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1. Introduction

Effective planning of the transport system and the promotion of sustainable mobility in the city of Osijek require a systematic focus on three key economic centres with extremely pronounced transport demand: the business zones Nemetin, S cesta and IT Park. These three zones represent the key development areas of the city, with expected growth in employment, logistics activities and daily workforce migrations. The forecast of future development therefore does not view transport in isolation, but in the direct context of land use, urban growth and planned development projects, because the spatial organization and functional structure of the city directly generate traffic flows.

1.1. Territorial context and key challenges

This Action Plan encompasses three territorially and functionally distinct zones that share one common, highly unfavourable challenge: an extreme dependence on personal automobiles, which in all of them exceeds 95 percent, alongside a negligible share of public and bicycle transport. On the western entrance to the city is the business zone S cesta (49.13 ha), which houses strong attractors like the Avenue Mall shopping centre and the Economic Center. Although excellently connected to the bypass, the zone has access by public transport solely via L.B. Mandić street, which is why 95.86% of users arrive by car. A similar paradox is recorded by the IT Park, a highly specialized entrepreneurial area located in the very urban centre of the city. Despite its small area (4,000 m2), proximity to the tram network and the fact that companies offer flexible hybrid work models that reduce daily fluctuations in traffic, the personal automobile is still used by as many as 95.90% of employees. On the other hand, the business zone Nemetin (92.65 ha) is spatially completely separated in the far eastern part of the city. It is intended for heavy manufacturing, working hours are organized in shifts, and working from home is not possible, which creates massive concentrations of workers during peak hours. Dependence on automobiles here reaches the highest 98.45%, and bicycle traffic does not exist at all because no pedestrian-bicycle infrastructure leads to the zone. Field research clearly shows that specific infrastructural deficiencies in each of the zones directly disable sustainable mobility.

1.2. Process of developing the Action Plan

The process of drafting this document is based on a systematic, multi-month and data-driven approach that integrated the results of territorial analysis, advanced computer modelling and cooperation with stakeholders. The development began with a detailed revision of strategic documents. The identification of key bottlenecks was carried out through three complementary research pillars. The first pillar consisted of a comprehensive survey on mobility habits conducted on a sample of 145 respondents in the wider city area for an in-depth understanding of movement patterns. The second pillar encompassed systematic field counting of road traffic at a total of 22 key locations, while the third consisted of analysing institutional data, including the e-ticketing system databases of the company GPP d.o.o. and official statistics of HŽ Passenger Transport. Representatives of the City of Osijek, operators of public and alternative transport, Hrvatske ceste, and 40 employees from 39 companies within the observed zones were directly involved in this partnership process. They actively participated in defining and validating future scenarios in the PTV Visum generated transport model for the horizons of 2027 and 2037. The entire process was concluded with the organization of a mandatory workshop where the Action Plan Canvas was presented and jointly validated, and deadlines, distribution of responsibilities and necessary financial resources were agreed upon.

1.3. Overview of the Action Plan

This Action Plan contains an integrated package of three complementary measures of sustainable mobility that are designed to achieve a maximum synergistic effect on reducing dependence on personal automobiles. The measures were carefully selected based on simulations from a calibrated traffic model

and are designed so that each action directly responds to the identified shortcomings of each individual zone.

The first measure, designated as Measure A-01, refers to the reorganization and improvement of bus lines and stops that directly serve all three economic zones. The measure was selected as a direct response to the extremely low shares of public transport use and aims to ensure an adequate, reliable and attractive alternative to the daily use of personal automobiles for arriving at the workplace.

The second measure, designated as Measure A-02, encompasses the improvement and integration of bicycle traffic by combining the targeted construction of missing infrastructure, especially towards the zones S cesta and Nemetin, with the intensive promotion of sustainable mobility. Given the data that as many as 94% of households in Osijek possess at least one bicycle, this measure utilizes this huge natural potential to enable employees to have safe non-motorized movement.

The third measure, designated as Measure A-03, is aimed at establishing a ride-sharing model among employees of the business zones through the cooperation of human resources departments in companies. By increasing the average vehicle occupancy, this action directly combats the extreme dominance of solo drivers in personal automobiles on trips towards the zones Nemetin, S cesta and IT Park.

2. Policy & Strategic Framework

The alignment of the proposed measures of the Action Plan with the overarching development policies and strategic documents of the regional and local level represents the foundation for ensuring professional legitimacy and long-term sustainability of the planned transport solutions. The proposed Action Plan and its three operational measures — Measure A-01 (Reorganization and improvement of the network of bus lines and stops of GPP), Measure A-02 (Arrangement of the pedestrian-bicycle path and promotion of cycling) and Measure A-03 (Introduction of a ride-sharing model - carpooling) — do not function as isolated projects, but form an integrated and networked system that acts synergistically on the sustainable redistribution of trips, reducing dependence on personal automobiles and solving critical transport problems in all three business zones of the City of Osijek (Nemetin, S cesta and IT Park).

