



TABLE OF CONTENTS

1. NON-SPECIALIST SUMMARY	3
2. SUBJECT AND PURPOSE OF THE DOCUMENT	13
3. REPORT SOURCE MATERIALS AND METHOD OF COMPOSITION	13
4. LEGAL GROUNDS FOR EXECUTION THE OF WORK	14
4.1. Legal acts	14
4.2. Legal classification of the planned investment	15
4.3. Determinations pertaining to basic programmatic and planning documents	15
5. LOCATION AND DESCRIPTION OF THE PLANNED UNDERTAKING	21
6. CHARACTERISTICS AND EVALUATION OF ENVIRONMENTAL CONDITIONS 29	
6.1. Geological structure, hydrogeological and hydrological conditions	29
6.2. Climatic conditions	30
6.3. Natural conditions	31
6.4. Protection of cultural sites	35
7. SPECIFICATION OF DIRECT, INDIRECT, SHORT-TERM, REVERSIBLE, AND IRREVERSIBLE INTERACTIONS WITH INDIVIDUAL ENVIRONMENTAL ELEMENTS AND HUMAN HEALTH	35
7.1. Interactions of the undertaking during the construction stage	35
7.1.1. Emissions of pollutants into the atmosphere	36
7.1.2. Noise and vibrations	38
7.1.3. Water and waste water management	39
7.1.4. Waste management	39
7.1.5. Influence of the undertaking on the ground surface and the natural and cultural environment	41
7.1.6. Influence on the level of non-ionizing electromagnetic radiation	42
7.1.7. Influence of the undertaking on Natura 2000 areas	42
7.2. Interactions of the undertaking during the exploitation stage	43
7.2.1. Emissions of pollutants into the atmosphere	43
Calculations of substance levels in the air for emitting groups	52
7.2.2. Noise emissions permeating into the environment	56
7.2.3. Influence of vibrations on the environment	63
7.2.4. Water and waste water management	63
7.2.5. Waste management	64
7.2.6. Influence of the undertaking on the ground surface and the natural and cultural environment	64
7.2.7. Influence on the level of non-ionizing electromagnetic radiation	64
7.2.8. Influence of the undertaking on NATURA 2000 Special Conservation Areas ..	65
7.2.9. Influence of the undertaking on the life and health of humans and natural resources 66	
7.3. Analysis of variants of the undertaking	67
7.4. Interactions of the undertaking during the liquidation stage	69
8. EMERGENCY SITUATIONS AND POSSIBLE COUNTERMEASURES	70
9. DESCRIPTION OF PROPOSED METHODS OF MINIMIZATION OF THE NEGATIVE IMPACT OF THE UNDERTAKING ON THE ENVIRONMENT AND HUMAN HEALTH	71
10. ACTIONS WITH THE PURPOSE OF PREVENTING, DECREASING, OR	



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COMPENSATING HARMFUL IMPACT ON THE ENVIRONMENT	71
11. MONITORING AND LIMITED EXPLOITATION ZONE	71



12. THIRD PARTIES AND THE DESIGNED INVESTMENT	71
13. COMPARISON OF INSTALLATIONS USING TECHNOLOGIES FULFILLING THE REQUIREMENTS OF ART. 143 OF THE ENVIRONMENTAL PROTECTION LAW	73
14. CROSS-BORDER IMPACT OF THE PLANNED INVESTMENT	74
15. CONCLUSIONS AND RECOMMENDATIONS	77

LIST OF ATTACHMENTS

1. Location and variants of the planned investment.
2. Plan for spatial development, infrastructure, and structural profile for the accepted VARIANT III of the investment.
3. Location of the planned investment in relation to protected areas.
4. Maps of acoustic interaction for the existing and planned states. Proposed location for the acoustic baffle.
5. Road noise measurements in the area of ul. Lodzka and ul. Witosa, ACESOFT Sp. z o.o.



1. NON-SPECIALIST SUMMARY

The object of this report on environmental impact is the construction and exploitation of the street "Nowa Łódzka".

