Cátedra de Investigación sobre Movilidad Sostenible

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Centro
de Investigación
del Transporte

POLITÉCNICA

CONSORCIO
TRANSPORTES
MADRID

MEMORIA DE ACTIVIDADES
AÑO 2023

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

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1. CONSTITUCIÓN Y GESTIÓN DE LA CÁTEDRA

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 la Comisión Mixta de Seguimiento, la cual está formada por:

1. Responsables:
    a. Por parte del CRTM:
        - Francisco Javier Gómez López, Director de Planificación Estratégica y Explotación.
    b. Por parte de TRANSyT-UPM:
        - Andrés Monzón de Cáceres, Catedrático de Ingeniería del Transporte de la Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos.
2. Comisión de Seguimiento:
    a. Por parte del CRTM:
        - Domingo Martín Duque, Jefe del Área de Estudios y Planificación.
        - Elena Tarruella Vidal, Jefa del Área de Transportes Interurbanos.
    b. Por parte de TRANSyT-UPM:
        - María Eugenia López Lambas, Profesora del Departamento de Transporte, Territorio y Urbanismo de la Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos.
        - Abid Al Akioui Sanz, Investigador del Centro de Investigación del Transporte, Secretario de la Cátedra, y redactor de esta Memoria.

[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 DE LA CÁTEDRA

La Cátedra de Investigación en Movilidad Sostenible tiene como objetivo la colaboración entre el CRTM y la UPM en actividades de formación, generación de conocimiento, difusión y transferencia en el área del transporte y la movilidad sostenible, promoviendo la investigación sobre aspectos técnicos, de planificación, económicos y de gestión del transporte público, y de la movilidad urbana en general.

La Cátedra de Investigación en Movilidad Sostenible, adscrita al Centro de Investigación del Transporte (TRANSyT), servirá de nexo activo entre las actividades de investigación de dicho centro y la experiencia en planificación, financiación y gestión del transporte urbano y metropolitano del CRTM. Se continúa, así, una relación permanente de investigación, transferencia de tecnología, apoyo a la innovación y difusión de resultados en el ámbito de la movilidad sostenible.

Durante el año 2023, 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 las actividades realizadas en el marco de la Cátedra de Investigación sobre Movilidad Sostenible (CIMS) se encuentra disponible en su página web http://cims-crtm.transyt-projects.com/.

3. ACTIVIDADES DE FORMACIÓN

3.1. Contratos para la formación de investigadores

Los investigadores contratados para la realización de actividades de investigación financiados por la Cátedra en 2023 son los siguientes:

- **Abid Al Akioui Sanz**, febrero a junio.
- **Emma Olmedo Rodríguez**, enero.

3.2. 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 2023, esta actividad fue desarrollada por los siguientes alumnos:

- **Alba Bastida Bárcena**, septiembre a diciembre.
- **Sergio Felipe Ferro Quiñonez**, septiembre a diciembre.
- **Diego Guzmán Fuentes Jiménez**, septiembre a diciembre.
- **Caroline Vidal Rainho**, septiembre a diciembre.

3.3. Becas para la formación de investigadores en TRANSyT

Los estudiantes becados para la realización de actividades de investigación relacionadas con los objetivos de la Cátedra en 2023 son los siguientes:

- **Shireen Al Suleiman**, febrero a diciembre.
- **María Luz Brownrigg-Gleeson Martínez**, enero a julio.
- **Héctor Echavarri Maestu**, febrero a junio.
- **Elena Gómez Blanco**, febrero a julio.
- **Marta Fernández García**, octubre a diciembre.
- **Patricia Morcillo Sanz**, junio a septiembre.
- **Ana Regaliza Rodríguez**, febrero a julio.
- **Ana Belén Torrejón García**, abril a agosto.

3.4. 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:

- Propuesta de mejoras de la movilidad en el municipio de Ciempozuelos. Alumno: **Alejandro Sánchez Sánchez**. Tutora: Natalia Sobrino.

Grado en Ingeniería en Tecnologías Ambientales:

- Estudio de accesibilidad de los barrios de Madrid a las Zonas de Bajas Emisiones. Alumna: **Marta Santos Pedro**. Tutor: Emilio Ortega.

3.5. 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 en Estrategias y Tecnologías para el Desarrollo:

- Urban sustainable mobility and multilevel governance: case study of Madrid. Alumna: **Ana Belén Torrejón García**. Tutores: Andrés Monzón y Rosario Otegui.

Máster en Ingeniería de Caminos, Canales y Puertos:

- 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 en Planificación y Gestión de Infraestructuras:

- Impactos sobre la movilidad ciclista a partir de la ampliación de BiciMAD en la periferia de Madrid. Alumno: **Carlos Eduardo Miranda Hoyos**. Tutor: Andrés Monzón.

3.6. Tesis Doctorales

A continuación, se incluye la tesis defendida que aborda temas relacionados con la movilidad en la Comunidad de Madrid, recogida con su resumen en el Anexo III.

Doctorado en Sistemas de Ingeniería Civil:

Título: *Low Emission Zones: acceptability evaluation and impact on mobility and retail activity. An empirical analysis in Madrid.*

Alumno: **Javier Tarriño Ortiz**.

Directores: José Manuel Vassallo y Julio Soria.

Defensa: 12 de abril de 2023.

Calificación: Sobresaliente Cum Laude - Mención Internacional.

3.7. Cursos y seminarios

A continuación, se detallan los cursos y seminarios organizados en 2023, los cuales se recogen en el Anexo IV.

Low Emission Zones: Challenges and Opportunities. Estambul, Turquía. 22 a 24 de febrero de 2023.

- Seminario con la participación de Andrés Monzón como ponente exponiendo la introducción al seminario.
- Seminario con la participación de María Luz Brownrigg-Gleeson como ponente exponiendo el caso de estudio de Madrid.

Augmenting and Evaluationg the Physical and Digital Infrastructure for CCAM deployment. Madrid, España. 15 de junio de 2023.

- Asistencia de Andrés Monzón y Ana María Rivadeneira al taller organizado por EMT Madrid.

La innovación del autobús en el transporte público. Madrid, España. 3 y 4 de julio de 2023.

- Asistencia de Allison Fernández y Ana María Rivadeneira al curso de verano organizado por la Universidad Complutense de Madrid y el Consorcio Regional de Transportes de Madrid.

Integrating urban planning and sustainable mobility. Roma, Italia. 11 de diciembre de 2023.

- Seminario con la participación de María Eugenia López como ponente exponiendo el caso de estudio de Madrid.

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 2023, las cuales se recogen en el Anexo V.

II Jornada de Movilidad Sostenible. Madrid, España. 14 de marzo de 2023.

- Big Data y Movilidad: impulsando la sostenibilidad en el Campus de Ciudad Universitaria. Mesa redonda moderada por María José Aparicio y Andrés Monzón.
- Club de Movilidad inteligente, sostenible y compartida en la Ciudad Universitaria. Mesa de debate con la participación de Borja Moya.

I Encuentro Híbrido RediMUS. Madrid, España. 19 de junio de 2023.

- Presentación de Rosa Arce de la ponencia "Análisis de comportamientos y expectativas de la movilidad en pandemia y post COVID".
- Presentación de Juan Carlos García de la ponencia "Servicios de movilidad compartida: pautas espaciales y temporales".

Jornada XX Aniversario del Centro de Investigación del Transporte. Madrid, España. 10 de octubre de 2023.

- Los retos de la movilidad. Mesa redonda moderada por Andrés Monzón con la participación de Pablo Rodríguez Sardinero.
- Investigación e innovación en movilidad. Mesa redonda moderada por José Manuel Vassallo.

4.2. Participación en congresos nacionales e internacionales

A continuación, se detallan las aportaciones a congresos nacionales e internacionales realizadas en 2023, las cuales se recogen en el Anexo VI.

Transportation Research Board 102st Annual Meeting - TRB 2023. Washington D. C., Estados Unidos. 8 a 12 de enero de 2023.

- Gonzalez, J. N., Gomez, J., & Vassallo, J. M. An empirical study on the effect of transport policies linked to environmental targets on parking demand. Evidence from the case of Madrid (Spain).
- Tarriño Ortiz, J., Gomez, J., Soria, J. A., & Vassallo, J. M. Analyzing the impact of Low Emission Zones on modal shift.
- Vega-Gonzalo, M., Gómez, J., Christidis, P., & Vassallo, J. M. The role of private cars in European cities after COVID-19.

17th AESOP Young Academics Conference - YA Conference 2023. Amberes, Bélgica. 28 a 31 de marzo de 2023.

- Ariza-Álvarez, A., & Soria-Lara, J. A. Coping with complex and unpredictable disruptions: a proposal for an adaptive scenario-building approach for land use and transport planning.

11th Young Researchers Seminar - YRS 2023. Lisboa, Portugal. 15 a 17 de mayo de 2023.

- Ariza-Álvarez, A., & Soria-Lara, J. A. Using scenario-building to incorporate disruptive futures into land use and transport planning.

XV Congreso de Ingeniería del Transporte - CIT 2023. San Cristóbal de La Laguna, España. 14 a 16 de junio de 2023.

- Aguiar, I., Monzon, A., & Lopez-Carreiro, I. MaaS potential user's profiles characterisation with a K-means clustering algorithm.
- Aguilera García, Á., Gómez Sánchez, J., Rangel, T., & Vassallo, J. M. Caracterización del uso del patinete compartido y privado en Madrid.
- Al-Akioui, A., & Monzón, A. El teletrabajo y su impacto en la movilidad de la Comunidad de Madrid
- Alonso Herrero, A. D., & Monzón de Cáceres, A. Evolution of public transport demand in the Region of Madrid because of the COVID-19 pandemic.
- Ariza-Álvarez, A., & Soria-Lara, J. A. Assessing the added value of mapping scenario narratives for collaborative transpot and urban planning.
- Bañuelos-Gimeno, J., Sobrino, N., & Arce, R. Efectos del tráfico en la contaminación atmosférica. Evidencia empírica en las olas de COVID-19 en la ciudad de Madrid.
- Brownrigg-Gleeson, M. L., Cortez, A., & Monzon, A. The role of stakeholders in early planning stages of urban mobility measures: anticipating barriers and challenges.
- Gómez Sánchez, J., Tapiador Cebrián, L., Garrido Maza, L., & Vassallo, J. M. ¿Cómo influye comprar por internet en las pautas de movilidad de la población?
- González, J. N., Gómez Sánchez, J., & Vassallo, J. M. ¿Cuál es el efecto de las políticas de transporte vinculadas a objetivos medioambientales en la demanda de aparcamiento en Madrid?
- Ibraeva, A., Monzón de Cáceres, A., & Lopez, E. Urban form factors at trip origin and destination as determinants of car use: evidence from Madrid Region.
- Lopez-Carreiro, I., Monzón, A., López, E, & Aguiar, I. Intention to uptake MaaS in Madrid Metropolitan Area.
- López de Leániz, C., & Fernández Lobo, A. Ciudad de los 15 minutos ¿utopía o realidad?
- López Moreno, T., & López Lambas, M. E. Influencia de la seguridad en el reparto modal de transporte de Madrid.
- Martin, C., Benavente, J., Julio, R., & Monzón, A. Cooperative operation of public transport infrastructure to prevent crowding.

- Navarro-Ligero, M. L., & Soria-Lara, J. A. Zonas de Bajas Emisiones: explorando formas de colaboración emergentes en entornos de transición ecológica.
- Romero, C., Zamorano, C., & Monzón, A. Preferencias de fuentes de información entre los usuarios de Cercanías Madrid: elección y satisfacción.
- Silveira-Santos, T., Vassallo Magro, J. M., Rangel, T., & Papanikolaou, A. Modelos estadísticos y de aprendizaje automático para predecir las tarifas de viajes compartidos de los VTC.
- Sobrino, N., González, J. N., Vassallo, J. M., & Baeza, M. A. Factores clave para la regulación de patinetes eléctricos compartidos en áreas urbanas: un estudio del caso español.
- Soukhov, A., Tarriño Ortiz, J., Soria-Lara., J. A., & Páez, A. Multi-modal spatial availability: a research proposal.
- Tarriño Ortiz, J., Gómez Sánchez, J., Soria Lara, J. A., & Vassallo Magro, J. M. Impacto de las Zonas de Bajas Emisiones en el cambio modal.
- Vega-Gonzalo, M., Aguilera-García, A., Gómez, J., & Vassallo, J. M. Análisis del uso de los servicios de moto compartida: aplicación a las ciudades españolas.
- Vega-Gonzalo, M., Gómez, J., & Christidis, P. Análisis del efecto de la pandemia de COVID-19 en el uso y la propiedad de coches privados en ciudades europeas.

15th Annual Conference on Planning Research - CITTA 2023. Coímbra, Portugal. 22 de junio de 2023.

- Navarro-Ligero, M. L., & Soria-Lara, J. A. Exploring new ways of visualizing social innovation in future urban-mobility scenarios: the implementation of Low Emission Zones in Spain.

25th Euro Working Group on Transportation Meeting - EWGT 2023. Santander, España. 6 a 8 de septiembre de 2023.

- Aguiar, I., Lopez-Carreiro, I., & López, E. Investigating residential self-selection in metropolitan areas: interactions between the built environment, travel attitudes and modal choice in Madrid, Spain.
- Gonzalez, J. N., Gomez Sanchez, J., & Vassallo, J. M. Transforming urban parking: how Low Emission Zones and on-street parking management are shifting the needle toward greener transportation.
- Ibraeva, A. Monzón, A., & López, E. Park-and-Ride users and travel apps: attitudes and use intention.
- Vega-Gonzalo, M., Aguilera-García, Á., Gomez, J., & Vassallo, J. M. An analysis of moped scooter sharing usage patterns and its potential to reduce vehicle ownership.

XXVI International Conference Living and Walking in Cities - LWC 2023. Brescia, Italia. 6 a 8 de septiembre de 2023.

- Lopez Lambas, M. E. The walking health.

4.3. Publicaciones de carácter científico

A continuación, se detallan las publicaciones científicas realizadas en 2023, las cuales se recogen en el Anexo VII.

- Aguiar, I., Monzon, A., & Lopez-Carreiro, I. (2023). MaaS potential users' profiles characterization with a K-means clustering algorithm. *Transportation Research Procedia*, *71*, 219-226. DOI: 10.1016/j.trpro.2023.11.078.
- Al-Akioui, A., & Monzon, A. (2023). Spatial analysis of COVID-19 pandemic impacts on mobility in Madrid Region. *Sustainability*, *15*(19), 14259. DOI: 10.3390/su151914259.
- Al-Akioui, A., & Monzon, A. (2023). Teleworking and its impacts on mobility in the Region of Madrid. *Transportation Research Procedia*, *71*, 30-37. DOI: 10.1016/j.trpro.2023.11.054.
- Al-Akioui, A., Monzon, A., & Martin, C. (2023). Mobility patterns in healthcare centres. Case study: La Paz University Hospital (Madrid, Spain). *Transportation Research Procedia*, *72*, 3252-3259. DOI: 10.1016/j.trpro.2023.11.864.
- Alonso, A., & Monzón, A. (2023). Evolution of public transport demand in the Region of Madrid because of the COVID-19 pandemic. *Transportation Research Procedia*, *71*, 38-45. DOI: 10.1016/j.trpro.2023.11.055.
- Alonso, A., Monzón, A., Aguiar, I., & Ramírez-Saiz, A. (2023). Explanatory factors of daily mobility patterns in suburban areas: applications and taxonomy of two metropolitan corridors in Madrid Region. *ISPRS International Journal Of Geo-Information*, *12*(1), 16. DOI: 10.3390/ijgi12010016.
- Ariza-Álvarez, A., Soria-Lara, J. A., & Aguilera-Benavente, F. (2023). Re-thinking the role of exploratory scenarios for adaptive policymaking: an application for land use and transport planning. *Futures*, *149*, 103139. DOI: 10.1016/j.futures.2023.103139.
- Bañuelos-Gimeno, J., Sobrino, N., & Arce-Ruiz, R. M. (2023). Effects of mobility restrictions on air pollution in the Madrid Region during the COVID-19 pandemic and post-pandemic periods. *Sustainability*, *15*(17), 12702. DOI: 10.3390/su151712702.
- Brownrigg-Gleeson, M. L., Monzon, A., & Cortez, A. (2023). Reasons to pedestrianise urban centres: impact analysis on mobility habits, liveability and economic activities. *Sustainability*, *15*(23), 16472. DOI: 10.3390/su152316472.
- Gonzalez, J. N., Gomez, J., & Vassallo, J. M. (2023). Are Low Emission Zones and on-street parking management effective in reducing parking demand for most polluting vehicles and promoting greener ones? *Transportation Research Part A: Policy and Practice*, *176*, 103813. DOI: 10.1016/j.tra.2023.103813.
- Lopez-Carreiro, I., & Monzon, A. (2023). Exploring travellers' willingness to adopt MaaS in two European metropolitan areas. *Transportation Research Procedia*, *72*, 1885-1893. DOI: 10.1016/j.trpro.2023.11.667.
- Lopez-Carreiro, I., Monzon, A., & Lopez, E. (2023). MaaS implications in the Smart City: a multi-stakeholder approach. *Sustainability*, *15*(14), 10832. DOI: 10.3390/su151410832.