In order to prove full compliance with the valid strategic framework, a compliance matrix is presented below, structured according to key thematic areas of sustainable mobility. The matrix connects concrete objectives and measures from the regional Transport Master plan of the functional region of Eastern Croatia up to 2030 and the local Development Strategy of the Urban Agglomeration of Osijek up to 2027 with exact, quantitatively modeled and simulated effects of individual measures of this Action Plan for the short-term (2027) and long-term (2037) development scenario, explicitly emphasizing the contribution of each individual measure.

Strategy / Plan / Policy	Level	Relevant objective or measure	How this Action Plan contributes
Transport Master plan of the functional region of Eastern Croatia up to 2030	*Regional*	*Master plan FRIH:* *• OC.5 Urban and regional mobility: Increase urban and regional mobility by using integrated public transport.* *• OC.7 Redistribution of trips: Improve the modal split in favour of public transport, environmentally friendly and alternative modes of travel.* *• MJ-OM.1 Intermodality of the transport system: By encouraging a modal shift towards active travel (cycling and walking), public transport and/or towards shared mobility schemes.* *• SC-JPP.1 Competitiveness of public passenger transport: Increase the competitiveness of all forms of public transport, including tram transport systems in Osijek.* *• SC-JPP.2 Integration of PPT: Integrate the international/national transport system into local and regional transport systems.*	*Measure A-01 (Reorganization and improvement of the network of bus lines and stops of GPP) directly contributes to the achievement of the objective through the reorganization of the public transport service for all three business zones and the introduction of a new line within the S-cesta zone.*
Transport Master plan of the functional region of Eastern Croatia up to 2030	*Regional*	*Master plan FRIH:* *• MJ-OM.1 Intermodality of the transport system: By encouraging a modal shift towards active travel (cycling and walking), public transport and/or towards shared mobility schemes.* *• MJ-PB.2 Construction of a bicycle*	*Measure A-02 (Arrangement and construction of a pedestrian-bicycle path and promotion of cycling) directly solves the problem of the lack of*

		network in cities: Designing, building new and reconstructing existing paths and calming traffic. *• MJ-PB.3 Construction of supporting bicycle infrastructure: Bicycle parking next to main traffic generators in cities (public institutions, public transport stations, city centres, tourist attractions, etc.), support to companies for the construction of bicycle infrastructure (parking, showers...), e-charging stations for bicycles.* *• MJ-PB.5 Promotion of cycling: Support for non-profit organizations, cooperation with schools, cycling maps, promotion and campaigns.*	*pedestrian-bicycle infrastructure towards the Nemetin zone, the construction of new and improvement of existing inadequate bicycle infrastructure within the S-cesta zone and the promotion of the use of personal and shared bicycles within all zones.*
Development Strategy of the Urban Agglomeration of Osijek up to 2027	*Local*	*Strategy UA Osijek:* *• Specific objective 3.1 Improvement of transport and information connectivity and support for sustainable forms of transport: Specific objective RSO2.8: Investments in the construction or significant upgrade of pedestrian, bicycle, e-bicycle and related infrastructure*	
Transport Master plan of the functional region of Eastern Croatia up to 2030	*Regional*	*Master plan FRIH:* *• MJ-OM.1 Intermodality of the transport system: By encouraging a modal shift towards active travel (cycling and walking), public transport and/or towards shared mobility schemes.* *• SC-UP.1 Innovativeness of urban transport: Increase the share of innovative forms of public transport* *• SC-UP.4 Balance of stationary traffic: Reduce the demand for parking in city centers, reduce the share of street parking in cities, optimize the relationship between supply and demand in the parking system.*	*Measure A-03 (Introduction of a ride-sharing model - carpooling) directly reduces the pressure on the road network and parking capacities of all business zones, especially the IT park zone.*

3. Stakeholder Analysis

The successful implementation of the Action Plan requires active cooperation among key local and regional stakeholders. This chapter identifies the main public and private entities involved in the project. The table below outlines their institutional roles, contact details, and specific responsibilities in executing Measure A-01, Measure A-02, and Measure A-03 across the targeted business zones.

