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PROMOTING GREEN LIVING AREAS



VISION STATEMENT

MUNICIPALITY OF POSTOJNA

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Document Information

Project id	Euro-MED0200882
Project Title	Planning for autonomous mobility on demand in the Euro-MED area
Project Acronym	ArtMED
Project Mission	Promoting green living areas
Programme Priority	Greener MED
Specific Objective	RSO2.4: Promoting climate change adaptation and disaster risk prevention, resilience, taking into account eco-system based approaches
Deliverable Number	D.2.2.1
Deliverable Title	4 vision statements from the 4 PTAs of ArtMED with input from the AMOD impact assessment tool.
Work Package Number	2
Work Package Title	Transferring the AMOD impact assessment tool to ArtMED PTAs to plan autonomous mobility on demand
Activity Number	2.2
Name of Activity	Using the AMOD impact assessment tool to develop the local vision statements for autonomous mobility on demand.

Partner in charge	Municipality of Postojna
Partners involved	PP4 TML, PP5 ALOT and PP6 PF
Date of production	December 2024



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EXECUTIVE SUMMARY

With its strategic location, the Municipality of Postojna is well integrated into all the most important transport systems, which enable residents to have good mobility and the economy to access key TNT corridors. Of all the transport systems, the dominant one is the road system, which, when used on a mass scale, also brings with it some negative consequences that the municipality will have to deal with in the near future. Gas and noise emissions are increased in the vicinity of busy roads, traffic safety is reduced, longer traffic jams occur, and therefore the quality of the living environment is lower. Due to the high degree of motorization, the need to invest in road infrastructure is great, and as a result, the rest of the road users, line cyclist or pedestrians, are in a subordinate position. They are faced with a deficient public passenger transport infrastructure and inadequate routes for cyclists and pedestrians. The municipality of Postojna will therefore promote the use of innovative and sustainable modes of mobility, for which it will ensure better conditions by investing in adequate public infrastructure. The goal is to achieve balanced development and equal accessibility of all forms of transport for all citizens. In realizing the desired future in the field of public passenger transport, the main role was played by the Comprehensive Transport Strategy (CPS), adopted by the Municipality of Postojna in 2017. For the introduction of new forms of sustainable mobility, the process of adopting the new Comprehensive Transport Strategy 2025-2032 is crucial. which itches in progress.

The process of planning new forms of sustainable mobility, such as AMOD, is significantly different from the classical approach, which usually focuses only on technical characteristics related to the flow of motor traffic and road infrastructure. By involving key stakeholders in the process of service development and terrain implementation, we have ensured a comprehensive consideration and planning of measures in the field of public transport. With a new modern approach in creating this vision statement for the implementation of AMOD, the Municipality of Postojna is moving towards long-term and sustainable planning of public passenger transport. This will take into account the existing planning practices, the possibilities of upgrading these only through a thorough analysis of the situation and an investment plan, the vision of transport development in the municipality and the strategic goals of the municipality. With such an approach, we will jointly contribute to a more inclusive and green way of transport development, which will enable a better quality of life in the municipality and at the same time ensure economic development.

In Slovenia, due to the lack of practice and experience in strategic traffic planning, motorized traffic is increasing, the quality of living is decreasing, and the large expenditure of budget funds does not lead to a significant improvement in the situation. The existing strategic state and local documents (spatial, environmental and development) do address sustainable transport, but they are mainly devoted to road infrastructure. However, there is a lack of strategies that would lead to measures based on a comprehensive assessment and that would also address individual innovative elements of the transport system, such as the implementation of AMOD in public passenger transport. In addition, the decision-making process itself is often not transparent, and in some areas, there is a lack of qualified staff.



LEGAL REGULATION OF PUBLIC PASSENGER TRAFFIC:

- Act on the Management of Public Passenger Transport - ZUJPP (Official Gazette of the RS No. 54/2022 of 20 April 2022); which, among other things, regulates the fundamental principles and objectives of public passenger transport management, the implementation of the system of integrated public scheduled passenger transport and the financing of PPPs. The law only states that one of the goals of public passenger transport is the regulation of special and interconnected advanced forms of public passenger transport, such as: on-call transport and specially adapted transport according to specificities. The provision of services with driverless vehicles or other forms of AMOD is not covered by the law.

- Act on Road Transport - ZPCP-2-NPB8 (Official Gazette RS No. 6/16-UPB, 67-18, 54/22-ZUJPP, 105/22-ZZNŠPP, 18/23-ZDU-10 and 23/24) – Upon adoption of the law in 2019, the law defines transport to work in more detail.

It was written that transport on demand can be carried out according to a predetermined timetable, which is subject to the "on-call transport" regime, and is carried out only if the condition of prior announcement of the transport by the potential passenger is met, or according to a flexible timetable, where the time and route of the journey are formed according to the passenger's transport needs.

When the law is amended in 2022, the article dealing with professional transport was cancelled, which means that we currently do not have legal views on the implementation and development of professional public transport services, DRT and AV public transport services.

The only one exception is the Act of on road traffic rules (ZPRCP), where it is written that an Automated Vehicle is a motor vehicle with built-in systems of the first, second or third level according to the international standard SAE J3016, which can independently operate the vehicle in road traffic without the driver's intervention and meet all the conditions for participation in road traffic, as stipulated by law, which regulates motor vehicles. In addition, the automated vehicle or automated driving system must be previously tested on surfaces intended for road traffic.

STRATEGIC DOCUMENTS ON LOCAL OR REGIONAL LEVEL:

- Comprehensive transport strategy for the Municipality of Postojna

The reason for the approach to the implementation and strategic introduction of new forms of public transport in the Municipality of Postojna is primarily the disordered and rigid national legislation and, for smaller rural municipalities, the financially unsustainable financing of classic public passenger transport.



INTRODUCTION

FEATURES OF THE REGION:

In 2021, 2.5% of the population of Slovenia lived in the Primorsko-Inland statistical region (3% in 2016). This region stands out not only for the number of inhabitants, but also for the lowest population density: an average of 36 inhabitants lived per 1 km². Recent demographic developments show that:

- Natural increase negative (-1.9)
- Migration growth is positive (3.1 – the second largest among regions)
- The share of foreign citizens among the inhabitants is the third largest in our region (8.6%)
- One of the highest rates of labor activity, 70%, and very low unemployment, but 40% of the labor force work outside the region.

