

Institutional building renovation

Efficiency vs appearance

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Abstract

Since the end of World War II which has destroyed all our cities especially the most resistant ones the great problem of country renovation has been raised. Belarus has lost up to 30% of its population, almost all our industry has been either relocated deep into Ural or Siberia or destroyed.

So, building industry has been between two presses: people needed more housing and public facilities while it was huge lack main building materials at that time.

Though we used template designs for the construction of almost everything, the labour was extremely cheap, our authorities which in fact have been strictly controlled by the Moscow trying to save more have introduced additional option. The central parts of big cities like Minsk, the capital, have been built with unique design buildings. For this our architects used the classical style, which was almost officially approved and promoted.

And often they built central avenues with well decorated classical buildings but from the main street aside. Very few buildings are decorated on its each side. The majority of them which now we may regard as our cultural heritage too are finished from the three sides, the front and profiles. The rear sides still stay undecorated, moreover unfinished, with the masonry exposed to atmosphere moisture, frost and wind which step by step deteriorate buildings.

Renovative and maintenance works are executed permanently but today, due to a big energy price growth, additional thermal insulative works has become compulsory according to our building codes which have been introduced from the 1997.

Though theoretically it is possible to improve thermal insulative capacity of building from inside practically it is very inefficiently and make take sense in very unique case.

So, if the building is not listed it should be covered by a quite thick layer of insulative structure during the reparation works. The matter is that we may regard as cultural heritage each building moreover if it is stylish. But when we do insulative works outside we make a rough intervention and harm building aesthetically.

We may calculate the economical advantage of building technical improvement. The good feeling, the health improvement in an appropriate surrounding is the value itself it doesn't need financial improvement.

But may be there are some monetary options to show advantage of beautiful environment though the money lost are obvious?

Introduction



Geography and economy

Population (2007 est.): 9,724,723 (growth rate: -0.4%); birth rate: 9.5/1000; infant mortality rate: 6.6/1000; life expectancy: 70.1; density per sq mi: 121

Capital and largest city (2003 est.): Minsk (Minsk), 1,769,500

Other large cities: Gomel, 502,200; Mogilyov, 374,000; Vitebsk, 355,800; Grodno, 314,100; Brest, 306,300; Bobruysk, 228,100

Monetary unit: Belorussian ruble

Languages: Belorussian (White Russian), Russian, other

Ethnicity/race: Belorussian 81.2%, Russian 11.4%, Polish 3.9%, Ukrainian 2.4%, other 1.1% (1999)

Religion: Eastern Orthodox 80%, other (including Roman Catholic, Protestant, Jewish, and Muslim) 20% (1997 est.)

Literacy rate: 100% (2003 est.)

Economic summary: GDP/PPP (2005 est.): \$79.13 billion; per capita \$7,700. Real growth rate: 8%. Inflation: 8%. Unemployment: 1.6% officially registered unemployed; large number of underemployed workers. Arable land: 26.77%. Agriculture: grain, potatoes, vegetables, sugar beets, flax; beef, milk. Labor force: 4.3 million (Dec. 31, 2005); agriculture 14%, industry 34.7%, services 51.3% (2003 est.). Industries: metal-cutting machine tools, tractors, trucks, earthmovers, motorcycles, televisions,

chemical fibers, fertilizer, textiles, radios, refrigerators. Natural resources: forests, peat deposits, small quantities of oil and natural gas, granite, dolomitic limestone, marl, chalk, sand, gravel, clay. Exports: \$16.14 billion f.o.b. (2005 est.): machinery and equipment, mineral products, chemicals, metals, textiles, foodstuffs. Imports: \$16.94 billion f.o.b. (2005 est.): mineral products, machinery and equipment, chemicals, foodstuffs, metals. Major trading partners: Russia, UK, Netherlands, Poland, Germany, Ukraine (2004).

Communications: Telephones: main lines in use: 3,175,900 (2004); mobile cellular: 2,239,300 (2004). Radio broadcast stations: AM 28, FM 37, shortwave 11 (1998). Television broadcast stations: 47 (plus 27 repeaters) (1995). Internet hosts: 20,973 (2005). Internet users: 1.6 million (2005).

Transportation: Railways: total: 5,512 km (2004). Highways: total: 79,990 km; paved: 69,351 km; unpaved: 10,639 km (2004). Waterways: 2,500 km (use limited by location on perimeter of country and by shallowness) (2003). Ports and harbors: Mazyr. Airports: 101 (2005).

International disputes: 1997 boundary treaty with Ukraine remains unratified over unresolved financial claims, preventing demarcation and diminishing border security; the whole boundary with Latvia and more than half the boundary with Lithuania remains undemarcated; discussions toward economic and political union with Russia proceed slowly.

Climate

Due to its geographical situation Belarus has a cold winters, cool and moist summers, so the climate is transitional between continental and maritime.

The max. temperature in July was registered as 39 Celsius, the min in January was -41 Celsius. The temperature of the coldest 5 days' period for the thermal insulation estimation is -25 Celsius.

The average temperature in July is 17 Celsius, the average in January is -4 Celsius.

The humidity during the winter and summer -70% in average and up to 80-90% in intermediate seasons.

The year water exposition 800...1200mm.

The vegetation period lasts from 170 (the Northern-East) till 210 (The Western-South) days per year.

It may reach up to 50 cycles of freezing and melting during the winter season.

Historical background

The first big state existed on our land was so called Great Lithuanian Duchy or the Grand Duchy of Litva which sounds on our language the same. It's a common spread opinion that ancestors of contemporary population of Lithuania (our neighbour country, the member of EU) were dominated above the slavonic tribes.

But according to the Belarusian historian Mikola Jermalovic, the 13th century "conquest" of Belarus by a Baltic Litva is an undocumented myth created in the 16th century. In the course of time, the "conquest" became a convenient historical dogma which no one bothered to question since it supported the status quo in Eastern Europe.

Mr. Jermalovic traces the beginning of Litva's statehood back to 1246 AD when Mindouh, a duke of Baltic origin, came to power in the duchy of Novaharodak (Navahradak in modern Belarusian, Novogrudok in Russian and Nowogrodek in Polish.) He and his son, Voisalk, expanded the duchy to encompass south-western Belarus and established the state later called the

Grand Duchy of Litva. The ethnic relationships in the region during the 13th century are illustrated on the map.



