



**Jornada Hispano-Alemana sobre el Sector Ferroviario –
un viaje hacia una movilidad más digital y sostenible**

Jueves, 18 de abril de 2024, 9:00 – 15:00h

Hotel ILUNION Barcelona - C/ de Ramón Turró, 196-198, Sant Martí, 08005 Barcelona

RAILWAY SUSTAINABLE MOBILITY and LOW EMISSIONS TRANSPORT



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RAILWAY SHOULD BE THE BACKBONE of A SUSTAINABLE MOBILITY FREIGHT AND PASSENGERS EU – IT IS NOT NOW...

ON MOBILITY IN EUROPE

- 1 European mobility as it has developed has empowered many people and implies self-determination; but these **ACHIEVEMENTS** also generate social and ecological **STRESSES**.
- 2 Mass tourism and trips on aircraft and cruise ships are particularly harmful to this **ENVIRONMENT**. The European single market has a **DECISIVE ROLE** to play in this regard and therefore Europeans have a fair share of **RESPONSIBILITY**.
- 3 Motorised **MASS TRANSPORT** has reached its limits. A European transport sector dominated by **FOSSIL FUELS** adds to global warming, pollution and stress.
- 4 Cars occupy too much space. The **LIMITED AVAILABLE PUBLIC SPACE** should be used **MORE EFFICIENTLY** for cycling, walking and various forms of public transport, especially in towns and cities.
- 5 Climate-friendly means of transport and fossil fuels are incompatible. Sustainable **ENERGY AND MOBILITY TRANSITIONS** go hand in hand.
- 6 **TRAINS** and railways will essentially be the backbone of a climate-compatible European transport system, but are today often limited to individual countries. Investments to extend and **REACTIVATE RAIL ROUTES** within and across borders are necessary.

Climate change, rising traffic demand, congestion, security and sustainable energy supply are some of the major issues that the European Union and the wider world are facing. At the same time, good accessibility is necessary for a society to function and to ensure economic development, job creation and housing supply. Tackling these challenges call for the railway sector to take on a larger share of transport demand in the next few decades.

Transport amounts for more than 30 percent of greenhouse gas emissions in Europe. Mobility is a key element of the interconnected European Union and its neighbours. Rail is (?) and has been the way to connect Europe sustainably.

- 7 With its Trans-European **TRANSPORT NETWORK CORRIDORS**, the EU has set up a system for a Europe-wide transport infrastructure. It is crucial that policies implemented within the European Green Deal follow this **TRANS-EUROPEAN IDEA**.
- 8 **DIGITALISATION** of European transport brings along **OPPORTUNITIES** by linking different forms of transport in one single **APPLICATION**. The accessibility and availability of such technologies for everyone is a **CHALLENGE**.
- 9 Transport industries are manifold. The **EUROPEAN AUTOMOTIVE SECTOR** is undergoing thorough **CHANGES**. Bicycle production reinforces regional value creation and strengthens European small and medium-sized businesses.
- 10 **AVOID – SHIFT – IMPROVE** is the strategy to make mobility in Europe more sustainable. The Covid-19 pandemic has forced people to adapt their mobility behaviour and has created the need to **RETHINK** conventional practices.
- 11 The external costs of cars and planes as the most polluting modes of transport are not reflected in what we pay for using them. So far the implementation of the **POLLUTER-PAYS PRINCIPLE** is deeply flawed and needs to be tackled by EU policies such as taxation, carbon pricing or road tolls.
- 12 The **EUROPEAN MOBILITY OF THE FUTURE** entails interlinked, attractive, resource-efficient and climate-friendly means of transport within a European framework and contributes to a **HIGH QUALITY OF LIFE** in cities and **WELL-CONNECTED** rural areas.



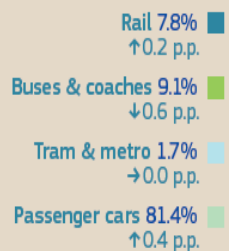
RAIL TRANSPORT potential still underexploited



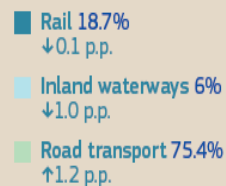
Land modal share

EU27 (2015-2018)

Passenger transport



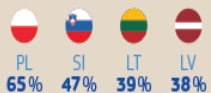
Freight transport*



80%

of all train kilometres run are passenger services

EU27 (2018)



* excluding pipelines

EUROPEAN RAIL MARKET DEVELOPMENTS 2015 - 2018



THE RAIL SECTOR REMAINS a key employer in the EU economy



In 2018 over 916 000 people were employed in the EU27 railway sector



Staff employed by
railway undertakings

527 000
(2018)



Staff employed by
infrastructure managers

389 000
(2018)

Demand for new talent in rail persists

Proportion of staff of main railway undertakings older than 50 years



Proportion of staff of main infrastructure managers older than 50 years



Proportion of women in railway workforce



EUROPEAN RAIL MARKET DEVELOPMENTS 2015 - 2018

KEY DRIVERS for RAILWAY EU



”Door to Door” Mobility Ecosystem

The usage of real-time information and data sharing will provide an accurate status within the full transport system and allow an overall optimization of the transport offer. **The emergence of new transports- and communication possibilities allows cities and regions to propose multimodal mobility-as-a-service solutions (focus on shared and on demand) to address the traffic congestion issue and enhance the attractiveness of the public transport.** The development of tools for public administration also provides valuable information to optimize the layout of stations and to refine the procedures for incidents. **With rapid development and disruptive solutions, we can also expect both simpler and cheaper solutions than the now established technology.**



Roadmap for a New Mobility Model

Disruptor	Digital Asset Market	Efficiency Play	Goal
New digital businesses built beyond public transport collective foundation with nondigital vested assets	New regulatory and organizational frameworks based on multimodal mobility value chain Customer convenience Agility	Efficiency-Flexibility Frictionless in modal change Multimodal e-Ticketing Fight fragmentation	<u>MaaS</u> for the Common Good <u>MaaS</u> gets where Public Transport not reaches Less congestion Less pollution Less private car



ONE

job in railway transport creates more than

ONE

other job in indirectly dependent economic activities.



RaaS: an example of how public transport is reinventing itself

KEY DRIVERS for RAILWAY EU - LOW EMISSIONS LOGISTICS – BUSINESS & TECHNOLOGY OPPORTUNITY



Environmental Sustainability and Carbon Free Mobility

As the railway is the cleanest mode of transport, promoting modal shift towards rail will support the reduction of emissions. But this is not enough, and rail will implement new light materials, new technical solutions for non-electrified lines and further increase its energy efficiency. **Improving the integration of transport systems in populated areas by reducing noise, vibration and carbon emissions** will be essential to increase social acceptance in urban environments and beyond. Indeed, rail systems are contributing to mitigating the climate change challenge.

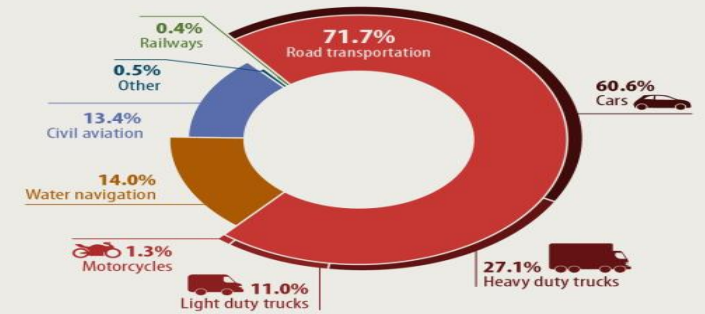
Additional research and innovation actions will improve the current situation from the environmental perspective. For instance to develop smart energy infrastructure. On board and line-side energy storage technologies and charging technologies will make it possible to recover a big amount of the braking energy and will support balancing the flow of energy. Electricity supply using SMART Grid technologies coupled with increasing the residence and variety of supply resources (e.g. main grid, local renewable, recovered, etc.), can be applied not only for rail traction systems but also for road usage and stations. Another example is the

necessity of work from an early phase on the adaptation of regulation and standards to consider (and even favour) the use of the cleanest technology being developed.



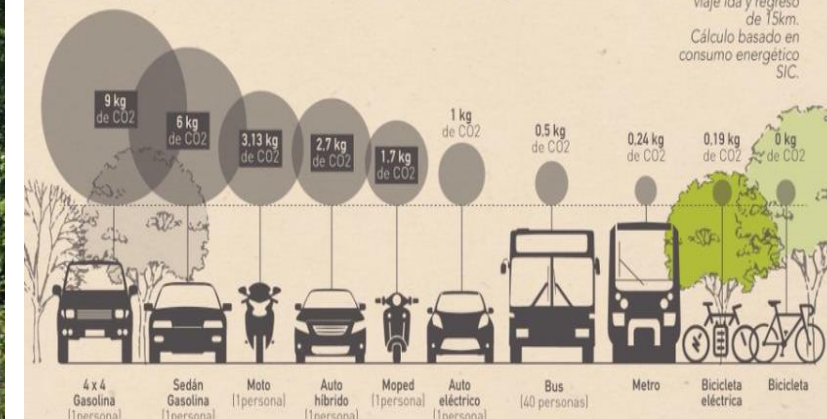
TRANSPORT EMISSIONS IN THE EU

Greenhouse gas emissions breakdown by transport mode (2019)



Source: European Environment Agency (2022)

Comparación de emisiones por viaje*



fuente: www.consumovehicular.cl

KEY DRIVERS for RAILWAY EU



Safety and security



Interoperability and safety enhance and ensure the seamless and safe circulation of passengers and goods on railway vehicles across the European Union and even beyond its borders.