The last piece of information points to the fact that mobility in our region is one of the key topics that needs to be addressed, as our region is:

- the most developmentally endangered (IRO)
- second in terms of the number of cars used (600 cars/1000 inhabitants) and
- has the lowest share of connection to public infrastructure (highways, public transport,...)

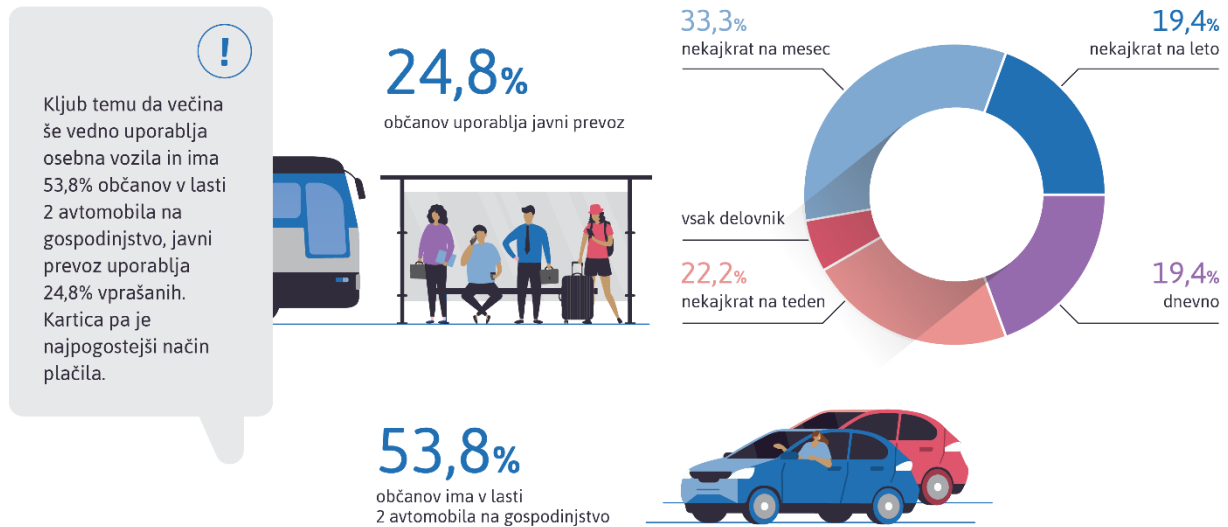
The Municipality of Postojna lies on the 1st development axis, which means that it is directly connected to the highway Austria - Croatia, Ljubljana - Koper. It also has direct access to the railway infrastructure that connects us to Ljubljana or Koper. While municipal public transport is non-existent. 40 settlements scattered around the center of Postojna have access to these mobility corridors only by private car, because there is no regular municipal line that provides service for all settlements according to the "last mile" principle. The municipality provides its citizens with 2 lines of the Furman city bus and the SOPOTNIK transport service, which specializes in transporting citizens over 65 years of age from the hinterland to the city center.

With the help of the Mobility Center, we conducted an extensive survey on citizens' travel habits, which gave us an interesting insight into the indications, preferences and wishes regarding public transport in the municipality.

I would like to list some of the most interesting information here:

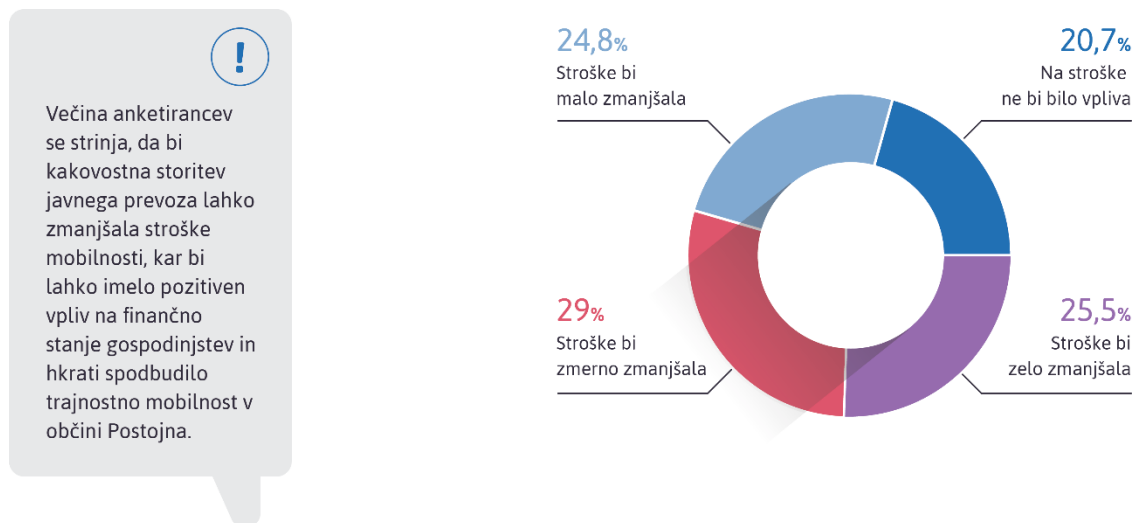
USE OF PUBLIC TRANSPORTATION





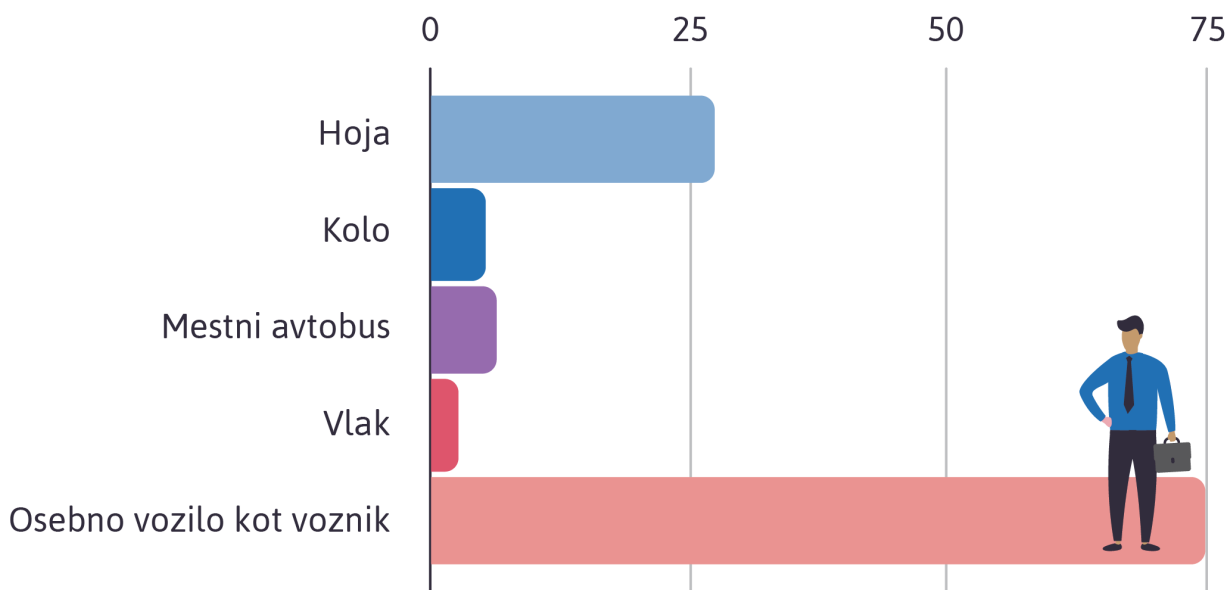
Despite the fact that the majority still use personal vehicles and 53.8% of citizens own 2 cars per household, 24.8% of respondents use public transport.

