ADOPT Publications: Consumer Choice Modeling Examples (2013–2024)

The following 43 publications from 2013–2024 provide examples of how the National Laboratory of the Rockies' Automotive Deployment Options Projection Tool (ADOPT) can be used to estimate technology improvement impacts on sales and energy use.

For more recent publications, visit the Publications section of the ADOPT webpage.

2024

1. A Comprehensive Assessment of the Marginal Abatement Costs of CO2 of Co-Optima Multi-Mode Vehicles
   Authors: Nicholas A. Carlson, Michael S. Talmadge, George G. Zaimes, Troy R. Hawkins, and Yuan Jiang
   Journal: *Energy & Fuels* (December 2024)

2. Potential Adoption and Benefits of Co-Optimized Multimode Engines and Fuels for U.S. Light-Duty Vehicles
   Authors: Doris Oke, Lauren Sittler, Troy R. Hawkins, George G. Zaimes, Hao Cai, Aaron Brooker, Douglas Longman, Ram Vijayagopal, David Gohlke, Emily Newes, Avantika Singh, Jennifer Dunn, and Daniel J. Gaspar
   Journal: *Energy & Fuels* (November 2024)

3. Formalizing Sustainable Urban Mobility Management: An Innovative Approach with Digital Twin and Integrated Modeling
   Authors: Andrea Grotto, Pau Fonseca i Casas, Alyona Zubaryeva, and Wolfram Sparber
   Journal: *Logistics* (November 2024)

4. Simulating Impacts From Transit Service Enhancements in the San Francisco Bay Area
   Authors: Cristian Poliziani, A. Zachary Needell, Haitam Laarabi, Rashid Waraich, Annika Todd-Blick, K. Sydny Fujita, Nazanin Rezaei, D. Juan Caicedo, Carlos Guirado, C. Anna Spurlock, and Tom Wenzel
   Journal: *Transportation Research Record: Journal of the Transportation Research Board* (November 2024)

5. Lightweighting Cost Impacts on Market Adoption and GHG Emissions in U.S. Light-Duty Vehicle Fleet
   Authors: Fan Yang, Aaron Brooker, Sarah Kleinbaum, and David Gotthold
   Journal: *Environmental Research Communications* (September 2024)

6. Assessment of Alternative Fueling Infrastructure in the United States
   Authors: Stephen Lommele, Ranjit R. Desai, Caley Johnson, Amy Snelling, Abby

Brown, Mark Singer, Jesse Bennett, Jeff Cappellucci, Johanna Levene, and Christopher Hoehne
Report: NLR (September 2024)

7. Impact of Electric Vehicle Charging Station Reliability, Resilience, and Location on Electric Vehicle Adoption
Authors: Bonnie Powell and Caley Johnson
Report: NLR (August 2024)

8. Technology Progress and Clean Vehicle Policies on Fleet Turnover and Equity: Insights From Household Vehicle Fleet Micro-Simulations With ATLAS
Authors: Ling Jin, Connor P. Jackson, Yuhan Wang, Qianmiao Chen, Tin Ho, C. Anna Spurlock, Aaron Brooker, Jacob Holden, Jeffrey Gonder, Mohamed Amine Bouzaghrane, Bingrong Sun, Shivam Sharda, Venu Garikapati, Tom Wenzel, and Juan Caicedo
Journal: *Transportation Planning and Technology* (May 2024)

9. The Hydrogen Economy Can Reduce Costs of Climate Change Mitigation by up to 22%
Authors: Paul Wolfram, Page Kyle, Jay Fuhrman, Patrick O'Rourke, and Haewon McJeon
Journal: *One Earth* (May 2024)

10. Navigating Widespread Urban Transit Dynamics with Standardized Data and Scalable Models
Author: Zackary Aemmer
Dissertation (Preview): University of Washington (2024)

2023

1. LA100 Equity Strategies: Household Transportation Electrification
Authors: Dong-Yeon Lee, Bingrong Sun, Alana Wilson, Megan Day, Patricia-Romero Lankao, Nicole Rosner, Fan Yang, Aaron Brooker, and Jane Lockshin
Report: NLR (November 2023)

2. Fast Charging Infrastructure for Electrifying Road Trips to and From National Parks in the Western United States
Authors: Dong-Yeon Lee, Kaylyn Bopp, Matthew Moniot, and Alicen Kandt
Report: NLR (September 2023)

3. Energy, Economic, and Environmental Impacts Assessment of Co-Optimized On-Road Heavy-Duty Engines and Bio-Blendstocks
Authors: Doris Oke, Lauren Sittler, Hao Cai, Andre Avelino, Emily Newes, George G. Zaimes, Yimin Zhang, Longwen Ou, Avantika Singh, Jennifer B. Dunn, and Troy

