Background for Cluster 5: network and mobility management

Cluster 5 addresses in general, measures in the areas of parking management, access management, traffic and mobility management and control, traffic information and journey planning systems, cooperative intelligent transport systems (C-ITS) and pricing policies. Specific emphasis is placed on technological and institutional challenges, and barriers for implementation.

The main goal is to provide examples of successful deployment in European Cities and lessons-learnt. The objective of the aforementioned areas for technical and planning measures is to ensure seamless transport, connectivity, more flexible travel, lower environmental impact and support of multimodal mobility behaviour and lifestyles.

Measures analysed in this cluster try to make the best use of available resources in cities and city regions, and help plan and implement additional measures. It is important to ensure that multiple mobility options in urban environments are provided, and not unduly restricted e.g. unavoidable car trips.

Solution 5.1: parking management

Parking management, particularly in densely populated city areas is increasing in importance. Growing and shrinking cities and districts in European member states are very often relatively close to each other, allowing for daily commuting from one centre to the other. This emerging type of urban structure, called central/city region, is different from urban sprawl structures in other regions.

In growing districts within the city these regions, in particular the inner city areas, parking stress is heavily increasing, due to the growing number of daily commuters, shopping and leisure visitors. Also, parking-capacity shortage is driven by increasing populations living in attractive inner city districts, further densifying these districts. Policy and planning objectives vary among city and city regions in

Europe; strategies to tackle the aforementioned problems and trends are manifold.

One strategy is to increase parking supply; new or retrofitted buildings must include parking space for residents, in most cases underground. In old buildings, e.g. those constructed before the introduction of cars, ground floor apartments can be converted to parking spaces.

Solution 5.2: access restriction

Urban access restriction management strategies aim to "restrict and enable" access to city districts or network intersections. These strategies allow congestion and parking stress to be reduced, and can improve traffic safety and network operation. The most far-ranging strategies for access restriction involve allowing entry for individual vehicles, booked in advance, such as in Bergamo and Rome in Italy. Alternatively, entry may be granted to holders of passes e.g. tags on number plates.

Access restriction schemes (ARS) can be classified in the following 4 types:

Point based access systems (e.g. restriction to cross a bridge or enter a section of the city); charging may differ with vehicle type and vary with time of day.

Cordon based access system: a restriction is applied to crossing a particular cordon, and may vary with time of day, direction of travel, vehicle type and location on the cordon. There could be a number of cordons with different access rules and charging schemes.

Area license or area charging: a restriction is applied for driving within a particular area during a period of time. Access and charging rules may vary with time and vehicle type.

Distance or time based charging: is essentially a restriction based upon charging for the distance or time a vehicle travels along a corridor or in a specific area and may vary with vehicle type, location and travel time. A specific vision is the allocation of network kilometres per user, e.g. with prepayment

systems or equal quota per user.

Solution 5.3: traffic management

Traffic management and control has the goal of maximising the effectiveness of existing infrastructure, ensuring reliable and safe transport, addressing environmental goals and ensuring fair allocation of infrastructure space to users.

This covers planning and preparing for expected traffic volumes, continuous monitoring and, if necessary, taking corrective measures by directly influencing traffic.

Solution 5.4: multimodal journey planner

Multimodal journey and mobility planning apps can be considered transport-related ICT, allowing users to plan and monitor their trips.

The speed of innovation in this field is very fast. Large companies and investors like Google and others are driving innovation and generating location-based data. This data is valuable in gaining consumer profiles and in order to personalise marketing. Although this data is very sensitive regarding privacy and surveillance aspects, as most users have to share their data.

Personal travelling companions are available as mobile applications, facilitating personalised travelling information, including different transport modes and other information like accommodation or restaurant opportunities along the route.

This additional information may not be relevant for all travellers, but is good business for the provider, who charges hotels and restaurants for providing their service. Mobile apps can provide personalised travel suggestions, offering a wide range of transport alternatives and, in case of delays or disruptions, provide alternative routes. These companions can encourage the use of climate friendly modes by informing users on their carbon footprint or even facilitating rewards.

Solution 5.5: Cooperative Intelligent Transport Systems (C-ITS)

The term Cooperative Intelligent Transport Systems (C-ITS) is a term for the next-generation of Intelligent Transport Systems (ITS). The deployment of new transmission technologies like wireless (WIFI), near field communication (NFC) in the past years, as well in satellite-based and other location systems are improving the possibilities offered by intelligent or smart transport systems.

C-ITS can be implemented at the local, regional, the national and international level. Such systems allow constant tracking and tracing of freight, enhancing GPS-based road user charging and, most significantly, are set to shortly allow semi-automated autonomous driving.

Currently in the USA, the use of autonomous driving systems has been proposed on large and heavily congested radial roads. However, such systems are still very costly because of the requisite combination of satellite, infrastructure, car-side sensors and positioning systems.

SUPERHUB project

Solution 5.6: car-sharing

Car sharing is a model of car rental for shorter periods than typical at conventional car-rental, called car clubs in some countries (UK). It allows car use without ownership.

The main factors driving the growth of car sharing in urban areas are the rising levels of congestion and parking stress, the increasing cost of individual vehicle ownership, and a convergence of business models to pool and share cars. For future applications, many car sharing companies are now investing in electric car fleets respectively in plug-in hybrid electric vehicles.