Cátedra de Investigación sobre Movilidad Sostenible

MEMORIA DE ACTIVIDADES
AÑO 2022

http://cims-crtm.transyt-projects.com/

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ANEXOS

1. CONSTITUCIÓN, OBJETO Y GESTIÓN

En octubre de 2004 se firmó el Convenio para la creación de la "CÁTEDRA DE INVESTIGACIÓN SOBRE MOVILIDAD SOSTENIBLE" (CIMS), entre el Consorcio Regional de Transportes de Madrid (CRTM) y el Centro de Investigación del Transporte (TRANSyT), de la Universidad Politécnica de Madrid (UPM)

Tras varias renovaciones, en el año 2020, se firmó un nuevo Convenio, como es preceptivo de acuerdo con la normativa vigente. El Convenio fue publicado en el Boletín Oficial de la Comunidad de Madrid Nº. 253, de 17 de octubre de 2020[1].

Tal y como se menciona en dicho Convenio, esta Cátedra sirve de nexo activo entre las actividades de investigación de TRANSyT y la formación de alumnos de la Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos de la Universidad Politécnica de Madrid, con la experiencia en la planificación, financiación y gestión del transporte metropolitano del CRTM.

Aunque las líneas generales de la actividad de la Cátedra las fija el Convenio de constitución, hay un seguimiento paritario de las actividades por parte de los responsables nominados por cada una de las partes. Los responsables de esta Cátedra, los cuales gestionaron el Convenio durante el año 2022, fueron Francisco Javier Gómez López, Director de Planificación Estratégica y Explotación del CRTM, y Andrés Monzón de Cáceres, Catedrático de Ingeniería del Transporte de la UPM.

Por su parte, el Comité Supervisor estuvo compuesto por Domingo Martín Duque, Jefe del Área de Estudios y Planificación del CRTM, Elena Tarruella Vidal, Jefa del Área de Transportes Interurbanos del CRTM, y María Eugenia López Lambas, Profesora del Departamento de Transporte, Territorio y Urbanismo de la UPM.

Finalmente, esta memoria fue realizada por Abid Al Akioui Sanz y Antonio Manso Barrio, ambos Investigadores de TRANSyT financiados por la CIMS.

[1] Consejería de Transportes, Movilidad e Infraestructuras. CONVENIO de colaboración de 18 de agosto de 2020, entre el Consorcio Regional de Transportes de Madrid y la Universidad Politécnica de Madrid, para el desarrollo de la Cátedra de Investigación en Movilidad Sostenible.

2. OBJETIVOS Y REUNIONES

El objetivo de la Cátedra de Investigación Sobre Movilidad Sostenible es servir de nexo entre la actividad investigadora del Centro de Investigación del Transporte y la actividad de planificación y operación del transporte y la movilidad del Consorcio Regional de Transportes de Madrid. Asimismo, complementar la formación de los alumnos de la Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos en materia de transporte urbano y movilidad.

TRANSyT mantendrá, con el soporte de la Cátedra, una línea de investigación en *Movilidad Urbana Sostenible*, financiando la dedicación de alumnos de posgrado y doctorandos a esta materia, y contando con la información necesaria para el desarrollo de la investigación en temas relacionados con el transporte público y la movilidad, en particular de la Comunidad de Madrid.

Por otra parte, la orientación de los trabajos permitirá formar a personas en el ámbito de los objetivos de la Cátedra, así como apoyar las tareas de planificación y estudio del Consorcio Regional de Transportes de Madrid.

Durante el año 2022, el Comité Supervisor ha mantenido varias reuniones y establecido contactos para la realización de las actividades de la Cátedra que se señalan en los siguientes epígrafes de la memoria. TRANSyT y el CRTM han colaborado en actividades de formación y participado en diversas jornadas y conferencias. En particular, estas colaboraciones se refieren a los ámbitos de la movilidad urbana, nuevos modos de transporte, regulación y accesibilidad, etc.

Además, se han seleccionado los alumnos becados que han realizado prácticas en distintos departamentos del CRTM. También se ha colaborado en el seguimiento y evaluación de competencias adquiridas y resultados de aprendizaje, en relación con las titulaciones oficiales impartidas en la Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos de la Universidad Politécnica de Madrid.

Por último, toda la información relacionada con la Cátedra de Investigación sobre Movilidad Sostenible (CIMS) se encuentra disponible en la página web siguiente http://cims-crtm.transyt-projects.com/.

3. ACTIVIDADES DE FORMACIÓN

3.1. Becas para estancias formativas en el CRTM

Como parte de las actividades previstas en el Convenio, se encuentra la dotación de becas a tiempo parcial, destinadas a alumnos de la E.T.S.I. de Caminos, Canales y Puertos que desarrollen labores de apoyo al Consorcio en su sede. Los alumnos becados colaboran en las áreas de *Estudios y Planificación* y *Transportes Interurbanos* del CRTM. A lo largo del año 2022, esta actividad fue desarrollada por los siguientes alumnos:

- **Javier Carrasco Gil**, octubre a diciembre.
- **Héctor Echávarri Maestu**, febrero a junio.
- **Marina Iniesta Oporto**, enero a abril.
- **Andrea Palomar Expósito**, enero.
- **Natalia Peña Salas**, octubre a diciembre.

3.2. Becas para la formación de investigadores en TRANSyT

Los estudiantes que disfrutaron de becas de formación realizando actividades de investigación relacionadas con los objetivos de la Cátedra en 2022 son los siguientes:

- **Aitor Acuriola García**, marzo a julio.
- **Marta Babiano Mayoral**, julio a septiembre.
- **María Luz Brownrigg-Gleeson Martínez**, enero a julio y septiembre a diciembre.
- **Alberto de Carlos González Gómez**, enero a noviembre.
- **Silvia Hernández Olea**, febrero a julio y octubre a noviembre.
- **Carlos López Caballero**, junio a septiembre.
- **Antonio Manso Barrio**, enero a junio.
- **Candela Martín Blanco**, enero a noviembre.
- **Patricia Morcillo Sanz**, junio a septiembre.
- **Ana María Rivadeneira Muñoz**, marzo a diciembre.

3.3. Trabajos Fin de Grado (TFG)

A continuación, se detallan los Trabajos Fin de Grado (TFG) que han contado con la colaboración del CRTM o que abordan temas relacionados con la movilidad en la Comunidad de Madrid, los cuales se recogen en el Anexo I.

Grado en Ingeniería Civil:

- Plan de Bajas Emisiones para Torrejón de Ardoz. Alumna: **Adriana Marcel Crescente Noriega**. Tutora: Natalia Sobrino.
- Estudio de Zona de Bajas Emisiones en el municipio de San Sebastián de los Reyes (Madrid). Alumno: **Javier Jordán Flores**. Tutora: Natalia Sobrino.

Grado en Ingeniería Civil y Territorial:

- Plan Parcial del Sector S.U.P – R2 "Aldovea" Torrejón de Ardoz (Madrid). Alumno: **Javier Alcolea Herreros**. Tutor: Cristina López.
- Plan Parcial del Sector SUP 2.3. "Arroyo del Arcipreste" de Majadahonda. Alumno: **Ignacio Cepeda Bajo**. Tutor: Cristina López.

3.4. Trabajos Fin de Máster (TFM)

A continuación, se detallan los Trabajos Fin de Máster (TFM) que han contado con la colaboración del CRTM o que abordan temas relacionados con la movilidad en la Comunidad de Madrid, los cuales se recogen en el Anexo II.

Máster Universitario en Ingeniería de Caminos, Canales y Puertos:

- Characterisation of Cycling Infrastructure Needs in terms of potential usage. Case Study of Madrid. Alumna: **María Guadalupe Aranda Sánchez**. Tutores: Andrés Monzón y Benjamin Büttner.
- Modelo dinámico de optimización de reparto de paquetería a través de Metro. Alumna: **Cristina Arribas Rey**. Tutores : Andrés Monzón y Rafael Villa.
- Estudio de reordenación del transporte público en el barrio de El Cañaveral. Alumno: **Víctor Bernabé Carte**. Tutora: María Eugenia López.
- Establecimiento de ZBE en Pozuelo de Alarcón, Madrid. Alumno: **Diego Corros Martínez**. Tutora: María Eugenia López.
- Estudio y análisis de los cambios en los hábitos de movilidad de los usuarios habituales del transporte público en la Comunidad de Madrid antes y después de la pandemia. Alumno: **Karim Lamarty Bélica**. Tutora: María Eugenia López.
- Modelo explicativo de la demanda de la movilidad a los campus universitarios de la Comunidad de Madrid. Actuaciones en el campus de Ciudad Universitaria. Alumno: **Antonio Manso Barrio**. Tutor: Andrés Monzón.
- Estrategias para la mejora de la accesibilidad para personas mayores de 65 años en el distrito de Retiro (Madrid). Alumno: **Carlota Manzanares Bennet**. Tutora: Rosa Arce.
- Estudio de indicadores de estrategias de mejora de la inclusión social a nivel urbano. Aplicación a dos barrios de Madrid. Alumno: **Fernando Ramos Ramírez**. Tutora: María Eugenia López.
- Estrategias de mejora de la accesibilidad peatonal para población mayor a 65 años en el Barrio del Pilar, Madrid. Alumno: **Adrián Vera Sánchez**. Tutora: Rosa Arce.

Máster Universitario en Sistemas de Ingeniería Civil:

- Impacto del COVID-19 en el uso de la bicicleta en Madrid. Caso de estudio BiciMAD. Alumna: **Ana María Rivadeneira Muñoz**. Tutor: Andrés Monzón.

3.5. Tesis Doctorales

A continuación, se detallan las Tesis Doctorales defendidas, recogidas en el Anexo III.

Doctorado en Sistemas de Ingeniería Civil:

- **Alessandra Boggio Marzet** - *Strategies to improve efficiency and sustainability of last-mile delivery in urban settings. A holistic perspective*, defendida el 4 de noviembre de 2022, bajo la dirección de **Andrés Monzón**. La tesis analiza las operaciones de distribución urbana de última milla bajo distintas perspectivas, con el objetivo de mejorar su eficiencia y sostenibilidad reduciendo los impactos negativos sobre las ciudades y los ciudadanos. A partir de un caso de estudio llevado a cabo en Madrid, se analizan las características operativas y energéticas de las operaciones de distribución en distintos contextos urbanos, y se proponen diferentes medidas de actuación bajo una perspectiva *multi-criteria* y *multi-stakeholder*.
- **Raky Julio Castillo** - *Explanatory factors for improving performance on bike-sharing systems*, defendida el 14 de noviembre de 2022, bajo la dirección de **Andrés Monzón**. La tesis realiza un estudio a detalle de la evolución del sistema de bicicletas de Madrid, BiciMAD. Identifica en profundidad la influencia del rendimiento de los elementos del sistema sobre la satisfacción del usuario, aplicando una nueva metodología y cuantifica el incremento en la frecuencia de uso en función de los niveles de satisfacción identificados.
- **Carlos Romero Morales** - *Perceived quality of suburban bus and rail services. Role of real-time information*, defendida el 30 de noviembre de 2022, bajo la dirección de **Andrés Monzón** y **Clara Zamorano**. La tesis tiene como objetivo conocer cómo la información en tiempo real puede aumentar la calidad percibida de los distintos modos de transporte público metropolitanos, partiendo de las necesidades de información de los viajeros. Para ello, se toman como caso de estudio dos servicios de transporte público en la Comunidad de Madrid: Cercanías y un operador de autobús (Interbús).

3.6. Cursos y seminarios

A continuación, se detallan los cursos y seminarios organizados en 2022 que contaron con la colaboración del CRTM, los cuales se recogen en el Anexo IV.

Challenges of urban mobility. Universidad Politécnica de Madrid. 4 de abril de 2022.

- Seminario impartido por Prof. Susan Handy, del Department of Environmental Science and Policy University de la Universidad de California en Davis. La Profesora Handy es conocida internacionalmente por sus investigaciones sobre las relaciones entre el transporte y los usos del suelo, especialmente el impacto del diseño de barrios en el comportamiento de los viajes, y sobre las estrategias para reducir la dependencia del automóvil.

Key drivers for optimal operation of public transport systems. Universidad Politécnica de Madrid. 20 de junio de 2022.

- Seminario impartido por el Dr. Sergio Jara, de la Universidad de Chile, de reconocido prestigio, especialmente en los campos de la microeconomía del transporte público, la evaluación de proyectos de transporte y el precio del transporte.

Urban Mobility solutions for liveable cities: the challenge of Low Emission Zones. Universidad Politécnica de Madrid. 6 a 8 de octubre de 2022.

- Seminario multidisciplinar de tres días de duración coordinado por Andrés Monzón y Amor Ariza, en el marco de la alianza EELISA, para identificar y diseñar soluciones para la movilidad urbana en el contexto de la Zona de Bajas Emisiones de Madrid. Además de los coordinadores, participaron en este seminario Miguel Navarro, María Eugenia López, Belén Martín, Andrea Alonso y Julio Soria.

4. ACTIVIDADES DE DIFUSIÓN Y TRANSFERENCIA DE CONOCIMIENTO

4.1. Jornadas de divulgación técnica y tecnológica

A continuación, se detallan la jornadas de divulgación técnica y tecnológica organizadas en 2022, las cuales se recogen en el Anexo V.

Jornada de Movilidad Sostenible. Madrid, España. 4 de mayo de 2022.

- Los servicios de movilidad compartida y la movilidad como servicio (MaaS - Mobility as a Service). Mesa redonda moderada por Andrés Monzón y Francisco Javier Gómez.

UPMday 2022. Madrid, España. 17 y 18 de mayo de 2022.

- Presentación de las actividades relacionadas con la movilidad y el transporte realizadas en el Centro de Investigación del Transporte por María Eugenia López.

4.2. Participación en congresos nacionales e internacionales

A continuación, se detallan las aportaciones a congresos nacionales e internacionales realizadas en 2022, las cuales se recogen en el Anexo VI.

Transportation Research Board 101st Annual Meeting. TRB 2022. Washington D. C., Estados Unidos. 9 a 13 de enero de 2022.

- Aguilera-García, Á., Gomez, J., Días, F. F., Bhat, C. R., & Vassallo, J. M. Modeling the characteristics of ridesourcing trips in Madrid, Spain.
- Aguilera-Garcia, Á., Gomez, J. & Vassallo, J. M. Who drives a shared car? Factors determining the adoption and frequency of use of carsharing in the European context.
- Gonzalez, J. N., Gomez, J., & Vassallo, J. M. Do parking management and Low Emission Zones encourage environmentally friendly vehicles or sustainable modes of transport?

4th Meeting on Transport Economics and Infrastructure. Barcelona, España. 28 de enero de 2022.

- Rangel, T., González, J. N., Gomez, J., Romero, F., & Vassallo, J. M. An empirical analysis of UBER fares: evidence from Madrid.

12th International Steering Committee for Transport Survey Conferences ISCTSC 2022. Travel Survey and Big Data: how to make the best of both worlds. Lisboa, Portugal. 20 a 25 de marzo de 2022.

- Julio, R., & Monzon, A. Using open big data sources for customizing bike sharing survey delivering and improving response rate.
- Manso-Barrio, A., Moya-Gómez, B., Monzón, A., & Balsero, L. University Mobility Survey 2021 in Madrid Region (Spain): Facing the challenge of getting responses during the COVID-19 pandemic.

IV Campus Científico del Foro de Ingeniería del Transporte. FIT 2022. Cercedilla, España. 25 y 26 de mayo de 2022.

- Ariza-Álvarez, A., Soria-Lara, J. A., & Arce-Ruiz, R. M. A participatory and adaptive scenario-building approach to address disruptive futures and Land Use and Transport (LUT) planning.
- Elizondo-Candanedo, R. F., Soria-Lara, J. A., & Arranz-López, A. The impact of Information and Communication Technologies on social inequalities originated by accessibility planning.
- González, J. N., Vassallo, J. M., & Gómez, J.Impacto de la regulación del aparcamiento en superficie y las zonas de bajas emisiones en la consecución de objetivos de movilidad sostenible.

25th European Conference on Mobility Management. BE INSPIRED by... Sustainable mobility! ECOMM 2022. Turku, Finlandia. 31 de mayo a 2 de junio de 2022.

- López-Lambas, M. E., & López, I. Mapping the potential for implementing a MaaS service in Madrid Metropolitan Area.
- Monzon, A. Evolution of Madrid bike-sharing system BiciMAD and impact on mobility patterns.

10th Symposium of the European Association for Research in Transportation. hEART 2022. Lovaina, Bélgica. 1 a 3 de junio de 2022.

- Julio, R., Monzon, A., & Susilo, Y. O. Key e-bike-sharing system attributes. A combination of explicit and implicit methods for user satisfaction assessment.

The Centennial Congress of the International Geographical Union. UGI-IGU 2022. Le temps des géographes - Time for geographers. París, Francia. 18 a 22 de julio de 2022.

- Vega-Gonzalo, M., Christidis, P. and & Gómez, J. The role of shared mobility services in post-pandemic urban mobility.

16th NECTAR International Conference. NECTAR 2022. Mobilizing Justice: Moving toward action for an equitable transportation future. Toronto, Canadá. 20 a 22 de julio de 2022.

- Boggio-Marzet, A., Villa, R., & Monzon, A. Towards sustainable alternatives for e-commerce delivery in urban area.
- Lopez-Carreiro, I., & Monzon, A. Planning sustainable MaaS strategies: integration of built environment and behavioural factors.
- Monzon, A., & Manso, A. Challenges after COVID-19 to recuperate sustainable modes trips on 14 major university campuses in the Madrid Region.
- Soria-Lara, J. A., & Ariza-Álvarez, A. Coping with uncertainty: A proposal of an adaptive scenario-building approach for transport policymaking.

6th Conference on Sustainable Urban Mobility. CSUM 2022. Smart Energy for Smart Transport. Skíathos, Grecia. 31 de agosto a 2 de septiembre de 2022.

- Royo, B., Politaki, D., Gonzalez, J. N., & Batalla, A. An Emerging and Innovation Transport Solution: Towards Transforming Parking Lot to Urban Consolidation Centre: Madrid Living Lab.

AIIT 3rd International Conference. TIS ROMA 2022. New Scenarios for Transport infrastructure and systems: transition to inclusivity, resilience and sustainability. Roma, Italia. 15 y 16 de septiembre de 2022.

- López Soler, J. R., Christidis, P., & Vassallo, J. M. Evolution of teleworking and urban mobility changes driven by the COVID-19 pandemic across European cities.
- Vega-Gonzalo, M., Christidis, P., & Gómez, J. Car Ownership and Post-COVID Urban Mobility across European Cities.

Joint Meeting JRC-NECTAR Cluster 4 & 6. Mobility and Accessibility after the Pandemic: Emerging Trends and Policy Challenges. Sevilla, España. 5 a 7 de octubre de 2022.

- Al-Akioui, A., & Monzon, A. Telematic activities and their influence on mobility after the COVID-19 pandemic in the Region of Madrid.
- Vega-Gonzalo, M., Gomez, J., & Christidis, P. Shifting trends in car use and car ownership: analysis of the effect of COVID-19 in urban areas of the EU.

9th Transport Research Arena. TRA 2022. Moving Together. Lisboa, Portugal. 14 a 17 de noviembre de 2022.

- Aguilera-García, A., Gómez, J., Antoniou, C., & Vassallo, J. M. Modelling the determinants of adoption and frequency of use of carsharing in the cities of Madrid and Munich.
- Al-Akioui, A., Monzon, A., & Martin, C. Mobility patterns in healthcare centres. Case Study: La Paz University Hospital (Madrid, Spain).
- Gómez, J., Aguilera-García. A., Días, F., Bhat, C.R., & Vassallo, J. M. A GHDM analysis to explore individuals´ adoption and frequency of use of ride-hailing in a European city: the case of Madrid, Spain.

- Gonzalez, J. N., Gomez, J., & Vassallo, J. M. The use of Parking Management and Low Emissions Zones to encourage cleaner vehicles and sustainable modes of transport.
- Lopez-Carreiro, I., & Monzon, A. Exploring travellers' willingness to adopt MaaS in two European metropolitan areas.
- Monzon, A., Cortez, A., Beltran, M., & Brownrigg-Gleeson, M. L. Evaluation approach for scaling up urban mobility measures on TEN-T urban nodes: the case of Madrid.
- Royo, B., Politaki, D., Gonzalez, J. N., & Batalla, A. Digital Twin opportunities and benefits in last-mile logistics for Madrid value case.
- Tarriño-Ortiz, J., Gomez, J., Soria-Lara, J. A., & Vassallo, J. M. Analyzing the impact of Low Emission Zones on modal shift.
- Vega-Gonzalo, M., Aguilera-García, A., Gómez, J., & Vassallo, J. M. Analyzing Individuals' Preferences and Usage Patterns of Traditional Taxi, E-hailing and Ride-hailing Users: a GSEM Approach.

4.3. Publicaciones de carácter científico

A continuación, se detallan las publicaciones científicas realizadas en 2022, las cuales se recogen en el Anexo VII.

- Aguilera-Garcia, Á., Gomez, J., Antoniou, C., & Vassallo, J. M. (2022). **Behavioral factors impacting adoption and frequency of use of carsharing: A tale of two European cities**. Transport Policy, vol. 123, 55-72. doi: 10.1016/j.tranpol.2022.04.007
- Aguilera-Garcia, Á., Gomez, J., Velazquez, G., & Vassallo, J. M. (2022). **Ridesourcing vs. traditional taxi services: Understanding users' choices and preferences in Spain**. Transportation Research Part A: Policy and Practice, vol. 155, 161-178. doi: 10.1016/j.tra.2021.11.002
- Arce Ruiz, R. M. (2022). **Tendencias sostenibles en la movilidad urbana**. El desarrollo urbano en la era Pos-Covid (pp. 45-70). ISBN: 978-989-9060-40-1
- Arias-Molinares, D., García-Palomares, J. C., & Gutiérrez, J. (2022). **Micromobility services before and after a global pandemic: impact on spatio-temporal travel patterns**. International Journal of Sustainable Transportation, 1-16. doi: 10.1080/15568318.2022.2147282
- Arias-Molinares, D., & Gutiérrez, J. (2022). **Las nuevas formas de movilidad en las ciudades: de los servicios de movilidad compartida a la movilidad como servicio**. Territorios comunes, miradas compartidas: aproximaciones desde la Geografía (pp. 149-164). ISBN: 978-84-1118-062-7
- Arias Molinares, D., Gutiérrez, A., & Ocaña Ortiz, R. V. (2022). **Exploración del impacto de la pandemia COVID 19 en los sistemas públicos de bicicletas compartidas: los casos de Madrid (BiciMAD) y Buenos Aires (EcoBici)**. Revista transporte y territorio, 27. doi: 10.34096/rtt.i27.12218

- Ariza-Álvarez, A., Soria-Lara, J. A., & Aguilera-Benavente, F. (2022). **Planning Adaptive Strategies for Urban Transport and Land Use using Scenario-Building**. Transportation Research Procedia, 60, 274-281. doi: 10.1016/j.trpro.2021.12.036
- Arranz-López, A., Mejía-Macias, L. M., & Soria-Lara, J. A. (2022). **E-shopping and walking accessibility to retail**. Transportation Research Procedia, 60, 298-305. doi: 10.1016/j.trpro.2021.12.039
- Arranz-López, A., & Soria-Lara, J. A. (2022). **ICT use and spatial fragmentation of activity participation in post-COVID-19 urban societies**. Land Use Policy, 120, 106302. doi: 10.1016/j.landusepol.2022.106302
- Casquero, D., Monzon, A., García, M., & Martínez, O. (2022). **Key Elements of Mobility Apps for Improving Urban Travel Patterns: A Literature Review**. Future Transportation, 2(1), 1-23. doi: 10.3390/futuretransp2010001
- García Palomares, J. C., & Arias Molinares, D. (2022). **Nuevas formas de movilidad en la ciudad**. El mundo visto de las ciudades (pp. 583-590). ISBN: 978-841-8970-21-4
- Gonzalez, J. N., Gomez, J., & Vassallo, J. M. (2022). **Do urban parking restrictions and Low Emission Zones encourage a greener mobility?** Transportation Research Part D: Transport and Environment, vol. 107, 103319. doi: 10.1016/j.trd.2022.103319
- Jara-Diaz, S., Monzon, A., Cascajo, R., & Garcia-Martinez, A. (2022). **An international time equivalency of the pure transfer penalty in urban transit trips: Closing the gap**. Transport Policy, 125, 48-55. doi: 10.1016/j.tranpol.2022.04.019
- Julio, R., & Monzón, A. (2022). **Long term assessment of a successful e-bike-sharing system. Key drives and impact on travel behaviour.** Case Studies on Transport Policy, vol. 10 (2), 1299-1313. doi: 10.1016/j.cstp.2022.04.019
- Julio, R., Monzon, A., & Susilo, Y. O. (2022). **Identifying key elements for user satisfaction of bike-sharing systems: a combination of direct and indirect evaluations**. Transportation 2022, 1-32. doi: 10.1007/S11116-022-10335-3
- Mateos-Mínguez, P., Arranz-López, A., & Soria-Lara, J. A. (2022). **Analysing the spatial impacts of retail accessibility for e-shoppers' groups**. Transportation Research Procedia, 60, 544-551. doi: 10.1016/j.trpro.2021.12.070
- Nuñez Corcuera, B., Navarro-Ligero, M. L., Boldo, E., Sarigiannis, D., Gotti, A., Garcia Dos Santos, S., & Soria-Lara, J. A. (2022). **A participatory scenario building application for greener, smarter, and healthier cities: the case of Madrid, Spain**. Fresenius Environmental Bulletin, 31(08A/2022), 8355-8360
- Ramírez Saiz, A., Alonso, A., Jiménez Martín, D., & Lamíquiz, P. (2022). **Can Proximal Environments Prevent Social Inequalities Amongst People of All Ages and Abilities? An Integrative Literature Review Approach.** Sustainability, 14(19), 12911. doi: 10.3390/su141912911

- Tarriño-Ortiz, J., Gomez, J., Soria-Lara, J. A., & Vassallo, J. M. (2022). **Analyzing the impact of Low Emission Zones on modal shift**. Sustainable Cities and Society, vol. 77, 103562. doi: 10.1016/j.scs.2021.103562

5. ACTIVIDADES DE FOMENTO DE LA I+D+i

Por último, se recogen los encuentros de expertos para el desarrollo de la transmisión de la I+D+i y otros eventos relacionados con los objetivos de la Cátedra, los cuales se recogen en el Anexo VIII.

