

TOSCA tiene el objetivo general de promover a través de la transferencia de tecnología de un operador de transporte público en Bremen a un operador de transporte público en Bolonia (ATC) la idea de una solución integrada para la movilidad donde el vehículo compartido (Car-Sharing) es considerado como un servicio complementario para los usuarios del transporte público. Este servicio esta basado en el desarrollo de tecnologías avanzadas que han sido desarrolladas en el seno de programas Europeos.

TOSCA ha come obiettivo generale la promozione, attraverso il trasferimento tecnologico dall'operatore del trasporto pubblico di Brema all'operatore del trasporto pubblico di Bologna (ATC), di un concetto di mobilità integrata in cui la macchina condivisa (Car-Sharing) viene considerata come un servizio complementare al trasporto pubblico. Tale servizio si basa sull'utilizzo di tecnologie avanzate sviluppatesi nell'ambito di programmi europei.

TOSCA a pour objectif de promouvoir, principalement par le biais d'une initiative de transfert technologique vers l'opérateur de transport public de Bologne (ATC), l'idée d'un concept de mobilité intégrée au sein duquel le Car-Sharing serait considéré comme un service de mobilité complémentaire destiné aux usagers des transports en commun. Celui-ci est basé sur des technologies de pointe développées dans des programmes européens.

Mit Car-Sharing bequem von Tür zu Tür - TOSCA's Ziel ist es, flexible ausgereifte neue Technologien aus Bremen auch in anderen europäischen Städten zu verwirklichen. Car-Sharing soll als Service verschiedener Mobilitätsanbieter wie z.B. Car-Sharing Unternehmen, ÖPNV-Anbieter, Taxiunternehmen gefördert werden. TOSCA wird teilfinanziert von der Europäischen Kommission.

### The TOSCA project is co-ordinated by:

**ATC S.p.A.** operates urban, suburban and interurban public road-transport in the whole Bologna City area and it is also in charge of the city's parking management on behalf of the City Council. Its fleet consists of about 900 buses. About 100 million passengers are carried annually with a slightly increasing tendency partly due to the introduction of a policy aimed at encouraging public transport by adopting innovative systems and transport means, which can harmonise both citizens needs and environmental requirements.

### The brochure is produced by:

**Polis** is an association of European cities and regions working together on transport and mobility issues.

Polis was founded in 1989 and currently represents over 60 municipalities and regions from the whole of Europe, including Central and Eastern European countries.

Our activities aim at increasing the awareness and expertise of local authorities in creating integrated and sustainable transport systems through the implementation of innovative technologies and policies.

**Car Free Cities** is a local authority network aiming to promote a new mobility culture throughout Europe. Launched in 1994, it gathers today over 70 European cities.

Car Free Cities represents cities views in EU policy debates on urban transport issues and promotes the exchange of experiences between European cities to help implementing practical actions at local level.

Car Free Cities co-ordinates several thematic working groups on key transport issues.

The working group, chaired by the City of Bremen, promotes the concept of Car-Sharing and led to the introduction of a Car-Sharing scheme in the city of Edinburgh and Brussels. The working group already produced a CD-Rom and issued a brochure on Car-Sharing.

### The TOSCA consortium is composed of:

ATC S.p.A, Italy  
Freie Hansestadt Bremen, Germany  
INVERS GmbH, Germany  
Rupprecht Consult, Germany  
Eurocities/Car Free cities, Brussels  
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# Car-Sharing

Intelligent Mobility for European Cities



What is Car-Sharing?

EU Project: TOSCA  
Technological and Operational  
Support for Car-sharing

The Benefits of Car-Sharing

How Car-Sharing works  
Book-Drive-Return

Intelligent technologies  
for efficient Car-Sharing

Bremen's experience



## What is Car-Sharing

Car-Sharing is a modern mobility service, which completes the range of environmentally friendly means of transport (public transport, cycling and walking) as it reduces car ownership dependence.

To be fully mobile without owning a car, public transport alone is not enough. In certain occasions it is difficult to manage without a car: for a week-end journey, for shopping, for meetings out of town, etc...

Car-Sharing is based on the principle that a modern service makes mobility more convenient, more rational and less car-dependent. Through the service, a large number of people share a small number of cars that are reserved for them and used individually as required.

