

## Alejandro Henao, Ph.D.

Mobility Researcher

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### SUMMARY

I am a mobility researcher with the National Renewable Energy Laboratory (NREL), and Deputy Director for Mobility Choice. My research focuses on the synergies between transportation and energy, with an emphasis on data collection strategies and innovation to answer key research questions including impacts of ride-hailing and future mobility. I hold a PhD in civil engineering from the interdisciplinary sustainable urban infrastructure program at the University of Colorado.

My passion for transportation, people, cities and the environment has driven me – literally – to explore the field first-hand, and has allowed me to gain unique knowledge, and experience. Realizing the difficulty in obtaining data directly from Uber and Lyft, I designed an ethnographic and survey-based experiment by conducting research while driving for both companies. With a strong background in data & research, and a diverse skill set, I'm eager to be part of the solution to meaningfully influence the future of mobility. I bring to the table critical thinking, innovative ideas, research and field experience, a team-oriented mentality and problem-solving skills.

### TRANSPORTATION EXPERIENCE

Mobility Researcher, Transportation System Center, National Renewable Energy Laboratory	2018 – Present
Deputy Director, Mobility Choice	2018 – Present
Postdoctoral Researcher, Transportation System Center, National Renewable Energy Laboratory	2017 – 2018
Research Assistant, University of Colorado Denver, Mountain Plains Consortium	2012 – 2017
Adjunct Professor, Guess Lecturer; University of Colorado Denver	2013 – 2016

### EDUCATION

<b>Ph.D., Civil Engineering</b> , University of Colorado Denver (GPA: 3.95)	May 2017
<u>Dissertation</u> : “Impacts of Ridesourcing on Transportation including VMT, Mode Replacement, Parking, and Travel Behavior”	
<b>Masters of Science</b> , Civil Engineering, University of Colorado Denver	Dec 2013
<b>Bachelor of Science</b> , Civil, Environmental and Architectural Engineering, University of Colorado Boulder	2006

### LIST OF PUBLICATIONS

Henao, A., & Marshall, W. E. (2018). The impact of ride-hailing on vehicle miles traveled. *Transportation*.

<https://doi.org/10.1007/s11116-018-9923-2>

Henao, A., Sperling, J., Garikapati, V., Hou Y. & Young, S. (2018). “Airport Analyses Informing New Mobility Shifts: Opportunities to Adapt Energy-Efficient Mobility Services and Infrastructure” Golden, CO: National Renewable Energy Laboratory. NREL/CP-5400-71036. <https://www.nrel.gov/docs/fy18osti/71036.pdf>

Henao, A., & Marshall, W. E. (2018). Impacts of Ride-hailing on Parking – and Viceversa. *Journal of Transportation and Land Use (JTLU)* (revise and resubmit)

Young, A., S. Young, & Henao, A (2018). Business Traveler Behavioral Shifts from Ride-Hailing: A before and after Case Study. *ITS America*, Detroit.

Henao, A., & Marshall, W. E. (2017). A Framework for Understanding the Impacts of Ridesourcing on Transportation. In *Disrupting Mobility: Impacts of Sharing Economy and Innovative Transportation on Cities* (pp. 197-209), Meyer & Shaheen (Eds.). Springer International Publishing. <http://link.springer.com/book/10.1007/978-3-319-51602-8>

## LIST OF PUBLICATIONS (CONTINUED)

Marshall, W. E., & Henao, A. (2015). The Shock Heard 'Round the Suburbs: Assessing Vulnerability, Resilience, and Transportation Affordability of Higher Fuel Price Scenarios. *Transportation Research Record: Journal of the Transportation Research Board*, No: 2531, pp 63-75. <http://dx.doi.org/10.3141/2531-08>

Marshall, W. E., Henao, A., & Bronson, R. (2015). Building a Framework for Transportation Resiliency and Evaluating the Resiliency Benefits of Light Rail Transit in Denver, Colorado. [MPC-15-279](#). U.S. Department of Transportation, University Transportation Centers Program, Upper Great Plains Transportation Institute, Fargo: Mountain-Plains Consortium.