Decarbonising mobility: the future of transport infrastructure financing. París, Francia. 22 de febrero de 2022.

- Participación de José Manuel Vassallo en la mesa redonda titulada "How to include sustainable develpment issues in investment choices" presentando "Funding and Financing to Ensure Sustainable Mobility".

Hacia dónde va la movilidad del futuro. Madrid, España. 24 de febrero de 2022.

- Entrevista de EXPANSIÓN y EL MUNDO a María Eugenia López.

Mesa de análisis de elEconomista. Madrid, España. 3 de marzo de 2022.

- Participación de José Manuel Vassallo en la mesa redonda de análisis donde cinco expertos del sector analizan el anteproyecto de la Ley de Movilidad Sostenible.

Mesa de debate de EXPANSIÓN. Madrid, España. 26 de abril de 2022.

- Participación de José Manuel Vassallo en la mesa de debate de expertos sobre la movilidad inteligente y sostenible.

La movilidad eléctrica en España, a debate. Madrid, España. 13 de julio de 2022.

- Participación de María Eugenia López en el debate de expertos organizado por elDiario donde se trataron temas relacionados con la movilidad eléctrica.

Si tuviéramos que crear una ciudad de cero hoy, ¿cómo sería? Madrid, España. 20 de julio de 2022.

- Participación de Andrés Monzón en el podcast de expertos organizado por El MUNDO en el cual se debatió sobre el diseño de las ciudades a partir de la arquitectura, la energía, la movilidad, el trabajo y la inteligencia artificial.

Mesa redonda de ACCIONA y LA RAZÓN. Madrid, España. 20 de julio de 2022.

- Participación de José Manuel Vassallo en la mesa redonda de expertos del sector, donde conversaron sobre la forma de mejorar la movilidad en la Comunidad de Madrid para crear un transporte conectado, compartido y sostenible.

Zonas de Bajas Emisiones: ¿llegarán en 2023? Madrid, España. 21 de octubre de 2022.

- Entrevista de LA RAZÓN a María Eugenia López.

ANEXO I

Actividades de formación:

Trabajos Fin de Grado (TFG)

UNIVERSIDAD
POLITÉCNICA
DE MADRID

PLAN DE BAJAS EMISIONES PARA TORREJÓN DE ARDOZ

ALUMNO:

ADRIANA MARCELA CRESCENTE NORIEGA

TUTORA:

NATALIA SOBRINO VÁZQUEZ

FECHA:

JULIO 2022

ESCUELA:

ESCUELA TÉCNICA SUPERIOR DE INGENIEROS DE CAMINOS, CANALES Y PUERTOS

ESTUDIO DE ZONA DE BAJAS EMISIONES EN EL MUNICIPIO DE SAN SEBASTIÁN DE LOS REYES (MADRID)

AUTOR: JAVIER JORDÁN FLORES

TUTOR: NATALIA SOBRINO VÁZQUEZ

ESCUELA TÉCNICA SUPERIOR DE INGENIERÍA CIVIL

UNIVERSIDAD POLITÉCNICA DE MADRID

POLITÉCNICA

TRABAJO DE FIN DE GRADO

PLAN PARCIAL DEL SECTOR S.U.P. – R2 "ALDOVEA" TORREJÓN DE ARDOZ (MADRID)

Autor: Javier Alcolea Herreros

Tutora: Cristina López García de Leániz

Ingeniería Civil y Territorial – Curso 2021/2022

ETSI CAMINOS, CANALES Y PUERTOS
UNIVERSIDAD POLITÉCNICA DE MADRID

TRABAJO FIN DE GRADO

PLAN PARCIAL DEL SECTOR SUP 2.3. "ARROYO DEL ARCIPRESTE" DE MAJADAHONDA

TOMO I: INFORMACIÓN DEL SECTOR Y SU ENTORNO

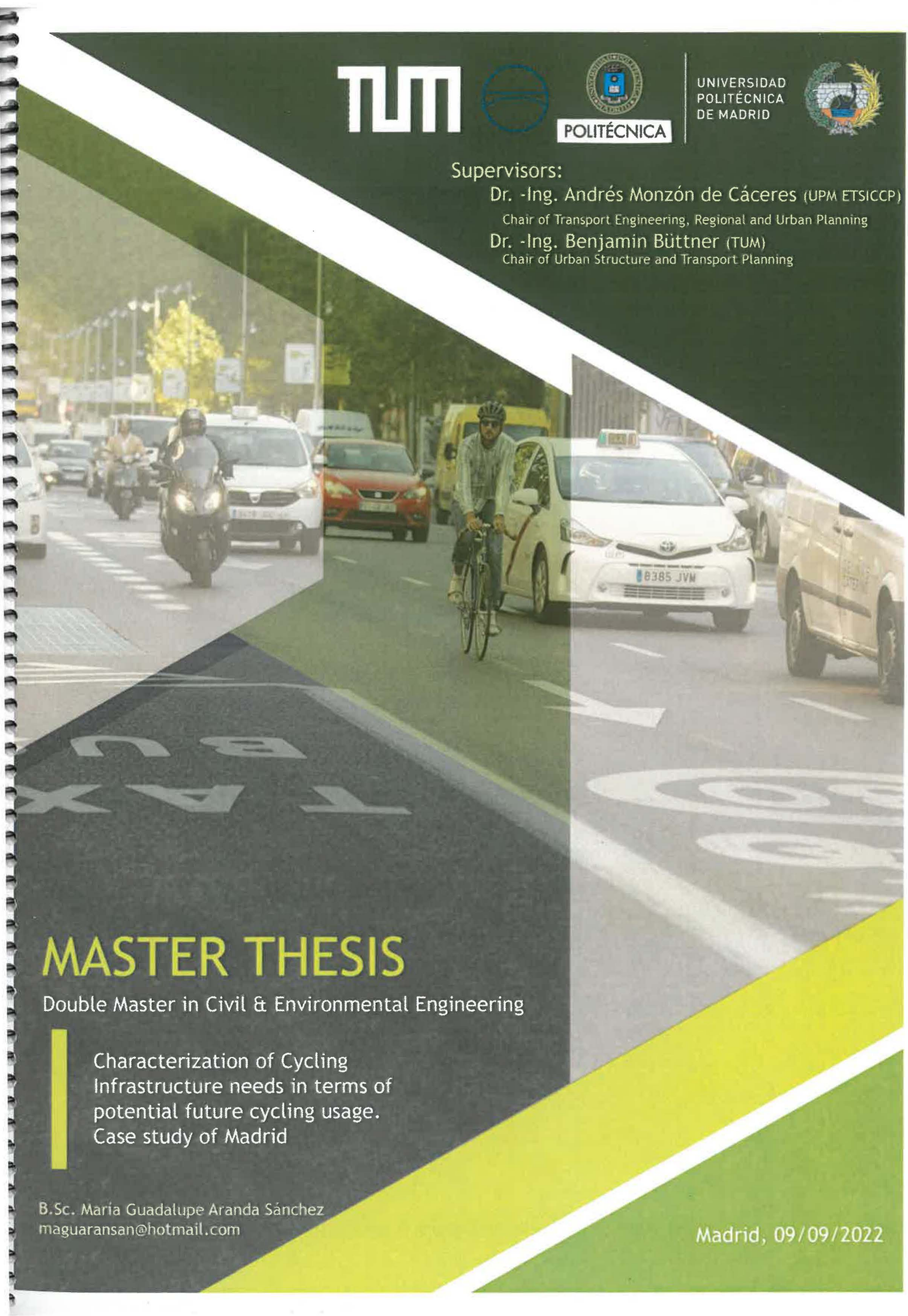
Autor: Ignacio Cepeda Bajo
Tutor: Cristina López García de Leaniz

Curso Académico 2021-2022

ANEXO II

Actividades de formación:

Trabajos Fin de Máster (TFM)



POLITÉCNICA

UNIVERSIDAD POLITÉCNICA DE MADRID

Supervisors:

Dr. -Ing. Andrés Monzón de Cáceres (UPM ETSICCP)

Chair of Transport Engineering, Regional and Urban Planning

Dr. -Ing. Benjamin Büttner (TUM)

Chair of Urban Structure and Transport Planning

MASTER THESIS

Double Master in Civil & Environmental Engineering

Characterization of Cycling Infrastructure needs in terms of potential future cycling usage. Case study of Madrid

B.Sc. Maria Guadalupe Aranda Sánchez

maguaransan@hotmail.com

Madrid, 09/09/2022

UNIVERSIDAD POLITECNICA DE MADRID
ESCUELA TECNICA SUPERIOR DE INGENIEROS DE CAMINOS,
CANALES Y PUERTOS

MODELO DINÁMICO DE OPTIMIZACIÓN DE REPARTO DE PAQUETERÍA A TRAVÉS DE METRO

TRABAJO FIN DE MÁSTER

AUTOR:
CRISTINA ARRIBAS REY

TUTOR: DR. ANDRÉS MONZÓN DE CÁCERES
COTUTOR: DR. RAFAEL VILLA MARTÍNEZ

Madrid, Julio 2022

ETSI CAMINOS, CANALES Y PUERTOS
UNIVERSIDAD POLITÉCNICA DE MADRID

TRABAJO FIN DE MÁSTER

ESTUDIO DE REORDENACIÓN DEL TRANSPORTE PÚBLICO EN EL BARRIO DE EL CAÑAVERAL

Autor: Víctor Bernabé Carte

Tutor: María Eugenia López Lambas

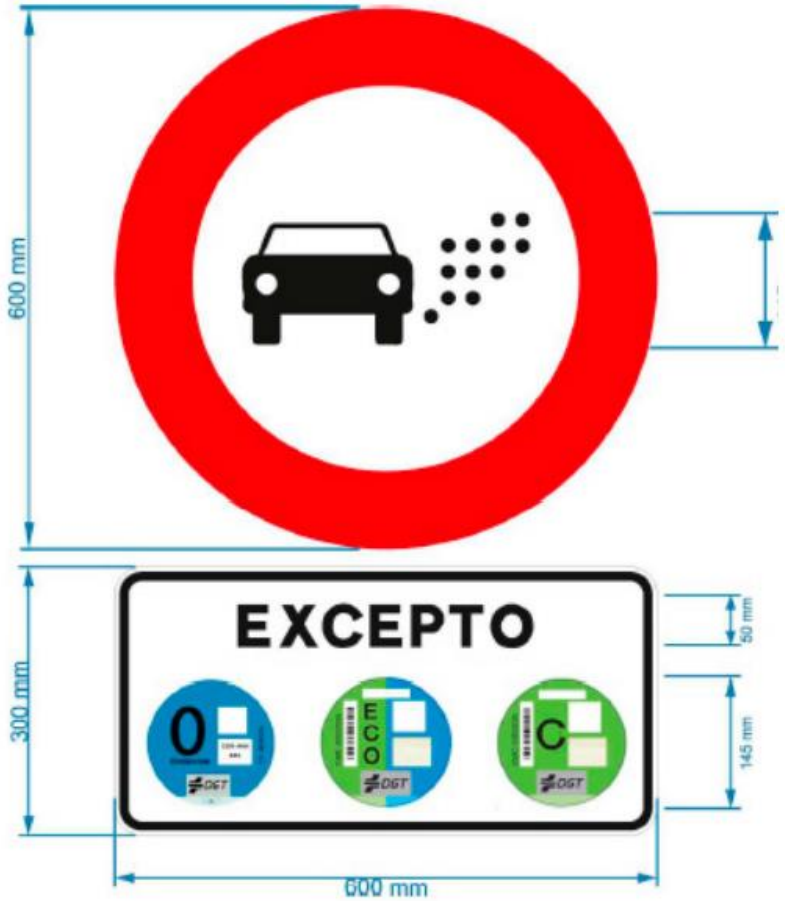
Curso Académico
2021/2022

MASTER EN INGENIERÍA DE CAMINOS, CANALES Y PUERTOS
TRANSPORTES Y SUS INFRAESTRUCTURAS

E.T.S.I CAMINOS, CANALES Y PUERTOS

UNIVERSIDAD POLITÉCNICA DE MADRID

ESTABLECIMIENTO DE ZBE EN POZUELO DE ALARCÓN, MADRID



Tutor: María Eugenia López-Lambas

Autor: Diego Corros Martínez

Máster Universitario en Ingeniería
de Caminos, Canales y Puertos

Curso 2021-2022

ETSI CAMINOS, CANALES Y PUERTOS

UNIVERSIDAD POLITÉCNICA DE MADRID

TRABAJO FIN DE MÁSTER

ESTUDIO Y ANÁLISIS DE LOS CAMBIOS EN LOS HÁBITOS DE MOVILIDAD DE LOS USUARIOS HABITUALES DEL TRANSPORTE PÚBLICO EN LA COMUNIDAD DE MADRID ANTES Y DESPUÉS DE LA PANDEMIA

Tutor: María Eugenia López Lambas

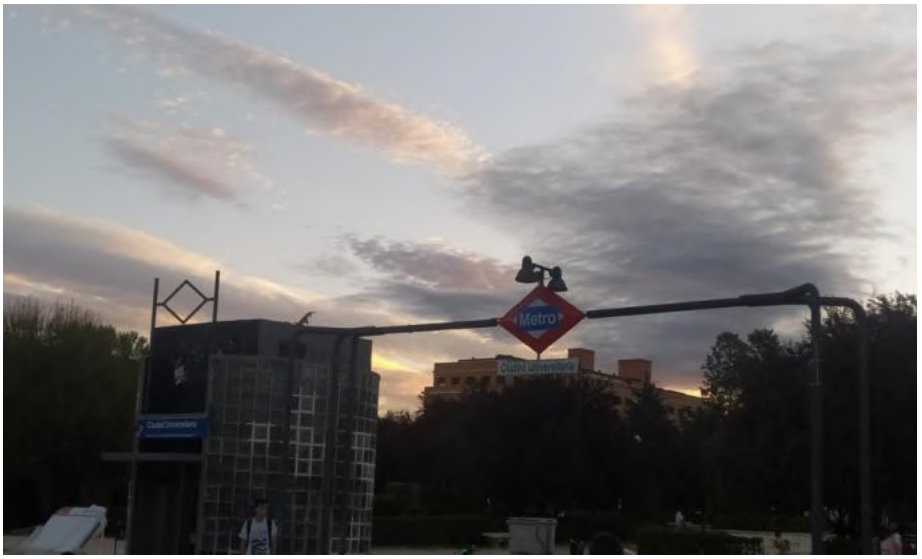
2021-2022

MASTER EN INGENIERÍA DE CAMINOS, CANALES Y PUERTOS
TANSPORTE/MOVILIDAD

ETSI CAMINOS, CANALES Y PUERTOS
UNIVERSIDAD POLITÉCNICA DE MADRID

TRABAJO FIN DE MÁSTER

Modelo explicativo de la demanda de movilidad a los campus universitarios de la Comunidad de Madrid. Actuaciones en el campus de Ciudad Universitaria



Autor: Antonio Manso Barrio

Tutor: Andrés Monzón de Cáceres

Curso Académico
2021/2022

MASTER EN INGENIERÍA DE CAMINOS, CANALES Y PUERTOS
Transportes y sus infraestructuras

E.T.S.I CAMINOS, CANALES Y PUERTOS. UNIVERSIDAD POLITÉCNICA DE MADRID

MÁSTER EN INGENIERÍA DE CAMINOS, CANALES Y PUERTOS

TRABAJO FIN DE MÁSTER

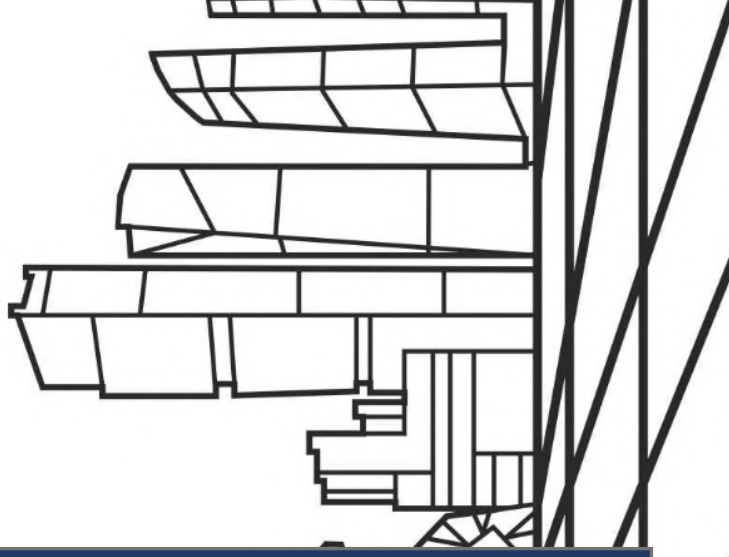
ESTRATEGIAS PARA LA MEJORA DE LA ACCESIBILIDAD PARA PERSONAS MAYORES DE 65 AÑOS EN EL DISTRITO DE RETIRO (MADRID).

PLANIFICACIÓN TERRITORIAL Y URBANISMO

Autora: Carlota Manzanares Bennett

Tutora: Rosa María Arce Ruiz

Madrid, Septiembre 2022



ESTUDIO DE INDICADORES DE ESTRATEGIAS DE MEJORA DE LA INCLUSIÓN SOCIAL A NIVEL URBANO.

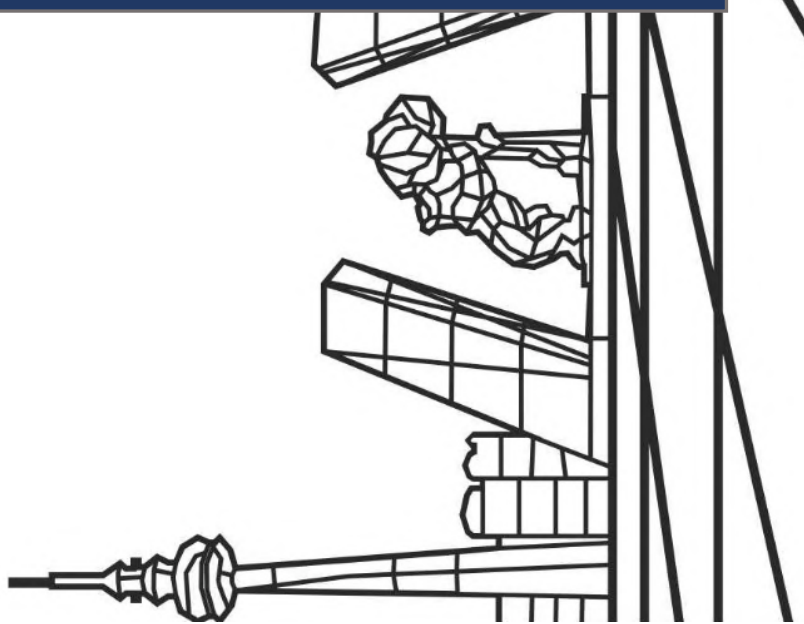
Aplicación a dos barrios de Madrid.

FERNANDO RAMOS RAMÍREZ

TRABAJO FIN DE MÁSTER

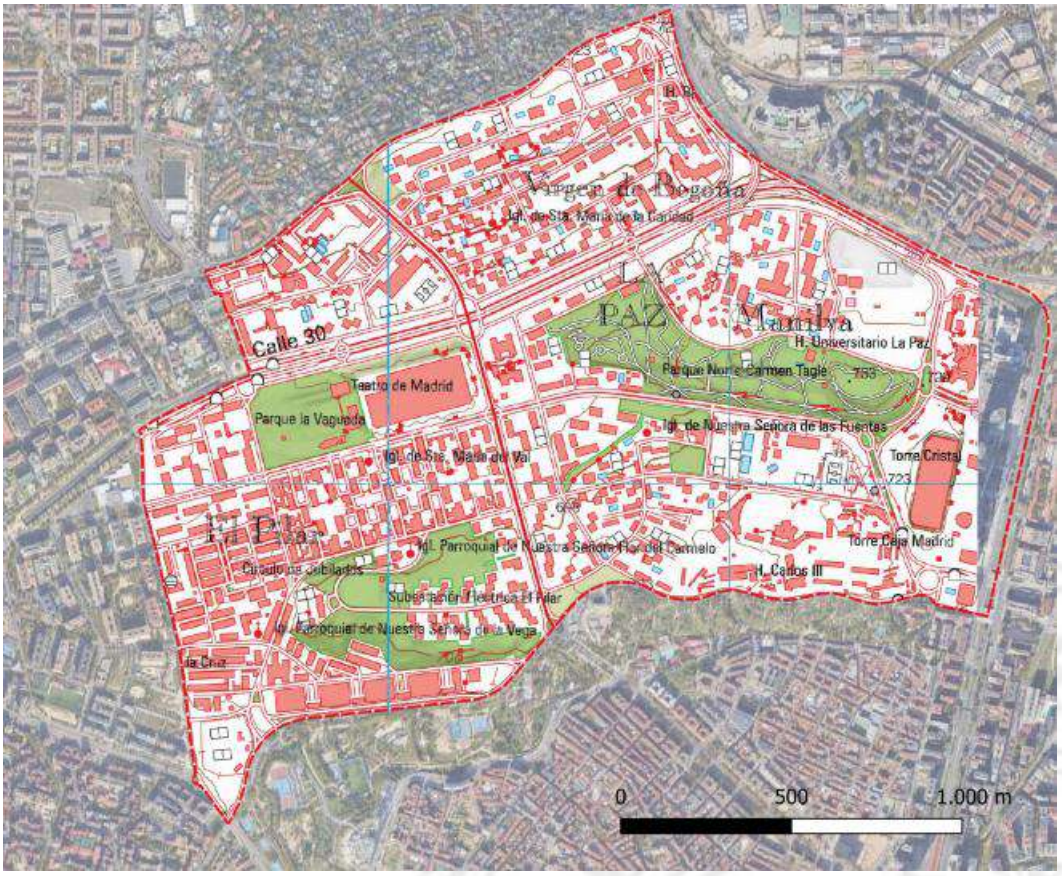
TUTORA: María Eugenia López Lambas

TITULACIÓN: Máster Ingeniero de Caminos, Canales y Puertos. ETSICCP-UPM



ETSI CAMINOS, CANALES Y PUERTOS
UNIVERSIDAD POLITÉCNICA DE MADRID

ESTRATEGIAS DE MEJORA DE LA ACCESIBILIDAD PEATONAL PARA POBLACIÓN MAYOR A 65 AÑOS EN EL BARRIO DEL PILAR, MADRID



Autor: Adrián Vera Sánchez

Tutor: ROSA ARCE RUIZ

UNIVERSIDAD POLITÉCNICA DE MADRID

ESCUELA TÉCNICA SUPERIOR DE INGENIEROS DE CAMINOS, CANALES Y PUERTOS

MÁSTER UNIVERSITARIO EN SISTEMAS DE INGENIERÍA CIVIL

TRABAJO FIN DE MÁSTER

IMPACTO DEL COVID-19 EN EL USO DE LA BICICLETA EN MADRID CASO DE ESTUDIO BICIMAD

ALUMNA

ANA MARÍA RIVADENEIRA MUÑOZ

TUTOR

ANDRÉS MONZÓN DE CÁCERES

MADRID, 2022

ANEXO III

Actividades de formación:

Tesis Doctorales

UNIVERSIDAD POLITÉCNICA DE MADRID

ESCUELA TÉCNICA SUPERIOR

DE INGENIEROS DE CAMINOS, CANALES Y PUERTOS

STRATEGIES TO IMPROVE EFFICIENCY AND SUSTAINABILITY OF LAST-MILE DELIVERY IN URBAN SETTINGS: A HOLISTIC PERSPECTIVE

DOCTORAL THESIS

ALESSANDRA BOGGIO-MARZET

MSc Civil Engineering

Infrastructures and Transportation systems

Madrid, 2022

UNIVERSIDAD POLITÉCNICA DE MADRID

ESCUELA TÉCNICA SUPERIOR DE INGENIEROS DE CAMINOS, CANALES Y PUERTOS

EXPLANATORY FACTORS FOR IMPROVING PERFORMANCE ON BIKE-SHARING SYSTEMS

DOCTORAL THESIS

RAKY JULIO CASTILLO

Civil Engineer
M.Sc. Project Management
M.Sc. in Seismic Engineering

Madrid, 2022

UNIVERSIDAD POLITÉCNICA DE MADRID

ESCUELA TÉCNICA SUPERIOR

DE INGENIEROS DE CAMINOS, CANALES Y PUERTOS

PERCEIVED QUALITY OF SUBURBAN BUS AND RAIL SERVICES

ROLE OF REAL-TIME INFORMATION

DOCTORAL THESIS

CARLOS ROMERO MORALES

Ingeniero de Caminos, Canales y Puertos

Madrid, 2022

ANEXO IV

Actividades de formación:

Cursos y seminarios

https://eelisa.eu/

EELISA is the first alliance of **Higher Education Institutions** from different countries in Europe meant to define and implement a common model of **European engineer** rooted in society.

