



# **Western High Speed Diameter**

## **Non-Technical Summary**

2007

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## **1 PROJECT DESCRIPTION**

In November 2006, the Russian Government and the Government of St. Petersburg announced a tender for the Concession Agreement for the design, construction, financing and operation of the Western High-Speed Diameter (WHSD) Motorway, a toll motorway to run across the western part of St. Petersburg, connecting northern, central and southern districts and providing an outlet to the federal roads. The Motorway will form part of the Pan-European Transport Corridor IX (connecting Helsinki, St. Petersburg, Moscow, Kiev and South-Eastern European countries), and will provide access to the Grand Port of St. Petersburg and a new ferry-passenger complex (currently being constructed). The new Master Plan for St. Petersburg adopted in December 2005 emphasises that the Motorway will constitute a part of a unified transport infrastructure of the city.

The Project comprises the following five main Phases illustrated in Figure 1.

- Phase 1 and 2: Southern Section (mostly through dense urban facilities of the city of St. Petersburg);
- Phase 3: Northern Section (through agricultural and open land);
- Phase 4 and 5: Central Section (through Neva Bay and along the Vasilievsky Island).

The company or consortium awarded the project would construct the Motorway by the end of 2011 and operate it as a toll facility over a 30 year period.

This document presents an English language non-technical summary of the information contained in the existing Russian environmental studies, including the Environmental Impact Assessment.

## **2 BACKGROUND**

### **2.1 LEGAL ASPECTS AND COMPLIANCE WITH RELEVANT ENVIRONMENTAL LAWS**

An environmental impact assessment (EIA, or OVOS in Russian) of the Project was completed in 2000 in accordance with Regulations on Assessment of Environmental Impacts from Planned Economic and Other Activities dd. 16 May 2000, and was approved by the State Environmental Committee of the Russian Federation.

An assessment of the environmental baseline along the proposed Motorway route was conducted on the basis of comprehensive environmental surveys carried out in 2005 through 2006 to support the EIA. The scope of environmental surveys complied with the Construction Standards and Rules No. 11-102-97 "Engineering environmental surveys for construction".

As part of the 2000 OVOS, a public health risk assessment was conducted in accordance with Guidelines on Risk Assessment to Manage the Natural Environmental Quality and Public Health in the Russian Federation adopted by the State Committee for Sanitary Control (Resolution No. 25 of 19 November, 1997).

The legal basis for project implementation on the terms of a public-private partnership is Law of the Government of St. Petersburg "On Participation of the City of St. Petersburg in Public-Private Partnerships" (No. 627-100 of 25 December 2006).

Pursuant to Article 7 of this Law, the Government of St. Petersburg has the right to bar a partner or any other parties from operating the Motorway if a partner violates the terms of an agreement or other circumstances arise specified in an agreement that require

intervention in order to prevent, mitigate or eliminate risks or consequences of emergency situations, ensure safety of property of both individual and legal entities, and protect the environment.

The Motorway route has been designed by a consortium of Russian companies led by “Institute Stroiproekt”. The design documents were elaborated on the basis of the Russian regulatory requirements.

## 2.2 NEED FOR THE SCHEME AND SCHEME OBJECTIVES

Currently, traffic pressures on the central part of St. Petersburg, access roads to the city centre, southern area roads, bridges, and embankments have reached their critical values. In addition, the 2005 Master Plan indicates that heavy traffic on access roads to the Grand Port of St. Petersburg is hindering port development.

As reported by the Master Plan, the vehicle fleet is projected to double by 2025, and cargo delivery to the Grand Port by vehicles will increase by a factor of 3 or 4.

The Motorway is expected to provide significant relief to central areas of the city and resolve the problem of permanent transport connection for Vasilievsky Island residents to the rest of St Petersburg area.

