While much of the CIVITAS Initiative’s work has sought to shift travellers out of their cars and onto public transport or bicycle, carpooling involves sharing rides among travellers in the same vehicle going to the same destination. Carpooling can be facilitated through ‘matching’ services, but the shared rides themselves are very casual.
The benefits of carpooling

Over the last few decades, social and economic improvement in Europe has been supported by a growth in individual mobility. However this has resulted in increasing traffic congestion in urban areas and environmental deterioration. Although satisfying demand for mobility is a key factor for urban residents’ quality of life, transport has begun to pose a threat to modern societies. In an era of increased demand for alternative means of transport, carpooling presents a viable solution for daily commutes. Although this Insight concentrates on carpooling, readers should be aware that there are many different forms of shared transport in this growing sector.

Although at first glance car sharing and carpooling may appear closely related, they each address different problems and different target groups. Car sharing can be defined as a group of people sharing a fleet of cars by paying an annual fee, as well as paying for each kilometre travelled and the time per use. The general idea of car sharing is ‘pay-as-you-drive’ which leads to more optimised car usage. Car sharing fleets are usually organised by a private company or association subsidised by a local or regional government or public transport authority, and is generally offered to the public and sometimes also to business customers.¹

Carpooling, meanwhile, refers to several individuals sharing a journey or portion of a journey in a single car. Household-based and non-household-based carpooling can be distinguished by the routes taken as well as the perceptions of the people who carpool. For example, the members of the same household have the same starting point and the level of trust between them is high. This is the simplest type of carpooling; in any other case, the system of carpooling becomes more complex, and requires flexible solutions for travelers.

This could include defining a meeting point at an intermediate place, or a driver picking up or dropping off other commuters on the course of his/her journey. Apart from the case that travellers may have different origin and destination locations causing increase of the complexity of carpooling, socio-demographic characteristics and psychological barriers, attitudes and perceptions seem to affect the success of a carpooling system. The review of relevant studies² showed that there is not a strong correlation between socio-demographic parameters with the tendency to carpool, even though it was observed that lower income classes, due to the lower percentage of vehicle ownership or car availability carpool more often than the higher income classes. Also, findings showed that higher educated people, probably associated with higher income, and females with young children carpool less.

Carpooling is one of the most common and cost-effective alternative modes, particularly in areas that are not well served by public transport. Many commuters carpool several times a week. Carpooling is also an important mobility option for non-drivers, particularly in small towns and rural areas. The success however, also depends on a variety of incentives, such as:

- Fare subsidies from employers or transit agencies.
- ‘Pay as you drive’ vehicle insurance that means that a vehicle’s insurance premiums are based directly on how much it is driven - less driving means lower premiums.
- HOV Priority, which refers to strategies that give priority to high-occupancy vehicles, including transit buses, vanpools and carpools. Two, three or four occupants may be required for a vehicle to be considered an HOV, depending on local circumstances.

¹ More information on Car sharing can be found in the CIVITAS Insight05 - Car sharing: New forms of vehicle use and ownership( accessed December 17, 2015, http://www.civitas.eu/content/civitas-insight-05-car-sharing-new-forms-vehicle-use-and-ownership.

Apart from the incentives previously mentioned, carpooling also provides both social and private benefits for users such as:

- A decrease in polluting emissions and related health problems.
- A decrease in congestion, waiting time in traffic jams, and the risk of car accidents.
- A reduced need for an extra car in the household.
- Shared costs such as for fuel, road tolls, or for parking among the carpoolers.

CIVITAS explores innovative ways to break the car habit

Carpooling schemes encourage car owners to cut congestion by sharing their journeys with others. Typically such schemes are led by workplaces and include information technologies such as online booking. CIVITAS counts carpooling as an important and innovative way to break the car habit and promotes the sharing of successful strategies among cities. The CIVITAS Thematic Group on Car-independent Lifestyles provides a number of resources relevant to the topic, aiming to spread lessons learned more widely.

CIVITAS I | Graz (Austria): Increasing car-occupancy rates

Aiming to reduce the proportion of single-occupancy cars on the roads of Graz, a bus-lane bypass was used to create the city’s first high-occupancy vehicles (HOV) lane, and ‘park and pool’ facilities for commuters were established on the outskirts of the city. The high-occupancy vehicle lane had to comply with the standards of the National Highway Administration, which ultimately meant that the city would have to purchase sections of road before the HOV lane could be implemented in December 2004. Since the introduction of HOV lanes was not foreseen in Austrian law, use of an existing bus lane was seen as a feasible way of proceeding. As a result, the bus lane could also be used by taxis and vehicles with three or more passengers. Other roads with bus lanes were assessed as potential HOV lanes. However, the disadvantages for public transport were greater than the advantages for cars. If just five percent of all cars used the lanes, a 35 percent negative impact could be expected, especially at traffic signals where bus priority would be shared by cars. Other roads would have required expensive reconstruction work to make the HOV lanes possible.