QUALITY OF PUBLIC TRANSPORT



Most respondents agree that a high-quality public transport service could reduce mobility costs, which could have a positive impact on the financial situation of households and at the same time encourage sustainable mobility in the Municipality of Postojna. While for transportation to work, personal errands and socializing, a personal vehicle is most often used.

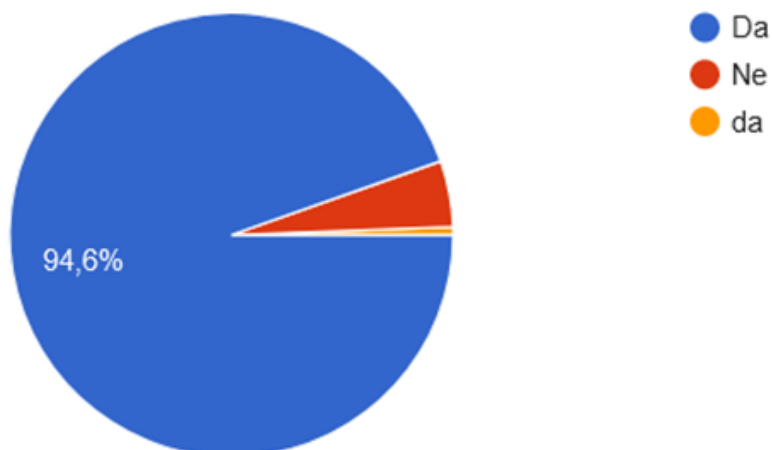
Na delo:



94,6% of the responders are willing to use the DRT service in our municipality.

Bi bili zainteresirani za uporabo storitve prevoza na zahtevo?

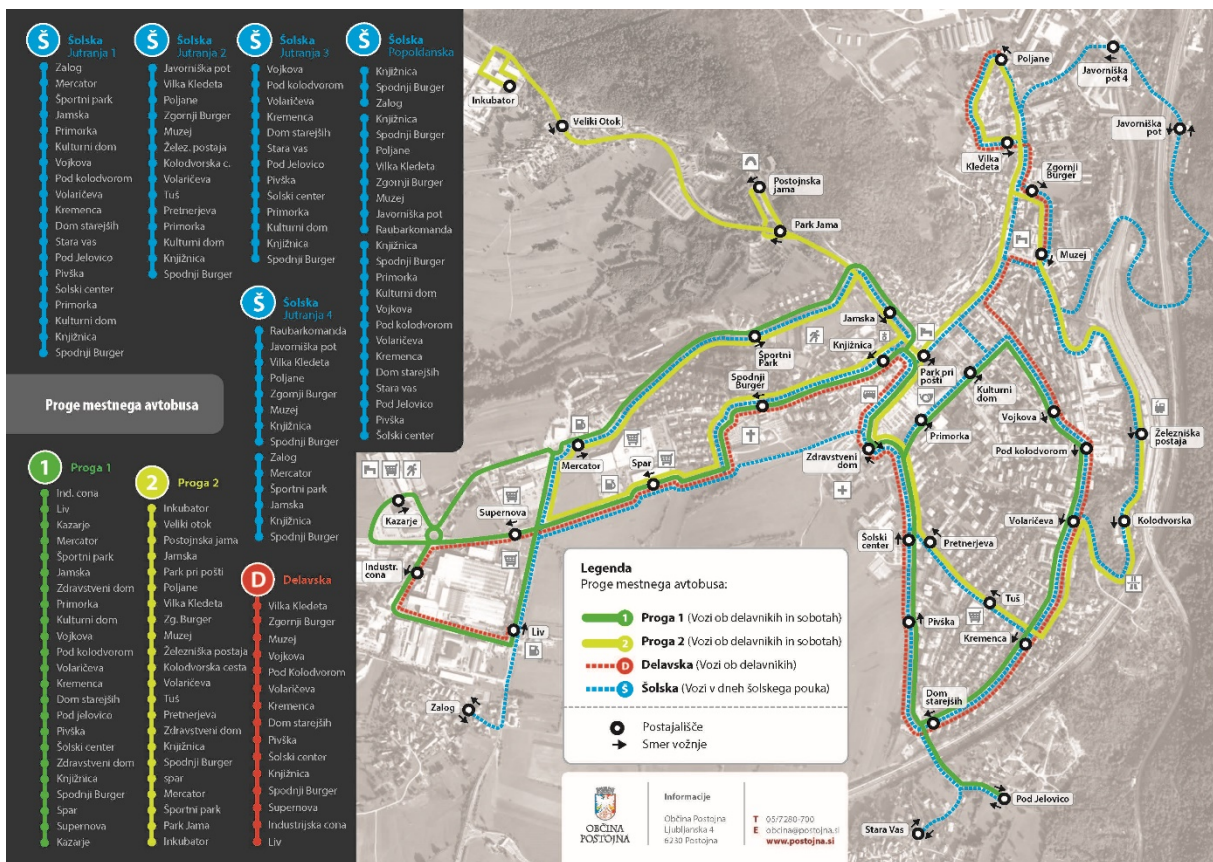
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USE CASE DEFINITION IN THE LOCAL CONTEXT

FREE CITY BUS FURMAN

Free transport that runs during the week on two regular routes around the city of Postojna, with many stops, from 5:52 a.m. to 5:38 p.m. The free Furman city bus covers the wider area of Postojna city center. The routes connect residential areas, schools, business zone, industrial zone and railway station. Information about routes, bus stops and timetables is available online. The advantage of this type of transport is that it is free and has several routes and semi-flexible timelines (adapted for school and bigger employees).



