

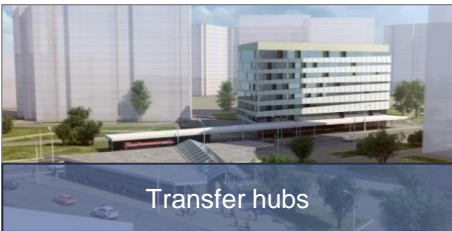
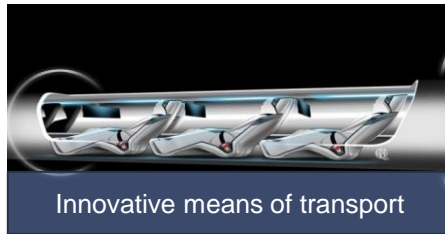
Rail passenger transport as a driver of urban agglomeration development

Scientific-Research and Design Institute
of Moscow Urban Transport “MosTransProekt”



Project planning of transportation facilities

«MosTransProekt» is the biggest Scientific-Research and Design Institute of Urban Transport in Russia. It is almost 70 years we are creating the intuitive transportation infrastructure in cities of Russia and abroad.



Moscow
Transport

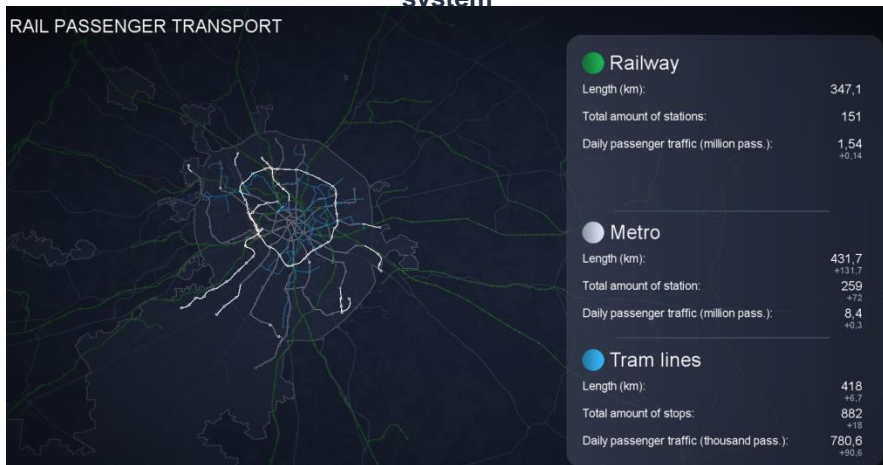


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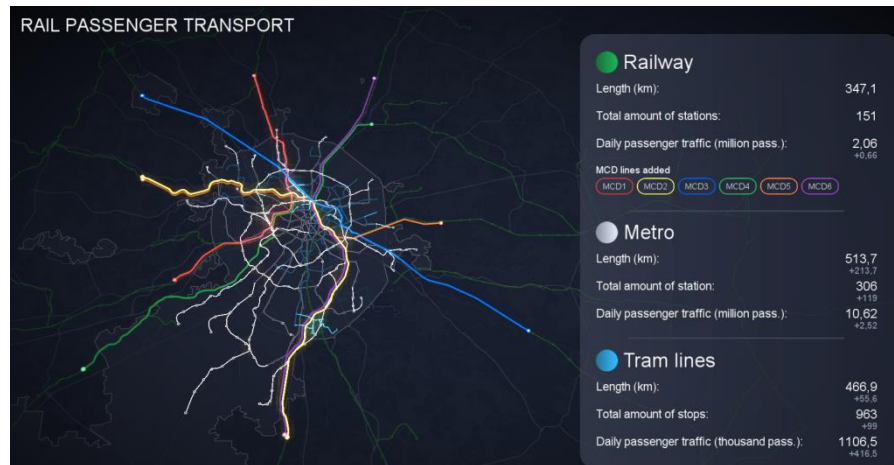
3 main elements of rail transport

Moscow extensively keeps trend of Railway passenger transport as a stable system that could be conducive to keeping up normally environmental background of the city.

