Annex 1 – Action plan template

Produced by each region, the **action plan** is a document providing details on **how** the lessons learnt from the cooperation will be exploited in order to improve the policy instrument tackled within that region. It specifies the nature of the actions to be implemented, their timeframe, the players involved, the costs (if any) and funding sources (if any). If the same policy instrument is addressed by several partners, only one action plan is required.

Part I – General information

Project: CISMOB
Partner organisation: University of Aveiro

Other partner organisations involved (if relevant): Municipality of Águeda

Country: Portugal
NUTS2 region: CENTRO

Contact person: Jorge Bandeira
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Part II – Policy context

The Action Plan aims to impact:

- ☐ Investment for Growth and Jobs programme
- x European Territorial Cooperation programme
- ☐ Other regional development policy instrument

Name of the policy instrument addressed: Operational Programme CENTRO 2020

Introduction

This document provides details on how the lessons learnt from the cooperation will be exploited in order to improve the Operational Programme CENTRO 2020, one of the policy instruments addressed in the CISMOB project.

The nature of the actions to be implemented, their timeframe and the players involved will be clearly specified throughout the document. We assume that for all planned actions, the funding could be made available through funds allocated to intervention areas 043 - Infrastructures and promotion of clean urban transport, and 044 - Intelligent transport systems.

This plan contains 3 different actions. In some areas, the objective is to encourage the number of projects submitted by local stakeholders on the basis of evidence of the success of other good practices learned in the cooperation project (A1 and A3). In other cases, it is considered necessary to implement a pilot action to ensure that the implementation of other inspiring good practices identified during interregional cooperation have practical and positive effects felt by citizens in the regional context. In other cases, policy improvement is expected to have practical effects on the implementation of other measures not directly supported by the OP CENTRO 2020 (A2).

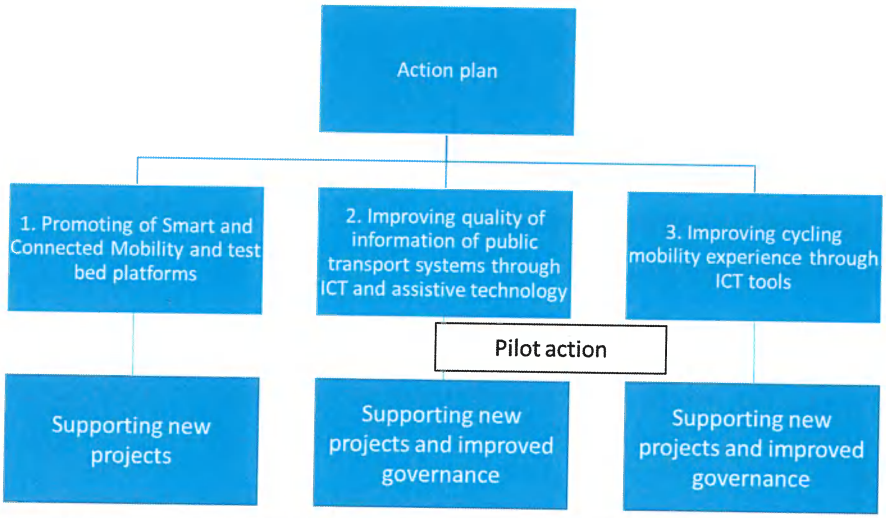

Fig. 1 Scheme of the main actions to be implemented and expected effect in regional policies.

In fact, the implementation of CISMOB project has not only facilitated the exchange of knowledge and good practices across European regions, but also contributed to increase the professional capacity of partner's staff and stakeholders involved in the project activities. Therefore, we hope that in addition to improving the quality of governance associated with this policy instrument, as well as, a higher number of projects focused on ICT, the effects of CISMOB activities may be observed at other levels. The exchange of experience events organized during the interregional cooperation, in which hundreds of representatives of municipalities, private sector, academia and other associations participated, was an important contribution for improving the quality of management of mobility services in Centro Region even out of the scope of this OP CENTRO 2020 instrument. A significant part of the topics addressed during workshops, conferences, and regional stakeholder meetings have focused on sharing good examples of information management and data sharing policies in the public transport sector. In this context, it is expected the acquired knowledge will be reflected in the development of better mobility policies such as higher quality of public transport service concession contracts or a higher interoperability between mobility services in the Centro Region. We also expect

the evidences of success in the CISMOB regions with a strong focus on open data policies will be an incentive for the development of open data portals in Centro Region in order to involve citizens and private sector in developing services that improve quality of life of all citizens.

