

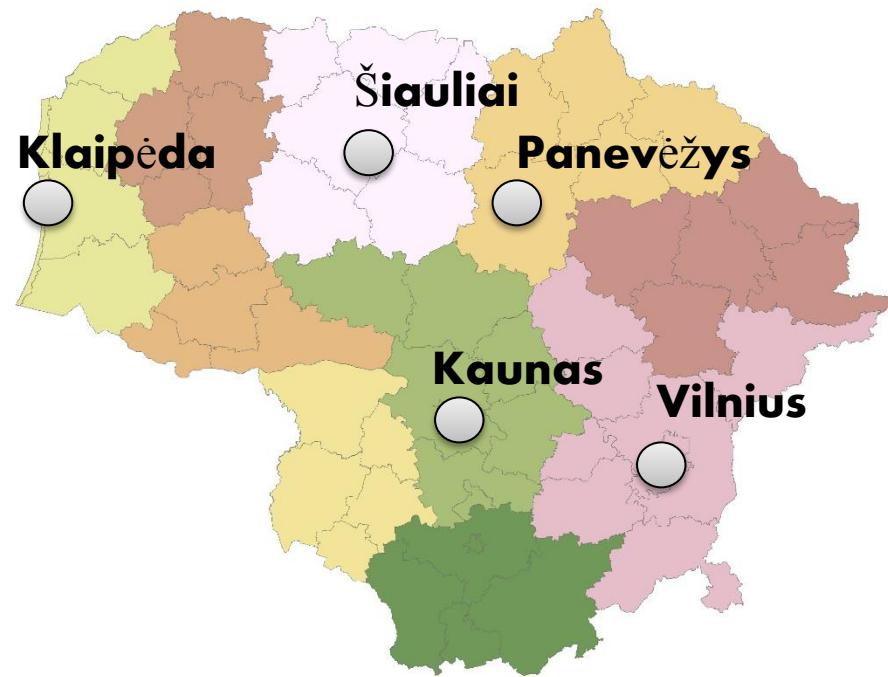


VILNIUS GEDIMINAS
TECHNICAL UNIVERSITY
FACULTY OF ENVIRONMENTAL ENGINEERING

Transport systems integration into urban development planning processes

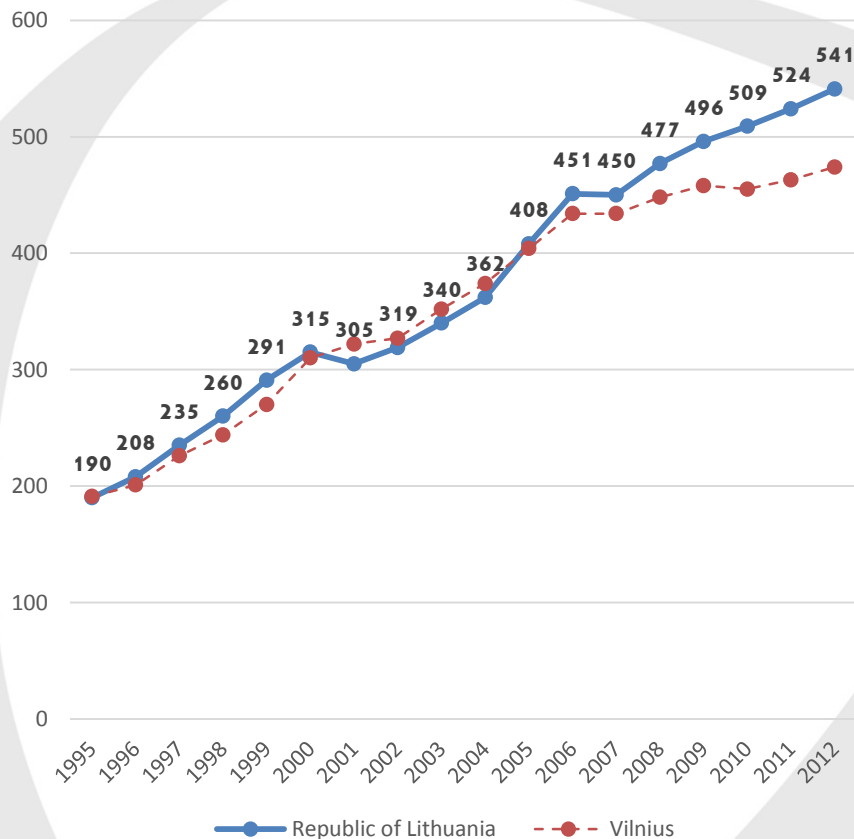
Phd. Vytautas Palevičius

2014-03-28



At the beginning of year 2013, Lithuania was populated by 2 million 972 thousand people. There are five main cities in Lithuania: Vilnius, Kaunas, Klaipėda, Šiauliai and Panevėžys. The largest one is the capital Vilnius with a half million population.

Automobilization, cars/1000 person



Over past 50 years the transport system in Vilnius changed completely. About 1960 system of public transport was practically the only way of communication (>95 %), about 1990 private cars were dominating already, in 2000 importance of public transport decreased about 20-30 %. From 1995 till 2012 an amount of cars in Vilnius increased 3 times. The reason of automobilization level growing – car protection policy.

Main transport systems in Lithuanian cities



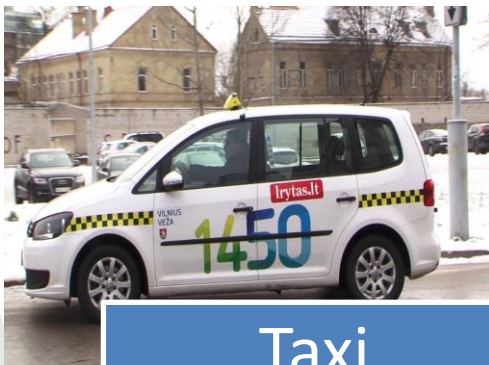
Bus



Trolleybus



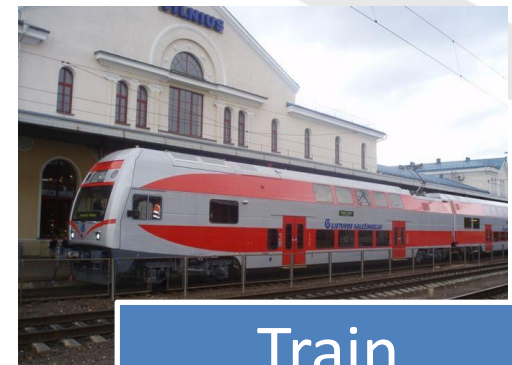
Minibuse



Taxi

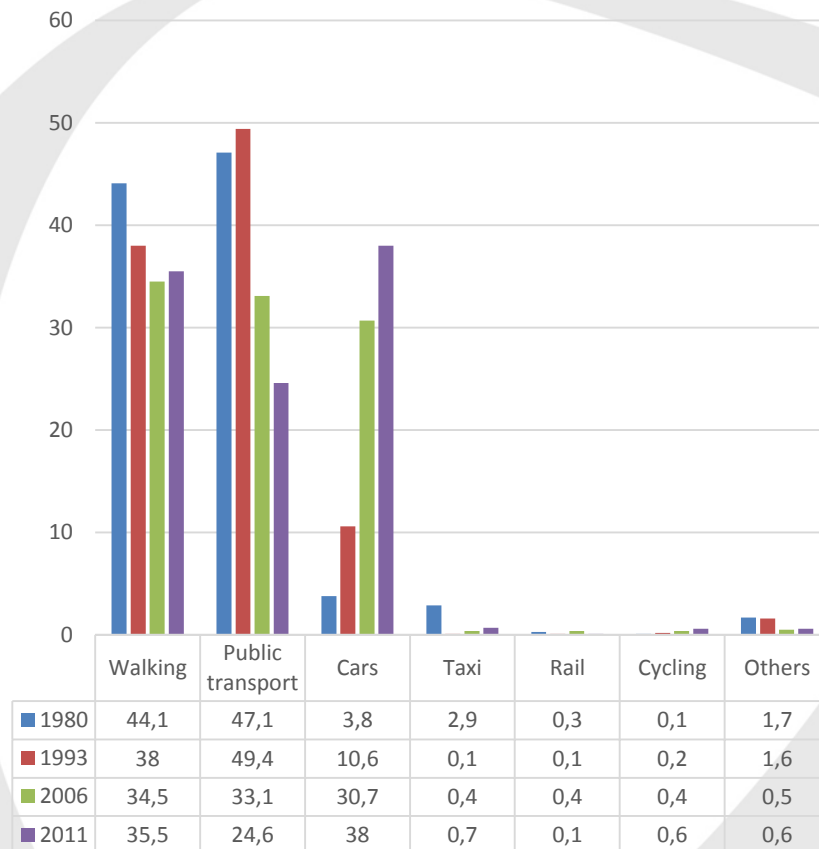


Bycycle



Train

Modal split



In 1980, 1993, 2006 and 2011 the survey of residents of Lithuania was held with an aim to identify how many residents travel and what kind of transport do they use. According to the results of the survey, travel structure (estimating types of transport system) in Lithuania from 1980 to 2011 changed completely: amount of pedestrian travels decreased from 44,1 % to 35,5 %, using public transport decreased from 47,1 % to 24,6 %, taxi – from 2,9 % to 0,7 %. Travels by private cars increased heavily – from 3,8 % to 38 %, slightly increased an amount of travels by bicycles – from 0,1 % to 0,6 %.

