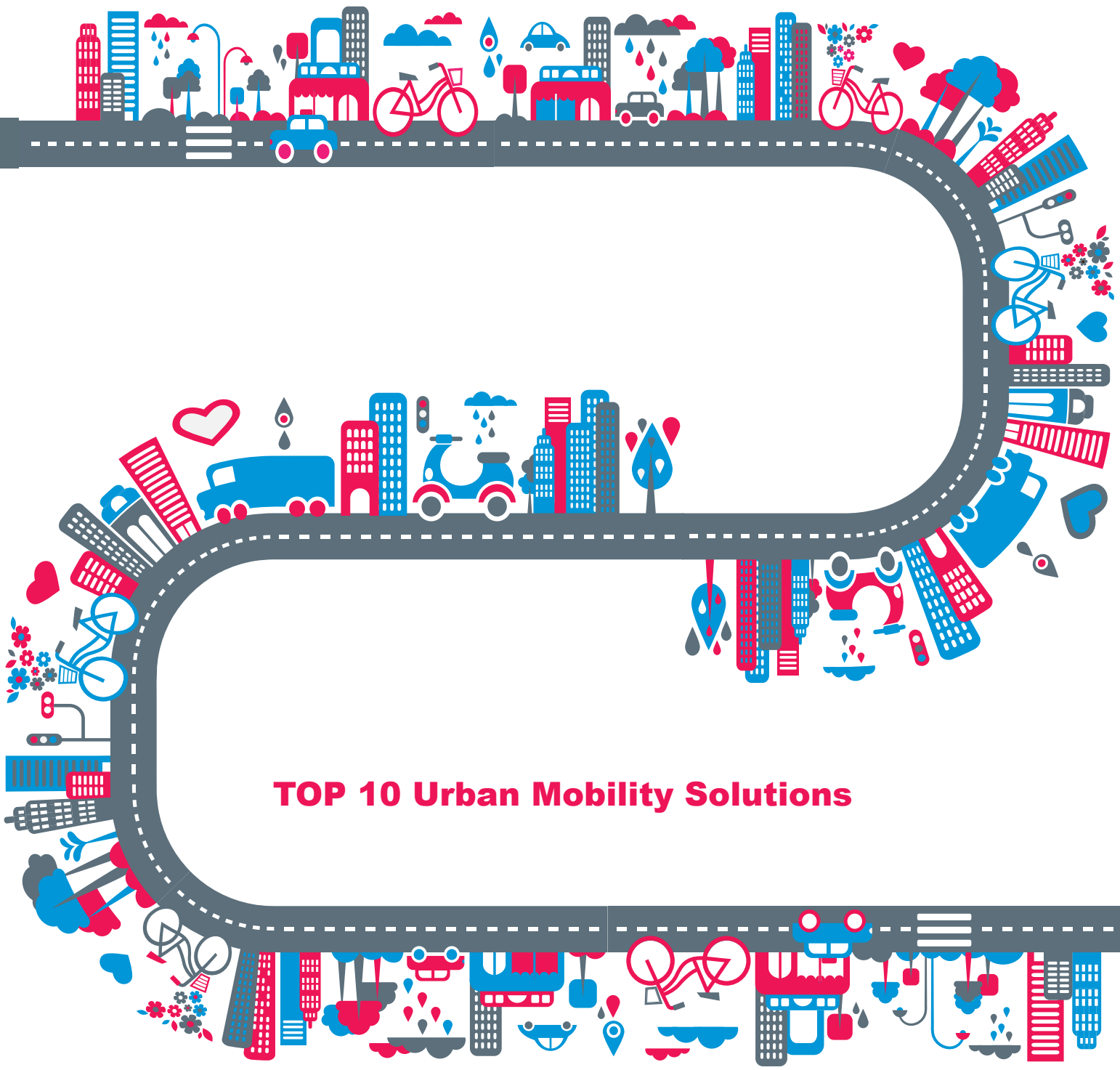




Viajeo PLUS



TOP 10 Urban Mobility Solutions

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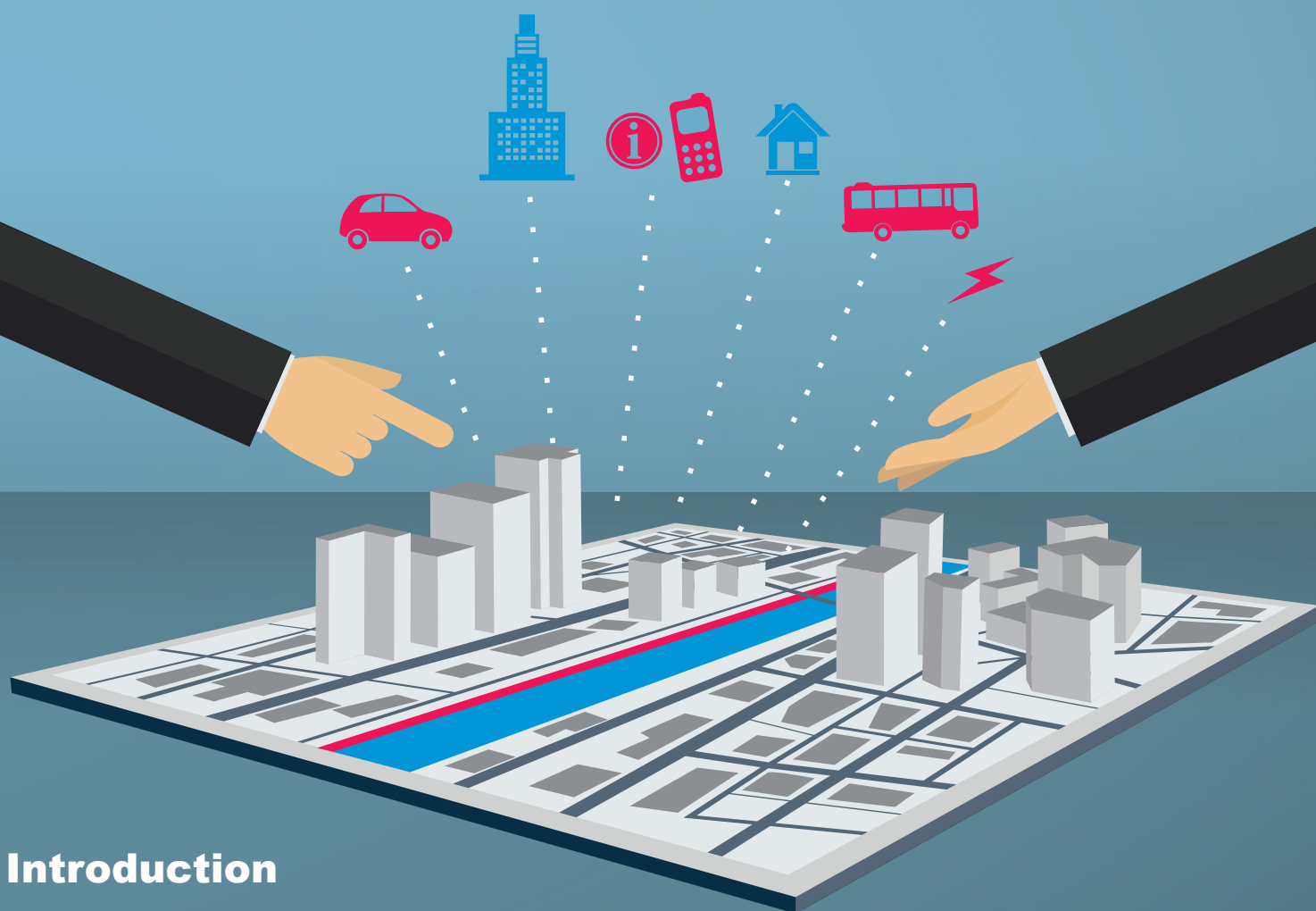
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Introduction

Urban transport is strategically important for economic competitiveness, social cohesion and sustainable growth.

This brochure showcases ten examples of innovative and sustainable urban mobility solutions implemented in different parts of the globe.

These measures seek to tackle urban congestion, greening the transport network and making it safer, more efficient and accessible.