A brief description of the background is provided for each action. However, for a more in-depth analysis of the situation of the Centro region in the context of the CISMOB consortium, we propose to consult the baseline assessment report (BAR) and the following technical papers (TP) available at the CISMOB project website library: However, for a more in-depth analysis of the situation of the Centro Region in the context of the CISMOB consortium, we propose to consult the baseline assessment report (BAR) and the following technical papers (TP) available at the CISMOB project website library:

TP1 Information Management for Smart and Sustainable Mobility

This TP demonstrates how it would be possible to read and predict traffic congestion and emissions levels with limited information and how data from multiple sources (GPS sensors, Video cameras, Google Traffic) can be managed in order to correlate and estimate emissions impacts in real time.

TP2 Assessing major pollutant on-road emissions and related costs in Portugal

This report provides the results of a study on major pollutant on-road emissions for all relevant road vehicle types from 2000 to 2014 based on Portugal car fleet data.

TP6 Exploring crowdsourcing information to predict traffic-related impacts

This TP explores an alternative source of data by demonstrating high correlations between the information provided by applications like Google Maps regarding the popular times of specific areas and the amount of air emissions produced during that period in kea arterials of a city.

TP 7 Exploring the impact of ICT on urban mobility in heterogenic regions

This TP explores the effectiveness of ICTs and environmental and economic impacts in a set of cities and regions with heterogenic characteristics, Emission and cost savings for 2 scenarios:

1) congestion and emission/congestion cordon tolls and 2) eco-routing systems.

TP8 Interregional European Cooperation platform to promote sustainable transport through ICT – an overview of best practices

This TP summarizes a set of good practices related to the use of ICT in the transport sector and identified in the course of cooperation.

TP9 Analysis of the results on road traffic emissions and related costs in 2014 for the regions of CISMOB consortium

Section 6 provides a detailed analysis regarding emissions and costs in terms of vehicle technology for Centro Region, Bucharest-Ilfov and Extremadura.

Part III – Details of the actions envisaged

ACTION 1 Promotion of Smart and Connected Mobility and test bed platforms

1.1 The background

One of the many good practices learnt during CISMOB interregional cooperation is the implementation of innovative mobility and urban platforms based on the Internet of Things (IoT) concept. Information and communication technology (ICT) is a key tool for developing an urban sustainable future, creating opportunities for more direct integration of the transport infrastructure into computer-based systems, aiming at increasing efficiency, accuracy and social and economic benefits.

The interaction of vehicles and vehicles to infrastructures is in the field of Cooperative Intelligent Transport Systems (C-ITS), which will allow both drivers and traffic managers to share data and information, as well as using such information to coordinate their actions, improving energy savings, road safety, and reducing environmental impacts. The ability to support mobile access on moving vehicles will be critical for 5G networks, including intelligent transport applications. In addition, some car manufacturers intend to start providing automated driving resources and in the nearly future may delegate the task related to driving to the car itself. The European Strategy for Low-Emission Mobility (2016) highlights the potential of cooperative, connected and automated vehicles to reduce energy consumption and emissions from transportation. In Centro Region, besides strategies for reducing Carbon dioxide (CO_2) emissions, efforts should also be focusing in Oxides of Nitrogen (NO_X) and Particulate matter (PM) emissions, atmospheric pollutants which deserve particular attention according to the objectives of the Operational Programme of Centro Region – CENTRO 2020. These concerns are in line with CISMOB Baseline Assessment Report (BAR), where it is demonstrated that these variables are the main negative environmental externalities related to the transport sector in Centro Region. It is estimated that the negative external cost per year related to CO_2, NO_X and PM are approximately, 389 M EUR in 2014 (see TP9).

In the framework of Interregional Cooperation, good practices related to innovative platforms were identified. The Urban ICT Arena lab located in Stockholm Sweden consists of an extensive and diversified IT-infrastructure, display window, meeting arena and project place having as main goal the development and demonstration of innovative solutions that benefit society. Urban Life at RISE ICT consists of a group of experts in sensor solutions and Internet of Things (IoT) platforms for environmental monitoring and energy efficiency, concepts based on open platforms, open data and access to digital infrastructure, focusing on prioritizing citizens' needs and experiences.

These good practices developed in Sweden can serve as inspiration for replicate similar projects in Centro Region, Portugal.

1.2 Actions

While the investment priority 4e of the OP CENTRO 2020 appears to be sufficiently ambitious and with the necessary framework to support projects in this area, regional stakeholders will continue to be encouraged to submit projects in the specific areas mentioned below.

- Creation of applied research platforms and test beds - namely the development and construction of real-world mobility prototypes - to study the requirements that transport systems will place on 5G networks and other communication protocols.

- Pilot-projects and test platforms in (real) urban environment for: 1) intelligent mobility solutions connected to the infrastructure; 2) innovative monitoring systems, including environmental assessment and monitoring of human activity patterns; 3) behavioral analysis on response to new information services in the area of mobility.