Mr. Jermalovic, however, places the ancient Litva to the east of the duchy of Novaharodak in the upper reaches of the river Nioman. Mr. Jermalovic quotes references from Eastern European and German chronicles to substantiate this claim. In addition, he has found five relevant place names in this region - vilages named Litva.

The inhabitants of Litva were paying taxes to the duchy of Polacak and there are many references to Litva serving as mercenary soldiers in the military campaigns of the dukes of Polacak. In fact, the Lithuanians developed a reputation for military prowess. Some historians point out that the suffix - tva in "Litva" is one commonly used in Slavic collective nouns to describe.

Initially, the entire Belarusian ethnic area was inhabited by Baltic tribes. In the sixth-to-seventh centuries, Slavic tribes came from the west. The Slavs fused with the Balts to form a new Balto-Slavic nation - the ancestors of today's Belarusians. The prevalent language became Slavic - Old Belarusian - which retained many Baltic elements in its pronunciation and vocabulary. Baltic elements are still recognizable in the folklore (dances, songs, costumes, folk ornaments, etc.) and toponyms (place names) of the present-day Belarus.

The Slavs belonged to three main tribes: the Kryvicy, who settled in northern and central Belarus, the Dryhvicy (Drehavicans), who settled in the south along the river Prypiac' and Radzimicy (Radzimidians) who settled in the upper Dniapro (Dnepr) region. Two other tribes, the Severianie and the Viacicy (Viatians), settled further east and only parts of their former territories are now considered ethnically Belarusian. (See also left the map: Historical beginnings of Belarus: Location of tribes in and around future Belarus toward the ninth century.)

These Slavic tribes all adopted Christianity in its Eastern Orthodox from the Kievan Rus. For some time they were also politically dependent from Kiev. However, the Kryvicy soon established their own state in the north - the Duchy of Polacak. Later, the duchies of Turau-Pinsk and Novaharodak were established in the south and Southwest respectively. The territory of the duchy of Novaharodak, which had been colonized by both the Kryvicy and the Dryhvicy, extended along the Nioman river between Horadzien (currently know as Hrodna or Grodno) in the west and Novaharodak in the east.

The duchy of Novaharodak was virtually surrounded by unassimilated Baltic tribes: the Jacviahi(Yatvegians) in the west (who were later belarusianized), the Nalscany in the north, the Litva in the east and Northeast, and the area called Aukstota in the south-eastern part of modern Lithuania. Another Baltic tribe, the Samogitians, who lived between Aukstota and the Baltic Sea, did not merge with the Slavs but remained a separate ethnic group. It was the Samogitians and the inhabitants of Aukstota who became the ancestors of today's Lithuanians.

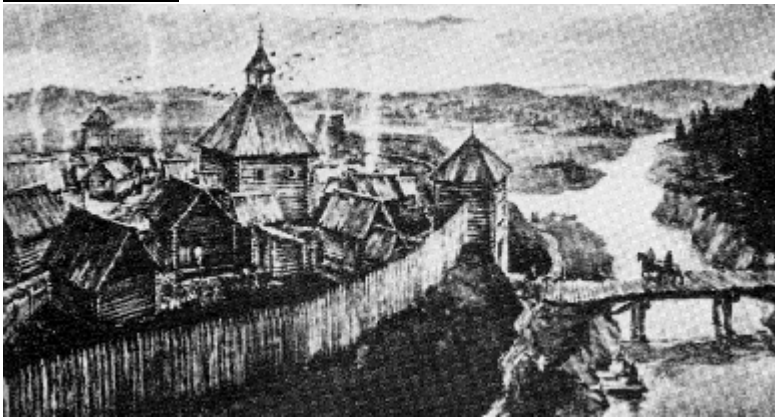
Aukstota - which means highland in Lithuanian - is nowhere mentioned as such in the medieval chronicles and did not seem to be a political entity. Many of its place names contain the word aukstas, or high, while Samogitia, further to the west, means lowland. The city of Vilna (currently know as Vilnius) the present capital of Lithuania, is in Aukstota and Lithuanian scholars consider Aukstota to be the heart of the Lithuanian ethnic area. They claim that Aukstota was the location of the original Litva and that it was from here that Duke Mindouh (Mindaugas in modern Lithuanian) left to conquer the adjoining Duchy of Novaharodak and established the Grand Duchy of Litva.

However, the separate ethnic character of Litva is supported by the non-Slavic names of their leaders - Mindouh, Vojsalk, etc. Mr. Jermalovic feels that Litva referred to an unassimilated Baltic ethnic island.



There are many legends relating to the foundation of Minsk and the origin of its name. Situated on the watershed of the river-routes linking the Baltic to the Black sea, its trading history going back to prehistoric times some have thought that the city owes its name to the word "miena" or "barter". Others look at a hill-fort known as Haradyschy by Stroczyce, a "Skansen"-village, a few kilometers away on the west from the city on the banks of the river Menka, which flows to the river Pticz and on to join the Pripiat' and Dniapro. A heroic folk legend that a giant called Menesk or Mincz kept a mill on the banks of a river, and ground rock and stones to make flour for bread in order to feed the war-band he had assembled to protect his settlement, and safeguard its prosperity. This depended, no doubt, on the portage of goods between the headwaters of Pripiat, Dniapro, and Nioman. So Menesk -- later Minsk -- came into being. The reference to "stone-flour" can allude to kneading and baking of potters clay used in brick-making and ceramics industry, which from the earliest times flourished in the area. There was no lack of wood to fire the kilns.

Ancient Minsk



In prehistoric times the "domain of the bear" predominated over "the domain of the goose"(as Napoleon soldiers aptly dubbed the forest- and meadow-lands of the area) with vast and impenetrable primeval forests covering most of the country and serving as a Delphic "wooden wall" to its successive inhabitants against attacks from the East. Scattered Lithuanians and Jatvyhs hunted and gathered, until merged with the more advanced Slavonic tribes moving northwards from the Carpathians during the so-called Dark Ages. These settled the area forming the watershed of the rivers flowing to the Baltic and the Black Sea, where the early Belarusians founded prosperous townships of Polacak, Viciebsk, Smalensk, Minsk, and Harodnia. Of these Polacak, first mentioned in the chronicles for 862, was to become the most important.

