SOLUTIONS

Sharing Opportunities for Low carbon Urban TransportatION

Publishable Summary

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[1] Usually the contact person of the coordinator as specified in Art. 8.1. of the Grant Agreement .

[2] The home page of the website should contain the generic European flag and the FP7 logo which are available in electronic format at the Europa website (logo of the European flag: http://europa.eu/abc/symbols/emblem/index_en.htm logo of the 7th FP: http://ec.europa.eu/research/fp7/index_en.cfm?pg=logos). The area of activity of the project should also be mentioned.

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A Final Report

1. (4.1) Final publishable summary report

1.1. Executive summary

Transport is a key enabler of economic activity and social connectedness. While providing essential services to society and economy, transport is also an important part of the economy and it is at the core of a number of major sustainability challenges, in particular climate change, air quality, safety, energy security and efficiency in the use of resources (EC 2011: Transport White Paper). The overall mission of this project was to support the uptake of innovative sustainable urban mobility solutions in Europe and other regions in the world, in particular in Asia, Latin America and the Mediterranean. The project facilitated dialogue and networking opportunities and promoted innovative platforms for knowledge exchange between European cities and cities across the world. Guidance and tailored advice were provided to city officials through regional analyses and implementation examples.

SOLUTIONS focused on urban mobility solutions in six different fields: i) public transport, ii) transport infrastructure, iii) city logistics, iv) integrated planning / SUMP, v) network and mobility management and vi) clean vehicles. The cluster leaders of the SOLUTIONS consortium have formed teams and identified solutions for each cluster theme. For each of the six clusters a team of project partners discussed and elaborated a set of potential solutions which would cover the scope of the cluster and have good transferability potential for cities around the world. A workshop was held to prioritise the solutions according to their relevance and transferability potential, with approximately ten solutions selected for further elaboration into SOLUTIONS fact sheets. The following measures were selected in the thematic clusters.

Key actions included the assessment of the transferability and the potential for uptake of urban mobility solutions in the target regions. Cities from Europe, Asia, Latin America and the Mediterranean were involved in the project's activities as leading, take-up or training cities.

- Leading Cities: Barcelona, Bremen, Budapest, Curitiba, Huangzhou
- Take-up Cities: Guiyang, Belo Horizonte, Kochaeli, Kochi, Leon
- Training Cities: Ammam, Casablanca, Durango, Hanoi, La Serena, Matale, San Jose, Sfax, Xi'an

While SOLUTIONS was strongly based on previous and on-going projects and initiatives, as is the nature of a coordinating action, it also provided added value that went beyond summarising and facilitating knowledge sharing and research and technology transfer. SOLUTIONS bridged the "implementation gap" between the potential of innovative sustainable mobility and transport solutions and the actual level of up-take and quality of the deployment mechanisms.

This project is funded by the Seventh Framework Programme (FP7) of the European Commission.

1.2. Summary of project context and main objectives

Cities around the world have a need to establish sustainable transport systems, to provide efficient and safe mobility for their citizens with minimal environmental impacts. With limited opportunity to build new infrastructure, many cities need to increase the efficiency and capacity of their transport systems and are turning to innovative and technically advanced systems to contribute to this objective.

The take-up of urban mobility and transport solutions between global regions is particularly challenging as socio-economic conditions and policy frameworks differ substantially across the regions. Within Europe, a number of projects have successfully demonstrated take-up between cities, which confirms the value of collaborative learning and exchange of experiences within different cultures and planning practices.

Cities, regions and countries around the world often share similar urban mobility challenges with some cities being more or less progressive than others. While there are advantages to sharing best practices, examples and lessons learnt, it is beneficial for city officials and other relevant stakeholders to have a robust methodology in place, which they can follow to implement and harmonise successful urban mobility policies, measures and technologies.

The experience gained by several leading European cities following advanced approaches towards sustainable urban transport can be extremely helpful for other cities, regions and countries seeking to improve urban mobility conditions.

The overall **mission** of this project was to support the uptake of innovative sustainable urban mobility solutions in Europe and other regions in the world, in particular in Asia, Latin America and the Mediterranean. The SOLUTIONS project aimed to support the exchange of innovative and green urban mobility solutions between cities from Europe, Asia, Latin America and the Mediterranean. The project made a substantial contribution to the uptake of innovative and green urban mobility solutions across the world, by facilitating dialogue and knowledge-exchange, promoting successful policies, providing guidance and tailored advice to city officials and fostering future cooperation on research, development and innovation. Project activities are organised around following six themes:

- Public transport
- Transport infrastructure
- City logistics
- Integrated planning / Sustainable Urban Mobility Plans
- Network and mobility management
- Clean vehicles

1.3. Main S&T results/foregrounds

1.3.1. Identification of sustainable urban mobilty solutions

The cluster leaders who are part of the SOLUTIONS consortium have formed teams and identified about ten solutions for each cluster. During a workshop, the solutions were prioritised according to relevance and transferability potential and a smaller number of solutions were selected for further elaboration into solutions fact sheets.

