



# SUITS

## **BUILDING SMALL-MEDIUM LOCAL AUTHORITIES' CAPACITY TO IMPLEMENT URBAN FREIGHT TRANSPORT MEASURES**

Workbook of participant

# 4

MODULE





# SUITS


## Capacity Building Programme

### Outline of the course

#### Welcome session

- 1** Introduction
- 2** Urban freight transport (UFT) measures
- 3** Value for S-M cities (Challenges, Benefits and Beneficiaries)
- 4** Successful Case studies or Best practices of SUITS cities
- 5** Innovative financing , procurement, partnership
- 6** Process and implementation aspects
- 7** Available tools and guidelines

This material is result of WP5 of SUITS project.









# 1

## Introduction

### TERMINOLOGY

The following terms will be extensively used throughout the course:

**SUITS:** Supporting Urban Integrated Transport Systems: Transferrable tools for Authorities

**CBP:** SUITS Capacity Building Program

**SUMP:** Sustainable Urban Mobility Plan

**LAs:** Local Authorities

**S-M cities:** Small-medium size cities, i.e. cities with population ranging between 50,000 and 250,000 residents in their urban centre

**UFT:** Urban Freight Transport | **SIA:** Social Impact Assessment

**LZT:** Limited Traffic Zone | **UCC:** Urban Consolidation Centres

**IoT:** Internet of Things | **SULP:** Sustainable Urban Logistics Plan

**IPPP:** Civil society organisation

**NGO:** Non-governmental organization

# SUITS Supporting Urban Integrated Transport Systems: Transferable tools for authorities



**Funded under:** H2020-EU.3.4. - SOCIETAL CHALLENGES - Smart, Green And Integrated Transport

**Topic:** MG-5.4-2015 - Strengthening the knowledge and capacities of local authorities

**Funding scheme:** RIA - Research and Innovation action

**Coordinator:** Coventry University

**Total cost:** approx. EUR 4M

**Duration:** 4 years (From Dec 1st 2016 to Nov 30th 2020)

**22 Partners** (see map)

**Project Website:** <http://www.suits-project.eu/>

## COORDINATOR

**UK:** Coventry University

## PARTICIPANTS

**UK:** Arcadis, Transport for West Midlands

**Italy:** Politecnico di Torino, RSM, Eurokleis, Citta di Torino

**Ireland:** Interactions

**Greece:** Lever, Sboing, Makios, Municipality of Kalamaria

**Spain:** ITENE, INNDea

**Romania:** Integral Consulting, Municipality of Alba Julia

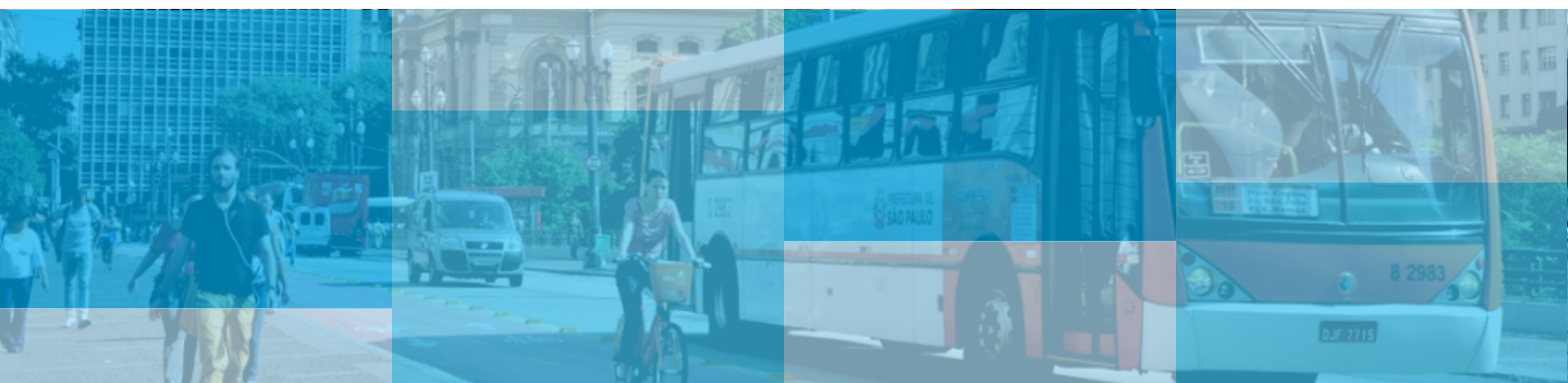
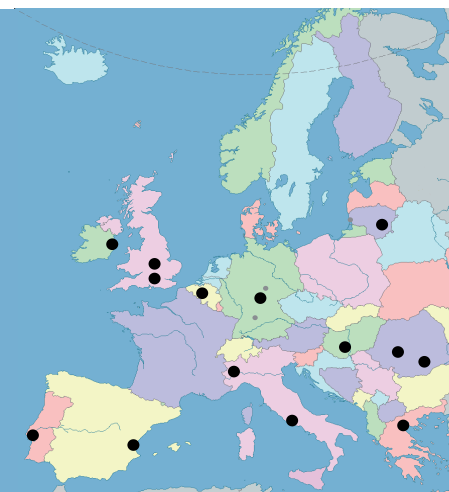
**Portugal:** VTM

**Hungary:** Logdrill

**Germany:** Wuppertal Institute, Technische Universitat Ilmenau

**Lithuania:** Smart Continent

**Belgium:** SIGNOSIS



## Course Framework: SUITS Project

### Main objectives of SUITS Capacity Building

**Overall aim:** To increase the capacity of S-M local authorities to develop and implement sustainable, inclusive, integrated and accessible transport strategies, policies, technologies, practices, procedures, tools, measures and intelligent transport systems that recognize the end-to-end travel experiences of all users and freight.

Support Small Medium Local Authorities in developing SUMP by:

- Transforming them into **learning organizations**.
- Make transport departments **resilient and responsive to new challenges and changes**.

*Without capacity building and the transformation of transport departments into learning organisations, training materials will not provide the step change needed to provide innovative transport measures.*

### Expected outcomes of SUITS project

Transformation of transport planning departments in Small Medium cities into change agents. Through development of:

- A validated **capacity building programme** for transport departments.
- Resource-light **learning assets** (modules, e-learning material, webinars and workshops), based on stated needs.
- **Decision support tools** to assist in:
  - procurement,
  - innovative financing,
  - engagement of new business partners,
  - handling of open, real time and legacy data.
- **Better Integration/use of freight and passenger data**.

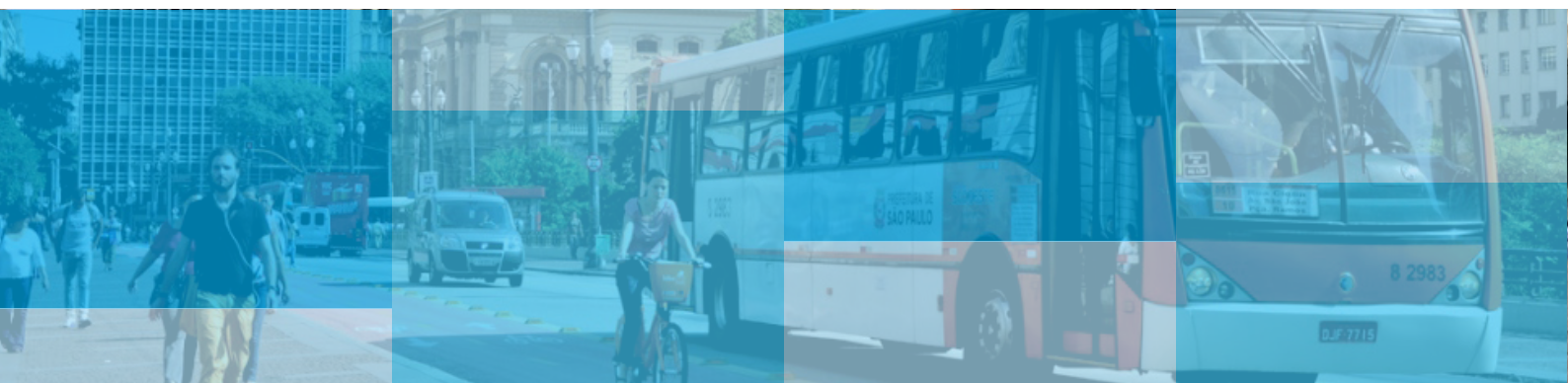




## Course Framework: SUITS Project Modules

<b>Module 1</b>	“Building S-M LAs’ capacity to implement emerging transport technologies” (ITS, Electric mobility, CAVs etc.)
<b>Module 2</b>	“Building S-M LAs’ capacity to introduce innovative transport schemes” (MaaS, Uber, Business Models etc.)
<b>Module 3</b>	“Building S-M LAs’ capacity to implement urban transport safety & security measures for all/vulnerable users”(passenger and freight vehicles etc.)
<b>Module 4</b>	“Building S-M LAs’ capacity to implement urban freight transport measures”(SULPs, Crowdshipping, cargo bikes etc.)
<b>Module 5</b>	“Data collection and analysis tools for integrated measures”
<b>Module 6</b>	“Innovative Financing, procurement and business models”

<b>Modules 1/3/4</b>	Delivered as classroom courses
<b>Module 2</b>	Delivered as classroom course and webinar/e-learning
<b>Modules 5/6</b>	Delivered as e-learning courses/webinars



## Module's purpose

**Overall module's aim:** To increase the capacity of S-M cities, to implement and monitor the Urban Freight Transport (UFT) measures throughout policymaking, designing and facing the current challenges when implementing these measures

### IN PARTICULAR AIMS AT:

- **Increase the understanding** about the value of UFT measures in our cities, the effects/cost of lack of urban freight transport regulations, the operators and the economy of the city and about the concept and methodology for developing UFT measures while being able to recognise or find out the needs of urban freight transport users
- **Build specific skills** regarding how success of the measures can be ensured
  - By convincing stakeholders and by overcoming financial, legal, administrative and technical barriers.

### SPECIFICALLY, THE COURSE IS DESIGNED TO:

- **Strengthen cooperation** between LA's staff.
- **Advance local priorities** on UFT measures.
- **Offer** concrete practical **tools** and **guidance** to better implement these measures.

## Key aspects of the problem

UFT is a vital part of the economy of cities and essential element for cities to function successfully but it also affects the following factors:

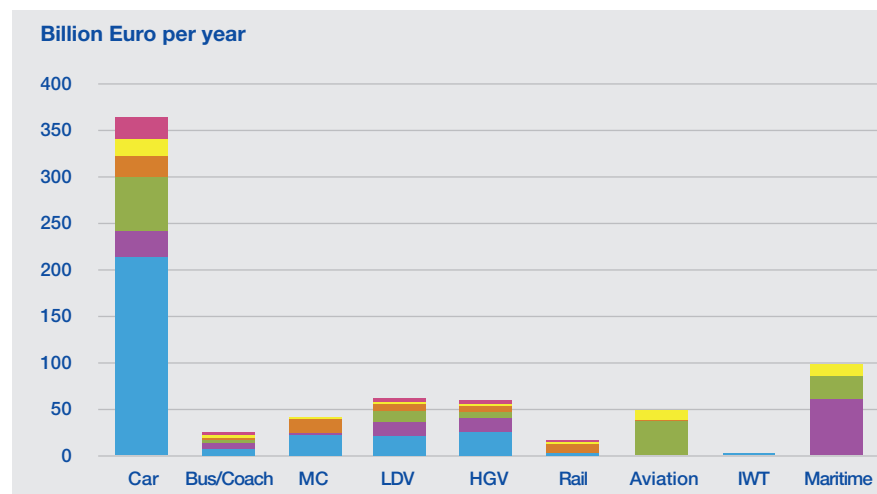
- **Environment** (noise, air quality, visual quality)
- **Road flows- levels of congestion**
- **Fuel Consumption**
- **Safety**

Lower capacity  
of LAs



## ASPECTS OF THE PROBLEM:

- Urban freight transport constitutes approximately **40%** of total emissions accounted in transport [1], [2]
- The top two issues businesses are concerned about in the urban environment are air quality and traffic congestion [2]
- Insufficient collaboration, lack of critical infrastructure and lack of investment in innovative solutions are the biggest barriers to more efficient and sustainable urban logistics [2].

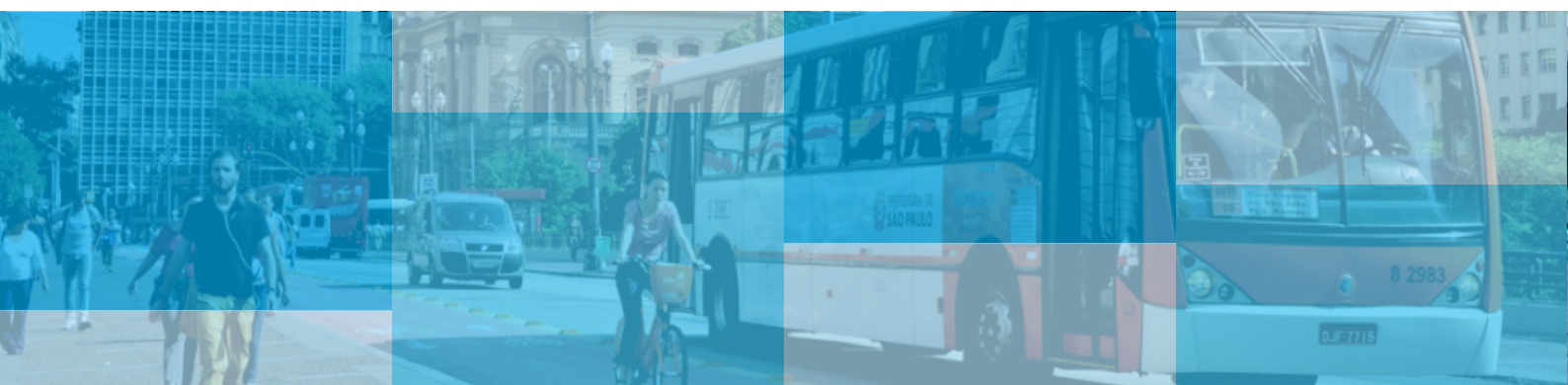


Total external costs per transport mode for EU28 in 2016 [4]

## EXTERNAL COST OF TRANSPORT

- **~12%** (€ 120 billion estimated) of total external cost of transport due to the use of Light Duty Vehicles (**LDV**) and Heavy Goods Vehicles (**HGV**) (EU28 in 2016). [3]
- **~27%** of overall external cost in EU28 (2016) stands for **road congestion** (total delay costs € 270 billion estimated). [3]

...while the extent of the **overall external costs of transport**, is estimated at around **€ 1 000 billion** (€ 981 billion) **annually** (almost 7% of the gross domestic product of the 28 EU Member States) through **air pollution**, **climate**, **habitat damage**, **well-to-tank**, **noise**, **congestion**, **accidents**. [4]



## HOW TO DETERMINE COSTS

- For retrieving cost estimates for specific countries and traffic situations there are plenty of methodologies and approaches.
- The components (e.g. value of time, cost of fatality) needed for each country-case study, vary in time and also depends on the individual economy of each country.
- The aim is for every interested S-M city, to use some tools and methodologies in order to calculate these costs.

APPROACH	DESCRIPTION
External Transport Cost Calculator [5]	Calculates the precise external costs of the urban freight transportation
Handbook on External Costs of Transport [6]	Gives guidance on how to determine costs about air quality, accidents etc. (accompanied by excel calculators)
Guidelines to estimate the external marginal accident cost [7]	Report of experts advisors that propose strategy on calculating the accidents cost in transport sector

## ISSUES NEED TO BE ADDRESSED FOR FREIGHT IN URBAN AREAS [8]

- **External congestion cost** (*Air Pollution/Air Quality, Noise and nuisance levels*)
- **Fatalities**
- **Casualties and injuries**

## KEY CONSIDERATIONS [2]

- Framework that includes **delivery spaces, access regulations, restrictions** and ways to enforce such actions in order to ensure the seamless operation of logistic services.
- Promotion of eco-friendly vehicles.
- Coordination and cooperation between **authorities and private stakeholders**.
- E-commerce and on-demand shipments increase, along with demand for immediate delivery (*more single-piece deliveries to individuals - and ultimately, more vehicles on the road*) should be taken into account.





## EXERCISE A1

### Analyzing characteristics of urban freight transport traffic and the problems that derive from it

#### Description of material

One table with 4 columns. The first column of the matrix refers to the areas of the city, where increased freight transport traffic is observed. The second column refers to the time periods when increased freight traffic is observed. The third column refers to the problems that derive from the increased freight traffic. The fourth column refers to the restrictions that can be applied.

Please fill in the following matrix with the areas of the city with increased freight transport flows, the time periods within a day, when freight traffic is increased and the problems that occur.

TEAM NAME

AREAS	TIME-SLOTS	PROBLEMS	RESTRICTIONS



## Further Reading

1. Mobility and Transport - European Commission. (2019). Clean and energy efficient vehicles - Mobility and Transport - European Commission. [online] Available at: [https://ec.europa.eu/transport/themes/urban/vehicles\\_en](https://ec.europa.eu/transport/themes/urban/vehicles_en) [Accessed 28 Mar. 2019]
2. Transport Themes- European Commission. (2019). Studies - Sustainable transport -- Transport Themes- European Commission [online] Available at: [https://ec.europa.eu/transport/themes/sustainable/studies/sustainable\\_en](https://ec.europa.eu/transport/themes/sustainable/studies/sustainable_en)

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1. Greater Manchester Transport Strategy 2040. (2017). Greater Manchester 2040. Transport Strategy. [online] Greater Manchester. Available at: [https://downloads.ctfassets.net/nv7y93idf4jq/7FiejTsJ68eaa8wQw8MiWw/bc4f3a45f6685148eba2acb618c2424f/03.\\_GM\\_2040\\_TS\\_Full.pdf](https://downloads.ctfassets.net/nv7y93idf4jq/7FiejTsJ68eaa8wQw8MiWw/bc4f3a45f6685148eba2acb618c2424f/03._GM_2040_TS_Full.pdf) [Accessed 27 Mar. 2019].
2. The Road to Sustainable Urban Logistics. (2017). [ebook] UPS/GreenBiz. Available at: [https://sustainability.ups.com/media/UPS\\_The\\_Road\\_to\\_Sustainable\\_Urban\\_Logistics.pdf](https://sustainability.ups.com/media/UPS_The_Road_to_Sustainable_Urban_Logistics.pdf) [Accessed 27 Mar. 2019].
3. Van Essen, H. (2018). Sustainable Transport Infrastructure Charging and Internalisation of Transport Externalities. [online] Available at: <https://ec.europa.eu/transport/sites/transport/files/2018-year-multimodality-external-costs-ce-delft-preliminary-results.pdf>
4. Mobility and Transport - European Commission. (2019). From infrastructure costs to health and environmental impacts - European Commission shares first findings on the true costs of EU transport - Mobility and Transport - European Commission. [online] Available at: [https://ec.europa.eu/transport/themes/logistics/news/2018-12-17-costs-of-eu-transport\\_en](https://ec.europa.eu/transport/themes/logistics/news/2018-12-17-costs-of-eu-transport_en) [Accessed 15 Apr. 2019].
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7. Final report of the expert advisors to the high level group on infrastructure charging (working group 3). (1999). [ebook] Sweden. Available at: <http://ec.europa.eu/transport/infrastructure/doc/crash-cost.pdf> [Accessed 15 Apr. 2019].
8. Work Package 7, D7.3 Social Impact Assessment Report. (2018). [ebook] Suits Project. Available at: <http://www.suits-project.eu/wp-content/uploads/2018/12/Social-Impact-Assessment-Report.pdf> [Accessed 15 Apr. 2019]





# 2

## Urban freight transport (UFT) measures

This chapter provides a **brief description** and the **key elements** of indicative **Urban freight transport (UFT) measures**.

**UFT measures** aim to **reduce negative impacts** of urban freight operations and help overcoming barriers to apply efficient and sustainable urban logistics.

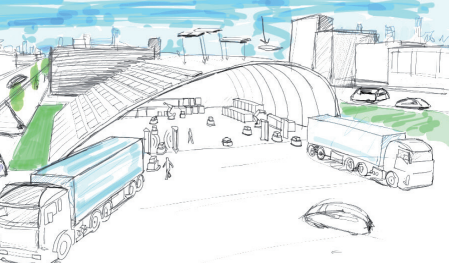
- Therefore UFT focus on:
- Increasing **energy efficiency**, to therefore improve the **sustainability and livability** of cities.
- Improving **reliability of systems**, increasing **customer satisfaction**
- Increasing **safety and security**, reducing the risk of road injuries and fatalities.