- López García de Leániz, C., & Fernández Lobo, A. (2023). 15-minute city: utopia or reality? *Transportation Research Procedia*, *71*, 203-210. DOI: 10.1016/j.trpro.2023.11.076.
- López Lambas, M. E. (2023). Los desafíos del urbanismo del siglo XXI. Una odisea en el espacio. *Grand Place*, *19*, 71-86. ISSN: 2386-429X.
- López-Lambas, M. E., Alonso, A., Ramírez-Saiz, A., & Pereira, A. (2023). These boots are made for walking: a qualitative study on the perceived barriers to pedestrian mobility in Madrid. *Future Transportation*, *3*(1), 111-132. DOI: 10.3390/futuretransp3010008.
- Monzón, A., Cortez, A., Beltran, M., & Brownrigg-Gleeson, M. L. (2023). Evaluation approach for scaling up urban mobility measures on TEN-T urban nodes: the case of Madrid. *Transportation Research Procedia*, *72*, 1288-1295. DOI: 10.1016/j.trpro.2023.11.589.
- Romero, C., Zamorano, C., & Monzón, A. (2023). Exploring the role of public transport information sources on perceived service quality in suburban rail. *Travel Behaviour and Society*, *33*, 100642. DOI: 10.1016/j.tbs.2023.100642.
- Silveira-Santos, T., Papanikolaou, A., Rangel, T., & Vassallo, J. M. (2023). Understanding and predicting ride-hailing fares in Madrid: a combination of supervised and unsupervised techniques. *Applied Sciences*, *13*(8), 5147. DOI: 10.3390/app13085147.
- Sobrino, N., Gonzalez, J. N., Vassallo, J. M., & Baeza, M. A. (2023). Regulation of shared electric kick scooters in urban areas: key drivers from expert stakeholders. *Transport Policy*, *134*, 1-18. DOI: 10.1016/j.tranpol.2023.02.009.
- Tarriño-Ortiz, J., Soria-Lara, J. A., Silveira-Santos, T., & Vassallo, J. M. (2023). The impact of Low Emission Zones on retail activity: Madrid Central lessons. *Transportation Research Part D: Transport and Environment*, *122*, 103883. DOI: 10.1016/j.trd.2023.103883.
- Vega-Gonzalo, M., Aguilera-García, Á., Gomez, J., & Vassallo, J. M. (2023). Traditional taxi, e-hailing or ride-hailing? A GSEM approach to exploring service adoption patterns. *Transportation*. DOI: 10.1007/s11116-022-10356-y.
- Vega-Gonzalo, M., Christidis, P., & Gomez, J. (2023). Car ownership and post-COVID urban mobility across European cities. *Transportation Research Procedia*, *69*, 305-312. DOI: 10.1016/j.trpro.2023.02.176.
- Vega-Gonzalo, M., Gomez, J., & Christidis, P. (2023). How has COVID-19 changed private car use in European urban areas? An analysis of the effect of socio-economic characteristics and mobility habits. *Transportation Research Part A: Policy and Practice*, 103679. DOI: 10.1016/j.tra.2023.103679.

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

5.1. Encuentros de expertos para el fomento de la I+D+i

A continuación, se recogen los encuentros de expertos para el desarrollo de la transmisión de la I+D+i, los cuales se recogen en el Anexo VIII.

I Congreso Future Mobility Challenges. Valladolid, España. 13 de abril de 2023.

- Participación de Cristina López en la mesa redonda "Evolución de la Demanda de la Movilidad Urbana".

Jornada Autonomous. Santander, España. 24 de mayo de 2023.

- Presentación de Rosa Arce de la ponencia "Tendencias y retos para la movilidad urbana sostenible".

ERTRAC 20 Years Anniversary Conference. Bruselas, Bélgica. 5 y 6 de julio de 2023.

- Presentación de Andrés Monzón de la ponencia "La ciudad de 15 minutos".

Jornada Movilidad Cero Emisiones. Madrid, España. 28 de septiembre de 2023.

- Participación de Cristina López en la mesa redonda "La oferta y la demanda, la planificación y la gestión del transporte cero emisiones".

5.2. Actividades de investigación sobre movilidad urbana

Además de las actividades de formación y las actividades de difusión y recogidas en esta Memoria, la financiación de la CIMS ha permitido desarrollar las siguientes actividades específicas de investigación, que se prevé tengan continuidad a lo largo de 2024.

Colaboración con el CRTM en los trabajos prospectivos para la implementación de una herramienta MaaS (Mobility as a Service) en los corredores A-2 y A-6.

TRANSyT colabora con el CRTM en el desarrollo e implementación de una herramienta regional integrada MaaS desde 2019. En colaboración con el CRTM, TRANSyT lanzó y coordinó una campaña de encuestas para examinar y comprender el potencial de adopción de MaaS en la Comunidad de Madrid. Las más de 9.000 respuestas de esta encuesta permitieron recopilar información sobre las diferentes necesidades y expectativas de los usuarios de MaaS en la región. Estos resultados se presentaron al CRTM para ayudar en el desarrollo de MaaS.

En 2024, TRANSyT asistirá en el estudio del piloto de la herramienta MaaS impulsada por el CRTM, junto con el que se han identificado diferentes grupos objetivo de MaaS para componer una encuesta panel:

- Residentes que tienen Tarjeta de Transporte Público, pero utilizan el coche para su viaje más frecuente.
- Residentes que utilizan el transporte público para su viaje principal, pero también tienen o utilizan coche.
- Residentes que sólo utilizan coche.

Está previsto seleccionar aproximadamente 200 participantes para el estudio piloto, de los cuales entre 10 y 15 participantes contribuirán a un estudio más detallado, por ejemplo, con un seguimiento del uso de la herramienta MaaS a lo largo de un periodo experimental. TRANSyT es responsable de la selección de participantes, comunicación con ellos, desarrollo de las encuestas y posterior análisis de datos.

Desarrollo de herramientas I+D para la planificación estratégica del transporte y territorio en la Comunidad de Madrid: Modelo MARS.

MARS es un modelo dinámico tipo LUTI (Land Use and Transport Interaction) desarrollado por Paul Pfaffenbichler en 2003 que relaciona los patrones de movilidad y el uso del transporte con los usos del suelo y la localización de actividades.

La colaboración del CRTM a través de la CIMS en esta línea de investigación comenzó en 2008 con el trabajo doctoral de Luis Ángel Guzmán, el cual comenzó el desarrollo del Modelo MARS de la Comunidad de Madrid a partir de los datos de la Encuesta Domiciliaria de Movilidad de 2004 (EDM2004) para optimizar los servicios de transporte según la oferta, el medio ambiente y el consumo energético. A continuación, Yang Wang continuó el desarrollo del modelo incluyendo indicadores para capturar los cambios en los niveles de accesibilidad al empleo producidos por las políticas de transporte. Por último, Andrea Alonso, actualizó el modelo con los datos de la Encuesta Sintética de Movilidad de 2014 (ESM2014) para analizar los factores que impulsan una movilidad urbana sostenible y definir estrategias a largo plazo para lograr ciudades sostenibles y eficientes.

En 2023 se recuperó esta línea de investigación con la tesis doctoral de Abid Al Akioui, supervisado por Andrés Monzón y Paul Pfaffenbichler, el cual está actualizando el modelo con la Encuesta Domiciliaria de Movilidad de 2018 (EDM2018) y una encuesta realizada por TRANSyT en 2022 para así analizar el impacto del COVID-19 y las nuevas tendencias que surgieron debido a este, como el auge de las actividades telemáticas y la relocalización de hogares, en los patrones de movilidad de la Comunidad de Madrid. Dentro de las actividades formativas, el doctorando realizó una estancia de investigación en el Instituto para Estudios de Transporte (IVe) de la Universidad de Recursos Naturales y Ciencias de la Vida (BOKU) de Viena (Austria). Durante esta estancia, el doctorando trabajó en la actualización del Modelo MARS Madrid junto a Paul Pfaffenbichler.

Así, el desarrollo de la herramienta de planificación estratégica continuará su desarrollo en el año 2024 y se utilizará para analizar los impactos de diferentes estrategias de movilidad en los patrones de viajes de los habitantes de la Comunidad de Madrid.

ANEXO I

Actividades de formación:

Trabajos Fin de Grado (TFG)

PROPUESTA DE MEJORAS DE LA MOVILIDAD EN EL MUNICIPIO DE CIEMPOZUELOS

TRABAJO FIN DE GRADO

UNIVERSIDAD
POLITÉCNICA
DE MADRID

ALEJANDRO SÁNCHEZ SÁNCHEZ

E.T.S. DE INGENIEROS DE CAMINOS CANALES Y PUERTOS (CENTRO RETIRO)
UNIVERSIDAD POLITECNICA DE MADRID

Grado en Ingeniería Civil (58CI) **Especialidad: Construcciones Civiles y Transportes**

FECHA: 4 DE JULIO DE 2023

Universidad Politécnica De Madrid (UPM)

Escuela Técnica Superior de Ingeniería de Montes, Forestal y del Medio Natural

ESTUDIO DE ACCESIBILIDAD DE LOS BARRIOS DE MADRID A LAS ZONAS DE BAJAS EMISIONES

MARTA SANTOS PEDRO

Trabajo de Fin de Grado

Grado en Ingeniería en Tecnologías Ambientales (GITA)

OCTUBRE 2023

ANEXO II

Actividades de formación:

Trabajos Fin de Máster (TFM)

URBAN SUSTAINABLE MOBILITY AND MULTILEVEL GOVERNANCE

CASE STUDY OF MADRID.

Trabajo de Fin de Máster

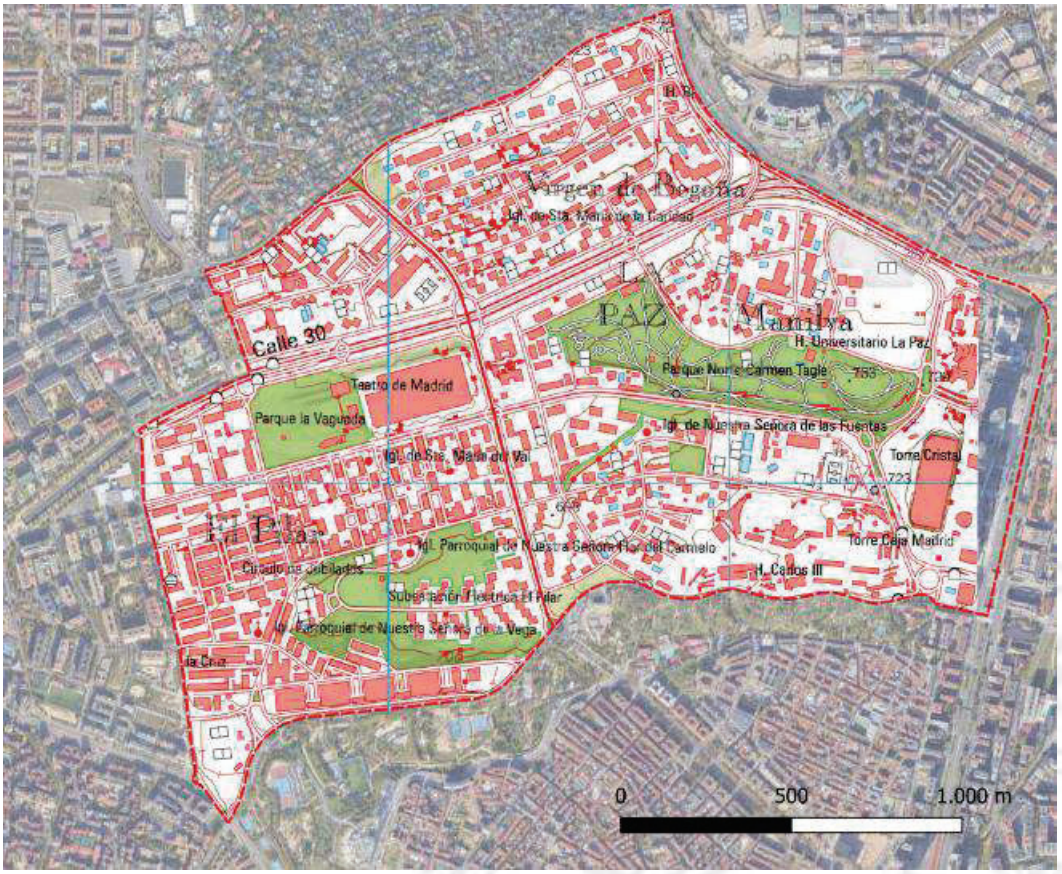
Nombre y apellidos del autor/as: Ana Belén Torrejón García

Nombre y apellidos del tutor/a y cotutor/a: Andrés Monzón y Rosario Otegui

Fecha de entrega: 5 de junio de 2023

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

PROYECTO FIN DE MÁSTER

"PLANIFICACIÓN Y GESTIÓN DE INFRAESTRUCTURAS"

IMPACTOS SOBRE LA MOVILIDAD CICLISTA A PARTIR DE LA AMPLIACIÓN DE BICIMAD EN LA PERIFERIA DE MADRID

Autor: Carlos Eduardo Miranda Hoyos

Tutor: Andrés Monzón de Cáceres

Fecha: julio 2023

ANEXO III

Actividades de formación:

Tesis Doctorales

UNIVERSIDAD POLITÉCNICA DE MADRID

ESCUELA TÉCNICA SUPERIOR

DE INGENIEROS DE CAMINOS, CANALES Y PUERTOS

LOW EMISSION ZONES: ACCEPTABILITY EVALUATION AND IMPACT ON MOBILITY AND RETAIL ACTIVITY

AN EMPIRICAL ANALYSIS IN MADRID

DOCTORAL THESIS

JAVIER TARRIÑO ORTIZ

Ingeniero Civil y Territorial

Máster Universitario en Ingeniería de Caminos, Canales y Puertos

Madrid, 2023

LOW EMISSION ZONES: ACCEPTABILITY EVALUATION AND IMPACT ON MOBILITY AND RETAIL ACTIVITY AN EMPIRICAL ANALYSIS IN MADRID

Javier Tarriño Ortiz

José Manuel Vassallo Magro y Julio Alberto Soria Lara

El problema de la calidad del aire es un hecho en las grandes ciudades del mundo, siendo el transporte por carretera una de las principales causas. Para solucionarlo, se están aplicando diferentes políticas de transporte destinadas a reducir el uso del vehículo privado y mejorar la calidad del aire, siendo de especial importancia la implementación de Zonas de Bajas Emisiones (ZBE).

Las ZBE constituyen áreas delimitadas donde se aplican restricciones de acceso, circulación y aparcamiento a ciertos vehículos en base a estándares ambientales para mejorar la calidad del aire y mitigar la emisión de gases de efecto invernadero, promoviendo el cambio modal hacia modos de transporte más sostenibles.

El principal objetivo de esta investigación es ganar conocimiento sobre los principales impactos ocasionados tras la implementación de una ZBE. Más allá de los potenciales beneficios ambientales, no existe mucha información sobre otros efectos sociales y económicos que pueden ocurrir. La tesis identifica las variables clave que explican: i) la aceptabilidad pública hacia la implementación de una ZBE; ii) la elección y cambio modal causada por una ZBE, con especial interés en analizar el cambio modal entre los usuarios de vehículo privado; y iii) el impacto de las ZBE en las tiendas y comercios de la zona, teniendo en cuenta el punto de vista de los potenciales clientes y de los comerciantes.

El caso de estudio se localiza en la ciudad de Madrid, donde se implementó una ZBE denominada "Madrid Central" en 2018. El proceso llevado a cabo para conseguir los objetivos de la investigación ha sido estructurado en dos fases principales: recogida de datos y modelización. El proceso de recolección de datos se basa en dos campañas de encuestas dirigidas a la población de la Comunidad de Madrid y a los comerciantes del área de la ZBE. La modelización utiliza modelos de elección discreta (logit) y se complementa con técnicas de machine learning.

Los resultados de esta tesis permiten conocer el efecto global de la implementación de las ZBE más allá del impacto ambiental. La creciente importancia de las ZBE es la principal razón por la que su análisis debe continuar en futuras investigaciones.

ANEXO IV

Actividades de formación:

Cursos y seminarios

EELISA European University

İTÜ 250

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://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

Istanbul 22-24 February

LOW EMISSION ZONES: CHALLENGES AND OPPORTUNITIES

A three-day intensive multidisciplinary seminar for identifying and designing urban mobility solutions to facilitate the discussion between stakeholders on low emission zones (ZEZ) in the context of possible Istanbul 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, Geomatics and Industrial Engineering.

UPM-Universidad Politécnica de Madrid

ITU-Istanbul Technical University

BME-Budapest University of Tech. and Econ.

