

## IPATH Annual Meeting 1-Day Conference Series

Thursday, 28 September 2023

### Accepted Abstract Session 1

9:00 - 10:30 EDT (USA)

#### **Mobility and Well-Being: Intersections of Health, Nature, and Accessibility**

Moderated by: Jacob Alhassan, PhD, [IPATH Board of Directors](#)

Presenting Author is indicated in **BOLD** text

#### RESEARCH ABSTRACT

*Exploring Relationships Between Nature Connection and Cycling*, **Cairns, M.** 1 Centre for Transport and Society, University of the West of England, School of Architecture and Environment, United Kingdom

##### **Background**

Both cycling and nature connectedness have been found to offer a range of benefits to human and planetary wellbeing. This presentation explores the ways in which nature in general, and connectedness in particular, interacts with cycling practices and experiences in Bristol, UK, drawing on a small-scale mixed methods research project.

##### **Methods**

An online survey was conducted with 417 Bristol adults, followed by in-depth qualitative interviews (n = 7). The survey captured responses to the Nature Connection Index scale and questions about cycling behaviour, with the interviews exploring experiences and perceptions about cycling and nature with cyclists and non-cyclists.

##### **Results**

Results are presented in the form of statistical analysis of relationships between nature connectedness and self-reported cycling behaviour, as well as themes arising from the qualitative analysis. Cycling duration is not associated with nature connectedness. Recreational cyclists (n = 228) in the sample have significantly higher nature connectedness ( $p < .01$ ) than the respondents who did not cycle recreationally (n = 181). Some possible mechanisms for this are suggested by the literature; the qualitative analysis supports the occurrence of 'pathway' processes, which increase nature connectedness, during leisure cycling in nature. This may be conditional on internal or spatial factors; a bidirectional effect, with nature connectedness influencing leisure cycling behaviour, is also feasible. The qualitative accounts also highlight ways in which cycling in nature increases enjoyment of cycle rides, raises awareness of nature spaces, and facilitates

access to them as well as identifying challenges associated with cycling in urban nature spaces. Limitations include the sampling approach and the timing of the research during the COVID-19 pandemic.

## Conclusions

Nature is part of the cycling experience for some cyclists during some journeys, and cycling can facilitate access to and connection with nature in various ways. Implications for improving sustainable wellbeing through increasing cycling levels and nature connectedness include the potential benefits of raising awareness of the enjoyable nature experiences that cycling can facilitate, considering nature connectedness pathways in the design of cycling infrastructure, and assessing whether norms of use on traffic-free greenways could be more optimally framed.



**Mel Cairns** is currently studying for a PhD at the Centre for Transport and Society at the University of the West of England, UK. Her doctoral research is concerned with nature and cycling in the West of England; the role of nature, and nature connectedness, in local cycling practices and experiences as well as the characteristics of 'nature cyclists' and 'nature cycling' journeys. Mel is interested in urban and rural nature connected mobilities and planetary wellbeing and mobility justice perspectives. She has contributed to place-based wellbeing research and measurement, particularly regarding rural wellbeing and social capital.

## PRACTITIONER ABSTRACT

*The Inextricable Link Between Transportation and Health*, **McGuinness K.** and Schwartz SI, Schwartz Engineering Transportation and Planning, USA

The intricate relationship between transportation and public health is deeply manifested in the urban landscape of New York City (NYC), encompassing factors such as traffic injuries, pollution, noise, access, health and equity.

NYC's bustling streets and densely populated neighborhoods make it susceptible to a high incidence of traffic crashes. Pedestrians, cyclists, and motorists alike are exposed to potential harm due to congestion and reckless driving. This poses a significant threat to public health, as it leads to injuries and fatalities, particularly affecting vulnerable populations such as children, the elderly, persons with disabilities, and persons living in poverty.

Pollution emerges as another critical facet of the transportation-health link. The exhaust emissions from vehicles release pollutants, including particulate matter (PM2.5) and greenhouse gases, contributing to poor air quality and heat islands. This exacerbates respiratory conditions and cardiovascular diseases, disproportionately impacting low-income communities which are often located near major roadways (or rather, the roadways are placed near them). NYC's commitment to sustainability through initiatives like

reduced-carbon transportation options, as well as highway mitigation efforts supported by the Bipartisan Infrastructure Law, reflect an attempt to mitigate this issue.