## 2 URBAN FREIGHT TRANSPORT (UFT) MEASURES

### URBAN CONSOLIDATION CENTRES (UCC) [1], [2], [3]

- An urban consolidation centre is a new logistics platform, either private or public, which is designed to serve the urban centre or other large magnitude sites.
- The principle and main objective is to receive large scale freight operations, break them down and deliver them to its target area while ensuring sustainability through the usage of Light Goods Vehicles (LGVs) and other smaller vehicles.
- The key purpose of UCCs is the reduction in total distance travelled and the avoidance of poorly-loaded goods vehicles making deliveries in urban areas.



### NEW TECHNOLOGIES AND TELEMATICS IN LAST MILE LOGISTICS [1], [2], [3]

- Include applications that provide fleet management along with route optimisation.
- Drivers are receiving real time information regarding their route choice, in order to minimize accumulative costs (financial, environmental, time etc.).
- Provides the optimal management of the company's fleet.



### REGULATIONS REGARDING NIGHT DELIVERIES AND ENFORCEMENT [1], [2], [3]

- Such actions aim at enforcing night time deliveries by taking advantage of lower congestion at these time slots.
- It contributes to avoid congestion due to freight operations.



### ECO-FRIENDLY VEHICLES [1], [2], [3], [4]

- Promotion and adoption of alternative and more environmentally friendly vehicles such as electric vehicles.
- LNG vehicles, cargo bikes both traditional and electric, tricycles, scooters, drones.
- With the future deployment of autonomous vehicles even more logistics delivery solutions will arise and replace traditional modes of freight transport.



## 2 URBAN FREIGHT TRANSPORT (UFT) MEASURES

### MULTI-USE LANES [1], [2], [3],[4]

- This measure is based on the idea that the capacity of the network (lanes in this case), can be dedicated to different specific transportation modes based on the time of the day, the traffic conditions, etc. Such a solution is very promising for both urban freight system and public transport.
- The allocation of the affected lane can be designed using different time windows among different users and restrictions can be applied by vehicle type, scope of transportation etc. In this aspect, supports busses operation in urban centres.



### REAL-TIME (DYNAMIC) LOADING SPACE BOOKING AND/OR MULTI-USE OF PARKING SPACE [1], [2],[3]

- Through digital solutions the logistics service provider can schedule and book available parking spaces for a limited amount of time in order to load/unload cargo.
- The allocation of the parking spaces could be designed using different time windows among different users and restrictions can be applied by vehicle type, scope of transportation etc.



### LOCKERS AS DISTRIBUTION POINTS [1], [2], [3],[6], [7]

- A network of automated delivery points which are located in convenient sites such as transportation stations or large groceries stores.
- The system works similarly to ATM machines, where with a temporary personal password the person is granted access and receives the shipped item.



### LIMITED TRAFFIC ZONES (LTZS) [2],[3]

- Access to urban areas is limited to freight vehicles that meet certain emissions standards.
- LTZs are becoming increasingly common in major European cities as mean for city authorities to meet European air quality standards.
- There is a positive impact by reducing emissions from freight vehicles both by renewing the fleet and reducing trips



### EXERCISE A2

## Introducing regulatory and innovative measures in response to problems in the urban freight transport system

#### Description of material

3 fields (open boxes), one per innovative urban freight measure, which could reply to specific problem

Please select innovative measures that could enhance the efficiency of the urban freight transport system and correspond them with a specific problem identified in Exercise A1.

TEAM NAME

MEASURE 1

PROBLEM  
TO SOLVE:

MEASURE 2

PROBLEM  
TO SOLVE:

MEASURE 3

PROBLEM  
TO SOLVE:



### Further Reading

1. Bestfact.net. (2019). Bestfact | Best Practice Factory for Freight Transport. [online] Available at: <http://www.bestfact.net/> [Accessed 28 Mar. 2019].
2. Feng, C. (2014). New prospects of transportation mobility. IATSS Research, 38(1), pp.22-26.
3. EU financial support to sustainable urban mobility and to the use of alternative fuels in EU urban areas. (2016). [ebook] Brussels: European Commission. Available at: <https://ec.europa.eu/transport/sites/transport/files/ex-post-evaluation-study-eu-financial-support-to-sustainable-urban-mobility.pdf> [Accessed 28 Mar. 2019].
4. Green Paper, A 2030 framework for climate and energy policies. (2013). [ebook] European Commission. Available at: <https://www.ceps.eu/sites/default/files/Vergote.pdf> [Accessed 28 Mar. 2019].
5. Franckx, L. (2015). Future trends in mobility: challenges for transport planning tools and related decisionmaking on mobility product and service development. [ebook] Available at: [http://www.mind-sets.eu/wordpress/wp-content/uploads/2015/11/D3.3-Future\\_Trends\\_in\\_Mobility\\_Challenges\\_for\\_transport\\_planning\\_tools\\_and\\_mobility\\_product\\_and\\_service\\_development.pdf](http://www.mind-sets.eu/wordpress/wp-content/uploads/2015/11/D3.3-Future_Trends_in_Mobility_Challenges_for_transport_planning_tools_and_mobility_product_and_service_development.pdf) [Accessed 28 Mar. 2019].
6. Drivers and Barriers for Integrated Mobility Services. (2017). [online] Available at: [https://www.researchgate.net/publication/316789415\\_Drivers\\_and\\_Barriers\\_for\\_Integrated\\_Mobility\\_Services](https://www.researchgate.net/publication/316789415_Drivers_and_Barriers_for_Integrated_Mobility_Services) [Accessed 28 Mar. 2019].
7. Liberato, A. (2015). Sustainable Urban Logistics Plans (SULP) Guidelines

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1. DG Move European Commission: Study on Urban Freight Transport. (2012). [online] European Commission. Available at: <https://ec.europa.eu/transport/sites/transport/files/themes/urban/studies/doc/2012-04-urban-freight-transport.pdf> [Accessed 27 Mar. 2019].
2. Smart choices for cities Making urban freight logistics more sustainable. (n.d.). [ebook] Available at: [https://civitas.eu/sites/default/files/civ\\_pol-an5\\_urban\\_web.pdf](https://civitas.eu/sites/default/files/civ_pol-an5_urban_web.pdf) [Accessed 27 Mar. 2019].
3. Impact evaluation methods in Civitas for urban freight measures. (2012). [ebook] Available at: [https://civitas.eu/sites/default/files/20120703\\_civitas\\_freight\\_measures\\_evaluation.pdf](https://civitas.eu/sites/default/files/20120703_civitas_freight_measures_evaluation.pdf) [Accessed 27 Mar. 2019].



## 2 URBAN FREIGHT TRANSPORT (UFT) MEASURES

→ References

4. UPS - The Road to Sustainable Urban Logistics, [https://sustainability.ups.com/media/UPS\\_The\\_Road\\_to\\_Sustainable\\_Urban\\_Logistics.pdf](https://sustainability.ups.com/media/UPS_The_Road_to_Sustainable_Urban_Logistics.pdf)
5. COE-SUFS.org. (2019). Initiative 26: Restricted Multi-Use Lanes. [online] Available at: <https://coe-sufs.org/wordpress/ncfrp33/psi/traffic-management/rmul/> [Accessed 27 Mar. 2019].
6. Landmark Global. (2014). The development of parcel lockers in Europe - Landmark Global. [online] Available at: [https://landmarkglobal.com/en\\_CA/trends-insights/the-development-of-parcel-lockers-in-europe/](https://landmarkglobal.com/en_CA/trends-insights/the-development-of-parcel-lockers-in-europe/) [Accessed 27 Mar. 2019].
7. American Locker. (2017). Intelligent Lockers for Parcel Delivery - The Last Mile - American Locker. [online] Available at: <https://americanlocker.com/electronic-parcel-lockers-for-parcel-delivery-the-last-mile/> [Accessed 27 Mar. 2019].







# 3

## Value for S-M cities (Challenges, Benefits and Beneficiaries)

This chapter presents:

- Some of the **benefits** UFT measures bring to the city, how these benefits are linked to **strategic city goals** and how they could be identified in a systematic way with **Social Impact Assessment tool**.
- The wider **added value** of UFT measures in a city taking also into account their relevance to local, national and EU strategies.
- The main beneficiaries and stakeholders of the UFT measures and how LAs could convince them to support measures implementation.

## Benefits of UFT

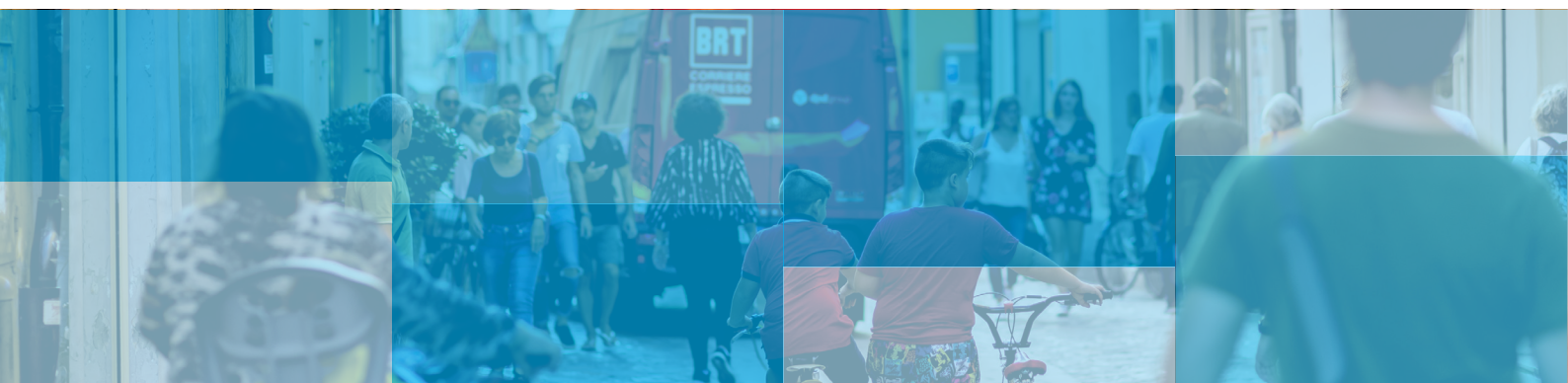
### DIRECT POSITIVE EFFECTS [1], [2], [3]

- Less congestion due to more efficient management of cargo deliveries.
- Reduced fuel consumption & less environmental pollution by the optimisation of deliveries routes, the usage of electric vehicles and anti-idling policies, optimisation of last mile urban logistics through UCC.
  - *Route optimisation software allows to reduce the size of the fleet needed for operations and increase the delivery/collection rate.*
- Reduced costs due to the reduced fuel consumption, reduced travel time, less vehicles damage (for all users - public transport, for municipalities vehicles and cargo drivers).
  - *By carrying out an adequate routes optimisation in an area may lead to total cost reduction of 10% - 20%.*
- Reduced noise (with eco friendly vehicles) and better management of public space (with multi-lanes/multi-parking spaces).

Global approach is required in order to achieve these benefits.

### FOLLOWING TABLE SHOWS UFT MEASURES CONTRIBUTION TO DEAL WITH DIFFERENT ENVIRONMENTAL, SOCIAL AND OTHER CITY CHALLENGES [4]

CHALLENGES MEASURES	CONGESTION	INADEQUATE INFRASTRUC- TURE	POLLUTION	NOISE	SAFETY	INVESTMENT NEEDS
URBAN CONSOLIDATION CENTRES						HIGH
PARKING REGULATION						LOW
TIME ACCESS RESTRICTIONS						LOW
COLLECT POINTS						LOW
REAL-TIME INFORMATION SYSTEMS						HIGH
ECO-DRIVING						MODERATE
UPGRADING CENTRAL OFF STREET LOADING AREAS						HIGH
LTZS						LOW



## EXAMPLE: BOLOGNA STRATEGIC OBJECTIVE [5]

According to the Local Evaluation Plan, the measure specific objectives are to:

- “Demonstrate the impact that a regulatory action upon freight distribution can have on urban traffic congestion and pollution level [...];
- Optimise and develop an effective integration between road pricing policies [...] and technological tools;

- Contribute to decrease the number of kilometers travelled to provide the same services;
- Favour the completion of the ‘City Freight Delivery Plan’ and disseminate the new opportunities provided” (Mimosa, 2009: 65)

## Social Impact Assessment tool

Transport measures impact all aspects of societies and human lives and more specifically dense urban centres.



Transport needs to be inclusive, accessible and make a positive contribution to quality of life.



Towards sustainable development, impacts assessment methods are needed regarding short and long-term social, health and wellbeing factors.

**“Social Impact Assessment is the process of analysing, monitoring and managing the social consequences of development.” (Vanclay, 2003)**

Issues: Factors, Samples, Social Groups, Data Collection Bias, etc.





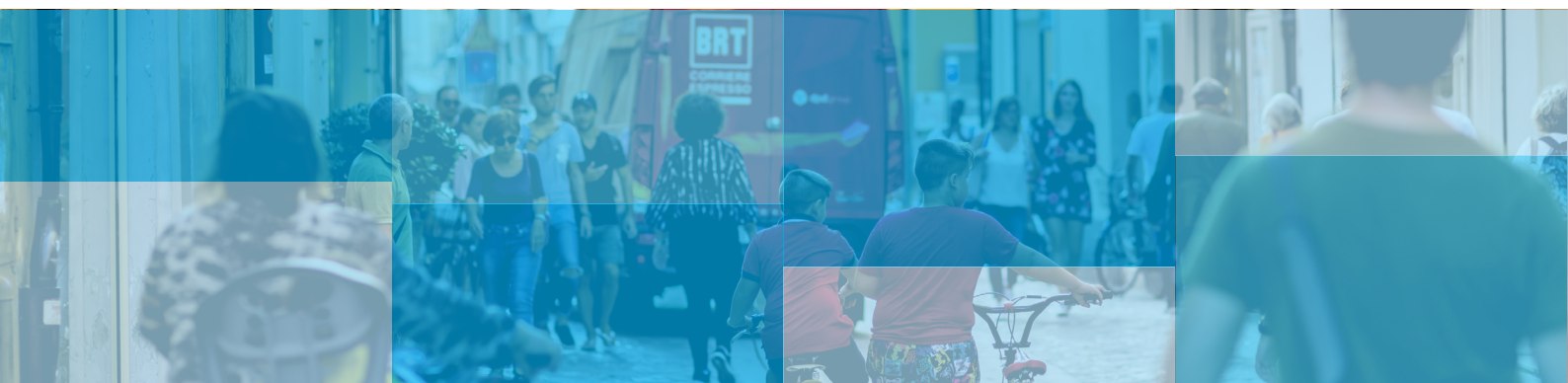
## Impact Assessment Dimensions

- **Environmental impact** is defined as “any changes to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation’s environmental aspects”.
- **Economic impacts** are defined in terms of the “effects on the level of economic activity in a given area” (Weisbrod & Weisbrod, 1997).
- **Social impacts** have been defined as the effects which characterize and influence the community’s social and economic wellbeing (Canter et al.1985).

IMPACTS		SUMMARY OF KEY IMPACTS	ASSESSMENT			
			QUANTITATIVE	QUALITATIVE	MONETARY £ NPV	DISTRIBUTIONAL 7 PT SCALE/ VULNERABLE GRP
SOCIAL	Commuting and other users		Value of journey time changes (£) Net journey time changes (£) 0 to 2 min   2 to 5 min   > 5 min			
	Reliability impact on Commuting and Other users					
	Physical activity					
	Journey quality					
	Accidents					
	Security					
	Access to services					
	Affordability					
	Severance					
	Option and no-use values					

Additionally in methodologies such as **WebTAG a 4th dimension** is integrated separately and includes Health Impacts.

**WebTAG** is an online tool of the UK Department for Transport’s web-based multimodal guidance on appraising transport projects and proposals.



## Overview of factors to be considered by type, source and level of human needs based on SUITS WP7 [7]

SOURCE	THEME	SUB THEME	IMPACT
PROVIDER BASED	Presence of infrastructure	Structurally	Visual quality
			Historical /cultural resources
			Severance/social cohesion
		Temporarily (during construction)	Noise nuisance
			Barriers and diversions
			Uncertainty of construction
	Presence of parked cars		Forced relocation
			Visual quality
	Presence of transport facilities, services and activities (accessibility) (inc. cost and temporal dimension)		Use of space
		Transport facilities	Availability and physical access
			Level of service provided
			Transportation choice /option values
Cultural diversity			
Land use/delivery/opportunity		Access to spatially distributed services and activities	
USER BASED	Traffic (movement of vehicles)	Safety	Accidents
			Averting behavior
			Safety perceptions
		Environment	Public safety (dangerous cargo)
			Noise levels, nuisance
			Soil, air and water quality
	Travel (movement of people)		Intrinsic value, journey quality
			Physical fitness (active travel)
			Security



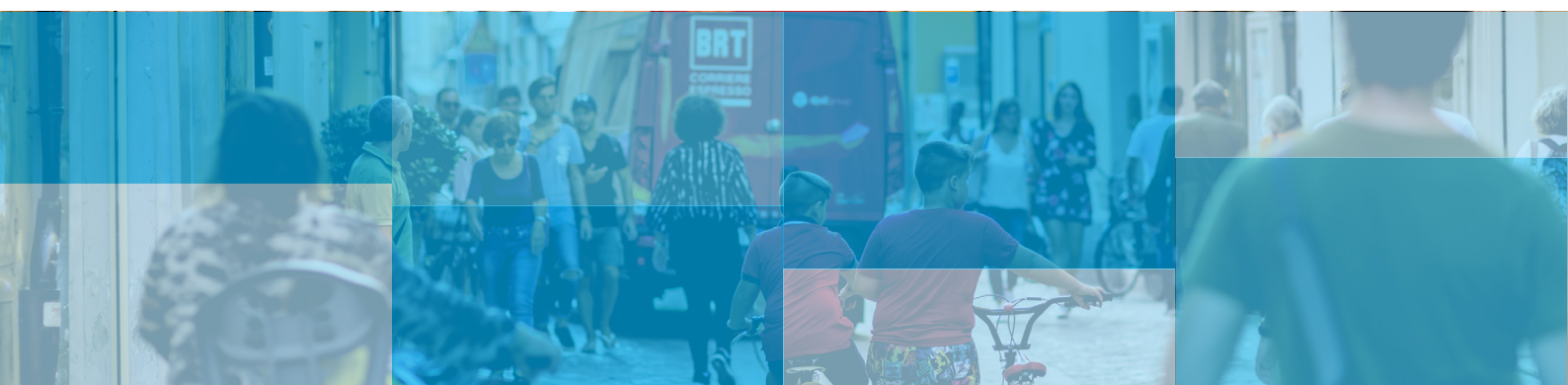
## Social Impact Assessment – WebTAG examples

### CASE STUDY: EXTENSION AND IMPROVEMENT OF ROUTING FOR FREIGHT TRANSPORTATION IN KALAMARIA (GREECE)

IMPACTS	QUALITATIVE ASSESSMENT/SUMMARY OF KEY IMPACTS [7]
ECONOMIC	Reduced congestion and traffic in the area will improve fuel economy for motorists who regularly travel through the improved routing
SOCIAL	Considered better accessibility, better journey quality
ENVIRONMENT	Reduction of pollutant emissions ( CO <sub>2</sub> , NO <sub>x</sub> , lead, PM), greenhouse effect (reduction of emission of CO <sub>2</sub> )

### CASE STUDY: CLEAN URBAN LOGISTICS AND GOODS DISTRIBUTION PLATFORM IN TOULOUSE (FRANCE)

IMPACTS	QUALITATIVE ASSESSMENT/SUMMARY OF KEY IMPACTS [7]
ECONOMIC	Related to different types of costs and compared to benefits result
SOCIAL	Considered in-depth public acceptance of the measure among different stakeholders
ENVIRONMENT	The assessment process resulted into expected reduction of emissions and mainly CO <sub>2</sub> emissions mainly due to usage of electric vehicles. Methods used included specialized simulation software packages



## Added value: (a) compliance with strategies/regulations (EU, NATIONAL, LOCAL)



Value is added also by the fact that UFT measures is relevant to local, national and EU strategies.

- In a **local** level, UFT measures could contribute to strategies for the **economic growth of commercial city centres**, the air pollution strategies and the local tourism (visual quality, public safety, low noise levels, air quality protect monuments and attract tourism).
- In **national and EU level**, these measures contribute to meeting its environmental, health and climate policy goals (e.g. Green Paper [8], swd (2016) 244 European Strategy on Low-Emission mobility [9], Strategic plan 2016-2020 Move March 2016 [10] etc.) and avoid penalties.
- **The alignment of UFT measures, as part of Sulp, to these policies could make S-M cities eligible to receive financial support from EU funds** [11].
- Further support about alignment of this kind of measures with EU policies is provided by EPPOM “Managing mobility for a better future” tools and CIVITAS cities network [12].





