THE STUDY OF WYBRZEŻE HELSKIE AND WYBRZEŻE SzczeCińskIE AND JAGIELLOŃSKA AND NOWO-JAGIELLOŃSKA STREETS.

SYNTHESIS

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The designing of communication connections is a complicated process, wherein the influence on undertaken decisions can have factors seemingly distant from connected problems with the communication. One ought to remember that on one hand transport system lets on the functioning and the development of municipal grounds- is as the blood-system in a body of the man, its bad functioning makes for diseases and good necrosis’s are responsible for life and the height. On the second hand however the badly projected system of ways and streets can become with the barrier restrictive the row of the function in the area through which runs. Because projecting the communication system cannot be assembled only on motorial factors or technical. One ought to bear in mind this that on the area of the project live connected people with him emotionally that the area possesses to be the perhaps unique natural environment that the area possesses the own history of which witnesses are buildings, streets, trees. It’s very easily to ravage one goods in the name of other. The problem consists in these that this process as a rule it will not surrender to turn and in the supplement not we always will reach intentional effects.

This analysis is an only soulless enumeration, an attempt of the objective look, valuing of this what so really will not surrender to fix the price. This test {attempt} is instead necessary because the world is not stood by local and his development places before us following challenges. Because implementators-conscious of refuse which it possesses, they appeal to readers so that do not treat represented in him arguments as specific „Deus ex the machine” of the golden centre proposed by the science but only as the attempt of the reconciliation of mutually contradictory positions. The settlement which every something gives but and to every something takes.
The object of the elaboration.

The elaboration was performed basing on the contract No. AM/001/1.3/B/159/06/1900 dated at 09.06.2006 year contracted among The Capital City of Warsaw to represented by the Office of the Chief Architect of the City and with the Office of the Engineering of the Transport sp.j. in Poznań.

An object of the elaboration was the Study of streets in the central area of Prague and particularly of the course of Jagiellońska street and Nowo-Jagiellońska street and Wybrzeże Helskie and the Wybrzeże Szczecińskie. The range of the elaboration illustrates the lower placed schema. The elaboration was divided into two stages:

1 Stage - Research, analyses of which a main objective was the qualification of the function and the class of above-mentioned courses of streets. Research referred to the area from the Targowa street - and Jagiellońska street to Vistula and from the Gdańsk bridge to the Poniatowski Bridge. They included analyses traffic, technical, preservation, environmental, spatial, economic and other analyses. The stage was finished by the many criteria analysis showing which functions should fulfill examined streets and which technical solutions are most profitable.

2 Stage - Detailed studies over solutions of the course of streets Wybrzeże Helskie and Wybrzeże Szczecińskie. Within the framework of this stage one assembled during the research of technical solutions with the greater exactitude than in the stage 1. More exactly one identified which conflicts will be met by the modernization of the route. In analyses one showed which parameters and technical solutions should be included by the future route of Wybrzeże Helskie and Wybrzeże Szczecińskie.
The synthesis of I part of the Study

In the first stage 92 variants were analyzed all together:

- the variant „0” - the state of the reference
- 35 variants of the course of streets of Wybrzeże Helskie and of Szczecińskie
- 24 variants of the course of streets Jagiellońska and Nowo-Jagiellońska
- 32 variants combined

Variants differed among themselves in: the function and the class of the street, the cross-section, technical solutions containing the depression of streets in the tunnels.

A result of works and the first stage are as follow:

1. A key-road-investment for the area of the elaboration is not one of the analyzed courses of streets but the Obwodnica Śródmiejska. Performed model-research of the traffic showed the considerable decrease of traffic flows on the area of the elaboration after building the downtown ring road. For the row of streets in prognosis for 2015 and 2025 lower traffic flows were obtained.

2. Main obstacle in construction of Nowo-Jagiellońska street in the tunnel is the collision with the general floating channel 250cm. One examined different variants of tunnel passage of Nowo-Jagiellońska street through the area of the Prague buildings. One analyzed both short variants with the depression only under Klopotowskiego and Okrzei streets and long variants in which the tunnel is guided under all the area of the building and under the Avenue of Solidarność. The most of the variants meet the conflict with the general floating channel 250cm. This is the channel with the fundamental meaning for the entire area of Prague because its reconstruction ties in with huge difficulties.

3. Variants of the construction of the Nowo-Jagiellońska street on the ground in consideration of the course in the housing-building can come in for too large with protests of inhabitants. In plans of the building and as in the ground was left the place for Nowo-Jagiellońska street. Not less the street runs near the buildings and in the case of variants with Nowo-Jagiellońska street of the class of the main street they expect difficulties for inhabitants.