ENPC-École des Ponts ParisTech

POLITÉCNICA

MÜEGYETEM 1782

École des Ponts ParisTech

STAKEHOLDERS:

İSTANBUL BÜYÜKŞEHİR BELEDİYESİ

İstanbul Büyükşehir Belediyesi Bimtaş

parabol

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)

Secretariat:
Cemre Aldoğan (aldogan17@itu.edu.tr)
Tugay Ozcan (tuayozcan@gmail.com)

Academic Coordination:
Mehmet Ali Silgu (masilgu@bartin.edu.tr)

Wednesday 22nd February

Location: Zemin Istanbul - Şişhane/Beyoğlu

11.00	Welcome and Introduction Hande Demirel and H.Berk Çelikoğlu (ITU/ EEMOVE Partner), Andres Monzon (EEMOVE coordinator)
11.20	Opening Speech of EELISA-ITU Lütfiye Durak Ata (Vice Rector - ITU/ EELISA) to be confirmed
11.40	Content and objectives of the seminar Mehmet Ali Silgu (Seminar Coordinator)
12.00	Istanbul Sustainable Mobility Plan (SUMPS), Policy Perspective Evren Müftüler, Melda Horoz (BİMTAŞ/ İBB)
12.40	*Lunch*
14.00	Urban mobility solutions for liveable cities: European experiences The cases of Madrid and Budapest Mariluz B.Gleeson (UPM) , Ali Jamal Mahdi (BME)
16.00	*Coffee break*
16.30	Data Driven Challenges and Solutions for Low Emission Zones Hande Demirel (ITU)
17.00	Micro - mobility Solutions for Low Emission Zones H.Berk Çelikoglu (ITU)

Thursday 23rd February

Location: Zemin Istanbul - Şişhane/Beyoğlu
Location: Low Emission Zone: Saraçhane-Sultanahmet

09.30	Guidance for the Field Work and Announcing Teams of Student Mehmet Ali Silgu (Academic Seminar Coordinator)
10.00	Technical Visit and Field Excursion to Historical Peninsula District of Low Emission Zone, Saraçhane-Sultan Ahmet
13.30	*Lunch – IBB Saraçhane Building*
14.00	Multidisciplinary students' team work: introduction and working group logic Mehmet Ali Silgu (Academic Seminar Coordinator)
14.15	Students' field work 4 groups working on 4 different areas in candidate LEZ (Historical Peninsula) TASK: SWOT analysis combining field work, official data, accessibility and walkability analyses, evaluating the potential of micromobility Supervisors
18.00	Students' presentation by teams (Until 19.30) Detecting environmental, social and mobility challenges
20.30	*Official dinner* Going to be announced soon.

Friday 24th February

Location: Zemin Istanbul - Şişhane/Beyoğlu

09.30	Multidisciplinary students' teamwork TASK: Based on the SWOT analysis conducted the previous day, each group of students will propose solutions to address the identified challenges. Supervisors:
11.00	*Coffee break*
11.30	Technological solutions for SUMPS and Low Emission Zones, Presented by Parabol
12.00	Students' final presentations Jury of stakeholders
13.30	*Lunch*
14.30	Memorial Ceremony for Beril Varol and Ömer Akın Coordinated by Hande Demirel
15.30	*Coffee break*
15.45	Students' Awards Jury of stakeholders

AUGMENTED CCAM

AUGMENTED CCAM

Augmenting and Evaluating the Physical and Digital Infrastructure for CCAM deployment

AGENDA

Retos y oportunidades para implemetación de soluciones de infraestructura física y digital (PDI) para la movilidad conectada, cooperativa y automatizada (CCAM)

15 June 2023

Salón de Actos de EMT Madrid

Anfitrión: EMT Madrid

Lugar: C/Cerro de la Plata 4, 28007, Madrid

Fecha: 15/6/2023

Versión: **Final**

Hora	Tema	Presentador
9:30	Bienvenida y registro	EMT Madrid
9:35	Introducción a AUGMENTED CCAM y soluciones PDI	ETRA
9:50	Presentación Casos de Prueba España	ETRA/EMT/TECNALIA
10:10	Sesión Interactiva 1: Vision e Impacto	Daniel Franco, RC
10:45	**Receso**	
11:00	Sesión Interactiva 2: Retos y oportunidades para implementación de soluciones PDI y la cooperación multi-actor	Daniel Franco, RC
12:10	Discusión y Conclusiones	
12:30	**Fin del evento**	

FUNDACIÓN COMPLUTENSE

3 - 4 de julio

LA INNOVACIÓN DEL AUTOBÚS EN EL TRANSPORTE PÚBLICO

SAPIENZA
UNIVERSITÀ DI ROMA

INTEGRATING URBAN PLANNING AND SUSTAINABLE MOBILITY

Professor Maria Eugenia Lopez-Lambas
Unversidad Politécnica de Madrid (UPM)
Transport Research Center (TRANSyT)

December 11th, 2023
14:30 - 16:00

ANEXO V

Actividades de difusión y transferencia de conocimiento:

Jornadas de divulgación técnica y tecnológica

II JORNADA DE MOVILIDAD SOSTENIBLE

14 MARZO 2023

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

ORGANIZAN

CIUDAD UNIVERSITARIA DE MADRID / CONSORCIO · UNIVERSIDAD COMPLUTENSE MADRID · POLITÉCNICA · UNED

COLABORAN

imágenes by www.freepik.es

AVANCE PROGRAMA

Aforo limitado.
Inscripción imprescindible: ccu@ucm.es.

09.00h. 09.45h. ***Registro de asistentes e inauguración oficial***

09.45h. 11.00h. ***Mesa Redonda BigData y Movilidad: impulsando la sostenibilidad en el Campus de Ciudad Universitaria***

Moderadores: **María José Aparicio**, subdirectora general de educación y formación vial en la DGT y **Andrés Monzón**, catedrático de Transportes de la Universidad Politécnica de Madrid.

Participan:

- >> Ministerio de Transportes, Movilidad y Agenda Urbana
- >> Ayuntamiento de Madrid-EMT
- >> Consorcio Regional de Transporte
- >> Acciona Mobility

ENTRADA LIBRE

11.00h. 11.30h. ***Pausa café.***

11.30h. 12.30h. ***Mesa de debate Club de Movilidad inteligente, sostenible y compartida en la Ciudad Universitaria.***

Moderador: **Jaime Huerta**, secretario general de ITS España.

Participan:

- >> Borja Moya, Grupo de investigación tGIS Universidad Complutense de Madrid
- >> Patxi Lamiquiz, DUyOT, Escuela de Arquitectura Universidad Politécnica de Madrid
- >> David Lois, profesor del Dpto. de Psicología Social y de las Organizaciones de la UNED
- >> Hoop Carpool
- >> Bird
- >> Estudiantes de las universidades del Campus de Moncloa

12.30h. 13.30h. ***Taller Del GPS al BigData: los datos en la gestión inteligente de la movilidad.***

Conductora: **Daniela Arias**, Grupo de investigación tGIS Universidad Complutense de Madrid

13.30h. 14.00h. ***Presentación de los concursos en redes sociales Movilidad sostenible en la Uni (Instagram y TikTok). Proyección de trabajos finalistas y entrega de premios.***

14.00h. ***Clausura oficial.***

A lo largo de la mañana habrá dos actividades educativas complementarias en el ámbito de la seguridad vial (Escape Room y un Safety Tunes), organizadas por la Subdirección General de Formación y Educación Vial de la DGT. Estarán orientadas a estudiantes de las tres universidades del Consorcio y tendrán lugar en el Edificio de Estudiantes de la UCM.

Abierta la convocatoria hasta el 12 de marzo para los concursos *Movilidad Sostenible en la Uni* de vídeos en TikTok y carteles en Instagram, con interesantes premios relacionados con la tecnología y la movilidad. Consulta de bases legales en: https://consorciocu.com/.

Todos los asistentes de la jornada recibirán certificado de asistencia, así como un bono de 5 minutos para el uso gratuito de las motocicletas eléctricas de Acciona*.

**Los usuarios de este servicio de motosharing de Madrid han de tener un mínimo de 3 años de antigüedad en la licencia de conducción B o ser mayor de 18 años con el carnet de conducir A, A1 o A2.*

RedIMUS
Red Iberoamericana de Investigadores de Movilidad Sostenible y Territorio.

I ENCUENTRO HÍBRIDO

RED IBEROAMERICANA DE INVESTIGADORES DE MOVILIDAD SOSTENIBLE Y TERRITORIO

Tendencias y desafíos de la movilidad: ¿Hacia un nuevo paradigma?

Argentina, 10 h; Venezuela, 9 h; Panamá, 8 h y México, 7 h. | **15:00 h**

Lunes, 19 de junio

Facultad de Geografía e Historia (UCM)
Sala de Grados

15:00	**Bienvenida.** Javier Gutiérrez Puebla (UCM) y Martín Orduña (UBA)
15:10	**Presentación de equipos.**
16:00	***El futuro de la movilidad sostenible.*** José Barbero (UNSAM)
16:45	**Debate y preguntas.**
17:00	Pausa (café): intercambio presencial y virtual.
17:20	***Análisis de comportamientos y expectativas de la movilidad en pandemia y poscovid.*** Rosa Arce Ruiz (UPM)
17:40	***Servicios de movilidad compartida: pautas espaciales y temporales.*** Juan Carlos García Palomares (UCM)
18:00	**Foro: *El futuro de la Red****

* Solo para equipos REDIMUS

Inscripción

Con la participación de:

TRANSyT POLITÉCNICA · tGIS · CIMS · moviTUR

INVITACIÓN

Jornada XX Aniversario
del Centro de Investigación del Transporte

TRANSyT-UPM 20 años
Investigación e innovación en movilidad

Martes, 10 de octubre de 2023, 18:00 horas

En la Sala Verde de la E.T.S.I. de Caminos, Canales y Puertos de Madrid (UPM)
c/ Profesor Aranguren, 3, Ciudad Universitaria

Se ruega confirmar asistencia antes del día 6 de octubre a María Elena Rosado

mariaelena.rosado@upm.es

91 06 74 222

PROGRAMA

TRANSyT-UPM 20 años en movimiento

17.45 - 18.00. – Recepción de invitados

18.00 – 18.15. **Inauguración**

18.15 – 19.00. **Mesa redonda**
"Los retos de la movilidad"

Modera: Andrés Monzón de Cáceres,
Catedrático de Transportes de la UPM.

Intervienen:

Mª José Rallo del Olmo
Secretaria General de Transportes y Movilidad del Ministerio de Ministerio de Transportes, Movilidad y Agenda Urbana.

Borja Carabante Muntada
Delegado del Área de Gobierno de Urbanismo, Medio Ambiente y Movilidad, Ayuntamiento de Madrid.

Pablo Rodríguez Sardinero
Director Gerente del Consorcio Regional de Transportes de Madrid (CRTM)

19.00 –20.15. **Mesa redonda**
"Investigación e innovación en movilidad"

Modera: José Manuel Vassallo Magro
Catedrático de Transportes de la UPM.

Intervienen:

Ricardo Sánchez Gómez
CINTRA

Alberto Cillero Hernández
ALSA

Ricardo Herranz López
NOMMON

Antonio García Pastor
AVANZA

Miguel Melchor García
ABERTIS Mobility Services

Margarita Jiménez Corral
ARRIVA

20.15. – Despedida y copa de vino español

ANEXO VI

Actividades de difusión y transferencia de conocimiento:

Participación en congresos nacionales e internacionales

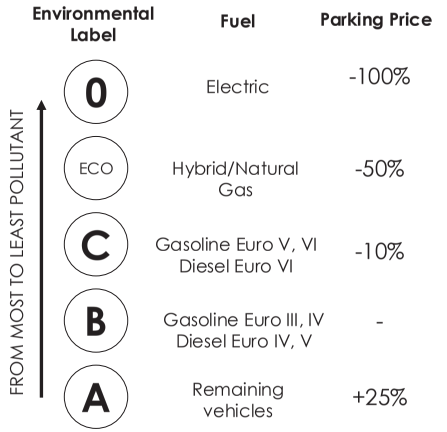
AN EMPIRICAL STUDY ON THE EFFECT OF TRANSPORT POLICIES LINKED TO ENVIRONMENTAL TARGETS ON PARKING DEMAND. EVIDENCE FROM THE CASE OF MADRID (SPAIN)

PhD. Candidate **Juan Nicolas Gonzalez**, *Prof.* **Juan Gomez**, and *Prof.* **Jose Manuel Vassallo**.
juannicolas.gonzalez@upm.es, juan.gomez.sanchez@upm.es, josemanuel.vassallo@upm.es
Universidad Politécnica de Madrid. Transport Research Centre (TRANSyT)

The objective is to explore the extent to which Parking Management and the implementation of Low Emission Zones reduce in practice the parking demand of polluting vehicles and promote the use of greener vehicles, thus contributing to tackling the adverse effects generated by road transport.

01 Introduction

- **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 compact city with high density.
- 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 city center.
- **Low Emission Zones (LEZ)** are areas within a city or region where vehicles are demanded to comply with a particular emission requirement to enter.
- **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.
- **SER manages, regulates, and controls** 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 on-street parking spaces subjected to charges.
- The Government **updated vehicle regulation** and implemented **an environmental label category** for vehicles.
- The SER implemented a parking pricing scheme with **discounts depending on the environmental label** of the vehicle.



02 Data and Methodology

Parking tickets
- June 2018 to June 2019
- **55,000,000 transactions (records).**
- 48 Zones (Spatial Units)

Real information on user behavior.

A **Spatial Panel Data** Approach

$$Y = \rho WY + \alpha + X\beta + WX\theta + u$$

$$u = \lambda Wu + \varepsilon$$

$\boldsymbol{WY}$: Spatial Interaction effect between endogenous variable.
$\boldsymbol{WX}$: Spatial Interaction effect between exogenous variables.
$\boldsymbol{Wu}$: Spatial Interaction effect between error terms.

If $\boldsymbol{\beta = 0}$ and $\boldsymbol{\lambda = 0}$ – Spatial Lag Model
If $\boldsymbol{\rho = 0}$ and $\boldsymbol{\lambda = 0}$ – Spatial Durbin Model
If $\boldsymbol{\beta = 0}$ and $\boldsymbol{\rho = 0}$ – Spatial Error Model

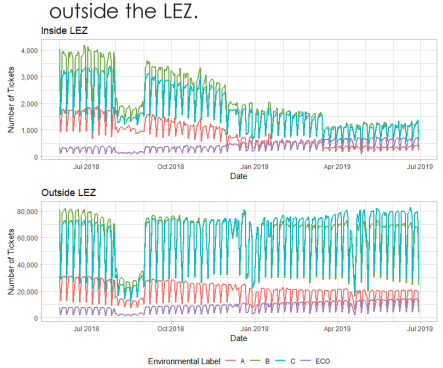
03 Results

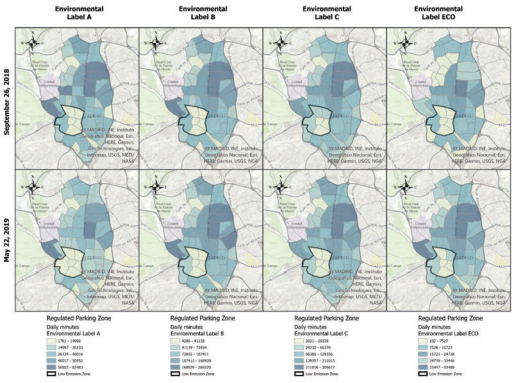
Daily Minutes Parking demand Model for each Environmental label

Variables		A	B	C	ECO
General parking supply		↑	↑	↑	↑
Parking and Ride supply		↑↑	↑↑	↑↑	↑↑
August		↓↓↓↓	↓↓↓↓	↓↓↓↓	↓↓↓↓
Day of Week Ref. Monday	Tuesday	↑	↑	↑	↑
	Wednesday	↑↑	↑↑	↑↑	↑↑
	Thursday	↑↑↑	↑↑↑	↑↑↑	↑↑↑
	Friday	↑	↑	↑	↑
	Saturday	↓↓↓↓	↓↓↓↓	↓↓↓↓	↓↓↓↓
Stage of LEZ Implementation Ref. Before LEZ	Transition Period	↓↓	↓	↑	↑↑
	Full LEZ implementation	↓↓↓	↓↓	↑↑	↑↑↑
	Transition Period Inside LEZ	↓	↓	↓	↓
	Full LEZ implementation Inside LEZ	↓↓	↓↓	↓↓	↓↓
Fuel price		-	-	↑↑	↑↑

A Spatial Lag Model was the best configuration assessed. Considering only Interaction effect between endogenous variable (Daily minutes Parking Demand)

- There is a clear decrease in the use of the most polluting vehicles (environmental labels A and B), both outside and, particularly, inside the LEZ.
- A trade-off trend can be noted Vehicles with environmental label C. While parking tickets for these vehicles sharply reduced inside the LEZ, an increase is observed for neighborhoods outside the LEZ.





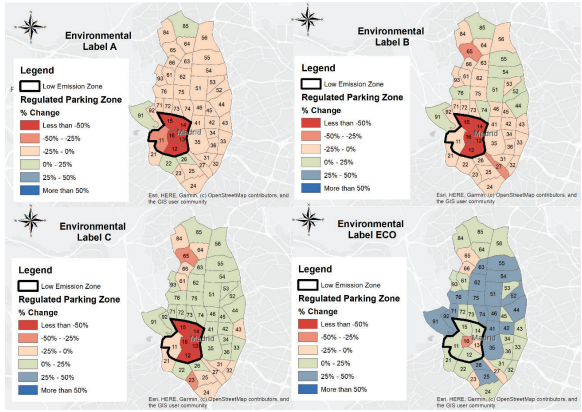
- An increment in the number of parking tickets for ECO vehicles both outside and inside the LEZ,.

04 Conclusions

The findings allow us to draw some interesting conclusions and policy recommendations summarized in three main facts:

(i) Promoting greener vehicles works, but it is not enough.
(ii) Complementary strategies promote a different use of public space throughout the city.
(iii) Data in, lessons out.

What if ... No LEZ



Acknowledgments:
Project TED2021-129239B-I00 funding by MCIN/AEI /10.13039/501100011033 and European Union NextGenerationEU/ PRTR.