The objective is to ensure that every European rail transport network is secured properly and can detect efficiently security incidents. To achieve this, a precondition is to enhance European collaboration so that more trains, both person and freight, can be driven safe and secure.

Rail is more than

20x safer



than road.



In the digital era, the protection of every subsystem against cyber-attacks is becoming critical, as most of the systems are now connected. The rail sector will not develop specific cyber protection but will use the best of the existing technologies. The Directive on security of network and information systems (NIS Directive) has initiated regulations that enforce cyber-security system accreditation.



Digitalization and Automation of the Railway System

Today, the deployment of **European Rail Traffic Management System** is a basis towards a progressively more automated interconnected railway system. This new traffic management system combined with **Automated Train Operations** and other new technologies, as Artificial Intelligence, **digital information sharing and embedded sensors and telematics** makes the system "smarter" and more effective.

The digital railway will drive the integration of the overall **mobility-digital eco-system** for all transportation modes.



AUTOMATION AND ARTIFICIAL INTELLIGENCE: Advanced inter-operable train control systems will deliver more flexibility in operation therefore better real-time adaptation to the demand and economic competitiveness by increased capacity.

Real-time management of the operation, along with new concepts such as virtual coupling and platooning, will support the increase of flexibility in operations. Autonomous trains and automated freight operation will

bring additional predictability and versatility.

The flow in the tracks is positively influenced and can be further streamlined as the trains can safely move closer to each other by means of smart communication. The logistics chain can be automated and on suitable stretches and times, such as night time, trains can be self-driving, overcoming the challenge of driver shortage.

All these elements together will support an increase of the capacity and resiliency of the system without major infrastructure investments. It will also lead to more end-user/citizen satisfaction from improved traffic management enabling better punctuality and comfort and more flexibility for real-time demand fulfilment.

KEY DRIVERS for RAILWAY EU



Intelligent Assets Lifecycle Management

Digital Asset Management will be the base for digital end-to-end mobility for passengers and freight, supported by a resilient and powerful telecommunication network.

Maintenance is quite manual today, executed with the support of machines. In a future digital system, the machines will be more and more able to do the maintenance themselves, reducing the costs, risks and the lead time before the actual repair. The knowledge will also feed back into the design and construction or manufacturing loop.



DIGITAL TWINS: Digital twins (digital copies) of a physical product, such as a railway track, a bridge or tunnel makes it possible to follow the plant's function and simulate circumstances such as weather, traffic volume, vehicle weight/load and soon. The collected information is used to plan maintenance activities exactly at the right time. That is, before it affects performance or compromises safety, but also when it gives the least impact on traffic.



El CBM implica un cambio de modelo de negocio, del terreno de la reparación al terreno de la anticipación. Un cambio de modelo de negocio relativo a la gestión de los datos proporcionados por la sensórica aplicada y la gestión de la información producida. Desde las Unidades, al propio Operador o a la plataforma de gestión de los datos generados y su carácter de diseño, plataforma abierta o cautiva. El estado del arte tecnológico al respecto es amplio, conlleva un amplio uso de IoT llegando a formular elementos de Edge Computing/Digital Twins y Algoritmos predictivos de última generación. WORKSHOP CBM. IN-MOVE by RAILGRUP 20.10.2022.

KEY DIFFERENTIATING FACTS

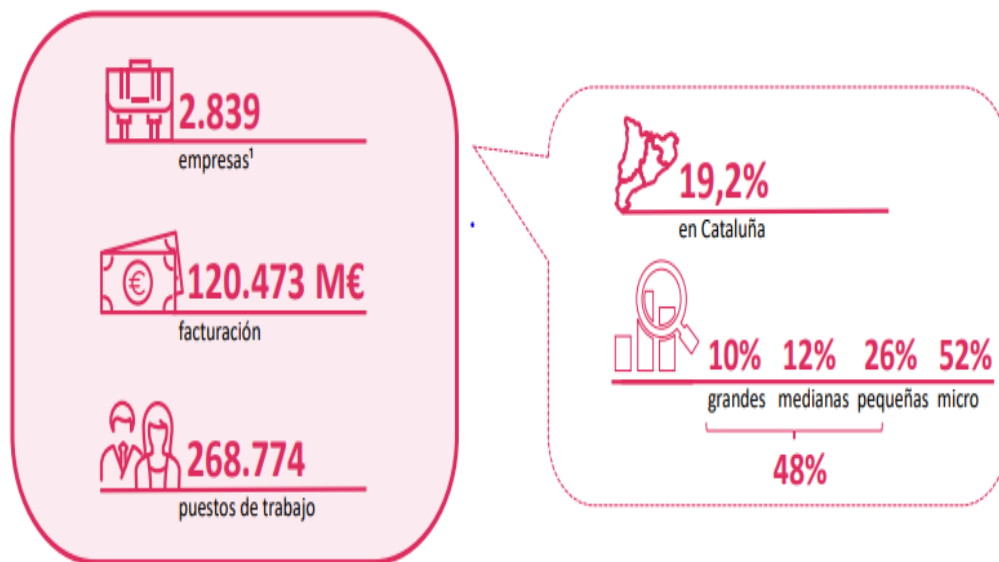
FOR A GROWING MARKET.

BUT

NEED TO BE REFOCUSED TOWARDS MARKET NEEDS IN TERM OF LIVEABLE MOBILITY NEEDS

3. Segmentación y cuantificación del sector

A nivel estatal se identifican 2.839 empresas que pertenecen al sector de la movilidad: generan más de 120 mil millones de euros de facturación y 268 mil puestos de trabajo. Más de la mitad de estas son 'micro' y casi una quinta parte de las empresas son catalanas.



¹ Las empresas identificadas en el mapeo han estado clasificadas según los diferentes medios a los que dedican parte de su actividad y a todos los eslabones de la cadena de valor a las que corresponden. Por eso hay empresas catalogadas en más de un medio de movilidad y más de un eslabón de la cadena de valor. Los datos han sido exportados del Registro Mercantil mediante la plataforma SABI.

2. Datos relevantes del sector: el segmento Rail

El mercado ferroviario

- Se prevé que el **mercado mundial del transporte ferroviario** crezca de los 468.570 millones de dólares en 2020 hasta los 519.430 millones de dólares en 2021, experimentando una **tasa de crecimiento anual compuesta (CAGR) del 10,9%**. El notable crecimiento se debe principalmente a la reorganización de las operaciones de las empresas y a la propia recuperación del impacto de la pandemia.
- De todas maneras, se espera que el mercado alcance los 658.390 millones de dólares en 2025 con un CAGR del 6%.
- Asia-Pacífico fue la región más grande del mercado** mundial del transporte ferroviario, que representaba el 42% del mercado en 2020. Europa occidental fue la segunda región más grande, que representaba el 21% del mercado mundial del transporte ferroviario. Por contra, África era la región más pequeña del mercado.
- El **sector ferroviario español es uno de los más competitivos en el mundo** y está formado por unas 600 empresas, de las cuales unas 220 trabajan en exclusiva para el sector y contratan 145.000 personas.

Fuente: https://www.reportlinker.com/p06009760/Rail-Transport-Global-Market-Report-COVID-19-Impact-and-Recovery-to.html?utm_source=GNW

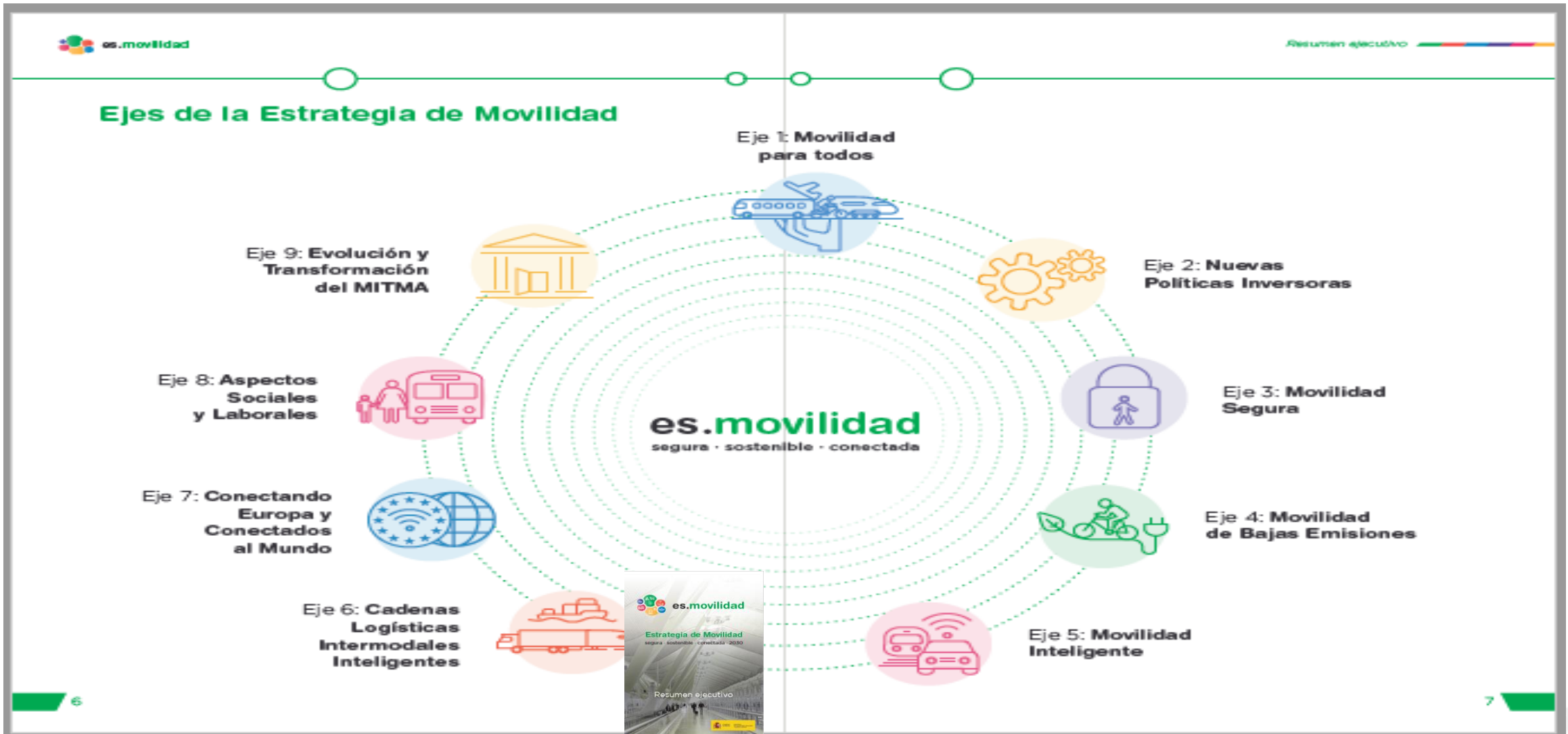
Fuente: ACCIÓ (2018): "El sector de la movilidad ferroviaria a Catalunya"

