

# COMBINED DELIVERABLE D.T1.5.1-4: PART 3/4

Report on pilot area selection and mobility related challenges, low-carbon mobility scenarios, stakeholder involvement and action plan development for the FUA Leipzig

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## Executive Summary

The current document reports on the Action Plans for integrated low-carbon public transport services and on the process conducted towards the development of these plans in pilot areas Leipzig, Brno, Koprivnica and Szeged. The report covers four different steps part of the Action Plan development, which were initially proposed as four separate reports for each of the four FUAs (Leipzig, Brno, Koprivnica and Szeged). The separate deliverables are listed as follows:

1. **D.T1.5.1 Report on pilot area selection and analysis of mobility related challenges** for public transport: Identification of pilot areas according to mobility related challenges for PT in FUAs Leipzig, Brno, Koprivnica and Szeged. Planning of stakeholder involvement, low-carbon performance objectives, expected outcomes and goals, based on LOW-CARB's strategies (section 2).
2. **D.T1.5.2 Low-carbon mobility scenarios** for pilot areas in functional urban areas: Collection of relevant data about mobility patterns, transport infrastructure and PT services supply in pilot areas to develop low-carbon mobility scenarios for these pilot areas. Szeged will focus on companies as the main target group of the action plan (section 3).
3. **D.T1.5.3 Report on stakeholder dialogue** and prioritisation of low-carbon mobility measures in pilot areas: Report on stakeholder and citizens/companies' involvement (at least two workshops or events per pilot area) to create a common ground for integrated mobility planning, and feedback/prioritisation of presented scenarios and planned low-carbon mobility measures for pilot areas (section 4).
4. **D.T1.5.4 Definition of "packages" of low-carbon mobility measures related to public transport**, based on stakeholder feedback and on the overall assessment of economic and environmental impacts. The action plans will include timeline, financing plans and responsibilities and lay at the basis of pilot actions implemented in WP T3 (section 5).

The decision to compile the four steps in the Action Plan development was based on the real situation in the respective FUAs showing that the steps are actually strongly linked one to another and the process not always follows the proposed structure. In addition, each FUA has its own characteristics and framework, thus it was decided to split the deliverable D.T1.5.1-4 into four parts, each referring to one of the respective FUAs. The current part of D.T1.5.1-4 refers to FUA Koprivnica Action Plan (Part3/4).

## NUTS region(s) concerned by the strategy (relevant NUTS level)

### 1. Functional urban area of Koprivnica

Country (NUTS 0)	HR
Region (NUTS 2)	HR04, Kontinentalna Hrvatska
Sub-region (NUTS 3)	HR045, Koprivničko-križevačka županija

## 1. Introduction

The present report includes the characteristics of the pilot area part of FUA Koprivnica, its issues and challenges related to mobility (corresponding to D.T1.5.1), development of low-carbon mobility scenarios for the pilot area (corresponding to D.T1.5.2), discussions around ideas, measures and prioritisation of measures together with the most relevant stakeholders at the FUA level (corresponding to D.T1.5.3), and finally the development of an action plan comprising packages of measures related to public transport improvement in the pilot area, time-line for implementation, budget, responsibilities and any challenges or risks related to implementation (D.T1.5.4).

## 2. Pilot area selection and analysis of mobility related challenges for public transport

- ✓ Description of the pilot area, mobility challenges in relation to public transport, goals and next steps towards action plan development



Figure 1: Population and geographical scope of the project – FUA Koprivnica. Source: QGIS tool, City of Koprivnica 2020

Koprivnica is a small-sized city located in the North-western part of Croatia. Koprivnica has a population of approximately 31.000 inhabitants that are dispersed across 9 settlements. The largest settlement and the urban centre is the City of Koprivnica, making the urban core and the rest 8 settlements have a smaller population and accordingly less population density. The reason why there is such a difference in population density is the fact that all of these settlements joined the City of Koprivnica recently. Prior to that, the settlements were mostly rural areas. City of Koprivnica is also the capital of the Koprivnica-križevci county, one of 21 counties in Croatia, with a population of 115.584 inhabitants. The county has in total 25 territorial units, among which 3 cities and 22 municipalities.

