



Bikesharing



E:sharing



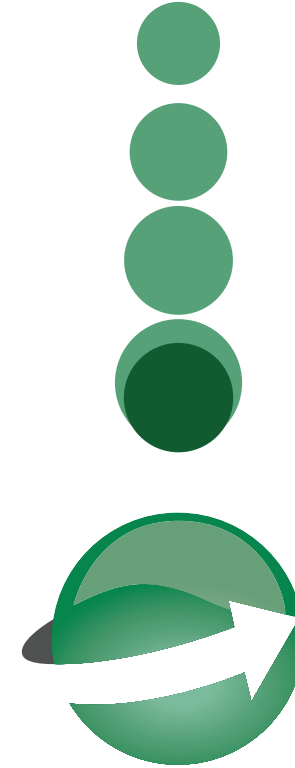
Car Pooling



Transport on Demand



# INNOVATIVE URBAN MOBILITY SOLUTIONS FOR SUSTAINABLE CITIES



# MOVUS

Enjoy a new concept of mobility



**Movilidad Urbana Sostenible (MOVUS)** is a company that operates in the mobility sector. Its principal activity is the development of studies and projects of new types of transport along with the experimental phase and its set up. The MOVUS mission encompasses the process of generating ideas, studies, experimentation and the rolling out of new and innovative techniques of urban and metropolitan displacement.

MOVUS offers the **use and exploitation of management systems for new kinds of urban displacement** that complement the more conventional use of existing public transport systems in our cities of today.

Since 2008 MOVUS has formed part of the associated group of transport companies, with which it shares clients, human resources and material means with the aim of associating new initiatives, research and development to conventional means of public transport that make the sector more user friendly and competitive.

The **mission of MOVUS** is to bring new sustainable solutions to the Urban Mobility sector that improve the quality of life and protect the environment. The **vision of MOVUS** is to bridge the gap between the latest advances in technology and traditional public sector transport companies so as to reinforce public transport competitiveness in comparison to that of the private vehicle.

#### INNOVATIVE TURNKEY PROJECT SOLUTIONS

Our company's principal objectives are to provide **sustainable turnkey strategies for urban mobility systems** with the aim of adding functionality and agility to the whole system from the planning to the starting phase in the street.

MOVUS prioritises the delivery of new types of urban displacement that provide a



First Prize for innovation in the trade fair Egética Energy Trade Show was for the MOVUS E:sharing project

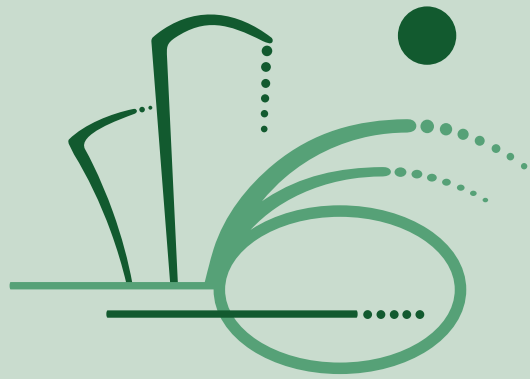
real alternative to the use of the private vehicle, the aim of which is to provide economic competitiveness, be socially more acceptable and to be more sustainable. This implies a deep understanding of the problems and the application of new management technologies that favour the integration of various types of transport solution.

In order to do this MOVUS drives the creation of local management systems that provide **support, advice and technologies** that meet that end. Where it is considered practical, MOVUS also manages and runs the mobility system.

In short the integrated management system includes:

- **Personalized studies of mobility service solutions:** planning, demand objectives, finance models.
- Agreement frameworks between different administrative bodies in order to **create larger interoperable areas.**
- **Development, purchase, installation and launching** of technological solutions.
- **The running of the operation and customer service.**





#### PROJECT AREA AND NEW PRODUCT RESEARCH AND DEVELOPMENT DEPARTMENT

The MOVUS project area and research and development department provides its services to the public and private sector and gives these organisations' operating areas the support they need.