Entidades colaboradoras

Queremos agradecer a las siguientes empresas y entidades su conocimiento y visión del sector, que nos han compartido para la realización de este estudio:



KEY DRIVERS for RAILWAY SPAIN



ESTUDIO de MOVILIDAD de IN-MOVE by RAILGRUP 2022



3. Segmentación y cuantificación del sector

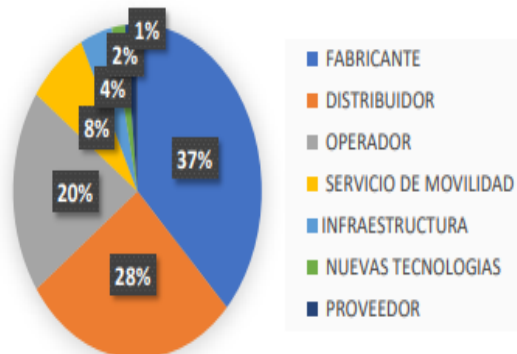
Clasificación de las empresas según su ubicación a la **CADENA DE VALOR**:

La facturación en el sector se concentra en un 65% entre las empresas **FABRICANTES** y **DISTRIBUIDORAS** (un 37% y 28% respectivamente). En cambio, en conjunto solo generan el 33% de los puestos de trabajo. El eslabón que más trabajadores ocupa es el de **OPERADORES** (48%).

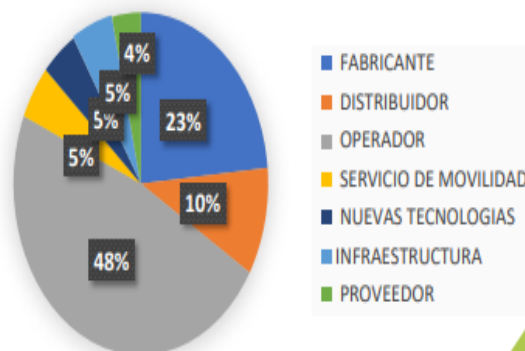
A pesar de que un cuarto de las empresas son de **INFRAESTRUCTURA**, solo representan el 4% de la facturación y el 5% de los puestos de trabajo. **NUEVAS TECNOLOGÍAS** y **PROVEEDORES** tienen una participación pequeña en cuanto a facturación, ya que tan solo suman un 3% y representan un 9% en número de trabajadores.



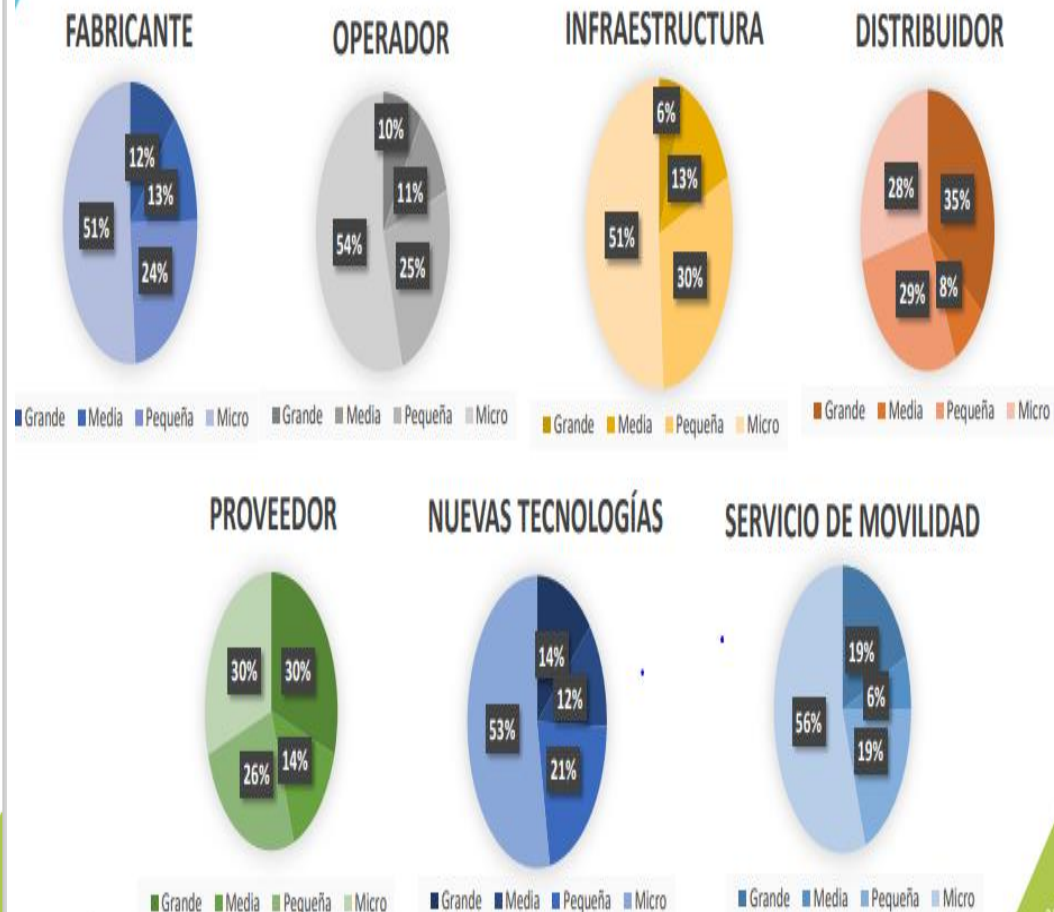
Distribución de la **FACTURACIÓN**



Distribución del **NÚMERO DE TRABAJADORES**



Clasificación de las empresas según su ubicación a la **CADENA DE VALOR** y teniendo en cuenta su tamaño:



ESTUDIO de MOVILIDAD de IN-MOVE by RAILGRUP 2022



EXPERIENCIA DEL VIAJERO

4. Tendencias del sector: Experiencia del viajero

Seamless Mobility
Este concepto hace referencia a la facilidad de uso del transporte público por parte del viajero, que debería de ser accesible y totalmente integrado. La capacidad de pagar de forma *contactless* por los controles de entrada y salida (*pay as you go*) es una innovación que permite facilitar la movilidad al viajero.



En el metro de Sevilla o de Londres ya aceptan la modalidad *pay as you go* por parte de los viajeros.

Mayor visibilidad de datos
El viajero quiere conocer toda la información para realizar un desplazamiento, como la disponibilidad del servicio, la previsión del tiempo de la ruta, alternativas de medios de transporte, entre otros. El *door-to-door mobility* facilita al consumidor una movilidad versátil, resiliente, intuitiva y con total transparencia.



La aplicación TMB ayuda a planificar el recorrido con toda la información de diferentes operadores de la AMB con el objetivo de mejorar la experiencia del viajero.

Liveable Mobility
El transporte ya no es únicamente un servicio, sino un elemento que es necesario adaptar a las vidas de los ciudadanos, a los nuevos patrones de movimiento, a las nuevas generaciones y a las nuevas necesidades.



La capital de Noruega, Oslo, e 'est' convirtiendo en una de las ciudades m'as 'liveable' en lo referente a la movilidad, gracias, en parte, al su programa llamado 'Car-free Livability'.



El Forum del Transporte Urbano para Ciudades Habitables, que se organiza en Manila (Filipinas), tiene como objetivo principal analizar casos de 'xito de las ciudades m'as 'habitables' en Asia en lo relativo a movilidad.



ESPACIOS PARA LA MOVILIDAD

4. Tendencias del sector: Espacios para la movilidad

Accesibilidad urbana
Las ciudades y los medios son cada vez m'as accesibles, facilitando que cualquier ciudadano pueda acceder a todos los espacios urbanos sin ninguna dificultad.

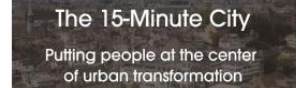


La ciudad de Madrid se ha marcado el objetivo de ser el destino tur'istico accesible referente en Europa.

Urbanismo t'actico
Este concepto est' directamente relacionado con el dise'no participativo y activo del espacio urbano mediante intervenciones acotadas y de bajo coste pero que suponen cambios efectivos y a largo plazo.