Henao, A., Piatkowski, D., Luckey, K., Nordback, K., Marshall, W. E., & Krizek, K. J. (2015). Sustainable Transportation Infrastructure Investments and Mode Share Changes: A 20-year background of Boulder, Colorado. *Transport Policy*, Vol. 37: 64-71. <http://dx.doi.org/10.1016/j.tranpol.2014.09.012>

Henao, A., & Marshall, W. E. (2015). Fuel Price Shocks, Affordability, and Transportation Economic Resilience. *94<sup>th</sup> Annual Meeting of the Transportation Research Board*, Washington, D.C.

Henao, A., & Marshall, W. E. (2013). Parking at Sporting Event Stadiums in Denver, Colorado. *Transportation Research Record: Journal of the Transportation Research Board*, No: 2359, pp 17-26.

Henao, A., Marshall, W. E., Luckey K., Nordback K., Stonebraker E., Krizek, K. J., & Piatkowski D. (2013). Sustainable Transportation Infrastructure Investments and Mode Share Changes: A 20- year case study of Boulder, Colorado. *92<sup>nd</sup> Annual Meeting of the Transportation Research Board*, Washington, D.C.

### Submitted and Working Papers:

Sperling, J., Henao, A., Schmitt, D., Duvall, A. & Young, S. (2018). Four Airport Megatrends Serving as Drivers of a Smart Resilient City – a Perfect Storm Rising.

Hou, Y., Sperling, J., Garikapati, V. & Henao, A. (2018). A Deep Learning Approach for TNC Trip Demand Prediction Considering Spatial-Temporal Features

Henao, A., Sperling, J., Garikapati, V., Marshall, W.E., Young, S. & Wenzel, T. (2018). Exploring the Impacts of Ride-Hailing on Transportation and Energy

Wenzel, T., Rames, C., Eleftheria, K. & Henao, A. (2018). Travel and Energy Implications of Ride-Hailing Service in Austin, Texas

Henao, A., & Marshall, W. E. (2018). Assessing Ride-Hailing Per Mile Cost to Passengers and Driver Wages

Henao, A. (2018). Impacts of Ride-hailing on Travel Behavior: A Tree-based Model.

## SELECTED PRESENTATIONS

### Ride-hailing and Future Mobility

- “Analyzing Automated Vehicle Factors Impacting Energy Consumption, Informed by Current Ride-Hailing Experience” (poster). *Automated Vehicle Symposium*, San Francisco, CA. July 2018
- “Mobility Behavioral Responses to Transportation Network Companies”. *2018 Annual Merit Review and Peer Evaluation Meeting, Department of Energy (DOE)*, Arlington, VA. June 2018
- “Futuro de la Movilidad”. Webinar in Spanish to the *United Nations and Move Latin-America*, June 2018
- Presentation to the *Denver Regional Mobility and Access Council (DRMAC)*. June 2018
- “Airport Analyses Informing New Mobility Shifts: Opportunities to Adapt Energy-Efficient Mobility Services and Infrastructure”. *ITS America*, Detroit, MI. June 2018 (with S. Young & J. Sperling)
- “Ride-hailing and Future Mobility”, *Smart Driving Car Summit*, Princeton University, NJ. May 2018
- *Mobility Workshop: Economic and Social Impacts*, Mcity and the University of Michigan Energy Institute, Ann Arbor, MI. April 2018