EELISA on-the-MOVE

Our **aim** is to create an academic and **multidisciplinary environment** to address the **challenge** of reaching **sustainable and inclusive cities through mobility planning.** It will rely on the **interaction** between **students, teachers, researchers, and stakeholders**, through **innovative teaching activities** focused on **creating efficient and technological-oriented solutions.**

1st 2022 Activity
Madrid 4 April

CHALLENGES OF URBAN MOBILITY

Prof. Susan Handy
Department of Environmental Science and Policy University of California at Davis

Dr. Susan Handy is internationally known for her **research** on the relationships between **transportation and land use**, particularly the impact of **neighborhood design** on **travel behavior,** and on strategies for **reducing automobile dependence.** Her recent work includes a series of **studies on bicycling in Davis,** in addition to projects for the **California Air Resources Board** and **Caltrans** on methods for evaluating the **impacts on vehicle travel** of proposed **land development**and **transportation** projects.

SCHEDULE

4 April 2022 Professor Susan Handy
Department of Environmental Science and Policy
University of California at Davis

11.30-13.00	Challenges of urban mobility: the problem of car use and how to deal with it
13:00-13:30	Light Lunch Break
13:30-15:00	Creating low car-dependent cities. International good practices.

Escuela de Ingenieros de Caminos, Canales y Puertos
C/ Profesor Aranguren, 3
Ciudad Universitaria, Madrid
Sala José Echagaray: 1st floor

EELISA CREDENTIAL

This activity is of **commitment (level 3 impact),** which means that the work carried out will be recognised with a **badge** for your **EELISA Credential**

The EELISA Credential is the **academic recognition of the participation in innovation-based activities** organized by communities such as EELISA on-the-MOVE.

Don´t hesitate and start collecting badges for your credential!

Registration eemove.community@upm.es

https://blogs.upm.es/eemove/

In collaboration with Cátedra de Investigación de Movilidad Sostenible. Master y Doctorado en Ingeneríra de Sistemas Civiles

EELISA European University

POLITÉCNICA

EELISA on-the-MOVE

EELISA is the first alliance of Higher Education Institutions from different countries in Europe meant to define and implement a common model of European Engineer rooted in society

https://blogs.upm.es/eemove/

Our aim is to create and academic and multidisciplinary environment to address the challenge of reaching sustainable and inclusive cities through mobility planning. It will rely on the interaction between students, teachers, researchers and stakeholders, through innovative teaching activities focused on creating efficient and technological-oriented solutions.

Madrid 20-21 June 2022

Key Drivers for Optimal Operation of Public Transport Systems

Prof. Sergio Jara Díaz
Universidad de Chile

Dr. Sergio Jara Díaz is a renown Professor in Transportation, Economics and Mobility, being his fields of research Microeconomics of Public Transportation, Evaluation of Transportation Projects and Strategies for transportation pricing. He currently teaches at the Civil Engineering Department of the Universidad de Chile.

SCHEDULE

20 June 2022
11.00-13.00

Sala José de Echegaray

Conference of Professor Sergio Jara Díaz
Universidad de Chile

21 June 2022
11.00-13.00

Sala Agustín de Betancourt

Mentoring of PhD Sudents regarding Mobility and Transportation

PhD Adriana Cortez
adriana.cortez@upm.es

Escuela de Ingenieros de Caminos, Canales y Puertos
C/Profesor Aranguren, 3
Ciudad Universitaria, Madrid

EELISA CREDENTIAL

This activity is of commitment (level 3 impact), which means that the work carried out will be recognised with a badge for your EELISA CREDENTIAL

The EELISA Credential is the academic recognition of the participation in innovation-based activities organized by communities such as EELISA on-the-MOVE.

Don't hesitate and start collecting your badges for your credential!

Registration:
https://forms.gle/ffE9tCYaMsQ29Crs7

You can also contact us for any questions at
anab.torrejon@gmail.com
Ana Belén Torrejón (EE-Move Coordination)

TRANSyT POLITÉCNICA

CONSORCIO TRANSPORTES MADRID

CIMS

EELISA European University

POLITÉCNICA

EELISA ON-THE-MOVE

EELISA is the first alliance of **Higher Education Institutions** form different countries in Europe meant to define and implement a common model of **European Engineer** rooted in society.

https://eelisa.eu/

https://blogs.upm.es/eemove/

EELISA-on-the-MOVE is a protocommunity belonging to the Universidad Politécnica de Madrid. It aims to create an academic and multidisciplinary environment to address the challenge of reaching sustainable and inclusive cities through mobility planning. It will rely on the interactions between students, teachers, researchers and stakeholders, through innovative teaching activities focused on creating efficient and technological-oriented solutions.

INTERNATIONAL SEMINAR

Madrid 6-8 October

URBAN MOBILITY SOLUTIONS FOR LIVEABLE CITIES:

THE CHALLENGE OF LOW EMISSION ZONES

A three-day intensive multidisciplinary seminar for identifying and designing urban mobility solutions in the context of Madrid Low Emission Zone. The seminar combines both student learning and real-world practice following a community-based learning approach.

PARTICIPANTS

The seminar will involve students and teaching staff from prominent universities of the EELISA network together with stakeholders from multiple disciplines, such as Urban Planning, Transport Planning, Civil, Environmental, and Industrial Engineering.

UPM–Universidad Politécnica de Madrid

ITÜ–Istanbul Technical University

BME–Budapest University of Tech. and Econ.

ENPC–École des Ponts ParisTech

OBJECTIVES

Both academic learning and real-world-practice problems will be addressed by proposing specific mobility solutions for environmental and social challenges (e.g., car dependency, urban air quality, noise).

EELISA CREDENTIAL

This activity will be recognised with a badge for your EELISA Credential (Academic recognition of the participation in innovation-based activities organized by communities such as EELISA on-the-MOVE)

ITU

MÜEGYETEM 1782

École des Ponts ParisTech

CONTACT: eemove.community@upm.es

REGISTRATION FORM:

STAKEHOLDERS:

TRANSYT POLITÉCNICA

MADRID

MADRID 360

Instituto de Salud Carlos III

Tema Ingeniería

ANEXO V

Actividades de difusión y transferencia de conocimiento:

Jornadas de divulgación técnica y tecnológica

JORNADA DE MOVILIDAD SOSTENIBLE

ORGANIZAN

CIUDAD UNIVERSITARIA DE MADRID / CONSORCIO

UNIVERSIDAD COMPLUTENSE MADRID

POLITÉCNICA

UNED

COLABORAN

CONSORCIO TRANSPORTES MADRID

DGT

VNIVERSITAT DE VALÈNCIA FACTHUM.lab INTRAS

cnaeFundación

acciona

FESVIAL

hoop carpool

voi.

4 MAYO 2022

EDIFICIO DE ESTUDIANTES, SALÓN DE ACTOS
CAMPUS UNIVERSIDAD COMPLUTENSE DE MADRID

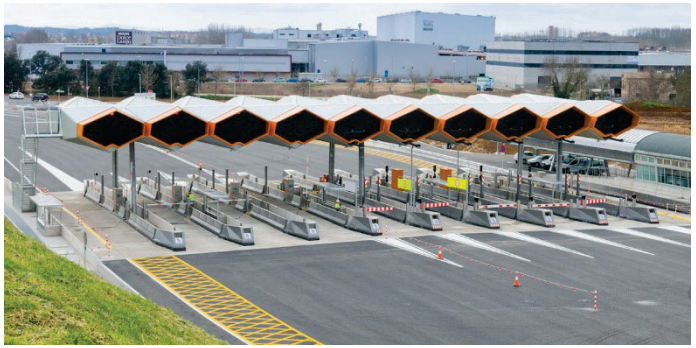
imágenes by www.freepik.es

TRANSyT

2022

mayo

#UPM day 22
INVESTIGACIÓN
UNIVERSIDAD POLITÉCNICA DE MADRID



ANEXO VI

Actividades de difusión y transferencia de conocimiento:

Participación en congresos nacionales e internacionales

MODELING THE CHARACTERISTICS OF RIDESOURCING TRIPS IN MADRID, SPAIN

PhD. Candidate **Álvaro Aguilera-García**[(1)], *Prof.* **Juan Gómez**[(1)], PhD. **Felipe F. Dias**[(2)], Prof. **Chandra R. Bhat**[(2)], and *Prof.* **José Manuel Vassallo**[(1)].
alvaro.aguilera@upm.es, juan.gomez.sanchez@upm.es, fdias@utexas.edu, bhat@mail.utexas.edu, josemanuel.vassallo@upm.es
[(1)]Universidad Politécnica de Madrid. Transport Research Center (TRANSyT); [(2)]The University of Texas at Austin. Dep. of Civil, Architectural and Environmental Engineering

1 INTRODUCTION

- **Ride-hailing** has experienced a **worldwide boom** since it provides convenient, on-demand door-to-door service for urban trips.
- Most of the scientific literature on travel behavior and ridesourcing focus on US cities (Dallas, San Francisco, NYC, etc.), while **almost no efforts have been devoted to other geographic areas, such as Europe**. Currently, more than 8,200 ride-hailing vehicles operate in Madrid (Spain) under Uber and Cabify platforms.
- **European cities** present particular characteristics that make them a case worth investigating, such as **higher density population, higher presence of public transport modes** or a **greater public concern** regarding **environmental issues**.

The aim of this research is to investigate ridesourcing trip characteristics in a European city. To that end, an exploratory choice model is carried out at the trip-level, based on the information collected from a survey campaign conducted in the city of Madrid (Spain).

2 DATA & METHODOLOGY

2.1 THE DATA: A SURVEY CAMPAIGN IN MADRID

The survey campaign included: (i) **in-person on-street interviews**, and (ii) **online questionnaires**, in conjunction with **physical on-street distribution of flyers** that explained the purpose of the research and included a link to access the online questionnaire.

Between **June and October 2019**

1,246 valid responses (466 trips)

Survey structure

i. General socioeconomic and demographic information
ii. Daily mobility trends and travel-related variables
iii. Personal attitudes and lifestyle preferences
iv. Adoption and use of ride-hailing services
v. Trip details of the last trip by ride-hailing

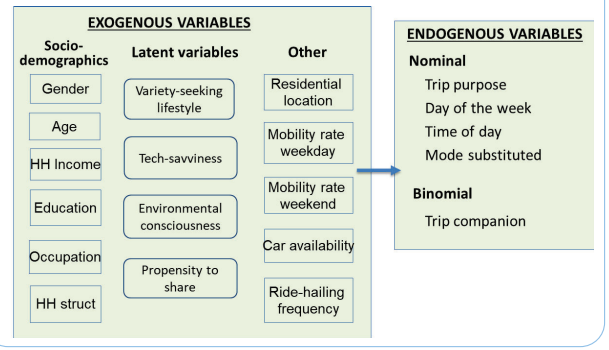
Main outcome variables of interest: Characteristics of the last trip by ridesourcing: trip purpose, travel time, day of the week, time of day, travel mode that would have been used if ridesourcing had not been available, trip companion, etc.

2.2 ANALYSIS APPROACH

- The model employed in our research is a **Choice Modelling Framework** to model multiple trip characteristics as a function of individual socio-demographics, unobserved psychological variables, and mobility-related characteristics.
- This analysis is intrinsically exploratory in nature. The model includes four unobserved latent constructs that capture **individuals' psychological preferences**: variety-seeking lifestyle; tech-savviness; environmental consciousness, etc.

2.3 THE MODEL STRUCTURE

- **Overview of the trip-level model adopted to explore mobility by ridesourcing (5 dimensions). Use of binary and multinomial logit models**

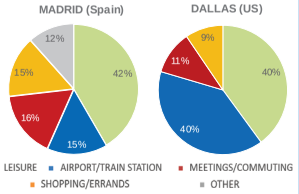


3 DESCRIPTIVE RESULTS

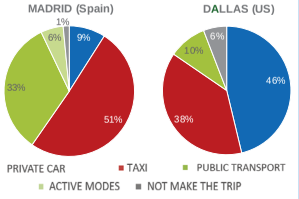
Trip characteristics: last ridesourcing trip

VARIABLE	Trips	% Sample
Trip purpose		
Bus/train station or airport	70	15.0%
Work	77	16.5%
Leisure	194	41.6%
Errands	71	15.2%
Other	54	11.6%
Day of week		
Monday-Thursday	194	41.6%
Friday	101	21.7%
Saturday-Sunday	171	36.7%
Time of day		
Morning (06-13:00h)	113	22.4%
Afternoon and early evening (13:00 – 19:00h)	91	18.0%
Late evening (19:00 – 23:30h)	159	31.5%
Night (23:30 – 6:00h)	142	28.1%
Companion		
I was alone	196	42.1%
There were family members or my couple with me	140	30.0%
There were friends with me	105	22.5%
There were co-workers with me	25	5.4%
Mode substituted		
Taxi	236	50.6%
Private vehicle	42	9.0%
Public transit: metro, bus, train, commuter rail, etc.	155	33.3%
Other: bike,walk, not make the trip	33	7.1%
TOTAL	**466**	**100.0%**

Trip purpose



Mode substituted



- Leisure trips are the most common trip purpose in the sample (41.6%), in line with previous findings.
- The intensity of trip-making is higher on Fridays and in the late evening and night periods.
- **Taxi is the main mode substituted** by ridesourcing (50.6%), **followed by public transport** (33.3%) and, to a lesser extent, private car (9.0%). **Similar results** on mode substitution due to ridesourcing are obtained in other transit-intensive areas such as **San Francisco**, particularly regarding taxi and public transport.
- By contrast, the share of **demand captured from public transport** is significantly **higher** in Madrid **than in car-dominated locations** such as Dallas.

4 MODELING RESULTS

Variables (base category)	Trip Purpose (base: airport or train/bus station)			Day of week (base: Monday-Thursday)		Time of day (base: afternoon and early evening)			Trip companion (base: alone)	Mode substituted (base: taxi)		
	Work-related	Leisure	Errands	Friday	Sat-Sunday	Morning	Late evening	Night	Not alone	Private veh.	Transit	Other
Latent variables												
Variety-seeking lifestyle		1.447 ***									0.869 **	1.967 **
Propensity to share		0.953 **							−0.980 **			
Gender (male)												
Female		0.479 ***								−0.696 **		
Age (under 25)												
25 to 34					0.460 **							
Above 34												
Education (non-university)												
University studies			−0.890 ***									
Employment (employed)												
Student or part/student												
Other: retired, unemployed, etc.		1.041 *										
Household structure (living al												
Living with flatmates											0.657 **	
Couple without children				−0.847 ***					0.757 **			
Couple with children below 24									0.660 **	0.755 **		
Couple with all children above 24										1.165 **		
Other					1.138 **							
Residence (inside M30 ring)												
Outside M30 ring												
Outside Madrid city	1.024 ***											
Trip purpose (airport or bus/t												
Work-related					−2.564 ***			−1.170 **				
Leisure				0.970 ***	1.192 ***	−0.909 **	1.009 ***	2.043 ***	1.228 ***		0.553 **	
Errands						−0.928 **			0.624 **	0.792 *	0.788 ***	
Day of week (weekday)												
Friday						−0.826 ***						
Weekend							1.159 ***	1.611 ***	0.623 **		−0.591 ***	−1.208 **
Time of day (afternoon & early evening)												
Morning												
Late evening												
Night										−1.438 **	−0.880 ***	
Log-likelihood at convergence			-455.238									
Log-likelihood at constants			-566.400									
Rho-bar squared value			0.186									

*** p < 0.01; ** p < 0.05; * p < 0.1

5 CONCLUSIONS AND RECOMMENDATIONS

- The **majority** of ridesourcing trips in the sample **substituted car-oriented options** (private vehicle and taxi).
- A **significant share** of trips also **captured from** environmentally friendly modes such as **public transport and active modes.**
- Ridesourcing **fills a rather important service gap** by providing opportunities for leisure activities over the **weekends** and **late nights** (**when public transport supply is significantly lower**).
- The analysis revealed a **strong relationship** between ride-hailing use and specific situations such as trips related to **leisure activities and errands.** Together with the **positive** aspects of ridesourcing (**increasing accessibility** for some vulnerable segments of the population or **keeping private vehicles out of streets**), some **negative** effects can arise such as a **decrease of revenues for transit operators**, or an **increase of empty trips** made by ridesourcing vehicles as observed in many cities worldwide. Therefore, trade-offs should also be carefully evaluated.
- Ridesourcing service **will take away** not only from public transportation but **also active modes of travel**, particularly over the weekends. This has the twin disadvantages of **increasing traffic demand** as well as **potentially having health-related impacts** because of the reduced active mode
- The attractiveness of these services versus public transport should reconsider the future role of this new actor within urban mobility and sustainability.

Acknowledgments:
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WHO DRIVES A SHARED CAR? FACTORS DETERMINING THE ADOPTION AND FREQUENCY OF USE OF CARSHARING IN THE EUROPEAN CONTEXT

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1 INTRODUCTION

- **Free-floating carsharing** has allowed gaining short-term access to cars on an as-needed basis, generally subject to payment for the use of the vehicle.
- These mobility services **have experienced remarkable growth** in the past few years worldwide, **particularly in Europe**.
- Despite the increasing number of studies applying the psychological dimension in travel behavior models, **scarce efforts have been devoted to exploring the role played by psychological and behavioral aspects on carsharing usage**.
- Carsharing has been analyzed mostly in contexts where these services are not available yet, while **there is a need to investigate adoption and frequency of use in cities where carsharing is already in operation**.
- **More case-study contexts are required** since the population is increasing the use of these services in recent years to meet their mobility needs.

The aim of this research is to explore travel behavior towards carsharing services in two European cities with a different timespan implementation (Madrid and Munich), identifying the key factors motivating carsharing adoption and frequency of use. To that end, a Generalized Structural Equation Model (GSEM) is carried out at the individual-level, based on the dataset from a survey campaign conducted in 2019.

2 DATA COLLECTION AND SURVEY DESCRIPTION

- The survey campaign was conducted in Madrid (Spain) and Munich (Germany), and included: (i) **in-person on-street interviews**, and (ii) **online questionnaires**, in conjunction with **physical on-street distribution of flyers** that explained the purpose of the research and included a link to access the online questionnaire.

Between **June and October, 2019**

1,246 (Madrid) and 619 (Munich) valid responses

Survey structure

i. General socioeconomic and demographic information
ii. Daily mobility trends and travel-related variables
iii. Personal attitudes and lifestyle preferences
iv. Use of carsharing services

- **Main outcome variables of interest**: Carsharing adoption and frequency of use, along with four additional co-endogenous variables: residential location, vehicle availability, and mobility rates during both weekdays and weekends.

3 METHODOLOGY

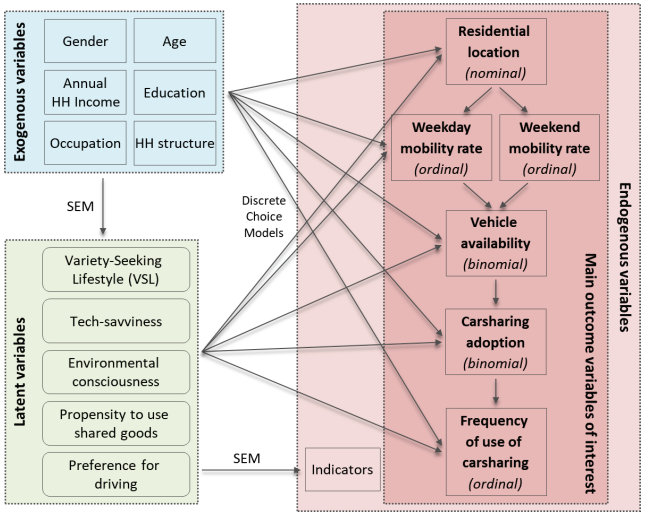
3.1 ANALYTICAL APPROACH

Modeling based on the utility-maximizing framework of **integrated discrete choice and latent behavioral constructs model**, using the **Generalized Structural Equation Model (GSEM)** approach in a sequential manner:

- EFA with orthogonal varimax rotation and CFA to address the five unobserved latent constructs.
- GSEM to simultaneously analyze **individuals´ behavior towards the adoption and frequency of use of carsharing**, along with the following endogenous variables: residential location, vehicle availability, and mobility rates during both weekdays and weekends. Carsharing adoption enables us to control the potential self-selection effect coming from non-users of these services, which allows us to better explain the frequency of use of carsharing.

3.2 THE MODEL STRUCTURE

Overview of the individual-level model adopted



4 MODELING RESULTS

VARIABLES			Carsharing adoption (base: never used)		Carsharing frequency (ordinal)	
			Madrid	Munich	Madrid	Munich
LATENT VARIABLES	VARIETY-SEEKING LIFESTYLE		0.204*	--	0.380***	0.649**
	TECHY		0.623***	--	--	--
	ENVIRONM. CONSCIOUSNESS		-0.398***	--	--	-0.485*
	SHARER		0.338***	0.269*	--	--
	PREFERENCE FOR DRIVING		--	0.411**	0.365**	--
EXOGENOUS EFFECTS	Gender (base: male)	Female	-0.370***	--	--	-0.382
	Age (base: under 25)	25 to 34	--	--	-0.410**	--
		35 to 49	-0.326**	0.424**	--	--
		50 to 59	-0.494**	--	--	--
		Above 59	-0.494**	--	--	--
	Annual HH income (base: Rank 1)	Rank 2	0.335*	0.350	1.094***	1.035**
		Rank 3	0.534***	0.350	--	0.859*
		Rank 4	0.632***	0.458*	--	1.054**
		Rank 5	n/a	0.744**	n/a	1.564**
	Education (base: lower secondary educ.)	Upper secondary education	n/a	0.575***	--	--
		University studies	0.448***	0.445**	--	--
	Occupation (base: employed)	Student or part/student	--	--	-0.813***	--
		Other	--	--	--	--
	Household structure (base: living alone)	Living with flatmates	--	--	--	--
		Couple without children	--	--	--	--
		Couple with children	--	--	--	--
ENDOGENOUS VARIABLES	Residential location (base: inside the innermost ring road)	Inside city boundary	-0.553***	--	--	--
		Outside city boundary	-1.370***	-0.720***	--	--
	Weekday mobility (base: zero trips)	1 to 2 trips	--	--	--	0.623
		3 or more trips	--	0.488**	--	0.879*
	Weekend mobility (base: zero trips)	1 to 2 trips	--	--	0.567**	--
		3 or more trips	--	0.370*	0.483*	--
	Vehicle availability (base: no availab.)	Availability	0.611***	-0.522**	--	-0.603**

*** p < 0.01; ** p < 0.05; * p < 0.1

5 CONCLUSIONS AND RECOMMENDATIONS

- This research found **both common and diverging trends between Madrid and Munich**, thereby suggesting that **the performance of carsharing systems may depend on many factors that vary from city to city**.
- The **technological gap** seems to be **greater in Madrid than in Munich**, significantly impacting carsharing usage. As a result, Munich respondents appear to be more familiar with carsharing services compared to the Spanish ones.
- Carsharing is not perceived as a green transport mode, since **higher environmental consciousness reduces individuals' carsharing usage**.
- This research identifies a **higher use of carsharing systems among males, young, wealthy, well-educated individuals, and those who reside in inner and denser districts**. However, **age has a different effect on carsharing adoption in Munich**, probably due to the role played by the tech-savviness of individuals, as well as the longer life of carsharing services in the German city compared to Madrid. In this regard, Munich respondents seem to be more familiar with carsharing services compared to Madrid ones.
- The **methodology** of this research (including the survey instrument, but also the modeling and analysis approach) **can be used to explore carsharing dynamics in other cities**. **Further contributions** should address how heavier restrictions to the use of private vehicles in urban areas may impact carsharing usage. Additionally, due to the changes in people's habits and travel behavior patterns, exploring the use of carsharing in post-COVID-19 times seems necessary. Finally, competition between carsharing and traditional transportation modes should be investigated more deeply, due to its relevance for understanding the future and current role of these emerging mobility services in achieving urban sustainability.

Acknowledgments: Y2018/EMT-4818
Comunidad de Madrid — Consejería de Educación e Investigación
Unión Europea — Fondos Estructurales — Invertimos en su futuro

DO PARKING MANAGEMENT AND LOW EMISSION ZONES ENCOURAGE ENVIRONMENTALLY-FRIENDLY VEHICLES OR SUSTAINABLE MODES OF TRANSPORT?

