



**Aldona
JARAŠŪNIENĖ**



**Domas
ČESNULAITIS**



Improving the efficiency of the Vilnius city transport system in the context of safe and sustainable mobility and multimodality



Sustainable mobility is a way to tackle congestion, protect environment, save time and increase traffic safety

Relevance of the research

Improve the efficiency of the Vilnius city transport system by applying sustainable mobility and multimodality.

Work objective

„Park-and-Ride“ as a sustainable alternative to solve problems.

Research problem

The various measures taken to improve the transport system and reduce congestion are largely limited to temporary solutions of the problem, without any lasting benefits in the fight against increasing road traffic flows.

Factors interfering with the optimal operation of the transport system

- **Environmental impact;**
- **Mechanical problems;**
- **Human fault;**
- **Infrastructure imperfections.**



Measures for controlling traffic congestion

- **Infrastructure improvement;**
- **Introduction of alternative working hours;**
- **Improving the traffic flow planning process;**
- **Optimal management of transport demand according to the needs of road users;**
- **Balanced and sustainable development of urban infrastructure.**



Innovation and technology for a safer, faster and more convenient trips

- **Intelligent transport systems;**
- **Promoting and creating sustainable urban mobility and multimodality;**
- **Integration of environmentally friendly vehicles.**



Vilnius city's sustainable urban mobility based approach for solving transport system problem

The sustainable mobility plan is based on 3 pillars:

- Formation of public travel habits by promoting walking, cycling and public transport;
- Management of access control to the arterial road and city street network through the intersection of personal vehicles;
- Coordination of urban development by regulating the dispersion of the city and ensuring the efficiency of urban logistics.



Based on a sustainable mobility plan and a joint response to the urban traffic situation

Renewal of the capital's public transport;

Investment in the development of its transport network and improvement of infrastructure;

Periodic passenger surveys and consultations with transport organization specialists and scientists;

Increasing the interoperability of different modes of transport and means;

Focus on the renewal of cycle and pedestrian paths, the development of their network and the safety of all road users.



North Street Project



Other measures applied by the city of Vilnius to improve the transport system

In order to achieve a more efficient functioning of the transport system in Vilnius city, and in addition to the improvement of public transport, the promotion of sustainable mobility and multimodal traveling in the city, it is necessary to build a well-developed infrastructure network of streets and roads.



„Park-and-Ride“ facilities as part of urban transport infrastructure and traffic planning system

- „Park-and-Ride“ system as part of an urban multimodal system that offer variety of transportation options and enable people to switch from a personal car to public transport.
- Inspired by the successful experience of other cities abroad and the implementation of the sustainable mobility plan, Vilnius City Municipality opened the first “Park-and-Ride“ sites in Lithuania in the summer of 2017.
- Despite the constantly growing number of users, the overall popularity of „Park-and-Ride“ in Vilnius remains relatively low.

