



# **Transport Innovation for Sustainable Development**

## A Gender Perspective



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# The International Transport Forum

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## Introduction

Innovation is transforming the transport sector at an unprecedented pace. It is removing barriers to the movement of people and goods and changing peoples' whole way of living and working, as well as the planet itself. Innovation can have a positive impact on women both as transport users and as professionals. Women as transport users can benefit from the various services provided by innovative technologies, new business models and other innovations to adapt mobility options to their needs. Innovation can also open new opportunities for women's employment in transport.

Meanwhile, the recent Covid-19 crisis continues disproportionately affecting women and girls as transport users and workers, intensifying pre-existing inequalities in the sector. Going forward, policy responses will be crucial to steer transport innovations to help address gender inequalities in the sector.

This third edition of the ITF Compendium on Women in Transport showcases the role of innovation in promoting gender equality in the sector. ITF stakeholder contributions, brought together here, highlight that innovation in transport – whether it implies new technologies, new business models or social innovation – should be designed to consider the needs of, and optimise access to opportunities for, all travellers. The authors present related challenges and propose solutions for transport innovations to serve women and girls, solutions that may ultimately result in more inclusive and sustainable transport. Examples are from different modes of transport, including aviation, road and rail, and it addresses related opportunities and challenges on the local, regional and global levels.

Entries demonstrate how women as transport users could benefit from the various services provided by new technologies and other innovations to adapt mobility options to their needs. They also highlight remaining challenges that are preventing women's travel behaviour being considered in the design of infrastructure and services. While women more than men tend to prefer flexible modes that facilitate trip chaining and travel with children and other dependents (i.e. "mobility of care"), this is not often accommodated in the design of transport infrastructure, services and vehicles. Women also feel less safe and secure in public spaces, which deters them from choosing public transport, taxis, shared mobility, or cycling and walking. Ultimately, this limits women's and girls' access to schools, jobs, health and other public services. A digital gender gap further limits women's access to innovative solutions, including smartphone-based mobility services. Other constraints to women's mobility, notably in developing countries, are affordability and availability of transport options.

Gender-disaggregated data are key to better understanding women's mobility features and designing transport networks with women's needs in mind, therefore optimising the positive impacts of present and future applications of innovative technologies. Gendered analysis will help assess whether specific gender needs are met properly and what the impact of innovation on mobility would be. For example, in the context of urban travel, understanding what it is that women want from cities and how this translates into a vision for urban transport should be at the heart of public policy. This will require much finer and differentiated knowledge of travel behaviour and people's needs than has been the case in the past. New data sources can help develop that knowledge base, but it is important to avoid biases that have become ingrained in past transport policies.

Contributions highlight the importance of public-private co-operation schemes to collect, share and process gendered data, notably a wealth of mobility data created by the Covid-19 pandemic. Gender-disaggregated data can help harmonise policies and make more impact.

New technologies and business models in transport are opening alternative pathways, and offering opportunities for women. For example, ride-hailing or -sharing improves women's ability to travel freely and provides women with mobility and a greater sense of independence. Accessibility to and affordability of these new mobility solutions often depend on income, educational and digital competence of the users. These aspects need to be taken into consideration while designing governance framework for deployment of innovative transport services, so that they are inclusive for all users.

Few industries have been as impacted by the Covid-19 pandemic as ride-hailing. In some markets, passenger trips have halted, while in others there has been a sudden surge in demand as riders shift away from public transport. As the author of the article on ride-hailing argues, a focus on women could be the key to a resilient recovery for this innovative industry, noting that the industry should gender-disaggregate user data, boost safety and security features of the sector, and adopt innovations that are targeted to women.

Innovation in transport means a change, so it is difficult to assess what the transport workforce of tomorrow will be, and to ensure that there will be professionals with the right sets of skills. The challenge for the sector is to leverage innovation to open new opportunities for women's employment. Although innovation can facilitate a more diverse workforce, significant impediments, such as a male-dominated transport sector with gender-based segregation, may still persist. However, there are also opportunities for new forms of work brought about by technological change. The authors insist that, in the wake of the Covid-19 pandemic, measures implemented in response to the crisis, including the introduction of new technologies, need to benefit women workers. For example, cashless payment or automated cleaning have the potential to reduce women's jobs in the gender-segregated sectors.

This report features a number of examples of best practices and recommendations from both the public and private sector that promote a fairer and more inclusive workplace for women. These examples include fostering women's representation in decision-making jobs, developing programmes to promote equality, and implementing benchmarks to measure how inclusive companies' services and employment are.

It is essential that women gain access to the training and skills necessary to benefit from employment opportunities brought to the sector by innovation. For example, in some of the most innovative sectors, such as remotely piloted aircraft systems (i.e. drones), gender disparities are prominent, and the industry is reflective of gender inequalities in science, technology, engineering and mathematics (STEM). A holistic approach is needed – including governance, nomenclature, education – to address these challenges.

Although more women are pursuing a career in STEM and related transport studies, transport is often not their first career choice. They often face a male-dominated labour market in which female needs and values are not fully considered. Thus, women often find transport a less attractive field of employment.

Good governance will help to avoid technological innovation leading change elsewhere than towards equity, inclusion and sustainability. In order to follow the rapid pace of innovation, there is also an urgent need to innovate governance, and create a regulatory system able to both define guidelines and goals, and allow implementation of innovative solutions. Finally, the authors argue that exchange of good practices among all stakeholders in transport is crucial.

Industry stakeholders point to the ITF as an institution that provides a unique platform to advance dialogue and research on gender issues in transport and to facilitate knowledge exchange among policy makers, business and academia. The ITF-led debate on the role of innovation in promoting gender equality in the transport sector will continue in the lead-up to and during the 2021 ITF Annual Summit on "Transport Innovation for Sustainable Development: Reshaping Mobility in the Wake of Covid-19".



## Gender equality in transport: A precondition for innovation and sustainability

Maja Bakran, Deputy Director-General for Mobility and Transport, European Commission

Fourteen European Union (EU) Member States are among the top 20 countries worldwide for gender equality. However, none of these of Member States has achieved full gender equality, and the progress in this respect is slow. With women occupying only 22% of jobs, the transport sector is among the EU economy's most male-dominated sectors, in all likelihood due to persistent stereotypes and sometimes harsh working conditions. In Europe, although female transport users are more likely to make green choices, the few available studies indicate that their needs are less likely to be taken into consideration in the design of transport systems, and that they are more likely to be affected by transport poverty.

Considering that gender equality is a precondition for innovation and sustainability, it is essential that we take strong, co-ordinated actions to address gender imbalances. This will ensure that we are well-placed to address the 21st-century challenges, including climate change, ageing populations, the digital transformation, and the socio-economic and health impacts of Covid-19.

There is evidence that diverse teams are more innovative. For the companies building such teams, this means more sustainability and resilience in times of change. Research shows that companies with a balanced workforce and an inclusive culture are six times more likely to be innovative. Including different categories of users also contributes to improved customer service.

Research also shows that women are more willing to limit their car use than men, show more support for environmental issues and be more positive towards car-use reduction measures, such as improving and expanding public transport. With their different attitudes towards mobility, it has been demonstrated that women tend to also be greener and more environmentally conscious than men.

Gender equality is a core value of the European Union, a fundamental right and a key principle of the European Pillar of Social Rights. In its 2020-2025 Gender Equality Strategy, the European Commission commits to systematically including a gender perspective in all stages of policy design in all policy areas. The strategy also contains targeted measures to address the digital gap. It recalls that today 90% of jobs require basic digital skills, but women represent only 17% of those in information and communication technology (ICT) studies and careers in the European Union, and only 36% of science, technology, engineering and mathematics (STEM) graduates, despite the fact that girls outperform boys in digital literacy.

With the digital gap well established, the share of female transport workers risks diminishing further as digitalisation expands. As women are currently under-represented in jobs linked to transport science and engineering, we can expect this imbalance to also be mirrored in transport research. Automation is another threat to gender balance, as many jobs occupied by women are expected to be automated.

Nonetheless, many transport stakeholders are optimistic, as future jobs will require fewer physical skills and more interaction. The option to work remotely will also improve work-life balance and make transport professions more attractive to women.

There are a number of initiatives taken by the European Commission to increase gender equality in transport, including:

- **Data gathering and research:** Gender is a relatively new topic in transport research, but two EU-funded research and innovation projects – DIAMOND and TInnGO – are already under way to analyse the current situation. Both projects are assessing gender differences related to the adoption of digital products and services in transport, while identifying the skills and strategies needed for women to fully benefit from these technological advances, and thus avoid exclusion. The European Institute for Gender Equality (EIGE) is working on disaggregating data on women and men in decision-making with a focus on the transport sector. Some progress is being made in terms of the amount of funding allocated to gender equality in recent years, with a view to addressing the gender dimension in EU research and innovation programmes more effectively. Further progress is, however, needed to address women’s issues through increased transport research on gender and further data collection.
- **Fighting stereotypes from an early age:** One of the main reasons for the gender imbalance within the transport sector is the persistence of strong gender stereotypes. As children begin to form their career aspirations from an early age, the European Commission is developing educational toolkits, for both primary and secondary school, to support teachers across the European Union as they organise class discussions addressing gender stereotypes. The toolkits include concrete examples from the transport sector.
- **Tools to increase the share of female transport workers:** EU stakeholders can join forces to increase female employment in transport through the action-oriented initiative Women in Transport – EU Platform for Change. This platform, put in place by the European Commission, has also published a list of measures that companies can take to increase their gender balance. As the transport sector, for the most part, provides essential services for our economy, its employees are often required to work long periods away from home, including weekend shifts. These demands make work-life balance a major challenge for both women and men. To this end, the European Commission is identifying and will publish good practices on staff scheduling and rostering.
- **Towards a better inclusion of female transport users:** For EU urban mobility policy, a new guidance document on inclusive mobility was published in 2020 as an annex (i.e. topic guide) to the Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan.
- **Raising awareness:** In September 2020, the European Commission called for volunteers to join a European Network of Ambassadors for Diversity in Transport.

These efforts are necessary now more than ever as the transport sector needs to be able to rely on the biggest pool possible of diverse and innovative resources as it seeks to rebuild after Covid-19. Some inclusion and diversity initiatives have been put on hold because of the pandemic, while we should be doing the exact opposite.

### Useful links:

TInnGO Project [www.tinngo.eu/](http://www.tinngo.eu/)

DIAMOND Project [www.diamond-project.eu/](http://www.diamond-project.eu/)

Women in Transport – EU Platform for Change [https://ec.europa.eu/transport/themes/social/women-transport-eu-platform-change\\_en](https://ec.europa.eu/transport/themes/social/women-transport-eu-platform-change_en)

Women in European Transport with a Focus on Research and Innovation <https://trimis.ec.europa.eu/content/women-european-transport-focus-research-and-innovation>

Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan [www.eltis.org/mobility-plans/sump-guidelines](http://www.eltis.org/mobility-plans/sump-guidelines)

## Travelling in a woman's shoes: Everyday stories for inspiring new thinking

Rachel Cahill, Head of Financial Management and Sustainable Mobility Lead, Transport Infrastructure Ireland

In 2014 the United Nations Commission on the Status of Women found a male bias in the planning, provision and design of transport systems. This finding sits uneasily with extensive global research showing apparent differences in overall patterns and trends in women's and men's mobility. Across the world, men and women have different travel needs – for two main reasons. First, mobility is heavily shaped by gender roles performed by women and men. Women still undertake a large portion of household and care-related activities daily which, when combined with work and education, make their travel patterns more complex. When you compare this with a commute to work in a business district, this mobility is often characterised by multipurpose travel and “trip chaining”. Second, women's mobility is more likely impacted by unsafe experiences and concerns for personal safety. As a result, women are exposed to greater levels of “travel burden” than men relating mostly to cost, stress, time poverty, lack of accessibility and above all, safety. There is growing research demonstrating that this travel burden results in high car dependency and a cohort of women not leaving the house.

As sustainable transport solutions advance, there is a clear need for better-informed transport policy and planning to ensure services and innovation benefit men and women equally. In this context, Transport Infrastructure Ireland (TII) has taken up the challenge of studying and understanding women's mobility in its new study “Travelling in a woman's shoes” (July 2020). The research seeks to understand the realities for women in Ireland today: why they make the mobility choices they do, what are their daily challenges and aspirations. Filling this gender data gap is the first step in balancing male bias in the design of future transport solutions.

### Our approach

This study, which investigates the needs and travel behaviours of women, is a first of its kind in Ireland, and TII is delighted to be part of an essential step towards a deeper understanding of the transport experience for women. “Travelling in a woman's shoes” analysed available data and studies from Ireland and relevant global literature. The primary research involved an ethnographic study where we conducted 21 two-hour in-home interviews with women in Dublin and Cork and a statistically significant quantitative survey to validate our findings.

The study tells real-life stories that demonstrate the key characteristics of women's mobility in Ireland. A research method which is not typically used in transport research, this ethnographic approach adds another dimension to existing transport research. The study shows us how issues of gender equality and social inclusion are well suited to the ethnographic method. This allows us to shed light on the disparities and the realities that women face every day, introducing a diversity of perspectives and enriched data that apply a gender lens to travel behaviour. Research participants were selected to represent a diverse demographic and geographic background, including varied daily transportation usage and behaviours. As part of the fieldwork, we also accompanied women on aspects of their everyday journeys to observe how they interact with the existing transportation infrastructure.

## Early insights

Ireland is pleased to share its early insights into the role of this ethnographic method in shaping future sustainable transport policy and planning.

- Ethnographic research produces evocative and nuanced insights into people’s lives and the role of mobility. It leverages the power of a person’s own words to create a vivid impression of an issue or concern faced by a woman on her journey. It is an essential vehicle for communicating complex problems and may be more effective in motivating transport professionals to engage in the subject than high-level statistical data.
- An ethnographic approach enables sensitive and complex human issues to be tabled and socialised in a government and business transport context. Through people candidly telling their stories, a broad range of social, infrastructure and technological issues are revealed without polemic. The integrated nature of mobility and socio-economic issues is made clear.
- The study was able to capture feelings of fear, stress and joy, which are significant motivators of transport behaviour, but which are often left out of customer surveys.
- The research generated rich and unexpected insights about the challenges for sustainable transport specific to the local and Irish context.
- Transport professionals are given a window into what is happening beyond existing measures, key performance indicators and statistical data. Decision makers are able to observe the impact of transport and land-use policies in real contexts.
- Photos taken from women’s journeys are an essential part of the storytelling process.
- Women’s rich and detailed anecdotes about their everyday mobility hold the clues to sustainable solutions. Transport innovation – technological, engineering-based and social – needs to start from these stories.

In summary, ethnographic research is highly suited to understanding gender issues in transport. It can enable the transport sector to understand the complexity and significance of women’s mobility challenges and to innovate on an experiential level. It is an essential tool in designing effective, sustainable solutions.

