COMBINED DELIVERABLE D.T1.5.1–4: PART 4/4

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

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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 the completed FUA Szeged Action Plan (Part4/4).

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

1. Functional urban area of Szeged

Country (NUTS 0)	HU
Region (NUTS 2)	HU33, Dél-Alföld
Sub-region (NUTS 3)	HU333, Csongrád

1. Introduction

The present report includes the characteristics of the pilot area part of FUA Szeged, 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, and if possible 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

2.1 Description of the pilot area

Szeged's Industrial-Logistics centre beside road nr. 5 is situated in the North-west of Szeged, close to motorway M5-M43. Main characteristics: more than 2000 employees are working in this area, at more than 100 workplaces.

Stakeholders to be involved: Employers, employees, PT operators (DAKK Zrt., SZKT), Municipality of Szeged.

Relevant low-carbon mobility strategies linked to pilot area: This industrial area is crowded, and majority of employees commute by car to work. Municipality of Szeged intents to minimize the chance of traffic jams and reduce CO2 emission at this area. The first step to reach this is to explore the mobility needs of employees working in this area.

2.2 Mobility challenges in relation to public transport

In the pilot area already exists PT infrastructure run by DAKK Zrt. (lines nr. 71, 72, 79H). The current situation shows that this area needs a different approach regarding PT services.

Figure 1: Map of Szeged northern industrial area (extract from Szeged Action Plan for the industrial area)

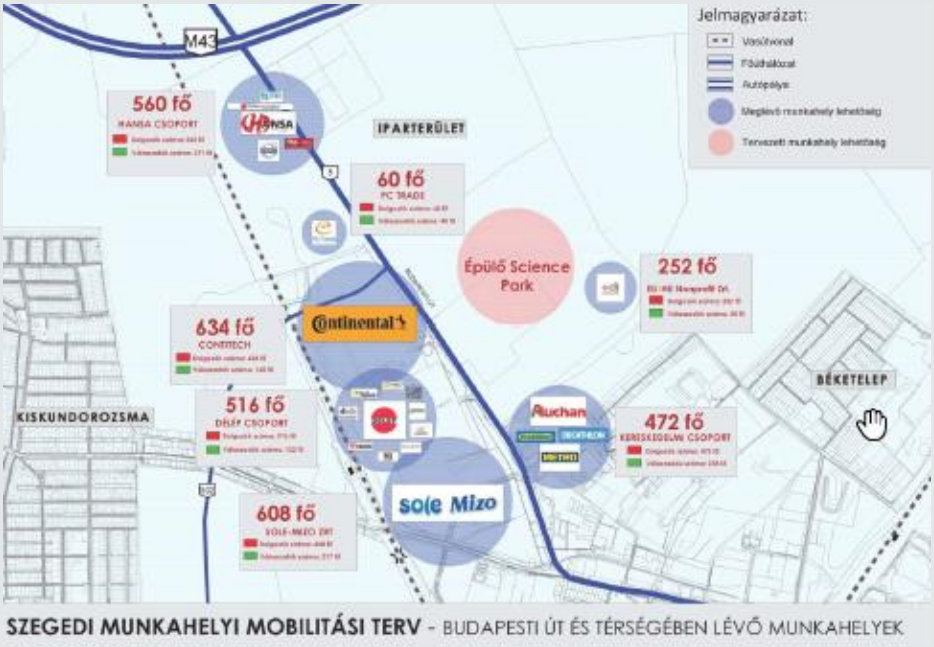


Figure 2: Large companies located in Szeged northern industrial area (extract from Szeged Action Plan for the industrial area)

In Szeged there is the challenge to reduce the number of cars in the Industrial area of Szeged. In this area are working around 2.500-3.000 people and from some unofficial questionnaires and surveys it is known that a major part of workers come from outside of Szeged, therefore the main option for them is to use their private cars and drive to work.

The city section of road nr. 5 (Budapesti út area) is very congested in the peak hours, so the City of Szeged would like to offer for them a more viable, low-carbon way to get to their workplace. Here it is worth considering that even a conventional diesel bus line is also more eco-friendly than individual car-use.

Figure 3: Main public transport connections in the target area (extract from Szeged Action Plan for the industrial area)

Figure 4: Main road connections in the target area (extract from Szeged Action Plan for the industrial area)

The main obstacle in the pilot area is that it's relatively close to motorways M5 and M43 is even closer, so this makes it easy to reach by car. The other point is that the current PT offer in this area has a bottleneck of schedule and longer tracking time of PT vehicles (currently diesel buses) with a relatively longer time to travel into this area

It would be a good idea to make this area more accessible for the people who wish to cycle or to take a local PT from the northern residential area of Szeged. Currently there is no cycle path or direct connections to this area from the big residential parts of Szeged.

Need for more clean bus services, more flexible schedules and line operations.

Need for combined and multimodal offers, e.g. sharing offers for last and first mile.

2.3. Expected outcomes and goals

SZKT's goal is to explore employees' mobility needs and tailor its PT offer based on future result of survey and action plan.

2.4. Next steps towards action plan development

Preliminary survey at one company (PC Trade Computer Inc.) already has been conducted in December 2018. The results of this survey will be available in February 2019 and next steps regarding surveys at remaining companies will be based on this preliminary report.

The last survey took place in April of 2019. Közlekedés Kft. presented the rates of the companies participating in the survey and their main insights about the cooperation between the companies. The evaluation report of the companies has been done, and based on these results, next step is to create the action plan documentation with the relevant indicators.

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

- ✓ How were scenarios developed? Describe the process of scenario development and name the aims of the process, tasks which need to be done, additional requirements and activities beyond for successful scenario development and the given timeframe of the process.

External expert Közlekedés Kft. Developed a scenario end of March 2020. The first step for compiling the scenario was to collect data from the target groups. Both employees and employers were interviewed in the FUA. The employee questionnaire contained 29 questions: when they go to work and with what, from which area of the city. In addition, general questions were asked: full time job/part time job, intellectual/physical worker. Finally, questions on how much time the trip would take, what the ideal duration would be, what mode of transport would like to travel with and why were asked. In addition, more questions about driving habits were asked: e.g. whether employees travel alone or with someone.

The data collection or survey respectively for the scenario process was carried out via both paper based and online. 23 companies with 3.007 employees from the industrial area around the ELI center were invited to participate and 1.106 employees filled out the questionnaire.

The participating companies were very interested in the final results of the survey, which had been discussed with employers during a dedicated workshop.

Some survey results are presented in the following showing some basic data analysis and basic context for the scenario development:

- 67% of the respondents came from Szeged urban area, 33% from surrounding areas;
- 53% are physical worker, 47% intellectual worker;
- 1/3 (386 employees) travel only with public transport: 61% from Szeged, 39% from surrounding areas

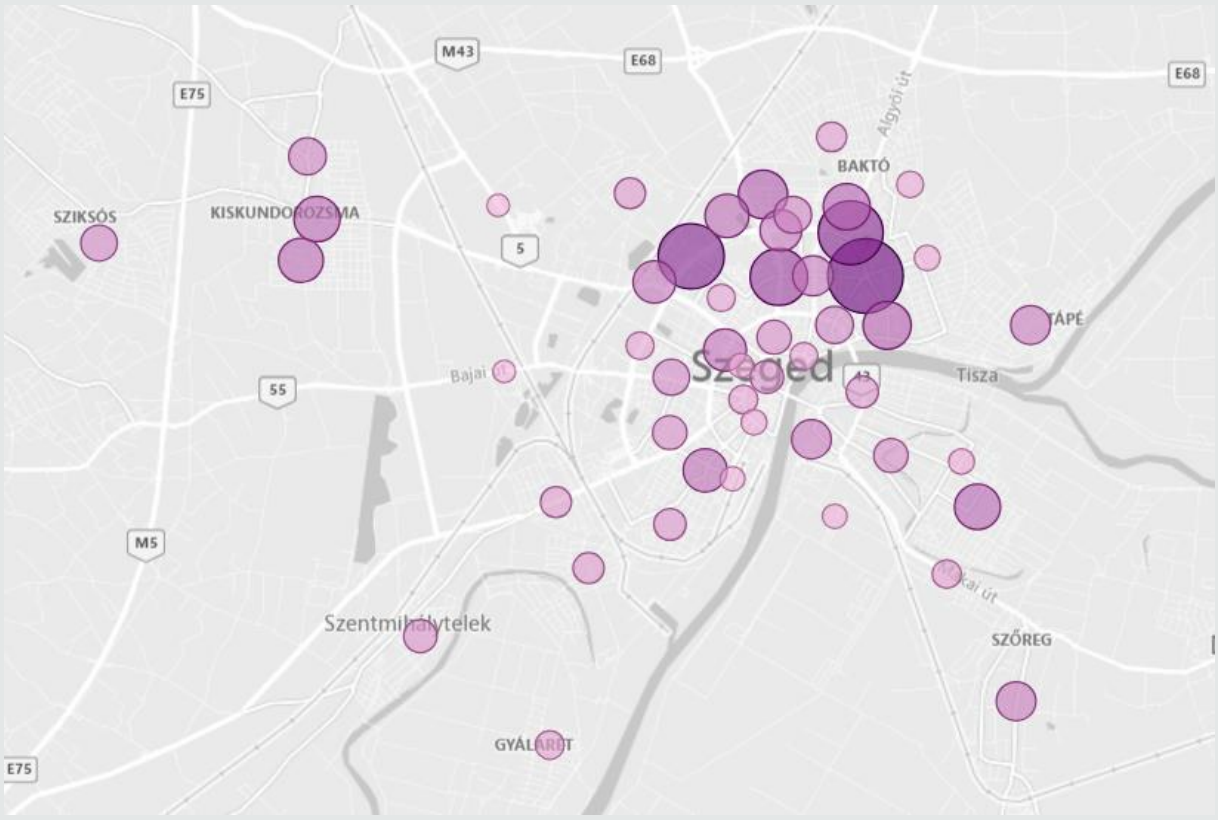


Figure 5: Place of departure of responders living in Szeged, by district (n=1.106)

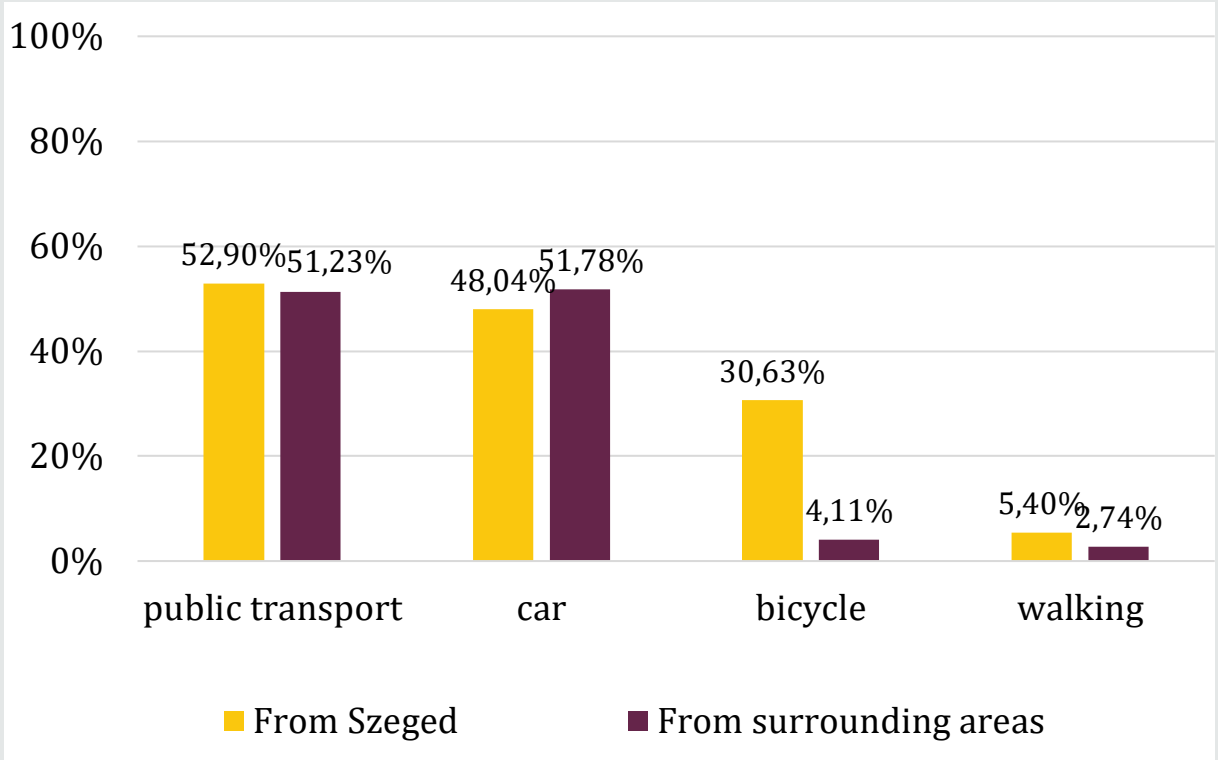


Figure 6: How Szeged and non-Szeged responders use means of transport to travel to work (n=1.106)

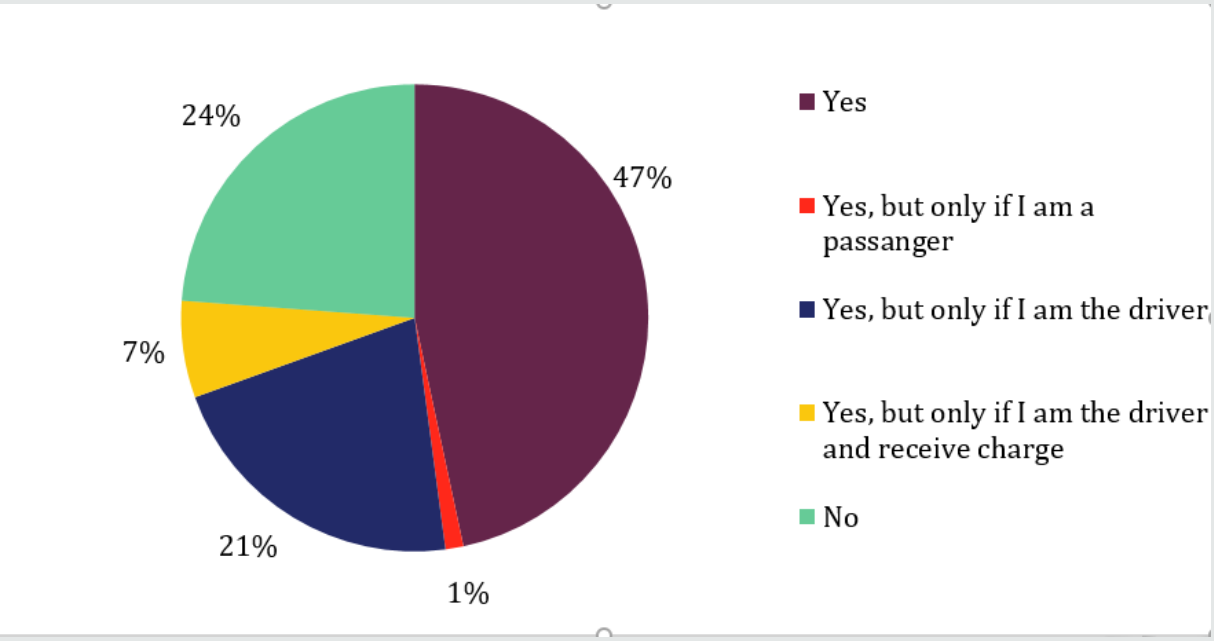


Figure 7: Willingness for car-sharing (n=1.106)

Based on the findings, the following main goals and scenario was agreed on:

- Develop public transport and cycle paths network as main backbone for low-carbon mobility of commuters to and from the industrial area;
- increase employers and employees' sustainability and environmental awareness;
- harmonise action plan measures with Szeged's SUMP objectives and goals.

All in all, 60 measures around public transport, cycling, improved road connections, car-sharing, green mobility promotion had been developed based on these goals and the mobility demand analysis of the target groups.

Some priority actions are the following:

- trolleybus network development,
- new (trolley-) bus stop,
- schedule harmonization/synchronization,
- building bike paths,
- new bicycle storages,
- increase awareness for shared mobility and
- developing passenger information system.

After the data processing and linked scenario and measure development, the compilation of the derived action plan could begin. The action plan (see Annex) begins with a description of the project and goals. Previous urban decisions have also been described, as well as social and sustainable transport goals. Selection of indicators was an important step, which were divided into three groups (service,

infrastructure, communication). 10 groups of measures were developed in the action plan which identify 60 targeted measures.

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

- ✓ How and against which background were the priorities set?
- ✓ What was the rationalle behind choosing these stakeholders? Please have in mind, that LOW-CARB has a PT focus. Priorities should be discussed and selected against low-carbon mobility and PT objectives and aims.

Szeged's Industrial Logistics Center is a dynamically developing area where more and more industry has representation (or is present). As a reason of the increased number of employees it was necessary to bring the modes of transport under a new consideration. It is essential that public transport and all other forms of less polluting sustainable transportation to be developed and organized to the area so that it facilitates commuting between home and workplace.

Thus, companies located in the pilot area and employees commuting to and from the industrial were both the main target groups and the stakeholders to be engaged and involved into the action plan development process. The largest and most relevant employers have been addressed (23 companies with more than 3.000 employers / commuters) for a cooperation and follow-up discussion of results and have been involved and engaged in developing and prioritizing measures for the action plan. Two trainings or stakeholder participation events respectively were organised with interested representatives from the addressed companies.