During the era of Viking expansion along the East European waterways, many towns and principalities were ruled over by Scandinavian warlords; in the 9th century the lands of Polacak were raided by two Viking princes Askold and Dir, and by the 10th century a Prince Ravhalod(Norse: Ragnvald) reigned over the Belarusian principality of which early Minsk formed part. The Belarusian nobility to this day distinguishes between families of old Lithuanian and those of Scandinavian descent(Hedyminoviczy and Rurikoviczy).

In XVI c. a reformation movement was widespread in GDL. It has been reflected in appearance of the Renaissance architecture. Calvinist houses were built in Astashyn, Kajdanau, Kamai, Smarhon', Charnauchycy. Most of the cathedrals still have fortified defense character. But Renaissance

architecture is characterized by appearance of cylindrical buildings, circular or semi-circular in plans. A moderate ornamental decoration is used.

The Counter-Reformation has brought a characteristic Baroque style cathedrals. These style was first used by Jesuits. The first Baroque style cathedral - Niasvich Cathedrals of Christ's Body was built in Belarus in 1587-93 by Italian architect J.M. Bernardoni. The characteristic cathedrals of this style are Farny cathedral in Hrodna, Klecak cathedral, Mikalaeuski Cathedral in Mir. The towers here have lost their defense function and are mostly used as decorative bell towers. At the end of XVI c. competition between different religious communities - Catholics (Jesuits, Basilians, Dominicans, etc), Uniats, Orthodox Christians, Protestants - was very strong. This resulted in building of outstandingly beautiful cathedrals. The later Belarusian Baroque is marked by exceptionally plastic and refined towers.

At the end of XVIII c.- beginning of XIX c. Belarusian lands have been added to Russian Empire as a result of three divisions of the commonwealth of Rzzech Pospolita Polsko-Litewska. This period coincides with the appearance of Classicism in Belarusian architecture. The basis of this was in re-planning of the Belarusian cities by Russian architects in St. Petersburg. Mostly towns in eastern Belarus were re-planned: Babinavichy, Belicy, Byhau, Viciebsk, Haradok, Klimavichy, Kopys', Mahiliow, Mscislau, Vorsa, Polacak, Rahachou, Surazh and others. The new plans of the cities were geometrically even and symmetric. The principle of regularity especially was evident in those towns that were moved to a new place nearby the old location - Babinavichy, Klimavichy, Haradok. These new towns were built according to ideal rectangular or square plan. The first buildings built in Classicism style were the estates of arriving Russian nobility who were given lands in Belarus (Homel' Palace of Pashkevich, Krychau Palace) and imperial government buildings (Postal Office in Polacak, . They were built by architects M.A. L'vov, I.Ia. Starov, J. Kvarengi. The projects of the buildings were often made in St. Petersburg. Classicism was less common in central and western Belarus. Here Classicism was often merged with Baroque style (architects I. Zigfridan, I. Zeidel). The years of 1800-1830 were the period when Classicism acquired a form of High Classicism. Many civic and residential buildings were built in this style. Most of the architects working in Belarus in XIX c. were the graduates of Vil'na , Warsaw and St., Petersburg Universities. Among the most prominent were: K.V. Bagemile, O.I. Betyni, J. Clark, L. Greipel, Iu.K. Lianchouski, V. Mikhaelis, F. Sankouski, L. Salenik, M.V. Chahouski.

The Russification of Belarus was reflected in significant diminishment of the number of Catholic and Uniat churches built since the end of XVIII c. Mostly Orthodox Christian Cathedrals were built during this time. The most known architects of Russian Orthodox architecture in Belarus were A. I. Mel'nikau and Stauberg. The cathedrals were built in a simple tradition of ancient Ruthenian churches (Mazalauk Cathedral of the Entrance, Rechyca church).

After 1830 the architectural styles in Belarus are penetrating each other. A period of Eclecticism and Neo-Gothics begins. One can define 3 main periods in Belarusian architecture of the second half of XIX c. - beginning of the XX c.

1830 - 1860. The transition from classical stylistics to the forms of architectural heritage esp. Gothics under the influence of Romanticism.
1860 -1890. The wide use of historism in architecture. In Belarus it was performed under the imperial control in two directions - a) official so called

"Pseudo-Russian" style with orientation on Byzantine and ancient Rus"ian examples; b) diametrically opposite style oriented on the Western Europe associated with democratic and national-liberation ideas.

1890 - 1917. The development on the background of retrospective styles of new architectural styles - Modern and Neo-Classicism.

Later came the First World War and one of the most dramatic episodes in the city's history -- the power-struggle between the Belarusian National Rada and the Bolsheviks from 1917-1919. On the national side stood such distinguished patriots as Professor E. Karski, General K. Aliexejuski, Anton Luckievicz, Edvard Vajnilovicz, the poet Ales Harun, Col. Kastus Jezavitau, Janka Kupala, Jazep Varonka, Count Skirmunt, Zmitrok Biadulia, Princess Mahdaliena Radzivil(the Countess Markievicz of Belarus) and others, in particular the railway workers. The Bolshevik side was led by Russian internationalist and professional revolutionaries -- Lander, Knorin, and Miasnikou, -- backed by mutinous but well armed Tsarist soldiers, who ultimately prevailed. Over the next twenty years, however, the bold ideas of the socialist revolution became stained with the blood of hundreds of thousands of victims summarily shot by Bolshevik special units in the "killing-fields" of Golden Hill and Kurapaty. Many more starved to death as a result of collectivization of agricultural land, hastily introduced by the 9th All-Belarusian Soviet Congress held in Minsk(1929).

The arrival of the Germans in 1941, after the encirclement near Minsk by General von Bock of 300,000 Red Army soldiers with more than 300 tanks, brought more bloodshed with the Nazi mass murders. However, many Jews escaping death at the hands of the Nazis were sheltered and helped by the local populace. There followed more executions and mass-deportations by the Bolsheviks of the so-called "collaborators". Yet some good came from all these ills: Eastern and Western Belarus(formerly under Poland) were reunited in 1939. The Belarusian Republic was admitted as a founding member of the United Nations in 1946. The ruined city of Minsk was rebuilt as the show-place capital of the modern Republic, larger and more populous than Bulgaria, Denmark, Portugal or Hungary.