La autoridad 'Transport for London' en Londres impulsa la movilidad activa con el objetivo de que el 80% de los trayectos se hagan a pie, en bici o en transporte p'ublico en el 2025.



El proyecto Ciudad de 15 minutos est' dise'no para ayudar a que las transformaciones urbanas sean lo que necesitamos que sean: ambiciosas, inclusivas, medibles y eficaces. Cualquier sitio deber'ia de estar a 15 minutos caminando o en bicicleta.

Redise'no de espacios
Muchas grandes ciudades del mundo est'an adaptando sus espacios para facilitar el uso de veh'iculos de micromovilidad y garantizar los espacios de seguridad de los usuarios de las bicicletas.



Copenhague se ha convertido en uno de los lugares m'as amigables para los usuarios de las bicicletas.



El objetivo de las super-islas en Barcelona es conseguir un espacio p'ublico saludable, m'as verde y seguro, que favorezca las relaciones sociales y la econom'ia de proximidad.



We have a momentum - now is the time to act!



Through wise investments today in the railway, the most environmentally-friendly mode of transport, we can create a sustainable, inclusive, affordable and accessible alternative for tomorrow's people and goods. Together with other modes of transport, we will build and develop a multimodal system with the railroad as the backbone of mobility. It is a good investment - for us, the society and for future generations.

Multimodalidad

Posibilidad por parte de los usuarios de informarse, reservar i pagar un trayecto completo desde un mismo lugar y aplicaci'on, aunque se utilicen diferentes medios de transporte. La movilidad como servicio permite realizar todas estas acciones por parte del viajero.



Con la aplicaci'on TMB App se pueden gestionar diferentes t'itulos de transporte y validarlos con el m'ovil.



GotoGlobal permite el uso integrado de diferentes veh'iculos que el usuario necesita para desplazarse por la Ciudad de Madrid.

Cambios en el reparto modal

Algunos de los cambios sociales y demogr'aficos ponen en evidencia la necesidad de reestructurar el reparto de los modos de transporte de pasajeros y mercanc'ias.



Algunos ayuntamientos como el de Tarragona han iniciado campa'nas de sensibilizaci'on para fomentar un cambio de h'abitos en los ciudadanos, priorizando modos de transporte m'as sostenibles que el veh'iculo privado.



El plan del MITMA establece diversas l'ineas de actuaci'on y medidas concretas para fomentar un cambio modal en el transporte de mercanc'ias hacia modos de transporte m'as eficientes.

4. Tendencias del sector: Medios de transporte

Veh'iculos el'ectricos

A nivel estatal, la venta de coches el'ectricos ha aumentado mucho en los 'ultimos a'nos, pero a'un no se pueden comparar con las ventas que experimentan la mayor'ia de pa'ises de Europa.



La gama de veh'iculos de movilidad urbana de Seat, llamada Moo, incluye motos, patinetes y coches el'ectricos.



TMB utiliza varios autobuses el'ectricos en Barcelona.

Veh'iculos aut'onomos

Algunos tipos de veh'iculos ya est'an totalmente automatizados (con algunas l'ineas de metro) mientras que hay otros que a'un no est'an preparados (coches particulares).



La l'inea de metro que conecta el aeropuerto de Josep Tarradellas con la ciudad de Barcelona es completamente aut'onoma.



Todos los coches Tesla vienen de serie con un hardware avanzado capaz de ofrecer las funciones de Piloto Aut'omtico.

Aumento de la micromovilidad

Los Veh'iculos de Movilidad Personal (como los patinetes el'ectricos) y las bicicletas se utilizan cada vez m'as en las grandes ciudades.



Lime ofrece sus patinetes el'ectricos a diversas ciudades del mundo, entre ellas est' Madrid.



Bicing dispone de m'as de 7.000 bicicletas en la ciudad de Barcelona, de las cuales aproximadamente un 20% son el'ectricas.



RAILWAY IS STILL THE FUTURE - WORDS-TO-PLAY

Sostenible.... Seguro → Eficiente y Orientado al Usuario

Safety

Efficiency

Experience

Security Monitoring

Road & Network Control

Operation Optimization

Public Service Push



Intelligence

Smart Applications

Business Digitalization

Video Service				Video network platform	Big data service		Internet of Things	Vehicle-Road Synergy	Converged Communications	GIS/BIM platform
Video parsing platform (algorithm management/service orchestration/unified interface)					Highway frame database		Data access management	V2X Service Management	Video conference management	Basic map information
Vehicle analysis	Vehicle density	Event monitoring	Accident monitoring		Data Collection/Aggregation/Integration		Modeling and rule management	Topology management	Unified video dispatch	Application Geographic Information
Video structuring	Congestion monitoring	Road monitoring	Device monitoring	Hadoop	MPPDB	Device management and monitoring	Access Management	Unified video dispatch	Sharing and exchange	
Industry Enablement Service										

Cognition

Digital Platform

Data Convergence + Service Enablement



Perception

All Things Connected

Infrastructure Digitalization

Connected People

Connected Vehicle

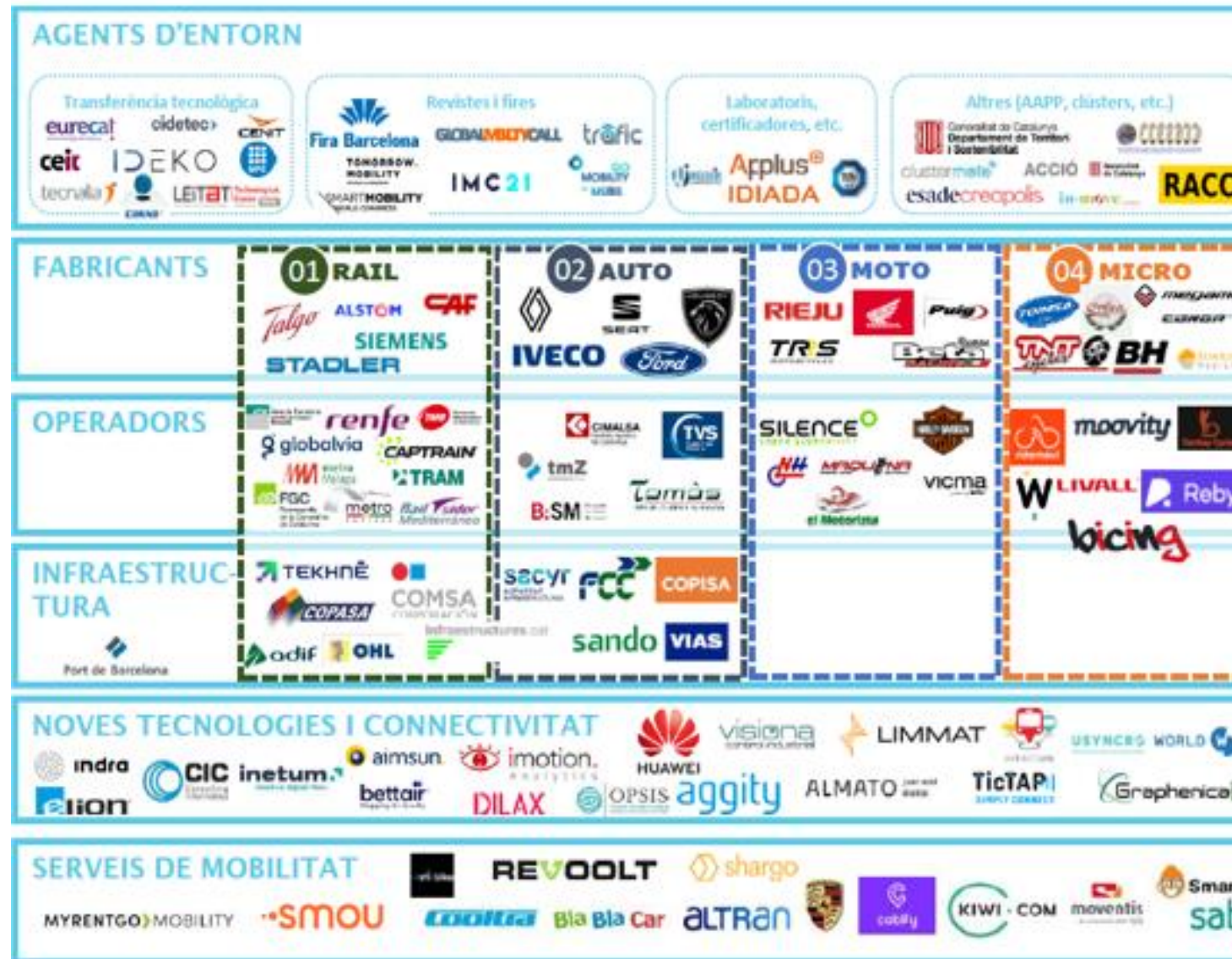
Connected Road

1848 – SPAIN. 175 years

RAILWAY IS STILL THE FUTURE but WE ARE NOT IN YET!!!