ANALYZING THE IMPACT OF LOW EMISSION ZONES ON MODAL SHIFT

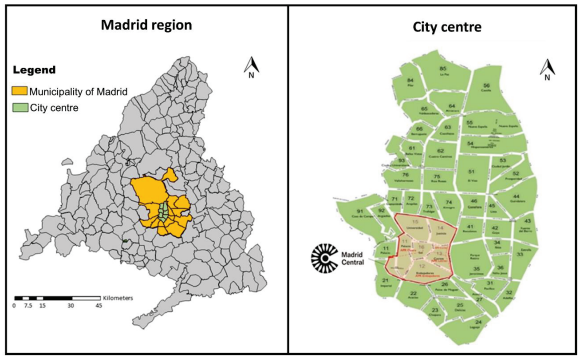
PhD. Candidate **Javier Tarriño Ortiz**, *Prof.* **Juan Gomez**, *Prof.* **Julio Alberto Soria**, and *Prof.* **Jose Manuel Vassallo**.
Javier.tarrino.ortiz@upm.es, juan.gomez.sanchez@upm.es, julio.soria-lara@upm.es, josemanuel.vassallo@upm.es
Universidad Politécnica de Madrid. Transport Research Centre (TRANSyT)

SCAN ME

The objective is to explore to what extent the implementation of LEZs affects modal choice in urban contexts and to identify key variables explaining modal changes caused by LEZs, with particular attention as to how LEZs affect modal shift of private vehicle users.

01 Introduction

- Madrid Region has 6.6 million inhabitants and covers an area of 8,000 km². The city of Madrid has 3.3 million inhabitants in an area of 600 km². According to the latest mobility survey, there are **15.8 million trips on a working day** within the area of **Madrid Region** and **3 million trips in private vehicle** inside **Madrid City**.
- Madrid Region is characterized by an **extensive transportation network**: highways, public transport, suburban bus, suburban rail, metro services, and shared mobility services (bike-sharing, kick-scooters, mopeds, and electric cars).
- **Low Emission Zones (LEZs)** are areas delimited by the Municipality where vehicle access and parking restrictions are applied **to improve air quality and mitigate greenhouse gas emissions by promoting modal shift** towards more sustainable transport modes and boosting energy efficiency in the use of transport. The implementation of LEZs occurs in places with a high concentration of economic and social activity.
- An **LEZ called "Madrid Central"** was implemented in the city of Madrid in 2018, covering an area of **5 km²** within the city center.

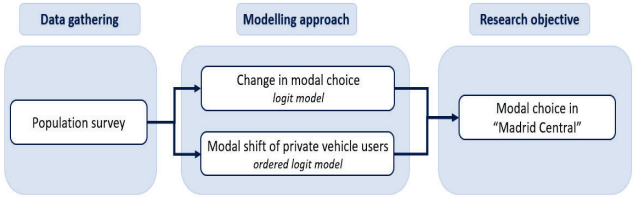


- **Traffic restrictions** have been imposed on private vehicles based on **five environmental labels** (from A, highest polluting level, to Zero, lowest polluting level). These environmental categories are harmonized at the national level, based on the engine type, as well as on the age and type of vehicle. General **exemptions** are applied 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

02 Data and Methodology

A **survey campaign** was conducted among **citizens from Madrid Region (799 respondents)** after the implementation of "Madrid Central". The questionnaire captured a wide range of explanatory variables: 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 implementation of "Madrid Central"**, with particular attention on how the LEZ affects **modal shift by private vehicle users (380 respondents).**

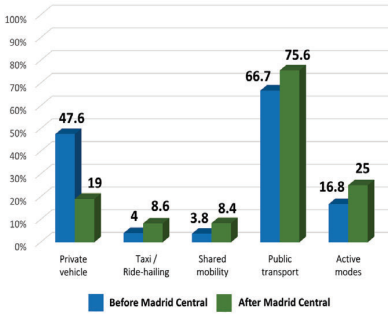


03 Results

A relevant change towards sustainable mobility patterns is observed after implementing "Madrid Central". **Half of respondents** (49.9%) **reported changing their usual transport mode** to access "Madrid Central" after adopting the policy. Descriptive results indicate a **remarkable decrease in private vehicle use** (-28.5% of total respondents), meaning that 60% of former car users have changed their previous transport mode.

Model 1 **analyzes changes in the modal choice** of individuals to get to "Madrid Central" due to the LEZ implementation, assuming such changes from a binary logic (0 = modal choice does not change after implementing "Madrid Central"; 1 = modal choice changes after implementing "Madrid Central"). A positive sign indicates a higher probability of modal shift after the implementation of "Madrid Central." By contrast, a negative sign indicates a probability towards modal change".

Modal share (% of population) before and after "Madrid Central".



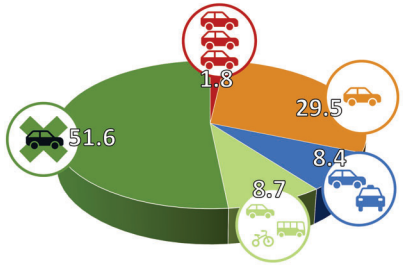
Individuals' modal change to access "Madrid Central" modelling results.

SOCIODEMOGRAPHICS	Employment sector	*Primary sector and industry*	↓
		Retail, hotel, and catering	↓
		Transport and logistics	↓
INDIVIDUAL PERCEPTIONS	Social awareness	*High*	↑
TRAVEL RELATED VARIABLES	Private car availability	*Yes*	↑
MOBILITY HABITS LINKED TO "MADRID CENTRAL	Impact on usual trips	*Negative*	↑
	Pedestrian evaluation	*High*	↓
	Time walking on foot	*Increase*	↑
	Trip frequency	*>1/month & <2/week*	↑
	Trip purpose	*Shopping*	↓
MODAL CHOICE IN "MADRID CENTRAL"	Before	*Private vehicle*	↑
	After	*Private vehicle*	↓
		Shared mobility	↑

Individuals using **shared mobility modes** after the implementation of Madrid Central (e.g., car sharing, moped scooter sharing, etc.) are more likely **to have changed their transport mode** to travel to "Madrid Central". This result may indicate that current users of those services mostly came from other transport modes due to the restrictions established by the LEZ. Additionally, 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.

Model 2 studies changes of **modal choice among individuals who used private vehicles before** the implementation of "Madrid Central". **A dependent variable** (*modal shift level*) **was built** with the following categories: (1) people increasing their private vehicle use compared to the situation prior to the LEZ; (2) drivers of private vehicles maintaining their modal habits after "Madrid Central"; (3) people replacing their private vehicles in favor of taxi/ride hailing; (4) people reducing the use of their private vehicles by partially substituting public transport or active modes; (5) individuals giving up using the private vehicle to get to "Madrid Central". A positive sign indicates a higher probability of reducing private vehicle use in favor of another transport mode to reach "Madrid Central".

Modal shift level of former private vehicle users: sample.



Modal shift of FORMER private vehicle users: modelling results

SOCIODEMOGRAPHICS	Age	*Below 25*	↓
	Gender	*Male*	↑
	Education level	*University*	↓
	Household composition	*Family with dependent people*	↓
	Monthly income	*< 1,300 €/month*	↑
INDIVIDUAL PERCEPTIONS	Political ideology	*Rightist*	↑
TRAVEL RELATED VARIABLES	Public transport pass	*Yes*	↑
	Use of public transport	*High*	↑
MOBILITY HABITS LINKED TO "MADRID CENTRAL	Impact on usual trips	*Negative*	↑
	Time walking on foot	*Increase*	↑
	Trip day	*Non-working*	↑
	Trip purpose	*Shopping*	↓

04 Conclusions and future research

- There is an evidence of **the remarkable power of "Madrid Central" to trigger changes in modal choice.** The results show the **high impact of the LEZ on decreasing car use** and promoting cleaner modes thereby contributing to reduce air pollution
- **Modal shift** after the LEZ is mainly **associated** with **socio-demographic variables** and **mobility habits** related to "Madrid Central".
- The results are particularly **useful for designing future policy strategies** for the implementation and functioning of LEZs, according to the environmental, economic and social goals.

Acknowledgments:

PROYECTOS DE TRANSICIÓN ECOLÓGICA Y TRANSICIÓN DIGITAL 2021.
PROYECTO TED2021-129239B-100 GREENSHARE.

THE ROLE OF PRIVATE CARS IN EUROPEAN CITIES AFTER COVID-19

PhD. Candidate **María Vega-Gonzalo**[(1)], *Prof.* **Juan Gómez**[(1)], PhD. **Panayotis Christidis**[(2)], and *Prof.* **José Manuel Vassallo**[(1)].

Maria.VEGA-GONZALO@ec.europa.eu, juan.gomez.sanchez@upm.es, Panayotis.CHRISTIDIS@ec.europa.eu, josemanuel.vassallo@upm.es

[(1)]Universidad Politécnica de Madrid. Transport Research Center (TRANSyT); [(2)]European Commission, Joint Research Centre (JRC), Seville, Spain, 41092

1 INTRODUCTION

- The decline in mobility, the widespread adoption of teleworking regimes and online shopping were seen as an opportunity to advance towards the decarbonization of urban transport and increase the sustainability of urban mobility.
- The fear of contagion and the desire to keep social distancing have pushed travellers to individual modes and away from public transport.
- The impact of COVID-19 on car-based mobility is not homogeneous across socio-economic groups. Since the private car has been signalled as the main winner among urban transport modes in European cities, the study of how the different socio-economic groups and traveller profiles have changed their car ownership and use of the car during the pandemic is especially relevant to understand the effect of this global crisis on urban mobility in coming years.

This work aims to analyze how the socio-economic characteristics and past travel habits of the individual and the household have influenced the changes in car use and ownership in European urban areas after the start of the COVID-19 pandemic.

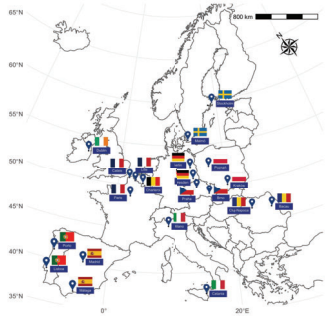
2 DATA: AN EUROPEAN URBAN MOBILITY SURVEY

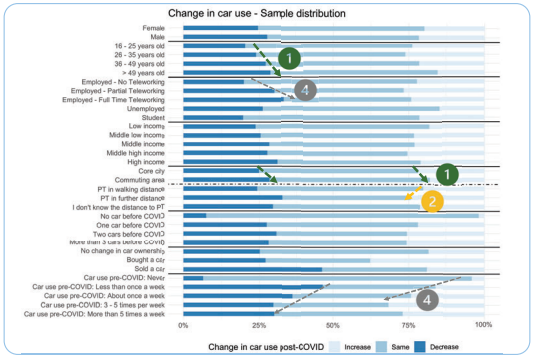
21 European cities of different sizes, characteristics and geographical locations

March – May 2021

10,063 valid responses (~500 per city)

- Socio-economic characteristics of the respondents and their households.
- Mobility habits before and after the start of the pandemic.



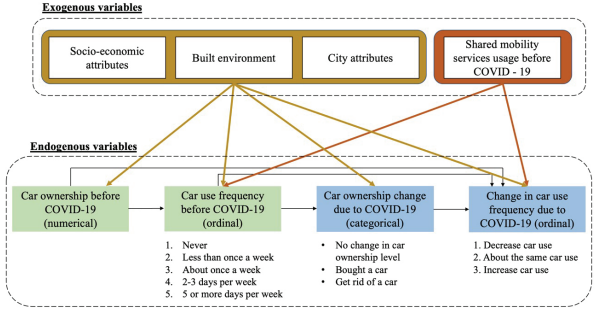


3 METHODOLOGY

The chosen modelling framework is a **Path Analysis,** that performs a series of regressions **to analyze the relationship** between pre- and post-COVID car ownership and car use. The explanatory variables include:

- The socio-economic attributes of the individuals and the household (gender, age, income, etc.)
- Built environment characteristics of the place of residence (distance to public transport, place of residence within the metropolitan area, etc.)
- Shared mobility (bike-sharing and car-sharing) frequency of use before the start of the pandemic. These variables aim to analyze how the different users of these services have modified their frequency of use of the car.
- City-level attributes (population, income per capita, mode performance, etc.).

A **nested multilevel model** to account for geographical differences between macro-European regions, countries and cities was also tested, but only differences across cities were significant. Once the city-level attributes were introduced the random intercepts were no longer significant, showing that this variables account for the difference between cities.



4 MODELLING RESULTS

Variable (*base category*)	Number of cars in the household pre-COVID (numerical)	Frequency of use pre-COVID*	Car-ownership change due to COVID (base category: no change in car ownership)		Change in frequency of car use post-COVID (ordinal)
			Bought car	Sold a car	
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
SOCIO-ECONOMIC ATTRIBUTES					
Gender (*Female*)					
Male	--	0.410***	0.161**	--	
Age (*16 - 25 years old*)					
26 - 35 years old	-0.087***	0.668***	-0.487***	--	
36 - 49 years old	-0.108***	0.722***	-0.821***	--	-0.232***
Over 50 years old	--	0.992***	-1.293***	-0.547***	-0.346***
Education (*Primary and Secondary school*)					
Post-Secondary and tertiary school	0.100***	0.200***	-0.234**	--	--
University	0.163***	0.313***	-0.274**	--	--
I prefer not to say	--	0.621***	-1.060**	--	--
Employment pre-COVID (*Employed – no TW*)	--	-0.141**	n/a	n/a	n/a
Employed - TW	--	-1.157***	n/a	n/a	n/a
Student	-0.099***	-0.425***	n/a	n/a	n/a
Unemployed	-0.077***	-0.390	n/a	n/a	n/a
Employment post-COVID (*Employed – no TW*)	n/a	n/a			
Employed - full TW	n/a	n/a	0.892***	0.363**	-0.412***
Employed - partial TW	n/a	n/a	0.460***	0.402**	-0.200***
Student	n/a	n/a	--	--	-0.256***
Unemployed	n/a	n/a	--	0.459**	-0.355***
Income (*Low income*)					
Middle – low income	0.148***	0.164**	0.145**	--	--
Middle income	0.217***	0.136**	0.145**	-0.347**	--
Middle high income	0.286***	0.136**	--	-0.347**	--
High income	0.345***	0.196**	-0.240**	--	-0.164**
I don't know	0.149***	-0.302***	-0.376***	--	--
I prefer not to say	0.196***	--	-0.493***	--	--
BUILT ENVIROMENT					
Residential location (*Core city*)					
Commuting area	0.302***	0.389***	-0.177**	--	-0.179***
Distance to public transport (*Walking distance*)					
Farther than walking distance	0.161***	0.398***	0.936***	--	0.143**
SHARED-MOBILITY					
Bike sharing use pre-COVID (*non-users*)					
Occasional	n/a	--	n/a	n/a	0.272***
Frequent	n/a	-0.304***	n/a	n/a	--
Car sharing use pre-COVID (*non-users*)					
Occasional	n/a	0.132**	n/a	n/a	0.278***
Frequent	n/a	--	n/a	n/a	--
ENDOGENOUS VARIABLES					
Number of cars	n/a	1.327***	1.064***	0.497***	--
Number of cars^2	n/a	--	-0.409***	--	--
Number of cars^3	n/a	--	0.048***	--	--
Car use pre-COVID (*5 or more times per week*)					
3-5 times per week	n/a	n/a	0.206**	0.975***	0.162**
About once a week	n/a	n/a	0.193**	0.481**	-0.444***
Less than once a week	n/a	n/a	0.193**	--	-1.053***
Never	n/a	n/a	-0.216*	--	0.142**
Car ownership change (*no change*)					
Bought car	n/a	n/a	n/a	n/a	0.500***
Got rid of a car	n/a	n/a	n/a	n/a	-0.492***
Constant	0.176***		-2.416***	-2.625***	n/a
Thresholds					
Threshold 1	n/a	0.921***	n/a	n/a	-1.443
Threshold 2	n/a	1.528***	n/a	n/a	1.201
Threshold 3	n/a	2.050***	n/a	n/a	n/a
Threshold 4	n/a	3.021***	n/a	n/a	n/a

* p≤0.05, ** p≤0.01, *** p≤0.001
*Positive coefficients imply a more frequent use of the car.

5 CONCLUSIONS AND RECOMMENDATIONS

1 **Reverting effect of the pandemic in common trends on car usage.** The pandemic has had a reversal effect on several trends regarding car ownership and car usage. For the case of car usage, this effect is observed among younger individuals and residents in the core city, that were usually identified as low car-dependent groups but have significantly increased their car use during COVID-19. In the case of car ownership, high income household are less likely to have bought a car due to COVID-19, while the displayed higher levels of car ownership than the other income groups before the pandemic.

2 **Persistent effect of sustainable urban planning on car ownership and car use reduction.** The results highlight the importance of sustainable urban planning to reduce car ownership levels and mitigate car dependency. Even during COVID, when public transport was often perceived as a risky option, the possibility of reaching public transport on foot significantly reduced the probability of a household purchasing a new car and the increase in car use.

3 **The use of shared mobility services before the pandemic has not mitigated the increase in private car during COVID-19.** While the frequent use of bike-sharing was correlated with a lower frequency of car use before COVID-19, the adoption of this kind of mobility was not able to avoid an increase in car use. In the case of car-sharing, occasional users of such services before COVID-19 are more likely to increase private car use after the pandemic. These results reveal that the potential of car-sharing to reduce private car use was not achieved during the pandemic.

4 **Increased use of the private car for presential workers and frequent users of the car before COVID-19.** The study of the socio-economic factors that are interrelated with an increase in car use, indicates that employees in fully presential regimes are clearly the ones that have chosen the car more often after the lockdowns. Furthermore, the results show that those that used the car rather often before the pandemic (between 3 and 5 times per week) have increased their car use significantly more than those that used it more than 5 times a week.

