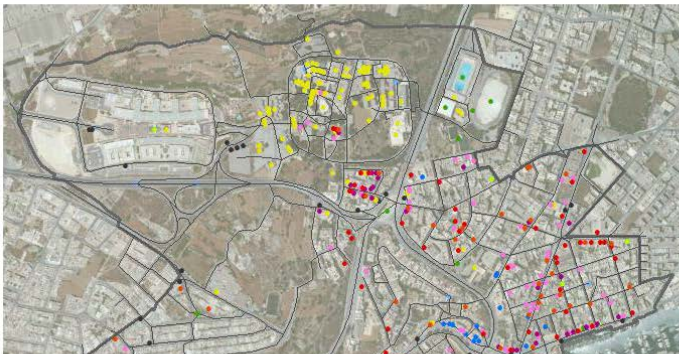




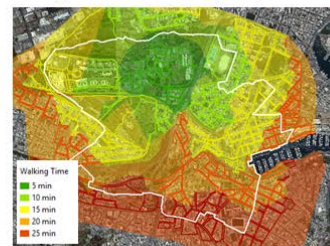
Institute for Climate Change and Sustainable Development

Annual Report 2016-2018

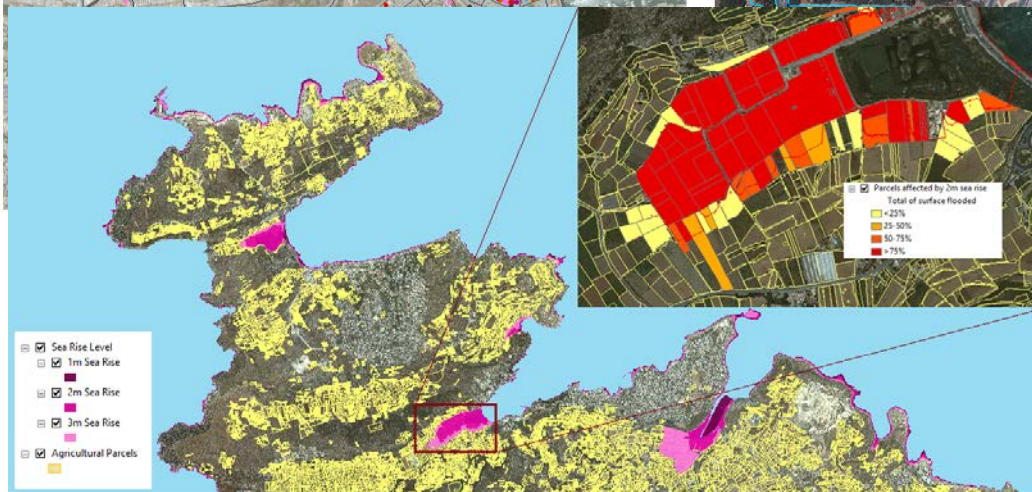
Distribution of opportunities in Msida, Malta, categorised by type.



Walking time towards university campus



Example of pedestrian network used for spatial analysis and accessibility assessment:



Introduction

The Institute for Climate Change and Sustainable Development was established in 2009. During 2016-2018 the Institute strengthened its research areas and continued with its research efforts to promote interdisciplinarity.

The Board of the Institute met regularly during this year where a number of key decisions were taken with respect to the work of the Institute and the development of programmes, projects and events.

This report outlines the work and achievements of the Institute for Climate Change and Sustainable Development during the period October 2016 and September 2018.

Aims of the Institute

- (a) to perform and promote interdisciplinary research on issues related to sustainable development, social sustainability, and climate change including mitigation and adaptation strategies;
- (b) to provide consultancy, advice and assistance on sustainable development and climate change including mitigation and adaptation strategies;
- (c) to provide continuous education, undergraduate, and postgraduate courses within the scope of the Institute subject to the Statutes and Regulations of the University;
- (d) to act as host institution for scholars, professors and chairs of international repute, as well as programmes, networks and fora, that aim to enhance the profile of the Institute within the regional and European research area, in areas related to sustainable development and climate change including mitigation and adaptation strategies;
- (e) to use telemetry, IT tools, intelligent systems, and modelling for monitoring, research, decision support and strategic planning;
- (f) to engage in knowledge transfer and awareness raising initiatives on sustainable development and climate change with companies, organisations and other institutions outside the University to promote best-practice (e.g. to promote the uptake of cleaner technologies; to mitigate and adapt to impacts of climate change on business operations and markets);
- (g) to network and liaise with similar or complementary, university institutions and centres for sustainable development or climate change; and
- (h) to disseminate acquired knowledge through online media, publications, seminars, conferences and teaching programmes.

THE BOARD OF THE INSTITUTE 2016-2018

Chairman **Prof. Simone Borg**
Vice-Chair and Director **Prof. Maria Attard**

Members:

Prof. Richard Muscat

Mr Godfrey Vella / Dr James Foden

Dr Philip Von Brockdorff

Dr John C. Betts

Prof. Alex Torpiano

Prof. Sandro Lanfranco

Prof. Adrian Muscat

Prof. John A. Schembri

Ms Thérèse Bajada

Ms Margaret Camilleri Fenech

Dr Anton Bartolo

Ing. Anthony Rizzo (student)

Ms Yolande Newton (student)

The University of Malta Institute for Climate Change and Sustainable Development

The Administrative Office

During 2016-2018 the Institute was located in 45, Triq l-Esperanto, Msida and in Porta Cabins located in Car Park 6. The office housed the administrative as well as the academic staff, whilst the researchers, interns, students and project work was transferred to the Porta Cabins. The Director's Office was located in the Humanities. Although not ideal, work continued unabated throughout the years.

The Institute's Human Resources

Ms Deborah Mifsud and **Mr Carlos Cañas Sanz** continued to work on a number of projects and their respective post-graduate studies. In May 2018 Ms Mifsud successfully completed her PhD. She went on to present her work in a number of conferences and served as post-grad representative on the Royal Geographical Society Transport Geography Research Group. She continued to service as casual lecturer at the institute and the Department of Geography at the University of Malta. Mr Carlos Cañas Sanz continued his work on his MPhil at the Institute and presented his work at a conference in London and a number of meetings locally and abroad.

Dr James Ciarlo joined the Institute for a brief period of time to assist in the drawing up of Malta's National Communication to the United Nations Framework Convention on Climate Change (UNFCCC). This work was funded by the Malta Resources Authority.

Mr Miguel Guerra joined the Institute for a brief period of time to work on the Interreg MED CAMP-sUmp Project coordinated by the Institute.

Mr Stephen Joseph Giuliano replaced Mr Guerra and joined the Institute as Part-time Research Support Officer I to support the work of the Interreg MED CAMP-sUmp Project and subsequently to support the project funded by Malta Public Transport. Mr Giuliano registered for a Master's with the Department of Geography.

Mr David Scicluna joined the Institute in June 2018 replacing Dr Deborah Mifsud who was successfully employed by Malta Public Transport upon the completion of her studies.

Ms Suzanne Maas and **Mr Mark Bugeja** joined the Institute in 2017 as Research Support Officers II to contribute to the H2020 CIVITAS DESTINATIONS Project. Both also enrolled as full-time MPhil students. Ms Maas enrolled with the Institute carrying out research on bicycle sharing in island destinations and Mr Bugeja enrolled with the Faculty of ICT, working in AI and transport.