- Development of intelligent mobility plans focused on the use of intelligent connected transport systems. Plans to be supported may address: 1) investment strategies and priorities to foster connected and automated mobility; 2) installation of sensors identification of critical points of congestion, pollution and areas of high vulnerability (exposed population) in which new communication technologies and intelligent transport systems can play a key role in their identification and solution. The main objective is to select the actions that have an effective impact in terms of air quality.

- Development of strategic plans to determine the necessary investments in road infrastructures to accommodate connected and autonomous vehicles in short to medium terms. These plans may include, for instance,

definitions of restriction criteria for autonomous circulation, reconfiguration of tracings and intersections, and quality of vertical/horizontal signaling.

1.3 Players involved (please indicate the organisations in the region who are involved in the development and implementation of the action and explain their role)

Local and regional authorities as Municipalities will be encouraged to submit proposals in the Smart and Connected Mobility topic. CCDR-Centro – Managing authority

1.4 Timeframe

Mai 2018 Oct 2018: Dissemination of the action plan
Oct 2018 – Dec. 2018: Establishment of contacts with regional stakeholders highlighting the funding opportunities and relevance of the problem to be solved
Jan 2019 – March 2020: Follow-up of projects submitted in this topic
Until March 2023: Implementation of approved projects.

1.5 Funding sources

The funding could be made available through funds allocated to intervention areas 043 Infrastructures and promotion of clean urban transport, and 044 Intelligent transport systems (including the introduction of demand management, tolling systems, information, monitoring and control).

ACTION 2 Improving quality of information of public transport services through ICT

2.1 The background

Providing all public transport users useful information supporting their travel decisions is an important step to make urban mobility greener. The more updated information is, the greater its value. Real-time information on current location of the vehicles, next station/stops and expected arrival times, delays, incidents, alternative lines/routes of public transport is important for current passengers, but it is also an effective way of encouraging new public transport passengers.

During the interregional cooperation within CISMOB, project partners and stakeholders were able to learn good practices from various different regions, namely on real-time information. It contributed to regional stakeholders become much more interested and aware of the potential of ICT. Stockholm, Ploiesti, Timissoara and Cáceres are CISMOB Regions, which have proved to improve its public transport passenger satisfaction rating by implementing real-time information systems for public transport. It is a way of improving the quality of public transport, the public confidence in the system and increasing passenger numbers. In these regions, special applications such as centralized systems, apps, phone, or screens installed on buses and/or bus stations/stops, provide passengers with real-time information about the next stops, connecting means of transport and journey planning options.

In Centro Region, Portugal, the usage of individual transport is massive and this type of measures regarding providing real-time information is a way of making public transport more attractive. Despite some recent efforts to improve quality of information for public transport users, real-time information to users is still scarce in Centro Region (only limited to the city of Coimbra). In the majority of bus lines operating in Centro Region, the frequency of public transport is reduced. Therefore, providing real-time information to passengers can be really useful for journey planning,

since these systems make it possible to increase the degree of confidence in the use of the public transport system and allow users to maximize their time through a more informed planning in the beginning of their journey.

During Local Stakeholders Meetings in Centro Region, participants showed to be aware of the need of reducing traffic-related externalities, promotion of public transport, and raised concerns related to introduction of ICT tools, mentioning that the development of integrated real-time information public transport solutions will be very important towards a more sustainable urban mobility. Having this in mind (mobility for all), real-time information can be delivered over different channels and considering specific citizen's profiles (apps, phone (sms/call), or screens).

In the last decades, the demographic change in Europe has become evident, with a tendency of aging. In Centro Region, 23% of the population is over 65 years old. This age group is particularly affected by the increasing complexity and automation of transport systems (e.g., ticketing systems, time and stop identification). Assistive technologies include wireless systems, Dedicated Short Range Systems (DSRS), Global Satellite Navigation Systems (GNSS), object detection and robotics. Some concrete examples are simple, exclusive devices that provide instructions on schedules and stops nearby, automatic ticket discount, call-to-order transport or pedestrian navigation systems. Other possibilities include remote monitoring of mobility standards and citizens' needs in order to adjust the provision of public transport to remote locations or flexible public transport systems.

CISMOB encourages the simultaneous introduction of inclusive technology in the implementation of modernization and digitization of the public transport sector in the Centro Region financed by the OP CENTRO 2020.