“Travelling in a woman’s shoes” provides the reader with real-life stories, a set of design challenges and policy takeaways, drawing on some of the OECD’s core skills of public-sector innovation. This study embraces the technique of user-centricity and storytelling to help shape new ideas and opinions around sustainable transport solutions. Further applying these innovation methods, the study recommends a process of co-creation between transport professionals and women to create sustainable transport services that women will use and enjoy. Ireland now has the opportunity to apply an innovative gender mainstreaming method to a number of the major transport projects outlined in Project Ireland 2040.

## Useful links and literature:

Transport Infrastructure Ireland (2020), “Travelling in a woman’s shoes” [www.tii.ie/technical-services/research/TII-Travelling-in-a-Womans-Shoes-Report\\_Issue.pdf](http://www.tii.ie/technical-services/research/TII-Travelling-in-a-Womans-Shoes-Report_Issue.pdf)

Project Ireland 2040 [www.gov.ie/en/campaigns/09022006-project-ireland-2040/](http://www.gov.ie/en/campaigns/09022006-project-ireland-2040/)

Ng, W. and A. Acker (2018), "Understanding urban travel behaviour by gender for efficient and equitable transport policies", *International Transport Forum Discussion Papers*, No. 2018/01, OECD Publishing, Paris. <https://doi.org/10.1787/eaf64f94-en>

## Advancing equitable mobility: Using gender-disaggregated data in the wake of Covid-19

Mouchka Heller, Automotive and Autonomous Mobility Lead,  
World Economic Forum

Women make up the large majority of the front-line workers that have kept the world above water throughout Covid-19. They are up to 90% of the nursing staff in hospitals; they perform over 75% of the unpaid care work globally, which has been adding up to an increasing number of hours since schools closed and telework began due to the pandemic; they make up over 53% of the “critical retail” workforce that has kept pharmacies and supermarkets open. Women are usually avid public transit riders, in spite of legacy systems that are still clearly configured to accommodate the male commuter with a conventional nine-to-five schedule. The damage done to public transit by Covid-19, however, took the option away for many of the female heroes of our time, impeding their capacity to get to the very front lines of the pandemic. Instead, privately sponsored solutions have offered alternatives to Covid heroes. Intentionally or not, these initiatives are therefore producing an unprecedented amount of data on how women travel, get to work, manage their multiple responsibilities throughout the day, and develop professionally and personally.

This is a historic opportunity because data collection processes, even through the Fourth Industrial Revolution, were not configured to capture the realities of women. For example, most of the processes and technologies currently used to track harassment in public transit rely on formal complaints made to law enforcement. However, safety, or the perception of safety at least, expands far past crimes that would be reported. Verbal harassment, unwelcome staring and touching, and petty theft are just a few of the behaviours that would make a rider feel unsafe. They are routinely experienced by women and transgender individuals and routinely under-reported.

As a result, transport providers do not always have an accurate representation of reality in the data they receive regarding safety conditions, which prevents them from making the appropriate decisions to protect and grow ridership. Worse, we have learned to worship data like a deity that does not get questioned, even though data are nothing without trained judgement, critical thought and insight. What makes the challenge all the greater is that most of the individuals collecting, processing and making decisions based on mobility data are not women. A consequence is that the inherent human bias that comes into play through the analytical phase of data processes is often masculine and digs yet another gap in adequately understanding the movement of women.

In January 2020, the World Economic Forum (WEF) launched the Inclusivity Quotient project to tackle such technological and governance gaps with a mix of mobility policy frameworks and pilots for Fourth Industrial Revolution technologies to reverse the trend. The goal, when the project was launched, was to design a blueprint to help solve inclusivity challenges, including gender parity. Since Covid-19, the project has adapted to at least two new realities. First, it now takes into account the lessons learned from the stress test this pandemic imposed on the world. In this case, Covid-19 has not only demonstrated that gender parity is essential to improve global prospects of growth in gross domestic product (GDP). In fact, it has shown that the backbone of modern society is women, even if we have not yet given them the means to effectively, reliably, continuously reach the front lines at times of crisis. The event is reminiscent of the two world wars, during which women maintained both economy and family while men were sent to the

front. Each time, the end of the crisis presented a major opportunity for the advancement of gender parity. This latest crisis is no different.

This takes us to our second point, which is the wealth of data that were created by Covid-19 on women's movement and the impact of reliable, multimodal, complementary mobility solutions on their ability to not only reach the front lines through a terrible crisis but to be more productive than ever, multitasking through double and triple shifts. As a result, the Inclusivity Quotient project launched a new work stream: the RESET Challenge, to reconfigure the public-private partnerships and financing of multimodal solutions for commuting, still with a focus on gender.

The international community has a choice to make, which is whether and how to harvest this newfound wealth for both societal progress and economic development. Have private mobility providers realised the potential of the underserved customer segment made of lower- to middle-class women, both in and out of urban centres? Will public investment target the shared, affordable, reliable infrastructure needed to help women continue to rise and carry the world higher on their shoulders? To optimise impact, both sectors need to redefine their collaboration and the value creation framework for joint ventures. The civic sector has a fundamental role to play in fostering that alignment, nurturing The Great Reset, the WEF initiative that promotes dialogues around the opportunities to reshape recovery from Covid-19, and guide foundational policy making. As just one example, the aforementioned wealth of data created by the pandemic are owned by a large spectrum of institutions, so unlocking their insights requires public-private data collection, sharing, storing and processing agreements. So far, efforts to better understand the pain points and motivations of female riders, such as the study recently done by the Los Angeles Metro in August 2019, have been done on a local, unimodal level, partly because of this challenge. Third parties and non-profits, such as the Open Mobility Foundation, who have boldly taken on the task of creating a framework for public-private data work are focusing on digitisation and modal integration rather than their effect on inclusivity because of the size of the task. Still, the time is ripe to connect the dots between all the work that has been and is being done, to integrate new and old data into a map for a more equitable, more resilient future.

### **Useful links:**

*Understanding How Women Travel* [www.scribd.com/document/426595576/Understanding-How-Women-Travel-Full-Report](https://www.scribd.com/document/426595576/Understanding-How-Women-Travel-Full-Report)

"Digitalizing and transforming mobility systems: Lessons from the Detroit region"  
[www3.weforum.org/docs/WEF\\_Digitizing\\_Transforming\\_Mobility\\_Systems\\_2020.pdf](https://www3.weforum.org/docs/WEF_Digitizing_Transforming_Mobility_Systems_2020.pdf)

## Women at the core of a resilient recovery for ride-hailing

Alexa Roscoe, Digital Economy Lead, International Finance Corporation, and Ahmed Nauraiz Rana, Associate Digital Economy Officer, International Finance Corporation

Few industries have been as impacted by the Covid-19 pandemic as ride-hailing. In some markets, passenger trips have virtually halted, while in others there has been a sudden surge in demand as riders shift away from public transport. Regardless, millions face the increasingly urgent question of how – or if – ride-hailing will be able to provide reliable work and inclusive transport opportunities moving forward.

The International Finance Corporation’s (IFC) research shows that a focus on women could be the key to a resilient recovery for the ride-hailing industry. While companies are starting to recognise the importance of the women’s market, fewer realise the scope of the opportunity, or the urgent need for change. There are three insights companies should consider as they look to bring women onto their platforms:

### Women riders are often the key to market growth

In *Driving toward Equality: Women, Ride-Hailing, and the Sharing Economy*, the IFC leveraged data from Uber alongside surveys of over 11 000 drivers and riders in six countries to give the first insights into how women engage with ride-hailing. The report found that women represent an average of 40% of riders across countries. In some countries, such as Indonesia, they represent the vast majority of riders, so understanding their needs and preferences is key to understanding the core user base. In others, such as India, women’s use is well below that of men’s, meaning that women users are the most likely source of future growth. This finding has since been reinforced: a forthcoming report with PickMe, a Sri Lankan platform, shows that annual ride-hailing revenues could jump by over a quarter if women’s ridership were brought up to the same levels as men’s.

### Passengers want more women drivers on the road

*Driving toward Equality* also showed that one of women riders’ main requests is to have more women drivers on the road, particularly when travelling alone, at night or in an unfamiliar environment. However, women remain widely under-represented across the transport sector and around the world, making up less than 5% of drivers in all countries studied. Women are often limited by strong social norms, serious concerns regarding safety and security, and substantial gaps in digital and financial inclusion. This holds back the market as a whole – and also leaves women out of a work opportunity that, when done right, increases incomes and provides flexible work. Research found that women’s incomes are boosted more than men’s after joining the sector.

### Companies are open to innovation for women

Tackling the type of deeply entrenched challenges faced by female providers and users will require a high level of innovation. The IFC recently explored a women-centred option that allow drivers, riders or both to be matched with only other women, in “Gender-segregated transport in ride-hailing: Navigating the debate”. This research, which drew on data and interviews from over 30 companies, analysed seven different models of segregated transport. It found that while there is early evidence that segregated transport can support women’s mobility and open work opportunities for women, companies face substantial operational challenges. For instance, matching female drivers and riders can mean that there

are fewer drivers to serve a large population, potentially decreasing driver income and increasing rider wait time. Despite the complexity, companies are looking to adopt these models both because of high demand from riders and as a recruitment tool for women who would not otherwise consider signing up to drive.

The challenges women face in ride-hailing are worth solving. As the industry comes back online, companies should sex-disaggregate user data, boost safety and security features, and adopt innovations that are targeted to women. For further exploration of women's user patterns and preferences, as well as the gender and development impact of the ride-hailing industry, see the reports below.

### **Useful literature:**

IFC (2018), *Driving toward Equality: Women, Ride-Hailing, and the Sharing Economy* [www.ifc.org/wps/wcm/connect/topics\\_ext\\_content/ifc\\_external\\_corporate\\_site/gender+at+ifc/drivingtowardequality#:~:text=On%20March%201%2C%202018%2C%20IFC,than%2011%2C000%20drivers%20and%20riders](http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/gender+at+ifc/drivingtowardequality#:~:text=On%20March%201%2C%202018%2C%20IFC,than%2011%2C000%20drivers%20and%20riders).

IFC (2020), "Gender-segregated transport in ride-hailing: Navigating the debate" [www.ifc.org/wps/wcm/connect/topics\\_ext\\_content/ifc\\_external\\_corporate\\_site/gender+at+ifc/resources/gender-segregated+transportation+in+ride-hailing](http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/gender+at+ifc/resources/gender-segregated+transportation+in+ride-hailing).

IFC (2020), "Women and ride-hailing in Sri Lanka" [www.ifc.org/wps/wcm/connect/region\\_ext\\_content/ifc\\_external\\_corporate\\_site/south+asia/resources/women+and+ride-hailing+in+sri+lanka](http://www.ifc.org/wps/wcm/connect/region_ext_content/ifc_external_corporate_site/south+asia/resources/women+and+ride-hailing+in+sri+lanka)



## Transformational technologies: New opportunities for women

Cristina Marolda, Independent Expert

Transformational technologies will enable a connected and automated transport network.

These new technologies and their related business models open the way to new forms of mobility that could respond better to women's specific mobility needs. Women, however, are at risk of further disadvantages in transportation access and equity if a proper governance of transport and mobility will not be pursued systematically. In order to ensure that these potential benefits will be a reality, it is crucial to ensure that digital applications, left to the free market alone, do not lead to exclusion of some societal groups, particularly the elderly, single mothers and those without access to modern technologies. It is urgent to raise awareness about the possible gender imbalances, innovate governance and identify public policies that can help these new technological solutions in reducing inequalities for disadvantaged groups, avoid the creation of new ones and guide the deployment of innovative transportation services that leave no one behind. This means that innovative services shall meet specific demands of groups not properly attended by traditional means: rural and peri-urban population, non-autonomous elderly, immigrants, etc.

Smart transport or smart mobility, including Mobility as a Service (MaaS), is too often considered mainly from the technology performance point of view, and the human aspect becomes a secondary concern for the service developers and providers. Profit-oriented private operators, in a libertarian system, might discriminate among users according to their purchasing power, thus increasing socio-economic disparities.

Access to new forms of mobility requires increased technological competence. The connected traveller has the option to integrate information about access to transportation services, thus increasing the ability to be mobile. Accessibility to and affordability of these new forms of communication and information depend as well on the level of income, education and digital competence of the users. New services and business models should not ignore these potentially discriminatory elements.

New mobility services have not been designed taking in due consideration emotional behaviour, such as the perceived security concerns of women. Only 5% of "OpenStreetMappers" (OpenStreetMap is a collaborative project to create a free editable map of the world) are women, and navigation systems usually do not include qualitative information on routes.

An example of what could provide women entrepreneurship is the platform Wher, a service designed by women for women. A community of women – the "Wherriors" – are engaged in providing maps with indicators ranking safety, that are simple to understand and that allow feedback, including textual comments that give information about routes where one should be careful or not, at different times of the day.

Similar information could be included in other platforms, such as share-driving and ride-hailing, to allow for example to select an all-female car or a female driver when using the platform.

The little consideration given to these specific needs is due to the fact that the transport sector is still strongly male-dominated, the lack of sufficient granularity in data collection and the new fast pace of technology-led innovation that overshadows a human-centred design.

“More women in the industry who are empowered to think for themselves are vital to transitioning to a more sustainable, integrated mobility sector”, noted Kelly Saunders in her article “The real reason why mobility is not women-friendly”.

Statistics report that a very low percentage of women are active as workers in the transport sector. But the jobs taken into consideration are in the majority of cases those related only to the personnel “on board” means of transport. The modern concept of mobility enormously enlarges the range of jobs related to the sector: changes in mobility strategy and related technologies offer new attractive jobs targeted at improving public transport and mobility management. New jobs include establishing mobility centres, promoting customer-friendly intermodal mobility systems, and ad hoc designed platforms (such as Wher) promoting innovations in mobility services and transport technologies, to name a few. This new job market can offer opportunities for women with more equity than more traditional markets.

A review of professions that are directly or indirectly linked to transport is needed, including exploration of how they are likely to change or disappear, which new or revised jobs may emerge, and which education and (re)training programmes/tools are required to facilitate the transition. Appropriate communication of the different possible job scenarios offered by the future mobility sector will increase the attractiveness for young girls, extending the range of required competences from engineering to social science, from information technology to management, from planning to co-ordination of policies, all basic knowledge to achieve a modern transport system and mobility for all.

Governance aiming at inclusive and sustainable transport system requires new thinking and new skill sets and this in turn requires radically new messages from the top. The presence of women at the decision-making level will contribute to the game change. There is an urgent need to collect not only quantitative but also qualitative data with finer granularity to better understand women’s mobility patterns and wishes. But it is also indispensable to develop appropriate capacities in analysing data and transform outcomes into concrete mainstreaming measures. More women employed in transportation fields present opportunities for dialogue on issues women experience in transportation, and thereby can help facilitate development and adoption of solutions that are both inclusive and socially sustainable, including relevant innovative business models for the benefit also of the financially weakest users.