Learn more about this and other solutions at www.viajeoplus.eu/best-solutions

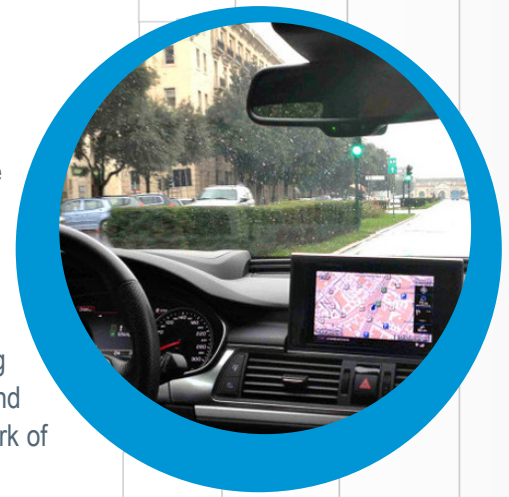
Cooperative ITS in Verona

Cooperative Intelligent Transport Systems (C-ITS) allow the vehicle to communicate wirelessly with another vehicle (V2V) or with infrastructure (V2I). The benefits of cooperative systems range from an improvement in traffic management and more traffic efficiency to less congestion and polluting emissions, among others.

Verona city, in partnership with Swarco and Telecom Italia, deployed a pioneering Cooperative ITS (C-ITS) system involving not only public services such as buses, taxis and cars from the municipality, but also general public. This has been done within the framework of the EU co-funded project Compass4D.

I2V tests were carried out also in 2012 in Verona in the context of public private partnership between municipality of Verona city and important leader industry in ITS solution SWARCO and car manufacturer-OEM AUDI.

A traffic light assistant app was developed to provide the driver with speed advice and time-to-green. The app can be either downloaded in a smartphone or integrated into the on-board unit of a car. By communicating with the infrastructure, vehicles can travel at an optimum speed as they are not required to stop-and-start at traffic lights; curtailing exhaust fumes emissions and traffic bottlenecks and improving safety. Moreover, the system grants priority to public transport, monitors traffic and warns about hazards, thereby speeding up emergency response.



Success factors

- C-ITS service provided at city wide level (in more than 100 intersections) using mobile communication (UMTS/LTE)
- Embedded into an advanced integrated traffic management system. Such integration permits data to be shared between different types of ITS applications implemented within the same geographical area
- Synergies allow making more and better information available to operators and to final users (travellers) while reducing costs due to the possibility of sharing equipment, databases and staff

Looking into the future

There are discussions ongoing about the possibility to merge Verona's urban C-ITS with Trento interurban C-ITS, extending the system towards the interurban Brennero motorway which connects both cities.

In Europe one of the main agenda points for the future is autonomous driving. An important pillar for their deployment will be C-ITS.



Beijing e-tricycle for last-mile delivery of goods



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The era of global exchange and ubiquitous information availability has boosted e-commerce. The requirement for capillary distribution has increased dramatically, emphasizing the significance of the 'last mile'. E-tricycles have been widely used in Chinese cities for the last mile delivery since an e-tricycle can park anywhere without request of additional loading space. They are made of a steering front wheel, the seat upon the battery, and a flat tray behind over the carriage two wheels. No public charge points are available. The vehicles are recharged with standard power sockets. It is estimated that in Beijing, 15,000 to 20,000 are used for parcel delivery. Approximately 90% of home deliveries in Beijing are carried out by e-tricycles.

Use of e-tricycles for last mile delivery has been a controversial topic for the Chinese transport and vehicle authorities as well as law enforcement bodies. Many cities including Beijing had banned or limited use of e-tricycles for delivery for safety reasons. However, because of the huge market and increasing demand on e-commerce, e-tricycles have never disappeared. In July 2014, China Post, commissioned by the central government, published a National Standard of Goods Delivery e-Tricycle. The standard came into force in October 2014. According to the standard, all e-tricycles have to be registered as motor vehicles and must meet certain safety standards.

Success factors

- The pressure of real time delivery demand and need for responsive solutions
- High quality of service through low tech design solution (cost efficiency)
- Affordable investment for the service provider
- Emission free mobility service at point of use
- Allowance for informal (but not illegal) activities and for parking of vehicles on the pavement
- Business support embedded solution accessible to single private venture
- Proximity and density of customer clusters
- Multiple applications of the wheelbase: parcel delivery, goods delivery, street vendor display, etc.

Looking into the future

Charging and parking issues need to be perfected, as well as their integration in the whole eco-system of vehicles, infrastructure, service and operation management. However, the use of e-tricycles demonstrates the feasibility of using small and green vehicles for last mile delivery.

The solution can also be integrated with other initiatives such as "Twizy cargo" and the "Twizy R plug concept" being developed by Renault, which use electric quadricycles.



Electric and hybrid buses in Hamburg

There are currently many cities in Europe deploying electrified bus systems including hybrid buses, plug-in hybrids and fully electric buses.