It is also expected to contribute to the national transport system development as it will provide relief to a motor bottleneck in the International Transport Corridor IX:

The specific objectives of the Project are to:

- develop access roads to the Grand Port of St. Petersburg;
- concentrate major traffic flows on the Motorway and provide a link between major port, rail, air and road terminals of the city and the outlets to the federal and regional road networks;
- provide a motorway connection of the new ferry-passenger complex (currently being constructed on Vasilievsky Island) with the main city locations;
- interconnect the north-western, central and southern districts, bypassing the historic centre, thus decreasing the traffic on bridges and streets of the city centre, reducing transportation delays, enhancing traffic safety, preserving architectural monuments of worldwide importance, and significantly improving environmental situation of the city;
- provide a new outlet to the Scandinavia federal road thus allowing to start the construction of new housing areas, industrial facilities and logistics terminals in the north-western part of St. Petersburg;
- address the problem of isolation of Vasiliyevsky Island when the bridges are raised.

## 2.3 ENVIRONMENTAL BASELINE

The current environmental conditions (Figure 2) can be described as follows:

### *Relief, Landscape and Soil*

Almost the entire motorway route is situated within the central part of the Prinevskaya plain, in a flat area with elevation of 25 m to 30 m above sea level. Within the boundaries of Phases 1, 2, 4 and 5 of the Motorway, top soils are typically 1 metre to 3 metres thick, loose

and instable. In the Phase 3 of the Motorway, peat soils up to 2 metres deep are predominant that cannot serve as a foundation for motor roads.

Virtually all top soils along the proposed route are water-saturated, with numerous wetlands. Elevated levels of heavy metals in soil were identified in some areas along the motorway route during the baseline surveys.

The city territory is classified as a zone of low seismic activity (up to a magnitude 5 on the Richter scale); for this reason, no special measures are required to strengthen earthquake protection of buildings.

The motorway route would cross three geological faults which pose risks for the integrity of the Motorway.

### *Climate*

The maximum temperature is +34°C in July and minimum temperature is -34°C in January. The annual average precipitation averages about 620 mm.

Snow cover may be for six months. Sudden temperature changes may result in ice formation on the ground surface. The freezing period lasts 120 to 130 days; and the ice thickness typically reaches 40 cm to 50 cm (maximum 70 cm).

Westerly and south-westerly winds prevail in the area. The average annual wind velocity is 2.7 m/sec. The maximum wind velocity reaches 22 m/sec.

### *Hydrology*

The Motorway would cross a number of surface-water features, including the Neva Bay, several Neva River arms, the Morskoy Canal (which is the main navigation canal from the Gulf of Finland to the Neva River), and the Ekateringofka and Smolenka rivers. Phase 3 of the Motorway would also cross four small rivers and approximately 30 ditches and wetlands.

Groundwater in deep water-bearing strata is fresh. The Dolinnoye aquifer is a major water resource for St. Petersburg. This aquifer would be crossed by Phase 3 of the Motorway.

The water level in the Neva Bay depends primarily on winds. Floods with a water level rise up to 3.5 m may occur due to steady westerly winds. Waves in the Neva Bay coastal areas can reach one meter. The construction of a flood prevention facilities (which is not part of the Project) funded from the Federal budget has not been completed yet, and they will not be put in full operation until at least 2010.

Small water courses within the city are considered as polluted, and the Neva River with its arms and the Neva Bay as moderately polluted by the environmental authorities. High content of heavy metals has been recorded in the sediments in the Neva Bay. The contamination is from a number of sources but predominantly inadequately treated effluent from wastewater treatment plants.

Intensive sediment excavation operations have been carried out in the Neva Bay. The soil is used for the construction of artificial land areas on Bely, Kanonersky and especially Vasiliyevsky Islands, where a new residential district and a ferry-passenger complex will be constructed.

### *Habitat and Biodiversity*

There are no natural habitats along the Phases 1, 2, 4 and 5 of the Motorway. Fauna is represented by bird and animal species associated with an urban to suburban environment. The vegetation includes forest plantations and lawns.

