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PhD candidate
(Defence date 11/11/2026)
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Profile

I am a PhD candidate in transport at Utrecht University. My research focused on understanding how individual travel behaviour is affected by transport systems and mobility interventions, with particular attention to socially disadvantaged groups from a transport equity perspective. I have experience with mixed-methods research and transport consulting with organisations such as the World Bank, Inter-American Development Bank, and local governments in Colombia.

Education

2022-2026 **PhD Candidate**, *Utrecht University*, Utrecht, Netherlands, *Supervisors: Dick Ettema and Jaime Soza-Parra.*

- Dissertation: *From the mountains to the sky: Aerial Cable-Cars lifting social inclusion and transport equity in Latin America*
- Research on travel behaviour, accessibility, and transport equity, using aerial cable cars as a case study in Latin American cities.
- Designed survey questionnaires, coordinated data collection, and analysed survey data (n=1362) to investigate travel behaviour and attitudes among socially and transport-disadvantaged communities.

2017-2019 **MSc in Engineering – Transport Infrastructure and Systems**, *Universidad Nacional de Colombia*, Manizales, Colombia, *Supervisor: Diego A. Escobar.*

2016-2017 **Postgraduate Specialisation in Roads and Transport Engineering**, *Universidad Nacional de Colombia*, Manizales, Colombia.

2012-2016 **BSc in Civil Engineering**, *Universidad Nacional de Colombia*, Manizales, Colombia.

Research Experience

Universidad Nacional de Colombia

2022-2024 ***Researcher, Data Modelling Lead***.

- Led the data modelling team in the research project CÍVICA, integrating spatial data across multiple scales and years to construct a multidimensional livability index to support community engagement and public policy analysis..
- Worked in collaboration with research teams of the consortium composed of Universidad Nacional de Colombia and Universidad de los Andes in Colombia, and stakeholders from Bogotá's government, such as the Secretary of Planning and Development and Health.

2019-2020 ***Young Researcher***.

- Developed a conceptual framework to study the association between road infrastructure development, accessibility to basic services and armed conflict in Colombia.
- Collected data using crowd-sourcing platforms such as OpenStreetMaps and GoogleMaps API, and government portals, including population census microdata.

2017-2022 ***Researcher***.

- Designed and coordinated qualitative and quantitative data collection to investigate the relationship between human behaviour, travel behaviour, and road safety.
- Investigated the effects of gender-based violence on travel behaviour among women and LGBTQI+ communities in Manizales using surveys and semi-structured interviews, in collaboration with the Inter-American Development Bank

Universidad de los Andes

2020 ***Researcher***.

- Calculated transport indicators for Manizales as part of a research project on low-carbon cities based on policy interventions, supporting the analysis of sustainable urban mobility transitions.

Consulting Experience

World Bank

2022-2026 ***Transport Consultant***.

- Developed accessibility measures at national scale to quantify how natural hazards affect access to essential services, supporting resilient infrastructure planning for vulnerable populations in Colombia
- Developed indicators related to access to digital, transport and social infrastructure in the Amazon region, considering vulnerable populations defined by income, rurality, and indigenous communities.

Freelance

2017-2022 ***Transport Consultant and Spatial Data Scientist***.

- Calculated geographic indicators related to immigrant groups and their vulnerability during the Covid-19 pandemic in England for a UCL project.
- Calculated and analyzed accessibility to urban facilities through public transport in Port-au-Prince, Haiti, and Ecuador for the Inter-American Development Bank (IADB) project.

Research Contributions and Expertise

- Using accessibility measures and travel behaviour data to understand and evaluate transport equity across distinct geographical levels and sociodemographic variables, including rurality, gender, age, income, and armed conflict [2, 3, 4, 5, 7, 8, 9, 10]
- Study travel behaviour using discrete choice models, integrating built environment and latent variables of transport-related social exclusion to explore activity participation, human crossing behaviour, and commuting mode choice [1, 2, 9].
- Using mixed methods research including etnographic observations, semi-structured interviews, and surveys to research human crossing behaviour, and LGBTQI+'s daily mobility [4, 9].
- Generate public policy recommendations to improve urban and rural transport in terms of equity and resilience [1, 3, 5, 10].

Publications (h-index = 9)

Scientific Articles (selected)

[1] The role of transport exclusion and aerial cable cars in shaping commuting choices in steep cities (2026), ***Cardona Urrea, S.***, *Soza-Parra, J., Raveau, S., Ettema, D.*, In *Journal of Public Transportation.*

[2] Activity participation among disadvantaged communities and the impact of an aerial cable car: The case of TransMiCable, Bogotá (2026), ***Cardona Urrea, S.***, *Soza-Parra, J., Ettema, D., Cities.*

[3] Flying the gap: Evaluating the impact of aerial cable car on accessibility to discretionary activities: The case of TransMiCable in Bogotá (2026), ***Cardona Urrea, S.***, *Soza-Parra, J., Ettema, D., Journal of Transport Geography.*

[4] LGBTQI+ People on the Move: Victimisation, Perception and Strategies against Gender-based Violence in Manizales, Colombia (2026), Montoya-Robledo, V., ***Cardona Urrea, S.***, Sabogal-Cardona, O, Rodas-Zuleta, M. de M., Escobar, D.A., Montes Calero, L., Bernal Carvajal, V, Schwanen, T., In *Gender, Place and Culture.*