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1 INTRODUCTION

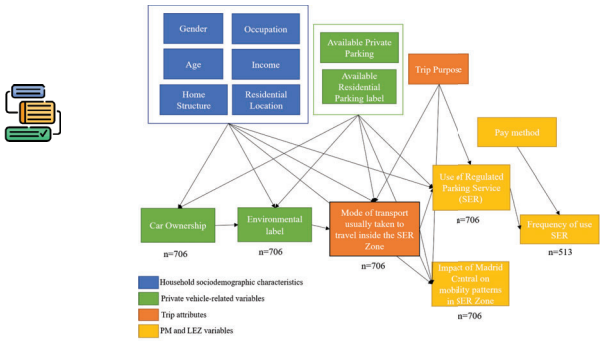
The main objective of this paper is to explore the drivers determining the use of on-street parking at a charge and to what extent Low Emissions Zones change private vehicle user behavior

- **Madrid is the capital of Spain and its most populated city**, with a total of **3.3 million inhabitants**.
- Madrid follows the general European trend of higher density. Population concentration is particularly dense in the central area inside the first ring road.

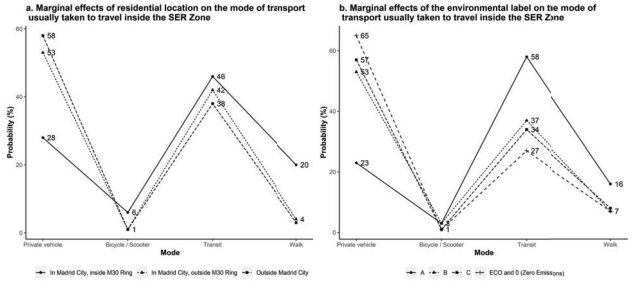
- Two crucial transport policies have been developed in recent years: **Regulated on-street Parking Service** (**SER** by its Spanish acronym), and **Madrid Central** (**MC**), a **Low Emission Zone** (**LEZ**) implemented in the center of the city.
- **SER** is responsible for **managing, regulating, and controlling** the on-street parking of vehicles **to rationalize and make compatible the use of public space and private vehicles' parking**. Madrid has more than 150,000 charged on-street parking spaces.
- **Low Emission Zones (LEZ)** are areas within a city or region where vehicles are demanded to comply with a particular emission requirement or pay a fee if they do not do it.
- **MC** was implemented with a set of specific measures **to promote a low-emission mobility lifestyle and develop a city center more friendly for pedestrians, cyclists, neighbors, and visitors**. MC establishes traffic and parking limitations depending on the emission characteristics of the vehicle.
- The Government **updated vehicle regulation** and implemented **an environmental label category** for vehicles. These categories are, from the least to the most pollutant ones: 0 (Zero Emissions), ECO, C, B, A (or without a label).
- The SER implemented a parking pricing scheme with **discounts depending on the environmental label**

2 DATA & METHODOLOGY

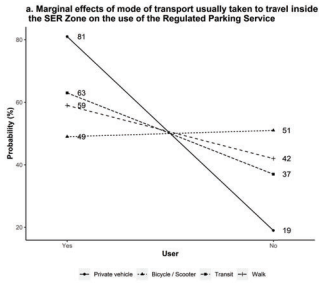
- The target population is people residing in the Madrid Metropolitan Area who are potential users of SER. We obtained a total of 706 valid responses.
- To achieve the objective, a **Path Analysis** was used. It performs a series of regressions **to analyze the relationship** between **independent** and **dependent variables.** In our case, multinomial and ordinal regressions were used.



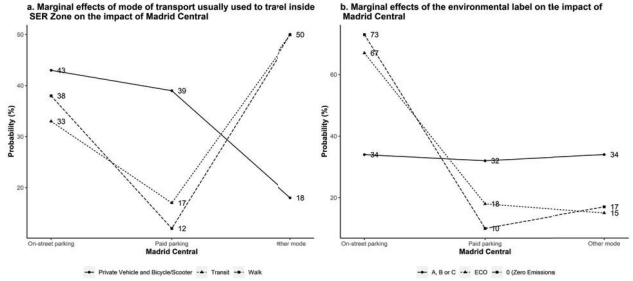
3 MODELING RESULTS AND POLICY ASSESSMENT



- Respondents **living in the city center** (inside de M30 Ring) are **more likely** to alternate their **private vehicles** with **more sustainable modes** such as walking, biking, or public transport.
- Respondents with the **most polluting labels** are the **least likely** to use their **private vehicles** to access the SER zone.
- Similarly, individuals owning an **environmentally-friendly vehicle** ("ECO" or "0" labels) are **the most likely** to **only use their private vehicles** to get to the SER zone and **not alternate** with **other modes of transport**, compared to other label categories.



- Respondents who only use their private vehicle when traveling by the SER zone are more likely to have used this service than individuals who alternate the use of the private vehicle with alternative transport modes such as transit, walking, or biking.



- Individuals who alternate using their private vehicle with **transit or walking** are significantly **less likely** to **pay for private parking** when traveling to Madrid Central and **more likely** to wholly **shift to a transport mode** different from the private vehicle in turn.
- The environmental label of the vehicle plays a crucial role in explaining mobility patterns within the LEZ area. Particularly, individuals owning an **environmentally-friendly vehicle** (either ECO or Zero emissions) are **more likely** to **continue using the charged on-street parking service** within Madrid Central than shifting from their private vehicle or paying for private parking.

4 CONCLUSIONS AND RECOMMENDATIONS

- **Towards more sustainable modes of transport.** The results show that the implementation of both LEZ and on-street parking pricing **positively affects** users with car availability **to switch to more sustainable modes** within the SER Zone. In addition, those with higher incomes do not think about changing their mobility habits and show the inequitable side of the current policy since those with higher incomes can continue with their daily mobility habits while less wealthy people have to switch to other options, which subsequently impacts their everyday lives.
- **Towards cleaner vehicles.** Due to the benefits awarded by the local government to clean vehicles (understanding them like "ECO" and "0, Zero Emissions"), the results show that citizens owning these labels do not tend to change to other modes. While a larger adoption of clean vehicles can contribute to a greener vehicle fleet and improve air quality in urban areas, this can turn into an additional problem since the goal of restricting cars is not only about reducing pollution but also alleviating congestion in the city center.

Acknowledgments:
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4th MEETING ON TRANSPORT ECONOMICS AND INFRASTRUCTURE

An empirical analysis of UBER fares: evidence from Madrid

Thais Rangel, Juan Nicolas Gonzalez, Juan Gomez,
Fernando Romero and José Manuel Vassallo

Universidad Politécnica de Madrid

January 28th, 2022

USING OPEN DATA SOURCES FOR CUSTOMIZING BIKE SHARING SURVEY DELIVERING AND IMPROVING RESPONSE RATE

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Universidad Politécnica de Madrid. Transport Research Center - TRANSyT

1. INTRODUCTION AND OBJETIVES

The assessment of the impact of transport policies on the **perception of users** has become urgent to manage effectively the available resources and to foster the use of public transportation.

Most of public transport surveys use the **traditional intercept method** by **capturing respondents on board** of the transportation mode, **while waiting at the stop** or in the vicinity.

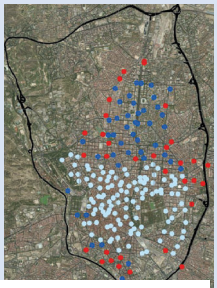
In the case of **bike-sharing systems (BSS)**, the difficulties of capturing a representative sample increase, since stations are scattered in cities, among different districts with different users profiles.

Difficulties of **increasing mobility surveys response rates** and the urgency to reduce the attrition and selection bias requires to find new ways to capture respondents, among which **Big data** is gaining popularity **as a source of travel information**.

The aim of this study is to evaluate **Big data sources** to customize a **survey deployment plan**, through a **hybrid method** that combines the advantages of personal interviews and online surveys. This with the final goal of improving response rate.

2. CASE STUDY - BiciMAD

BiciMAD is Madrid's public bike-sharing system.
Deployed in June of 2014



Service area expansions

Three survey campaigns: 2014 · 2015 · 2016 · 2019

2015
- 1560 bikes
- 123 stations

2019
- 2500 bikes
- 207 stations

2019 Survey

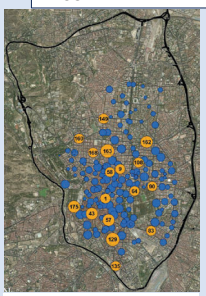
Section A — Characterization of "day to day" mobility and user profile
What type of BiciMAD user is?

Section B

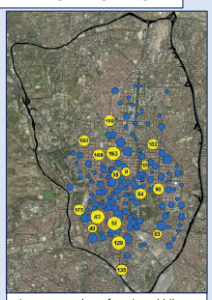
B1 Subscribers	B2 Occasional	B3 Not Users
BiciMAD attributes	BiciMAD and IPA*	BiciMAD
Factors influencing the use of bicycle	Other modes of soft mobility	Electric bicycles
Other modes of soft mobility	Cycling and walking priority measures	Other modes of soft mobility
Cycling and walking priority measures		

Section C — Socioeconomic

SURVEY PLAN – DEMAND-BASED ZONING



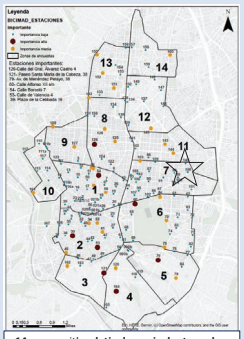
Average number of unpinned bikes - Weekends



Average number of unpinned bikes – Working days

Almost **7 million** of records from **pin-unpin** bicycles from the stations were analysed to determine demand and its variations.

SURVEY PLAN – DEMAND-BASED ZONING



14 zones with **relatively equivalent number of trips** identified based on the demand

7,300 cards distributed
⇩ in
7 days
⇩ by
11 pairs of interviewers
⇩ in
7.5 hours shifts with one half an hour break
⇩ at
Highest periods of the day: 07:00 - 22:00

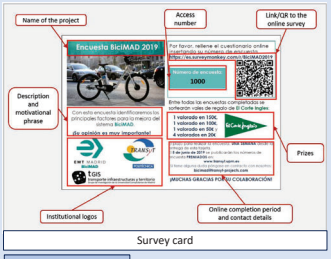
- Zones were separated following districts divisions.
- Surveyors could move between stations within their zones.
- BiciMAD service administration distributed the survey through a diffusion email to **65,200** subscribers.

DATA CAPTURE

Hybrid surveying method:

(1) Personal interview — **Direct personal contact** between the surveyor and the potential respondent.

(2) Online — **Confidential, honest and convenient** due to anonymity and privacy.



Survey card

Project information: Name & institution

Survey´s objective: Clear to **engage** respondent

Instructions: To **access** the survey **Time** needed **Period** in which it can be completed

Prizes: For the ones that **complete** it.

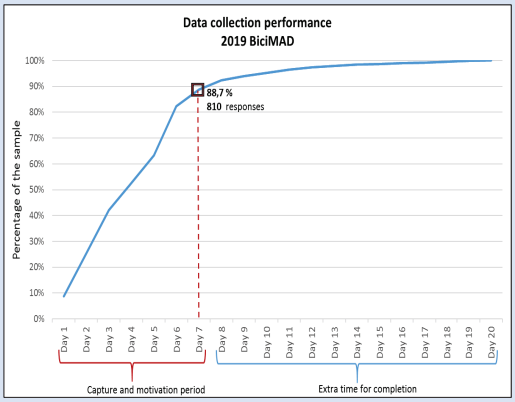
Key considerations

Cards should include **institutions logos** to **differentiate** the **campaign from commercial flyers** or advertising.
Interviewers should politely approach the service users and briefly explain the project.

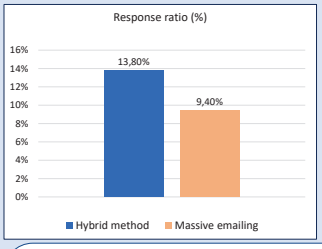
4. PERFORMANCE AND RESPONSE RATE

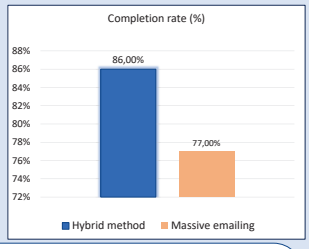
91% accomplishment of the set objective
7,300 from the 8,000 cards **delivered**

- The sample was gattered in a short period (**7 days**). **88,7%** during the capture and motivation. Which shows the benefits of **engaging the respondents** through **face-2-face** card delivering.
- **BiciMAD users** seem to be more willing to answer to surveys than users of other modes of transportation, since they seem to **have a bigger commitment with the wellbeing of the service**.
- Using **Big data sources** could help to **fit traditional surveying methods**. Among **multiple advantages** it is possible to **increase productivity**, to **focus on specific targets** and to obtain **better response ratios**.



Fitted hybrid method vs Massive emailing





- The **response ratio difference** between the two methodologies is **4,4%**, showing the validity of the TRANSyT methodology and the convenience of tailoring the survey campaign based on demand open-source, data improving the response rate.
- The survey completion ratio falls in **favour of the hybrid method** with a **difference of 9%.**
- By analyzing the **socioeconomic sections**, it is also possible to perceive a **bias on the emailing survey**, as the respondents are mainly young, educated men. This contrast with the **advantage of the hybrid method**, that allow the surveyor to capture heterogeneous profiles and avoid biases.

5. CONCLUSIONS

- The detailed analysis of the service **demand**, based on the **open-source** data provided by the operator, helped to **optimize the human resources and time**
- It was possible to **distribute 47 cards per surveyor per day.** Without **a customized distribution campaign,** the task of **reaching such a wide sample with 11 couples** covering the nearly **200 stations would be too difficult**
- The service is mainly used **during working days** for **commuting purposes.** Based on this fact, resources were concentrated **to deliver more cards on working days on a ratio of 60/40.**
- The **face-to-face** short interaction **improves the response and completion rate**, since encourage respondents to participate
- The **response ratio** of the **hybrid survey** reached the **13,8%** while with the **massive emailing** it was only **9.4%**
- **Big data** sources are a **valuable resource** to draw **tailored survey plans, accounting for the particularities** of the sample presented
- There is no need to choose between **"aggregate or individual"** information, but to **combine** these **sources** of information **to improve current methodologies and optimize well-known techniques**

University Mobility Survey 2021 in Madrid Region (Spain): Facing the challenge of getting responses during the COVID-19 pandemic

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1. INTRODUCTION

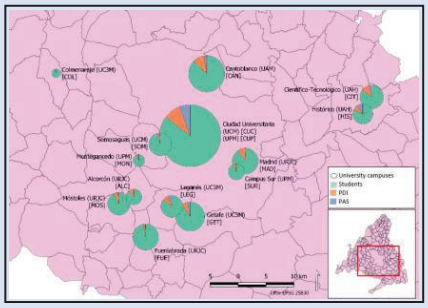
University campuses are places where large **educational and research centers** are concentrated.

- These campuses **attract a large number of people** throughout the day.
- They are, by themselves, **important urban centers** that generally behave differently from other urban developments, with specifically designed transport infrastructures and services
- They usually have **additional services** apart from the proper academic ones, such as sports facilities, restaurants, coffee shops, or even bank offices.

This **research** finds out the efficiency of different **communication actions** carried out to **improve the response rate** in the survey campaign delivered among the university community of the Madrid Region in 2021, during the second year of **COVID-19 restrictions**. The survey addressed **students, teaching and research staff (PDI), and administration and services staff (PAS)**. This survey was the basis for the development of *Sustainable Mobility Plans* for each of the university campuses in the Madrid Region. Therefore, the promotion of sustainable modes and the reduction of car trips were the target scenario of the different actions started by the mobility survey.
The Transport Research Center of the UPM (**TRANSyT**) played the coordination and secretarial roles and was **responsible** for the design of the survey.

2. CASE STUDY

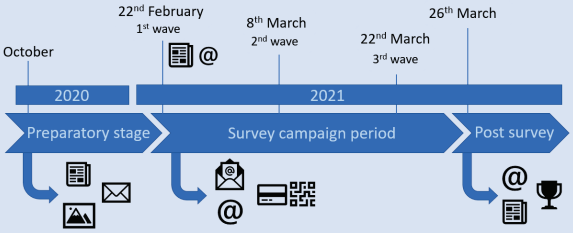
The **attendance** of the university community was still **affected**. Most of the lessons could be followed **online** except practical lessons, laboratories, or exams, which were all done presential on site. Many **services** were provided **online**, requiring previous appointments or with a **reduction of services** or hours. **No face-to-face activities could be carried out.**



Distribution of the percentage of students, PDI, and PAS by campus

University	Campus	Level of attendance
UAH	CIT	10 – 25%
	HIS	10 – 25%
UAM	CAN	About 10%
UC3M	COL	About 50%
	GET	About 50%
	LEG	About 50%
UCM	CUC	25 – 50%
	SOM	25 – 50%
UPM	CUP	25 – 50%
	MON	1st course 100%; others about 10%
	SUR	20 – 30%
URJC	ALC	School of Dentistry 100%; others about 10%
	FUE	About 25%
	MAD	About 25%
	MOS	5 – 10%

3. METHODOLOGY



@movunicam

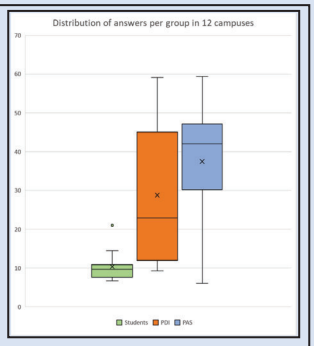
Section	Part
1 General information	Socioeconomic data
2 Current trips	Mobility to campuses
	Mobility within campuses
	Mobility from campuses
3 Mobility before COVID-19 pandemic and during the survey period	COVID-19 incidence
	Proposals for improvement
4 Other information	Household characteristics

The survey was designed to be **completed** in about **15 minutes** and it was **customized** to **each university and campus**.

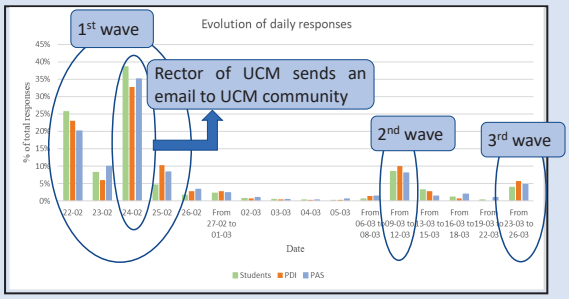
4. PERFORMANCE OF THE SURVEY

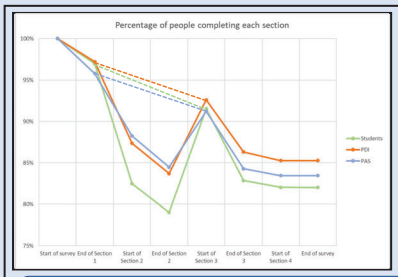
University	Group	Population	Responses	Response rate (%)
UAH	Students	15,436	1,130	7.32
	PDI	1,837	187	10.18
	PAS	1,098	86	7.83
UAM	Students	21,870	1,467	6.71
	PDI	2,606	418	16.04
	PAS	626	263	42.01
UC3M	Students	23,870	2,878	12.06
	PDI	2,075	667	32.14
	PAS	930	381	40.97
UCM	Students	39,544	8,306	21.00
	PDI	4,769	2,007	42.08
	PAS	2,781	1,277	45.92
UPM	Students	29,858	2,748	9.20
	PDI	2,269	574	25.30
	PAS	1,429	420	29.39
URJC	Students	28,459	2,550	8.96
	PDI	2,043	359	17.57
	PAS	201	92	45.77

Note that SOM and MOS campuses have not been included due to outliers pending correction



Although the percentage of **total responses received from students** corresponds to **75%**, this is **12% of** the total number of **students**. However, in the case of **PDI and PAS**, they account for **25% of total responses**, although the **percentage of participation** of these groups is **around 30%.**





The **peak** existing at the **beginning of section 3** is caused by the fact that the last question in Section 1 allows you to **skip Section 2** and start Section 3 directly if the respondent did not go to the campus at the time of the survey **(dotted line).**

Section 3 is the one with a **higher attrition rate**. This is the section with **longer texts to read** in the questions and it has been placed in the **second half** of the survey.

5. CONCLUSIONS

- More than **34,000 responses** were received with a more than **80% completion rate**.
- The importance of **involving the higher levels** in participation is noted (institutional email, institutional social networks accounts, Rectorate…).
- Sending the **email** could have had a **greater effect** than in other circumstances due to a large part of the **academic and teaching activity** being carried out in an **online format**.
- It would be advisable for these **communication actions to be designed from the beginning**, including this topic as part of the research.
- Use a **unique link for each university** to access the questionnaire, not directly accessible from social networks, and **limit the number of responses per IP address** to avoid cyber-attacks.

ACKNOWLEDGMENTS

A PARTICIPATORY AND ADAPTIVE SCENARIO-BUILDING APPROACH TO ADDRESS DISRUPTIVE FUTURES IN LAND USE AND TRANSPORT (LUT) PLANNING

AUTHOR: Amor Ariza-Álvarez

SUPERVISORS: Julio A. Soria-Lara, Rosa M. Arce-Ruiz

PhD THESIS OBJECTIVES

1. Stimulating non-linear thinking in visioning processes
2. Experimenting with scenario-building narratives to trigger LUT integration
3. Re-thinking the role of scenario-building visions for adaptive policymaking

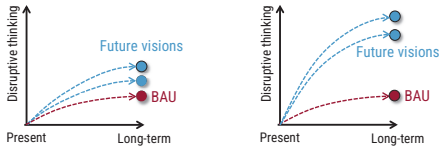
CASE STUDY: The Henares Corridor, Metropolitan Area of Madrid, Spain

1 BUILDING DISRUPTIVE LUT FUTURE VISIONS

Scan to see publication

WILD CARDS FOR THINKING DISRUPTIVELY

Traditional visioning → **Visioning based on wild cards**

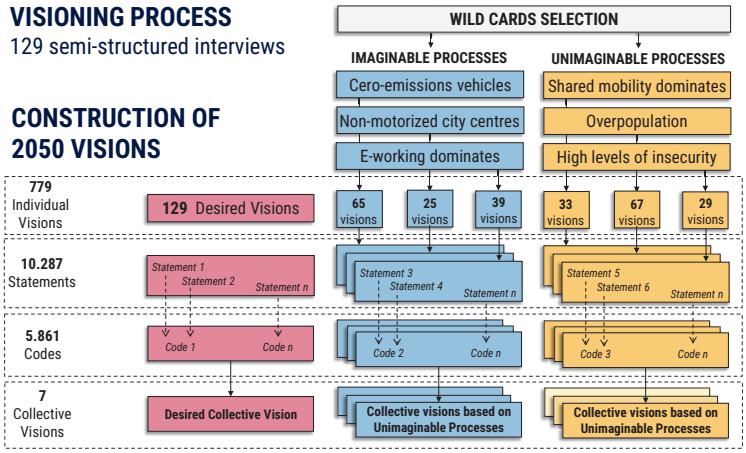


Wild cards: sporadic or long-lasting processes that are assumed to be improbable, but would have large consequences for cities, transport systems, and social trends.

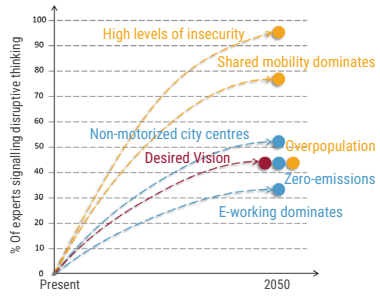
VISIONING PROCESS

129 semi-structured interviews

CONSTRUCTION OF 2050 VISIONS



EVALUATION OF DISRUPTIVE THINKING



21 experts in innovation, strategic decision-making, and creative thinking evaluated the level of disruption of the 2050 visions

The most disruptive 2050 visions were:

- **Those generated by using unimaginable processes**, indicating higher probability to generate disruptive thinking when surprising factors are incorporated
- **Those generated by a minority of participants** during semi-structured interviews, indicating that smaller sample sub-groups have more divergent and disruptive opinions on LUT futures

2 EXPERIMENTING WITH SCENARIO-BUILDING NARRATIVES TO TRIGGER LUT INTEGRATION

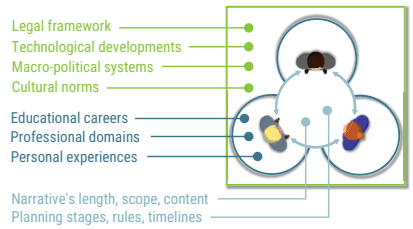
MULTI-LAYER FRAMEWORK

Three layers of factors are examined, focused on identifying and characterizing the nature of the interactions that take place between planning actors while using narratives

LAYER 1 - GLOBAL ENVIRONMENT
Common boundary conditions affecting all planning actors during the use of narratives

LAYER 2 - INDIVIDUAL ENVIRONMENT
Individual peculiarities of planning actors engaged in the use of narratives

LAYER 3 - INTERNAL ENVIRONMENT
Inherent factors in both future narratives and the planning conditions



EXPERIMENTATION – Three workshops focused on three future narratives

Workshop 1
Non-motorized city centres

Workshop 2
Overpopulation

Workshop 3
High levels of insecurity

18 Planning actors:
Policy-makers
Urban planners
Transport planners
Property developers
Environmental consultants

18 Conversation Episodes → 914 Interventions → 1.919 Codes

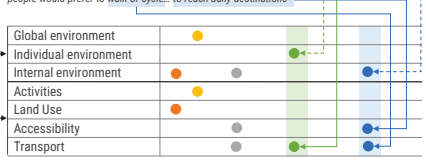
Participants interventions were transcribed and coded according to:

- The three groups of factors of the **Multi-Layer Framework**
- The four categories of the **LUT feedback cycle**

Coding example:

Planning actor 1: *"From my professional experience, ... cycling will not become dominant"* [...]