According to the new definition of Functional urban area (FUA) that was developed jointly by the European Commission and the Organisation for Economic Co-operation and Development (OECD) the



City and its commuting zone are creating a FUA. According to that definition, a commuting zone can be identified based on commuting patterns using the following steps:

- ✓ If 15 % of employed persons living in one city work in another city, these cities are treated as a single city.
- ✓ All municipalities with at least 15 % of their employed residents working in a city are identified.
- ✓ Municipalities surrounded by a single functional area are included and non-contiguous municipalities are dropped.

Even though there is no clear data available, according to the official definition, the presumption is that the City of Koprivnica and the 11 surrounding municipalities are creating the Koprivnica FUA with a total of 62.464 inhabitants.

Name of public authority in Koprivnica FUA	No. of inhabitants
Općina Koprivnički Bregi	2.403
Općina Novigrad Podravski	3.161
Općina Peteranec	2.848
Općina Hlebine	1.407
Općina Virje	5.197
Općina Drnje	1.863
Općina Sokolovac	3.964
Općina Rasinja	3.818
Općina Koprivnički Ivanec	2.361
Općina Legrad	2.764
Općina Đelekovec	1.824
Grad Koprivnica	30.854
<b>TOTAL</b>	<b>62.464</b>

As shown in the table above, City of Koprivnica is a clear center regarding size and the number of inhabitants. Also, City of Koprivnica is the clear economic center of the region, not only the FUA but also from the whole Koprivnicko-krizevacka county. The industry is largely predominated by the group Podravka, which is dealing mostly with food processing and pharmaceuticals. The Podravka group currently employs around 5500 workers, with most of the industrial facilities being in Koprivnica. Due to this fact there is a large commuting community that is traveling on an everyday basis to Koprivnica from the surrounding municipalities ie. the FUA.

Also, Koprivnica is offering many of the services that are being used by the citizens of the local communities like sports, educational and other facilities.

### 3. Development of scenarios for low-carbon mobility in pilot areas of the FUA Koprivnica



City of Koprivnica was one of the first cities in Croatia to develop a sustainable urban mobility plan (SUMP). The process of developing the SUMP Koprivnica in 2014 was innovative because it introduced a new element in the traditional planning practices: the participatory approach. By involving a broad range of stakeholders and the general public, which was at that time a pioneer approach to strategic planning in Croatia, the city opened the road for a new planning culture at the regional and national levels. Based on resource and knowledge assessment, the

Koprivnica SUMP team ascertained that there were not enough resources and that therefore there was a need to involve external mobility experts. With the help of experienced mobility experts, the city conducted a status analysis and a baseline traffic survey.

Following the successful approach from the SUMP development, the city of Koprivnica involved an external expert also in developing the SUMP Action Plan in 2020 in the framework of LOW-CARB. The expert was involved in data collection and processing and in scenario building. The proposed scenarios were developed taking into account two basic elements; a) current, existing local, regional and national policies and strategic documents and b) needs and requirements of the FUA Koprivnica which excludes the City of Koprivnica i.e. areas that are not mentioned in the aforementioned documents, all in cooperation with the representatives of the FUA of the City of Koprivnica through a number of stakeholder meetings and workshops.

The most important documents that form the basis for developing the SUMP Action Plan are as following:

#### a. National level strategic documents

- ✓ The Republic of Croatia Regional Development Policy 2014 - 2020

Partial goal of the document is to increase the quality of life by promoting sustainable territorial development by provision and improvement of basic local and regional infrastructure and the development of public infrastructure of local importance. The document focuses on the support for the development of a qualitative, equally accessible transport infrastructure, reducing congestion and increased security, development of tourist destinations with the promotion of green mobility, supporting the development of sustainable urban and regional plans mobility '(SUMP). There is a large support for investment in railway infrastructure for a purpose increasing the bandwidth of the railway and increasing the freight and passenger rail transport and the support in local service quality improvement activities in transport.

