eBussed project (PGI05948)

Action Plan – final version

20 July 2022

Prepared on behalf of DDRIÜ Nonprofit Ltd. by Open Inno Kft.

The participation of the Hungarian partner in the project is co-financed by the Hungarian State.
The project is co-funded by the European Union.
https://www.interregeurope.eu/ebussed/

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INTRODUCTION

The eBussed project provides technical assistance for the transition from public transport with internal combustion engines to public transport with electric bus fleets. The project covers several areas related to the launch and support of the development of e-bus. eBussed will focus on the exchange of experience between partner regions at different stages of the development of e-bus operations, thus serving regions struggling with this highly technical and fast developing field. As no partner region has yet fully developed its e-bus migration roadmap, new ideas, solutions, and technologies can continue to be introduced into their development plans. eBussed will support the transition of European regions towards low-carbon mobility and more efficient public transport. It promotes the uptake of e-buses and supports the expansion of existing e-fleets.

The eBussed project contributes to the specific objective of Interreg Europe 3.1 "Improving low-carbon economic policies" by encouraging regions to develop and implement better policies for the deployment of e-buses. The project will also facilitate the integration of electricity generation based on renewable energy sources and low carbon electrified public transport. Through new ideas and better policies, the project will facilitate the demand and supply side of electricity from clean renewable sources and the subsequent transition towards a low-carbon economy.

In line with the above project framework, the South Transdanubian Regional Agency aims to promote the development of related national policies. Based on the project implementation schedule, the IKOP Plus is considered a realistic policy intervention target. Transport development through the IKOP Plus remains an important instrument for economic development and territorial cohesion, but in line with the European Green Agreement, it places a strong emphasis on the promotion of sustainable forms of transport: the development of public transport by rail and cycling, the interconnection of modes of transport, the greening of motorized transport through the expansion of alternative fueling infrastructure, and the early replacement of public transport vehicles by supporting the

purchase of clean and energy efficient road vehicles. Priority Axis 1 of the IKOP Plus (Strengthening clean urban-suburban transport) is linked to the objectives of the project.

The activities carried out so far along the objectives of the project and the framework set out have guided the Action Plan's actions. The related activities were the definition of indicators of readiness for e-bus deployment, the inventory of incentives and barriers, the technological expectations, the primary analysis of regional good practices and the analysis of user attitudes. On this basis, 4 proposed actions were developed. Two actions will be further developed in spring 2022, based on policy discussions with the Managing Authority of the Integrated Transport Operational Programme in the Ministry of Innovation and Technology (Managing Authority for Transport Programmes, Deputy State Secretariat for Transport Operational Programmes):

- reducing the environmental impact of urban and suburban bus transport,
- the development of an electric charging network.

At this stage of the Action Plan preparation, we have developed the policy linkages and the good practices identified in the project. On this basis, we have also defined the technical content of the actions.

POLICY CONTEXT

The policy instrument

The Action Plan aims to impact:

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

Name of the policy instrument addressed: **Integrated Transport Operational Programme Plus (IKOP Plus)**

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Background and rationale

The policy basis for the Action Plan has close links to the related policies, including National Electromobility Strategy (Jedlik Ányos Plan 2.0) and National Transport Infrastructure Development Strategy. While the policy impact perspective, Integrated Transport Operational Programme Plus (IKOP Operational Programme Plus) 2021-2027 will be addressed.

The IKOP will be continued in the 2021-2027 programming period with the Integrated Operational Programme for Transport Development Plus (IKOP Plus). In line with the European Green Agreement, IKOP Plus places a strong emphasis on promoting sustainable forms of transport: developing public transport by rail and cycling, intermodal transport, greening motorized transport and replacing public transport vehicles as soon as possible. The areas of intervention of the operational programme also cover improvements in the field of waterborne transport.

The Operational Programme is linked to the EU's policy objectives "A greener, low-carbon Europe" (PO2) and to the policy objective "A better connected Europe - mobilityand regional ICT interconnectivity" (PO3).

The OP consists of three priority axes, which can be further broken down into specific objectives and areas of intervention.