Integrate planning

Application

~~**Multifunctional special planning**~~

**Overall strategic urban development
planning, formulation of goals and
visions**

Urban planning national policy

„S.Neries“ residential area

Information:

Start of construction (year)	2005
Population	4550
Number of flats	2000
Auto mobilization (cars/1000 person)	>600
Workers	2480

Difficult to maneuver to PT,
parking's problems and etc..



„Perkūnkiemis“ residential area

Information:

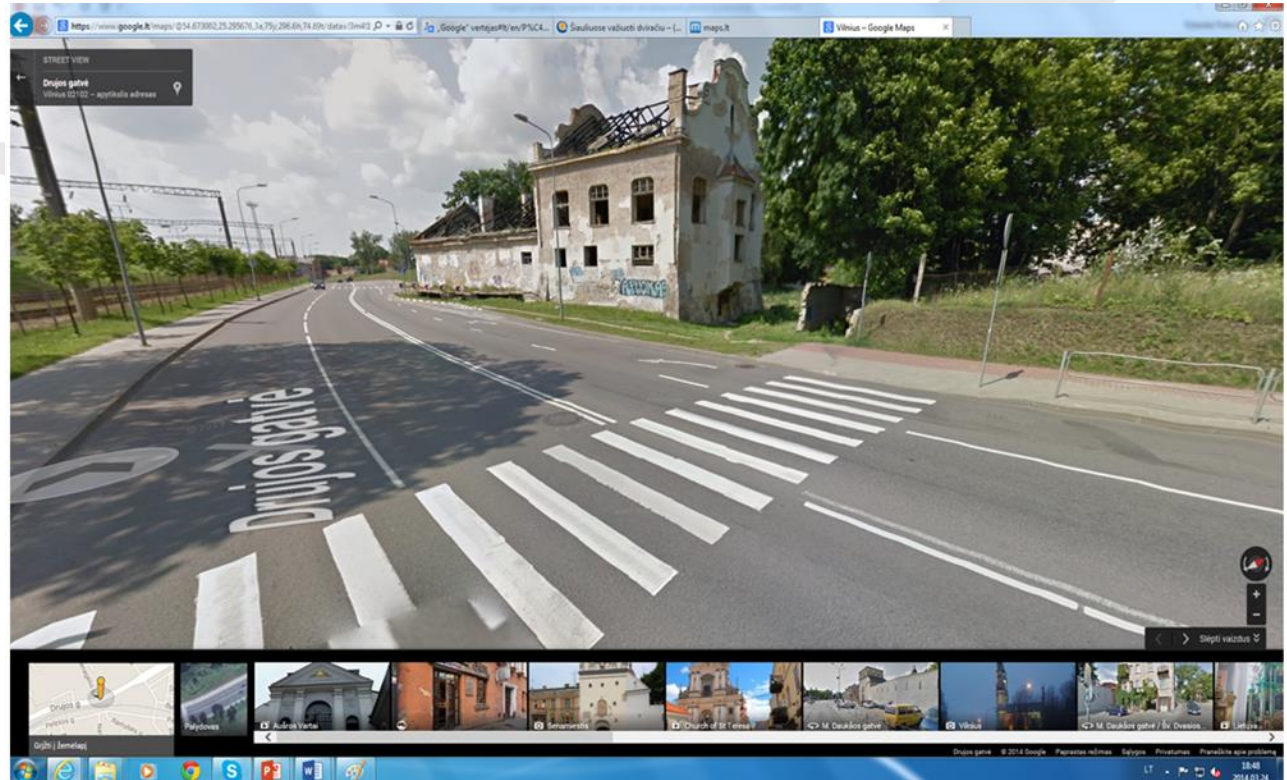
Start of construction (year)	2008
Population	4810
Number of flats	2120
Automobilization (cars/1000 person)	>600
Workers	2870

No PT, parking's problems, traffic jams and etc..





Land issues (1)



Very frequent inconvenience in Lithuania is the question of territory reclamation. For example in Vilnius in Drujos street southern circuit is driven. Going towards the train station street suddenly narrows. „Bottle neck effect“ appears, the consequence of which is traffic jam.

Land issues (2)

In "Perkūnkiemis" residential area, which was planned as a residential district, the unresolved question of ownership divided the neighborhood into two parts, thus preventing the development of urban communication (especially public transport).



Political powers

Ministry of Transport and Communications of the Republic of Lithuania promotes the implementation of combined traveling systems (Park&Ride, Bike&Ride, Park&Rail, etc.). The authority of Vilnius municipality approves the implementation of tram transport system, but in order to implement this project, the project has to be granted a status in terms of high importance. Only Parliament of the Republic of Lithuania can grant this status and this institution demonstrates a big support for the metro idea. This situation has a very negative effect on transport systems integration into urban development planning processes.



Members of
Parliament



Ministry of
Transport



Vilnius
municipality

SWOT analysis of Vilnius public transport system

STRENGTHS

- Current PT network provides communication between all areas;
- Large PT network density;
- PT system meets the STR requirements;
- Discount system for different social groups.

OPPORTUNITIES

- One ticket system;
- PT network optimization;
- More efficient use of funds;
- Reduced demand for compensation of losses;
- Various kinds of PT routes divided into a hierarchy;
- Reduced passenger travel time;
- Cheaper and more convenient travel for passenger;
- Higher PT service level;
- Increased number of passengers - higher income;
- New image of urban PT.

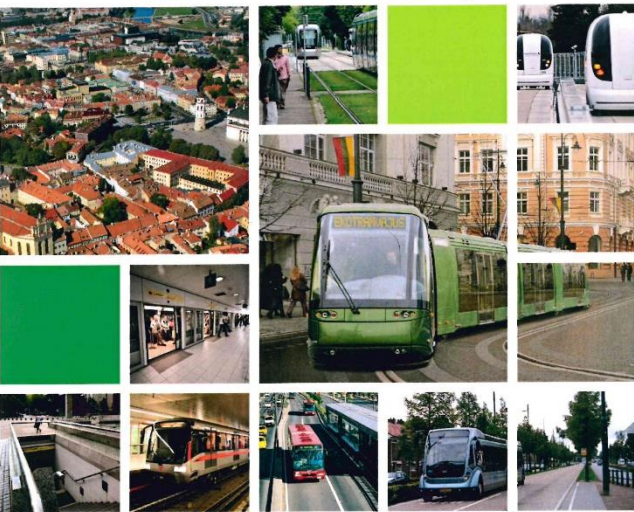
WEAKNESSES

- No one ticketing system between the municipal and private operators;
- Large duplication of routes, non-hierarchized network;
- Unequal competitive conditions for all operators;
- Lack of investment funds to upgrade the vehicle fleet;
- Not ensured funding;
- No priority in streets;
- Current PT system can not compete with the individual car;
- Long travel time;
- Poor PT image.

THREATS

- Instability in the legal environment;
- Failure to provide the required funding;
- Changing the habits of passengers;
- Private operators dissatisfaction;
- Car drivers dissatisfaction.