R. Hawkins
Journal: *Sustainable Energy Fuels* (August 2023)

4. Sustainable Development Pathways for Energies in Yangtze River Delta Urban Agglomeration
   Authors: Da Xie, Chao Xu, Chenghong Gu, Pengfei Zhao, Xitian Wang, and Yanjia Wang
   Preprint: Research Square (August 2023)

5. Best Practices in Electricity Load Modeling and Forecasting for Long-Term Power System Planning
   Authors: Ella Zhou, Sika Gadzanku, Cabell Hodge, Mike Campton, Stephane de la Rue du Can, and Jingjing Zhang
   Report: NLR and Lawrence Berkeley National Laboratory (April 2023)

6. Economic Analysis of the Benefits to Petroleum Refiners for Low Carbon Boosted Spark Ignition Biofuels
   Authors: Nicholas A. Carlson, Avantika Singh, Michael S. Talmadge, Yuan Jiang, George G. Zaimes, Shuyun Li, Troy R. Hawkins, Lauren Sittler, Aaron Brooker, Daniel J. Gaspar, Robert L. McCormick, and M. M. Ramirez-Corredores
   Journal: *Fuel* (February 2023)

7. USAID Colombia Young Leaders Workforce Training Program Action Plans: Planning for Electric Vehicle Charging Infrastructure in Bogota
   Authors: Jeff Cappellucci, Dustin Weigl, Sean Esterly, and Hallie Lucas
   Report: NLR (February 2023)

2022

1. Projecting California Light-Duty Vehicle Attributes (2019–2035)
   Authors: Catherine Ledna, Aaron Brooker, and Dong-Yeon Lee
   Report: NLR (September 2022)

2. How To Support EV Adoption: Tradeoffs Between Charging Infrastructure Investments and Vehicle Subsidies in California
   Authors: Catherine Ledna, Matteo Muratori, Aaron Brooker, Eric Wood, and David Greene
   Journal: *Energy Policy* (June 2022)

3. Mapping the Opportunity Space to Model the Circular Economy Using Tools Funded by the DOE Office of Energy Efficiency and Renewable Energy
   Authors: Shubhankar Upasani, Julien Walzberg, Dwarak Ravikumar, Alberta Carpenter, Garvin Heath, Ulises Gracida-Alvarez, Thathiana Benavides, Hui Xu, Troy Hawkins, Daniel Desantis, and Joe Cresko
   Report: NLR (April 2022)

4. Mobility Trends in Transport Sector Modeling
   Authors: Stefan Kraus, Thomas Grube, and Detlef Stolten
   Journal: *Future Transportation* (February 2022)

5. Developing an Interactive Landscape for Mobility Resources: Preprint
   Authors: Lauren Janicke, Benjamin Burch, K. Shankari, and Arthur Yip
   Conference: Transportation Research Board Annual Meeting (January 2022)

2021

1. Multidimensional Models to Understand Travel Behavior Implications for Transport and Household Energy Use
   Authors: Shivam Sharda
   Dissertation: Arizona State University (December 2021)

2. Future Automotive Systems Technology Simulator (FASTSim) Validation Report – 2021
   Authors: Chad Baker, Matthew Moniot, Aaron Brooker, Lijuan Wang, Eric Wood, and Jeffrey Gonder
   Report: NLR (October 2021)

3. Vehicle Technologies and Hydrogen and Fuel Cell Technologies Research and Development Programs Benefits Assessment Report for 2020
   Authors: Aaron Brooker, Alicia Birky, Evan Reznicek, Jeff Gonder, Chad Hunter, Jason Lustbader, Chen Zhang, Lauren Sittler, Arthur Yip, Fan Yang, and Dong-Yeon Lee
   Report: NLR (August 2021)

4. Implications of Competitor Representation for Profit-Maximizing Design
   Authors: Arthur Yip, Jeremy Michalek, and Kate Whitefoot
   Journal: *Journal of Mechanical Design* (July 2021)

5. Carbon-Neutral Pathways for the United States
   Authors: James Williams, Ryan Jones, Ben Haley, Gabe Kwok, Jeremy Hargreaves, Jamil Farbes, and Margaret Torn
   Journal: *AGU Advances* (January 2021)

2020

1. Biofuels with Tailored Properties (A) for Hybrid and Plug-in Electric Vehicles (B)
   Authors: Doris Oke, Doug Longman, Emily Newes, Troy Hawkins, Jennifer Dunn, Hao Cai, Aaron Brooker, Scott Curran, Greg Zaimes, Lauren Sittler, and Ram Vijayagopal
   Conference: Applied Energy Symposium (August 2020)

