Summary in a Non-Specialist Language

1. Project description

The planned construction of the Puławy by-pass is a part of a major investment task i.e. construction of the express road no S12 from Radom to Lublin. The road will be constructed partly with the use of the existing sections of National Road No. 12, whereas the existing passages through towns and cities where reconstruction is impossible, will be replaced with by-passes (Radom, Zwoleń, Puławy, Końskowola) The aim is to upgrade National Road No. 12 in the section of Radom- Lublin (including the Puławy by-pass) into a double carriageway expressway road.

Phase I of the Puławy by-pass being designed, in the route of National Road No. 12 Radom- Lublin will be located in the Lublin Province, Puławy District, Puławy Commune and the Town of Puławy. The new road will cut the Vistula River Valley, where a new 1012 m bridge will be constructed. A border between the town and the commune area will go through the middle the Vistula river, therefore the left bank section of the by-pass will be located entirely in Puławy Commune, whereas the right bank section will be entirely in town (fig. 3). In phase II the by-pass will be extended in the east direction to the connection with the National Road No. 17 Warsaw-Lublin in the area of Sielce-Chrząchówek, in Końskowola Commune (fig. 2).

For phase I of the by-pass a construction of high-speed road class standard (GP-class) was approved. For the bridge section there will be immediately realised the two target carriageways of two traffic lanes with a median. For the remaining sections there will be one carriageway road will two lanes with land being kept in reserve for construction of the second carriageway in the future.

On both ends of the bridge section two double-deck road junctions were designed: on the left bank of the Vistula river – the "Bronowice" junction crossing the Provincial Road No. 738 Góra Puławska-Kozienice, and on the right bank of the Vistula – the "Dęblińska" junction crossing the Provincial Road No. 801 Puławy- Dęblin. On ends of the by-pass there were one-level crossings designed: first crossing in Anielin at the connection of the by-pass with the existing Road No. 12 with an exit from the by-pass to the old route to Góra Puławska and Papaw, and the second crossing "Azoty" with an exit from the by-pass to the existing Road No. 12 Puławy- Lublin (1000-lecia Państwa Polskiego Avenue) or to the existing Road No. 824 Puławy –Żyrzyn and then to Road No. 17 Warsaw- Żyrzyn-Lublin. Between these crossings and junctions entry to and exit from the by-pass will not be possible.

2. Environmental surrounding of the by-pass

The nearby surrounding of the section of the Puławy by-pass being designed on the left bank of the Vistula river can be characterised as a typical, open, hilly, agricultural landscape with trees area between fields and with isolated forests. Prevailing tree species are petiole oaks, common pines, common birches, small-leaved limes, black poplars, white willows and black alders. Occasionally Berlin poplars, Italian poplars, walnut trees, common hornbeams, mountain ashes, natural pears, cultivated plums but also elder bushes and blackthorns are present.

The new road will be going through the valley of the Vistula river with two flood-land terraces (lower and higher one) and one above-the-flood-level terrace. In the Pulawy area the river is engineered and the valley is approx. 5 km wide. On the left side of the river there is a flood-land higher terrace with the Klikawka river flowing through the old Vistula river bed. The terrace is protected by flood embankment running near the right edge of the lower flood-land terrace. This area is intensively used for agricultural cultivation with only small parts of primeval marsh forests preserved. In the area of the lower flood-land terrace there is a dense complex of poplar-willow marsh forests. Moreover, over the Vistula banks, in the old river bed there is a wide range of rush and water plants. On the right bank of the Vistula the flood-land terrace with its bordering erosion edge is thickly afforested with primeval plants. The Vistula river is in bad sanitary condition.

On the above-the-flood-level terrace of the Vistula the primeval mixed forest landscape of the analyzed area was turned (as a result of human activity) into urban landscape. The remaining parts of forests are under forest management control. Within the forest area there is a large industrial complex known as the Nitrogen Works called “Azoty”. The surrounding forest is a sort of an isolating belt separating the chemical facilities from the agricultural areas and urban buildings of the Puławy town.