Phase 3 passes through natural forests and peat lands with fauna and flora species included in both the Red Book of the Russian Federation and the List of Plant Species under Special Protection in St. Petersburg and Leningrad Oblast.

Phase 3 also runs at a distance from 150 to 700 metres from the border of the Yuntolovsky designated wildlife reserve which is a protected area of regional significance. It is protected as it is a resting area for migratory birds, of which four species are included in the Red Book of the Baltic Region and in the list of European Protected Species. In addition, the reserve is a habitat of river otter (*Lutra lutra*), a rare and endangered species also included in the European Protected Species list. The areas of the reserve that border popular recreational areas are reported to be under high pressure.

The Neva Bay, Sestra River and its tributary, Chernaya-Lakhtinskaya River are important fisheries. There are several temporary resting sites of migratory birds in the Neva Bay coastal zone.

### *Air Quality*

A high level of air pollution with nitrogen dioxide is regularly reported in the city. The content of nitrogen dioxide in some sections of the Phase 1 route area already exceeds the applicable standards. The projected values of background concentrations of other pollutants do not exceed the standards for other sections of the motorway route.

### *Cultural Aspects*

The following sites of historical and cultural significance which have protection were found in the areas potentially affected by the Motorway:

- Kiryanovo Estate (18<sup>th</sup> century), a summer residence (*dacha*) of Countess Yekaterina Dashkova that is a monument of federal significance;
- Ekaterinhof (Catherinehof) Park (18<sup>th</sup> century);
- Epiphany Church on Gutuev Island (19<sup>th</sup> century);
- facilities of Gutuev Textile Mill (19<sup>th</sup> century);
- facilities of Rezvoostrovsky textile mill "Voronin, Lutsch & Chesher" (19<sup>th</sup> century);
- facilities of the Bone Burning Plant (19<sup>th</sup> century);
- other protected buildings (not specified by the design documents).

## **2.4 PROPOSED WORKS AND SUBSEQUENT MAINTENANCE/OPERATION**

The Project envisages the construction of:

- 14 interchanges at the intersections of the Motorway with major city roads (Figure 3);
- overpass sections (including overhead roads and bridges) with a total length of 23.77 km;

- a tunnel under the Smolenka River;
- an open trench road along Vasilievsky Island at the depth of 6 m below the ground level.

The Smolenka River tunnel is planned to be constructed using the cut-and-cover technique, with temporary diversion of the River. The tunnel will comprise two tunnels for two opposing traffic streams with service area above the tunnels. The total width of this facility will be approximately 50 metres.

The pre-construction phase will include the demolition of buildings and facilities located within the area allocated for the Motorway, re-laying of communication lines, and removal of upper soils and vegetation. The buildings to be demolished include the following (none are protected or considered to be of historical significance):

- about 6,800 private garages
- four apartment buildings on Kanonersky Island (constructed 1940s)
- one private house in Beloostrov community (constructed 1950s)

Temporary sites for subcontractors' supply bases will be organised in approximately every 500 m distance. The sites will be used for storage of construction materials, accommodation and parking of construction machinery.

Upon completion of the construction phase, land reclamation is planned, with revegetating the site with trees (also for noise abatement) and planting lawns.

The Design specifies measures for the Motorway's maintenance, including removal of snow in the winter and de-icing. The installation of engineering systems and communications is envisaged, including the installation of an Automatic Traffic Control System.

It is envisaged that the Motorway will be managed through:

- nine toll collection stations;
- surveillance cameras;
- emergency alert system;
- meteorological observation posts;
- environmental monitoring system;
- fire alarm/fire suppression systems in the tunnel.

## 2.5 *HISTORY OF PROJECT DEVELOPMENT AND PLANNING*

The construction of a road linking the north-western and central districts of the city was envisaged by the Master Plan of St. Petersburg in the 1970s.