### **Useful links and literature:**

Wher platform <https://w-her.com/en/>

Saunders, K. (2019), “The real reason why mobility is not women-friendly”, *The Urban Mobility Daily*, 3 October 2019 <https://urbanmobilitydaily.com/the-real-reason-why-mobility-is-not-women-friendly/>

## Making free-floating e-carsharing more attractive for women

Ines Kawgan-Kagan, Managing Director, AEM Accessible Equitable Mobility GmbH

In 2013, I was told about a phenomenon that was surprising to me – from a personal and from a scientific perspective. This phenomenon was that more than 80%, perhaps even 90%, of users of innovative mobility services were male. This homogeneous group of users still has not changed much in 2020. The question, therefore, arises as to what can be done to promote such services among women in cities and to encourage them to switch from private cars or prevent them from buying new ones. Back then, I decided to dedicate my time to find out what was behind this in my PhD project and focused on the use of free-floating e-carsharing.

This mixed-method research project provides insights into gender differences between women and men with regard to innovative solutions for urban mobility by examining the use of and attitudes towards free-floating e-carsharing in urban areas from a gender perspective.

In addition to accompanying family members and work-related journeys, women, compared with men, take on household tasks more frequently. Therefore, they take more trips, but travel shorter distances and for shorter durations. In consequence, the mobility behaviour of women is more complex than that of men and the mode choice differs, especially when it comes to innovative mobility solutions.

Due to the complicated nature of the topic of this dissertation, a mixed-method approach was chosen, structured in the form of mobility planning and consisting of five steps.

In the beginning, important terms were systematically defined since traffic and mobility, gender and sex, and car sharing are mostly not clearly defined. Three empirical studies followed, beginning with an analysis of female urban dwellers who used e-carsharing at a very early stage of its market diffusion. A sample of female early adopters from Berlin was studied to determine whether they exhibit the same characteristics as the internationally homogeneous groups of people identified earlier.

In the second empirical step, the resulting characteristics were compared with a representative sample of urban dwellers from Germany. This study examined the differences between men and women, both with and without children, in their attitudes towards different, but above all sustainable, modes of transport.

In the last sub-study, the use of modes of transport was examined in a gender-sensitive research design with qualitative interviews based on GPS tracking data in order to demonstrate the complexity of gender-sensitive data collection and to identify specific advantages and disadvantages of the use of free-floating car sharing services.

In the final step, various measures were described to make the existing services more attractive for women. Summarising the results from the three empirical steps, four social constructs were identified that create barriers for women to adopt free-floating e-carsharing. These social constructs do not only include the problem of child seats, which has been the subject of many discussions in the media and in science; rather, it became clear that complex obstacles exist which create a socially created distinction between masculinity and femininity and related aspects of mobility.

From these social constructs, it was then possible to formulate overarching goals, whose detailed sub-goals were contrasted with specific measures. These measures were evaluated in terms of their objectives but also with regard to their potential effects on other groups of people.

As a result, 31 measures were compiled that have the potential to increase the use of free-floating e-carsharing by women in the short, medium and long term to make it a basic component of sustainable urban mobility. Not only can private car ownership be reduced and subsequently the quality of life in cities improved; additionally a huge step towards equal transport planning can be achieved since gender is one of the strongest determinants in the choice of transport mode.

## Is shared mobility innovative enough for gender needs?

Malin Henriksson and Michala Hvidt Breengaard, Senior Researchers, VTI/TInnGO

Travelling enables economic activity. A central starting point for traffic planning has therefore been to design a transport system that makes it possible to travel to and from work in an efficient manner. The prominence of the idea that car driving is efficient has led to a traffic system that benefits the automobile. Yet the environmental crisis means that the main principles of traffic planning must be renegotiated. Many believe that shared mobility can be a green and more sustainable solution. However, when travelling is renegotiated, it may also be appropriate to question the view of what travelling is for different groups of people. If we do not do this, there is a great risk that new forms of sharing will reinforce gendered injustices that traditional traffic planning has cemented.

Men and women travel differently. This is a long-known fact for transport researchers with an interest in gender issues, such as Inés Sánchez de Madariaga, Susan Hanson, Sandra Rosenbloom, Ana Gil Solá and more. Men as a group drive more, whereas women walk and use public transport more. One explanation for this is the unequal distribution of economic resources; that is, men tend to have more money than women. Another equally important explanation is that women make more care trips than men do. Women transport or accompany children to school, preschool and leisure activities to a greater extent. They are also more often than men in charge of providing the family with groceries, and other goods associated with the home. Women's travels therefore often have several stops and can include several errands. In gender research, we call this chain-tripping. A consequence of women's caring responsibilities is that women more often than men choose to work closer to home. Proximity to service, work and home saves time – especially if you are dependent on public transport, cycling or walking. Complex travel patterns with several stops place high demands on the transport system, especially on public transport. But since the transport system has been designed based on the view that travel enables economic activity, it has primarily been planned for business travel. That is, trips from A to B: home to work.

Can a shift towards more shared mobility push the transport system towards more flexibility where more complex travel chains are included? An example of shared mobility that has emerged in Asia and the United States and that has become increasingly common in European cities is bicycle-sharing schemes. That bicycle sharing enables sustainable mobility for all is something that is often emphasised as the benefit of these schemes. Sharing might be innovative as a business model, but how does it innovate everyday mobility from a gender perspective? Shared bicycles are usually offered according to the "one size fits all" principle. Bicycles for children, or children's saddles, are rare. In an analysis of Oslo's ambitious bicycle sharing scheme, with 244 stations spread across the city, researcher Tanu Priya Uteng and colleagues show that mainly men use the system. One reason is that the bicycle stations are located adjacent to workplaces where mainly men work. Female-dominated workplaces, on the other hand, are not as well connected to the system. The system simply does not consider the gender differences in travel needs and patterns. Therefore, the innovativeness of bicycle sharing should be questioned.

A transition towards sustainable travel is inevitable, but it is important that it becomes sustainable for everyone. This requires inclusive transport solutions that take into account that travellers constitute a heterogeneous group of individuals who all want to be able to carry out their everyday activities as smoothly as possible. This means that for traffic planning to be inclusive and just, the idea that travel is

mainly about getting from home to work as quickly as possible must be questioned. Practices of care must be included in the mix. This is an important task for policy and planning. Here, gender research focusing on mobility is essential since it provides necessary knowledge and insights to make a shift possible.

### **Useful literature:**

Perez, C.C. (2019), *Invisible Women: Exposing Data Bias in a World Designed for Men*, Random House.

Scholten, C.L. and T. Joelsson (eds.) (2019), *Integrating Gender into Transport Planning: From One to Many Tracks*, Springer.

Uteng, T.P. (2019), "Smart mobilities: A gendered perspective", *Kart og Plan* [Map and Plan], Vol. 112/04, pp. 258-281.

## Designing transport networks with women's mobility needs in mind

Floriea Di Ciommo, Co-director, cambiaMO/changing MObility, and Suzanne Hoadley, Sustainable Mobility and Intelligent Transportation System Expert

Throughout the world, the mobility of care – journeys to carry out errands, for shopping and visits to health centres, and escorting dependent persons – represents nearly 40% of trips on average. Work-related trips account for less than 20% (the remainder are distributed among study, leisure and personal matters). Analysis of available data shows that the population groups with the most complex and greatest unmet needs include older and disabled people, children, and female workers or caregivers. This is clear when we analyse travel satisfaction by gender, where housewives, who tend to be the main caregivers, are the most dissatisfied, as well as employed women who suffer time poverty due to the integration of work and family care duties. Women account for 80% of people in charge of mobility of caring. Most of these caring trips are made by women using sustainable modes, mainly walking and on public transport. However, transport planning is typically focused on commuting trips, resulting in higher frequencies of public transport during peak hours and lower during the off-peak, and the predominance of public transport services on arterial corridors, with more attention (and investment) given to high-capacity roads.

### Redirecting planning towards unmet needs

Mobility patterns for care do not necessarily coincide with commuting patterns and that there is a need to accommodate trips for caregiving in the transport system. Mobility of care may involve shorter, local and more frequent trips within a short time span. It does not show the pendular pattern of commuting, with its regularities in time (peak/off-peak) and in space (from residential areas to the city centre). Also, most of the caregiving responsibilities fall upon women, who have different considerations determining mode choice, such as personal security, road safety and the need to carry things. Furthermore, women have more complex trip chains than men and many rely on local services and sectors for the purpose of caregiving and to access employment.

Transport planners need to find a balance between the supply of transport systems designed for work-related trips and the unmet mobility needs for caregiving purposes. While the travel difficulties of women are starting to be considered in strategic city/regional transport planning documents (on paper at least), reconfiguring transport planning to cater for caregiving mobility requires a fundamental change. Mobility of care implies a local geographic focus, rather than optimising high-capacity road infrastructure, which is a typical concern of planners. The latter focus typically occurs when decision-making teams are mainly staffed by work-mobility-oriented technical professionals, leaving other identity-based experiences of the public space and infrastructure behind (Collectiu Punt 6, 2019). There are some encouraging innovations in planning developments with concepts such as neighbourhood mobility planning, focused on improving accessibility at the (micro) local level, and the “15-minute city”, for example in Paris with the aim for all economic and social needs to be met within a 15-minute trip radius of home. These initiatives should help reorient the transportation planning focus towards the local level and offer great potential in reducing the environmental impact of transport and virus containment.

In a similar vein, there are examples of operational and technological innovations in mobility services for caregivers. They include the increase in frequency of bus services in Valladolid (Spain) during the pandemic, despite lower passenger demand, to allow front-line medical workers to reach their workplace

in the hospital. Another example is the Demand Transport service in the southern part of Madrid within the districts of Puente de Vallecas and Villaverde, which serves two hospitals to allow patients and especially medical and care workers to reach their workplace in a more comfortable way.

### Mediation among needs

One recurrent debate in urban and transport planning is how to maximise the social benefit of an intervention, considering that different citizens have different needs to satisfy. Furthermore, the needs of different social groups may be contradictory. The notion of need is naturally linked with the notion of benefit: estimating the benefits of a population means measuring how much the needs are covered. Nevertheless, current benefit-based methodologies do not always succeed in highlighting unmet needs (such as a cost-benefit analysis). This is because some needs are not easy to conceptualise for those who do not experience the deficit. Making needs visible is essential for measuring transport equity (Di Ciommo et al., 2019). To translate needs into policies and interventions it is important to raise awareness on different social conditions and about vulnerabilities in the use of transport.

It is equally important to include more women in decision-making jobs, planning and transport service delivery, including front-line services and maintenance services. UK research has shown that transport has the lowest representation of women within the public sector at 6.25% and that women account for just 15% in most decision-making bodies and advisory boards (Sustrans, 2018). Gender-progressive Sweden also shows low levels of female participation in transport-related committees (Hiselius et al., 2019). Countries such as the United Kingdom or Viet Nam have specific provisions to increase the employment status of women in the sector of planning public transport infrastructure. It is expected that more women in decision-making roles will naturally lead to a greater focus on service alignment with mobility caregiving needs. Concretely, Transport for London innovated in its recruitment policies by selecting its personnel based on capabilities more than on the achieved engineering degrees. Therefore, women without an engineering degree have the incentive to apply and have the option to learn the more technical aspects of their work after being hired. Another good social innovation example is coming from the city of Hanoi, where about 30% of the jobs generated by civil works for constructing the metro are now occupied by women on equal wages (Di Ciommo, 2020).

Although the link between representation and sustainability demands further research, further studies should also consider how to move research from the counting of bodies and the representation of women in sustainable transport policy making to looking at how gender norms inform policy making, since the low representation of women in policy making demonstrated here appears to be a more general trend.

### Useful literature:

Collectiu Punt 6 (2019), *Urbanismo Feminista: Por una transformación radical de los espacios de vida [Feminist Urbanism: For a radical transformation of public spaces]*, Virus Editorial, Barcelona.

Di Ciommo, F. (2020), "Rights and claims for metropolitan mobility", Metropolis Observatory Issues Paper 10.

Di Ciommo, F. et al. (2019), "A behavioral framework for needs-based transport assessment", in *Measuring Transport Equity*, Elsevier, pp. 265-275.

Hiselius, L.W. et al. (2019), "Investigating the link between transport sustainability and the representation of women in Swedish local committees", *Sustainability*, Vol. 11/17, MDPI.

Sustrans (2018), Are we nearly there yet? Exploring gender and active travel.



## Social inclusion starts with acknowledging gendered mobility patterns

Laureen Montes Calero, Transport Specialist, Inter-American Development Bank, and Valentina Montoya, Transport and Gender Consultant, Inter-American Development Bank

Before the coronavirus disease 2019 (Covid-19) pandemic, enhancing social inclusion and equality was one of the main development challenges for Latin American and Caribbean countries. Today, with the economic and social impacts of the pandemic, that challenge is even bigger. Covid-19 has exposed deep structural gender gaps rooted in our societies, such as increased hours of care work at home, higher rates of domestic violence and unemployment for women. Our governments are faced today with the titanic mission of paving the way towards the post-Covid economic recovery. In particular, the transport sector has a golden opportunity to advance more sustainable and inclusive transportation services, where gendered mobility patterns are acknowledged and included in the planning, construction and operation of transportation infrastructure and services.

Collecting and analysing urban mobility data with a gender perspective is increasing. Latin American cities are also on that path to better understand the differences in the mobility patterns of women and men. A good example is the city of Buenos Aires, which conducted a study in 2019 to analyse the profiles of female users of the public transportation systems in the Metropolitan Region, with the support of the Transport Gender Lab (TGL) of the Inter-American Development Bank (IADB). The study revealed the heterogeneity of female users of public transport services: women with different mobility needs and patterns depending on their age, socio-economic status and caregiving roles.

Moreover, the research showed that the “mobility of care” (Sánchez de Madariaga, 2009, 2013), a concept developed by Inés Sánchez de Madariaga referring to the trips related to household and caregiving activities, is one of the main reasons to travel for women. Women surveyed spent, on average, 42% of their total commuting time on a typical week on the mobility of care. Additionally, the study confirmed that women caregivers have a more substantial dependence on public transportation. For instance, out of total surveyed caregivers between 25 and 50 years old, 75% use public transportation (mostly the bus) when taking or accompanying someone to the doctor, while others use private or non-motorised transportation, according to a forthcoming report from IADB. Caregivers participating in the study also highlighted the poor quality of public transportation services, which is usually evidenced in overcrowding, non-operating electric stairs, lack of baby changers in the restrooms, and non-existent infrastructure to travel with strollers, wheelchairs and groceries bags.