The public transport company Hamburger Hochbahn A, is running comparative tests of innovative drive technologies under the strict everyday conditions of scheduled services, utilising Volvo vehicles. The Innovation Route 109 of HOCHBAHN will be almost exclusively served by buses with innovative drive technologies. Different types of vehicle and drive modes are being tested in parallel and under identical conditions.

Three 7900 electric hybrid buses in both 18 metre articulated and 12 metre versions have been tested on the route, as well as battery fuel cell buses and fuel cell buses from different manufacturers.

The Innovation Route 109 runs from the new Electric Bus Terminal near Hamburg Central Station to the final stop at the underground station in Alsterdorf. With a length of about ten kilometres, it is highly suitable for the electric hybrid buses with plug-in technology that permits full electric operation over at least seven kilometres. Charging takes place at the two bus terminals.

Success factors

- High public demand for clean, quiet and efficient public transportation
- Strong collaboration between the key actors
- New electric bus models
- High-capacity batteries and super-capacitors as storage media
- Convenient bus-stop charging stations
- Battery swapping stations, swapping robots and remote battery monitoring systems

Looking into the future

In spite of investment costs for new buses and charging stations, limited battery life and reduced operational efficiency for the need to charge at selected bus stops, electrification of public transport has a great potential.

The city of Hamburg has a plan to completely electrify its public transport system, and from 2020 it will only use emission-free buses.



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Madrid Public Transport Interchanges Plan

Transport interchanges are a crucial part of public transport, allowing travellers to make multi-leg trips pleasantly. They reduce journey times and improve quality of service.

In Madrid, 5 interchanges have been built up in the nodes where the main road infrastructures are linked to the Circular metro line, which provides interchanges with the other lines. Metro Madrid is the backbone of the metropolitan transport system, which is complemented by urban and metropolitan bus network as well as suburban railway and light rail.

Interchanges are big-sized infrastructures which act as access gateways to the city public transport system, optimizing the transfer between different transport modes. This has been complemented with smaller interchange infrastructures called “intermodal areas”, which facilitate the transfers between urban bus and metro lines.

Madrid’s Interchanges move more than 1 million users per day and manage the passengers’ flows accessing the city from all its main entries.

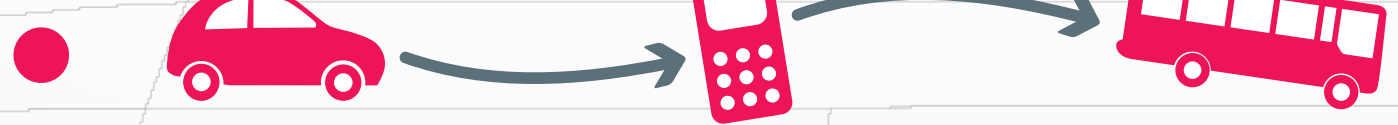
Success factors

- Strong public-private cooperation
- Profitable infrastructure and high potential to obtain complementary revenue (e.g. parking facilities, commercial area)
- Located in strategic points of Madrid
- Integration of different modes and mobility demands with reduced transfer time
- Good signalling, accessibility and safety
- Adaptation to operating needs (e.g. tunnels entering in the interchange to avoid congested surroundings)

Looking into the future

Two more interchanges will be built in Madrid, together with additional intermodal areas located in strategic points of the urban area, where the mobility demand is very high.

In the future, similar interchanges will be built in the metropolitan area to connect radial bus lines from areas of minor density towards high capacity radial transport modes. They will also facilitate transverse through the region and private-public transport intermodality.



Bus Rapid Transit in Brazilian cities

Large events require the host city to adapt its transport network in order to cope with intense and highly polarized traffic flows. Temporary transport services designed for mobility of participants and logistics need to be set up. However, large events can become a golden opportunity to finance structural reforms. In Brazil, 9 of the 12 cities selected to host sport events in the frame of FIFA World Cup in 2014 chose to introduce or further develop Bus Rapid Transit Systems (BRTs). Originally designed, tested and operated in Curitiba, BRT systems are a key ingredient in Brazil's urban transport mix. BRT combines exclusive and segregated bus ways and traffic signal management that can help minimize delays by holding green signals for BRT buses approaching an intersection. This integrated transit system results in substantial reduction of travel times and improved public perception of public transport.