It is a convenient service as the Car-Sharing operator owns the vehicles and takes care of insurance and repairs. Car sharers only use the vehicle when they need it and pay only for the period of time and the distance covered.

Car-Sharing represents a more flexible and less expensive alternative to car rental and is to be distinguished from car pooling, where charges of car ownership remain unchanged

As a private car is permanently available, the owner tends to use it without realising that other means of transport are available. Any Car-Sharing scheme is intrinsically linked to a public transport system. Consequently, car sharers make less journeys by car than car owners, as their use of the car comes from a very deliberate and conscious decision. Thus Car-Sharing places itself as an integral part of an intermodal transport system.

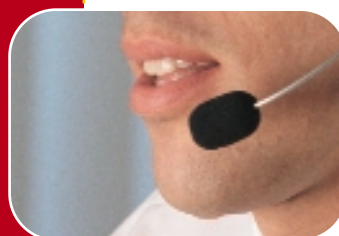
## EU Project: TOSCA Technological and Operational Support for Car-sharing

TOSCA is a project supported by the European Commission to promote integrated Car-Sharing concepts, taken as elements of flexible and intermodal door-to-door mobility, among mobility service operators (e.g. public transport, private company fleet managers, taxi operators, etc.)

Through a technology transfer initiative, the project seeks to promote and test abroad mature proven and leading edge technologies, together with innovative implementation/business concepts of Car-Sharing, already applied in the city of Bremen.

The project also aims to establish an integrated, information technology-based Car-Sharing concept as European best practice and to prepare for further take up in several European cities. ATC Bologna is developing and implementing a pilot application of Car-Sharing in the City of Bologna, based on the implementation and business concept of the Car-Sharing system used in Bremen.

TOSCA is funded by the European Union's **Information Society Technologies (IST)** Programme. The strategic objective of the IST programme is to realise the benefits of information society for Europe, to develop the technologies, to enhance their applicability, and accelerate their take-up in Europe. Information society technologies are increasingly transforming our lives. Their social and economic impact is far reaching and represents key opportunities and challenges for individuals, industry and governments.



## Bremen's experience in Car-Sharing

### General remarks

Bremen is one of the leading cities for environmentally sustainable mobility solutions and in particular for Car-Sharing. The first Car-Sharing experience in Bremen started in 1990, following some early examples from Switzerland. There was some scepticism at the very beginning, but the concept has finally convinced the citizens. From 28 participants sharing three vehicles in November 1990, Car-Sharing has grown to about 2300 clients a decade later. The fleet has extended to more than 90 cars in 40 stations around the city of Bremen. The positive impact on the urban environment and the quality of urban life has led to the establishment of a strong cooperation between the city of Bremen and the car-sharing operator StadtAuto – now renamed Cambio.

### Achievements

- > Since 1998 the public transport season ticket ('**Bremer Karte**') is available in a special offer including the electronic key for the Car-Sharing system ('**AutoCard**').
- > Thanks to the European telematics project **INTERCEPT** (Intermodal Concepts for European Passenger Transport) co-financed by European Commission's Directorate Generals for Energy-Transport and Information Society, the use of modern technologies has been improved. Car-Sharing bookings are now available through Internet, and it has become part of the Bremen intermodal trip-planner scheme. The travel-data is transmitted automatically via the vehicle's on-board computer.
- > In Bremen, Car-Sharing became an integral part of urban development. In housing development schemes, such as the Bremen **Beginenhof project**, Car-Sharing made it possible to reduce the number of parking facilities and to improve the efficiency of the infrastructure. The combination of Car-Sharing and an intermodal trip-planner kiosk, helped to reduce the number of parking places needed to one third of the usual amount.
- > To ensure the high quality of the service and the environmental quality of Car-Sharing, in 1997 the Bremen Department for Environmental Protection launched an initiative within the German Conference of the Ministers for Environmental Protection (made up of ministers from all 16 states and the Federal government) to attach the **eco-label 'Blue Angel'** ('Blauer Umweltengel'), to Car-Sharing schemes. The official German eco-label defines strong requirements in terms of service quality, tariff structure and vehicle standards



## How Car-Sharing works

Car-Sharing is a modern service, which gives its clients full personal mobility. It represents a flexible and cost efficient alternative to the private car. Car-Sharing vehicles can be rented at any time of the day, by the hour or on a daily (and even longer) basis.