#### b. Regional strategic documents

- ✓ Regional Operational Program of the County of Koprivnica-Križevci

The Regional Operational Program of the County of Koprivnica-Križevci, when considering sustainable mobility issues, focuses on the following strategic goals and priorities:

- Development of transport and utility infrastructure
- Construction of transport infrastructure

The main goals of the document are to provide better connection of the County with the rest of Croatia and thus contribute economic development, raise the standard of transport infrastructure and environmental protection throughout the County, and by relieving state and county roads provide greater traffic safety. The document emphasizes the development of transport infrastructure as one of the key segments of development economy in the County all with the goal of ensuring greater traffic safety.

✓ Master Plan for Integrated Passenger Transport in the Northern Croatia Region

One of the main goals of this document was to create a core strategic document that will allow the area of northern Croatia area to create a strategic foundation for sustainability-based transport development in the 2027 timeframe. This is not just about sustainability in terms of environmental conservation and energy savings, but also about sustainability in a broad sense that, in addition to the environment, also considers the economic and social dimension. Thus, in a broader sense, it seeks to contribute to the achievement of sustainable development. The document proposes the development of cities and towns and cities to be developed as places equipped with pedestrian and bicycle paths, and that the transport of passengers should mostly be organized by public transport. When integrated, the rail and bus systems are interconnected and easy to combine. The general (main) objectives are: general objectives (those that speak to the advancement of society, the economy and the transport sector), the improvement of the public transport system, the increase of the international, regional and local accessibility in passenger transport.

✓ Koprivnica-križevci county development strategy

Even though the document is a comprehensive approach to solving potential problems in the county area, sustainable mobility issues are scarcely mentioned in the document. The objectives for the development of transport and communal infrastructure are the development of existing road infrastructure and the development of railway infrastructure.

### c. Local strategic documents

The Koprivnica SUMP developed in 2014 was one of the first SUMPs in Croatia. The catchment area of the document is the administrative area of the City of Koprivnica. The document Sustainable Urban Mobility Plan of the City of Koprivnica defines several sets of measures tackling the following mobility topics:

- Awareness raising among decision-makers and citizens Educating on sustainable forms of transport
- Improvement of pedestrian and bicycle traffic through the development of the primary cycling network
- Increasing the connectivity of the existing network of pedestrian and cycling routes
- Intermodality of public transport
- Electromobility

City of Koprivnica was one of the first cities in Croatia that has developed and adopted a sustainable urban mobility plan (SUMP). The document has been developed according to the European commission guidelines on Developing and implementing a Sustainable urban mobility plan. The scope of the document is focused entirely on the administrative area of the City of Koprivnica while it does take some elements of the FUA into consideration. The Koprivnica SUMP has been used as the basis for the future SUMP Action Plan, but the geographical scope in the Action Plan changed. With the new mobility challenges arising in the commuting zones at the periphery of the city and in the connected settlements





that depend economically on the city, the Action Plan covers the entire functional urban area with its specific challenges and problems.

The conclusions drawn at stakeholder consultations, workshops, meetings and bilateral communication have led to the development of different scenarios that would suit strategic requirements of the local, regional and national documents and on the other hand the requirements of FUA Koprivnica.

The agreed scenario proposes the creation of a single transport environment and developing measures that would increase the sustainability of transport towards a larger usage of sustainable means of transport and increasing the safety of all transport participants. Overall goal of the FUA Koprivnica mobility strategy and Action Plan should be to recognize the interconnections of the FUA, common problems within the area, possibilities of cooperation and the identification of individual measures that should respond to these requirements.

The measures that this Action Plan would touch are built along three main pillars:

- ✓ the development of the cycling/pedestrian infrastructure in the surrounding areas
- ✓ connection of that infrastructure with the infrastructure of the City of Koprivnica
- ✓ expansion of the public bike system and the bus system of the City of Koprivnica into the FUA area.

The scenarios were developed taking into account two basic elements; a) current, existing local, regional and national policies and strategic documents and b) needs and requirements of the FUA Koprivnica which excludes the City of Koprivnica i.e. areas that are not mentioned in the aforementioned documents, all in cooperation with the representatives of the FUA of the City of Koprivnica through a number of stakeholder meeting and workshops.

The functional urban area (FUA) concept is still new in Croatia and what Koprivnica tried to do was to introduce the concept and define it linked to the administrative framework in the country. They defined their FUA in connection to a functional public transport (PT) system which is optimised to improve the connectivity in the inter-urban area of the city.