Dr Thérèse Bajada successfully defended her PhD thesis at UCL and was promoted to Lecturer and **Ms Margaret Camilleri Fenech**, Assistant Lecturer (TR4) have continued to pursue their PhD studies, as well as supporting the growth in the Institute's teaching and administration.

Mr Raphael Mizzi has continued to work on the Green Travel.

Ms Romina Zammit, the Institute Administrative Assistant has continued to manage and support the Institute, its staff and activities.

Community Outreach

The Institute on the WWW

The Institute website has continued to act as a medium for communication with the University community and the general public. The Institute's website contains reference to almost all the work that the Institute engaged in since its opening in 2009. The structure of the website continues to change and adapt according to the themes of research at the Institute. Further content is uploaded regularly ensuring all the activities are documented online and accessibility to the general public.

In 2014, the Institute also launched its Facebook page. A very good response was received from the public, and use of the Institute Facebook page remained active throughout with some evident peaks during particular events and uploads.

The Institute in the Media

Times of Malta 14 October 2016 When roads lead to a standstill

<https://timesofmalta.com/articles/view/When-roads-lead-to-a-standstill.627909>

MaltaToday 19 October 2016 Is mobile-app solution to Malta's rush-hour gridlock?

https://www.maltatoday.com.mt/business/technology/70672/is_mobile_app_solution_to_malt_as_rushhour_gridlock#.YEJM9ZNKjlw

The Business Observer (distributed with the Times of Malta) 20 October 2016 Maas Transport... and other measures

https://www.um.edu.mt/iccsd-old/images2/masstransport_MA.jpg



Times of Malta 13 November 2016 Researchers discuss paths to a low-carbon economy
<https://timesofmalta.com/articles/view/Researchers-discuss-paths-to-a-low-carbon-economy.630907>

Times of Malta 9 January 2017 Park your car and hop on to a 'flexible' bus
<https://timesofmalta.com/articles/view/park-your-car-and-hop-on-to-a-flexible-van.635887>

Multiple newspapers 5 February 2017 Multigas announces environmental dissertation competition winners
<https://timesofmalta.com/articles/view/Multigas-announces-environmental-dissertation-competition-winners.638695>
<https://www.independent.com.mt/articles/2017-02-06/newspaper-lifestyleculture/Multigas-announces-environmental-dissertation-competition-winners-6736170048>
<https://www.um.edu.mt/iccsd-old/docs/20170205-mument.pdf>



TVM 8th February 2017 Letturi johlqu app biex iheggu studenti jmorru l-Universita' minghajr karozzi
<https://www.tv.com.mt/mt/news/letturi-johlqu-app-biex-iheggu-studenti-jmorru-l-universita-minghajr-karozzi/?src=hm>

ONE News Malta 11 February 2017 Iċ-Ċittadin ikejjel eko Għawdex
<https://www.youtube.com/watch?v=2r0WPIT7dwc>

ONE News Malta 12 February 2017 Bus stop viċin id-dar mhux bizzejjed
<https://www.one.com.mt/news/2017/02/12/bus-stop-vicin-id-dar-mhix-bizzejjed/>

ONE News Malta 25 February 2017 Ix-xewqa li jitnaqqas l-użu tal-karozzi
<https://www.youtube.com/watch?v=h7zdzVYI4uc>

Times of Malta 4 June 2017 Project to encourage low-carbon, energy-efficient mobility
<https://timesofmalta.com/articles/view/Project-to-encourage-low-carbon-energy-efficient-mobility.649948>

Times of Malta 9 August 2017 University cannot have any more parking spaces
<https://timesofmalta.com/articles/view/watch-university-cannot-have-any-more-parking-spaces.655237>

Newsbook 10 August 2017 Id-deċizjoni ta' Donald Trump ma taffettwax lil Malta
<https://newsbook.com.mt/artikli/2017/8/10/awdjo:-id-decizjoni-ta'-donald-trump-ma-taffettwax-lil-malta.63647/>

Newsbook 14 August 2017 Malta trid tipprepara għal iktad mewġiet to sħana u għargħar.

<https://newsbook.com.mt/artikli/2017/8/14/%22malta-trid-tipprepara-qhal-iktar-mewġiet-ta'-shana-u-gharghar%22---prof-maria-attard.63809/>

MaltaToday 22 August 2017 Malta's average temperature increased 1°C in 70 years... and experts warn of more frequent heatwaves

https://www.maltatoday.com.mt/environment/environment/79879/maltas_average_temperature_increased_1c_in_70_years#.YEJR4pNKjly

Multiple news outlets 23 August 2017 App ġdida se ttiprovdi taġħrif dwar is-sitwazzjoni tat-traffiku madwar il-Belt

<http://www.tvn.com.mt/mt/news/app-qedida-se-ttiprovdi-taġħrif-dwar-sitwazzjoni-tat-traffiku-madwar-il-belt/>

<http://www.one.com.mt/news/2017/08/23/tiqi-mnedija-vatis-parti-mill-gimgha-ewropea-tal-mobilita/>

<http://netnews.com.mt/2017/08/23/filmat-mintix-cert-qhandekx-tidhol-il-belt-bil-karozza-din-l-app-se-tqhinek/>

<http://www.independent.com.mt/articles/2017-08-23/local-news/VaTIS-launched-as-part-of-European-Mobility-Week-6736178162>



Times of Malta 3rd September 2017 Is this the transport solution for University students?

<http://www.timesofmalta.com/articles/view/20170903/education/is-this-the-transport-solution-for-university-students.657145>

Times of Malta 24 September 2017 Get app and move – New app support travel behaviour change

<http://www.timesofmalta.com/articles/view/20170924/technology/Get-app-and-move.658789>

Times of Malta 20 November 2017 Malta's transport policy driving against climate change direction

<http://www.timesofmalta.com/articles/view/20171120/life-features/Malta-s-transport-policy-driving-against-climate-change-direction.663575#>

MaltaToday 14 December 2017 Has our public transport failed the elderly?

http://www.maltatoday.com.mt/news/national/82982/has_our_public_transport_failed_the_elderly#.WjOADVWnGUJ

UVNews (University of Valencia) 27 March 2018 Presentation of the conclusions of a European project to improve the mobility of the university campuses

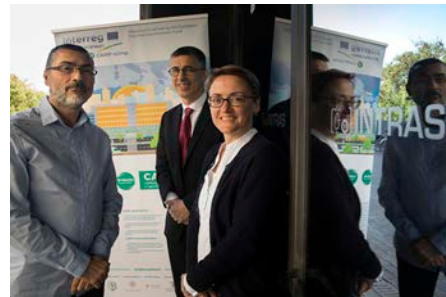
https://www.uv.es/uvweb/uv-news/en/news/l-intras-acull-la-presentacio-de-les-conclusions-d-un-projecte-europeu-a-millorar-la-mobilitat-als-campus-universitaris-1285973304159/Novetat.html?id=1286036950586&plantilla=UV_Noticies/Page/TPGDetailNews

Think Magazine 5 April 2018 Where does it go? A snapshot of waste management in Malta.

<https://www.um.edu.mt/think/where-does-it-go-a-snapshot-of-waste-management-in-malta/>

Times of Malta 15 May 2018 A shade of corporate green

<https://timesofmalta.com/articles/view/A-shade-of-corporate-green.679089#>



Times of Malta 19 June 2018 Plastic, plastic everywhere?