The addressed companies were interested in the topic of sustainable mobility planning for the workers mobility and supportive in organizing the survey process both online and at site. The success of the action plan is based on the collection of accurate and relevant data. Due to diversity of involved companies, surveys were always offered with personal presence/assistance, in addition to the possibility to fill it out online. SZKT and external expert representatives were present at the survey/questionnaire filling out processes for both to answer possible questions and to listen to individual opinions. Close cooperation with companies and communication with the management contributed to the success of the survey process.

Figure 8: Example for filling in the questionnaire together at an involved company I

Figure 9: Example for filling in the questionnaire together at an involved company II

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

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

Accurate analysis of the data was important, and thus SZKT reviewed the results several times, also with relevant stakeholders. The next step was to select the most important indicators. An action plan includes several types of measures: not only city level actions, but measures which affecting the city but are not decided locally. Based on these, indicators have been selected. This was reviewed in several times within the SZKT at management level. Of course, we could not ignore the national or regional projects and developments affecting the city, so we also wanted to list a number of larger measures (e.g. tram train project). It was important that the plan was consistent with the SUMP and the objectives set for the area. Action plan and measures were adopted after technical consultations with Közlekedés Kft. The measures are list into 10 groups of measures and were also grouped according to competence (local government, state, companies) and complexity (see Annex).

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

Once the actions have been selected, it is necessary to plan them carefully so that they can become a reality. For each action, specify:

- **Timing (start date - end date)**
- **Body responsible for implementation**

- **Stakeholders involved**
- **Risk and /or vulnerability** tackled
- **Estimated cost**
- **Modality of financing**: as municipality resources are scarce, there will always be competition for available human and financial resources. Therefore, efforts should be continuously made to find alternative sources of human and financial resources
- **Estimated impacts** in terms of energy savings, CO2 emission reduction (for mitigation actions)
- **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.

Action groups
I. City-wide actions
II. Strategic developments not linked to specific locations
III. Convenient public transport services
IV. Public transport infrastructure development
V. Uniformisation of cycle track network connections
VI. Making the bicycle service more attractive
VII. Improved road connections
VIII. Energy-saving driving services
IX. Knowledge base for environmental consciousness
X. Support of travel decisions and means selection using digital tools

In the table below are described what measures should be implemented in order to realize the recommended actions described in the action plan. In 2020 it is foreseen that majority (35-40%) of these measures will be financed from state/governmental funds, 20-25% municipality funds (including SZKT's own funds), 25-30% EU funds and maximum 5% of funds can be granted by companies in FUA. The indicated numbers are only preliminary estimations.

List of prioritized measures from the Szeged industrial area action plan:

Measure	Description of measure	Responsibility	Activities within a measure	Implementation period	Resources needed	Cost	Stakeholder-involvement
Harmonize the schedule (package 2)	*Marked lanes and tracks along major urban streets*	*Municipality, State*	*Analysis of schedules (bus, tram, trolleybus - local and intercity)*	*Until 2023*	*Traffic and city planners*	*50.000.000 HUF*	*Transport company (Volánbusz)*
E-ticket (package 2)	*E-ticket system introduction*	*Municipality, State*	*Prepare for integration ticket system into an application*	*Until 2023*	*IT expert, transport expert*	*470.000.000 HUF*	*IT companies*
Data warehouse (package 2)	*Build a city-wide database with traffic information*	*Municipality, State*	*Collect accurate data, plan the data transfer, provide hardwares*	*Until 2030*	*Planners, developers*	*300.000.000 HUF*	*Construction companies*
Trolleybus line (package 3)	N	*Municipality, State*	*Analysis of public transport lines in area needed, develop infrastructure, provide new trolleybuses*	*Until 2030*	*Expert on behaviour change, traffic planner*	*1.500.000.000 HUF*	*Construction companies*
New stops (package 3)	*New stops close to existing bus lines/new trolleybus line*	*Municipality*	*Analysis of public transport lines in area needed*	*Until 2023*	*Traffic and city planners*	*2.000.000 HUF/stop*	*Construction companies*
Informing passengers in stops (package 4)	*Digital passenger information devices*	*Municipality*	*Provide devices, communication plan*	*Until 2023*	*IT expert, transport expert, devices*	*5.000.000 HUF/stop*	*Development companies*
Bicycle infrastructure development (package 5)	*New bicycle path in the industrial area*	*Municipality, State*	*Develop a bicycle network plan, plan and construct bicycle lanes*	*Until 2023*	*Traffic and city planners*	*50-100.000.000 HUF*	*Construction companies, bicycle associations*
Bicycle storage at companies (package 6)	*New bicycle storages at companies*	*Municipality, Companies*	*Plan at the same time with the bicycle network, cooperation with companies*	*Until 2023*	*Traffic expert, storages*	*<10.000.000 HUF*	*Bicycle associations, companies in the area*
Car sharing (package 8)	*Popularise car sharing, car sharing application*	*Companies, Municipality*	*Develop application, communication plan*	*Until 2023*	*IT expert, transport expert*	*<10.000.000 HUF*	*Development companies, companies in the area*
Real-time transport information (package 10)	*Real time data based applications (e.g. route planner application)*	*Municipality, Companies*	*Develop application, communication plan*	*Until 2023*	*IT expert, transport expert*	*<10.000.000 HUF*	*Development companies, companies in the area*

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

The introduction of the e-ticket system is in progress in Szeged already, since September it is already possible to buy through certain applications, we would like to make the service available through additional applications as well. This is a very important measure in Szeged's FUA, because in that outside of the city

area there are fewer shopping opportunities than in the city center. With the help of the e-ticket system, those who working in the field can also easily buy tickets. The main goal of Szeged is to encourage contactless payment, and this measure also promotes this.

Building of the database is a priority measure which is currently in progress within the framework of the Open Data Strategy, in collaboration with the SASMob project (OVAK). This large urban database allows for easy data access, facilitates communication and collaboration with companies in FUA too. We could see mobility and other problems with the help of data, examine the area more easily, so we can find solutions to mobility problems faster.

A possible new trolleybus line would be a big help to those who working in the area, it provides a direct connection with the city center and the most frequent areas (Rókus, Makkosház). We can use battery hybrid trolleybuses with in-motion charging. Half of the route will be without wire, but electric infrastructure development is necessary in the area. This could be the most environmentally friendly transport solution. Hopefully, we can implement this action in the coming years thanks to various development projects.

In addition, the tram train project is also having huge importance in Szeged. Implementation is a state task in this case and expected in 2022. The tram-train will connect Szeged and Hódmezővásárhely, thus making it easier for employees from outside of the the city to get to work.

5.5. Monitoring & evaluation

We believe that the best way to monitor and evaluate the measures in the future is through close cooperation and communication. In addition, it is essential to re-assess the data. In the area, the survey needs to be repeated in the coming years, and based on learnings from previous mistakes, a redesigned method of the survey, or revised questions shall be included. Collecting data in the mobility of the area is presumably the responsibility of the municipality and the transport company. Data collection and analysis will require experts, like mobility analysis and consulting companies (like Közlekedés Kft.), as well as mobility managers in the participating companies. Different passenger counting methods can also be used to further measure the data, like camera passenger counting in stops. We can also evaluate the success of the actions with our Wi-Fi based passenger counting system.

For example the following indicators will be monitored in order to evaluate the implemented measures:

- reduction of travelling time (passenger hours / year);
- increase of passenger number in FUA (million passengers/ year);
- increase of sold products for industrial area (products/ year);
- increase of selling points in industrial area.

6. Measure package around existing trolleybus network

The external expert trolley:motion analysed the 60 action plan measures and developed a prioritized measure package around the main objectives or goals respectively of the LOW-CARB action plan development, i.e. to

- develop public transport and cycle paths network as main backbone for low-carbon mobility of commuters to and from the industrial area and b) increase employers and employees' sustainability and environmental awareness;

with the existing trolleybus network in Szeged as a backbone.

The following 32 measures have been prioritised incl. all 10 action areas and amounting to an investment of ca. 15-20 Mio. EURO for the near future (2023) and beyond, i.e. between 2025 and 2030.

Action				Connections			Competencies	Mobility plan index		Cost						Phase		
Group	Number	Name	Contents	Objectives	SUMP	CO_2MM			Th	<10m Ft	10–50 million HUF	50–100 million HUF	100 million HUF–1 billion HUF	1–10 billion HUF	10 billion HUF<	from 2020	until 2023	until 2030
I. City wide actions	3.	ELI Science Park	New workplaces and new innovation in the northern industrial area. Transport is a development extending to every branch	M1	P50		key		2.7			900 million HUF					until 2023	
II. Strategic development	6.	Societal agreement on transport development	Societal consultation and agreement on tramway line extension and procurement of E-buses	M2		T1	Loc. Govt. (state)	48% (MV27)									until 2023	
	7.	Joint bicycle and public transport pass	Conditions for incentivising joint pass	M2		K2	Loc. Govt.	15% (MV27)		-							until 2023	
	8.	Pay as you go bicycle and public transport pass	A fee structure that takes the level of usage at the launch of the E-ticketing system into account	M2		K2	state, Loc. Govt.	19% (MV27)		-								until 2030
III. Convenient public transport service	1.	Multi-directional bus accessibility of the industrial area	Transfer-free commuting. Directions:districts of Tarján, Északi város, Makkos, Újszeged, Kiskundorozsma, Rókus, Mars tér, Szőreg, Tápé and Odessza	V1		T1	Loc. Govt.	33% (MV26)			10–50 million HUF						until 2023	
	2.	Trolleybus line extension towards ELI	Driverless trolleybus operation along the Vértói Rd.–Zsámbokréti Ln.–Vinkler Rd.–Zápor St.–Budapesti Rd. section. New service direction from the housing estate.	V1-V2	P5	T1	Loc. Govt.	30% (MV27)	1.3									until 2030
	5.	Demand driven transport	Targeted midibus service between kindergarten and workplace, operated with a booking system	V1 M4		T4	Loc. Govt.	16% (MV27)			10–50 million HUF						until 2023	
	8.	New stop	Better accessibility for Szeged Industrial and Logistics Centre, Back B. Street	V1	P36	T4	Loc. Govt. (companies)		74.2	2 million HUF/stop							until 2023	
	9.	Acceleration of bus transport	Implementation of a priority system by installing bus lanes and transit signal priority. Rókus, Izabella, Dorozsmai Road and Budapesti Road	M1	P1		Loc. Govt.	33% (MV26)	12		10–50 million HUF						until 2023	
	13.	Modernisation of the suburban bus stops	Implementation of higher stop elevations, installation of bus stop shelters and pavement connection at 20 stops	V1	P73		State	18% (MV16)	4.8	5 million HUF/stop							until 2023	
IV. Public transport infrastructure development	1.	Development of the trolleybus fleet	construction of + 5 trolleybuses	V2	P2	T1	Loc. Govt.	47% (MV27) 27% (MT 12)	1.3				150 million HUF/vehicle				until 2023	
	2.	Procurement of electric city buses	15-15-15 units of zero-emission buses until 2030	V2	P8	T1	State	43% (MV27)	1.3				150 million HUF/vehicle				from 2022	
	3.	Procurement of low-emission local buses	Procurement of 20 buses by 2030	V2	P63	T1	State	42% (MV27)	1.1			80 million HUF/vehicle				from 2020		
	4.	Accessibility	Accessibility for the pavements between the accessible bus stops and the workplaces	V1	P32		Loc. Govt.	62% (MV28)	6.5	2 million HUF/bus stop								until 2030
V. Uniformisation of cycle track network connections	1.	Implementation of cycle route network	Continental–Szeged Industrial and Logistics Centre–Szatymaz junction cycle track construction	V3	P20	K7	Loc. Govt.	42% (MV26,27)	2.6			50–100 million HUF					until 2023	
	2.	City cycle routes	Napos Rd.– Régi Posta St., Vértói St.– Vinkler Rd., Zápor St., Zsámbokréti Ln. – until 502nd Street, with a new cycle track in the proximity of ELI	V3 V3 V3 V3	P24	K7	Loc. Govt.	45% (MV26,27)	6.5			50–100 million HUF					until 2023	
VI. Making the bicycle service more attractive	1.	Bicycle parking stations at companies	Installation, expansion, modernisation, sheltering and security	V3		K1	Companies	81% (MV28) 84% (MT 22)									until 2023	
	2.	Changing rooms and shower facilities for bicycle users at companies	New facility or involvement of existing facility for this purpose	V3		K4	Companies	72% (MV28) 95% (MT 23)									until 2023	
	3.	Encouragement of employees to purchase bicycles for commuting	Employee contract for bicycle usage, discount purchase	V3		K5	Companies	42% (MV28)									until 2023	
	4.	Handing over company-owned bicycles for employee use	Conditions of handover for use, contract. Company or leased bicycle	V3		K3	Companies	27% (MV28)									until 2023	
	7.	Bonus system for bicycle usage	A set of conditions incentivising the use of bicycle for commuting	V3		K6	Companies	76% (MV28)									until 2023	
	8.	Electric chargers	Installation of 2-8 chargers at each bicycle parking station	V3			Companies, Loc. Govt.										until 2023	

VII.Improved road connections	1.	ELI transport connections	Vértói Rd.–Vinkler Rd.–Zápor St, new road connection to the eastern part of the city, upon expansion of the trolleybus service	V4	P7		Loc. Govt.	30% (MV27)	1.9					3 billion HUF			until 2023	
	2.	Upgrading of National Road no. 5	2 × 2 lanes between the M43 motorway and the ELI junction, in order to designate separate bus lane	V4	P68		State	34% (MV26)	4.6					1.5 billion HUF				until 2030
	4.	Electric chargers in car parks. Installation of E-chargers	Scheduled steps to install zero-emission parking spaces and E-charging points Installation of E-chargers Advance booking options	V4 M3		St1	Companies	2% (MT18 – all car parks) 4% (MT18)								cont.		
	5.	Rendering company vehicle stock multi	Elaboration of a multi-purpose daytime car sharing and booking system	V4 M3		St4	Companies	38% (MV28)									until 2023	
IX. Knowledge base for environmental consciousness	1.	Promotion of public transport	teaching materials and mobile workshops	K1	P37	T1	Local Government, Szeged Transport Ltd.	9% (MV16)	358							from 2020		
	2.	Promotion of alternative modes of transport	teaching materials and mobile workshops	K	P37	T1 K7	Loc. Govt.		358							from 2020		
	3.	Promotion of car sharing and car pooling		K1	P54	A2	Loc. Govt.	59% (MV28)								from 2020		
	6.	Environmentally conscious corporate strategy	Strategy creation and training of employees	M2		K2 GY1 T1	Companies									from 2020		
X. Support of passenger decisions and selection of means of transport. Digital tools	1.	Real time traffic information	Public transport, bicycle, pedestrian, micromobility application, route, time, cost	K2 M3	P38	K7	Loc. Govt.	78% (MV3)								cont.		
	2.	Real-time route planner	Optimal route and means planner application, route, means, cost	K2 M3	P38		Loc. Govt.	49% (MV3)								cont.		

Trolleybuses network as main backbone for seamless low-carbon mobility

The scenario for a low-carbon mobility includes a strengthening of the public transport – including a further electrification of the bus services in Szeged – combined with a multimodal offer for first and last mile for commuters to and from the industrial area (see scheme below). This includes new mobility trends like sharing and micro-mobility. The trolleybus network could be a backbone for such multimodal offers, and therefore the demand driven analysis of commuters' current mobility patterns should be used to identify locations for new public transport stops, linked cycling infrastructure and sharing offers and a potential set-up of mobility hubs to create a seamless low-carbon mobility offer for commuters.