Noise pollution is also interwoven with health outcomes. The relentless cacophony of traffic, honking horns, and construction can lead to chronic stress, sleep disturbances, and cognitive impairment. These health repercussions underscore the need for planning strategies that consider noise reduction, green spaces, and pedestrian-friendly zones.

Equity is a pivotal concern. Access to efficient and affordable transportation directly influences access to healthcare services, education, and employment opportunities. Socioeconomic disparities are amplified when marginalized communities lack dependable transportation options, hindering their overall well-being. Initiatives like improved public transit and investment in underserved areas strive to rectify these imbalances. As a practicing urban planner at Sam Schwartz, my team has examined the complex web of challenges embodied by transportation and health in NYC. This presentation will provide an overview of several topics related to the health impacts of poor transportation policy, as well a case study example of related work that we've help to develop for NYC DOT: a 'Jobs Access' index to highlight areas where public transportation is a less desirable option than vehicles. By fostering a healthier transportation ecosystem, NYC, as an expel to other cities, can pave the way for a future where the benefits of mobility harmonize with the well-being of its diverse population.



**Kelly McGuinness**, AICP is an urban planner at Sam Schwartz, specializing in transportation planning and policy with a focus on equity. Kelly leverages data-driven insights to inform transportation policies that benefit all users, using evidence-based decision-making and by translating data into meaningful insights. Her expertise lies in analyzing complex data sets to promote community well-being, equity, and future planning. With a passion for creating safe, livable, and equitable streets, she has worked on high-profile projects for public agencies like the New York City Department of Transportation, private organizations, and non-profit organizations across the United States.

## PRACTITIONER ABSTRACT

*A Review of Policies and Practices of Disabled Parking Permits in South Africa*, **Engelbrecht, M.** City of Cape Town, Western Cape, South Africa

South Africa has 11 million registered vehicles, a population of 58,429 000 with 6.6 percent (3,461,000) living with disabilities. Approximately 1.976,000 of people with disabilities report difficulties in walking, according to the National Household Survey 2019.

The main modes of motorized transport in South Africa are the car and the minibus taxi, complemented by a car-driven road infrastructure and culture. There is a lack of accessible public transport infrastructure, which places a reliance on private car use for persons with disabilities. Complicating the problem is a lack of

available public parking, which influences travel behaviour and planning, especially for persons with disabilities.

This project describes the challenges expressed by municipalities and organizations throughout South Africa in serving their disabled constituents with accessibility to parking options due to:

- Different application procedures and application forms to obtain a disabled parking permit/disc for each municipality and in each province. The requirements, costs, length of validity and even the process of application are different.
- No reciprocity between provinces/towns.
- Many different opinions about who should qualify or is eligible and the criteria or requirements are not uniform throughout the country.
- Delegation of processing from national government to disability organizations, including use of the organization's discretion as to the process and eligibility.
- Abuse of disabled parking spaces by able bodied persons.
- Abuse of discs by next-of-kin of disc holders.
- And lastly limited availability and accessibility of information to the public on disabled parking and discs.

We identified a need for training of health professionals, including occupational therapists and medical doctors in assessing eligibility for disabled parking. Working with the City of Cape Town and the Western Cape Network for persons with disabilities, a process of review and development of the current application form and assessment process was designed and implemented.

The results of this project included a review and re-engineering of the current disabled parking permit application, application fees modified, website information changed, and development of a short assessment form to be used by medical doctors and occupational therapists. The City of Cape Town is the first municipality in South Africa where all 18 driver's licensing testing centers (DLTC) process applications. In 2022, the City issued 1302 discs. This has been beneficial for persons with disabilities as it allows closer access to application centers within the community. This is an ongoing project with the aim of closer collaboration between medical professionals, disability organizations and our local municipality.



**Marian Engelbrecht** is a registered Occupational therapist practicing in Cape Town, South Africa. She has worked in a variety of rehabilitation settings and hospitals since she graduated and has experience in Neuro and General Rehabilitation as well as Geriatrics. Marian has been actively involved in driving rehabilitation for the last eight years, as well as engaging in public awareness talks for older drivers. She has served on the committee for the Driver Fitness Coalition (NPC) for three years where she has been part of developing training for occupational therapists on driving and community mobility and promoting the profession.