Present-day development level of the public passenger transport system








Prospective development after 2022

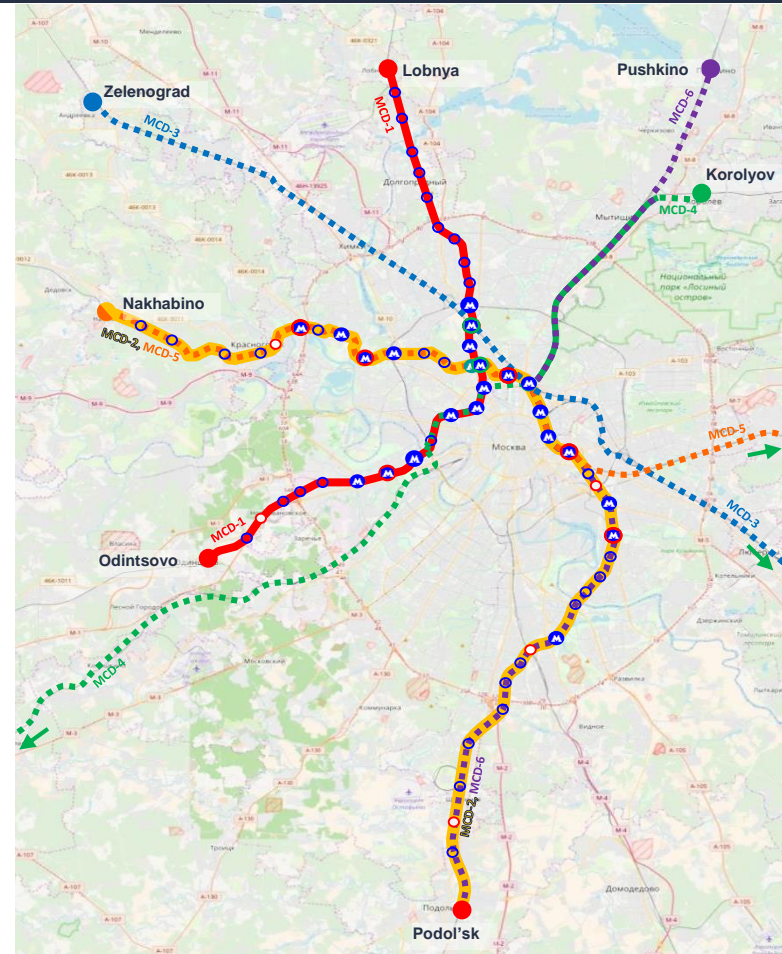


In next 5 years the government of Moscow is going to leap forward in the development of rail transport: railway, metro, tram

Railway infrastructure development events – MCD 1 and MCD 2

Realization of megaproject «Moscow central diameters» (MCD) will allow to keep a high-quality service at new transport corridors.

	MCD1	MCD2
Flag stations (FS) total amount	28	38
 New passenger platforms as part of MCD project	3	7
 Total amount of interchanges on the metro	12	15
 Underground pedestrian crossings needed	6	5
 Site Improvement needed	22	32
 Optimization of the route network of the surface public transport (SPT) needed	25	29



The Opening of the Moscow Central Diameters (MCD)

As a result of this project the movement of trains will be effected on flow-through railway diameters



Unified system of payment

Works in the Moscow metro, MCC and surface public transport



Offered version of rolling stock for MCD

Over **250 000 000** expected passenger traffic per year

105 000 000 of which within the limits of Moscow

830 000 journeys – projected daily average passenger traffic for MCD on weekdays

5-6 minutes headway between the trains

Up to **7%** load decrease of passenger flow on metro

Up to **15%** decrease of passenger traffic on interchanges in metro due to interchanges from MCC to suburban trains