Another study conducted in Mexico City confirmed that the infrastructure to access public transportation also lacks a gender perspective. Moreover, it is not tailored to facilitate the mobility of care (Soto Villagrán, 2019). This research, conducted with the support of the TGL, was focused on assessing the travel needs of women using three Modal Transfer Centres of the city (CETRAM for its acronym in Spanish), where most of the transfers between transit modes occur. Based on the mobility barriers identified, the authors proposed a CETRAM design that put women at the centre. Safety, security, urban accessibility and the mobility of care are the guiding principles for improving the infrastructure of the CETRAM. Family bathrooms with baby-changing stations, panic buttons, protected pedestrian crossings, wide spaces to walk and free of obstacles, development of rest and recreation areas, well-lit and clean infrastructure, and

digital kiosks to process payments for public services are some of the main features included in the designs for new CETRAM, while in other cases these changes are being incorporated in the existent CETRAM.

In addition to women performing the mobility of care, there is another universe of women executing the mobility for care, meaning those paid care workers who use public transportation to access their jobs. About three-quarters of the Americas' caregiving workforce are women. Moreover, in the context of the pandemics these women represent a large fraction of the so-called essential workers, according to the International Labour Organization. A recent study conducted by the IADB and the organisation Grow, Género y Trabajo analysed the mobility patterns of essential workers before and during the pandemic in some member cities of the TGL. The study's preliminary results show that the percentage of women who used buses decreased, on average, from 35.4% before the pandemic to 21.1% during the pandemic; and in the case of metro users, the percentage went from 6.3% to 3.7%. Accordingly, a vast number of lower-income women, who are captive commuters of public transportation in Latin America and who use it to perform activities related to their familial responsibilities, stopped using public transportation. This might imply that they had to use other affordable modes to perform familial responsibilities, including walking, which might have increased the time invested in these types of activities. Meanwhile, private car usage among surveyed women went from 18.3% to 22.7%; ride-hailing apps went from 7.3% to 10.1%; and taxis from 7.7% to 11.7%. These are options primarily for women with a higher income, but not for lower-income women who cannot afford them, according to a forthcoming report from IADB (Grow and IADB).

In conclusion, according to the studies supported by the TGL in the cities of the network (Buenos Aires; Bogotá; Cali, Colombia; Quito; Santiago, Chile; San Salvador; Ciudad de Guatemala; Mexico City; Estado de Hidalgo, México; Hidalgo, Estado de Jalisco, Mexico) women continue exercising mobility of care, but both traditional public transportation and active mobility do not respond to the familial responsibilities they perform while commuting. During the pandemic, the situation has only worsened, especially for lower-income women who are often captive commuters of public transportation. Mobility planning, in terms of both service and infrastructure, must take into account the needs of this vast number of women who travel to perform familial responsibilities. Finally, it is practically impossible to improve social inclusion without addressing first those gender disparities in the realm of urban transportation services, where the planning and operation follow a “one size fits all” approach and do not respond to the diverse needs of female users.

### Useful links and literature:

Webinar on the mobility patterns of essential workers before and during the pandemic [www.youtube.com/watch?v=Nb-BrbiXFUs&feature=youtu.be](https://www.youtube.com/watch?v=Nb-BrbiXFUs&feature=youtu.be)

Sánchez de Madariaga, I. (2013), “The mobility of care: Introducing new concepts in urban transportation”, in *Fair Shared Cities. The Impact of Gender Planning in Europe*, Ashgate, New York.

Sánchez de Madariaga, I. (2009), “Vivienda, movilidad y urbanismo para la igualdad en la diversidad: ciudades, género y dependencia” [Housing, mobility and urbanism for equality in diversity: cities, gender and dependency], *Ciudad y Territorio*, pp. 161–162, 581–598.

Soto Villagrán, P. (2019), *Análisis de la Movilidad, Accesibilidad y Seguridad de las Mujeres en Tres Centros de Transferencia Modal (CETRAM) de la Ciudad de México [Analysis of Women's Mobility, Accessibility and Safety in Three Modal Transfer Centres (CETRAM) in Mexico City]*, Inter-American Development Bank.

## Safe transport for all users: Innovative governance

Peruvian Ministry of Transport and Communications, Sustainable Urban Transport Projects in Peru, implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Since 2018, the Peruvian Ministry for Transport and Communications (MTC, for its Spanish acronym) has developed an inter-sectoral and multilevel strategy to strengthen the safety of passengers in all ground transport services available across national territory.

As a starting point, early in 2018, the MTC carried out a field investigation to gain in-depth knowledge of the situation of women on public transport in Lima and Callao, with an emphasis on the issue of harassment of women, children and teenagers. The study is considered a milestone as, for the first time, sex-disaggregated data was produced for the public urban transport sector on a topic such as gender-related violence. The study revealed critical information on the safety of women and men, as well as on the obstacles women face when working as drivers in public urban transport. For example, the research showed that seven out of ten women reported having been a victim of harassment on public transport at some point in their lives; of these, 73% were between the ages of 13 and 18 when they first suffered it. Likewise, it was revealed that in 2018, the number of female drivers in the local bus corridor system represented 0.04% of the total number of drivers. Women represented only 0.37% of the total drivers who have worked in these corridors in its eight years of operation.

The MTC took the lead to develop and implement measures to discourage and prevent sexual harassment in public and interprovincial transportation services. It was the first time in Peru that a sectoral ministry led the response to the gender-based violence issues, as this is usually the responsibility of the Ministry for Women's Affairs and Vulnerable Populations (MIMP, for its Spanish initials). The MTC works closely and in co-ordination with the MIMP.

Among these measures are the Directorial Resolutions No 009 and 016-2019-MTC/18, which require public transport providers, both national and regional, to indicate in a visible area within their vehicles and terminals that sexual harassment behaviours are prohibited and subject to sanction and criminal charges. MTC also promotes national emergency line "Line 100", managed by the MIMP, which constitutes a free national service that provides emotional support, guidance and information in case of family violence and sexual abuse. From 2019, the line has also addressed cases of harassment in public space and public transport.

A series of workshops and trainings for transport inspectors at regional, provincial and local government levels were organised to raise awareness with regard to prevention of sexual harassment in public transport. Officials from 196 provincial municipalities were trained with regard to implementation of Law No. 30314 to prevent and punish harassment sexual in public spaces and Law No. 30364 to prevent, punish and eradicate violence against women and members of the family group. Furthermore, a proposal for national response protocol on sexual harassment in public transport was developed to guarantee secure travelling conditions for users of public and interprovincial transport, as well as to provide adequate attention to harassment victims on these vehicles.

With the support of the sustainable urban transport projects of the German cooperation for development (GIZ), this protocol has been validated and agreed upon through participatory workshops in three cities with the biggest concentrations of population at the north, centre and south of the country: Trujillo, Lima and Arequipa. These workshops gathered diverse stakeholders from public institutions and private and

civil society organisations involved in the process of acting upon sexual harassment in public transport to review the proposal.

The development process of this national response protocol has provided the MTC with a few innovations on the formulation of public policies. First, this protocol has been produced under the leadership of a national public institution, supporting its implementation by regional and local governments. This characteristic distinguishes the response to the issue from others that have been implemented within the Latin American region, in which response protocols are proposed at city level. Second, the proposal was developed based on hard evidence. Lastly, the proposal was developed in a participatory process, with the inputs of a diverse range of stakeholders. This process has also empowered citizens and civil society organisations to demand the MTC not lose sight of the issue and not delay the creation of the protocol.

This protocol is established under the guidelines of the National Urban Transport Policy, approved in April 2019. The policy includes as one of its main objectives having effective public transport systems for the movement of people and, to achieve this, it establishes the need to guarantee the safety of women, children and teenagers. The protocol will be implemented at local government level, at a national scope through the technical assistance offered by the National Programme for Sustainable Urban Transport (known as Promovilidad). This programme aims to promote integrated transport systems in the cities within its area of action, with an approach that combines sustainable urban mobility and a gender perspective.

As the next steps in the short term, the protocol will be pre-published and shared with key actors involved in the processes of prevention, response, reporting and sanction of harassment in public and interprovincial transport. In addition, online seminars will be held with civil society and the general public to communicate the proposal.

For the implementation of the protocol, the design of a specific training programme on the measures established by this mechanism is under way. This programme is targeted to transport operators (i.e. drivers and collectors) who will be in charge of their application within their units and carried out by the urban transport or social development areas within local government administration. In addition, the ministry understands the importance of raising awareness among the general public in order to promote the reporting of sexual harassment incidents on public transport, applying the mechanisms provided by the protocol. Therefore, with the support of GIZ, communication campaigns will be launched to increase the visibility of this issue, inform and orient citizens on the application of the protocol.

It is important to mention that prior to the development of a national implementation plan for the protocol, a pilot trial will be carried out in the city of Trujillo, which is one of the cities with the highest number of trips per day nationwide. Its local government is interested in supporting this matter alongside the MTC. A study is being conducted to determine the needs of women in the city of Trujillo, in terms of safety from sexual harassment in public transport.

Although the first actions implemented by the MTC regarding gender and transport focus on safety of women and children in public interprovincial transport, these actions will be inserted into a broader sectoral strategy that will allow deeper gender-mainstreaming in the transport sector. In this sense, a sectoral Gender and Transport Agenda will be developed, whereby safety measures will continue, and the employment of women in the urban transport sector will be increased, considering the limited participation of women as drivers in formal transport. Finally, the MTC understands that change and acceptance of a gender-sensitive approach must also begin within its own institution. For this reason, the MTC has set as a long-term objective the institutionalisation of this perspective, within the organisational culture of the ministry. Likewise, the gender perspective is expected to be mainstreamed within the normative and management documents of the MTC itself.

## Sustainable mobility: An inclusive future

Lenka Čermáková, Guarantor, Diversity & Sustainable Development Project, Ministry of Transport, Czech Republic

Modern mobility involves a mix of different modes of transport, and people should choose the mobility they prefer. While cars will continue to remain vital for many, the future of transport and mobility is much more diverse. The Covid-19 crisis has brought a change in which people are rethinking their mobility behaviour. Many cities are being transformed by networks of cycling and pedestrian infrastructures with wider pavements, safer junctions, protected spaces for cycling and bus-only corridors.

With the Sustainable Development Goals (SDGs) and the Green Deal commitments, and strong support particularly from the young generation, we should rethink our mobility behaviour towards more sustainable and healthier solutions to restructure urban space. Notably, SDG 11 stresses the importance of providing access to safe, affordable, accessible and sustainable transport systems for all by 2030, improving road safety, notably by expanding public transport, with special attention to the needs of vulnerable parts of society: women, children, persons with disabilities and older persons.

Sustainable transport clearly has a social dimension and requires the consideration of diverse mobility needs. Current trends related to sustainable transport and mobility highlight inclusive, innovative and safe public transport, which takes into account the special mobility needs of different groups of the population as well as related infrastructure and transport planning.

Transport planning has to be further linked to sustainable urban mobility planning processes. Many cities have already been working on sustainable urban mobility plans, but authorities need to adopt gender-sensitive planning and support inclusive and sustainable public transport and better pedestrian infrastructure. A human-centric approach to mobility should be their guiding principle. This includes passengers, employees, employers, citizens and other stakeholders. Women face different challenges than men when it comes to mobility, whether it is inclusion, safety, accessibility or entering the workforce in the transport sector. Women's mobility is more multimodal and intermodal than men's travel patterns.

How can innovation in transport contribute to achieving this? Firstly, gender-disaggregated data and analysis are key to planning and designing transport networks with better understanding of the specific mobility needs. Intelligent Transport Systems can significantly contribute to a cleaner, safer and more efficient transport system. But there are still a number of questions that need to be answered and we also need to overcome the fear related to innovative solutions – as transport users or transport professionals.

The Transport Ministry of the Czech Republic has led several initiatives to promote and implement equal opportunities and diversity across the transport sector. In 2019, a new Working Group for Equal Opportunities for Women and Men was set up to implement equal opportunities into all relevant policies, supporting women as transport professionals and collecting and analysing gender-disaggregated data.

Since 2018, the ministry has had a Diversity & Sustainable Development Project as part of the Operational Employment Programme Fund under the Implementation of the Government Strategy for Equality of Women and Men, and related activities, for 2014-20. The professionals involved in this project have been actively participating together with the Transport Research Centre (CDV) in the Women in Transport initiative. The centre collects and analyses gender-disaggregated data and supports the implementation of equal opportunities and diversity into relevant transport policies. As part of its activities, the centre conducted a first study into how Czech women travel in 2020.

Digitalisation may create many new jobs, but at the same time, many jobs are likely to disappear. Although innovation can facilitate a more diverse workforce, many obstacles for women may still occur. The number of women among the decision makers remains low. Gender segregation in the transport workforce means that women are typically concentrated in the lower-paid administrative and customer service functions. As a result of automation, women may lose their jobs. But digitalisation in transport will also create new jobs. Therefore, it is essential that girls and women have access to education, training and skills necessary for such employment opportunities.

In the Czech Republic we still fight against socio-cultural prejudices and gender stereotypes, lack of training and challenges related to work-life balance. Physical, sexual and psychological violence, especially in public transport, ride-hailing and the sharing economy, remain a challenge.

In co-operation with the CDV, the Transport Ministry has been working on other projects to assess the impact that gender equality can have on various transport policies and innovations in transport. The regular survey on the role of gender and age in autonomous mobility conducted by the centre shows a paradox of acceptance in the context of autonomous mobility. One of the long-term goals of autonomous mobility is to achieve mobility for non-drivers or those with difficult access to mobility, for older persons, women, children or other groups of people who are not able to drive. The surveys revealed that respondents in these subpopulations were reluctant to use connected and automated vehicles (CAVs). One of the reasons is lack of information on CAVs. Will then better-informed women (especially elderly) have a more positive attitude towards CAVs? Are these negative attitudes of a different or deeper nature? These questions need to be addressed in order to switch to modern and intelligent mobility.

The Covid-19 pandemic is disrupting our societies and economies worldwide. How will this outbreak change our travel behaviour in the long run? Has the Covid-19 crisis brought only huge losses for the transport sector or will we seize the opportunity to change towards a more sustainable future? These questions are foremost in the minds of transport professionals. Much has already been said about the fact that this crisis will widen the gap between the people who have opportunities and the ones who do not. Those already in a more vulnerable position are likely to be most affected by financial insecurity, job loss, less access to different mobility options and greater risk of social isolation. We are committed to supporting innovations in transport and mobility at a time when new technologies and digitalisation are opening up new opportunities to transport professionals and offering solutions that will contribute to more inclusive and sustainable transport for all.