## Eu policy/strategic documents relevant to UFT measures

CORRESPONDING DOCUMENT	TOPIC	TYPE OF CONTENT	RELEVANCE TO SUITS (1-5)	RATING EXPLANATION
1. Study on Urban Freight Transport - Final Report [4]	<ul style="list-style-type: none"> <li>Regulatory measures at local level</li> </ul>	European Commission's Study	4	The content is not relevant exclusively for small and medium sized cities but can be adopted by any city regardless of size
2. Urban Freight research roadmap [6]	<ul style="list-style-type: none"> <li>Research priorities related to urban freight delivery</li> <li>Sustainability and security of these activities</li> </ul>	European Road Transport Research Advisory Council and Alliance for Logistics Innovation	4	The content is not relevant exclusively for small and medium sized cities but can be adopted by any city regardless of size
3. COM 2017 283 An agenda for a socially fair transition towards clean, competitive and connected mobility for all [13]	<ul style="list-style-type: none"> <li>Urban freight transport</li> <li>Safety and security</li> <li>Mobility management</li> <li>Car independent lifestyles</li> <li>Data management (evidence &amp; argument)</li> <li>New and emerging technologies</li> </ul>	Communication from the Commission	3	The content is not relevant exclusively for small and medium sized cities but can be adopted by any city regardless of size
4. Strategic plan 2016 - 2020 Move March 2016 [13]	<ul style="list-style-type: none"> <li>Safety and security</li> <li>New and emerging transport schemes</li> <li>Mobility management</li> <li>Car independent lifestyles</li> <li>New and emerging technologies</li> </ul>	Strategic Plan	3	The content is not relevant exclusively for small and medium sized cities but can be adopted by any city regardless of size
5. Clean and energy efficient vehicles [15]	<ul style="list-style-type: none"> <li>Clean transport systems</li> <li>Reduce energy consumption</li> <li>Co2 emissions</li> </ul>	European Commission's Policy Objectives	3	The content is not relevant exclusively for urban freight transport but there are some strategic goals for clean transport systems
6. Proposal for post - 2020 CO2 targets for cars and vans [16]	<ul style="list-style-type: none"> <li>Zero- and -low emission vehicles</li> <li>Eu fleet wide targets for 2020/2021 for light commercial vehicles</li> </ul>	European Commission's legislative proposal	2	The content has a part which is relevant for commercial vehicles (vans) but can be adopted by any city regardless of size
7. European Urban Mobility [6], [17]	<ul style="list-style-type: none"> <li>Urban mobility policy</li> <li>Sustainable urban mobility planning</li> <li>Funding instruments</li> <li>Underlying trends</li> </ul>	European Commission's Policy Context	2	The content is not relevant exclusively for urban freight transport but there are some strategic goals for a sustainable mobility
8. White paper [18]	<ul style="list-style-type: none"> <li>Emission reduction target</li> <li>Mobility management</li> <li>Competitive and resource efficient transport system</li> <li>Low-carbon sustainable fuels</li> <li>Optimising the performance of multimodal logistic chains</li> </ul>	European strategic document	1	The content is not relevant exclusively for urban freight transport but there are some strategic goals for a sustainable mobility





## Added value: (b) the collaboration of all actors/ stakeholders



Communication, collaboration and coordination between many different stakeholders/actors is needed in many aspects of UFT measures development and implementation process.

These procedures are essential to arrive to an agreement and wide support [1], [3] but **they also give LA the opportunity to:**

- **create a deeper interaction** with them and **facilitate the development of future projects** action plan,
- **make new synergies** and develop **new ideas** and **projects**,
- ensure constant **collaboration in future projects**.

Maximising synergies should be one of the priorities for S-M cities due to the limited available resources (scarcity of technical staff working with LA, limited financial resources etc.)



## How to build collaboration/ identify the stakeholders and actors needs

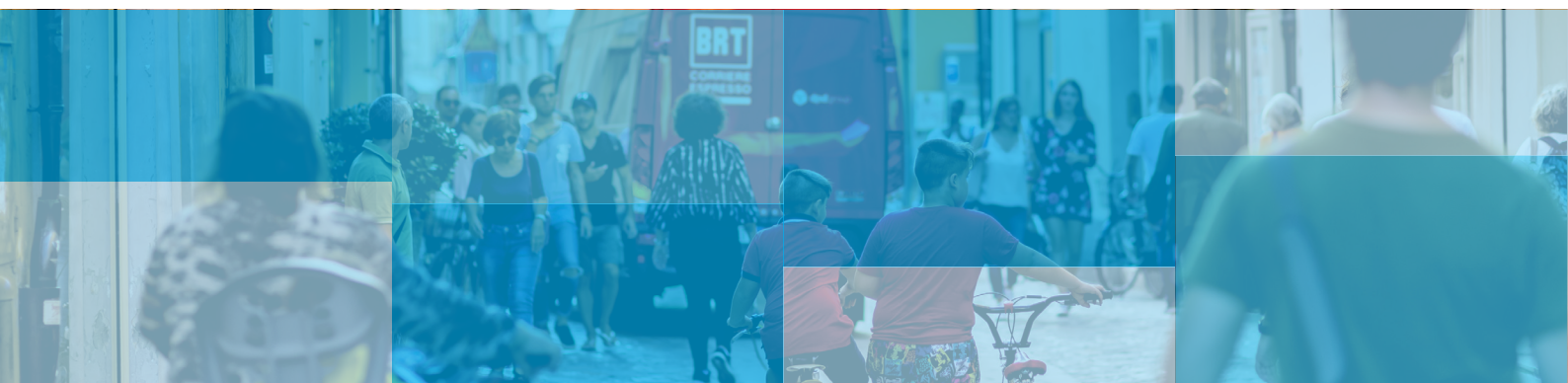


- Targeted interviews to representatives of stakeholders groups in order to inform them about:
  - municipality plans and objectives,
  - the potential benefit for them if supporting the project implementation,
  - the value of their contribution to the project.
- Running survey with questionnaires to stakeholders groups, asking for their perception of problems and solutions, for expressing their needs and restrictions that may hinder their contribution.
- Public consultation and open meetings to be invited all stakeholders in every implementation stage.
- Frequent inspections in the most busy spots of the road network where issues may be arise.
- Tailored approaches to different stakeholders/actors (i.e. customers through questionnaire, shop owners through short interviews, freight operators through short interviews- conversations).

## Identification of actors and stakeholders



- The first step towards the formulation of a framework that ensures integration of all actors and stakeholders of a city in urban freight decision making is to **identify them by producing an extensive list of them**. UFT measures implementation can be improved by involving a wide range of stakeholders. Additionally this results in the identification of factors that influence both local authorities and freight-related stakeholders, factors which currently require further investigation.
- **Usual actors and stakeholders for UFT measures implementation:**
  - Local authorities,
  - Public Transport Operators,
  - Citizens & Visitors, Customers
  - Enforcement units,
  - Non-Governmental Organizations,
  - Trade associations,
  - Commercial organizations,
  - Freight Transport Operators,
  - Shippers (Senders, Consignors, Own transports, Drivers) etc.



## Identification of actors and stakeholders for UFT measures based on administrative level

ACTORS AND STAKEHOLDERS	ADMINISTRATIVE LEVEL			
	INTERNATIONAL	NATIONAL	REGIONAL	LOCAL
Trade associations	X	X		
Commercial organisations	X	X	X	
Land owners/Property owners			X	X
Citizens & Visitors				X
Public transport operators		X	X	X
Vehicle manufacturers	X			
Shippers(Senders, Consignors, Own transports, Drivers)	X	X	X	X
Freight transport operators(3rd party logistics, hauliers, drivers, construction, maintenance)		X	X	X
Customers				X
Local Authorities			X	X
Central Government		X	X	

## Challenges and responses about Urban Consolidation Centres (UCC) <sup>[1], [19]</sup>

Examples of challenges and benefits UCC specific

### Challenges:

- Shipper and carriers may find difficult to obtain real estate in order to appropriately operate the centre (especially in large cities).
- In many cases, businesses are forced to operate in separate locations because of the lack of land or of the extreme financing costs which can further lead to higher operating costs.

### Responses:

- Urban consolidation centres enhance travelling less miles in order to deliver products → less travel cost → more reliability.

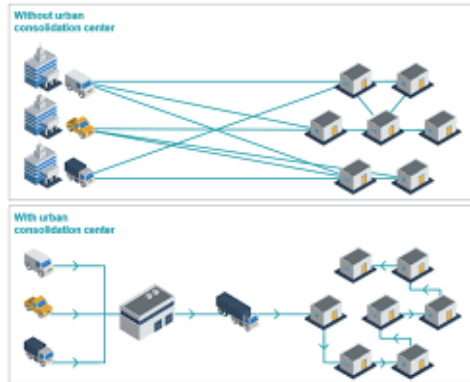




### 3 VALUE FOR S-M CITIES (Challenges, Benefits and Beneficiaries)

→ Challenges and responses about Urban Consolidation centres (UCC) [1], [19]

- Also, less travel miles lead to → reduced traffic congestion → less fuel consumption for the companies.
- Lowers pollution emitting activities and consequently improves air quality while ensuring less negative health impacts for people who working in deliveries.
- Improved loading processes arise from the creation of such a measure.



#### Groups to be benefited:

- trade associations,
- commercial organizations,
- land owners/Property owners,
- shippers (Senders, Consignors, Own transports, Drivers),
- freight Transport Operators,
- shop owners.

## Challenges and responses about New technologies and Telematics in last mile logistics [1], [19]

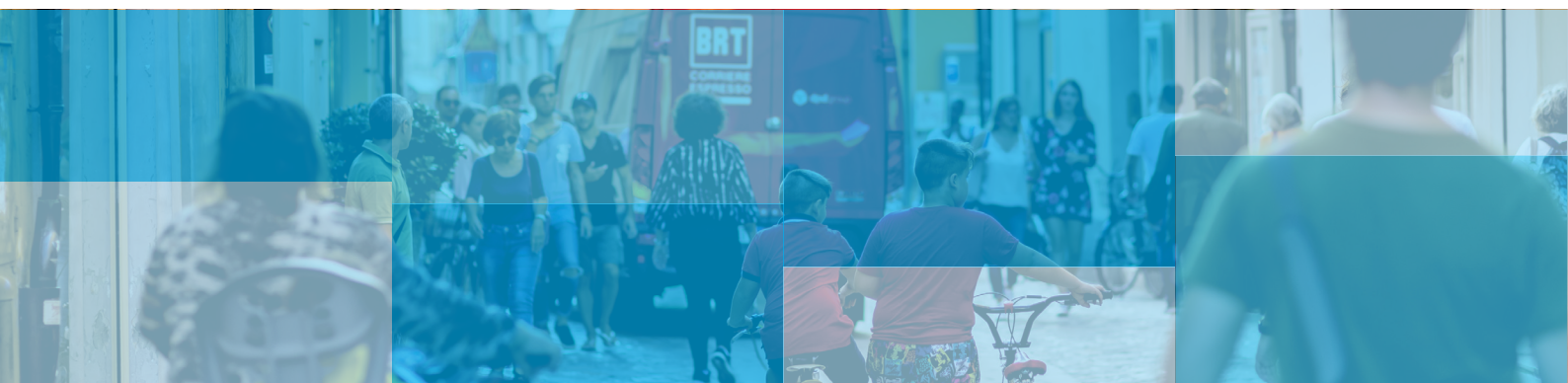
(Examples of challenges and benefits measure specific)

#### Challenges:

- Social groups consisted mainly of elders and/or other digitally illiterate groups tend to react negatively to such solutions. They usually find the ever growing digitalised transport system harder to cope with and they tend to be excluded from it.

#### Responses:

- Traditional practices (e.g. call centre) could be used for transferring real time information to customers of this group. Regarding digitally illiterate employees, the company is suggested to train them accordingly.
- Overall customer satisfaction is improved due to increased efficiency and speed of product deliveries.
  - Safety and security of the product is enhanced due to continuous traceability of packages while flexibility and control is granted to the companies.



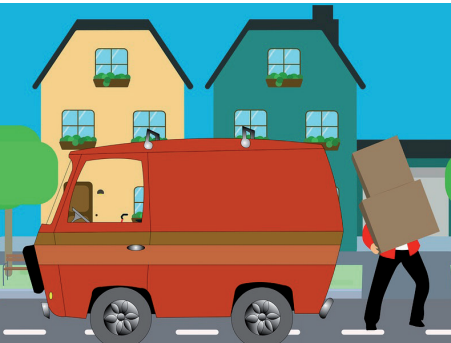
### 3 VALUE FOR S-M CITIES (Challenges, Benefits and Beneficiaries)

→ Challenges and responses about New technologies and Telematics in last mile logistics [1], [19]

- Visibility into fleet operations increase the business performance of the companies overall (improve scheduling and service delivery).

#### Groups to be benefited:

- freight transport operators,
- consumers,
- drivers,
- shop owners,
- customers.



## Challenges and responses about Night-time deliveries: Regulation and Enforcement

[1], [19]

(Examples of challenges and benefits measure specific)



#### Challenges:

- Residents of the surrounding areas tend to react on night-time deliveries especially due to noise levels.
- Drivers and other employees of the operators tend to dislike this option because of the required night shifts. Shop owners need additional staff resources to receive the goods.

#### Responses:

- The use of electric vehicles, cargo bikes etc. help overcoming the noise barrier.
- Reduced congestion and less parking demand for the urban area **during daytime** improves sustainability and liveability for all users (both residents, shops customers so shop owners etc.).
- Reduced congestion and less parking demand **during night time**
  - minimise operating costs and improves delivery times → high financial benefits for the operator may lead to less costs for the shop owners (special reductions etc.).
  - facilitate drivers in delivering the products.



## Groups to be benefited:

- citizens,
- employers and employees,
- road users,
- freight Transport operators,
- customers.

## Challenges and responses about Eco-friendly vehicles

[1], [19]

(Examples of challenges and benefits measure specific)

### Challenges:

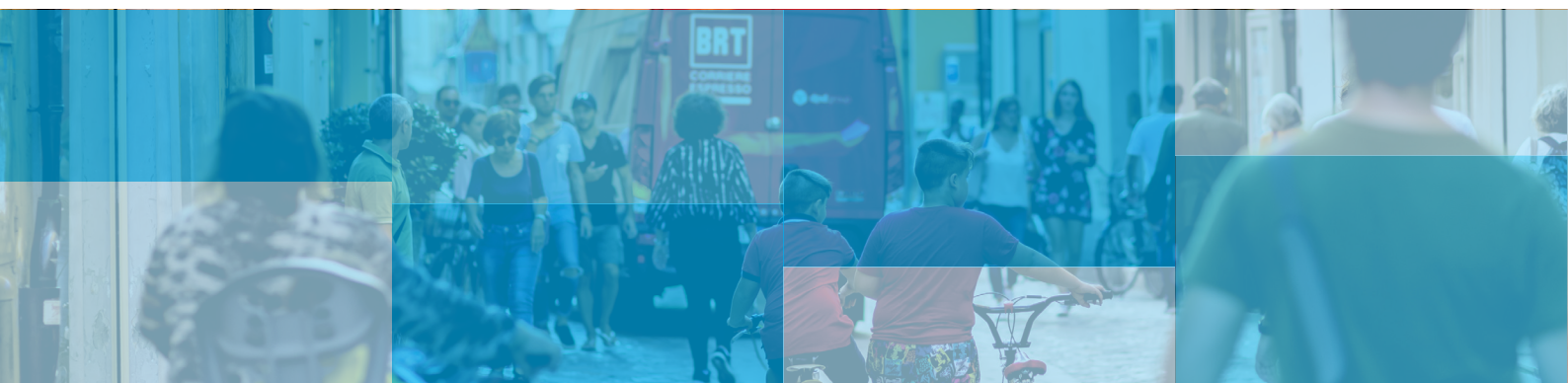
- High cost for electric vehicles purchase.
- Probable objections regarding cargo- bike may be risen because of the heavy loads they need to carry.

### Responses:

- Giving incentives (advantages in parking, less taxes, enabling access everywhere – combination with LTZ) etc.
- Highlighting environmental benefits due to reduced polluting emissions and noise along with lower energy consumption or in many cases cargo bikes and other man powered vehicles.
- These solutions are translated into health benefits for both the active users as well as occupants of the surrounding area → economic benefit for the central government and the local authorities.
- Electric bikes might be used as more suitable for uphill areas and narrow streets.

## Groups to be benefited:

- road users,
- residents,
- tourists,
- employees.





## Challenges and responses about Multi-use lanes

[1], [19]

(Examples of challenges and benefits measure specific)

### Challenges:

- Negative reactions are derived through public transport operators who have to coexist with freight operators.
- This measure might confuse other drivers or even cause conflict with them and/or passengers, cyclists etc.

### Responses:

- There is a need for a) right design, b) coordination/combination with other UFT measures (the night time deliveries) c) choose correctly the time slots d) good collaboration with both actors (public transport operators and UF operators, d) better enforcement.
- As a response to the possibility of confusion of drivers it should be a) the right conditions of implementation with clear signals, c) training of the users and better enforcement.
- With appropriate implementation of the measure safety for vulnerable road users and passenger drivers is enhanced while efficiency of the overall network is increased.

### Groups to be benefited:

- citizens & visitors,
- shippers at all stages such as senders, drivers, etc.,
- freight transport operators,
- customers.



## Challenges and responses about Real-time loading space booking and/or Multi-use of parking space [1], [19]

(Examples of challenges and benefits measure specific)

### Challenges:

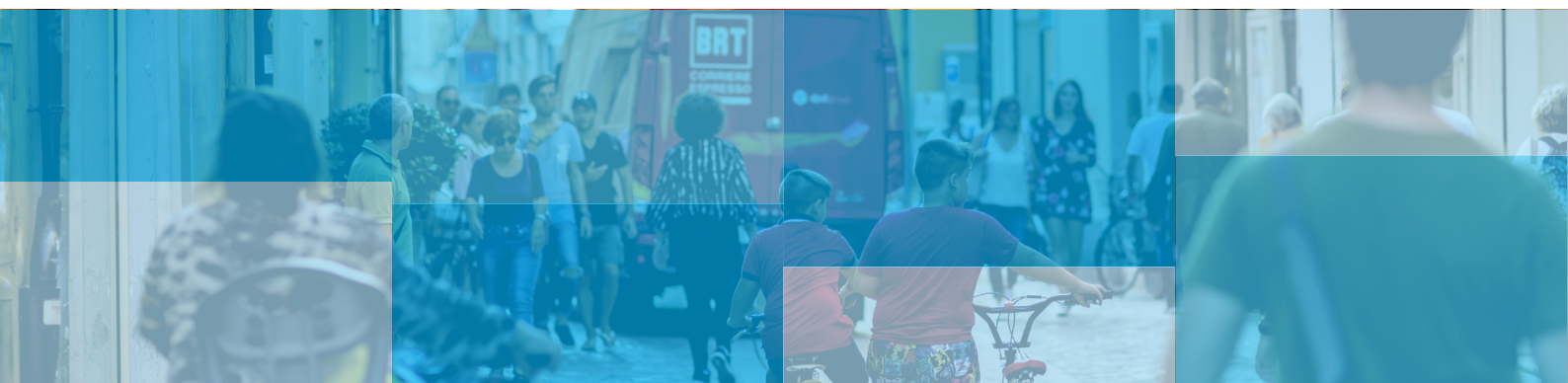
- Real time loading space booking requires planning and coordination among different stakeholders as well as implementation of intelligent transport systems which increases costs. Negative reactions may rise from local and regional authorities which are responsible for the implementation of this measure.

### Responses:

- Through the implementation of this measure, traffic conditions may improve such as reduced congestion and more available parking spaces. This also leads to safer and more sustainable transport networks and urban areas while improved environmental conditions and more specifically lower emissions and improved health conditions which are direct impacts.
- Cooperation between the public and the private sector is required in order for this initiative to be successful.

### Groups to be benefited:

- citizens & visitors,
- shippers at all stages such as senders, drivers, etc.,
- freight transport operators,
- customers.





## Challenges and responses about Lockers as distribution points to be used as delivery points [1], [19]

(Examples of challenges and benefits measure specific)



### Challenges:

- No negative reactions are identified regarding lockers and their use as distribution/delivery points. Due to the fact that this is an optional delivery method, even those people that would otherwise be opposed to the use of lockers and would require home or office delivery can opt out and choose traditional delivery methods.

### Responses:

- It is a measure with a variety of major benefits for the majority of the involved stakeholders. Such are the improved convenience which allows 24/7 deliveries, the increased security since fewer packages are lost and complete visibility due to the fact that it provides complete tracking and accountability.
- It reduces operational costs for freight operators while it also improves traffic condition due to less vehicle kilometers travelled and also improved environmental conditions due to lower failed attempts of product deliveries.
- The location of such lockers which usually are included in high proximity areas with multiple uses such as super markets, shopping malls etc., increase in-store traffic for the respected stores.

### Groups to be benefited:

- carriers,
- drivers,
- consumers/customers,
- residents and retailers are the identified as beneficial groups of the implementation of this measure.