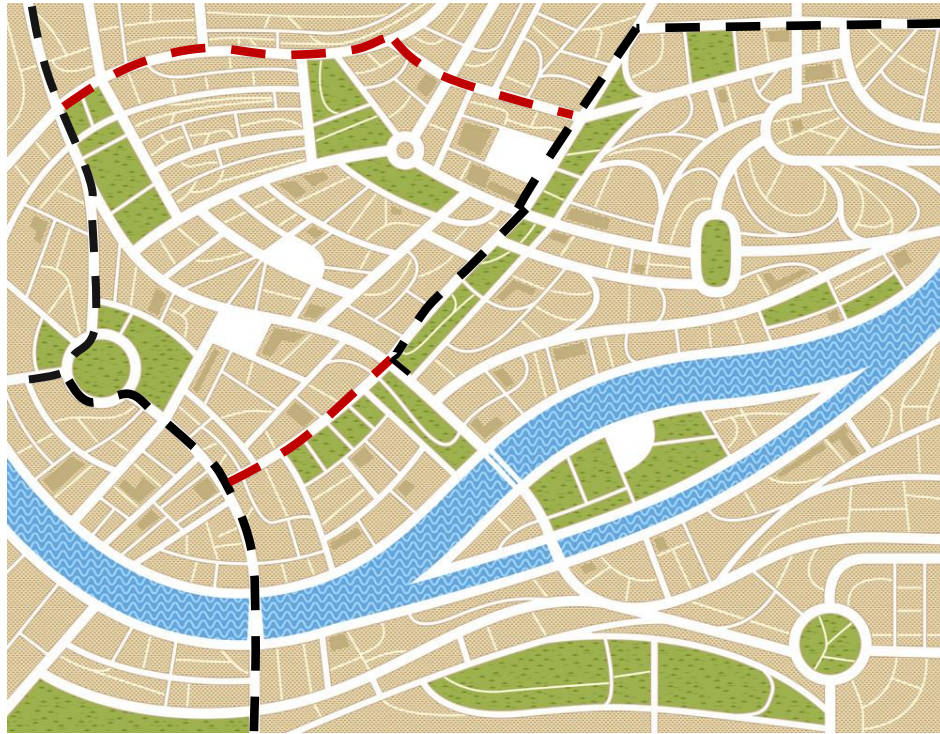


Moscow Transport



MosTransProekt

Proposal of integration railway into urban transport network








--- Current railway lines

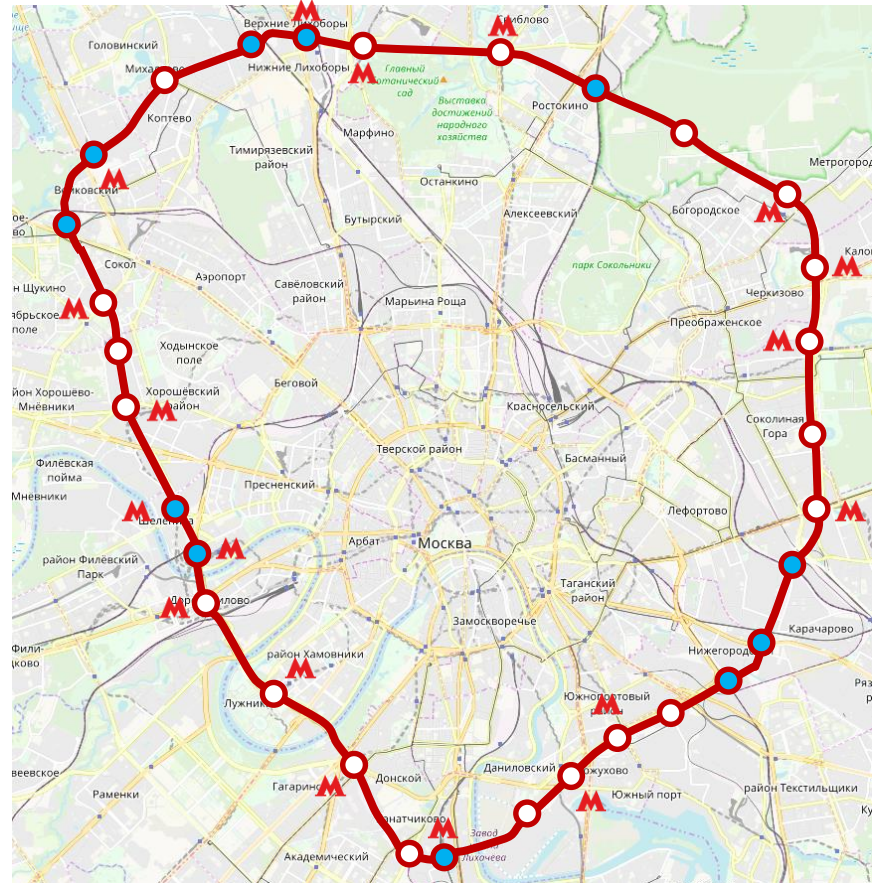
--- Long-range shares of buildings railway lines

- ❑ Current system of public transport in regions doesn't allow accommodate different needs of local community, what much of it is owed to low development of nowadays transport infrastructure.
- ❑ Upon that it stands to mention occurrence in cities the **ample quantity of not full used railways**.
- ✓ **There is the good reason to consider** to solve this problem by using the whole existent **railway infrastructure** in order to actualisation urban passenger transportation, maybe, thanks to tram lines.
- ✓ As an example we can use Moscow, where the movement of rolling stock was actualized by Moscow central circle (MCC).

Illustration of Moscow's experience of using railway infrastructure for passenger transportation

Moscow Central Circle (MCC) – circle line of Moscow railway, integrated in subway system. By MCC you can buckle between the radial lines of suburban trains without metro and other urban transport.