## Accepted Abstract Session 2 11:00 - 13:00 EDT (USA)

### Travel Insights: From Local Regions to Global Roads

Moderated by: Stephen Mattingly, PhD - [IPATH Board of Directors](#)

Presenting Author is indicated in **BOLD** text

#### RESEARCH ABSTRACT

*Exploring Travel Anxiety in Hilly Regions: The Role of Travel Attitudes and Perception*, **Asghar S.**<sup>1</sup>, B Raghuram Kadali<sup>2</sup>, Nikhil Menon<sup>1</sup>

*1Penn State Harrisburg, School of Science, Engineering and Technology, Middletown, United States, 2National Institute of Technology, Warangal, Telangana, Civil Engineering, Hanamkonda, India*

#### Background

The study of urban travel behavior is well-documented within existing literature, yet the examination of travel attitudes, perceptions of safety and usefulness, and the influence they have on travel-related anxiety within hilly regions remains relatively unexplored. This study seeks to bridge this gap, investigating these variables in a hilly context and their impact on travel behavior.

#### Methods

A stated preference questionnaire was developed using theory of planned behavior and disseminated within the public living along selected hilly areas in India, ensuring the validity of the data through careful data cleaning and preparation processes. The Questionnaire included questions categorized into different factors related to travel attitudes and different perceptions (usefulness and safety). Out of 520 responses, only 420 valid responses were included in the analysis and this data served as the foundation for the development of a factor-based regression model, specifically constructed to identify and investigate the various factors influencing travel anxiety within hilly terrain.

#### Results

The results of the analysis revealed some notable findings. A significant correlation emerged between a pro-car travel attitude and perceived usefulness, suggesting that travelers who favored car travel perceived it as a more useful mode of transport in hilly regions. Conversely, all other travel attitudes evaluated in the study - including those towards active travel, pro-public transportation, and disliking two-wheelers - had a significant impact on travel anxiety levels. Another vital finding was the link between the perceived usefulness of active travel modes and anxiety levels. The study suggests that by enhancing the perceived usefulness of active modes of travel, there is potential to alleviate anxiety levels among travelers navigating through hilly terrains.

#### Conclusions

This research offers important insights to transportation planners, urban designers, and policy makers, aiding in the understanding of travel behavior and anxiety in hilly regions. This new understanding can guide

the development of effective policies and interventions, with the goal to mitigate travel anxiety, improve safety, and enhance the overall travel experience within hilly terrains.

## RESEARCH ABSTRACT

*Anxiety, Social Norms, and Travel Attitude: A Travel Behavior Analysis in Hilly Regions*, **Asghar S.**<sup>1</sup>, B

Raghuram Kadali<sup>2</sup>, Nikhil Menon<sup>1</sup>

*1Penn State Harrisburg, School of Science, Engineering, and Technology, Middletown, United States, 2National Institute of Technology, Warangal, Telangana, Civil Engineering, Hanamkonda, India*

### **Background**

Existing research has provided a plethora of insights into travel behavior, focusing on attitudes towards different modes of transportation within urban landscapes. In contrast, regions with hilly terrains have not been given the same level of attention. This has created a distinct knowledge gap in the field, limiting our understanding of travel behavior in such unique geographical contexts. Addressing this research deficit, the current study delves into the nuances of travel behavior within hilly regions in India using a stated preference survey that concentrated specifically on the influences of anxiety and social norms.

### **Methods**

Using Structured Equation Modelling (SEM), this study tried to uncover the subtle interplay between different travel related attitudes (such as pro car travel, active travel, disliking motorbike, pro public transit and disliking active travel attitude), anxiety and social norms and their impacts on travel behavior. These factors were extracted from a questionnaire which was developed using theory of planned behavior. Five travel-related attitudes were employed as both exogenous variables and mediators, to better understand the travel behavior in hilly regions.

### **Results**

Study findings revealed that anxiety experienced in hilly regions tends to have a significantly more influence on individuals who prefer sustainable modes of transportation. This observation underscores a stark divergence between the travel behaviors witnessed in hilly regions versus those typically seen in urban areas. The unique challenges and anxiety associated with traveling in hilly terrains can impact public attitudes towards different modes of transportation, especially those considered more sustainable.

### **Conclusions**

These findings are particularly insightful, as they not only enhance our understanding of the nuanced influences on travel behavior in hilly regions but also provide a foundation for future research in this domain. The knowledge gained can further aid in designing policies and transportation systems that account for the anxiety and attitudes of individuals living in hilly terrains, thereby promoting sustainable practices in these regions.