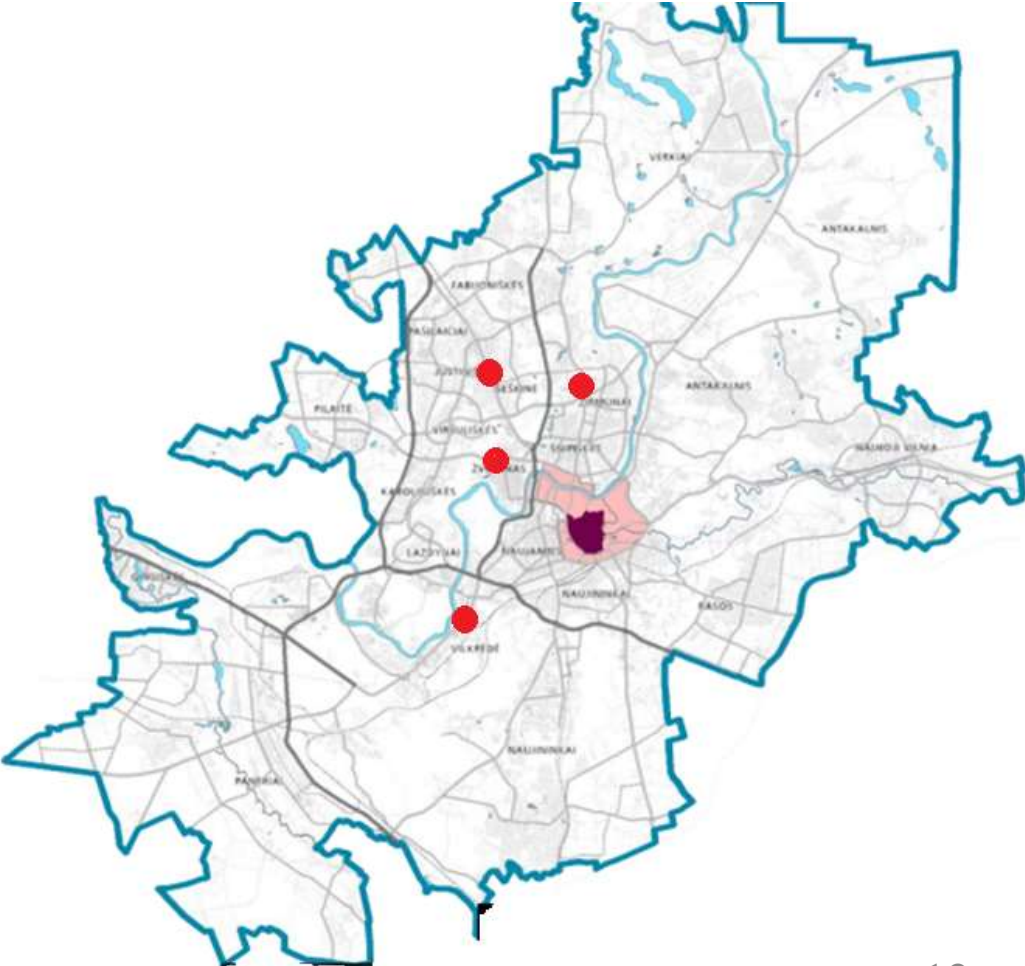


Problems of „Park-and-Ride“ activities in Vilnius

Praha



Vilnius



Questionnaire survey of Vilnius city transport system users

In order to find out the formed travel habits of Vilnius residents in the city, their reasons and attitude towards more environmentally friendly alternative travel methods, especially distinguishing the services provided by the „Park-and-Ride“ platform, a public opinion poll was conducted, which revealed:

- 1) the shortcomings of mobility, security and the „Park-and-Ride“ platform in the city observed by the citizens;
- 2) citizens' views on the circumstances in which they would use measures to ensure sustainable mobility and multimodality.



Evaluation of Vilnius „Park-and-Ride“ sites

The evaluation was performed on a five-point system with the following values:

5 - excellent,
 4 - good,
 3 - satisfactory,
 2 - bad,
 1 - very bad

Aspect / site	Sėlių str. 62	Ukmergės str. 246	V. Gerulaičio str. 1	Savanorių ave. 124
Location attractiveness to users	2	3	1	4
Location logic in conformity with the platform principle	1	2	2	4
Further travel options offered by public transport	4	4	5	3
Network of A-lanes around	4	3	2	3
Site accessibility	1	2	2	4
AVERAGE	2.4	2.8	2.4	3.6

SWOT analysis

Strengths

- Well developed quality of roads and public transport and constantly improved;
- Approved by the SUMP, whose tasks create environmentally and socially friendly travel opportunities;
- High technological and scientific development enabling the deployment of ITS.

Weaknesses

- Majority of daily trips occurred in personal vehicles ;
- High prevalence of old and polluting cars;
- Congestion during peak hours due to low interactions between individual modes of passenger transport.

Vilnius city transport system

Opportunities

- Absorption of financing provided by EU investment funds;
- Implement ITS and other innovation-enhancing traffic management and control processes;
- Promoting the interaction of public and private

Threats

- Growing population in the city;
- The movement of the population or important infrastructure objects in the city is not beneficial for the transport movement;
- Lack of funding and outdated and difficult to change societal habits.