#### 4. Report on stakeholder involvement process and prioritisation of low-carbon mobility measures in pilot areas

- ✓ How and against which background were the priorities set?
- ✓ What was the rationale behind choosing these stakeholders?

City of Koprivnica has a relatively strong catchment area, mainly because it is the largest urban area in a 30 km radius, which offers basic services, like health care institutions, basic state functions that are delegated on a local level, social and commercial services and a strong industry, that, off course, is responsible for the majority of everyday migrations.

The selections of stakeholders i.e. municipalities that are making the part of Functional urban area of Koprivnica is largely based on the administrative layout that existed 30 years, before the establishment of the Republic of Croatia and the new administrative layout that came as a part of the change.

One of the main problems related to cooperation is that the municipalities part of the FUA Koprivnica have in average 2-3 employees that do not have the necessary capacities to tackle the proposed topic. After some initial invitations, the response rate was rather low, so it was decided to have a different approach. To gain interest of the municipalities and to open the dialogue, the most appropriate solution



found was to organise bilateral meetings in the respective municipalities and get them acquainted with the topic to raise their interest in participation. Initially, all the municipalities have expressed their interest to take part in the development process.

To make the process simpler, the agreement was made to combine the meetings with other events to get the largest response rate for the stakeholders. Up to now, two workshops were organised together with stakeholders from the 9 FUA municipalities with the scope of opening a dialogue and agreeing on a common collaboration basis for further development of FUA Koprivnica Action Plan.

The topics that were addressed at these two workshops are presented below:

- **Public transport issues**

*Non regulated bus transport system*

- Most of the participants have noted that the travel of school children, especially middle school children, traveling to middle schools in Koprivnica is not regulated.

*Deterioration of public transport accessibility*

- Bus lines between Koprivnica and surrounding areas are becoming less frequent.
- Prices of bus tickets are getting higher.

*Infrastructure issues*

- *Lack of infrastructure for cyclists and pedestrians*
- There is a clear lack of cycling and pedestrian infrastructure in the outskirts of the FUA
- Non-existing cycling-pedestrian lanes connections between municipalities

*Safety issues*

- High number of cyclist and pedestrian deaths

*Financial issues*

- Lack of funding sources from national and EU funds

*Economic benefits*

- There are potential economic benefits in developing cycling/pedestrian infrastructure and public transport services, especially in cycle tourism.

After these topics were presented, the discussions among stakeholders revealed the fact that each locality has an own understanding of the challenges that are focusing mainly on their administrative area, but that they are also aware of the larger economic and functional context and understand the need to collaborate and to develop common strategies and act together as one single entity in order to contribute to the even development of the area and the raise of life quality for all citizens that are part of the FUA Koprivnica. Even though not all localities agreed on the presented vision and common objectives, it was clear that they understood the need for a unified way of thinking mobility issues at the FUA level, and that together the major challenges can be overcome. Also, the funding opportunities are more diverse if the localities act together.

The main input of public authorities that are part of the newly established FUA was to communicate their needs in relation to sustainable mobility and suggestions on how to better connect in terms of infrastructure with Koprivnica.

The overall conclusion of the discussions among stakeholders was that there is a lot of space for collaboration and the development of joint projects that could contribute to the common goal, that is





improving the sustainability of transport in the FUA. But also, there is a strong barrier in this endeavour, and that is the lack of a legal framework for collaboration within FUA Koprivnica localities, which makes it more difficult to implement and develop further strategies, documents and projects since it diminishes the chances to apply for external funding, which is especially important for smaller municipalities with a weak financial background. There is an urgent need to continue the collaboration based on partnership agreements among Koprivnica and the surrounding localities in the absence of a clear regulatory framework.

## 5. Development of the Action Plan for low-carbon public transport services in pilot area

- 5.1. Introduction
- 5.2. Formal approval of measures
- 5.3. Action Plan for low-carbon public transport services in pilot area
- 5.4. What measures are planned or most likely to be realized?
- 5.5. Monitoring & evaluation
- 5.6. Risks associated to planning and implementation of measures

One of the first activities of the city of Koprivnica at the start of their SUMP Action Plan development was to define *de facto* the geographical scope of the FUA and to get all key actors on board. A lot of effort was put into analysing the existing data and the needs of the FUA, an activity conducted by the external expert. Thus, to have a good document the compliance with the national, regional and local strategic framework had to be taken into account.