Table 1: SOLUTIONS thematic clusters and respective urban mobility measures and solutions

1. Public transport	2. Transport infrastructure	3. City logistics	4. Integrated planning/SUMPs	5. Network & mobility management	6. Clean vehicles
BRT systems	Dedicated bus lanes	Urban deliveries with cargo-cycles	Stakeholder participation	Parking management	Registration restrictions / number-plate auctions
Trolley bus systems	Intermodal interchanges	Low Emission Zones	Institutional cooperation	Access restriction	Managing electric two-wheelers
Metro systems	Pedestrian infrastructure	Forums, portals, labels & training	Measure selection	Traffic management	Fuel economy / CO_2 standards
Alternative-fuelled public transport vehicles	Non-motorised infrastructure	Pick-up point networks	Monitoring and evaluation	Multimodal journey planning	Switching fuels: taxi fleets to EVs
Electric and hybrid public transport vehicles	Innovative, safe cycling infrastructure	Vehicle and operation restrictions		Cooperative ITS systems	Switching fuels: taxi fleets to LPG/ CNG
ITS for public transport	Cycle highways	Urban Consolidation Centres		Carsharing schemes	Taxing vehicles based on emissions
Integrated public transport network planning	Infrastructure for car- and bike-sharing	Reorganising municipal procurement			Clean vehicles in municipal fleets
Financing public transport	Pedestrianising city centres/ streets	Rail/ waterways for urban freight deliveries			Low Emission Zones
Integrated fare systems		Urban truck lanes			Informing about/ promoting clean vehicles
Eco-driving for professional drivers		Pricing measures			Infrastructure for clean vehicles
Bus priority measures					Clean modes of delivery in urban areas
Bike-sharing/ public bicycles					Replacing private cars / motorcycles with clean models

1.3.2. Regional analysis

The current situation regarding sustainable urban mobility was analysed for the three target regions: Latin America, Asia and the Mediterannean.

Regional analysis Latin America

Over the last two decades, some Latin American countries have implemented a series of measures to improve urban mobility, from more efficient public transport, often including integrated transport systems with specific solutions for high-demand corridors, as well as the development of non- motorised transport solutions.

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The research shows that Latin America has a number of urban mobility problems. Mainly characterised by rapid rates of urbanisation, the consequent growth of informal settlements in the region has led to urban sprawl - and the public transport sector has failed to cope. There are high fatality rates among people using sustainable mobility. Car ownership, and motorcycle ownership in some parts of the region, is increasing - very evidently in Colombia, Peru, Brazil, Uruguay, the Dominican Republic and Costa Rica.

However, the status of urban mobility transport in the whole region cannot be summarised into a single broad trend for all countries. Urban mobility is strongly influenced by a spectrum of economic, social and political factors indicating the need for analysing the conditions, trends and implications of sustainable urban mobility solutions in each of the different Latin American countries.

The SOLUTIONS project focused in particular on the situation in Mexico and Brazil. The cities of Belo Horizonte, Curitiba and San José dos Campos, from Brazil, as well as the Mexican cities León and Durango, participated in this project.

The Regional Report is avaiable on the website: http://www.urban-mobility-solutions.eu/resources/products/

Regional analysis Asia

The SOLUTIONS project focused in particular on the situation in China and India as the two emerging economies with the highest levels of greenhouse gas emissions in Asia.

The mobility challenges faced by cities in China and India, ranging from difficulties in the development of cost- effective transport infrastructure to health hazards due the environmental deterioration caused by vehicular demand for urban roads, have made sustainable transport solutions desirable. In addition to improvements to public transport systems and improving the modal share of walking or cycling, these cities reflect a consensual need to restrict the entry of motor vehicles on their busiest or central thoroughfares.

The Regional Report is avaiable on the website: http://www.urban-mobility-solutions.eu/resources/products/

Regional analysis in the Mediterranean

The Mediterranean Partner Countries (MPCs) are diverse in their urban mobility characteristics. These include rapid rates of urbanisation, the consequent proliferation of informal settlements leading to urban sprawl, the difficulties for public transport to meeting growing demand, and increasing incomes and car ownership rates in different parts of the region.

There is a real need to analyse the conditions, trends and implications of sustainable urban mobility solutions in different Mediterranean partner countries. Three MPC were selected for a detailled analysis: Turkey, Israel and Morocco.

Efficient and well-integrated public transport systems as well as the development of the appropriate infrastructure for promoting sustainable transport modes, such as walking and cycling, prove to be high priorities for the region due to their appropriateness in addressing the severe congestion present in most Mediterranean cities.