For instance, the city of Rio de Janeiro, which already has 2 BRT corridors, will create two more (Transolímpica and Transbrasil) in preparation for the Olympic and Paralympic Games 2016. In total, these corridors, connected and monitored by the Operational Control Centres, are expected to move 1.6 million passengers per day.

Success factors

- Reduced travel time
- High frequency of buses
- Inter-modal integration in the metropolitan region
- Electronic information about lines, schedules and destinations available
- Cost-effective (cheaper than light rail and subway)
- Low time for implementation required
- Flexibility in terms of capacity

Looking into the future

As Brazilian authorities aim to promote non-motorized modes of transport, the construction of bike paths along the BRT corridor is planned. The integration between BRT and bicycle mode occurs through the construction of bike racks on all integration terminals. For pedestrians, the project of implementation of the BRT envisages the treatment of the sidewalks along the corridor.



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Property and Rail development in Hong Kong

Hong Kong is one of few places in the world where public transport creates profit. The “Rail-Property” (R+P) approach (i.e. integrated planning of public transport, residence areas and commercial property developments) has enabled the city’s success.

In the 1980s, Hong Kong started to integrate railway stations and real estate development above and around them, resulting in a sustainable finance model of public transport. The approach not only covers the capital and running costs of public transport but also aims at providing good living and work environment around station areas and along railway lines.

The main railway operator in Hong Kong, MTRC, is not subsidised by the HK government but receives the exclusive development rights for the land above and adjacent to its stations. MTRC operates on commercial principles - financing and operating railway services that generate a net return of investment. Property development has been the main means for generating revenues that cover the cost of railways, operations and maintenance.

Success factors

- Collaboration between public transport agencies and city administration on integrated land planning to identify best locations for stations and property
- Good timing and project phasing
- High population density and busy traffic make it more appealing for people to live near a station
- Property market boom and demand of good quality of living spaces
- Improved infrastructures and services
- Link between efficient public transport and economic growth

Looking into the future

The R+P approach has been very influential in eastern Asian region and major cities such as Singapore and Shenzhen have adopted it. Many other cities in mainland China plan to use this model to develop their expensive metro and urban railway systems.

Financing public transport has also been identified as a key priority by Mediterranean Partner Countries (MPCs). Most major cities in MPCs lack good public transport services. Since many major cities in MPCs also have high density the R+P may be a good solution.

Flexible Cycling Facilities in São Paulo

São Paulo has massively expanded its cycling network and implemented exclusive bus lanes (BRT) in order to make this mobility option more attractive and reduce congestion, air pollution and noise.

São Paulo has applied an innovative approach to allow flexible use of road space. The approach is called “Leisure Operating Cycling lane” (or Operational Bike Lane) which turns middle or left lanes into cycling lanes on Sunday and national holidays from 7:00 – 16:00. Such cycling lanes are totally separated from general traffic by pipeline elements such as cones and easels and special signals are put in place. Currently 120.8 km of roads are converted to Leisure Cycling Lanes and more the 120, 000 people use the infrastructure.

The first Leisure Cycling Lane implemented in 2009 was a major success.

This led to the creation of new routes in 2011 and in 2012, reaching up to 19.5 km and 59.5 km respectively. The success also led to an extension of the operation hours and days, with the inclusion of national holidays.



Success factors

- Severe congestion in the city urged authority and citizens to seek more sustainable transport solutions
- Strong political push for sustainable transport solutions
- Effective lobby and promotion of the ‘Leisure-oriented’ for cycling in the city
- Good public participation and user acceptance

Looking into the future

São Paulo continues to expand its cycling network, aiming to connect the cycling paths with the main business and residence areas as well as public transport services, while improving traffic signals for cyclists and motorists.

This model has been adopted by other cities such as Brasília, Curitiba and Rio de Janeiro. However, to improve the cycling infrastructure in some of them it is still necessary to connect it with leisure and parking facilities.

London Urban Logistics Solutions

In London, economy and population density are expected to grow in parallel. This will increase the need for people and businesses to share the limited space of the city. In this context, sustainable urban freight will be important. These are the three pillars of the London Freight Plan 2007:



Fleet Operator Recognition Scheme (FORS): Free membership scheme which provides vans or lorries operators with advice on how to reduce fuel consumption, CO₂ emissions, vehicle collisions and penalty charges. The programme is delivered through company training, workshops and electronic tools.