Civil engineering, transport planning, urban and organisational mobility planning, feasibility and technical solution for bike sharing traffic studies, highway and pathway infrastructure construction, vehicle pool management support and advice, detailed electrically powered mobility projects and studies, new transport system technical and economic viability studies are MOVUS' principle fields of action.

MOVUS carries out an intense research and development programme, participating actively in some principal European, national and regional research and development programmes. The company's has recently participated as an external expert in **The European CATALIST project** along with Iberdrola, a multinational electricity provider in the **"Development of an interoperable carsharing model and standard for The Valencian Community"**, financed by The Marco Programme VII and led by The Valencian Energy Agency (AVEN), in addition to the EPV regional strategic project, **"Analysis and design specification of new energy efficient urban transport systems based on the use of electric grid network electric vehicles powered by renewable Energies"**, financed by the Valencian Community Trade and Industry Council are examples.

MOVUS is presently involved with several nation-wide bike sharing, on demand transport, and Electric Carsharing projects.



● ● Coresponsible Business and Sustainable Development Prize Business Entrepreneur Day 2010

● ● CEEI-IMPIVA 2010 Best Business Project Prize

<b>NUMBER OF EMPLOYEES</b>	18	<b>TOTAL SALES 2010</b>	1.280.669,36 euros
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#### DESCRIPTION

MOVUS commenced business in 2008 to positively contribute to the quality of life and wellbeing of those people in urban and city settings by providing sustainable Urban Mobility Solutions via the effective investment in technology, installing, running and maintaining operations and carrying out transport planning projects.

#### TRANSPORT PLANNING PROJECTS

- Sustainable Urban Mobility Plan, Catarroja (Valencia)
- Sustainable Urban Mobility Plan, Puçol (Valencia)
- Sustainable Urban Mobility Plan, Vall D'Uixó (Valencia)
- Technical assistance in the Planning and Studies Area of AVSA-Edetania, public transport companies
- UPV mobility studies and accessibility improvement proposals
- Murcia Bicycle Feasibility study and global technical bikesharing solutions plan
- Paterna Bicycle Feasibility study and global technical bikesharing solutions plan
- L'Horta Sud regional community Bicycle Feasibility study and global technical bikesharing solutions plan
- L'Eliana, town council, Integrated Metered parking an public transport scheme (Valencia)
- Traffic flow gauging and reporting for CEPSA petrol stations
- European CIVITAS and CATALIST civil engineering projects

#### CIVIL ENGINEERING PROJECTS

- Bus stop adaptation building projects for Carrefour Hypermarket, Paterna (Valencia) and works supervision
- Viability studies and new bus station design for the town of Santa Pola (Alicante)
- Highway traffic light study for the implementation of an exclusive public transport line in Sagunto (Valencia)
- Parking and electric vehicle recharging construction project in Sagunto (Valencia)

#### TRANSPORT SYSTEM MAINTENANCE AND MANAGEMENT PROJECTS

- Experience electric Carsharing: urban area of Valencia
- CridaBUS: On demand transport in Paterna
- Car Pooling: Itinerary and vehicle sharing system
- Public bicycle management and maintenance system in metropolitan Valencia: Paterna, Burjassot, Godella, Moncada, Torrent, Catarroja, Aldaia, Alaquàs, Quart de Poblet y Xirivella





MOVUS is the **main Bikes sharing operator in the metropolitan area of Valencia**, where it undertakes the complete management of public bicycle systems for 10 municipalities.

### BIKESHARING SOLUTION PERSONALIZED STUDIES

MOVUS' complete bikes sharing management begins with an in depth municipality transport type demand characterization, study, planning and proposal of each model and new public bicycle offer.

This is done via the **Feasibility study and global technical bike sharing solutions plan** that determine each municipality's bicycle mobility development needs and resources along with its compatibility and integration with bordering schemes, sources of financing and financial study.