## SELECTED PRESENTATIONS (CONTINUED)

- *15<sup>th</sup> Annual Spring Transportation Symposium*, Denver, CO. April 2018
- Webinar to the Rocky Mountain Chapter of the *Association for Commuter Transportation*. April 2018
- Presentation to the *Boulder County Leadership Fellows*, Louisville, CO. March 2018
- Presentation to the *Boulder Transportation Connections*, Boulder, CO. February 2018
- “Assessing Impacts of Future Transportation through Ride-Hailing Research”, Institute of Transportation Studies, University of California Davis Seminar, Davis, CA. February 2018
- Ride-hailing Research Informing Future Transportation (poster). *Colorado State Capitol*, Denver. Jan 2018
- *Presentation to the Committee on Emerging Ridesharing Solutions AP020(2), 97<sup>th</sup> Annual Meeting of the Transportation Research Board*, Washington, D.C. January 2018
- *Presentation to the Colorado Department of Public Health & Environment*, Denver, CO. August 2017
- *Automated Vehicle Symposium*, San Francisco, California. July 2017
- *ITE Western District Meeting*, San Diego, California. June 2017
- *Designing Innovative Transportation Systems Solutions Workshop*, Berkeley, California. May 2017
- *14<sup>th</sup> Annual Spring Transportation Symposium*, Denver, CO. April 2017
- *Time Use Observatory (TUO)*, Chile. March 2017
- *Grupo Sur, Universidad de Los Andes*, Bogota, Colombia. March 2017. In spanish
- *Presentation to the City and County of Denver*. Denver, CO. February 2017
- *96<sup>th</sup> Annual Meeting of the Transportation Research Board*, Washington, D.C. January 2017 (with W. Marshall)
- *ITE Western District Meeting*, Albuquerque, NM. July 2016
- *13<sup>th</sup> Annual Spring Transportation Symposium*, Denver, CO. April 2016
- *Disrupting Mobility Summit*, MIT, Cambridge, MA. November 2015 (with W. E. Marshall)

### Information Communication Technologies and Evolving Transportation Services

- *Innovations in Travel Modeling (Organized by TRB)*, Denver, CO. May 2016
- *ITE Western District Meeting*, Las Vegas, NV. July 2015
- *23<sup>rd</sup> Congress for the New Urbanism Annual Meeting*, Dallas, TX. April 2015

### Fuel Price Shocks, Affordability, and Transportation Economic Resilience (with W. E. Marshall)

- *94<sup>th</sup> Annual Meeting of the Transportation Research Board*, Washington, D.C. January 2015
- *11<sup>th</sup> Annual Spring Transportation Symposium*, Denver, CO. April 2014

### Parking at Sporting Event Stadiums in Denver, Colorado (with W. E. Marshall)

- *10<sup>th</sup> Annual Spring Transportation Symposium*, Denver, April 2013
- *92<sup>nd</sup> Annual Meeting of the Transportation Research Board*, Washington, D.C., January 2013

### Sustainable Transportation Infrastructure Investments and Mode Share Changes: A 20-year case study of Boulder, Colorado (with D. Piatkowski, K. Luckey, K. Nordback, E. Stonebraker, W. Marshall, & K. Krizek)

- *92<sup>nd</sup> Annual Meeting of the Transportation Research Board*, Washington, D.C., January 2013
- *53<sup>rd</sup> Annual Conference Association of Collegiate Schools of Planning*, Cincinnati, November 2012

## SELECTED SCHOLARLY ACTIVITIES

- Panel Member of the Transportation Research Board, National Academy of Science, TCRP J-11/Task 26, Collaborations and Partnerships between Public Transportation and Transportation Network Companies
- Young Member of the National Research Council, Transportation Research Board, Standing Committee on Emerging and Innovative Public Transport and Technologies (AP020), April 2016 – April 2019
- Institute of Transportation Engineers (ITE) Student Chapter President, University of Colorado, 2014 – 2017
- Creator and Organizer, *The Future of Transportation in Denver Summit*. ITE & WTS, University of Colorado, 2015
- Student Leader, Active Communities / Transportation (ACT) Research Group, 2011 – 2017
- Discussant, Transportation Modeling Group. *Congress for the New Urbanism Transportation Summit*, Chicago, 2013

### Research Interest

- Transportation and Energy
- Current trends and future mobility options (e.g. ride-hailing, autonomous vehicles, electrification, sharing)
- Car-dependency reduction, mode choice, travel behavior;
- Sustainable, resilient, equitable, efficient, and affordable transportation systems;
- Transportation economics, transport flexibility, and value of transit;
- Infrastructure and design, parking;
- Safety, Vision Zero

## SELECTED NEWS & PRESS

The New York Times, The Upshot, August 2018. “What’s the Right Number of Taxis (or Uber or Lyft Cars) in a City?” <https://www.nytimes.com/2018/08/10/upshot/uber-lyft-taxi-ideal-number-per-city.html>