Special plan of implementation of new transport means in Vilnius city

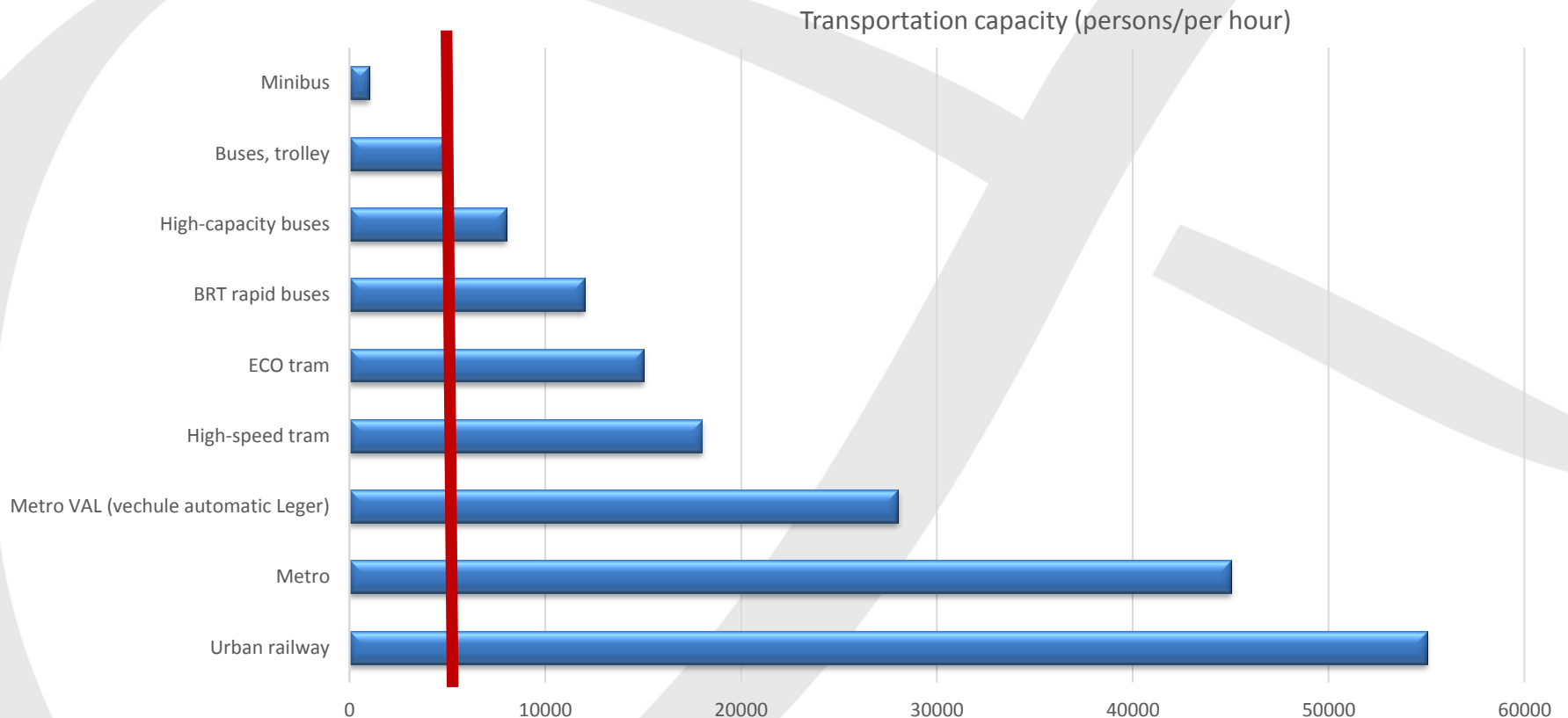


**Naujų transporto rūšių
diegimo Vilniuje
SPECIALIOJO PLANO KONCEPCIJA**

At the conceptual stage the green light for the future vision of Vilnius transport system was given:

- 1) Based on principles of sustainable development;
- 2) Based on principles of sustainable and adjustable urban development;
- 3) Based on priority of public transport, especially in the city centre;
- 4) Restricting number of car parking lots and increasing parking costs in the city centre;
- 5) Based on development of pedestrian walkway network and formation of non-motorized traffic zones;
- 6) Taxing non-ecological transport in the old town and city centre;
- 7) Building PARK&RIDE system's stations near public transport terminals and near lanes of new means of public transport.

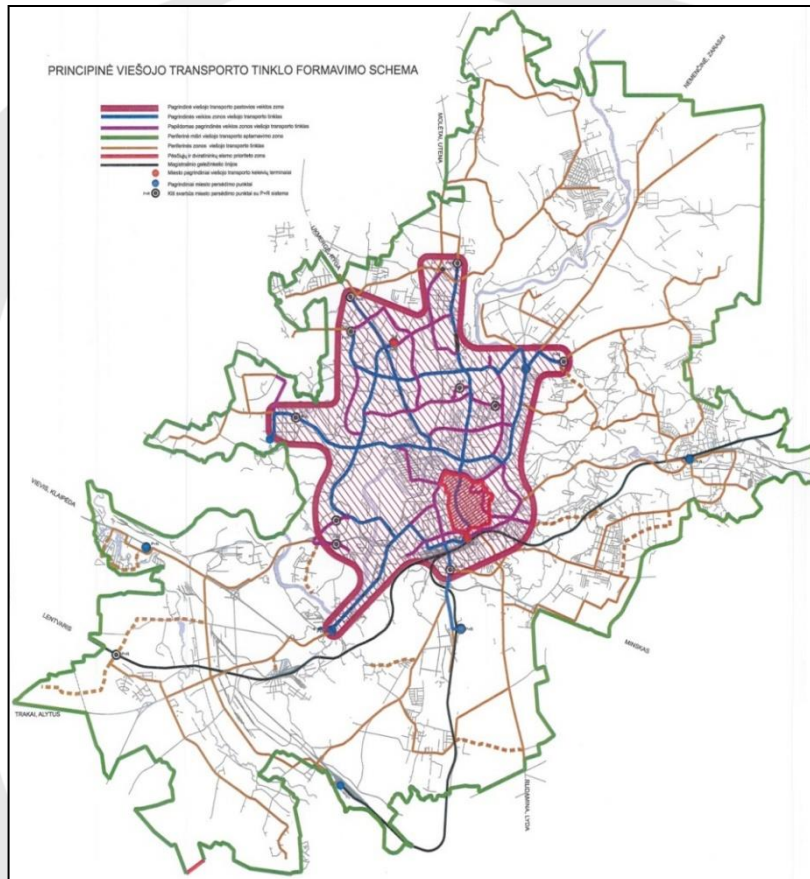
Capacity of urban transport means



Public transport planning

- 1) integrate minibuses, private buses into one PT system;
- 2) develop and implement rapid bus route network. Install the rapid bus route network, using existing and developing new special PT lanes, create the priority for PT at intersections;
- 3) optimize and ensure PT network development and modernization. Adjust the PT city routes and schedules based on passenger flows, evaluating the newly formed PT rapid routes network;
- 4) develop PT terminal in the northern part of the city – *Fabijoniškės* – for urban and suburban passenger service by reducing the traction of existing bus station.

PT network optimization scheme



Main city activitie zone, where are about 75% of the population and work places. Here is formed rapid bus network with the main city routes.

Peripheral and middle city zone. The area is formed by the additional network of major routes (which has a connection to the main urban area) and low intensity routes (which includes the small capacity buses). P+R network is formed in the peripheral area of the city.