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Comunidad de Madrid
UNIÓN EUROPEA
Fondo Europeo de Desarrollo Regional
Collaborative Doctoral Partnership [Agreement nº 35364]

AESOP YA CONFERENCE 2023

Planning for Action:
Making sustainable transformation of cities and territories happen

Track 4. *Complex and unpredictable cities and territories: Planning approaches and institutions*

Coping with complex and unpredictable disruptions: A proposal for an adaptive scenario-building approach for land use and transport planning

Amor Ariza-Álvarez (mariaamor.ariza@upm.es)

Supervisor: Dr. Julio A. Soria-Lara

Department of Transport Engineering, Urban and Regional Planning
Universidad Politécnica de Madrid, Spain
Transport Research Centre (TRANSyT)

Young Researchers Seminar 2023
LNEC, Lisbon, Portugal, 15-17 May

Using Scenario-Building to Incorporate Disruptive Futures into Land Use and Transport Planning

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June, 14th 2023

Caracterización del uso del patinete compartido y privado en Madrid

Álvaro Aguilera García
Juan Gómez Sánchez
Thais Rangel
José Manuel Vassallo

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EL TELETRABAJO Y SU IMPACTO EN LA MOVILIDAD DE LA COMUNIDAD DE MADRID

Abid Al-Akioui
Andrés Monzón

Financiado mediante el convenio entre la Comunidad de Madrid (Consejería de Educación, Universidades, Ciencia y Portavocía) y la Universidad Politécnica de Madrid para la concesión directa de una ayuda de 7.912.000,00 euros para financiar la realización de actuaciones en materia de investigación sobre el SARSCOV2 y la enfermedad COVID-19 financiado con los recursos REACT-UE del Fondo Europeo de Desarrollo Regional.

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Financiado como parte de la respuesta de la Unión a la pandemia de COVID-19

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Evolution of public transport demand in the Region of Madrid because of the Covid-19 pandemic

Impact of anti-pandemic measures on public transport demand

Note: This research was included in the Procedia Special Issue of the XV Conference of Transport Engineering, CIT23
https://authors.elsevier.com/sd/article/S2352-1465(23)00336-8

Angel D. Alonso Herrero
Andrés Monzón de Cáceres

ASSESSING THE ADDED VALUE OF MAPPING SCENARIO NARRATIVES FOR COLLABORATIVE TRANSPORT AND URBAN PLANNING

Amor Ariza-Álvarez

Julio A. Soria Lara

Universidad Politécnica de Madrid (UPM). Centro de Investigación del Transporte (TRANSyT)

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EFECTOS DEL TRÁFICO EN LA CONTAMINACIÓN ATMOSFÉRICA. EVIDENCIA EMPÍRICA EN LAS OLAS DE COVID-19 EN LA CIUDAD DE MADRID

Jorge Bañuelos-Gimeno, Natalia Sobrino, Rosa Arce

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¿Cómo influye comprar por internet en las pautas de movilidad de la población?

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Laura Garrido Maza
José Manuel Vassallo

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Juan Gómez Sánchez
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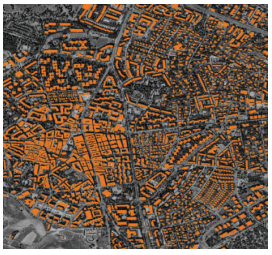
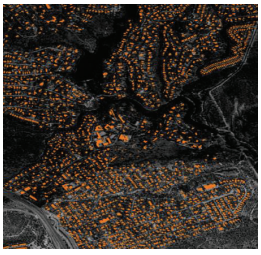
Junio 2023

URBAN FORM FACTORS AT TRIP ORIGIN AND DESTINATION AS DETERMINANTS OF CAR USE: EVIDENCE FROM MADRID REGION

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XV Congreso de Ingeniería del Transporte (CIT 2023)

15 June 2023

INTENTION TO UPTAKE MAAS IN MADRID METROPOLITAN AREA

Iria Lopez-Carreiro, Andres Monzón, Elena López, Iago Aguiar

XV Congreso de Ingeniería del Transporte

15 de Junio de 2023

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Dept. of Transport Engineering, Urban and Regional Planning,
Universidad Politécnica de Madrid, Madrid, Spain

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María Vega-Gonzalo[ab], Alvaro Aguilera-García[a], Juan Gómez[a], José Manuel Vassallo[a]

[a]Centro de Investigación del Transporte (TRANSyT), Universidad Politécnica de Madrid
[b]Joint Research Centre, European Commission

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María Vega-Gonzalo[ab], Juan Gómez[a], Panayotis Christidis[b]

[a]Centro de Investigación del Transporte (TRANSyT), Universidad Politécnica de Madrid
[b]Joint Research Centre, European Commission

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Miguel L. Navarro Ligero (TRANSyT-UPM)
Julio A. Soria-Lara (TRANSyT-UPM/CSIC)

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Juan Nicolas Gonzalez, Juan Gomez Sanchez and Jose Manuel Vassallo
juannicolas.gonzalez@upm.es
Transport Research Centre – TRANSyT
Universidad Politécnica de Madrid

September 2023

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Anna Ibraeva, Andrés Monzón, Elena López

An analysis of moped scooter sharing usage patterns and its potential to reduce vehicle ownership.

María Vega-Gonzalo[ab], Álvaro Aguilera-García[a], Juan Gomez[a], José Manuel Vassallo[a]

[a]Centro de Investigation del Transporte (TRANSyT), Universidad Politécnica de Madrid.
[b]European Commission, Joint Research Centre, Seville.

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ANEXO VII

Actividades de difusión y transferencia de conocimiento:

Publicaciones de carácter científico

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MaaS potential users' profiles characterization with a K-means clustering algorithm

Iago Aguiar[a]*, Andres Monzon[a], Iria Lopez-Carreiro[a]

[a]*Transport Research Centre, Universidad Politécnica de Madrid, Calle del Prof. Aranguren, 3, Madrid 28040, Spain*

Abstract

Mobility as a Service (MaaS) is building its way into cities all across the globe to change how their residents move around today. Given the user-centric nature of this model, it is essential to understand individuals' needs and expectations for its successful deployment. The paper explores different potential users' profiles in the metropolitan area of Madrid (Spain) by applying a machine learning clustering algorithm. Our analysis reveals three clusters in terms of individuals' willingness to adopt MaaS: the "MaaS-enthusiasts", who are significantly open to embrace the new mobility solution; the "innovation doubtful users", who are likely to adopt MaaS but need more persuasive incentives; and the "anti-new technologies", a group averse to innovation. Tailored strategies are defined to foster MaaS within these three groups, with the goal of encouraging more sustainable behaviours. Our results demonstrate how machine learning can be helpful to transport planners and policymakers for getting insightful information from large datasets.

Keywords: MaaS; user profile; cluster; machine learning.

1. Introduction

In the current era of digitalization, Mobility as a Service (MaaS) has gained the attention of transport researchers, policymakers, service operators, and other stakeholders as an opportunity to revolutionize the mobility scenario and encourage sustainability.

Since its emergence in 2014, MaaS is expected to bring a wide variety of benefits, such as addressing the individual

* Iago Medeiros Aguiar. Tel.: +34 910 67 42 31.
E-mail address: iago.aguiar@upm.es

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Article

Spatial Analysis of COVID-19 Pandemic Impacts on Mobility in Madrid Region

Abid Al-Akioui * and Andres Monzon

Transport Research Centre (TRANSyT), Universidad Politécnica de Madrid, 28040 Madrid, Spain; andres.monzon@upm.es
* Correspondence: a.asanz@upm.es

Abstract: After three years of COVID-19 lockdown and restrictions, mobility seems to have returned to normality. However, the pandemic has left changes in the mobility patterns of the Madrid Region produced by new trends emerging from COVID-19. This paper analyzes these changes, focusing on the impacts on public transport use, the effects of telematic activities and the influence of home relocation. The basis of the analysis is a survey conducted from November to December 2022, with more than 15,000 valid responses. The results show that public transport lost 6% of trips. These trips have different transfer rates depending on their geographic location. In the City Center, the majority transferred to active modes. However, the car attracted most of these trips in the Metropolitan Ring. These changes in mobility patterns are partly a consequence of the increase in telematic activities. Teleworking has increased by more than 20% in the Madrid Region and has caused changes in trips per week and trip purpose. In addition, teleworking has caused 18% of home relocations to peripheral zones of the region. This paper investigates through statistical analysis which sociodemographic and spatial factors explain the differences in mobility impacts throughout the zones of the Madrid Region.

Keywords: COVID-19; post-COVID-19 mobility; urban and metropolitan mobility; modal share; modal shift; public transport; active modes; mobility survey; mobility patterns; binary logit model

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1. Introduction

For years, mobility trends have focused on pursuing sustainable transport, seeking trip reductions and modal shift toward more sustainable modes, such as public transport or active modes. The COVID-19 pandemic was a turning point in these trends due to the induced changes. Some authors identify the COVID-19 crisis as an accelerator of the changes that were to emerge in the long term. However, the pandemic's direct impacts are short-term [1].

The rapid transmission of the virus and the poor reaction time to control the pandemic led to the imposition of various restrictions. The restrictions imposed due to the COVID-19 pandemic ranged from closing jobs and commercial activities to introducing telematic activities as the primary model for work or study [2]. As expected, these restrictions directly impacted mobility patterns [3]. The worldwide imposed restrictions caused the volume of trips to decrease drastically [4]. For example, lockdown reduced trips by up to 39% in Germany [5] and caused a drop of more than 4500 trips in Shenzhen (China) [6]. In the case of Spain, these reductions were more significant, reaching values of around 40–50% fewer trips [7]. These decreases were more notable in public transport, with reductions close to 50% of trips compared to 2019 usage values [8]. Finally, focusing on the Madrid Region, the impacts were more significant than those in the rest of Spain. This was because the restrictions were harsher and more extended in time. The Madrid Region is one of the most densely populated regions in the country. Hence, the total trips were reduced by up to 70% during the lockdown in the Madrid Region [9]. Mobility patterns changed dramatically during the COVID-19 crisis. However, research should focus on something other than these short-term effects. Therefore, it should focus on the overall long-term impact and

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Teleworking and its impacts on mobility in the Region of Madrid

Abid Al-Akioui [a,*], Andres Monzon [a]

[a] *Transport Research Centre, Universidad Politécnica de Madrid, Calle Profesor Aranguren 3, 28040 Madrid, Spain*

Abstract

Because of restrictions caused by COVID-19, new trends such as teleworking or e-learning have emerged. These new trends have a direct impact on the generation and attraction of trips, affecting mobility. This work analyzes what that impact is in the Region of Madrid, where more than three million people work. According to the Spanish National Statistics Institute, 18% of the Spanish population teleworked in 2021, increasing this percentage to 35% in the Region of Madrid. Through a three-step methodology that combines information from three different data sources, it is possible to analyze the teleworking rate associated with each branch of activity and estimating teleworking rates in the different zones of the Region. According to the results, in the central zones of the Region there are activities with a higher teleworking rate, which gives rise to higher reductions in the number of trips. For example, in the case of the city of Madrid, teleworking rate is 30%, which is consistent with the reduction of trips (27%). By contrast, in outer zones where teleworking rates are lower (20%), the reduction of trips is not so high (10%). This work serves as a basis for the proposal of strategies and policies concerning teleworking, adapting them to the employment characteristics of each zone of study.

Keywords: Type your keywords here, separated by semicolons ;

1. Introduction

The arrival of COVID-19 brought with it a myriad of measures to prevent contagion, such as the closure of schools and workplaces, restrictions on commercial activities, and the introduction of telematic activities (Shibayama, Sandholzer, Laa, & Brezina, 2021). Due to these restrictions, mobility in the Region of Madrid fell by 70% during lockdown, recovering progressively during 2020 (Al-Akioui, Monzon, & Alvarez, 2021). However, one year after the crisis, in 2021, the number of trips has not equaled the number made before COVID-19.

* Corresponding author. Tel.: +34 910 67 42 31
E-mail address: a.asanz@upm.es

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

Abid Al-Akioui [a,*], Andres Monzon [a], Candela Martin [a]

[a]*Transport Research Centre (TRANSyT), Universidad Politécnica de Madrid (UPM), Calle Profesor Aranguren 3, 28040 Madrid, Spain*

Abstract

The COVID-19 pandemic has highlighted the need to ensure good accessibility to healthcare centres, which first requires to study mobility patterns. This work presents a new method based on a dual vision of healthcare centres: as a public facility and as a workplace. This method is applied to the case study of La Paz University Hospital, one of the most important Spanish hospitals. Through a survey campaign using different collection methods, the mobility patterns of patients and staff were studied, obtaining a total of 2,160 valid responses. According to the results, the private vehicle is the predominant mode with a modal share of more than 50%, aggravating the parking problems. Finally, this study has analysed behavioural changes due to the COVID-19 pandemic, which have led to a decrease in the use of public transport, with commuters now opting for active modes or the private vehicle.

Keywords: hospital; transport; hybrid survey method; behaviours and mobility patterns; gender issues in mobility; social inclusion and societal issues in mobility

1. Introduction

Accessibility of public facilities, especially healthcare centres, has been actively studied (Jiao et al., 2022). Different authors have used several study methods considering factors like location and catchment area (Wang et al., 2019), the presence of multiple modes (Mao & Nekorchuk, 2013), or different socioeconomic profiles (Tao & Cheng, 2018).

Guaranteeing good accessibility requires adapting urban and transport planning and design to current and future travel demand. Therefore, the first step is to analyse the mobility patterns of people attending healthcare centres.

* Corresponding author. Tel.: +34 910674231
E-mail address: a.asanz@upm.es

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Evolution of public transport demand in the Region of Madrid because of the Covid-19 pandemic

Angel Alonso[a]*, Andrés Monzón[b]

[a]PhD Candidate, Universidad Politécnica de Madrid, Calle Profesor Aranguren 3, 28040 Madrid, Spain
[b]TRANSyT - Transport Research Centre, Universidad Politécnica de Madrid, Calle Profesor Aranguren 3, 28040 Madrid, Spain

Abstract

The health pandemic caused by Covid-19 has resulted in an unprecedented health, economic and social crisis both in terms of the number of people affected and the type of containment measures taken to prevent and mitigate the spread of the coronavirus. The impact of Covid-19 on public transport behaviour in the Region of Madrid has continued two years after the World Health Organization (WHO) upgraded the situation from a public health emergency to an international pandemic on 11 March 2020, although the impact was different during the first and second State of Alarm. In general, a positive trend was observed in the recovery of demand from the time of the lowest levels (between the days 03/30/20 and 04/12/20, coinciding with the cessation of non-essential work activities) until two years after the start of the pandemic, when all kinds of restrictions on any economic and social activities had already been eliminated, although at that time the pre-pandemic levels of demand had not yet been reached (-19.24% average decrease value in March 2022 compared to the equivalent month in 2019). Furthermore, we have found that the measure associated with the closure of schools had a lower long-term impact on public transport than other measures related to the closure of workplaces, teleworking and the restriction of capacity in public establishments and leisure venues, with different impacts depending on the size, population density and geographical location of the cities that are part of the Region of Madrid.

Keywords: Covid-19; Public Transport; Demand Management; Passenger Behaviour; Madrid

* Corresponding author.
E-mail address: angelalonso@alumnos.upm.es

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Article

Explanatory Factors of Daily Mobility Patterns in Suburban Areas: Applications and Taxonomy of Two Metropolitan Corridors in Madrid Region

Andrea Alonso [1,*], Andrés Monzón [2], Iago Aguiar [3] and Alba Ramírez-Saiz [1]

[1] Department of Urban and Regional Planning, Universidad Politécnica de Madrid, 28040 Madrid, Spain
[2] Transport Engineering, Urban and Regional Planning Department, Universidad Politécnica de Madrid, 28040 Madrid, Spain
[3] Transport Research Centre—TRANSyT, Universidad Politécnica de Madrid, 28040 Madrid, Spain
* Correspondence: andrea.alonso@upm.es

Abstract: Understanding the characteristics that shape mobility could help to achieve more sustainable transport systems. A considerable body of scientific studies tries to determine these characteristics at the urban level. However, there is a lack of studies analyzing those factors for the heterogeneous zones existing in the suburbs of big cities. The study presented in this paper intends to fill this gap, in the context of two metropolitan corridors in the Madrid Region. Correlation analyses are used to examine how mobility patterns are affected by socioeconomic and urban form variables. Then, a cluster analysis is carried out to classify the types of zones we may find in the suburbs. Results show that the main characteristics leading towards higher car use are low urban density, few local activities, a high percentage of children, and a low percentage of seniors. As for the variable distance to the city center, it does not explain car use. Moreover, some remote areas have many walking trips. This is well understood in the cluster analysis; there are zones far away from the city center but that are dense and well provided for, which work as self-sufficient urban centers. Results reinforce the theories underlying polycentrism as a solution to the urban sprawl challenge.

Keywords: suburban mobility; explanatory factors; metropolitan corridors; urban form; land use; socioeconomic characteristics; residential trips; household surveys; residential trips

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1. Introduction

Cities are centers of innovation, wealth, and job creation, but are also often characterized by air pollution, noise, heat, and disease [1,2]. One of the main challenges facing cities in their efforts to address these problems is urban mobility [3–5]. In fact, achieving a sustainable mobility has become one of the most widespread objectives in policy agendas, whatever the political ideology of the decision maker [6–8]. Protecting the environment or achieving healthier urban environments are now the main goals for transport and urban planners. The actions to achieve these goals are well known, and there is even agreement between the main actors concerned about what should be done (e.g., promote a modal shift towards walking, cycling, and Public Transport, reduce trip lengths or encourage greater efficiency) [9].