-  **31** stations with interchanges to urban public transport
-  **18** transfers to 11 lines of Moscow metro
-  **10** interchanges to 9 radial lines of railway
-  **177** pair of trains operate on MCC per day
-  **54** rail mileage, km



Moscow Central Circle

MCC – is the new interchange line, which enlisted the part of traffic flow from radial lines of metro and from railway stations in a central part of the city, more uniformly and proportionally loaded Moscow's transport infrastructure, let the passengers reduce journey times.



Unified system of payment

Works in the Moscow metro, MCC and surface public transport



200 000 000 passengers since the launch of MCC

430 000 daily average passenger traffic

5 minutes – max waiting time

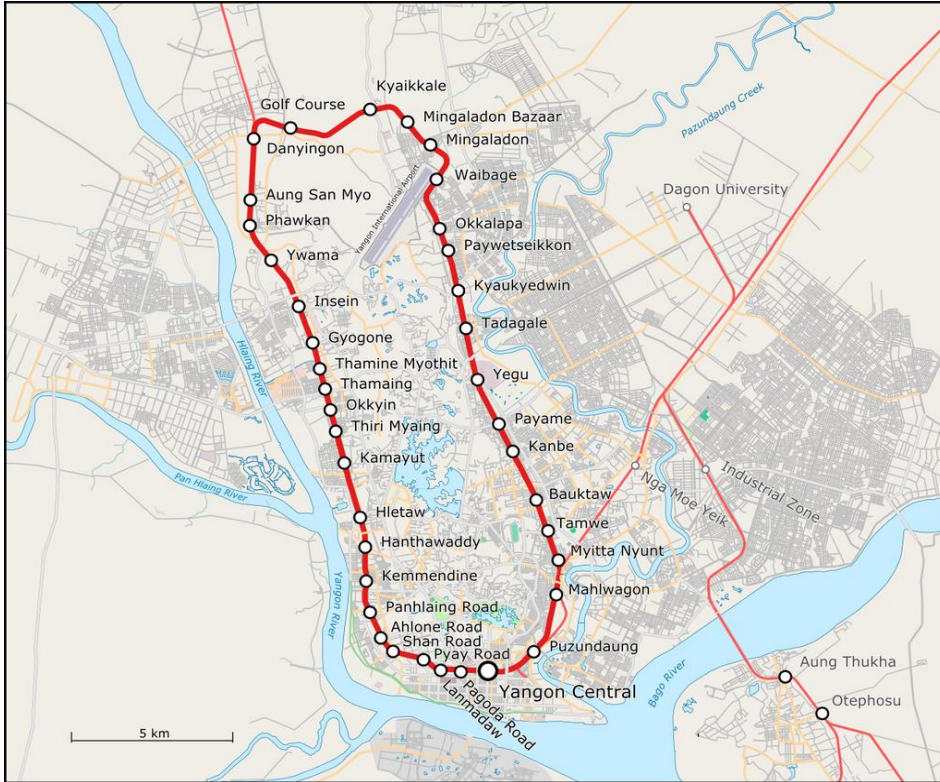
Up to **20%** decreased passenger flow on metro

Up to **40%** decreased passenger flow on central railway stations due to transfers from the MCC to suburban trains

More than **61%** passengers are from MCC stations contiguous with metro stations

Analog of MCC – the railway in Yangon, capital of Myanmar

Is the local commuter rail network that serves the metropolitan area*



* the population in this area is 7.6 million people

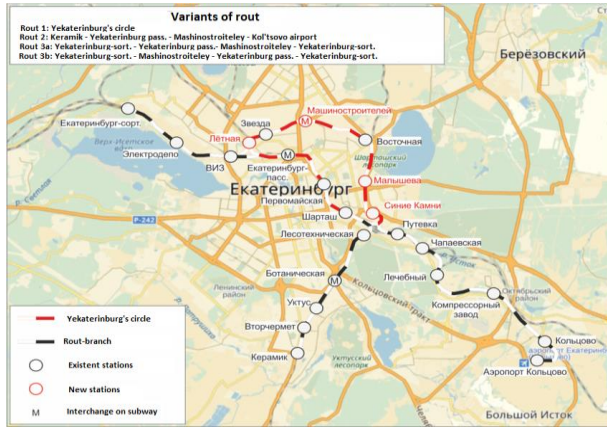
□ Features:

- 100,000 to 150,000 tickets daily
- The length is 45.9-kilometre
- Average speed is 15.3 km/h
- 39-station loop system
- 20 pairs of trains per day
- The entire circular trip takes approximately 3 hours. For comparison, the length of the MCC 54 km, full circle time 1.5 hours. It is planned to reduce the lap time from 90 to 80 minutes.