Achieving the target of sustainability in urban mobility also means considering the needs of different groups of users. The need to adopt a gender-sensitive perspective is emerging as a challenging task for urban mobility policy makers and planners. The International Transport Forum's (ITF) focus on gender issues provides an opportunity to share experiences and promote gender-related initiatives in the sector across the globe. Cities everywhere need sustainable urban mobility plans with an emphasis on gender-sensitive planning fully embedded in policies. The ITF plays an important role in encouraging transport professionals to collect gender-disaggregated data and help integrate gender perspectives into transport policy making and thereby making a positive impact on the daily lives of all citizens.

### Useful links:

*Transactions on Transport Sciences*, 2019, Vol. 10/2, Palacky University Olomouc <https://tots.upol.cz/magno/tot/2019/mn2.php>

## Future of work: Building a gender-equal new normal

Claire Clarke, Deputy Women Transport Workers' and Gender Equality Officer, International Transport Workers' Federation

One of the most important challenges facing workers everywhere is the introduction of new technologies that have the potential to transform the world of work – with potential benefits and risks for employment.

In 2019, the International Transport Workers' Federation launched a major report on *The Impact of the Future of Work for Women in Public Transport*. The report includes 12 recommendations that provide a foundation to ensure that the needs and concerns of female workers are reflected in policy, strategy and action at global and sectoral levels as public transport work changes.

The report highlights the important role of women in the public transport workforce (currently and in the future), and reveals how the development of new transport systems and technological change has the potential to bring benefits for female public transport workers – for example in opening up new opportunities for work in the formal sector and in improving vehicle operation and safety.

However, some innovations, such as the introduction of automatic ticket vending machines, have led to job losses (in particular in roles where women are concentrated); increased hiring of outsourced workers (which can drive down working conditions for women); impacts on job grades and wages when new technology deskills a work process; and health and safety implications for workers (i.e. customer-facing workers who are exposed to public anger when machines break down or the technology is not reliable).

The research supports claims that platform taxi driving work can offer access to flexible employment opportunities for women. However, these benefits may be more available to some women than others. For example, women who do not rely on this work as their sole household income or to those who have access to their own vehicle. For women who have to pay others for use of a vehicle, or who need to work very long hours to earn sufficient income – especially in cities with high competition from multiple platform companies – the potential for exploitation is great. Women also face a gap in the use and ownership of technology compared with men. The risks of violence and sexual harassment for female drivers (and passengers) working for platform companies were also highlighted, with the result that women tend to avoid working in certain areas and at night, thus losing out on some of the most profitable jobs. And in areas where the legal status of platforms is unclear or platform workers are denied legal employment status, female employees have no legal recourse against the employer or abusive passenger.

Technology is complex. It does not have a simple, linear impact on workers. But without policy intervention, there is potential for new technology to undermine working conditions or exacerbate existing inequality. For female transport workers, technological development is happening in the context of unequal pay, discrimination, gender-based occupational segregation and exposure to gender-based violence, on top of economic stagnation and an economic model that incentivises precarious work and the lack of formal work opportunities.

We, therefore, need policies to help address technology and gender inequality and to give transport workers the right to decent work in a fast-changing world – at the workplace level, at government level and through regulation, and making use of opportunities linked to the United Nations Sustainable Development Goals – and ensuring that such discussions include labour rights and gender equality.

We need access to education and training that helps women take roles created by new technology and ensures that women gain access to new jobs when transport infrastructure is introduced or upgraded, including retraining for female transport workers of all ages.

And more broadly, women’s unequal position in the economy requires gendered public policies that target the root causes of discrimination and ensure women’s right to paid work, safety, dignity and respect. For example, laws and collective bargaining to ensure that female transport workers earn equal pay for work of equal value, are protected from pregnancy discrimination, have access to paid leave for childcare and caring, to appropriate uniforms and decent toilet and sanitary facilities.

At the global level, the international social partners – the International Transport Workers’ Federation and the International Association of Public Transport – signed a joint agreement in March 2019 to strengthen women’s employment in public transport. The practical recommendations cover nine core areas: working culture and gender stereotypes, recruitment, work environment and design, facilities (including sanitation), health and safety at work, work/life balance, training, pay equality, and corporate policy.

Transport innovation has the potential to transform transportation. But there is also the potential that there will be winners and losers. Unless there are gender impact assessments using gender-disaggregated data, proactive policy interventions, and the involvement of women in decision making about transport planning and technology, then women risk becoming the losers. Gender-responsive innovation must ensure that transforming transportation benefits all workers equally.

This also applies to the Covid-19 response and recovery. Female transport workers are a proud part of the workforce, which is keeping the world moving – and while all transport workers are being severely impacted by the pandemic, there will be specific and additional impacts for women. The International Transport Workers’ Federation has identified nine priority areas for action by employers, governments and investors – negotiated with unions and with women’s participation – to protect and enhance female transport workers’ rights. This includes making sure that measures implemented in response to the crisis, including the introduction of new technology, benefit, not cost, women workers. For example, new working practices to minimise virus transmission and facilitate social distancing – such as cashless payments and automated cleaning – have the potential to significantly reduce women’s jobs in the gender-segregated transport industry. We therefore need to consider how this impacts women’s workforce participation and to take appropriate action.

After Covid-19, we cannot go back to a “normal” which for many female transport workers means being over-represented in precarious employment without social protections, being under-represented in leadership and decision making, facing violence at work and home, and sanitation indignity. This is not normal. Instead, we have an opportunity to ensure that as we emerge from this crisis, transport is organised to meet social and economic priorities and there is a “gender-equal new normal” that guarantees good jobs for all workers.

### **Useful links:**

*The Impact of the Future of Work for Women in Public Transport* [www.itfglobal.org/en/reports-publications/impact-future-work-women-in-public-transport](http://www.itfglobal.org/en/reports-publications/impact-future-work-women-in-public-transport)

“ITF/UITP positive employer gender policy” [www.itfglobal.org/en/reports-publications/itfuitp-positive-employer-gender-policy](http://www.itfglobal.org/en/reports-publications/itfuitp-positive-employer-gender-policy)

“Women transport workers’ rights and Covid-19” [www.itfglobal.org/en/reports-publications/women-transport-workers-rights-and-covid-19](http://www.itfglobal.org/en/reports-publications/women-transport-workers-rights-and-covid-19)



## Fostering women's participation in STEM education

Andree Woodcock, Coordinator of TInnGO H2020 Project, Professor at Coventry University, and Miriam Pirra, Italian TInnGO Hub Leader, Researcher at Politecnico di Torino

The innovations and the new technologies catching on in the transport sector have implications for women both as users and as “providers” of transport and mobility services. However, serious gender gaps continue in the sector with only 22% of female workers employed at the EU level and even lower percentages in other regions. The TInnGO project (Transport Innovation Gender Observatory), funded under the H2020 programme, aims to create a framework and mechanism for a sustainable game change in European transport concerning gender and diversity. It is argued that a starting point for this is implementing gender and diversity mainstreaming across the transport sector. A prerequisite for this is ensuring i) removal of barriers, the glass ceiling and other challenges women may face in a heavily masculinised environment; and ii) that there are suitably qualified and powerful women to enter the profession.

With an under-representation of women in most science, technology, engineering and mathematics (STEM) sectors, along with more vacancies and opportunities for skilled workers, governments are keen to incentivise women and those from other groups to make up the gaps in employment. This is not only desirable in terms of achieving equality, but also in drawing on the strengths and insights of those traditionally excluded from employment in the sector. Creativity and wider skills and experiences are needed to meet the pressing challenges of urbanisation, climate change and accessibility/inclusivity targets. Moreover, organisations that are committed to and understand diversity are better placed to create new services and serve various communities; it is the “diversity” in knowledge, feeling, thinking, and experience which is crucial.

Research conducted by the TInnGO project has revealed that far-reaching reforms are needed in education, employment, operation, planning and usage to create future transport systems that facilitate gender- and diversity-sensitive smart mobility. The roots of smart mobility lie in traditionally male-dominated STEM subjects such as engineering, manufacturing, computing and planning. However, women's participation, in particular in engineering, is still low in most EU countries. Statistics about graduates show that only 12.6% of females have a degree in STEM-related subjects, while the corresponding share for males was 37.5% in the European Union in 2012. Therefore, the starting point to address gender gaps in transport is an analysis of gender-related educational issues.

As part of the project's broader research agenda, interviews with female students entering automotive design revealed intriguing results. They were not surprised by, and indeed accepted, the lack of women as lecturers, the fact that approximately 90% of their classmates were men, the laddish culture, and that they seemed to have to work harder to achieve the same levels of recognition as their male counterparts. They not only accepted this as a given; they also saw it as beneficial, as it prepared them for their careers in the industry.

These results seem to be linked to a series of mechanisms related to specific systems of expectations and identity definitions that influence the work choices of women, who tend to exclude themselves from occupations in the information technology, technical and scientific sectors. Various barriers limit the participation of women in these domains including familial stereotypes, welfare policies and absence of women role models. These may be compounded by limited access to information, networks, funding or institutional support.

Positive changes have happened at the EU level regarding education. TInnGO's review of initiatives across ten countries revealed that academics and secondary schools are proposing more and more specific initiatives to increase the interest of women in STEM disciplines. For example, a technical university in Italy has financed a particular project which includes tutoring activities to sensitise girls in secondary schools to the characteristics of the engineering course of study and profession, and a competition of ideas to create a targeted communication campaign. The effectiveness of the actions found through TInnGO's review may be shown in increases in the percentage of female students enrolled in technical universities, which create interventions aimed at secondary schools to introduce and enthuse young people about STEM. For instance, a Danish communication campaign including mentoring, workshops and camps increased the percentage of female students admitted at the IT University of Copenhagen from 25% to 34% in the period 2016-18.

Moreover, a vast network of associations and mentoring is found operating in various European countries. In essence, most of them organise communication campaigns, events and workshops to increase the awareness of women about their potential in deeply gender-biased fields such as the STEM. Their effectiveness is confirmed as, for example, in the case of the initiative proposed by an association aiming at inspiring and supporting young women into those careers. After just one event presented, 95% of attendees reported an increased interest in STEM. Unfortunately, few initiatives explicitly focus on the transport sector, and this is undoubtedly a domain where projects such as TInnGO or organisations such as the International Transport Forum (ITF) can contribute by supplying new knowledge and suggesting specific ways to address this issue.

Looking at academic pathways and research footprints, TInnGO's surveys revealed gender and diversity gaps among researchers in most of the technical universities, and in the transport domain. Fewer women and people from diverse groups progress to leadership roles and influential positions where they can shape the direction of research and innovation. The convening power represented by the ITF can be significant in the promotion of women's involvement in the transport domain by increasing the value of networks and ensuring equality in transport committees, policies and research.

As seen from the TInnGO project results, dissemination and awareness-raising campaigns are essential factors for the increase of female participation in the field. The ITF has clearly shown to be sensitive and attentive to the gender issue in transport. It can help in advancing the dialogue and spreading the need for exploiting the innovation and the creative proposal that the female half of the population, commonly not considered in the decision-making process and technological contribution, would bring.

### Useful links:

TInnGO project website [www.tinnngo.eu/](http://www.tinnngo.eu/)

TInnGO Observatory <http://transportgenderobservatory.eu/>

European Commission (2019), *Transport in the European Union: Current Trends and Issues* <https://ec.europa.eu/transport/sites/transport/files/2019-transport-in-the-eu-current-trends-and-issues.pdf>

Caprile, M. et al. (2015), "Encouraging STEM studies: Labour market situation and comparison of practices targeted at young people in different Member States" [www.europarl.europa.eu/RegData/etudes/STUD/2015/542199/IPOL\\_STU\(2015\)542199\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2015/542199/IPOL_STU(2015)542199_EN.pdf)

Pirra, M., A. Carboni and Diana, M. (2020), "Assessing gender gaps in educational provision, research and employment opportunities in the transport sector at the European level", *Education Science*, Vol. 10/5 [www.mdpi.com/2227-7102/10/5/123](http://www.mdpi.com/2227-7102/10/5/123)

## Remotely piloted aircraft systems in Canada: Gender considerations

Transport Canada, Government of Canada

Remotely piloted aircraft systems (RPAS), also referred to as drones, is a growing industry across the world, including in Canada. This growth is largely driven by a number of global and domestic trends, including rapid technological advancement, increasing availability of drones at a low cost, and a broad industry in which drones have the potential to facilitate work tasks more safely and efficiently than traditional aviation. Operational drone services are expanding for a number of applications, including aerial photography, surveying, building inspections, disaster response, monitoring of traffic patterns, planning road repair, research and development, and much more.

Transport Canada is working closely with industry and international partners on research and development, pilot projects, and regulations to further integrate these technologies safely into Canada's airspace. In 2019, Transport Canada achieved a major milestone towards the safe integration of RPAS by establishing a new set of regulations for small drones (less than 25 kilogrammes) flown where the pilot can see it ("visual line-of-sight") that creates a stable regulatory environment for businesses while allowing more space for recreational pilots to fly for fun.

As part of its policy and regulatory development process, the Government of Canada must factor gender considerations into its analysis. While developing RPAS regulations, it was found that the RPAS industry is reflective of the gender disparity inherent in science, technology, engineering and mathematics (STEM) fields. An overwhelming proportion of RPAS engineers, manufacturers, educators and operators are male. While sex-disaggregated data in the RPAS industry are extremely limited, there is much literature written about the lack of female participation in STEM, which parallels that of the aviation and RPAS sectors. Barriers to employment in the drone sector are similar to those for women in STEM and in the air sector, including marginalisation, an intimidating male-dominated environment and a lack of female mentorship.

Transport Canada has taken steps to address this gender disparity. One way is through the use of gender-neutral language in drone nomenclature. Canada uses the term RPAS instead of unmanned aircraft system or unmanned aerial vehicles. Literature addressing gender dynamics in STEM has noted that gendered language reinforces stereotypes of who belongs in which "space" (or not). Gendered language sends underlying messages of exclusion and subordinates the achievement and role of women. In the United States, the National Aeronautics and Space Administration (NASA) moved to use gender-inclusive language in 2006 to signal that space was an environment for men and women, employing the terms "crewed" and "uncrewed" instead of "manned" and "unmanned". By employing the use of gender-neutral terminology, Canada is signalling gender inclusiveness to RPAS operators and the larger industry.

Internationally, Canada is promoting broader adoption of gender-neutral terms through various events and fora. For example, in 2018, Canada presented a paper on RPAS terminology at the International Civil Aviation Organization's (ICAO) 13th Air Navigation Conference to invite participants to reconsider ICAO's use of the term "unmanned" to describe aviation without a pilot on board. Canada will continue to seek opportunities to raise awareness on the importance of inclusive language.

In addition, Transport Canada continues to implement a robust safety education campaign on its RPAS regulations. The campaign is deliberately inclusive. It is designed with gender, age and ethnic diversity in

mind by using neutral or inclusive imagery, text and visuals. Ideas to specifically target women and girls will be considered in upcoming campaign efforts.