### AGREEMENT FRAMEWORK FOR THE CREATION OF LARGE SCALE INTEROPERABLE AREAS BETWEEN ADMINISTRATIONS

MOVUS proposes and helps to establish agreement frameworks between different administrations in order to provide viability, elegant solutions and an improved service. Presently 67 bases facilitate the daily in the street journeying of 450's bicycles that save the municipalities and citizens some 275,000 litres of petrol or diesel per year, 210 EPTs and 541 tonnesless CO<sub>2</sub> emissions.

The potential of these systems is huge and MOVUS is basing its expansion on siting the bases in the most fitting municipalities, establishing systems in new municipalities and making all the systems compatible to allow interchangeable bases independent to the differing Bikes sharing technical requirements of each municipality.



●● Bikes sharing System implementation. Godella - Gobicí

●● Technological solution of Bikes sharing System. Godella - Gobicí

### TECHNOLOGICAL SOLUTION PURCHASE: INSTALLATION AND START UP

MOVUS chooses the best fitting systems for each implantation depending on the different needs and necessities of each municipality. Currently MOVUS operates these systems with two providers: **ITCL** and **Green Power Tech**, assuring full technological and mechanical compatibility of the bases and bicycles and developing built in software management that allows the systems to be integrated between different town halls.

MOVUS hands over a turnkey system that comprises the carrying out of the project and any civil works, bicycle design and personalization, location study, scheme introduction, preventive maintenance and bicycle repair and bike parking bases, bicycle storage, repair workshop, vehicles and personnel to maintain and redistribute bicycles.

● economic and energy savings	2010
● petrol savings in litres	275,000
● energy saving (ETP)	210
● emissions savings (tones CO <sub>2</sub> )	715



### SYSTEM MONITORING AND MAINTENANCE

MOVUS coordinates and carries out all the activities relevant to defining the project objectives, finding and conditioning locations and the completion of lighting and telecommunication civil engineering work as well as the installation of the bases in each municipality, programming, testing and start up. MOVUS certifies all works carried out and offers supervision and guarantees for each municipality for the entire system provided.

MOVUS manages the whole system: **Instant registry of new users; Web design and maintenance; Registration and subscription fee charging; Civil Liability Insurance; Personalized design and issue of cards for each scheme; Customer service and user registration Call Center; Marketing and advertising campaigns; PBase and bicycle personalisation and design; Bicycle and bicycle stand maintenance and repair; Public bicycle fleet storage; Customer service and incident and breakdown service; Promotional campaigns for Bicycle use, attendance at trade fair and bicycle mobility promotional events.**



● ● Technological solution of Bikesharing System using electric bikes

● ● Paterna Local Police Electric Bikesharing Systems

### BIKESHARING POTENTIAL AND DEVELOPMENTS

MOVUS manages 10 Bikesharing systems in the Greater Valencia Metropolitan Area, operating 67 bases and more than 1,500 bicycles. Currently some specially designed and adapted Bikesharing bases also allow electric bicycle charging.

Torrent and Paterna have a fleet of 10 electric bicycles for town hall staff such as local government workers and local police, who use this kind of transport and are able to charge the bicycles when they securely park them at the bases.

MOVUS' development and innovation strategy includes the phasing in of more electric bicycle secure charging bases for anyone who wishes to use the electric bikes.

### BIKESHARING SYSTEM IN THE GREATER VALENCIA METROPOLITAN AREA

- Burjassot BurjaBike, 4 bases, 100 bicycles
- Catarroja Catarroja, 9 bases, 140 bicycles
- Godella Gobici, 4 bases, 100 bicycles
- Horta Sud Mancomunitat L'Horta Sud en Bici (Alaquàs, Aldaia, Quart de Poblet, Xirivella), 19 bases, 400 bicycles
- Moncada Moncabici, 7 bases, 100 bicycles
- Paterna BiciPaterna, 12 bases, 300 bicycles and 10 electric bicycles
- Torrent TorrentBici, 12 bases, 400 bicycles and 10 electric bicycles





MOVUS is working intensively on the development of different Carsharing systems for municipalities throughout the country. Carsharing makes a network of vehicles available to the user to rent for a limited amount of time, without the need to buy and so contributing to a limited resource respectful, air, petrol and space, sustainable mobility. Similar experience in other countries shows that Carsharing systems save approximately 4.5 times the cost of an equivalent length journey in a private vehicle.