4. The extension of the course of streets Wybrzeże Helskie and Wybrzeże Szczecińskie causes far less technical problems than the extension of the course Jagiellońska street – Nowo-Jagiellońska street. The extension refers to the existing street running on the verge of the building because it appears far less technical problems as with the lofting of the new street inside the Prague building.

5. A greatest difficulty with the extension of Wybrzeże Helskie is the course of this street on the border of the Prague Park registered as a monument. The street takes runs in the historically oldest part of the Park. Only the depression of the street in the tunnel or the radical calming and the decrease of the traffic on the street allows the connection with pedestrian courses of the historic and present part of the park. Tunnel leadership of the street permits the better farm implements of the ground.

6. The course of Wybrzeże Helskie and Wybrzeże Szczecińskie is a barrier separating Prague from Vistula. All plans „to return the City over the river” must solve a problem of these streets. A solution is the construction of tunnels in the course of these streets, so as this takes place on Wisłostrada or the stint of the vehicular traffic on the course of these streets.
7. Highest natural values are in the area of Prague Port. Only variants restricting the movement on the course of Wybrzeże Helskie - Wybrzeże Szczecińskie have an affirmative influence on the functioning of the natural environment in this area. The construction of tunnels in consideration of the height of the vehicular traffic which is in the neighborhood of the Prague Port is guided on the area that has not the affirmative influence on the natural environment.

8. The extension of the analyzed streets has not the significant influence on the improvement of conditions of the traffic in the area of the all city. The average speed of vehicles for a year 2015 prognosis on the ground of independent Warsaw varies within 34,80-35,09 km/h.

9. In respect of traffic, better results are given by the extension of the course Jagiellońska street - Nowo-Jagiellońska street. The average speed of vehicles in the area for prognosis for a year 2015 varies in sections: 26,86-31,73 km/h for variants of the extension of Wybrzeże Helskie and Wybrzeże Szczecińskie , 30,77-33,43 the km/h for variants of the extension of Jagiellońska street and Nowo-Jagiellońska street.

10. The construction of the hitch of Wybrzeże Helskie and the Avenue of the Solidarność is profitable from traffic point of view. In all variants in which the hitch was constructed the average speed of the traffic grew and transportation job decreased in relation to of analogous variants tieless.

11. The influence of the lock of the Ratuszowa street on conditions of the traffic is not significant. Instead the lock is profitable for the connection of grounds of the Prague Park and The Zoo and the possibility of economizing of additional places of demurrages.

12. The many criteria analysis shows the need of the reconstruction of Wybrzeże Helskie and Wybrzeże Szczecińskie without the need to reconstruct Nowo-Jagiellońska street. However the reconstruction can go both towards the enlargement of the capacity and the traffic flow as to their limitations. In the ranking of variants the first variant of the extension of Jagiellońska street and Nowo-Jagiellońska street appears only in 6 of the group of variants what means that 13 variants of the extension of Wybrzeże Helskie and Wybrzeże Szczecińskie is better than it.

13. Only the quite profitable variants of the extension of the Nowo-Jagiellońska street include the maximum extension of this street (G2x3) with the simultaneous stint of the capacity of the course of Wybrzeże Helskie and Wybrzeże Szczecińskie. Without economic criteria this variant in the ranking is even in the second group of variants (better than it are only variants of the sole extension of Wybrzeże Helskie and Wybrzeże Szczecińskie with tunnels) but in consideration of economic criteria it comes down to 6 groups of variants.

14. Variants with tunnels look favorably in the case of not taking into account the economic criteria. The high price of tunnels causes that at the regard of economic criteria with the first 10 variants in the ranking 4 contain tunnels however when we won’t take economic variants into account on the first 10 variants only 3 do not contain tunnels. One ought to notice, that economic analysis in the second stage inversely showed economic advantages from the construction of tunnels but this analysis took into account only two variants.

15. For further works one chose the variant of the extension of Wybrzeże Helskie and Wybrzeże Szczecińskie as the street G2x2 with tunnels and the street Z2x2, instead the course of Jagiellońska street and Nowo-Jagiellońska street as the Z2x2.
The synthesis of II part of the Study

The range of the elaboration.