Organisation / Name	Contact details	Sector Public / Private	Role	Involved in Actions
City of Osijek	*Headquarters: Franje Kuhača 9, 31000 Osijek.*	*Public*	*Main pilot stakeholder*	*As the overarching public authority and bearer of the GreenPATH project, the City of Osijek makes strategic decisions, adopts spatial planning documents, and provides the institutional framework. The City is the lead investor in public infrastructure on unclassified roads (A-02), while through its ownership of GPP, it strategically supports the reorganization of public transport lines (A-01) and actively supports and conducts the promotion of carpooling (A-03)*
GPP d.o.o. Osijek	*Headquarters: Cara Hadrijana 3, 31000 Osijek.*	*Public*	*Public transport operator (Bus/Tram/Bike sharing scheme owner)*	*Utility company owned by the City of Osijek. GPP d.o.o. is the direct implementer and operator of public bus and tram transport, in charge of redefining and optimizing timetables and introducing new lines to the business zones (A-01). At the same time, it is the owner of the public bicycle system and conducts logistical and operational management in the field (maintenance of equipment and daily redistribution of bicycles) (A-02).*
SUSTAV JAVNIH BICIKALA d.o.o. (NextBike subsidiary)	*Headquarters: Prisavlje 2, Zagreb*	*Private*	*Bike Sharing system operator*	*A private company that acts as a technology partner and provider of IT/software infrastructure for the public shared*

				bicycle system in Osijek. (A-02).
Hrvatske ceste d.o.o.	*Headquarters: Vončinina 3, 10000 Zagreb*	*Public*	*Technical advisor / Consulted authority*	*HC d.o.o. manages the state road network. Their technical opinion and construction approvals represent a mandatory legal prerequisite (Dependency) for the construction/reconstruction of the pedestrian-bicycle path. (A-02).*
HŽ Passenger Transport d.o.o. (HŽPP)	*Headquarters: Trg kralja Tomislava 11, 10000 Zagreb.*	*Public*	*Public partner*	*State railway operator participating in the integration of passenger transport. It is connected to Measure A-01 through the application and improvement of the joint subscription ticket HŽPP-GPP (IPP card system), which enables workers traveling from the wider region (e.g. Čepin, Tenja, Vladislavci, Đakovo) an easier arrival and transfer to bus lines that drive directly to the zones.*
Gospodarski centar OBŽ d.o.o.	*Headquarters: Gospodarska zona 10, 31000 Osijek.*	*Public*	*Business zone occupant of the S Cesta zone*	*Company owned by the Osijek-Baranja County. As a key stakeholder and trip generator in the S cesta zone, Gospodarski centar d.o.o. is directly interested in the introduction of regular bus lines (A-01) since paying for extraordinary shuttle lines for fair and congress visitors is financially unsustainable for them. Also, it commits to encouraging worker carpooling through promotion (A-03).*
OS Centar d.o.o.	*Headquarters: Gacka ulica bb, 31000 Osijek.*	*Public*	*IT Park zone operator*	*Utility company founded by the City of Osijek for the management and development of the IT Park. OS Centar d.o.o. coordinates the needs of all companies within the IT Park. It is included in Measure A-01*

				(harmonization of timetables), Measure A-02 (installation of supporting equipment/bicycle racks) and Measure A-03 (solving the parking deficit through the model of carpooling promotion).
Inspecto d.o.o.	*Headquarters: Industrijska zona Nemetin, Vukovarska cesta 239, 31000 Osijek.*	*Private*	*Business zone occupant of the Nemetin zone*	*Private company in the Nemetin zone. Inspecto d.o.o. directly participates in Measure A-01 through requests for the harmonization of GPP bus line timetables with office working hours (since the current timetable covers only shift work). It is included in Measure A-03 because a large portion of workers travel from Đakovo, so the company currently organizes shuttle transport by vans itself, and the carpooling model would bring significant financial savings.*
IVER d.o.o.	*Headquarters: Industrijska zona Nemetin, Vukovarska cesta 221, 31000 Osijek.*	*Private*	*Business zone occupant of the Nemetin zone*	*Private company in the Nemetin zone. IVER d.o.o. has its own shuttle transport for workers. IVER d.o.o. is a key user (Beneficiary) that would abolish its own shuttle transport if adequate public bus transport is established (A-01) and if carpooling is established in cooperation with other companies (A-03).*
Association for Nature and Environment Protection Zeleni Osijek	*Headquarters: Opatijska ulica 26f, 31000 Osijek.*	*Citizens association (without owners)*	*Educate and activate citizens in improvement of quality of living through advocacy, promotion and implementation of the ecologically acceptable technologies and sustainable development / home-to-work transport*	*Civil society organization (NGO) that acts as a non-profit advisory and technical partner. It is connected to Measure A-02 and A-03 because it has the professional and technical capacities to conduct promotional, informational and behavioral campaigns for employees in the zones for the purpose of popularizing cycling and carpooling.*

4. Objectives

4.1. General objective of the Action Plan (Overall Objective)

The general objective of this Action Plan is the systematic reduction of the extreme dependence on personal automobiles (which currently amounts to between 95.86% and 98.45%) on daily commutes of employees towards the business zones, through the introduction of an integrated, sustainable and multimodal transport system in Osijek by 2037. By harmonized implementation of three complementary measures, this Action Plan contributes to the redistribution of trips (modal share) in favour of public transport, active micromobility and organized models of shared journeys (carpooling), thereby directly solving local challenges of traffic congestion and the lack of parking space.