2.2 Actions

- Monitoring the results of the pilot action on assessing perceived usefulness, perceived ease of use, and user acceptance regarding different approaches to disseminate real-time information on public transport services (see annex 1).
- Promote the implementation of new projects for support public transport usage including new tools to improve the quality of life of the most vulnerable citizen namely elderly population and/or with some degree of incapacity. Promote the implementation of new projects for supporting public transport usage by including new tools to improve the quality of life of the most vulnerable citizens, namely elderly population and/or with some degree of incapacity.
- Improve the quality of the evaluation of new projects submitted in the field "Applications of Intelligent Transport Systems and Public Passenger Transport"
    - B2 - Include "other modes of transport" besides road and rail on intermodal communication platforms,
    - B4.2 - In addition to the exiting criteria awarding integrated ticketing systems in multiple operators, it should be also including a new criteria to award projects that include open data platforms and real-time information systems
    - Adjust the criteria for the relative reduction of carbon emissions by establishing more realistic targets
    - Include an evaluation bonus for projects involving senior citizen assistive technology, including service alerts, information services for vulnerable users, simplified and / or passive ticketing systems.

2.3 Players involved

Municipal and transport authorities will be encouraged to submit proposals focused on improving the quality of information related to public transport.

Municipality of Cantanhede – supporting the execution of the pilot action – urban public transport line will be the test bed for CISMOB pilot action

Intermunicipal Community of the Coimbra Region – transport authority that will facilitate the contact with regional transport operators in order to install the prototype of the pilot action in selected lines (see annex 1).

CCDR-Centro will improve the criteria for project proposals' evaluation in this topic.

2.4 Timeframe

April 2018 – August 2019: Pilot Action implementation (Real-time information for public transport)
April 2019 – March 2020: Mobilization of regional stakeholders (municipalities and intermunicipal communities) for the relevance of the theme and implementation of projects related to this topic.
June 2018 – August 2018 – Improvement of criteria of evaluation of projects submitted under this topic

ACTION 3 Improving the quality of cycling mobility experience through ICT tools

3.1 The background

Whereas considerable investments have been carried out by regional authorities to promote cycling mobility (e.g., public electric bike sharing systems, new cycling routes) and involving 2,5 MEUR supported by the OP CENTRO 2020, ICT and software component should be further explored to promote the involvement of new generations, the scientific community, industry, urban planners and citizens, in general.

Providing accurate and real-time information about mobility services is an effective way of encouraging passengers to use more sustainable transport modes such as walking and cycling. In addition to the construction of physical infrastructure such as cycling lanes, ICT may encourage people to use alternative modes of transport. Innovative applications and information media can be created to facilitate the exchange of information among cyclists.

Additionally, bicycles can be seen as authentic living and dynamic urban laboratories. Installing environmental sensors on bicycles can help municipal authorities to collect information with a high degree of resolution and space coverage greater than conventional methods. Such knowledge can become an important tool for municipalities to monitor the quality of the environment and report the successes of their environmental policies.

Part of the intent of Urban ICT Arena and the project not boring 5G bikes (projects who have been presented to CISMOB partners and Stakeholders) is to show how, through the innovative use of ICT, a city area can transform its working and living environment into one that opens up a broad and inclusive range of opportunities in business creation, knowledge exchange, and social development. One way that Urban ICT Arena does this is by making digitalization resources available to those who want to use them in an innovative process. A sister project in Sweden (Urban Health Bike Data Tour) collect data about the quality of air, light and sound levels.

3.2 Actions

- Contact local stakeholders to submit new projects related to cycling mobility, preferably including new communication technologies and sensors to improve the experience of cycling mobility, to increase the interoperability with other means of

public transport, to enhance the capacity of municipalities in monitoring urban environmental parameters.

- Improve the evaluation criteria of new projects based on infrastructures to support cyclable mobility, namely by:
  - Prioritizing the investments based that use road accident data to support the selection of road sections where the cylce lanes will be implemented
  - Adjust the criteria for the relative reduction of carbon emissions by establishing more realistic targets.

3.3. Players involved

Municipal and transport authorities will be encouraged by CISMOB partners (University of Aveiro and CM Águeda) to submit new applications related to the above mentioned topic.

CCDR-Centro has the role to establish possible criteria for project proposals' evaluation.

3.4 Timeframe

Mai 2018 – Oct 2018: Dissemination of the action plan ,
June 2018 – August 2018 – Improvement of criteria of evaluation of projects submitted under this topic,
Oct 2018 – Dec 2018: Establishment of contacts with regional stakeholders highlighting funding opportunities and relevance of the problem to be solved,
Jan 2019 – March 2020: Follow-up of new projects submitted in this topic,
Until March 2023: Implementation of approved projects.

Date: 18.06.2018

Signature: Ana Abrunhosa

Stamp of the organisation (if available): COMISSÃO DE COORDENAÇÃO E DESENVOLVIMENTO REGIONAL DO CENTRO — A Presidente Ana Abrunhosa