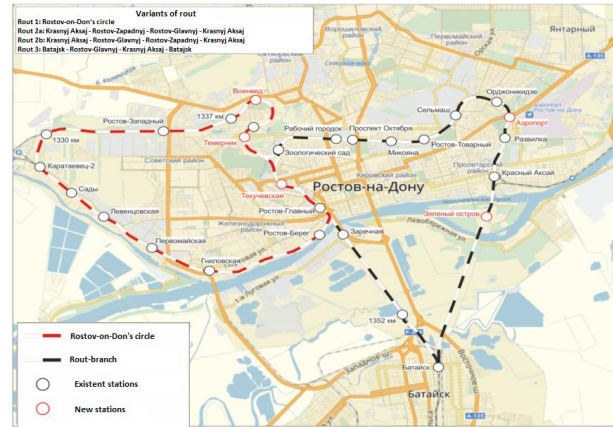
□ What gives reconstruction:

- Railway transport has great prospects, especially if there is such a base. Its potential can be realized with the help of moderate volumes of construction and organizational measures.
- As a result, many passengers will get a convenient high-speed and reliable transport.

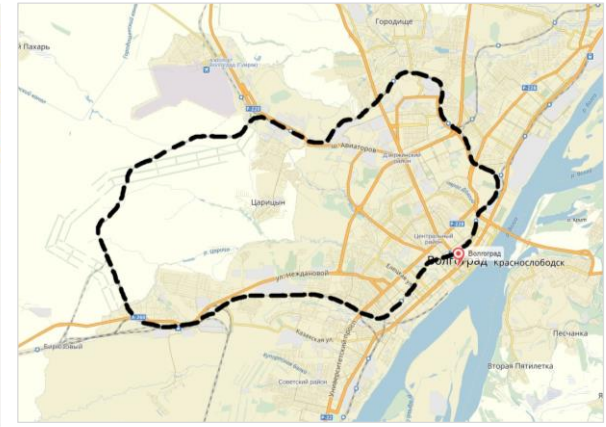
Circular rail services could be implemented in largest Russian cities with little to no construction



Yekaterinburg



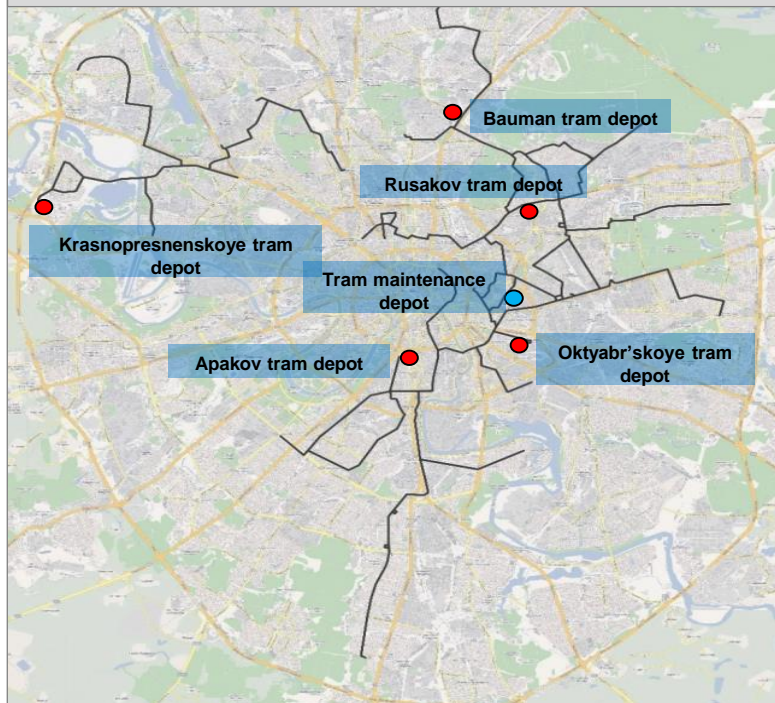
Rostov-on-Don



Volgograd

Moscow is the tram city

Existent tram lines and depots



Features of light rail transport system in Moscow

Total mileage: 418 km.