The **advantages of the Carsharing system** are:

- Carsharing avoids the need to buy and maintain a private vehicle
- It rationalizes car use, reducing the amount of kilometers travelled
- The user utilises the means of most adequate means of transport for each journey with more energy efficient vehicles

Distinct studies show that Carsharing systems reduce the overuse of the car and produce positive effects with its integration that complement public transport that contribute to urban environmental policies that attempt to eliminate greenhouse gases and noise in urban areas.

Furthermore, urban traffic congestion is reduced and they support urban area sustainable mobility policies in limited traffic zones (LTZ), public highway parking, metered parking zones and so on. Apart from the wider benefits for society, the client also enjoys a series of advantages.:

- Flexibility: Clients use the vehicle for as long as they like in contrast to conventional car rental



Electric vehicle reader (on the left) and starting card

- The service is free of the worry of maintenance, insurance, parking, road tax and so on
- The client saves money based on journey length to the extent of 5,000 euros per year in comparison to private vehicle use

**E:SHARING: SUSTAINABLE URBAN MOBILITY**

MOVUS has defined and implemented one of the most innovative modalities of Carsharing as an alternative means of traffic to the private vehicle: el **E:sharing system uses wholly electric powered vehicles** that recharge at solar powered fixed bases installed on the public highway.

By so doing, MOVUS has become the first Spanish operator to implant this system effectively in a municipality in the national territory with:

- Combined Carsharing and electric vehicle use
- New management and control technologies
- **Novel:** street system location that parks and charges the vehicles



Electric vehicles  
Think City and ION

## E:SHARING CLIENTS

E:sharing solutions cover a wide range of user profiles:

- **Individuals and tourists:** Lifestyle choice non car-owners. Realistic alternative to second car ownership. Car rental alternative.
- **Town Halls and businesses:** Alternatives to the ownership of vehicle fleets or underutilized fleet. Alternative to paying employee vehicle mileage. As an additional incentive to participate in improvement programmes or to reduce sponsored parking space for private journeys to work.

## E:SHARING TARIFFS

The E:sharing system has the following tariffs:

- **Ordinary:** 5€ monthly quota and distance and timing charging. In electric cars, the hourly tariff is 1€ for 15 minutes rental and mileage is free up to 20km, after which a charge of 40 cents per kilometer applies.
- **Business:** The quota is 17€ per month and distances and times are charged. In electric cars, the hourly tariff is 60 cents every 15 minutes and the distance charge applied is free up to 20 km and from then on stands at 25 cents per kilometer.

## IMPACTO SOCIAL Y AMBIENTAL DEL SISTEMA E:SHARING EN SAGUNTO

El sistema E:sharing implantado en Sagunto prevé que para 2012 sea utilizado por 300 usuarios, con una media de 15 usos al año y 30 km de recorrido en cada uso.

economic and energy savings	foresight 2012
petrol savings in litres	9,450
energy saving (ETP)	7.22
emissions savings (tones CO <sub>2</sub> )	24.6



● ● Electric charging point in Sagunto, Valencia



● ● E:sharing web main page for online handling of the electric Carsharing service  
<http://www.esharing.es>

● ● Online vehicle maintenance simulator

## E:SHARING PROJECT DEMONSTRATIONS SAGUNTO (VALENCIA)

MOVUS and AVSA, in collaboration with Green Power and Politechnic University have developed and introduced a pioneering electric car E:sharing project available to the public in Sagunto (Valencia). This fleet of vehicles and their recharging points are available to the user in the public highway and is charged by renewable energy.