At the European level, the production and dissemination of official documents recommending policies to achieve a more sustainable mobility are also wide and diverse [10–12]. As a result, most European cities are planning and carrying out actions such as the creation of segregated bus lanes, the implementation of bicycle rental services, or the pedestrianization of streets [13,14]. These policy interventions, aimed at improving the efficacy and efficiency of urban transport systems, are usually implemented in the core cities, while their peripheries are often disregarded [15]. However, it is precisely in core cities where the mobility patterns tend to be more sustainable, especially in the European context, mainly

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Re-thinking the role of exploratory scenarios for adaptive policymaking: An application for land use and transport planning

Amor Ariza-Álvarez [a,b,*], Julio A. Soria-Lara [a,b,c], Francisco Aguilera-Benavente [d]

[a] Transport Research Centre -TRANSyT-, Universidad Politécnica de Madrid, C/ Profesor Aranguren, 3, 28040, Madrid, Spain
[b] Department of Transport Engineering, Urban and Regional Planning, Universidad Politécnica de Madrid, C/ Profesor Aranguren, 3, 28040, Madrid, Spain
[c] Institute of Economics, Geography, and Demography, Spanish National Research Council -CSIC-, C/ Albasanz 26, 28037, Madrid, Spain
[d] Department of Geology and Geography, Universidad de Alcalá, C/ Colegios, 2, 28801, Alcalá de Henares, Spain

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ABSTRACT

While scenario-building has proven useful in situations marked by considerable uncertainty in the context of land use and transport policymaking, additional research is needed to develop adaptive and dynamic scenario-building schemes. To address this gap, the present paper conceptualises an adaptive scenario-building approach that would facilitate adaptive policy responses by using exploratory scenarios as intermediate tipping points. An empirical research design is also conducted following a participatory approach, with a case study of the Henares Corridor in the Metropolitan Area of Madrid, Spain. Three exploratory scenarios are assessed as experimental tipping points for the basic policy pathways initially adopted by regional and local governments. The use of such tipping points suggested different adaptive policy responses: (i) preserving policy responses when exploratory scenarios are strongly aligned with the basic pathways; and (ii) transforming policy responses when significant deviations are perceived between the exploratory scenarios and the basic pathways. The paper also discusses the real-life application potential of this adaptive scenario-building approach, further research steps, and future horizons for scenario-building.

1. Introduction

The future of cities and transport systems is now – more than ever – shaped by disruptive events with low predictability, which trigger dynamic responses and social change (Marchau et al., 2019; Lyons & Marsden, 2021). For example, the ongoing COVID-19 outbreak shapes urban planners' perceptions of the future as deeply uncertain, where any predictions are strongly contested (Batty, 2020). In this highly dynamic context, supporting policymaking processes that effectively address Land Use and Transport integration (LUTI) is crucial for achieving sustainable outcomes (Banister, 2005; Bertolini, 2017; Ariza-Álvarez et al., 2021). However, achieving this goal demands high flexibility and adaptability among policymakers, to be able to cope with unexpected futures marked by turbulences (Van Dorsser et al., 2018, 2020; Walker et al., 2010; Soria-Lara et al., 2021; Van Drunen et al., 2011). Such approaches may result in alternative policymaking schemes based on interaction and learning processes between stakeholders and institutions,

* Corresponding author at: Transport Research Centre -TRANSyT-, Universidad Politécnica de Madrid, C/ Profesor Aranguren, 3, 28040, Madrid, Spain.
E-mail address: mariaamor.ariza@upm.es (A. Ariza-Álvarez).

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Article

Effects of Mobility Restrictions on Air Pollution in the Madrid Region during the COVID-19 Pandemic and Post-Pandemic Periods

Jorge Bañuelos-Gimeno, Natalia Sobrino and Rosa María Arce-Ruiz *

Transport Research Centre TRANSyT-UPM, c/Profesor Aranguren, 3, Ciudad Universitaria, Universidad Politécnica de Madrid, 28040 Madrid, Spain; jorge.banuelos@upm.es (J.B.-G.); natalia.sobrino@upm.es (N.S.)

* Correspondence: rosa.arce.ruiz@upm.es; Tel.: +34-91-06-74232

Abstract: Air quality is one of the problems cities face today. The COVID-19 pandemic provided a unique opportunity to study the influence of traffic reduction on air quality during 2020, 2021, and 2022. The aim of this paper is to analyze the impacts and relationship between mobility restrictions in six COVID-19 wave periods and air pollution and evolution in the post-pandemic period differentiating Madrid city from its metropolitan area. We tested whether the changes produced for NO_2, NO_x, $PM_{2.5}$, PM_{10}, and O_3 in the urban traffic and suburban traffic air quality stations data in comparison to the 2019 reference period were significant. The findings of this study show that the periods with the greatest reduction in pollutant concentrations were the first and third COVID-19 waves, when mobility restrictions were most stringent: there was strict confinement for the first wave (i.e., 47% reduction in daily average NO_2 concentration), while severe weather forced a reduction in traffic in the region in the third wave period (i.e., 41% reduction in daily average NO_x concentration). With the return to normal activity in the last period, pollutant concentrations began to exceed pre-pandemic levels. At the urban level, the reductions were more noticeable in relation to NO_2 and NO_x, while at the suburban level, changes were less prominent, except for the O_3. The results are particularly inspiring for designing future mobility strategies for improving air quality in urban and metropolitan areas.

Keywords: air pollution; COVID-19 pandemic; mobility restrictions; air quality

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1. Introduction

Ensuring good health and well-being in the world's population is Goal 3 of the United Nations (UN) Sustainable Development Goals (SDG) [1]. Air pollution poses the greatest environmental risk to the health of the urban population, causing cardiovascular and respiratory diseases that result in the loss of years of a healthy life and, in the most severe cases, premature death [2]. The world recently faced an unprecedented global health crisis. COVID-19 was spreading human suffering, destabilizing the global economy, and drastically changing the lives of people around the world during the last three years. It would be of interest to analyze approaches beyond the strictly health-related sphere and to study the impact of the COVID-19 pandemic on air pollution in urban areas.

The declaration of the COVID-19 pandemic by the World Health Organization (WHO) on 11 March 2020 [3] led many countries around the world, supported by the recommendations of experts, to take measures to prevent the spread of the virus. These took the form of social distancing, the suspension of all non-essential activities, and the strict confinement of a large part of the population. In Spain, the Madrid region was the first territory to become aware of the risk of COVID-19, and on 9 March, the regional authorities decided to close all its educational centers [4]. The Spanish national government declared a state of nationwide emergency from 14 March 2020 [5] to 21 June 2020 [6], during which time all citizens were obliged to stay at home except in extenuating circumstances, as indicated by

sustainability

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Article

Reasons to Pedestrianise Urban Centres: Impact Analysis on Mobility Habits, Liveability and Economic Activities

Mari Luz Brownrigg-Gleeson [1,*], Andres Monzon [1] and Adriana Cortez [2]

[1] Transport Research Centre-TRANSyT, Universidad Politécnica de Madrid, 28040 Madrid, Spain; andres.monzon@upm.es
[2] Higher Polytechnic School, Universidad Francisco de Vitoria, 28223 Pozuelo de Alarcón, Madrid, Spain; adriana.cortez@ufv.es
* Correspondence: ml.bgleeson@upm.es

Abstract: Pedestrianisation entails the full removal of motorised vehicles. It promotes walking and active means of transport and has a wide range of benefits in terms of health, the environment, mobility and the economy. However, it often faces widespread opposition. This results in a lack of political will and, to a lesser degree, in temporary pedestrianisations, which can be reverted. We consider that infrastructural change and long-term pedestrianisation are key for long-lasting benefits and more resilient and sustainable cities. To explore and assess this, a survey of pedestrians and semi-structured interviews with businesses were conducted in recently pedestrianised areas of Madrid, a large capital city. Data on satisfaction and changes in mobility, liveability and business were gathered. Over 755 citizens and 38 local businesses answered. The results show high levels of satisfaction (2/3) among citizens, while 1/2 businesses consider it positive for their commercial activity. Car use has fallen, active means of transport have been fostered and perceived attractiveness has increased, although some congestion has been noticed in nearby streets. This and the rest of the evidence presented in this paper can be used to back long-term restrictive policies in other dense and busy cities.

Keywords: pedestrianisation; car restriction; user survey; citizen acceptability; city centre liveability; impact on local business

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1. Introduction

Even though walking is the oldest mode of transportation known to humankind, it is clearly not a thing of the past. With interest in walkability increasing, the benefits of a more active lifestyle and of walking [1–3] have been thoroughly studied. Walking is recommended and promoted by researchers in the fields of transport and health [4–7]. What is more, in recent years, decision makers and society as a whole have become more environmentally conscious, which has also led to changes in urban mobility and the promotion of active means of transport by a diversity of institutions [8–10]. The European Union (EU) has established several policy frameworks, such as the European Green Deal or the Sustainable, Smart and Resilient Mobility Strategy, that pave the way for improved urban mobility [11]. Along these lines, the sustainable mobility paradigm, as defined by Banister in 2008 [6], highlights the need to shift from understanding the street as a road to seeing it as a communal space and slowing movement down instead of speeding it up. In alignment with this idea, pedestrianisation schemes, considered a key policy to promote walking [5], have been introduced in many cities worldwide, including Copenhagen, Oslo, Paris, Milan, New York and Singapore [12,13].

On the whole, walking is good for society, the environment and the economy [1]. The climate emergency and COVID-19 have also highlighted the need for more sustainable urban mobility, and measures such as pedestrianisation have been promoted. In addition,

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Are low emission zones and on-street parking management effective in reducing parking demand for most polluting vehicles and promoting greener ones?

Juan Nicolas Gonzalez *, Juan Gomez, Jose Manuel Vassallo

Transport Research Centre – TRANSyT, Universidad Politécnica de Madrid, Calle Profesor Aranguren s/n, 28040 Madrid, Spain

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ABSTRACT

Parking Management and Low Emission Zones (LEZs) are two of the most widely applied policies to reduce the negative externalities of private vehicles in urban areas and, in particular, to prevent the incorrect use of public spaces and encourage drivers to use the parking service more efficiently. Recently, some cities have been adjusting these measures to the environmental characteristics of the vehicles, but up to date, there is little empirical evidence about the effectiveness of that measures. The objective of the paper is to explore to what extent Parking Management and the implementation of LEZs reduce the parking demand of the most polluting vehicles. Based on a detailed database obtained from parking payment records (more than 50 million) in Madrid (Spain), a spatial econometric approach is conducted to analyze the impact of both policies on parking demand. Our analysis indicates that implementing Parking Management and LEZ policies resulted in more efficient use of parking space by incentivizing the use of environmentally friendly vehicles and reducing demand for highly polluting ones. This was achieved through a combination of LEZ restrictions and parking fare incentives or penalties linked to the environmental label of the vehicle. Consequently, on-street parking became a more attractive option for clean vehicles. Interestingly, this study also found that this phenomenon significantly impacted overall parking behavior throughout the city, not just within the LEZ.

1. Introduction

Reducing the negative externalities generated by private vehicles has been a recurring objective for all public authorities at the national and local levels worldwide. The main externalities of motor vehicles comprise road congestion, air pollution, and noise pollution, mainly caused by fossil fuels and engine noise. However, as noted by Chatziioannou et al. (2020), there are further negative externalities generated by road transport, such as water pollution, land use adjustments, vibration damage, effects on historical monuments, and impacts on biodiversity and ecosystems. Local governments have adopted multiple strategies to mitigate these externalities at the urban level, which is receiving increasing attention in scientific literature. According to Caicedo et al. (2016), the main strategies adopted include promoting fuel-efficient vehicles, developing urban planning strategies, improving city breathability, and implementing Transportation Demand Management (TDM) actions.

* Corresponding author.
E-mail addresses: juannicolas.gonzalez@upm.es (J.N. Gonzalez), juan.gomez.sanchez@upm.es (J. Gomez), josemanuel.vassallo@upm.es (J.M. Vassallo).

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Transport Research Arena (TRA) Conference

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

Iria Lopez-Carreiro[a]*; Andres Monzon[a]

[a]*Transport Research Centre (TRANSyT), Universidad Politecnica de Madrid, Profesor Aranguren, 3, 28040 Madrid, Spain.*

Abstract

Mobility as a Service (MaaS) has recently gained popularity as an opportunity to support a more sustainable mobility model. Today, it is still uncertain if travellers are willing to adopt it and shift their habits. In the paper, we explore individuals' behavioural intentions in Madrid (Spain) and Randstad (The Netherlands). First, a Structural Equation Model uncovers a set of attitudinal constructs relevant for MaaS adoption. Then, a cluster analysis determines four groups according to the disposition to use the new solution. Overall, we detect three barriers that may hinder MaaS uptake: low willingness to integrate mobility services, low technological affinity, and low reliability on new mobility services. We also note that a strong sense of ownership and low environmental concerns seem to block innovativeness. Policy makers are suggested to consider these obstacles when promoting MaaS.

Keywords: Mobility-as-a-Service; Sustainability transition; Acceptance of innovations; Behavioural model.

1. Introduction

Sustainable transport systems are at the heart of accomplishing the 2030 Agenda for Sustainable Development (UN, 2019). Today, these systems are disruptively changing, driven by global mega-trends in society, such as urbanization, digitalization, and servitization. Within this context of "dynamic environments", the notion of Mobility as a Service (MaaS) has recently gained popularity as an opportunity to encourage a paradigm shift in the transport sector. Its ultimate goal –and most attractive added value– is the promotion of a behavioural transition towards more sustainable and less car-oriented lifestyles, while increasing individuals' satisfaction (Lopez-Carreiro et al., 2021). The key proposition relies on the application of Information and Communication Technologies to place travellers at the core of urban mobility, providing them with customized multimodal solutions through a single digital application (commonly a website or a smartphone).

Nevertheless, despite the real-world MaaS pilots in operation and the multiple benefits expected of them, it is still unknown if individuals are willing to embrace the new mobility model. This means to (i) adopt the new digital

* Corresponding author. Tel.: +34-91-06-74223.
E-mail address: iria.lopez@upm.es

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MaaS Implications in the Smart City: A Multi-Stakeholder Approach

Iria Lopez-Carreiro *, Andres Monzon and Elena Lopez

Centro de Investigación del Transporte (TRANSyT), Universidad Politécnica de Madrid, 28040 Madrid, Spain; andres.monzon@upm.es (A.M.); elena.lopez@upm.es (E.L.)
* Correspondence: iria.lopez@upm.es

Abstract: Cities worldwide are calling for smart mobility strategies to tackle the negative externalities of their transport networks. Mobility as a Service (MaaS) is expected to introduce a new mobility model that promotes smarter and more sustainable urban futures. Given the novelty of the concept, this paper explores the implications that might arise from the implementation of MaaS in today's metropolises in relation to the six dimensions of smart cities: smart governance, smart economy, smart mobility, smart environment, smart people, and smart living. To this end, 42 semi-structured interviews with MaaS stakeholders were conducted in Madrid (Spain). Thematic analysis identified a set of 35 urban implications. The success of MaaS requires more than the mere deployment of technologies and must be supported by the reorganisation of institutional structures, the reform of the regulatory scenario, the stimulation of innovation-based entrepreneurship, the promotion of environmental awareness, the encouragement of cultural transition, and the consideration of the public sphere. Overall, valuable insights are identified for policymakers when designing MaaS. Assessment of multiple stakeholders' perspectives enables a holistic understanding of these strategies and thus maximises their potential to address the limitations of our complex mobility systems in meeting urban sustainability goals.

Keywords: smart city; smart mobility; Mobility as a Service; multi-stakeholder perspective

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1. Introduction

Driven by the rapid growth of the world's population and rising urbanisation processes, urban sprawl is taking over human settlements [1]. At the same time, other global megatrends, such as digitalisation and servitisation, are enhancing hyper-connected and "liquid" societies through constant change [2], re-shaping lives worldwide [3]. In particular, advances in information and communications technologies (ICTs) are democratising data, which are now conceived as the "new oil" of the 21st century [4]. Within this dynamic scenario, the concept of a smart city (SC) was introduced in the 1990s, fostered by the agile development of technological innovations and the aim of improving people's quality of life [5–8]. This phenomenon has been widely addressed in the past decade as it appears to be an opportunity to re-think our metropolises and tackle the heterogeneous challenges that threaten their sustainability.

Today, there are numerous interpretations of SCs in academia, which shows that the intended reality is still unclear [9,10]. However, and despite this lack of global understanding, SCs are usually described as the confluence of six smart dimensions (articulated by ICTs): smart governance, smart economy, smart mobility, smart environment, smart people, and smart living [11–13]. Even though some authors have used other terminology to refer to these dimensions, this paper adopts the well-known approach of [11]. Each of the SC dimensions can be further broken down into different "areas of action" that help to clarify their scope. It is worth pointing out that the literature has not yet reached a consensus on the definition of these "areas" [14,15]. This is therefore the first knowledge gap that this paper aims to examine.

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15-Minute City: Utopia or reality?

Cristina López García de Leániz[a*], Allison Fernández Lobo[b]

[a]*Technical Director of theMetropolitan Mobility Observatory (MMO) , Profesor Aranguren 3, Madrid 28040, Spain*
[b]*Software and data analysis manager at the Metropolitan Mobility Observatory (MMO), Profesor Aranguren 3, Madrid 28040, Spain*

Abstract

The city model of the 21st century is in a moment of transformation and reflexion, especially after the impact of the 2020 pandemic and the serious energy crisis that is emerging. In the *Green Deal* and the scope of the *EU Mission: Climate-neutral and Smart Cities By 2030*, European policies have placed mobility at the focal point of the environmental and social challenges of cities, with the aim of making Europe the first climate-neutral zone of the world in 2050. At COP21 in Paris in 2015, the concept of the *15-Minute City* was coined for the first time. An integrated and sustainable urban development model that can help cities achieve climate neutrality focussing on the human being that is having a strong national and international impact. To achieve these objectives, a mobility transformation is necessary. This article analyses the city of Madrid based on the holistic approach proposed by *C40 Cities*. Specifically, it is applied to three neighbourhoods with different sociodemographic, physical, and urban variables of the city. From the results obtained, it can be concluded that these neighbourhoods are aligned with the key points of the decahedron and with the main variables for the implementation of the *15-Minute City* strategy; however, it is observed that the model faces the great challenge of answering displacements for work purposes.