## Limited Traffic Zones (LTZs) <sup>[1], [19]</sup>

(Examples of challenges and benefits measure specific)

### Challenges:

- Carriers are concentrated during the night while retailers prefer day deliveries.
- The demand representatives broadly shared the view that indicating congestion followed by illegal parking at load/unload bays as the most severe problems.
- The unfair allocation of exemptions, based on type of goods distributed inside LTZs.
- Entrance fees (if they exist) → are regarded as too high in view of the large increase in recent years.
- Extensive illegal use of time-windows and load/unload bays from carriers.

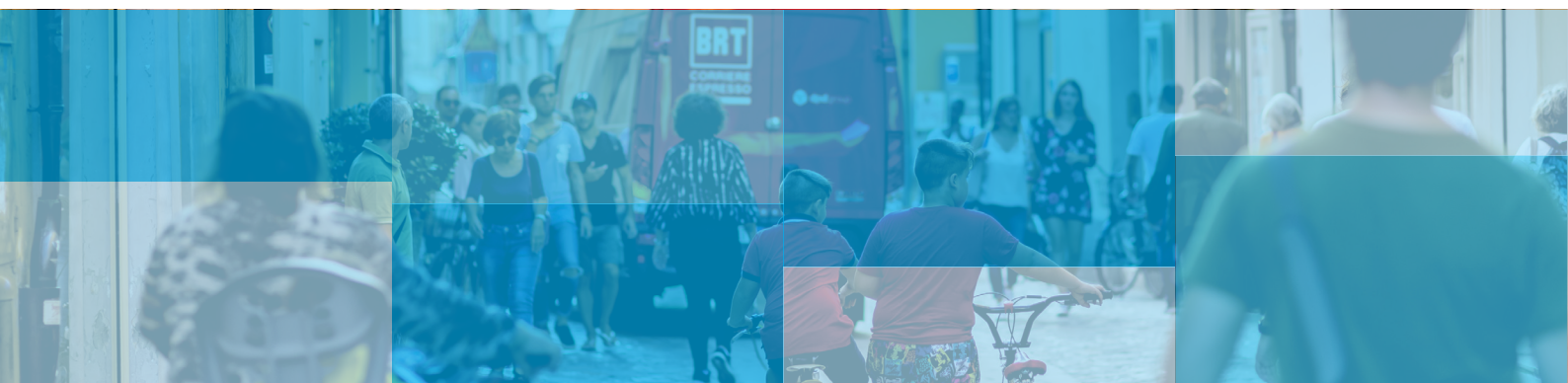
### Responses:

- Caution in endorsing the most innovative initiatives emerging from the stakeholder focus groups. It needs efficient communication and collaboration between stakeholders.
- Enforcement systems are necessary to avoid illegal behavior.
- Taking into account the type of goods delivered in the initial stage of planning.



### Groups to be benefited:

- vehicle manufacturers,
- public transport operators,
- residents and retailers,
- carriers.



## Best practices from SULPs Guidelines

The following tables, part of “Guidelines for the Planning & Development of Sustainable Urban Logistics Plans (SULPs)” [3] Best practices, summarise benefits, challenges (obstacles) and responses (enablers) of UFT measures implemented in different cities.

Measure and example of best practices	Benefits and Opportunities	Key enablers and Critical Success Factory	Possible Primary Obstacles
<b>Green public procurement for freight transport</b> Den Bosch	Stimulate suppliers to focus environmental impact for freight and suggest green alternatives. Higher number of energy efficient and green vehicles used by local governments	Procurement policy as an instrument to stimulate innovation and apply sustainable solution and corporate responsibility	Market offer of vehicles meeting all requirements is still limited. Development of highly customized vehicles might be conflicting with the transparent procurement policies of public organisations and governments
<b>Use of green vehicles (FEVs, PHVEs, Bio Gas Vehicles)</b> Den Bosch, Trondheim, Lucca, Reggio Emilia, Parma	Integration of zero-emission vehicles in the overall urban mobility. Societal benefits (more employment, education, air quality, noise, etc.). Significant public acceptance.	Electric vehicles can replace operationally conventional freight vehicles for last mile services. Electric vehicles are technically reliable and accept by the drivers. Public financial support in the context of an overall program involving environmental targets	A relatively new market, cost of vehicles and related services are still high. Lack of core infrastructures such as gas filling stations and charging infrastructure. Electric driving has new issues around road safety and daily use (e.g. recharging strategies). The use of (local/regional) renewable energy is still difficult.

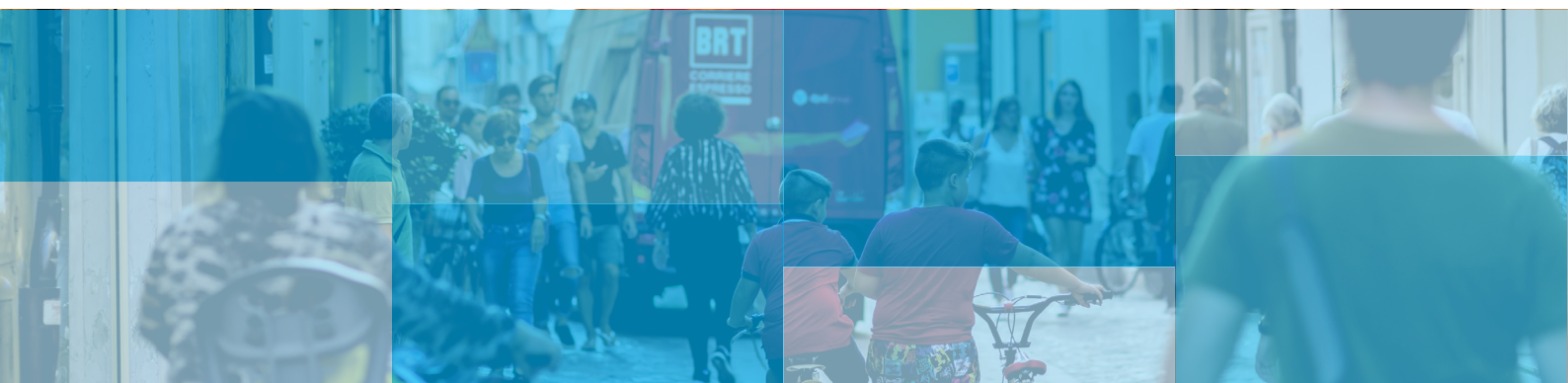
Measure and example of best practices	Benefits and Opportunities	Key enablers and Critical Success Factory	Possible Primary Obstacles
<b>Sustainable Urban Mobility Plants</b> Den Bosch, Granada, Terrasa, San Sebastian-Donostia	Reduced access, circulation and impacts of traffic in critical (protected) urban areas Less pollution, less noise and risk for pedestrians. Improved accessibility to historic centre, improved urban life. Urban renewal and possibility to regain qualified public spaces, attract more businesses opportunities. Increase citizens participation. Raiser awareness on sustainable city solutions.	Willingness of public authorities and stakeholders representatives (associations) to accept the idea and purpose of the project. Suitable policies balancing restrictions and incentives. Importance of communications to increase the societal revenue of the initiative. Relevance of neighbourhood participation to enlarge the acceptance of the measures.	Insufficient political commitment. Possible resistance and opposition to norms and rules enlarging pedestrianisation and introducing limitations on traffic circulation. Concerns by shops and retail open possible reductions of activities.
<b>Low emission zones, Freight distribution Plans</b> London, Bologna, Utrecht, Prague	Reduced access, circulation and environmental impact of traffic (PM10, CO, NO, etc.) in critical (protected) urban areas. Reduced noise and risks for pedestrians. Improved accessibility to historic centre, improved urban life. Reduced traffic stress on historic assets and heritage. An overall policy including both passenger and goods transportation is possible.	Willingness of public authorities and stakeholders representatives (associations) to accept the idea and purpose of the project. Importance of communications to increase the societal revenue of the initiative. Decision about the type and age of the vehicles accepted for circulation. Enforcement patterns and system for the LEZ, combination with road pricing schemes. Integration with other mobility governance measures (e.g. Zone Access Control, access and road charging, etc.).	Possible long and controversial process. Possible resistance and opposition to norms and rules enlarging pedestrianisation and introducing limitations on traffic circulation. Worries by shops and retail operators on possible reductions of activities. Need to balance between restrictive policies and the requirements of free market and competition. Enforcement costs may be high for the authority.





### 3 VALUE FOR S-M CITIES (Challenges, Benefits and Beneficiaries)

<b>Urban consolidation Centres and related services</b> Vicenza, Lucca, Padua, Siena, Parma, Thun	<p>Optimisation of distribution trips.</p> <p>Reduction of trips and vehicles on the centre.</p> <p>Possibility to serve both direct and reverse logistics.</p> <p>Possible support for 3rd party logistics services.</p> <p>Enhanced safety and liveability of the historic centre.</p>	<p>Adequate support by legislation (regional, national) transport operators.</p> <p>Consultation and consensus building with key stakeholders associations (transport operators, small independent carriers, shop and retailers, businesses, consumers, etc.)</p> <p>To reach the critical mass of small independent transport operators for consolidation services.</p>	<p>Cost of infrastructures and required investment.</p> <p>Possible resistance and opposition from transport operators (impact on current practices, worries about competition, etc.).</p> <p>Competition between UCC and other carriers not using UCC services is to be dealt with.</p> <p>Economic sustainability of operation (moving from public subsidy to financial autonomy).</p> <p>Strong efforts in marketing may be required.</p>
<b>Quality partnership programs</b> Den Bosch, Toulouse	<p>Improving the sharing of the road space between cars, delivery vehicles, pedestrians and other street space users.</p> <p>Rationalise delivery operation in the urban centre, reduce the impacts of freight vehicles.</p> <p>Reduction of through commercial traffic in the area.</p> <p>Higher number of energy efficient and green vehicles used by suppliers.</p>	<p>Definition and sharing of a common "charter" fixing the roles and good practices for the urban transport of goods.</p> <p>Solution must ensure entrepreneurs and suppliers both benefit from the scheme.</p> <p>Carriers have been in favour of the scheme.</p> <p>Cooperation with all parties is essential.</p> <p>Local initiatives need to work on a commercial basis to survive.</p> <p>Long term involvement of the administration and elected officials is needed.</p>	<p>To reach a consensus for the definition of the common Charter.</p> <p>To make the Charter easy to enforce</p> <p>Commercial initiatives need a certain time to develop.</p> <p>In economic downturn times, suppliers tend to protect their own business.</p>





## EXERCISE B

## Analysing benefits and views of stakeholders on Urban Freight Transport measures

### Description of exercise

- A) Use sticky notes to fill in the two open Boxes. The first field refers to the benefits of a selected UFT. The second field refers to the actors/stakeholders/social groups that will be affected (positively or negatively) by the measure.
- B) On the left column of T-Chart transfer the actors/stakeholders which would present the most negative reactions to the proposed measure. On the right column, transfer the sticky notes (i.e. the benefits of Exercise A) so they can be used as convincing arguments to the stakeholders written on the left corner. (To perform the exercise focusing on specific city, a city map, mobility data and relevant information are distributed to support brainstorming).

Please fill in the following box with the benefits that you believe the UFT measures that you selected can bring to your city.

TEAM NAME

### MEASURE TITLE

BENEFITS  
FOR YOUR CITY:

Please fill in the following box with the actors/stakeholders/social groups that you believe will be negatively or positively affected by the UFT measures that you selected.

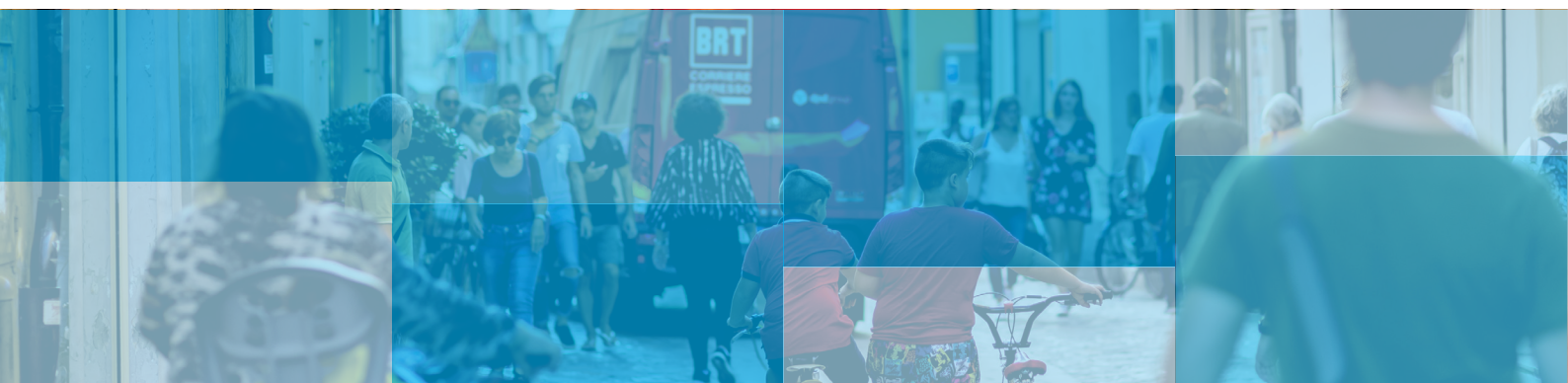
STAKEHOLDERS:

Please fill in the T-chart below, according to the arguments that may be expressed by actors in favour/against the implementation of the UFT measure provided to your group.

ACTORS	ARGUMENT

## Further Reading

1. Smart choices for cities Making urban freight logistics more sustainable. (n.d.). [ebook] European Commission. Available at: [https://civitas.eu/sites/default/files/civ\\_pol-an5\\_urban\\_web.pdf](https://civitas.eu/sites/default/files/civ_pol-an5_urban_web.pdf) [Accessed 27 Mar. 2019].
2. Guidelines for developing and implementing a Sustainable Urban Logistics Plan. (2015). [online] <http://www.eltis.org>. Available at: [http://www.eltis.org/sites/default/files/trainingmaterials/enclose\\_d5\\_2\\_sulp\\_methodology\\_final\\_version\\_0.pdf](http://www.eltis.org/sites/default/files/trainingmaterials/enclose_d5_2_sulp_methodology_final_version_0.pdf) [Accessed 27 Mar. 2019].
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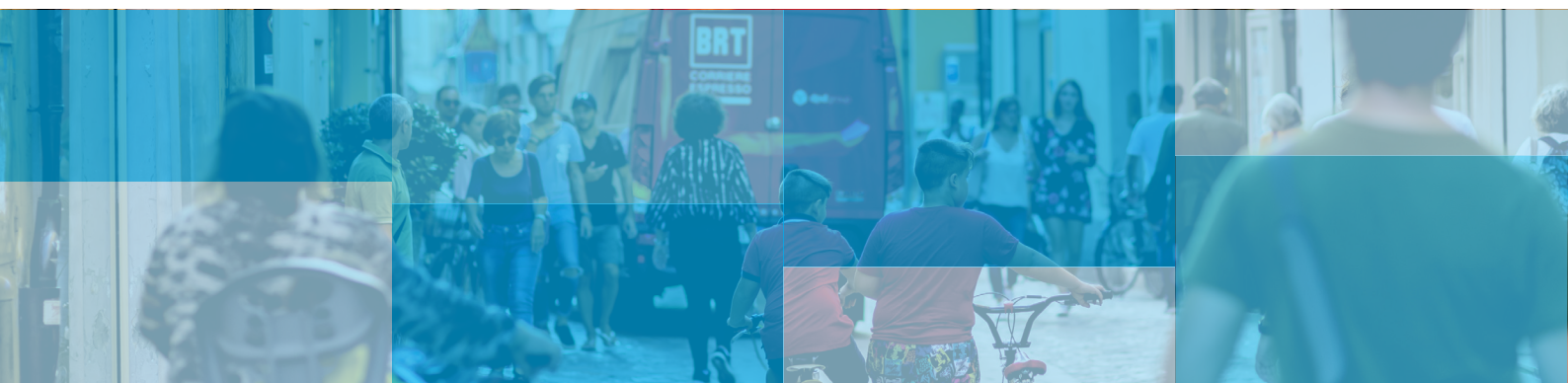
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# 4

## Successful Case Studies or Best practices of SUITS cities

This chapter demonstrates:

- **Three case studies- as best practices-** of implemented UFT measures.
- It includes an extensive analysis about the **barriers and the drivers** that city had to deal with (from the LA's perspective)
- Best practices from Sustainable Urban Logistics Plan (**SULP**) depository summarise benefits, enablers and obstacles of UFT measures applied in different cities.

### Case Study 1

Case Study 1: Rome's Limited Traffic Zone (LTZ) (case study from city participating in SUITS project)

### Case Study 2

Case Study 2: Turin's Multi-Use Lanes, Parking regulation and LTZs. (Case study from SUITS city consortium)

### Case Study 3

Case Study 3: City of Utrecht with electric freight road vehicle, LTZs, UCC and Lockers as distribution points



# Urban Freight Transport

## Limited Traffic Zone (LTZ) - Freight distribution system (Rome)

### LOCATION

Rome, the capital of Lazio region has 2,872,800 residents and it's one of the Italian cities with Limited Traffic Zones (called Zona Traffico Limitato or ZTL in Italian).

### WHY THIS IS A BEST PRACTICE IN THIS FIELD?

By implementing these measures, traffic mobility condition improves, road safety increases and traffic related pollution decreases. Also UFT measures re-habilitate urban spaces, rationalize public space and safeguards citizens' health and life quality.

Several benefits derived from the measure: a) renewal of cargo fleet, b) decrease permits issued to enter LTZ, c) CO2 emissions decrease.

In fact, in 2015 euro 5 category freight vehicles represented the 56% on the total fleet vehicles (4% in the 2010); in 2015, euro 6 freight vehicles were 11% of total fleet (1% in the 2010). The number permits to enter LTZs decreased by 47%.

### INITIAL PROBLEM AND TARGET GOAL

ZTL was put in place to reduce congestion in high traffic areas, helping to slow the inevitable structural decay of the historic city center.

### MEASURE DESCRIPTION

The freight distribution is supported by rules system and incentives implemented in the previous years by Rome Municipality, regarding access rules (freight LTZ set up), restriction to enter in LTZ, permission fee and ecological vehicles incentives.

Since 1st November 2011, new rules are characterized by a strong reward system aimed to encourage more environmentally friendly vehicles (LPG, CNG, electric, hybrid)

This is made by a huge discount on the LTZ permit's price and by allowing low emission vehicles to enter into freight LTZ also out of the time windows that diesel/petrol vehicles have to respect.

There is also a progressive ban of older vehicles (e.g. since October 2012 Euro 2 vehicles were denied entrance in the LTZ, while Euro 3 diesel had access only until December 2013).

Rome Municipality approved the New Mobility Master Plan in 2015, a programming tool for the medium period to rationalize existing systems and mobility services and regulate the mobility demand. The plan outlines how to contain impacts of circulating freight vehicles for a "sustainable city". These measures will be adopted in the Sustainable Urban Logistic Plan (SULP), including Urban Consolidation Centre (UCC), revise/update the loaded and unloaded freight time windows in the city centre, etc.

Main rules on freight distribution (official resolution):

- n.856/2000: vehicles taxation with a loaded weight until 3,5 tons, limiting the access into the LTZ from 20.00 to 10.00 and from

14.00 to 16.00; October 2001 (as per previous official resolution): starting up e-gates for LTZ access;

- n.44/2007: freight LTZ boundary redefined;
- n.58/2011: "free" circulation in the LTZ for all electric vehicles;
- n.245/2011: restrictions to gradually prohibit polluting vehicles, according to emission factors of Euro categories;
- n.215/2012: introduction new criteria for incentives with the extension of the contribution and new vehicles categories;
- n.119/2014: new permits fee.

### SCALABILITY/ REPLICABILITY

The measure may be more effective in big and medium sized cities, without excluding smaller cities. Particularly appropriate for historic city centres.

### IMPLEMENTATION REQUIREMENTS

The implementation costs aren't measurable. The financing schemes consist of national and local funds. The implementation time is 19 years in total, since the beginning of this initiative.

**Use of IT system:** The Electronic Gates Access System based on automatic plate number recognition (ANPR) and New Technologies.

### Monitoring Access to LTZ Gates

50 Access control systems monitor the restricted traffic areas (Historic Center, Trastevere, San Lorenzo, Testaccio, Imperial Forums) by detecting incoming flows and classifying them by type of vehicle. The electronic gates detect the vehicle license plate in telematic form by activating the sanction procedure. The measuring stations are connected to the system where the following information are obtained:

- date,
- hour,
- entrance gate,
- number of steps.

The data is aggregated to 15 minutes and stored as a record in a temporary DataBase, to which the accredited user can connect and extract the required information in csv format.

As sanctioning systems are available (only during time windows of the openings gates), data on violations, and whitelisted vehicles (authorized vehicles) are willing. Data on vehicles liable for fine are maintained within the system on average for approximately 40 days, after those are cancelled for privacy.