Pursuant to the act of October 3, 2008 on **providing access to information concerning the environment and environmental protection, participation of the public in environmental protection and on environmental impact assessments** (*Journal of Laws No. 199, item 1227*) and the Decree of the Council of Ministers of November 9, 2004 on **specification of the types of undertakings that may significantly affect the environment and detailed conditions related to qualification of undertakings for purposes of reporting environmental impact** (*Journal of Laws No. 257, item 2573 as amended*), the planned undertaking is to be considered as **potentially causing significant environmental impact**, and for which evaluation of the impact of the undertaking on the environment can be required. In the decision of May 22, 2009 (WŚ-I-7639/II/68 Ps/2009/AN), the Mayor of the City of Gdansk stated the responsibility of evaluating the environmental impact of the analyzed undertaking.

The planned undertaking does not include the use of installations subject to the responsibility for obtaining an integrated permit pursuant to the Decree of the Minister of the Environment July 26, 2002 on **the types of installations that may cause significant pollution of individual natural elements or of the environment as a whole** (*Journal of Laws No. 122, item 1055*).

"**The development strategy of the Pomeranian Voivodeship 2020**" has been accepted by the Pomeranian Voivodeship Assembly in resolution No. 587/XXXV/05 of July 18, 2005. It is the primary strategic document laying out the directions for development of the Pomeranian Voivodeship. The updated "Strategy..." lays out three complementary priorities for development: competitiveness, cohesion, and accessibility. In the Strategy, competitiveness is understood as a strong and permanent stance of the region in European relations; accessibility is linked with the efficient transport of goods and persons, among other things.

One of the strategic goals is to link the tri-city metropolitan area with the super-regional area, mainly the Baltic region. Another goal is a safe and effective transportation system. The realization of these goals is made possible by the development of the road and street system of Gdansk, creating conditions enabling the effective undertaking of developmental challenges in the super-regional and international context.

The "**Study of Local Determinants and Directions in Spatial Development for Gdansk**", passed on December 20, 2007 by the Resolution of the City Council of Gdansk No. XVIII/431/07 includes the most significant goals for the transportation system, *inter alia*:

- development of the municipal street system (including the Gdansk-Południe District);
- construction of a bicycle subsystem as an element of the municipal transportation system.

The main grounds of the investment are included in the local spatial development plan "**Ujeścisko I**" (1803), approved by Resolution No. LVI/751/97 of the City Council of Gdansk of December 18, 1997 (*Journal of Laws of the Pomeranian Voivodeship 1998, No. 14, item 45*). The planned undertaking is not contradictory to the establishments of the above plan.



The investment will be located in the southern part of Gdansk, in the area bounded by the streets:

- from the north – Al. Armii Krajowej,
- from the south – ul. Swietokrzyska
- from the west – ul. Lodzka.

This includes a large area, from the intersection of ul. Nowa Lostowicka – ul. Wilanowska, further in the direction of the existing ravine along ul. Zakoniczynska through the intersection of ul. Lodzka – ul. Wilanowska, up to the existing ul. Swietokrzyska.

An underground water intake ("Ujeścisko") constituted by two idle (since 1989), completely exploited quaternary deep wells, is found in the direct vicinity of the path of the planned ul. Nowa Lodzka (at the level of the intersection of ul. Lodzka and ul. Przemyska). The intake has only one zone of direct protection. It is assigned for liquidation; however, a final decision has not been made on this matter. Several transit streets leading traffic from the area of Srodmiescie and Wrzeszcze to estates situated in the area of the Trojmiejska Ring Road and leading outgoing traffic from Gdansk pass through the area of the districts Chelm, Gdansk-Poludnie, Wzgorze Mickiewicza and Siedlce. One of these is the street route Lostowicka – Warszawska – Lodzka, constituting the relation between districts Piecki-Migowo and Orunia and the relation between ul. Kartuska, the W-Z Route and ul. Swietokrzyska (and further in the direction of the Trojmiejska Ring Road). This relation is serviced by a two-way, two-lane street, and the section of ul. Lodzka is a "bottleneck" of this system of streets. The planned undertaking is based on:

- the construction of ul. Nowa Lodzka with infrastructure and realization of work in stages;
- construction of the intersection of ul. Nowa Lodzka with ul. Nowa Swietokrzyska along with the intersection of the tram line currently under construction;
- redevelopment / construction of intersections on the route of the planned street and tram line;
- ensuring pedestrian and vehicle access to existing structures and newly designed tram stops;
- ensuring access of handicapped persons to tram stops along with monitoring and intercom communication systems linked to the Monitoring Center at ul. 3 Maja;
- construction of engineering structures, including overpasses, footbridges over culverts, etc.
- redevelopment / construction of the gas, heating, water networks and the sanitary and storm sewage system.

The section encompassed by this document, *i.e.* from the intersection of ul. Nowa Lostowicka – ul. Wilanowska to the existing ul. Swietokrzyska, is an area with significant changes in elevation, which has a significant effect on the shape of the planned road. Locally, in the region of the existing ravine of ul. Zakoniczynska, the differences between the top of the slope and its bottom reach approx. 9.00 m. High and low greenery that is to be removed and underground development are present in the area under analysis. A small forest area is found in the terminal section of the route, on the other side of ul. Lodzka, with a length of approx. 400 m. It is outside of the grounds of the planned investment. **The planned undertaking is strictly related to the investment "Tram line connecting the Chelm District with the Gdansk-Poludnie District from the "Chelm" loop through ul. Witosa, ul. Nowa Lodzka to the "Nowa Łódzka" loop" that is being realized at the same time. This report presents the cumulative impact of both investments and neighbouring grounds on the environmental components that may be influenced (especially by noise pollution).**



Three variants of the investment are considered and described in detail in the fundamental portion of the report. The most important differences between them are:

VARIANT I – the tram line runs between the lanes of the dual-carriageway ul. Nowa Lodzka. The existing ul. Lodzka is a local road.

VARIANT II – the tram line runs between the lanes of the dual-carriageway ul. Nowa Lodzka. It assumes utilizing the existing ul. Lodzka as one of the roadways.

VARIANT III—“ul. Nowa Łódzka” is designed as a dual-carriageway road divided by a green belt with two traffic lanes in both directions. The tram line has been situated on the eastern side of the road system. The existing ul. Lodzka is a local road.

Storm water drainage is designed for leading off water from the drainage system of the planned road system. The locations of connection of the planned drainage system to existing collectors will be executed according to the conditions specified by the system manager.

The planned road system collides with the following existing systems:

- water supply system,
- sewerage system,
- storm drainage system,
- gas line system,
- heating system.

In the event it proves impossible to maintain the required distances of objects from existing networks as specified by their operators, the existing pipelines will be subject to redevelopment within the sections indicated in the technical conditions.

Work related to road construction will be divided into the following stages:

- marking of the route;
- disassembly/redevelopment of objects and cutting of trees colliding with the course of the planned route;
- trough creation;
- development of embankments (in the place of the planned route above the existing ground level);
- compaction of native soil or exchange of non-bearing ground;
- placement of geotextile, layers of coarse-grained sand and broken stone;
- road construction.

During the construction phase, use of the following is foreseen:

- construction materials – aggregate of various granulations, concrete elements, steel elements (rails, turnouts), cables;
- fuels – in motors of means of transport and construction equipment;
- water – for preparation of concrete mixtures;
- electricity – for operation of electric tools, lighting of the construction site.

The consumption of the following is foreseen during the exploitation phase of ul. Nowa Lodzka:

- electricity – street lighting and road signals;
- water – wet cleaning of streets;
- fuel – in technical service and sanitation vehicles.



Furthermore, no consumption of other resources and energy is foreseen, excepting periods of conducting of maintenance and repair work. At present, it is not possible to give the amounts of consumed utilities and fuel.

Within the framework of exploitation of the undertaking, actions related to the following will be taken:

- maintenance of the street in the proper technical condition (including the pavement, road signs and markings, lighting, etc.);
- care for the accompanying greenery;
- cleaning and maintenance of the storm drainage network.

Small repair works with regard to the above are also foreseen.