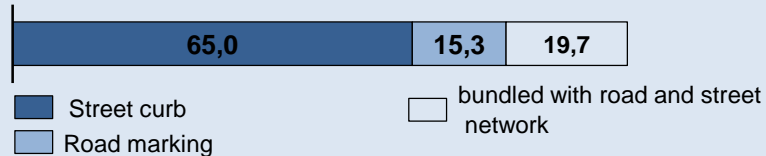
Daily average passenger traffic: about 900 000 passengers

Total amount of routes: 48

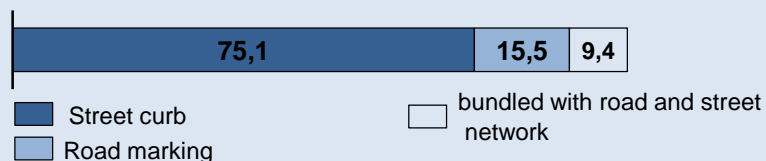
Total amount of trams: 786, 300 of low-floor trams will spring up by the end of 2018

About 30% of tram stops are equipped with high-floor platforms

Quantity of isolated tram lines



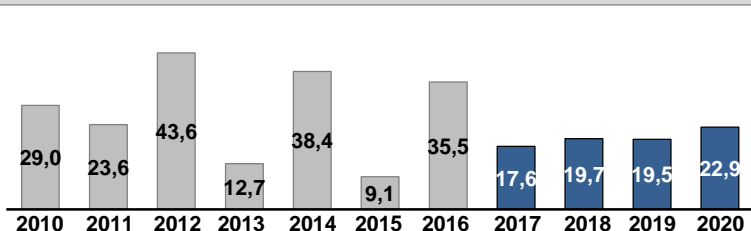
Target indicators of isolation



No revolution - evolution! Modernization of tram lines

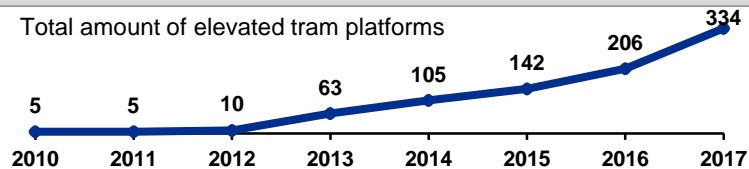
Modernization of tram tracks

(total length 191,9 km – around 50% for 7 years)



Tram stops

Total amount of elevated tram platforms

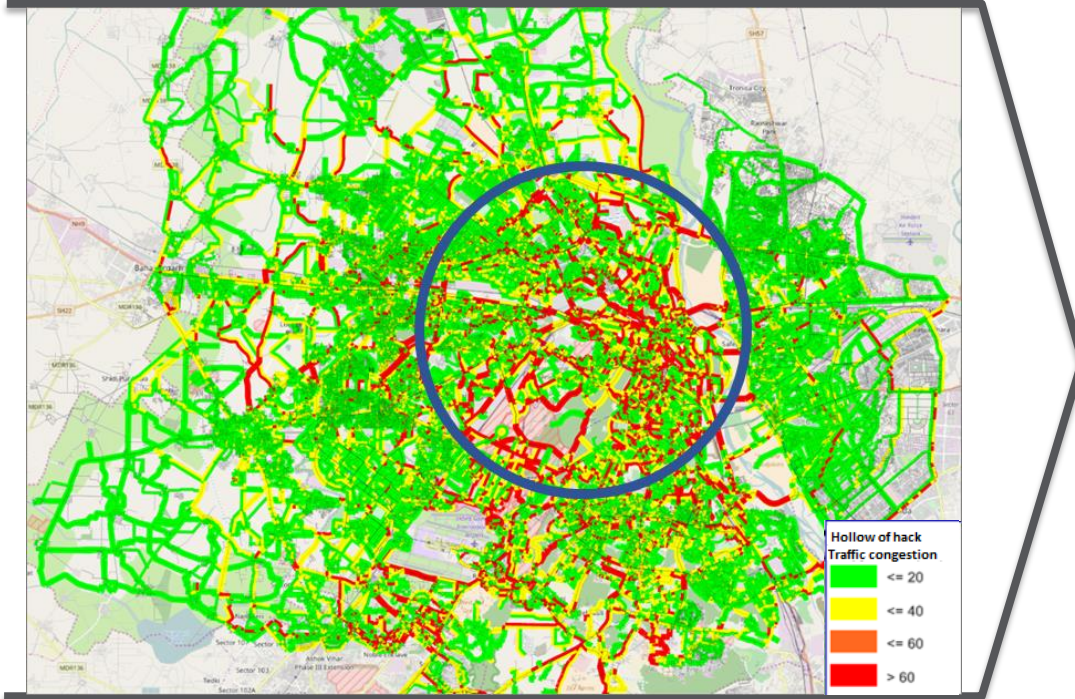


The result of modernization:

- Improving reliability and safety of tram transit
- Quantity reduction of road traffic accident up to 10-15%
- Reduction in sound level on new tram tracks while using an old rolling stock
- Speed increase due to new tracks and traffic insulation
- Significant increase of passengers comfort

Illustration of Delhi's example conception of development rail transport

In order to encompass analysis of whole transport situation **the basic transport model of city Delhi was build**, that gives the ability to analyze main transport activities.