<https://timesofmalta.com/articles/view/plastic-plastic-everywhere.682145>

TV and Radio Contributions

During the year Prof. Maria Attard contributed to a number of television and radio programmes to raise awareness and discuss issues related to sustainable mobility. Programmes included TVAM (PBS), Newsbook (RTK Radio), Għandi X'Nghid (Radju Malta), NET Television, Super One Television and Campus FM.

Participation in conferences, invited lectures and other events

8th April 2017 TEDx Talk by Prof. Maria Attard Valletta Campus, Valletta

... and what about our mobility?

<https://www.youtube.com/watch?v=WNBt2P7wkc>



3rd November 2016 Climate Change Platform Seminar
Path to a Low-Carbon Economy, University of Malta



16 March 2017 **Public Lecture by Prof. Maria Attad** Flimkien għall-Ambjent Aħjar, Orpheum Theatre, Gzira

5-6 September 2016 **COST ACTION TEA TU1209** Workshop on Stakeholders' involvement for testing transport equity guidelines, Greenwich University, UK. Attendance by Deborah Mifsud

9th March 2017 **COST ACTION TEA TU1209** Final Conference, Barcelona, Spain. Attendance by Deborah Mifsud

19th April 2017 – 19th June 2017: **ERASMUS + Student Mobility for Traineeship**, Loughborough University, UK Deborah Mifsud

Ms Deborah Mifsud was a visiting student at the then Civil and Building Engineering Department at Loughborough University UK. This was an ERASMUS student exchange as part of her PhD studies, and she was under the supervision of Prof Stephen Ison. During her stay she obtained feedback from different academics and also presented her work to the transport group at the University.



20-24 August 2018: **Aalto University Summer school in Spatial Planning and Transportation Engineering** "Enabling Human-Centred Mobility Systems", Aalto University, Helsinki, Finland. Stephen Joseph Giuliano was awarded a scholarship to attend the Summer school.

16-18 May 2018 CIVITAS DESTINATIONS Work Placement, Limassol, Cyprus. Suzanne Maas

<https://civitas.eu/news/civitas-destinations-enables-limassol-and-malta-exchange-cycling-expertise>





28th April 2017 **Seminar Waste Management – An integrated approach**, St Julian's

Cleaner Technology Centre



24th January 2017 Seminar **Water Problems and Solutions – A Comprehensive Approach**, Valletta

Cleaner Technology Centre.

26 October 2016 Seminar **National Transport Strategy. What Next?** Valletta

The Malta Chamber

9th Edition of the Environment Awards for Industry 2018

Cleaner Technology Centre



PhD Student Cafe at the ICCSD

Bi-monthly PhD / Master student meetings, where PhD and Master students of the Institute and related departments/faculties (Geography, Built Environment) meet to discuss their research in an informal setting.

The students hail from different shores, from Zambia, Spain, the Netherlands, Grenada, and of course Malta, and are thus able to provide each other with different perspectives on their work.



Secret Santa Christmas lights donation initiative together with the Bicycle Advocacy Group to donate to refugees and migrants who are often cycling without lights. ICCSD donated 20 Hi-Viz

vests, which were handed over to the migrants and refugee community, together with almost 60 sets of front and rear lights donated by members of BAG, offered at a discount by bicycle shop The Cyclist, and a bicycle sponsored by UNHCR Malta for a lucky raffle winner. On Tuesday 9th January an event was organised at Marsa Open Centre, with the support of AWAS and UNHCR, to meet and hand over the gifts to migrants and refugees.

Times of Malta article: <https://www.timesofmalta.com/articles/view/20171221/local/secret-santa-lights-up-migrant-bikes.666174>

Blogpost by UNHCR Malta: <https://www.unhcr.org/mt/3107-lets-get-visible-safer-cycling-refugees.html>

List of Conference Presentations:

- Cremona, F., Muscat, A., Attard, M. (2018) Speed Aware – a Mobile App Prototype for the Promotion of Responsible Driving. Presented at the Junior College Multi-Disciplinary Conference: Research, Practice and Collaboration Breaking Barriers, Msida, Malta, 18-20 September.
- Attard, M. (2018) Politics, planning and mobility justice in a small island state. Presented at the RGS-IBG Annual International Conference, Cardiff, 28-31 August.
- Maas, S., Fortuin, K., Frantzeskaki, N., Roorda, C. (2018) Starting Up Transition Management: A Closer View on the Systems Analysis and how it Initiated Transformative Thinking in Ghent and Aberdeen Cities in 'Co-creating Sustainable Urban Futures: A Primer on Applying Transition Management in Cities', Frantzeskaki, N., Hölscher, K., Bach, M., Avelino, F. (Eds.). Springer, Future City, Vol. 11. Springer International Publishing.
- Mifsud, D., Attard, M., Ison, S. (2018) Travel disadvantage and older people in Malta. Presented at the RGS-IBG Annual International Conference, Cardiff, 28-3 August.
- Maas, S., Attard, M. (2018) Cycling and the uptake of bicycle sharing systems in Southern European island cities. Presented at the RGS-IBG Annual International Conference, Cardiff, 28-31 August.
- Pajarito, D., Maas, S., Attard, M., Gould, M. (2018) Mapping cyclists' routes: involving citizens in collecting open cycling data. In Ali Mansourian, Petter Pilesjö, Lars Harrie, and Ron von Lammeren, editors, Geospatial Technologies for All : short papers, posters and poster abstracts of the 21th AGILE Conference on Geographic Information Science. Lund University 12-15 June 2018, Lund, Sweden ISBN 978-3-319-78208-9. URL <https://agile-online.org/index.php/conference/proceedings/proceedings-2018>
- Vlahogianni, E., Papantoniou, P., Yannis, G., Attard, M., Regattieri, A., Piana, F., Pilati, F. (2018) Analysis of mobility patterns in selected University Campus Areas. Proceedings of the Conference on Sustainable Urban Mobility (CSUM) 2018, Skiathos Islands, Greece, 24-25 May.
- Papantoniou, P., Vlahogianni, E., Yannis, G., Attard, M., Valero Mora, P., Campos Diaz, E., Tormo Lancero, M.T. (2018) Investigating Mobility Gaps in University Campuses. Proceedings of the Conference on Sustainable Urban Mobility (CSUM) 2018, Skiathos Islands, Greece, 24-25 May.

Attard, M. (2018) Tourism Travel in Islands: trends and implications for Malta's transport system. NECTAR Cluster 5 Workshop, Università del Salento, Lecce, Italy, 24-25 May.

Pajarito, D., Maas, S., Attard, M., Gould, M. (2018) URBAN CYCLING Lessons learned from volunteers' use and feedback of the Cyclist GEO-C App. ExCiteS Citizen Science and HCI Workshop, University College London (UCL), London, 27 April.



Attard, M. (2018) Mobility justice in a car dependent society. The role of politics and planning. Presented at the Association of American Geographers (AAG) Annual Meeting, New Orleans, USA, 10-14 April.

Camilleri, M., Muscat, A., Buttigieg, V., Attard, M. (2018) Improving a Smartphone's Power Consumption - Application for an Automated Travel Diary. International Conference on Information Systems and Management Science (ISMS) 2018, Valletta 22-23 February.

Attard, M. (2018) Ten years of the Controlled Vehicular Access (CVA) System in Valletta, Malta. Poster presented at the Transportation Research Board 97th Annual Conference held in Washington, D.C., USA, 6-11 January.

