



CLEANER AND BETTER TRANSPORT IN CITIES –  
ESTABLISHING SHARING SCHEMES IN DYN@MO  
CITIES TO REDUCE INDIVIDUAL TRANSPORT

# Establishing sharing schemes in DYN@MO cities

Sharing a vehicle, whether it's a car or a bicycle, has many advantages such as saving money for the individual and improving the environment due to fewer vehicles on the road. In addition, it paves the way for multi-modal use of transport systems since the vehicle-sharing concept excels at high flexibility due to the independency of timetables and predetermined routes. Automated sharing systems can reliably be in operation year-round, day and night. Furthermore, the user freely chooses the fastest route to his destination not being bound to bus or train lines. In other words, a vehicle-sharing system adds customer value to the whole transport chain.

The DYN@MO cities of Aachen, Gdynia, Koprivnica and Palma have been strongly committed – each city in its own way and own scale – to introducing and extending the usage of sharing schemes, with traditional bicycles, electric bicycles as well as with electric and hybrid cars. This brochure describes the partner cities' practical experiences of their establishment of sharing schemes within the CIVITAS DYN@MO project.

The brochure supports the general aims of the CIVITAS Initiative to support cleaner and better transport in cities.



## DYN@MO project in a nutshell

- ▶ DYN@MO (2012–2016) is part of the CIVITAS Initiative, supporting cities to introduce ambitious transport measures and policies towards sustainable urban mobility
- ▶ Four DYN@MO cities Aachen, Gdynia, Koprivnica and Palma have agreed on a common mission to strengthen sustainable mobility
- ▶ The project consists of 28 partners in the four cities supported by Union of the Baltic Cities, Rupprecht Consult and Lund University
- ▶ The strategic aims of the DYN@MO project are to:
  - ▶ develop “Mobility 2.0” systems and services by applying new web-based technologies
  - ▶ implement innovative electric mobility solutions, using new electric and hybrid vehicles and
  - ▶ engage in dynamic citizen dialogue for mobility planning and service improvements



Photo: City of Aachen

## Aachen, the electromobility forerunner in Germany – also succeeding in implementing sharing schemes

Text: Tobias Meurer / Velocity & Gisela Warmke / cambio CarSharing

### Car-sharing in Aachen

The first car-sharing organisation in Aachen began 25 years ago with the objective of sharing cars to reduce the number of vehicles on the road. A service was created for the customer that would make the need to own a private vehicle redundant and would encourage the use of public transport such as trains, buses and bicycles. The current 6,200 licensed drivers in Aachen can choose from over 100 vehicles of different sizes at 40 different stations. In 2000, the merging of the Cambio group together with two other car-sharing companies in Bremen and Cologne was an important step towards expanding this service. Today, this has made it possible for Aachen residents to hire a vehicle from any of the 100 German and Belgian cities where car-sharing is made available.

### E-bike sharing to complement public transport

Analysing Aachen's mobility situation, the installation of an e-bike sharing scheme is an evidently suitable measure to amend the public transport system. Not only the comparatively high air pollution due to the high volume

of road traffic but also the capacity overload on several bus routes call for an economical and environmentally sustainable complement for public transport. Moreover, the compactness and hilliness of Aachen are ideal prerequisites for the use of e-bikes as a means of transport.

Velocity – an Aachen-based company funded by university students in 2014 – has set a target for building 100 fully automated rental stations with 1000 pedelecs in Aachen. In the first stage, the exploitation focuses on the city centre as well as the RWTH Campus area. Several of those stations are part of the CIVITAS DYN@MO project. Within the next few years, the coverage of the whole city area will be accomplished. Planning and construction of the station locations has been undertaken by Velocity, Cambio CarSharing and ASEAG, in close collaboration. It is the declared aim of all partners to facilitate the intermodal use of different vehicles, whether a car, an electric bike or the public transport system. An illustrating example of this effort is the new mobility station at the Aachen-West railway station, which has been set up in the summer of 2015, enabling travellers to change easily between car, e-bike, train and bus.