- ✓ More than 352 000 severances road and street network;
- ✓ More than 130 000 hubs;
- ✓ More than 763 transport districts with socio-economic characteristics.

Solvable problem with help of transport model



Transport planning and urban design

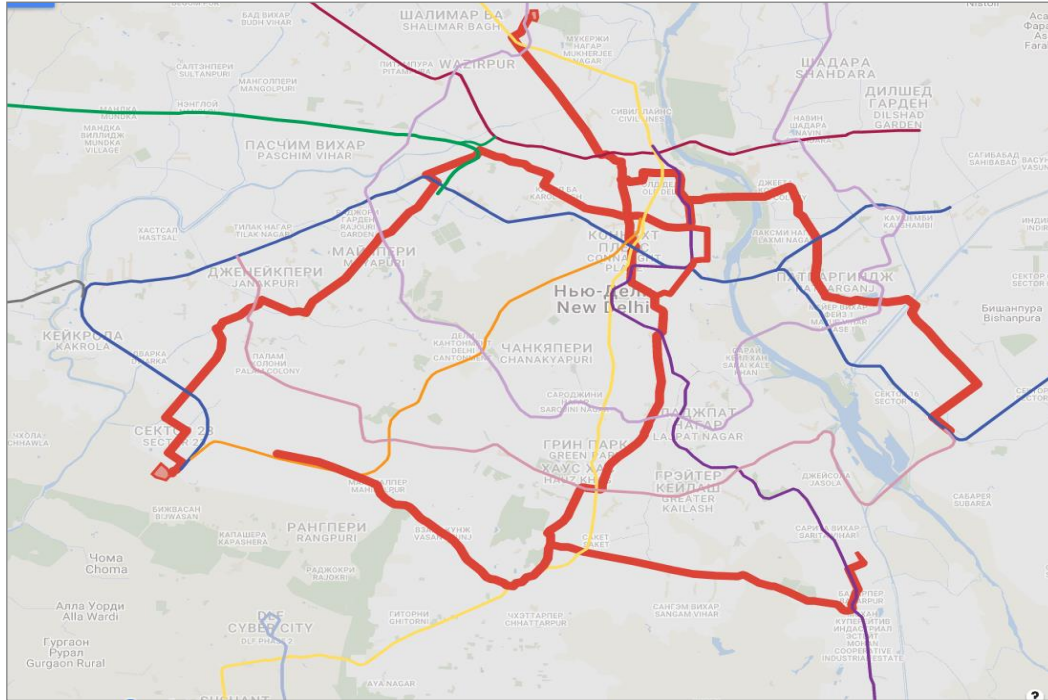
Analysis of development urban and transport infrastructure, which includes projects with road and street network

The reckoning of passenger traffic on changes of network public transport

Impact assessment of activities on traffic management and organization of parking space

Due to high-loaded central part of the city – attraction zone of tourists and locals, it is necessary to increase it's accessibility at the cost of development of railway passenger networks and isolated from main vehicular movement.

Proposals on the LRT system development in Delhi



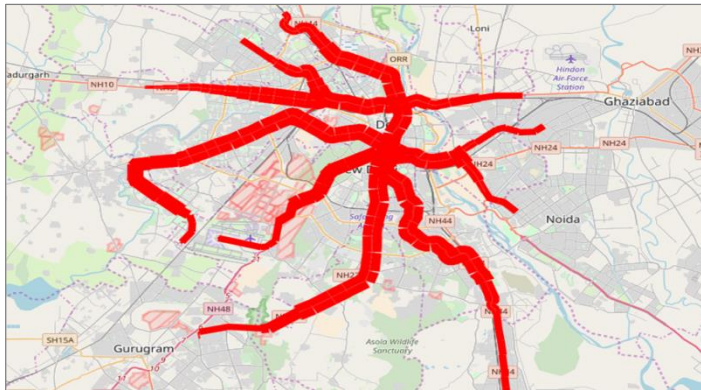
- Suggested tram lines**
- Subway lines:**
 - Line 1: Barwala – Dilshad Garden
 - Line 2: Badli – Gurgaon Sect 47
 - Line 3: Gurgaon Sect 47 – NOIDA City Center
 - Line 4: Shiv Vihar – Vaishali
- Line 5: Kirti Nagar – Inderlok
- Line 5: Bahadurgarh – Delhi Gate
- Line 6: Kashmiri Gate – Faridabad YMCA Chowk
- Airport Express: New Delhi Railway Stn–Dwarka Sec 21
- New Line 8
- New Line 9
- Gurgaon metro: 1st line