1. Priority axis: strengthening clean urban-suburban transport
   1.1. Measure: Strengthen biodiversity in the urban environment, green infrastructure and reduce pollution

The measure includes the following interventions:

- development of suburban railway sections not part of the TEN-T network, procurement of rolling stock (e.g. trains for metro),
- developments to help link transport chains (e.g. P+R, B+R, intermodal passenger transport hub),
- development and implementation of IT applications and databases favoring public

transport,

- development of public transport (trams, trolleybuses, buses) and other public transport services, removing bottlenecks (construction of new lines, purchase of vehicles, modernization and accessibility of stops, infrastructure development),
- Budapest urban road transport infrastructure mixed traffic, cycling improvements,
- development of alternative fueling infrastructure (e.g. e-charging stations, H-charging stations).

2. Priority axis: development of TEN-T rail and regional intermodal transport
   2.1. Action 3: Developing a resilient, smart, safe and intermodal TEN-T to cope with the impacts of climate change

The measure includes the following interventions:

TEN-T rail network:

- removing bottlenecks on the rail network,
- strengthening rail digitalization (e.g. central traffic management, transformer replacement),
- the purchase of motor trains and passenger cars,
- modernisation of railway stations and stops;

TEN-T waterborne transport:

- Developing the water and land-side infrastructure of TEN-T ports,
- converting the propulsion chain of ships on the Hungarian stretch of the Danube to natural gas or hydrogen;

3. Priority axis: more sustainable and safer road mobility
   3.1. Action: sustainable, climate resilient, smart, safe and intermodal TEN-T
   3.2. Action 3: Developing sustainable, climate resilient, smart and intermodal national, regional and local mobility, including improved access to TEN-T and cross-border mobility

The measure includes the following interventions:

- upgrading of missing sections of expressways and 1-3 digit roads, expansion of road network capacity, interventions to improve the environmental and technical sustainability of road infrastructure and thus the current level of service, interventions to improve road safety (e.g. intersection reconstruction, replacement of ramps, visibility improvement, further development of intelligent transport systems),
- Development of EUROVELO cycling facilities,
- developing renewable energy technologies for transport, in particular biogas (bio LNG, CNG), renewable hydrogen and advanced biofuels,
- development of alternative fueling infrastructure (e.g. e-charging stations, H-charging stations),
- improvement of border crossing points, acquisition of equipment to speed up border crossing,
- building/developing systems to support self-driving cars,
- Preparing the management tools for the National Transport Strategy.

DETAILS OF THE ACTIONS ENVISAGED

1. ACTION: Reducing the environmental impact of urban and suburban bus transport by preparing for digitalization and testing solutions

The background

The main objectives of transport development are to improve accessibility, increase competitiveness and strengthen socio-economic and territorial cohesion. The development of interurban public transport is an important part of transport development. In recent years, public road transport has been developed mainly to improve the quality of the roads used for transport and to provide new accessibility options. These developments have also contributed to improving the quality of public transport, with better, faster roads reducing journey times and making journeys more comfortable and safer. In addition, the Széll Kálmán Plan 2.0 objective of promoting environmentally friendly modes of transport has made it necessary to replace public transport buses with more modern, environmentally friendly ones.

In view of the above, the development directions are clearly aimed at modernizing the vehicle fleet and improving the road network. However, reducing the environmental burden also involves several other aspects in addition to renewing infrastructure and equipment. The most important of these are route optimization, measuring and monitoring passenger demand, and promoting alternative modes of transport. This action aims to disseminate the knowledge needed for these transport management solutions.

Throughout the project we have been able to identify, process and adapt successful collaborations to reduce the environmental impact of urban and suburban bus transport, in particular to share knowledge and improve knowledge between the relevant disciplines. The first of these is the E-bus training for all staff by City Traffic Turku Ltd (Turku, Finland), which provides continuous training in operation, maintenance and management for all operating staff based on a common training theme. For the present action, the main priorities are to maximize utilization rates, increase passenger comfort and reduce energy consumption. The implementation of the action is also supported by the Change Management and Information Strategy for Drivers and Technicians solution, implemented by VHH (Hamburg). The good

practice places a strong emphasis on supporting drivers and technicians to become increasingly digitalized and to learn new technologies. The preparation for the rapidly changing technological environment in Hungary and the training solution (video content) used clearly support the local application of the good practice. The third integrated good practice Optimizing the driving skills of bus drivers (Qdrive monitoring system, Qbuzz, The Netherlands) is an online system that provides bus drivers with processed information on driving data, energy efficiency, helping to optimize driving and traffic management. For the present action, the elements aimed at making transport management more efficient are of relevance.