DB characteristics: LTZ Historical centre - Oracle - 120Gb

### INDICATORS TO MEASURE SUCCESS AND FINAL OUTCOME/IMPACT

The indicators to measure the success of measures are:

- Freight vehicles number per euro category.
- Permits issued number.
- CO2 emissions (kilogram).

## BARRIERS AND DRIVERS

### COOPERATION/COORDINATION ISSUES

**Barrier:** Lack of coordination between the Local Authority and stakeholders involved in the freight distribution on the main topics regarding demand regulation.

**Driver:** All these challenges seem to be solved when the heads of the city councils would be convinced of the relevance of the organizational change. This is the most important action for the cities in the short-run.

### FINANCIAL RECOURSES ISSUES

**Barrier:** Being rules and official resolutions, the costs aren't measurable.

### PROCESS

**Barrier:** The main problem regards the acceptance degree of stakeholders involved (shop owners, logistic operators and residents): the LTZ limits the mobility of vehicles and customers during specific time slots.

**Driver:** Constantly hearing and informing the stakeholders on the goals to achieve in term of pollutants reducing in the areas involved by traffic restrictions.

### TECHNICAL/DATA RESOURCES

**Barrier:** Not particular barriers detected

### STAFF

**Barrier:** Knowledge gaps in the wider city council departments that occur distrust.

### POLITICAL

**Barrier:** The politics have to balance different interests among the stakeholders, causing delay in measure applying.

**Driver:** Participant process implementation and awareness campaign.

### LEGAL

**Barrier:** Not particular barriers detected.

### SOCIETAL

**Barrier:** Conflict between business interests and sustainable liveability.

**Driver:** Encourage good behaviours to guarantee better health conditions for citizens themselves.

## FURTHER INFORMATION

<http://www.smartset-project.eu/downloads>





# Urban Freight Transport

## Multi-Use Lanes, Parking regulation, LTZs (Turin)

### LOCATION

Turin, the capital of the Piedmont region with population of 886.837, is the leading city in Italy for urban logistics, having developed a set of 'push and pull' measures dealing with restrictions and incentives for logistics operators delivering their operations in accordance with the Freight Quality Partnership (FQP) Agreement.

### WHY THIS IS A BEST PRACTICE IN THIS FIELD?

Thanks to the project a very interesting and fruitful cooperation has been created with the stakeholders. Moreover, innovative 'Pull' measures have been implemented through the use of innovative ITS tools.

### INITIAL PROBLEM AND TARGET GOAL

Despite the Freight Quality Partnership (FQP) Agreement, increasing commercial traffic continues to affect traffic flow and burden the environment.

Turin municipality has been actively involved in the Novelog project (<http://noveleg.eu/>). The NOVELOG project focuses on the enabling of knowledge and understanding of freight distribution and service trips by providing guidance for implementing effective and sustainable policies and measures. This guidance will support the choice of the most optimal and applicable solutions for urban freight and service transport and will facilitate stakeholder collaboration and the develop-

ment, field testing and transfer of best governance and business models. The objectives are set as follows:

1. To understand, assess and capture current needs and trends in Urban Freight Transport, revealing the reasons for failures in city logistics implementations and to identify the key influencing factors and develop future Sustainable Urban logistics scenarios.
2. To enable determination of optimum policies and measures, based on city typologies and objectives, link them to tailored business models and test and validate them.
3. To develop a modular integrated evaluation framework for city logistics that will portray the complexity of the life cycle of UFT systems and implement it to assess the effectiveness of the policies and measures.
4. To incorporate the best fitting policies and measures in integrated urban planning and SUMP, at local level, to facilitate and guide multi-stakeholder cooperation for improved policy making.
5. To field test, implement and validate all the above, in selected EU cities, and demonstrate applicability and sustainability of the tools and ensure the continuity of the impacts by creating and establishing take-up strategies and roadmaps for the best city logistics solutions.

The objective of the pilot of Turin is to improve the average speed of traffic flows and reduce emissions, while proving that innovative concepts and business models in urban logistics can help to build more efficient, effective and sustainable urban transport and logistics networks.

### MEASURE DESCRIPTION

NOVELOG local activities in Turin (Italy) are focused on two core measures:

Multi-user lanes - incorporating bus lane sharing with freight vehicles - and the management of loading/unloading parking lots, in a selected subset of city centre Limited Traffic Zones, using existing cameras to monitor the parking booking and control system.

Thanks to the project, specific actions and measures have been implemented at an experimental level. A specific freight quality partnership has been created in order to cooperate among the Municipality itself and the Chamber of commerce, freight transport associations and the trade operators located on the territory.

### SCALABILITY/ REPLICABILITY

S-M cities with similar challenges and characteristics can design and implement such plans to improve the city's overall quality.

### IMPLEMENTATION REQUIREMENTS

Local and European Research funds have financed this scheme implemented in Turin. From the identification of the problem, the design of the concept and its implementation is approximately 5 years.

IT systems have been used to provide freight vehicles with on board units to trace their path. Moreover, a specific protocol to connect the public infrastructure with the private



device has been implemented in order to have an efficient traffic prevision thanks to floating cars data.

## ► INDICATORS TO MEASURE SUCCESS AND FINAL OUTCOME/IMPACT

Thanks to the measure, the older and more polluting vehicles have been changed with more sustainable ones. The starting point has been in 2014, when the fleet vehicles pre-Euro4 have been scrapped. In 2017, instead, the first experimentation with EV and CNG injection have been introduced.

### Indicators to measure success/implementation:

- Production indicators
- Level of pollution
- Safety indicators

## ► BARRIERS AND DRIVERS

### COOPERATION/COORDINATION ISSUES

**Barrier:** The main problems arise since it is usually difficult to cooperate and have contact with stakeholders, mainly the operators working in the freight distribution. A good cooperation is, instead, found in the LA department.

**Driver:** Thanks to the personal intent and work of the people involved in the activity a good and active work has been operated. In particular, they pushed for the creation of productive and challenging working tables with express courier operators to discuss and present the advantages of the measure.

### FINANCIAL RECOURSES ISSUES

**Barrier:** Any specific financial resource is required at the LA, since the measure is implemented during a EU project. However, the operators

are required to change their vehicles in order to access the special permission included in the measure.

**Driver:** The devices where in loan, moreover some specific permission where granted to the fleet, generating more production and possibility to deliver goods. It is, however, necessary to illustrate properly to the operators the economic advantage in their vehicles changing.

### PROCESS

**Barrier:** The main issues regards the implementation of the process connected with the drivers' tracing. In fact, the main problems are due to the workers' law, since the measure would require the collection of their movements around the city. So they would be worried about.

**Driver:** A proper solution is found analysing the process and its risks: the data will not be given directly to the operators themselves, but they will be analysed and provided in an aggregate format. Moreover, they will be used to highlight the general benefit of the measure after and during its implementation.

### TECHNICAL/DATA RESOURCES

**Barrier:** There is a lack in the resources and expertise inside the LA since there is any department that have the proper knowledge in the data analysis.

**Driver:** Innovation in the process and in data acquisition: this kind of data was not available previously and would require new kind of analysis. This pushes the writing of a call for tender notice to lean on some external help, all financed thanks to another EU project.

### STAFF

**Barrier:** There is a lack in the resources and expertise inside the LA since there is any department that have the proper knowledge in the data analysis.

**Driver:** Thanks to a good network

built previously it has been possible to lean on a consulting agency very keen on such themes: the necessary expertise and skills on how to move has been acquired during the meetings with them.

### POLITICAL

**Barrier:** There is a lack in the resources and expertise inside the LA since there is any department that have the proper knowledge in the data analysis.

**Driver:** Innovation in the process and in data acquisition: this kind of data was not available previously and would require new kind of analysis. This pushes the writing of a call for tender notice to lean on some external help, all financed thanks to another EU project.

### LEGAL

**Barrier:** There is a lack in the resources and expertise inside the LA since there is any department that have the proper knowledge in the data analysis.

**Driver:** Thanks to a good network built previously it has been possible to lean on a consulting agency very keen on such themes: the necessary expertise and skills on how to move has been acquired during the meetings with them.

### SOCIETAL

**Barrier:** On the whole, the measure is rather focused on a specific professional category (express courier operators and freight delivery), so the citizens are not expected to directly feel the effect of such measure.

**Driver:** Any special action, since the citizens do not feel directly the changing due to this measure.

## FURTHER INFORMATION

<http://simone.5t.torino.it/>

<http://novelog.eu/>



# Urban Freight Transport

## Electric Freight Vehicles (The Cargo - Hopper and the Beer-boat) (Utrecht)

### LOCATION

The city of Utrecht is the Netherlands 4th largest city, densely populated, with a population of more than 320.000 and growing. Its centre is of historical and cultural importance.

The city of Utrecht accommodates numerous cafes and restaurants located in and around its historic centre (consists of many narrow streets) which results in attracting tourists in a very high rate. Additionally, due to the fact that the city's economy is mainly based on the service sector, many offices and institutions are located in the centre generating major economic activity.

### WHY THIS IS A BEST PRACTICE IN THIS FIELD?

Utrecht's integrated planning actions along with the implementation of tailor made measures that improve and enhance existing conditions. Due to its success, this initiative of the local authority led to the purchase of more boats by the local businesses.

### INITIAL PROBLEM AND TARGET GOAL

Due to recent freight operations, damages to its traditional form were identified and along with the additional difficulties modern logistics operations sustained because of its form, efforts were made to tackle urban freight transport related problems.

A Freight Transport Action Plan was developed in 2010 to address freight transportation including air quality and climate change. This plan attempted to suggest non prohibitive and non-expensive solutions with the co-operation between public and private sector.

### MEASURE DESCRIPTION

The city introduced two new and innovative methods of transport: the waterborne electric Beer Boat, and the solar-powered electric freight road vehicle known as the Cargo hopper.

These measures make part of the integrated approach of Local Authority to mitigate negative impacts of urban freight and they are complementary with other implemented measures such as time restrictions for vehicles entering the city and the designation of low-emission zones, the establishment of urban consolidation centres (UCC) and lockers as distribution points.

The Beer-boat is a specially adapted barge that operates on the Oudegracht and delivers beverages and catering supplies to the numerous cafes and restaurants which line the canal. By reducing the number of LGVs making deliveries on the road, it allows deliveries to be made directly from the barge at the level of the canal. The beer boat is electrically-powered but with a diesel auxiliary engine and is owned by the city of Utrecht. Its customers are major beverage suppliers and a catering wholesaler, which each rent the barge for half-day periods to make their deliveries. The cost of the service for its customers is lower than using LGVs making multiple trips.

Another clean vehicle introduced in Utrecht was an electric-powered delivery vehicle called the Cargohopper. This vehicle was initially launched in April 2009 and due to its small size it is easy to maneuver through small streets. The Cargohopper is an electrically powered goods vehicle that delivers retail goods and parcels into the historic centre of Utrecht from a transfer site close to the city centre and it is controlled by a second version of the vehicle was introduced two years later that included solar panels as well and can travel 250km without recharging.

Finally, the City of Utrecht is considering implementing measures to reduce the number of vans and other goods vehicle movements in the city through two further measures:

1. Merchandise Pick-up Points: Implementation of a network of collection points located at a variety of convenient locations, such as railway stations or Park and Ride car-parks.
2. Consolidation: Development of a consolidation centre to consolidate the loads of small to medium scale suppliers of fresh produce to city centre cafes and restaurants.

### SCALABILITY/ REPLICABILITY

It is considered as a city example to be imitated by others if transferable and applicable. The solar-powered electric freight road vehicle, known as the Cargohopper, could be implemented to cities with narrow streets and historic city centres with uphill, where a conventional vehicle is inappropriate. The Beer-boat applies to cities with rivers, canals and lakes which offer accessibility to numerous of businesses for deliveries.

Dymph Hoffmans, Utrecht's transport program manager, says that a vessel like the Beer Boat can only be transferable when a city has shops and cafes which are accessible over water. But the Cargohopper has proven to be very transferable and has been adapted by other Dutch cities like Amsterdam and Amersfoort.

### IMPLEMENTATION REQUIREMENTS

Estimated implementation costs: The Beer-boat costed €600.000 which were funded through the city's air quality improvement budget. The

Cargohopper costed €60.000 and is owned by Hoek Transport whereas its second version which transformed it into a solar-powered vehicle added €15.000 in costs.

Financing scheme = Public/private partnership + Local funds

**Implementation time planning:** In Utrecht case, the conduction of the Urban Freight Action Plan and the full implementation of the measures lasted approximately two years. The Cargohopper was fully operational four months after the decision of its deployment. No specific IT systems were needed.

## ► INDICATORS TO MEASURE SUCCESS AND FINAL OUTCOME/IMPACT

Improved air pollution and lower noise levels, Promotion of walkability, Increased safety, Improved flexibility on deliveries, Reduced traffic congestion. Citizens of Utrecht, Tourists, Pedestrians, Residents.

As indicators have been used the CO<sub>2</sub> emissions and the travelled kilometers of conventional freight vehicles. Reduced air pollution and lower noise levels, promotion of walkability, increased safety, improved flexibility on deliveries, mitigation of damages.

Between April 2009 and October 2010, Hoek Transport estimates that Cargohopper has made more than 12,000 deliveries of around 66,000 parcels/boxes. This equates to a reduction of 122,000 vehicle-km and 34 tonnes of carbon dioxide.

The Beer Boat reduced CO<sub>2</sub> emissions by over 38 t, NO<sub>x</sub> emissions by 31kg and PM<sub>10</sub> emissions by 6kg during the lifespan of the project. For Utrecht's city centre as a whole, this was the equivalent of a 13% decrease in CO<sub>2</sub> emissions and 10% and 6% of PM<sub>10</sub> and NO<sub>x</sub> emissions, respectively.

## ► BARRIERS AND DRIVERS

### COOPERATION/COORDINATION ISSUES

**Barriers:** It is important to find common goals, for the city and for partner companies. Sustainability and com-

pany efficiency have to coincide and in practice this turns out often difficult.

**Drivers:** Due to the city's strategy to agree on a long-term goal and work a plan of bridging the gap between different stakeholders, they managed to further their plans and lead future co-operations on being emission-free in freight transportation.

### FINANCIAL RECOURCES ISSUES

**Barrier:** The beer-boat required a substantial amount of funding on behalf of the city's budget. The Cargo- hopper was done with no direct public subsidy.

**Driver:** City ensured a small income by renting the boat to the suppliers and a catering wholesale. As a cost-neutral vehicle, the Beer Boat is expected to make a profit on rental revenues, although it did not during the 4-year length of the MIMOSA project, which ran from 2008 to 2012. However, the environmental results of its transformation from a diesel-powered vessel to an electric powered, zero-emission boat are striking. The company responsible for Cargo-hopper operation receives indirect support from not being subject to the time window and length restrictions and being able to use restricted parts of the road such as the Bus Lanes. City found a way to attract private investment.

### PROCESS

**Barrier:** Since it is a complex planning, the implementation process required careful consideration of organisational and monitoring parameters on LAs behalf.

**Driver:** The conduction of an urban freight plan leads to numerous multilevel benefits for the city along with ability to manage and organise better the implementation of complex measures.

### TECHNICAL/DATA RESOURCES

**Barriers:** Technical barriers are not identified from the part of the local authorities since only partial technical responsibility is accounted to LA. Companies are mainly responsible for the technical processes of the operational framework of aforementioned measures.

### STAFF

**Barriers:** Due to the variety of different measures and actions available to

be taken and due to the specific conditions in each city, different skills are needed and in most cases close co-operation with private companies also.

### POLITICAL

**Barriers:** Such measures directly affect companies and working personnel which means that citizens and other remaining stakeholders. Any problems that might arise tend to be addressed between LAs and participant actors.

**Drivers:** As a cost-neutral vehicle, the Beer Boat is expected to make a profit on rental revenues.

### LEGAL

**Barrier:** A challenge faced by manufacturers of the Beer Boat is that it is not efficient as it could be as companies refuse to share deliveries with competitors in fear of giving away sensitive business information.

**Driver:** The city changed laws and regulations to give companies, that embraced sustainable forms, advantages.

### SOCIETAL

**Barriers:** The public and private sectors have sought to address the above issues by planning and implementing two new measures in recent years.

**Drivers:** The cargohopper has proved to be transferable to other similar S-M cities.

## FURTHER INFORMATION

<http://www.eltis.org/discover/case-studies/utrechts-sustainable-freight-transport-netherlands>

[http://www.bestfact.net/wp-content/uploads/2016/01/CL1\\_151\\_QuickInfo\\_ZeroEmissionBoat-16Dec2015.pdf](http://www.bestfact.net/wp-content/uploads/2016/01/CL1_151_QuickInfo_ZeroEmissionBoat-16Dec2015.pdf)

<https://halshs.archives-ouvertes.fr/halshs-01078143/document>

<https://ec.europa.eu/transport/sites/transport/files/themes/urban/studies/doc/2012-04-urban-freight-transport.pdf>

[http://www.bestfact.net/wp-content/uploads/2016/01/CL1\\_078\\_QuickInfo\\_Cargohopper-16Dec2015.pdf](http://www.bestfact.net/wp-content/uploads/2016/01/CL1_078_QuickInfo_Cargohopper-16Dec2015.pdf)

## Further Reading

- 1.** SUITS deliverable from task T3.4. “Best practices”. WP03 Data collection and analysis tools for intergrated measures [unpublished].
- 2.** NOVELOG Guidelines for the Planning & Development of Sustainable Urban Logistics Plans (SULPs). (2018). [ebook] Available at: [http://novelog.eu/wp-content/uploads/2018/07/NOVELOG\\_SULP-Guidelines.pdf](http://novelog.eu/wp-content/uploads/2018/07/NOVELOG_SULP-Guidelines.pdf) [Accessed 27 Mar. 2019].
- 3.** Civitas.eu. (2019). CIVITAS | Clean and Better Transport in Cities. [online] Available at: <https://civitas.eu/> [Accessed 2 Apr. 2019].



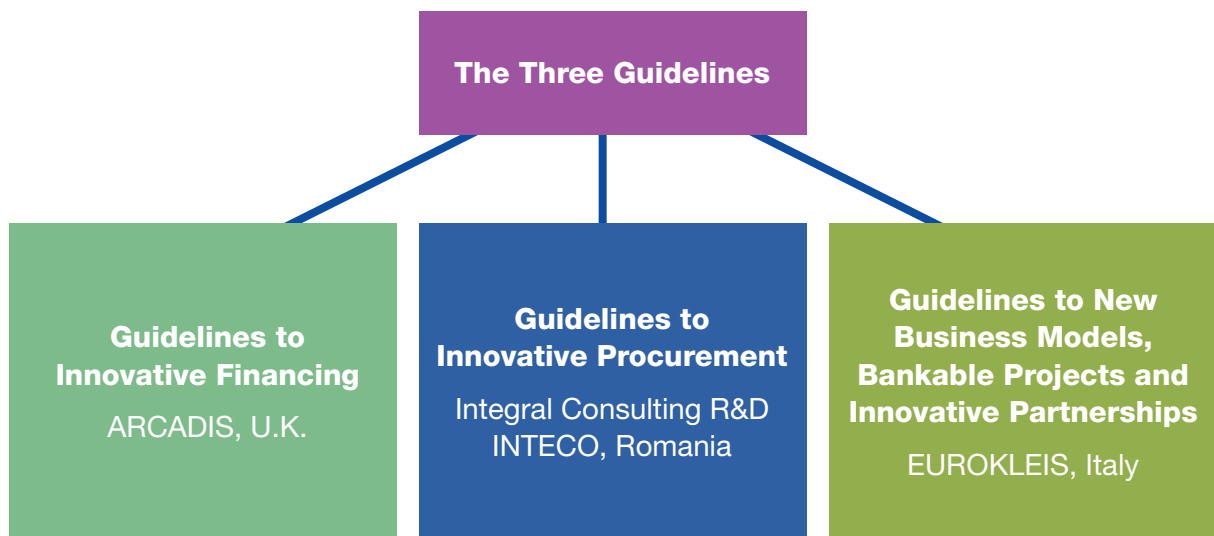


# 5 Innovative financing, procurement, partnership

This chapter provides some key points about:

- The available **tools** developed within SUITS project in order to **support LAs of S-M cities** to deal with **financing, procurement and partnerships**.
- The available **innovative financing mechanisms** which could be used for UFT measures implementation. A selection of the most relative to UFT measures is made.
- The **recommended steps** for **innovative procurement procedures** which respond to the current needs for implementing mobility measures in general and could be applied to UFT measures as well.
- The probable **partnerships** that might **facilitate the implementation**.

## SUITS TOOLS supportive to LAs for Innovative financing, procurement and partnerships: Three Guidelines



## Objective of the three Guidelines

**Objective:** Enhancing the capacities of local authorities and stakeholders through innovative procurement procedures, innovative financing methods, and new business models and partnerships, in support of sustainable mobility development.