The awakening to nationhood in 1863 and 1904, the role played by the citizens of Minsk of every class in the creation of an independent Republic in 1918, and the subsequent destiny of the city as the cultural capital of Belarus, rather than of some administrative area in a Marxist dreamworld, -- all these cemented by years of strife, suffering and persecution during the Revolution and the Nazi-Soviet conflict(1941 - 1945), has helped to make Minsk a united city with a character very much of its own. Despite the destruction and thoughtlessness of planners, a great deal of the old Minsk has survived, and is being painstakingly restored. Neither were the visions of the totalitarian idealists entirely fruitless, as the fine avenues, squares, parks and impressive new buildings of the new Minsk demonstrate. These were result of plans drawn as long ago as 1926, which included constructivist art deco of Government House(1934), the National Opera and Ballet(1939) and the Academy of Sciences(c. 1935) by Ja. Langbard, and later in 1944 with the impressive neo-classicism of the Congress Palace (1954), the Polytechnical Intitute(1946), Victory Square(1954) and Skaryna Avenue. Industry, technology and the arts have made great strides, and city now boats two airports and a fine modern underground railway system. It has become an international city on the circuits of world.

Architecture

Traditional Architecture

Early Ages (IX-XV)

The first cities appeared in IX-X cc as castles and fortresses that were built to protect nearby population from the military invasions. Most of the towns have appeared in the North, North-Western part of Belarus: Polacak, Vicebsk, Lukoml', Miensk, Vorsha, Druck, Zaslaue, Lahoisk, Braslau, Shklou, Navahrudak, Vaukavysk. Turaw was the only big town in the South at that time. The number of towns has grown sharply during XI-XII cc. owing to development of crafts and economy. Most of the towns were founded on the banks of the rivers or lakes. On one hand it allowed easier transportation by boats. On another hand this made castles less accessible and was a strategic military advantage. More than 40 towns has emerged in Belarusian lands during IX-XIII cc. In the North towns were emerging mainly as fortresses whose primary function was to protect surrounding population against military dangers. In the swampy and almost impenetrable South towns were appearing mostly as the centers of trade, craftsmanship and service of the population of surrounding lands (except Turaw and Brest). Only in XII-XIII cc. several southern towns (Homel', Chachersk etc) have also acquired some sort of fortifications.

The plans of towns (except Vicebsk, which has shaped finally only in XVI c.) were very stable. In many cases all of the buildings inside the city walls were aligned suggesting existence of a general city plan. Major features were a castle and a trade square outside the city walls. Inside the walls buildings were situated very closely to each other. Most of them were having their own wooden fences. Often 2-3 residential houses and several household buildings were sharing one fence. The entrance to this yard was through monumental gates - "brama". In XI-XII cc traditional construction of buildings was done predominantly of wood. These were mainly one-chamber log houses. The floor was often made out of split wood. Some houses were having mica or glass windows. For example many houses in ancient Navahrudak were having 3-4 round glass windows, in which glass plates were installed into special wooden frames. The houses of Navahrudak, Slonim and Brest were often having more complex plans and multiple chambers.

The places of religious service were given special attention. These were initially pagan grounds for burning sacrificial fires - "kaphishchy". They were having wooden idols surrounded by arched fences. In the IX c. Orthodox Christianity has made its way to Belarusian lands. The Christian architectural tradition was brought by Byzantine masters. Churches were build from thin red clay bricks - "plinfa". One of the first churches built is the XI c. St. Sophia Cathedral in Polacak. It was built from plinfa and natural stone. It was in fact a "shortened" copy of St. Sophia Cathedral in Kiew and St Sophia Cathedral in Nowharad - the other two main principalities of eastern Slavs of that time. In XII c. the ancient political structure of eastern Slavs - Kiewan Rus' has fallen apart. Polacak principality was at that time the strongest in Belarusian lands. The political power of this state resulted in creation of a bright and original new Polacak school of arts and craftsmanship. In the second half of XII c. master Ian of Polacak constructs a distinctive monument of original Polacak School of Architecture - a tower-like Spasa-Efrasinneuskaia Church in Polacak.

XIV-XIX centuries

The defeat of crusaders under Grunwald (1410) has stopped a threat of German invasion and resulted in a period of relative political stability and

growth in Grand Duchy of Litva (GDL). Still many wars and invasions has interrupted economic and cultural development of GDL. From second half of XIV c until 1530 southern parts of GDL were continuously devastated by invasions of Crimean Tartars. A bloody Livonian War lasted from 1558 to 1583. In 1654 a disastrous Russian War burned major eastern Belarusian cities. Huge destruction was done to the central GDL lands during the Northern War (1700-1721). As a result of this the development of Belarusian architecture was uneven and often interrupted. A major accent was made on defense aspect of architecture (even in cathedral building). And yet the period of XVI c and the first half of XVII c. could be considered the golden age of GDL and what is now Belarusians and Lithuanian nations.

The period of XVI-first half of XVII c. was characterized by a strong cultural and economic development of GDL. A branched system of feudal domains has been established. 312 towns and large settlements are designated in the map of Makouski made in 1613. Most of these settlements were so called "miastechki" with a population below 1,500 people. The center of such typical settlement was a towns trading square surrounded by houses of traders and craftsmen. The perimeter of "miastechka" ("shtetl") was typically taken by agricultural homesteads. The town citizen were striving for their independence and many towns were awarded self governing privilege - so called Magdeburg Law of Rule (Magdeburg Rights) - in XVI-XVII cc. The privilege of self-governing required citizen to build a town hall with stores, a guarding tower and wax manufacturing shop, a hotel , communal bath, a diner and other. As a result the center of the town moved from the castle to a trading square. The town composition became more open and civil. As an influence of Renaissance philosophy many towns were completely reconstructed to arrange the buildings in certain geometrical plan - circle, semicircle, square, rectangle. The civic center of the town was defined by city hall with a high clock tower of a town hall - "ratush" (Hrodna, Vicebsk, Niasvizh, Klecak, Mahilyow). Most of the trade was going on around the square adjacent to city hall.