Content of the action

The aim of the action is to reduce the environmental impact of urban and suburban transport by preparing for digitalization and testing the solutions. To this end, a pilot action area will be defined to examine the adaptability of digital solutions adopted from good practices and to test digital solutions.

Activities carried out under the action:

- Delimitation of the pilot action area;
- An overview of the adaptability of good practices;
- Testing digital solutions - to assure all the components required to deliver the optimal user experience. The testing assess the digital solutions' vulnerabilities, functionality, usability, performance, etc. across an online test platform. Testing means individual and crowd testing and includes functional testing, accessibility and usability testing, all through thematic online surveys.

In terms of policy impact, the main objective of the action is to increase energy efficiency, maximize occupancy rates and improve passenger satisfaction to help achieve the environmental objectives through the implementation of new projects integrating the digital solutions tested in the action. It will do so with a direct impact on the priority A.1 of the IKOP Plus (Strengthening clean urban-suburban transport). The results of the action will be integrated in the calls for proposals to support the green transport transition of municipalities and local transport operators organizing public transport, in line with the sub- objective Development of demand-driven transport systems and databases. As a final result of the action, a supporting measure will be added to the calls text – as a new impact indicator to

accelerate implementing new projects with digitalization elements - during the expert consultation in autumn 2022. The call with the described updates will be published in Q1 2023.

Players involved

DDRIÜ is responsible for the implementation of the action, involving the following organisations:

- Community bus transport operators,
- municipalities,
- Regional Transport Offices,
- Urban and Suburban Transport Association.

Timeframe

- in months 1-12 of phase 2: full implementation

Costs

- EUR 10 000

Funding sources

- DDRIÜ own resources
- TÜKE Busz Zrt. (local public transport company of the city of Pécs) own internal development funds

2. ACTION: Upscaling the efficiency of electric charging network

The background

Reducing urban air pollution requires not only a reduction in the share of cars with internal combustion engines, but also a key task to replace diesel buses with clean electric ones. The battery powertrain is particularly ideal for moving buses, as the route and journey times of the vehicles are known, so charging can be easily timed - the question is which charging solution(s) will prove to be the best and cheapest.

There are currently a number of charging solutions available, the most common being conventional charging cables with CCS connectors, current collectors, reverse pantographs, induction charging or in-road charging rails.

Current charging network development trends focus mainly on centralised, on-site charging solutions, which limit the possibilities for transport management. A combination of on-board and on-route charging solutions and technical solutions is still possible. Taking these into account could significantly improve the efficiency of e-bus public transport, thus accelerating the achievement of environmental targets.

Three of the related good practices identified in the project will be adapted under this action. The first is the On-Call Service for charging problems in Turku (Turku Energy Ltd. Finland). The central element of the good practice is the operation of an on-call service to deal with charging problems of e-buses. The aim is to shorten the repair time (minimise downtime). In the present action, this solution will be integrated in the deployment of the charging network. The preconditioning of e-buses, a good practice of others, is a working solution for the Hamburg VHH. Pre-conditioning of e-buses uses mains electricity to heat or cool the interior and the battery pack while still connected to the charging point at the depot. This is the solution we intend to apply in the design of the on-site charging points in this action, to increase autonomous capacity. Finally,the solution of Tribus Innovative Mobility from the Netherlands to optimise the load on the network infrastructure can be transferred to the local development environment. The objectiveis to evaluate whether peak reduction, V1G and V2G/V2B smart charging can be an appropriate

solution for balancing the network, reducing costs and emissions. The results of good practice can be used to develop model solutions for action.

Content of the action

The aim of the action is to increase the charging efficiency of the fleets used in public transport and those planned to be purchased, thus making public transport more efficient. The action will develop easily adaptable and combinable model solutions for operators planning fleet development.