## What can you expect to find in the Guidelines?

- Presentation of how different transport measures are currently procured and financed, as well as the business models and partnerships used.
- Overview of existing gaps in current knowledge and organisational capacity to implement sustainable transport measures.
- Presentation of new, innovative financing methods, procurement procedures, business models and partnerships which could be used to enhance the capacity of Local Authorities and stakeholders to implement sustainable transport measures.
- Case studies and examples of where and how these methods and procedures have been successfully applied.
- Steps to use these methods and procedures.

## How to make the best use of the Guidelines

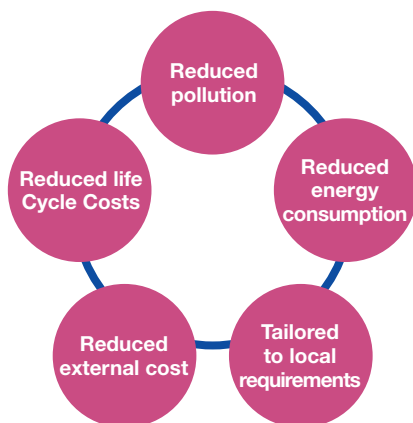
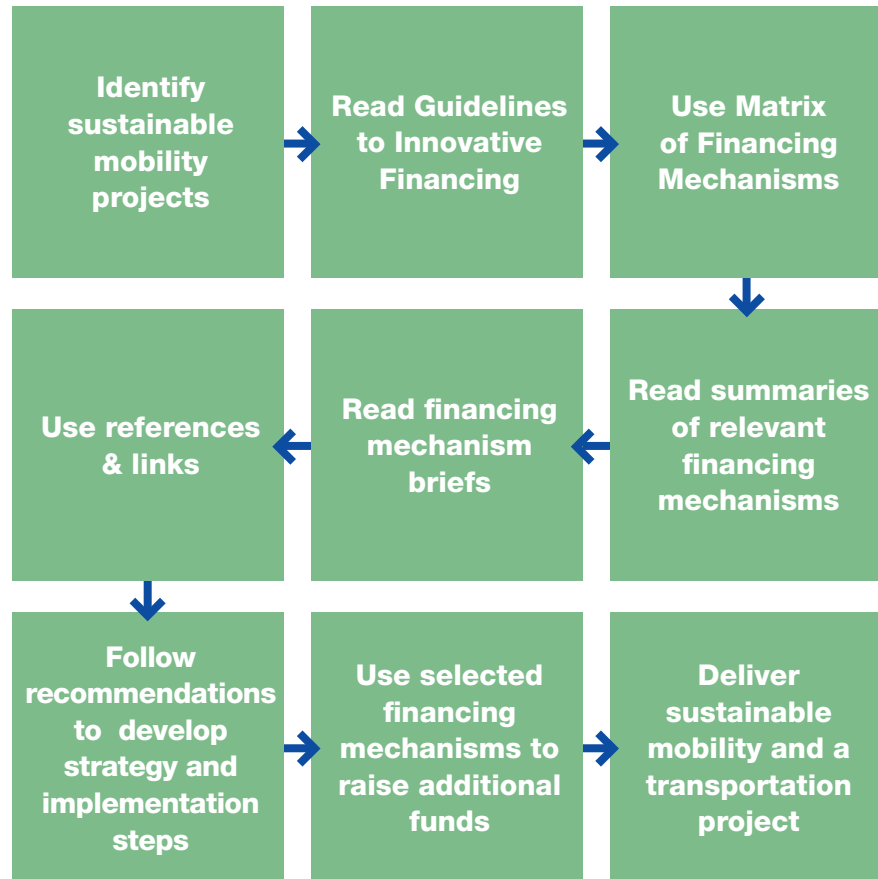
Tips for Implementation:

- The 3 Guidelines are complementary to one another and should be used together.
- Local Authorities should set up a team to take control of the implementation of the Guidelines within their organisation. The purpose of this team would be to:
  - 1) Read the Guidelines.
  - 2) Decide on the types of sustainable mobility measures in which they want to implement within the local area.
  - 3) Identify the innovative procedures and methods which are most suitable to each sustainable mobility measure identified, as well as to the local economic, political and social situation.
  - 4) Use the selected procedures and measures.
  - 5) Evaluate the success of the use of the innovative procedures and measures
- Communicate with the authors of the Guidelines. The authors will provide support to the Local Authorities/ other stakeholders to clarify the information in the Guidelines at their request.





## Guidelines to Innovative Financing <sup>[1]</sup>



## Guidelines to Innovative Procurement <sup>[2]</sup>

EU Public Procurement Reform

**Underlying principle:** “Public procurement must become levers through which the Contracting Authorities can obtain the biggest long-term advantages for the society, generating business opportunities, economic growth, jobs, enhanced sustainable mobility, higher life quality.”

**Contract Award Criteria**





# Guidelines to New Business Models, Bankable Projects and Innovative Partnerships

## SET GOALS

1.  
2.  
3.



### THE KEY OBJECTIVES:

- Provide the knowledge of innovative business models in urban mobility services including sharing mobility, integrated mobility and MaaS.
- Address the main partnership schemes in the field and introduce the new ones.
- Enhance the capacity of creating fundable projects providing the guidance for feasibility analysis.
- Identify: evolving commercially viable business strategies, new forms of partnership and important aspects to prepare bankable documents.
- Improve the administrative and organizational capacity of the urban mobility authorities of S-M cities.

### RECOMMENDATIONS:

#### NEW FORMS OF PARTNERSHIP

- Creation of solid institutional mechanism addressing specific sector policies.
- Integrated approach of financial, technical and business planning.
- Development of efficient project management regarding the business idea and contractual forms.
- Successful implementation depends on recognition of partner's objectives.
- iPPPs require careful consideration of control and management systems through project agreements.

#### INNOVATIVE BUSINESS MODELS

- The business model innovation foresees the top-down approach. The top management should support and provide the resources for new business opportunity.
- Constant monitoring of market tendencies.
- Constant monitoring technological innovation.
- Consulting the business model analogies and learning from best practices.
- Searching for new investment opportunities for project development.

#### BANKABLE PROJECT

- Provide the research on different investment programs and financial opportunities.
- Allocate the human resources to develop the bankable documents.
- Ensure that all the necessary feasibility studies are included in the document.



## Innovative financing mechanisms <sup>[1]</sup>

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Congestion Charge</li> <li>• Municipal Green Bonds</li> <li>• Crowdsourcing</li> <li>• Stamp Duty Land Tax (SDLT)</li> <li>• Lottery Funding</li> <li>• Voluntary Capture</li> <li>• HGV Charging Schemes</li> <li>• Work Place Parking Levy (WPL)</li> <li>• Community Infrastructure Levy (CIL)</li> <li>• Advertising, Sponsorship and Naming Rights</li> </ul> | <ul style="list-style-type: none"> <li>• Collaborating with other cities, research consortia and private companies</li> <li>• Citizen Cooperatives</li> <li>• Emission Trading</li> <li>• Planning Obligations / Developer Contributions</li> <li>• Tax Increment Financing</li> <li>• Sales Tax</li> <li>• Toll Roads</li> <li>• Selling Expertise and Technical Know-how</li> </ul> |
|---|---|

Several innovative financing mechanisms can be applied directly to urban freight transport measures with (check the ones in boxes above). All detailed description are available in the Guidelines.



## Key points of financing mechanisms more relevant to UFT measures <sup>[1]</sup>

CONGESTION CHARGE	
DESCRIPTION	Applied in numerous larger metropolitan areas and megacities
METHODS	Works by charging people who travel with private vehicles entering or passing through predefined geographical areas that have been identified as congested locations usually during peak hours
BENEFITS	This aims to encourage shift towards alternative transport modes, more sustainable than private vehicles, such as public transport, active travel, etc. and eventually through revenues derived from the congestion charging to finance new mobility projects while improving environmental conditions

MUNICIPAL GREEN BONDS <sup>[4]</sup>	
DESCRIPTION	It is a financing mechanism that allows institutional investments for projects mainly with environmental benefits such climate change mitigation and resilience but it also attractive to other types of projects that promote sustainability, meaning that social and governance related beneficial projects are also eligible for funding through it
METHODS	Aims into attracting investors to invest in sustainable mobility projects and even the residents and members of communities to participate in such processes
BENEFITS	Can lead to additional benefits for the local communities but Municipal Green Bonds as a mechanism, require standardization and more information from the part of local authorities and national governments in order to achieve promotion and fully exploit its capabilities

HGV CHARGING SCHEMES	
DESCRIPTION	This system imposes a fee on Heavy Good Vehicles or other types of trucks to compensate for the external cost that results from their operation
METHODS	It is usually operated at national level but there are cases that large cities have established such schemes and they aim to collect revenues to reinvest and finance more sustainable transport infrastructure projects. This measure can be off different types such as that of electronic tolls, tolls with physical barriers and/or time-base charges
BENEFITS	On a city level it is challenging to develop independent charging policies for HGVs and resistance is often met from stakeholders such as the road freight industry

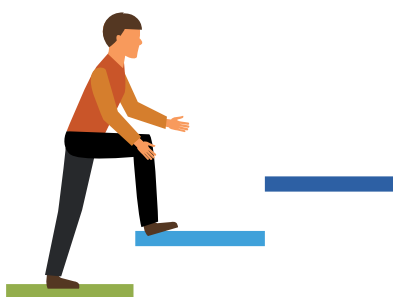


## 5 INNOVATIVE FINANCING, PROCUREMENT, PARTNERSHIP

→ Key points of financing mechanisms more relevant to UFT measures [1]

EMISSION TRADING	
DESCRIPTION	Emissions trading is a market-based approach that is used to control pollution by providing financial incentives for achieving reductions in the emissions of pollutants and it is operational at national and regional levels across Europe, the USA, Japan, New Zealand and more
METHODS	This market system works based on carbon credit which acts as a financial instrument that gives the right to the holder to emit carbon dioxide and a carbon credit is equivalent to one tone of carbon dioxide or other greenhouse gases
BENEFITS	The particularity of this financing mechanism is that it allows countries, cities or industries to sell unused carbon credits to others in order to raise revenue to finance other sustainable transport and mobility projects

TOLL ROADS	
DESCRIPTION	This mechanism includes the payment of a fee in order to access or pass a specific area or part of a network. This measure aims to improve environmental conditions and promoting sustainability by lowering traffic volumes due to payment fees and by promoting the public shift towards public transport. Urban toll roads usually are a matter of conflict between the public and local political authorities and it requires strong political support for its implementation
METHODS	Revenues generated through tolls are used for maintenance of existing or funding of new parts of the infrastructure, usually large and thus expensive projects
BENEFITS	This measure aims to improve environmental conditions and promoting sustainability by lowering traffic volumes due to payment fees and by promoting the public shift towards public transport. Urban toll roads usually are a matter of conflict between the public and local political authorities and it requires strong political support for its implementation



## Innovative procurement steps [2]

- 1) Select, employ, train, educate procurement management team;
- 2) Learn about legal framework, of the legislative changes, and specific regulations for various situations and procedures;
- 3) Develop an annual and multi-annual procurement plan;
- 4) Develop an evaluation plan and performance indicators;
- 5) Enhance the exchange of knowledge between public authority and suppliers;
- 6) Organise centralised public procurement procedures across local / regional / cross-border public authorities having the same requirements;
- 7) Promote public - private partnerships and the collaboration with the industry;





- 8) Use public financing for research and innovation in a strategic way in order to improve challenge impacts of public procurement;
- 9) Use the new 'Innovation Action' and 'Pre-Commercial Procurement' instruments to encourage cities and the innovation community to collaborate.
- 10) Understand and raise awareness to the importance of innovative procurement and prepare their application;
- 11) Develop a long-term procurement strategy.

## Innovative Public Private Partnerships (IPPP) [3]

IPPP is a new form of partnership where the main actors are:

- public and private organisations,
- civil society organisations (CSOs),
- non-governmental organisation (NGO),
- communities.

These new forms of collaboration enable to identify the opportunities for the design and implementation of the long-term strategies for partnership.

**Each actor of the iPPPs has its important role in the alliance.**

Detailed description is available in the Guidelines [3]

## Innovative Public Private Partnerships

### Probable roles allocation [3]

- **State organisations** are usually in charge of the drawing up, financing and implementation of policies and programmes.
- **Public organisations** are usually defined as an important actor who not only has a key roles of supervising, creating incentives and regulatory frameworks, but also developing new opportunities and governance mechanisms to enable the sustainable long-lasting collaboration with the private sector and other forms of organization, in order to optimize outcomes, impact and sustainability.
- **Private sector** has a significant role in the partnership. It contributes to bring the investment and expertise in the alliance having its business for-profit orientation.



- **NGOs, CSOs or communities** may bring their expertise and vision of transport and mobility sector. Establishing an iPPP requires strengthening the capacities of all the actors involved.

#### **Benefits of iPPP for mobility local authorities:**

- Addressing market needs and tendencies.
- Transferring localized institutional knowledge to the public and private organisations.
- Creation a collective awareness of the innovative solutions created by the alliance.
- Elaboration of the social standards and clarification schemes.
- Enhancement of the possibility of the project to obtain the investments by involving the mobility communities in the consortium.
- If the project addresses green or climate finance, mobility communities' participation may bring innovation and an ethical approach to investments.
- The CSOs or NGOs may gain the social relevance and influence and builds capacity for policy monitoring.

Detailed description is available in the Guidelines [3]

**R&D Partnerships** are strategic partnerships between businesses and organizations capable to develop a new product or service (or improve an old one) and other actors who are economically interested in the development of such innovations.

#### **Type of R&D partnerships:**

- R&D-Public partnership.
- R&D-Private partnership.
- R&D-PPP.

#### **Benefits of the R&D partnerships for mobility local authorities**

- Possibility to develop new product or service, improve the current one or to innovate operations, monitor market requirements and trends.
- Help public or private organisations to advance their business.
- Research and development costs and the risks sharing associated with the investment of time, money and other resources.
- R&D partner may help to assess the market or test the prototype.
- R&D partner provides monitoring of the project results.
- The involvement of the R&D partner may provide an added value in searching of investments due to the expertise that this partner can provide.



**EXAMPLES OF INNOVATIVE PARTNERSHIPS****Example of CSO involvement in the transport projects:**

*The CSO was involved in the improvement of the public transport in Germany in Rhine-Main-Area. The Rhein-Main-Verkehrsverbund (RMV) transport association established a passenger advisory board that were represented by individuals and CSO. The advisory board organise meetings four times a year, and has already initiated concrete improvements. [5]*

**Example of the R&D institutions involvement in the transport projects**

*Frankfurt RheinMain, major transport authorities and operators, including partners from industry and consultancy, and supported by the Hessen State Government. Namely, ZIV institute was founded at the Darmstadt University of Technology. [6]*



## Further Reading

1. SUITS CBP: “Guidelines to Innovative Financing” ARCADIS, U.K. 2018
2. SUITS CBP: “Guidelines to Innovative Procurement” Integral Consulting R&D (INTECO), Romania, 2018
3. SUITS CBP: “Guidelines to New Business Models, Bankable Projects and Innovative Partnerships”, EUROKLEIS, Italy, 2018
4. SUITS e- learning course: “Financing, procurement and business models for sustainable urban transport”. Available at: [www.nuacampus.org/elearning](http://www.nuacampus.org/elearning)
5. Civitas tool inventory. Application area: Financing, procurement, legal aspects, measure implementation. Available at: [https://civitas.eu/tool-inventory?f%5B0%5D=field\\_application\\_area%3A927](https://civitas.eu/tool-inventory?f%5B0%5D=field_application_area%3A927)

## References

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2. SUITS CBP: “Guidelines to Innovative Procurement” Integral Consulting R&D (INTECO), Romania, 2018
3. SUITS CBP: “Guidelines to New Business Models, Bankable Projects and Innovative Partnerships”, EUROKLEIS, Italy, 2018
4. Reichelt, H. (2010). Green bonds: a model to mobilise private capital to fund climate change mitigation and adaptation projects Climate change is a problem of global proportions, 8
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# 6 Processes and implementation aspects

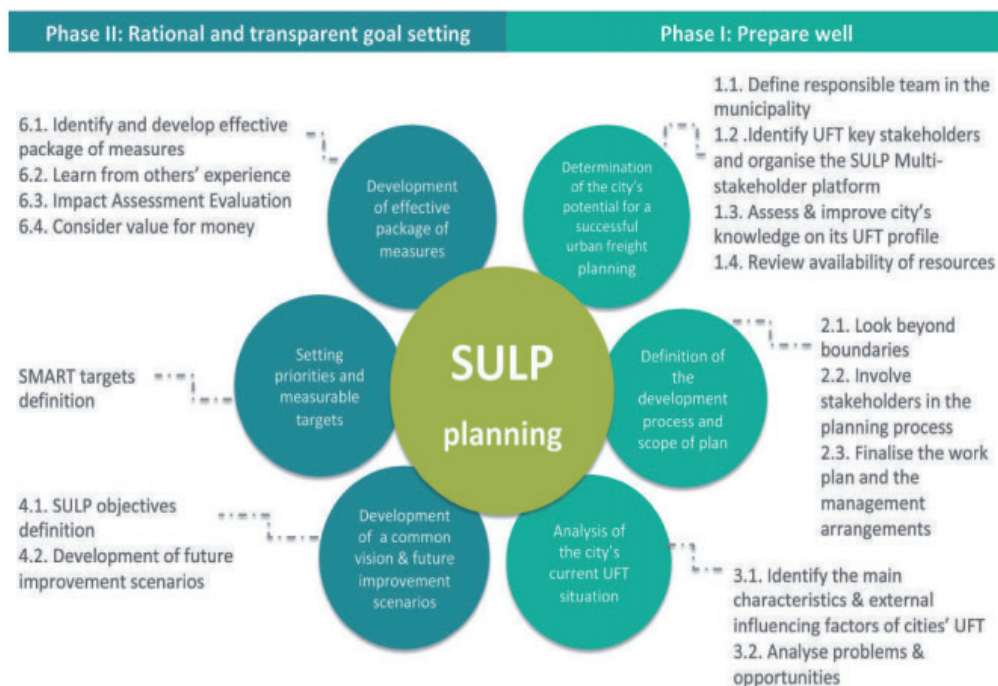
This chapter provides:

- Details on the **design and implementation process - stages**. Required data & surveys, potential legal difficulties, risks, budget, assessment indicators for UFT measures.
- With regard to handy and automated data collection methods for estimating UFT indicators, reference is made to the relative SUITS deliverables.

## 1. Integrate measures in a wider strategic plan: Sustainable Urban Logistics Plan (SUMP)<sup>[2]</sup>:

- A **Sustainable Urban Logistics Plan** is a useful tool supporting Local Public decision-makers and stakeholders in “governing” city logistics measures and enhancing freight distribution processes.
- The plan involves **strategies**, **measures** and **rules** that can be adopted with a cooperative approach among different actors.