Planning actor 2: [...] *"According to 2050 narrative ... people would prefer to walk or cycle... to reach daily destinations"*



EVALUATION OF LUT INTEGRATION

13 Conversation episodes with low levels of LUT integration

- One or two layers of factors dominated
- Low complexity of conversation

5 Conversation episodes with high levels of LUT integration

- Scenario-building narratives provided the starting point for complex interactions between planning actors, in which factors from the internal, individual, and global environments are simultaneously used

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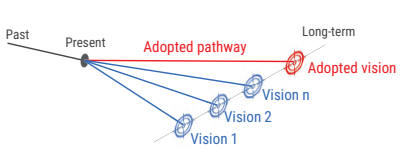
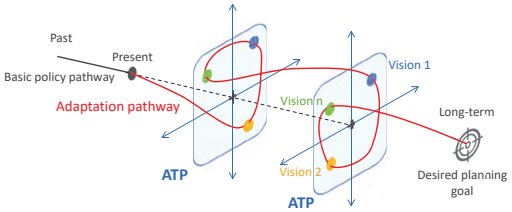
3 RE-THINKING THE ROLE OF SCENARIO-BUILDING VISIONS FOR ADAPTIVE POLICYMAKING

MOVING FROM STATIC TO ADAPTIVE SCENARIO-BUILDING

Static Approach: scenario-building visions as long-term endpoints



Adaptive Approach: future visions as **Adaptation Tipping Points (ATPs)**



ATPs assessment would be based on **two main dimensions:**

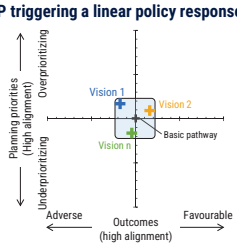
- Alignment of **planning outcomes**
- Alignment of **planning priorities**

} Between the basic policy pathway and future visions

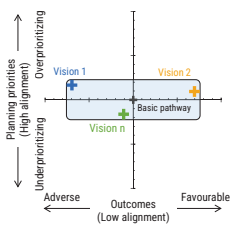
ADAPTIVE POLICY RESPONSE

Each ATP require specific policy response to adjust or modify the initial policy pathway

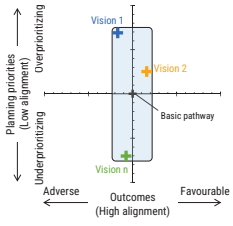
ATP triggering a linear policy response



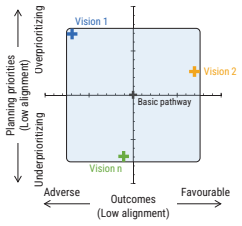
ATP triggering an outcomes-oriented policy response



ATP triggering a priority-oriented policy response



ATP triggering a winding policy response



Foro de Ingeniería del Transporte

CENTRO DE INVESTIGACION DEL TRANSPORTE
UNIVERSIDAD POLITÉCNICA DE MADRID

UNIVERSIDAD POLITÉCNICA DE MADRID

The impact of Information and Communication Technologies on social inequalities originated by accessibility planning

PhD. Student	Raúl F. Elizondo-Candanedo[1] [1]Universidad Politécnica de Madrid	Supervisors:	Dr. Julio A. Soria-Lara[1] Associate Professor, [1]Universidad Politécnica de Madrid	Dr. Aldo Arranz-López[2] Marie Curie Postdoctoral Researcher, [2]Luxembourg Institute of Socio-Economic Research

Introduction

- Over the last three decades, accessibility planning has been adopted as a key approach to evaluate social issues in transport policy and planning, but some accessibility levels can generate inequalities between population groups (Banister, 2018).
- Living in a digitalized society has radically changed the way people experience accessibility, as people can easily cover daily activities via internet (e.g. e-working, e-shopping, and e-leisure). This latter turns measuring accessibility-related disadvantages with current accessibility-planning strategies somehow challenging (van Wee, 2016).
- The theoretical approaches in accessibility planning focused on the physical version of activities, while disregarding breadth of equivalent teleactivities (e.g., telecommuting as an equivalent of commuting, and so forth) (Figure 1)
- The lack of a sound deductive framework for accessibility measures regarding ICTs-accessibility bonds is a limitation at the implementation in practice for such proposition.

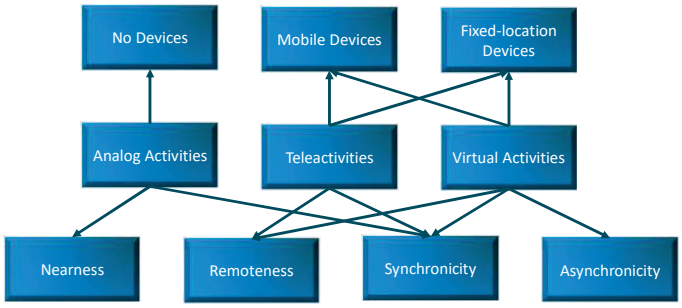


Figure 1. Types of activities attending spatiotemporal and digital constraints

Objective

The proposed PhD thesis aims:

- To better **understanding the impact of the ICTs, and particularly e-activities** (e-working, e-shopping, and e-leisure) **on accessibility planning**, as well as the effects on social inequalities.
- To integrate into physical accessibility measures, a new conceptual framework contemplating ICTs' impact on accessibility assessment is proposed via a new approach labelled as "augmented accessibility".
- To consider a bottom-up approach for individual accessibility by implementing the Amartia Sen´s Capability Approach to measuring accessibility (Vecchio & Martens, 2021).

The proposed research framework is exhibited in Figure 2.

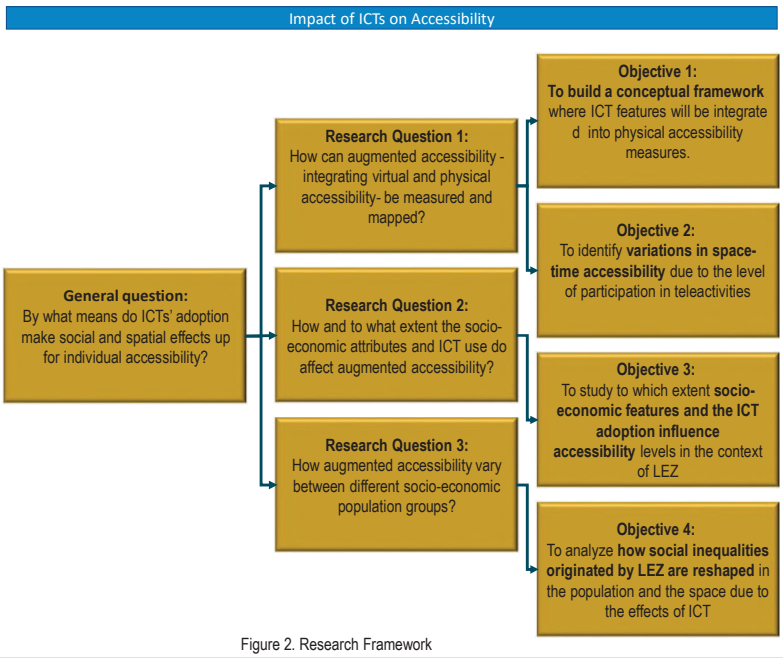


Figure 2. Research Framework

Case Study

- The proposed approach will result in a new measure computed to study to which extent the built environment, the socio-economic characteristics, and the use of ICT influence accessibility levels in the context of the selected case study: **the implementation of a Low Emission Zone in the city of Madrid, Spain.**
- In 2018, the local government made a first attempt to implement a LEZ in the Madrid city center called "Madrid Central" (Figure 3). Recently, the city council has approved a new "Ordenanza de Movilidad Sostenible (13/9/2021)", which establishes the criteria to progressively implement a permanent ring-LEZ.
- The geographic delimitation of the Low Emission Zone (LEZ), Madrid 360, will originate depth changes in accessibility levels to major destinations in the downtown of Madrid. Therefore, **the measures of augmented accessibility may help benchmark accessibility levels to analyze how social inequalities originated by LEZ are re-shaped by the effects of ICT** and develop an assessment framework to evaluate LEZ accessibility levels from the paradigm of the augmented accessibility, in which physical and virtual accessibility co-exist.

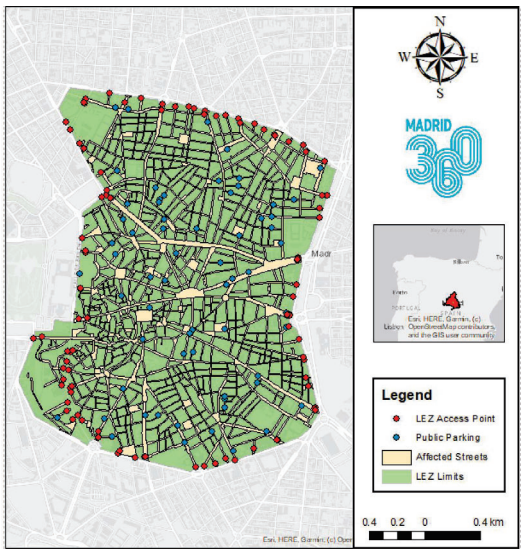


Figure 3. LEZ in Madrid

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IV CAMPUS CIENTÍFICO DEL FORO DE INGENIERÍA DEL TRANSPORTE

IMPACTO DE LA REGULACIÓN DEL APARCAMIENTO EN SUPERFICIE Y LAS ZONAS DE BAJAS EMISIONES EN LA CONSECUCIÓN DE OBJETIVOS DE MOVILIDAD SOSTENIBLE

DOCTORANDO: JUAN NICOLÁS GONZÁLEZ
DIRECTORES DE TESIS: JOSÉ MANUEL VASSALLO Y JUAN GÓMEZ

1 MOTIVACIÓN

La aplicación de estrategias de **gestión del aparcamiento** y de **Zonas de Bajas Emisiones (ZBE)** son algunas de las políticas de transporte más utilizadas para combatir las externalidades negativas en las zonas urbanas.

La **gestión del aparcamiento** se utiliza ampliamente para **limitar, regular y controlar el estacionamiento**, mientras que las ZBE tienen como objetivo **mejorar la calidad del aire** al mantener los vehículos contaminantes fuera de los centros urbanos. **Estas medidas son flexibles y suelen aplicarse conjuntamente.**

2 OBJETIVOS

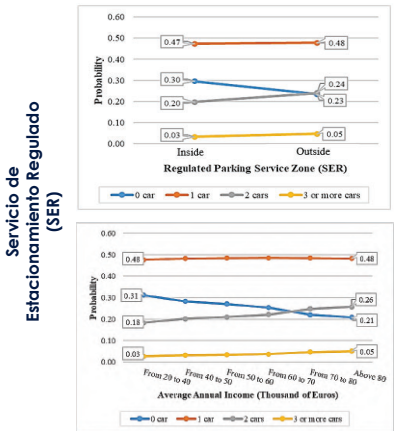
Evaluar el impacto generado en la demanda y la cuantificación de beneficios en la ciudad de las políticas de aparcamiento y la ZBE de Madrid.

La investigación se centra en Madrid (España), que ha implementado múltiples estrategias de transporte. Entre ellas, destacan el **Servicio de Estacionamiento Regulado (SER)** y la **ZBE** conocida como **"Madrid Central"**, que restringe la oferta de aparcamiento y el uso del coche en el centro de la ciudad. Las restricciones de aparcamiento en vía se implantaron en 2002, mientras que la ZBE se inició en 2018.

3 IMPACTO EN LA PROPIEDAD DE AUTOMÓVILES

Datos obtenidos de la Encuesta de Movilidad de Madrid 2018.

Variables explicativas consideradas:
- Características sociodemográficas de los hogares
- Variables del entorno urbano
- Atributos de la red de transporte
- Variables relacionadas con la políticas públicas implementadas en la ciudad.

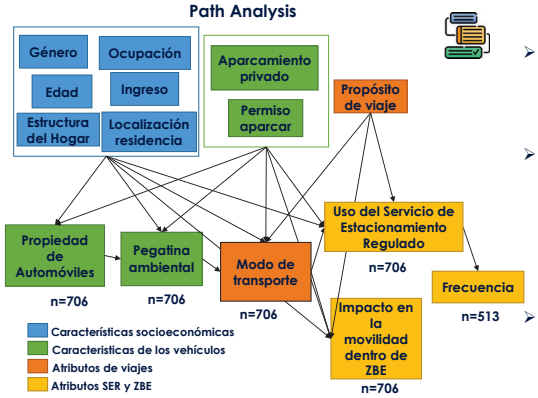


Las políticas de transporte implementadas en Madrid son efectivas a la hora de disuadir a los hogares de su adquisición.

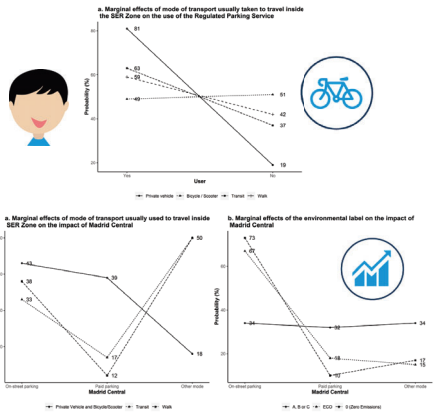
- Una ampliación del SER conllevaría efectos adicionales en las decisiones de propiedad de vehículo

Quiero saber más!

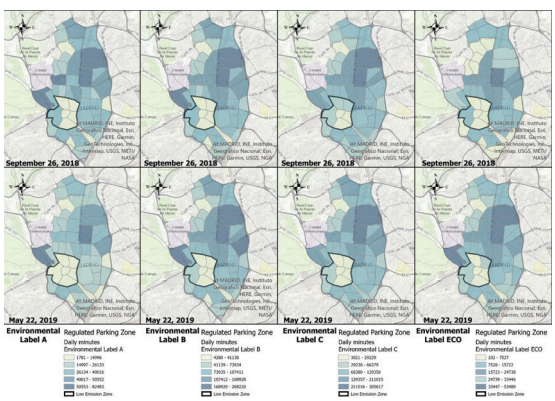
4 FACTORES QUE DETERMINAN EL USO DEL APARCAMIENTO EN SUPERFICIE



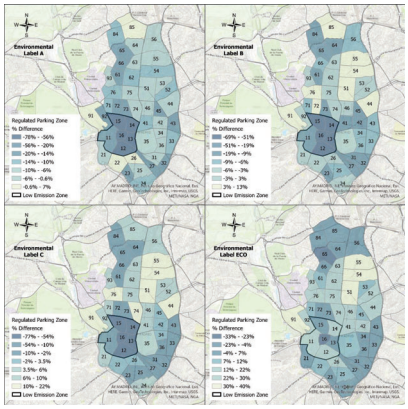
- Se realizó una encuesta en Madrid para explorar el efecto de las restricciones del SER y de ZBE en la elección del modo de transporte y el comportamiento de aparcamiento. **Se obtuvieron un total de 706 respuestas válidas**.
- Los resultados muestran que las dos políticas influyen positivamente en que **los usuarios del vehículo privado cambien a modos más sostenibles**. Sin embargo, se observa que **las personas con mayores ingresos no se plantean cambiar sus hábitos de movilidad ligados al vehículo privado**, estando dispuestas a pagar más por su uso, ya sea adquiriendo vehículos más limpios o pagando garajes privados.
- Debido a los beneficios concedidos por el gobierno local a los vehículos limpios, los resultados muestran que **los ciudadanos que poseen estos vehículos no cambian al transporte público o a los modos activos** de la ciudad.



5 IMPACTO EN LA DEMANDA DE APARCAMIENTO



- **Con datos de tickets de aparcamiento**, se evaluó empíricamente el efecto de la implementación de la ZBE 'Madrid Central' en el uso del aparcamiento. Para ello se dispone de un año de información, en el cual se identifican tres periodos: **(i) Antes de Madrid Central, (ii) Periodo de Transición** y **(iii) Plena implantación de Madrid Central**.
- Haciendo uso de **modelos de econometría espacial** se analizó el efecto causal entre la demanda de aparcamiento y diferentes variables económicas, ambientales y del entorno urbano, según la categoría ambiental de los vehículos.
- Como resultado, se encontró que **'Madrid Central' aumentó la demanda de vehículos menos contaminantes mientras que la de los más contaminantes se redujo considerablemente**. Las zonas aledañas a Madrid Central presentan un incremento en el número de vehículos, lo cual es entendible debido al efecto desbordamiento generado por las restricciones de la ZBE.



ECOMM TURKU 2022
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Mapping the potential for implementing a MaaS service in Madrid metropolitan area

María Eugenia Lopez-Lambas, Iria Lopez-Carreiro, Andres Monzón & Soledad Pérez-Galdós

TRANSyT POLITÉCNICA

Evolution of Madrid Bike-Sharing System **BiciMAD** and **impacts on mobility patterns**

Andrés Monzón
Raky Julio
Sergio Fernández

ECOMM TURKU 2022
EUROPEAN CONFERENCE ON MOBILITY MANAGEMENT
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Key e-bike-sharing attributes.

A combination of explicit and implicit methods for user satisfaction assessment

Raky Julio

Andres Monzon

Yusak Susilo

hEART 2022

TRANSyT POLITÉCNICA

The role of shared mobility services in the post – pandemic urban mobility

Interactions with private car across the European Cities

María Vega-Gonzalo[12], Juan Gómez[1], Panayotis Christidis[2]

[1]Centro de Investigación del Transporte (TRANSyT), Universidad Politécnica de Madrid

[2]European Commission, Joint Research Centre (JRC)

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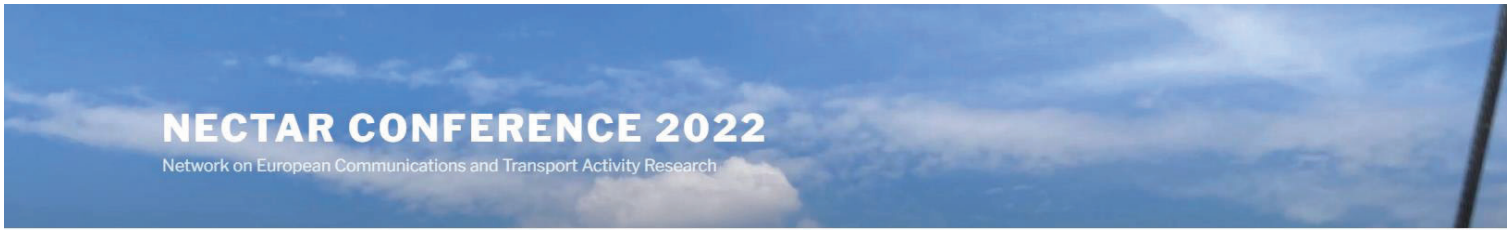
TOWARDS SUSTAINABLE ALTERNATIVES FOR E-COMMERCE DELIVERY IN URBAN AREA.

Alessandra Boggio-Marzet
PhD Candidate
Universidad Politécnica de Madrid

July 22nd, 2022



Planning sustainable MaaS strategies: integration of built environment and behavioural factors

Iria Lopez-Carreiro
Post-doctoral researcher
TRANSyT, Universidad Politécnica de Madrid (Spain)

22 July 2022. Toronto, Canada

Challenges after COVID-19 to recuperate sustainable modes trips on 14 major university campuses in the Madrid Region

Professor Andrés Monzón
Antonio Manso

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2022 NECTAR CONFERENCE
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COPING WITH UNCERTAINTY: A PROPOSAL OF AN ADAPTIVE SCENARIO-BUILDING APPROACH FOR TRANSPORT POLICYMAKING

Julio A. Soria-Lara

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Evolution of teleworking and urban mobility changes driven by the COVID-19 pandemic across European Cities

September 15-16, 2022

Session 19 – Mobility in a post-COVID era

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TIS ROMA 2022

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Car Ownership and Post-COVID Urban Mobility across European Cities

September 15-16, 2022

Session 19 – Mobility in a post-COVID era

TELEMATIC ACTIVITIES AND THEIR INFLUENCE ON MOBILITY AFTER THE COVID-19 PANDEMIC IN THE REGION OF MADRID

Abid Al-Akioui & Andrés Monzón

Transport Research Centre – Universidad Politécnica de Madrid

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Shifting trends in car use and car ownership: analysis of the effect of COVID-19 in urban areas of the EU

Maria Vega-Gonzalo[ab], Juan Gomez[a], Panayotis Christidis[b]

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7th October, 2022. Seville.

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POSTER SESSION

Aguilera-García, Á., Gomez, J., Antoniou, C., Vassallo, J.M.

SCAN ME

Modelling the determinants of adoption and frequency of use of carsharing in the cities of Madrid and Munich

INTRODUCTION

Free-floating carsharing has allowed gaining **short-term access** to cars on an as-needed basis and has experienced notable growth in the past few years.

The research explores the **key factors** motivating **carsharing adoption** and **frequency of use** in two European cities: Madrid & Munich.

Carsharing has been analyzed mostly in contexts where these services are not available yet. There is a **need to investigate** its usage **in cities where carsharing is already in operation**.

Carsharing started to operate in Munich and Madrid in 2011 and 2015, respectively

DATA AND METHODOLOGY

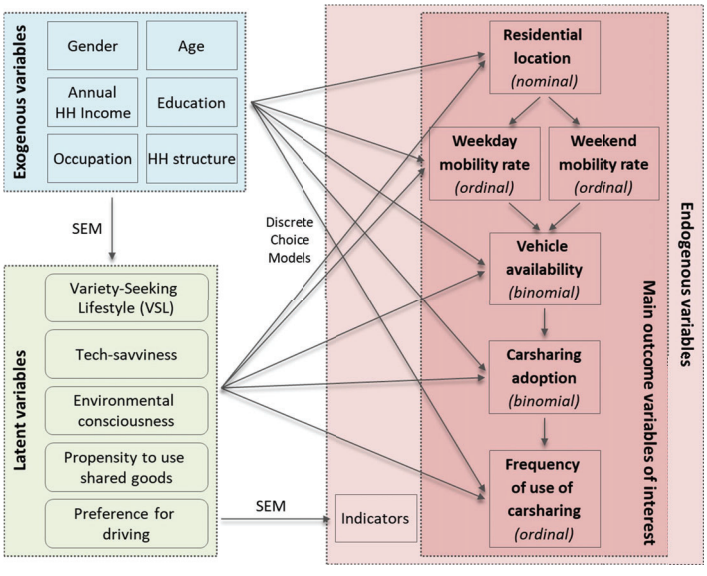
Survey campaign conducted among citizens from Madrid and Munich metropolitan areas with a total of **1,246 (Madrid) and 619 (Munich) valid responses**.

SURVEY STRUCTURE

i. General socio-demographic information
ii. Daily mobility trends and travel-related variables
iii. Personal attitudes and lifestyle preferences
iv. Use of carsharing services

Modeling based on a **Generalized Structural Equation Model (GSEM)** that integrates discrete choice and latent behavioral constructs models. Simultaneous analysis of individuals´ behavior towards the use of carsharing, together with other endogenous variables.

Carsharing adoption enables us to control the potential self-selection effect coming from non-users of these services, and thus to better explain the frequency of use of carsharing



MAIN RESULTS

Both common and diverging trends between Madrid and Munich are found, thereby suggesting that the performance of carsharing systems may depend on many factors that vary from city to city.

EXPLANATORY VARIABLES		Carsharing adoption		Frequency of use of carsharing	
		Madrid	Munich	Madrid	Munich
LATENT VARIABLES	Variety-seeking lifestyle	↑		↑	↑
	Tech-savviness	↑			
	Environmental consciousness	↓			↓
	Propensity to share	↑	↑		
	Preference for driving		↑	↑	
EXOGENOUS EFFECTS	Gender *(base: male)*	↓			
	Age *(base: under 25)*	↓	↑ 35 - 49	↓ 25 - 34	
	HH income *(base: rank1)*	↑	↑	↑ Rank 2	↑
	Level of education *(base: lower than secondary educ.)*	↑	↑		
	Occupation *(base: employed)*			↓ Student	
	Household structure *(base: living alone)*				
ENDOGENOUS EFFECTS	Residential location *(base: inside inner ring road)*	↓	↓		
	Weekday mobility rate		↑		↑
	Weekend mobility rate		↑	↑	
	Car availability *(base: no)*	↑	↓		↓

Higher use of carsharing among males, young, wealthy, well-educated individuals, and those who reside in city centres. Age has a different effect on carsharing adoption in Munich, probably due to the influence of tech-savviness, and the longer life of these services in Munich.

Carsharing not perceived as a green transport mode, since higher environmental consciousness reduces carsharing usage.

CONCLUSIONS AND FUTURE RESEARCH

Key drivers determining the adoption and frequency of use of carsharing identified

Munich respondents seem to be more familiar with carsharing services compared to Madrid ones.

Further contributions should address: i) how heavier restrictions to the use of private vehicles in urban areas may impact carsharing usage; ii) impact of COVID sensitivity on carsharing usage; iii) competition between carsharing and traditional transport modes due to understand the future and current role of carsharing in achieving urban sustainability

This work was supported by the Comunidad de Madrid, which has funded the Project S-2020/L3-736 // PM210430C-066A (SHAPE). The project has also been co-funded by the European FSE funds

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Mobility patterns in healthcare centres. Case Study: La Paz University Hospital (Madrid, Spain)

Abid Al-Akioui, Andres Monzon & Candela Martin

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POSTER SESSION

Gomez., J. Aguilera-García, Á.,
Dias, F., Bhat, C.R., Vassallo, J.M.

