Development around Transit as a Tool for Improvement of Transport Systems and Transformation of Public Spaces in post-Soviet Cities

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Large cities in the post-Soviet countries have come to the point when the decision concerning their future should be made. Should the city continue to grow outwards or reorganize itself and function more effectively? What needs to be done to insure a more sustainable development? How to transform post-Soviet cities into better friendlier places for living?
In this report I will focus on two large cities in Belarus: Minsk, the capital and the largest city of the country and Brest, the 6th largest city of the country. I will briefly examine the stages of their development and analyze the current situation in urban planning and design. I will then focus more precisely on the existing railway transportation network and explain my proposal of how to use it to create a new system of Public and Transport Nodes. Such system will contribute to creation of a rapid public transport, will provide the possibility of associated services and in general will improve the quality of urban space.

Belarusian cities in the context of European urban development
The development of large Belarusian cities is compatible to the development of the traditional European city up until the second half of the 20th century. The cities have then changed dramatically under the post - World War II urban planning policy. The new mass construction of dwelling districts was introduced making the cities quadruple in size and moving its inhabitants to the outskirts.
Roughly, we could identify three historical stages of development, typical to the Belarusian cities:

- First stage (until the middle of XIX century) - the development of urban structure before the construction of railways;
- Second stage (mid XIX - mid XX century) - construction of railways and the first industrial enterprises;
- Third stage (mid-XX century - present) - the post-war urban development.

These three stages can easily be identified on the plan of modern cities. Belarusian cities such as Minsk and Brest have a radial-circular or a very similar structure, which can be divided into 3 planning zones: central, middle and peripheral. These zones have predominantly developed in certain historical stages.

- Central zone - This is the historical core of the city, which was formed before the appearance of railways, it was then changed and restructured on every stage of city development. This area of the city is characterized by fairly dense development; there is a number of monuments of architectural, historical and cultural value, preserved historical fragments of urban form, valuable elements of complex urban environment, landscape and recreational facilities. Although central zone is very well served by transportation network and easy to reach, there is very little possibility for large new development in this area.

- Middle zone - This zone was mainly formed on the 2nd stage of city development. In the mid XIX - mid XX century the middle zone was on the outskirts of the settlements and was therefore filled with railroad tracks and stations, industrial sheds and warehouses. As the city grew bigger in latter stages, it jumped over the middle zone, leaving the grey mass behind. At present this area is predominantly occupied by

transportation, industrial and utility facilities. It is full of numerous railroad trunk lines and access roads, municipal servicing and communal storage facilities, some businesses, as well as low-density residential development, which appeared near these businesses. Usually, this zone has no clear planning structure, accommodation facilities and attendant infrastructure has been stretched over time, which contributed to the emergence of unused or abandoned areas. Currently, many businesses located in this zone are ineffective, or they require larger areas and would prefer to relocate. This zone acts as a protective belt for the centre of the city. Here, on the one hand there is no heritage protection restrictions, on the other - this area has good transport service, is easily accessed. The middle zone has the highest potential for reconstruction and transformation.

- Peripheral zone. The development of this zone started after the World War II and still continues today. Here the large scale high rise residential districts and major industrial enterprises were built from scratch. The development of this zone was processed under the strong governmental planning control; the zone has an easily identifiable structure. The very dense development is home to over 70% of city inhabitants; the new districts have a predominant residential function and are therefore called “dormitory districts”. Each day most of the inhabitants of the peripheral zone have to commute to the city core to work or study.