## New technology brings about new challenges

The DYN@MO CIVITAS project focusing on electric mobility provides car-sharing companies the opportunity to get acquainted with and to make use of this technology in a practical manner. However, this too brings about new challenges. Previously, with conventional vehicles, only the requested booking times were managed and reserved for customers. In terms of electric vehicles, the car-sharing company must assume the guarantee of the necessary covered range. The customer, therefore, must consider the distance required beforehand and include this in the booking. It is important that the booking system recognises the correct stated charge in order to determine whether the available energy is sufficient enough. For e-bike sharing schemes this is not as important since the distance to be covered is rather low.

Rental stations and bikes as well as the backend software had been developed together with the RWTH Aachen University and the Aachen University of Applied Science to perfectly meet the requirements for the future sharing system in Aachen. Velocity's server-based software provides basic functions such as management of customer accounts, renting process transaction, database administration for charging station sites and pe-delecs and invoicing of the user fees. In addition, extra software components have been developed to feature for innovative future mobility concepts. For example,

location and real-time bike availability data can be requested by travel information service systems, which allows for an easy integration of the e-bike sharing offering in intermodal routing applications. Thus potential users conveniently get instructions about how to optimally organise their individual intermodal transport chain.

## Sharing schemes to facilitate access to electromobility

In essence, car-sharing, e-bike sharing and electromobility work hand in hand. Two thirds of all car trips with small vehicles are less than 25 km in distance, which comply perfectly with the electric vehicle range – albeit a car or an electric bike. The concept of initial high investment, limited range and uncertainty of the new technology is what deters consumers from investing in an e-car whereas these reasons play a less significant role for the individual user of car-sharing. Car-sharing provides the opportunity to familiarise oneself with the new technology and to test alternative mobility. If the e-car is not deemed suitable, it can then be replaced with another vehicle from the Cambio fleet – or with an e-bike. To conclude, the use of e-car-sharing and building up an e-bike sharing scheme through the DYN@MO CIVITAS facilitate access to electromobility and are therefore considered a double future investment.



Photo: City of Aachen

# Bike sharing system for Gdańsk – Gdynia – Sopot metropolis

Text: Rafal Studzinski / City of Gdynia

Even though many cities in Poland are following the global trend of introducing a bicycle-sharing system, the Tri-City union of Gdansk, Gdynia and Sopot – often considered as a Polish leader in the field of promoting active mobility – has postponed the implementation of such a system. Based on earlier experiences in the city of Sopot, where a small-scale bike-sharing system did not succeed due to a lack of stations and therefore insufficient coverage within the agglomeration, the Tri-City believes that this kind of system should be carefully thought through and only be implemented when positive results can be assured. When comparing Polish cities where a bike-sharing scheme has been successfully implemented with the Tri-City, one needs to take into account the differences in scale of the cities' characteristics, such as density of stations, amount of bicycles, number of inhabitants and modal split. Further, the system shouldn't be just an alternative for current passengers of public transport; the main challenge is to encourage car users to start bicycling.



Photo: City of Gdynia

## Cycling in Tri-City

Bicycle infrastructure investment since 2005	32 mln €
Bicycle paths increase since 2005	133 km
Bicycle ways and lanes currently	195.5 km
Population	~ 747,000
Highest point (Gdynia, Donas)	205.7 MAMSL

In recent years, the Gdansk-Gdynia-Sopot metropolis has focused on creating a functional network of bike routes. New projects are being prepared, extending the cycle paths and 30kmph zones with two-way bicycling on one-way streets. The cities are determined to build the infrastructure before launching a bike sharing system since a fast increase in the number of cyclists without a well prepared infrastructure could have a significant impact on the number of accidents.

## Feasibility study

A feasibility study of the bicycle-sharing system will be conducted soon and will contain, among others, an analysis of system functionality under different financial models. For example, cities will be able to define the chances of partial financing from outdoor advertising. Also the adaptation to the hilly terrain will be taken into account in the feasibility study. Possible solutions for this could be a distinction of fees in relation to height above sea level or a longer off-charge period for hill travellers. GPS technology might be of support here. The hilly terrain also causes challenges when it regards bike redistribution and must be taken into consideration when planning the station locations. Although there are challenges, bicycle sharing gives many interesting possibilities for the Tri-City to implement sustainable mobility.