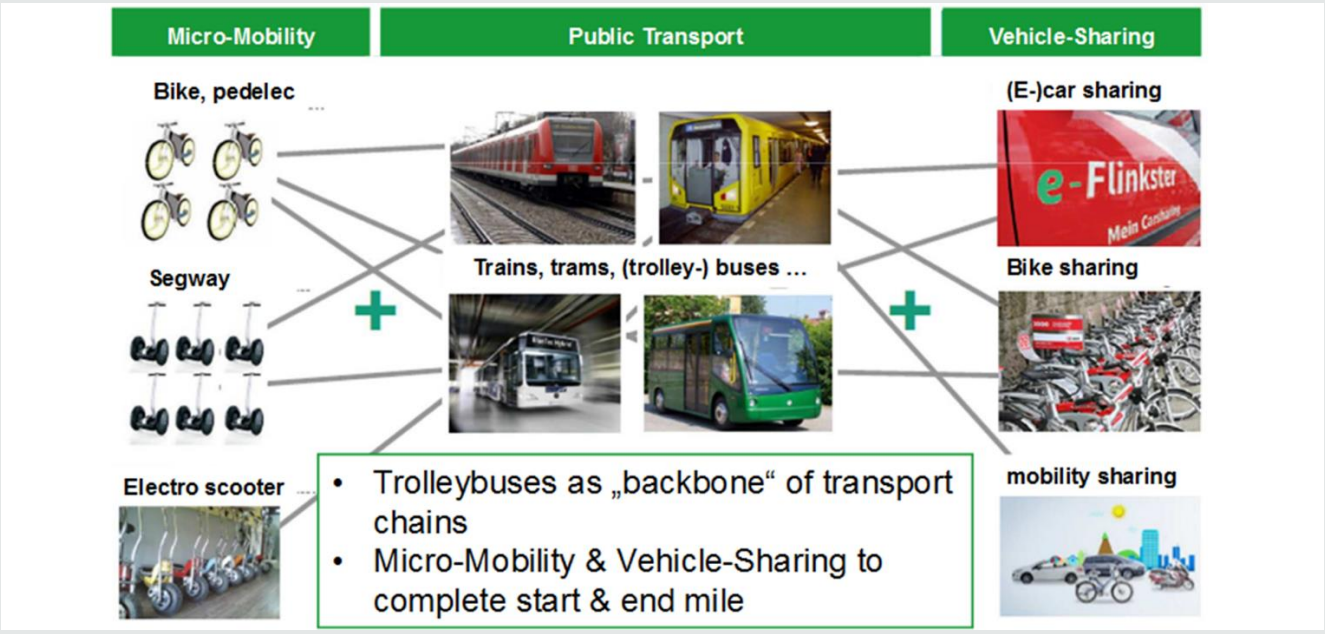


Figure 10: Scheme for public transport with trolleybus network as main backbone for seamless low-carbon mobility (source: Spath, IAO, 2001; revised by trolley:motion)

For such an analysis of accessibility of the industrial area by low-carbon mobility modes, the newly developed REACHIE tool could be used. REACHIE is a powerful online journey planner comparing modes per trip by isochrones and visualizes routes according to its level of accessibility with respect to the starting point (see figure 11 below). REACHIE was developed during the LOW-CARB project by the City of Leipzig, Central German Transport Association (MDV), Leipzig Transport Company (LVB) as an open-source mobility information system to promote using more sustainable modes among commuters. The tool is an excellent option for both to analyse accessibility and public transport offers by the authorities and operators together with the employers, and for commuters to plan their trips and gain insight on how accessible their workplace is using different transport modes. REACHIE could improve quality of public transport trips to outlying stops, by increasing user awareness of suitable services and for environmental consciousness through a CO2 savings' comparison between trips, and by increasing the liability of connections vital for commuting.

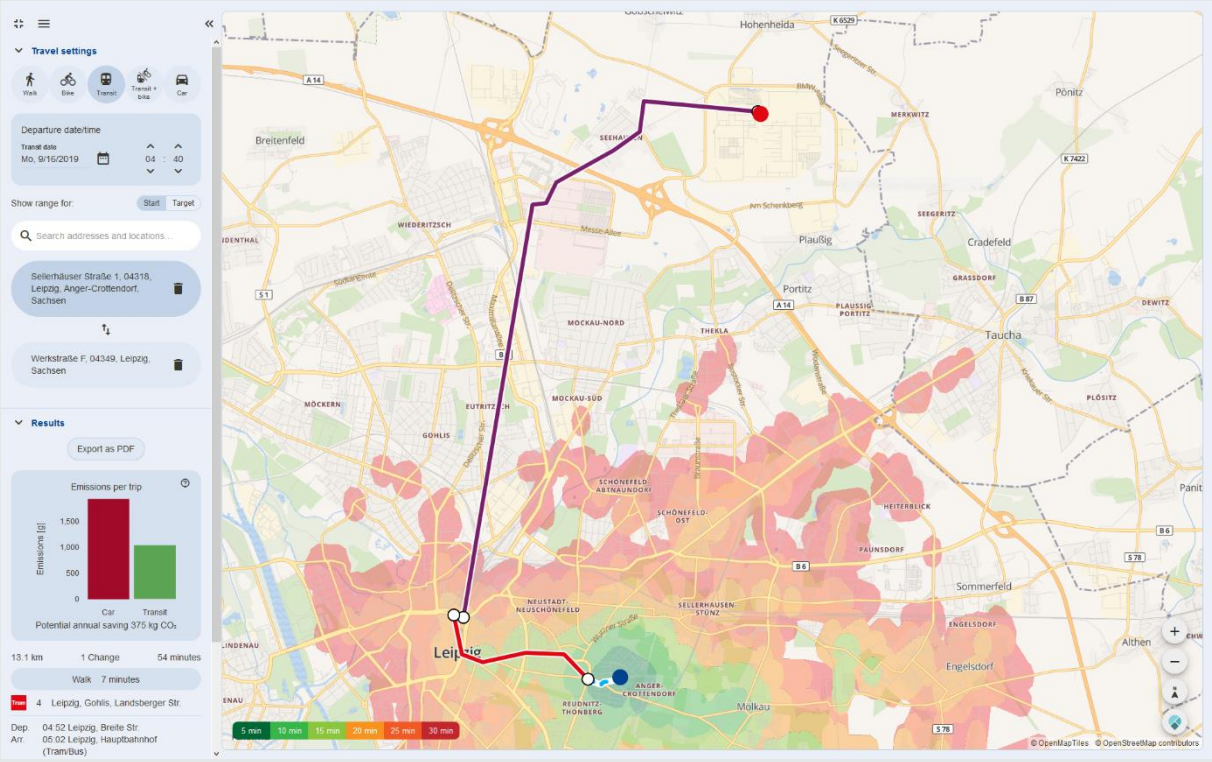


Figure 11: REACHIE screenshot - demonstrating accessibility (in time and per mode) of sites by multimmodal mobility (source: LVB/MDV, LOW-CARB final conference, 2020)

Trolleybus network extension to serve industrial area

The new trolleybus line to the industrial area is one of the key measures in the action plan. To lower the financial risk associated with it, SZKT plan to implement an In-Motion-Charging (IMC) concept which would allow for the introduction of a new line by extending the trolleybus network without major infrastructure cost. The IMC concept implies the purchase of new battery-hybrid-trolleybuses, which could operate without overhead connection for about half of the lien length and would eb enabled to charge the battery in motion while connected to the overhead wire (see below figure 12 with basic IMC scheme and advantages of IMC systems). This key measure would include a new trolleybus line between the city centre and the industrial area with direct connections to the most frequent areas (Rókus, Makkosház). It is planned to build the line with half of the route without overhead wire connection. Nevertheless, new electric infrastructure deployment would be necessary which could also be used for multipurpose charging options based on this new electric infrastructure (see below figure 16).

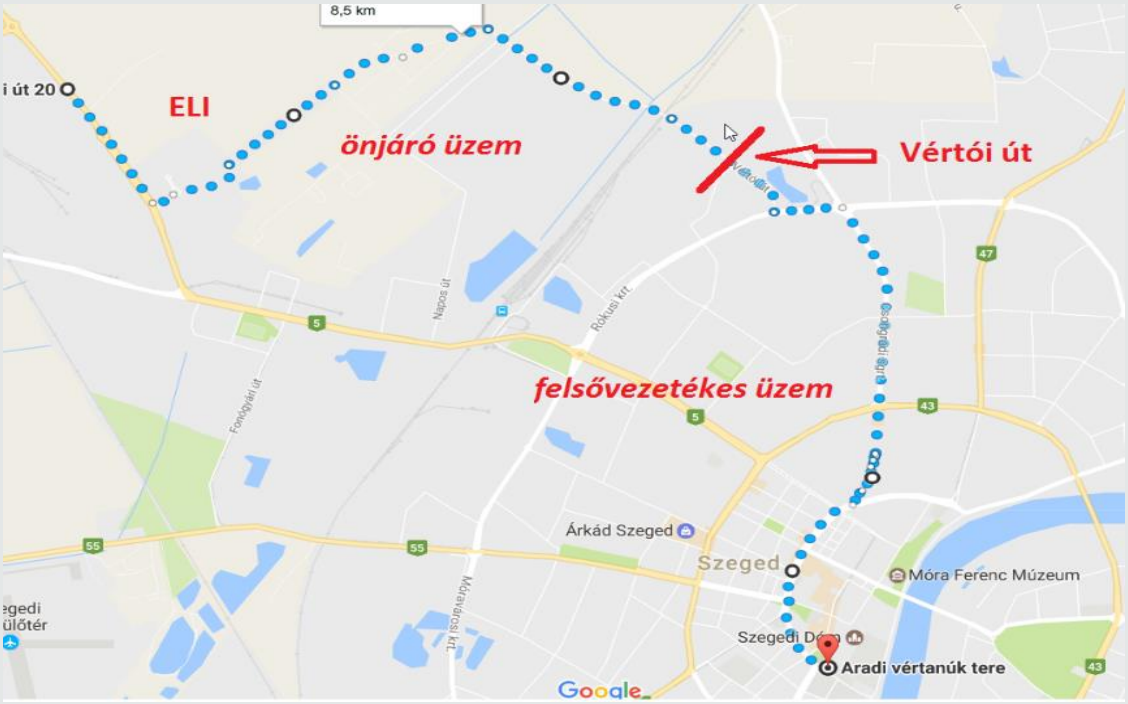


Figure 12: Possible TROLLEYBUS NETWORK extension for Szeged FUA to industrial area with IMC (50% overhead coverage, source: SZKT 2020)

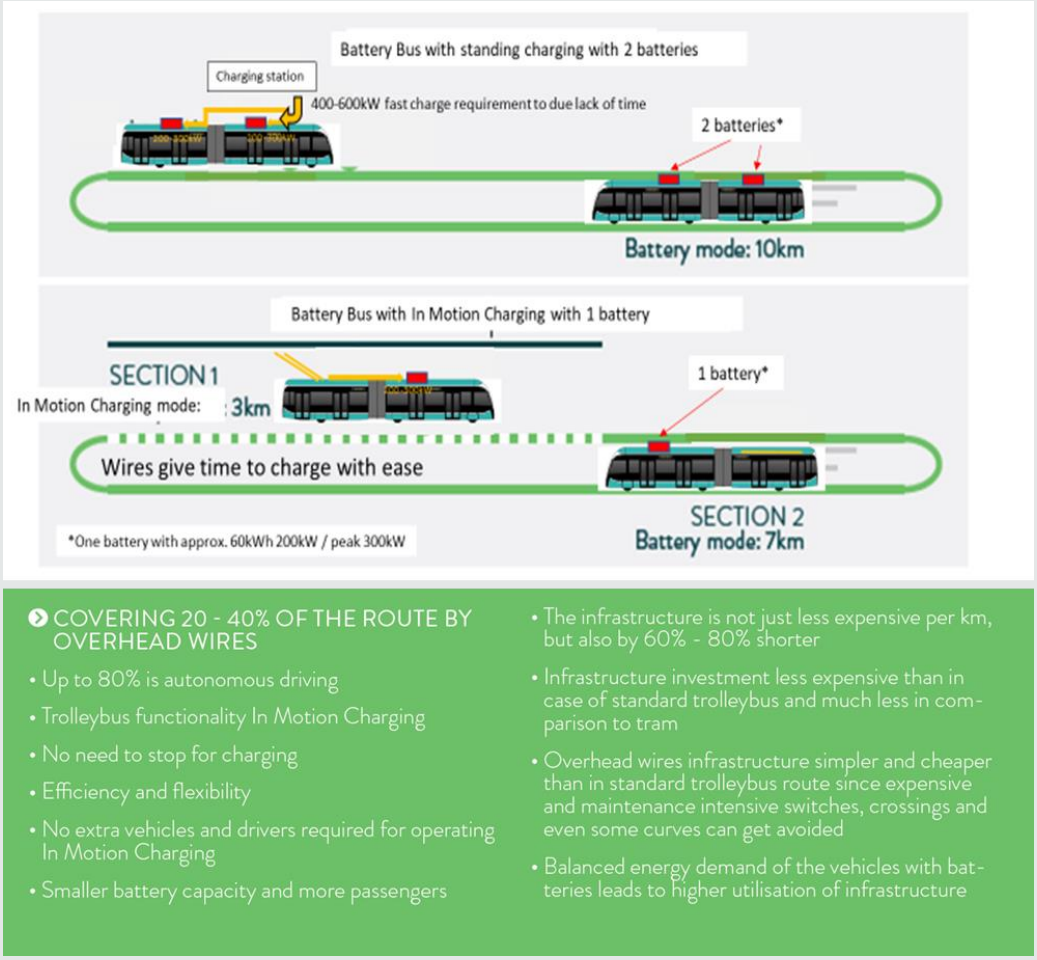


Figure 13: Basic conceptof In-Motion-Charging (IMC) and main criteria/advantages (source, UITP 2019)

The IMC concept hast established itself for trolleybus network extensions (e.g. Gdynia, PL, Solingen/Esslingen , DE, Cagliari, IT, Pilsen, CZ, Arnhem, NL), and even new IMC-based networks are under discussion, e.g. Berlin, DE, Maribor, SL or Prague, CZ for the Central Europe area.

One best-practice is the small community Eberswalde, DE, which started its IMC concept phase already in 2012 in the framework of the Central Europe Interreg project TROLLEY, in which the local public transport operator Barnim Bus Company (BBG) started its first battery-trolleybus pilot and tested this system for several years in terms of battery performance for off-wire operation. Meanwhile, BBG finalised a follow-up project TROLLEY 2.0 in the ERA-Net Electric Mobility Europe project, in which all 12 trolleybuses now have been retrofitted with a battery and a first diesel bus line was replaced by an IMC trolleybus line (see best practice box below, figure 14).

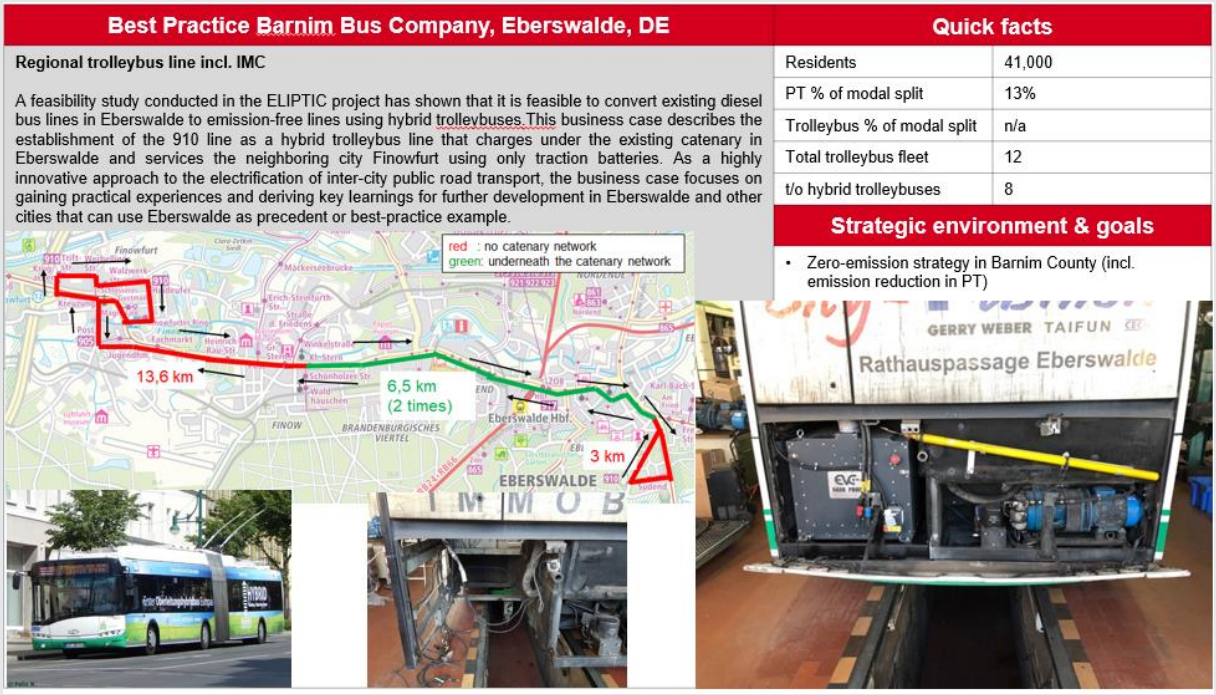


Figure 14: Best-Practice BBG, Eberswalde for IMC realsiation to replace existing diesel bus line with trolleybus operation - based on retrofitted battery-trolleybuses line (source, trolley:motion, 2020)

More flexible trolleybus operations

As a rule, trolleybuses are used for high-capacity lines. However, the IMC concept also allows trolleybuses to be used more flexibly due to their independence from the overhead line. In support of this idea, the partner SZKT has developed a smaller trolley midi-bus in the TROLLEY 2.0 project, which could also be used on lines to cushion peak passenger loads, or as an on-demand or pure works transport bus (e.g. from outskirts to industrial area). This would make sense for the low-carbon mobility goal for the industrial area, also against the background of different work schedules and more flexible working time models.

Together with the local manufacturer “evopro”, SZKT worked on a prototype with a longer battery range and lower energy consumption due to a lightweight construction. They chose to work with the model “Modulo” – a modular structure, that can be assembled according to the ideas of the customer. Four to seven segments can be assembled to create buses, with different lengths and more importantly different capacities to transport public transport users. The team from Szeged decided to assemble a bus out of five segments, one for the driver and the front wheels, one for the rear wheels and in between to segments with doors and one regular middle segment. The advantage of this kind of bus is not only its flexibility and that it can be designed

precisely as needed, but also the bus is comparably light weight. When fitted with comparably small batteries, because of temporary catenary grid use, this bus turns out to be very economically and ecologically efficient.

Figure 15: Modulo EP095T, composite framed midi-bus with IMC (source: SZKT 2020)

Trolleybus stops as (electric) mobility hub/station

To realise a seamless (electric) mobility trip with a smooth change over from first or last mile to a public transport service, the offers for sharing and/or micro-mobility shall be integrated into the public transport network.