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FREE TRANSPORT SERVICE FOR THE ELDERLY - SOPOTNIK

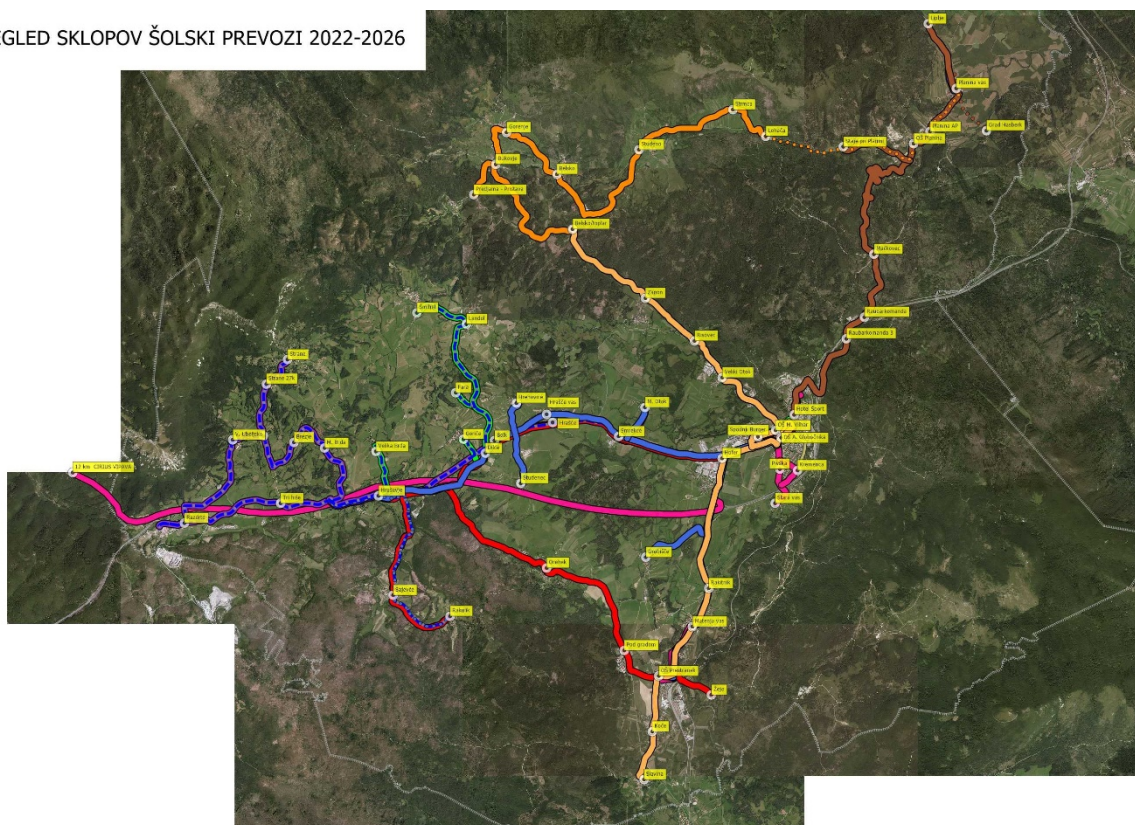
Zavod Sopotniki, an institution for intergenerational solidarity, was founded with the aim of helping the elderly to integrate into active social life. Through intergenerational cooperation, the institute aims to prevent or break the isolation and loneliness of older residents, especially from smaller, more remote places, who almost never leave their homes due to distance, lack of a car or poor transport connections.

Citizens who live outside the city center of the municipality and who are over 65 years old are entitled to the service. In 2023, 212 transports were carried out, 108 different users were brought, the volunteers were in the field for 336 hours and traveled 5812 km during this time. In general, we have 119 registered users and 20 volunteers for this service. The elderly mostly use the service for transportation to the doctor, to the store, to the post office, or after errands and for visiting.

POTENTIAL IMPACT

DEMAND RESPONSIVE TRANSPORT (DRT) - FREE SERVICE

PREGLED SKLOPOV ŠOLSKI PREVOZI 2022-2026



Area covered 270 km² Population 16.677 Km coverage/per ride: 10 - 20 km

DEFINITION OF SERVICE DESIGN:



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Service coverage is large and the operational demand is simple. We would need a small fleet of shuttles, who would drive on a fixed route, with a flexible timetable and on public roads. Implementation in the existing traffic is simple. The service would not offer special assistance, and its speed must be high.

DEFINING THE IMPACT ON SERVICE DESIGN:

- **Social:**
 - **Accessibility:** DRT improves access to transportation, especially in rural areas, underserved regions, or for individuals with limited mobility. This enhances social equity by providing services to people who may not have access to traditional public transport.
 - **Community Integration:** It can promote stronger community ties by ensuring that people in various demographics (elderly, disabled, low-income) have access to social services, work, healthcare, and education.
 - **Convenience & Flexibility:** Passengers benefit from more flexible transportation options, which can increase overall satisfaction with the transport system and reduce reliance on private vehicles.
- **Environmental:**
 - **Reduced Emissions:** If designed well, DRT can reduce the number of single-occupancy vehicles on the road, lowering carbon emissions and improving air quality, particularly in urban areas.
 - **Optimized Routes:** By adjusting routes based on demand, DRT services can optimize vehicle usage, leading to fewer miles traveled compared to traditional fixed-route buses, reducing overall fuel consumption and environmental impact.
 - **Sustainable Mobility:** In combination with electric or hybrid vehicles, DRT can contribute to greener public transportation systems and the broader environmental goals of cities.
- **Economic:**
 - **Cost Efficiency:** DRT can be more cost-efficient for service providers, particularly in low-demand areas, as resources are allocated dynamically based on actual ridership rather than running under-utilized services.
 - **Increased Employment:** The implementation of DRT can create jobs, such as drivers, operators, and software developers for the technological platforms used to manage and optimize services.



- o Support for Local Economies: By improving mobility and access, DRT can help stimulate economic activity in local areas, particularly for small businesses that rely on transportation accessibility to draw customers.