Photo: City of Koprivnica

## | Car and bike-sharing schemes in the City of Koprivnica

Text: Helena Hecimovic / City of Koprivnica

### E-car sharing scheme for the municipal employees in the City of Koprivnica

Since car-sharing is already an innovative concept of car use in the local and national context, e-car sharing could be seen as even more innovative. For quite some time it has been obvious that there is a need for a more efficient use of the municipality's car fleet and that of other public institutions and businesses. The city's participation in the CIVITAS DYN@MO project made it possible to actually meet this need. The decision-makers were convinced that the efficient use of electric vehicles, organised in a car-sharing scheme would prove to be the most cost-effective solution.

The procurement of five electric vehicles, one hybrid and one plug-in hybrid vehicle by the municipality attracted a lot of media attention since it was a national premium. As part of the national electricity provider's HEP electromo-

bility programme (HEP ELEN), a contract for the setting up of five fast electric charging points was signed in the City of Koprivnica to enable the use of this first electromobility fleet. In the meanwhile, additional users for the e-charging stations system were provided by Podravka Inc. as this main international company located in the city purchased several electric vehicles.

As part of the mobility programme of the National fund for Environmental Protection and Energy, a subsidy for the procurement of the vehicles was provided. Employees that had the wish to participate in the e-car sharing scheme were trained first. As the number of trained employees increased, the e-cars were used more efficiently. In the meantime, the car-sharing scheme was being developed; besides electric and hybrid vehicles, also the conventional vehicles that were already owned by the municipal authority and its companies were included in the sharing-scheme.

The car-sharing concept has won over several barriers, the first one being the lack of a “car-sharing culture” i.e. some institutions claimed to have a need to keep some vehicles for their exclusive use. The second barrier was the limited range of electric vehicles, due to the low number of charging points and their minimal territorial distribution. This explains why electric vehicles are not used for distances of more than 80 kilometres. E-cars are most often re-charged during the day, between two consecutive users.

The use of the system is still in its experimental phase, but some conclusions can already be drawn: the cost-effectiveness is improving with the rising number of users and the vehicles are being used throughout the working day. In addition, the first cost savings on fuel have been recorded, even in the colder winter months. The system has attracted the attention of local, regional, national and international media. Several local businesses have expressed their interest and the representatives of the City of Skopje (Macedonia) intend to start an e-car municipal taxi service, using Koprivnica’s example as the starting point.



Photo: auto-info.hr



Photo: City of Koprivnica

## Facts about e-car-sharing system in Koprivnica

- ▶ 8 e-cars
- ▶ 5 e-car chargers
- ▶ 200 users



Photo: auto-info.hr



Photo: City of Koprivnica

## Bicycle and pedelec-sharing systems

The idea of implementing a bike-sharing scheme is not new in Koprivnica. In fact, some earlier attempts involving bicycles donated by local firms have attracted a lot of local interest. In 2014 a sustaining bike-sharing system was implemented in both Koprivnica (Croatia) and Héviz (Hungary) as a result of a cross-border cooperation project (IPA CBC Hungary-Croatia). In Koprivnica, the system comprised 60 bicycles, 7 docking stations with IT surveillance systems and publicly available GIS maps for tourists. The system is maintained by the Municipal Utility Company Komunalac, which uses a transport and maintenance vehicle to transfer the bikes among the docking stations.

As part of the CIVITAS DYN@MO project the system was recently upgraded by 10 additional pedelec bicycles and one extra docking station at the university campus. The system is fully compatible with the existing conventional bike's rental system and uses the same docking stations. Both the conventional and pedelec-sharing system are part of the intermodal public transport scheme of the City, currently developed in the CIVITAS DYN@MO project.

The bike-rental scheme has over 1000 registered users and was free of charge until September 2015. The pedelec scheme is run by Campus d.o.o. and has been registering its first users during spring 2015: students and employees of University North. There have been some instances of vandalism and theft at the beginning of the scheme. Also there were some minor technical problems, but these have been solved. As the previously tried rental schemes have made the general public already familiar with this kind of concept, the new system seems not to have major market barriers.