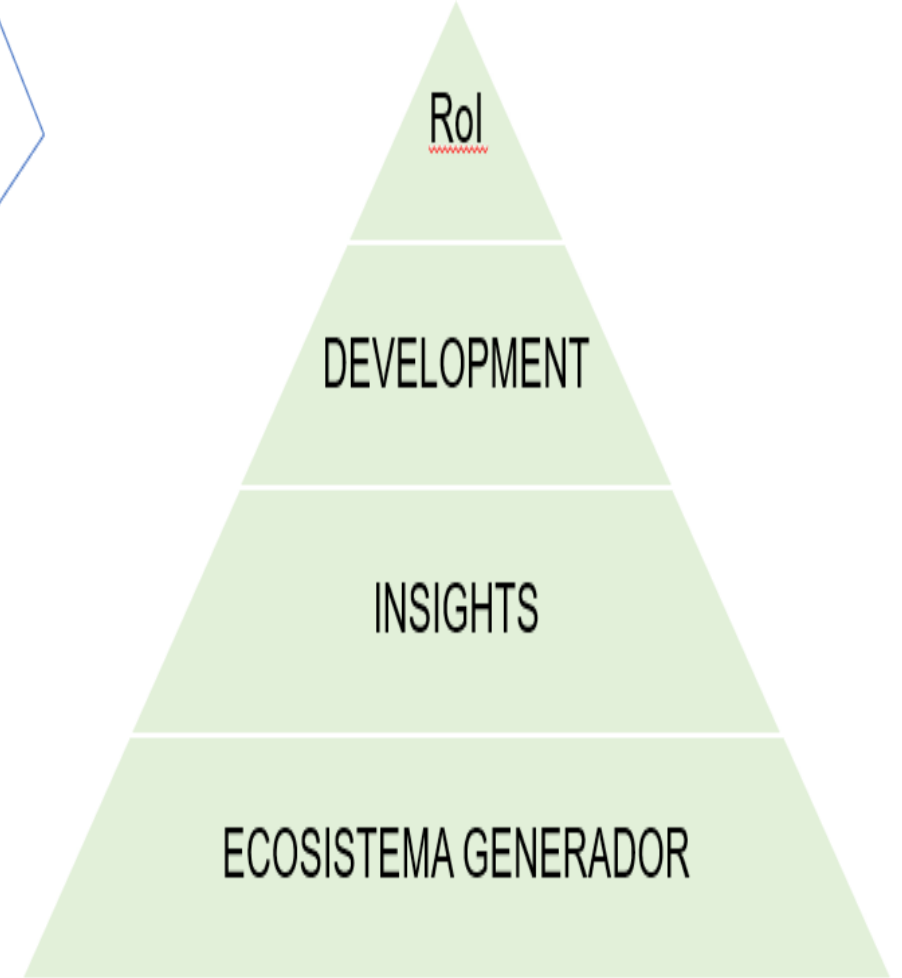
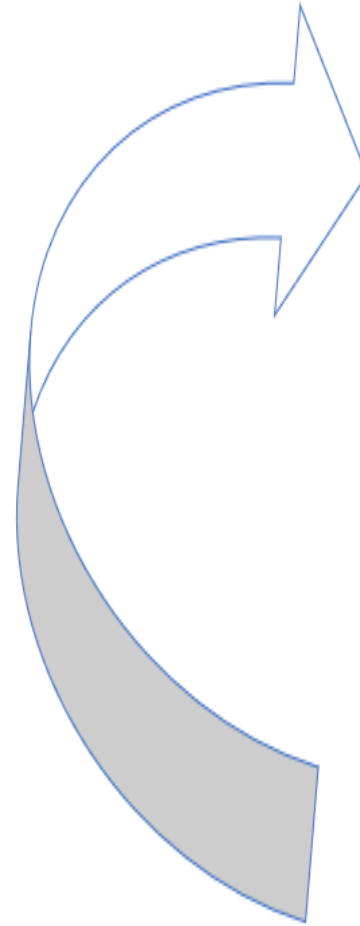
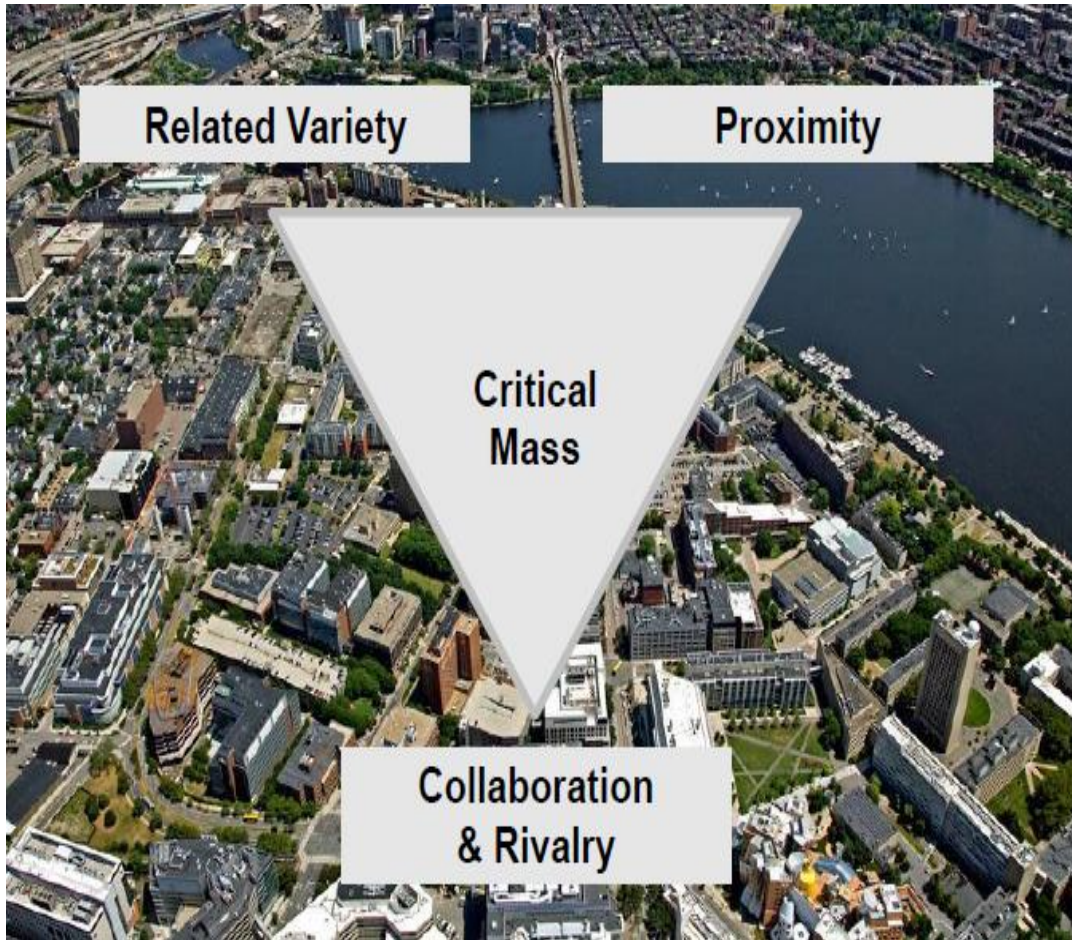
- ADVANCED FUNCTIONALIZED MATERIALS
- NEW INTERIORISM
- ECODESIGN
- CLIMATE CHANGE RESILIENCE
- DIGITAL SOLUTIONS
- CBM – DIGITAL TWIN
- TRAVELLERS – USER – CLIENT EXPERIENCE
- MaaS/MaaF
- CONNECTED COOPERATIVE AUTOMATED MOBILITY (CCAM)
- PHYSICAL DIGITAL INFRASTRUCTURE (PDI)
- AI – IOT – CONNECTED TO PEOPLE NEEDS BY USING THE TRAIN
- LOW EMISSION LOGISTICS – FREIGHT (3% RAIL in SPAIN. MULTIMODAL-MULTIPRODUCT-MULTICLIENT. GROWING MARKET)

- Technology Cooperation
- H2????



Competitiveness Upgrading in Turbulent Times The Role of Clusters

Dr. Christian H. M. Ketels
Harvard Business School
Chair, TCI Advisory Board
Catalan Cluster Managers
Cambridge, MA
17 May 2022



WORKSHOPS/EVENTOS
CO-DISEÑADOS
CON TARGET CLIENTE
FINAL

GENERAR
KNOWLEDGE

TRABAJAR INSIGHTS

CREACIÓN GRUPO
TRABAJO ALTO NIVEL
AI GENERATIVA

ECOSISTEMA

PROYECTOS EU
DESARROLLOS
B2B

POSICIONAR

COMUNICAR

CLUSTER
DISSEMINATION
EU's LEVEL via ERCI
- METACLUSTER

by Railgrup

Cluster de Movilidad Sostenible y Logística Multimodal

En 2023...