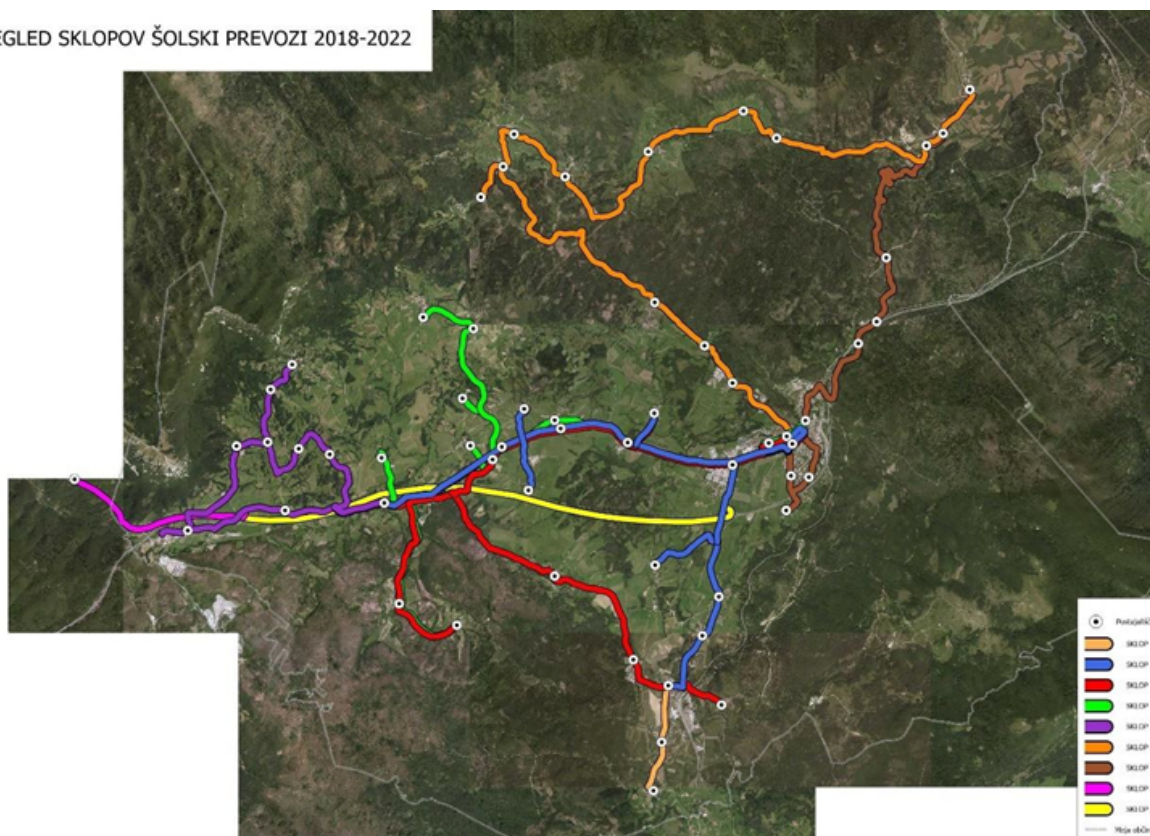
DEFINING THE TIMING ON SERVICE DESIGN:

Milestones to unlock business case	Timing needed	Use-Case Complexity				Service design requirements				
		Traffic type	Route Predictability	Operational Domain	Road ownership	Fleet size needed	Special Assistance needed	Vehicle type	Timetable	Speed of service required
		Simple	Dinamic	Complex	Public	Small	NO	Shuttle	Flexible	High
Mature regulation, simplified permit process	Mid	Yellow	Yellow	Yellow	Yellow	Yellow	Light Blue	Yellow	Yellow	Yellow
High Social Acceptance	Mid	Yellow	Yellow	Yellow	Yellow	Yellow	Light Blue	Yellow	Yellow	Yellow
High Performance Tech	Mid	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue
Safety Operator Removed from vehicle	Short	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue
Fleet manager possible	Short	Yellow	Yellow	Yellow	Yellow	Yellow	Light Blue	Yellow	Yellow	Yellow
Remote control possible	Short	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue
Smart Infra	Mid	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue
Advanced accessibility features	Long	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue
Commercial availability	Mid	Yellow	Yellow	Yellow	Yellow	Yellow	Light Blue	Yellow	Yellow	Yellow



DEMAND RESPONSIVE TRANSPORT (DRT) - PAID SERVICE

PREGLED SKLOPOV ŠOLSKE PREVOZI 2018-2022



Area covered 270km². **Population** 16.677 **Km coverage/per ride:** 10-20km

focus group: school kids who travel back to the city center.

DEFINITION OF SERVICE DESIGN:

Service coverage is Large and the operational demand is simple. We would need small fleet of shuttles, who would drive on a fixed route, with a flexible timetable and on public roads. In our municipality the traffic is simple. The service would not offer special assistance and its speed must be high.

DEFINING THE IMPACT ON SERVICE DESIGN:

- **Social:**
 - o **Accessibility:** DRT improves access to transportation, especially in rural areas, underserved regions, or for individuals with limited mobility. This enhances social equity by providing services to people who may not have access to traditional public transport.



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- o Community Integration: It can promote stronger community ties by ensuring that people in various demographics (elderly, disabled, low-income) have access to social services, work, healthcare, and education.
- o Convenience & Flexibility: Passengers benefit from more flexible transportation options, which can increase overall satisfaction with the transport system and reduce reliance on private vehicles.
- **Environmental:**
 - o Reduced Emissions: If designed well, DRT can reduce the number of single-occupancy vehicles on the road, lowering carbon emissions and improving air quality, particularly in urban areas.
 - o Optimized Routes: By adjusting routes based on demand, DRT services can optimize vehicle usage, leading to fewer miles traveled compared to traditional fixed-route buses, reducing overall fuel consumption and environmental impact.
 - o Sustainable Mobility: In combination with electric or hybrid vehicles, DRT can contribute to greener public transportation systems and the broader environmental goals of cities
- **Economic:**
 - o Cost Efficiency: DRT can be more cost-efficient for service providers, particularly in low-demand areas, as resources are allocated dynamically based on actual ridership rather than running under-utilized services.
 - o Increased Employment: The implementation of DRT can create jobs, such as drivers, operators, and software developers for the technological platforms used to manage and optimize services.
 - o Support for Local Economies: By improving mobility and access, DRT can help stimulate economic activity in local areas, particularly for small businesses that rely on transportation accessibility to draw customers.