A proposed set of measures was defined to enhance the level of sustainability in transport in the FUA: lying in the expansion of the PT system in Kop and FUA, bike and e-bike system, organisational set up of the PT system, cost projections of the investments and running costs of the investments, important because they are in the process of organising the next financial period 2021-2017, thus to apply for funding they need a strategic basis.

In conclusion, the aim of the SUMP Action Plan was to (1) define measures, (2) define costs and (3) prepare projects for accessing national and European funds starting with year 2021.

### 5.1. Introduction

The core part of the Action Plan relates to the policies and measures that will allow reaching the objectives that have been set in steps 1 to 3. The action plan elaboration is only one step in the overall process and it should not be considered as an objective in itself, but rather as a tool that allows to:

- Outline how the pilot area will look like in the future, in terms of economic development leading to a more dynamic and challenging traffic, and of sustainable mobility services;
- Analyse current action in the field of low-carbon mobility and build a systematic action plan starting from the existing situation but with a view to an ambitious vision
- Communicate actively and systematically with the stakeholders at the FUA level
- Translate the pilot area vision into practical actions assigning deadlines and a budget for each of them

- Serve as a reference during the implementation and monitoring process.

Also, it was clear that the work does not finish after drafting the Action Plan and after its formal approval. On the contrary, this moment should be the start of the concrete work of putting the planned actions into reality. A clear and well-structured Action Plan is essential for this (i.e. all actions have been carefully designed and described properly, with timing, budget, sources of financing and responsibilities, etc.)

### 5.2. Formal approval of measures in the Action Plan

Formal approval of measures in the Action Plan and the formal approval of the plan in total will be done through the process of developing the 2<sup>nd</sup> generation of SEAP. Namely, City of Koprivnica will develop the second generation of SUMP in 2021. and the Action plan for the FUA Koprivnica area will be an essential part and attachment of 2<sup>nd</sup> generation SUMP. After the completion of the 2<sup>nd</sup> generation SUMP it will have to be approved by the City Council of the City of Koprivnica, the same way the 1<sup>st</sup> generation SUMP was approved. The internal approval of the document was done in cooperation with the City of Koprivnica departments and the local utility company that is in charge of the public transport operations.

### 5.3. Action Plan for low-carbon public transport services in pilot area

Table with Action plan list of measures selected in FUA Koprivnica

Measure	Description of measure	Responsibility	Activities within a measure	Implementation period	Resources needed	Cost	Stakeholder involvement
Completion of the cycling-pedestrian infrastructure on FUA Koprivnica area	Building of cycling/pedestrian infrastructure	City of Koprivnica, FUA Koprivnica municipalities	Investing in building infrastructure				
Expansion of the public bike system on FUA area	Expansion of the existing public bike system to the whole FUA Koprivnica area. The measure is based on the two main activities, investing in equipment and the yearly running of the system by the City of	City of Koprivnica, MUC Komunalac Koprivnica, FUA Koprivnica municipalities	Investment in equipment	Year 0:	4 staff members of the responsible partners.	680.000,00 € + 2 full time employee and 2 20% employee for responsible partners-	Local NGOs
			Operating costs; electric energy, insurance, system	Year 1 - 5:	4 staff members of the responsible partners.	92.600 €	Local NGOs



	Koprivnica. Equipment includes the following; 121 conventional bikes, 79 electric bikes with the supporting infrastructure ( terminals, transportation, software..)		management, advertising				
<b>Expansion of the electric public transport system on FUA area</b>	Expansion of the electric public transport system on FUA Koprivnica are a. The measure is based upon two main activities; purchase of the needed equipment and the yearly maintenance of the system. Major equipment needed for the full operation of the system is as follows; 10 electric buses, 9 high speed charging stations software and other small scale equipment.	City of Koprivnica, MUC Komunalac Koprivnica, FUA Koprivnica municipalities	Investment in equipment	Year 0:	4 staff members of the responsible partners.	3.750.000 €	Local NGOs
			Operating costs	Year 1 -7:	4 staff members of the responsible partners.	373.800 €	Local NGOs