The architectural styles of ancient Rus' were gradually replaced in XIV-XVIII cc. by Gothic, Renaissance and Baroque. An original bi-color decoration was often used when the out coming surfaces of the buildings were left bare red brick, whereas the inside surfaces of niches and belts were covered with white plaster. Since the end of XVI c. many brick buildings were completely covered with plaster (esp. Baroque style).

The methods of building castles have been changed from "dungeon" type to "castel" type. The later was square in plan with two towers in the opposite angle (castles in Lida, Kreva). Inside different wooden buildings were constructed. On the outside castles were surrounded by the water trenches. The most complex was a castle of Navahrudak. It was built in the place of an ancient Wooden fortress on a highest geographical point of Belarus - The Castle Hill. It had 7 fighting towers, a palace and church inside. Even more fortified was Vitaut Castle (now - "Old Castle") in Hrodna. Most of fortification construction was done in XIV-XV cc. Such the Vorsha Castle was rebuilt in the beginning of XIVc. Lower and Upper Castles of Vicebsk were built by duke Al'hierd and his wife in XIV c. Vicebsk castle was the most fortified Belarusian castle in XVII c. It had 33 towers! The early Belarusian castles were having severe and impenetrable look - thick walls, powerful trenches and ramparts. The decoration of facades was almost not existent, except some elements of Roman style (for example arcature in Lida Castle). The interiors of these castles were also dark and gloomy - massive arcs, small fighting windows, narrow stairways inside the walls.

In XVI c. distinct Renaissance features appeared in architecture. It was especially evident in private castles, in which the major defense aspect was gradually transferred to outside structures like ramparts and bastions. The very castles acquired features of palaces with rich decoration of facades and interiors.



In XVI-XVIII c a characteristic type of Belarusian estate or country-seat ("siadziba", "fal'varak") is shaping. Since XVI c. the axis of ensemble's plan was defined by a main building and the gates ("brama"). It was completed with different side buildings of different purpose - wings, annexes, libraries, private chapels, household buildings like barns, stables, kennels. The mills were mainly build as water mills, and only in XVIII c. wind mills appeared in Belarus. The central part of the ensemble was usually not occupied. Artificial ponds were used very often in planning the estates. Parks and gardens were not common until XVIII c. except so called "Italian gardens". The majority of gardens and parks was established in XVIII-XIX cc. They were either geometrically regular - "French type", or landscape "English type". As for the main houses they were various in type - from traditional 2-3 chamber to multi-room buildings. The latter were either suite of rooms ("anfilada") or corridor type. There were houses built on top of household dwellings, with mezzanines, central or side towers, complicated roofs often of broken geometry or layered.

The Mir castle

(150km to South-West from Minsk)



The Paskevich Palas, Homel



The same features were transferred to Belarusian palaces. In XVII c. it still had defense function (see Haiciunishki house). But the XVIII c. Baroque style palaces have already lost this function. They were usually built in a U shaped plan (palaces in Pinsk, Ruzhany, Mahilyow etc.). Enfilade planning was very common. Facades were decorated with pillars, niches, rustics, ornaments. The broken lines of roofing was also fulfilling certain aesthetic function. In XVIII c. a Rococo style was formed within Baroque style and became very popular in Belarus. Most of the estates and palaces were later built in this style (Hrodna Royal Palace - now "New Palace"; Hrodna Augustian Estate; Liavonpal' and Stanislavau estates). Among most famous architects building estates and palaces in Belarus were: A.A. Henu, I.K. Hlaubits, L. Hrynčevic, A. Cahovic; German baroque and rococo: I.F. Knobel, M.D. Pepelman, I.H. Iauh; polish-born B. Kasinski, Laube.

Another typical example of the Gothic style was characteristic to Catholic churches in Central Europe and is often encountered in Belarus since XV c. It has three chambers united ion one rectangular in plan building . The bell tower is very similar to a castle tower - "octangle on square" type (Zaslau, Hnezna, etc). These cathedrals were moderately decorated with relief ornamental belts, arched windows and niches.

As for the monuments of cult architecture it was mainly within Belarusian Gothic, Renaissance and Baroque styles. in XV-XVIII c. Belarusian Gothic appeared as a result of merging of Ruthenian- Byzantine cross-dome cathedrals and compositional characteristics of local castle architecture. Later western European traditions were added to this style. The fortified churches that carried a defense function were commonly built in XV-XVI cc. These were usually rectangular in plan buildings with 4 towers in the corners and a central dome (Suprasl', Muravanka, Synkavichy). This plan was taken from one the most famous and one of the oldest Belarusian churches - St. Sophia Cathedral in Polacak.

In XVI c. a reformation movement was widespread in GDL. It has been reflected in appearance of the Renaissance architecture. Calvinist houses were built in Astashyn, Kajdanau, Kamai, Smarhon', Charnauchycy. Most of the cathedrals still have fortified defense character. But Renaissance architecture is characterized by appearance of cylindrical buildings, circular or semi-circular in plans. A moderate ornamental decoration is used.

The Counter-Reformation has brought a characteristic Baroque style cathedrals. These style was first used by Jesuits. The first Baroque style cathedral - Niasvizh Cathedrals of Christ's Body was built in Belarus in 1587-93 by Italian architect J.M. Bernardoni. The characteristic cathedrals of this style are Farny cathedral in Hrodna, Klecak cathedral, Mikalaeuski Cathedral in Mir. The towers here have lost their defense function and are mostly used as decorative bell towers. At the end of XVI c. competition between different religious communities - Catholics (Jesuits, Basilians, Dominicans, etc), Uniats, Orthodox Christians, Protestants - was very strong. This resulted in building of outstandingly beautiful cathedrals. The later Belarusian Baroque is marked by exceptionally plastic and refined towers.

