Institution: Coventry University		
Unit of Assessment: UoA32		
Title of case study: Innovation to facilitate safer, inclusive and more sustainable urban public transport in Europe		
Period when the underpinning research was undertaken: 2012 - 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	**Role(s) (e.g. job title):**	**Period(s) employed by submitting HEI:**
Andree Woodcock	Professor of Education, Ergonomics and Design	1999- present
Anne-Marie Nienaber	Professor of Human Resource Management and Organisation Behaviour	2013- present
Period when the claimed impact occurred: 2016- 2020		
Is this case study continued from a case study submitted in 2014? No		

1. Summary of the impact (indicative maximum 100 words)

Addressing United Nations Sustainable Development Goal 11: Sustainable Cities and Communities, Woodcock's design and ongoing leadership of three European interdisciplinary research projects (totalling over €9m), has impacted on policy and implementation of new mobility strategies that encourage cleaner, safer and more inclusive transport. The research has led to: (1) implementation of cleaner and safer innovative transport solutions; (2) new processes and policies within cities to increase sustainable transport measures; (3) increased LA capacity in sustainable mobility planning; (4) improved inclusion and representation in sustainable transport planning and contribution to wider SUMP (sustainable urban mobility planning) uptake in Europe.

2. Underpinning research (indicative maximum 500 words)

Woodcock's research is driven by her vision for safer, inclusive, affordable, accessible and sustainable transport systems. Integrated sustainability planning is a major focus for European cities under the SUMP initiative. Supporting Local Authorities (LAs) in this process is critical. They control multimillion-euro budgets (e.g. beneficiary Transport for West Midlands (TfWM) has operational and capital expenditure of £300m p.a.), with master plans mapping long-term city development and the health and wellbeing of citizens. Through interdisciplinary collaboration and leadership of over 20 European partners, Woodcock's research has combined design thinking and organisational change to help LAs deal with global challenges, meet climate and inclusivity targets and improve the quality of active and public transport. Central to her research, has been the application of systems-thinking, empathy and user-centred design to understand people's mobility needs and the development of resources (training materials, tools and processes) for stakeholders to apply this information to mobility planning, measurement and implementation (R1).

In FP7 METPEX (2012-2015) (G1), Woodcock recognised the need to 1) shift perceptions of public transport (R1), 2) widen definitions of hard to reach groups to include women, travellers with dependents, the elderly, young people, commuters, those on low incomes, with communication and mobility difficulties so their journeys could be recorded, 3) standardise data collection. METPEX developed a whole journey (from planning through to arrival at destination) multimodal measurement instrument to capture travel experiences (R2, R3) across 8 European cities, and derive and validate 25 Key Performance (Passenger-related) Indicators (R2).

H2020 CIVITAS SUITS (*Sustainable Urban Integrated Transport Systems: Transferable tools for small - medium Local Authorities*) (2016-2020) (G2) built on METPEX, by increasing the capacity of small to medium cities to plan sustainable, inclusive, safe and integrated transport. Without one agency responsible for the whole journey experience (R2) and a plethora of new service providers, LAs need additional support to understand and plan appropriate, integrated, safe and inclusive transport innovations (such as e-bikes, drones) to reach environmental targets and make their cities healthier and attractive. Working with 9 EU cities, ranging in size from about 17k to 2.3M citizens (total population 5.4 million) SUITS developed a range of tools (R5), based on LAs requirements to support organisational change (Nienaber) (R4), citizen engagement, capacity building, collaboration, innovative financing and procurement, data collection and integration and inclusivity. SUITS outputs (R4-5) have had a significant and direct impact on LA organisation, planning, awards of new tenders and safer, more inclusive measures benefiting all citizens.

Following a thread in her work since 1999 and building on previous projects, TInnGO (Transport Innovation Gender Observatory) (2018-2021) (G3) addresses the need for a paradigm shift in the transport sector to remove gender and diversity gaps in transport education, employment and usage. TinnGO's Pan-European website is a one-stop shop for tools, resources, data and information about gender and transport (R5). It incorporates an Open Innovation Platform (www.tinngo.eu) for ten national design and research hubs to gather intersectional and gender disaggregated data, and uses citizen science and codesign to engage hard to reach groups and promote tools to improve workforce diversity. The Hubs thereby act as beacons of engagement to collect and increase awareness of women as employees, entrepreneurs and transport users, and facilitate the development of gender sensitive transport innovations (R5, R6).