In 1996, Design Plan of the WHSD Motorway route was elaborated and approved by the St. Petersburg Committee for Planning and Architecture (CPA).

Feasibility studies were carried out by the CPA on the basis of Orders of the Mayor of St. Petersburg (Order No. 1942-r dd. 19 October 1997, Order No. 118-r dd. 05 February 1998, Order No. 165-r dd. 16 February 1998 and Order No. 76 issued by the Federal Road Service on 14 April 1998).

In 2000, the Project Allocation Act was approved by Order of the Mayor of St. Petersburg (No. 113-r).

The project designs for all Phases of the Motorway were elaborated in 2005 and 2006. The design documents for the Phases 1, 2 and 3 were approved by the relevant regulatory authorities in 2005 and 2006, the design for the Phase 4 has been submitted to the State Review Expert Commission, and the design for Phase 5 is currently in the process of submission.

The construction of Phase 1 is currently underway, about 70% of construction works have been completed to date. The completion of Phase 1 construction is currently planned for the last quarter of 2008.

### 3 *PROCESS*

#### 3.1 *ALTERNATIVES CONSIDERED AND REASON FOR CHOICES*

In the course of developing an EIA/OVOS in 2000, projections of air pollution in St. Petersburg were calculated for the two alternatives: 1) completion of the Project, and 2) the 'do-nothing' option. Air pollution projections were calculated for the city as a whole as applied to the area of a direct impact of the Motorway and to the central districts of the city.

The findings demonstrate that, after commissioning the Motorway, the level of air pollution with contaminants from vehicles will drop by 14% to 17% in the central areas of the city as compared with the 'do-nothing' option.

In addition, the analysis of the ecological impact of options for the Phase 3 concluded at the feasibility study stage that the Yuntolovsky wildlife Reserve should be at a maximal distance from the Motorway.

At the stage of the project design, several alternatives were considered, including the following:

- construction of Phases 4 and 5 in the form of a tunnel, an overpass or an open cut, taking into account environmental considerations,
- the exact location of the Motorway within a route previously selected for Phases 1 and 2, and
- the options for interchanges and crossings with other roads.

It was decided to use open cut since tunnel construction would cause significant environmental impacts associated major ground excavation works.

#### 3.2 *EIA PROCESS CARRIED OUT AND INTEGRATION WITH DESIGN*

An environmental impact assessment (EIA) of the construction and operation of the Motorway was completed by the Independent Environmental Review Centre of the Russian Academy of Sciences in 2000 as part of the feasibility studies. This document was developed for the entire motorway route and assessed two options for Phase 3 along with the environmental consequences of running via a 2-km tunnel under the Neva Bay (Phases 4 and 5).

The EIA was in compliance with requirements of the Regulations on Environmental Impact Assessment of Planned Economic or Other Activities in the Russian Federation adopted by the State Committee for Environmental Protection (Order No. 372 dd. 16 May 2000).

The assessment identified main environmental issues of concern and proposed mitigation measures to be included in the process of designing the Project. These were specified in the conclusion of a commission of experts from the State Environmental Review Expert Commission with regard to the feasibility study.

The design documents developed in 2003 to 2006 include “Environmental Protection Books” (EPB) for each of the five Phases. The EPBs comprise an assessment of adequacy of final design solutions aimed at the elimination or minimisation of potential adverse environmental impacts from project implementation.

### **3.3 PUBLIC CONSULTATIONS AND DEALING WITH OBJECTIONS**

Public consultations were held in accordance with procedures provided for by the following legislation:

- Federal Law “On Environmental Protection” No. 7-FZ dd. 10 January 2002;
- Law of the Government of St. Petersburg “On the Procedure of Public Consultations and Public Awareness in the Process of Planning Activities”, No. 400-61 dd. 20 July 2006;
- Regulations on Environmental Impact Assessment of Planned Economic or Other Activities in the Russian Federation adopted by the State Committee for Environmental Protection (Order No. 372 dd. 16 May 2000).