Delivery and Servicing Plans (DSP): It is about management and organisation of multiple operations of last mile deliveries optimised by efficient freight planning. The aim is to provide a framework to better manage freight vehicle movement with a focus on the receiver within the supply chain, as opposed to traditional intervention strategies that have focused on the transport operator. DSP application is still on a trial phase.



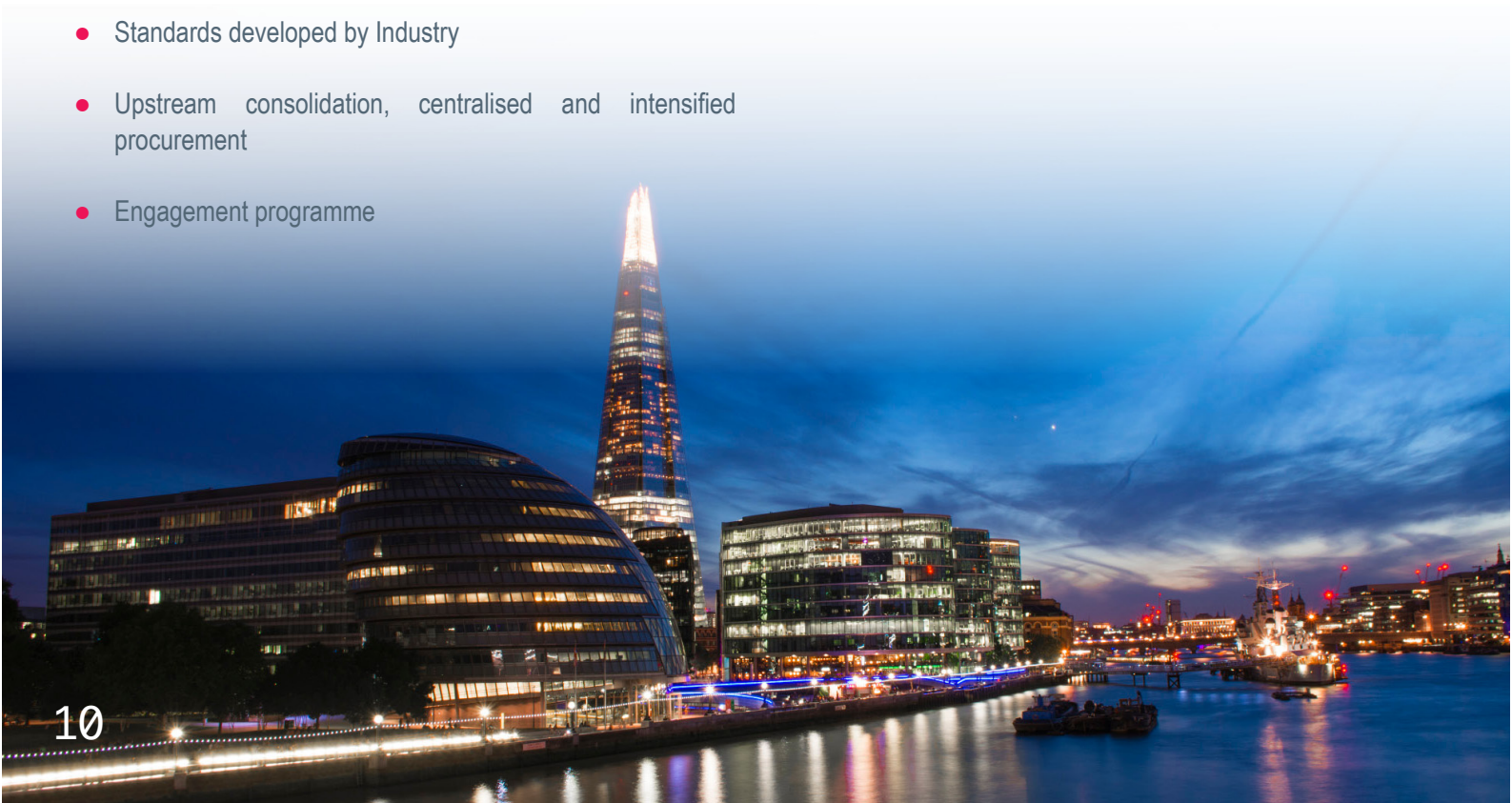
Construction Logistics Plans: The 2007 Transport for London freight plan introduced the use of consolidation centre for construction to serve four major construction sites in the city, reducing the number of deliveries going there and, as a result, reducing traffic congestion and vehicle emissions. It eliminated the use of Heavy Goods Vehicle or articulated goods vehicles for site delivery and significantly reduced the use of vans.