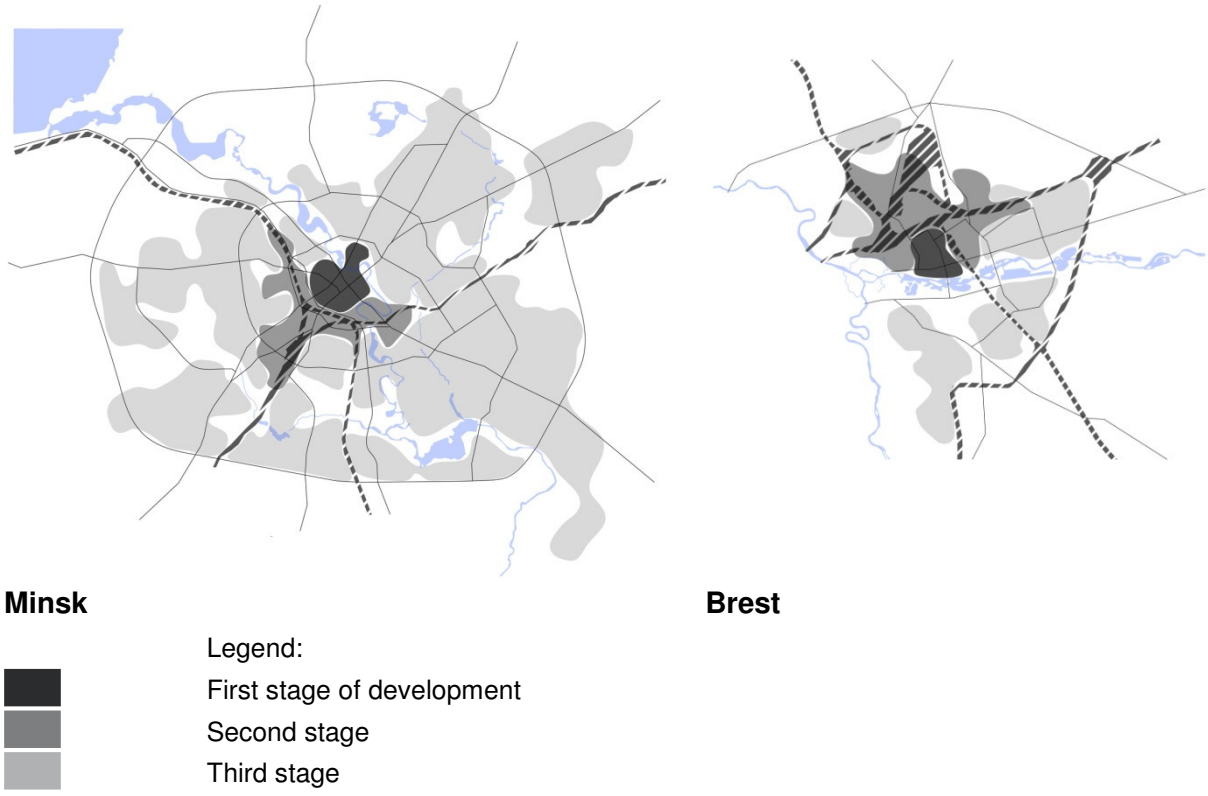

Figure 1- Development stages in Minsk and Brest

Contrary to the traditional European city, which has a dense city core and then sprawls outwards, post-Soviet cities have a very dense high rise districts on the outskirts, whereas large areas around historical core are used ineffectively.

The middle zone areas in the post-Soviet cities have a tremendous potential to transform into a dense urban fabric of the 21st century.

Current trends in the development of transportation networks

The development of the city is strongly linked to the possible development of its transportation networks. It is therefore worth to analyze the existing trends and highlight the potential for new transportation networks to come.

As it was mentioned in the previous chapter the largest urbanization boom in Belarus has started after the World War II. At that time it was understood that the city should be structured along the system of automobile roads. Even though the car ownership in the Soviet Union was very low, the roads were built wide to allow for the future. The public transportation system followed the road network with the buses and trolleybuses. Only in the city of Minsk there is an underground metro system, which also follows the directions of main city avenues.

After the collapse of the Soviet Union there was a rapid growth of the car ownership. People see a car as a symbol of their status. It is prestigious to possess the car. Such trends have their negative consequences: city roads get full of traffic, public buses and trolleybuses get stacked in the traffic jam.

There is a need for alternative public transportation networks, which will not depend on automobile roads. In search for such networks it is worth to look at the existing underutilized city transport infrastructure, such as railroad.