Mobility hubs or stations are understood as multimodal connection points where at least two means of transport are linked. The linkage is realized in such a way that a local change between the means of transport through concentration of the offers are designed in a user-friendly way. Public transport forms the backbone of the mobility offer at mobility stations, and depending on the specific type of location (inner city district, main railway station of a large city, railway station / public transport stop of a small town, industrial area, etc.), other tasks such as accelerating travel times, the substitution of journeys by private car, reduction of company cars or the improvement of accessibility, can also be achieved. Especially in outskirts within FUAs, mobility stations contribute to securing and improving the accessibility of various destinations.

In addition, through mobility services that complement public transport around the clock (e.g. car sharing), a mobility station can be an innovative public transport promotion, but also as a model for testing shared (e-) mobility, as integrated offers such as car sharing and bicycle rental systems could promote the sharing idea.

Figure 16: Vision for a mobility hub/station (taken from LOW-CARB presentation from VRS/NVR (LOW-CARB advisory board member); 2017)

The existing electric public transport infrastructure, either the overhead wire, a sub-station or even an additional opportunity charger at the terminus of an IMC trolleybus line, can be designed as multipurpose charging hub for several electric vehicle types at a mobility station. The example below shows (figure 17) the usage of tram infrastructure in the German City Oberhausen for charging electric buses and e-cars, providing fast-charging spots for e-cars.

There are several advantages for such an approach (taken from ELIPTIC final project brochure, 2018):

- Potential for high power charging: When using the existing DC grid, it is possible to draw relatively high power due to available capacities in the usually over-dimensioned systems enabling the application of DC fast charging stations (>=50kW). Therefore, vehicles can be charged in a relatively small amount of time.
- More efficient use of public transport grids: In case of over-dimensioned grid capacities or times of low energy demand of rail/trolley-bound traction energy (e.g. at night), surpluses can be used to charge other electric vehicles without requiring new infrastructure and costly grid extensions. Thus, additional consumers can increase receptivity and thereby increase the efficiency of the grid.
- Higher cost efficiency: In a lot of cases using the public transport grid can be more cost-effective than using the public distribution network to charge non-rail-bound electric vehicles.
- Less additional space requirements: Existing switchgears, converter transformers and rectifiers of public transport sub-stations can be used. Chargers can be placed in sub-stations with weather-proof conditions Less bureaucratic installation of charging points. Data (regarding grid connection etc.) can be accessed in-house and do not necessarily have to be requested elsewhere. Building permissions are unnecessary when land is owned by the public transport operator and determining sites for charging points can be done completely independently. This can highly reduce the regulatory burden for public transport operators.
- Potential to integrate different e-mobility services: Possibility to offer various e-mobility services in multimodal e-mobility hubs in order to also allow for e-mobile trip chains including energy provision for these e-vehicles.
- Enhancing image of public transport: Enhanced image of public transport operator as providers of clean mobility solutions

However, there are still legal barriers due to current regulatory uncertainties in most European countries, as it is very difficult for public transport operators to resell energy to 3rd parties. Therefore, it would be recommended to start with the charging of municipal or own (PT owned) fleets such as service cars or shared e-cars as an additional mobility offer of PT companies /municipal energy providers etc., as this does not involve any complicated metering and billing processes

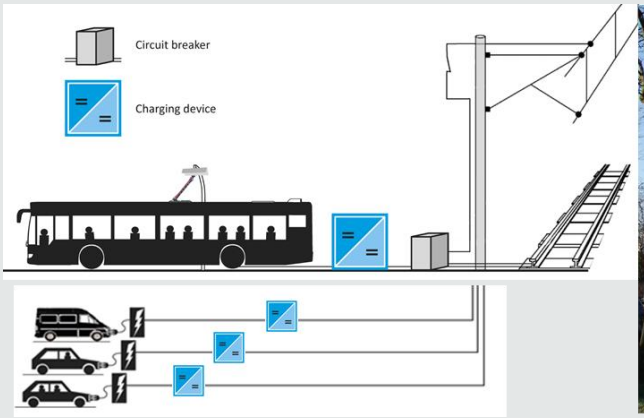


Figure 17: Basic scheme for using existing tram infrastructure for charging electric buses and e-cars (left); and "real" pilot in Oberhausen, DE, charging electric buses and e-cars based on tram infrastructure (source: ELIPTIC project, STOAG 2017)

There are already few examples of e-car fast-chargers, powered by a DC trolley network across Europe. Ongoing tests with such devices are currently carried out in the Dutch trolleybus city Arnhem, where a DC charger prototype was integrated into the trolley network. The figures below show the basic scheme and a best practice example for such an integrated charging solution- based on the existing trolley infrastructure.

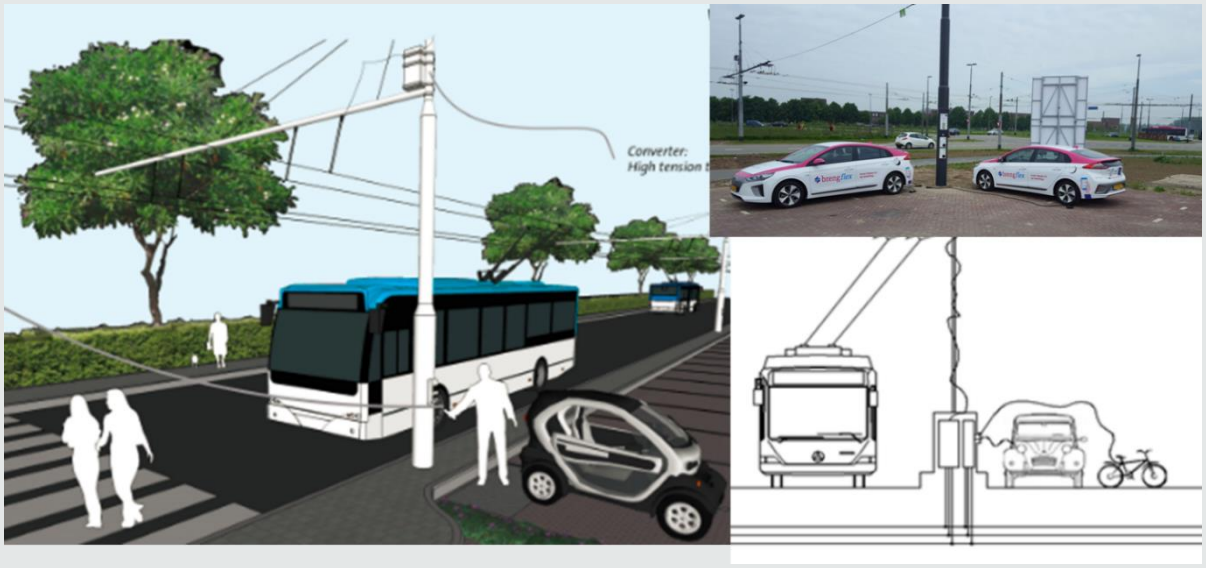
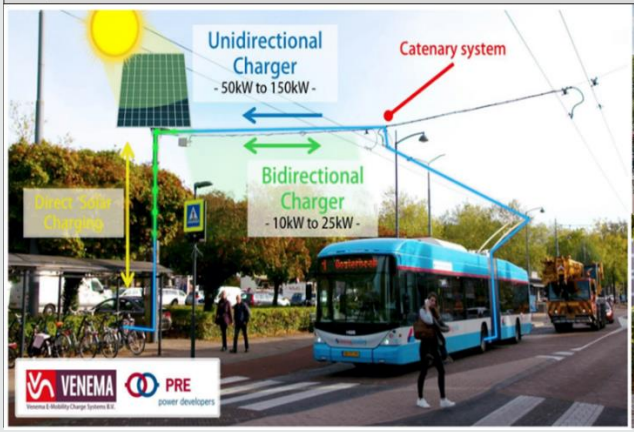


Figure 18: Modulo EP095T, composite framed midi-bus with IMC (source: SZKT 2020)

Best Practice Arnhem, NL	Quick facts	
Multifunctional trolley grid incl. RES & decentral SES The municipality of Arnhem has the ambition to be a global leader in trolley grid technology and be the world's first city with a truly smart trolley grid. Arnhem also wants to become an "energy city", for which a smart trolley grid is indispensable. These two ambitions come together within the trolley:2.0 project and demonstrating the potential of trolley grids to become DC backbones for battery-electric vehicle charging, integration of photovoltaic energy, brake energy recuperation for trolleybuses, as well as installation of stationary energy storage. In doing so, the business case focusses on advancing the theoretical model of the Arnhem trolleybus network, serving as an analytical basis for the implementation of a smart and multifunctional trolley grid in comparable cities.	Residents	159,000
	PT % of modal split	10%
	Trolleybus % of modal split	10%
	Total trolleybus fleet	43
	t/o hybrid trolleybuses	2
	Strategic environment & goals	
	• Zero-emission public transport system in Arnhem • Build leading smart trolley grid	



DC-AC catenary solutions, power solutions for charging machines for public transport cards, WiFi access points and dynamic travel information that's powered by the overhead contact line in Arnhem, NL

DC-DC Charge solutions for E-Mobility: e-car fast charger from the overhead contact line in Arnhem, NL

Figure 19: Best-Practice example for multi-purpose charging solutions based on trolleybus grid (source: trolley:motion, TROLLEY 2.0 project brochure 2020)

European Clean Vehicle Policy, funding and promotion of public transport

In addition, trolley-battery buses are considered as zero emission vehicle under the updated and revised Clean Vehicle Directive (EU 2019/116): According to the Directive, trolleybuses are considered to be zero-emission buses, provided that they run only on electricity or use only a zero-emission powertrain when not connected to the grid (i.e. battery equipped trolleybuses). Otherwise, they still count as clean vehicles. In countries where trolleybuses are classified as rail vehicles and not as road vehicles, the national implementation of the Directive would have to clarify whether trolleybuses count towards the procurement targets.

The revised Clean Vehicles Directive requires Member States to ensure that minimum percentages of "clean" and "zero-emission" vehicles will be procured within two reference periods: the first phase from 2021-2025 and the second one from 2026-2030, which matches the given Action Pan time frame. For Hungary the quotas are 37% (2021-2025) and 53% (2026-2030), for both periods fifty percent of each quota will have to be fulfilled with zero-emission buses.

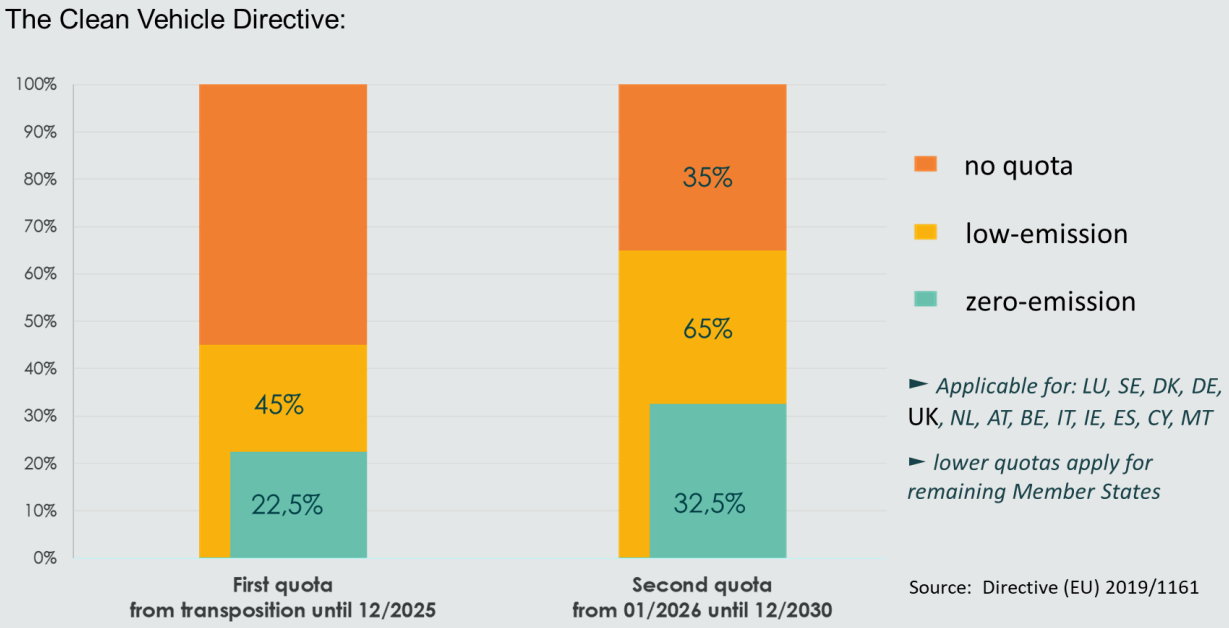


Figure 20: Best-Practice example for multi-purpose charging solutions based on trolleybus grid (source: trolley:motion, TROLLEY 2.0 project brochure 2020)

Support for the deployment and financing of clean bus fleets provides the newly established Clean Bus Europe Platform (https://cleanbusplatform.eu/about/the-platform), which is an initiative under the European Commission's Clean Bus Deployment Initiative that aims to support the deployment of clean bus technologies across Europe. The Platform brings together European cities, transport authorities and operators, together with relevant stakeholders like social dialogue partners, industry, financing and funding institutions, associations, etc. to boost and support the exchange of knowledge and expertise on clean bus deployment.

Main recommendations for the implementation of the measure package with a trolleybus network as main backbone for a multimodal low-carbon mobility for the industrial area include a more flexible PT service (on demand, special companies' route(s) services), based on new vehicle concepts (e.g. midi-trolleybus, IMC capable trolleybuses) to take into account the diverse mobility demands of companies' employees.

In addition, a close cooperation between City, PT providers, companies, further mobility service providers and employees is needed, also based on repeated mobility demand surveys to adapt to new contexts and situations. To put a bigger accent on cycling, new shared bike concepts shall be tested, incl. also e-bikes for longer

distances, linked to public transport offers (e.g. based on multipurpose charging hubs using existing trolley infrastructure). Last but not least, it will be very important to develop new passenger information systems providing real-time data about PZT / mobility offers (e.g. through applications like REACHIE) to promote low-carbon mobility offers for the industrial area – with the existing trolleybus network as amin backbone.

7. Conclusions

Development of action plans for implementation of integrated low-carbon public transport services in FUAs Leipzig, Brno, Koprivnica and Szeged is an ongoing process that has been taken up in the framework of LOW-CARB project by following a model structure comprising four different steps:

1. Analysis of mobility related challenges in relation to public transport
2. Development of different low-carbon scenarios and comparison against "do-nothing" and "business-as-usual" scenarios
3. Stakeholder involvement in the identification and prioritisation of low-carbon mobility measures
4. Action Plan elaboration

These four steps that are described in this document are necessary in the process of Action Plan development for low-carbon mobility measures focusing on enhancing public transport services at the FUA level.

Referring to Szeged's Action Plan for low-carbon mobility measures, the following success factors were key for the development of the realistic Action Plan with very good chances for implementation:

- knowledge of the area and companies through target group orientation, stakeholder engagement and involvement into the action plan development
- data collection through surveys (with a good response rate based on promotion activities, e.g. during European Mobility week 2019)
- sound data analysis of survey responses to get a sound basis for targeted measure development
- compilation of measures around different areas of actions (creating measure packages)
- setting goals -linked to the SUMP objectives and goals of the City of Szeged.

8. **Annexes** (images or maps, photos from workshops and stakeholder consultations, screen shots and other relevant materials to be provided as annex)

The complete workplace mobility action plan (in the following), developed by the external expert KÖZLEKEDÉS Fővárosi Tervező Iroda Kft., is attached to this document. As well as the linked SUMP Action Plan, the measure evaluation and a brochure (in pdf version, Hungarian language) as three separate files attached to this deliverable).