Canada is also planning further research on gender and drones. Currently, there is a lack of sex-disaggregated data pertaining to RPAS, particularly on a large scale. To better understand the extent of gender disparity in the industry, Transport Canada is pursuing different areas of research and data collection, including contracting reports. For example, Transport Canada is currently involved in a two-year study in partnership with Western University that focuses on evaluating the impact severity of small RPAS collisions on humans and the impacts on women and populations more at risk of harm (e.g. children, seniors). In addition, a public opinion research study is planned to better understand the level of knowledge drone users and the public have of the rules. The study will also incorporate questions focused on the gender distribution of drone pilots in order to better understand gender representation in the industry. These actions will not only lead to better targeting of education and safety promotion, but will help influence the development of RPAS policies in the future.

Going forward, Transport Canada looks to further collaborate with other federal departments, industry, stakeholders and international partners to raise awareness and address the gender disparity in the RPAS sector. This could include ensuring the drone sector is included in efforts to address the under-representation of women in STEM and including RPAS in the broader discussion of increasing women's representation in the aviation sector.

## Sustainability and gender in the aviation sector

Marina Estal, María Ibáñez, Spanish Aviation Safety and Security Agency, and Noa Soto, Spanish Civil Aviation General Directorate

The Spanish Civil Aviation Administration has a strong commitment towards sustainability and gender balance in aviation. These two concepts should be considered fully integrated and interlinked, otherwise the sector will fail to achieve the Sustainable Development Goals (SDGs). Sustainability is a global issue, with both social and environmental dimensions.

Aviation, which has become critical to worldwide connectivity, faces one of its greatest challenges for the future: how to maintain connectivity while damaging our planet as little as possible. There are several factors that should be considered such as industry strategies to minimise environmental impact, decent work and economic growth, and social demands towards the sector.

First, when it comes to industry goals for aviation, there is a broad consensus among air transport stakeholders that sustainability would be based on four pillars:

- 1) Market-based mechanisms, such as the EU Emissions Trading System or the Carbon Offsetting and Reduction Scheme for International Aviation, developed by the International Civil Aviation Organization (ICAO) and about to start its pilot phase in 2021.
- 2) Operational measures, which aim to make the operation of aircraft and the procedures for air navigation and airport operations more efficient. The most notable in this respect is the optimisation of air traffic management, which is developed at the European level through the Single European Sky.
- 3) Sustainable aviation fuels, one of the issues where innovation in the aeronautical field is most developed, providing also the release of agricultural or forestry waste and reducing emissions by up to 94%, depending on technology. There is a strong commitment from the European Union for its development, for example the launch of the ReFuel initiative to regulate its development and supply.
- 4) Technology, where one of the most ambitious strategic research and innovation agendas is defined in the Clean Aviation proposed European partnership, within both the horizons 2030 and horizons 2050. The main lines for research and development are disruptive technologies for hybrid electric regional aircrafts, ultra-efficient short- and medium-range aircrafts, and hydrogen-powered aircraft.

Second, for achieving sustainability goals, it is crucial to bear in mind the mobility needs of passengers, especially needs of women, as their point of view has not been taken into consideration over the course of history. Therefore, the need to adopt a gender perspective in mobility policies and plans has become a primordial task. Why do we believe civil administrations should consider this?

Gender differences in travel behaviour can be determined by analysing the labour market and social life. Women have different travel patterns than men. This is reflected in the means of transport used, journey frequencies, distances travelled, even the purpose of the trip. Also, it is important to note that in Europe the population is ageing and, as women live longer than men, they represent the majority of the ageing population, so the demographic trends could also be a relevant factor in this case.

According to different studies, women not only adopt more environmentally friendly mobility patterns (use of public transport, walking, cycling), but they also tend to be more sensitive and aware of ecological issues. Therefore, their attitude towards mobility and sustainability is different, so they may be willing to change their travel choices to reduce the environmental impacts of transportation, such as reducing the use of the car or, in the case of air transport, these choices might be buying airline services that offer more sustainable routes or have a better hiring policy.

In addition, one of the SDGs is decent work and economic growth. Nowadays, the worldwide Covid crisis might make us forget sustainability towards economic growth. Hence, civil aviation administrations must remain alert to avoid the adverse effects from the pandemic, or at least to mitigate them, especially when it comes to women's employment in the aviation sector. Also, civil aviation administrations should tackle worldwide environmental claims along with industry goals, otherwise the sector could undermine consumers' confidence.

Prioritising innovation should be a strategy for civil aviation administrations considering innovation's benefits for women in terms of employment, as less physical work and more digital skills will be required in the sector. New technologies can remove current constraints and barriers in traditional jobs. To illustrate the wide range of women's share in employment in the air transport sector, while a third of Spanish air traffic controllers are women, less than 2% of mechanical aviation licences are awarded to women. In addition, in the medium term, benefits for innovation should have a positive impact for passengers in terms of efficiency, environmental awareness and economic growth, which might be bigger as women tend to be more aware of the negative issues the aviation sector faces nowadays.

One of the goals of the updated Spanish State Safety Programme for Civil Aviation, aligned with the ICAO Global Aviation Safety Plan, is to ensure that the appropriate aviation infrastructure (mostly aerodromes and air navigation infrastructure), aircraft development and suitable regulatory framework are available to support safe operations. Boosting new technologies is key to help the sector be more sustainable.

In addition, the upcoming Spanish Mobility Strategy launched by the Ministry of Transport, Mobility and Urban Agenda integrates labour and social issues, along with smart mobility and new mobility guidelines, and Connecting Europe Facility and connected to the world. Thereby, the Spanish Civil Aviation Administration will help not only to reduce inequality of gender mobility, but also to promote a more sustainable development of transport.

## **Improving diversity in the road sector: International knowledge exchange**

Anna-Karin Salmi, Technical Advisor, Christos Xenophontos, Chair, Technical Committee on Performance of Transport Administrations, and Anna Wildt-Persson, Technical Committee 1.1 and Working Group 3 Co-leader, the World Road Administration

The roads and road transport fields are constantly evolving and innovating in response to large social, economic and environmental shifts. The World Road Administration (PIARC) provides an arena for exchange of knowledge on roads and road transport policy and practices within an integrated sustainable transport context, in which both innovation and the gender perspective is included.

This integrated point of view is a new development for PIARC members, who have decided to actively address how decision makers, professionals, and organisations in charge of road planning and administration should keep up with the complexities brought by ever-changing demographics, fast-paced urbanisation, technological innovation and changing environmental conditions. Road administrations and transport providers face a growing need to contribute to sustainable development, such as resource efficiency and advanced construction techniques and materials, coupled with the use of data and innovation to promote automation and digitalisation, connected infrastructure and transport systems, and safety and security conditions.

The work cycle of 2020-23 is the first where PIARC clearly expresses that innovation, diversity, equity and gender are integral to achieving a sustainable road transport system and decides to explore this within one of the technical committees.

### **PIARC Technical Committee 1.1 Performance of Transport Administrations**

Technology innovation and the emergence of sharing platforms are forcing transport industries to re-evaluate their current business models. These new paradigms even have the potential to redefine what constitutes our transportation network. This will require organisations that are currently narrowly focused on the “traditional” road infrastructure to adapt to the new paradigms if they are to provide the required services to their customers.

Transport administrations should focus on, and reflect, all sections of society within their customer base, and they should also mirror this base within their own management structures and workforces. Possible approaches to achieve diversity within these areas include affirmative action, setting of targets for recruitment or career progression, professional networks, publicity around role models, and selective support for educational or training opportunities. A diverse workforce is shown to display more creativity and innovation, as well as to improve co-operative behaviour and to provide superior solutions to brainstorming activities, in comparison with homogenous groups. This can thereby improve organisational efficiency, effectiveness and performance.

These concepts are outlined in the terms of references for PIARC Technical Committee 1.1 Performance of Transport Administrations, which are incorporated in the PIARC Strategic Plan 2020-2023. To achieve these objectives, the committee plans to organise roundtable discussions addressing these topics during this work cycle. A full report summarising the findings and lessons learned will be presented at the PIARC World Road Congress in 2023.

## Foresight Session in October 2019

During the 26th World Road Congress in 2019 in Abu Dhabi, PIARC partner organisations (the International Transport Forum [ITF], the International Road Federation and the World Bank), organised a Foresight Session on “Transport Is Not Gender Neutral: From Increasing Mobility to Enhancing Employment in the Road Sector”. The purpose of this session was to address topics that had not been included in the PIARC Strategic Plan for 2016-19, but were still considered relevant to the road transport community and the PIARC membership.

The organisers of the Foresight Session recommended that PIARC build competencies and raise awareness on diversity and inclusion within PIARC. Key recommendations for decision makers at road organisations that emerged from this session are presented in the article “A new gender perspective for the road sector: Adopting the people-centred approach”, by the International Road Federation and the World Bank, included in this Compendium.

## Covid-19 impact on roads and road transport: A gender perspective

The Covid-19 pandemic has had a significant impact on roads and road transport, as well as the activities and modes of working within the PIARC membership. To facilitate rapid sharing of knowledge and practice between PIARC members, PIARC set up a response team and organised a series of webinars on the impact of Covid-19 on roads and road transport. One of these webinars was “The Impact of Covid-19 on Women in Transport”.

Women in the transport sector, where they are already significantly under-represented, face precarious and vulnerable employment situations in different ways than men in the sector. This vulnerable employment for women in transport has been further accentuated by the Covid-19 pandemic and the related economic crisis. The transport sector is a place of employment as well as an important enabler for maintaining other livelihoods and functioning societies, of which women play an integral part. As such, it must play a bigger role in addressing issues of equity and diversity, both within its own workforce and in the service it provides to its customers.

Any post-Covid response is likely to require innovation within the transport sector and must recognise gender differences, involve both men and women in its development, and be equitable and inclusive in its impact. There is a need to think about who is developing and implementing any future direction. It is likely that transport institutions will be at the forefront of the recovery phase, and there is a significant need to incorporate gender mainstreaming in their practice. Women and men need to be equally involved in providing solutions to the current problems and the development of the future.

In conclusion, PIARC welcomes further collaborations with the ITF in PIARC’s work cycle of 2020-23. One possible area of interaction could be the organisation of roundtable discussions within the Technical Committee 1.1 Performance of Transport Administrators.

## Useful links:

PIARC Strategic Plan [www.piarc.org/en/PIARC-Association-Roads-and-Road-Transportation/strategic-plan](http://www.piarc.org/en/PIARC-Association-Roads-and-Road-Transportation/strategic-plan)  
 “Transport Is Not Gender Neutral: From Increasing Mobility to Enhancing Employment in the Road Sector” session conclusions [www.piarc.org/en/News-Agenda-PIARC/Coronavirus-PIARC-and-Covid-19](http://www.piarc.org/en/News-Agenda-PIARC/Coronavirus-PIARC-and-Covid-19)



## Adopting the people-centred approach: A new gender perspective for the road sector

Susanna Zammataro, Director-General, International Road Federation, Julia Funk, Senior Programme Manager, International Road Federation, Karla Dominguez Gonzalez, Gender Specialist, World Bank, Karla Gonzalez Carvajal, Practice Manager, Transport, World Bank

The World Bank, the International Road Federation and the International Transport Forum (ITF) jointly organised a session “Transport Is Not Gender Neutral: From Increasing Mobility to Enhancing Employment in the Road Sector” at the PIARC World Congress hosted in Abu Dhabi in 2019. The session was a real premiere in 110 years of history of the PIARC Congress and an innovative way to debate gender issues in the road transport sector as it walked the audience through a threefold approach to road and transport infrastructure: i) putting the differentiated users at the centre of designs with a strong emphasis on women; ii) addressing social risks derived from construction projects; and iii) bringing diversity into decision making within transport agencies.

Women represent only 15% of transport sector employees, and 113 countries still do not mandate equal pay for equal work. Twenty percent of engineering graduates are women. Out of these, 40% quit or never enter the profession. “The importance of closing the gender gap is a no-brainer”, said Guangzhe Chen, Global Director at World Bank Transport, opening the session.

### Recommendations for decision makers that emerged from the session:

Innovative thinking for including gender considerations and disaggregated data to inform and plan road design and infrastructure. Road design shall incorporate features to address the differentiated mobility needs of women, who represent 50% of the population. Women walk more than men, travel accompanied, and their mobility patterns are linked to the economy of care. These factors restrict their access to services and economic opportunities as they travel at a slower pace, access shorter distances and disproportionately are affected by the cost for multiple trips and what that represents for their available income. Women are more affected by unsafe public spaces and infrastructure. A recent analysis in rural Tanzania revealed that women felt unsafe when using roads in quiet areas and shortcuts, notably at night because of lack of lighting and visibility. Women will avoid travelling if possible and do it only in case of emergencies, in which case they would use a known motorcycle taxi.

Using methodologies and innovative approaches, such as a people-centred approach, safety audits and design thinking, can capture gender considerations (i.e. inclusion and location of footpaths, lighting, visibility features, and location of complementary infrastructure) to decrease women’s mobility barriers and increase perception of safety. These will support the elimination of other non-infrastructure related barriers, such as inclusive transport services and gender norms hindering women’s mobility.

Innovative policy dialogue through a business case that brings diversity into the road transport and infrastructure sector. Some recommendations for public entities to address the barriers that women face to access decision-making positions in the road, transport and infrastructure sectors are to i) develop diagnostics to assess women’s barriers to participation and experiences; ii) elicit buy-in from senior leadership leveraging the business and economic case to promote women’s professional development; iii) develop a clear strategy with measurable results and indicators to track progress on the implementation of measures to address women’s barriers to participation; and iv) budget and assign the requisite

resources to ensure the strategies are fully implemented. All these considerations shall go beyond an instrumental approach to women's participation and enable women's decision making, position and power.

The private sector can enhance women's participation in the road sector; this requires finding innovative ways to bring women's voices and presence to the arena. Contractual obligations and company-based gender action plans will enhance women's participation in the road sector by: i) mobilising labour in an inclusive manner for both women and men by conducting consultative meetings in venues and at times appropriate for both; ii) sensitising the communities, among others, on the importance of women's employment and the need for an equitable recruitment strategy; iii) recruiting labour in collaboration with community leadership (e.g. female community leaders); iv) ensuring that the organisation of works take into consideration women's and men's seasonal and daily work schedules and that there is flexibility in the working hours; v) promoting women's and men's efficiency and safety in the workplace, e.g. separate camp/site facilities for women and men, equal pay for equal work done, adequate personal protection equipment, and zero tolerance for sexual harassment, and vi) gender-responsive monitoring and reporting.

