano, and Simiu, Diane. "Comparative Life-Cycle Analysis of Brazilian Sugarcane Ethanol and North American Ethanol". Presented at the Transportation Research Board (TRB) Conference in 2009.
- Facanha, Cristiano. "Data Challenges in the Development of a Nationwide Inventory of Emissions from Port-Serving Trucks and Locomotives ". Presented at the Data for Goods Movement Impacts on Air Quality Conference in Irvine, California on March 17-18, 2008.
- Facanha, Cristiano, and Ang-Olson, Jeff. "Comparison of Technological and Operational Strategies to Reduce Trucking Emissions in Southern California". Presented at the Transportation Research Board (TRB) Conference in 2008, and approved for publication at the Transportation Research Record.
- Ang-Olson, Jeff, and Facanha, Cristiano. "Comparative Evaluation of Infrastructure Strategies to Reduce Emissions from Intermodal Freight Movement in Southern California ". Presented at the Transportation Research Board (TRB) Conference in 2008, and approved for publication at the Transportation Research Record.
- Davis, John; Facanha, Cristiano, and Aamidor, Joe. "Greenhouse Gas Emissions from U.S. Freight Sources: Using Activity Data to Interpret Trends and Reduce Uncertainty". Presented at the Transportation Research Board (TRB) Conference in 2008.
- Facanha, Cristiano, and Horvath, Arpad. "Evaluation of Life-cycle Air Emissions Factors of Freight Transportation" *Environmental Science and Technology*, 41 (20), pp. 7138 -7144, 2007.
- Facanha, Cristiano. "Life-cycle Air Emissions Inventory of Freight Transportation in the United States." Ph.D. Dissertation, University of California at Berkeley, 2006.

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- Facanha, Cristiano, and Horvath, Arpad. "Environmental Assessment of Freight Transportation in the U.S." *International Journal of Life-Cycle Assessment*, 11 (4) pp. 229-239, 2006. Also presented at the Transportation Research Board (TRB) Conference in 2006.
- Facanha, Cristiano, and Horvath, Arpad. "Environmental Assessment of Logistics Outsourcing." *Journal of Management in Engineering*, January, 2005.