Public consultations with respect to the feasibility study were held on 20 November 2000. The results were included into a final report. In general, consultees supported the Project and recommended to follow the State Environmental Review procedures.

Similar views about Phase 3 where the Yuntolovsky reserve is located were reported after public consultations held on 18-19 December 2006. Numerous comments and proposals were submitted during consultations, with only some of them recommended for the incorporation during project implementation.

The Project was also discussed during public consultations with regard to the new Master Plan of St. Petersburg up to 2015.

## **4 IMPACTS AND MITIGATION MEASURES**

### **4.1 LAND USE PLANNING AND CHANGES**

Phase 3 involves the majority of land use changes associated with the Project with rezoning of agricultural and forest use for the construction of the Motorway (Figure 4). The rezoning was agreed upon by all concerned land owners and tenants under a special land rezoning approval programme. It is planned to complete rezoning activities by the end of 2007

Within the city, the lands previously used for the garages are currently being reclassified as transport lands. The rezoning activities were agreed upon and approved by relevant land users and regional administrations and municipal authorities.

### **4.2 WATER RESOURCES**

The following potentially significant adverse impacts to waste resources were identified:

- For the period of construction, Smolenka River and the Ligovsky Canal will be temporarily diverted;
- Hydrochemical characteristics of watercourses may worsen because of i) excessive suspended solids potentially transferred from disturbed lands into watercourses during the construction; ii) discharges of oil products contaminated storm water from the road surface; and iii) high salinity of melt water;
- Temporary construction of artificial small islands in the Neva Bay may impact the marine environment. Excessive levels of sea water turbidity would be recorded in large water areas during the construction and removal of these artificial small islands;
- Contamination of surface water and groundwater with storm water run-off polluted with oil products or melt water contaminated with salts used for road de-icing.

The Design includes the following mitigation measures with regards to water resource impacts:

- construction of outlets for water discharge from adjacent areas via reinforced concrete gutters to drain shafts, water treatment plants and then to the municipal sewage system or on land-ameliorative system;
- construction of culverts when crossing all creeks, ravines and depressions in order to avoid changes in surface water flow formation and prevent water logging and flooding of land areas adjoining the Motorway;
- specifying certain sizes of under-bridge areas to prevent a backwater effect and negative changes of the hydraulic regime and river-bed processes upstream and downstream;
- carrying out all construction operations outside the water protection zones of the watercourses crossing the motorway route;
- construction of bridges over rivers in such a way so that to ensure minimisation of adverse impacts on flood-lands;
- additional sowing of top soil layers with grass or covering of the motorway slopes with turf blankets in order to mitigate soil erosion;
- storm water from the Motorway would be sent to local storm water treatment plants or to hydrobotanic settling ponds (Phase 3) which correspond to the national standards. If needed, additional storm water treatment plant can be installed to achieve the standards established for water bodies of fishery significance;
- using sand pads with improved filter ability under the Motorway;
- using de-icing tools with least potential environmental impact for de-icing.

#### 4.3 SOIL

The following potentially significant adverse impacts to soil were identified:

- contamination of soils in land areas adjoining the Motorway, including soil contamination potentially caused by emergency spills of transported chemical substances or oil products ;
- continuous expropriation of land, including lands used for agricultural purposes;
- water logging of soils, especially for Phase 3.

The Project Design includes the following mitigation measures with regards to soil impacts:

- removal of top soil layers prior to the construction;
- removal of heavily contaminated soils and landfilling of low contaminated soils;
- peat excavation and removal from construction sites;
- delivery of natural construction materials (sand, gravel, etc.) from authorised quarries; no new quarries will be developed;
- strengthening of the road bed slopes;
- construction of pile foundations for overpasses; given the fact that the moraine stratum rests at depths of 16 m to 30 m, piles will be driven to these depths;
- while constructing the tunnel, a reinforced concrete wall (30 meter deep and 0,5 meter thick) will be erected as a fence;
- construction of temporary artificial small islands in the water area of the Neva Bay during the erection of overpasses and bridges and removal of these islands upon completing construction;
- reclamation of lands disturbed during the construction; for this purpose top soils previously removed will be used along with soils to be imported from other sources.