Identification of problem areas

The SWOT analysis of the Vilnius city transport system and the public opinion poll allowed to identify additional problem areas in the context of security, sustainable mobility and multimodality:

- 1. High public attachment to personal and mostly old vehicles;**
- 2. Low speeds of public transport due to the underdeveloped A-lane network and low interoperability of such transport with other modes of transport ensuring sustainable mobility and multimodality;**
- 3. Outdated habits of the townspeople, which prevent acceptance of the proposed innovations;**
- 4. It is useless and impractical for the city to start developing the „Park-and-Ride“ platform.**



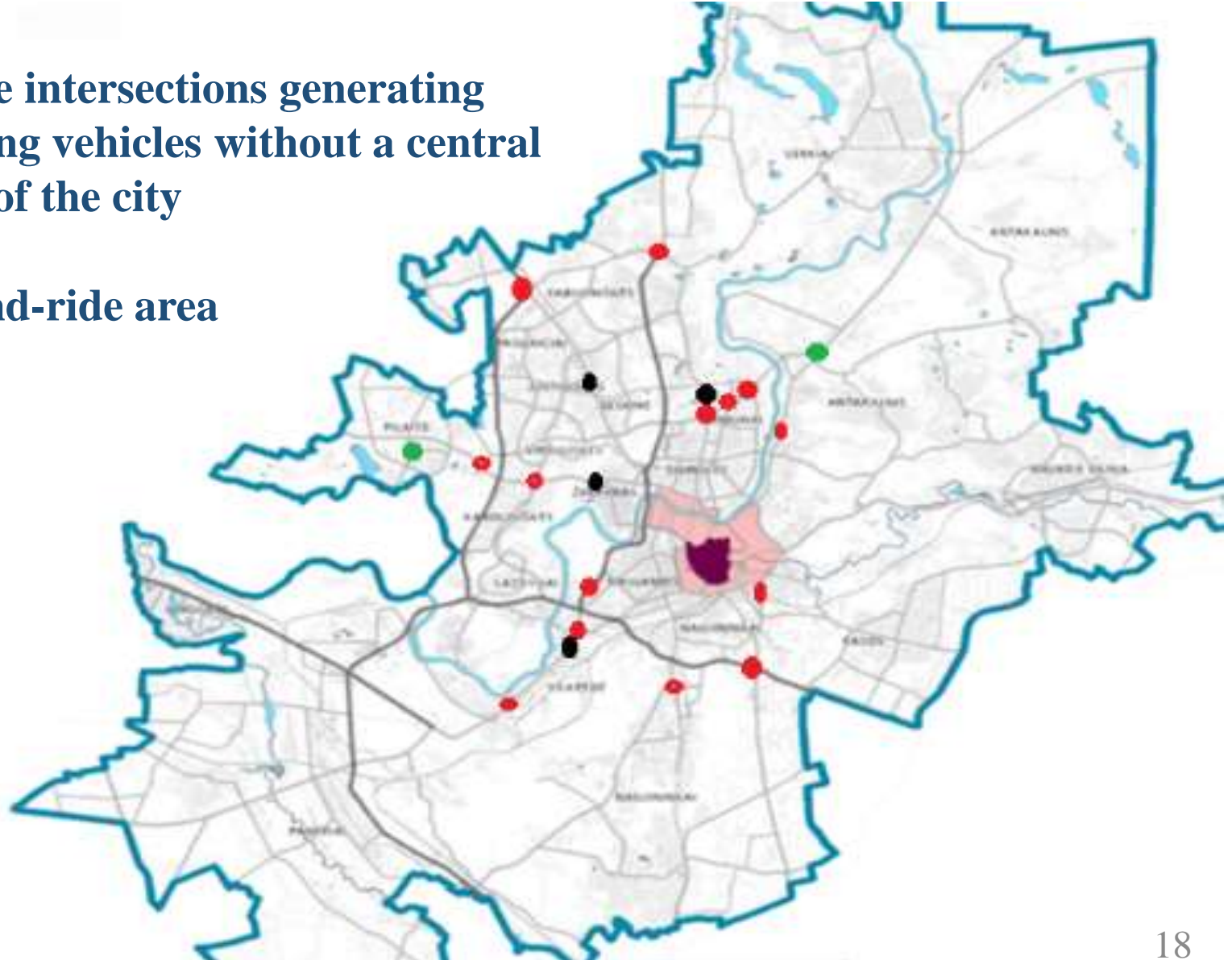
Action is needed to address the problem areas identified above

- The efficient operation of the „Park-and-Ride“ platform, which directly contributes to the implementation of the principles of sustainable mobility and multimodality in the city, is crucial for improving the efficiency of the urban transport system, thus ensuring traffic safety, mobility and sustainability.
- This requires the expansion of the „Park-and-Ride“ network of sites and the upgrading of existing sites and other transport system infrastructure.