**Suhail Asghar** is a dedicated PhD student at Pennsylvania State University, specializing in transportation planning with a keen focus on Travel Behavior Analysis. His research primarily revolves around the intricacies of travel behavior with a unique emphasis on hilly regions, where mobility presents distinctive challenges. With a passion for unraveling the complexities of how people navigate such challenging topography, Suhail aspires to contribute invaluable insights to the field of transportation planning.

## RESEARCH ABSTRACT

*Evaluating the Impact of Brazil's Daytime Low Beam Headlight Law on Road Safety Danger Reduction and Injury*, **Nepomuceno T.**, de Macêdo Góis L., and De Carvalho A. Federal University of Pernambuco. Federal University of Pernambuco Avenida, Brazil

### **Background**

Traffic accidents have emerged as a significant public health concern. Extensive research has been conducted to propose measures to mitigate this issue, which causes physical and material damage and significantly impacts the economy. To address such a social issue, Brazilian law no. 13290 implemented in 2016, known as the Headlight Law, made it mandatory for vehicles to have low beams turned on during daylight hours on state and federal highways.

### **Methods**

This study aims to examine the efficacy of the Headlight Law using a similar method as in Nepomuceno et al. (2017) empirical assessment reported in the *Int. Journal of Law, Crime and Justice*, 51, 34-44. The analysis is conducted on 9887 traffic-related fatalities in all five regions in Brazil from 2012 to 2020 employing parametric T-tests and non-parametric Wilcoxon Signed-Rank hypothesis tests, and Kolmogorov-Smirnov adherence tests on stratified data from prior and after implementation of the law. Time scenarios are constructed for validation. The pandemic period is excluded from the analysis to make the assessment robust to disturbances caused by COVID-19 social isolation policies. We also control the potential increase in accidents due to the increasing number of drivers using the number of first driving licenses (1-year permit) as a proxy variable.

### **Results**

Initially, 56 hypothesis tests were conducted, one parametric and one non-parametric for every 27 states in Brazil (and Brazil as a whole), comparing mean and median occurrences before and after the Headlight Law implementation. Subsequently, time scenarios and 28 Kolmogorov-Smirnov adherence tests were performed for validation.

Among the results with statistically significant support for rejecting the hypothesis of equal means/medians, only the state of Paraíba exhibits lower average frontal collision occurrences after implementing the law. The states Santa Catarina, Mato Grosso do Sul, Rio Grande do Sul and Bahia report an increase in collisions

after the law implementation with statistical support. Results for the remaining states (and Brazil) fail to reject the null hypothesis of mean and median equality.

## Conclusions

The results support the conclusion that the law had no significant effect on road safety and danger reduction in 26 Brazilian states, except for Paraíba. Structural and environmental factors such as road quality, increasing number of drivers and weather conditions might explain most differences among the states. Such a perspective, including the Paraíba exception, may be subject to further investigation in future studies.



**Thyago Nepomuceno** holds a Ph.D. in Industrial and Management Engineering (Sapienza University of Rome) and is a professor in the Department of Statistics at Federal University of Pernambuco, Brazil. Dr. Nepomuceno has been awarded Bolsista de Produtividade em Pesquisa by the Brazilian National Council for Scientific and Technological Development (CNPq) and works mainly in the fields of efficiency and productivity analysis, data envelopment analysis, operational research, geographic information systems and quantitative methods for econometric evaluations.

## RESEARCH ABSTRACT

*The Relationship Between Lifestyle, Driving Anger and Dangerous Driving Behaviours: An Explorative Study in a Chinese Sample*, **Zhai C.**, and **Xi W.**, Institute for Transport Studies, University of Leeds, United Kingdom and The Faculty of Mechanical and Transportation, Southwest Forestry University, Kunming, China

### Background

Drivers who exhibit dangerous driving behaviours, such as aggressive, risky, and negative emotion cognition driving, are more likely to be involved in road crashes. A key motivator behind unsafe driving behaviours is driving anger. However, it is unclear whether lifestyle, driving anger, and dangerous driving behaviours are related.

### Methods

A total of 344 Chinese drivers with a formal driving license were asked to complete the socio-demographic information, the Chinese lifestyle questionnaire (Self-designed), the 14 items Driving Anger Scale (DAS), and the Dula Dangerous Driving Index (DDDI). The Chinese driver's lifestyles were analysed using Exploratory Factor Analysis (EFA), revealing a four-factor structure ("Culture", "Workaholism", "Sports" and "Amusement"). The 14 items DAS factor structure was determined using a Confirmatory Factor Analysis (CFA), yielding a two-factor structure ("Safety Concern anger" and "Arrival Concern anger").