#### 5.4. What measures are planned or most likely to be realized?

The main challenge related to public transport and mobility at the FUA level are the large disparities between the state of infrastructure of the Koprivnica and the rest of the Functional Urban Area. Koprivnica has a much more advanced infrastructure, and the rest of the FUA has a much less developed infrastructure, in terms of built cycling/pedestrian tracks, bus stops, safety features for pedestrians and cyclist etc. There are some bright examples where this infrastructure is existing in the surrounding areas, but it is not physically connected with the infrastructure of the City of Koprivnica. The opportunity here is connecting the area into one function area that will have the same level of infrastructure and to increase the level of sustainable means of transport that is extremely low in the surrounding areas.

All of the measures that are listed in the action plan have been endorsed by decision makers and are, in an indirect way, mentioned in strategic documents of stakeholders that are a part of this FUA area and therefore planned. The realisation of the measures depends on several factors but the most important are the availability of additional, local, national and EU funds for financing. At this moment, the realisation of all measures is realistic in a 5 - 10 years period. The priority in implementing measures is as follows:

**I. Completion of the cycling-pedestrian infrastructure on FUA Koprivnica area**

The implementation of this measure is set to be the most important one, since it will, most notably, increase the safety of pedestrians and cyclists on the FUA area and set the basis for the implementation of the expansion of the public bike system in the FUA area.

**II. Expansion of the electric public transport system on FUA area**

The implementation of this measure is important due to the large number of transit passengers that commute every day to Koprivnica and many school children that are dependent on the centralized schooling system.

The following is an overview of the structure of capital costs according to the proposed lines A, B and C, as well as student line, which is based on the concept for operations of the new public transport service and on proposed timetables.

**Line A (Novigrad Podravski - Koprivnica - Sokolovac)**

Considering the stated characteristics of the proposed line and the specific needs of the organization of passenger transport services by electric buses, it is necessary to plan the procurement of one electric bus and two fast charging stations at the starting or end stop. The table below provides an overview of the total investment costs in the e-bus system for Line A:

Item	Model	Units	Cost per unit (in HRK)	Total cost (in HRK)
Electric bus	IVECO Daily 50CH3 Electric Bus or equivalent	1	1.504.287,80	1.504.287,80
Charging station	ABB charger Terra 53 CT or equivalent	2	240.686,05	481.372,10
<b>TOTAL</b>				1.985.659,90

**Line B (Legrad - Koprivnički Ivanec - Koprivnica - Drnje - Legrad)**

The Line B proposal is planned based on the number of potential beneficiaries, their daily needs, and the size of the area under consideration. On the proposed route it is necessary to purchase 2 electric buses. For each of the two bus lines, 13 stops are planned on the route. The table below provides an overview of the total investment costs in the e-bus system for Line B:

Item	Model	Units	Cost per unit (in HRK)	Total cost (in HRK)
Electric bus	IVECO Daily 50CH3 Electric Bus or equivalent	2	1.504.287,80	3.008.575,60
Charging station	ABB charger Terra 53 CT or equivalent	2	240.686,05	481.372,10
<b>TOTAL</b>				3.489.947,70

**Line C (Koprivnički Bregi - Koprivnica - Starigrad - Janjegdovac)**

The table below provides an overview of the total investment costs in the e-bus system for Line C:

Item	Model	Units	Cost per unit (in HRK)	Total cost (in HRK)
Electric bus	IVECO Daily 50CH3 Electric Bus or equivalent	1	1.504.287,80	1.504.287,80
Charging station	ABB charger Terra 53 CT or equivalent	1	240.686,05	240.686,05
<b>TOTAL</b>				<b>1.744.973,85</b>

### On-demand public transport system

To establish an efficient on-demand transport service it is necessary to establish an organizational framework. The complete management model includes a software solution with a management web interface that provides detailed information on each individual ride, line, vehicle, and travel reservation (location, destination, time and route of travel) and enables real-time communication with drivers via installed tablets in buses. On the other hand, users should also be provided with real-time monitoring of the system via a web browser or application on a smartphone (IOS and / or Android). In addition, it is necessary to establish a dispatch service or control unit that will monitor the work of drivers, vehicles and traffic flow and receive telephone reservations and send orders for driving. The table below provides an overview of the total investment costs in the e-bus system for the on-demand service:

Item	Model	Units	Cost per unit (in HRK)	Total cost (in HRK)
Software solution (on-demand system)	On-demand software Ride with via (VIA) or equivalent	1	300.857,56	300.857,56
Tablet	Android tablet	6	3.008,58	18.051,48
Computer	Desktop computer	1	3.760,72	3.760,72
Telefon		1	752,14	752,14
Smartphone		6	1.504,29	1.504,29
<b>TOTAL</b>				<b>332.447,64</b>

### Overview on total investment planned in the BUSKO system

The total cost for the investments and measures planned in the BUSKO system is of 28.071.514,69 HRK (equivalent of approx. 3.702.719,53 EUR).

#### III. Expansion of the public bike system on FUA area

The existing public bike system is located purely in the urban area of Koprivnica leaving the rest of the administrative are of Koprivnica and rest of FUA Koprivnica deprived of the possibility of using a bike system. One of the key factors that is missing for a successful implementation of the measure is a good infrastructural connection with bike lanes between Koprivnica and the rest of the FUA area. Therefore, the main precondition of the implementation of this measure is development of the infrastructure listed in point I. The potential benefit of implementing this measure is the increased number of cycling commuting to Koprivnica and in the FUA area in general and the decreased usage of motorized transport.

For the needs of expanding the system of shared bicycles to the area of the City of Koprivnica, the municipality plans to purchase 70 conventional and 48 electric bicycles. Also, it is planned to install 17 terminals with bicycle stands in attractive and easily accessible locations. As already pointed out, for the needs of redistribution of bicycles and servicing of equipment in the entire area of FUA

Koprivnica, the procurement of vans is planned. In addition, other municipalities plan similar investments (e.g. the municipalities of Drnje, Đelekovec, Koprivnički Bregi, Koprivnički Ivanec, Legrad, Novigrad Podravski, Sokolovac).

The table below provides an overview of the total investment costs in the public bike-sharing system, which resulted from the analysis of the current situation and the plan for expanding the system to FUA Koprivnica:

Item	Quantity	Cost (in HRK)	Total cost (in HRK)
Conventional bike with GPS	121	7000,00	847.000,00
Conventional bicycle parking rack	121	3.500,00	423.500,00
Electric bicycle with GPS	79	22.000,00	1.738.000,00
Electric bicycle parking rack with charger	79	6.500,00	513.500,00
Terminal - rental / return station	29	35.000,00	1.015.000,00
Public bicycle system license	1	150.000,00	150.000,00
Implementation and design of a complete solution for public bicycle systems	1	160.000,00	160.000,00
Van - bicycle redistribution vehicle	1	200.000,00	200.000,00
<b>TOTAL</b>			<b>5.047.000,00</b>

More detailed information on the measures planned, prioritization, timeline, costs and funding sources can be found in the Annex 1 and 2 of the Koprivnica SUMP Action Plans (separate files, in Croatian language).

### 5.5. Monitoring & evaluation

Identify data and indicators to monitor progress and results of each action, the methods for data gathering and timing (how often they will be collected). Specify how and by whom the data will be collected, and who will compile it. To facilitate implementation, complex actions could be broken down into simple steps, each of them having its own timing, budget, person responsible, etc.

The monitoring and the evaluation of the Plan will be done in the scope of monitoring the implementation of the 2<sup>nd</sup> generation SUMP that the plan is a part of. City of Koprivnica will oversee monitoring and evaluation activities through its two administrative units, Department of construction and asset management and the administrative department for finances, economy, and European affairs. In total, there will be two employees in charge of monitoring and evaluating how successful the implementation of the Plan will be. Main indicators for measure implementation are as follows:

Measure	Indicator	Baseline	Desired outcome
Completion of the cycling-pedestrian infrastructure on FUA Koprivnica area	No. of cycling-pedestrian infrastructure connections	0	2
Expansion of the electric public transport system on FUA area	No. of new lines	2	6
Expansion of the public bike system on FUA area	No. of conventional and electric bikes	60	121

More detailed information on the monitoring and evaluation of measures can be found in the Annex 1 and 2 of the Koprivnica SUMP Action Plans (separate files, in Croatian language).