Above the designed bridge the Vistula flows through an 80 km-long area among the Polish Upland hills. This area is also a tectonic embankment of the Carpathian wall. The relative elevation of the Vistula valley side goes up to 100m in Kazimierz Dolny region. In the narrowest place, the river valley is only 1km wide and the river bed narrows to about 500 m. This area is called the Małopolski Gorge of the Vistula River and it is under legal environmental protection as the Kazimierski National Landscape Park.

On the left side of the Vistula the designed by-pass was directed in such a way as not to encroach on any big forest area. Nevertheless, cutting down the minor isolated forest pieces and single trees in the midfield forestation will be necessary. In the surrounding of the designed by-pass there are deer, wild boars, foxes, hares and other small animals. The by-pass is going to run through the existing migration paths of those animals, especially the main migration route along the Vistula river connecting the Świetokrzyskie Mountains region with the Kozienice Primeval Forest.

There are many species of water and mud birds in the area of the flood-land terrace of the Vistula. In order to protect them, the initial design of 800m bridge with its embankments to be built on the flood-land areas was replaced with a 1012m bridge connecting both ends of the flood –land terrace of the so-called river mid-embankment. In this way forest clearance will be reduced to a minimum. Flow conditions for flood waves will also be much better.

At the open area on the right side of the Vistula river near the designed ”Dęblińska” junction, the construction of the new bridge structure will require pulling down of housing and farm buildings, taking over house gardens and removing trees and bushes. As regards the further section going through the forest, it will be necessary to remove parts of forest, especially in the place of the designed crossing “Azoty” and access roads to the new over bridge over the railway tracks to Warsaw. Occupation of the forest grounds was kept to a minimum by setting out the new road in the route of the existing Długa Street.

3. Potential impact of the project on the environment

If the new road is not equipped with the required environmental protection devices, then after its handing over for traffic the surrounding environment will be exposed to an intense harmful impact of the factors connected with road traffic such as:

- heavy noise for the surrounding housing,
- air pollution exceeding the limits,
- pollution of soil, crops and plants,
- water pollution in the surrounding rivers and drainage ditches and underground waters,
- traffic collisions with wild animals which in the long run may lead to reduction in their population.

4. Environment protection measures

In order to limit or eliminate environmental hazard the following arrangements for environment protection have been introduced to the road design:

- trees and bushes isolation zones (in open areas),
- sound-proof windows
- non-collision passages for animals (of various size),
- grassy ditches, reservoirs and separators purifying waters from roads,
- treatment plants at the river slope draining off purified rain water from the bridge (by means of suspended rainwater collectors) and the “Dęblinska” junction (by means of traditional underground storm drainage) to the Vistula river
- sealing of ditches and reservoirs with plastic foil as a means of protection against underground water pollution.

It is estimated that the above mentioned measures of environmental protection are properly adopted. Also when taking into consideration the most probable scenario of

ecological situation development in the surrounding of the designed road it should be stated that they will be effective. The aim is to provide necessary area protection in the road surrounding for the period by the year 2015. In this scenario it will not be necessary to set up a restricted usage area near the new road.

However, due to a possible increase in the traffic volume in comparison with the forecast one (and subsequent road inconveniences) it is necessary to organize periodical monitoring of ecological situation in the road surrounding. Also a post-construction analysis of the project influence on the surrounding environment will be required (within 6 months after opening of the road to traffic) and an environmental assessment study to be carried out 10 years after opening the road. These actions should be aimed to resolve the matter of a restricted usage area near the new road and to specify the scope of anti-noise protection by means of sound-proof windows for scattered farm areas (if tests show that noise level standards are not met).

The designed green belts will consist of two-sided rows of trees or bushes. They will be at least 2x3 m and they are also going to fulfill landscaping functions. They will also protect the surrounding agricultural and forest grounds from traffic noise and harmful toxic components. In total the design includes planting of 6582 new trees which should partly compensate possible vegetation losses.