### Results

Based on Hierarchical Multiple Regression (HMR), only "Workaholism" was associated with aggressive, risky, and negative emotion cognition driving. The trait driving anger was examined as a mediator between



the “Workaholism” and dangerous driving (aggressive, risky, and negative emotion cognition driving) through a Structural Equation Modelling (SEM) approach.

### Conclusions

“Workaholism” was shown to influence these dangerous driving behaviours through trait driving anger.



**Chenzhao Zhai** is a postgraduate researcher at the Institute for Transport Studies, the University of Leeds. His research interest mainly focuses on understanding road users' behaviours and road safety.

## Accepted Abstract Session 3 13:30 – 15:00 EDT (USA)

### The Health of Equity in Public Transit

Moderated by: Ron Deverman - [LinkedIn Profile](#)

Presenting Author is indicated in **BOLD** text

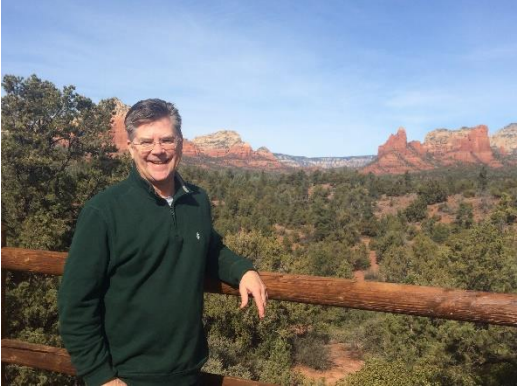
#### PRACTITIONER ABSTRACT

*Equity in Public Infrastructure*, **Deverman R.** STV Inc. National Environmental Planning, USA

Equity in transport infrastructure is a vitally important issue in the U.S., as historically marginalized communities have been disproportionately impacted by the lack of investment in transport infrastructure in most major cities. To promote equity, public agency officials, policymakers and stakeholders must prioritize investments in underserved communities and ensure that transport infrastructure projects address the unique needs of these communities. This includes access to affordable and reliable transportation, affordable housing near public transport and centers of employment, and nearby multi-modal access to public parks and green spaces. Additionally, it is essential to involve these diverse residents and neighborhoods in the planning and decision-making process to ensure that their voices are heard, and their substantial life needs are met.

By prioritizing equity in transport infrastructure investment, the leaders of our major metropolitan centers can create a more just and inclusive society for everyone. This presentation will first briefly explore the theme of equity and its' integral role in defining the goals and outcomes of transport infrastructure projects. Next, the presentation will examine, through three case studies, the evolution of equity within transport infrastructure, and how equity has changed over the years, from Title VI of the Civil Rights Act to Executive Order 12898 (Environmental Justice), and more recently the Justice 40 Initiative. Always being true and responsive in our

engagement of diverse populations within transport project development continues to highlight the importance of looking at transport projects through an equity lens.



**Ron Deverman** is Vice-President and National Environmental Planning Leader for STV, a national planning, engineering, and architecture firm. Ron has over 35-years-experience managing NEPA environmental impact assessment projects for transportation infrastructure improvements, such as transit, passenger and freight rail, highways, and bridges, with special expertise in community impact assessment, cumulative effects analysis, and other federal environmental regulations. As Program Manager, Ron oversaw environmental, design, and construction management services for the \$4.8 billion Chicago Region Environmental and Transportation Efficiency (CREATE) program. He was instrumental in expediting the implementation of projects while developing Phase I, II, and III processes and procedures to streamline decision-making and optimize program delivery.

Ron is a Past President of the National Association of Environmental Professionals (NAEP), Chair of NAEP's Leadership Development Committee, and a Board Trustee of the Academy of Board-Certified Environmental Professionals (ABCEP). Ron is a Certified Environmental Professional by Eminence and a NAEP Fellow for his exemplary service and over 35-year commitment to the environmental professions. Ron is also an Adjunct Professor at Northwestern University teaching a Masters' course in NEPA and Context Sensitive Solutions. Ron comes from generations of farmers in Illinois' heartland and farmed for a living while attending college. Ron's education includes a BS in Civil Engineering from the University of Illinois - Urbana, a MA in English from the University of Illinois - Springfield, and post-graduate studies in NEPA and related environmental studies.