CommonWealth, January 2018. “The big worry: Transit ridership is declining as ride-hailing apps gain steam” <https://commonwealthmagazine.org/transportation/the-big-worry/>

Colorado Public Radio (CPR), May 2017. “Two Ways Uber And Lyft Are Clogging Denver-Area Streets, And One Way They’re Helping” <https://www.cpr.org/news/story/two-ways-uber-and-lyft-are-clogging-denver-area-streets-and-one-way-they-re-helping>

Denver7 News, April 2017. “Study: Uber and Lyft could be adding traffic to Colorado roads” <http://www.thedenverchannel.com/traffic/traffic-news/study-uber-and-lyft-could-be-adding-traffic-to-colorado-roads>

Streetsblog Denver, March 2017. “Study: Uber and Lyft Add Traffic, Reduce Efficiency on Denver and Boulder Roads” <http://denver.streetsblog.org/2017/03/29/study-uber-and-lyft-add-traffic-reduce-efficiency-on-denver-and-boulder-roads/>

London School of Economics (LSE) United States Politics and Policy (USAPP), June 2015. “How cities are reducing auto dependence by investing in sustainable transportation infrastructure” <http://bit.ly/1FqHphA>

The National Science Foundation, August 2014. “CU Denver study shows excess parking at some Denver sports stadiums” [http://nsf.gov/news/news\\_summ.jsp?cntn\\_id=132283](http://nsf.gov/news/news_summ.jsp?cntn_id=132283)

Channel 9 News Colorado, August 2014. “Study: Plenty of parking at Denver stadiums” <http://www.9news.com/story/news/local/2014/08/04/study-plenty-of-parking-at-denver-stadiums/13603525/>

## SELECTED FELLOWSHIPS AND SCHOLARSHIPS (GRADUATE SCHOOL)

- *Dwight D. Eisenhower Transportation Graduate Fellowship* (2014 – 2015 & 2016 – 2017), U.S. D.O.T.
- *Executive Committee Leadership & Graduate Student Scholarships* (2012, 2013 & 2016), ITE CO/WY Section
- *The Mountain-Plains Consortium (MPC) Student of the Year Award* (2015 – 2016), U.S. D.O.T.
- *Bridge to the Doctorate (B2D) Program Fellowship* (2014 – 2016), National Science Foundation (NSF)
- *President's Diversity Fund for Development and Support Award* (2014, 2015 & 2016), University of Colorado Denver
- *Integrative Graduate Education and Research Traineeship (IGERT) Fellowship* (2011 – 2013), NSF

## ENGINEERING EXPERIENCE

Consultant, GES LiveWell Colorado, Denver (2014)

- Research consultant in transportation projects for the Globeville & Elyria Swansea (GES) neighborhoods. Active participation and engagement with the community.
- Developed a survey on travel behavior and attitudes regarding the I-70 East Project

Bridge Engineer, Contech Construction Products, Denver (2007 – 2010)

- Worked as a design bridge engineer providing technical expertise to sales engineers, contractors, and customers. Reviewed project plans, developed product solutions, and prepared submittal drawings
- Developed new tools to ensure compliance with current industry standards and policies. Implemented best practices and procedures. Provided training and mentoring to new engineers

Field Engineer, Insituform Technologies Inc., Denver (2007)

- Evaluated field conditions and measurements for design. Created logistics plans including schedule, permits, equipment access, traffic control and logistic plans
- Calculated and designed bypass plans based on field characteristics including contingency situations

Project Intern, Opus Northwest, L.L.C., Denver (2006)

- Coordinated documents and submittal for LEED Gold level certification, EPA Headquarters 8
- Supported project managers by managing subcontractors, reviewed initial bids and cost estimates, revised and updated RFI's, field bulletins and product submittals

## OTHER CERTIFICATIONS & SKILLS

- Programming in R statistical software
- ArcGIS spatial analysis software, Microsoft SQL Server, PGAdmin III and PostGIS
- Certified Engineer-in-Training (E.I.T.), State of Colorado, 2007 – Present
- Youth Soccer Coach, Colorado Soccer Clubs, 2010 – Present
- Fluent in Spanish – written and oral

*Updated September 2018*