Annex: Workplace mobility plan – as basis for Action Plan

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TRANSPORT DEVELOPMENT AUTHORITY	PLAN NUMBER: **5401**	SUBPLAN NUMBER: **06**

CLIENT:
Szeged Transport Ltd. (SZKT)

ASSIGNMENT SUBJECT:
Preparation of Workplace mobility plan for the employment institutions situated in the area of Budapesti Road and its surroundings

PLAN TYPE:
WORKPLACE MOBILITY PLAN

SECTOR:
TRANSPORT

SUB-TRANSACTION:
ACTION PLAN

SECTOR SUBGROUP: **01**	DOCUMENT NUMBER: **001**	VERSION: **03**
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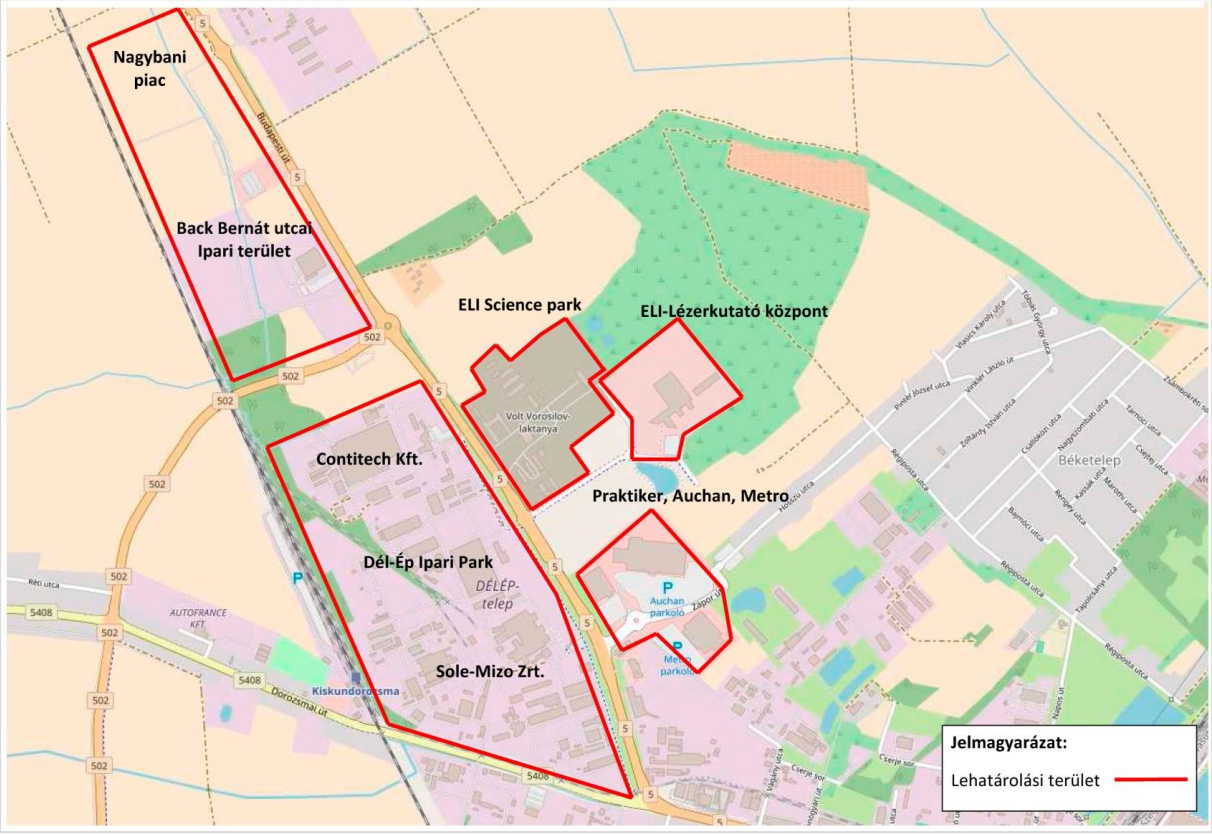
• Introduction – The presentation of the project

More than 20 years ago, the European Union laid down that the sustainable development of cities is attainable through joint consultation of a city's residents and experts and influencing travel needs and passenger behaviour.
This is the notion of mobility management. One of its means is the preparation of a workplace mobility plan for an entire city or a larger, contiguous area. The planning begins with defining the area and is followed by a detailed assessment of the current state of affairs in which the travel habits of a large number of employees who work at the companies located there are surveyed. The final objective is to identify any problems and, based on them, to determine appropriate objectives, then, again in cooperation with the companies, to prepare an Action Plan in order to implement uniform and executable operations for the entire action area.
Szegedi Közlekedési Kft. and 10 of its affiliated organisations made a successful bid to plan mobility for the industrial areas in the north-western part of Szeged and the preparation of an Action Plan that promotes the decarbonisation of urban mobility and the promotion of low-carbon public transport within the LOW-CARB project. .
The planning area is shown in the following figure:
Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-1. Szeged northwestern industrial area**



The action area is enclosed by the section of National Road no. 5 that enters Szeged (Budapesti Road), the M43 motorway and Dorozsmai Road. The mobility plan focuses on the institutions and facilities operating in this area, especially those companies and institutions that employ more than 50 people. The planning period was between May 2018 and March 2020.

a. Objective

The objective of the task is to prepare a mobility plan that promotes the decarbonisation of urban mobility through a more effective and environmentally friendly organisation of public transport in Szeged's north-western area. The aim is to promote sustainable transport, especially by reducing car usage and the installation of any zero-emission transport means that could promote this process.

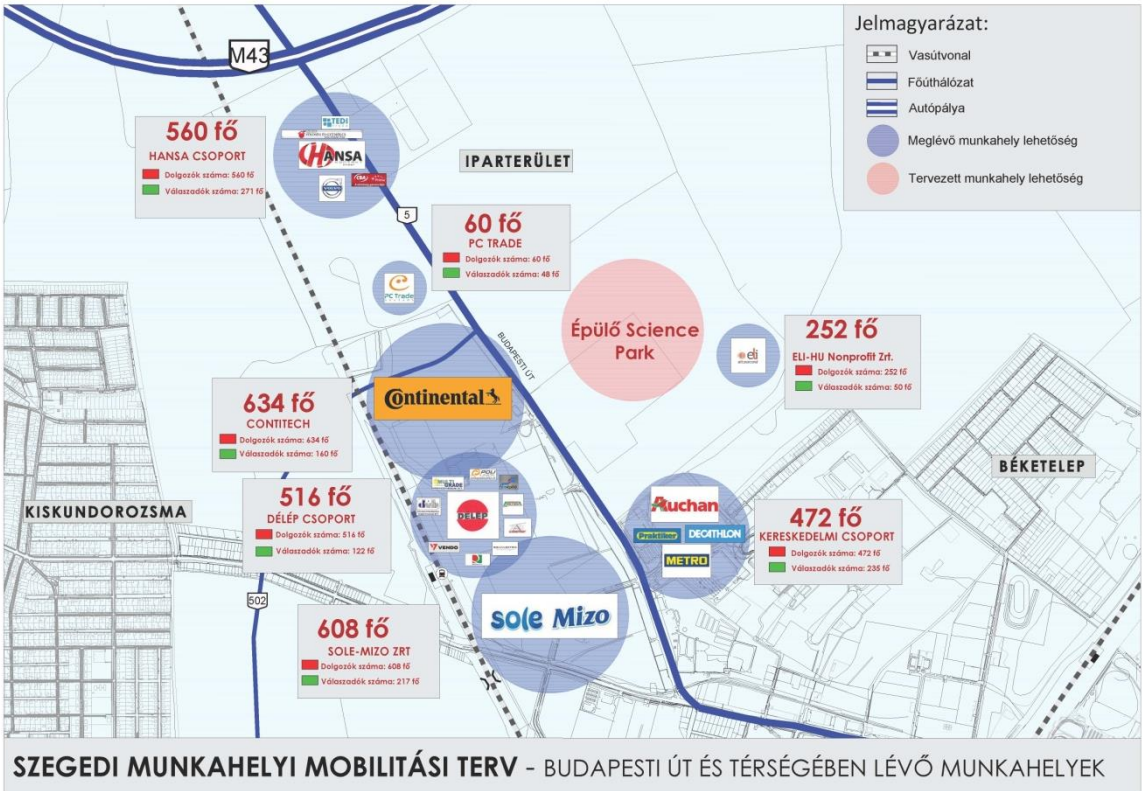
The further aim is to improve the general well-being and state of health of the workers. Furthermore, a reduction in costs, both for employers and employees, can also be an additional objective.

b. Assessment of the habits and tendencies of workers

The mobility planning was based on a questionnaire survey conducted in the period between December 2018 and April 2019. 1106 employees from 23 companies responded – online or on paper – on their transport habits, decisions and future intentions. The 37% respondence rate means the opinion formed is representative. The assessment was completed by November 2019 with a common evaluation for all companies, independent assessments for the seven key companies and a group evaluation for three groups of companies. In addition, the concluding documentation also includes the evaluation material prepared by the employers.

On 11 November 2019, the evaluation was introduced in the form of a presentation at a workshop held for Szeged Transport Ltd. The measures designated in the Action Plan are based on the evaluation documentation.

Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-2. Assessment of the habits and tendencies of workers**



- **Former decisions defining the scope of the Action Plan**

In this chapter, we briefly summarise the decisions made on the levels of the Government and the General Assembly that directly affect the accessibility and traffic of the industrial area.

c. Antecedents and fundamental background

A. Cooperation agreement concluded between Szeged and the Hungarian Government within the framework of the Modern Cities Programme (30 January 2017)

I. Government Decision no. 1151/2017 (III.20.) on the tasks related to the performance of the cooperation agreement concluded between the Government of Hungary and Szeged City with County Rights

1. In the interests of improving the accessibility and the expressway connectivity of Szeged and its surroundings, the Government:

> *b)* Calls on the Minister of National Development to ensure the preparation and implementation of the development project entitled "Szeged–Makó suburban transport development with the construction of a mixed-traffic **bridge across the Tisza river**" – using partly domestic funds and partly those available within the framework of the Integrated Transport Operational Programme (ITOP), including the traffic junction serving the rail and bus transport linked to the new Tisza bridge and a P+R parking facility;

2. In order to promote the economic development of the city and its region, the Government:

> a) Calls on the Minister of the Prime Minister's Office, the Minister of National Development and the Minister of Agriculture to examine local food industry development projects and, within the framework of this, the opportunities for governmental measures enabling the territorial acquisitions and the implementation of the developments of **Pick Szeged Zrt**., to make a proposal to the Government for the measures to be taken, based on the results obtained;

3. The Government consents to continue supporting the innovation projects in Szeged, in the framework of which:

> a) Calls on the Government Commissioner in charge of preparing the educational, research and economic development concept of the **ELI Science Park project**, the Minister of National Economy and the Minister of National Development to examine, with the involvement of the President of the National Research, Development and Innovation Office, the set of conditions available for setting up an incubator house next to the ELI Laser Research Centre and to

make a proposal for its implementation, including an examination of the possible involvement of European Union development funds;

II. Government Decision no. 1932/2017 (XII. 8.) on the possibility of the electrification of the public transport system of Szeged City with County Rights within the framework of the Modern Cities Programme

The Government, in order to implement point 5 of Government Decision no. 1151/2017 (III. 20.) on the tasks related to the performance of the cooperation agreement concluded between the Government of Hungary and Szeged City with County Rights 1. Consents to support, in the framework of the Modern Cities Programme, the **development of the electric public transport system** of Szeged City with County Rights (hereinafter referred to as: the development programme), and that a maximum amount of HUF 9,459,000,000.00 is to be ensured for the Local Government of Szeged City with County (hereinafter referred to as: Local Government) with the following disbursement schedule:

a) HUF 2,838,000,000.00 necessary in 2018,

b) HUF 6,621,000,000.00 necessary in 2019;

III. Government Decision no. 1512/2019 (VIII. 26.) on the development of the Szeged-Subotica/Szabadka railway line

The Government:

1. Consents to the development concerning the **modernisation of the track and equipment of the Szeged-Rendező–Röszke–national border railway line** and **the electrification of the section**;

2. Calls on the Minister of Foreign Affairs and Trade to administrate the necessary reconciliations in order to implement the Szeged-Subotica/Szabadka-Baja railway line, with the involvement of the Government Commissioner in charge of coordinating the implementation of the line, the Minister of the Interior, the Minister of Finance and the Minister of National Innovation and Technology, in cooperation with MÁV Hungarian State Railways (hereinafter referred to as: MÁV Zrt), with the competent Serbian authorities and organisations; Responsible officials: the Minister of Foreign Affairs and Trade, the Government Commissioner in charge of coordinating the implementation of the Szeged-Subotica/Szabadka-Baja railway line, the Minister of the Interior, the Minister of Finance and the Minister of National Innovation and Technology.

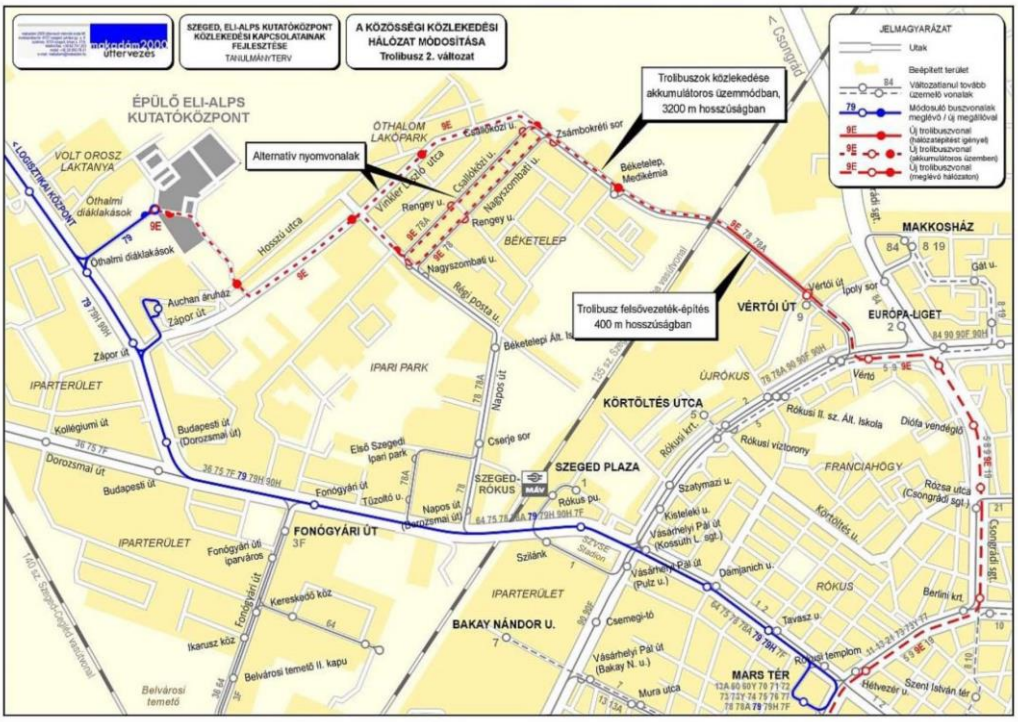
B. Key projects approved by the General Assembly of Szeged City with County Rights

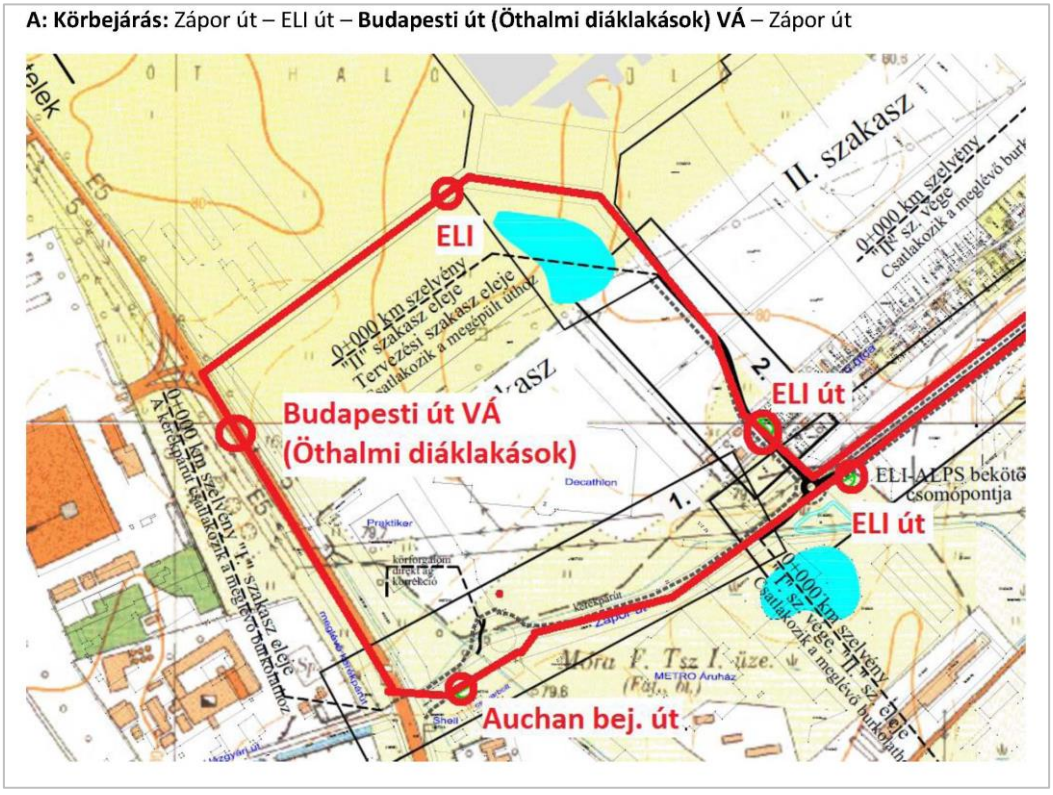
The governmental decisions are supported by the General Assembly, of which the transport projects are listed below:

- Construction of the southern bridge on Tisza river
- Development of the ELI Knowledge City
- Development of the trolleybus network

- Construction of a new bus station
- The development of the ELI Knowledge City and its surroundings within the framework of the Modern Cities Programme

Figure Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-1. Development of an automated trolley line (Source: Szeged Transport Ltd., The possibility of an electrified basis for the public transport of Szeged City with County Rights in the framework of the Modern Cities Programme, preliminary feasibility study, v3.1)**





C. Szeged Sustainable Urban Mobility Plan (SUMP) (Trenecon, September 2017) Transport – connection of strategic objectives and means

The materials for the Szeged SUMP in 2017 (prepared by: Trenecon) examined the full scope of means from the perspective of sustainability.

Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-2 Transport – connection of strategic objectives and means (Source: Szeged Sustainable Urban Mobility Plan (SUMP) (Trenecon, September 2017))**

- ## Comprehensive societal objectives

Before defining the transport objectives, the comprehensive societal objectives are summarised in the following. These are the following:

S1.A healthy and sustainable society

A society ensuring health and long-term capacitation for work, continuously strengthening the sense of security that provides equal opportunities for the various age groups to mobility and its alternative modes.

S2.Respect for the environment, a behavioural development towards increased environmental consciousness

The conscious reduction of the environmental burden through the development of a sense of individual responsibility, the improvement in individual behaviour and the example set for others. The improvement in individual behaviour and the example set for others. Environmental consciousness becomes a definitive behavioural element.

S3.Competitive economy

The emergence of employee contribution and competency as a driving force of a competitive economy. The establishment of societal and individual well-being, with a rational use of the elements of well-being.

S4.Partnership

Cooperation in the partnership between the economic, statal and municipal sectors and the individual. This partnership is the reception interface of individual initiatives. Civic thinking and activity as the compass of modern society.

- ## Transport objectives

Derived from Szeged's SUMP, the sustainability objectives of the Action Plan can be summarised as follows:

Figure Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-1. Sustainability objectives**

SUSTAINABLE URBAN OPERATIONAL OBJECTIVES		
Operational objectives	**Mobility development objectives**	**Changes in the decisions of commuters**
M1 Urban management decisions and transport organisation on a unified platform	**V1** Expansion of the public transport network and services, improved connections	**K1** Extension of the knowledge base on sustainability and environmental consciousness
M2 Continuous reduction of the total operating cost by targeted synergic measures	**V2** Achievement of zero-emission rate for the entire vehicle stock	**K2** Support of the right transport decisions with the help of digital knowledge
M3 SMART measures in the smart city	**V3** Networking of non-motorised transport (bicycle, walking) infrastructure, good solutions, safe circumstances	
M4 Extension of the range of means of public transport, alternative usage, increasing popularity by cooperative transport	**V4** Expansion of the urban possibilities of road transport	

- **Indicators**

We consider the following indicators indispensable in the objectives, which, following implementation of the measures, will allow the quantification of the effects and continuous monitoring.

Table Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-1. Selected indicators**

SELECTED INDICATORS		**LINKAGE TO SUSTAINABILITY OBJECTIVES**
FEATURES OF THE TRANSPORT SERVICE	**METRIC**	
Mutual planning of timetables – reconciliations with users	(number of introduced measures reconciled in advance with the users) [pcs]	M1
Reduction of the number of transfers	[number of transfers]	V1
Reducing travel time	[passenger hours/year]	V1
Level of comfort, Reduction of congestion	[utilisation rate, %]	V1
Change in public transport use (number of passengers)	[million passengers/year]	M1, V1, K1
Increase in the number of linked community and individual transport services	[pcs]	M4, V1, V4, M2
TECHNOLOGICAL IMPROVEMENT OF TRANSPORT CONDITIONS		
Expansion of the cycle track network	[km]	V3
Increase in the number of bicycle parking stations	[pcs]	V3
Expansion of the trolleybus network	[km]	M1, V1

Expansion of the environmentally friendly vehicle stock	[pcs]	V2
Construction of new stops	[pcs]	V1
TRANSPORT INFOCOMMUNICATION TECHNOLOGY		
Expansion of mobile applications	[pcs]	K2, M3
Development of passenger information (creation of a subpage on the official webpage)	number of users reached [persons]	K1
Increase in the number of sales channels	[pcs]	M1, M3

Connection to special objectives in the areas concerned

Table Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-2. Connection to special objectives**

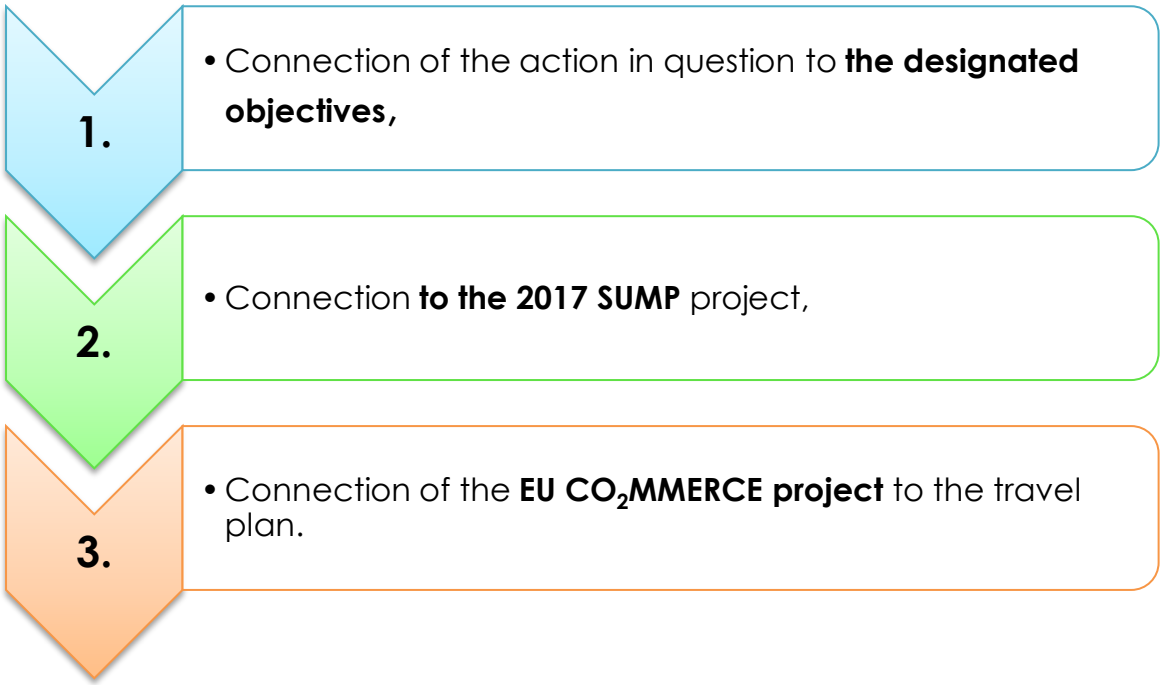
RELATED OBJECTIVES	SELECTED INDICATOR	MEASUREMENT NUMBER
Scheduling the timetables of the lines serving the area and reduction of travel time	Number of transfers, travel time	Data deduced from the questionnaire results [pcs] [sec]
Construction of cycle tracks in the area	Size of the cycle track network	[km]
Construction of bicycle parking stations in the area (perhaps by the companies examined)	Number of bicycle parking stations	[pcs]
Trolleybus line to ELI	Size of the trolleybus network	[km]
Trolleybus to ELI in the area	Number of environmentally friendly vehicles	[pcs]
New stop in the area (e.g. Hansa)	Number of new stops	[pcs]
Installation of a new ticket-dispenser at Szeged Industrial and Logistics Centre (Sole-Mizo)	Increase in the number of sales channels	[pcs]
E.g. by creation of a subpage on the official webpage	Passenger information	number of users reached [persons]

- **Measures attributed to the objectives**

Workplace mobility is one of the pillars of sustainable urban mobility operation. The set of objectives (10) described in the target system are implemented through actions. In order to establish logical order, sets of actions have been designated. In the designated 10 sets of actions, a total of 60 targeted actions have been identified.

For each action, we have indicated its role in the system of connections. Three connections have been identified:

Figure Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-1. Role of the actions in the system of connections**



The EU CO_2MMERCE project is a project aimed at reducing the emission of harmful substances by commuting.

The three links guarantee that all measures have been examined and taken into consideration that may, based on international experience, produce results in Szeged's northern industrial area.

We also examined the competencies corresponding to the particular actions. These can be statal, municipal or the companies' own competencies or, occasionally, mutual competencies.

The mobility plan index indicates how many of the 1104 interviewees and respondents considered the measure important. In addition to this, we also indicated the societal efficiency score the SUMP received upon evaluation, if this measure was defined. These two index figures indicate significance.

Cost columns mean being classified into cost categories. The scheduling is short-term until 2023, and indicates the measures to be introduced on the long run until 2030.

d. Action groups

The action groups are summarised in the following table.

Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-1. Action groups**

Action groups	Number of recommended actions [pcs]
I. City-wide actions	3.
II. Strategic developments not linked to specific locations	8
III. Convenient public transport services	13
IV. Public transport infrastructure development	5
V. Uniformisation of cycle track network connections	6
VI. Making the bicycle service more attractive	7
VII. Improved road connections	4
VIII. Energy-saving driving services	5
IX. Knowledge base for environmental consciousness	6
X. Support of travel decisions and means selection using digital tools	3.
Total:	**60**

Table Fehler! Kein Text mit angegebener Formatvorlage im Dokument..**2. Actions – Connections-costs – Phase**

Action				Connections			Compe-tencies	Mobility plan index		Cost						Phase		
Group	**Number**	**Name**	**Contents**	**Objectives**	**SUMP**	**CO_2MM**			**Th**	**<10m Ft**	**10–50 million HUF**	**50–100 million HUF**	**100 million HUF–1 billion HUF**	**1–10 billion HUF**	**10 billion HUF<**	**from 2020**	**until 2023**	**until 2030**
I. City wide actions	**1.**	Tram-train	A new means of transport to be constructed between Hódmezővásárhely and Szeged (zero emission in the city)	M1-M4	P41		key State – Loc. Govt.		0.8						10 billion HUF<		until 2023	
	2.	Southern road bridge on the Tisza river, new railway bridge	A new element of the city's north-south connectivity, reducing traffic in the city centre, with new suburban fixed rail transport towards Makó.Long distance rail transport	M1-V4	P42-43 P61		key State		2.6 1.6						10 billion HUF<			until 2030
	3.	ELI Science Park	New workplaces and new innovation in the northern industrial area. Transport is a development extending to every branch	M1	P50		key		2.7			900 million HUF					until 2023	
II. Strategic developments not linked to specific locations	**1.**	Timetable synchronisation	Current project of the Ministry of Innovation and Technology and the Institute for Transport Sciences. Synchronisation of long-distance and local timetables. Assertion of the interests of the parties concerned is required	M1-V1	(P54)	T1	State – Loc. Govt.	44% (MV26)	76.5			50 million HUF					until 2023	
	2.	Pass contribution for public transport	Companies should wholly or partly pay for the public transport passes	M1		T3	companies	37% (MV26MV28.)										
	3.	E-ticketing	Electronic pass validation	M2	P27		state	16% (MT12)	28.9				470 million HUF				until 2023	
	4.	Data repository	Common transport database, traffic model, common urban and suburban database	M1	P25-26		State – Loc. Govt.		285				300 million HUF					until 2030
	5.	Monitoring	Regular check and evaluation of actions, impact assessments	M1	P25		Loc. Govt.		285		20 million HUF						until 2023	
	6.	Societal agreement on transport development	Societal consultation and agreement on tramway line extension and procurement of E-buses	M2		T1	Loc. Govt. (state)	48% (MV27)									until 2023	

	7.	Joint bicycle and public transport pass	Conditions for incentivising joint pass	M2		K2	Loc. Govt.	15% (MV27)		-						until 2023		
	8.	Pay as you go bicycle and public transport pass	A fee structure that takes the level of usage at the launch of the E-ticketing system into account	M2		K2	state, Loc. Govt.	19% (MV27)		-								until 2030
III. Convenient public transport service	**1.**	Multi-directional bus accessibility of the industrial area	Transfer-free commuting.Directions:districts of Tarján, Északi város, Makkos, Újszeged, Kiskundorozsma, Rókus, Mars tér, Szőreg, Tápé and Odessza	V1		T1	Loc. Govt.	33% (MV26)			10–50 million HUF						until 2023	
	2.	Trolleybus line extension towards ELI	Driverless trolleybus operation along the Vértói Rd.–Zsámbokréti Ln.–Vinkler Rd.–Zápor St.–Budapesti Rd. section. New service direction from the housing estate.	V1-V2	P5	T1	Loc. Govt.	30% (MV27)	1.3									until 2030
	3.	Rationalisation of the bus network linked to the Intermodal Centre	Total transformation by abandoning the area at Mars Square	V1	P48	T1	Loc. Govt.	39% (MV26)	1.3		10–50 million HUF							until 2030
	4.	Kiskundorozsma mainline railway station – Shuttle bus link to workplaces. New shuttle bus transfer line	Morning and afternoon shuttle service, synchronised with the arrival times of the trains. Opening a new exit from the station towards the Délép area.	V1 M4	P78	T4	Loc. Govt. (companies State)	24% (MV27)	4.8		10–50 million HUF							
	5.	Demand driven transport	Targeted midibus service between kindergarten and workplace, operated with a booking system	V1 M4		T4	Loc. Govt.	16% (MV27)			10–50 million HUF						until 2023	
	6.	School bus	School bus service to replace parents taking children to school by car	M4			Loc. Govt. (state)	19% (MV23)			10–50 million HUF						until 2023	
	7.	Linking poorly serviced areas into the bus network	Transfer-free commuting	V1	P36	T4	Loc. Govt.	21% (MV26,27)	74.2			50–100 million HUF					until 2023	
	8.	New stop	Better accessibility for Szeged Industrial and Logistics Centre, Back B. Street	V1	P36	T4	Loc. Govt. (companies)		74.2	2 million HUF/stop							until 2023	

	9.	Acceleration of bus transport	Implementation of a priority system by installing bus lanes and transit signal priority.Rókus, Izabella, Dorozsmai Road and Budapesti Road	M1	P1		Loc. Govt.	33% (MV26)	12		10–50 million HUF						until 2023	
	10.	Traffic-dependent acceleration of bus transit	Peak time priority for buses to avoid congestion.Kossuth L. St.	V1	P39		Loc. Govt.	28% (MV23,26)	67		10–50 million HUF						until 2023	
	11.	Modernisation of the city bus stops	Implementation of higher stop elevations and installation of bus stop shelters at 25 stops	V1	P19		Loc. Govt.	13% (MV16)	4	2 million HUF/stop							until 2023	
	12	Implementation of a regional bus network fitting to needs better	From the municipalities with the largest traffic.Sándorfalva, Szatymaz, Zsombó, Bordány, Üllés, Kistelek, Domaszék and Makó	V1			State (Loc. Govt.)	31% (MV23,26)			10–50 million HUF						until 2023	
	13.	Modernisation of the suburban bus stops	Implementation of higher stop elevations, installation of bus stop shelters and pavement connection at 20 stops	V1	P73		State	18% (MV16)	4.8	5 million HUF/stop							until 2023	
IV. Public transport infrastructure development	**1.**	Development of the trolleybus fleet	construction of + 5 trolleybuses	V2	P2	T1	Loc. Govt.	47% (MV27) 27% (MT 12)	1.3				150 million HUF/vehicle				until 2023	
	2.	Procurement of electric city buses	15-15-15 units of zero-emission buses until 2030	V2	P8	T1	State	43% (MV27)	1.3				150 million HUF/vehicle				from 2022	
	3.	Procurement of low-emission local buses	Procurement of 20 buses by 2030	V2	P63	T1	State	42% (MV27)	1.1			80 million HUF/vehicle				from 2020		
	4.	Accessibility	Accessibility for the pavements between the accessible bus stops and the workplaces	V1	P32		Loc. Govt.	62% (MV28)	6.5	2 million HUF/bus stop								until 2030
	5.	Passenger information at stops	Installation of real-time, digital passenger information boards at 10 stops	K2	P34		Loc. Govt.	52% (MV3)	14	5 million HUF/bus stop							until 2023	

V. Uniformisation of cycle track network connections	**1.**	Implementation of cycle route network	Continental–Szeged Industrial and Logistics Centre–Szatymaz junction cycle track construction	V3	P20	K7	Loc. Govt.	42% (MV26,27)	2.6			50–100 million HUF					until 2023	
	2.	City cycle routes	Napos Rd.– Régi Posta St., Vértói St.– Vinkler Rd., Zápor St., Zsámbokréti Ln. – until 502nd Street, with a new cycle track in the proximity of ELI	V3 V3 V3 V3	P24	K7	Loc. Govt.	45% (MV26,27)	6.5			50–100 million HUF					until 2023	
	3.	Rendering the urban cycle routes securely to junctions	Dorozsmai Road	V3	P23	K7	Loc. Govt.	42% (MV26,27)	6.2		10 million HUF						until 2023	
	4.	New crossing at Izabella Bridge	Safe crossing along the bridge, new traffic coordination system installation	V3		K7	Loc. Govt.	42% (MV26,27)				50 million HUF						until 2030
	5.	Cycle route along Zsombói Road	Construction of new cycle route	V3	P51	K7	State	29% (MV26,27)				50–100 million HUF						until 2030
	6.	Cycle route along the Sándorfalva–Szatymaz–Szeged route	Construction of new cycle route	V3		K7	State	33% (MV26,27)				50–100 million HUF						until 2030
VI. Making the bicycle service more attractive	**1.**	Bicycle parking stations at companies	Installation, expansion, modernisation, sheltering and security	V3		K1	Companies	81% (MV28) 84% (MT 22)									until 2023	
	2.	Changing rooms and shower facilities for bicycle users at companies	New facility or involvement of existing facility for this purpose	V3		K4	Companies	72% (MV28) 95% (MT 23)									until 2023	
	3.	Encouragement of employees to purchase bicycles for commuting	Employee contract for bicycle usage, discount purchase	V3		K5	Companies	42% (MV28)									until 2023	
	4.	Handing over company-owned bicycles for employee use	Conditions of handover for use, contract. Company or leased bicycle	V3		K3	Companies	27% (MV28)									until 2023	
	5.	Public company bicycle parking station for occasional use	Elaboration of the usage conditions	V3		K3	Companies	20% (MV28)									until 2023	
	6.	Bicycle repair service	Deployment at companies or a consolidated or mobile service. Preparation of conditions	V3		K9	Companies	22% (MV3)									until 2023	