## RESEARCH ABSTRACT

*Rural Transportation and Vulnerability: A Qualitative Analysis of Health Equity Impacts of Cuts to Intercity Public Transportation in Canada*, **Alhassan J.** University of Saskatchewan, Community Health and Epidemiology, Canada.

### **Background**

Transportation is a critical determinant of health particularly for chronically ill patients yet Canadian evidence on intercity transportation barriers for healthcare access remains scant. In 2017 the Saskatchewan Government eliminated a 70-year-old bus company, the Saskatchewan Transportation Company (STC), as part of austerity measures aimed at saving \$85 million. No health equity impact analysis was conducted by the government, yet the bus served 253 communities and provided medical passes for chronically ill patients and families prior to the closure. We explored health equity impacts of the decision and how particular aspects of people's identities and social position predispose them to vulnerability following the loss of STC.

## Methods

Drawing on intersectionality theory, we interviewed 100 former bus riders seeking healthcare and other services and conducted six focus groups with 24 stakeholders including physicians, nurses and Indigenous health system organizations' staff. We used qualitative case study methodology to inform analysis and ensured rigour through a synthesized member checking.

## Results

Many patients were female (68%) and self-reported living with disabilities (27%). The closure has limited access to specialized care especially for those with chronic conditions such as HIV/AIDS, Diabetes etc. Reduced healthcare access is experienced unequally depending on people's social and geographical locations (gender, age, (dis)ability, geography and ethnicity). The closure produces unique vulnerabilities for patients and community members through five key pathways: ability to drive, vulnerable geographies, poverty, safety (especially for Indigenous women) and lost freedom (for those with disabilities), and these vulnerabilities are worse for those experiencing intersecting oppressions.

## Conclusions

Disinvestment and budget cuts to public transportation create unique vulnerabilities and health inequities. Countries such as Canada, need nationwide public transportation systems to promote healthcare access. Transportation-related austerity decisions ought to be assessed through a health in all policies (HiAP) framework to protect vulnerable populations from pathogenic public policies.



**Jacob Alhassan** is an Assistant Professor in the Department of Community Health and Epidemiology, University of Saskatchewan. He is an interdisciplinary activist scholar interested in how transportation policies produce health inequities and the political aspects of transportation related public policy. Jacob is interested in transport accessibility, safety, and equity particularly in rural and remote contexts. He has also worked on the role of intersectoral collaboration in promoting active transportation in urban contexts in Canada. Jacob's work is focused on influencing policy to promote equity and has involved engagement with governments (federal, provincial, and municipal), civil society and marginalized communities.

## RESEARCH ABSTRACT

*When There's No Way Left to Go: Public Transport Use Cessation Among Older Adults*, **Dilan O.**, Technion, Israel Institute of Technology, Israel, Davidovitch N., Ben Gurion University of the Negev and Martens K., Technion, Israel Institute of Technology

## Background

Mobility is a hallmark of functional aging, and is known to decline with the aging process. Yet, except for research on driving cessation, little is known about the role of transport modalities' use in this decline. This exploratory research focuses on public transport use, and aims to understand older adults' transit

experiences, triggers leading to public transport use cessation, and coping behaviors before and after cessation.

### **Methods**

Seventeen semi-structured interviews with older adults living in urban centers in Israel, aged 67-86, pre-, during, and post-cessation have been conducted. Thematic analysis was used to identify dimensions of public transport use cessation.

### **Results**

Interviewees expressed different levels of concern regarding possible public transport use cessation. Bus drivers' attitudes, fear of falling and actual falls in public transport were described as the main factors affecting the decision to avoid public transport. Participants without other personal transport modes to rely on describe a decline in independence and quality of life.

### **Conclusions**

Public transport use cessation is an important yet understudied process in older adults' age-related mobility decline. Further studies are required to determine its epidemiology and to identify interventions to allow older adults to maintain independence and mobility after driving cessation.



**Omer Dilian** is an MD-PhD student at the Technion – Israel Institute of Technology, faculty of architecture and town planning. With previous research experience in aging processes, Omer is currently studying the characteristics of public transport use among older adults, and its links with mobility and health. Coming from the field of medicine, he believes that (public) transport planning can allow older people to maintain their mobility and independence further into their later years of life, greatly affecting health and wellbeing.