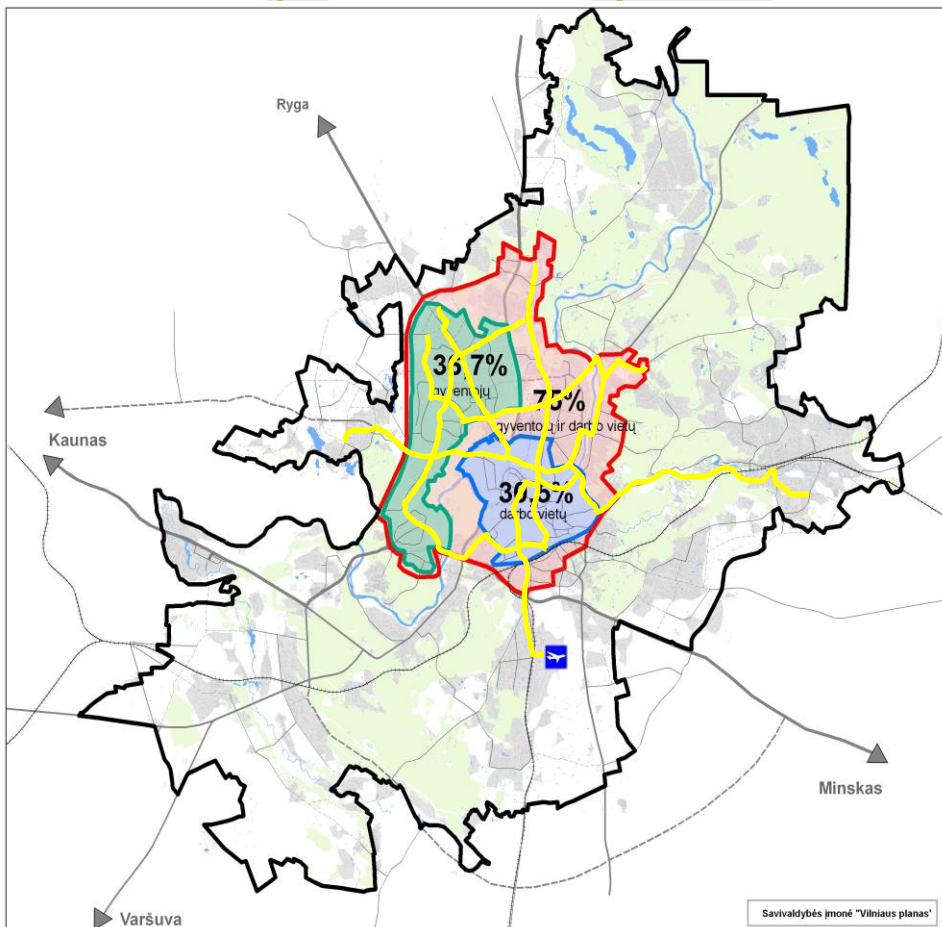
PT service efficiency levels:

- inefficient < 25 inh./ha (not recommended);
- Low intensity – 26-42 inh./ha (30- 60min.);
- middle intensity – 43-92 inh./ha (<30 min);
- intensive traffic > 92 inh./ha (<10min).

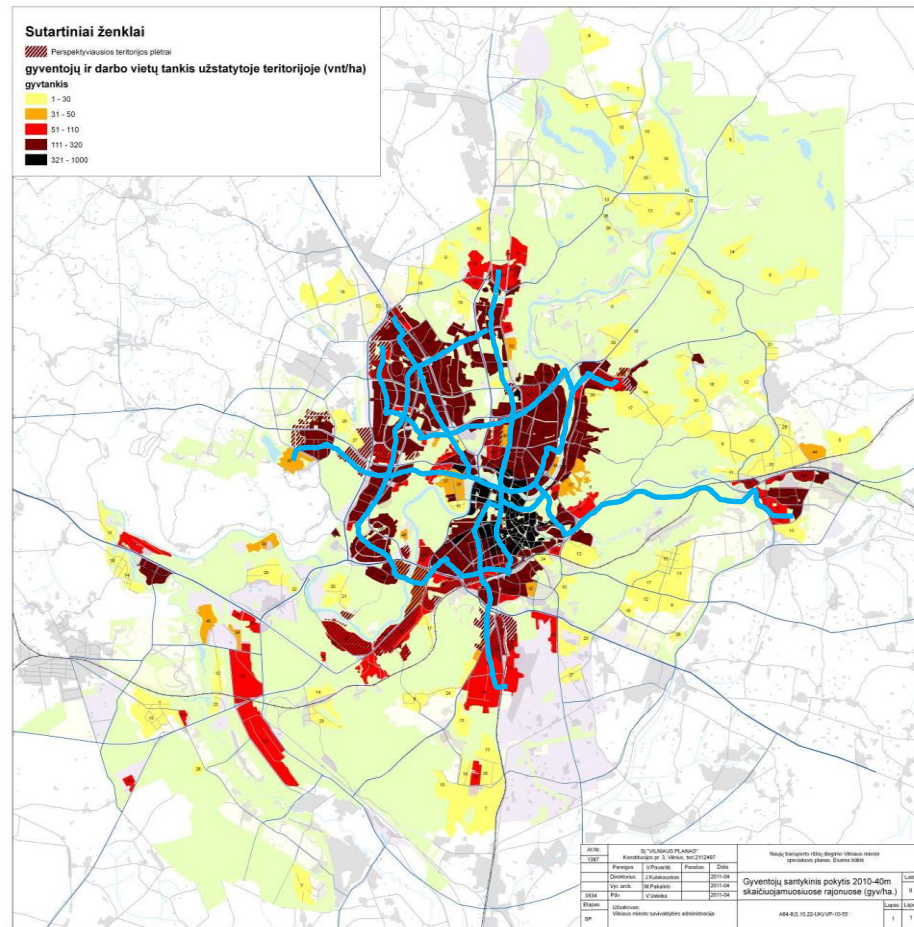
~ 55% territory of Vilnius city belongs to non effective PT service level.