City authorities have also started favouring an integrated approach towards urban planning, realising the benefits that may be derived for the local community if the principles of the SUMP concept are followed. There is less attention placed on city logistics, but city authorities recognise the importance of addressing the negative externalities of urban freight operations. Overall, Mediterranean cities can greatly benefit from European experiences in addressing the urban mobility problems they are currently facing, paving the way towards sustainability.

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1.4. Potential impact and main dissemination activities and exploitation results

A main objective for the SOLUTIONS project was the development and implementation of sustainable urban mobility solutions in mid-sized cities in key emerging economies. For each of the participating Take-up Cities measures were discussed and identified in close cooperation with local officials. Several initiatives were implemented during the project, such as:

Belo-Horizonte, Brazil: Bicycle lane and speed limit

The pilot project in Belo Horizonte started with a bicycle lane and a speed limit area of 30 kmh. The city completed a total cycling infrastructure of 70,42 km in August 2015, with a forecast of 411 km by 2020. The proposed place for the Solutions pilot project is part of Belo Horizonte´s central area and integrates the collaborative map produced by cyclists in a workshop that indicated urban solutions towards bicycles. This change in urban planning is meant to reduce congestion, emissions and travel times in an effort to build a more sustainable city.

Kochi, India: Car-free day

The first car-free day in Kochi (India) was successfully implemented on the 1st of May 2016 in organization with the Kochi Metro Rail Limited (KMRL), CODATU and EMBARQ-WRI India. The initiative was meant to improve awareness of non-motorised transportation, its challenges and issues. During this event, the participants were able to rent bicycles, take Zumba classes or other recreational classes. The car-free day was an initiative of KMRL and is meant to actively promote

non-motorized transportation in urban areas and highlight the change in urban planning requirements to give more space to pedestrians and cyclists.

Other initiatives were taken further, such as the inclusion of an emobility concept for the old-town in Kochi as part of the city´s Smart cities project, funded by the Government of India. This and other initiatives will further be supported through a number of actions and partnerships.

As a continuation of the SOLUTIONS project this network aims to sustain the collaboration on sustainable urban mobility implementation action among researchers and practitioners. This will build on activities from the SOLUTIONS project, such as the e-learning, trainings, research and policy advice. The network acts as a pool of experts, for example for short-term assignments, conference speeches, trainings etc.

As continuation of the cooperation within the SOLUTIONS project we aim to establish a global network on sustainable urban transport, building on the SOLUTIONS consortium members and expanding on that with organisations involved in the various project activities. This would then also provide the opportunity to have specific regional activities and exchange. Collaboration among the research partners of the network could include:

- Support for the implementation actions initiated by SOLUTIONS
- Joint publications on thematically related topics and projects
- Joint research initiatives
- Knowledge exchange and transfer
- Staff exchange and secondments
- Joint thesis' supervisions

Members

Beyond the SOLUTIONS consortium, new members of the SOLUTIONS network can include other interested organisations working on urban mobility issues. Interested organisations can join the SOLUTIONS network for free, but partners are asked to bring in relevant projects and initiatives that provide relevant knowledge, dialogue and/or dissemination opportunities to the network. This aims to complement the research and implementation activities of network partners by generating synergies between research and policy activities with a particular focus on transferability to and from developing and emerging countries.

Structure and operations

SOLUTIONS will continue to support implementation action in cities and twork on maintain the legacy beyond the project´s lifetime. This includes support for city-take-up and project twinning activities to continue our cooperation with cities in key emerging economies. This will be supported by the European Commission (through the FUTURE RADAR project) and UN-Habitat will be used primarily to continue the take-up actions in the existing partner cities and gradually expand these activities. These activities will also contribute to the Urban Electric Mobility Initiative (UEMI). The coordination of the network will be supported by the Wuppertal Institute in close cooperation with partners who are willing to contribute to this task.

Towards low-carbon, sustainable urban mobility

This project is funded by the Seventh Framework Programme (FP7) of the European Commission.

The SOLUTIONS network will help delivering on the Paris Agreement and the NDCs in the context of the New Urban Agenda and the Sustainable Development Goals. It will establish an international partnership to support national and local governments to develop action plans and concrete implementation measures to boost low-carbon urban mobility. The partners will work together on developing national action plan and local implementation concepts in key emerging economies with a high mitigation potential. The plans will include an assessment of the political, technological, socio-economic and financial viability. The local implementation concepts will be developed into bankable projects, focusing on the infrastructure and policy measures with the highest mitigation potential. This process will then be replicated regionally with support of the pilot country partners. Areas of cooperation between network partners include:

- Testing the transferability of low-carbon urban mobility concepts,
- Identifying appropriate funding solutions and facilitate dialogue with relevant funding agencies,
- Analysing the political and institutional framework and the facilitation of stakeholder dialogue to establish coalitions for the implementation of selected measures,
- Upscaling at the national level with the establishment of national city-to-city cooperation networks,
- Facilitation of exchange between local, regional and national level policy makers to harmonise policy objectives and measures,
- Global upscaling with an international platform to replicate the success in the initial pilot countries.