At the end of XVIII c.- beginning of XIX c. Belarusian lands have been added to Russian Empire as a result of three divisions of the commonwealth of Rzzech Pospolita Polsko-Litewska. This period coincides with the appearance of Classicism in Belarusian architecture. The basis of this was in re-planning of the Belarusian cities by Russian architects in St. Petersburg. Mostly towns in eastern Belarus were re-planned: Babinavichy, Belicy, Byhau, Viciebsk, Haradok, Klimavichy, Kopys', Mahiliow, Mscislau, Vorsa, Polacak, Rahachou, Surazh and others. The new plans of the cities were geometrically even and symmetric. The principle of regularity especially was evident in those towns that were moved to a new place nearby the old location - Babinavichy, Klimavichy, Haradok. These new towns were built according to ideal rectangular or square plan. The first buildings built in Classicism style were the estates of arriving Russian nobility who were given lands in Belarus (Homel' Palace of Pashkevich, Krychau Palace) and imperial government buildings (Postal Office in Polacak, . They were built by architects M.A. L'vov, I.Ia. Starov, J. Kvarengi. The projects of the buildings were often made in St. Petersburg. Classicism was less common in central and western Belarus. Here Classicism was often merged with Baroque style (architects I. Zigfridan, I. Zeidel). The years of 1800-1830 were the period when Classicism acquired a form of High Classicism. Many civic and residential buildings were built in this style. Most of the architects working in Belarus in XIX c. were the graduates of Vil'na , Warsaw and St., Petersburg Universities. Among the most prominent were: K.V. Bagemile, O.I. Betyni, J. Clark, L. Greipel, Iu.K. Lianchouski, V. Mikhaelis, F. Sankouski, L. Salenik, M.V. Chahouski.

The Russification of Belarus was reflected in significant diminishment of the number of Catholic and Uniat churches built since the end of XVIII c. Mostly Orthodox Christian Cathedrals were built during this time. The most known architects of Russian Orthodox architecture in Belarus were A. I. Mel'nikau and Stauberg. The cathedrals were built in a simple tradition of ancient Ruthenian churches (Mazalauk Cathedral of the Entrance, Rechyca church).

After 1830 the architectural styles in Belarus are penetrating each other. A period of Eclecticism and Neo-Gothics begins. One can define 3 main periods in Belarusian architecture of the second half of XIX c. - beginning of the XX c.:

1830 - 1860. The transition from classical stylistics to the forms of architectural heritage esp. Gothics under the influence of Romanticism.
 1860 -1890. The wide use of historism in architecture. In Belarus it was performed under the imperial control in two directions - a) official so called "Pseudo-Russian" style with orientation on Byzantine and ancient Rus"ian examples; b) diametrically opposite style oriented on the Western Europe associated with democratic and national-liberation ideas.

1890 - 1917. The development on the background of retrospective styles of new architectural styles - Modern and Neo-Classicism.

Modern Architecture

XX century. The Architecture of Soviet Period

This period was determined by industrialization of Belarus. 300 plants and factories were built in Belarus only in 1928-1932. The architectural style acquired the features of laconism, simplicity and functionality (see Government Building in Minsk). The unusual volume of construction required new methods. In 1936 a so called Typical Project construction began. The Typical Projects of the buildings were developed in architectural institutes such as Beldziarzhpraekt (1933) and Belprampreaekt (1936). And then they were built in multiple copies all over the country.

Belarusian cities (especially our capital Minsk) were demolished during WWII. After the liberation of Belarus in 1944 an all-union campaign for restoration of Belarusian cities begun. During 1946 -1949 the general plans were developed and adopted for most of the Belarusian cities. Unfortunately many priceless monuments of Belarusian architecture were blown up according to this plans to clear the way to our bright communist tomorrow. In the mid-fifties a new period of industrial methods of construction begun in Belarus. The main attention was given to economics of the construction, the usage of reinforced concrete assemblage parts, standardization and unification. Architecture was considered a science rather than art. 60% of industrial, 90-95% of residential and 90% of social-cultural buildings were made as Typical Projects in multiple copies.

Minsk after the World War II



The main direction of city growth was in formation of residential "Massives" on the perimeter. This concept was further developed into idea of micro-region - a self sufficient residential area with multi-store apartment buildings that has its own infrastructure of communications, transportation, central heating and power supplies, commercial center, schools, day care centers etc. These cities within city are very common in Belarus nowadays. In the last years an ecological aspect was given more attention resulting in somewhat more natural blending of the micro-regions with surrounding landscapes - lakes, rivers and parks.

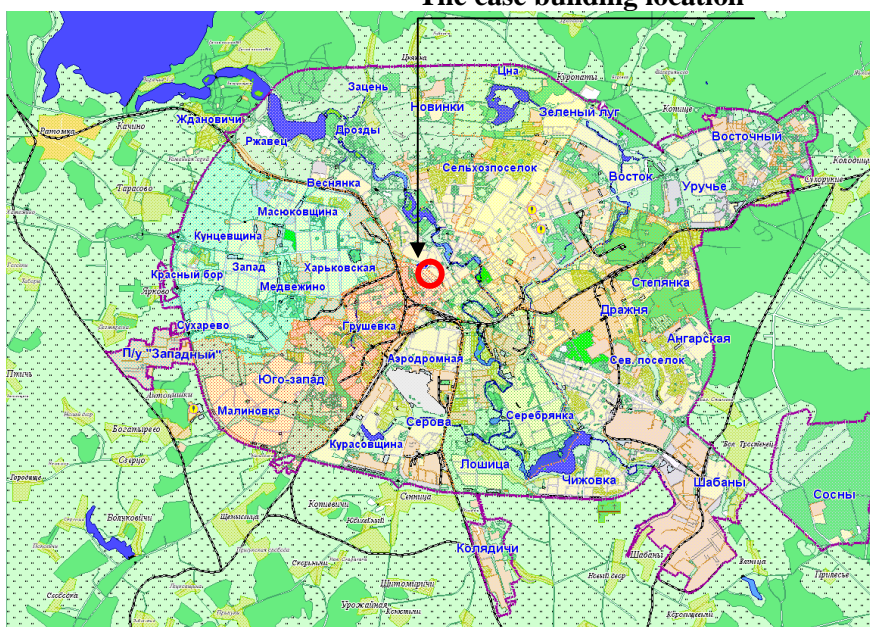
The main attention in construction of industrial buildings is given to their function. Different plants and factories are built as a part of industrial parks ("nuts") usually outside the city thus optimizing on water, power and communication lines. The skeletons of industrial buildings are usually assembled from the standard reinforced concrete parts manufactured on specialized plants. These skeletons are then covered with lighter panels made of a selection of materials. The architectural artistic effect in such industrial ensembles is often achieved in a contrast low stretched production line buildings and tall towers of administrative buildings.