New PT network corresponding to the distribution of population and work places

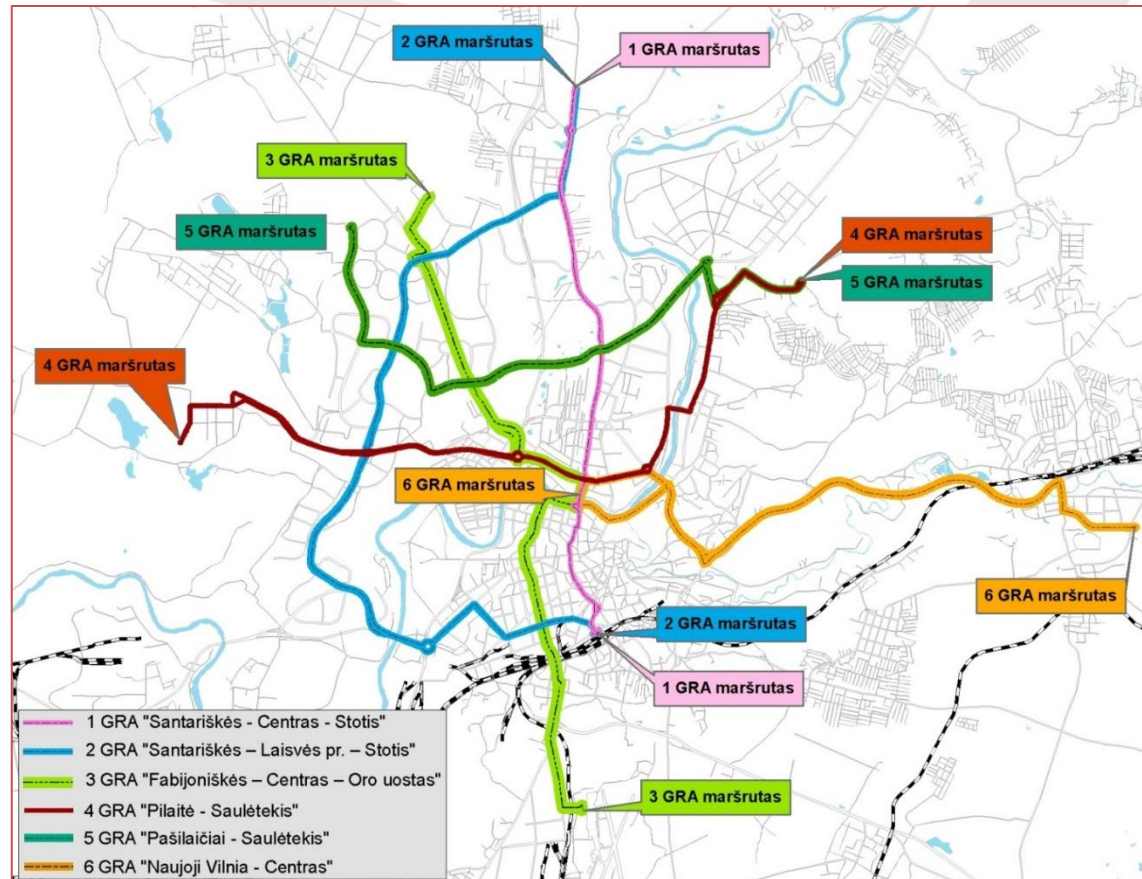
Population and work places



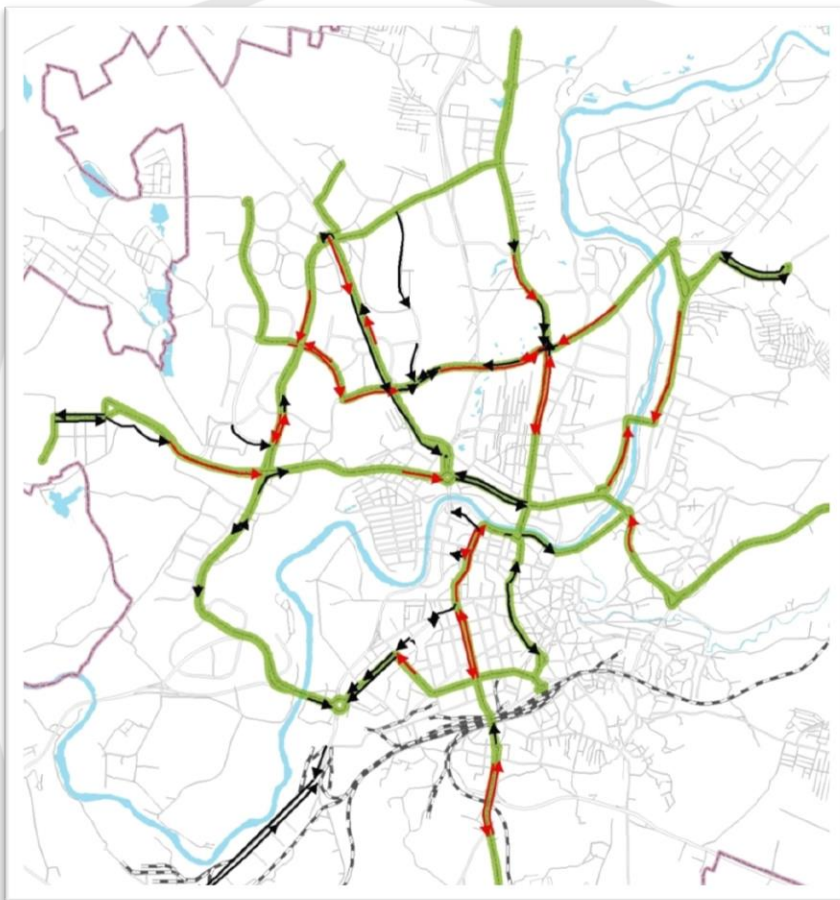
Population and employment density in built-up area