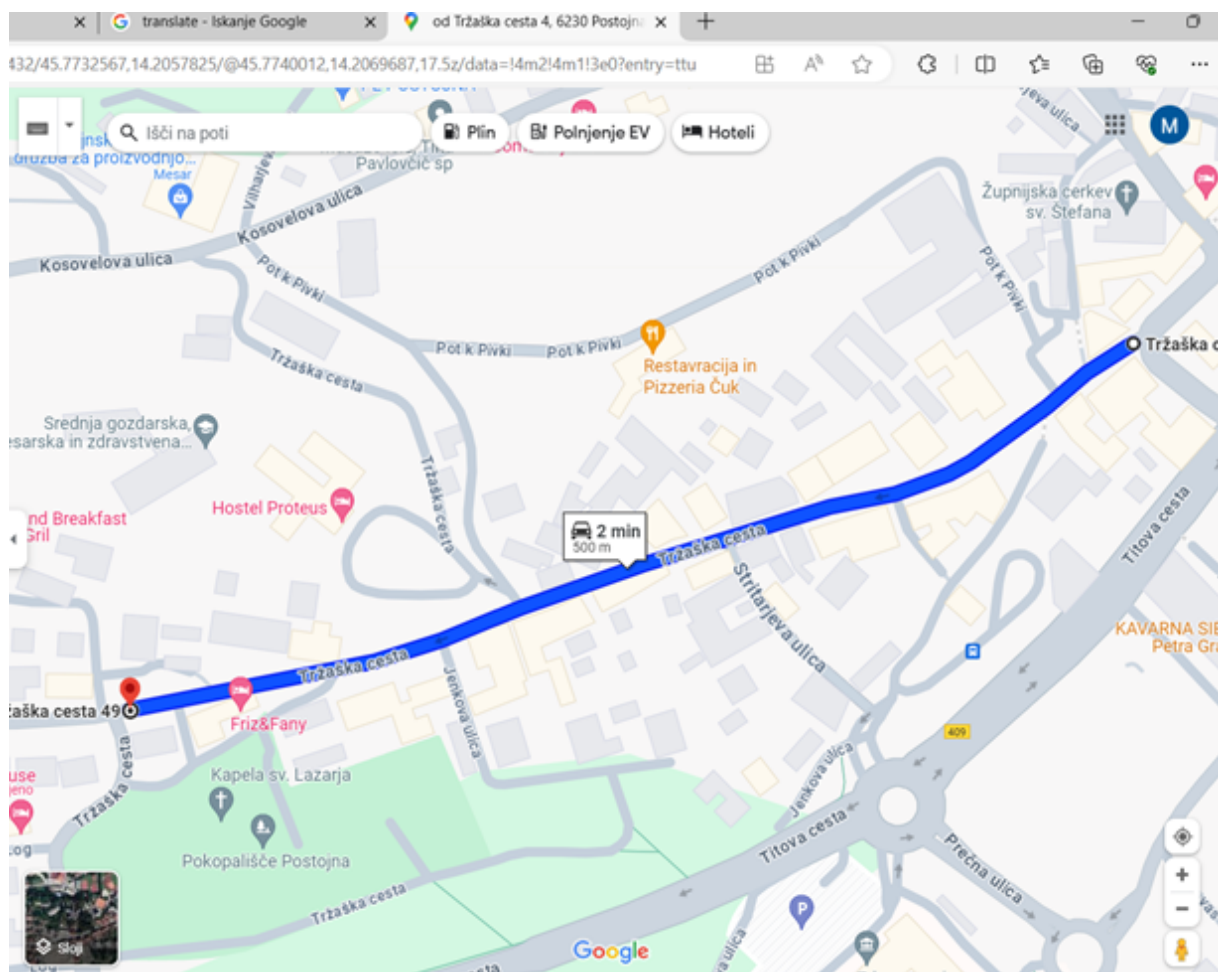
DEFINING THE TIMING ON SERVICE DESIGN:

Milestones to unlock business case	Timing needed	Use-Case Complexity				Service design requirements				
		Traffic type	Route Predictability	Operational Domain	Road ownership	Fleet size needed	Special Assistance needed	Vehicle type	Timetable	Speed of service required
		Simple	Dinamic	Complex	Public	Small	NO	Shuttle	Flexible	High
Mature regulation, simplified permit process	Mid									
High Social Acceptance	Mid									
High Performance Tech	Mid									
Safety Operator Removed from vehicle	Short									
Fleet manager possible	Short									
Remote control possible	Short									
Smart Infra	Mid									
Advanced accessibility features	Long									
Commercial availability	Mid									

Expected timing on service design is short-term (2025-2030). Use-Case Complexity in DRT is low. Service design requirements needed for DRT are not too demanding.



AUTOMATED TRANSPORT



Area coverage: 7 km² **Population:** 500 **KM coverage:** 0,90 km

Focus group: Citizens who travel on one seamy closed road in the heart of the city center

DEFINITION OF SERVICE DESIGN:

Service coverage is small and the operational demand is complex. We would need small fleet of shuttles, who would drive on a fixed routh, with a flexible timetable and on public roads. Implementation of AV in the existing traffic would be complex. The service would need to offer special assistance and its speed would be low.

Defining the impact on service design:

- **Social:**



- o Increased Accessibility: AVs can provide greater mobility for individuals unable to drive, such as the elderly, disabled, or those without a driver's license. This increases social inclusivity by offering independence and access to essential services.
- o Safety Improvements: Automated systems could significantly reduce accidents caused by human error, improving overall road safety and saving lives.
- o Reduced Stress & Convenience: By removing the need for active driving, AVs could enhance passenger convenience, reduce travel stress, and improve the overall journey experience. However, there may also be societal concerns related to job displacement for professional drivers and privacy/security risks associated with autonomous systems.
- Environmental:
 - o Reduced Emissions: If AVs are electric or hybrid, they can significantly reduce greenhouse gas emissions, contributing to cleaner air and helping cities achieve sustainability goals.
 - o Optimized Traffic Flows: AVs can use real-time data to optimize routes, avoid traffic congestion, and reduce idle time, which lowers fuel consumption and pollution. Their ability to communicate with other vehicles and infrastructure can lead to smoother traffic flow.
 - o Reduced Vehicle Ownership: Autonomous ride-sharing could lead to fewer privately owned vehicles, reducing the environmental impact associated with car manufacturing and parking infrastructure. However, the ease of AV use might also increase vehicle miles traveled, offsetting some environmental gains.
- **Economic:**
 - o Cost Efficiency for Operators: In logistics and public transport, automated vehicles can reduce labor costs (such as drivers) and increase operational efficiency, which may lower transportation costs for businesses and consumers.
 - o Job Market Disruption: AVs could lead to job displacement in sectors such as trucking, delivery services, and taxi driving. However, new jobs may emerge in areas such as AV maintenance, AI development, and infrastructure upgrades.
 - o Increased Productivity: As passengers are no longer required to drive, they can use travel time for work or leisure, increasing productivity. Companies may also benefit from more efficient delivery and logistics services using AVs.
 - o Infrastructure Investment: The widespread adoption of AVs will likely require significant investments in new infrastructure (smart traffic systems, charging stations, etc.), which could stimulate economic activity but also impose upfront costs on cities and governments.