CIVITAS PLUS | Craiova (Romania): Encouraging carpooling to and from industrial areas

In Craiova, like many cities in Romania, the private car is the most popular and convenient mode of transport, especially for commuting to work. Many employees working in the industrial areas of the city have reduced access to public transport and no option other than using taxis or their private cars to get home. In this area, the distance to the nearest public transport stop is between two and four kilometres. This further discourages employees to use the public transport service. The number of cars on the road in this industrial area was approximately 2,500 standard vehicles per hour (in 2012) and this was predicted to rise to 3,000 by 2015. Another major problem is the low number of parking spaces available.

This measure aimed to optimise transport for specific users such as the employees of large plants and factories by setting up a flexible transport service of carpooling and parking facilities for carpooling service users. Employees were encouraged to carpool with at least three passengers in each vehicle. Moreover, one of the most effective ways of encouraging carpooling was to designate parking places for carpool vehicles. During implementation a software program was developed that allowed the identification of groups of up to five employees which lived in close proximity to each other, making it more realistic for them to carpool together. As a result, 33 carpooling groups were created. Although the operation period was short, the first results and the social impact evaluation showed good results in terms of the use of the service, reductions in costs, and the willingness by users to continue carpooling.

CIVITAS II | Norwich (United Kingdom): Relaunching a carpooling scheme

The aim of this scheme was to develop a voluntary carpooling scheme as a way of tackling road congestion and emissions, targeted at businesses in the Norwich area. In the early 1960s, car ownership grew dramatically and the road network expanded, and the need to travel to out-of-town facilities such as supermarkets and leisure centres also increased. By the late 1980s, local car ownership had grown to such a degree that just over a third of the adult population owned a car, leading to a rise in single-occupancy car journeys. Norwich’s measure was designed to tackle the resulting congestion in the overburdened transport network by relaunching and rebranding an existing carpooling web tool to make it easier for people interested in the system to match journeys. A travel plan officer identified companies and organisations with existing workplace travel plans that could make use of a carpooling scheme. The officer then assisted in establishing, maintaining and monitoring the scheme and making recommendations for improvement. All 20 target workplaces set up a carpooling scheme and information was disseminated to a further 20 businesses outside the city centre.

Membership of the carpooling scheme rose to 2,400 across public and private companies and organisations. The measure reduced local congestion by lowering the number of commuters travelling in single-occupancy cars. Since 76 percent of commuting carpoolers previously travelled in single-occupancy cars, the measure removed approximately 1,646 single-occupancy cars from the network at peak travel times. The measure saved 304 tonnes of CO₂ and contributed to improved air quality and a reduction of 993,690 commuter miles (i.e. 1.6 million km) travelled and reduced costs for both commuters and companies.
Comparative data from the European Environment Agency suggest that passenger car occupancy rates are stabilising in Western Europe (Austria, Denmark, Italy, Netherlands, Norway, Spain and United Kingdom) but declining from a higher baseline in countries like Czech Republic, Slovakia, and Hungary. This would be expected given that rates of car ownership are growing more rapidly in Central and Eastern Europe. The most recent data for the average number of passengers per car for the Eastern European countries sampled is approximately 1.8 passengers per vehicle. This is considerably higher than the average number of passengers per car for the Western European countries sampled which was 1.54 passengers per vehicle (2007 data). Therefore, a significant portion of road congestion from daily commuting seems to stem from unwillingness on the part of some commuters to consider options other than driving. This suggests that even if a small share of the current drivers switch to carpooling, a directly proportional decrease in congestion can be expected. For instance, if the average vehicle occupancy were increased by just 0.3 passengers per car, car traffic would be reduced by up to 20 percent. The higher the rate of carpooling, the more congestion will decrease, with accompanying decreases in wasted time and energy.

It is important to note that the European Commission has always put emphasis on promoting effective public-private partnership in the projects it supports, and particularly in relation to carpooling. The following non-exhaustive list provides an overview of different examples and experiences of past and ongoing projects and initiatives in Europe.

- The objective of the CARPLUS project (1996 – 1998, co-funded under FP4) was to integrate carpooling applications within the existing telematics infrastructure of a city in order to provide additional real-time information and improve the service for users and encourage its use. CARPLUS included demonstrations in the five cities Madrid (Spain), Rome (Italy), Lille (France), Stuttgart (Germany), and Zurich (Switzerland) to cover a wide range of characteristics, both in terms of the characteristics of users segment and different telematic solutions.