When you become a client of a Car-Sharing service, you pay a deposit or create a direct debit from your account, you receive a smart card and a personal PIN code that become your personal key. You also receive a booklet showing the cars available at several locations in your town. Car-Sharing is very easy, and you have access to the cars at any time of day.

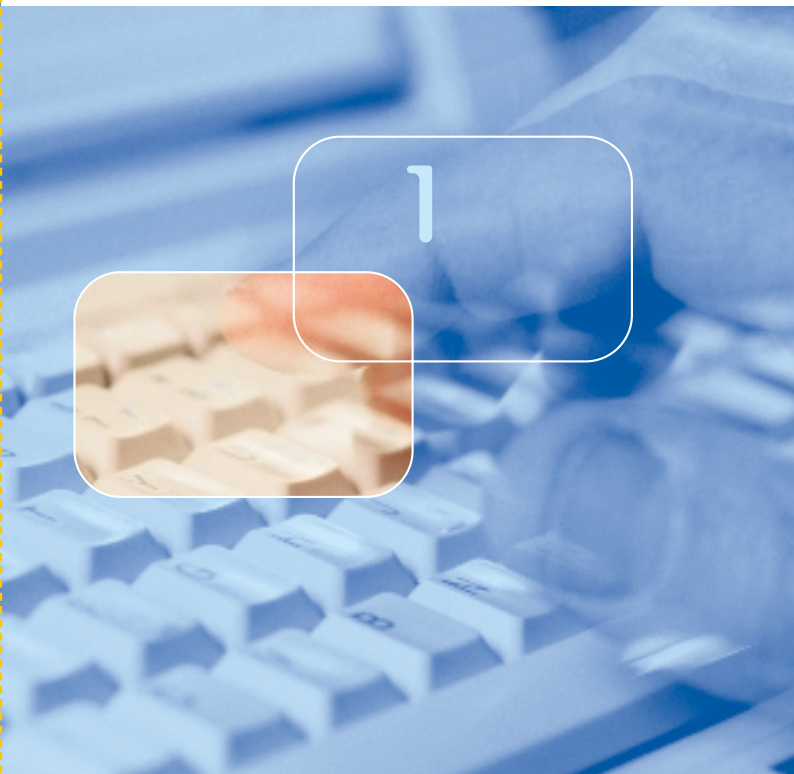
So how does it work?

### 1. Book

The vehicles can be booked at any time, seven days a week. The reservations can be made spontaneously shortly before the trip or days and weeks in advance. Most of reservations are currently made by phone. The use of Internet, however, is becoming more and more popular.

The process is quick and simple. All you need to do is to give your customer identification and to provide information about the type of car required, the location preferred and the booking period. The booking procedure is usually completed in less than two minutes!

Internet has become increasingly useful for Car-Sharing. It enables to check very quickly what type of car will be available, at which stations, and for the period of time you intend to travel. The whole booking procedure can also be completed via the web.



## 2. Drive

You will find the Car-Sharing vehicles at local sites, in reserved parking spaces.

To collect the car key, there is either an electronically controlled locker, or you have direct smart card based access to the car. With direct smart card access to the car, you simply unlock the doors of the car by passing your card along a transponder field on the windscreen, and take the keys from the glove compartment. Via a keypad on the dashboard you type in your PIN code, which releases the vehicle immobiliser.

Since there are no staff at the car park, you need to check the condition of the car yourself. You are expected to return it in the same state. In case you have to refill the tank, there is a fuel-card on-board for easy cash-free transactions.

## 3. Return

At the end of your trip, return the car to its parking space. Put the keys back in their place, and close car or locker with your smart card.

As modern Car-Sharing is increasingly relying on electronic systems, ride data (mileage and time) are usually recorded and transmitted automatically. Otherwise you need to fill in a simple receipt showing your mileage and time of start and return.