Attard, M., Muscat, A., Camilleri, M. (2018) Developing the technology for a shared demand responsive transport system at the University of Malta. Proceedings of the Transportation Research Board 97th Annual Conference held in Washington, D.C., USA, 6-11 January.

Attard, M. (2018) Operational reforms and policy implications on public transport safety a preliminary analysis of bus accident data in Malta. Paper presented at the Universities' Transport Study Group (UTSG) 50th Annual Conference held in London, UK, 3-5 January.

Cañas, C. (2018) Walking to University in Malta. Assessing the determinant of walking behaviour among university students. Paper presented at the Universities' Transport Study Group (UTSG) 50th Annual Conference held in London, UK, 3-5 January.

Attard, M., Muscat, A., Camilleri, M. (2018) Designing new flexible transport services for a University campus – the case of Malta. Paper presented at the Universities' Transport Study Group (UTSG) 50th Annual Conference held in London, UK, 3-5 January.

Camilleri, M., Muscat, A., Attard, M. (2017) Developing the underlying technology for a Shared Demand Responsive Transport at the University of Malta. Presented at the RGS-IBG Annual International Conference, London 30 August - 1 September.

Attard, M. (2017) Preliminary investigations into the potential of LRT as a tool for urban regeneration in Malta. Presented at the RGS-IBG Annual International Conference, London 30 August - 1 September.

Mifsud, D., Attard, M., Ison, S. (2017) Determinants of Travel Behaviour for Older People in Malta. Presented at the RGS-IBG Annual International Conference, London 30 August - 1 September.

- Migliore, M., Attard, M., Mifsud, D., Castelluccio, F. (2017) An analysis of the transport supply and passenger demand between Sicily and Malta. Presented at the ITEA (International Transportation Economics Association) Annual Conference and School on Transportation Economics (ITEA 2017), Barcelona, Spain, 21-23 June.
- Attard, M., Camilleri, M., Muscat, A., Buttigieg, V. (2017) Automated personal trip identification app for mobility data collection in Malta. Presented at the NECTAR XIV International Conference Transport in a Networked Society held in Madrid, Spain, 31 May - 2 June.
- Camilleri Fenech, M. (2017) Where do islands put their waste? – A material flow and carbon footprint analysis of municipal waste management in the Maltese islands. IIIIE Alumni network conference. Lund University, Lund, Sweden, 17-19 May.
- Dingli, A., Attard, M. (2017) Congestion Pricing and Travel Information: the Valletta Travel Information Service (VaTIS). Poster presented at the Transportation Research Board 96th Annual Conference held in Washington, D.C., USA, 8-12 January.
- Attard, M., Miceli Farrugia, A., Borg Barthet, J. (2017) Sustainable Mobility, Livability and Public Space in Historic Village Cores – the case of Lija, Malta. Proceedings of the Transportation Research Board 96th Annual Conference held in Washington, D.C., USA, 8-12 January.
- Attard, M., Azzopardi, J. (2016) Cultural Mapping – Tools to Engage. In Fondation de Malte and Valletta 2018 Foundation Cultural Mapping Debating Space and Places. Proceedings of the Second Annual Valletta 2018 International Conference on Cultural Relations in Europe and the Mediterranean, Valletta, 22-23 October 2015.
- Caruana, J., Attard, M. (2016) Social Sustainability, Urban Regeneration and Postmodern Development approaches for Strait Street, Valletta. Presented at the V18 International Conference. Valletta, Malta, November.

The Institute Visiting Lecturers



Muki Haklay, Professor of Geographic Information Science, Department of Geography, University College London, UK
<http://www.geog.ucl.ac.uk/people/academic-staff/muki-haklay>

2018



Dominic Stead, Associate Professor of Urban and Regional Planning, Faculty of Architecture and the Built Environment, Delft University of Technology, The Netherlands
<https://online-learning.tudelft.nl/instructors/dominic-stead/>

2017

New Research Activity

The Institute has continued to work on the projects awarded in the previous year. It has also succeeded to submit and participate in project proposals, both locally and abroad. Table 1 shows the projects and the outcome of the funding applications for 2016-2018.

Funding Programme	Title of Project	Project Partners	Outcome and Value
UOM R&I	Assessing the impact of transport measures on sustainable mobility	Prof. Maria Attard, ICCSD	AWARDED (€1,500)
HORIZON2020	CIVITAS DESTINATIONS	Prof. Maria Attard, ICCSD and 27 other partners from six European islands destinations	AWARDED (€373,779)
INTERREG MED	CAMP sUmp	Prof. Maria Attard, ICCSD and 6 other partners from seven university campus cities in the MED region	AWARDED (€55,600)
Italia-Malta	BETTER CITIES	Prof. Maria Attard, ICCSD and other partner cities and Universities from Sicily	NOT AWARDED
HORIZON 2020	POSITIVE	Prof. Maria Attard, ICCSD and other partner cities and Universities from several European Countries	NOT AWARDED
HORIZON 2020	INRASE	Prof. Maria Attard, ICCSD and other partner cities and Universities from several European Countries	NOT AWARDED
Inspirasia Foundation	Walking Malta (Social Impact Awards)	Prof. Maria Attard, ICCSD; Carlos Cañas, ICCSD	NOT AWARDED
European Mobility Week Awards	Valletta Bicycle Kitchen	Institute for Climate Change and Sustainable Development and Valletta Local Council	NOT AWARDED
Malta Resources Authority	Malta's Communication to the UNFCCC	Coordinated by Prof. Maria Attard	AWARDED (€31,000)
Malta Public Transport	Study on Bus Emission Reduction Strategies	Coordinated by Prof. Maria Attard	AWARDED (€22,000)
COST	COST Action (CA17133) Nature-based solutions for creating a resourceful circular city	Ms Margaret Camilleri Fenech	AWARDED
CNR-UOM	Collaboration Proposal	ICCSD and Universities of Naples and Siena, Italy	NOT AWARDED
COST	COST Action (CA16222) WISE- ACT Socio-economic Implications of Autonomous & Connected Vehicles	Prof. Maria Attard	AWARDED
	Urban Transform	Prof. Maria Attard and University of Luxemburg	NOT AWARDED
HORIZON 2020	AGENTE - A GENDER PERSPECTIVE FOR TRANSPORT IN EUROPE	Prof. Maria Attard, ICCSD and other partner cities and Universities from several European Countries	NOT AWARDED
MOBILE LIVES (Switzerland)	An Exploratory Understanding of Mobility Biography in Malta	Deborah Mifsud, Prof. Maria Attard	NOT AWARDED
European Mobility Week Awards	Msida Walking Totems	Institute for Climate Change and Sustainable Development (Carlos Cañas) and Msida Local Council	NOT AWARDED
European Mobility Week	Valletta Walking Totems	Institute for Climate Change and Sustainable Development and Valletta Local Council	NOT AWARDED
UM RIDT Small Grants	Sensing Mobility	Prof. Maria Attard and Prof. Adrian Musca	AWARDED (€4,000)

On-Going Projects

H2020 CIVITAS DESTINATIONS

The project builds up an integrated approach to address mobility and tourism, testing balanced strategies to face the rising challenges of these two growing sectors and to achieve sustainable development and a better quality of life in Funchal, Limassol, Rethymno, Elba, Las Palmas de Gran Canaria and Valletta.