The private sector also has a responsibility to mitigate and respond to social risks potentially derived from infrastructure investments. These measures may include: i) conducting a thorough risk assessment for different groups (including women and children) following ethical considerations; ii) embedding responsible business conduct (RBC) into the enterprise's policies and management systems; iii) undertaking due diligence by identifying actual or potential adverse impacts on RBC issues; iv) ceasing, preventing or mitigating them; v) tracking implementation and results; vi) communicating how impacts are addressed; and vii) enabling remediation when appropriate, including, for instance, via the National Contact Point mechanism developed under the OECD Guidelines for Multinational Enterprises. The whole RBC management process should also rely on a close consultation with different stakeholders.

**The ITF can contribute to the body of knowledge in this area by furthering research on the following topics:**

- Baseline about perceptions and gender relations in the road infrastructure sector both i) vertically: among different decision makers, technical staff and community members; and ii) horizontally: within beneficiaries at community level.
- Baseline of contractors that are currently mitigating and responding to social risks in construction, including measures to address sexual exploitation and abuse, sexual harassment in the workplace, and other forms of violence and discrimination against women.
- Analysis of barriers and facilitators for women to participate in decision-making positions in the road transport and infrastructure sectors and development of action plans to address said barriers.
- Compendium of examples of occupational health and safety clauses, including gender and inclusion considerations.

### **Useful links and literature:**

International Finance Corporation (2013) [Investing in Women's Employment: Good for Business, Good for Development](#).

McKinsey & Company (2013), "[Women matter: A Latin American perspective – Unlocking women's potential to enhance corporate performance](#)", McKinsey, New York.

World Bank (2020), *Promoting Women's Employment in Infrastructure Sectors*, World Bank, Washington.

## Innovation for gender equality in the Black Sea region

Ambassador Michael B. Christides, Secretary-General, Permanent International Secretariat of the Organization of the Black Sea Economic Cooperation

The Organization of the Black Sea Economic Cooperation (BSEC) and its Permanent International Secretariat (PERMIS) attach special importance to co-operation in transport, focusing on how to effectively use intra-region capacity and the growing transit potential of the Black Sea region.

Achieving gender equality in transport and making a greater use of all human resources and talents in the region remains BSEC's priority. In their Joint Declarations on the occasion of the 20th and 25th BSEC's Anniversary Summits, Heads of States and Governments of BSEC members stressed the importance of gender equality and the vital role of women's participation in the economic and political processes for achieving sustainable and inclusive development.

To date, however, the transport sector remains a male-dominated sector; women are under-represented in all modes of transport and at all levels of decision making. The ratio becomes even more disappointing when it comes to senior management positions.

Nevertheless, there are a number of positive trends in BSEC with regard to more gender diversity in transport. In 2018, out of 12 BSEC Member States, only one member was represented by a female minister in charge of transport. Currently, the BSEC has three female ministers responsible for transport, including Prof. Dr Zorana Mihajlović, who is leading the Coordination Body for Gender Equality, established by the Government of the Republic of Serbia in 2014 to promote gender equality.

The BSEC's institutional capacity in the transport area has been substantially enhanced as a result of its fruitful co-operation with a number of transport partners, mainly with the Union of the Road Transport Associations in the BSEC Region (BSEC-URTA), led by URTA President Mrs Asli Calik.

Fostering gender equality, notably the representation of women and men on equal terms in the decision-making process, is an important aspect of broader values of social justice and democracy, as well as key issue for the economic development. Therefore, BSEC PERMIS welcomes the International Transport Forum efforts in this respect and wishes to contribute to its promotion.

The transport sector should provide equal opportunities for women and men, as users and employees. However, prevailing conditions in the transport sector today make this vision almost unattainable, at least in the part of the overall transport economy that refers to drivers. These include, low salaries, long days away from home, poor to unacceptable facilities along the long-haul transport routes, "inhuman" working hours and days, long delays (sometimes a week long) at border crossings, to name just a few. As a result, women in transport are mainly employed in "administrative jobs" or in support of logistic services.

The introduction of new technologies, innovative solutions, artificial intelligence and 5G in the transport sector will certainly help alleviate many of the problems mentioned above.

Digitalisation will mean faster and less cumbersome procedures in the transport sector. "Self-driving" trucks or the introduction of exclusive driving lanes for trucks will also contribute to transforming today's reality of huge "truck goliaths" into a much easier task, thus, more women could be attracted to employment in the sector, notably as "digital age" drivers.

Technological change and innovation are transforming the transport sector, offering employment opportunities for both men and women. It is, therefore, essential that women have equal access to training and skills to take the most of these opportunities.

Today, employment opportunities in the local and regional transport systems should be the same for men and women. For local and regional transport, distances are shorter and time away from home is briefer. Many of the challenges of long-haul transport, mentioned above, do not apply to local and regional transport systems. In addition, women know their region best, thus they feel more comfortable in engaging in regional transport systems.

The Covid-19 pandemic revealed that the demand for local and regional transport will intensify, with the dramatic increase of e-commerce. People are buying more products and services on line than ever before. Overall, the growth of e-commerce has been accelerated by at least 5 if not 10 years. This will create new employment opportunities in the delivery sector at the local and regional levels.

Sustainable development implies gender equality, notably providing equal employment opportunities for women and men. Research shows that gender equality decisively stimulates economic growth, which can be crucial, in particular, in low-income countries. All stakeholders in the transport sector should draw the necessary conclusions from this research and act accordingly.

**Useful link:**

Organization of the Black Sea Economic Cooperation (BSEC) [www.bsec-organization.org/](http://www.bsec-organization.org/)

## Overcoming barriers to women's employment in transport

Dr Evangelos Bekiaris, Director, The Hellenic Institute of Transport in the Centre for Research & Technology Hellas, President, Conference of Transport Research Institutes

Employment in transport is by far male-dominated compared with other sectors. The share of women working in the transport sector in the European Union (EU) is only 22%, while the share of women working in the entire European Union is 46%. This segregation is both horizontal and vertical. The percentage of female employees ranges from 10% in land transport (including road and railway), to over 20% in the maritime sector, to 40% in the aviation sector. Women account for only 17.5% of the workforce in EU urban public transport and hold less than 10% of technical and operational jobs.

Diversity in the workforce is a high priority for policy makers to prevent a biased and restricted view of the way innovation is prioritised and implemented in the sector. In April 2016, Transport Commissioner Violeta Bulc together with the commissioner in charge of gender equality, Věra Jourová, organised a transport stakeholder's event – Women in Transport – to reflect on how to attract more women to the transport sector. Commissioner Bulc noted, “We need to find a gender balance in the transport sector, to avoid perpetuating stereotypes and to overcome unattractive working conditions from a woman's point of view. Automation and digitalisation represent a unique opportunity to facilitate the entry of women in the sector”. A number of proposals for action to improve female employment in transport emerged from this meeting, including the EU Platform for Change.

In today's dynamic business environment, achieving gender equality is considered to be a determinant of any organisation's competitiveness. Women's under-representation in the workplace has been a feature of the global economy for ages, losing out on the skills, ideas, improved decision making and perspectives that are essential for the evolution and development of an organisation.

The main reasons for women's under-representation in the transport workforce are a general masculine stereotype of the sector, rough working conditions and security problems, such as the night shifts in some transport sectors, as well as challenges related to work-family life balance. To address these barriers and foster more gender equality in a workplace, some simple yet crucial measures need to be implemented, including:

- Adopting hiring practices to increase diversity, both by promoting gender equality with better job descriptions and by constituting diverse interview panels.
- Fostering opportunities for leadership roles for both men and women: according to the World Economic Forum's *Global Gender Gap Report* (2017), women represent fewer than 50% of leaders in every industry analysed, although there has been a slow but positive progress in this regard. A better representation of women in leadership roles will improve gender equality, while a higher percentage of female employees due to opportunities in career advancement and mentorship can be achieved.
- Adopting equal pay practices: compensation should always be reliant on the job roles, and an appropriate payment system needs to be introduced to improve transparency and eliminate any discrimination in payment rates.

- Introducing strict policies and precautionary measures against any type of workplace harassment. The EU law prohibits harassment on the ground of a person's sex and sexual harassment and equates both with sex discrimination. Employers should act immediately in such cases, but mainly they should take precautionary measures at the workplace to avoid such violations.
- Facilitating work-life balance: there are some challenges that employers face in the acknowledgement of the benefits of work-life balance. However, none of these challenges are exclusive to an industry as they are interconnected to every organisation and its employees.

Creativity and innovation are crucial to enhance Europe's ability to compete internationally. In this respect, all citizens should be given the opportunity to acquire transversal key competences such as digital competence, learning to learn, a sense of initiative and entrepreneurship, and cultural awareness. Cross-sectoral co-operation should be also promoted between EU initiatives in education and training and those in related policy areas, namely with regard to employment, enterprise, social policy, youth policy and culture. Synergies between education, research and innovation should also be enhanced. For such innovation measures to flourish, actions should be taken on several levels, covering different aspects of education and employment, including:

- building necessary skills, including issues related to training promotion through mixed funding schemes, focusing on more under-represented groups of workers (e.g. women)
- promoting stakeholders' co-operation, including the interaction and co-operation of social partners, such as labour unions, company representatives and governmental bodies
- Fostering measures relevant to legislative or organisational issues at European, national, local or sectoral level, including the emerging new flexible and platform-based work schemes (e.g. Uber).

These kinds of measures could help overcome the barriers to gender equality in the transport sector. A distinction can be made between the barriers related to employers' willingness and flexibility to hire more women and the barriers related to the employees applying for a job in transport. This distinction is very important when considering the measures that can be taken to increase female employment in different transport areas, as well as the costs or barriers relevant to such measures (e.g. maternity leave legislation).

The Hellenic Institute of Transport (HIT) of the Centre for Research & Technology Hellas (CERTH) is a non-profit organisation that conducts and supports applied research activities in transport in Greece. With respect to gender equality, 36.5% of employees are women, including in the senior management positions: (the deputy director, 3 (out of 5) heads of sectors and 12 (out of 22) heads of HIT/CERTH laboratories). This has been achieved through equal pay practices, mentoring between women employees at different levels in the organisation and the measures to enable a good work-life balance.

### Useful links:

European Commission (2018), *Business Case to Increase Female Employment in Transport: Final Report* <https://ec.europa.eu/transport/sites/transport/files/2018-business-case-to-increase-female-employment-in-transport-final-report.pdf>

The Hellenic Institute of Transport (HIT) of the Centre for Research & Technology Hellas (CERTH) [www.imet.gr/](http://www.imet.gr/) and [www.certh.gr/](http://www.certh.gr/)

World Economic Forum (2017) *Global Gender Gap Report* [www.weforum.org/reports/the-global-gender-gap-report-2017](http://www.weforum.org/reports/the-global-gender-gap-report-2017)

## **Inclusive transport workforce : A Fairness Maturity Model**

Dr Maria Chiara Leva, Dr Mary Kinahan, Dr Alberto Caimo, Technological University Dublin; Dr Yvonne Hail, Prof. Ron McQuaid, Stirling University, Scotland; Dr David Laniado, Eurecat, Barcelona; Dr Andrea Gorrini, Systematica, Milan; Ms Elena Garcia, Ms Sara Poveda, Dr Francisco Santarremigia, AITEC, Valencia; Ms Chris Blache, Genre et Ville, Paris

Despite increasing technological advances in transport systems, and women’s increasing participation in the labour market, there is still considerable gender inequality regarding women’s roles in the transport sector. Several studies have shown that there are differences between men and women in participation in transport-related jobs. In particular, there is marked gender segregation within the sector, with female employees generally placed in gender-typical positions, with 60% of female employees holding positions in the human resources department compared with only 3% of train drivers (European Commission, 2017). Furthermore, the data currently being collected on women as employees in the transport sector are problematic as they apply very simplistic categories in terms of gender, which lacks context such as age, class, ethnicity, disability, and caring responsibilities, which impact women in their employment.

Given recent technological advances and societal changes, there is an important shift in transport and mobility. This shift should be seen as an opportunity for remodelling transport systems to become more inclusive, safe and secure for women, from both the employment and service perspectives. In order to seize this opportunity, a deep understanding of women’s needs linked to their physical and psychosocial characteristics is required. Thus, the DIAMOND project aims to use such technological advances and innovations to i) analyse real-world scenarios where these gender inequality issues exist, and ii) facilitate concrete action to create a fair and inclusive transport system.

The main research aim is to examine women’s employment within the transport sector by studying women’s needs in terms of recruitment, retention and promotion in railways, freight transport and logistics sectors. Preliminary data on women’s employment were gathered via focus groups in Dublin. The focus groups, which included public transport employees, transport experts and industry representatives, were asked to discuss and assess the definition of fairness as an employee in the transport sector, fairness characteristics, and transport employees’ needs and barriers. Initial results indicate agreement with the working fairness definitions, as well as highlighting needs and barriers for employees.

Based on these pilots, an employee satisfaction survey was developed that examined a range of topics including employees’ work community, job characteristics, company culture, safety and security, training, access to amenities (e.g. female facilities), adaptability, and job satisfaction. As part of the inclusive nature of our research, personal circumstances were also included (e.g. caring and parenting responsibilities), supports provided for personal circumstances (e.g. childcare services), and it included questions on health and well-being (e.g. long-term illness or disability). Data are currently being collected and analysed in a number of public transport organisations that were willing to pilot it in Ireland, Spain and Poland.

The survey was conducted by the DIAMOND research team across users and employees of three EU rail service providers. Approximately 50 questions covered the following themes that were used to summarise the fairness characteristics previously identified as part of the literature reviews and initial focus groups:

- socio-economic conditions – job segregation; demand factors; policy and legal

- job characteristics – human resources recruitment policies, retention, promotion, etc.; training provision; safety and security; female facilities
- personal circumstances – caring and family; economic deprivation; access to resources
- individual characteristics – skills; adaptability; educational level/attainment; health status; demographic (age, ethnicity, etc.).

The data from the questionnaire have been analysed using factor and regression analysis to identify key drivers of user satisfaction or barriers to fairness in the workplace. The approach chosen is designed to have a triangulated view of user perceptions and observable conditions as well as a self-audit form to allow organisations to assess and benchmark their fairness and inclusivity on a newly adapted Fairness Maturity Model.

The DIAMOND project has adopted and formulated an approach to help organisations evaluate how fair and inclusive their services and employment conditions are. The model is based on the Safety Culture Maturity Model first developed by Dr Mark Fleming in 2000 in an Offshore Technology Report issued by the UK Health and Safety Executive (HSE) (Fleming, 2000). The maturity model concept was developed on the basis of a five-level process issued by the Software Engineering Institute (Paulk et al., 1993) as a mechanism to assist organisations in developing better software engineering practices. The maturity model framework has been adapted to be used in other domains and to address issues such as project management (Fincher and Levin, 1997), human resources and usability (Earthy, 1998). The capability maturity model concept is useful because it can be used as a diagnostic tool, to enable organisations to establish their current level of maturity and the actions required to reach the next level.