DEFINING THE TIMING ON SERVICE DESIGN:

Milestones to unlock business case	Timing needed	Use-Case Complexity				Service design requirements				
		Traffic type	Route Predictability	Operational Domain	Road ownership	Fleet size needed	Special Assistance needed	Vehicle type	Timetable	Speed of service required
		Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	Low
Mature regulation, simplified permit process	Mid	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	Low
High Social Acceptance	Mid	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	Low
High Performance Tech	Mid	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	Low
Safety Operator Removed from vehicle	Short	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	Low
Fleet manager possible	Short	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	Low
Remote control possible	Short	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	Low
Smart Infra	Mid	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	Low
Advanced accessibility features	Long	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	Low
Commercial availability	Mid	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	Low

Expected timing on service design is medium-term (2030-2035). Use-Case Complexity in autonomous mobility is high. Service design requirements needed for autonomous mobility are demanding and expensive.



DEFINITION OF SERVICE DESIGN:

Service coverage is small and the operational demand is complex. We would need small fleet of shuttles, who would drive on an fixed routh, with a flexible timetable and on public roads. Implementation of AMOD in the existing traffic would be complex. The service would need to offer special assistance and its speed would be high.

DEFINING THE IMPACT ON SERVICE DESIGN:

- **Social:**
 - o **Enhanced Mobility:** AMoD systems provide flexible, accessible transportation options for a wide range of people, including those who are elderly, disabled, or unable to drive. This promotes greater independence and social equity by ensuring transportation is available when and where it's needed.
 - o **Reduced Traffic Congestion:** Through dynamic routing and vehicle sharing, AMoD can reduce the number of cars on the road, helping to alleviate congestion and create more efficient urban transport networks. This can also improve quality of life in crowded cities by shortening travel times.
 - o **Job Displacement and Skill Shift:** Similar to other automated systems, AMoD could reduce demand for drivers, which may lead to job losses in the transportation sector. However, it could also create new opportunities in tech-related fields like vehicle maintenance, software development, and fleet management.
 - o **Social Equity and Inclusion:** As AMoD services expand to underserved areas, they can help bridge the transportation gap for low-income communities, making it easier to access essential services like healthcare, education, and employment.
- **Environmental:**
 - o **Reduced Emissions:** Automated, electric-powered AMoD fleets can significantly reduce greenhouse gas emissions, especially when integrated with renewable energy sources. They eliminate the inefficiencies associated with single-occupancy vehicles and personal car ownership.
 - o **Optimized Energy Use:** AMoD systems rely on algorithms that optimize vehicle usage and routes based on real-time demand. This reduces unnecessary driving, energy consumption, and environmental footprint, making transportation systems more sustainable.



- o Decreased Parking Needs: As fewer people own personal vehicles in an AMoD model, cities may see a reduction in the need for parking spaces, freeing up land for green spaces, housing, or commercial use.
- o Possible Increase in Total Vehicle Miles Traveled: While AMoD reduces the number of cars on the road, the convenience of on-demand travel may lead to more trips overall. This could offset some of the environmental benefits if not carefully managed.
- **Economic:**
 - o Cost Savings for Consumers: AMoD services can be more cost-effective than traditional vehicle ownership, especially in urban areas. Users only pay for the transportation they need, reducing costs associated with purchasing, maintaining, insuring, and parking a personal vehicle.
 - o Operational Efficiency: Fleet owners and service providers benefit from reduced labor costs (since drivers aren't required), greater vehicle utilization, and improved cost efficiency through dynamic route planning and optimization. This leads to more profitable business models.
 - o Increased Investment in Technology: AMoD will stimulate demand for advanced technologies, including AI, sensors, and electric vehicle (EV) infrastructure. This can lead to significant economic growth in the tech, automotive, and energy sectors.
 - o Economic Disruption for Certain Industries: Traditional taxi, ridesharing, and public transport sectors could face challenges due to the shift toward autonomous fleets, potentially displacing current market players. However, this disruption may also drive innovation and competition within the transportation sector.



DEFINING THE TIMING ON SERVICE DESIGN:

Milestones to unlock business case	Timing needed	Use-Case Complexity				Service design requirements				
		Traffic type	Route Predictability	Operational Domain	Road ownership	Fleet size needed	Special Assistance needed	Vehicle type	Timetable	Speed of service required
		Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	High
Mature regulation, simplified permit process	Mid	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	High
High Social Acceptance	Mid	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	High
High Performance Tech	Mid	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	High
Safety Operator Removed from vehicle	Short	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	High
Fleet manager possible	Short	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	High
Remote control possible	Short	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	High
Smart Infra	Mid	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	High
Advanced accessibility features	Long	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	High
Commercial availability	Mid	Complex	Fixed	Complex	Public	Small	YES	Shuttle	Flexible	High

Expected timing on service design is medium-term (2030-2035). Use-Case Complexity in autonomous mobility on demand is high. Service design requirements needed for autonomous mobility on demand are demanding and expensive.



ESTIMATED TIME OF DEPLOYMENT

The estimated time of deployment for Automated Mobility on Demand (AMOD) and other solutions in the Municipality of Postojna can be examined from two perspectives: market readiness and the regulatory framework.

Demand Responsive Transport (DRT): This solution is well-suited for rural areas like Postojna, where the population density is low and scattered. The DRT model is relatively straightforward to implement, especially because it requires a small fleet of vehicles and the technology needed is already widely available. Based on the insights from Postojna's existing transport system, the introduction of DRT could happen in the short-term, between 2025 and 2030, as the service design and operational complexity are low. The availability of vehicles, driver hiring, and coordination with existing local systems should be manageable within this timeframe. DRT can initially be introduced as a paid service to meet the needs of commuters like school children traveling to the city center, with the possibility of scaling it up depending on public acceptance and funding availability.