SCAN ME

A GHDM analysis to explore individuals´ adoption and frequency of use of ride-hailing in a European city: the case of Madrid, Spain

INTRODUCTION

The research explores the **key factors** motivating **ride-hailing adoption** and **frequency of use** (at the individual level) in a European city.

Most of the scientific contributions on this topic focus on US cities, but European urban areas are worth investigating since they present higher **density population**, greater **presence of public transport** modes or a **greater** public **concern** for **environmental** issues.

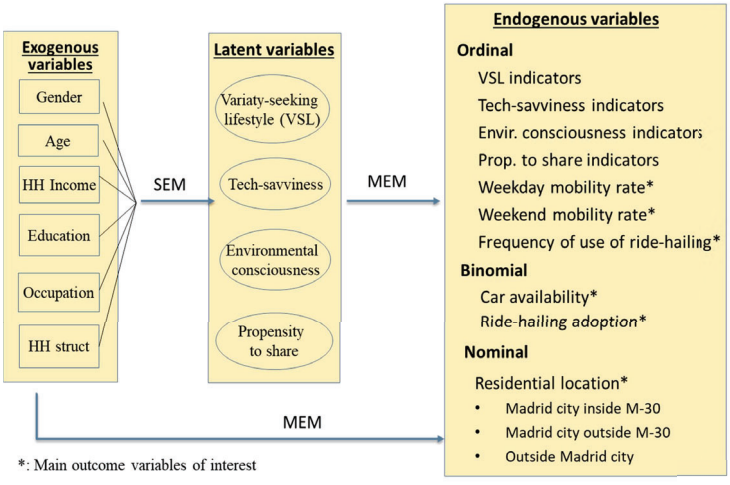
DATA AND METHODOLOGY

A **survey campaign** was conducted among citizens from Madrid metropolitan with a total of **1,246 valid responses**.

SURVEY STRUCTURE

i. General socio-demographic information
ii. Daily mobility trends and travel-related variables
iii. Adoption and use of ride-hailing services
iv. Personal attitudes and lifestyle preferences

Based on this information, we adopted a **Generalized Heterogeneous Data Model (GHDM)** developed by Bhat (2015), which is estimated at the individual-level. The model is a comprehensive approach that enables us to investigate the relationship between ride-hailing adoption and other transportation decisions while controlling for observed and unobserved factors that simultaneously influence such decisions



MAIN RESULTS

As in other parts of the world, Madrid ride-hailing (RH) **users** also **tend to be young, well-educated, wealthy individuals**, who are **familiar with new technologies**

EXPLANATORY VARIABLES		RH adoption	Frequency of use of RH
LATENT VARIABLES	Variety-seeking lifestyle		
	Tech-savviness	↑	
	Environmental consciousness		↓
	Propensity to share		
EXOGENOUS EFFECTS	Gender *(base: male)*	↑	
	Age *(base: under 25)*	↓	
	HH income *(base: <18,000 Euro)*	↑	
	Level of education *(base: lower than secondary educ.)*	↑	
	Occupation *(base: employed)*		↓ Student
	Household structure *(base: living alone)*	↑ Sharing a flat	
ENDOGENOUS EFFECTS	Residential location *(base: inside inner ring road)*	↓	↓
	Weekday mobility rate		
	Weekend mobility rate		↑
	Car availability *(base: no)*	↑	↑

Older segment does not seem to benefit substantially from RH services as an overall accessibility enhancer. Need to increase their tech-savviness levels and acceptance of RH may open up new possibilities for them.

Strong relationship between ride-hailing use and weekend mobility (**leisure activities**).

CONCLUSIONS AND FUTURE RESEARCH

Important role played by environmental consciousness and car propensity in ride-hailing frequency of use. Pro-environmental attitudes reduce the use of car-oriented options (both private vehicle and ride-hailing) in favor of sustainable modes such as transit. This is found in a context with an intensive supply of public transport and restrictions to private cars in the city center, which differs from US case studies previously analyzed.

RH use is likely to increase in coming years. Looking for coordination or integration with taxi services will be essential to avoid excessive fleets and limit the impact on congestion due to empty trips

This work was supported by the Comunidad de Madrid, which has funded the Project S-2020/L3-736 // PM210430C-066A (SHAPE). The project has also been co-funded by the European FSE funds

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POSTER SESSION

Juan Nicolas Gonzalez, Juan Gomez, Jose Manuel Vassallo

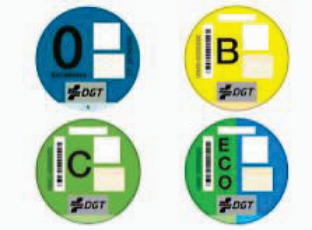
The use of Parking Management and Low Emissions Zones to encourage cleaner vehicles and sustainable modes of transport

INTRODUCTION

The main objective of this paper is to explore the drivers determining the use of on-street parking at a charge and to what extent Low Emissions Zones change private vehicle user behavior.

Two crucial transport policies have been developed in recent years: **Regulated on-street Parking Service (SER by its Spanish acronym), and Madrid Central (MC), a Low Emission Zone (LEZ)** implemented in the center of the city.

The Government updated vehicle regulation and implemented an environmental label category for vehicles. These categories are, from the least to the most pollutant ones: **0 (Zero Emissions), ECO, C, B, A (or without a label)**.

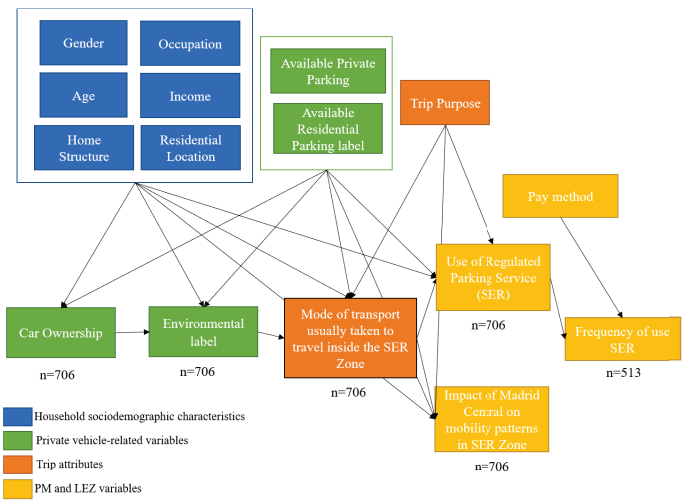


The SER implemented a parking pricing scheme with discounts depending on the environmental label

DATA & METHODOLOGY

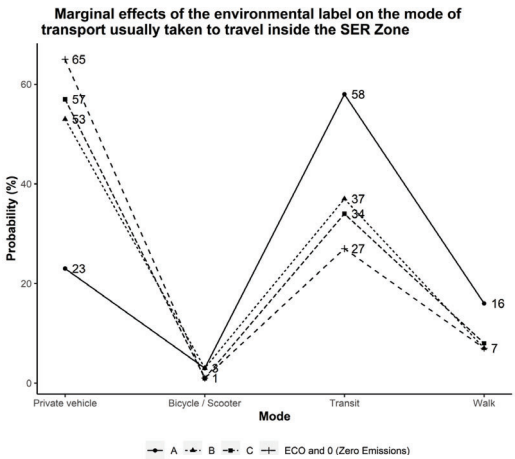
SURVEY. The target population is people residing in the Madrid Metropolitan Area who are potential users of SER. We obtained a total of **706 valid responses**.

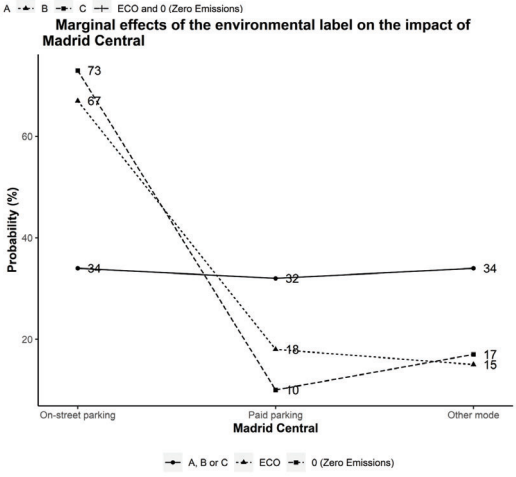
To achieve the objective, a **Path Analysis** was used. It performs a series of regressions to analyze the relationship between independent and dependent variables. In our case, multinomial and ordinal regressions were used.



MODELING RESULTS AND POLICY RECOMMENDATIONS

The environmental label of the vehicle plays a crucial role in explaining mobility patterns within the LEZ area. Particularly, individuals owning an environmentally-friendly vehicle are **more likely to continue using the charged on-street parking service** within Madrid Central than shifting from their private vehicle or paying for private parking.





Scan me!

Towards more sustainable modes of transport. The results show that the implementation of both LEZ and on-street parking pricing **positively affects** users with car availability **to switch to more sustainable modes** within the SER Zone.

Towards cleaner vehicles. Due to the benefits awarded by the local government to clean vehicles the results show that citizens owning these labels do not tend to change to other modes.

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Exploring travellers' willingness to adopt MaaS in two European metroplitan areas

Lopez-Carreiro, I. & Monzon, A.
Presented by Brownrigg-Gleeson, M.L.

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Evaluation approach for scaling up urban mobility measures on TEN-T urban nodes: the case of Madrid

Adriana Cortez

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POSTER SESSION

Beatriz Royo, Dimitra Politaki,
Juan Nicolas Gonzalez, Angel Batalla

Digital Twin opportunities and benefits in last-mile logistics for Madrid value case

ABSTRACT

This poster presents the concept of Digital Twins applied to city logistics in Madrid developed in the framework of the LEARN Project (No 723984) . It required mapping entities in the digital world and integrated real data, models and physical entities in a virtual representation of reality. It focuses on the benefits for the city stakeholders' needs to improve policymaking and business decisions.

MADRID VALUE CASE

The value case of Madrid compares the business as usual (BAU) scenario with a prototype for e-commerce last-mile deliveries. The BAU consists of direct deliveries from San Fernando to end e-commerce consumers in the Low Emissions zone “Madrid Central” using Diesel vans. The pro prototype supplies a UCC in an accommodated public underway parking using Hybrid vans. Then, it delivers the parcels with electric three-wheelers (Fig 1).

Fig. 1. Madrid value case physical representation.

DIGITAL TWIN REPRESENTATION

Fig 2. shows the inputs, outputs and models of the digital twin. The scenario of Madrid consists of a rough cut model that calculates the resources for BAU and UCC scenarios. Then, the user selects one of the scenario to be optimized by a routes optimization engine. The final step provides the environmental KPIs and optimized routes for the selected scenario.

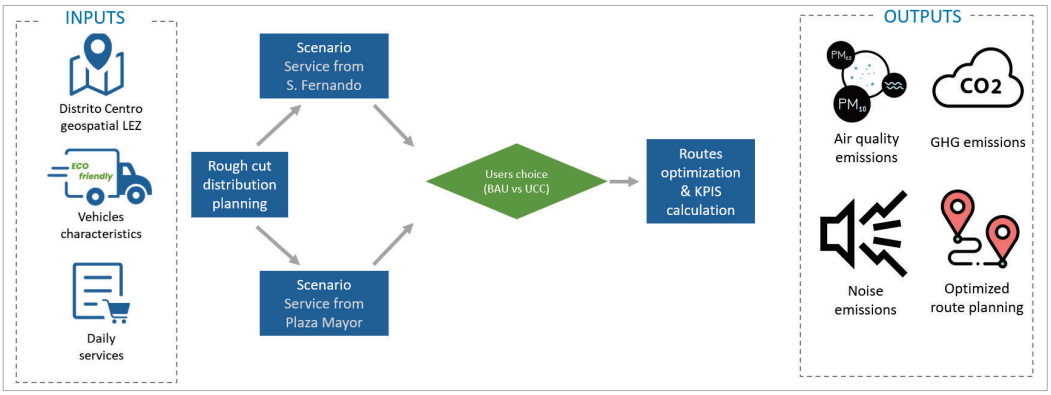

Fig. 2. Madrid value case digital representation.

Initial Results

Table 1 shows the results of the optimization engine for the AS IS scenario. The next phase will calculate and compare the AS IS and UCC scenarios and help the operator select the one to follow depending on different scenarios as the environmental constraints, and the number of services. It will help policymakers understand the impact of enabling public space for logistics operations to perform as UCC.

Parameter		Result
Monthly activity (Total)	Working days	25
	Services	5.701
Daily services	Average	228
Daily vehicles used	Average	4
Daily km driven	Average	310
Daily time to serve	Average	18:53:00
Daily vehicles capacity utilisation	Average	35%
Daily average km driven per vehicle	Average	79
Daily average time to serve per vehicle	Average	4:40:12

Table 1. Optimisation engine results (services from December 2021).

Digital Twin: Challenges and benefits

- Real-time operational data integration.
- Sensing the city to harness the power of real-time data.
- Capacity of the city to capture real-time disruptions and share information with local communities to allow synchronous planning.
- Reliable and accurate operational decision-making.
- Support network and public sphere reallocation based on what-if scenarios using reliable and accurate after-the-fact data.

Conclusion and future work

Despite the cost and difficulties of sensing the city and sharing data, both should be a priority of local communities to be able to harness the power of real-time data. The digital twin provides a tool to create virtual replicas qualified to predict potential disruption, simulating “what if” scenarios and reallocating resources and routes in real-time.

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LEAD

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POSTER SESSION

Tarriño-Ortiz, J.,
Gómez, J.,
Soria-Lara, J.,
Vassallo, J.M.

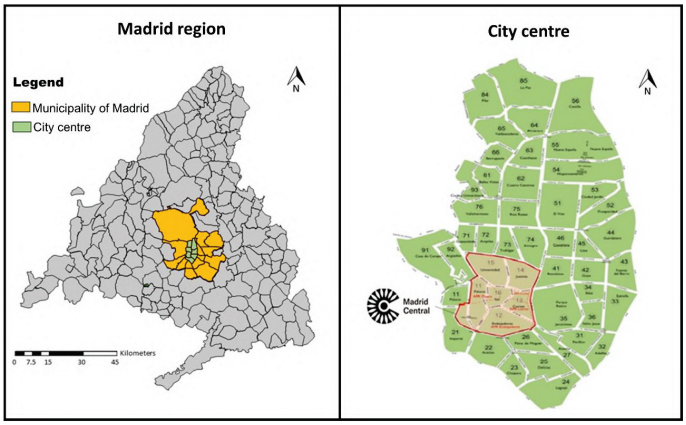
SCAN ME

Analyzing the impact of Low Emission Zones on modal shift

INTRODUCTION

The research explores **to what extent the implementation of Low Emission Zones (LEZs) affects modal choice in urban contexts**, with particular attention as to how LEZs affect modal shifts by private vehicle users.

An **LEZ called "Madrid Central"** was implemented in the city of Madrid in 2018, covering an area of 5 km^2 within the city center. Traffic restrictions have been imposed on private vehicles based on five environmental labels (from A to Zero), with exemptions to disabled people, residents, security, emergency services, and freight distribution.

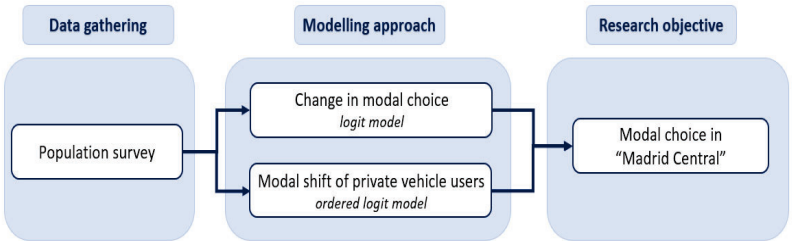


Population	Environmental label and access to "Madrid Central"				
	A	B	C	Eco	Zero
Car	No	Except to parking/garages	Except to parking/garages	Yes	Yes
Motorcycle	No	Restricted hours (7 to 22h)	Restricted hours (7 to 22h)	Yes	Yes

DATA AND METHODOLOGY

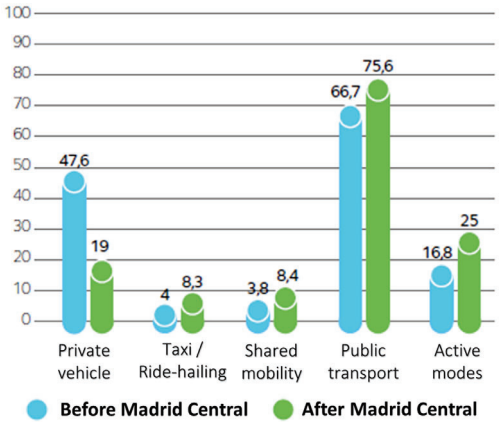
A **survey campaign** was conducted among citizens from Madrid metropolitan area after the implementation of "Madrid Central". The questionnaire captured a wide range of explanatory variables from respondents: socio-demographics, mobility habits, travel-related variables, and individual perceptions.

Based on that information, a **discrete choice analysis** was conducted to determine factors explaining modal choice following the introduction of "Madrid Central," with particular attention as to how this LEZ affects modal shifts by private vehicle users.



MAIN RESULTS

The results show the **high impact of the LEZ on decreasing car use and promoting cleaner modes** thereby contributing to reduce air pollution.



The research concludes that **modal shift is mainly associated with socio-demographic variables, individual perceptions towards LEZs and mobility habits**. In the case of "Madrid Central", it could be observed that: respondents with low monthly income (<1,300€/month) and people who travel to the area less than twice a week and more than once a month tend to reduce the use of their private vehicle more than people with high income, while families with dependent relatives, and citizens whose principal activity conducted in the LEZ is shopping are significantly less likely to give up using their car. By contrast, **attitudinal variables were not found relevant** for explaining modal shift due to LEZs. This research shows that personal reasons appear to be more important for modal choice than ideology or awareness.

CONCLUSIONS AND FUTURE RESEARCH

The effectiveness of "Madrid Central" in reducing car use provides policy-makers with relevant lessons to be applied. The results can be the basis for developing specific guidelines that help increase the impact of LEZs on modal shift. **The success observed in the case of Madrid underlines the opportunity** to design social interaction spaces on major and secondary streets to cover the needs of vulnerable population groups such as children and the elderly, to activate mechanisms that consolidate shared mobility as a real and efficient modal option, and to find ways to incentivize frequent and shopping travelers to switch to cleaner modes.

This work was supported by the Comunidad de Madrid, which has funded the Project S-2020/L3-736 // PM210430C-066A (SHAPE). The project has also been co-funded by the European FSE funds.

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POSTER SESSION

Maria Vega-Gonzalo

ANALYZING INDIVIDUALS' PREFERENCES AND USAGE PATTERNS OF TRADITIONAL TAXI, E – HAILING AND RIDE-HAILING USERS

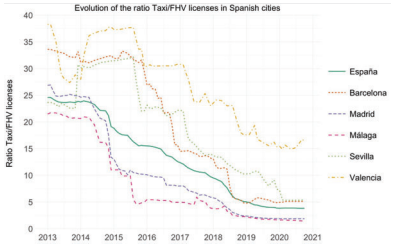
1. INTRODUCTION

- The **advent of ride-hailing** has revolutionized the hailing sector by offering an **improved user experience** motivated by the use of **digital applications**.
- The response of traditional taxi services has been twofold: (1) to call for **regulatory changes** that allow to level the playfield for both competitors; (2) **to launch digital applications** that allow them to provide a service more similar to that of ride-hailing services (**e-hailing**)
- Few works in the existing literature address the effect of the introduction of e-hailing in the demand for traditional taxi and ride-hailing, and none of them analyses the three of them simultaneously.

The goal of this research is to analyse how the adoption of the new forms of hailing services (ride-hailing and e-hailing) and the usage patterns of the three available services are determined by the psychological and socio-economic attributes of the individuals.

2. THE CONTEXT: HAILING SERVICES IN SPAIN

- Ride-hailing vehicles in Spain are required to have a **FHV license** to offer their services. The **ratio between taxi and FHV** licenses has been steadily decreasing.
- The topic has generated a significant **social polarization** between those that see the traditional taxis as outdated sector that needs to update and advocate for its liberalization and those that see the advent of ride-hailing as a case of **unfair competition.**



- E-hailing offers a regulated service and some of the advantages of app-based hailing, which breaks this disjunctive in the hailing market

3. MODELLING RESULTS

*** p ≤ 0.01, ** p ≤ 0.05, * p ≤ 0.1	RH adoption	E-hailing adoption	Hailing usage profile (*base: Reluctant to app-based service*)			
			RH oriented	Taxi oriented	App-based oriented	Hailing oriented
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
LATENT VARIABLES						
POLITICAL IDEOLOGY	0.174***	-0.110***	0.055***	-0.031***	0.014*	-0.033***
QoS DEMAND BEHAVIOR	--	--	--	0.057***	--	0.034**
TECHNOLOGICAL COMFORT	0.056***	0.070***	--	--	0.020**	-0.040**
HAILING EXPERIENCE	n/a	n/a	0.145***	-0.173***	-0.030**	--
Gender (male)						
Female	--	-0.063**	--	-0.039**	0.109***	--
Age (under 26)						--
26 to 34	--	--	--	0.122***	-0.051**	--
35 to 49	--	--	--	0.219***	-0.082***	--
Above 49	-0.010**	--	--	0.244***	--	--
Monthly income (below 1,000 Euro)						
1,000 to 1,600 euro	--	--	0.119***	0.046**	--	0.144**
1,600 to 2,500 Euro	--	--	0.234***	--	--	0.238***
Above 2,500 Euro	--	--	0.195***	--	--	0.194***
Without own income	--	--	0.201***	--	0.152***	--
Education (non-university)						
University studies	0.046*	--	-0.105***	--	0.052**	0.060**
Occupation (student)						
Employed	--	--	-0.166**	-0.146***	0.131***	--
Student and part-time employee	--	--	--	-0.061***	0.129***	--
Housework, unemployed or retired	-0.132**	--	-0.250**	-0.219***	0.107**	0.305***
Household structure (living alone)						
Living with flatmates	0.062**	-0.144***	--	--	--	-0.168***
Couple without children	--	--	--	0.094**	--	-0.246***
Couple with children below 24	--	--	-0.106***	--	0.042**	-0.182***
Couple with all children above 25	--	--	-0.146**	--	--	--
City of residence (*Madrid*)						
Barcelona	--	--	0.099**	--	--	--
Valencia, Seville or Málaga	--	--	--	-0.107**	-0.123**	0.113**
Residential location (city center)						
Municipal area	-0.040*	--	--	0.044***	-0.064**	0.062**
Metropolitan area	-0.090***	--	--	0.039**	--	--
Main mode of transport (PV)						
Public transport	--	--	0.060**	--	--	--
On foot or bicycle	--	--	0.098**	0.117***	--	-0.093**
Trip purpose (work related trips)						
Both types	--	--	--	-0.052***	--	--
Leisure trips	--	--	0.062**	-0.069**	--	--
No available alternative	--	--	--	--	-0.135***	-0.071**
Constant	0.661***	0.599***	0.237***	0.037 (ns)	-0.066**	0.190***

3. SURVEY DATA

April – June 2018

906 valid responses

Spanish cities where the three hailing services were available: Barcelona, Madrid, Málaga, Sevilla y Valencia.

Survey structure

1. Socio-economic attributes of the respondents
2. Mobility habits and use of hailing services
3. Beliefs and preferences regarding the different hailing services (Likert-scale indicators)

4. MODELLING FRAMEWORK

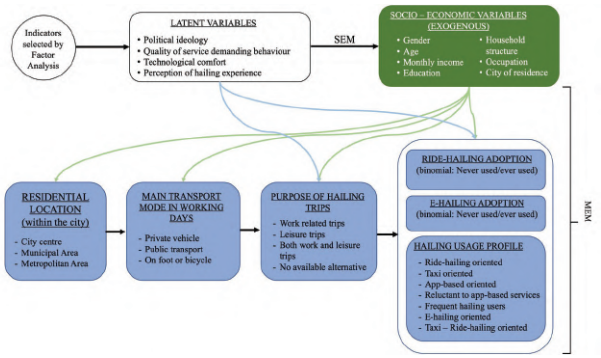
Latent psychological variables – Factor Analysis

Factor Analysis has been used to build measurement scales for the unobserved latent constructs based on the indicators included in the survey that capture the subjective beliefs and preferences of the individuals.

- Political ideology
- Quality of service demand behaviour
- Technological comfort
- Perception of the hailing experience

GSEM

A **Generalized Structural Equation Model (GSEM)** has been chosen aiming to simultaneously consider the intercorrelation between subjective preferences, socio-economic characteristics, long term decisions (such as residence location), mobility decisions and the effect that all these factors have on the adoption and usage patterns of the available hailing services.



5. CONCLUSIONS

- The adoption of both ride-hailing and e-hailing is mainly determined by **psychological preferences**. Users who wish to enjoy an **improved service** but are **reluctant to adopt ride-hailing** due to their political and economic values, are more likely to **adopt e-hailing**.
- On the other hand, while taxis seem to have managed to level up with ride-hailing services in the field of quality-of-service, **ride-hailing** is still the preferred option for users with a **high liberal thought.**
- The frequency of use and chosen combination of hailing services showed to be affected by psychological constructs as much as by socioeconomic variables and mobility habits.
- **Young and employed** individuals are observed to be significantly more likely to use **ride-hailing** and **e-hailing** intensively.
- Those who use hailing only when there is **no alternative** option tend to prefer **traditional taxis** over technology-based services, showing how traditional taxi services are still indispensable to **complement public transit** systems when its provision is not sufficient.