- Stop Covoiturage is an innovative scheme combining aspects of hitchhiking and carpooling. Launched in July 2013, the initiative is located in Val de Saône (France). Members of the scheme travel short journeys, taking people to public transport hubs or to work. By boosting the connection between public and private transport, the number of individual car journeys are reduced and use of intermodal transport is increased. Physical meeting and stop points have been established at locations where people can meet a driver to share a short trip.

- The CHUMS project (2014 – 2016, co-funded by Intelligent Energy-Europe) builds on proven strategies and technologies to remove non-technological barriers to wider uptake of carpooling for commuters. The strategic aim of CHUMS is simple: to attract carpoolers, to match them and retain them, to increase their numbers, and to develop and transfer this proven practice to other cities. The goal is to create a sustainable market for carpooling across Europe, making it a more common way to travel and recognised as a conventional mobility mode. All of the five champion cities Craiova (Romania), Edinburgh (United Kingdom), Leuven (Belgium), Perugia (Italy), and Toulouse (France) have carpooling systems at various stages of maturity, which serve ‘closed’ target groups such as workplaces, large employers or universities. Once proven, the application will be equally valid for systems used by the general public. The project’s Behaviour Change Strategy includes a Carpooling Week, personalised travel plans which include carpooling options, and a mobility jackpot lottery to attract carpooling users. These activities have been shown to produce significant behavioural
changes and lead to increased car occupancy, reduced car numbers on the roads and significantly reduced energy use. The Carpooling Week, which has been tested in over 1,000 sites in the United Kingdom, won a Queen's award for its achievement.11

- The SocialCar project (2015 - 2018, funded under Horizon 2020) takes the achievements from CHUMS project to a new level, using the latest innovations in Intelligent Transport Systems (ITS). By integrating carpooling with public transport networks, carpooling can become a mainstream travel mode. In this way, it can extend public transport to areas of cities where it has proved difficult to operate services without large investments or subsidies from public funds. The system will be tested in 10 European cities which currently offer carpooling services at different levels of maturity. The aim is to develop a system that can work in all cities across Europe, with a clear cost benefit analysis and business model to encourage others to replicate it.12

The term ‘shared economy’ tends to involve the use of same goods and services by a community of people. However in recent years, shared mobility has become a byword for reducing individual and societal carbon footprints and fostering more sustainable transport. In particular, carpooling as a service has a bright future, although its growth and direction are uncertain.

The future of carpooling: a crowded backseat?

The next decade is likely to see positive developments in terms of service, technology and political support. Sharing journeys is relatively cheap compared to developing new infrastructure, and is able to offer significant returns on investment for sustainable local transport. Several key messages can be discerned from the experiences of CIVITAS cities which established carpooling systems:

- **Raising awareness**: Good marketing is vitally important to the successful implementation and operation of a carpooling service. Marketing and publicity campaigns have to be comprehensive, using a range of available media to communicate clear and concise messages. The way the service works needs to be clearly explained as a large section of the population is likely to be unfamiliar with the concept. The positive benefits of carpooling need to be ‘sold’ to potential users, and selling the concept to decision makers is a prerequisite for political support. There is also clear value in dedicated awareness campaigns focussing on particular target groups for membership. Marketing also has to be sustained to build and maintain a large enough user base to support the operation of carpooling.

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**Policy integration:** Carpooling services often depend on the successful integration of the system with a city’s wider transport policies and operations. Carpooling is most effective if it is part of a city’s overall mobility management strategy with complementary measures and incentives. Cities which have formal goals to increase carpooling have higher rates of carpooling overall, suggesting that leadership has a small but significant effect in influencing commuters’ decisions. Rather than try to expand carpooling across a large area, planners should focus on building a self-sustaining amount of users along several smaller routes. They should be promoted as one of a number of transport options available to travellers in the city.

**Clear strategy:** There should be a clear strategy for implementation, with clear objectives which match the needs of potential users - therefore, stakeholder engagement is critical at the planning stage. Among the key factors for determining the need for carpooling are the energy, environmental and economic costs of motoring; congestion; parking provision and related land-use issues; quality of existing public transport and non-motorised transport services; and infrastructure. Carpooling should seek to complement, rather than compete with, public transport, walking and cycling.

**Work travel planning:** Carpooling should be integrated into work travel-planning strategies. The greater the number of employees in a given location, the more likely it is that carpooling matches can be found. A common incentive for large companies, universities, and hospitals is to encourage carpooling to reduce the need for parking infrastructure. Extending pre-tax benefits for employees, such as free parking or transit costs, could make carpooling more appealing to commuters.

In summary, it can be said that carpooling has the potential to make a valuable contribution to making urban mobility more sustainable and support a new culture of car use. As such services develop, it is important to consider the needs of existing and future users to understand the possible long-term impacts on car ownership and travel behaviour. As people who carpool do so by choice, it is important to tailor the service to users and support their needs.