Railroads in cities – an obstacle today, an urban armature for the future

There is an extensive network of railroads in all large Belarusian cities. For example within Minsk this network is 45,4 km long (the railroads cross the city in four directions), in Brest – 26,6 km. At the same time the railroads are hardly used for innercity communication. The biggest reason behind that is the isolation of the railroad network; the railroads today run inbetween the above mentioned grey areas (mostly filled with servicing and communal storage facilities). The catchment areas around stations do not have enough public and residential density to insure passenger flow. There is a number of regulations which limit the development along the railroads, as one of the major obstacles it is ought to mention the 100m zone – a protective zone along the railway tracks (according to Norms of Planning and Development [2]), in which it is forbidden to construct residential buildings. The analysis of the central zone of Minsk shows that currently 4,2% (51ha) of its total area are owned by railroads and the development of another 14,6% (175ha) is restricted because of the vicinity of the rail tracks.

It is worth to reconstruct railways, create more stations in addition to the existing ones and establish new rapid rail intercity connections. This should be done simultaneously with the redevelopment of the middle zone in the post-Soviet cities. Major developments, new city public centres should be formed around stations. Such developments or Public and Transport Nodes will accommodate the future growth of the city, stopping it from sprawling, making more compact. Large Public and Transport Nodes located in the middle zone will act as the protective belt for the city centre, will become a convenient work location for the people living in the dormitory districts in the peripheral zone.

Figure 2 - The existing state of "Minsk-Paunochny"

System of Public and Transport Nodes

Today post-Soviet cities should change their attitude towards growth and should start to redevelop instead of building on the green land. Large opportunity areas lie within the catchment area of the railways and it is therefore necessary to link the new development and creation of the new rapid rail intercity transportation.

It is important to insure that the development along rapid innercity rail lines is done according to overall idea, vision of the whole system. Such development should start around stations, where Public and Transport Nodes must appear.

Public and Transport Nodes are seen as new city subcentres, which will incorporate service facilities as well as public spaces.

Project Proposal: Minsk

In the following paragraphs the System of Public and Transport Nodes for the city of Minsk is described. This system is a project proposal based on the throughout analysis of the city, its current spatial structure and projected future development.

It is proposed to reconstruct the existing railway network to allow for rapid innercity trains. The whole system should include 22 stations located in the city and suburbs. It is possible to use 10 existing stations, but 7 new stations have to be build and the location of 5 other stops should be significantly changed (to bring them closer to the main streets). In total the new system will comprise of 8 stations located in the central and middle zone and 14 stations located in the peripheral zone of the city.

Public and Transport Nodes in the peripheral zone of the city will be primarily used to serve the adjacent residential districts, acting as local community centres. 3 stations in this area will have a more specific function mix, one will serve the university campus, the other - the existing large market and the third one - High Technologies park. Public and Transport Nodes of the peripheral area will comprise of the station, associated shops and services and the concentration of higher-density residential buildings in the catchment zone of the node. The stations should be located near the intersections of the railroad and the main streets to ensure fast and easy transfer to public transport. It is advisable to build “park and ride” structures close to these stations.

Public and Transport Nodes located in the middle zone of the city should themselves become major city magnets and include in their catchment zones business areas, shopping and cultural facilities. Among the 8 stations mentioned two have the most potential, these are “Minsk-Ushodni” and “Minsk-Paunochny” located at the intersection of rail lines with underground (metro) lines. These nodes should act as main destination stations for suburban trains and help relieve the central station of excess passenger flow.