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ANEXO VII

Actividades de difusión y transferencia de conocimiento:

Publicaciones de carácter científico

Transport Policy 123 (2022) 55–72

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Behavioral factors impacting adoption and frequency of use of carsharing: A tale of two European cities

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ARTICLE INFO

Keywords:
Carsharing
Emerging mobility services
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Travel behavior
Latent variables
Generalized structural equation model

ABSTRACT

Innovative mobility services have emerged in many urban areas, causing a notable change in transport supply. Particularly, free-floating carsharing has allowed gaining short-term access to cars on an as-needed basis. In Europe, carsharing has experienced remarkable growth in the past few years and is often perceived as a shift towards sustainable mobility. While an increasing number of studies have analyzed individuals' behavior, most authors analyze carsharing in contexts where this service is not available yet. Furthermore, little attention has been given to exploring the role played by psychosocial aspects. This study aims to fill this gap in the literature by exploring carsharing usage in two European cities (Madrid and Munich), cities with a different timespan implementation. Based on the individual-level dataset from a survey campaign conducted in 2019, we develop a Generalized Structural Equation Model (GSEM) that estimates how sociodemographic characteristics, mobility-related attributes, and psychological attitudes affect carsharing usage. The research identifies a higher use of free-floating carsharing among males, young, wealthy, well-educated individuals, and those who reside in inner and denser districts. Interestingly, the model results suggest that people with a high sharing propensity, variety-seeking lifestyle, and preference for driving have a significantly higher familiarity with carsharing services, while pro-environmental behaviors reduce carsharing usage. This research shows the importance of the background and sociodemographic context on carsharing usage by comparing the results obtained for each city. Finally, the paper provides interesting policy implications, helpful for planners and policymakers to better understand the factors impacting carsharing usage and its potential effects on travel behavior and sustainability.

1. Introduction

In the context of strengthening and promoting sustainable mobility, more attention is being devoted to the design, operation, and management of urban mobility systems in the planning agendas (Banister, 2008). In the past few years, emergent technologies on the Internet of Things, connectivity, wireless communications, and big data, along with the widespread use of smartphone technology, have fostered an important development of app-based mobility solutions in many urban areas. These innovative mobility services have changed the traditional way of planning, modeling, and doing business in urban transportation (Smith and Hensher, 2020). From the citizens' point of view, they have also allowed gaining short-term access to vehicles (car, moped, bicycle, scooter, etc.) on an on-demand basis. This is the case for shared mobility systems launched in the past few years, such as scooter sharing, bikesharing or free-floating carsharing.

Carsharing services allow users for a car short-term access on an as-needed basis, generally subject to payment for the use of the vehicle (Shaheen and Cohen, 2013; Münzel et al., 2018). Shared vehicles are owned by a platform company so this service promotes new forms of car use, in which drivers do not necessarily need to bear car ownership-related costs. These mobility services have increased markedly in the past few years worldwide, particularly in Europe, as is the case of free-floating services operating within a defined area (Münzel et al., 2020). Carsharing has brought great changes in, e.g., car ownership or how individuals plan and make their trips, thus the implications for cities, urban mobility, and the automobility business model are deep. Free-floating carsharing, also referred to as point-to-point or one-way carsharing, is often viewed as a shift towards more sustainable mobility. Many authors have pointed out the positive impacts of

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Ridesourcing vs. traditional taxi services: Understanding users' choices and preferences in Spain

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ARTICLE INFO

Keywords:
Ridesourcing
Taxi
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Travel behavior
Latent variables
Generalized Structural Equation Model

ABSTRACT

Both the traditional taxi and ridesourcing market provide similar on-demand door-to-door transportation services from the users' viewpoint, although operate under different legal and regulatory frameworks. Ridesourcing has experienced notable growth in urban mobility in the last few years since it gives a convenient, on-demand door-to-door service, provides app-based real-time information about the trip, and offers flexible prices that vary according to the level of supply and demand at each moment. This new actor in urban mobility directly competes with taxis, a more regulated mode that has traditionally provided door-to-door trips. While competition between taxi and ridesourcing has generated great controversy in the public debate, little attention has been paid to the users' viewpoint. Additionally, most of the scientific literature on travel behavior and ridesourcing focus on specific characteristics of these services, while scarce efforts have been devoted to study users' choices and preferences towards ridesourcing vs. its main competitor, taxi services. To bridge this gap, this paper investigates the main factors (individual sociodemographic, mobility-related characteristics, psychological attitudes, etc.) determining individuals' choices between ridesourcing and traditional taxis. To that end, a Generalized Structural Equation Model (GSEM) is carried out, based on the information collected from a survey campaign conducted in Spain. The results show that, from a behavioral perspective, people opened to technological innovation and with liberal thought (in the sense of being favorable to market openness) tend to use ridesourcing services more often than taxis. Our results also suggest a higher tendency to use ridesourcing among women, young people, and people using hailing services for leisure, recreational or social purposes. Interestingly, individuals having already used both taxi and ridesourcing in Spain, tend to rate higher the quality-of-service performance (driver and/or vehicle fleet) provided by ridesourcing compared to taxis.

1. Introduction

The development of information and communication technologies (ICT), along with the widespread use of smartphones, have enabled users to gain short-term access to individual transportation modes (vehicle, motorcycle, bicycle, etc.) on an on-demand basis. In the past few years, app-based mobility solutions have emerged as a disruptive approach to the traditional way of planning, modeling, and doing business in urban transportation (Lopez-Carreiro et al., 2020). As a result, the range of mobility alternatives for

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30 ANOS DO SISTEMA URBANO
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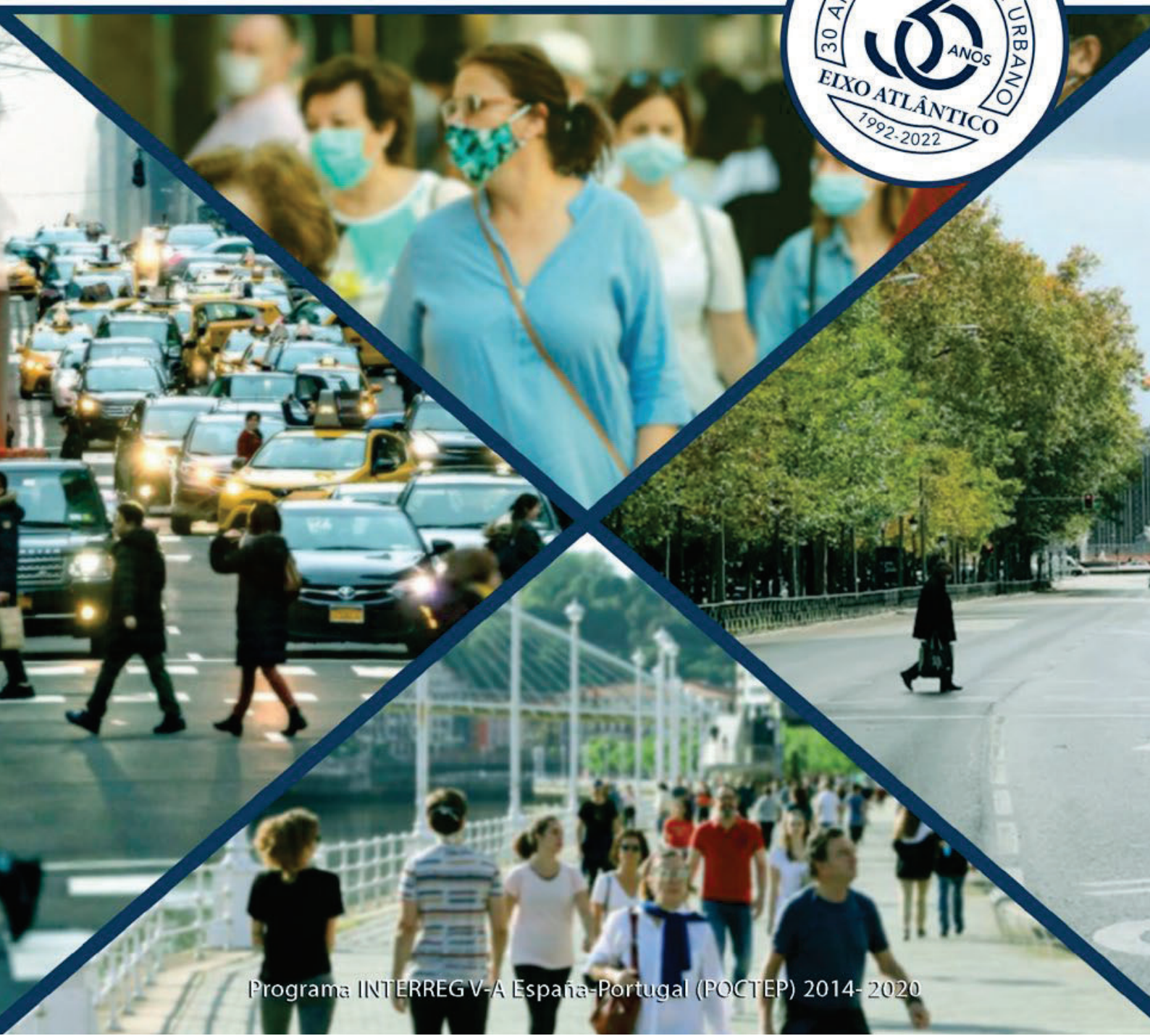

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Micromobility services before and after a global pandemic: impact on spatio-temporal travel patterns

Daniela Arias-Molinares, Juan Carlos García-Palomares & Javier Gutiérrez

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Abstract

Sudden changes in urban mobility were caused due to the COVID-19 pandemic. The impacts are yet to be furtherly measured and analyzed. Our article uses GPS records provided by three different micromobility operators in Madrid to study how the pandemic affected their service usage and its relationships with land use. Thus, spatio-temporal travel patterns are compared between pre-COVID 19 (from January 2019 to February 2020) and COVID times (from March to December 2020). Additionally, multiple regression analyses are conducted to assess how the two scenarios differentiate in relation to micromobility trips, generated or attracted, to or from different land uses, and during morning or afternoon peak hours. Results show that the most pandemic-resilient shared mode is bike-sharing, and that COVID-19 has caused a downfall in micromobility trips of approximately 10%, which is relatively lower compared to the 80% ridership drop reported by the public transport system. Our models reveal that residential and commercial areas gained importance after the pandemic, while workplace locations (office and industrial), educational and transport facilities lost relevance with teleworking and online studying. These findings could help authorities to plan future policies and improve the infrastructure needed to promote micromobility services.

Keywords: Micromobility | shared mobility | spatial analysis | COVID-19 pandemic

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Declaration of interest statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Territorios comunes, miradas compartidas

Aproximaciones desde la geografía

C. Gago García, J. Córdoba Ordóñez,
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PUV
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6. LAS NUEVAS FORMAS DE MOVILIDAD EN LAS CIUDADES

De los servicios de movilidad compartida a la movilidad como servicio

1. INTRODUCCIÓN

La movilidad sostenible se ha convertido en el paradigma dominante en la planificación del transporte y la gestión de la movilidad en las ciudades. La idea central de este modelo radica en fomentar la movilidad peatonal y en bicicleta, así como el transporte público, disuadiendo del uso del vehículo privado, con estrategias que disminuyan su atractivo (Machado et al., 2018). En este contexto, las alternativas al automóvil deben ser ambientalmente más sostenibles y cubrir eficientemente los viajes de última milla, además de ser cómodas y flexibles. Esta idea parecía poco viable hace algunos años, pero está tomando cada vez más fuerza con la introducción y consolidación de la economía colaborativa y los múltiples avances tecnológicos disruptivos que están favoreciendo el surgimiento de nuevos servicios de movilidad compartida y promoviendo la intermodalidad (Arias-Molinares y García-Palomares, 2020).

Los cambios en la forma en que nos movemos están siendo muy rápidos, especialmente en lo relativo a los servicios de movilidad compartida (Shaheen y Cohen, 2019). La actual crisis climática exige cada vez más avanzar hacia un modelo de desarrollo más sostenible y respetuoso con nuestro planeta. Adicionalmente, los nuevos avances tecnológicos (penetración de los teléfonos móviles, geolocalización con GPS, el internet de las cosas, etc.) y los nuevos estilos de vida de los jóvenes están cambiando la forma en que se concibe la movilidad personal. Más que poseer activos de transporte, se utilizan a conveniencia. Con esta filosofía, los consumidores se benefician de menores costos por el uso de bienes y servicios al mismo tiempo que evitan el desperdicio de recursos (Cohen, 2019; Leismann et al., 2013). Este modelo de desarrollo se ha extendido a todos los ámbitos y sectores económicos, y más claramente, en el sector del transporte y la movilidad. En lugar de poseer un coche, una moto o un patinete eléctrico, por ejemplo, es posible utilizar servicios de

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Exploración del impacto de la pandemia COVID 19 en los sistemas públicos de bicicletas compartidas: los casos de Madrid (BiciMAD) y Buenos Aires (EcoBici)

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RESUMEN

Los sistemas públicos de bicicletas compartidas (SPBC) son servicios de préstamo ofrecidos al público suscrito, que permiten tomar una bicicleta en un punto y devolverla en otro diferente. En Buenos Aires y en Madrid se implantaron SPBC en 2010 y 2014 por los gobiernos de la ciudad y la municipalidad respectivamente como sistemas de transporte público y alternativo a los de transporte colectivo. Las ventajas que ofrecen los SPBC son múltiples, social y ambientalmente. El objeto de este artículo es realizar una exploración y análisis del patrón temporal y espacial de los viajes realizados en los SPBC para ambas ciudades antes y durante la pandemia de COVID 19, con el fin de contribuir con el estado del arte. Los patrones temporales y espaciales en ambas ciudades eran semejantes prepandemia. Los dos sistemas tuvieron un impacto negativo en 2020 en número de viajes, producto de restricciones de actividades y circulación. Ambos SPBC fueron afectados durante la pandemia, mientras el uso de las bicis privadas aumentaba. En ambas ciudades existe correlación entre nivel de oferta y el uso del sistema y se identificaron nuevos espacios de micromovilidad. Es pertinente considerar las carencias en el tratamiento y la disponibilidad pública de datos.

Palabras clave: *Bicicleta compartida. EcoBici. BiciMAD. Pandemia. Buenos Aires. Madrid.*

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XXV International Conference Living and Walking in Cities - New scenarios for safe mobility in urban areas (LWC 2021), 9-10 September 2021, Brescia, Italy

Planning Adaptive Strategies for Urban Transport and Land Use using Scenario-Building

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Abstract

Incorporating low probability and high impact events in land use and transport planning (e.g., COVID-19 pandemic) remains as a challenge. Scenario-building techniques are frequently used to examine and incorporate those deep uncertainties into planning processes. However, limited attention has been paid to explore how scenario-building visions can contribute to design adaptation policy pathways, which further increases land use and transport resilience against unexpected and low probability events. This paper initially shows a theoretical framework that links scenario-building visions to adaptive planning, defining four potential adaptation policy pathways: linear, priority-oriented, outcomes-oriented, and winding. Such adaptation pathways are based on comparing both priority of planning goals and outcomes differences across a set of long-term visions and the basic policy pathway adopted. The theoretical approach is supported by an empirical analysis implemented in the Madrid Metropolitan Area (Spain), where a scenario-building process has been developed, creating three long-term visions that differ from the basic pathway: "Non-motorized city centers", "Overpopulation", and "High levels of insecurity in urban areas". The comparison between long-term visions and the basic pathway was made by surveying a group of experts and stakeholders, distilling different adaptation pathways for the case study. The obtained results support the theoretical framework described, opening a discussion about its robustness, implementability, effectiveness, and limitations for real planning processes.

Keywords: Uncertainty; Adaptation Pathways; Policymaking; Scenario Planning

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E-shopping and walking accessibility to retail

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Abstract

Previous research on e-shopping and transportation has paid limited attention to accessibility-oriented approaches. To address this gap, the present paper explores the importance of e-shopping habits in predicting three types of walking accessibility (real, potential, and perceived) to grocery and clothing stores for individuals younger than 55 years. The municipality of Getafe (Madrid Metropolitan Area, Spain) provides the empirical staging ground. The methodology utilizes a face-to-face questionnaire to record e-shopping habits and socio-economic characteristics. The Random Forest algorithm is used to establish the importance of e-shopping habits and socio-economic characteristics for predicting real, potential, and perceived walking accessibility. The results reveal that both e-shopping habits as well as socio-economic variables are relevant for predicting each type of walking accessibility, but with varying impacts and targeted in specific use cases. For groceries, e-shopping habits demonstrated high predictive power for potential accessibility, whereas such predictive power was similar to socio-economics for real and perceived accessibility. Regarding clothes, e-shopping habits were more relevant than socio-economics in predicting real and potential accessibility, while a similar importance level was seen between e-shopping habits and socio-economic factors for perceived accessibility. The concluding remarks provide a summary of the key findings and a few reflections on transport policymaking.

Keywords: accessibility; digitalization; online shopping; active modes; COVID-19

1. Introduction

Academia has explored the factors that shape walking accessibility to major destinations, including in-store retail as a major out-of-home activity (Ariza-Álvarez et al., 2019; Battista and Manaugh, 2018). In parallel, e-shopping is growing in application, which may impact everyday mobility patterns (Berg and Henriksson, 2020; Maat and Konings, 2018). E-shopping is becoming especially popular with those under 55 years of age for specific products, such as

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ICT use and spatial fragmentation of activity participation in post-COVID-19 urban societies

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Time geography
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E-working
E-shopping
E-leisure
Transport

ABSTRACT

With the outbreak of the COVID-19 pandemic, the use of Information and Communications Technology (ICT) came to dominate daily activities (e.g., e-working, e-shopping, and e-leisure). The intensive use of ICT might trigger higher levels of spatial fragmentation of daily activities, having significant consequences for planning purposes. This paper seeks to estimate how ICT use and habits affect the individuals' spatial fragmentation patterns in urban contexts on post-COVID-19 societies, while controlling for socioeconomic and built environment characteristics. The city of Alcalá de Henares (Madrid Metropolitan Area, Spain) serves as the case study. The research design is based on activity diaries obtained by face-to-face interviews, and Tobit and Poisson regression analyses are used to examine the relationships between spatial fragmentation measures (outcome variable) and ICT use (predictors). The results reveal that ICT might originate higher spatial fragmentation for work-related activities than for shopping-leisure purposes. For working activities, higher spatial fragmentation patterns are found among people with higher willingness to e-work and individuals who e-work at least once a month, but rather dependent on the occupation type. Regarding shopping and leisure activities, higher spatial fragmentation patterns are noted with car owners and more frequent consumers of online entertainment. The study provides insight into how ICT use is transforming spaces traditionally adapted for a single purpose into multifunctional spaces as well as the spatial effect of this phenomenon.

1. Introduction

Information and Communications Technology (ICT), via e-working, e-shopping and e-leisure, is playing a significant role in reorganizing daily spatial patterns at urban and regional levels (Shen et al., 2020). People can perform daily tasks anywhere and at any time, thus overcoming space-time barriers (Ben-Elia and Zhen, 2018; Thulin and Vilhelmson, 2019). It also serves as a catalyst in new fragmentation patterns of daily activities in both space and time, reshaping planning practice, for example, by changing use of dedicated places and modifying traditional travel patterns (Alexander et al., 2011). The COVID-19 pandemic accelerated digitalization[1], fundamentally altering perception and use of ICT in daily life (Mouratidis and Papagiannakis, 2021). However, the potential impact of the "new online habits" on spatial patterns and activity fragmentation processes (e.g., fragmented vs clustered), as well as the persistence of this phenomenon in the mid- and long-term, is not yet clear (Lyons, 2009; van Wee and Witlox, 2021).

Time geography (Hägerstrand, 1970), with its concept of activity fragmentation, is a good approach to examine the impact of ICT. Inspired by Couclelis (2003), activity fragmentation "is a process whereby a specific activity is divided into several smaller components, which are performed at different times and/or locations" (Hubers et al., 2018, p.95). Spatial fragmentation is traditionally made up of three measures (Ben-Elia et al., 2014): (i) number of locations, indicating the number of unique locations where each activity is performed on a certain day; (ii) distribution of fragment sizes, measuring how the total time spent on one activity in a particular day is spread across different locations; and (iii) configuration of fragments, estimating the spatial dispersion of locations in which one activity is completed in a given day. Since mandatory (e.g., working) and discretionary activities (e.g.,

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[1] The research team did not explicitly ask whether the participants (or some family members) were in quarantine at the moment of the interview. This statement describes a likely situation based on the events occurred in Alcalá de Henares at the moment of conducting the fieldwork.

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Review

Key Elements of Mobility Apps for Improving Urban Travel Patterns: A Literature Review

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Abstract: In recent decades cities have applied a number of policy measures aimed at reducing car use and increasing public transportation (PT) patronage. Persuasive strategies to change mobility behavior present notable limitations in economic and logistical terms and have only minor impacts. The smartphone has emerged as a promising tool to overcome these challenges, as it can host persuasion strategies through mobility apps. Simultaneously, Mobility-as-a-Service (MaaS) schemes could open up new possibilities for addressing both sustainability goals and the needs of urban travelers. This paper carries out a literature review to identify the key elements of mobility apps that foster more sustainable travelers' choices. The findings show that some persuasive strategies such as eco-feedback, rewards or social challenges are effective because they are well received by users. From the users' point of view, the perceived barriers (e.g., usability, privacy) relate negatively to app adoption, and it is considered useful to include functional needs such as real-time information (e.g., to avoid congestion), cost savings (e.g., customized multimodal packages), comfort (e.g., crowding on public transport) or health (e.g., calories burned). We have found that a proper design of multimodal travel packages based on (i) financial incentives and (ii) environmental awareness, could help increase public transport patronage and reduce private car use.

Keywords: mobility apps; travel behavior; transfer car trips to PT; persuasive technology; Information and Communication Technology (ICT)

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1. Introduction

Many cities have been planned or transformed to allow massive car use, and major efforts are needed to reverse this situation. The current challenge is therefore to convince travelers to choose more sustainable modes of travel. The measures implemented to meet this challenge have generally been classified as "hard" and "soft". Hard measures, involving changes to transport infrastructures with high associated costs for public administrations, are sometimes controversial and are unfeasible for politicians [1]. For this reason, public administrations have started to take an interest in soft measures, which try to persuade and make sustainable mobility more attractive. Among the soft measures, travel behavior change programs (TBCP) have become popular, demonstrating their potential to reduce car use [2]. However, their effects on participants are somewhat limited and they are difficult to apply to large population groups [3].

ICT has changed the way travelers move around cities, as smartphone technology provides users with high-value information. The arrival of smartphones may dramatically help change travel patterns [1] and enhance the effects of TBCP interventions. In the last decade, some TBCP programs have started to be run through smartphones [2,3], and are known as technology-based interventions. In this case, travel apps incorporate persuasive elements to encourage users to adopt sustainable modes of transportation.

El mundo visto de las ciudades

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Do urban parking restrictions and Low Emission Zones encourage a greener mobility?

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ARTICLE INFO

Keywords:
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ABSTRACT

Decreasing air pollution produced by road traffic represents one of the main actions of both national and local governments to improve air quality in urban areas. This research explores to what extent measures restricting the use of the private vehicle, such as on-street parking regulations and the implementation of Low Emission Zones encourage the use of environmentally-friendly vehicles and promote a shift towards more sustainable transport modes in the city of Madrid. By calibrating multinomial and ordered regression models, we study how the implemented measures impact individuals' choices. The results indicate that these measures encouraged citizens to switch to more sustainable modes. However, citizens with cleaner vehicles are reluctant to shift to public transport or active modes due to the benefits stemming from the ownership of those vehicles, such as the possibility of enjoying free parking.

1. Introduction

Cities are growing to such an extent that 55 percent of the world's population in 2019 lives in urban areas, and this ratio is expected to rise to 68 percent by 2050 (United Nations, 2019). The growth of cities brings about new mobility challenges such as traffic congestion, accidents, noise, and air pollution (Timilsina and Dulal, 2011). According to the World Health Organization (2021), ambient air pollution accounts for an estimated 4.2 million premature deaths per year worldwide. Thus, improving air quality standards is a high priority in many cities to reach a greater quality of life. An increasing number of European cities are enacting legislation to promote transport policies in urban areas. Multiple successful interventions have been implemented: park and ride promotion, traffic calming, priority lanes for buses, encouraging bicycle use, car-pooling promotion, enhancing pedestrian areas, and parking management.

Reducing air pollution caused by road traffic represents one of the main actions of both national and local governments to improve air quality in urban areas. Caicedo et al. (2016) suggested four strategies to tackle this problem: *(i)* promoting more efficient vehicles, *(ii)* developing urban planning strategies, *(iii)* enhancing city breathability, and *(iv)* implementing Transportation Demand Management (TDM) measures. Bigazzi and Rouleau (2017) categorized TDM strategies in operating restrictions, pricing (including parking management), lane management, speed management, traffic flow control, and trip reduction strategies.