INTERREG MED CAMP-sUmp



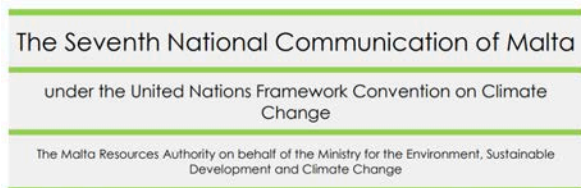
CAMP-sUmp aims to improve sustainable urban mobility planning instruments with innovative mobility strategies for University students in regions of the European shores of the Mediterranean, and their integration with the urban areas. Project's main results are the definition of a common strategy in Mediterranean northern sea basin regions that integrates student flow in urban mobility planning with support of ICT instruments and reduction of negative externalities on urban areas and Campuses.

Seven campuses are involved in the project including the University of Malta, University of Split, National Technical University of Athens, the University of Bologna, University of Catanzaro and the Fondazione Magna Grecia (Lead Partner), and University of Valencia and University of Cyprus.



Malta Resources Authority, Climate Change Group – National Communication to the United Nations Framework Convention on Climate Change (UNFCCC)

The Institute for Climate Change and Sustainable Development was requested to compile Malta's National Communication to UNFCCC by the Malta Resources Authority. Dr James Ciarlo, Research Support Officer with the Institute coordinated the drafting with various members of the University academic community.



https://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/42967815_malta-nc7-1-nc7_malta_2017_final.pdf

Travelling Smart – The Green Travel Plan Committee at the University of Malta



Prof. Maria Attard continues to chair the Green Travel Plan (GTP) Committee which aims to implement the University Green Travel Plan approved in 2012. Mr Raphael Mizzi, the GTP Coordinator administrates the GTP work as well as act as secretary to the GTP Committee.

The GTP Committee for 2015 – 2017 was made up of:

Prof. Maria Attard (Chair)
Ms Thérèse Bajada (Travel Plan Expert, ICCSD)
Mr Robert Napier (President, KSU)
Mr Joseph Camilleri (Precincts Officer)
Ms Amanda Ciantar (Office of Human Resources)
Ms Nathalie Cauchi (UHM)
Mr Raphael Mizzi (Secretary)
Ms Maronia Schembri (Precincts Office)
Prof. Luciano Mulé Stagno (UMASA)
Perit Christopher Spiteri (Director Estate & Works)

During 2016/2018 a number of initiatives were undertaken by the GTP Committee and the GTP Coordinator in order to improve travel to the University.

The Website

In order to maintain communication lines open with the University community the GTP website is updated on a regular basis with useful information and links about green travel to and from University.

Further useful links and information is made available through this website and publicised from time to time internally within the University community.

<http://www.um.edu.mt/greentravel>

Facebook

Since 2015 the ICCSD created a Facebook page where all the news and events related to the Institute are posted on this page. The GTP coordinator uploads several weekly news to create awareness about green travel with UoM members and other visitors.

Cycling

On the 13th October the GTP co-ordinator was present at the launch which was attended by Hon. Joop Nijssen - the Dutch Ambassador for Malta, Pierre Vella from the Malta Road Safety Council, Michael Rosner from the Bicycling Advocacy Group together with Paragon Europe, the press and participating cyclists.

During the Bike2Work campaign bicycles parked in bicycle racks within the UoM Msida Campus were randomly selected for a gift from the GTP Co-ordinator and on the 9th November 2016, winners were presented with the gift.



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MANAGED SERVICES

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The project is co-funded by the Intelligent Energy Programme of the European Union. The sole responsibility for the content of this project lies with the authors. It does not necessarily reflect the opinion of the European Union. The European Commission is not responsible for any use that may be made of the information contained therein.



Walking - Call for University of Malta Walking Ambassadors

On the 23rd November 2016 the following call for a Walking Ambassador was issued at the UoM;

What is a Walking Ambassador? A walking ambassador is a volunteer trained to lead walks that inspire, connect, and inform the community. A catalyst for change vis-à-vis our countries future transport challenges.

What is the commitment? It's really up to you. You may be called upon to give occasional advice or attend the odd meeting. But in effect you're on duty whenever you're walking. It's leading by example.

What are the advantages of having a Walking Ambassador?

- *Students become physically fitter*
- *Businesses thrive*
- *University natural environment becomes healthier*
- *Social connections improve when more people are out walking*

Thinking of volunteering? This is a voluntary post with a chance to help and guide the University on making walking safer and more accessible. Time to make a difference and also help your locality resolve traffic congestion and parking problems. To apply for this post please contact the Green Travel Plan Coordinator on greentravel@um.edu.mt

University of Malta Walking Ambassadors Kick-off Meeting



In November 2016, a call for Walking Ambassadors was issued by the Green Travel Plan Coordinator within the Institute for Climate Change and Sustainable Development.

Four members of staff within University of Malta applied and became officially recognized University of Malta Walking Ambassadors.

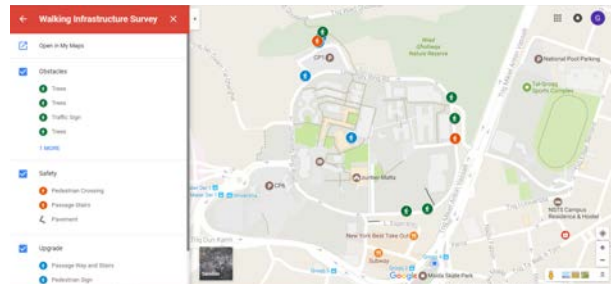
The GTP Coordinator at the University of Malta organised a meeting at the Institute for Climate Change and Sustainable Development. Present at the meeting were Jelena Agranov, Carlos Cañas, Carmel J Caruana and Lalit Garg. The vision is that the University will, over time, develop its tailored walking policies with the collaboration of the University of Malta Walking Ambassadors.

During the meeting a good number of suggestions were highlighted. Walking Ambassadors can start by becoming points of reference for advice and information and encourage other University of Malta members to walk. Finding safe walking routes to/from University has been identified as an important first task.

University of Malta Walking Ambassadors will support the University's efforts to implement Green Travel and help reduce the number of cars driving to and from the University, with the ultimate aim of reducing the CO2 footprint of the University.

Pedestrian Safety - Walking Infrastructure Survey

As part of the walking campaign for January 2017 the GTP Co-ordinator surveyed the UoM walking infrastructure and completed the report on a Google Map indicating the Obstacles, Safety and Upgrade which were found in UoM grounds. For every report an image and a suggestions was included for improvement and this was passed on the UoM Estate & Works Department.



First **Free Bike Check** at the University of Malta organised by our Green Travel Plan coordinator in collaboration with Magri Cycles at the University of Malta, 9 May 2018



CAMP sUmp Second Local Working Group Meeting

On the 27th September 2017 the GTP Coordinator and several members of the GTP Committee participated in the Second Local Working Group at the UM for the Interreg MED CAMP sUmp Project.



The main aim of the meeting was the 'Presentation of Camp sUmp analysis results and mobility issues. Mr Guerra presented the analysis of the camp sUmp project questionnaires for the UM, highlighting the most relevant criteria for the selection of transport mode: Safety, Reliability, and Trip Duration; the highest graded mobility problems: Road infrastructure and Parking Management, explaining the necessity of understanding results in relation with the characteristics of the sample and the university community where the car is still the main transport mode.

CAMP-sUmp project – Award Ceremony

On the 16th December 2016 the GTP Coordinator presented the project's aims and actions to be carried out that will promote sustainable mobility for UoM Msida Campus.



Photo: DOI - Anthony Sultana



Freshers' Week 2016

The UoM GTP participated during Freshers' Week. The stand consisted of information about the variety of different ways of travelling to campus.