Keywords: 15-Minute City; Green Deal; EU Mission; Mobility; C40 Cities.

1. Introduction

Carlos Moreno spreads the concept of the *15-Minute City* (C15'), and the *30-Minute Territory*, linked to the 'city of proximity', which took off strongly in the campaign to Anne Hidalgo's mayor's office in Paris in 2019 and, above all, a year later with the outbreak of the pandemic. An idea that goes beyond being a slogan for the city, since it proposes a change in the way of living in cities, so that they are no longer a hostile space and become places to live and enjoy public space. In essence, it is not a new concept, but it has arrived at the right time. According to a 2020 survey by the World Economic Forum, 9 out of 10 people around the world want a more sustainable and equitable world after the pandemic (World Economic Forum, 2021).

Currently, there are already many cities that are adhering to this new approach and its contribution to improving the quality of life of their citizens. In these cities, they try to reinvent themselves by focussing the urban model on

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LOS DESAFÍOS DEL URBANISMO DEL SIGLO XXI. UNA ODISEA EN EL ESPACIO

MARÍA EUGENIA LÓPEZ LAMBAS

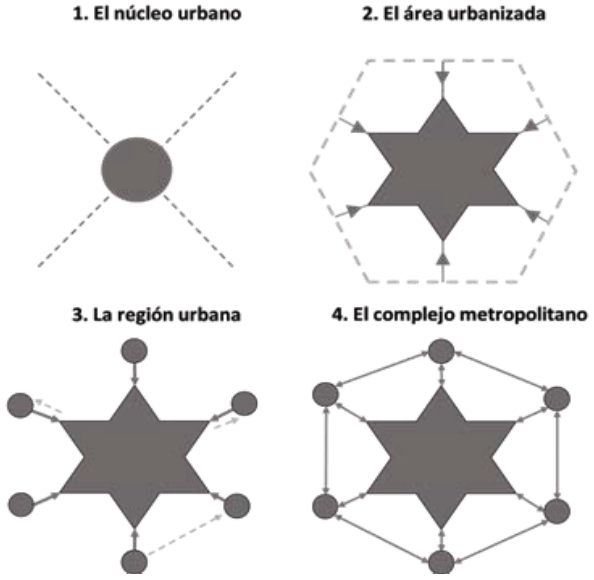
What are the cities but the people?

Shakespeare,
Coriolanus, Acto III, Escena 1

Introducción

Desde la revolución agrícola que, con su especialización técnica y funcional del trabajo, transporte y complejidad de la organización social, supuso la aparición de la ciudad como estructura más compleja que la aldea o el poblado, pasando por las varias revoluciones industriales experimentadas desde el siglo XIX (Santamera, 2006), hasta la ciudad actual, posmoderna, mucho ha llovido. De la ciudad medieval, amurallada, autocontenida, donde las calles son tan estrechas que apenas permiten el paso de varias personas a la vez, hasta la urbe posindustrial, descentralizada, en la evolución de la forma urbana se distinguen varias etapas:

Gráfico 1. Evolución de la forma urbana



En la actualidad. aproximadamente el 60 % de la población europea viva en las ciudades; cifra que, para 2030, se espera alcance el 80 %. Si nos referimos a la población mundial,

future transportation

MDPI

Article

These Boots Are Made for Walking: A Qualitative Study on the Perceived Barriers to Pedestrian Mobility in Madrid

M. Eugenia López-Lambas [1], Andrea Alonso [2,*], Alba Ramírez-Saiz [2,*] and Andrés Pereira [2]

[1] Transport-Civil Engineering Department, Universidad Politécnica de Madrid, 28040 Madrid, Spain
[2] Urban and Regional Planning-Architecture Department, Universidad Politécnica de Madrid, 28040 Madrid, Spain
* Correspondence: andrea.alonso@upm.es (A.A.); alba.ramirez@alumnos.upm.es (A.R.-S.)

Abstract: As an active mode of transportation, walking has proven to be an effective strategy to tackle environmental problems while improving health. The current paper highlights the main factors that either encourage or deter pedestrians in their daily trips by analyzing the arisen discussions in three different Focus Groups (FGs), which were later synthesized into factors ranking according to their positive or negative outcomes. The results help identify these factors and show how a variety of target groups (seniors, young adults, middle-aged adults, divided by male and female perspective) perceive the city in different ways: younger adults prioritize accessibility and quality of the infrastructure, females highlighted the insecurity suffered during nighttime trips, and older adults emphasized the relevance of street maintenance. Finally, the benefits of walking on physical and mental health are viewed positively amongst all target groups, considering walking as a means to help people reduce stress.

Keywords: barriers; pedestrian mobility; walkability; travel behaviour; sustainable transportation

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1. Introduction

Pedestrians play a vital role in the metropolis from the social, health, or urban mobility points of view. Walking represents the oldest means of transport, and the most universal and sustainable way to access the city, which reverts to the dwellers' perception of the city [1]. In other words, walking promotes a cordial relationship between individuals and the urban environment by participating in cultural and commercial street activities, appreciating architectural beauty, or interacting with other pedestrians [2].

Despite all the advantages of walking, the acceptance of the Modern Urbanism Movement has fed a debate about the private car monopolizing public space since the Athens Charter was signed in 1930. The increase in the use of private vehicles over the 20th century has allowed the development of sprawling cities and reduced the importance of proximity relationships [3,4]. The excesses in motorized transport contribute to 70% of environmental pollution and 40% of greenhouse gas emissions in European cities [5] and are estimated to cause more than 400,000 deaths annually [5,6].

Furthermore, the dependence on motorized transportation has facilitated a sedentary lifestyle [7,8]. Nowadays, more than 30% of all adults are estimated to engage in insufficient physical activity, which is directly associated with an increase in mortality due to cardiovascular diseases, type 2 diabetes, or cancer [9]. Promoting active modes of transportation improves not only the physical but also the mental health of citizens [10], as well as reducing emissions and congestion in cities [11,12]. Therefore, active modes of transport (walking and cycling) are necessary to improve air quality and encourage combined and more sustainable mobility in cities [5].

The need for radical re-thinking, together with pressing socio-economic issues, has prompted modern cities to adopt urban planning mechanisms to ensure that a better

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

Andrés Monzón[a], Adriana Cortez[a]*, Maria Beltran[a], Mari Luz Brownrigg-Gleeson [a]

[a]*Transport Research Centre – TRANSyT Universidad Politécnica de Madrid Calle Profesor Aranguren 3, 28040 Madrid Spain*

Abstract

The European Green Deal intends to speed up the transition towards sustainable mobility to achieve climate neutrality by 2050. Among the different transformative policies it proposes, accelerating the shift to sustainable, smart, and inclusive mobility is one of the main strategies. This work presents a phase on how to apply the evaluation framework from CIVITAS SCALE-UP project, in Madrid's context. This paper describes the project's multilevel evaluation framework being developed and presents relevant findings on Madrid´s mobility baseline. Results support the need for the different strategies and plans that are currently being implemented in the city and the region, which include the 8 mobility measures studied in SCALE-UP.

Keywords: CIVITAS SCALE-UP; upscaling; replication; sustainable cities and communities; multimodal transport;

1. Introduction

The transport sector generates negative externalities to society, among which, traffic congestion, air pollution and accidents have been identified as some of the most important ones (Maibach et al., 2008; Newbery,1990; Parry, Walls, &Harrington, 2007). As Banister (2008) points out, in order to improve transport sustainability, it is necessary to take actions in both the physical layer of the city (urban form and traffic flows) and the social dimension (people and proximity). To achieve that, the integration of transportation policies in different plans and policy packages plays a key role in finding ways of addressing transportation problems (Hull, 2008).

In this regard, one of the European Commission's primary initiatives is to accelerate the shift to sustainable, smart, and inclusive mobility (Poppeliers & Ricci,2013) as well as to reduce transport emissions, which currently account for a quarter of the European Union (EU´s) greenhouse gases, with a sustained upward trend (Eurostat,2016).

* Corresponding author. Tel.: +34 910674224
E-mail address: adriana.cortez@upm.es

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Exploring the role of public transport information sources on perceived service quality in suburban rail

Carlos Romero [a,*], Clara Zamorano [b], Andrés Monzón [a]

[a] TRANSyT – Transport Research Centre, Universidad Politécnica de Madrid, 28040 Madrid, Spain
[b] Department of Transport Engineering, Regional and Urban Planning, Universidad Politécnica de Madrid, 28040 Madrid, Spain

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ABSTRACT

Information is a powerful tool to enhance the perceived service quality of public transport. Online information sources have become very popular and coexist with traditional sources like posters and signage, however it remains unclear whether those sources impact evenly to the service perception. This paper aims to explore the influence of different information sources on the service attributes and perceived service quality. For that, we take data from the annual Traveller Satisfaction Survey of the suburban rail of Madrid Region and adapt a robust service quality assessment framework to consider information sources. First, four passenger segments arise according to their preferred information source, including online and offline. Then, we assess the perceived service quality of each segment using a combination of CART and IPA techniques. Results expose a relevant role of information on the suburban rail service satisfaction, contrarily to previous studies focused on urban rail. We have also detected some heterogeneity on the relative importance of attributes depending on the information role: online-informed passengers care most about core attributes while traditionally informed passengers are more influenced by comfort. Last, the IPA reveals a general need to improve service reliability, train supply and up-to-date information.

1. Introduction

Mobility in suburban areas is highly car-dependent due to the lower attractiveness of Public Transport (PT) compared to urban cores. Suburban PT struggles to provide enough territorial accessibility because of sprawl and it also suffers from uncertainty in travel time due to longer trip distances, hence worsening the perception of PT. Transport operators try to retain and attract passengers by addressing their needs, that is, making passengers more satisfied with PT services.

Passenger satisfaction is a subjective construct, measuring a divergence between expected and perceived service quality (SQ). To that end, the European Standard EN 13816 (CEN, 2002) establishes a general framework to evaluate the degree of passenger satisfaction. It proposes a data collection instrument – Traveller Satisfaction Surveys (TSS) – and eight general service attributes to be assessed: availability, accessibility, information, time, customer care, comfort, security and environmental impact. These attributes have unequal weight in the overall passenger satisfaction, which can be estimated from satisfaction ratings (Weinstein, 2000). Knowing which attributes play relevant roles for passenger satisfaction is paramount for transport operators to prioritize investments.

Among these service attributes, information has the potential to deal with trip uncertainty and thus to enhance suburban passengers' trip experience (Cats and Gkioulou, 2017; Hu et al., 2019). In fact, the European Commission's Sustainable and Smart Mobility Strategy states that 'seamless multimodality enabled by digital solutions is vital in urban and sub-urban areas' (European Commission, 2020). In this sense, PT companies and agencies are evolving from basic to high-value information supported by the ICT advances in devices and connectivity.

Traditionally, official PT information sources have consisted of printed leaflets, posters and displays at bus stops and train stations, as well as public address system at stations. In the last 15 years, PT operators and agencies have also launched two main online information sources, namely websites and mobile apps, after the sequential internet and smartphone uptakes (Mulley et al., 2017).

In parallel to official PT information sources, several IT companies (e.g. Google, Apple) have developed their own online transport information services, including both traffic and PT. These sources collect either static or real-time information (RTI) released by PT agencies and operators, and thus presumably display accurate and dynamic data

* Corresponding author.
E-mail address: carlos.romeromorales@upm.es (C. Romero).

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Article

Understanding and Predicting Ride-Hailing Fares in Madrid: A Combination of Supervised and Unsupervised Techniques

Tulio Silveira-Santos [1,*], Anestis Papanikolaou [2], Thais Rangel [1,3] and Jose Manuel Vassallo [1]

[1] Transport Research Center (TRANSyT), Universidad Politécnica de Madrid, 28040 Madrid, Spain; thais.rangel@upm.es (T.R.); josemanuel.vassallo@upm.es (J.M.V.)
[2] Volkswagen Data:Lab, Volkswagen AG, 80805 Munich, Germany; anestis.papanikolaou@volkswagen.de
[3] Department of Organizational Engineering, Business Administration and Statistics, Universidad Politécnica de Madrid, 28012 Madrid, Spain
* Correspondence: tulio.silveira@upm.es

Abstract: App-based ride-hailing mobility services are becoming increasingly popular in cities worldwide. However, key drivers explaining the balance between supply and demand to set final prices remain to a considerable extent unknown. This research intends to understand and predict the behavior of ride-hailing fares by employing statistical and supervised machine learning approaches (such as Linear Regression, Decision Tree, and Random Forest). The data used for model calibration correspond to a ten-month period and were downloaded from the Uber Application Programming Interface for the city of Madrid. The findings reveal that the Random Forest model is the most appropriate for this type of prediction, having the best performance metrics. To further understand the patterns of the prediction errors, the unsupervised technique of cluster analysis (using the k-means clustering method) was applied to explore the variation of the discrepancy between Uber fares predictions and observed values. The analysis identified a small share of observations with high prediction errors (only 1.96%), which are caused by unexpected surges due to imbalances between supply and demand (usually occurring at major events, peak times, weekends, holidays, or when there is a taxi strike). This study helps policymakers understand pricing, demand for services, and pricing schemes in the ride-hailing market.

Keywords: ride-hailing; dynamic pricing; machine learning; artificial intelligence; data analytics; prediction error; clustering analysis; decision-making process; transport policy

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1. Introduction

Urban transportation has changed significantly in recent years, given the fast development of innovative technologies. New app-based mobility services such as ride-hailing are becoming more and more popular because of the consumer behavior shift from ownership to accessibility [1]. Ride-hailing has recently exploded in popularity, as indicated by the business success of transportation network companies (TNCs) such as Uber and Lyft [2].

The popularity of these companies can be explained in part by the fact that they often provide cheap, comfortable, on-demand door-to-door transportation options in urban areas [3]. In many cities, this service has thus become an essential part of the transportation system. In tandem with the global rise of this mobility alternative, several scholars have investigated the impact of ride-hailing services on individuals' travel behavior and mode choice, pricing structure, etc. Nevertheless, the findings are still uncertain in several aspects, particularly regarding the pricing scheme.

Ride-hailing companies use real-time dynamic algorithms to adjust their fares at any moment, whereas taxi fares are usually fixed and regulated [4]. Dynamic pricing, also known as surge pricing, is an automated system based on demand and supply principles. While it is unclear how these rates are adjusted at any given time, understanding the behavior of the ride-hailing fares will be valuable to (i) users, to anticipate fares in advance;

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Regulation of shared electric kick scooters in urban areas: Key drivers from expert stakeholders

Natalia Sobrino [a,*], Juan Nicolas Gonzalez [a], Jose Manuel Vassallo [a], Maria de los Angeles Baeza [b]

[a] Centro de Investigación del Transporte (TRANSyT), Universidad Politécnica de Madrid, Calle Profesor Aranguren 3, 28040, Madrid, Spain
[b] Departamento de Economía Financiera y Contabilidad, Universidad de Granada, Campus de la Cartuja, 18071, Granada, Spain

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ABSTRACT

Shared electric kick scooters (SEKS) have become widespread in many cities worldwide with great expectations from both users and municipalities. Most cities have not yet passed specific legislation to regulate this new phenomenon, thereby increasing uncertainties across different players such as users, operators, etc. This research provides guidelines for regulating SEKS in urban areas for their successful implementation, taking advantage of a collaborative approach with expert stakeholders that look at the regulation problem from different perspectives. The study focuses on the case of Spain where SEKS have been booming over the last few years. The methodology applied follows a three-step process consisting of the identification of crucial issues and key expert stakeholders, a general survey to them, and a final focus group intended to reach consensus. The paper provides regulatory recommendations in four main areas: market access, technical requirements, traffic and safety, and supervision. It finds large agreement on key aspects such as promoting a homogeneous regulation across the municipalities within the same metropolitan area; establishing fixed bases for parking in the city centre while allowing free floating in low density areas located in the outskirts; and promoting an integration with the public transportation system.

1. Introduction

Recent technological advances bring new opportunities that may have a significantly impact on urban mobility with important implications for the environment. This is the case of app-based electric kick scooter sharing services that enable citizens to gain short-term access to vehicles designed to be ridden generally in an upright position, with a handlebar, deck, and wheels propelled by an electric motor (Shaheen and Cohen, 2019). Shared Electric Kick Scooters (SEKS), which might help reducing traffic externalities, have become widespread in many cities worldwide, generating great interest for both users and municipalities. Dias et al. (2021) provide an overview of the world's SEKS market (operators), being the United States (U.S.) and Europe the areas where companies are mostly operating. The number of SEKS systems has increased since first appearing in the U.S. in 2017, with 248 systems spread across 110 cities by August 2021 (U.S. Department of Transportation, 2022). In Europe, SEKS are available in almost 100 cities. Paris and Berlin appear to be the hub of e-scooter sharing, followed by Madrid and Stockholm (Mobility Mobility Foresights, 2022).