The implementation of Parking Management (PM) strategies and Low Emission Zones (LEZs) are among the transport policies more widely used to tackle pollution and improve air quality in urban areas. PM is widely used to manage, regulate, and control parking

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An international time equivalency of the pure transfer penalty in urban transit trips: Closing the gap

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ABSTRACT

The perception of transfers in urban transit trips plays a key role when choosing an appropriate design of a public transport network for a given city, as there are lines structures that involve significantly more connections than others, e.g. hub-and-spoke or feeder-trunk. Besides additional walking and waiting, a transfer involves the interruption of a trip, whose value, called *pure transfer penalty* (PTP), has not received the same attention from a behavioral viewpoint. In this paper we contribute to find whether there is an equivalency with as general validity as walking and waiting regarding in-vehicle time. We do this by reviewing available evidence – all in relatively large cities - and by estimating the PTP in the very small Spanish city of Vitoria adapting a generic methodology that has been applied only to a metropolitan area (Madrid). Although Vitoria is much smaller in size, with fewer shares of multimodal trips, harder climate and shorter trip distances, results reveal that PTP is perceived as an increase of 18.4 Equivalent-In-Vehicle-Minutes (EIVM) when it does not rain or snow, very close to the values obtained in Madrid (15.2–17.7) and other reported meta-analysis (17.6). This figure drops when bad weather happens, which yields a weighted annual average of 13.9 EIVM. We propose 13–18 as a reasonable equivalence range for planning purposes.

1. Introduction

One of the key challenges in the strategic design of urban transit systems is to find the most appropriate lines structure, i.e. the network of transit services that can best satisfy all trip needs in all origin-destination (OD) pairs at all periods. As lines can be organized in many forms – as, for example feeder-trunk, hub-and-spoke or direct services -, deciding which structure is superior requires valuing all elements appropriately, including not only the cost of operating the system but also users' perceptions of the different components of travel time. This is the basic reason why the design of routes, frequencies and lines spacing matter, as each element is linked directly with in-vehicle, waiting, and access times respectively. There is one element, however, that has not received the attention it deserves: the number of planned transfers inherent to every lines structure.

Cities have evolved increasing distances travelled and travel times (Banister, 2011), forcing many transit users to combine different transport modes to complete their trips. As stated by Hernández and Monzón (2016), reducing the inconvenience inherent in transferring between modes seems to be a basic principle for achieving sustainable mobility. Along this line, a key point for the improvement of passenger transport in urban areas is to streamline transfers and decrease the perceived penalty of users to enhance their intention to travel sustainably (European Commission, 2013). A paradigmatic (bad) example is that of Santiago, Chile, where surface transit was redesigned by 2007 moving from mostly direct services towards a feeder-trunk system, increasing the percentage of trips that needed a transfer from 10 to 60 percent, which ended up in an unprecedented disaster (Gschwender et al., 2016).

In an urban transit trip, a transfer involves additional walking, additional waiting and the interruption of the trip, but only the former two have been usually studied from a behavioral viewpoint leading to perceived values of access and waiting times that are always larger than in-vehicle time: 1 min walking or waiting is perceived in most places as two or three times 1 min in-vehicle. What about the third element, the interruption of a trip? In other words: if a transfer meant neither

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Identifying key elements for user satisfaction of bike-sharing systems: a combination of direct and indirect evaluations

Raky Julio[1] · **Andres Monzon**[2] · **Yusak O. Susilo**[3]

Abstract

Bike-sharing systems (BSS) are gaining popularity in cities worldwide, as a part of a generalized strategy to mitigate the problems derived from motorized transportation (congestion, pollution, noise, etc.). These systems have proved to have positive effects on cities, moreover, many of them have reached a performance peak and require improvements to attract/retain users and compete against emerging soft mobility alternatives. Whilst there are broad studies evaluating BSS demand and design, less attention has been paid to user satisfaction and the complexities underlying the relationships between the system attributes importance. This study proposes a novel combination of two methodologies for satisfaction assessment that allows decision-makers to identify the most influential system attributes on user satisfaction. The combined methods are the direct, explicit, *Importance Performance Analysis* (IPA), and the nonlinear, implicit *Three-Factor Theory* (3FT), which combined generate a three-dimensional scheme that facilitates the comprehension of the results. The combination was applied to a dataset of Madrid´s BSS to identify the attributes that perform poorly, and then assess their implicit influence on satisfaction to establish improvement priorities. The results suggest that *station occupancy and bicycle availability* and *totem functioning* are key service attributes to enhance satisfaction. Also, the combination of the two methodologies makes it possible to differentiate that *maintenance* is a priority for subscribers and *network extension* for occasional users. The *pedelec* system is a key attribute that might help overcome Madrid´s unfavorable cycling environment. This user-centric evaluation is a valuable tool that guides precise measure implementation, service operation, future design, and planning oriented to increase ridership.

Keywords User satisfaction · Bike-sharing · Attribute importance · Importance-performance analysis · Three-factor theory.

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Long term assessment of a successful e-bike-sharing system. Key drivers and impact on travel behaviour

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ABSTRACT

The many benefits of cycling, such as eco-friendliness, low cost, health benefits, and efficiency in congested areas, had encouraged governmental strategies to promote it, triggering a global growth of bike-sharing systems (BSS). In this line, it is important to avoid service termination by assessing the evolution, identifying drawbacks and success factors, that could be determinant on the system's future. Nonetheless, in many cases, subjective and objective information regarding BSS was not collected nor compared. In this study, we analyse the evolution of Madrid's pioneer electric system, by combining the subjective data of three surveys, conducted since 2014 to 2019, with objective data from the service operator. The insights extracted shed light on the key factors determining the system's success, and its influence on travel behaviour. Results suggest that the user profile of the young early adopters evolved to middle-aged workers. Strong *maintenance* campaigns and *network* expansions improved *bikes availably* and user satisfaction. *Slope of the streets* is one of the lowest importance factors, whereas *pedelec assistance* the highest. It is likely to believe that there is a relationship between both, suggesting that electric assistance encourages cycling in a hilly city like Madrid. Transferable experiences to other cities evolving from traditional to e-BSS could be valuable, like the results suggesting that the introduction of an electric BSS is a potential trigger for bicycle adoption in dense urban environments. In addition, that subscribers tend to reduce the use of private car while increase cycling. This longitudinal analysis offers valuable policy implications, like those related with bike maintenance, network extension, and measures focused on keeping the new subscribers of the COVID-19 post-lockdown.

1. Introduction

The idea of bicycles as a shared mode of urban transport is not new. It is widely recognized by the scientific literature that the first attempt of a bike-shared system (BSS) dates back to the decade of the 60 s with the White Bikes from Amsterdam (Shaheen et al., 2010). Furthermore, considerable changes have happened since this first initiative. Nowadays, thousands of cities around the world have implemented these systems with the aim of complementing the public transport services with an active, healthy, and ecofriendly mode of transport (Torrisi et al., 2021) with potential to reduce greenhouse gases (K. Wang et al., 2022). Indeed, bike-sharing might be considered one of the most widespread sustainable modes of transport, that proved its resilience against extreme situations, like the occurrence of the COVID-19 pandemic in the year 2020 (WHO, 2020).

Bike-sharing has experienced a series of notorious changes and evolution at organizational, functional, user profile, and behavioural levels, turning a simple initiative against unsustainable city planning into a potential alternative to mitigate the effects of the growing population living in cities (Demographia, 2021) and complement the transport network.

The prompting global growth of bike-sharing systems is mainly related to three general aspects: (i) those that are directly associated with the benefits of bicycle use, such as the eco-friendliness, low cost, and efficiency in congested areas such as the city centres, (ii) others related with the affordability and popularization of the technology needed to support the systems, such as GPS equipment, use of smartphones, and mobile apps, and (iii) the government strategies which include bike-sharing as a core element of sustainable mobility in cities since the benefits that BSS bring to cities are linked to the three components of sustainability.

Thus, service administration should establish transport policies to

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Analysing the spatial impacts of retail accessibility for e-shoppers' groups

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Abstract

Amidst the growing interest in enhancing the academic understanding of the relationships between e-shopping and transport, a key element remains underexplored – the impact of e-shopping on spatial accessibility to in-store retail. The paper studies variations in multimodal accessibility to in-store retail between e-shopper groups and the associated spatial effects. The research is based on a face-to-face questionnaire, administered in the city of Alcalá de Henares (Madrid Metropolitan Area, Spain), which provides data on socio-economic characteristics, e-shopping habits, and travel time preferences to reach in-store retail. Clustering techniques serve to identify three e-shopper groups: occasional e-shoppers with a car, infrequent e-shoppers with a car, and frequent e-shoppers without a car. A comparison of e-shopper distance-decay functions to reach in-store retail is made, revealing significant differences between the three e-shopper groups for car and public transport for any time interval. However, for walking such differences are limited to time intervals between 10 and 40 minutes. Distance-decay functions are processed through a gravity-based model, identifying three main multimodal accessibility places: highly resistant places to e-shopping, moderately resistant places, and vulnerable places. Places that are highly resistant to e-shopping are mainly located in the city centre, while vulnerable places are mostly found in the city's periphery. The paper closes with concluding remarks on policymaking and a few pathways for future research.

Keywords: Online shopping; internet; transport; mobility; clusters

1. Introduction

These are challenging times for in-store retail activity at the city level. The unprecedented growth of e-shopping rates is generating both competing and complementing dynamics between e-shopping and in-store retail, with a strong

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A PARTICIPATORY SCENARIO BUILDING APPLICATION FOR GREENER, SMARTER, AND HEALTHIER CITIES: THE CASE OF MADRID, SPAIN

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ABSTRACT

Scenario building is a set of methods to explore and anticipate strategic futures when business-as-usual trends are no longer appropriate. This research shows a collaborative scenario building application, using the context of Madrid (Spain) as case study conducted in the frame of the H2020 project ICARUS. The aim of the scenario building approach is to obtain long-term narratives for a greener, healthier, and smarter city by 2050. The future trends were identified in a set of semi-structured interviews followed by a face-to-face workshop to transform such future trends into narratives. Finally, a multi-criteria analysis to prioritize the narratives come up with "the slow city" narrative as the most appropriate by Madrid 2050. The paper shows the methodological process implementation, its appropriateness, and the results.

KEYWORDS:
Scenario planning, Co-creation, SLOW CITY

INTRODUCTION

Cities must cope with the challenges of rapidly increasing urbanization and growing mobility needs, but researchers enjoy the advantage of accessing new massive databases (e.g., big data compiled from thousands of devices and sensors), disruptive innovation (e.g. Uber), and the active engagement of policymakers in improving the urban environment (e.g. low emissions urban areas). In this highly dynamic context, addressing global challenges at city level, such as air quality, requires methodologies that can respond to these changing dynamics in a timely fashion and ensure the long-term alignment of future innovations and urban systems [1].

Scenario-Building application is a well-established family of methods that can effectively address these challenges and seize emerging opportunities [2]. Its main aim is to investigate and anticipate strategic futures marked by considerable uncertainty (e.g., the allocation and use of street space in cities) and/or situations where business-as-usual is no longer appropriate (e.g. transport emissions). Then, it proposes policy schemes that can help cities reach these goals, linking the present to long-term outlooks. Applications expand to local [3], regional [4], and European levels [5]. According to the nature of the future scenario, they can be defined as descriptive, exploratory and normative. This means that future scenarios can be assembled for a forecasting, an exploratory or a backcasting point of view.

Relevant changes are taking place in the context of city planning, resulting in new communicative paradigms based on effective interaction between stakeholders [6, 7]. A communicative paradigm means interactive processes between different group of actors, emphasizing participation and learning planning processes. Scientific and instrumental reasoning give way to consensual discussion [8]. Under this context, the match between scenario building and planning actors must be taken into consideration [9], being a relevant point to bridge the gap between the theoretical elegance of scenario building and its practicalities for implementation.

Based on those important issues, the present paper aims to build and prioritize a set of strategic futures narratives by 2050 for the particular context of the Madrid city, Spain. The long-term narratives forecast on achieving greener, smarter, and healthier cities. To carry out the scenario building process a

sustainability

MDPI

Review

Can Proximal Environments Prevent Social Inequalities Amongst People of All Ages and Abilities? An Integrative Literature Review Approach

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Abstract: Although many studies are currently examining the city of proximity as a way to promote sustainable and environmentally friendly cities, few consider it meaningful to achieve an "inclusive" mobility model for people of all ages and abilities, including people with disabilities, children, or the elderly. This literature review paper focuses on the extent to which the city of proximity can provide inclusive mobility and reduce inequalities in the urban scene, thus achieving social sustainability. Out of the 256 references analysed under an integrative review methodology, only 10 delivered solid results. One of the main contributions of this paper is an indicator and sub-indicator system to improve the integrative methodology in urban studies, which led to the identification of several incoherencies in proximity models in terms of accessibility and design for all risking fostering urban with these policies. Although the mentioning of vulnerable collectives may mean a rise in inclusion awareness, one of the most relevant outputs of this paper is the lack of specific measures to revert the disadvantageous situations that conventional mobility planning delivers, as well as the neglection to use proximity actions to promote inclusive and socially resilient urban cities.

Keywords: inclusive design; social sustainability; social inequalities; healthy cities; proximity models; urban mobility; cities for all; urban resilience; spatial justice; liveable communities

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1. Introduction

Proximity city models, specifically the 15 min city, have arisen as a viable solution to improve urban health while fostering pedestrian mobility and neighborhood services [1,2]. It gained popularity during the COVID-19 crisis, when the city proved to be a hostile environment for pedestrians, while proximity models, such as the 15-minute city of Paris, presented a pack of measures to boost the potential of streets [3–5]. Not only do these chrono-typed models promote a more active way of transportation throughout the city, either on foot or using bicycles, they also look for a renovation in land uses to enhance street life [6].

> "Talking about proximity is, therefore, talking about vital, diverse, and multifunctional cities, neighborhoods, and streets, in which the design can safeguard the pedestrian security against other means of transport." [7] (p. 160) (Self-translated from Spanish)

While the 20th century conceived the roads as a symbol of progress, it is clear today that they have degraded our urban ecosystems and decreased the quality of life for their inhabitants [7], [8] (pp. 333–334). More than ever, city policies and urban studies put the person first instead of the car, prioritizing walkable transportation over private vehicles [9]. Some of these authors include Jacques Lévy [10], Nuno Portas [11], Jan Gehl [12–15], Francesco Careri [16], or Jeff Speck [17].

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Analyzing the impact of Low Emission Zones on modal shift

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ARTICLE INFO

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air pollution

ABSTRACT

Although Low Emission Zones (LEZs) have been adopted to address the environmental challenge of improving air quality in urban contexts worldwide, limited attention has been paid to studying their effects on promoting a shift to greener modes. This paper aims to gain insight into that issue by studying the case of "Madrid Central", a LEZ recently implemented in Spain. A survey campaign was conducted to explore changes in modal shift declared by respondents due to the LEZ implementation. Based on that, a discrete choice analysis was conducted to identify key factors determining changes in the modal share after implementing the LEZ. The results show the high impact of the LEZ on decreasing car use and promoting cleaner modes thereby contributing to reduce air pollution. The paper concludes that modal shift is mainly associated with socio-demographic variables, individual perceptions towards LEZs and mobility habits. By contrast, attitudinal variables were not found relevant for explaining modal shift. The effectiveness of "Madrid Central" in reducing car use provides policy-makers with lessons and a guidelines for implementing LEZs. Given the scarcity of research about that specific topic, the results are scalable to other experiences in the international context.

1. Introduction

Cities are nowadays facing the global challenge of reducing air pollution (Badach et al., 2020; Colvile et al., 2001; Comisión Europea, 2018; He, Ding, & Prasad, 2019), as the increase in the urban population results in an increased number of daily motorized trips (World Population Prospects, ONU 2019). In this context, coming up with policies that achieve sustainable urban mobility patterns seem crucial for political, social, and academic agendas worldwide (Banister, 2008). During the past few years, the implementation of specific transport policies aimed at improving air quality in urban areas has become notably relevant (Vardoulakis et al., 2018; Bigazzi and Rouleau, 2017). Most of those policies have been focused on discouraging the use of private vehicles through car restrictions by engine type in certain urban areas, license-plate access limitations, restrictions on vehicle use to specific time slots, and implementation of congestion charges. Although the ultimate goal of those policies is the improvement of air quality, they tend to prompt significant changes in modal choice, impacting on the patterns of citizens' mobility (Moser et al., 2007; Graham-Rowe et al., 2011; Ahanchian et al., 2019).

The adoption of Low Emission Zones (LEZs) has become one of the most frequent transport policies used to address air quality challenges at the city level (Tögel and Špička, 2014). Although the definition of an LEZ can vary depending on the context, it is here considered as a geographical area where the access of the most polluting vehicles is regulated. The target of this regulatory action can address the reduction of different types of air pollutants, such as NO_x, PM, ozone, and greenhouse gases such as CO_2. Such restrictions on the most polluting vehicles can be established through a variety of specific policies: time-slot limitations, charges to motor vehicles, car-sharing promotion, and pedestrianization (Cass and Faulconbridge, 2016). Table 1 lists some of the specific policies included in the LEZs worldwide. The implementation of LEZs occurs in places with both very high traffic levels and a relevant concentration of economic and social activity. The nature, extension, and characteristics of LEZs vary depending, among other variables, on cultural norms, legal systems, and air quality objectives, (Alduán, 2014; Holman et al., 2015). For example, the European Union (EU) has compiled a database[1] collecting the main characteristics of LEZs implemented across European cities according to EU emission standards (vehicle type, fuel type, vehicle age). In recent years, many countries are developing specific legislation to standardize the implementation of LEZs, such as China (which has its own CHN emissions standard), Mexico, Spain, and France.

Although LEZs mostly focus on limiting the access of private vehicles

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ANEXO VIII

Actividades de fomento de la I+D+i

FRANCE22

Decarbonising mobility
The future of transport infrastructure financing

EUROPEAN CONFERENCE

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SOSTENIBILIDAD

Hacia dónde va la movilidad del futuro

El gran reto actual de la descarbonización está íntimamente ligado con las mejoras que se produzcan en el transporte durante los próximos años. Un desafío que plantea la necesidad de encontrar nuevas alternativas, más allá de la electrificación, para lograr un modelo de movilidad más limpio y eficiente en el futuro.

Empresas y finanzas

Ley de Movilidad: necesaria pero con lagunas en financiación y gobernanza

* *Cinco expertos del sector analizan el anteproyecto de ley*

Raquel Sánchez, ministra de Transportes, Movilidad y Agenda Urbana.

Lucía Gómez
7:00 - 3/03/2022

El Gobierno ha dado el primer paso de la tramitación de la Ley de Movilidad Sostenible. Esta nueva norma, que no se aprobará hasta finales de 2023, ha suscitado múltiples opiniones que van desde "un proyecto ambicioso por cuanto pretende un cambio del modelo de movilidad y transporte", como apunta **María Marelza Cózar,** asociada sénior de **Garrigues** especializada en el sector de Transporte y Marítimo, a "imprescindible pero con complejidad en la gobernanza y la financiación", que señala **J. Víctor Esteban**, secretario general de la **Fundación Correll**. Ahora se abre un periodo de alegaciones en el que la participación de los agentes del sector será clave para dar forma a una norma que aspira a ir más allá de los colores políticos que pasen por el Ministerio de Transportes y Movilidad. En una primera aproximación, expertos del sector analizar para *elEconomista* la norma y sus puntos clave.

"La Ley responde a nuevos problemas que han surgido por los cambios tan relevantes que ha experimentado la movilidad en los últimos años. Incorpora grandes retos como la digitalización y el cambio climático. También contempla como alternativa a los modos tradicionales nuevos servicios de movilidad que pueden tener un papel muy importante en el futuro", señala **José Manuel Vassallo, catedrático de Transportes de la Universidad Politécnica de Madrid**, que califica la norma como "bastante completa" pese a no llegar a "establecer compromisos serios en materia de financiación de la movilidad". "Prueba de ello es que la Ley se iba llamar "Ley de Movilidad Sostenible y financiación del Transporte, y finalmente se ha caído la última parte, precisamente la que se refiere a la

Más Leídas

EVENTOS Y CONFERENCIAS

Hacia un ecosistema de movilidad más inteligente y sostenible

JESÚS DE LAS CASAS

26 ABR. 2022 - 23:53

De izquierda a derecha: Marifrán Carazo Villalonga, consejera de Fomento, Infraestructuras y Ordenación del Territorio de la Junta de Andalucía: Francisco Iglesias, consejero delegado de Alsa; y José Manuel Vassallo, catedrático de Transportes de la Universidad Politécnica de Madrid. **Fotos: Mauricio Skrycky EXPANSIÓN**

El transporte está llamado a ser uno de los ejes de la recuperación económica, con la colaboración público-privada como pilar para dar respuesta a las demandas de los usuarios.

Hace apenas diez años hubiera resultado muy difícil imaginar un **ecosistema de movilidad tan nutrido como el actual.** Los usuarios tienen cada vez más medios y servicios a su disposición, pese a que existen desafíos tan relevantes como la descarbonización y la digitalización. La tecnología tiene un papel protagonista en este contexto de cambio, en el que han emergido **nuevas opciones de movilidad que introducen alternativas al vehículo** privado y requieren una mejora continua de los sistemas de transporte público.

La colaboración entre las instituciones públicas y el sector privado se antoja fundamental para dar respuesta a las necesidades de los usuarios y extraer el máximo valor de las distintas alternativas de transporte. Así se puso de manifiesto en el **último encuentro sobre Movilidad sostenible, organizado por EXPANSIÓN** en **colaboración con Alsa.**

La movilidad verde, a debate: "No se trata de cambiar los atascos de coches de combustión por otros con coches eléctricos"

La movilidad eléctrica crece en España, pero a una velocidad menor de la proyectada y más lentamente que en otros países comunitarios. Un debate en elDiario.es aborda los retos que afronta la industria

Debate organizado por elDiario.es con el patrocinio de Acciona sobre los retos que afronta la industria. Xabi González

Andrea Menéndez Faya 13 de julio de 2022 - 21:46h **Actualizado el 14/07/2022 - 10:28h** 1

"La movilidad es inherente al ser humano. Cubrir las necesidades de movilidad en los tiempos que vivimos, a corto y medio plazo, es insostenible y trae muchas incertidumbres". Con esta frase de Isabel Olmo ha comenzado el debate organizado este miércoles en **elDiario.es** con el patrocinio de Acciona y moderado por el director de opinión de **elDiario.es**, Gumersindo Lafuente, en el que María Eugenia López, subdirectora del Centro de Transporte de la Universidad Politécnica de Madrid, Carlos Ferreras, director comercial de Silence e Isabel Olmo, jefa del departamento de movilidad sostenible y ciudad del IDAE (Instituto para la Diversificación y Ahorro de la Energía) han abordado el reto de la movilidad eléctrica.

Los últimos acontecimientos mundiales han puesto sobre la mesa un problema de suministro que obliga a una transición tanto para el transporte de pasajeros como de mercancías. Cambiar estos hábitos de movilidad supondrá una mayor eficiencia e introducir tecnologías alternativas que permitan una mayor sostenibilidad y asegurar el compromiso de descarbonización. El vehículo eléctrico, hoy por hoy, es una tecnología que mejor puede garantizar este plan.

"En las ciudades energéticamente sostenibles que tienen paneles solares, edificios bioclimáticos..., pero tienes que ir en coche a cualquier destino, la eficiencia de la movilidad es totalmente negativa. Tampoco podemos pretender que haya un autobús en la puerta de casa. La clave está en la intermodalidad",

Andrés Monzón, catedrático de Ingeniería del Transporte en la Universidad Politécnica de Madrid y el Centro de Investigación del Transporte.

La movilidad del futuro madrileño es compartida

Expertos del sector conversaron sobre la forma de mejorar la movilidad en la Comunidad de Madrid para crear un transporte conectado, compartido y sostenible

L. R. M.

Creada: 22.07.2022 09:19
Última actualización: 22.07.2022 09:19

La movilidad urbana ha avanzado, se ha transformado y ha alcanzado un nuevo modelo de costumbres dentro de la Comunidad de Madrid. La pandemia ha generado uno de los cambios más drásticos en desplazamientos y, además, cada vez hay más consciencia de la importancia de la sostenibilidad y la reducción de contaminación.

ACCIONA y LA RAZÓN organizaron el 20 de julio un coloquio que reunió a grandes personalidades del sector del transporte para hablar de los nuevos modelos, opciones y estudios que involucran a la movilidad actual que existe en la Comunidad de Madrid.

Zonas de Bajas Emisiones: ¿llegarán en 2023?

A dos meses de que la Ley obligue a las ciudades de 50.000 habitantes a contar con ZBE, la confusión en los ayuntamientos es máxima

▲ **Más de 30.000 personas mueren cada año por enfermedades asociadas a la contaminación** Enrique Cidoncha / La Razón

EVA MARTÍNEZ RULL

Creada: 21.10.2022 09:19
Última actualización: 21.10.2022 09:19

El informe «Cuantificación del impacto de las zonas de bajas y cero emisiones: revisión de la evidencias» presentado este semana es claro. Las Zonas de Bajas Emisiones (ZBE) bien diseñadas ayudan a mejorar la calidad del aire. En el caso del dióxido de nitrógeno las concentraciones se reducen aproximadamente un 20% en una amplia gama de condiciones. El estudio encargado por la campaña europea Clean cities (de la que forma parte en España la Fundación Ecodes) afirma que «se puede ir más allá. En Londres, esta cifra llegó al 44% tras la ampliación de la Zona de Ultra Bajas Emisiones – donde solo se permite caminar o montar en bicicleta– en 2019».