101 /eventos

23 Online

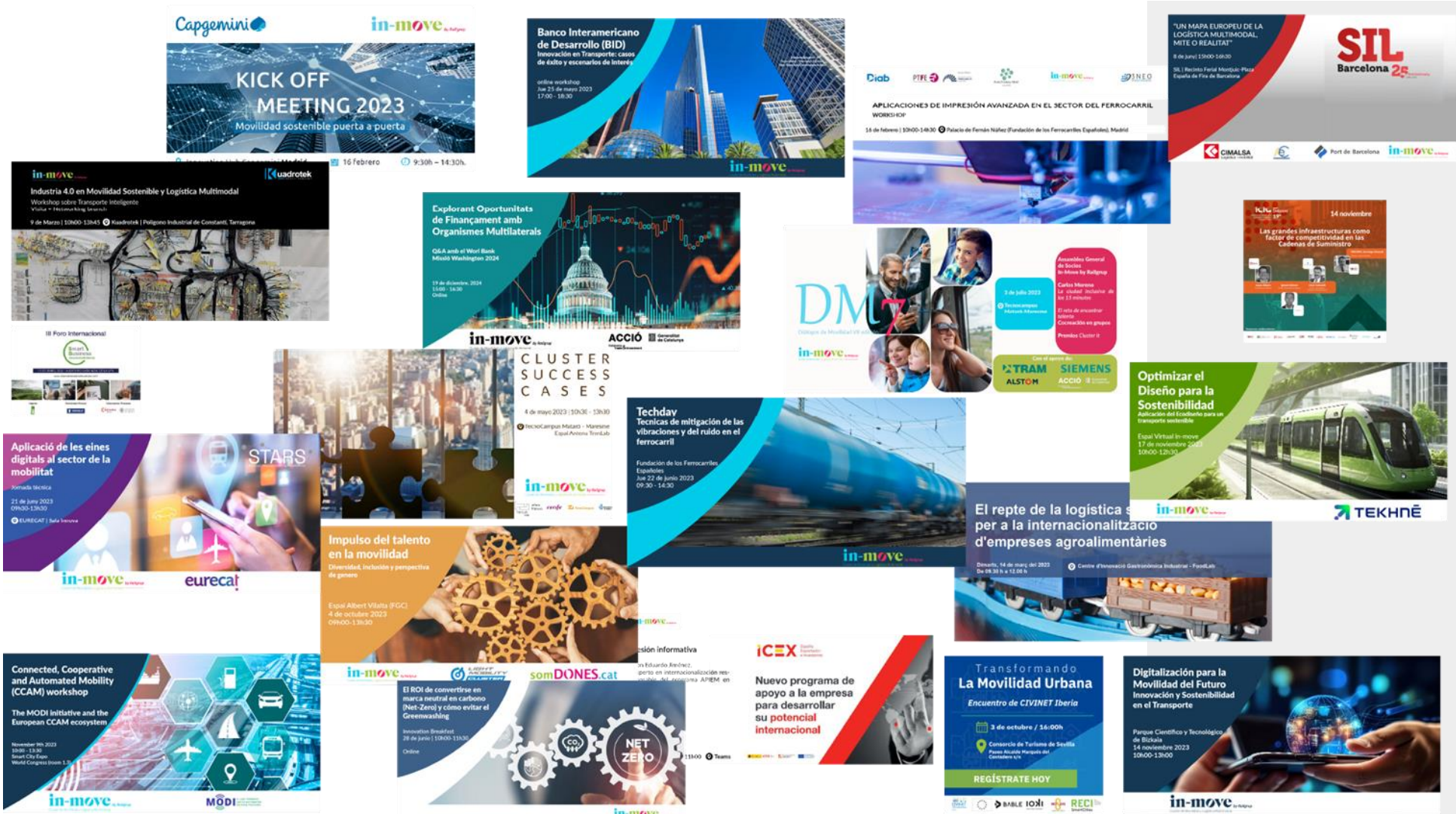
78 Presencial



554 /contactos

in-move *by Railgrup*
Cluster de Movilidad Sostenible y Logística Multimodal

Workshops



Valor creado 

Espacio de aprendizaje y colaboración

Intercambio de conocimientos

Creación de sinergias

Refuerzo de la competitividad y crecimiento conjunto

Networking alto valor – eventos



MODI and its requirements are disclosed to international stakeholders



Valor creado 

Networking entre asociados y actores clave europeos



MODI participates at FISITA World Congress!

Intercambio de experiencias



Más visibilidad y colaboración



Refuerzo participación en proyectos UE





2012. THE USER OF THE FUTURE, TOGETHER WITH RENFE

*El usuario del tren del futuro:
Smart Mobility*

creafutur + railgoup

Generalitat de Catalunya ESADÉ Business School

EASY TRIP FIRST APP. BASE of RaaS, in 2012.
LEADER of 2012 THE PROJECT IS NOW 2020 DIRECTOR OF RENFE HST LOW COST AVLO



EFFICIENT MOBILITY, MULTIMODAL-PARK&RIDE

Efficient Mobility. Multimodal.
Infrastructure + Information System + Integrated Mobility

AUTORITAT DEL TRANSPORT METROPOLITÀ

ATM Àrea de Barcelona

RAILSA Automatic Rail Safety Solutions

5 PARK & RIDE EV-Train Multimodal MOBILITY

ContactLess Ticketing No barriers T-Mobilitat Project ATM 2018

simon empark COFELY

"Railway operation needs can be fulfilled by IoT Solutions" Colinas (Alentia Telecom) SIGFOX Project

www.railgoup.net

01. Beginning of the journey

From traditional mobility to **Mobility as a Service (MaaS)**



Renfe positions itself as a leader in this mobility ecosystem, innovating and adapting to new needs and generating positive impact on society while keeping alive its key values.

- Digital Transformation**

Exponential evolution of technology not only impacted the transport sector but also the user's perception of mobility.
- New mobility patterns**

Climate change action, improvement of air quality and decentralization of urban areas require:

 - The use of eco-friendly vehicles and energy.
 - Solutions to reduce traffic congestion and crowds in public transport.
 - The need to improve security and safety.
- Impact of telework**

A demand forecast based on predictive analysis rather than historical data, and the need to optimize transport offer at every moment of the day.
- Emergence of platform economy**

The emergence of integrated and integral platforms that foster mobility data exchange and collaboration between mobility operators to share data for the public good.
- Integration of micromobility**

The increase of micro-mobility in cities as a direct response to traffic congestion and air contamination, and enhanced solutions to reach destination quickly and avoiding traffic jams.

UNIVERSAL ACCESSIBILITY IN THE BACELONA METRO

AUTORITAT DEL TRANSPORT METROPOLITÀ VISUAL PMR- Anàlisi global de l'accessibilitat per a persones amb discapacitat visual al transport públic ferroviari a la regió metropolitana de Barcelona

ATM Àrea de Barcelona Autoritat del Transport Metropolità

RAILSA Automatic Rail Safety Solutions

railgoup

UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH Facultat d'Òptica i Optometria de Terrassa

Universal Accessible condition that processes that services must as well as objectives and devices are understood as star conditions of comfort and independent autonomous possible

In Catalonia there are more than **79,000** people between 65 and 79 years of age who present **visual impairment** we add those over the age of **80** we reach **123,000** people who may experience difficulties in moving autonomously using public transport, if there was no accessibility measures

KEY DRIVERS for RAILWAY EU

<https://www.railgrup.net/in-move-events/>



PREVIOUS EXPERIENCE RAILGRUP on ECOINNOVATION RAILWAY



2015



2017



2019

PROYECTOS REALIZADOS SIGNIFICATIVOS

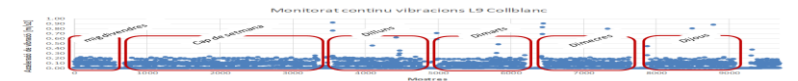


Objective

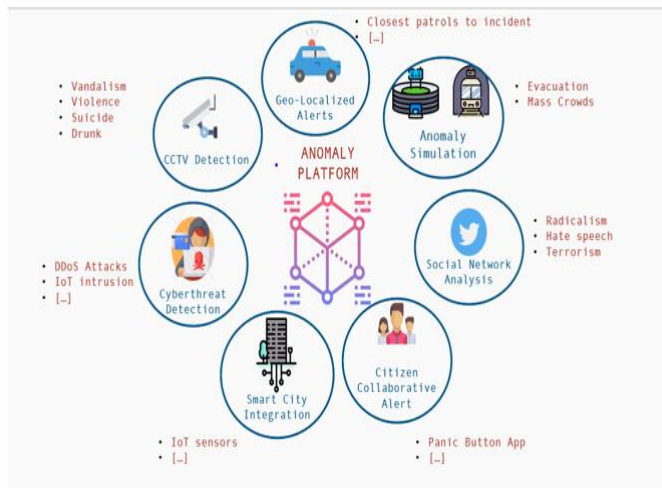
In the transportation sector, the objective of AV Ingenieros is to transfer the experience and know-how of its team to have a more environmentally respectful transportation infrastructures and to guarantee the comfort standards for its users.



.... Noise and Vibration Creativity



ANOMALY-CYBERSECURITY




SMART LINING SYSTEM

REVESTIMIENTO E INTEGRACIÓN DE SISTEMAS

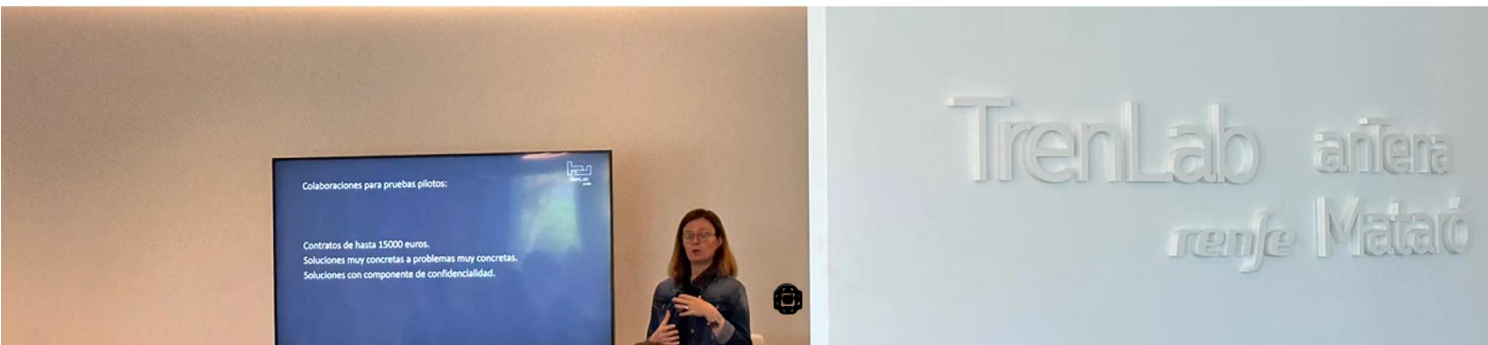
APLICACIONES ACTUALES

Procesos encadenados de diseño y montaje:



IMAGEN: BOMBARDIER

Ecosistema innovador



Reproducir vídeo

App&Town Compagno

Smart Railway Station



imotion.
Analytics

Artificial Vision as a Service



IoT
sensing



Traitement
Vidéo
Local



Traitement
metadata
Cloud



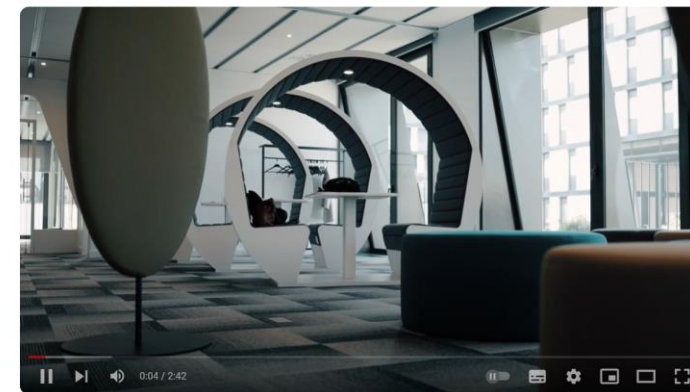
BI &
Tableau de bord

Experts en vision artificielle

Compteur précise et rapide,
en Temps Réel
et non intrusive.