	7.	Bonus system for bicycle usage	A set of conditions incentivising the use of bicycle for commuting	V3		K6	Companies	76% (MV28)								until 2023	
	8.	Electric chargers	Installation of 2-8 chargers at each bicycle parking station	V3			Companies, Loc. Govt.									until 2023	
VII.Improved road connections	**1.**	ELI transport connections	Vértói Rd.–Vinkler Rd.–Zápor St, new road connection to the eastern part of the city, upon expansion of the trolleybus service	V4	P7		Loc. Govt.	30% (MV27)	1.9					3 billion HUF			until 2023	
	2.	Upgrading of National Road no. 5	2 × 2 lanes between the M43 motorway and the ELI junction, in order to designate separate bus lane	V4	P68		State	34% (MV26)	4.6					1.5 billion HUF				until 2030
	3.	Improved regional road network and bus transportation opportunities	Szatymaz–Sándorfalva–Algyő–Kiskunmajsa–Szeged	V4 V4	P64 P65		State State	31% (MV26)						2.7 billion HUF 2 billion HUF				until 2030
	4.	City road programme	Reconstruction of Fonógyári Road	V4	P4		State	35% (MV26)						1.7 billion HUF			until 2023	
VIII.Energy-saving driving services	**1.**	Modernisation and security upgrading of existing parking facilities	Conditioning, registered spaces, occupancy indication and anti-theft protection	V4 M3		St1	Companies	44% (MT21)								cont.		
	2.	Rationalised design of car parks	Rationalised and controlled occupancy management system at car parks. Outdoor and indoor car parks	V4		St1	Companies	95% (MT17)								cont.		
	3.	Registered priority space at car parks for car sharing and car pooling	Priority location in the car park	V4 M3		St1 A2	Companies	59% (MV28)								cont.		
	4.	Electric chargers in car parks. Installation of E-chargers	Scheduled steps to install zero-emission parking spaces and E-charging points Installation of E-chargers Advance booking options	V4 M3		St1	Companies	2% (MT18 – all car parks) 4% (MT18)								cont.		
	5.	Rendering company vehicle stock multi purpose	Elaboration of a multi-purpose daytime car sharing and booking system	V4 M3		St4	Companies	38% (MV28)								until 2023		

IX. Knowledge base for environmental consciousness	**1.**	Promotion of public transport	teaching materials and mobile workshops	K1	P37	T1	Local Government, Szeged Transport Ltd.	9% (MV16)	358							from 2020		
	2.	Promotion of alternative modes of transport	teaching materials and mobile workshops	K	P37	T1 K7	Loc. Govt.		358							from 2020		
	3.	Promotion of car sharing and car pooling		K1	P54	A2	Loc. Govt.	59% (MV28)								from 2020		
	4.	The deepening of the service provision philosophy among community operators (Szeged Transport Ltd and Volánbusz)	organised education and training	K1	P54		Szeged Transport Ltd. and Volánbusz	5% (MT11)								from 2020		
	5.	Environmentally conscious work. Reducing mobility needs	Teleworking, work from home, part-time employment, flexible working hours	M2		St2	Companies	46% (MV28)								cont.		
	6.	Environmentally conscious corporate strategy	Strategy creation and training of employees	M2		K2 GY1 T1	Companies									from 2020		
X.Support of passenger decisions and selection of means of transport.Digital tools	**1.**	Real time traffic information	Public transport, bicycle, pedestrian, micromobility application, route, time, cost	K2 M3	P38	K7	Loc. Govt.	78% (MV3)								cont.		
	2.	Real-time route planner	Optimal route and means planner application, route, means, cost	K2 M3	P38		Loc. Govt.	49% (MV3)								cont.		
	3.	Parking space finder	Search system application	K2 M3	P38		Loc. Govt.	49% (MV3)									until 2023	

Grouping of the actions from the perspective of professional correlations

In the table, the II.City bus service, III. Development of trolleybus service and IV. Making the bicycle service more attractive. Upon preparation of the table, we moved from simple actions to more complicated ones.

Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-3. Actions taking place at the area examined and the origin of the actions related to them.**

Action				Connections			Compe-tencies	Mobility plan index		Cost						Phase		
Group	Number	Name	Contents	Objectives	SUMP	CO_2MM			Th	<10m Ft	10–50 million HUF	50–100 million HUF	100 million HUF–1 billion HUF	1–10 billion HUF	10 billion HUF <	from 2020	until 2023	until 2030
I.New workplaces	1.	ELI Science Park	New workplaces and new innovation in the northern industrial area. Transport is a development extending to every branch	M1	P50		key		2.7			900 million HUF					until 2023	
II.City bus service	1.	Multi-directional bus accessibility of the industrial area	Transfer-free commuting.Directions:districts of Tarján, Északi város, Makkos, Újszeged, Kiskundorozsma, Rókus, Mars tér, Szőreg, Tápé and Odessza	V1		T1	Loc. Govt.	33% (MV26)		t	10–50 million HUF						until 2023	
	2.	Procurement of electric city buses	15-15-15 units of zero-emission buses until 2030	V2	P8	T1	State	43% (MV27)	1.3				150 million HUF/vehicle				from 2022	
	3.	Demand driven transport	Targeted midibus service between kindergarten and workplace, operated with a booking system	V1		T4	Loc. Govt.	16% (MV27)			10–50 million HUF						until 2023	
	4.	Linking poorly serviced areas into the bus network	Transfer-free commuting	V1	P36	T4	Loc. Govt.	21% (MV26, 27)	74.2			50–100 million HUF					until 2023	
	5.	Acceleration of bus transport	Implementation of a priority system by installing bus lanes and transit signal priority.Rókus, Izabella, Dorozsmai Road and Budapesti Road	M1	P1		Loc. Govt.	33% (MV26)	12		10–50 million HUF						until 2023	
	6.	New stop	Better accessibility for Szeged Industrial and Logistics Centre, Back B. Street	V1	P36	T4	Loc. Govt. (companies)		74.2	2 million HUF/stop							until 2023	
	7.	Modernisation of the city bus stops	Implementation of higher stop elevations and installation of bus stop shelters at 25 stops	V1	P19		Loc. Govt.	13% (MV16)	4	2 million HUF/stop							until 2023	
	8.	Accessibility	Accessibility for the pavements between the accessible bus stops and the workplaces	V1	P32		Loc. Govt.	62% (MV28)	6.5	2 million HUF/bus stop								until 2030

	9.	Passenger information at stops	Installation of real-time, digital passenger information boards at 10 stops	K2	P34		Loc. Govt.	52% (MV3)	14	5 million HUF/bus stop							until 2023	
	10.	Upgrading of National Road no. 5	2 × 2 lanes between the M43 motorway and the ELI junction, in order to designate separate bus lane	V4	P68		State	34% (MV26)	4.6					1.5 billion HUF				until 2030
III. Expansion of the trolleybus service	**1.**	Trolleybus line extension towards ELI	Driverless trolleybus operation along the Vértói Rd.–Zsámbokréti Ln.–Vinkler Rd.–Zápor St.–Budapesti Rd. section. New service direction from the housing estate.	V1-V2	P5	T1	Loc. Govt.	30% (MV27)	1.3									until 2030
	2.	Development of the trolleybus fleet	construction of + 5 trolleybuses	V2	P2	T1	Loc. Govt.	47% (MV27); 27% (MT12)	1.3				150 million HUF/vehicle				until 2023	
	3.	ELI transport connections	Vértói Rd.–Vinkler Rd.–Zápor St, new road connection to the eastern part of the city, upon expansion of the trolleybus service	V4	P7		Loc. Govt.	30% (MV27)	1.9					3 billion HUF			until 2023	
IV. Making the bicycle service more attractive	**1.**	Implementation of cycle route network	Continental–Szeged Industrial and Logistics Centre–Szatymaz junction cycle track construction	V3	P20	K7	Loc. Govt.	42% (MV27,26)	2.6			50–100 million HUF					until 2023	
	2.	City cycle routes	Napos Rd.– Régi Posta St., Vértói St.– Vinkler Rd., Zápor St., Zsámbokréti Ln. – until 502nd Street, with a new cycle track in the proximity of ELI	V3	P24	K7	Loc. Govt.	45% (MV26,27)	6.5			50–100 million HUF					until 2023	
	3.	Rendering the urban cycle routes securely to junctions	Dorozsmai Road	V3	P23	K7	Loc. Govt.	42% (MV26, 27)	6.2		10 million HUF						until 2023	
	4.	New crossing at Izabella Bridge	Safe crossing along the bridge, new traffic coordination system installation	V3		K7	Loc. Govt.	42% (MV26, 27)				50 million HUF						until 2030
	5.	Bicycle parking stations at companies	Installation, expansion, modernisation, sheltering and security	V3		K1	Companies	81% (MV28)									until 2023	
	6.	Changing rooms and shower facilities for bicycle users at companies	New facility or involvement of existing facility for this purpose	V3		K4	Companies	72% (MV28)									until 2023	

	7.	Encouragement of employees to purchase bicycles for commuting	Employee contract for bicycle usage, discount purchase	V3		K5	Companies	42% (MV28)									until 2023	
	8.	Handing over company-owned bicycles for employee use	Conditions of handover for use, contract. Company or leased bicycle	V3		K3	Companies	27% (MV28)									until 2023	
	9.	Public company bicycle parking station for occasional use	Elaboration of the usage conditions	V3		K3	Companies	20% (MV28)									until 2023	
IV. Making the bicycle service more attractive	**10.**	Bicycle repair service	Deployment at companies or a consolidated or mobile service. Preparation of conditions	V3		K9	Companies	22%									until 2023	
	11.	Electric chargers	Installation of 2-8 chargers at each bicycle parking station	V3			Companies, Loc. Govt.										until 2023	
	12.	Cycle route along Zsombói Road	Construction of new cycle route	V3	P51	K7	State	29% (MV26,27)										until 2030
	13.	Cycle route along the Sándorfalva–Szatymaz–Szeged route	Construction of new cycle route	V3		K7	State	33% (MV26, 27)										until 2030
V. Energy-saving driving services	**1.**	Modernisation and security upgrading of existing parking facilities	Conditioning, registered spaces, occupancy indication and anti-theft protection	V4		St1	Companies	44% (MT21)									cont.		
	2.	Rationalised design of car parks	Rationalised and controlled occupancy management system at car parks. Outdoor and indoor car parks	V4		St1	Companies	98% (MT17)											
	3.	Registered priority space at car parks for car sharing and car pooling	Priority location in the car park	V4 M3		St1 A2	Companies	59% (MV28)									cont.		
	4.	Electric chargers in car parks. Installation of E-chargers	Scheduled steps to install zero-emission parking spaces and E-charging points Installation of E-chargers Advance booking options	V4 M3		St1	companies	2% – Parking for all companies; 4% – Corporate car park; are you planning to install chargers? (MT18)									cont.		

VI. Knowledge base for environmental consciousness	**1.**	Promotion of public transport	teaching materials and mobile workshops	K1	P37	T1	Local Government, Szeged Transport Ltd.	9% (MV16)	358		10 million HUF					from 2020		
	2.	Promotion of alternative modes of transport	teaching materials and mobile workshops	K	P37	T1	Loc. Govt.		358		10 million HUF					from 2020		

VII. Regional bus service	**1.**	Implementation of a regional bus network fitting to needs better	From the municipalities with the largest traffic,Sándorfalva, Szatymaz, Zsombó, Bordány, Üllés, Kistelek, Domaszék and Makó	V1			State (Loc. Govt.)	31% (MV23,26)			10–50 million HUF						until 2023	
	2.	Procurement of low-emission local buses	Procurement of 20 buses by 2030	V2	P63	T1	State	42% (MV27)	1.1			80 million HUF/vehicle				from 2020		
	3.	Modernisation of the suburban bus stops	Implementation of higher stop elevations, installation of bus stop shelters and pavement connection at 20 stops	V1	P73		State	18% (MV16)	4.8	5 million HUF/stop							until 2023	
	4.	Improved regional road network and bus transportation opportunities	Szatymaz–Sándorfalva–Algyő–Kiskunmajsa–Szeged	V4	P64		state	31% (MV26)						2.7 billion HUF				until 2030

Table for checking correlations

Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-4. Correlation between tables**

Action		Table 6.2.		Table 6.3.	
Name	**Contents**	**Group**	**No.**	**Group**	**No.**
ELI Science Park	New workplaces and new innovation in the northern industrial area. Transport is a development extending to every branch	*I.Citywide actions*	**3.**	*I.New workplaces*	**1.**
Multi-directional bus accessibility of the industrial area	Transfer-free commuting.Directions:districts of Tarján, Északi város, Makkos, Újszeged, Kiskundorozsma, Rókus, Mars tér, Szőreg, Tápé and Odessza	*III.Convenient public transport service*	**1.**	*II.City bus service*	**1.**
Procurement of electric city buses	15-15-15 units of zero-emission buses until 2030	*IV.Development of public transport infrastructure*	**2.**	*II.City bus service*	**2.**
Demand driven transport	Targeted midibus service between kindergarten and workplace, operated with a booking system	*III.Convenient public transport service*	**5.**	*II.City bus service*	**3.**
Linking poorly serviced areas into the bus network	Transfer-free commuting	*III.Convenient public transport service*	**7.**	*II.City bus service*	**4.**
Acceleration of bus transport	Implementation of a priority system by installing bus lanes and transit signal priority.Rókus, Izabella, Dorozsmai Road and Budapesti Road	*III.Convenient public transport service*	**9.**	*II.City bus service*	**5.**
New stop	Better accessibility for Szeged Industrial and Logistics Centre, Back B. Street	*III.Convenient public transport service*	**8.**	*II.City bus service*	**6.**
Modernisation of the city bus stops	Implementation of higher stop elevations and installation of bus stop shelters at 25 stops	*III.Convenient public transport service*	**11.**	*II.City bus service*	**7.**
Accessibility	Accessibility for the pavements between the accessible bus stops and the workplaces	*III.Convenient public transport service*	**4.**	*II.City bus service*	**8.**
Passenger information at stops	Installation of real-time, digital passenger information boards at 10 stops	*IV.Development of public transport infrastructure*	**5.**	*II.City bus service*	**9.**
Upgrading of National Road no. 5	2 × 2 lanes between the M43 motorway and the ELI junction, in order to designate separate bus lane	*IV.Development of public transport infrastructure*	**2.**	*II.City bus service*	**10.**
Trolleybus line extension towards ELI	Driverless trolleybus operation along the Vértói Rd.–Zsámbokréti Ln.–Vinkler Rd.–Zápor St.–Budapesti Rd. section.New service direction from the housing estate.	*III.Convenient public transport service*	**2.**	*III.Expansion of the trolleybus service*	**1.**
Development of the trolleybus fleet	construction of + 5 trolleybuses	*IV.Development of public transport infrastructure*	**1.**	*III.Expansion of the trolleybus service*	**2.**

ELI transport connections	Vértói Rd.–Vinkler Rd.–Zápor St, new road connection to the eastern part of the city, upon expansion of the trolleybus service	*VII.Improved road connections*	**1.**	*III.Expansion of the trolleybus service*	**3.**
Implementation of cycle route network	Continental–Szeged Industrial and Logistics Centre–Szatymaz junction cycle track construction	*V.Uniformisation of cycle track network connections*	**1.**	*IV.Making the bicycle service more attractive*	**1.**
City cycle routes	Napos Rd.– Régi Posta St., Vértói St.– Vinkler Rd., Zápor St., Zsámbokréti Ln. – until 502nd Street, with a new cycle track in the proximity of ELI	*V.Uniformisation of cycle track network connections*	**2.**	*IV.Making the bicycle service more attractive*	**2.**
Rendering the urban cycle routes securely to junctions	Dorozsmai Road	*V.Uniformisation of cycle track network connections*	**3.**	*IV.Making the bicycle service more attractive*	**3.**
New crossing at Izabella Bridge	Safe crossing along the bridge, new traffic coordination system installation	*V.Uniformisation of cycle track network connections*	**4.**	*IV.Making the bicycle service more attractive*	**4.**
Bicycle parking stations at companies	Installation, expansion, modernisation, sheltering and security	*VI.Making the bicycle service more attractive*	**1.**	*IV.Making the bicycle service more attractive*	**5.**
Changing rooms and shower facilities for bicycle users at companies	New facility or involvement of existing facility for this purpose	*VI.Making the bicycle service more attractive*	**2.**	*IV.Making the bicycle service more attractive*	**6.**
Encouragement of employees to purchase bicycles for commuting	Employee contract for bicycle usage, discount purchase	*VI.Making the bicycle service more attractive*	**3.**	*IV.Making the bicycle service more attractive*	**7.**
Handing over company-owned bicycles for employee use	Conditions of handover for use, contract.Company or leased bicycle	*VI.Making the bicycle service more attractive*	**4.**	*IV.Making the bicycle service more attractive*	**8.**
Public company bicycle parking station for occasional use	Elaboration of the usage conditions	*VI.Making the bicycle service more attractive*	**5.**	*IV.Making the bicycle service more attractive*	**9.**
Bicycle repair service	Deployment at companies or a consolidated or mobile service.Preparation of conditions	*VI.Making the bicycle service more attractive*	**6.**	*IV.Making the bicycle service more attractive*	**10.**
Electric chargers	Installation of 2-8 chargers at each bicycle parking station	*VI.Making the bicycle service more attractive*	**8.**	*IV.Making the bicycle service more attractive*	**11.**
Cycle route along Zsombói Road	Construction of new cycle route	*V.Uniformisation of cycle track network connections*	**5.**	*IV.Making the bicycle service more attractive*	**12.**
Cycle route along the Sándorfalva–Szatymaz–Szeged route	Construction of new cycle route	*V.Uniformisation of cycle track network connections*	**6.**	*IV.Making the bicycle service more attractive*	**13.**
Modernisation and security upgrading of existing parking facilities	Conditioning, registered spaces, occupancy indication and anti-theft protection	*VIII.Energy-saving driving services*	**1.**	*V.Energy-saving driving services*	**1.**
Rationalised design of car parks	Rationalised and controlled occupancy management system at car parks.Outdoor and indoor car parks	*VIII.Energy-saving driving services*	**2.**	*V.Energy-saving driving services*	**2.**
Registered priority space at car parks for car sharing and car pooling	Priority location in the car park	*VIII.Energy-saving driving services*	**3.**	*V.Energy-saving driving services*	**3.**
Electric chargers in car parks.Installation of E-chargers	Scheduled steps to install zero-emission parking spaces and E-charging points Installation of E-chargers Advance booking options	*VIII.Energy-saving driving services*	**4.**	*V.Energy-saving driving services*	**4.**
Promotion of public transport	teaching materials and mobile workshops	*IX.Knowledge base for environmental consciousness*	**1.**	*VI.Knowledge base for environmental consciousness*	**1.**
Promotion of alternative modes of transport	teaching materials and mobile workshops	*IX.Knowledge base for environmental consciousness*	**2.**	*VI.Knowledge base for environmental consciousness*	**2.**