4.2. SMART performance indicators by measures

The table below presents concise, quantitatively measurable and modelled SMART performance indicators. Each of the three operational measures of the Action Plan is presented in a separate row, with clearly defined initial state and short-term and long-term goals for all three business zones.

Measure	SMART Indicator	Initial state (Baseline 2025.)	Short-term goal (Year 2027.)	Long-term goal (Year 2037.)	Stakeholder for monitoring
Measure A-01 Reorganization and improvement of the network of bus lines and stops of GPP	*Increase in the number of public transport departures*	*• S cesta: 0 departures through Gospodarska zona street. 96 departures through L.B. Mandića street • Nemetin: 9 departures • IT Park: 20 departures*	*• S cesta: 0 departures through Gospodarska zona street. The number of departures through L.B. Mandića street rises from 96 to 112 departures. • Nemetin: Growth of departures from 9 to 35. • IT Park: Growth of departures from 20 to 39.*	*• S cesta: 74 departures through Gospodarska zona street. The number of departures through L.B. Mandića street rises from 112 departures to 300), • Nemetin: Growth of departures from 35 to 39 departures • IT Park: Growth of departures from 39 to 62 departures*	*GPP d.o.o. Osijek City of Osijek*
Measure A-02 Arrangement and construction of a pedestrian-bicycle path and promotion of cycling	*Increase in the share of cyclists in the modal split*	*• Nemetin: (0% share of cyclists). • S cesta (1.67% share of cyclists) • IT park (2.36% share of cyclists)*	*• Nemetin: (0% share of cyclists). • S cesta (1.72% share of cyclists) • IT park (1.86% share of cyclists*	*• Nemetin: : (1.74% share of cyclists) • S cesta (2.89% share of cyclists) • IT park (2.66% share of cyclists)*	*City of Osijek (in cooperation with Nextbike and employers)*

Measure A-03 Introduction of a ride-sharing model - carpooling	*Number of active employees using carpooling.*	*• 0 employees using carpooling*	*• 166 employees using carpooling • Nemetin: 74 workers (Jabil and shift work). • S cesta: 39 workers. • IT Park: 53 workers*	*Total 745 active workers using carpooling: • Nemetin: 323 workers (Jabil and shift work). • S cesta: 306 workers. • IT Park: 116 workers*	*Employers in the zones City of Osijek*

4.3. Data-driven approach and stakeholders (Data-Driven Focus)

As an expert, data-driven Action Plan, all target values and engineering scenarios will be continuously developed and calibrated based on real databases that will be collected and processed.

- Surveys for activity A-02 and A-03: Regular surveying of employees and citizens will be conducted to monitor expressed preferences and analyse the modal choice.
- Traffic counting: Systematic field counting of road vehicles at key intersections will be conducted for continuous recalibration and verification of the stability of the PTV Visum traffic model.
- Public transport: Passenger validations by lines and stops will be continuously extracted and monitored directly from the e-ticketing database of the utility operator GPP d.o.o. Osijek.
- Railway transport: Official statistics on transported passengers will be collected and analysed in cooperation with HŽ Passenger Transport.
- Micromobility: Databases and ride statistics of the Nextbike system will be systematically integrated into the demand and planning model.
- Socio-demographic data: Demographic projections, the exact number and distribution of jobs with employers and spatial plans will be regularly updated.

5. Actions

The Action Plan will strictly focus on soft, smart, digital and behavioural solutions, but also on key infrastructural interventions that are necessary for the functioning of non-motorized transport in the three targeted business zones. The implementation will take place within three key domains of the GreenPATH project:

- Behavioural shared mobility solutions (Measure A-03): The carpooling model will be based on the organizational synergy of employers and employees. Physical incentives (reservation of priority parking for carpooling vehicles in front of companies) will directly encourage a change in employee habits and alleviate the critical spatial deficit of parking spaces.
- Technological and network integration of micromobility (Measure A-02): The implementation will combine the construction of completely new and the repair of existing pedestrian-bicycle infrastructure with the expansion of the Nextbike network to create a coherent and safe whole. Specifically in the targeted business zones:
    - In the business zone Nemetin, where bicycle traffic currently does not exist at all due to the complete absence of paths, a completely new pedestrian-bicycle path will be built which will enable a safe arrival to work by bicycle.
    - In the business zone S cesta, the existing bicycle path along Sv. Leopold Mandić Street will be repaired, expanded and reconstructed to eliminate critical shortcomings such as discontinuities and a low level of arrangement and the construction of a new bicycle path within the zone.
    - In the business zone IT Park, new solutions will be directly integrated with the developed city network, and support for companies will include the construction of supporting bicycle infrastructure (safe anti-theft racks) to eliminate behavioural barriers and the fear of theft.
- Digital management and supervision (Measure A-01): The reorganization and improvement of the network of bus lines and stops of GPP (including the introduction of a new line through Gospodarska zona) will utilize an upgrade of the e-ticketing system and digital channels of information about arrivals. All collected data will be integrated into an open-source dashboard that will serve as a central digital tool for decision-makers for continuous supervision over the achievement of SMART indicators.

Measure A-01: Reorganization and improvement of the network of bus lines and stops of GPP

Action ID	A-01
Action Title	Reorganization and improvement of the network of bus lines and stops of GPP
Type of Action	Service and investment (Service & Investment)
Challenge Addressed	Extremely low share of public transport in the modal split (share of public transport within the three business zones 1.66%), unfavourable timetable, low frequency of departures and poor connectivity of residential neighbourhoods with the business zones Nemetin, S cesta and IT Park, which causes extreme dependence on personal automobiles (share of personal automobiles within the three business zones 97.50%)
Link to existing strategies	Transport Master plan of the functional region of Eastern Croatia up to 2030.
Description and Key implementation steps	Reorganization and introduction of a new bus line directly contributes to the achievement of the objective through the reorganization of the public transport service for all three business zones and the introduction of a new line within the S-cesta zone. The realization is carried out in a chronologically and technically coordinated sequence to ensure maximum efficiency: • Step 1: Reorganization and adjustment of timetables (by the end of 2027): Rapid operational optimization in cooperation with GPP d.o.o. Osijek. The number of departures in both directions increases in the Nemetin zone from a base of 9 to 35 departures per day, and in the IT Park zone (north side) from 20 to 39 departures per day. In the S cesta zone, a new line within the zone is not yet introduced, but the frequency in Sv. L.B. Mandića Street increases from 96 to 112 departures per day to provide a fast alternative for workers. • Step 2: Digital updating and publication (by 2027): All short-term changes to routes and updated timetables from Step 1 are immediately digitally integrated into the GPP databases and are automatically updated and published on the internet and within existing applications such as Google Maps and the mobile application of GPP for the timely information of passengers in real time. • Step 3: Physical establishment and marking of new stops (long-term, before 2037): Since the S cesta zone requires construction preparation for new lines, physical marking and equipping of new bus stops is carried out. • Step 4: Long-term/optimal reorganization and introduction of a new line (by 2037): Complete introduction of a new bus line through the Gospodarska zona street (S cesta) with as many as 74 departures per day in both directions, along with raising the frequency in Sv. L.B. Mandića Street to 300 departures per day. The number of departures in the Nemetin zone is raised to 39 per day, and in the IT Park zone to 62 departures per day from the north side.
Responsible institution	GPP d.o.o. Osijek
Other institutions involved	City of Osijek
Expected results	• In the S cesta zone: Expected increase in the number of public transport users by 4.8 times by 2027 and growth in the number of users by 22.2 times by 2037 compared to the base year 2025. • In the Nemetin zone: Expected increase in the number of public transport users by 3.9 times by 2027 and growth in the number of users by 7.8 times by 2037 compared to the base year 2025.

	• In the IT Park zone: Expected increase in the number of public transport users by 3.4 times by 2027 and growth in the number of users by 4.3 times by 2037 compared to the base year 2025.

Measure A-02: Arrangement and construction of a pedestrian-bicycle path and promotion of cycling