TAD HYPERVISOUL



Premio Antena TrenLab 2020. Unificació existent en un únic dels retos "Keep it Asset!"

Empresas Limmat

	Limmat	Website limmat-group.com
Sector económico	← Status I Convocatoria	

Ganadora de los retos mantenimiento ferroviario del futuro y seguridad operacional

PROYECTOS REALIZADOS SIGNIFICATIVOS



ANÀLISI D'OPORTUNITATS DEL TRANSPORT FERROVIARI
DE PRODUCTES CARNIS ENTRE CATALUNYA I EUROPA



europa press

El transporte de mercancías por ferrocarril reduce un 92% las emisiones, según una prueba piloto

BARCELONA, 23 Dic. (EUROPA PRESS) -



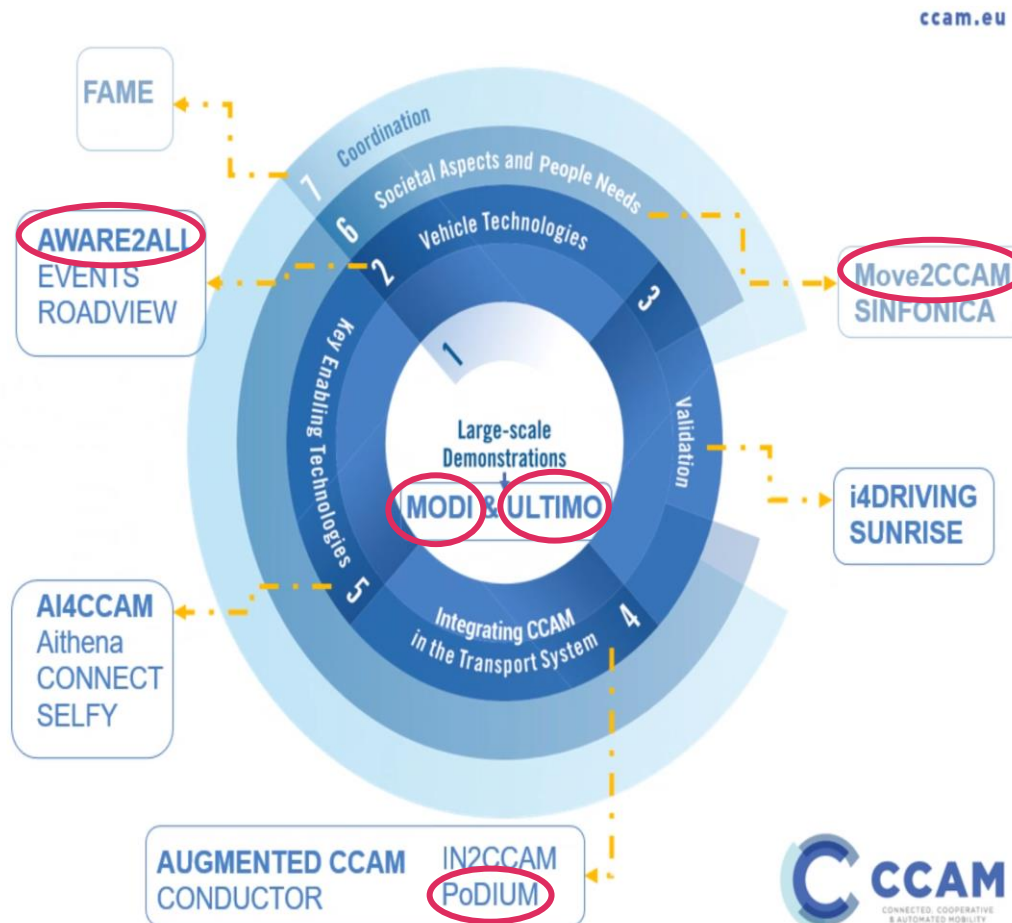
Impacto internacional



Horizon
Europe
Cluster 5
WP

Destination 6
Transport and
Smart Mobility
services

Calls 2021 &
2022 Projects



- +110M € obtenidos por IN-MOVE y socios en proyectos CCAM!
- MODI & PoDIUM proyectos generados en el seno de IN-MOVE!
- Top 18 iniciativas CCAM de Horizonte Europa – CINEA!