The analyzed area is located in the eastern part of the Pojezierze Kaszubskie, according to the physical and geographic division given by J. Kondracki. The region of the undertaking is an area of a hilly moraine plateau, formed during the last Baltic glaciations and formed of sands, with local admixtures of gravels and boulder clays. The analyzed investment is located in the area of the Main Underground Water Reservoir (GZWP) No. 111 K – Gdansk Sub-basin.

The subsoil of the grounds of the analyzed investment consists of quaternary formations. Uncontrolled anthropogenic embankments and humus sands occur directly from ground surface. Their composition is very diverse – they contain fine humus sand, fine sand, clayey sand, clayey humus sand, organic matter and rubble. Ground water is present in the form of relatively scarce filterings from sandy interbeddings in the vicinity of cohesive soils and on their ceiling. The level of ground water and the amount and intensity of ground water filtering may be subject to deviations depending on atmospheric conditions.

Only small reservoirs of surface waters (water holes) are found in the vicinity of the investment, the smallest at a distance of about 200 m to the northwest and about 350 m west.

No natural areas and objects protected on the grounds of a natural protection act are present in the area of the planned investment. There is also a lack of the above in the direct vicinity of the undertaking. The closest area subject to protection is the natural and landscape complex **“Orunski Brook Valley (Dolina Potoku Orunskiego)”** at a distance of 0.5÷1 km southeast of the planned investment. The closest areas of the NATURA 2000 network are the **“Bunker at Oliwa”** and the **“Oliwsko-Sopockie Forests”** at a distance of about 9 km north and the **“Wisłoujscie Fortress”** at a distance of about 9.5 km northeast of the investment.

There are also no structures significant to the cultural and historical heritage of the region in the vicinity of the planned undertaking.

The influence of the emissions of pollutants from construction work will be practically insignificant to the state of the environment and will not permanently worsen the aerosanitary state of the area of the undertaking, based on the location of the planned investment.

The source of traffic emissions will be the process of burning gasoline and diesel fuel in motors of vehicles commuting in the existing and designed road system.

It was stated from simulation calculations for the year 2009 and 2015, that:

- nitric oxides will have the greatest effect on air quality in the future,



- worsening of this effect will be caused by the significant forecasted increase in the number of cars, despite the predicted constant decrease of unitary values of emissions from vehicles caused by increasingly strict standards for emissions from motors,
- emissions of remaining pollutants – sulphur dioxide, dust, carbon dioxide, aliphatic and aromatic hydrocarbons – will not cause a risk of air pollution in the area despite their relative increase.

The influences of pollutant emissions from vehicular means of transport for the considered variants are very similar and practically insignificant.

During the construction phase, sources of noise will mainly consist of machines and construction equipment such as excavators, bulldozers, compressors, freight transport, etc. These interactions are not subject to standardization according to current legal regulations. Their spatial scope can be specified to within about 100 m of the group of working construction equipment, and the noise emitted into the environment will be partially screened by the existing buildings in the vicinity of the investment. Work causing significant noise emission will be executed during the least sensitive hours, *i.e.* from 6⁰⁰ to 18⁰⁰.

On the basis of conducted cumulative acoustic calculations, the following evaluation of the planned investment and solution variants may be formulated:

1. The existing noise level in the considered area is mostly caused by vehicular traffic on roads located in the area that do not enter into the scope of the planned investment (Al. Armii Krajowej, ul. Swietokrzyska, ul. Malomiejska, and further, ul. Warszawska, ul. Witosa and ul. Wilanowska). Vehicular traffic on ul. Lodzka is only locally decisive in regard to the noise level, in the vicinity of the street in the section from its intersection with ul. Warszawska to the intersection with ul. Swietokrzyska.
2. Tram noise in the considered area is currently negligible and pertains to a relatively small area near the tram loop near Al. Wladyslawa Sikorskiego. In the vicinity of Al. Wladyslawa Sikorskiego, tram noise is significantly less than that of car noise (thanks to the modern construction of the subgrade and tram-cars - Bombardiers).
3. The existing car noise from streets located in the considered area and in the vicinity of the planned investment, not, however, encompassed in its scope, causes significant exceeding of the admissible noise levels in protected areas. Breaches of this level exceed 10 dB during the daytime, especially in the relatively large area with a single family residential development between Al. Armii Krajowej and ul. Warszawska and on the grounds of the school between Al. Armii Krajowej and ul. Witosa. Breaches also reach 10 dB within the relatively large area with residential development near ul. Witosa. The admissible level for the daytime and night-time is also exceeded by about 5 dB within the area of residential development located on the western side of ul. Lodzka. The residential development area on the eastern side of ul. Lodzka exhibits no breach of admissible noise levels. The admissible level is also not exceeded within the part of the area with single family residential development located between ul. Warszawska and ul. Lodzka, near the planned location of ul. Nowa Lodzka.
4. Forecasts for the year 2015 assume a significant increase in the intensity of car and tram traffic in relation to the current state for all variants of development of the road and tram network. An especially large increase in vehicular traffic is forecasted for Al. Armii Krajowej and ul. Lostowicka. Large traffic intensity is also forecasted for the planned ul. Nowa Lodzka and ul. Nowa Warszawska.
5. The realization of the planned investment will cause an increase in street noise due to the increase of traffic intensity but will also cause its shifting from streets with forecasted

decrease of traffic intensity after realization of the investment (e.g. the old ul. Warszawska) to the area of planned streets, above all ul. Nowa Lodzka and ul. Nowa Warszawska. As a result, the admissible noise levels for the daytime and night-time will be exceeded by about 5-6 dB within the area of residential development located on the eastern side of ul. Lodzka, especially the first line of development from the intersection with ul. Wilanowska (facing ul. Plocka) to the intersection with ul. Dabrowki. Within the area of residential development on the western side of ul. Lodzka, the noise level will increase only slightly (about 1 dB) as a result of shifting of traffic from the "old" ul. Lodzka to ul. Nowa Lodzka. The admissible levels will also be exceeded within the part of the area with single family residential development located between ul. Warszawska (the "old" one) and ul. Lodzka, near the planned location of ul. Nowa Lodzka. Exceeding of noise levels on the facade of the building located closest to the planned ul. Nowa Lodzka will amount to about 10 dB during the daytime and about 4 dB during the night-time.

6. There are no very significant differences in noise emissions between individual variants. According to the traffic forecast for the year 2015, only a slight increase in the size of surfaces protected against noise in relation to the current state can be expected, within which breaches of admissible levels (from 0 to 20 dB) will be about 0.5% during the daytime and about 0.7% during the night-time. This indicates that the acoustically dominant source in this area is not related to the planned undertaking. Isophone analysis indicates that it comes from Al. Armii Krajowej.
7. The greatest increase of area with the largest breaches (from 10 to 20 dB) can be expected in protected areas in the case of realization of VARIANT III. The above area will increase by about 0.45% relative to the current state.
8. The increase in noise level within the area with single family residential development located between ul. Warszawska (the "old" one) and ul. Lodzka, near the planned location of ul. Nowa Lodzka can be decreased by about 8 dB by means of an acoustic baffle parallel to ul. Nowa Lodzka on its western side. Initial baffle dimensions: length of approx. 250 m and height of approx. 5 m. The exact location and dimensions of the baffle will be specified in the construction design.
9. Due to the fact that acoustic baffles are not an effective protection against noise for multi-storey development, they have not been recommended for areas of residential development on both sides of ul. Nowa Lodzka. In buildings situated in these areas, with breaches of admissible levels stated on their facades, evaluation of existing acoustic insulating power of the outside walls and windows from the side of ul. Nowa Lodzka is to be conducted, and, if necessary, the insulating power of these construction elements is to be increased in order to ensure an admissible noise level inside residential habitats.

Vibrations will be present during the construction of the road. In many cases, mechanical vibrations are a working factor, purposely introduced by designers in machines or devices as an indispensable element for the realization of technological processes, e.g. in machines and devices for vibration disintegration, separation through vibration, compaction and break-up of materials through vibration, cleaning and grinding through vibration, drilling, boring, and grinding, and are caused by the operation of earthwork machines, surface work, the operation of steamrollers, excavators, loaders, and machines for compaction. The influence of vibrations during construction is of a temporary nature, which significantly minimizes its influence on the environment, and the amplitude of these vibrations as transferred by the ground to the buildings generally does not exceed the vibration zones affecting buildings and is not harmful to their construction.