In terms of water logging, a separate study commissioned by the city administration and conducted by the State Hydrological Institute confirmed the feasibility of the majority of Phase 3. However, special measures were recommended for some sections of Phase 3. Those should be considered at the working project stage.

Similar assessments of potential water logging impacts caused by the Motorway were not performed for the aboveground sections and especially for the open trench road section in Phase 5. It is recommended to conduct water logging impact assessments for these parts of the Motorway at the working project stage.

#### 4.4 *ECOLOGY AND NATURE CONSERVATION*

The following potentially significant adverse impacts to the environment were identified:

- Habitat loss, particularly in Phase 3 (corridor 17km by 100m).
- Phase 3 will split habitats located to the east of the Yuntolovsky wildlife reserve and Sestroretsky Lake. Migration routes of larger fauna across the Motorway will be lost north of the ring road; and migration conditions for smaller fauna will deteriorate.
- Noise will become a disturbance factor for big mammals, particularly for elks that can lead to reduction of elk populations that live north of the ring road at the present time. Reportedly, the construction of the Northern part of the City Ring Road in 2005 does not allow elks to cross the Ring Road and get to Yuntolovsky Reserve.
- Conditions for vegetation in adjacent areas may also worsen as a result of water logging and soil contamination with salts (including salt aerosols) potentially caused by de-icing.
- habitat loss in areas occupied by artificial small islands in the water area of the Neva Bay.
- habitat changes to marine species in the areas of increased levels of water turbidity.

The Design includes the following mitigation measures in relation to ecological impacts:

- imposing a ban on felling operations during the vegetative period;
- ensuring a maximal distance between the motorway route and the Yuntolovsky Reserve;
- planting deciduous trees in protective spruce plantations to prevent potential spruce windfalls;
- constructing special passages for small animals underneath the Motorway;
- constructing barriers (0.9 m to 1.3 m high) for preventing big animals to enter the Motorway;
- restoring green areas in residential communities and planting of trees and bushes in free areas along the motorway route (Phase 3 of the construction);
- imposing a ban on the construction in the Neva Bay water area during spawning and fish feeding seasons;
- removing temporary artificial small islands in the water area of the Neva Bay after construction phase.

#### 4.5 *LANDSCAPE AND VISUAL IMPACTS*

The proposed solutions with respect to the Motorway will essentially change the existing landscape along the whole route. The following specific potentially significant adverse impacts to landscape were identified:

- The main part of Phases 1 and 2 passes within the boundaries of the city development zone of Category II, where intensive renovation and new construction are permitted on condition that there is no discord with the existing architectural and historical visage of the city.
- Most elevated sections will be visible from city roads, residential areas, public centres, and road junctions..

The Design includes the following mitigation measures in relation to visual impacts:

- Inclusion in the initial design an objective to create a uniform and distinguished appearance of the new structure along the whole route length and to create the sea façade of the city.
- The Motorway will pass along Vasilievsky Island through the partially covered hollow tunnel with green slopes, limiting impacts with the Gulf of Finland.
- Overpass sections and bridges are designed to emphasise the aesthetically beautiful appearance of St. Petersburg and to ensure that residents are not disappointed with the view of changed territories.
- Specific design of acoustic baffles and lighting along the Motorway will contribute to the distinctive style;
- Planting of ornamental shrubs and trees in all WHSD sections adjoining residential areas.
- The areas under overpasses will be paved for further use. Disturbed foot paths and resting areas will be renovated.