Action ID	A-02
Action Title	Arrangement and construction of a pedestrian-bicycle path and promotion of cycling
Type of Action	Investment and policy (Investment & Policy)
Challenge Addressed	The lack of safe and continuous bicycle infrastructure, especially towards the business zone Nemetin, the lack of safe supporting facilities (bicycle racks) at employers in other zones and poor promotion of cycling (personal and public bicycles) prevents the utilization of high natural potential (94% of households possess at least one bicycle).
Link to existing strategies	• Transport Master plan of the functional region of Eastern Croatia up to 2030. • Development Strategy of the Urban Agglomeration of Osijek up to 2027.
Description and Key implementation steps	This measure solves the problem of the lack of safe and continuous bicycle infrastructure (especially towards the Nemetin zone), the lack of safe supporting facilities at employers in other zones and poor promotion of cycling, thereby seeking to utilize exceptional natural potential (94% of households possess at least one bicycle). The implementation takes place through three logical steps based on the spatial and temporal needs of the zones: • Step 1: Procurement and installation of supporting equipment at employers (by 2027): Installation of safe parking lots (racks) for bicycles next to main traffic generators at employers in all business zones, which directly eliminates the behavioural barrier of fear of theft in the short term. • Step 2: Promotional campaigns and awareness raising (from 2027 - implemented in all zones): Launching and implementing systematic promotional campaigns and marketing events in cooperation with non-profit associations and employers in two business zones (S cesta, IT Park) with the aim of promoting the use of personal and public (Nextbike) bicycles and reshaping the behavioural attitudes of workers. • Step 3: Construction and reconstruction of pedestrian-bicycle paths (by 2037). Business zone Nemetin: Construction of a new pedestrian-bicycle path connecting the city network (Vukovarska street) with the zone, allowing safe access to non-motorized transport (growth of the share of cyclists from a baseline of 0%). Business zone S cesta: Construction of a new bicycle path within the S cesta zone itself to ensure internal connectivity, and thorough repair, remediation and expansion of the existing path along the entire Sv. Leopold Mandić Street which is in poor condition (discontinuities, low level of arrangement and insufficient width). • Step 4: Promotional campaigns and awareness raising (by 2037 - implemented in the Nemetin zone): Launching and implementing systematic promotional campaigns and marketing events in cooperation with non-profit associations and employers in the business zone Nemetin with the aim of promoting the use of personal and public (Nextbike) bicycles and reshaping the behavioural attitudes of workers.
Responsible institution	City of Osijek
Other institutions involved	GPP d.o.o. Osijek NextBike d.o.o.

	Hrvatske ceste d.o.o.
Expected results	• In the Nemetin zone: Establishment and emergence of bicycle trips of employees thanks to the construction of a new pedestrian-bicycle path by 2037. • In the S cesta zone: No increase in the number of bicycle users is expected by 2027, however, an increase in the number of bicycle users by 13.2 times is expected by 2037. • In the IT Park zone: No increase in the number of bicycle users is expected by 2027, however, an increase in the number of bicycle users by 1.5 times is expected by 2037.

Measure A-03: Introduction of a ride-sharing model - carpooling

Action ID	A-03
Action Title	Introduction of a ride-sharing model - carpooling
Type of Action	Policy and service (Policy & Service)
Challenge Addressed	Extremely high dependence on solo rides in personal automobiles within the three business zones (97.5%) which causes traffic congestions in peak hours and a critical lack of parking spaces in the zones (especially in IT Park which has a deficit of about fifty parking spaces for 210 workers).
Link to existing strategies	Transport Master plan of the functional region of Eastern Croatia up to 2030.
Description and Key implementation steps	This measure focuses on reducing the extremely high dependence on solo driving in personal automobiles (which in the business zones ranges from 95% to over 98%) by introducing an organized carpooling model. The model is based exclusively on the direct organizational synergy of employers and employees, financial savings for workers and the introduction of highly attractive physical incentives. The implementation of this measure takes place through the following steps: • Step 1: Promoting carpooling (by 2027): Launching an umbrella campaign to inform workers about the direct financial savings brought by carpooling (sharing costs of fuel, tolls and depreciation). • Step 2: Organization of stakeholders and matching of employees (by 2027): Activation and cooperation of human resources departments of companies within the three business zones to create simple internal databases and lists of employees who daily travel from the same parts of the city or surrounding municipalities of the agglomeration to work. Matching and coordination of shared rides are carried out directly and administratively.
Responsible institution	Private and public companies (employers) in the business zones
Other institutions involved	City of Osijek (as regulator and owner of road and utility infrastructure)
Expected results	• In the Nemetin zone: Active inclusion of approximately 74 employees in the carpooling system by 2027 and inclusion of 323 employees in the system by 2037. • In the S cesta zone: Active inclusion of approximately 39 employees in the carpooling system by 2027 and inclusion of 306 employees in the system by 2037. • In the IT Park zone: Active inclusion of approximately 53 employees in the carpooling system by 2027 and inclusion of 116 employees in the system by 2037.

6. Implementation Timeline

The table below presents a detailed schedule of all implementation steps for each individual measure, with exact deadlines (short-term horizon to the end of 2027 and long-term to the end of 2037) and responsible stakeholders.