The range of the elaboration embraces the detailed study of the course sorted partly and two variants of the reconstruction of the course of the streets the Wybrzeże Helskie/Szczecińskie:

- the variant of the route of the section 2x2 of the technical class „G” segmentally hollow in tunnels with the limited accessibility called further Variant 1,
- the variant of the route about the section 2x2 of the technical class „Z” with the regard of solutions reassuring the vehicular traffic led {driven} in the level of the ground called further Variant 2.

The range of variant is illustrated on pic.1.

Rys.1 Range of the variants and project-foundations.
The study of situation-height solution.

In works {compositions} of II part the Study, one analyzed the course about 3,6 km of the route in two variants, in respect of the geometrical form in the plan {schedule}, in section to transverse and of height. The description of project-solutions in the small of the back to of road, in chosen, most essential locations one introduced {one represented} below

*The location Gdański Bridge*

One analyzed here 3 versions of the form of the communication node junctive projected route with Starzyński Street and to nearby ZOOS. The version recommended by authors, founds {puts on} the leadership of the objective route in the two-way- tunnel pierced under the existing trunk of the embankment of the railway-route and trams. The service of the parking space at the Zoo, takes place by means of crossings with junction-lines located on the south side of the node, with the use of the one-way- entrance and the trip, located on the main route and one of junction-lines.

*The location the Zoo*

The course of the route in this location differs fundamentally in both variants with the height-form. In the variant 1 one proposes the segmental depression tunnel routes of main with the location of places of demurrages on the surface of the ground and the lack of connections with Street Town hall. In the variant 2, the main route runs in the level of the ground and is brought into contact with Ratuszowa street by means of sewered one-level crossing.

*The location Śląsko-Dąbrowski Bridge*

In this location one proposes the construction {build} in both variants of 2 ways connecting-, making possible full bringing into contact of projected main route with Al. Solidarności.

*The location Okrzei street*

One projected here in both variants of the route one crossing with the two-way- inflow on Okrzei street, instead existing two with one-way- inflows on Okrzei street and Kłopotowskiego street.

*The location Stadion X-lecia*

The course of the route in this location differs fundamentally in both variants with the height-form and the manner of the service of the future National Centre of Sport, located on the ground of the today's Stadion X-lecia. In the variant 1 one proposes the segmental depression of the tunnel of main route with the location of places of demurrages on the surface of the ground and with the full possibility of the entrance and the trip from the Stadium on projected main route Wybrzeże Szczecińskie street with the utilization of projected connecting (the additional entrance was situated also about the precincts of the tie of Northern of the existing node) ways. In the variant 2,
the main route runs in the level of the ground and brought into contact is with the Stadium by means of additional of sewered one-level crossing, located a high of the Stadium.

Below, for example, representing the form of the space in section to transverse for tunnel (in the variant 1 - the section G2x2) solutions and leaderships of the route in the level of the ground (in the variant 2 - the section Z2x2) a high of the Prague Zoo.

The Wybrzeże Helskie street - the section at the Zoo the variant with tunnel passage - the section G2x2
The technical infrastructure - conflicts and the drainage.

Conflicts

Most important identified in the Project conflicts are:
- with the thermal network in both variants,
- with the gas-network ahigh of the garden THE ZOO in the variant 2,
- with the gas-network on the section Ratuszowa – Okrzei street - in both variants,
- with the sewer system - the stormy collector 2,20 x 1,20 m ahigh of the crossing with Ratuszowa street - in the variant 1.

The drainage

One projected the drainage in both variants with the help of covered collectors rainy, separate for the drainage of tunnel solutions and surfaces of the ground in the small of the back to of road. Projected channels demand dispositions of the pumping system, sediments and delivery ducts. In tunnel variants except the proper protection of sides of the casing, one foresees the necessity of the construction of the proper drainage system, with the aim of the drawdown of subterranean waters, for the nearby location the water-course of water.
The farm implements of the ground.

Planning farm implements of the ground in the nearness neighborhood of zoos, streets Kłopotowskiego and Okrzei and the Stadion X-lecia was illustrated on after-mentioned scheme:

One foresees the following conflicts with the spatial farm implements:

- the realization of the Project in both variants will not imply necessaries of demolishing,
- projected reconstruction will have a greatest influence after the manner of the farm implements of grounds in the region of streets Al. Solidarności - Olszowa; one foresees that this area, is potentially an area of possibly social conflicts- to present inhabitants it will change so called „the view from the window”, will worsen acoustic circumstances conditions and create yet another communication barrier,
- remaining grounds which manner of the farm implements will stay intact, should not invoke conflicts.