Taking two years to develop, the project is now a reality and is operational and effective in Sagunto, where **two pick up and drop off points** in Sagunto's main town and at Sagunto port each boast **8 park and charge points, 4 of which form the Carsharing project**, whilst the remaining four are for private electric vehicle recharging.

## CARSVAL PROJECT IN VALENCIA

Scheduled for the latter half of 2011, CARSVAL will boast a first site of 8 electric vehicle park and charge points. This first phase also includes an exclusive model for business, called "Corporate Sharing", that has the following modalities:

- A1. Technological installation.** Companies with large vehicle fleets will be able to have Carsharing technology available to them.
- A2. Exclusive work day timetabled use.** Businesses and councils will have a scheduled timetabled use available to them.
- A3. Public use.** For business tariff users.



# CAR POOLING



MOVUS has developed a Carsharing service that contains substantial improvements over traditional web-based systems. MOVUS offers integrated carsharing system management between private users in a way that when these register on the web, they can publish their journey and find people to share their journey with.

Once a group is formed an on board device is offered to them that tracks the journey in real time and (GPS and GPRS), identifies the passengers and their pick up and drop off points. This guarantees the user that the **Customer Mobility Service Office** knows who is picked up or dropped off, when and where as well as providing other useful information to the customer about their journey.

It is in this way the following improvements are made:

- **Safety.** The real time monitoring of the system includes passenger identification
- **Real user data.** Knowing the real use of the system allows easy savings calculation, sharer information, payment information and payment method set up.
- **Guaranteed return in the event of unforeseen circumstances.** With this system MOVUS introduces a guaranteed return home for registered users in the event of unforeseen circumstances.

## VALENCIA TECHNOLOGICAL PARK: PIONEERS IN THIS SERVICE

In 2010 in VALENCIA technological park, with its 400 companies and 8,000 employees, the **COMPARTEC car pooling system** was started. The system consists of a MOVUS designed web page and on board devices that Paterna Town Hall Transport Company uses.

The guaranteed return home for registered users system and other incentives are in



place. Furthermore, MOVUS is developing Carsharing system improvements via the feedback it obtains on the service in the technological park.

## SOCIAL AND ENVIRONMENTAL IMPACT

The Carsharing system has had a considerable impact in Valencia Technology Park since its introduction in June 2010. The following table shows these savings and are formed from data collected since June 2010 to April 2011:

economic and energy savings	2010	2011 estimate
petrol savings in litres	69,470	606,488
energy saving (ETP)	53.04	463.05
economic saving (euros)	90,311	788,435
emissions savings (tones CO <sub>2</sub> )	180.62	1,576.87

## TECHNOLOGICAL SOLUTION OF THE CAR POOLING SYSTEM

To introduce the carsharing system, MOVUS has developed user software management that allows users to **find out journey and free space information** immediately on registering. In this way, journeys are published on the web in a comfortable, speedy and safe way for the driver and passenger alike.

Furthermore, a journey search by user proximity can be carried out by introducing this information into a dynamic map. This software also allows each user to modify their profile, consult details of any journey they have made, produce periodical reports and so on.

In addition, car drivers that share their vehicle have an on board GPS device that tracks and locates the vehicle at all times and identifies users as they enter and leave the vehicle via a radio frequency identifier (RFID). The device also has GPRS technology so that the system operator disposes of real time information.