6 speed routes



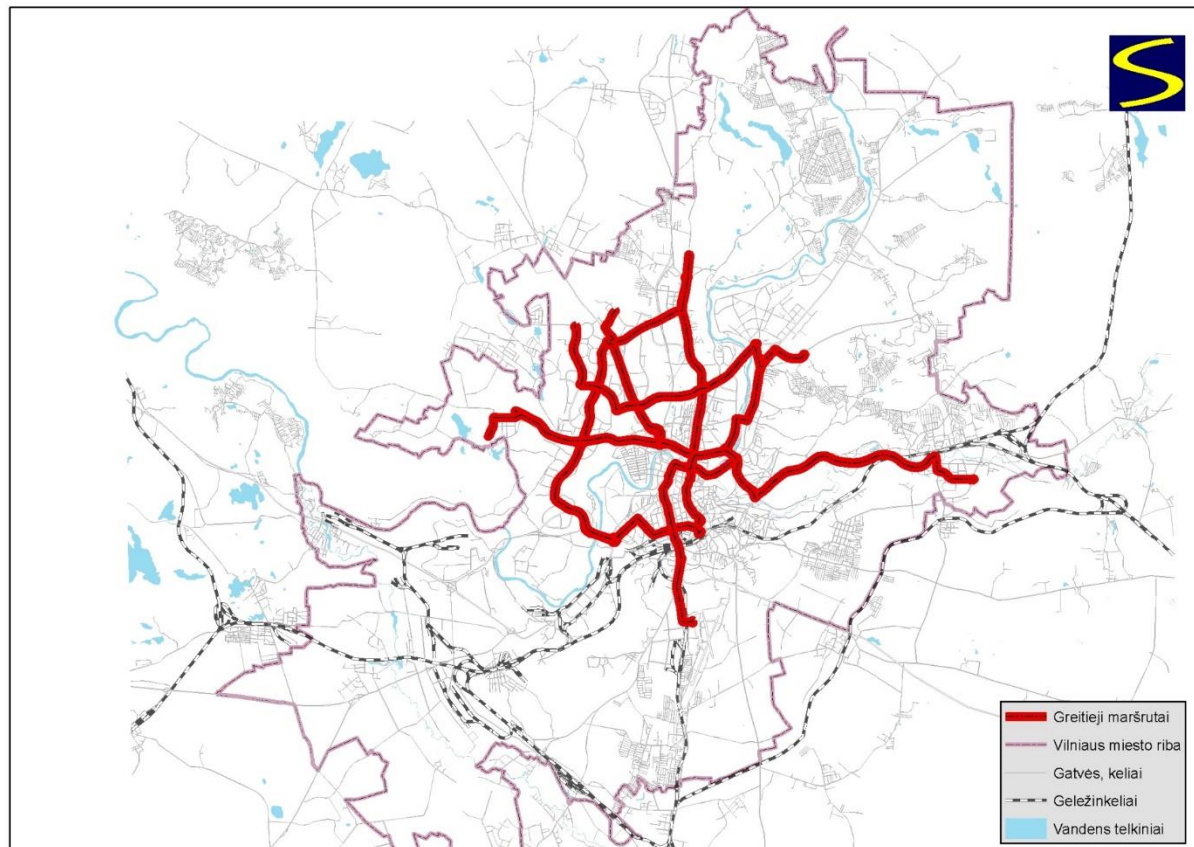
Special lines for buses



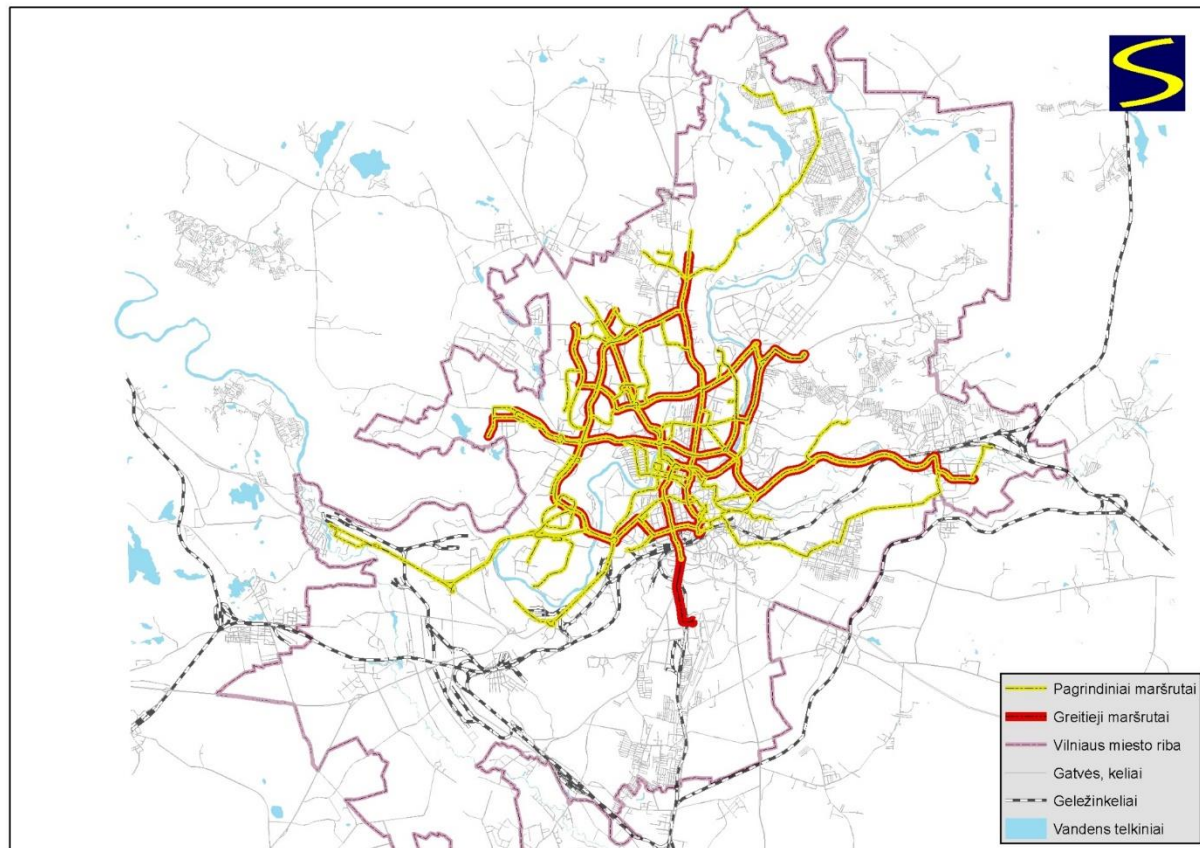
WAS: 25 km
NOW: +15 km



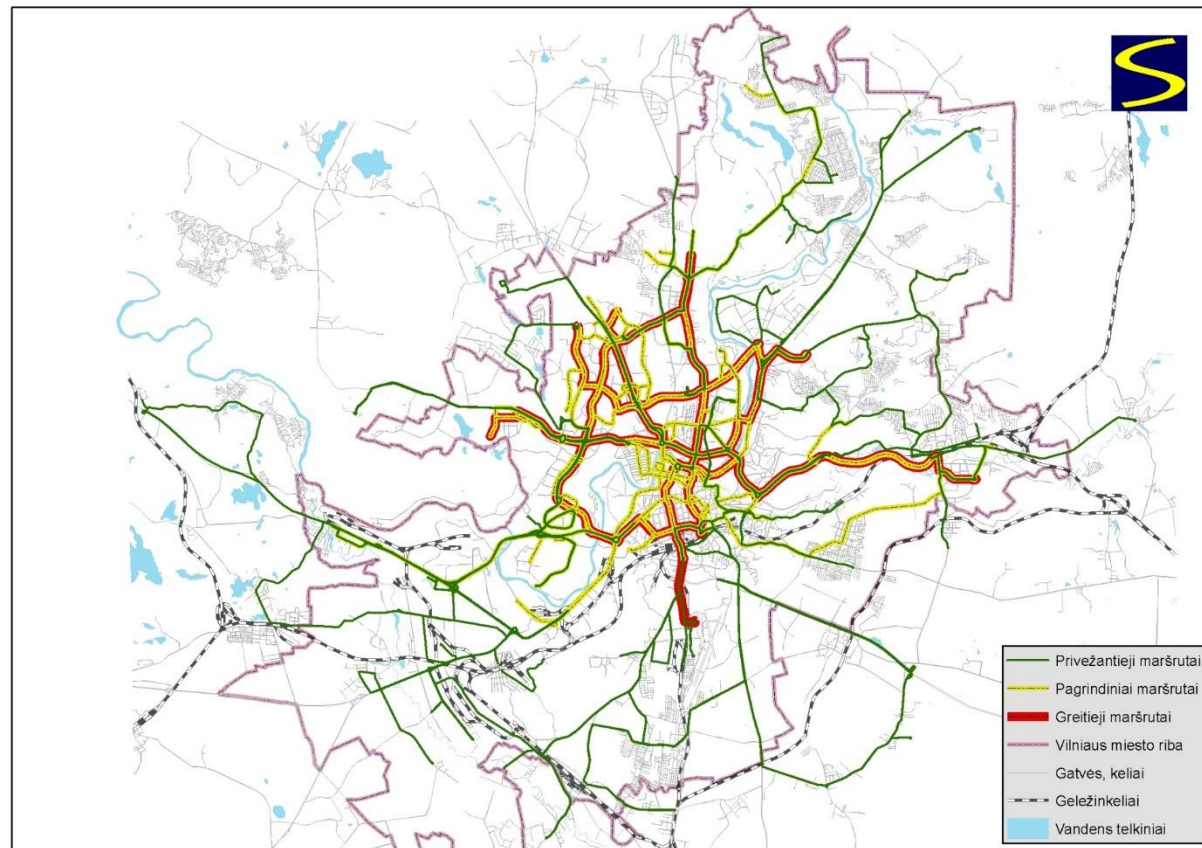
Rapid route



Rapid + main routes



Rapid + main + low intensity routes





PT network hierarchical levels

WAS

Main city routes

- Territory: whole territory of city;
- Vehicle types: buses, trolleybuses, minibuses;
- Speed: 12-20km/h;
- Traffic interval: 7-60 min.



Localized city districts routes

- Territory of individual districts of the city;
- Vehicle types: buses, minibuses;
- Speed: 20-25km/h;
- Traffic interval: 30-60 min.



Routes serving the suburbs

- Territory: close suburb, peripheral part;
- Vehicle types: buses, minibuses, trains;
- Speed: 20-25km/h;
- Traffic interval: 30-90 min.

NOW

Rapid routes

- Territory: main city zone;
- Speed: >25km/h;
- Traffic interval: 5-6 min;
- Forming principles: reduction of travel time by thinning stops, increasing number of special lines and introducing priority traffic conditions.



Main routes

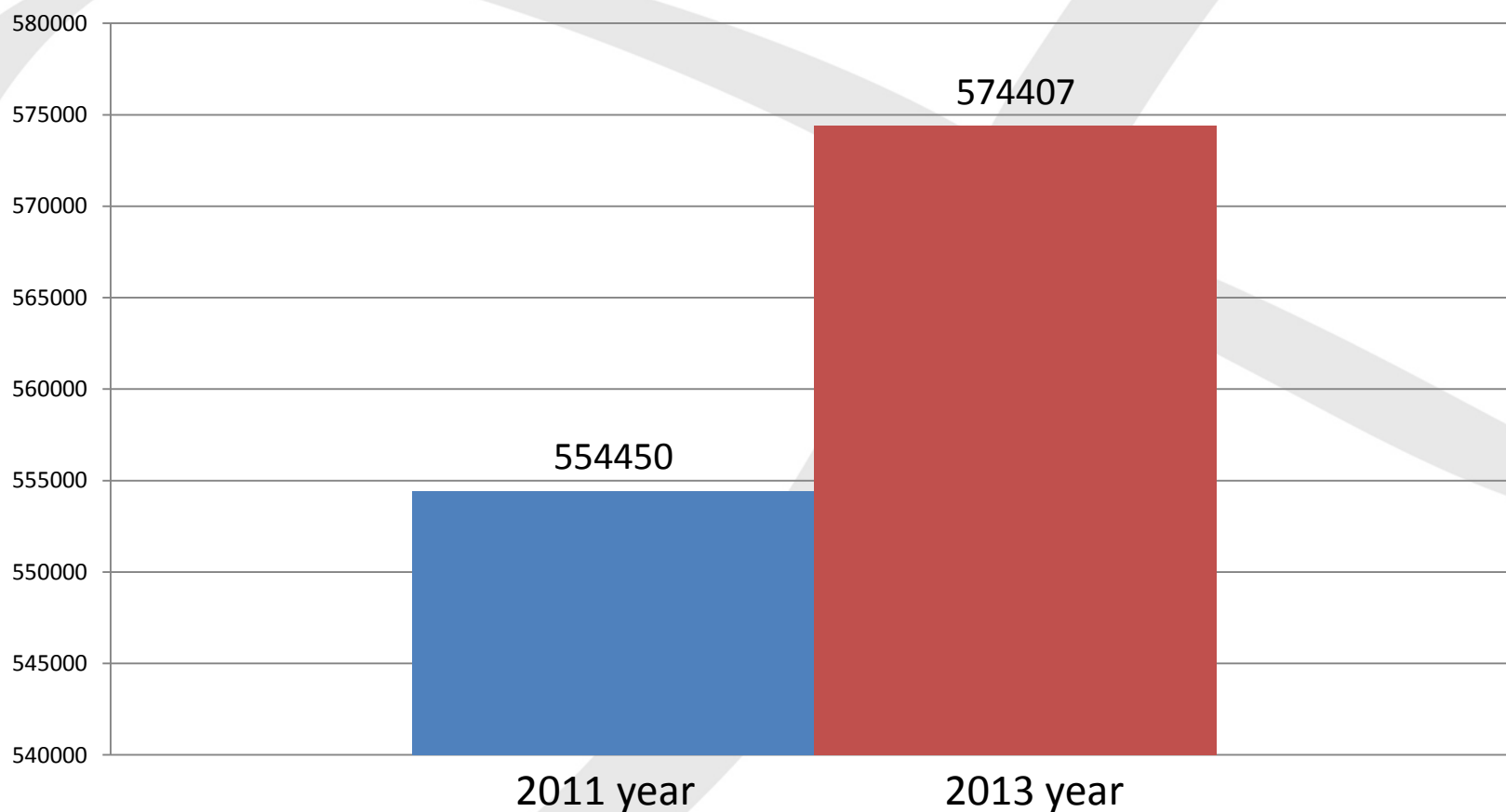
- Territory: main and middle city zones;
- Vehicle types: buses, trolleybuses;
- Traffic interval: 10-15 min;
- Forming principles: present autonomous buses and trolleybuses routes.