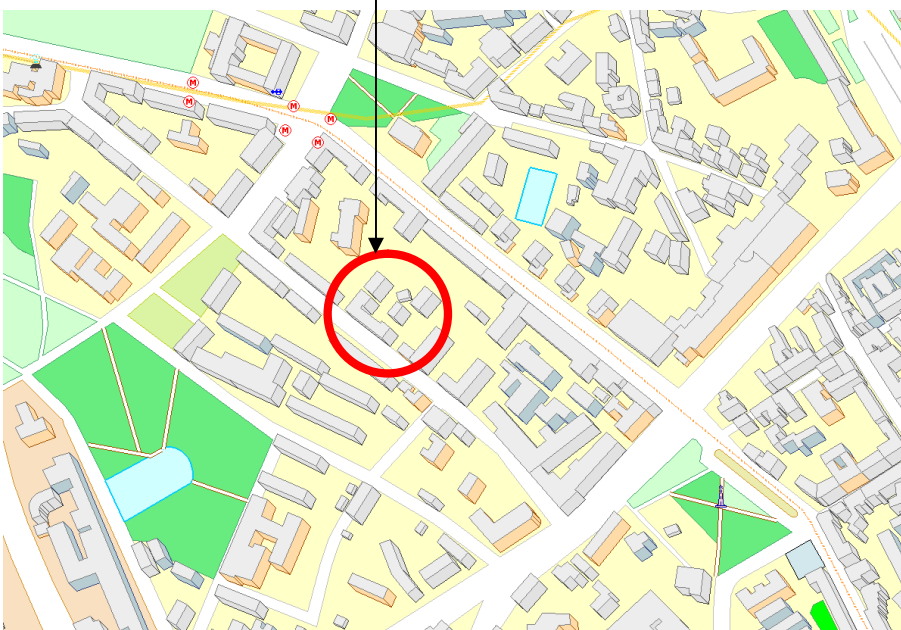
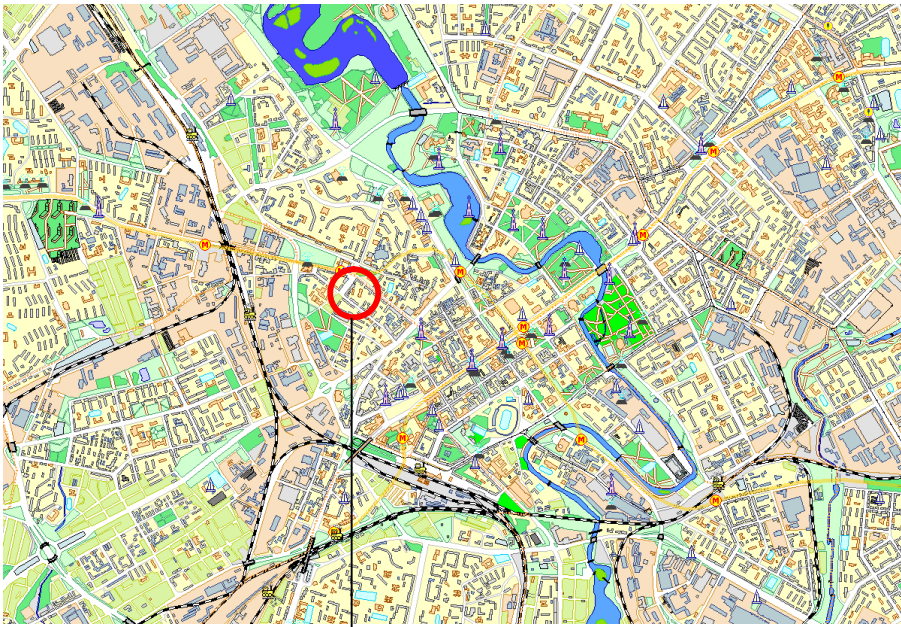
After the Perestroika many formerly neglected and empty churches were given back to believers. Surprisingly this act endangered the monuments even more than during last years of Brezhnev's socialism. In many cases the priests (this is especially true for Orthodox Christian priests) are hurrying to finish a cheap fix of their church without giving much attention and care to its restoration. This way a XII c. Kalozha Church was almost destroyed by Orthodox priest in Hrodna. Only interference of local activists saved the monument. Today our main Orthodox Christian figure - Filaret, Metropolitan of Minsk and Slucak, Patriarch of Exharchy for all Byelorussia, is planning a tasteless reconstruction which would disfigure the monument of Belarusian Gothic - Zaslau Savior Transfiguration Cathedral (depicted on the left). It seems that only national program of restoration of the monuments of such national significance and some kind of public supervision committee could prevent such problems in future.

Problems

Minsk,
The capital city

The case building location







The building is situated close to the core city centre of the capital, Minsk. It has been built along the street with it's main long fa•ade aside. It's neighbor buildings are the residential ones now.



The main fa•ade

The yard fa•ade

1. Building's history

This building was designed at the beginning of the 1950thies and completed in 1955. Initially it was designed as the students' hostel.

It is a 4-storeyd, 58x30m, covered with pitch roof, and with cellar. Total height is about 16m. Total space is about 3600sq.m. including cellar.

It's architectural style may be regarded as neoclassical or even phseudoclassical because of style's presence on the outside walls only. All the interiors and the backyard facades have been designed and built in very simple and functional way, on the edge of minimal quality performance. So, the other two facades from the inner yard are not finished at all and have no any details and decoration to present it's style as a whole.

The two main facades presents the building as a "palazzo", with first two stories made of sandstone and upper two ones of limestone. Both were been plastered with the cement plaster and painted with a organic silicate paints.

Outer and inner bearing walls are made of masonry with ceramic and silicate brick and "portland" cement mortar. The quality of masonry is not so good because it was build after the WW2 when we had a big lack of materials and their quality, especially of mortar was quite poor.

For this reason many buildings have been build in quit ridiculous manner: only main facade(s) has(ve) been decorated, the inner facades have been left with the inatrctive brick masonry, leaving exposed to atmosphere aggression.