The recommendation

The variant 1 proposed solutions is more environmentally friendly - not to the state of the barrier in places in which the street is led through a tunnel, permits to consolidate grounds after both sides of the street, into the resoluteness the less degree demands usages of acoustic protections, and first of all lets on the location of new, desirable places parking space; besides is not at variance with recordings of structurally obligatory in the now of the document of the project of the change the study UIKZP.
The communication service.

Below on schemata one introduced rules of the communication service of the area:
Greenery.

In the contiguity of the investment one identified following essential areas, determined foreseen conflicts with green protected areas:

A. The ground in the area of the Prague Park- in both variants for projected node at the Bridge Śląsko-Dąbrowski,
B. Grounds of the coastal green of Vistula (the Varsovian Area of the Protected Scenery) - depending on the variant the Project demands the slight extension of the existing road-belt in the neighborhood of the Bridge Śląsko-Dąbrowski, Okrzei street (the location of newly designed for the bus) gulf and the Trasa Świętokrzyska (the location newly designed for the bus)

Indispensable occupations of grounds described above, are conditioned first of all a necessity of the assurance of the correct communication service of planned National Centre of Sport, the maintenance without the reconstruction of the existing Bridge Śląsko – Dąbrowski assurances of the communication connection of projected route on this node.

The protection against the noise.

As result of conducted analyses and prognoses of the influence of the noise in the neighborhood of planned investment one ascertained the necessity of the construction of the screen a high of the section Śląsko-Dąbrowski bridge – Okrzei street. In both variants one proposes there situating of the anti-noise screen about the length about 225 m. One rates that anti-noise protections in 2 the variant of the route from the point of view of obligatory regulations and on the ground of the calculated range of the influence of the over normative noise level caused with the communication traffic on the section of modernized dear way in the nearness neighborhood of the Zoo and the Prague Park , with reference to normative values accepted for the ground of the housing-building- are not necessary. It founds there as, solutions communication pursuing calms of the traffic.

The flood control.

The objective section of the route one divided on 3 parts on which one proposed separate solutions technical constructions of flood-protections

Besides one analyzed the existing technical documentation of the protection of the flood-section of the route among Kłopotowskiego street to the height of the Gdańsk Bridge.

For the existing farm implements of the area in the contiguity of the objective route (the Zoo, the Prague Park, the building in the neighborhood of streets Okrzei - Kłopotowskiego), one proposes technical solutions, without necessaries of the elevation of projected route with relation to of the state existing.

As of approach, one recommends system-solutions of the flood control of the city in the form of the construction of flood-reservoirs in the upper course of Vistula.
Costs of the investment.

A base fixable of costs of the construction {build} of the course of streets the Wybrzeże Helskie/Szczecińskie in two variants were pre-measures of works performed for elements of the route.

Outlays on the realization, one fixed on the ground integrated „Prices of building and of the installation” obligatory in III term the year 2006. Total costs the investment-assignment {exercise} they present themselves as follows:

The variant 1 - 270,1 millions zloty + 59,4 millions zloty (value added tax)
The variant 2 - 72,3 millions zloty + 15,9 millions zloty (value added tax).

Building expenses of tunnels, determine about 67% costs of the construction {build} of the all investment of engineer objects in the variant 1.

Economic analysis.

It was assumed that the period of the Project functioning will take 20 years what is in agreement with a period of the lastingness of the road surface.

Results of passed analyses in the form of basic coefficients were taken down in the board below:

### Variant W1 to W0

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<th>Description</th>
<th>symbol</th>
<th>Unit</th>
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<th>2,00%</th>
<th>4,00%</th>
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<td>3</td>
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<td>-28242 2623</td>
<td>-25615 2495</td>
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<td>EIRR</td>
<td>%</td>
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<td>2,19%</td>
<td>2,19%</td>
<td>2,19%</td>
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</table>

* the variant W0 marks {means} that the investment will not be analysed.

The cost-analysis and advantage passed {effected} for the variant Into showed his absolute unprofitable - EIRR = ###.