Action ID / Step	Name and detailed description of the activity (from Chapter 5)	Planned implementation deadline	Responsible stakeholder
A-01 Step 1	*Reorganization and adjustment of timetables: Rapid operational optimization of departures in cooperation with GPP. The number of departures rises in Nemetin from 9 to 35, in IT Park from 20 to 39, and in Sv. L.B. Mandića Street from 96 to 112 departures per day to adapt to worker shifts.*	*Short-term deadline: Q2 2027.*	*GPP d.o.o. Osijek*
A-01 Step 2	*Digital updating and publication: Integration of all short-term route and timetable changes into the databases of GPP, Google Maps and the mobile application of GPP to inform passengers in real time.*	*Short-term deadline: Q3 2027. - Q4 2027.*	*GPP d.o.o. Osijek*
A-01 Step 3	*Physical establishment and marking of new stops: Construction preparation, asphalting of lay-bys, installation of shelters and info boards within the S cesta zone.*	*Long-term deadline: During 2028. - 2030.*	*City of Osijek*
A-01 Step 4	*Long-term reorganization and introduction of a new line: Introduction of a new line through the interior of the S cesta zone (Gospodarska zona street) with 74 departures per day, and raising departures in Mandićeva to 300, in Nemetin to 39, and in IT Park to 62 per day.*	*Long-term deadline: Continuously until the end of 2037.*	*GPP d.o.o. Osijek, City of Osijek*
A-02 Step 1	*Procurement and installation of supporting equipment at employers: Installation of safe parking lots (racks) for bicycles next to main traffic generators at companies in all business zones to eliminate the fear of theft.*	*Short-term deadline: Q3 2027.*	*City of Osijek in cooperation with employers*
A-02 Step 2	*Promotional campaigns and awareness raising in S cesta and IT Park: Launching and implementing systematic marketing events and campaigns for workers with the aim of promoting the use of personal and public (Nextbike) bicycles.*	*Long-term deadline: Continuously from Q4 2027.*	*City of Osijek*
A-02 Step 3	*Construction and reconstruction of pedestrian-bicycle paths: Construction of a new path Vukovarska towards Nemetin, construction of internal paths in the S cesta zone and thorough reconstruction and expansion of the path in Mandićeva cesta.*	*Long-term deadline: 2027. - 2035. (according to phases)*	*City of Osijek, Hrvatske ceste d.o.o.*
A-02 Step 4	*Promotional campaigns and awareness raising in the Nemetin zone: Targeted implementation of promotional activities in the Nemetin zone in cooperation with associations and employers, launched exclusively after the physical completion of the Vukovarska path.*	*Long-term deadline: 2035. - 2037.*	*City of Osijek*
A-03 Step 1	*Creation of HR database and administrative matching of employees: HR departments of companies in the zones conduct lists and analyses of employee trips and create*	*Short-term deadline: Q2 2027.*	*Employers in the zones*

	databases with compatible routes for easier matching into crews for shared driving.		
A-03 Step 2	*Umbrella promotional campaign on carpooling savings: Implementation of info-campaigns, flyers and internal presentations to workers about financial savings and ecological benefits of ride-sharing.*	*Long-term deadline: Continuously from Q4 2027.*	*Employers in the zones, City of Osijek*

7. Risk Analysis

The administrative and operational implementation of the Action Plan requires systematic identification and management of risks. To ensure timely control, risks were analysed at the level of the three key measures (A-01, A-02 and A-03). For each risk, the probability and impact were assessed, and preventive and corrective mitigation measures (mitigation measures) were prescribed.

Action ID	Risk	Likelihood (L/M/H)	Impact (L/M/H)	Mitigation measure
A-01	*Lack of professional driving staff in GPP for the planned increase in departures and introduction of a new line*	*Medium (M)*	*High (H)*	*Active cooperation with the Croatian Employment Service (HZZ), retraining programs and long-term improvement of material and working conditions of drivers.*
A-02	*Slow dynamics of construction works or problems with property-legal relations along state roads*	*Medium (M)*	*High (H)*	*Launching an early partnership dialogue with Hrvatske ceste d.o.o., timely preparation of detailed technical documentation and introduction of phased execution of works.*
A-02	*Low worker turnout for cycling due to bad weather conditions or fear of theft*	*High (H)*	*Medium (M)*	*Construction of closed and covered parking lots for bicycles at employers, placement of Nextbike stations right at the entrances.*
A-02	*Low interest of employees for cycling (habit of personal comfort of solo driving)*	*High (H)*	*Medium (M)*	*Intensive promotion of financial savings through media and workshops*
A-03	*Low interest of employees for ridesharing (habit of personal comfort of solo driving)*	*High (H)*	*Medium (M)*	*Intensive promotion of financial savings through media and workshops*

8. Financial Overview

The financial structure and estimated budget are directly aligned with the official Development Strategy of the Urban Agglomeration of Osijek up to 2027. The main source of co-financing for large infrastructural and technical interventions is the Integrated Territorial Program (ITP) and EU structural funds for the urban area of Osijek, while soft and behavioural measures are co-financed from local city budget and private budgets of employers.