3. References to the research (indicative maximum of six references)

Publications:

(R1) Woodcock, A. (2013) 'The Role of Ergonomics in the Design of Future Cities. In Contemporary Ergonomics and Human Factors': Proceedings of the international conference on Ergonomics & Human Factors 2013, Cambridge, UK, 15-18 April 2013 (p. 203). CRC Press. ISBN-13:978-113800042

(R2) Tovey, M., Woodcock, A., & Osmond, J. (Eds.). (2016) 'Designing Mobility and Transport Services: Developing Traveller Experience Tools' (1st ed.). Routledge. https://doi.org/10.4324/9781315587295

(R3) Diana, M., Pirra, M., Castro, A., Duarte, A., Brangeon, V., Di Majo, C., Hrin,G. R and Woodcock, A. (2016) 'Development of an integrated set of indicators to measure the quality of the whole traveller experience'. Transportation Research Procedia, 14, 1164-1173. https://doi.org/10.1016/j.trpro.2016.05.187

(R4) Nienaber AM., Spundflasch S., Soares A., Woodcock A. (2020) Employees' Vulnerability – The Challenge When Introducing New Technologies in Local Authorities. In: Krömker H. (eds) HCI in Mobility, Transport, and Automotive Systems. Driving Behavior, Urban and Smart Mobility. HCII 2020. Lecture Notes in Computer Science, vol 12213. Springer, Cham. https://doi.org/10.1007/978-3-030-50537-0_22

(R5) SUITS Tools: are detailed on the SUITS project website https://www.suits-project.eu/tools/ and capacity building program: outputs are disseminated by the central European repositories ELTIS (https://www.eltis.org/resources/tools/suits-capacity-building-toolbox) and CIVITAS (https://civitas.eu/projects/suits)

(R6) Woodcock, A., Christensen, H.R. and Levin, L. (2020). TInnGO: Challenging Gender Inequality in Smart Mobility, Journal of Road and Traffic Engineering. DOI: 10.31075/PIS.66.02.0

Grants:

(G1) 2012-2015 METPEX A MEasurement Tool to determine the quality of the Passenger EXperience. EU FP7-TRANSPORT. Grant agreement ID: 314354; €3,542,972. PI Andree Woodcock. https://cordis.europa.eu/article/id/158532-innovative-tool-to-measure-passenger-experience-for-entire-public-transport-journeys

(G2) 2016-2021 Supporting Urban Integrated Transport Systems: Transferable tools for authorities. H2020-EU.3.4. Grant agreement ID: 690650; €4,111,361.26. PI Andree Woodcock. https://cordis.europa.eu/project/id/690650

(G3) 2018-2021 Transport Innovation Gender Observatory. H2020-EU.3.4. Grant agreement ID: 824349. €3,979,502.50. PI Andree Woodcock. https://cordis.europa.eu/project/id/824349

A clear impact strategy (G1-3) includes 3 EU conferences, policy notes and practitioner briefings, guidelines for European cities and web-based resources supporting the Pan-European SUMP (Sustainable Urban Mobility Plans) initiative. Multilingual outputs from all projects have been included in Pan European collections. Woodcock demonstrates sustained commitment to addressing mobility issues of excluded groups in Europe and building capacity to meet sustainability and equality targets, taking a more people centred and holistic approach to transport design. She is one of the few female leaders of transport research in Europe. The quality of the research is conveyed through its publication in key journals and conferences in the field, and through significant award of European Union research and innovation funding through the Seventh Framework Programme (FP7) and the Horizon 2020 programme.

4. Details of the impact (indicative maximum 750 words)

The research has led to the implementation of sustainable transport measures and changes in public transport policy in six European cities: Alba Iulia, Romania (S1), Kalamaria, Greece (S2), Turin, Italy (S3), Valencia, Spain (S4), Coventry (S5) and the West Midlands region, UK (S6). Benefits have been realised through (1) implementation of cleaner and safer public transport solutions; (2) new processes and policies within cities to increase sustainable transport measures; (3) increased LA capacity in sustainable mobility planning; (4) improved inclusion and representation in transport planning.

Implementation of cleaner and safer public transport solutions

Woodcock and Nienaber's research has accelerated sustainable transport planning and the implementation of new technology to improve safety. In Kalamaria, the research has provided a process and tools (G2) to help implementation of solar-powered, smart pedestrian crossings near four schools leading to a reduction in accidents and increased awareness of speed and sustainability issues amongst drivers (S2). An intelligent parking scheme has also been agreed for the centre of Kalamaria (due end 2021) to reduce pollution and congestion:

"Initially 50 spaces were agreed, but the arguments we were able to present (through increased understanding brought about by the SUITS capacity building programme) along with our research findings helped us influence perceptions within the municipality and persuaded them to expand the plan to accommodate 150 spaces". (S2)

New processes and policies within cities to increase sustainable transport measures

Application of innovative financing and procurement processes (G2; R5) has increased the capacity of cities to finance and implement sustainable transport measures (S1, S3, S5-6). In Alba Iulia, this enabled procurement of cleaner vehicles equipped to monitor pollutants:

"*Alba Iulia will be one of the first cities in Romania with electric buses in 2022. Through an innovative public tender with the Ministry of Development, the city has procured 15 new buses installed with air quality monitors, enabling the monitoring of pollutants in the city*" (S1).