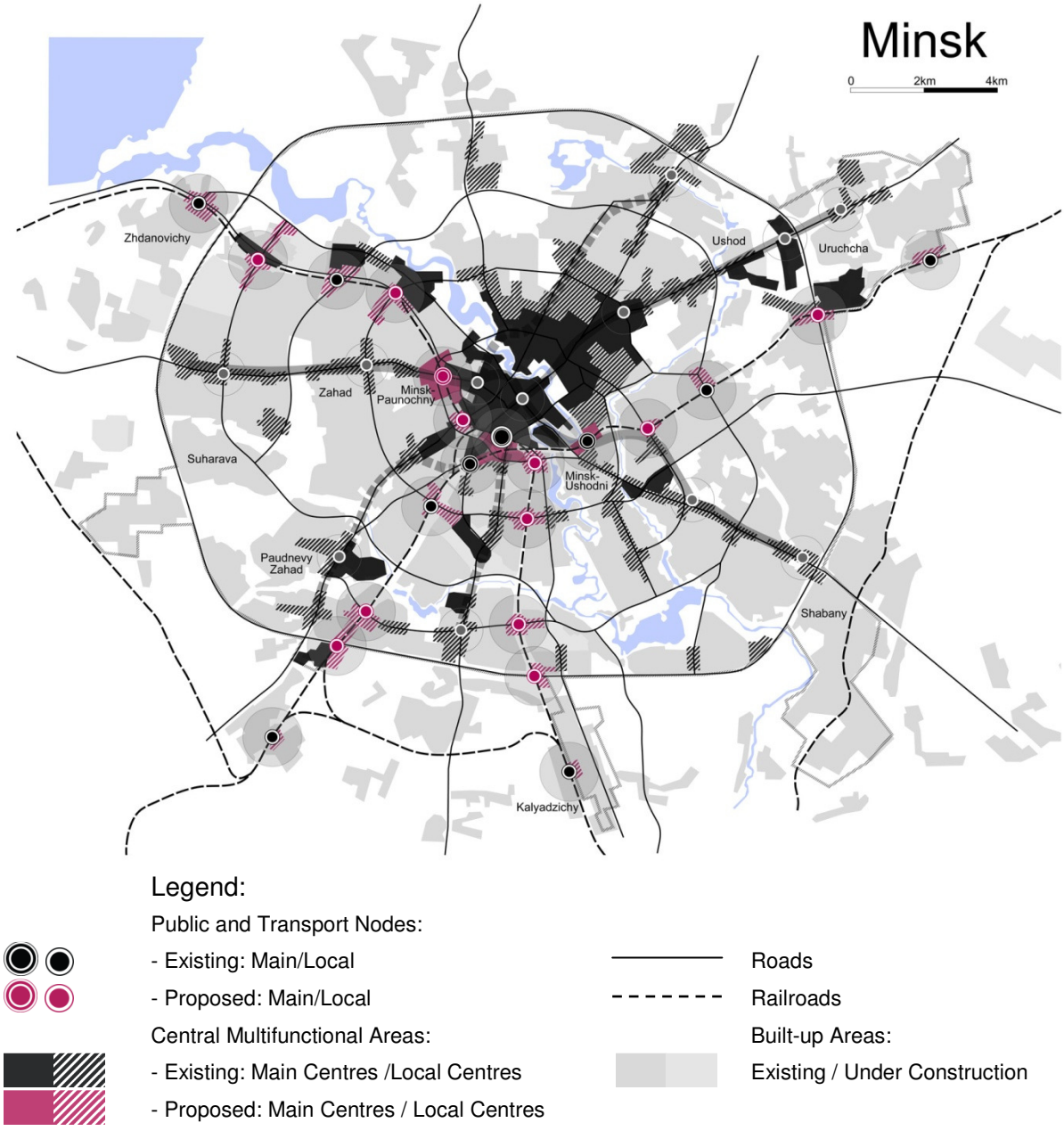

Figure 3 - System of Public and Transport Nodes for the city of Minsk

Project Proposal: Brest

System of Public and Transport Nodes for the city of Brest is to be formed in two stages. At first stage it is proposed to use existing rail infrastructure with addition of necessary elements. There will be three radial lines departing from the central railway station and one in the southern part of town.

In the second stage the now derelict line in the southern part of town could be revived and extended to the central railway station. This will require the construction of a new bridge across the Mukhavets River and tunnel in the central part of the city. At the same time another existing railway line in the northern part of town should be revived (an extra railroad intersection is needed).

The full System of Public and Transport Nodes for the city of Brest is comprised of 19 (13 in the first stage) stations located in the city and suburbs. 6 existing stations can be used.

Another 9 (6 of which the second stage) are to be build and the layout of 4 should be changed significantly (in order to relocate them closer to the main streets).
There will be 16 (11 in the first stage) stations in the peripheral zone of the city and 3 (2 in the first stage) in the central and middle zones. The functioning of these nodes is similar to the ones in the city of Minsk.