*So as a client of Car-Sharing all you need is your smart card, your PIN code and a phone, or Internet access. The Car-Sharing operator will deal with car maintenance, insurance and all the other hassles car owners usually have to deal with. Just the driving is left to you!*



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## Intelligent technologies for efficient Car-Sharing

Information society technologies are definitely increasing the potential of Car-Sharing in European cities. IT based Car-Sharing enables electronic data processing from booking to billing (making manual trip report no longer necessary).

A whole range of software and hardware components are required for setting up a reliable Car-Sharing organisation and communication system, enabling the administration of vehicle pools where several drivers have access to a number of cars.

Some important elements of an IST based Car-Sharing system are:

### Smart cards

The smart card contains an integrated chip, which can be read electronically. For safety reasons, a secret PIN protects the data structure of the smart card to avoid misuse in case of loss or theft. The card has to be presented to the keymanager or, with more sophisticated technologies, it can also be used to give direct keyless access into the car.

As common standards will allow easy use of intermodal transport, Smart Cards will be used increasingly. Car-Sharing will have a significant part to play in this. The contactless Smart-Card can be easily combined with electronic ticket systems.

### Electronic key-manager

This application is installed on the site of the car park. It contains and controls the keys for all the cars related to that location. To collect the ignition key of a reserved car, the customer just has to introduce his contactless smart card and the secret PIN to the keymanager. If a reservation is available, the keymanager opens the doors and releases the ignition key of the reserved car.



### On-board computer

An on-board computer is installed in the car. For security reasons, an electronic immobiliser is installed: only if a key has been correctly released from the keymanager it can be used to start the engine!

The on-board computer records all trip data, and automatically transmits the information at the end of the trip into the keymanager.

In more advanced systems, the on-board computer can be connected with a mobile data radio systems (GSM) or satellite navigation (GPS).

### Software for administration, booking and accounting

A part from the hardware components, there are many different software packages especially designed for Car-Sharing applications. They include administration databases and car-sharing reservation and accounting programmes. The different types of software need to fit with the onboard computer of the vehicles.

### Web server software for reservation via the Internet

The number of online reservations is steadily increasing. The advantage of using the Internet pages is the possibility of finding a wide range of information on the vehicles types and on the integrated mobility services available (public transport, cycling lanes, footpaths, etc..).

This page includes information provided by Invers GmbH, a leading company in technologies for Car-Sharing a partner to the Tosca project.

## The Benefits of Car-Sharing

Saving money while improving your quality of life

### Car-Sharing improves city life and your environment

Car-Sharing provides an incentive to drive less. As each journey is a conscious decision, car sharers travel many fewer kilometres by car than car owners. A reduction in number of kilometres driven means a reduction in traffic congestion problems, local emissions and noise.

### Car-Sharing creates space

Surveys of Car-Sharing showed that each vehicle used for Car-Sharing replaces four to ten private cars. In Bremen, for example, this represents the replacement of more than 500 privately owned cars. As a result 2500 metres of street space has gained.

### Car-Sharing reduces housing costs

Car-Sharing reduces housing costs New houses usually need to have large areas set aside for parking. By reducing these, more houses can be built on the same site. Alternatively, more space can be made available for gardens, play areas or other amenities. Higher quality housing can be provided at lower cost.

### Car-Sharing saves money

Owning a car costs money – whether you drive the car or not! Car-Sharing instead is based on the principle of the “pay as you drive” system. Members of Car-Sharing only pay a low monthly (or annual) association fee and then are charged only for the time and kilometres driven. The less you drive, the more you save.

### Car-Sharing improves your flexible mobility

While reducing the dependence on the private car, Car-Sharing emphasises the role of the car as an integrated element of a multimodal transport system. The car becomes useful if public transport does not provide a sufficient service or when walking and cycling is not convenient.

Furthermore, cooperation with taxi companies and public transport operators is a crucial element in strategies of sustainable transport development. Public transport, Car-Sharing and taxi companies are not competitors but partners in competition with the private car.

### Car-Sharing revitalises local shops

Car sharers make rational travel choices. This means that they usually consider the real cost of each journey they make. Whereas a car-owner would go to a peripheral supermarket, the car sharer would instead consider shopping in a local shop. This choice contributes to the sustainability of urban development.