The floors above the ground one are supported by wooden beams 250x200mm, the ground floor is made of reinforced concrete.

The partitions are made of wooden frame covered with the rough wooden boards then plastered with lime plaster.

Windows initially have been made of pine wood with doubled glassing.

During the beginning of the 1990thies it's interiors were rebuilt and adopted as the low range hotel.

During the 2005 it's roof covering materials and details have been changed, all windows have been replaced by a cheap white plastic ones.

In addition during these works all the ventilation chimneys have been demolished.

Initially engineering systems were as the electrical network, the central Heating supply, cold water supply, natural ventilation and sewerage. The plot includes the building itself and small yard from the side opposite the street- The total plot area is about 36x70m. The rest of plot's perimeter is closed by the metal bar's fence. The entire plot's area excepting the building itself is paved with asphalt of modest quality.

The distance between the main facade and street's road is 4,5m. The entrance is situated on this facade and is added by different style but functional enough plastic marquee cover.

The outer plaster was partly renovated where deteriorated and refurbished by painting ones more but nobody investigated it's original color.

2. Present situation.

Now the building's appearance has become poor because of many leakage traces on the walls. The reason is that the roof sleeves have not been made properly and do not provide sufficient water protection. It has been lead the moisture penetration between the plaster and brick which cause the plaster destruction during the freezing and melting cycles in winters.

Because of no ventilation the humidity inside rooms are high which cause the inner finishing like lime plaster has started to deteriorate, in bathrooms' corners and in some other corners moisture started to condensate.

The water supply and sewerage pipes are corrodised, the electrical wires are old and don't fit to contemporary engineering codes.



Venilyation system destroyed, chemneys are removed, the rested are deteriorated



Leakadge on the outer walls, the plot is not paved well, the fence is unfinished

3. Client's needs.

The client is maintenance and logistic department on behalf of Ministry of Education.

This year it is going to apply for the money for the further building renovation but the budget is limited however. According to client's information the total sum is limited by the outer walls' thermal insulation only. As far as this building is not listed it's renovation design is totally subjected by the building codes, which includes the minimal thermal insulating outer walls' capacity as $R=2,0m^2 \text{ } ^\circ C/Wt$.

4. The problem.

The insulative works are very profitable in case of Belarus. According the preliminary estimation the heating for such a building will take 2\$/1sq.m per month during the heating season which means $2 \times 3600 \times 6,5 = 47,000$ \$ per year. After the thermalinsulative works it will take 0,5 USD/sq.m or $0,5 \times 3600 \times 6,5 = 11,700$ \$ yearly.

The thermal insulating works for such a building take about 50\$ per 1sq.m of outer wall surface which mean $50 \times 2500 = 125,000$ \$.

The investments return back in 3,5 years.

But I see a big aesthetical disadvantage of this insulation. Obviously it should totally destroy building's style.

According the existing technologies of thermalinsulating works approved in Belarus it is impossible to keep the shape of all decorating details in their initial proportions. For the such kind of walls the total thickness of thermalisulative, structural and finishing layers should be 80...100mm.

Though the client cares about it he is responsible for the right budget managing rather than it's appearance.

Hypotheis

If we spend money instead the thermal insulating works for the all the facades' restoration including the yard facades, if we improve the paving of the plot and change it's fence by the more aesthetical one, what we will loose and what we will gain?

Method

We may compare the total cost of isolative works from outside and total cost of isolative works from inside. And the subsequent maintenance cost should be estimated and the benefit of aesthetical value should be taken into account as well.

Results

Here are presented comparison of just alternative works and maintenance costs. Others like engineering equipment networks' renovation, maintenance costs excluding heating should be the same.

The estimating results may be presented in following table (all costs have been taken out of similar works in Belarus and are presented in USD)

	Thermal isolation from outside		Facades' restoration and thermal isolation from inside		
	Thermal isolation works	Heating costs annually	Facades' restoration works	Thermal isolative works	Heating cocts annually
Per 1m•	50	0,5	50	50	0,5
Per building	125,000	47,000	125,000	125,000	47,000
Total	172,000		297,000		

The difference of initial costs is 125,000 USD and will never be returned during the maintenance period.

To estimate financial part of the question seems to be very simple. But how to estimate all the benefits of aesthetical improvement of the building and it's surrounding which we see as undoubtfull?

What I've found is try to compare peoples attitude before and after the living environment improvement.

On my vision it doesn't take sence to make such kind of surveys like interviews, discussions etc. Everybody wants to live at the appropriate place but they should pay for this opportunity the certain price (indirectly through the taxes). What they gain back is their health.

Quite recently in Belarus authorities have started to improve the quality of our cities doing it step by step and accumulating money on one district city each year. The average population of such a city with some exeptions is 10,000...50,000 people. The money spent vary from 10,000,000\$ till 20,000,000\$. It is quite big sum in case of my country.

Everything is being made within the one year period from designs to the implementation. They pave pedestrian paths, repaire asphalt roads, refurbish buildings from outside. Sometimes they build new ones if necessary.

Allthough I could criticize this way because all engineering network should be renovating prior the finishing works, people are happy.

The real estate suddenly grows up considerably in these areas.

In case of Minsk the price per 1 sq.m in aesthetically improved areas raises by 500\$ in average, in smaller cicies it's less but quite considerable.

The block where the case building is situated has a big 9 storey apartment house just infront to the yard. The improvement of the plot relates to the better condition of the recreation area around the apartment building. The yview from the flats relates both to the plot improvement and renovated facades appearance.

The total living area in this apartment house is about 10,000 sq.m. So, atfer the site and facades improvement the total price of this real estate may be increased by $500\$ \times 10,000 = 5,000,000\$$ which theoretically covers the heating expences for a 10 years.

(Discussion &) Conclusions

The main question that out of this change of money investment the ovner (government) looses while people, the owners of their apartments, gains much more.

Authorities should takes care about stylish building in case of their thermal rehabilitation, though they are not listed. While the question of certain building's thermal isolation arises when the design works start the local architectural department should control the design works to keep the arcitektural identity of building and support the client to apply to authorities for the extra costs appovement.

Concurrently the listed procedure should be simplified and become more flexible.

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Appendix 1