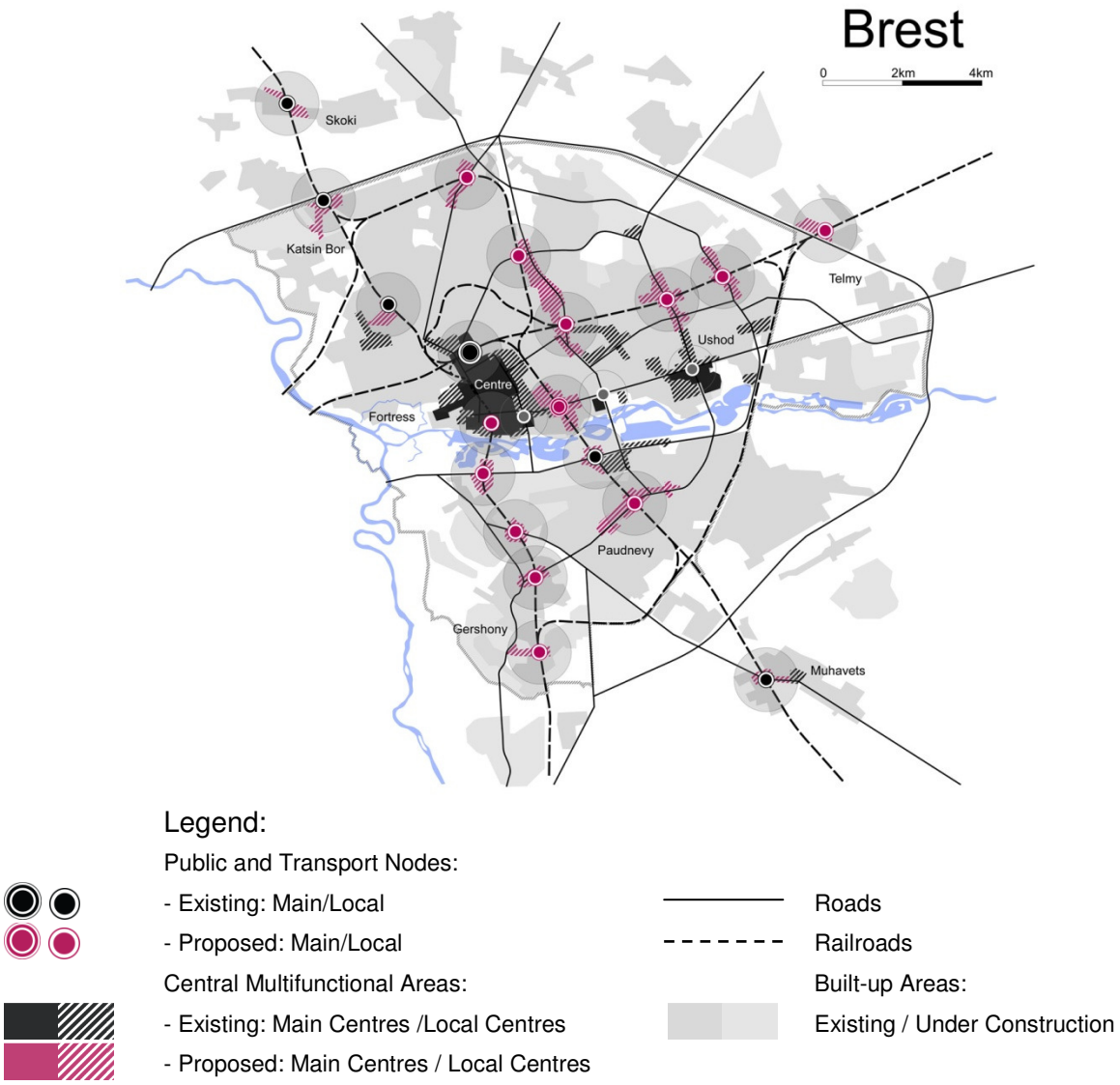

Figure 4 - System of Public and Transport Nodes for the city of Brest

It is worth to mention that the specific characteristics of each spot make every Node in the proposed System of Public and Transport Nodes unique. The planning and construction of each node should be supported with the urban design vision of the surrounding catchment areas. Here below is an example of urban plan for the Public and Transport Node in Minsk prepared by the student of Belarusian National Technical University under my coordination.