### SUSTAINABLE URBAN LOGISTICS PLAN (SULP)

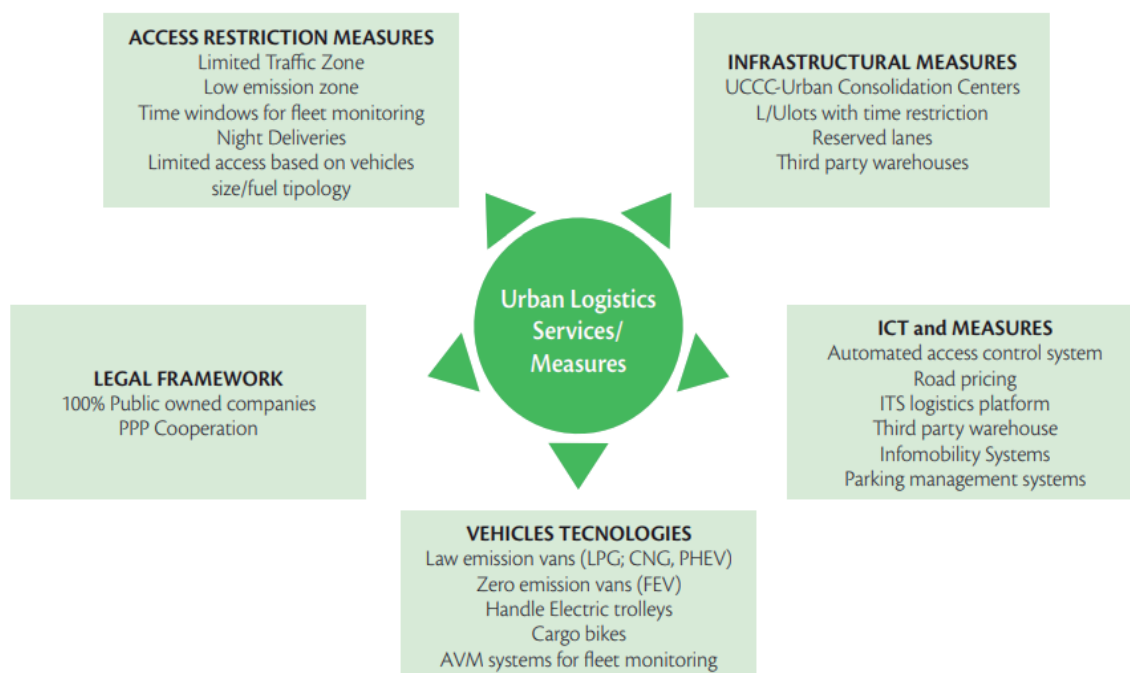


Planning Cycle [2]

## 6 PROCESSES AND IMPLEMENTATION ASPECTS

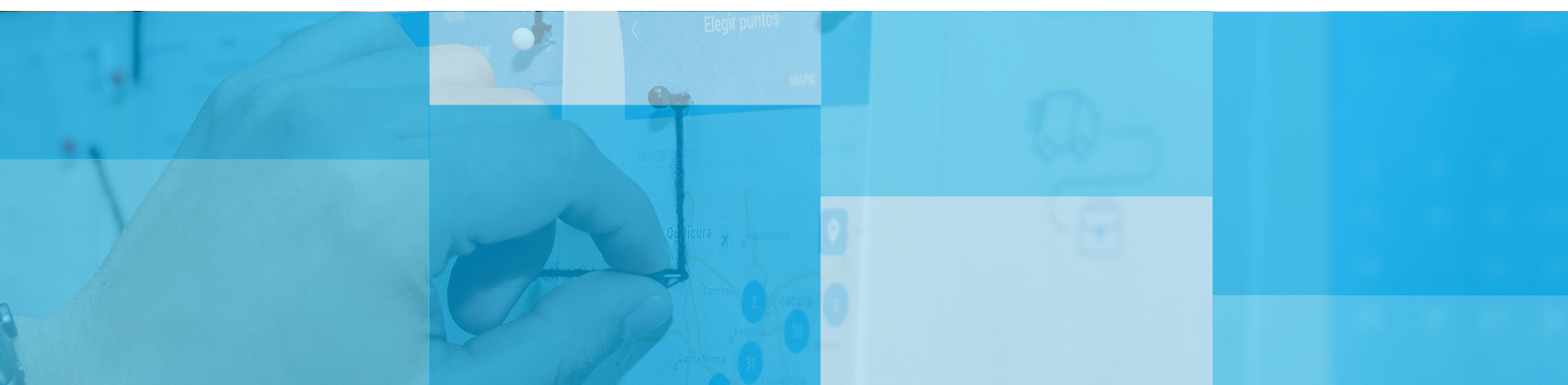
→ Integrate measures in a wider strategic plan:  
Sustainable Urban Logistics Plan (SUMP)[2]

### THE SUSTAINABLE URBAN LOGISTICS PLAN (SULP): MAIN URBAN LOGISTICS SERVICES/MEASURES [2]



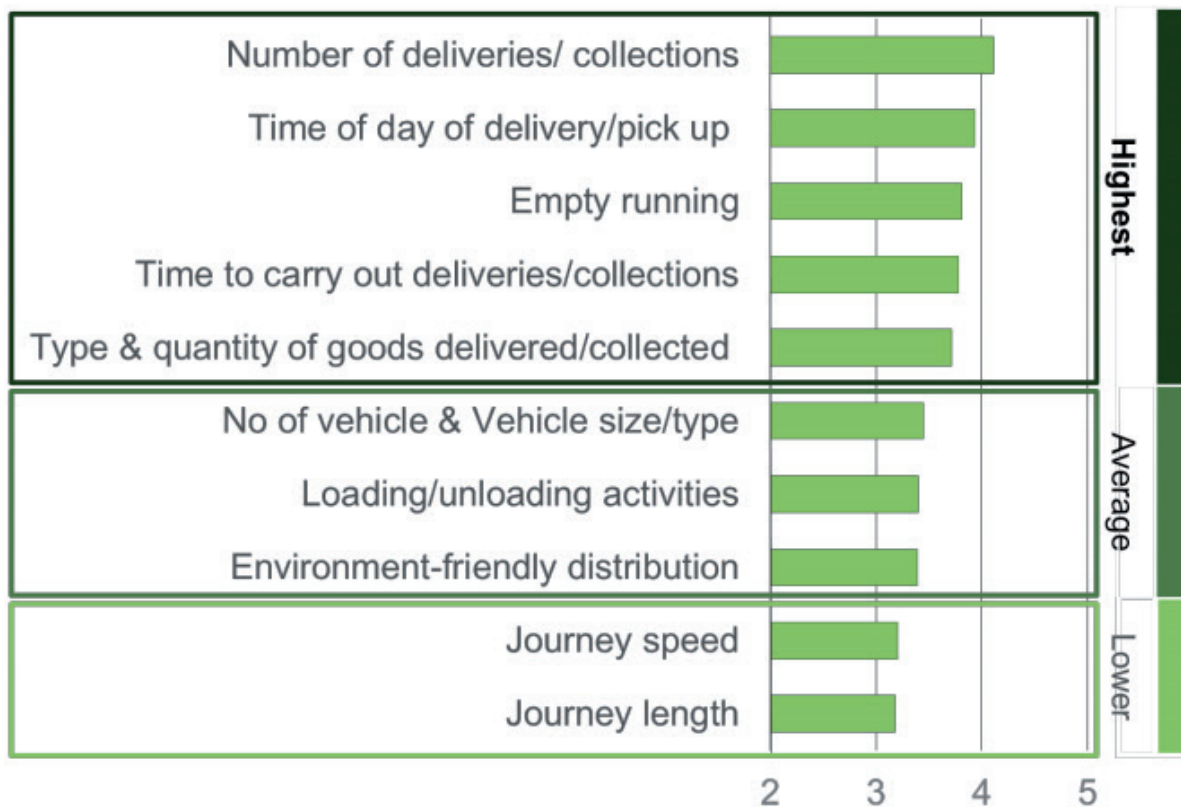
### SULP - BOUNDARIES AND HOW TO DEAL WITH THEM [1]

PROBLEMS	SOLUTIONS
City logistics infrastructure are usually located at the boundaries of the urban areas while the negative impact of city logistics operations may be concentrated on a specific urban area demanding for local measures in order to be alleviated	NOVELOG created a poly-parametric city typology to describe, benchmark and support the definition of the urban area on which the SULP should focus
Difficulties in involving a variety of relevant stakeholders throughout the planning process	NOVELOG developed and made available to the cities a Stakeholders Governance Platform which supports stakeholders' consensus building
Difficulties in finalize the work plan and the management arrangements	Cities should draft a work plan including objectives, type of procurement, roles of the single stakeholders, activities and specific stakeholders' deadlines during SULP development and implementation
Before developing improvement scenarios, it is necessary to understand the current state of a city's UFT but due to the heterogeneity of the city logistics sector, gaining this knowledge is quite complicated	The Understanding Cities Tool offers the opportunity to quantify the current status of each city logistics component as well as to assess the future state of the city logistics, in two-time horizons (2020-2030), considering that no additional intervention will take place in the city's UFT environment in the meantime

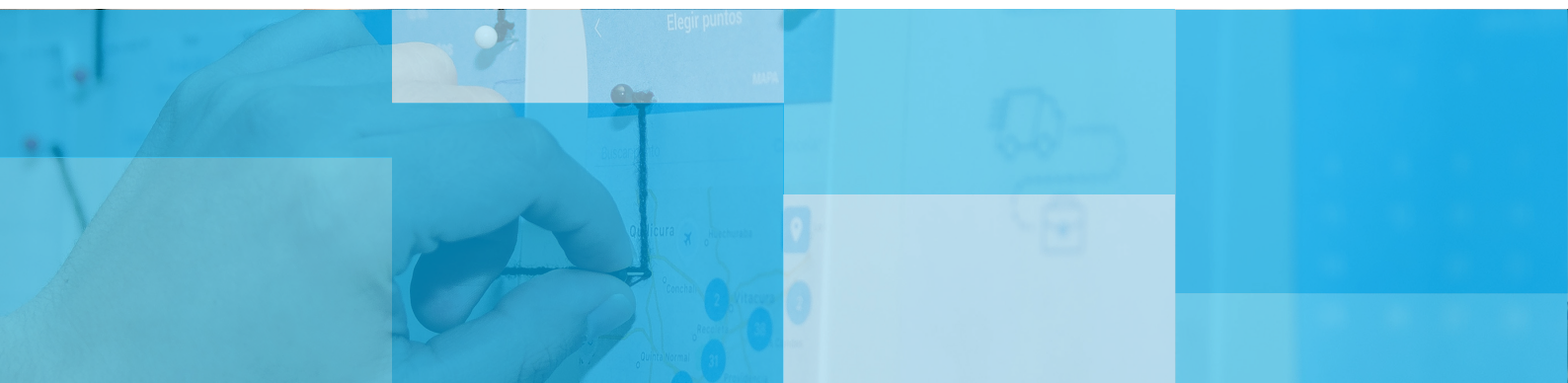




## 2. Define implementation indicators, required data sets and sustainable data collection/selection methods



Set of data proposed to be collected regularly by the local authorities, concerning the priority they should collect them (i.e. data of number of deliveries is the most important) [1].

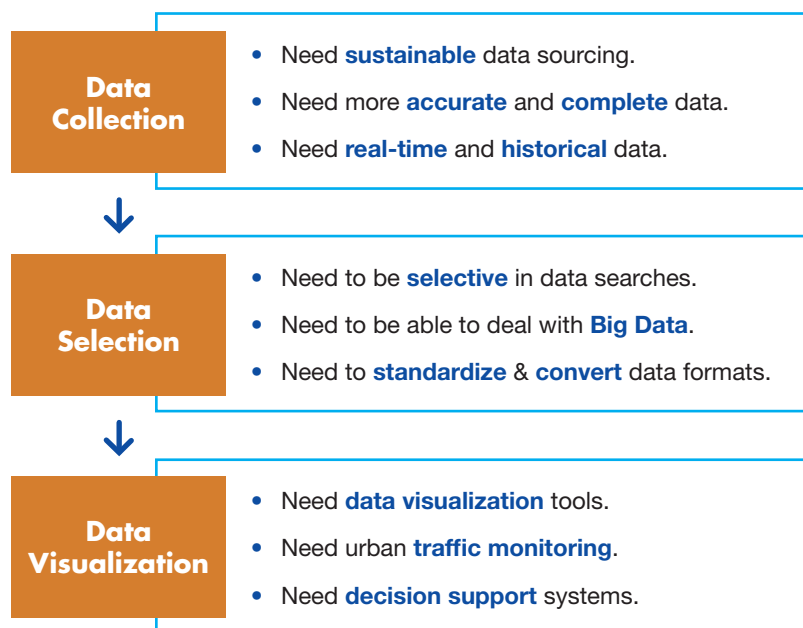




## 6 PROCESSES AND IMPLEMENTATION ASPECTS

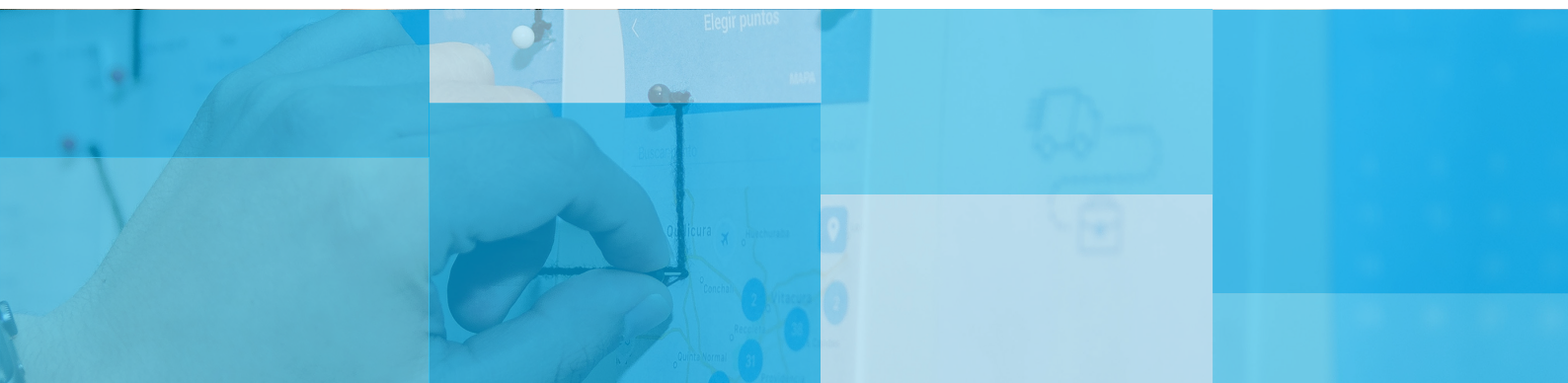
→ Define implementation indicators, required data sets and sustainable data collection/selection methods

### CONSIDERATIONS FOR DATA MANAGEMENT [4]



### PROPOSED DATA TO BE COLLECTED FOR EACH CATEGORY OF MEASURES

REQUIRED DATA FOR REGULATORY MEASURES		
TYPE OF MEASURE	TYPE OF DATA	DESCRIPTION
REGULATORY MEASURES	Number of authorised logistics services providers	It is important to know how many companies are operating in an area and how many vehicles are used
	Type of vehicle and plate number (license plate) that companies use	Some readers would be needed in the entrance of the restricted area
	Current time windows for deliveries per kind of goods to be delivered	An investigation on when is the peak hour for deliveries per type of the goods helps to define the best time window for a specific zone. Questionnaires survey on shops owners may be one of data gathering methods
	Data of people living in the affected area	Access restrictions usually affect people living in the area, so a register of vehicles and users is crucial to avoid citizens' complains



## 6 PROCESSES AND IMPLEMENTATION ASPECTS

→ Define implementation indicators, required data sets and sustainable data collection/selection methods

### PROPOSED DATA TO BE COLLECTED FOR EACH CATEGORY OF MEASURES

REQUIRED DATA FOR INNOVATIONS IN URBAN FREIGHT TRANSPORT		
TYPE OF MEASURE	TYPE OF DATA	DESCRIPTION
INNOVATIONS	Real time traffic data	This information is necessary in order to navigate fleet vehicles properly in order to avoid traffic jams, road incidents etc. GPS trackers in vehicles and other crowdsourcing tools are needed to gathering primary data. Then, a sophisticated software can calculate the real time traffic conditions in the network and communicate them to the drivers
	Available parking spots for deliveries Time for carrying out deliveries/ collections	For implementing real-time (dynamic) loading space booking and/or Multi-use of parking space, a survey of the available parking spots in the study area is needed as well as an investigation on the average occupation time of the parking spot
	Type and quantity of goods delivered in the study area	This kind of information contributes to better design innovative measures such as lockers as distributed points and dynamic loading space booking systems

### EVALUATION INDICATORS

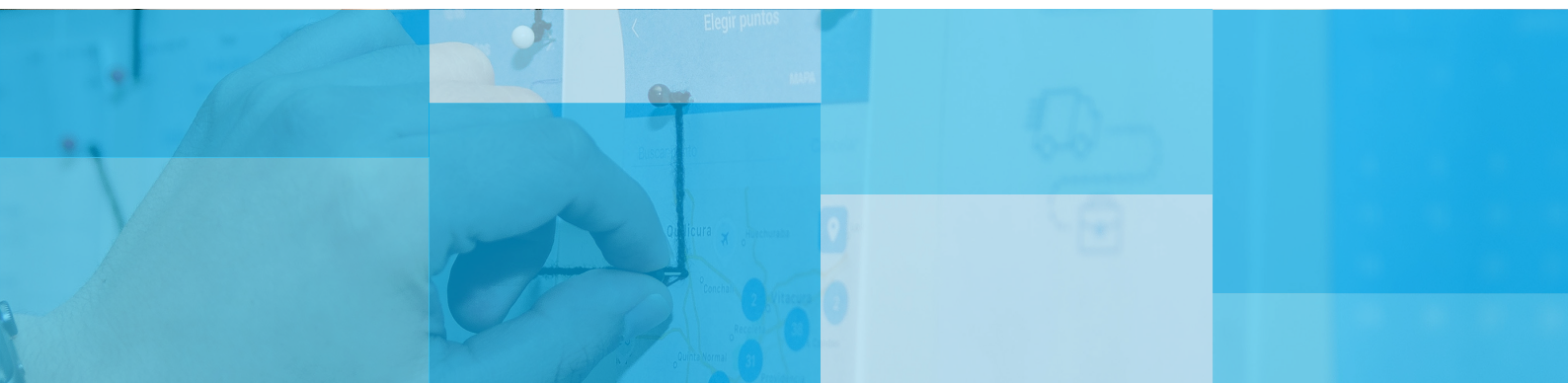
- Indicators are one of most important parameter of implementation and evaluation process.
- Key performance indicators (KPI) consist of the main tool of assessing impact of the implemented measures.
- The following table presents the proposed KPIs for the assessment of UFT measures.



## 6 PROCESSES AND IMPLEMENTATION ASPECTS

→ Define implementation indicators, required data sets and sustainable data collection/selection methods

	KEY PERFORMANCE INDICATOR	DESCRIPTION	SOURCE
ECONOMY	The amount of operating revenues and costs	(1) Revenues per pkm or vkm (2) Capital costs (3) Operating costs	(1) Euros/pkm or Euros/vkm, quantitative, derived or measured (2) Euros, quantitative (3) Euros/pkm or Euros/vkm, quantitative, derived or measured
ENERGY	The amount of Fuel Consumption in Urban Freight Transport	Fuel used per vkm, per vehicle type	MJ/vkm, quantitative, derived or measured
ENVIRONMENT	Level of Air quality	(1) CO levels (2) Nox levels (3) Particulate levels	(1) (2) (3) Ppm or g/m3, quantitative, measured
	Level of Noise	Perception of noise	Index (%), qualitative, collected, survey
	Level of Emissions	(1) CO2 emissions (2) CO emissions (3) NOx emissions (4) Particulate emissions	(1) (2) (3) G/vkm, quantitative, derived
SOCIETY	Acceptance	(1) Awareness of the policies/measures (2) Attitude survey of current acceptance of the measure	(1) (2) Index (%), qualitative, collected, survey
	Accessibility	(1) Perception of accessibility (2) Relative cost of service	(1) Index (%), qualitative, collected, survey (2) Index (%), quantitative, measured
	Security	Perception of security when using service	Index, qualitative, collected, survey
TRANSPORT	Traffic Levels	Average vehicles per hour by vehicle type - peak	Veh per hour, quantitative, measured
	Congestion Levels	Average vehicle speed over total network (peak or off peak)	Km/hr, quantitative, derived
	Freight Movements	Daily number of goods vehicles moving in area	No, quantitative, derived or measured
	Modal split	Percentage of trips for each mode	%, quantitative, derived



## 3. Identify potential difficulties/ barriers and check for solutions

### POTENTIAL LEGAL DIFFICULTIES AND SOLUTIONS FOR REGULATORY MEASURES

POTENTIAL LEGAL DIFFICULTIES		
TYPE OF MEASURE	TYPE OF LEGAL DIFFICULTY	SOLUTION
REGULATORY MEASURES	There is an extremely varied picture, ranging from countries where no specific legal provision exists to deal with access restrictions (although in some cases local rules are issued) to others where road codes and other specific pieces of legislation offer more explicit legal grounds	Requiring Member States to develop national policy frameworks for the market development of alternative fuels and their infrastructure
		Foreseeing the use of common technical specifications for recharging and refueling stations
		Paving the way for setting up appropriate consumer information on alternative fuels, including a clear and sound price comparison methodology

### POTENTIAL LEGAL DIFFICULTIES AND SOLUTIONS FOR INNOVATIVE MEASURES

POTENTIAL LEGAL DIFFICULTIES		
TYPE OF MEASURE	TYPE OF LEGAL DIFFICULTY	SOLUTION
INNOVATIONS	Regarding e-cargo bikes, in many countries there is lack of regulations	They have to be cataloged as motor vehicles, or as simple bikes. There should be special vehicle classification for electric cargo bikes; this type of vehicle could be considered between an electric-assist bicycle and an electric van
	Concerning UCCs, procurement contracts for deliveries to city entities must be changed to route deliveries via UCC	Application for new regulation must be filed in good time