In order to lower the costs a form of a joint construction of animal passages with bridges and road culverts has been proposed. For bigger animals such as deer or wild boars a bridge over the Klikawka river in Bronowice will be designed. For smaller animals such as hares or foxes road culverts will be used. On the main animal migration route in the valley of Klikawka river in Kajetanów settlement there will be constructed a separate bridge structure designed for medium size animals (deer and wild pigs) in a form of the so-called ecological culvert under the road. Also a bridge will be constructed on the main route of animal migration where the road crosses the Vistula valley. Small, medium-size and big animals will be able to pass under this bridge. This bridge will not pose any danger to migration of birds along the river valley. There will be two animal passes constructed for medium-size animals on the right side of the Vistula river in the Puławski forest. One animal passage will be constructed together with an overbridge to direct the existing railway line under the road and the second will be constructed together with a frame culvert for the existing tourist route.

5. Changes in the ground surface

As a result of road earth works the surface shape within the right of way will undergo some changes. Also the ground layer (cultivated land, topsoil) will be permanently removed from the area designed for by-pass construction. Main carriageways of the Puławy by-pass located outside the primeval valley of the Vistula will be constructed either at the ground level or on a small embankment up to the height of 1 m. There will be higher embankments of 5-8 m at the passing through the primeval valley of the Vistula. There will also be high embankments constructed at access points to abutments

up to 6 meters above the existing terrain level at the locations of bridge structures designed for cross roads.

In the area of the left-side edge of the proglacial stream valley of the Vistula in Bronowice the new road will be set out in a 7m deep cutting. The above was required due to the necessity to create an easy descent of the road from the plateau to the bottom of the original valley.

The designed road ditches will be 0,5m to 1,5m deep below the ground level. Despite the use of the excavation soil for construction of embankments, there will be lack of soil material to construct the new road.

Potential borrow-pit sites for the by-pass construction are situated nearby the route but the decision about choosing the ultimate borrow-pit has not been taken yet. There will be a separate environmental impact assessment prepared for the use of a certain borrow-pit. However locations for the use of the remaining topsoil have been pointed out.

6. Changes concerning ground and water relations

As a result of the designed road drainage works there will be changes in the ground and water relations. These changes will be temporary for the period of the project execution and they will be permanent at the time of the project operation once the construction has been completed. After completion of the road ditches construction and after deepening of melioration ditches there will be permanent lowering of maximum levels of underground water of the first water-bearing level. The lowering will not be significant: app. 10-20 cm, maximum 30 cm. From agricultural and forest management point of view, such lowering will be beneficial; it will be restoring the designed level assumed during melioration ditch network construction, and it will be mainly clearing out of melioration ditches which cross up with the by-pass. The designed deep road excavation in Bronowice will not reach ground water surface and it will not disturb the water-ground relations; it will not influence plants either, because the existing tree plants are accommodated to deep ground water level.

7. Inconvenience of the construction works for the project's surrounding

Execution of road and bridge works on the Puławy by-pass construction can be connected with periodical inconvenience for the environment, such as noise of site equipment (especially during the placing of bridge piles), air pollution (unpleasant odours and dusts) or water pollution (silt-up of ditches and nearby areas after heavy rains). In the proper, standardized construction work organization these difficulties should be reduced to a minimum and they should not exceed permitted levels.

The completion of road, bridge and infrastructure works during construction of the new road will be connected with occurrence of building debris, such as removed pieces of old pavement, bits and pieces of plastic and foil, used wood, metal pieces, empty containers, etc. The total amount of the debris is estimated for 1,5 tons. Dangerous debris can also occur, such as: cans containing used paints for painting bridge structures or decomposed

pieces of tar pavements. The management of the debris is incorporated in strict formal and legal rules, so environment dangers will be reduced to a minimum.