### Facts about bicycle and pedelec-sharing system in Koprivnica

- ▶ 60 conventional bikes
- ▶ 10 pedelecs
- ▶ 8 terminals
- ▶ over 1000 users



Photo: City of Koprivnica





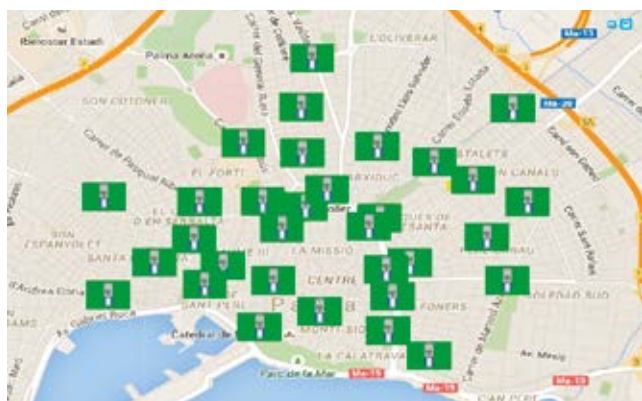
Photo: City of Palma

## Bicipalma, implementing a public bike share scheme

Text: Emilio López / City of Palma & Jesus Moreno, City of Palma

The implementation of Bicipalma, Palma's public bike-sharing system, was the result of a municipal campaign for the promotion of the bicycle in 2008 as a means of urban transport. This campaign focussed on mainly three areas:

1. To provide a bicycle path network within the urban space that would guarantee sufficient comfort and security for cyclists.
2. To update municipal regulations in order to facilitate the bicycle as a substantial transport mode, in a peaceful cohabitation with pedestrians and cars.
3. Cycling promotion with awareness-raising campaigns that would lead to a critical mass of users.



The city decided to opt for a system that had been already successfully tested in other cities such as in Barcelona and Sevilla. Initially the scope of the service was limited to the downtown area but guidelines were already established to cover a larger area (see map with pick-up/drop off points). After a pilot of one year in which several problems were solved in the infrastructure and management software, the new bicycle scheme was launched in March 2011. In 2013, as a first result of one CIVITAS DYN@MO measure, an extension of the system took place introducing 4 new stations with 75 anchors and 50 new (stronger) bikes, summing up to 560 anchors and 250 operating bicycles in total, distributed among 32 bicycle stations. In the same year, the first campaign to attract long-term subscribers was launched and finally in 2014 as a response to a common demand of tourists, short-term subscriptions of two to five days were added to the system.

	DYN@MO	Total in 2015
Bicycle stations	4	32
Anchors	75	560
Bicycles	50	250

## The control centre

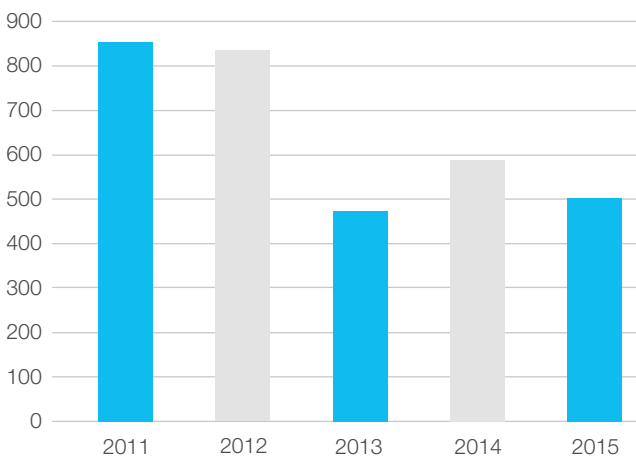
The public bicycle system's control centre is located in the City's Mobility Department and monitors the following aspects:

- ▶ Free anchors, available bikes and bikes in use.
- ▶ Station occupancy rates.
- ▶ System performance.
- ▶ User and operator management.
- ▶ Management of sanctions and incidents.
- ▶ Maintenance management.
- ▶ Video observance system at each station, providing recordings for further analysis in case of incidents.