Success factors

- Strong policy basis with funding and enforcement mechanisms
- Private sector involvement
- Freight Quality Partnership
- Use of the planning system (e.g. re-timing and booking, vehicle routing, use of consolidation and holding areas, etc.)
- Standards developed by Industry
- Upstream consolidation, centralised and intensified procurement
- Engagement programme

Looking into the future

Cities in UK with urban freight issues is encouraged by the central government to adopt FORS alongside other feasible combination measures such as DSP and Construction Logistics Plans as promoted in London and/or other typical city logistics interventions such as the adoption of urban consolidation centres with the use of electric/hybrid/non-polluting vehicle for the last mile delivery.



Shanghai Freight Market

The main purpose of a freight market is to link the owner-operator with the transport buyer through a transport agent, often using a cover logistics company. A freight market is usually a very large physical distribution centre for trucks. In Shanghai there are two main freight markets: Huahuan and Hongbao.

In the core of the freight market are the booths for the agents and the information screens displaying available shipment details. The agents are in contact with the goods owners and transport agents gathering information regarding available shipments. Information regarding destination, size and weight of the goods through person, telephone etc. is then made available for the fleet operators and truck drivers on information screens at the freight market. The drivers and fleet operators contact the agent to negotiate price and other transport details before performing the transport assignment according to the goods owner instructions, where to pick-up and deliver goods.



The freight markets also provide additional services; basic warehouse services, vehicle repair, spare parts shops, restaurants, shops, hotel services, parking facilities and more to support the drivers and small fleet operators.

Success factors

- Integration of transport agents and freight services in one physical location
- To enable owner operators access to transport buyers through the agents, thus enabling small owner operated logistics companies to compete with big logistics companies;
- Additional services, e.g. basic warehouse services, vehicle repairing, provide physical social networking opportunities which serve as hub for trucker drivers.

Looking into the future

The online freight market is also growing in China alongside the rapid growth of e-commerce. There are several internet-based online web-portals available today, e.g. www.56885.net. In addition there are several freight market smartphone apps available with links to Chinese social media such as WeChat .



Singapore Travel Smart Programme

Travel Smart is a programme addressed to commuters and companies to influence travel behaviours, to shift travelling commuters to off-peak periods, encourage a switch to more sustainable modes of travel (e.g. public transport, car pooling, car sharing, walking and cycling) or reduce travel demand altogether.

The Travel Smart programme encourages companies to implement measures such as flexi travel arrangements to support employees who may wish to travel during off-peak periods. For a start, Land Transport Authority (LTA) cooperates with companies with a staff strength of more than 200 employees in major employment centres located near MRT stations and that are willing to trial travel demand initiatives. Free-travel to Singapore commercial centre before 7:45 for all public transport is a measure implemented since June 2013. Some companies that participate in the programme take advantage of early arrival of staff and organise sports sessions in the morning to make staff enjoy more balanced working and leisure life. Travel Smart programme gives reward to commuters. Commuters can earn points for public transport trips with extra points for morning off-peak trips. The points can be changed to be cash rewards. In addition, there is a monthly lucky draw of \$1,500 for all commuters. Cash rewards can be transferred to either their public transport cards or registered bank account.

Pilot with 12 organisations has shown on average, close to 12% of employees shifting out of the morning peak.



© Scania Group

Success factors

- Cooperation with local companies and giving advising to the local companies how they can meet staff's travel demands;
- Wide awareness campaigning to attract more partners and commuters to join;
- Growing conscience on environmental impact, healthy lifestyle and sustainability

Looking into the future

The programme was launched in June 2013 for 1 year trial. After 1 year trial, LTA has decided to extend the programme to June 2016 and it will continue to evaluate the results and bring more organisations to join the programme. LTA also looks into extent the network covered by the programme.



Consortium



Viajeo Plus in brief

Viajeo PLUS is an EC funded FP7 international cooperation project. The project aims to benchmark outstanding solutions for innovative and green urban mobility in Europe, Latin America, China and Singapore and subsequently facilitate the uptake of these solutions across different cities in these regions, and in Mediterranean Partner Countries (MPCs).

Viajeo Plus organises interactive showcases, meetings and workshops to allow stakeholders to gain first-hand experience of innovative solutions, exchange knowledge and information. This project also develops recommendations to the EC for future collaboration among cities and for cooperative research initiatives.

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