The implementation of these shared services has prompted the study of their impacts by the scientific community. Recent research works address topics related to the impacts of SEKS use on pedestrian safety (Che et al., 2020; Ma et al., 2021), urban planning (Gössling, 2020), mobility demand (Kostrzewska and Macikowski, 2017; Lee et al., 2021), and environmental impacts (Hollingsworth et al., 2019; Severengiz et al., 2020; Wang et al., 2021). However, the regulation of SEKS is an issue that is currently gaining relevance as most authorities have not passed yet specific legislation flexible enough to frame this new rapid phenomenon.

This study advances on the abovementioned issues by providing guidelines for regulating SEKS in urban areas for their successful implementation, taking advantage of the points of view of key expert stakeholders with different perspectives and interests. This research contributes to the existing literature in the following areas: (i) the methodology implemented; (ii) the regulatory aspects studied; and (iii) the policy recommendations provided. The study follows a three-phase

* Corresponding author.
E-mail address: natalia.sobrino@upm.es (N. Sobrino).

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The impact of Low Emission Zones on retail activity: Madrid Central lessons

Javier Tarriño-Ortiz *, Julio A. Soria-Lara, Tulio Silveira-Santos, José M. Vassallo

Transport Research Centre TRANSyT, Universidad Politécnica de Madrid, C/ Profesor Aranguren, 3, 28040 Madrid, Spain

ARTICLE INFO

Keywords:
Low emission zone
Retail activity
Air quality
Madrid

ABSTRACT

The implementation of Low Emission Zones (LEZs) is hampered by a lack of knowledge about social and economic impacts. This paper presents insights into how LEZs impact retail activity, innovatively including perspectives from both residents and retailers. A two-pronged research approach was implemented in Madrid, with two survey campaigns that analysed key drivers impacting residents' shopping activity and retailer sales levels within LEZs. The research design was based on discrete choice analyses. The main results indicate that private vehicle users with limited access to LEZ are expected to decrease their shopping activity within the LEZ. At the same time, inequalities in performance emerge between different types of stores, according to turnover and time at the location. The results provide policymakers with insights into more inclusive design and implementation of LEZ.

1. Introduction

Achieving sustainable mobility tops political, institutional and professional agendas worldwide (Banister, 2008; Bertolini, 2017; European Comission, 2018; World population prospects, 2019). Fossil fuel vehicles are one of the primary sources of air pollution in urban contexts, damaging the residents' health and the environment (Bigazzi and Rouleau, 2017; Vardoulakis et al., 2018). To cope with this threat, local governments are prioritizing the implementation of policy packages that reduce the use of the most-polluting vehicles for both passengers and freight (Zainol et al., 2014; Szarata et al., 2017; Soria-Lara et al., 2019).

Low Emission Zones (LEZs) are one common approach used in a growing number of cities (Tögel and Špička, 2014). LEZs aim to improve air quality by regulating the access of the most-polluting vehicles to specific geographical zones (Sánchez et al., 2021; Lurkin et al., 2021; Rodriguez-Rey et al., 2022). The specific schemes are diverse, often combining several measures, such as time-slot restrictions, vehicle charges and access regulation by emission standards (Cass and Faulconbridge, 2016). Athens and Rome have implemented time-slot restrictions, while London and Milan rely on a combination of emission standards and access fees. LEZs based on environmental vehicle labels of emission standards are used in Paris (France), Copenhagen (Denmark), and Madrid (Spain).

This variety emanates from differences in local legislation, city characteristics and cultural features (Alduán, 2014; Holman et al., 2015; Ku et al., 2020). Moreover, LEZs affect how people experience both cities and transport systems (Börjesson et al., 2021; Tarrino-Ortiz et al., 2021; De Vrij and Vanoutrive, 2022), thus impacting various economic sectors.

Given the relevance of in-store retail activity at the city level, previous studies have already examined the impact of some transport policies, such as pedestrianization, car restrictions and modification of collective bus routes. Most studies report initial disappointment

* Corresponding author.
E-mail address: javier.tarrino.ortiz@upm.es (J. Tarriño-Ortiz).

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Traditional taxi, e-hailing or ride-hailing? A GSEM approach to exploring service adoption patterns

Maria Vega-Gonzalo[1] · **Álvaro Aguilera-García**[1] · **Juan Gomez**[1] · **José Manuel Vassallo**[1]

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Abstract

The provision of on-demand door-to-door trips within the hailing sector has experienced significant disruptions in the last years due to the advent of ride-hailing services. The evolution of the sector is ongoing and one of the latest novelties is the introduction of e-hailing, which allows the booking of conventional regulated taxis through digital applications. The regulatory and technological dimensions of taxi and ride-hailing seem to play a key role when trying to explain users' choices of hailing services. For this reason, providing travelers with an option that combines traditional regulated services with the advantages of digital applications promises significant changes in users' preferences. This paper aims to understand the preferences of hailing users taking Spain as case study because of the controversy after the advent of competition in the hailing market. To that end, a Generalized Structural Equation Model (GSEM) has been built to simultaneously study the influence of socioeconomic characteristics, latent psychological constructs, and mobility habits on individuals' frequency of use of hailing services and their probability to belong to a specific hailing user profile. The results show that the adoption of ride-hailing and e-hailing is mainly influenced by psychological constructs. Individuals who wish to enjoy a high quality of service, but are not so liberal from the economic perspective, are more likely to have used e-hailing. Furthermore, the frequency of use of hailing services is affected by psychological constructs as much as by socio-economic variables and mobility habits. Finally, the effect of the openness to competition in the hailing market is discussed.

Keywords Ride-hailing · Ridesourcing · Taxi · E-hailing · Travel behavior · Latent variables · Generalized Structural Equation Model · Spain · Travel behavior

✉ Maria Vega-Gonzalo
maria.vega.gonzalo@alumnos.upm.es

✉ Álvaro Aguilera-García
alvaro.aguilera@upm.es

Juan Gomez
juan.gomez.sanchez@upm.es

José Manuel Vassallo
josemanuel.vassallo@upm.es

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

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Car Ownership and Post-COVID Urban Mobility across European Cities

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

[a]*Centro de Investigacion del Transport (TRANSyT), Universidad Politécnica de Madrid, Madrid, Spain*
[b]*European Commission, Joint Research Center (JRC), Seville, Spain.*

Abstract

The COVID-19 pandemic has greatly affected households' mobility habits and choices in the past two years. Scarce evidence is available concerning medium term decisions such as the purchase or sale of a private vehicle. This work aims to explore the factors that have influenced households' decisions to buy or sell a private car due to the pandemic and foresee how these decisions might influence their travel behaviour in the next few years. To achieve this goal, an EU-wide survey gathering information from 21 European cities was carried out during the second term of 2021, when lockdowns were no longer in place, but some mobility and sanitary restrictions were still maintained. The survey focuses on the impact of the pandemic and the consequent mobility restrictions on the transport habits and preferences of the respondents. The questionnaire collected socio-economic characteristics and mobility habits of 10,152 individuals. Interestingly, the analysis of the survey does not provide any evidence of a reduction of motorization rates for teleworkers. On the contrary, both partial and full-time teleworkers have bought significantly more cars than the rest of the groups. These findings greatly contrast with the fact that changes in daily habits resulting from the adoption of teleworking regimes are the main cause of reductions in car use among car buyers. This result suggests that further incentives for car ownership reduction are needed to harness the full potential of teleworking for decreasing car dependency. A positive relation between number of cars owned before COVID and car purchases has been found, pointing out that these purchases are probably not solving accessibility limitations for car-less households. Finally, a positive relation is also observed between car purchases and increased use of shared mobility services.

Keywords: Car ownership; COVID; Urban mobility; Shared mobility; European Cities.

* Corresponding author. Tel.: + 34-607-619-719; *E-mail address:* MARIA.Vega-Gonzalo@ec.europa.eu

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How has COVID-19 changed private car use in European urban areas? An analysis of the effect of socio-economic characteristics and mobility habits

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

[a] Centro de Investigación del Transporte (TRANSyT), Universidad Politécnica de Madrid, Spain
[b] European Commission, Joint Research Centre (JRC), Seville, Spain

ARTICLE INFO

Keywords:
Car use
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EU-wide travel survey
Path Analysis
Urban areas
COVID-19 pandemic

ABSTRACT

The private car has been identified as the main winner among transport modes in urban areas during the COVID-19 pandemic. The fear of contagion when using public transport or the decrease in road congestion are likely to have induced changes in citizens' travel habits with respect to cars. This work investigates the impact of the pandemic on individuals' habits and preferences regarding their car ownership levels and car usage in the European urban context, with a special focus on the role played by individual socio-demographics and urban mobility patterns. For this purpose, a Path Analysis approach has been adopted to model car ownership and use before and after COVID-19. The main data source employed in this research is an EU-Wide Urban Mobility Survey that collects detailed information (individual and household socio-economic characteristics, built environment attributes and mobility habits) of 10,152 individuals from a total of 21 European urban areas of different sizes, geographical locations, and urban forms. The survey data has been complemented with city-level variables that account for differences across the cities that may explain changes in car-related behaviour. The results show that the pandemic has induced an increase in car use among socio-economic groups that are generally associated with low car-dependent behaviour, revealing that policy instruments that discourage the use of the private car in urban areas are needed to avoid reversing past trends in the reduction of urban transport emissions. High-income, well-educated teleworkers are observed to be the ones that have reduced their car use to a larger extent. On the contrary, low-income individuals are mostly maintaining similar levels of car mobility. Finally, frequent public transport users are more likely than occasional users to have substituted this mode by the private car.

1. Introduction

The COVID-19 pandemic has induced stark behavioural changes that heavily disrupted urban transport. Initially, the decline in mobility, the widespread application of teleworking regimes and the increased adoption of online shopping were seen as an opportunity to advance towards the decarbonization of urban transport and a more sustainable urban mobility (Zhang & Zhang, 2021). At

Abbreviations: PA, Path Analysis.

* Corresponding author.
E-mail addresses: maria.vega.gonzalo@alumnos.upm.es, Maria.VEGA-GONZALO@ec.europa.eu (M. Vega-Gonzalo), juan.gomez.sanchez@upm.es (J. Gomez), Panayotis.CHRISTIDIS@ec.europa.eu (P. Christidis).

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ANEXO VIII

Actividades de fomento de la I+D+i

futuremobilitychallenges.es

PRIMER CONGRESO

FUTURE MOBILITY CHALLENGES

13 de abril de 2023

Centro Cultural Miguel Delibes - Sala de Cámara (Valladolid - España)

ORGANIZADOR

FaCyL CLUSTER AUTOMOCIÓN

POLO DE LA AUTOMOCIÓN

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future mobility CHALLENGES 13 de abril de 2023 Valladolid

PROGRAMA

9:00 h. Recepción y Acreditación

09:30 h. Bienvenida, Félix Cano de la Fuente, Presidente Cluster FACYL

Ponencia Inaugural "El automóvil en la movilidad sostenible"

- José María López, Comisionado del PERTE del Vehículo Eléctrico y Conectado Ministerio de Industria, Turismo y Comercio MINCOTUR

Ponencia Experta "Visión Global de los Grandes Retos Tecnológicos, Geopolíticos y Sociales del Ecosistema de Movilidad en Europa"

- Rafael Westinner, Senior Partner de McKinsey

10:40 h BLOQUE I COMPETITIVIDAD

Competitividad, clave para la resiliencia

- Ricardo García, Vicepresidente Ejecutivo Región Southern Europe de BENTELER

Estrategias de adaptación a los nuevos retos de la movilidad sostenible (entrevista)

- Jesús Presa, Director de Asuntos Públicos, Impacto Social y Comunicación de Renault Iberia

11:30 h. Intervención de Excmo. Sr. Alfonso Fernández Mañueco Presidente de la Junta de Castilla y León

11:50 - 12:30 h PAUSA CAFÉ

Grandes desafíos y oportunidades en el sector de automoción

- Francisco J. Riberas, Presidente Ejecutivo GESTAMP

13:00 h BLOQUE II TECNOLOGÍA

Fábricas Inteligentes para el Desarrollo del Vehículo del Futuro

- Mª Helena Antolín, Vicepresidenta de ANTOLIN
- Mª Paz Robina, Presidenta de Michelin España Portugal

Conclusiones bloques de la mañana

- Ana Mª Núñez Nava, Directora Cluster FACYL

14:00 - 15:30 h CÓCKTAIL NETWORKING

15:30 h BLOQUE III SOSTENIBILIDAD Y PERSONAS

Mesa Coloquio ANFAC - ECODES "Industria, Movilidad y Desarrollo Sostenible"

- José López-Tafall, Director General, ANFAC
- Cristina Monge, Politóloga y Vocal, ECODES

Retos y Oportunidades del Vehículo Conectado y Autónomo y la Infraestructura Inteligente

- Jaime Sánchez, Director de la Plataforma Next Generation de la gama media y pesada de IVECO
- Sara Gutiérrez Lanza, Directora de Unidad de Negocio de Automoción, GMV
- Mauro Gil , Coordinador Proyectos de Innovación de Transportes, INDRA
- Jacobo Díaz Pineda, Director General, Asociación Española de la Carretera

Visión Estratégica del Impacto en la Movilidad Sostenible del Marco Regulatorio Europeo de Transporte y Energía

- Aleix Pons, Principal Consultant – Transport Policy, RICARDO Consulting

Evolución de la Demanda de la Movilidad Urbana

- Ángeles Marín, Directora de la Oficina de Estrategia y Movilidad de la Secretaría General de Transportes y Movilidad del MITMA
- Ramón Mateo, Director de Análisis e Impacto Regulatorio, beBartlet
- Javier Burrieza Galán, Ingeniero Senior de Desarrollo de Negocio, NOMMON Solutions and Technologies
- Cristina López García de Leániz, Directora Técnica, Observatorio Movilidad Metropolitana OMM

Conclusiones bloque de la tarde

- Ana Mª Núñez Nava, Directora, FACYL

Clausura Oficial

18:10 h FIN CONGRESO

futuremobilitychallenges.es

FaCyL CLUSTER AUTOMOCIÓN POLO DE LA AUTOMOCIÓN

JORNADA AUTONOMOUS

Formas innovadoras de planificación urbana y de transporte frente a los nuevos sistemas de movilidad basados en la conducción autónoma

Santander, 24 de mayo de 2023
E.T.S.I. de Caminos, Canales y Puertos a las 09:30

GOBIERNO DE ESPAÑA · MINISTERIO DE CIENCIA E INNOVACIÓN · SUM+ LAB · JRC EUROPEAN COMMISSION

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Centro de Investigación del Transporte

Centro de Investigación del Transporte - Noticias

Conferencia de Aniversario de ERTRAC: 20 años trabajando juntos para acelerar la innovación en el transporte.

julio 13, 2023 8:38 am

El Consejo Asesor Europeo de Investigación sobre el Transporte por Carretera, **ERTRAC**, conmemora el vigésimo aniversario de su creación. Para conmemorar este hito, **ERTRAC** celebró un evento en Bruselas, en el *Palais des Académies*, durante los días 5 y 6 de julio.

28 SEPTIEMBRE 2023

JORNADA PRESENTACIÓN INFORME

EL IMPULSO DE LA MOVILIDAD CERO EMISIONES: UNA GRAN OPORTUNIDAD PARA DESCARBONIZAR EL TRANSPORTE Y GENERAR ACTIVIDAD ECONÓMICA Y EMPLEO

PROGRAMA - 28 SEPTIEMBRE 2023

LUGAR: CS de CCOO

C/ Fernández de la Hoz, 12 Madrid. Sala de prensa, 2ª planta

10:00h

BIENVENIDA Y APERTURA

MARIANO SANZ LUBEIRO

Secretario de Salud Laboral y Sostenibilidad Medioambiental de CCOO Confederal

10:15h

PRESENTACIÓN ESTUDIO

"EL IMPULSO DE LA MOVILIDAD CERO EMISIONES: UNA GRAN OPORTUNIDAD PARA DESCARBONIZAR EL TRANSPORTE Y GENERAR ACTIVIDAD ECONÓMICA Y EMPLEO"

ALBERT VILLALONGA

Técnico Fundación 1° de mayo

10:45h

MESA DEBATE

"ACTIVIDAD ECONÓMICA Y EMPLEO EN LOS SECTORES DEL TRANSPORTE CERO EMISIONES"

GARI SANCHO

Responsable del sector ferroviario de la Federación de Industria de CCOO

JESÚS FREIRE

Secretario General de la Asociación de Marcas y Bicicletas de España (AMBE)

VALENTÍN ALEGRÍA GALLARDO

Director de Innovación y Estrategia de Red de Renfe Operadora

DAVID BARTOLOMÉ

Presidente de la Asociación de vehículos compartidos en España (AVCE) y Director de Car2go

MODERA: PEPA LÓPEZ

SG Sector Ferroviario. Federación de Servicios a la Ciudadanía - CCOO

11:45h

Debate

12:15h

MESA DEBATE

"LA OFERTA Y LA DEMANDA, LA PLANIFICACIÓN Y LA GESTIÓN DEL TRANSPORTE CERO EMISIONES"

CRISTINA LÓPEZ

Directora Técnica del Observatorio de Movilidad Metropolitana. Transyt-UPM (Centro de Investigación del Transporte)

JUAN ORTIZ

Director-Gerente del Consorcio de Transportes del Área de Zaragoza

MODERA: ISIDRA BAIDES

Secretaria de Medioambiente, Igualdad y Movimientos Sociales. Federación de Servicios a la Ciudadanía - CCOO

12:45h

Debate

13:15h

CONCLUSIONES Y CIERRE

VICENTE LÓPEZ ORTIZ

Director Fundación 1° de Mayo

INSCRIPCIONES

LIVE