● ● Promotional campaign for Paterna Technological Park Car Pooling System



● ● Aerial view of Valencia Technology Park  
Car Pooling shared car system application

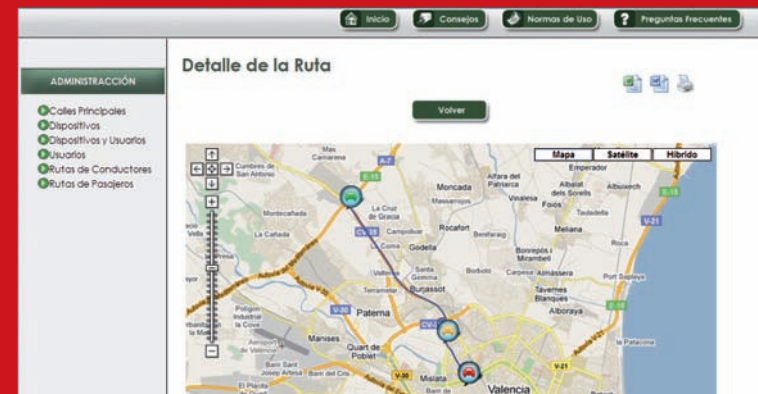
In Valencia Technological Park nearly 15,000 journeys are carried out daily, 95% of which are in private vehicles, with a passenger to vehicle coefficient of 1.08%, which causes access problems to the park and unsustainable inefficiency.

With the triple objective in mind of alleviating the problems of rush hour access, limitations on parking space and boosting productivity in the site by lowering energy consumption, the **COMPARTEC Car Pooling System** was rolled out.

Prior to its introduction, a detailed analysis of vehicle types and traffic, parking studies, business surveys and employee questionnaires was carried out. After this study, the operational and delivery conditions were known and set and the service was centralized in the Mobility Office.

The **Technological Park Mobility Office** has the following programmes in place:

- **Guaranteed return:** Programme with budget assignation and the guaranteed return for registered users in the event of unforeseen circumstances.
- **Incentives:** From the introduction of the service into 2011, a programme of incentives is in place so that users receive products and services to the value of 1 € for every 100 km of journeying to and from work that takes place.



● ● COMPARTEC online consultation and system management programme details





● ●  
 Paterna CridaBUS Service  
 Nighttime bus on demand

**Transport on Demand (TOD)** is the adaptation of public bus services to existing demand in a way that regular bus lines are replaced by a network of real demand bus-stops, lines and timetables.

Transport on demand is a practical solution to providing cohesive and vertebrate public transport to areas where demand is low and is proven to be an excellent energy efficiency tool for the transport sector in areas of densely populated areas with high mobility needs.

Using MOVUS' expertise in the field of mobility management, studies the feasibility, design and introduction of transport services on demand. The system MOVUS offers allows the **easy management of different transport model kinds:**

- Small and large peripheral and outer-urban areas
- Integration or substitution of traditional transport services
- Many-to-many, door to door and hybrid transport models

MOVUS Transport on Demand allows the supplier an automated modification system in relation to the specific needs of the service on offer:

- Journey length optimization
- Request priority management
- Bus-stop cluster management
- User maximum length of time on board
- Maximum journey length in time and distance
- Maximum delay in respect to requested pick up time
- Maximum requested arrival time prevision
- Maximum flexibility parameters

**MUNICIPALITIES THAT PROVIDE ON DEMAND TRANSPORT**

Since 2010, Paterna disposes of a TOD service called **CridaBUS**, that runs on Saturdays between Paterna and the downtown bar and night-life area in Valencia to efficiently attend to night transport needs avoiding wasted kilometers and improving the overall quality of the service.

**CridaBUS** is an off-line service: all week and up to 20:00h on Friday evenings, reservations for Saturday can be made. Routes are compiled on Saturday mornings and pick up proposal times are sent to the users who made a service request who then confirm the request.

These routes are then made public so that any other public transport user can benefit from the route. Route requests can be made by phone, or by internet and proposals are sent by email.





Map in Spanish of stops of CridaBUS ●●



CridaBus logo and promotional campaign of the service at the bus



Soon the possibility of booking via sms text and receiving route proposals will be a reality.