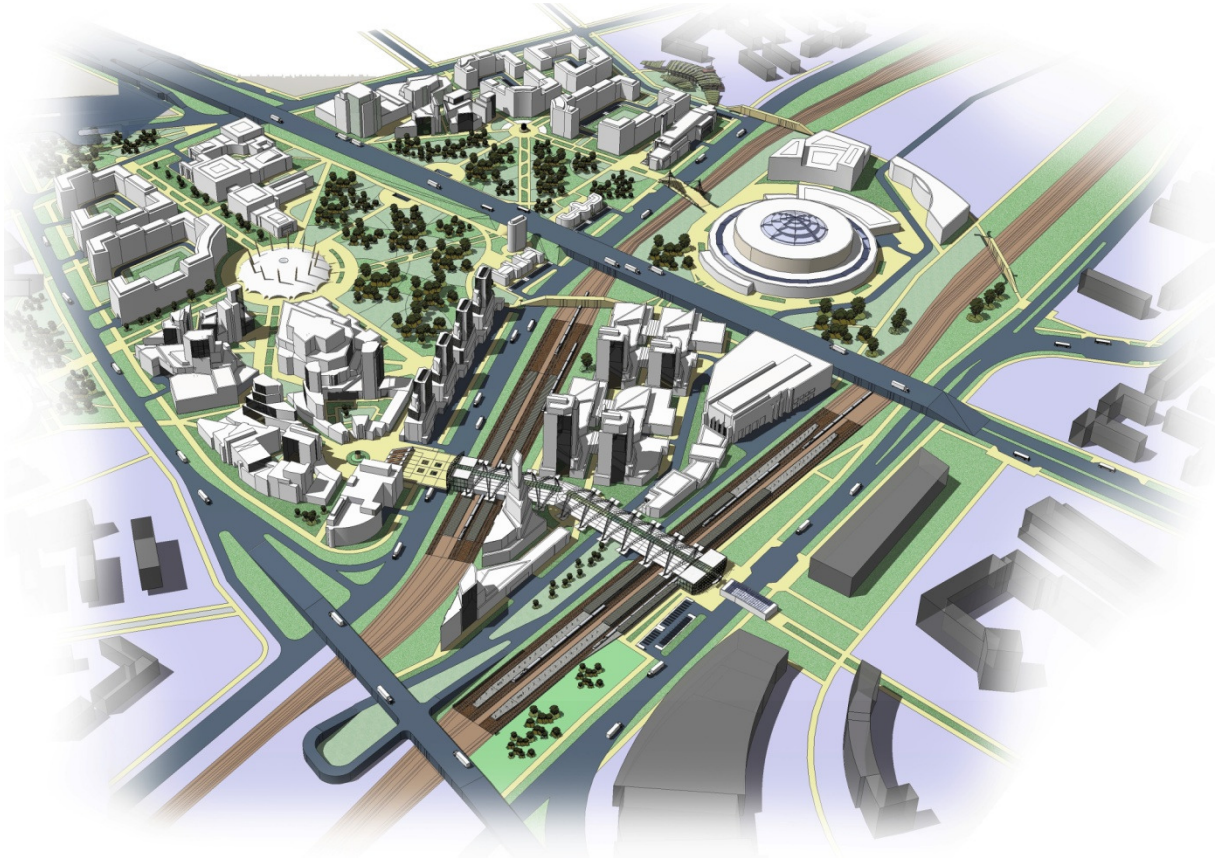

Figure 5 – Proposed development of the area around "Minsk-Stalichny".
Source: diploma project O. Latushko, 2009

The above described vision of how Belarusian cities should redevelop in the future is a hypothesis, which still needs to be proved. The actual effects of System of Public and Transport Nodes being implemented in Belarusian cities are still to be tested on the computer model.

References:

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2. Urban planning. Settlements. Norms of Planning and Development. 45-3.01-116-2008(02250). Ministry of Architecture and Construction of the Republic of Belarus, Minsk, 2009
3. Akentyev, Alexander (2010) "Correction of Minsk Masterplan", *Arhitektura I Stroitelstvo,* Vol.4