Vjaġġ representatives were promoting the vjaġġ mobile application, which seamlessly collects data about journeys carried out by the user throughout the day.



The GTP Coordinator assisted Bumalift representatives by giving information to students on how to register and use the car-pooling application. The 'Walking' theme was sponsored by Mochika who brought some items related to walking, such as, trekking shoes, socks, clothing and insoles. During the week representatives from Paragon EU were promoting the Bike2Work initiative for October and representative from Transport Malta focused on bicycle safety.

Junior Lyceum Career's Expo

On the 28th November 2016 The GTP Co-ordinator delivered a presentation to Junior College students for the Career's Expo. Part of the presentation included information about the courses offered to students at the ICCSD and how G.I.S. (Geographic Information Systems) can be applied in different working scenarios.

On the 29th November 2016 the GTP Coordinator was present with other members of staff from ICCSD at the Junior College Career's Expo, delivering information to visitors about the courses offered by the Institute.



Visitors had also the chance to learn about Vjaġġ mobile application and Green Travel Plan Initiatives.

Green Travel Plan Stand during Freshers' Week 2017

During the first week of October 2017 the UM GTP participated during Freshers' Week. The stand consisted of information about the variety of different ways of travelling to campus. Vjaġġ representatives were present on stand promoting vjaġġ mobile application, which seamlessly collects data about journeys carried out by the user throughout the day. This information is valuable and essential for research in transport.

Students who visited the stand had the opportunity to win gifts which are useful for cycling and walking by participating in some games related to walking to UM. CAMP-sUmp representatives also joined our team by giving information to students on sustainable mobility projects which are taking place at the UM.



Cycle to Uni Campaign

For the week of 23rd October 2017, the GTP Coordinator organised a cycling campaign for a week entitled 'Cycle to Uni Campaign'.



UM members were encouraged to cycle to UM and to park their bicycles in the provided bicycle racks within UM Campus. Everyday different bicycles were randomly selected for a gift by the GTP Coordinator. The gifts which consisted of high visibility vests to be worn during cycling and bicycle saddle covers were presented by the GTP Coordinator to the winners.



GTP Presentation to University Administrative & Technical Staff at the UM Valletta Campus

On the 27th November 2017 the GTP Coordinator gave a presentation at the UM Valletta Campus to the UM Administrative & Technical Staff during an event on Health and Safety organised by the Human Resources Department.

Efforts done by KSU with the support of the Green Travel Plan



Towards a sustainable mobility framework

In July 2017 KSU also launched a Transport Survey online in which it received a positive feedback from 590 students who participated. This sample of the university population provides us with a critical and open approach to students' needs themselves, their strengths and challenges, aiding ourselves to take the right decisions in their interest.

- 64.9% of respondents use the private vehicle as their main mode of transport to the University of Malta while 19% make use of public transport.
- 61% of private vehicle users spend more than 20 minutes on average daily to find parking on campus.

- 70% of private vehicle users have missed at least one lecture due to lack of parking on campus.
- 92% of respondents agree that more money should be invested in alternative modes of transport.
- Carpooling (40%) is the most popular alternative mode of transport amongst private vehicle users followed by using a Park and Ride system (25%) and Public Transport (19%).
- 57% of private vehicle users would carpool if adequate parking is provided.
- 'Buses are on time' is the greatest concern amongst students followed by 'efficient routes' when considering public transport as an alternative mode of transport.
- 44% of private vehicle users would consider cycling as an alternative mode of transport with the 'safer routes to the University of Malta' being the highest concern.
- Cycling as a first-choice alternative to the private car is highest amongst students in Northern Harbour (20) and Western regions (10).
- 28% of private vehicle users would consider a motorcycle as a mode of transport if 'financial incentives on lessons' would be provided.
- 77% of private vehicle users would consider a Park and Ride service if provided.

KSU launched the following initiatives

- Car Pooling
- Park and Ride – proposal to TM for a site in Mosta
- Malta Public Transport Fund - €10,000 allocated to encourage the use of public transport amongst students 21 years of age and over.
- Motorcycles - the Category B Motorcycle Permit 125cc consisting of 10 hours subsidised by KSU, where the total cost of Euro 170 would be reduced by 50%, with the revocation of their parking permit (if applicable). KSU would be allocating Euro 5,000 in which 58 students can benefit from the scheme.
- Cycling - increase bicycle parking on campus and Nextbike Malta will be offering the Annual Membership at 50% off.

Increase of Bicycle Racks on Campus

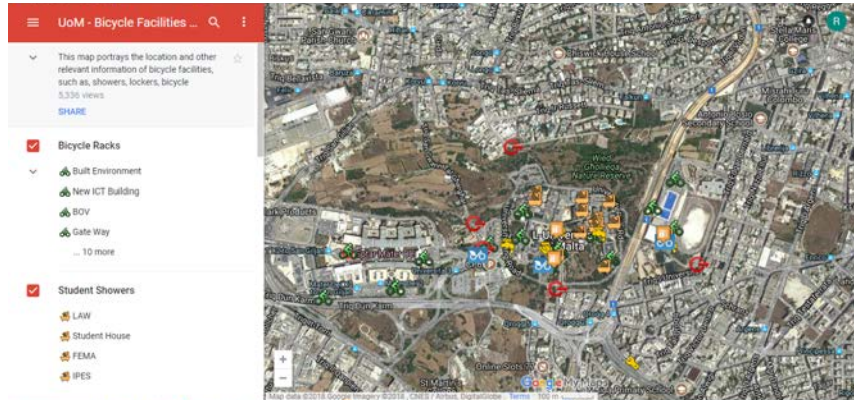
During the month of December an increase in a particular bicycle rack within UM campus was observed. Following requests by UM cycling students the GTP with the assistance of E&W Dept. and Precincts Office installed another bicycle rack.



UM Bicycle Facility Map Update

During the month of December 2017, the GTP Coordinator updated the UM Bicycle Facility Map which contains seven different layers; Bicycle Racks, Student Showers, Staff Showers, Water Dispensers, Entry/Exit Paths, Bicycle Services and Lockers.

The map which is constructed with Google Maps had over 5,000 views.

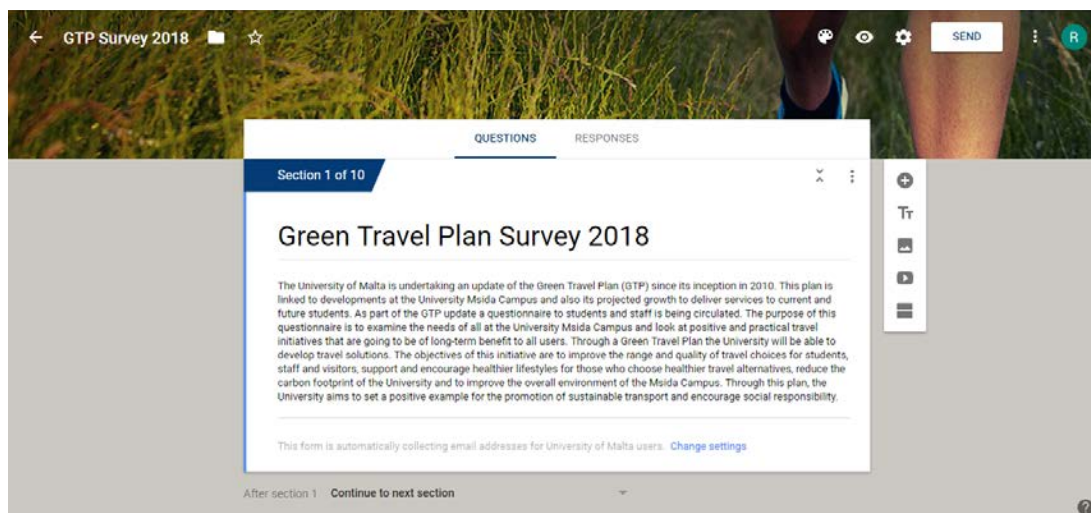


Donation by the GTP during Christmas Time.