- Criteria according to which the following solutions are proposed:**
1. LRT lines are proposed on rather wide streets in predominantly high density areas;
 2. LRT lines connect with the central part of the city;
 3. LRT lines do not generally follow metro lines;
 4. LRT lines support overloaded metro lines
 5. LRT lines provide the maximum number of transfers to the metro network;
 6. LRT lines provide the maximum number of transfers between different metro lines;
 7. LRT lines LRT lines increase connectivity of the city's rail transport network;
 8. LRT lines cover objects with high passenger demand: central stations, administrative buildings, stadiums, amusement parks, etc.;
 9. The land use possibility for depot placement, e.g. near the existing metro depots

The combination of segregated and street-running segments within a unified network provides a large coverage of the urban territory, minimum number of transfers, low cost and high speed of construction

The ESTIMATE of passenger flow on the proposed LRT lines

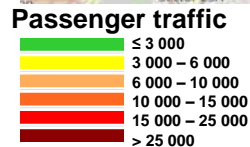
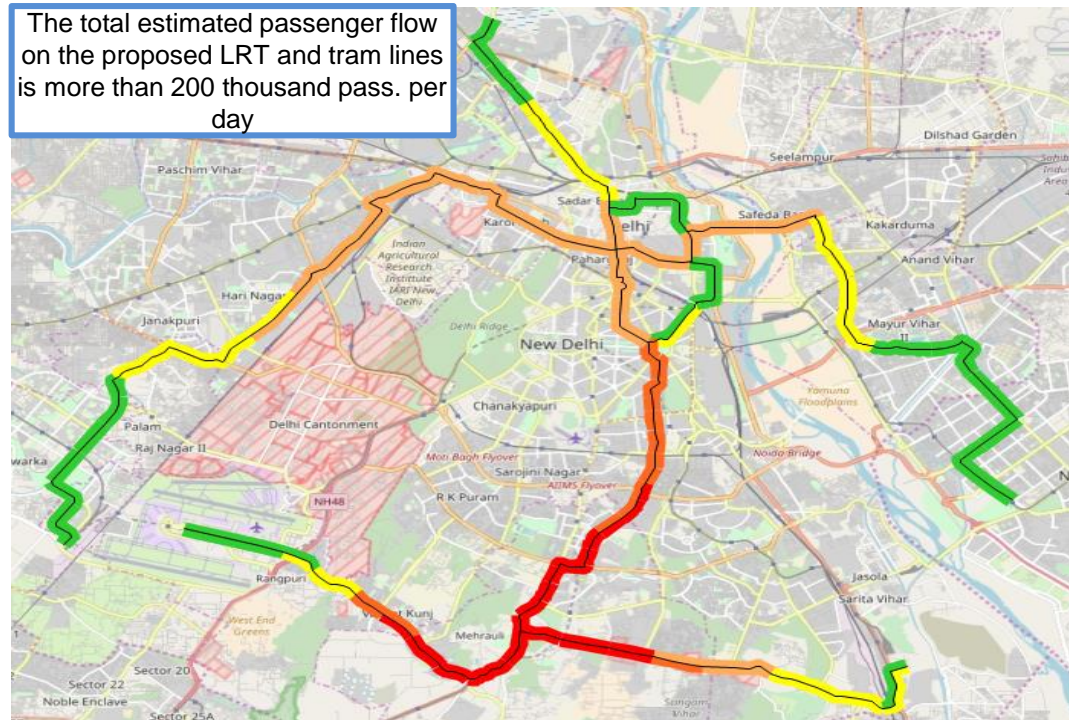
The current load of metro lines



Forecast load of proposed LRT lines



The total estimated passenger flow on the proposed LRT and tram lines is more than 200 thousand pass. per day



The implementation of the proposed project will relieve the current metro lines, as well as significantly improve the connectivity of Delhi's urban transport systems

Urban development of Moscow agglomeration is mostly tied to major objects of rail infrastructure

- ❑ Urban development of Moscow Agglomeration is mostly tied to major objects of rail transport infrastructure
- ❑ With the opening of Moscow Central Diameters service the role of railway transport in suburbs of Moscow will become much more significant and lead to a dramatic increase of living and business development next to railway stations
- ❑ **Railway lines are a powerful driver to commercial development**
- ❑ **Moreover the capacity of rail infrastructure is high enough to fulfill the growing demand in transportation**