The CridaBUS service uses 55 bus-stops throughout the main residential areas of Paterna that covers all the main night-life areas of Valencia: **The town center: 19 stops; La Cañada: 22 stops; Valterna: 2 stops; Terramelar: 2 stops; Mas del Rosari: 1 stop; Heron City: 1 stop; Valencia: 8 stops.**

#### USERS STATISTICS AND SOCIAL AND ENVIRONMENTAL IMPACT

The CridaBUS system is more popular than the systems it replaces, transporting more than 100 users per year.

The service provided supports a demand that is much superior to that which the two previous lines met, more efficiently and will soon reach its objective of beating 2,600 passengers per year.

#### TIMETABLES AND ITINERARIES

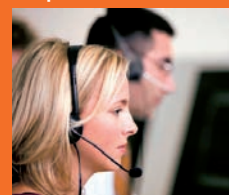
- **Fixed itineraries:** where the journey is based on user request at the bus stops required
- **No fixed itineraries:** related bus stops where the service can be requested from. This information forms the basis of the routes and timetables

#### OPERATIVE SERVICE

- **Off-line:** Reservations are stored until the date limit and. These reservations form the basis for the routes and are sent to the route operator to reroute the dispatch to the user
- **Online:** The services are processed in real time and the routes are modified in real time, which requires effective direct communication to bus driver. The GPS fitted to the bus allows the exact location of each vehicle on the reception of each service request and the display of the modified route to the driver

#### SYSTEM USER COMMUNICATION

##### Telephone



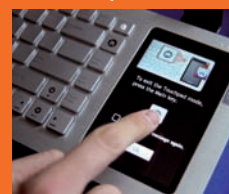
##### SMS text (automatic)



##### Web (automatic)



##### Automatic point at bus stops



##### Interactive Voice Response

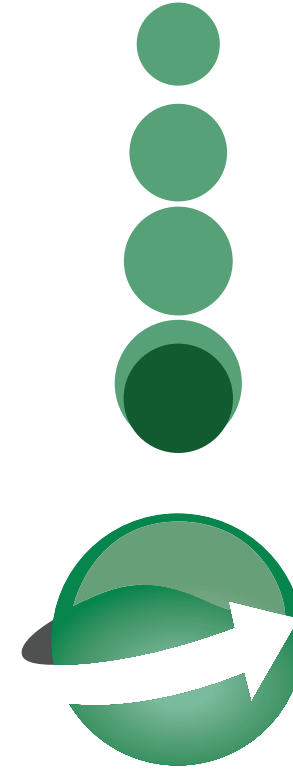
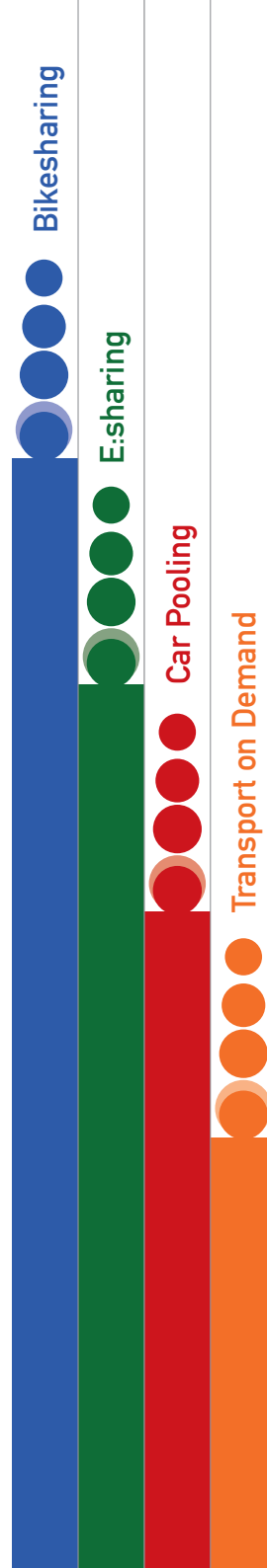


##### Driver cockpit (automatic)



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