Vibrations during street exploitation are caused only by the traffic of heavy vehicles (trucks). Due to the new, smooth surfaces and the technology applied, a significant impact with regards to vibrations is not foreseen – the amplitude of vibrations transferred by the ground to buildings in the vicinity of the planned investment will not exceed the lower limit of the vibration zone affecting buildings.

Rain sewage created during construction work will be drained by the existing storm drainage system or will penetrate into the ground. Precipitation occurring during construction work will not negatively influence the quality of the natural environment. It is recommended to assign hardened places for refuelling of construction machines and to equip the construction site with sorbents.

Water consumption during exploitation of the undertaking will be related to wet cleaning of street surfaces and cleaning of sewer pipes. As of now, it is not possible to precisely specify the type and amount of water consumed for these purposes.

The planned undertaking will not be a source of industrial and domestic waste sewage. Drained precipitation water will be led to the municipal storm drainage system after possible treatment, according to the requirements of the sewage system operator. The planned investment will cause an increase in the amount of precipitation water led off to the receiving body of the municipal sewage system due to the hardening and sealing of significant surfaces and the construction of new storm drainage.

The predicted amount of hazardous waste produced during construction will amount to a maximum of about 10 Mg. Waste emissions from the grounds of the planned investment will come from:

- processes of cleaning settling tanks and separators of petroleum derivatives installed on the grounds of the investment,
- repairs and maintenance of new roads: repairs or replacements of damaged elements or pavement, replacement of lighting, cleaning of stops and streets, etc.

Pursuant to the Waste Act, the producer of waste created as a result of *inter alia* rendering services in the scope of construction and object disassembly is the entity rendering the services, unless the contract for rendering of services stipulates otherwise.

It is not predicted for ground masses from the grounds of the investment to be polluted due to the method of management of these grounds up to the present time. This earth can be used e.g. to level the ground on-site or for transport outside the grounds of the investment. Because local spatial development plans do not specify the method of managing ground masses, this can be specified in the decision on the location or building permit, after which the regulations of the Waste Act of April 27, 2001 is not applicable to these ground masses.



The planned investment will not cause any hazard from environmental factors to the ground surface, landscape, or monuments of the analyzed area during construction. Actions eliminating and limiting the possibility of negative impacts are to be taken during the realization of the investment, *i.e.*:

- construction work is to be realized in a manner making it possible to avoid solid and liquid waste pollution;
- during construction work, paints, lubricants, and other substances that are not harmful to the environment are to be used, pursuant to the decree of the Minister of Economy and Labour of July 5, 2004 **on limitations, prohibitions, or conditions for production, turnover, or use of hazardous substances and preparations and products containing them** (*Journal of Laws No. 168, item 1762 as amended*);
- construction materials fulfilling construction strength conditions and also not harmful to the environment are to be selected, according to the above decree of the Minister of the Economy and Labour.

Cutting of trees and bushes colliding with the planned investment is planned within the framework of realization of the undertaking. Regarding the selected VARIANT III, for construction of ul. Nowa Łódzka and the tram line realized simultaneously the following is predicted:

- trees to be removed: 207 (including 30 due to bad health);
- approximate area of groups of bushes and undergrowth to be removed: 22,000 m².

The planned cutting has been limited to a necessary minimum and the trees to be removed do not constitute a significant natural value. These are mainly so-called "self-seeding" plants. Fees will be paid for the removed trees according to current legal regulations.

Trees to be kept that are situated near the conducted construction work will be protected during construction in accordance with the detailed plans.

Underground water and soil will be well isolated from the potential impact of the investment through construction of watertight pavements for traffic and efficient sewage installations.

Impact of the investment on the quality of the water in the Main Underground Water Reservoir (GZWP) No. 111 K – Gdansk Sub-basin is not expected.