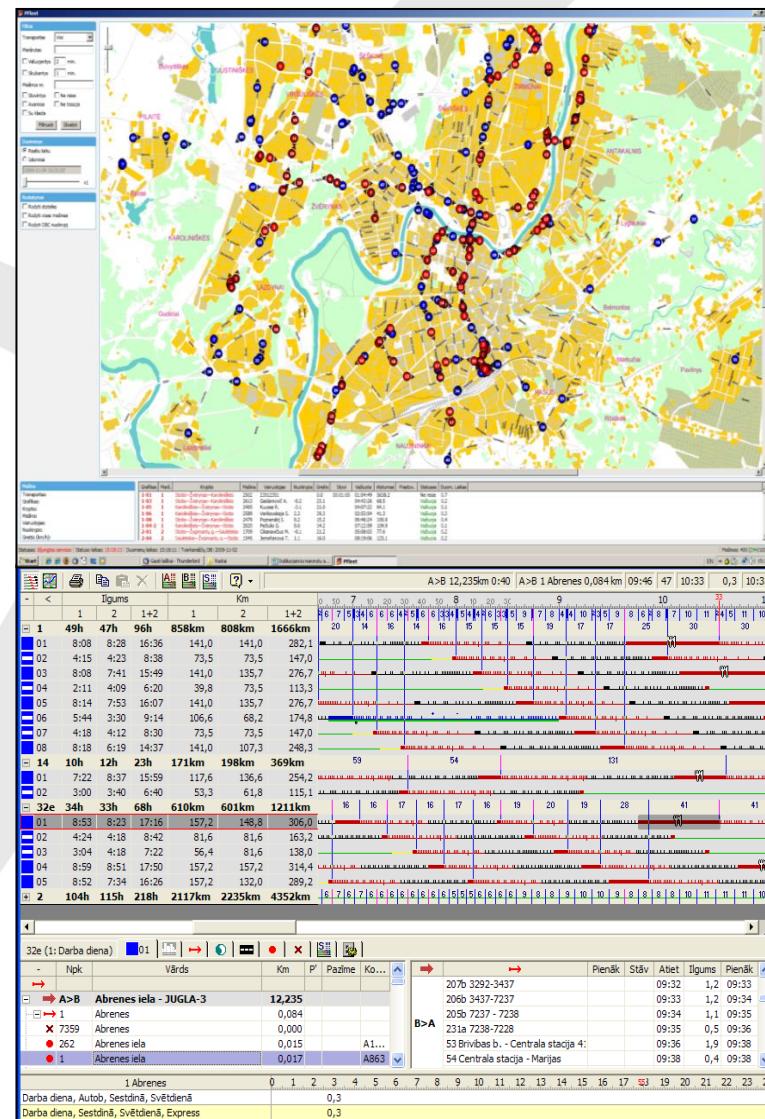
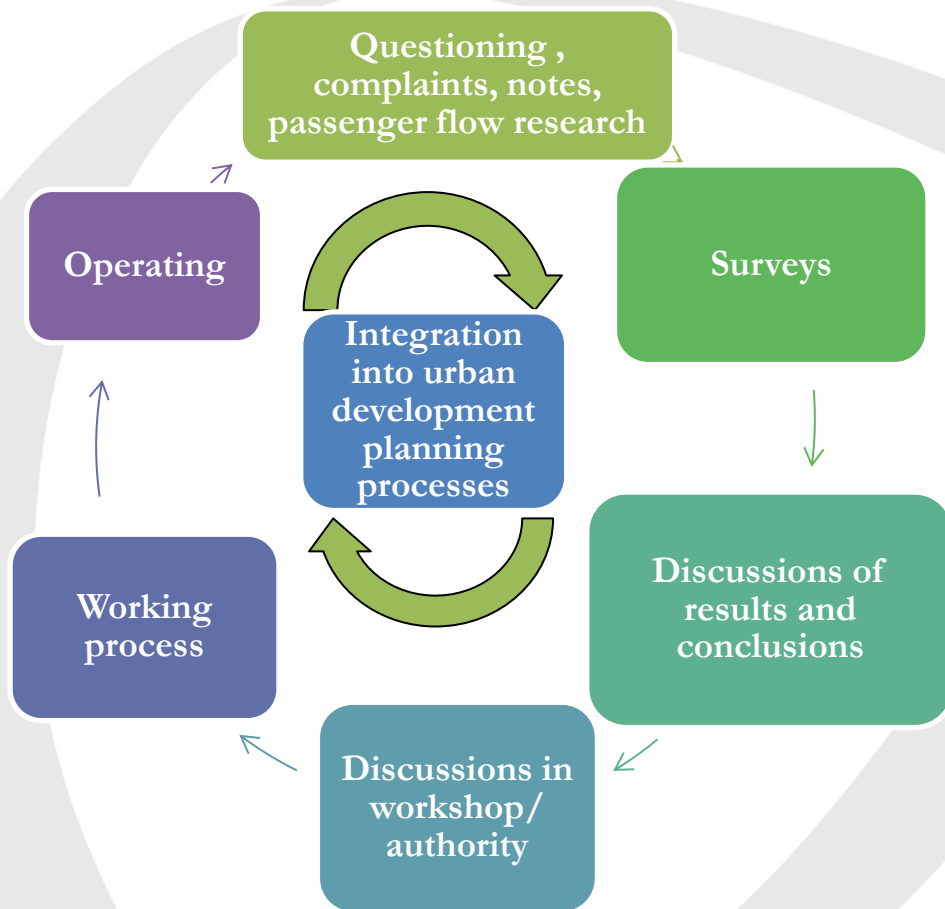
Low intensity routes

- Territory: peripheral part of city, suburb and center (low capacity buses)
- Vehicle types: various capacity buses;
- Traffic interval: due to passenger flow.
- Forming principles: transportation to rapid and main routes, P+R points.

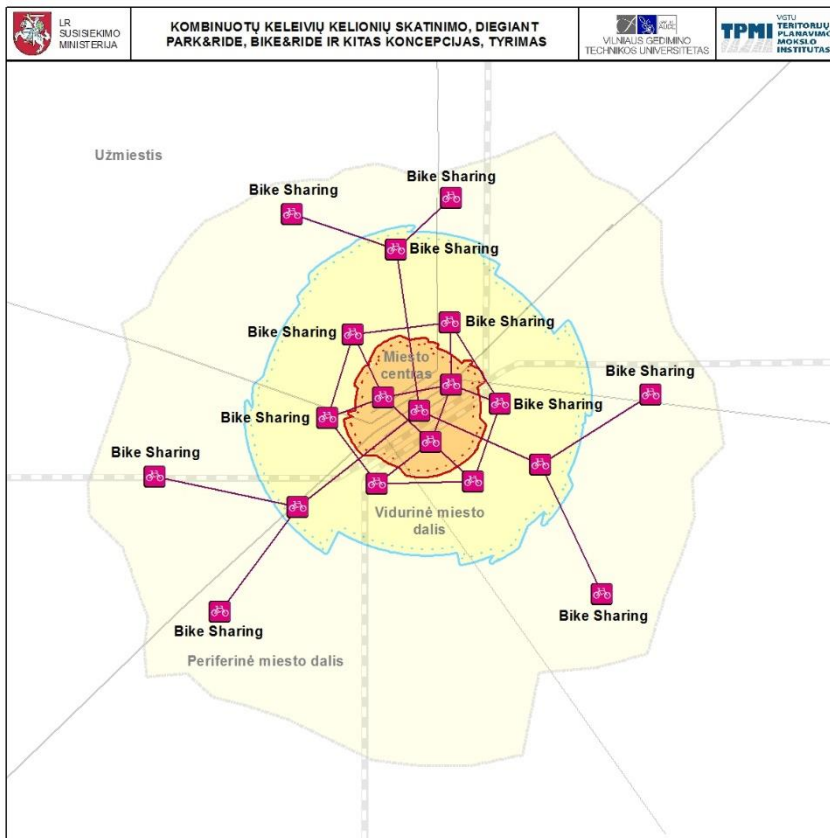
Number of passengers using public transport in Vilnius per day