2019

1. Scenario Evaluation and Regionalization Analysis (SERA) Model: Demand Side and Refueling Infrastructure Buildout
   Authors: Brian Bush, Matteo Muratori, Chad Hunter, Jarett Zuboy, and Marc Melaina
   Report: NLR (June 2019)

2. Connected Autonomous Electric Vehicles as Enablers for Low-Carbon Future
   Authors: Binod Vaidya and Hussein Mouftah
   Book chapter: *Energy Efficiency in Smart Grids* (March 2019)

2018

1. The Demand-Side Grid (dsgrid) Model Documentation
   Authors: E. Hale, H. Horsey, B. Johnson, M. Muratori, E. Wilson, B. Borlaug, C. Christensen, A. Farthing, D. Hettinger, A. Parker, J. Robertson, M. Rossol, G. Stephen, E. Wood, and B. Vairamohane
   Report: NLR (August 2018)

2. Light-Duty Vehicle Attribute Projections (Years 2015–2030)
   Authors: E. Kontou, M. Melaina, and A. Brooker
   Report: California Energy Commission (July 2018)

3. Future Automotive Systems Technology Simulator (FASTSim) Validation Report
   Authors: J. Gonder, A. Brooker, E. Wood, and M. Moniot
   Report: NLR (July 2018)

4. Electrification Futures Study: Scenarios of Electric Technology Adoption and Power Consumption for the United States
   Authors: T. Mai, P. Jadun, J. Logan, C. McMillan, M. Muratori, D. Steinberg, L. Vimmerstedt, R. Jones, B. Haley, and B. Nelson
   Report: NLR (June 2018)

5. Assessing Energy Impacts of Connected and Automated Vehicles at the U.S. National Level—Preliminary Bounds and Proposed Methods
   Authors: T. Stephens, J. Auld, Y. Chen, J. Gonder, E. Kontou, Z. Lin, F. Xie, A. Mohammadian, R. Shabanpour, and D. Gohlke
   Book chapter: *Road Vehicle Automation* (June 2018)

6. Biomass Market Dynamics Supporting the Large-Scale Deployment of High-Octane Fuel Production in the United States
   Authors: P. Lamers, R. Nguyen, D. Hartley, J. Hansen, and E. Searcy
   Journal: *GCB Bioenergy* (March 2018)

7. Development of Fleet Energy Savings Evaluation Tools for SMART Mobility: Smart Vehicle Energy Technology (SVET) Model for Passenger Fleets and Freight Fleet Level Energy Estimation Tool (FFLEET) for Freight Fleets
   Authors: T. LaClair and A. Moore
   Report: Oak Ridge National Laboratory (February 2018)

2017 and Earlier

1. Electrification Futures Study: End-Use Electric Technology Cost and Performance Projections through 2050
   Authors: P. Jadun, C. McMillan, D. Steinberg, M. Muratori, L. Vimmerstedt, and T. Mai
   Report: NLR (December 2017)

2. Comparison of Vehicle Choice Models
   Authors: T. Stephens, R. Levinson, A. Brooker, C. Liu, Z. Lin, A. Birky, and E. Kontou
   Report: Argonne National Laboratory (October 2017)

3. Well-to-Wheels Greenhouse Gas Emission Analysis of High-Octane Fuels with Ethanol Blending: Phase II Analysis with Refinery Investment Options
   Authors: J. Han, M. Wang, A. Elgowainy, and V. DiVita
   Report: Argonne National Laboratory (August 2016)

4. Summary of High-Octane Mid-Level Ethanol Blends Study
   Authors: T. Theiss, T. Alleman, A. Brooker, A. Elgowainy, G. Fioroni, J. Han, S. Huff, C. Johnson, M. Kass, P. Leiby, R. Martinez, R. McCormick, K. Moriarty, E. Newes, G. Oladosu, J. Szybist, J. Thomas, M. Wang, and B. West
   Report: Oak Ridge National Laboratory (July 2016)

5. High-Octane Mid-Level Ethanol Blend Market Assessment
   Authors: C. Johnson, E. Newes, A. Brooker, R. McCormick, S. Peterson, P. Leiby, R. Martinez, G. Oladosu, and M. Brown
   Report: NLR (December 2015)

6. SERA Scenarios of Early Market Fuel Cell Electric Vehicle Introductions: Modeling Framework, Regional Markets, and Station Clustering
   Authors: B. Bush, M. Melaina, and M. Penev
   Report: NLR (September 2013)