On the grounds of the analysis conducted in this report, it is to be stated that none of the elements of the planned undertaking will significantly affect species for which Natura 2000 areas have been designated or other legally protected areas during the phases of construction and exploitation.

The weighted classification method of variant analysis has shown that the ranking of the considered variants is as follows:

1. VARIANT III
2. VARIANT I
3. VARIANT II



In accordance with the above, it was shown that the variant that is most advantageous for the environment is VARIANT III, proposed for realization by the Applicant. The factors deciding on the selection of this variant were, above all:

- road safety and capacity for traffic,
- no significant cutting of trees,
- conformity with the spatial development plan,
- the level of acceptance of the local community.

VARIANT "0" (no investment) does not predict any changes and is related to costs to be covered for the ongoing maintenance and repair of the existing road system and its adaptation to requirements related to the safety of drivers and other road users. This is a disadvantageous variant from the perspective of environmental protection, because it is related to increased emissions of traffic pollutants and noise emissions due to the congested road system of the existing ul. Łódzka.

The planned undertaking does not create a potential risk of pollution of the environment predicted for a severe industrial emergency. The planned investment does not provide grounds for its qualification as an investment with increased or large risk of occurrence of an emergency.

From January 30 to February 9, 2009, the Department of Developmental Programs of the City Hall of Gdansk conducted an information campaign with the purpose of learning the opinions of the local community regarding the development of the road system enabling access to the northern districts of Gdansk with the omission of Srodmiescie (the downtown area).

On the basis of 164 messages sent to the e-mail address given in the announcements and posts on 5 discussion forums (42 posts), the Sociological Studies Workshop of the University of Gdansk composed a comparison of opinions and comments pertaining to the proposed variants for situating the tram line and ul. Nowa Łódzka.

Threads signifying acceptance of variants II and III were dominant. A significant thread in all of the remarks drew attention to the large amount of parking spaces near the planned "Nowa Łódzka" loop, so that it would be possible to realize the idea of "park & ride"¹ which assumes that the residents of suburbs arrive at points in which lines of municipal transport are focused with their own cars, and then ride to their workplaces in the downtown area. Another problem expressed by the local community was that of noise at places of residence generated by road traffic. Internet surfers expressed the conviction that the construction of sound-absorbing screens must accompany such investments.

Generally, no opinions negating the planned undertaking in its entirety were noted, with most residents seeing a necessity for improvement of the transportation structure in this region.

In relation to the above, no significant social conflicts related to the planned undertaking are predicted.

Also no limitations in the scope of management of the grounds, technical requirements pertaining to structures, and methods of their use are predicted.

¹ "Park&Ride" or P+R is a parking lot for persons arriving from the suburbs of large cities with their own cars who then use municipal transportation. Drivers leave their vehicles in assigned spots, switch to mass transportation, and continue on to the downtown area of the city in this way. The first parking lots of this type were created in western Europe.



Due to the fact that the impact of the planned investment on the environment will be limited to the boundaries of the investment, and the distance to protected areas is relatively great, no additional preventive or compensational measures are foreseen.

Monitoring of the planned undertaking during construction as well as during exploitation of the routes is not foreseen.

According to the requirements of the Environmental Protection Act, the city of Gdansk is to conduct an evaluation of air quality and the acoustic state of the environment. These tasks are currently being realized in full – the ARMAAG air monitoring network and measurements taken by the Voivodeship Inspectorate for Environmental Protection and an elaborated acoustic map of the city.

As a result of the analysis conducted on the influence of the planned investment on individual elements of the natural environment and its distance from the boundary of the Republic of Poland, it was stated that no cross-border interactions will take place as a result of its realization and exploitation.

Conclusion of exploitation of the installation in a manner not creating a hazard to the environment will be essentially based on the complete disassembly of all objects along with disassembly of devices. If necessary, disassembly work will be preceded by analysis of ground pollution levels and elaboration of a plan of remedial action for the grounds, if the results of tests indicate breaches of ground quality standards. The course of the liquidation process will be monitored and documented in accordance with legal regulations.