Activities carried out under the action:

- Setting up an expert group to evaluate e-bus charging solutions (1 expert group with at least 3 industry stakeholders). The expert group will engage in regular dialogue, analyze existing solutions and prepare an assessment.
- Developing model solutions for charging networks in public electric bus transport (summarised in 1 technical study). Based on the evaluation, model solutions will be developed, including an assessment of their feasibility and deployment conditions, in line with the priorities of the IKOP Plus.
- Organising professional, thematic online and in-person events (2 professional events). The aim of the events is to reach as wide a target group as possible, to present, discuss and test the model solutions before their implementation. Testing in this case means collecting and evaluating feedbacks. The planned two face-to-face meetings are a good opportunity to do this. The testing here is based on answering a set of predifined questions and evaluating each factors.

In terms of policy impact, the main objective of the action is to implement more efficient e-bus fleet and transport management projects, thus enabling procurers to develop more appropriate solutions by the implementation of new projects. The action has a direct impact on the priority A.1 of the IKOP Plus (Strengthening cleanurban-suburban transport). The sample solutions to be developed under this action will be presented as alternative solutions in calls for proposals to support organisations developing networks, in line with the sub-objective 'Development of demand-driven transport systems anddatabases'. The first calls for proposals, which will include examples of solutions to be developed under this action, will be launched in Q1 2023.

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Players involved

DDRIÜ is responsible for the implementation of the action, involving the following organisations:

- Community bus transport operators,
- thematic professional organisations.

Timeframe

- in months 1-12 of phase 2: full implementation

Costs

- EUR 5 000

Funding sources

- DDRIÜ own resources
- Paks Busz (local public transport company of the city of Paks) own internal service development funds

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MONIRORING OF THE ACTIONS

The monitoring period of the Action Plan will be from 1st August 2022 (once validated by the Joint Secretariat) to 31st July 2023.

There will be two monitoring mechanisms for the Action Plan: 1) a common one for all APs designed by the Lead Partner to monitor, analyse and report the implementation of actions, 2) a self-monitoring defined by the partner according to its needs and internal structure.

The self-monitoring mechanism has been defined to ensure the correct implementation of actions as foreseen.

The table below shows the measurable indicators for the implementation of the actions:

Action	Indicator		How	Who
	Measurement unit	Value		
1.	A good practice adaptability summary	1	record	STRIA
1.	Tested digital solutions	3	record	STRIA
1.	The number of new projects generated by the action	1	record	STRIA
2.	Expert group set up	1	record	STRIA
2.	Technical summary on model solutions	1	record	STRIA
2.	Professional events	2	record	STRIA
2.	The number of new projects generated by the action	1	record	STRIA

Date: 20/07/2022

Signature: _____

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Adószám: 14194799-2-02

Stamp of the organisation (if available): _____

eBussed
Interreg Europe

European Union
European Regional
Development Fund

Endorsement Letter from the relevant organisation responsible for the action

Project acronym	eBussed
Project title	Building capacities for European-wide e-bus deployment
Name of the signing organisation (original) including department (if relevant)	Közlekedési, Környezeti és Energiahatékonysági Fejlesztési Programok Végrahajtásáért Felelős Helyettes Államtitkárság, Kötöttpályás Projektek Főosztály, Miniszterelnökség
Name of the signing organisation (English) including department (if relevant)	Deputy Secretariat of State Responsible for Transport, Environmental and Energy Efficiency Development Programmes, Railway Projects Department Prime Minister's Office
Name of the policy instrument addressed (original)	Integrált Közlekedésfejlesztési Operatív Program Plusz (IKOP Plusz)
Name of the policy instrument addressed (English)	Integrated Transport Development Operational Programme Plus (ITDOP Plus)
Name of partner(s) concerned in the application form (English)	South Transdanubian Regional Innovation Agency Non-profit Ltd.

We hereby confirm:

- that on 22 June 2022 we received the Action Plan prepared by South Transdanubian Regional Innovation Agency in the framework of the above-mentioned project;
- that we participated in the regional stakeholder group of the above-mentioned partner in the project;
- that we are effectively acquainted with the contents of the Action Plan, and we will consider possibilities for the implementation of the Action Plan through our policy instrument.

Name of signatory	Balázs Nagy
Position of signatory	Head of Deputy Secretariat of State
Date	21 July 2022
Signature (compulsory) and institution stamp (if exists)