The elements that form the safety culture maturity model have been adapted from the safety culture components listed by the UK HSE in a guidance document called HSG48 (HSE, 1999). In DIAMOND the maturity model will be based on the characteristics identified for each use case on the basis of the literature review and the initial focus groups and revised on the basis of the fairness characteristics identified from the literature review and from preliminary focus groups and further revised through the datasets collected focusing on each use case of DIAMOND: i) Use of Public Transport Infrastructures (Railways); and ii) Employment of Women in Rail Industry and Freight/Corporate Social Responsibility Protocols.

In summary, the fairness and inclusiveness dimensions considered are those aspects that different and diverse female users find important for a comfortable, safe and useful service or for inclusive and fair employment in transport.

### **Useful literature:**

Earthy, J. (1998,) *Usability Maturity Model*, Lloyd's Register and the European Commission, London.

European Commission (2017), Women in transport [https://ec.europa.eu/transport/themes/social/women-in-transport\\_en](https://ec.europa.eu/transport/themes/social/women-in-transport_en).

Fincher, A. and G. Levin (1997), "Project Management Maturity Model", Project Management Institute 28th Annual Seminars & Symposium, Chicago, pp. 1028-1035.

Fleming, M. (2000), "Safety Culture Maturity Model", Offshore Technology Report, UK Health and Safety Executive.

HSE (Health and Safety Executive) (1999), *HSG48: Reducing Error and Influencing Behaviour*, The Stationery Office, Norwich.

Paulk, M.C. et al. (1993), "Capability Maturity Model, Version 1.1", *IEEE Software*, Vol. 10/4, pp. 18-27.



# Transport innovation for sustainable development: A gender perspective from Kenya

Naomi Mwaura, Executive Director, Flone Initiative, Kenya

## Women working in public transport in Kenya

Public transport is a key sector of the economy that offers employment for millions of people globally. In Kenya, the industry generates an estimated annual revenue of KES 200 billion (Kenyan shillings) (USD 1 is approximately KES 109) and is one of the main economic contributors to the economy.

However, the public transport sector in many African cities has been overwhelmingly male-dominated. For example, women make up roughly 7% of the workforce in Kenya. These women are relegated to low-ranking positions that generate low incomes. Some of the other notable challenges that come as a result of this are hostility towards women working in public transport, unfavourable schedules, insecure employment status, lack of policies addressing sexual harassment, few promotion opportunities and low representation of women in management.

## Covid-19 and women working in public transport

Women and girls, across all sectors, continue to face more socio-economic impacts from Covid-19. Notably, this is the case for women working in the public transport sector, since most of them work as conductors, meaning they are in direct physical contact with many commuters, therefore more vulnerable to Covid-19. Moreover, women have borne the largest proportion of job losses and reduced income due to the Kenyan government's strict measures targeted at public service vehicles to curb the spread of Covid-19.

While women are losing paid employment, their unpaid care work at home has increased exponentially due to school and workplace closures. This greater caring responsibility makes it difficult for women to find alternative employment and income sources. These women live within informal settlements, and the majority of them are single parents. Disruptions, including movement restrictions, have compromised their ability to make a living and meet their families' basic needs.

## Innovative measures taken by Flone Initiative in the fight against Covid-19

Flone Initiative has taken a number of actions to help tackle challenges faced by women in transport because of the Covid-19 pandemic. These include: i) facilitating unconditional cash transfers; and ii) providing awareness courses on Covid-19 via text messaging (SMS).

- **Unconditional cash transfers**

The chaos that erupts during food distribution makes cash transfers a better option. Mobile money cash transfers are preferred since they provide people with cash to buy food while avoiding the massive gatherings that food distributions can draw, which can fuel the spread of the disease.

Flone Initiative is working towards raising funds to cushion female employees in public transport who have been affected by the Covid-19 pandemic. Flone is working with various partners, including Humanity Kenya Cotswold Foundation, and well-wishers to offer an unconditional cash transfer. Flone's core principle is to trust its beneficiaries to know how best to address their individual family needs and respond to the Covid-19 crisis.

Since May 2020, this initiative has supported the households of 31 women working in public transport with a cash transfer of KES 500 to KES 2 000 each to cater for their basic needs. Several well-wishers have contributed towards the cause, and the proceeds have gone directly to supporting the women. A follow-up conversation with the women indicated that they spent the money on basic needs.

- **Covid-19 SMS course**

In July 2020, Flone Initiative partnered with Zydii, which is an online training platform, to develop a one-month Covid-19 awareness training targeting women working in the matatu industry (i.e. privately owned minibuses in Kenya) as drivers, conductors and booking clerks. The training was delivered through the SMS platform, where women received training lessons via SMS and later downloaded links for both the e-book and audio versions of the courses. One hundred twenty-two women enrolled in this course.

**The International Transport Forum can contribute to the body of knowledge by:**

- Highlighting the impact of Covid-19 on the lives of women working in the public transport in mainstream media.
- Actively consulting and participating in the design of work practices, processes and all healthy safety measures in the public transport sector.
- Campaigning to ensure that governments recognise both the demands of unpaid work and that paid work by women is too often undervalued. Ensure that governments recognise as well that women are subject to sex discrimination and gender-based occupational segregation in transport, and propose policy solutions that tackle these challenges.

## Useful literature

“Implications of Covid-19 on women professionals in the Kenya public transport sector” (2020) <https://floneinitiative.org/index.php/2020/09/02/implications-of-covid-19-on-women-professionals-in-the-kenya-public-transport-sector/>

“Impact of Covid-19 on women in transport” <https://floneinitiative.org/index.php/2020/04/20/impact-of-covid-19-on-women-in-transport/>

## Talent has no gender: Good practices in promoting equity in the workplace

Ineco, the Spanish engineering and consultancy firm of the Ministry of Transport, Mobility and Urban Agenda

With almost 40% women among its more than 3 000 employees, Ineco has a firm commitment to gender equality.

Carmen Librero, Ineco's chairwoman and its first female president, supports the critical role played by women in the mobility sector, along with her belief that equal opportunities for all genders should form part of the company's duty and commitment to society.

In December 2019, Ineco launched its new Equality Plan, which represents a milestone for the company's contribution to achieving real and effective gender equality between men and women in the thoroughly male-oriented engineering sector. The new plan is the result of work carried out within the Equality Commission, which is made up of both company and legal representatives of Ineco's employees. It is based on the firm commitment to enhance and boost the key role of women in the engineering sector, as talent has no gender.

In the first half of 2020 the company developed several actions within the framework of this Equality Plan, integrated in the company strategy and its commitment with the 2030 Agenda. Promoted by the Equality Commission, Ineco has launched the second edition of the pioneering mentoring project "Mujeres IN"(Women In), which aims to give visibility and power to the role of women in the company.

As a part of the second edition of the Mujeres IN programme in 2020, a new group of women with high potential in the organisation, selected through an exhaustive process, are participating for 12 months in a comprehensive development programme. The professionals have the advice and guidance of accredited internal mentors and have tools, resources and methodologies to promote their professional career and personal development. They also have the opportunity to share experiences with other women who are leaders in the business, economic and social fields outside of Ineco, generating important and valuable relationships – all of this with maximum support and endorsement from their managers.

Moreover, in order to convey to school girls the important role that engineering and transport play in people's everyday lives, the members of the first edition of Mujeres IN will take part in various workshops where they will share with the future professionals in the sector the decisive role that mobility and infrastructure play in the quality of life of society, encouraging them to become part of an area where today, women represent only one out of every four students in technical careers.

In addition, in 2020 Ineco also carried out a specific equality training course completed by over 60% of the employees. Another initiative was a specific document on gender-based violence, designed and disseminated internally.

### Key elements of Ineco's Equality Plan

- Breaking through the "40% barrier" of women's representation in the company. Although the number of women working in engineering is increasing, they account for only 25% of undergraduates in engineering and architecture in Spain. At Ineco, women account for nearly 38% of the workforce, and in 2019 the number of women hired rose by 11%. The new Equality

Plan aims to eradicate any potential discrimination from the hiring process and to encourage the employment of women in areas where they currently have less presence.

- Encouraging communication. Specific sections of the Ineco website and the corporate employee mailbox have been dedicated to fostering a culture of communication and awareness around the subject of equality, with a response rate of under a month.
- Promoting equal training opportunities for men and women. Our objective is to maintain an equal level of training for men and women, given that training – to which Ineco dedicates more than 140 000 hours a year – is one of the cornerstones of professional and personal development. This includes specific training in the areas of equality and work-life balance, as well as on the reporting procedures for incidents of psychologically or sexually motivated harassment.
- Endorsing equality in areas with less female representation. Ineco will continue to foster equality in professional development across the board, with special emphasis on those areas with less female representation. Ineco will ensure that applicants' ability to meet the criteria set out in job description is judged on equal terms, based on applicants' knowledge, experience and skills. Women will be given preference for promotions to jobs or professional groups in which they are currently under-represented.
- Promoting work-life balance rights. The company will continue to implement measures that support joint responsibility and reconcile the personal, family and work lives of all personnel. Information on work-life balance rights will be reinforced, extending accessibility to these rights to the entire workforce and ensuring that those working under reconciliation measures have access to the same career opportunities as other employees.
- Fostering equal pay rules. As talent has no gender, neither should salaries. Ineco's Equality Plan guarantees the principle of equal pay through its policies on fixed remuneration, variable remuneration and social benefit allocation, as well as through measuring its compliance with quantitative indicators. A progressive reduction of the overall wage gap, guaranteeing an annual decrease of at least half a point, is one of the plan's objectives.
- Zero harassment and better protection for victims. Our aim is to guarantee an atmosphere of mutual respect preventing, and where necessary, eradicating, any behaviour that could be construed as harassment in the workplace. Moreover, we aim to offer protection to women who have been the victims of gender violence and to facilitate the prevention, mediation and abolition of harassment in the workplace, as well as to establish responsive and simplified internal procedures with all the necessary guarantees of protection and confidentiality.
- Biannual monitoring and evaluation. Monitoring is an essential tool for proper analysis of the plan's progress. To this end, Ineco has set up the Equality Plan Monitoring Committee to assess and advise on the matter.

### Useful links:

Ineco's Equality Plan [www.ineco.com/webineco/en/about-us/corporate-responsability/equality](http://www.ineco.com/webineco/en/about-us/corporate-responsability/equality)

## **Bridging the gender gap in vehicle occupant safety assessments**

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Although governments in European countries and other parts of the world aim at creating inclusive societies for all individuals through gender equality, a gap that needs bridging between this aim and how vehicle occupant safety is currently assessed still remains.

Despite injury statistics showing that protection in the event of a crash is not equal for women and men, to date the average man still represents the whole adult population in the UN Regulations, developed for assessing vehicle occupant safety by the World Forum for Harmonization of Vehicle Regulations, the United Nations Economic Commission for Europe (UNECE) and the Federal Motor Vehicle Safety Standards (FMVSS) tests. The UNECE includes 56 member states in Europe, North America and Asia. The FMVSS is the United States counterpart to the UNECE regulations, recognised to varying degrees by most countries except the United States.

In the UNECE regulations and the FMVSS, the adult population is represented by the average-sized man; consequently, the female part of the population is not represented in regulations assessing the protection of adult vehicle occupants. Although the general structure of male and female bodies is similar, certain inherent differences prevail that have the potential to, and already have in a range of crash scenarios been shown to, influence the protective performance of a vehicle. As an example, certain seat designs have been shown to provide increased protection for both women and men, while others do not offer similar protection. The proportion of drivers suffering permanent medical impairment was reduced by 52% for women and 47% for men when seated on a seat equipped with the Whiplash Injury Lessening (WIL) system or the Whiplash Protection System (WHIPS), whereas if seated on a seat equipped with a reactive head restraint, the incidence of permanent medical impairment was increased by 13% for women and reduced by 70% for men, compared with the equivalent proportions in a standard seat.

Injury statistics show that more men than women are killed and injured in traffic accidents. At the same time, women are more likely to sustain serious injuries and fatalities than men in comparable crash conditions. The larger number of males compared to females killed and injured has primarily been found to be due to men exhibiting higher risk-taking behaviour than women, such as speeding, driving under the influence of alcohol and wearing seat belts less frequently.

The legal values expressed in general provisions and principles stated in the Treaty on European Union and the Treaty on the Functioning of the European Union, such as gender equality between women and men as well as non-discrimination, are not reflected in the regulatory tests assessing vehicle occupant safety. Thus, a gap exists between the law and practice, as well as a gap between the superior legal principle of gender equality and subordinate legal rules.

Development and usage of occupant models representing the female part of the population, i.e. crash test dummies representing the average women, for use in UNECE regulatory tests together with the male equivalent, would narrow this gap.

The lack of use of occupant models in vehicle safety assessments representing both parts of the population prevents society from identifying and promoting the most efficient innovations for occupant vehicle safety.

In addition, consumer purchasing power is diminished since the protection of both the female and the male parts of the population can currently be identified only from injury statistics of used vehicles. Enhancing consumers' power to choose a vehicle equipped with the best-performing safety systems, for both women and men, requires that this information can be identified through safety testing. To date, this safety testing feature is not possible, since crash test dummies representing the female part of the population are not required to be used in either regulatory tests or consumer tests.

The International Transport Forum (ITF) could play an important role in achieving the vision of occupant safety performance of new cars assessed for both women and men by 2030 by:

- creating awareness of the gap in current vehicle occupant safety assessments and how to bridge the gap in the manner suitable for ITF
- actively engaging in the improvement of vehicle occupant safety assessment for both women and men.

## Useful literature

Bose, D., M. Segui-Gomez, and J.R. Crandall (2011), "Vulnerability of female drivers involved in motor vehicle crashes: An analysis of US population at risk", *The American Journal of Public Health*, Vol. 101/12, pp. 2368-73.

Forman, J. et al. (2019), "Automobile injury trends in the contemporary fleet: Belted occupants in frontal collisions", *Traffic Injury Prevention*, Vol. 20, pp. 607-612.

Linder, A. and W. Svedberg (2019), "Review of average sized male and female occupant models in European regulatory safety assessment tests and European laws: Gaps and bridging suggestions", *Accident Analysis & Prevention*, Vol. 127, pp. 156-16, <https://doi.org/10.1016/j.aap.2019.02.030>.

## Transport Innovation for Sustainable Development

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This compendium assembles voices from the transport sector that highlight positive examples of how women as transport users can benefit from the innovations that are transforming the transport sector. They show that the future of mobility can be more inclusive and sustainable where mobility services use technology and other innovative solutions adapted for women's needs and where innovative approaches enhance women's professional opportunities in transport.

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