PT planning processes

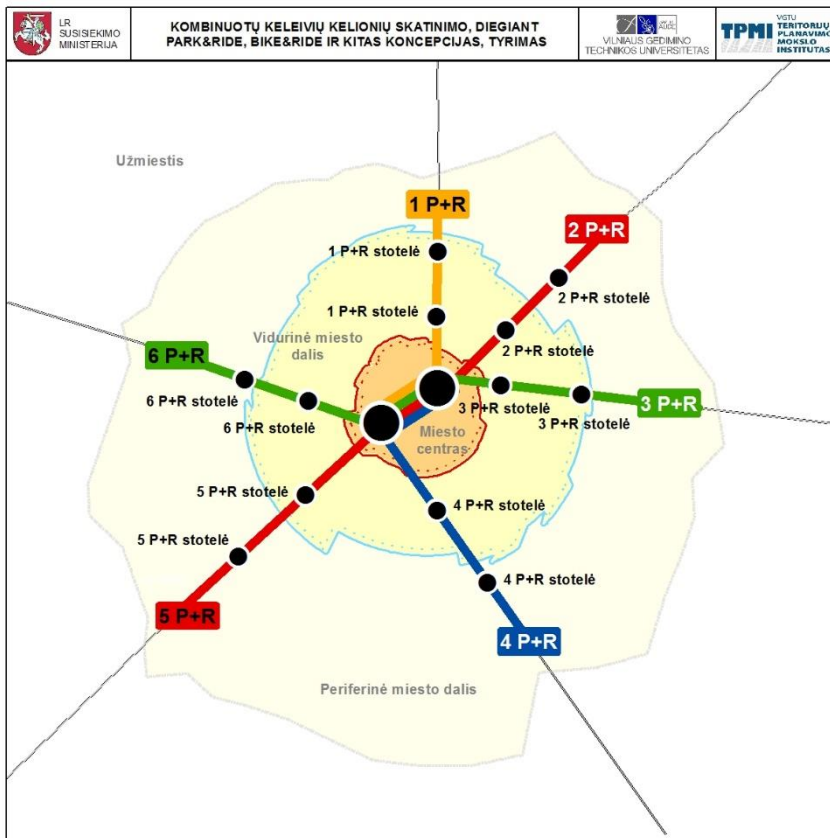


Bikesharing system



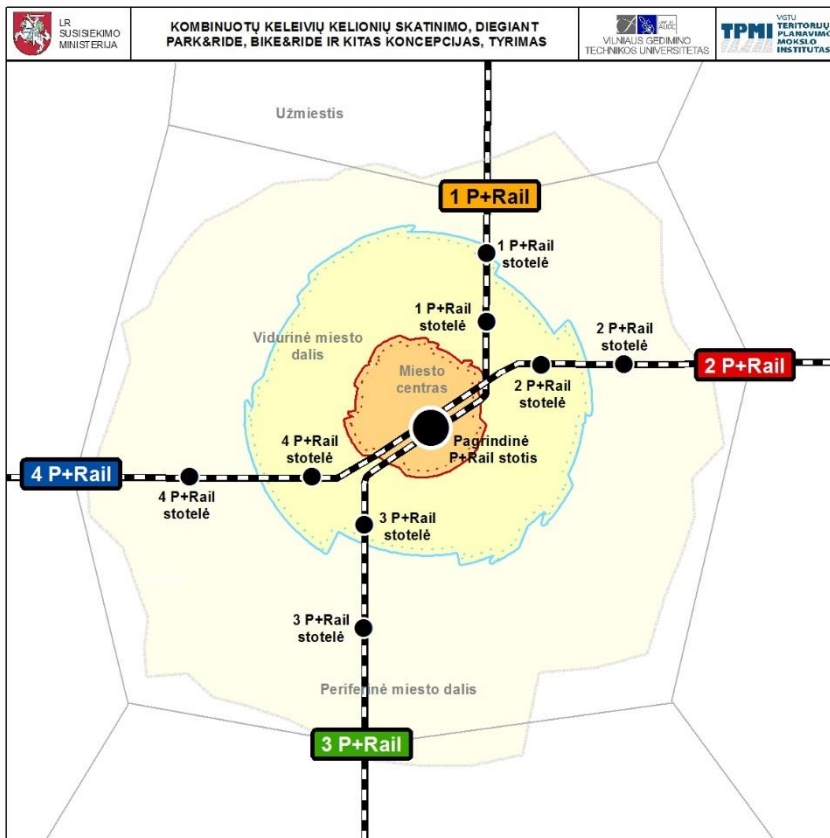
In 2013, as part of the Vilnius City Municipality initiative, a company JCDecaux opened 24 bike stations in the city center that will offer riders more than 200 bikes for rent. If this system granted in Vilnius, JCDecaux plans to install 8 new bike stations.

Park&Ride system



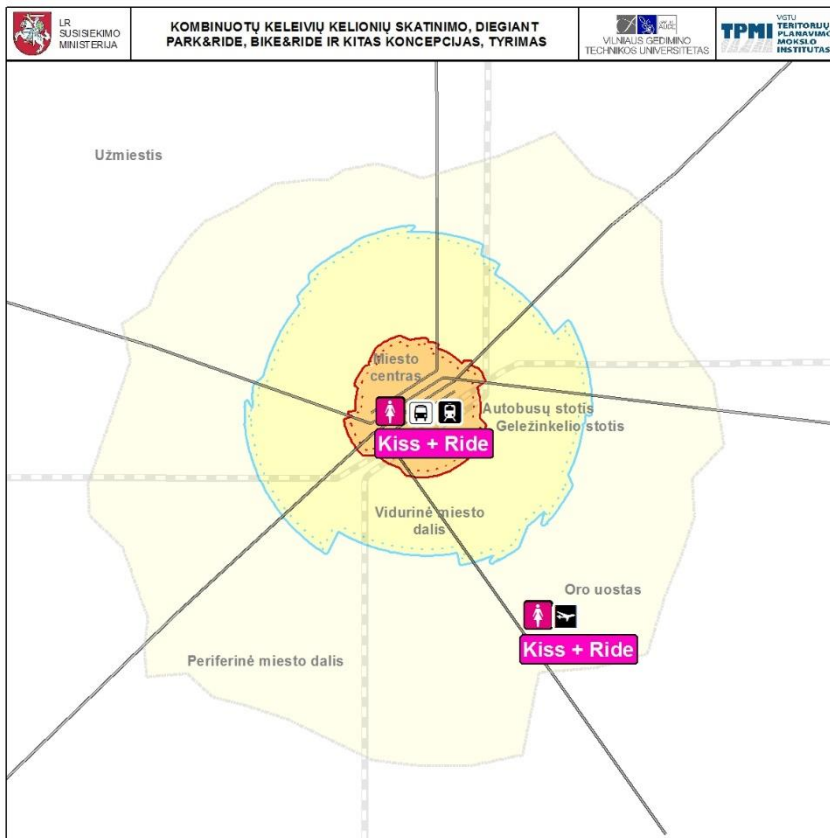
Authorities of Lithuanian municipalities in, preliminary, 2014-2020 planning to apply for funding of EU structural support for Park and Ride system installation in Lithuanian cities.

Park&Rail system



It is planned to install Park&Rail system in Lithuanian cities, which will allow more efficient use of existing rail lines. This system is intended for residents of the city's peripheral zones and it would reduce the travel time and cost.

Kiss&Ride system



Kiss&Ride system is planned to be installed next to the biggest objects of attraction: airports, railway and bus stations, schools, etc. Development of this system will help to save travelers time, it is comfortable, safe and attractive to use. In addition, the system provides the opportunity for family members to share a single car.

Conclusion:

It may be stated that transport system's integration in planning processes of urban areas is very important. Transport system infrastructure's development level is one of the main indicators ensuring the city's and country's social, economic and business activities as well as transporting passengers. Street length, density and technical parameters is a basis of Vilnius city transport system, which creates relevant conditions to the city's territorial development, vehicular and pedestrian traffic.



Thank you for your attention!