## 6 PROCESSES AND IMPLEMENTATION ASPECTS

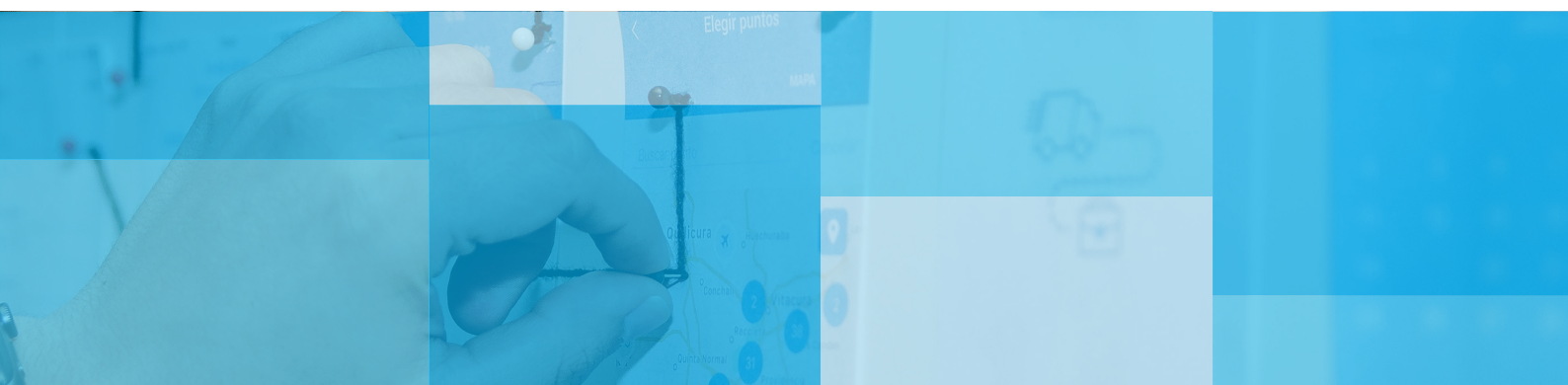
→ Identify potential difficulties/barriers and check for solutions

### POTENTIAL DIFFICULTIES RAISED BY STAKEHOLDERS FOR REGULATORY MEASURES

POTENTIAL DIFFICULTIES RAISED BY STAKEHOLDERS		
TYPE OF MEASURE	TYPE OF DIFFICULTY	SOLUTION
REGULATORY MEASURES	A current barrier is that in most cities they are not prepared for a 24-hour economy (or in certain time slots). Thus, to deliver cities within 24 hour needs also its counterpart a 24-hour economy providing the willingness of consignees to accept deliveries in the established schedules and modes	Public administrations need to apply a fair and favorable regulatory framework (critical for this kind of measures)
		Urban Logistic Service Providers need to adopt new regulatory schemes for their activities. They need to readapt their current organization to new regulations, considering the use of zero-emissions vehicles or redefining delivery times
		Retailers, who are one of the main affected by these measures, as stated before, need to prepare their current systems to accept deliveries in new time slots and push for the use of environmental-friendly vehicles

### POTENTIAL DIFFICULTIES RAISED BY STAKEHOLDERS FOR INNOVATIVE MEASURES

POTENTIAL DIFFICULTIES RAISED BY STAKEHOLDERS		
TYPE OF MEASURE	TYPE OF DIFFICULTY	SOLUTION
INNOVATIONS	Lack of willingness to develop Innovative Public Private partnerships from the side of private domain	<ul style="list-style-type: none"> <li>• Meeting and discussing together urban freight transport issues from the initial stage of planning</li> <li>• Sharing data and thoughts</li> <li>• Identifying problems, finding approaches and measures, implementing policy measures, evaluating them and feedback</li> <li>• Benchmarking - Key performance indicators developing</li> </ul>



## EXERCISE C

### Final selection of urban freight transport measures and identification of key actions to be implemented by LAs

#### Description of exercise

A. A table with 6 fields: (a) required data and surveys for implementation and evaluation of success - identification of relevant indicators, (b) main activities (both administrative and designing/application ones), (c) time plan, (d) milestones, (e) needs for outsourcing, (f) potential legal barriers

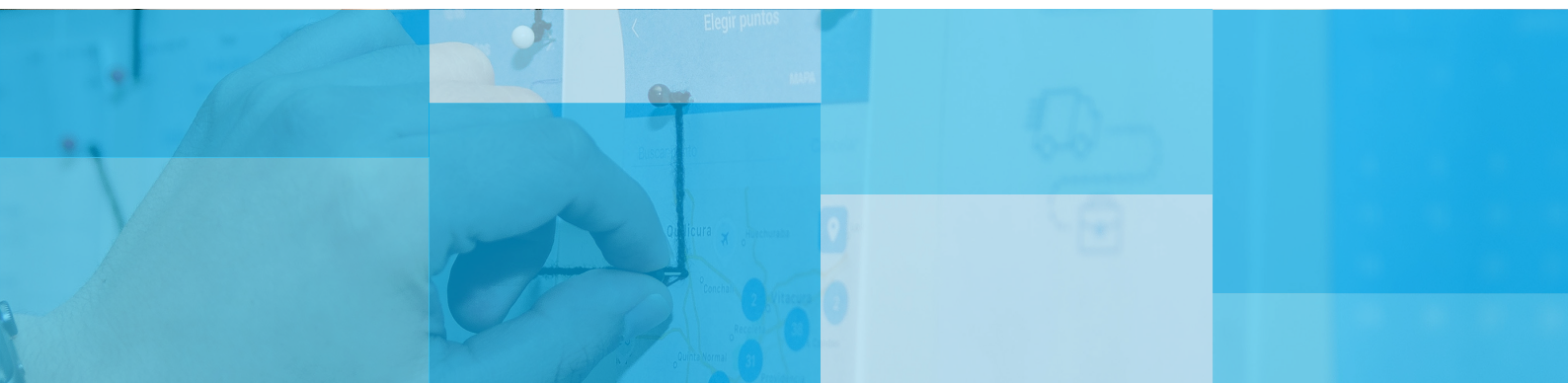
TEAM NAME

MEASURE TITLE

MAIN ACTIVITIES (administrative and designing/ application)	REQUIRED DATA, SURVEYS FOR IMPLEMENTATION	EVALUATION INDICATORS	NEED FOR OUTSOURCING yes(what kind)/no	POTENTIAL LEGAL BARRIERS

## Further Reading

1. Guidelines, Developing and Implementing a Sustainable Urban Logistics Plan. (2015). [online] <http://www.eltis.org>. Available at: [http://www.eltis.org/sites/default/files/trainingmaterials/enclose\\_d5\\_2\\_sulp\\_methodology\\_final\\_version\\_0.pdf](http://www.eltis.org/sites/default/files/trainingmaterials/enclose_d5_2_sulp_methodology_final_version_0.pdf) [Accessed 27 Mar. 2019].
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3. Lindholm, M. (2012). Enabling sustainable development of urban freight from a local authority perspective. [online] Available at: [https://www.researchgate.net/publication/277193481\\_Enabling\\_sustainable\\_development\\_of\\_urban\\_freight\\_from\\_a\\_local\\_authority\\_perspective](https://www.researchgate.net/publication/277193481_Enabling_sustainable_development_of_urban_freight_from_a_local_authority_perspective) [Accessed 28 Mar. 2019].
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10. Civitas. City Logistics Living Lab Handbook [online] <https://civitas.eu/tool-inventory/city-logistics-living-lab-handbook>



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4. SUITS deliverable D3.2. “Guidelines for cities on how to exploit open data and develop business opportunities” (WP3)







# 7 Available tools and guidelines

- **Guidelines** and **tools** to **support the design and implementation of such measures are numerous**. However, this chapter aims to provide **the ones most correlated to S-M cities instead of being generic**. The rate of the relevance to SUITS objectives supports the reader to prioritize these tools.
- Besides Sulp guidelines that include generic suggestions (available in all EU languages by ELTIS), there are also specific guidelines and tools for UFT developed in the frame of EU projects.

## 7 AVAILABLE TOOLS AND GUIDELINES

TOOL NAME	FORMAT	SOURCE / LINK	USEFULNESS FOR S-M CITIES AND IMPORTANCE IN SUITS PROJECT	RATING OF RELEVANCE [1-5]	RATING EXPLANATION
<b>NOVELOG</b>	PDF document, interactive self assessment	EU project [1]	Interesting for both, S-M and big cities	5	Interesting self-assessment tool. Visual and useful
<b>STRAIGHTSOL</b>	PDF document, Youtube video	EU project [2]	Mainly solutions for big cities, but some of them can also be implemented in S-M cities	4	Interesting results from applied measures, but results presentation could be improved
<b>FREIGHT TAILS</b>	PDF document	EU project [3]	Relevant to both small, medium and larger cities. Partners - regions of every size are involved in the project	4	Development of urban freight management policies tailored to the different sized cities
<b>BESTUFS</b>	PDF document/ presentation	EU project [4]	Yes. Some of the examples and BPs provided come from S-M cities (ex. Liège) and they can also be applied to S-M cities	3	Many information and examples are included, the only issue is that measures included can be quite outdated (2008)
<b>CITYLAB</b>	PDF document/ presentation	EU project [5]	More focused in the transferability to big cities (London, Oslo, Paris, Brussels, Rome)	3	Interesting implementations, but maybe quite far from S-M cities level. It also needs a more detailed explanation (implementation steps, etc.)
<b>FREVUE</b>	PDF document/ presentation, webinars	EU project [6]	Focused on big cities	3	Interesting material and resources, but focused on Big cities
<b>SMARTSET</b>	PDF document	EU project [7]	Yes. Cities participating are mainly S-M sized cities	3	Measures focused in mobility and some of them related to freight transport





## Novelog - Evaluation Tool

- A multi-criteria multi-stakeholder decision making process, which facilitates the establishment and combination of objectives, performance criteria and indicators, and relevant weights to reveal stakeholders' preferences
- The Tool is composed of 140 indicators that are grouped into seven impact areas of a life cycle-based sustainability framework.
- Each stakeholder selects the indicators that fit to each city case and perform a holistic assessment of the proposed measure/policy.
- Pre-defined weights stimulate the stakeholders' engagement in the decision-making process and result in consensus building within each city.

<http://evalog.civ.uth.gr/>

The output:

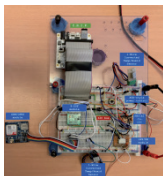
- the integration of all indicators addressed in all impact areas, and
- the formulation of a Logistics Sustainability Index (LSI) for each measure/policy tested,
- the accurate estimation of the solution's sustainability.

More specific results:

- 1) *Social Cost Benefit Analysis*
- 2) *Transferability and Adaptability*
- 3) *Risk Analysis*

## Data collection tools

SUITS Pilot Demo  
In Kalamaria



### • Crowdsourcing

Crowdsourcing using conventional GPS trackers & IoT telecom services.

### • Multi-GNSS + INS tracker

Advanced, multi-GNSS + INS tracker prototype for urban vehicle tracking.

### • Vehicle navigation

Collaborative, crowdsourced navigation system adapted for in-vehicle multimedia consoles.

## Data selection tools

### • S-DARE SELECTION TOOLS

- GPX format (converter).
- GPX file anonymisation / pseudonymisation.
- Insertion of GPX file metadata into a Geospatial DB.
- Geo-selection of GPX trace datasets.



**DaRe.SUITS-project.eu/tools**



**S-DaRe Tools (by )**

### • PP4TM SYSTEM

Scalable, data homogenisation funnel and fast query processing engine over big transport data.



**SUITS Tool: The PP4TM System**



**GPX file** is a GPS data saved in the GPS Exchange format, an open standard that can be freely used by GPS programs. It contains longitude and latitude location data, which includes waypoints, routes, and tracks. GPX files are saved in XML format that allows GPS data to be more easily imported and read by multiple programs and web services.





## S-DaRe: SUITS' Data Repository

[DaRe.SUITS-project.eu/tools](http://DaRe.SUITS-project.eu/tools)

- The data, including associated metadata, needed to validate the results presented in scientific publications.
- Collected data during the project, after anonymization and including associated metadata, as specified in the DMP.
- Generated data during the project, including associated metadata, as specified in the Consortium Agreement and in the DMP.
- Public project reports and public deliverables.
- All dissemination-related material (all that is public).



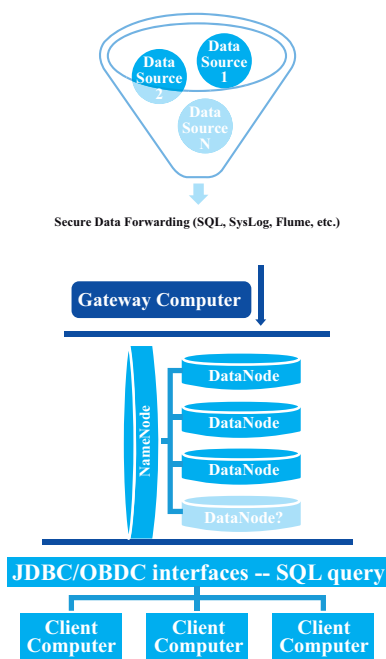
## SBOING's Repository:

- Hosted in Germany (@Hetzner.de), 3TB+, SFTP accessible (+more).
- (Mirrored in LOGDRILL's (local) Data centre).

## PP4TM: SUITS database for big data

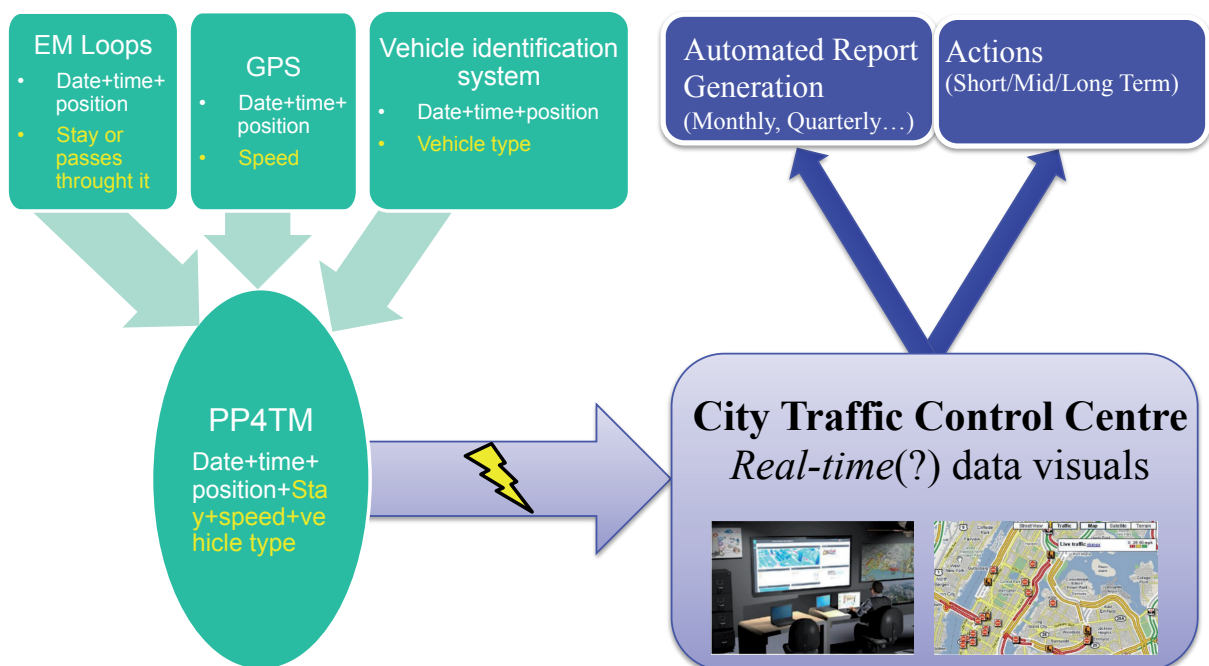
Fast and robust analytic database solution for civil traffic research and development purposes.

- Convert any data sources and formats (including historical) to common data format at once.
- Store lots of data (Big Data) and access them very quickly.
- Very easy and cheap to expand the storage capacity in runtime.
- Easy to connect to any visualization tools.
- Quickly serve your visualization needs.



## How to use PP4TM

- 1) Create a table in PP4TM, will contain all of your data (common data format).
- 2) Use PP4TM to convert different data sources to „common data format”.
- 3) Store all of your data in PP4TM.
- 4) Connect your favorite visualization tools to PP4TM (example MS Power BI free)
- 5) Analyze your data instantly (find a correlations in different type and source of data).
- 6) Expand your data to real-time (use step 2 continuously).
- 7) Use the live visualization (step 5 with refreshing).

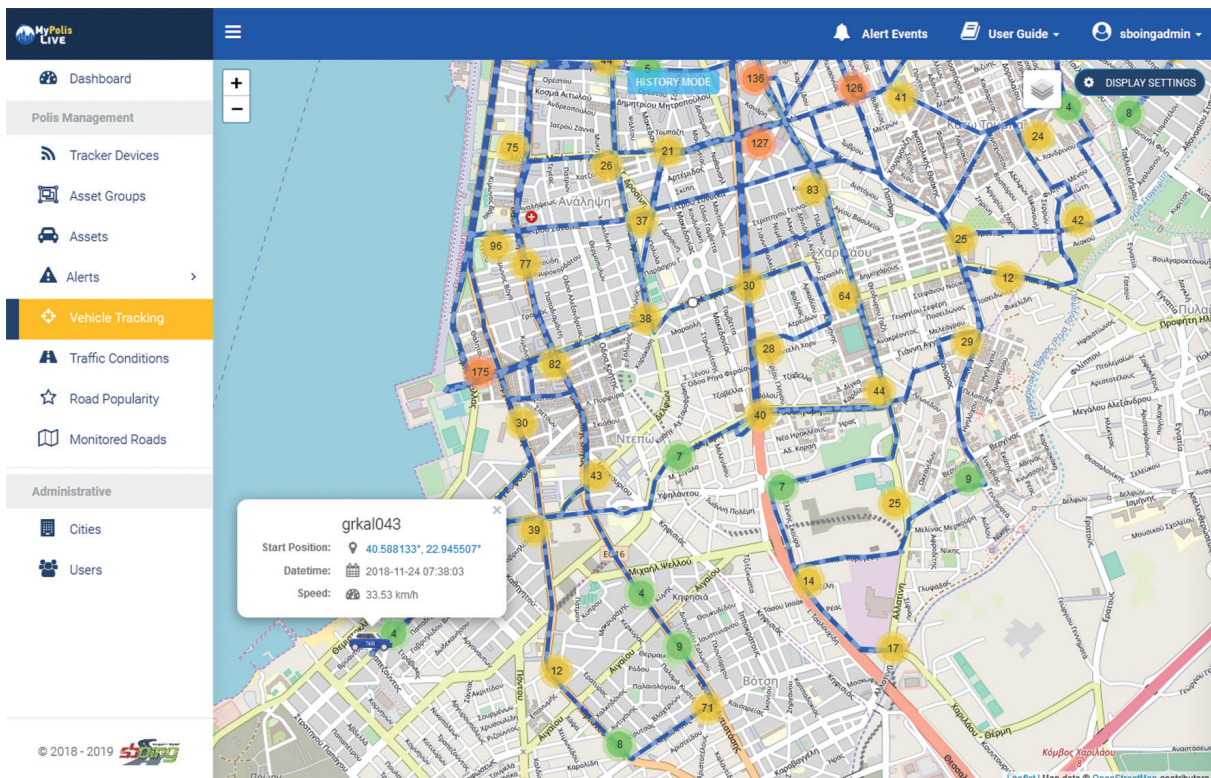




## Data visualisation tools

- **MyPolisLive.net**

A platform for real-time vehicle tracking and traffic monitoring for urban traffic management.



<https://www.mypolislive.net/>

## Further Reading

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- 5.** Sustainable Urban Logistics Plan for Dundee DRAFT. (2014). [ebook] Available at: <https://www.dundee.gov.uk/sites/default/files/publications/Draft%20SULP%20-%20Dundee%20-%20for%20ARE.pdf> [Accessed 28 Mar. 2019].
- 6.** Urbact.EU(2019). Freight TAILS| URBACT. [online] Available at: <https://urbact.eu/freight-tails> [Accessed 28 Mar. 2019].
- 7.** Citylab-project.eu. (2019). CITYLAB - Follower cities and regions. [online] Available at: <http://www.citylab-project.eu/transfercities.php> [Accessed 28 Mar. 2019].
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2. Straightsol.eu. (2019). Straightsol - Results. [online] Available at: <http://www.straightsol.eu/results.htm> [Accessed 27 Mar. 2019].
3. Urbact.eu. (2019). Freight TAILS | URBACT. [online] Available at: <http://urbact.eu/freight-tails> [Accessed 27 Mar. 2019].
4. Bestufs.net. (2019). BESTUFS.NET. [online] Available at: <http://www.bestufs.net/results.html> [Accessed 27 Mar. 2019].
5. Citylab-project.eu. (2019). Citylab - Homepage. [online] Available at: <http://www.citylab-project.eu/> [Accessed 27 Mar. 2019].
6. Frevue. (2019). Resources - Frevue. [online] Available at: <https://frevue.eu/resources/> [Accessed 27 Mar. 2019].
7. Smartset-project.eu. (2019). SMARTSET | The SMARTSET products and technical deliverables. [online] Available at: <http://smartset-project.eu/downloads> [Accessed 27 Mar. 2019].



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