Through innovative procurement (R5), Turin has implemented sustainable freight delivery, with incentives introduced for the acquisition of clean vehicles. As a result, freight operators have experienced a 20% increase in productivity, with a 90% reduction of common air pollutant emissions (S3). This increase in transport operator productivity has enabled the municipality to demonstrate to other operators and stakeholders the value of investing in technologies with zero emissions.

Implementation of the research (R4-5) through a new organisational change process has optimised trust and skill-sharing within, and between LAs, and influenced transport policy (S1, S3-7):

"The biggest impact was adopting Professors Woodcock and Nienaber's approaches to organisational change and trust. Increasingly, we have adopted a 'bottom-up approach' where the management listen to employees and there is daily contact with citizens and the wider society and transport sector." (S4)

The research (G1, G2) has directed the refresh of the Statutory Transport Plan for the West Midlands (S6) and helped shape Valencia's people-centric and sustainable approach outlined in their new Mobility Regulation and associated documentation: '*Towards a (+) sustainable mobility in València. Policies and objectives in the area of mobility and public space of the City Council of València. '* (S4).

Increased LA capacity in sustainable mobility planning

Application of Woodcock's research (G1-3), has increased knowledge and developed capacity in citizen engagement, and the use of data informed approaches to planning, implementing and assessing sustainable mobility measures (S1, S2, S4-7):

"Employing a data driven approach and the METPEX measures developed by Professor Woodcock, has enabled an understanding of community diversity in Coventry in respect to public transport. Following SUITS guidelines, there has been wide consultation with vulnerable road users, which has led to a more effective implementation for the new e-Scooter and smart crossings schemes." (S5)

The use of mobility data (R2, R3) has enabled cities to demonstrate progress against their sustainability plans, gain recognition, benefit from the award of new related projects (S1, S2, S6), and grow internal LA capacity (e.g. S2, S6):

"Professor Woodcock's focus on intelligent mobility and the METPEX measurement instruments … have informed our approach to data usage and enabled the measurement of public satisfaction with transport safety and security and public transport. Adopting these principles, TfWM has established the Data Insight Service to collect a raft of data to inform transport decision-making (S6).

Improved inclusion and representation in transport planning.

New approaches to improve the inclusion of marginalised groups in transport planning have been embraced (G1-3). Woodcock's inclusive and participatory approaches to strategy development and implementation have been embraced by the LAs is each of the 6 cities (S2-8):

"*Two sets of lights have been installed in areas selected following consultation with people who are impaired"* (S2).

Impact is clear in the city of Alba Iulia, where a change in thinking and policy is evident in the adoption of the' European Charter for Equality of Women & Men in Local Life' in November 2020 (S8). The charter aims to balance participation of women and men in political, social and public decision-making and was promoted and sustained by the Romanian Hub of the TInnGO project (R6, G3).

5. Sources to corroborate the impact (indicative maximum of 10 references)

(S1) Testimony. Mayor of Alba Iulia Municipality, Alba Iulia Municipality, Calea Motilor Str. 5A, Alba Lulia, Alba County, 510134
(S2) Testimony. Mayor of Kalamaria, Komninon 58, 55132 Kalamaria, Greece
(S3) Testimony. Official at the Municipality of Turin, Staff of the Deputy Mayor in charge of Mobility, City of Torino, Italy
(S4) Testimony. Mobility specialist at Las Naves, Greater València Metropolitan Area, Valencia
(S5) Testimony. Transport Innovation Manager, Coventry City Council, One Friargate, Coventry, CV1 2GN
(S6) Testimony. Head of Transport Innovation, Transport for West Midlands, 16 Summer Lane, Birmingham, B19 3SD
(S7) Testimony. Direzione Ingegneria, Roma Servizi per la Mobilità S.r.l. Italy
(S8) Press release on the TInnGO website (online as at 05.03.21) https://transportgenderobservatory.eu/2021/02/08/equal-is-the-new-normal-alba-iulia-municipality-has-officially-adopted-the-european-charter-for-equality-of-women-and-men-in-local-life/