The SOLUTIONS network will aim to make a substantial contribution to a 1.5 Degree Celsius stabilisation pathway and will also contribute to making human settlements more inclusive, safe, resilient, and sustainable by providing access for all to adequate, safe, affordable, accessible and sustainable mobility services and infrastructure.

The SOLUTIONS network will work on the development of national action plans for low-carbon urban development and local implementation concepts to deliver on the New Urban Agenda and the Paris Agreement. This will support national and local action and international dialogue linked to the UNFCCC and Habitat III processes.

To assess the gap between the Nationally Determined Contributions (NDCs) and the action required for a 1.5 Degree Stabilisation Pathway national and city-level decarbonisation pathways and action plans for pilot countries will be developed in close cooperation with a network of partners from Europe, Asia, Africa and the Americas.

Together with the city networks city-to-city exchange partnerships will be established, which will be dedicated to support the implementation process of low-carbon urban mobility solutions.

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1.4.1. Training and exchange activities

E-learning and webinars

The SOLUTIONS project held two programmes of e-learning courses in 2015 for professionals working in the field of urban mobility. The free online courseswere organised for those interested in bringing innovative transport solutions to their town, city or region, and who wished to expand their knowledge and share their experiences with participants from around the world. Each course, , was designed to include tailored tasks and interactions with experts and other participants.

Nearly 1,800 participants from 232 cities in 73 countries – covering all inhabitable continents – had the opportunity to learn about innovative solutions for fostering sustainable urban mobility in cities and regions around the world. This included transport planners and decision-makers from public authorities, advisors and consultants from the private sector, as well as students and post-grads.

In addition, the SOLUTIONS project offered five free webinars for mobility experts. The webinars were conduced in November and December 2015 and covered the topics: City Logistics, Electric Vehicles for cleaner cities, Sustainable Urban Mobility Plans, Sustainable Public Transport, Light Electric Vehicles for cleaner cities.

1.4.2. Publications

1.4.3. Events

SOLUTIONS organised a number of side events to existing renowned events to initiate a broad dialogue on sustainable urban mobility solutions and to provide targeted input to the project. SOLUTIONS partners attended numerous local and international events where they presented and promoted the project to a wide and international audience. SOLUTIONS contributed to a large number of events with presentations, panel discussions or side events. Examples of notable events include:

- EU-China Urbanisation Dialogue (Foshan, China – May 2013)
- COP 19 Transport Day (Warsaw, Poland – November 2013)
- Transport Research Arena (Paris, France – April 2014)
- World Urban Forum (Medellín, Colombia – April 2014)
- CIVITAS Forum, (Casablanca, Morocco – September 2014)
- X-International Congress for Sustainable Transport (Mexico City, Mexico – October 2014)
- Integrated Conference of BAQ 2014and Intergovernmental 8th Regional EST Forum in Asia (Colombo, Sri Lanka – November 2014)
- Michelin Challenge Bibendum, (Chengdu, China - November 2014)
- Transportation Research Board (Washington D.C., USA – January 2015)
- International Transport Forum (Leipzig, Germany – May 2015
- COP 21 (Paris, France - December 2015)
- 3rd European Conference on Sustainable Urban Mobility Plans (Bremen, Germany – April 2016)

- World Clean Air Congress and Better Air Quality Conference (Busan, Korea – August 2016)
- Habitat III (Quito, Ecuador - October 2016)
- Liveable Cities Symposium (Sapanca, Turkey – October 2016)
- COP 22 (Marrakech, Morocco – November 2016)

Furthermore, the Urban Electric Mobility Initiative, which is supported by the SOLUTIONS project, was promoted at several events.

SOLUTIONS held a number of multiplier workshops where the key results of the project were presented to practitioners from all target regions. The focus of the workshops was on the deployment of innovation in urban transport. Each workshop lasted one day and included between 25 and 50 participants.
Notable multiplier workshops include:

- CIVITAS Forum, (Casablanca, Morocco – September 2014)
- CODATU (Istanbul, Turkey – February 2015)
- Mayors Summit – Cities of the Future and the Cities & Transport International Congress (Rio, Brasil – September 2015)
- CIVITAS Forum 2015 (Ljubljana, Slovenia – October 2015)
- 3rd European Conference on Sustainable Urban Mobility Plans (Bremen, Germany – April 2016)

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