Selection of location of „Park-and-Ride“

- Large intersections generating passing vehicles without a central part of the city
- Current park-and-ride area
- Planned new park-and-ride.



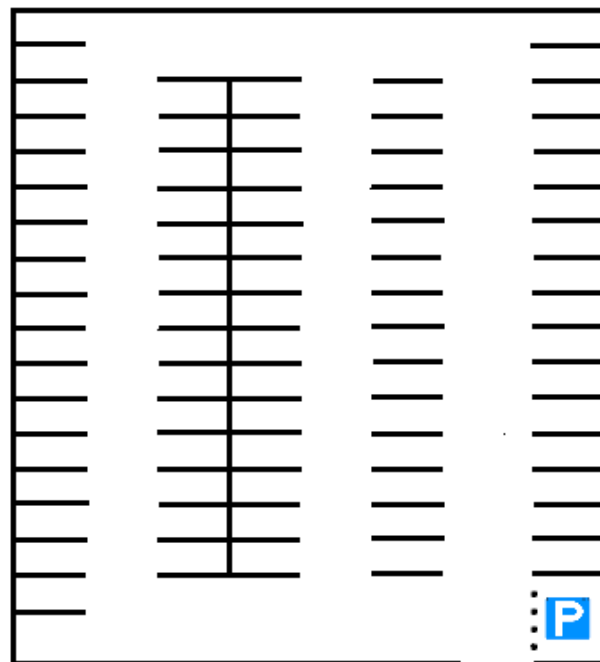
The characteristics of the planed car park

Location: **Vydūno str. 20**

The dimensions of the site: 46m × 41m;

Parking capacity—77 cars;

Site plan:

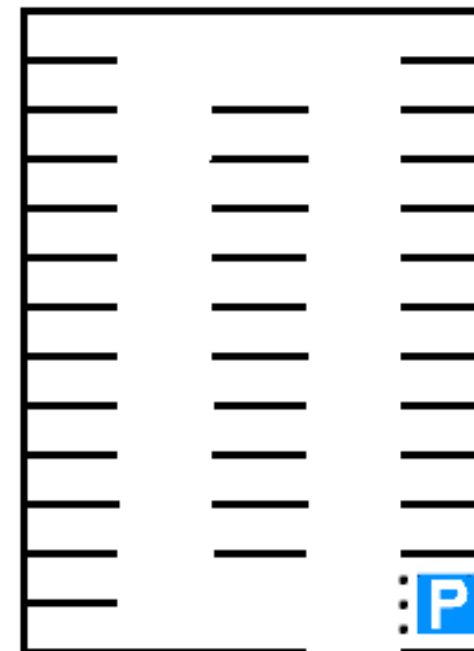


Location: **Nemenčinės pl. 13**

The dimensions of the site: 32 m × 24 m;

Parking capacity—33 cars;

Site plan:



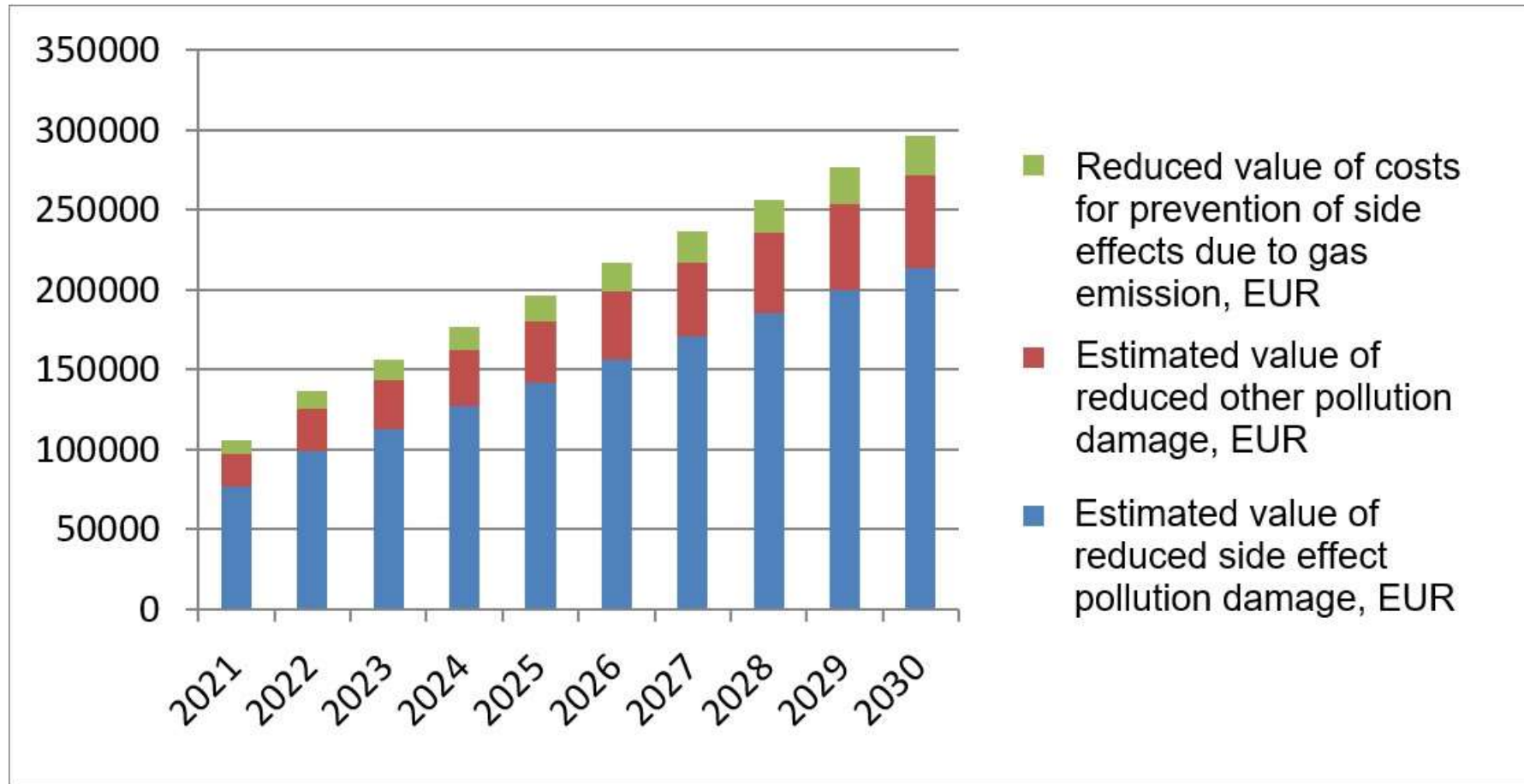
Planned value of ecological savings in monetary terms

Ecological return was calculated based on 2 indicators:

- 1. Estimated distance traveled by private vehicles due to sustainable mobility measures;**
- 2. Assessing the monetary and safety impacts of light vehicles in monetary terms, based on data provided by the Victoria Institute for Transport Policy.**

Damage	Value in EUR/km
Damage causing greenhouse effect	0.0834
Other air pollution damage causing non-greenhouse effect	0.02265
Damage of Greenhouse effect control measures	0.00959

Planned value of ecological savings in monetary terms



Save about 4,050 tons of carbon dioxide during the forecasted decade; where the accumulated value of ecological savings will reach about EUR 2 055 818.

Dissemination plan for the organization of sustainable mobility

- Municipality media platforms;
- Articles on popular media sites;
- Outdoor video screens.



The results and benefits of a sustainable mobility organization based on the „Park-and-Ride“ principle

Expected project results:

- 50% expansion of the number of „Park-and-Ride“ parking lots, 33% increase in the number of parking spaces in strategically attractive parking locations for users will increase the demand for the platform and increase its popularity;
- About 33,000 kg of CO₂ emissions will be avoided every month, other air and noise pollution will be reduced, and the number of car accidents in the city will be reduced;
- „Park-and-Ride“ users will reduce travel time by 10-40% during peak hours;

There will be about 30,000 fewer journeys by private vehicle per month, which will lead to 15,000 km not being travelled in the city, resulting in added value for road users of around € 32,500 per month.

Recommendations



- The institutions responsible for the efficiency of the Vilnius city transport system recommend to continue to perform the tasks provided for in the sustainable urban mobility plan.
- Also continue to invest in various projects promoting sustainable mobility, networking them and creating greater benefits for society and the city.
- The implemented project of development and renewal of the „Park-and-Ride“ platform will provide various benefits in the long run.
- „Park-and-Ride“ sites are also expected to bring even greater benefits in ecological and social terms, as they will make a significant contribution to reducing environmental and noise pollution, congestion, waste of time and road fatalities in the future.