Implementation of a regional bus network fitting to needs better	From the municipalities with the largest traffic.Sándorfalva, Szatymaz, Zsombó, Bordány, Üllés, Kistelek, Domaszék and Makó	*III.Convenient public transport service*	**12.**	*VII.Regional bus service*	**1.**
Procurement of low-emission local buses	Procurement of 20 buses by 2030	*IV.Development of public transport infrastructure*	**3.**	*VII.Regional bus service*	**2.**
Modernisation of the suburban bus stops	Implementation of higher stop elevations, installation of bus stop shelters and pavement connection at 20 stops	*III.Convenient public transport service*	**13.**	*VII.Regional bus service*	**3.**
Improved regional road network and bus transportation opportunities	Szatymaz–Sándorfalva–Algyő–Kiskunmajsa–Szeged	*VII.Improved road connections*	**3.**	*VII.Regional bus service*	**4.**

Related measures defined in connection with the key measures – Tram-train and the New southern road bridge on Tisza river

Identified measures for the Tram-train and for the southern road bridge on Tisza whose detailed elaboration is due in the near future.

Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-5. Specific actions corresponding to city-scale measures**

Action				Connections			Competence	Mobility plan index		Cost						Phase		
Group	**Number**	**Name**	**Contents**	**Objectives**	**SUMP**	**CO_2MM**			**Th**	**<10m Ft**	**10–50 million HUF**	**50–100 million HUF**	**100 million HUF–1 billion HUF**	**1–10 billion HUF**	**10 billion HUF <**	**2020**	**until 2023**	**until 2030**
I.Citywide actions	**1.**	**Tram-train**	A new transport link to be constructed between Hódmezővásárhely and Szeged (zero emissions in the city)	M1-M4	P41		key State – Loc. Govt.		0.8						10 billion HUF<		until 2023	
		Details of the contents of the action																
	1.1.	Bus network	Designation of the connection points of the bus network to be modified and the Tram-train, planning the network connections.															
	1.2.	A new connection at Rákus bus stop	Examination of the possibility of a bus terminus at the Rákus railway station Tram-train stop and the designation of the directions for connections.															
	1.3.	Tram-train and demand-driven transport	Evaluation of demand and possibilities for Tram-train and demand-driven bus network connections.															
	1.4.	Cycle route network connections	Tram-train connections with the cycle route network, storage stations, especially at the Rákus stop.															
	1.5.	Procurement of electric buses	Procurement of electric buses in Szeged and their connection to the Tram-train and the public transport of the northern industrial area.															

Action				Connections			Competence	Mobility plan index		Cost						Phase		
Group	Number	Name	Contents	Objectives	SUMP	CO_2MM			Th	<10m Ft	10–50 million HUF	50–100 million HUF	100 million HUF–1 billion HUF	1–10 billion HUF	10 billion HUF <	2020	until 2023	until 2030
I.Citywide actions	2.	**Southern road bridge across Tisza river, new railway bridge**	A new element of the city's north-south connectivity, reducing traffic in the city centre, with new suburban fixed rail transport towards Makó.Long distance rail transport	M1-V4	P42-43 P61		key State		2.6 1.6						10 billion HUF<			until 2030
	Details of the contents of the action																	
	2.1.	Public road network developments	Construction of the road connections to the bridge, of junctions and connections to the existing network on the two banks of Tisza river.															
	2.2.	Bus network	The effect of the bridge on the bus network.New connections between Újszeged-Northern industrial area, Újszeged agglomeration and the City Centre Northern industrial area.															
	2.3.	Cycle route network connections	Incorporation of the bridge into the cycle track network.															

Grouping of actions with respect to competence

Three groups may be formed: According to the levels of competence of the Local government, the State and the Companies. By the principle of progressiveness, we progressed from simple to more complex within the group.

Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-6. Local governmental actions in order of significance**

Action		Connections			Competence	Mobility plan index		Cost						Phase		
Name	Contents	Objectives	SUMP	CO_2MM			Th	<10m Ft	10–50 million HUF	50–100 million HUF	100 million HUF–1 billion HUF	1–10 billion HUF	10 billion HUF <	2020	until 2023	2030
Timetable synchronisation	Current project of the Ministry of Innovation and Technology and the Institute for Transport Sciences. Synchronisation of long-distance and local timetables. Assertion of the interests of the parties concerned is required	M1-V1	(P54)	T1	State – Loc. Govt.	|||UNTRANSLATED_CONTENT_START||44% (MV26)|||UNTR	76.5			50 million HUF					until 2023	

Promotion of public transport	teaching materials and mobile workshops	K1	P37	T1	Local Government, Szeged Transport Ltd.	9% (MV16)	358		10 million HUF					from 2020		
Promotion of alternative modes of transport	teaching materials and mobile workshops	K	P37	T1 K7	Loc. Govt.		358		10 million HUF					from 2020		
Multi-directional bus accessibility of the industrial area	Transfer-free commuting.Directions:districts of Tarján, Északi város, Makkos, Újszeged, Kiskundorozsma, Rókus, Mars tér, Szőreg, Tápé and Odessza	V1		T1	Loc. Govt.	33% (MV26)			10–50 million HUF						until 2023	
New stop	Better accessibility for Szeged Industrial and Logistics Centre, Back B. Street	V1	P36	T4	Loc. Govt. (companies)		74.2	2 million HUF/stop							until 2023	
Acceleration of bus transport	Implementation of a priority system by installing bus lanes and transit signal priority. Rókus, Izabella, Dorozsmai Road and Budapesti Road	M1	P1		OK	33% (MV26)	12		10–50 million HUF						until 2023	
School bus	School bus service to replace parents taking children to school by car	M4			Loc. Govt. (state)	19%			10–50 million HUF						until 2023	
Modernisation of the city bus stops	Implementation of higher stop elevations and installation of bus stop shelters at 25 stops	V1	P19		Loc. Govt.	13% (MV16)	4	2 million HUF/stop							until 2023	
Traffic-dependent acceleration of bus transit	Peak time priority for buses to avoid congestion.Kossuth L. St.	V1	P39		Loc. Govt.	28% (MV23,26)	67		10–50 million HUF						until 2023	
Passenger information at stops	Installation of real-time, digital passenger information boards at 10 stops	K2	P34		Loc. Govt.	52% (MV3)	14	5 million HUF/stop							until 2023	
Demand driven transport	Targeted midibus service between kindergarten and workplace, operated with a booking system	V1		T4	Loc. Govt.	16% (MV27)			10–50 million HUF						until 2023	

Electric chargers	Installation of 2-8 chargers at each bicycle parking station	V3			Companies, Loc. Govt.										until 2023	
Development of the trolleybus fleet	construction of + 5 trolleybuses	V2	P2	T1	Loc. Govt.	47% (MV27); 27% (MT12)	1.3				150 million HUF/vehicle				until 2023	
ELI transport connections	Vértói Rd.–Vinkler Rd.–Zápor St, new road connection to the eastern part of the city, upon expansion of the trolleybus service	V4	P7		Loc. Govt.	30% (MV27)	1.9					3 billion HUF			until 2023	
Trolleybus line extension towards ELI	Driverless trolleybus operation along the Vértói Rd.–Zsámbokréti Ln.–Vinkler Rd.–Zápor St.–Budapesti Rd. section. New service direction from the housing estate.	V1-V2	P5	T1	Loc. Govt.	30% (MV27)	1.3									until 2030
Implementation of cycle route network	Continental–Szeged Industrial and Logistics Centre–Szatymaz junction cycle track construction	V3	P20	K7	Loc. Govt.	42% (MV27,26)	2.6			50–100 million HUF					until 2023	
City cycle routes	Napos Rd.– Régi Posta St., Vértói St.– Vinkler Rd., Zápor St., Zsámbokréti Ln. – until 502nd	V3	P24	K7	Loc. Govt.	45% (MV26, 27)	6.5			50–100 million HUF					until 2023	
	Street, with a new cycle track in the proximity of ELI															
Rendering the urban cycle routes securely to junctions	Dorozsmai Road	V3	P23	K7	Loc. Govt.	42% (MV27, 26)	6.2		10 million HUF						until 2023	
Accessibility	Accessibility for the pavements between the accessible bus stops and the workplaces	V1	P32		Loc. Govt.	62% (MV28)	6.5	2. million HUF/stop								until 2030
Joint bicycle and public transport pass	Conditions for incentivising joint pass	M2		K2	Loc. Govt.	15% (MV27)									until 2023	
Promotion of car sharing and car pooling		K1	P54	A2	Loc. Govt.	59% (MV28)								from 2020		
Monitoring	Regular check and evaluation of actions, impact assessments	M1	P25		Loc. Govt.		285		20 million HUF						until 2023	

Societal agreement on transport development	Societal consultation and agreement on tramway line extension and procurement of E-buses	M2		T1	Loc. Govt. (state)	48% (MV27)									until 2023	
Real time traffic information	Public transport, bicycle, pedestrian, micromobility application, route, time, cost	K2	P38	K7	Loc. Govt.	78%								cont.		
Real-time route planner	Optimal route and means planner application, route, means, cost	K2	P38		Loc. Govt.	49%								cont.		
Rationalisation of the bus network linked to the Intermodal Centre	Total transformation by abandoning the area at Mars Square	V1	P48	T1	Loc. Govt.	39% (MV26)	1.3		10–50 million HUF							until 2030
Data repository	Common transport database, traffic model, common urban and suburban database	M1	P25-26		State – Loc. Govt.		285				300 million HUF million HUF					until 2030
Pay as you go bicycle and public transport pass	A fee structure that takes the level of usage at the launch of the E-ticketing system into account	M2		K2	state, Loc. Govt.	19% (MV27)										until 2030
Kiskundorozsma mainline railway station – Shuttle bus link to workplaces.New shuttle bus transfer line	Morning and afternoon shuttle service. synchronised with the arrival times of the trains. Opening a new exit from the station towards the Délép area.	V1	P78	T4	Loc. Govt. (companies, state)	24% (MV27)	4.8		10–50 million HUF							until 2030
Parking space finder	Search system application	K2	P38		Loc. Govt.	49%									until 2023	
Linking poorly serviced areas into the bus network	Transfer-free commuting	V1	P36	T4	Loc. Govt.	21% (MV26,27)	74.2			50–100 million HUF					until 2023	

Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-7. Government actions in order of significance**

Action		Connections			Compe-tencies	Mobility plan index		Cost						Phase		
Name	**Contents**	**Objectives**	**SUMP**	**CO_2MM**			**Th**	**<10m Ft**	**10–50 million HUF**	**50–100 million HUF**	**100 million HUF–1 billion HUF**	**1–10 billion HUF**	**10 billion HUF <**	**from 2020**	**until 2023**	**until 2030**
City road programme	Reconstruction of Fonógyári Road	V4	P4		State	35%						1.7 billion HUF			until 2023	
Implementation of a regional bus network fitting to needs better	From the municipalities with the largest traffic Sándorfalva, Szatymaz, Zsombó, Bordány, Üllés, Kistelek, Domaszék and Makó	V1			State (Loc. Govt.)	31% (MV26)			10–50 million HUF						until 2023	
Modernisation of the suburban bus stops	Implementation of higher stop elevations, installation of bus stop shelters and pavement connection at 20 stops	V1	P73		State	18% (MV16)	4.8	5 million HUF/stop							until 2023	
Procurement of electric city buses	15-15-15 units of zero-emission buses until 2030	V2	P8	T1	State	43% (MV27)	1.3				150 million HUF/vehicle				from 2022	
Procurement of low-emission local buses	Procurement of 20 buses by 2030	V2	P63	T1	State	42% (MV27)	1.1			80 million HUF/vehicle				from 2020		
Cycle route along Zsombói Road	Construction of new cycle route	V3	P51	K7	State	29% (MV26)				50–100 million HUF						until 2030
Cycle route along the Sándorfalva–Szatymaz–Szeged route	Construction of new cycle route	V3		K7	State	33% (MV26)				50–100 million HUF						until 2030
Upgrading of National Road no. 5	2 × 2 lanes between the M43 motorway and the ELI junction, in order to designate separate bus lane	V4	P68		State	34% (MV27)	4.6					1.5 billion HUF				until 2030
Improved regional road network and bus transportation opportunities	Szatymaz–Sándorfalva–Algyő–Kiskunmajsa–Szeged	V4	P64		State	31% (MV26)						2.7 billion HUF				until 2030

Table Fehler! Kein Text mit angegebener Formatvorlage im Dokument.**-8. The companies' actions in order of significance**

Action		Connections			Compe-tencies	Mobility plan index		Cost						Phase		
Name	**Contents**	**Objectives**	**SUMP**	**CO_2MM**			**Th**	**<10m Ft**	**10–50 million HUF**	**50–100 million HUF**	**100 million HUF–1 billion HUF**	**1–10 billion HUF**	**10 billion HUF <**	**from 2020**	**until 2023**	**until 2030**
Environmentally conscious corporate strategy	Strategy creation and training of employees	M2		K2 GY1 T1	Companies											
Pass contribution for public transport	Companies should wholly or partly pay for the public transport passes	M1		T3	Companies	37% (MV26)										
Electric chargers	Installation of 2-8 chargers at each bicycle parking station	V3			Companies, Loc. Govt.										until 2023	
Bicycle parking stations at companies	Installation, expansion, modernisation, sheltering and security	V3		K1	Companies	81% 84% (MV28)									until 2023	
Changing rooms and shower facilities for bicycle users at companies	New facility or involvement of existing facility for this purpose	V3		K4	Companies	72% 95% (MV28)									until 2023	
Encouragement of employees to purchase bicycles for commuting	Employee contract for bicycle usage, discount purchase	V3		K5	Companies	42% (MV28)									until 2023	
Bonus system for bicycle usage	A set of conditions incentivising the use of bicycle for commuting	V3		K6	Companies	76% (MV28)									until 2023	
Public company bicycle parking station for occasional use	Elaboration of the usage conditions	V3		K3	Companies	20% (MV28)									until 2023	
Bicycle repair service	Deployment at companies or a consolidated or mobile service. Preparation of conditions	V3		K9	Companies	22%									until 2023	
Handing over company-owned bicycles for employee use	Conditions of handover for use, contract. Company or leased bicycle	V3		K3	Companies	27% (MV28)									until 2023	

Modernisation and security upgrading of existing parking facilities	Conditioning, registered spaces, occupancy indication and anti-theft protection	V4		St1	Companies	44% (MT21)								cont.		
Rationalised design of car parks	Rationalised and controlled occupancy management system at car parks. Outdoor and indoor car parks	V4		St1	Companies	95%										
Registered priority space at car parks for car sharing and car pooling	Priority location in the car park	V4 M3		St1 A2	Companies	59% |||UNTRANSLATED_CONTENT_START|||(MV28)|||UNTRANSLATED_CONTENT_END|||								cont.		
Electric chargers in car parks. Installation of E-chargers	Scheduled steps to install zero-emission parking spaces and E-charging points Installation of E-chargers Advance booking options	V4 M3		St1	Companies	2% – Parking for all companies; 4% – Corporate car park; are you planning to install chargers ? (MT18)								cont.		
Rendering company vehicle stock multi purpose	Elaboration of a multi-purpose daytime car sharing and booking system	V4 M3		St4	Companies	34% (MV28)									until 2023	
Environmentally conscious work. Reducing mobility needs	Teleworking, work from home, part-time employment, flexible working hours	M2		St2	Companies	46% (MV8)								cont.		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