Action ID	Action Title	Estimated cost (EUR)*	Funding source	Status
A-01	*Reorganization and improvement of the network of bus lines and stops of GPP*	*700.000,00 - 2.000.000,00*	*Share of own financing (budget of the City of Osijek), ITP mechanism 2021-2027, EU structural funds 2028-2034*	*Partly secured*
A-02	*Arrangement and construction of a pedestrian-bicycle path and promotion of cycling*	*2.000.000,00 - 4.000.000,00*	*ITP Share of own financing (budget of the City of Osijek), ITP mechanism 2021-2027, EU structural funds 2028-2034*	*Partly secured*
A0-3	*Introduction of a ridesharing model - carpooling*	*250.000,00 - 500.000,00*	*Share of own financing (budget of the City of Osijek), ITP mechanism 2021-2027, EU structural funds 2028-2034, own funds of employers*	*Partly secured*
TOTAL		*2.950.000,00 - 6.500.000,00*		

* - these are cost estimates. Exact amounts will be defined in the corresponding feasibility studies and cost-benefit analyses (planned after the GreenPATH project end).

9. Monitoring

The continuation presents a complete tabular overview of the monitoring plan, structured exclusively at the level of the three operational measures and aligned with all specific SMART indicators, data sources and stakeholders responsible for implementation.

Action ID	Action Title	Monitored implementation indicator	Data source and collection method	Responsible stakeholder and frequency
A-01	*Reorganization and improvement of the network of bus lines and stops of GPP*	*• Number of daily bus departures in the zones.* *• Number of transported passengers*	*• GPP traffic office: AVL/GPS monitoring in real time.* *• GPP e-ticketing database: Reports on ticket validations.*	*Responsible stakeholder:* *• GPP d.o.o. Osijek* *• City of Osijek* *Frequency:* *• Annually*
A-02	*Arrangement and construction of a pedestrian-bicycle path and promotion of cycling*	*• Share of bicycle traffic (Modal Share).* *• Number of rentals of the Nextbike system.* *• Status of construction of new bicycle paths and restoration of existing ones*	*• Employers of business zones: Surveying employees about travel habits* *• Nextbike: Insight into the use of public bicycles* *• City of Osijek: Collecting data on the construction and arrangement of bicycle paths.*	*Responsible stakeholders:* *• City of Osijek* *• NextBike d.o.o.* *• Employers in the zones* *Frequency:* *• Annually*
A-03	*Introduction of the carpooling model*	*• Number of active employees who use carpooling.*	*• Employers of business zones: Internal HR registers and records of included employers.*	*Responsible stakeholders:* *• Employers in the zones* *• City of Osijek* *Frequency:* *• Annually*

By annual calibration and validation of the public transport demand matrix by entering the obtained data into the software tool PTV Visum, the City of Osijek obtains a stable data foundation for making strategic and spatial decisions, thereby realizing the vision of a smart, green and functionally connected urban centre tailored to all citizens and employers.

10. Conclusions

The establishment of this Action Plan is a key turning point in the development of sustainable mobility within the functional urban area (FUA) of Osijek. Through three aligned measures — Reorganization and improvement of the network of bus lines and stops of GPP (A-01), Arrangement and construction of a pedestrian-bicycle path and promotion of cycling (A-02) and Introduction of a ride-sharing model - carpooling (A-03) — the plan directly solves the problem of extreme dependence on personal automobiles (which in the business zones amounts to about 97.5%) and mitigates traffic congestions and the lack of parking especially in the business zone IT Park.

The implementation, which begins at the beginning of 2027, has a firm analytical foundation in the dialogue with key employers and the surveying of employees, along with aligning the planned budget of 6,520,000.00 EUR for infrastructural and operational interventions. The effects of the measures — such as the introduction of a new bus line, the construction of the Vukovarska path and the inclusion of up to 745 employees in carpooling — will be measured and proven through systematic monitoring based on the GPP GPS/AVL system, e-ticketing databases, Nextbike API logs and HR records of employers.

Annually, a calibration and validation of the public transport demand matrix will be performed by entering the obtained data in the software tool PTV Visum which will serve as a foundation for making strategic and spatial decisions, thereby realizing the vision of a smart, green and functionally connected urban centre tailored to all citizens and employers.

The realization of this plan will provide employees with fast, environmentally friendly and financially viable alternatives of daily commuting to work, transforming the business zones of Osijek into a modern, green and functionally connected entrepreneurial environment.

11. List of Annexes

Annex 1 – Action Plan Canvas