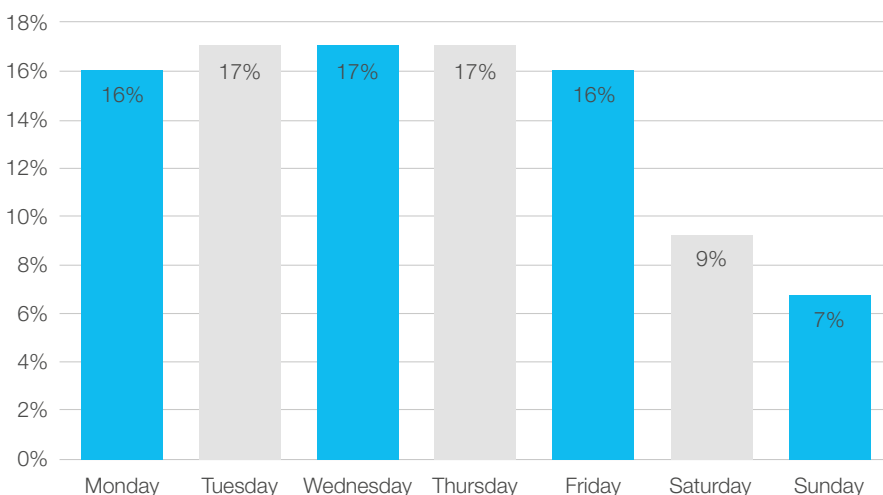
## Maintenance

A team of 7 persons of the municipal parking company is responsible for the maintenance of the User Interaction Points, anchors and bicycles. The team also takes care of the redistribution of the bicycles among the stations by 2 trailer vans, each with a capacity of 15 bikes.

## Average loans/day



## Loans by day of the week



## Subscriptions and rates

Bicipalma has two types of users, distinguished by sort of subscription:

- ▶ Long-term subscribers, who are obliged to own a citizen card to register for the system.
- ▶ Occasional users, with the only requirement of having a credit card.

Both types of users are stimulated to use the bicycle for only a short period per single time by not charging them for journeys of less than 30 minutes. Longer trips are "penalised" by 50 cents per 30 minutes.

## Work trips and leisure trips

Due to the strong touristic nature of the city, the intention of the public scheme was to function mainly for short point-to-point leisure trips. Instead, Bicipalma is rather used for daily transport by residents. So far, tourists prefer to use the traditional rental bikes and Segways that nowadays can be seen in the city centre. (See below figure: less loans in the weekend, bikes are mainly used for daily trips and not for leisure).

## Conclusions

Bicipalma offers an appropriate complement to other public transport. Nevertheless some improvements still need to take place. For example, the scheme's redistribution could be made more efficient and environmentally-friendly. Staff moving bicycles back and forth between stations of high supply and low demand to stations of low supply and high demand is time consuming, expensive, and pollutant.

“By providing bike-sharing services to tourists, the citizens of Palma will notice that this concept has significant opportunities for creating a new cycling citizen”; this was the initial aim of the mobility department. In fact this aim has been reached to an extent more than expected and differently than intended, since quite many citizens have started to use Bicipalma already for their commute, whereas tourists prefer other modes of transport to get around in the city. The future for Bicipalma looks bright since it seems to be just a matter of time and targeted marketing to get also the tourists to use Bicipalma and it’s expected that citizens and visitors will start to use Bicipalma more extensively in combination with other modes of transport (as a first mile/last mile solution), especially with the launch of the new version of the local mobility App Mobipalma (see box).

It is undeniable that bike-sharing is a new way of getting around in the city that has come to stay. It’s affordable, clean, and simple. It’s good for your health, your pocket and our environment. CIVITAS DYN@MO, in the context of the local Measure “Planning for cycling and walking”, will continue facilitating next enlargements of the system before November 2016, with new stations, anchors and bicycles.



Photo: City of Palma

## Key points: What to remember when implementing a similar measure

1. Establish a favourable legal framework.
2. Choose a scalable system and go ahead in subsequent phases.
3. Beware of innovations since they can lead to a source of unforeseen problems.
4. The bicycle redistribution part can be a weakness of the system.
5. A connection with an app would be an added value.

Thanks to recent users’ contributions, the mobility department has launched a second stable version of Mobipalma (the local mobility App), which means a qualitative leap forward in terms of service. While the previous version offered real-time info on buses, bike services and traffic conditions, the new module shows the user the best route between two points in the city using various combinations of public transport and giving much importance to the bike-sharing system. The system can guide cars to nearby parking and show where to take a public bike to reach the destination.

New special features of Mobilpalma are, among others:

- ▶ The user can go to a BiciPalma bike station knowing in advance the number of available bikes and open anchor points.
- ▶ The user can evaluate his/her usage history, for example to make sure that a trip was closed correctly when the bike was left in its anchor point, or to find out about a penalty for extra time.

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Cover photo: City of Koprivnica