[5] Evaluating climate impacts on geographical accessibility to basic services in rural Colombia (2025), ***Cardona Urrea, S.***, *Gómez J.M., Ivarsson, E., Espinet Alegre, X., Transportation Research Part D: Transport and Environment.*

[6] Aerial cable cars as a transit mode: a review of technological advances, service area characteristics, and societal impacts in Latin America and the Caribbean (2024), ***Cardona Urrea, S.***, *Soza-Parra, J., Ettema, D., Transport Reviews.*

[7] Life cycle assessment and potential geolocation of a multi-feedstock biorefinery: Integration of the avocado and plantain value chains in rural zones (2023), Piedrahita-Rodriguez, S., ***Cardona Urrea, S.***, Escobar, D.A., Ortiz-Sánchez, M., Solarte-Toro, J.C., Cardona-Alzate, C.A., In *Bioresource Technology Reports.*

[8] Gender-based violence and Women's mobility, findings from a medium-sized Colombian city: A quantitative approach (2022), Rodas-Zuleta, M.de.M., ***Cardona Urrea, S.***, Escobar, D.A., In *Journal of Transport and Health.*

[9] Risky pedestrian behaviour and its relationship with road infrastructure and age group: An observational analysis (2021), Escobar, D.A., ***Cardona Urrea, S.***, Hernández-Pulgarín, G., In *Safety Science.*

[10] Isolation typology through accessibility measures considering rurality and armed conflict, A case study in Caldas, Colombia (2021), ***Cardona Urrea, S.***, *Escobar García, D.A., Montoya, J.A., Rural and Remote Health.*

Grants and Awards

2022 ***International Doctoral Fellowship*** from the Ministry of Science, Technology and Innovation of Colombia.

2018 ***Young Researcher Scholarship*** from the Ministry of Science, Technology and Innovation of Colombia and Universidad Nacional de Colombia. Ranked first in the national call among 1605 applicants

2018 ***Master's Thesis Scholarship*** from Universidad Nacional de Colombia.

Teaching Experience

Universidad de Caldas

2021-2026 ***Lecturer***.

- Teaching the module "Spatial Data Analysis" in the course Analysis of Information in Social Sciences.
- Designed and developed the curriculum for the course "Spatial Data Analysis for Social Sciences" in the Master's program in Data Science

Utrecht University

2022-2026 ***Guest Lecturer***.

- Delivered guest lectures on doctoral research in the course "Mobility, Transport and Networks" in the Human Geography Master's program
- Second reader Master's thesis investigations in the program of Data Science.

Universidad Nacional de Colombia

2017-2022 ***Lecturer***.

- Lecturer in the course "Advanced Traffic Engineering" in the Master's program in Engineering – Transport Infrastructure and Systems
- Guest lecturer in the course "Sustainable Urban Mobility Plans", teaching methods for calculating accessibility measures with GIS
- Thesis examiner in the Master's program in Infrastructure and Transport Systems.

Conference presentations (Selected 6 out of 11)

2026 NECTAR - Network on European Communications and Transport Activity Research, *Munich, Germany.* **Oral presentation:** *Forecasting the modal share of future Aerial Cable-Car projects: A case study in Manizales, Colombia.*

2026 WSTLUR - 6th World Symposium on Transport and Land Use Research, *Beijing, China.* **Oral presentation:** *Differences in how transport-related social exclusion is perceived: A latent profile analysis.*

2025 CASPT - The 16th International Conference on Advanced Systems in Public Transport, *Kyoto, Japan.* **Poster:** *The Role of Transport Exclusion and Aerial Cable Cars in Shaping Commuting Choices in Steep Cities.*

2025 TRS - Transportation Research Symposium, *Rotterdam, The Netherlands*, **Oral presentation:** *Integration of Self-Perceived Transport Limitations and Social Disadvantages: Understanding Transport Poverty.*

2024 IATBR - 17th International Conference on Travel Behavior Research, *Vienna, Austria*, **Oral presentation:** *Are they participating more than before? The impact of an aerial cable car on activity participation in disadvantaged communities.*

2024 WSTLUR - 5th World Symposium on Transport and Land Use Research, *Bogotá, Colombia*, **Oral presentation:** *Breaking barriers: Evaluating Aerial Cable Cars impact on Employment Accessibility: Case of Transmicable, Bogotá.*

Relevant Courses

2023 Advanced Choice Modelling, *University of Leeds, England*

2023 Qualitative Research Methods, *Graduate School of Urban and Regional Research, The Netherlands*

2021 Geolocated Big Data: Tools for Capture, Analysis and Visualisation, *Universidad Complutense, Spain*

2020 Global Challenges in Transport: Urban Mobility after Covid-19, *University of Oxford, England*

2020 Data Science for All, *Ministry of Science, Technology and Innovation of Colombia and Correlation One*

Skills and Methods

Languages	Spanish (native), English (C1 - IELST Academic)
Coding	Python (Pandas, GeoPandas, Rasterio), R (Apollo, lavaan, r5r)
Spatial analysis	QGIS, ArcGIS
Platforms	Qualtrics, Git/GitHub, Google Cloud
Transport data	GTFS, OSM, Google Maps API, smart-card, mobile phone, and GPS data

References

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