Besides one passed also the analysis at the foundation of the decrease of costs of the investment about 20%. One bets here the resignation from the construction {build} of the part of engineer (eg. the construction {build} of the tunnel at the Stadion X-lecia) objects. Results evidence the significant (near 100-proportional) height of the economic effectivity of such solution. The coefficient EIRR attains then the equal value 4,2 %.
Many criterion analysis

Within the framework of the elaboration one passed also with many criterions of the comparative analysis of both variants. As criteria of principle of the comparison accepted:

The criterion 1 - the number of trees intended to segments.
The criterion 2 - the influence way after realizing on grounds about different natural values.
The criterion 3 - the speed the average of the vehicular traffic in the area of,
The criterion 4 - the forwarding work in the area of.
The criterion 5 - the size of the through traffic in the examined area.
The criterion 6 - changes and spatial conflicts in the area.
The criterion 7 - conflicts with the existing technical infrastructure.
The criterion 8 - financial connected outlays editions with the realization of the investment.
The criterion 9 - the size of the coefficient ENPV, at the established temporary horizon.
The criterion 10 - the number of additional places of demurrages possible to the obtainment in the small of the back way.

Conclusions and recommendations.

1. The analysis of both variants at an angle of prospective conflicts and spatial conflicts , permits to ascertain that projected reconstruction will have a greatest influence after the manner of the farm implements of grounds in the region of streets Al. Solidarności – Olszowa street; one foresees that this area , is potentially an area of possibly social conflicts- to present inhabitants it will change so called „the view from the window”, will worsen acoustic conditions and will create yet another communication barrier.

2. The variant 1 proposed technical solutions is more environmentally friendly, not to the state of the barrier in places in which the street led {driven} is a tunnel, permits to consolidate grounds after both pages {sides} of the street, into the resoluteness the smaller {less} degree demands usages of acoustic protections {guarantees} , and first of all lets on the location of new, desirable places parking space.

3. One recommends, so that the possible realization of the construction {build} of flood-protections {guarantees} , take place {happen} without necessaries of the reconstruction of the existing arrangement {system} of the street; a recommended solution is the system-protection {guard} before the flood, realized across the construction {build} of flood-reservoirs in the upper course of Vistula which minimalize the danger of the pronouncement of the flood wave also in Warsaw; one priced {one rated}, that this type the solution is in principle an only efficient manner of this protection {guard}.

4. Projected route in the variant 1 is stayed by in concert with recordings of the project of the change the study UIKZP (the class of projected street - „G”) 

5. One identified areas of the conflict with the protected green in the area of grounds of the coastal green of Vistula and the Prague Park.
6. On the section among the midday south junction-line of the node at the Śląsko-Dąbrowski bridge and Okrzei street for both variants one ascertained the necessity of the construction (build) of anti-noise protections.

7. Most essential identified conflicts with the technical infrastructure are conflicts with the network thermal, gas- and of sewage.

8. Total costs constructions (builds) of the section of the objective route from the Gdańsk Bridge to the Poniatowski bridge one estimated as:
   - the variant 1 - 270,1 millions zloty + 59,4 millions zloty (value added tax) in this about 67% building expenses of engineer objects,
   - the variant 2 - 72,3 millions zloty + 15,9 millions zloty (value added tax).

9. The variant 1 is found on the border of the economic (EIRR = 2,2%) profitability.

10. The variant 2 is an investment absolutely unprofitable (EIRR = ###).

11. Passed economic analysis profitabilities of the Variant 1 at the decrease of costs of the construction of tunnels, as result of from the resignation eg. from the construction of the tunnel at the Stadion X-lecia, evidences the considerable improvement of economic (near about 100%) coefficients. The coefficient EIRR attains the value in this situation, near 4,2%. The above-attention does not refer the variant Into, wherein no matter which test (attempt) of the decrease of outlays stays without the influence on his profitability - he is always an unprofitable investment.

12. Experiments computational many variant analyses show preferences for the realization of the variant 1.

13. The lock in both variants of the street Town hall for the traffic loose end with the Zoo and the Prague Park creates new profitable possibilities of the creation of pedestrian roads junctive these attractive grounds and lets on liquidations of the deficit of places parking space for the Zoo.

14. From the point of view of the construction of the National Centre of Sport an only possibly variant is the extension of the course of the Wybrzeże Helskie street and the Wybrzeże Szczecińskie as the street of the class G2x2 along with an access of the ground the Centre to the Wybrzeże Szczecińskie.

15. The communication service of the National Centre of Sport in how (as) greatest degree leaning should be on the collective communication because necessary is the acceleration of works over the construction of the line of the underground of serving right-bank-Warsaw and the modernization of the railway station Warsaw the Stadium.

16. In the recapitulation of above-settlements, as preferred to further analyses and elaborations one recommends the variant 1 with the regard of the resignation from the realization of engineer (tunnels) constructions in full to analyzed in the Study the range.