## Recommendations and implementation plan

This chapter contains recommendations for the development and improvement of the public transport system, which consists of the BUSKO city bus transport (regular and student) and the BICKO (public shared bicycle system). Given that these systems constitute a unique public transport service in the area of FUA Koprivnica, the planned expansion of individual systems is based on an integrated planning approach. Therefore, the above recommendations are still written with the aim of implementing an integrated public transport service with an emphasis on bicycle and bus transport and related infrastructure. Furthermore, it is necessary to envisage the reorganization of the existing BUSKO and BICKO systems so that in the extended solutions the services are optimally established with efficient operational work.

Therefore, the FUA Koprivnica Action Plan concluded that, in the context of expanding the existing public bus transport service to FUA Koprivnica, the optimal solution is the implementation of bus transport services on demand (DRT) and the establishment of organized student transport.

The scenario of expanding the system of public shared bicycles is based on the assumption that the optimal coverage of the network of bicycle stations with quality cycling infrastructure is a key factor in the success of the system in the urban part of FUA Koprivnica. In less populated areas, the cycling system has the role of connecting different modes of transport and improving multimodality.

### 5.6. Risks associated to planning and implementation of measures

All measures that are listed in the FUA Koprivnica action plan are in some ways planned in many documents, especially strategies promoting the development of Koprivnica as a climate neutral and smart city. The possibility of implementing the selected measures depends on several factors, but the two most important ones are political and economic. Political factors include changes in the political decision makers in municipalities that are a part of the FUA Koprivnica area which can direct their efforts in another direction and not follow the Plan. Economic factors include the lack of available funds for the implementation of the measures, especially external funding, like EU sources. Lately, due to the COVID crisis, many municipalities have got into financial difficulties due to decreased income. Therefore, even co-financing of 15% for certain EU funded measures can be difficult for a small municipality and can lead to not implementing certain measures.

Mitigation measures in these two, most probable risks are as follows:

- Economic risk - partial implementation of the measures through a larger time span and the focus on not so clean technologies (i.e. electromobility)
- Political risk - increased support campaign from the national level since most of the measures are following the national strategic policy documents.

Other risks are minimal since the technology that will be implemented is proven and already present on the market.

### 5.7 Possible financing for measure implementation

With the measures listed in the Action Plan, also a cost estimation has been conducted for each package of measures. More details are offered in Annexes 1 and 2 of the Action Plan (attached to this deliverable, in Croatian language). As possible funding sources, the city and the surrounding localities rely on the national and European funds they will apply for starting with year 2021.

## 6. Conclusions



Establishing an integrated, efficient and a functional public transport is a challenge that is faced even by larger cities and urban areas with high population density. Cities across Europe face high levels of air pollution caused by road motor vehicle emissions. Therefore, one of the basic preconditions for the development of sustainable mobility is the reduction of the share of road vehicles on urban roads. The modal redistribution in favour of sustainable forms of transport when choosing a mean of travel depends on the habits of users and daily migrants in general. Desirable changes in these habits can only be encouraged if a quality public transport service is provided as an alternative to individual road transport. However, expectations from public transport users regarding the characteristics of the offered service are continuously growing. The public transport service is expected to adapt to the real needs of users as much as possible, and this is evaluated through the proximity and accessibility of public transport stops, comfort and safety of travel, reliability of the service, timely timetable and schedule of routes and lines. when traveling.

Meeting the required requirements is certainly achievable, but the key challenge is to find solutions that will be financially and economically sustainable, and this is most evident when organizing public transport services in rural areas and areas with reduced population density. From all the above, public transport planning in an area should be approached in a unique way, trying to detect the real needs of mobility, i.e. to respond directly to traffic demand. The model of public transport services can never be a uniform solution because it calls into question the efficiency of the service and the use of potential.

The focus of this Plan was to find a solution and an optimal model of public transport service that will be sustainable in every long term and respond well to the needs of the residents of FUA Koprivnica.

## 7. Annexes (if applicable, images or maps to be provided as annex)

*Annex 1 and 2: FUA Koprivnica sustainable mobility Action Plan (two separate files, in Croatian language)*