During the month of December 2017, the GTP donated 20 high visibility vests to migrants who make use of bicycles, mainly as a commuting method.

GTP Survey 2018

During the initial months of the year 2018 the GTP Coordinator has been working on the design and construction of the new GTP Survey 2018. The survey interface would be different to the previous surveys of 2010 and 2014. The scope is to make it more user-friendly and attract more participants to fill out the online survey.



Participation in International Scientific Committees

Academic members of staff of the Institute have participated and contributed to a number of scientific committees and conferences during the period under review. Below is a list of contributions.

- **Prof. Maria Attard** continues to co-lead the NECTAR Research Cluster 2 on Policy and Environment. NECTAR is the European Transport Research Association
- **Prof. Maria Attard** continues to co-lead the Special Interest Group G3 on Urban Transport Planning and Policy in World Conference on Transport Research (WCTR).
- **Prof. Maria Attard** was Member of the Scientific Organising Committee for Urban Transitions 2018 Conference organised by Elsevier, Sitges (Spain), 25th- 27th November 2018.
- **Prof. Maria Attard** was Member of the Scientific Committee for the 14th World Conference on Transport Research organised by the World Conference on Transport Research Society (WCTRS), Tongji University, Shanghai (China), 10th – 15th July 2016.
- **Prof. Maria Attard** was Member of the Scientific Committee for the NECTAR 2016 Joint Cluster Workshop “The role of planning for sustainable urban mobility” organised by the Association of European Communications and Transport Activities Research (NECTAR), Transport Research Centre Brno (Czech Republic), 17th May – 18th May 2016.



During the period under review **Prof. Maria Attard**, **Ms Thérèse Bajada** and **Ms Deborah Mifsud** acted as paper reviewers to a number of academic journals including Case Studies in Transport Policy (Elsevier), Journal of Transport Geography (Elsevier), Transportation and Research Part A: Policy and Practice (Elsevier), Transport Reviews (Taylor and Francis), Transport Planning and Technology (Taylor and Francis), Travel Behaviour and Society (Elsevier), Journal of Transport Geography (Elsevier), ICE (Institute of Civil Engineers) – Transport (ICE) and Transportation and Research Part A: Policy and Practice (Elsevier).

Other staff news

Ms Deborah Mifsud and **Ms Thérèse Bajada** have continued to support the MATSEC Boards for Geography and Environmental Studies.

Ms Margaret Camilleri Fenech was part of the evaluation committee for the 2016 Sustainable Industry Award supported by the Ministry for the Economy, Investment and Small Businesses (MEIB). The Cleaner Technology Centre was once again asked to assist in this award.

Ms Margaret Camilleri Fenech also supported the organization of a seminar *Sustainability in Industry*, organised by the Cleaner Technology Centre at the Palace Hotel, Sliema. The seminar hosted a number of speakers both from the industry, the Chamber of Commerce and the newly formed Environment and Resources Authority (ERA).

Prof. Maria Attard was invited to deliver the following talks/keynotes:

The Mediterranean – the role of ports and transport infrastructures for sustainable development. Invited keynote at the International Conference on Urban Transit and Sustainable Networks (UTSN) organised by the University of Palermo and IEREK, Palermo, Sicily, Italy. 25-27 October 2017.

Principles of Sustainable Development and Planning Invited speaker at the Conference entitled Planning for Today and Tomorrow organised by the Planning Authority, Malta, St Paul's Bay, Malta. 12th -13th October 2017.

... and what about our mobility? Invited TEDx University of Malta talk, Valletta, Malta. 7th April 2017. Available at <https://www.youtube.com/watch?v=WNbBt2P7wkc>

Interactions of transport and land use Invited guest lecturer at TU Munich Master in Transport, Technical University of Munich, Munich. 2 November 2016.

Reactions to the National Transport Strategy and Master Plan Invited speaker at the Seminar entitled National Transport Strategy, What Next? organised by the Malta Chamber of Commerce, Enterprise and Industry, Valletta, Malta. 26 October 2016.

Prof. Maria Attard co-edited two Journal Special Issues:

Attard, M., Ison, S.G., Emberger, G. (2018) Transport Policy and Planning. Journal Special Issue in Case Studies for Transport Policy Vol. 6.

Brůhová Foltýnová, H., Attard, M., Melo, S. (2018) The role of planning towards sustainable urban mobility. Journal Special Issue in European Transport Research Reviews 10:38.

The Director of the Institute **Prof. Maria Attard** continued to serve as member of a number of Boards and Committees during this year. These included

- Member of the newly set up **Environment and Resources Authority (ERA)** Board, Malta
- Evaluator for the **European Research Council (ERC)** Work Programme 2016 and 2018, Brussels, Belgium
- Expert evaluator for the Strategic Research Programmes of the Research Council of the Vrije Universiteit Brussel (VUB), Belgium (2018).
- Expert evaluator for the research programme coordinated by FWO (Research Foundation – Flanders), Call for Lead Research Projects, Belgium (2018).
- Visiting External Examiner, PhD Thesis Nursitihazlin Ahmad Termida, KTH Royal Institute of Technology, Stockholm, Sweden 17-19 April 2017.

Staff Publications for 2016-18

Camilleri-Fenech, M., Oliver-Solà, J., Farreny, R., & Gabarrell, X. (2017) Where do islands put their waste? – A material flow and carbon footprint analysis of municipal waste management in the Maltese islands. *Journal of Cleaner Production*, 195, 1609-1619.

Brůhová Foltýnová, H., Attard, M., Melo, S. (2018) Topical collection on the role of planning towards sustainable urban mobility. (Volume Editors). *European Transport Research Review* 10:38.

Attard, M., Ison, S.G., Emberger, G. (2018) Introduction to the Special Issue Transport Planning and Policy. (Volume Editors). *Case Studies in Transport Policy*, 6.

Boggia, A., Massei, G., Pace, E., Rocchi, L, Paolotti, L., Attard, M. (2018) Spatial multi-criteria analysis for sustainability assessment: a new model for decision making. *Land Use Policy*, 71, 281-292.

Mifsud, D., Attard, M., Ison, S.G. (2017) Old Age. What are the main difficulties and vulnerabilities in the transport environment? In Musselwhite, C. (Ed) *Transport, Travel and Later Life, Transport and Sustainability Vol. 10*, Emerald. Chapter 3.

Attard, M. (2017) The environment in the provision of transport. In Cowie, J. and Ison, S. G. (eds) *The Routledge Handbook of Transport Economics*, Routledge. Chapter 16.

Mifsud, D., Attard, M., Ison, S.G. (2017) To drive or to use the bus? An Exploratory Study of Older People in Malta. *Journal of Transport Geography*, 64, 23-32.