8. The influence of the project on the NATURA 2000 network areas

The new road will be located outside the NATURA 2000 network areas (fig. 1).
The distance between the road and the nearest NATURA 2000 area is 14 km as far as the Special Bird Protection Area "the Valley of the Middle Vistula" is concerned , 10 km from the Special Bird Protection Area " the Małopolski Gorge of the Vistula River" and 12 km from the Special Habitat Protection Area of ''the Zwoleńka River Valley". The area of the Małopolski Gorge of the Vistula (along with the Zwoleńka River Valley) is connected with the area of the Middle Vistula Valley where birds and mammals can be found migrating between these areas along the Vistula valley. For the place where the project collided with migration paths a bridge over the Vistula Valley was designed, which will solve the problem of collision with mammal migration paths and provide safe passage for the migrating birds. Therefore it can be safely assumed that that the investment will not cause losses, fragmentation, disturbances or any changes to key elements of the NATURA 2000 areas and it will not spoil the integrity of the NATURA 2000 network.

9. Influence of the project on material possessions and cultural values.

The route of the by-pass interferes with 4 detached buildings and 5 nearby farm buildings. All these buildings will be demolished and their owners will receive compensation allowing them to build new houses or move to the remaining buildings.

There are no heritage or any other elements of the so called "cultural values" under protection of law in the area of the designed section of Puławy by-pass. Therefore, there is no need to provide protection for these types of objects or areas.

As far as archeological objects are concerned, there has been a surface assessment carried out in the project areas. As a result there have been two archeological sites discovered on the route of the Puławy by-pass plus five more possible archeological sites clashing with the by-pass route.

In order to provide protection of archeological objects it is necessary to carry out salvage excavations in the area of the discovered sites prior to the works, carry out additional research in the area of possible sites and commence general archeological supervision of all earth works during the by-pass route construction. These activities will be undertaken after obtaining the construction permit.

It is also likely that some relics of the castle in Bronowice may be found. It is located on the high Vistula slope north of the nearby village in the construction zone of the designed "Bronowice" junction. In this area earth works should be carried out under special archeological supervision. The Bronowice Castle was rebuilt into an ornamented palace

in the 18th century, but in the 19th century it declined and was gradually demolished. Currently its exact location is not known.

10. The analyzed project alternatives

At the time of initial analyses of the Puławy by-pass route there were two alternative locations taken into account; on the south side or north side of the town. After numerous analyses taking also ecological criteria into consideration, the north alternative of the by-pass was chosen as final solution. The choice of this alternative was mainly caused by the fact that the south alternative route interfered with the Kazimierski National Landscape Park.

Also the possibility of retracting from the Puławy by-pass construction and leaving the existing route of National Road No. 12 through the town without changes (zero option) or upgrading it (minimum option) was taken into consideration. Nevertheless, it was decided that such alternatives would be definitely less beneficial from the environmental point of view than construction of the new by-pass – mainly for the reason of transit traffic through the Puławy town. After construction of the by-pass we should expect decrease in the traffic noise level and toxic car fumes in the Puławy city and in other surrounding towns along Road No. 12 such as: Zarzecze, Dobrosławów, Klikawa, Góra Puławska and Końskowola. Moreover, abandonment of this investment would mean loss for the community and the economy i.e. longer travel speed, periodical traffic jams during rush hours and more traffic accidents on the old road in comparison with the new one to be constructed. Acceptance of zero or minimum option would mean worsening of physical and mental health of people. These options are also unfavourable from the environmental point of view because an accomplished investment means introduction of environmental protection devices and also safe animal passages in the Klikawka Valley and the Puławski Forest which would improve animal living conditions and help increase their number.

11. Community consultations

During the process of the project preparation there were lots of meetings with local people and local administration. On these occasions the local communities were informed about the planned investment. All concerns were explained and every time when it was possible local community requests were taken into consideration and incorporated into the design.

Generally speaking, the community of the Puławy town and its nearby areas have a positive attitude towards the project investment because they are aware of the fact that the new bridge route will solve their traffic problems and reduce traffic jams on the existing bridge over the Vistula. The protests were connected mainly with specific situations, especially as far as road inconvenience to the surrounding issue is concerned.

As a result of these protests the initial route of the by-pass was moved from the village of Bronowice by additional 20-30 m. This enabled setting out the route in the excavation, which will reduce the problem of traffic noise for the village.

There were some requests concerning the bridge over the Vistula submitted by the National Polish Bird Protection Association. They were fully taken into consideration in the design and location of the by-pass project.