RDS
MATED
TURES

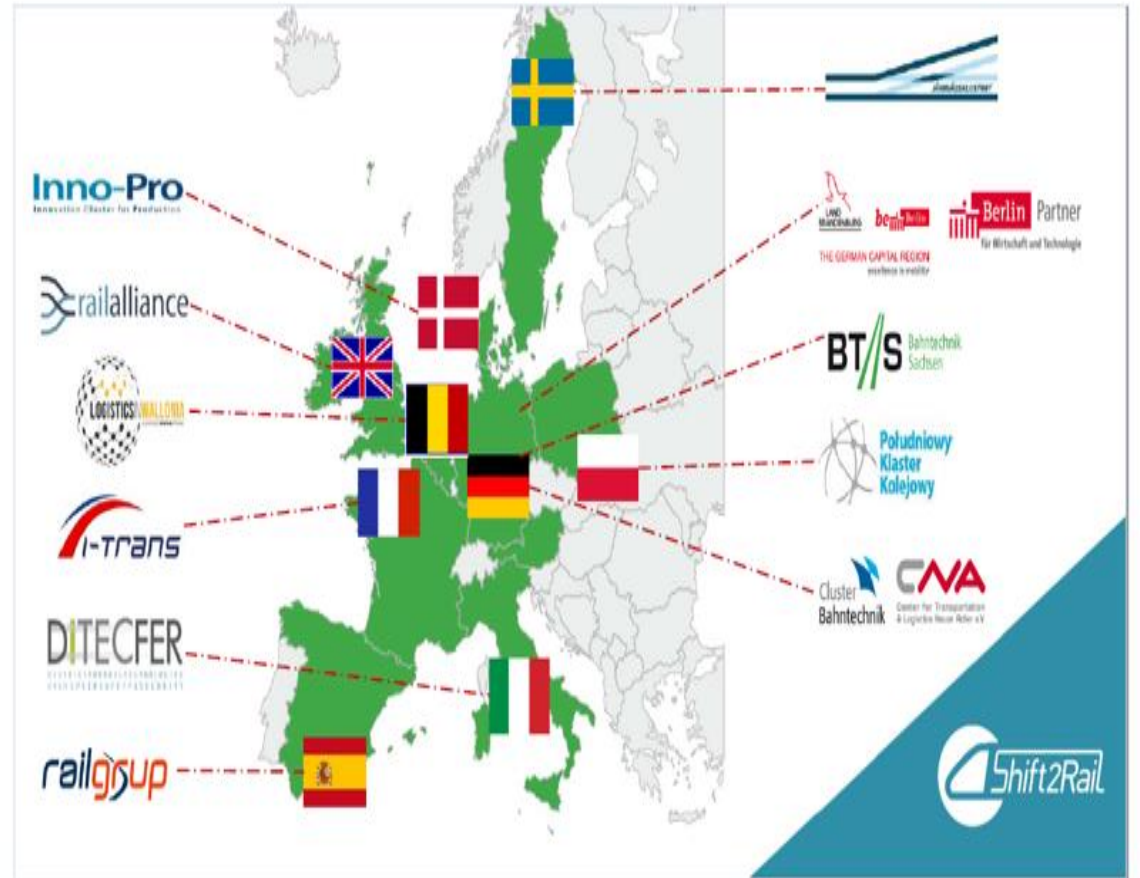
Partnerships, alliances and networks



MAIN MAIN Images Global Cargo...	indra INDRA	tecnalia Tecnalia	PILZ PILZ	eximp ort Ecomart	WELDON WELDON	Alava Ingerss Alava Ingenieros	Global Composites Global Composites	Sylvestris Sylvestris
cenex Cenex	Mosaic Factor S.L. Mosaic Factor S.L.	magma design MAGMA DESIGN	InCom INCOM	elektro Grupo Elektra	ate Composites ATE	ite Electronic S.L. ite Electronic S.L.	CAPTRAIN Captrain	SMART MOBILITY FIRA DE BARCELONA
CIMALSA Cimalsa	TUV SUD TUV SUD	Port de Barcelona Port de Barcelona	ELION ELION S.A.	Diab Diab	Unex UNEX Aparatos Eléctricos S.L.	TicTAP TicTAP	gpo GPOD INGENIERIA	aytic Ayti
wengler Wengler	DG Meta Engineering Meta Engineering	IPL IPL	CT INGENIEROS CT INGENIEROS	ALSTOM Alstom	renfe Renfe	Augst+Pfuler Augst+Pfuler	LIMMAT LIMMAT	bettair Wagging Air Quality Bettair Cities
OLVA TORRAS OLVA TORRAS	USYNCR0 Uyeneru	TMB TMB	imotion Imotion Analytics	3M 3M Spain	Estata Politécnica Superior d... Estata Politécnica Superior d...	metro Metro de Sevilla	Sinalux SINALUX	STADLER STADLER
CENIT Centre d'Innovació del Transp...	Departament de Territori S... Departament de Territori S...	Indar Almirans S.L. Indar Almirans S.L.	inetum INETUM S.A.	CONECTA Fundación CIDETEC	ESTIMA PORT CONSULTING Estrada Port Consulting SL	CIC CIC Consulting Informàtica	raifl equip RAIL EQUIP	trafag Trafag España S.L.
aggity Aggity	OPTIMUS S.A. OPTIMUS S.A.	M&M M&M	W&W W&W	SENER SENER Ingeniería y Sistemas...	ALMATO Almato Iberia	esade creapolis ESADE Creapolis	Horn & Bauer Horn & Bauer	AV Engineers AV Engineers
Weidmüller Weidmüller	VISIONA VISIONA	ISC ISC	CAF Construccions i Auxiliar de F...	MOSBACHER Mosbacher Upreza Rail SAU	Orma S.L.U. Orma S.L.U.	eurecal Eurecal	enide Enide Solutions S.L.	ERION Eren Mantenimiento Ferro...
ROLEN ROLEN	AC AC	Mass Factory Urban Access Mass Factory Urban Access	Infraestructuras de la Gener... Infraestructuras de la Gener...	tempel Tempel Group	MainRail Mainrail S.L.	TEKHNE MECHATRONICS INNOVAT...	STEGOTRONIC STEGOTRONIC, E.A.	INFAIMON INFAIMON GROUP
DILAX DILAX	LAMILUX COMPOSITES LAMILUX COMPOSITES	TRAM TRAM	TENALACH Tenalach Consulting S.A.	Railaidr Railaidr Mediterraneo	La Celis S.A.S. La Celis S.A.S.	colway COLWAY FERROVIARIA S.L.	ANSITEC Ansitec	ZONAIRO3 ZONAIRO3 S.L.
CYLOT CYLOT	Graphical S.L. Graphical S.L.	TYS TYS	Huawei Technologies Huawei Technologies	tmZ tmZ	connectingbrates Connecting with Innovation S.L.	MEC S.L. MEC S.L.	BABLE BABLE	MASATS MASATS
TALGO TALGO	FERRMED FERRMED	OMNE OMNE	Opsis Vision Technologies S... Opsis Vision Technologies S...	SACC SACC	Candela Group Candela Group	Cogemini Engineering Cogemini Engineering	Kuadrotek Kuadrotek	Centro de Innovación y Tec... Centro de Innovación y Tec...
SIEMENS SIEMENS	metro metro	Panasonic Panasonic	integratedesign Integral Design & Developm...	HARTING HARTING Iberia	COMSA COMSA Corporación	in-move by Railgrup Cluster de Movilidad Sostenible y Logística Multimodal		
BOSSARD BOSSARD	PTV GROUP PTV Group	GRUPO FLEXCEL Flexcel Industrial	globalvia Globalvia	Happy Switches Ltd Happy Switches Ltd	Autorail del Transport Metr... Autorail del Transport Metr...	our members		
LEITZ Leitz	Baumer Baumer	SOENGE BERNA S.A. SOENGE BERNA S.A.	Ferrocarriles de la Generalit... Ferrocarriles de la Generalit...	DAEVI DAEVI	IDOM IDOM			



European Rail Clusters Initiative



About IN-MOVE, by RAILGRUP



Nueve entidades se unen en la alianza Movem para desarrollar la movilidad sostenible (europapress.es)



Una decena de entidades se unen en la alianza Movem
- EUROPA PRESS

Nueve entidades se unen en la alianza Movem para desarrollar la movilidad sostenible

Un total de 9 entidades que representan a unas 1.466 empresas relacionadas con el mundo de la movilidad se han unido en la alianza Movem para desarrollar la movilidad sostenible y conectada.

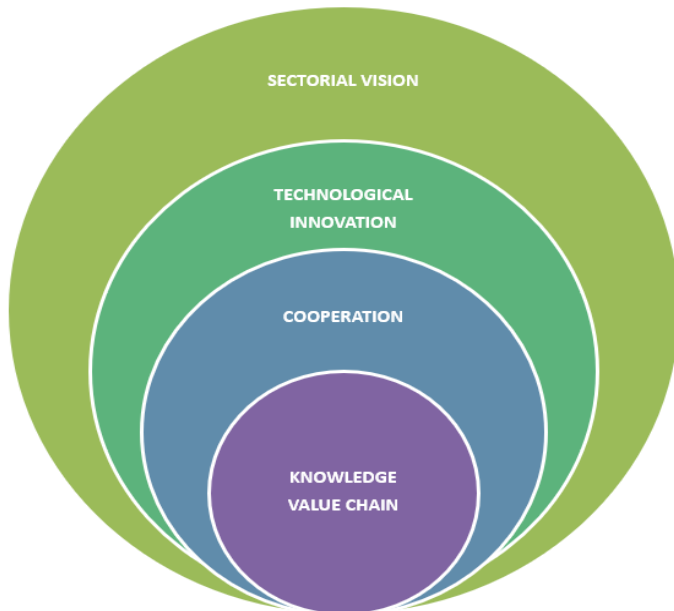
Leer más: <https://www.europapress.es/catalunya/noticia-nueve-entidades-unen-alianza-movem-desarrollar-movilidad-sostenible-20231214182727.html>

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About IN-MOVE, by RAILGRUP



- Innovative Cluster based in Barcelona.
- **Business Innovation & Digital solutions** to meet social challenges in **Sustainable Mobility and Multimodal Low Emissions Logistics** sector;
- INMOVE by RAILGRUP (INM) **Cluster was created in 2002** as the result of an initiative to strengthen the competitiveness of the railway industry
- Access to a **large industrial network** of partners at International level;
- INM has become a benchmark cluster in Spain not only in the railway ecosystem but in the transport sector in general.



Harvard
Business
School

N9-724-404
NOVEMBER 27, 2023

CHRISTIAN H.M. REBELS

Three Decades of Cluster Policy in Catalonia: What's Next?

The mood was festive among the close to 400 leaders from government and the private sector that entered the World Trade Center in Barcelona on December 10th, 2022. There was a clear sense that 30 years of cluster policy in Catalonia was something worth celebrating: few other policy programs had been sustained over such a long period of time, surviving through deep changes in political leadership and economic circumstances. And there were strong indications that this success in keeping the program active reflected the value it was delivering to Catalonia and its economy. Private sector leaders confirmed how engaging with the cluster activities had helped their businesses in critical ways. Additional government agencies wanted to engage on new cluster efforts.

With the anniversary event drawing to a close, the discussions in the leadership team of ACCIO, the Catalan Agency for Business Competitiveness, turned to the future. Should the program continue in its present form, or was there a need for change? Was the cluster approach still relevant 30 years on, given a fundamentally different economic context and a policy debate that was now considering ecosystems, societal missions, and "new" industrial policies? And was the cluster program playing its full potential role in addressing Catalonia's broader competitiveness issues, from dealing with a highly complex external economic context to nagging questions about whether Catalonia and its capital Barcelona were losing their touch?

Through **open innovation, technological excellence, cross-sectoral knowledge** and the development of joint projects.

INM currently gathers more than 126 members including public and private operators, engineering firms, start-ups, sensor-mobility systems, OEMs, rail infrastructure suppliers and logistics stakeholders.

INM is founder member of the European Railway Cluster Initiative (ERC.I). 15 Clusters along EU, collaborating together to enhance the competitiveness of companies in the cluster. More than 2000 SMEs under the E.R.C.I. Ecosystem.

+20 framework programme projects catalyzed for members

RAILWAY SHOULD TAKE THE MOST AS CRUCIAL ASSET IN SUSTAINABLE MOBILITY and LOW EMISSIONS TRANSPORT. WE HAVE TO MAKE IT MORE PART OF OUR LIVES

“ Trains have changed the world
... It's time to do it again ”



Thinkz...

Trains are the most sustainable mode of transport, connecting both large and small cities within countries and across international borders.

The trains of the future will be faster, lighter, comfortable, flexible and connected.



It's about Communication between people, the rest is Technology. Peter Ferdinand Drucker.

Cluster it!

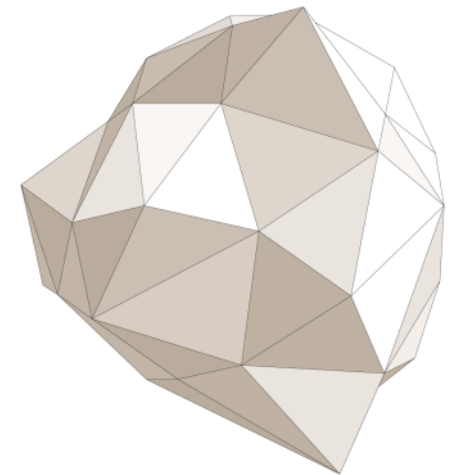
in-move *by Railgrup*

Muchas gracias por su atención

Vielen Dank für eure Aufmerksamkeit

gerencia@railgrup.net

www.railgrup.net



INNOVATION BROKERS