Dingli, A., Attard, M. (2016) VaTIS – a travel information service for the city of Valletta, Malta. *International Journal of Conceptual Structures and Smart Applications. Special Issue on Smart Applications for Smart Cities*, 4(2), 1-15.

Attard, M., Haklay, M., Capineri, C. (2016) The potential of Volunteered Geographic Information (VGI) in future transport systems. *Urban Planning*, 1(4), 6-19.

Dingli, A., Attard, M. (2016) The Valletta Travel Information Service. *Journal of Digital Landscape Architecture*, 1, 243-253.

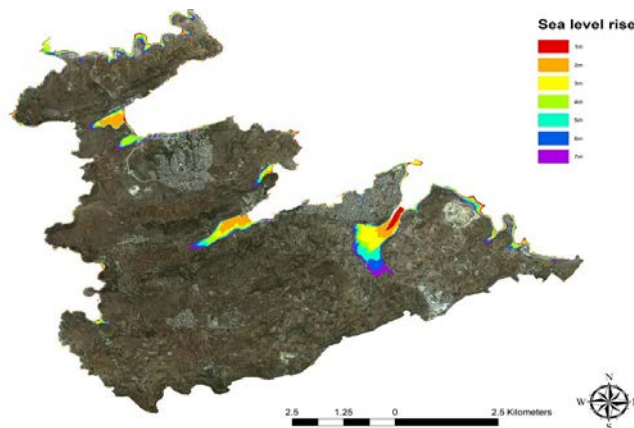
Bajada, T., Mifsud, D. & Di Ciommo, F. (2017) Accessibility as an indicator of transport equity. The case of public transport infrastructure in Malta, and its impact on the elderly, *Xjenza Online - Journal of The Malta Chamber of Scientists, Special Issue: COST 2017*, 5, 49-58.

Bajada, T. & Titheridge, H., 2017. The attitudes of tourists towards a bus service: implications for policy from a Maltese case study. *Transportation Research Procedia*, 25C, 4114–4133.

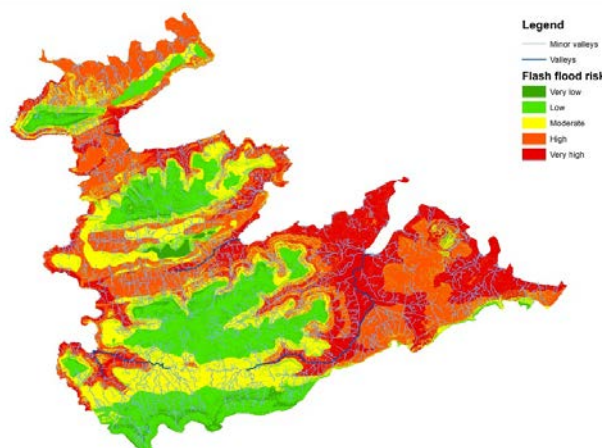
STUDENT RESEARCH

Esther Cortis B.Sc. Hons (Melit.), M.Sc. (Melit.)

THE RISKS OF CLIMATE CHANGE ON MALTA'S AGRICULTURAL LAND: A GIS-BASED APPROACH



GIS model 1: Sea level rise under various scenarios in the northern part of Malta



GIS model 2: Flash flooding under various risk levels in the northern part of Malta

A critical environmental issue that has developed and received a lot of attention is global warming, which is causing severe impacts on different socio-economic activities. Flooding and sea level rise are two devastating effects of global warming. Flash flooding has always been a threat for the Maltese Islands, particularly for the lower parts of the catchment areas and adjacent to valleys. Directive 2007/60/EC emphasized that every member state of the European Union should have flood risk and hazard maps. Considering Malta's population growth and development, a good part of infrastructure, built up and socio-economic activities are located in low lying areas, which can be affected by flash flooding and sea level rise.

Food security happens when all people, at all times, have sufficient, safe and nutritious food. However, climate change is affecting basic human rights. Therefore, such maps can help increase awareness and knowledge among people and farmers about these effects.

Two GIS models were created in this study in order to investigate how much and which farmland can be affected by flash flooding and sea level rise. These two models showed that low lying areas, such as Burmarrad Basin, Pwales Valley, Għadira and Ġnejna, could be affected inversely by these phenomena. This study also tried to engage farmers through map visualization. This research showed that map visualization can help communicate new data in a simpler way, which increases awareness among farmers and help them to better remember.

Furthermore, this study used two databases, Land Parcel Identification Systems (LPIS) and CORINE Land cover (CLC), which showed that LPIS is more accurate than the CLC database. For Malta, the CLC is not very accurate since it has a relatively large minimum mapping unit of 25 hectares. This means that dispersed areas that do not cover more than 25 hectares, which are abundant given the small scale of the island and the variety of land uses in relatively small spaces, are not included in the database. Therefore, the Authorities are highly recommended to create an up-to-date, more detailed and complete land cover map for the Maltese Islands.

This study presented two GIS models which can be improved and updated with new data. Moreover, this research can be considered as the first step in helping farmers to better understand how climate change can affect their farmlands. This could also encourage the Authorities to produce risk and hazard maps to meet the Directive 2007/60/EC. Additionally, knowing and mapping such risks on the agricultural sector is crucial for local food security planning. This is because, such maps can help farmers to make better decisions during farmland investments.



Esther Cortis completed her MSc research in 2018 under the supervision of Prof. Maria Attard

Christian Magrin B.A. Hons (Melit.), M.Sc (Melit.)

WATER USAGE IN THE MALTESE AGRICULTURAL SECTION: A STUDY ANALYSING GROUND WATER IRRIGATION IN THE ISLAND OF GOZO

Water is critical for the agricultural sector and worldwide food provision. It has proved to be the most important factor for both animal husbandry and crop production. Rainfall sustains the majority of crop production, but other water sources are used when crop water requirements are not fully met by rainwater. While a number of different water sources are used for irrigation, groundwater is the most used resource worldwide (GWP, 2012).

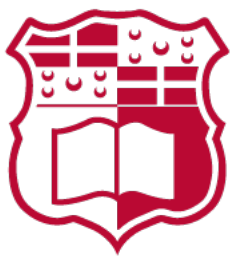
Groundwater use for irrigation developed over the last half a century with technology advancements aiding this development. It led to large scale farming across the globe and consequently improved food security, increased production and served as an economic incentive to farmers. This research posits 'accessibility and availability of groundwater' as the most attractive driver for the use of groundwater for irrigation. On the other hand, rainfall inconsistency is the most determining factor which forces farmers to seek water.

The exploitation of groundwater resources is noted in places with arid characteristics. The over-reliance on groundwater in Malta is reflected in national official statistics. In this research a series of meter readings, reflecting actual groundwater usage showed there is a substantial use of this resource although data varied from national statistics. The reason for the variance between the two sets of data is due primarily to modelled national groundwater usage data. Groundwater usage data based on actual use is still to be compiled from water meters which have only been installed in recent years.

Alternative water sources and the implementation of irrigation management strategies are the best methods to reduce damage on groundwater while ensuring that water for irrigation is being used sustainably. Alternative water sources include the 'new water' that is still being developed in Malta and stored rainwater. The most ideal irrigation management strategy involves the use of irrigation methods which are water saving.



Christian Magrin completed his MSc research in 2017 under the supervision of Prof. Maria Attard



University of Malta
Institute for Climate Change and Sustainable Development
University of Malta, Msida, Malta

T: +356 2340 3403
E: iccsd@um.edu.mt
W: www.um.edu.mt/iccsd