Automated Transport: Autonomous vehicles (AVs) for collective transport face a more complex set of challenges. While small-scale tests and pilot projects are happening around the world, fully operational AV systems for public transport are still in their developmental phase. Postojna could face significant barriers in implementing AVs, including regulatory obstacles and a lack of technological infrastructure. In this scenario, the use of AVs would require major investments in vehicle procurement, road infrastructure adaptation, and public acceptance of these new technologies. Medium-term deployment (2030-2035) seems more realistic for AV services. The municipality would first need to engage in mapping public roads and developing the necessary technology to operate AVs safely and effectively.

AMOD (Automated Mobility on Demand): AMOD is a highly complex system that builds on the technology and operational frameworks of AVs. This system would require specialized vehicles, real-time data management for dynamic routing, and integration with other public transport systems. Given the current lack of legal provisions for autonomous vehicles in Slovenia, AMOD is projected to be introduced in the medium-term (2030-2035). It will likely come after the regulatory framework for AVs is established, and once the technology is fully integrated into existing public transport systems.

Regulatory Considerations

Current Legal Framework: The current legal framework in Slovenia does not yet provide comprehensive guidelines for the use of autonomous vehicles. The Road Transport Act regulates on-demand transport but is limited to traditional vehicles and does not cover driverless systems. Amendments would be required to create a clear legal pathway for autonomous vehicles, including safety protocols, liability issues, and operational guidelines. Furthermore, there are no provisions specifically for AMOD, making it difficult to deploy this solution without significant legislative changes.



Potential Changes: The slow pace of regulatory development means that even if the technology is ready, deployment will be delayed until the legal aspects are resolved. For instance, the Municipality of Postojna may not be able to introduce AMOD services until there are national or EU-level regulatory frameworks that address liability, safety, and data privacy concerns. The timeline for regulatory adjustments is uncertain but could take several years, pushing the deployment of fully autonomous services beyond 2030.

The municipality of Postojna presents both opportunities and challenges for deploying these new mobility solutions. Its location, population size, and reliance on private vehicles create an urgent need for sustainable mobility solutions. The immediate potential lies in DRT, as it can be implemented with minimal changes to current infrastructure and at a relatively low cost. As demand grows, DRT could evolve into more advanced solutions like AMOD. However, the long-term vision depends heavily on advancements in autonomous vehicle technology, public acceptance, and a supportive regulatory environment. Therefore, it is expected that AVs and AMOD would not be operational in Postojna before 2030 due to technological, regulatory, and financial barriers.

In conclusion, while short-term deployment (2025-2030) is achievable for simpler systems like DRT, more complex solutions such as AMOD will require a longer timeframe due to regulatory and technological hurdles, with a likely medium-term deployment (2030-2035).



VISION STATEMENT

The vision for the Municipality of Postojna is to create a sustainable, inclusive, and modern public transport system that addresses the mobility needs of all its residents while minimizing environmental impact. By integrating advanced mobility solutions such as Demand-Responsive Transport (DRT) and, in the future, Automated Mobility on Demand (AMOD), the municipality aims to reduce dependency on private vehicles, improve access to essential services, and enhance the overall quality of life. Through strategic investments in public infrastructure and alignment with technological advancements, Postojna envisions a future where transportation is flexible, environmentally friendly, and accessible to all citizens, regardless of location or income.

This vision is underpinned by the municipality's commitment to overcoming current regulatory and financial challenges, especially with regard to the integration of autonomous transport systems. By focusing on innovation, stakeholder engagement, and long-term planning, Postojna will ensure a balanced, efficient, and sustainable mobility network that promotes social equity and economic growth.

CLOSING REMARKS

The Municipality of Postojna is embarking on a transformative journey to create a sustainable, inclusive, and modern public transport system. With its strategic location and growing mobility needs, the municipality recognizes the importance of reducing reliance on private vehicles and embracing innovative transport solutions. As outlined in the comprehensive analysis, current challenges, such as inadequate public transport infrastructure, environmental concerns, and regulatory gaps, demand urgent attention. Through the implementation of Demand Responsive Transport (DRT) and preparation for Automated Mobility on Demand (AMOD), Postojna aims to enhance connectivity, improve access to services, and reduce its carbon footprint.

Despite the clear benefits, several challenges stand in the way of achieving this vision. The lack of national regulatory frameworks for autonomous vehicles and AMOD services presents a significant barrier. Moreover, financial constraints, public acceptance of new technologies, and the complexity of coordinating multiple stakeholders will require strategic and coordinated efforts. However, Postojna has already taken important steps in addressing these issues through its Comprehensive Transport Strategy and stakeholder engagement. By working closely with national policymakers, private sector partners, and the local community, the municipality is well-positioned to navigate these obstacles and create a resilient transportation ecosystem.

The future of mobility in Postojna is promising. The successful deployment of DRT in the short term (2025-2030) will serve as a foundational step towards broader, more advanced mobility solutions like AMOD. With careful planning, investment in infrastructure, and a focus on social equity, Postojna will ensure that transportation is accessible to all citizens, regardless of their location or economic status.



This vision of an interconnected, sustainable transport network will not only improve quality of life but also contribute to the municipality's broader environmental and economic goals. By staying committed to innovation and sustainability, Postojna will set a new standard for smart, efficient, and inclusive transportation systems.

In conclusion, while challenges remain, Postojna's proactive approach, strategic planning, and investment in future mobility solutions will pave the way for a greener, more inclusive future. Through collaboration, innovation, and persistence, the municipality is poised to become a leader in sustainable transportation, ensuring a high quality of life for its residents while contributing to global sustainability efforts.

SOURCES

1. Zavod Sopotniki - brezplačni prevozi za starejše
2. Vsebina Uradnega lista | Uradni list (uradni-list.si)
3. Zakon o prevozih v cestnem prometu (ZPCP-2) (PISRS)
4. DUJPP - Družba za upravljanje javnega potniškega prometa
5. Regionalni razvojni program Primorsko-notranjske regije 2021-2027
6. Celostna prometna strategija
7. Zakon o celostnem prometnem načrtovanju (Ur.List RS št. 130/2022 z dne 11.10.2022)
8. Dogovor za razvoj regij – Ministrstvo za kohezijo in regionalni razvoj

CONTACTS

Maja Piškur, Project Manager

Municipality of Postojna

Mail: <mailto:maja.piskur@postojna.si>



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