#### 4.6 AIR QUALITY

The following specific potentially significant adverse impacts to air quality were identified:

- During the construction phase, maximum concentrations of pollutants on the borders of the nearest residential areas are calculated to not exceed critical levels, with the exception of the construction sites of Phases 1 and 2 (a section from Leninsky Prospect to an interchange on the Ekateringofka River), where excessive levels of nitrogen dioxide may be recorded under unfavourable meteorological conditions.

The Design during construction includes the following mitigation measures in relation to air quality impacts:

- ensuring that engines of construction machinery are shut off during the breaks;
- ensuring application of appropriate technologies;
- proper handling of bulk construction materials during unloading and transportation;
- relocation of construction machinery not involved in continuous technological processes;
- monitoring of air pollution during construction and operation phases.

At the operational stage, abatement of air emissions from running vehicles will be achieved through the optimal speed regime and speed regulation.

#### 4.7 TRAFFIC NOISE AND VIBRATION

The recent assessment showed that the nearest residential areas suffer from noise, with infra-sound and vibration not exceeding critical levels. During the construction, noise levels in the nearest residential areas may exceed the applicable national standards if noise abatement measures will not be taken. Noise projections to 2025 (the year of maximal traffic intensity) demonstrate that, in the absence of protective measures, noise levels will considerably exceed the applicable national standards.

The Design includes the following mitigation measures in relation to noise impacts:

- anti-noise glazing of apartments which face the Motorway or off-ramps;
- installation of acoustic baffles on the main route;
- anti-noise planting of greenery on the sites adjoining the Motorway.

In addition, the following measures are planned during the construction:

- construction sites will be fenced with concrete fences near urban facilities;
- construction works will be prohibited from 11.00 p.m. till 07.00 a.m. near urban facilities;
- engine idling will be prohibited.

No special measures are specified by the Design to protect the nearest residential areas against infra-sound and vibration impacts.

A separate independent study analysed harmful physical impacts from the construction and operation of the new St. Petersburg ring road. Constructed in similar geologic conditions

and experiencing similar levels of traffic, the ring road does not cause critical levels of noise or vibration.

#### 4.8 *CULTURAL HERITAGE*

The assessment of historical and architectural value indicates that neither the Motorway nor the temporary construction facilities will disturb the protection zones of historical and cultural monuments. However, the following specific potentially significant adverse impacts to cultural heritage were identified:

- The construction of certain motorway phases may cause changes in groundwater table which may lead to the destruction of wooden piles of foundations of some buildings and theoretically of these buildings which are monuments of cultural heritage. This issue is planned to be addressed at the working project stage.
- Near Beloostrov community, the Motorway would run in the vicinity of archaeological evidences of the late Middle Ages.
- The most affected would be the Kiryanovo estate, the important historic monument, which is located in close proximity to Phase 2 of the Motorway. The Motorway is expected to increase noise impact on the monument and affect the building structure by vibration.

Although no archaeological evidences were found in the course of preliminary surveys, further discoveries cannot be excluded during construction phase.

The Design includes the following mitigation measures in relation to cultural impacts:

- carrying out additional comprehensive archaeological surveys near the Beloostrov community prior to the construction. Since it is highly likely that archaeological evidence can be found in the areas adjacent to the construction sites, a contractor is recommended to conduct construction strictly within allocated land boundaries.
- To ensure maximal distance between the Motorway and the Kiryanovo estate, constructing a two-level motorway section with installation of special acoustic baffles.

#### 4.9 *SOCIAL AND COMMUNITY IMPACTS*

The following potentially significant social and community impacts were identified:

- demolition of four apartment houses and one private house located. There were about 6,800 garages within the construction zone before the construction of Phase 1 and 2 has started. The land below the garages was provided for a temporary use, but the garages were built at the expense of their owners.

The amounts of compensation were established and compensation payments started. However, following the decision of regulatory authorities these compensations were suspended due to the absence of a federal procedure for such compensations. Management and compensatory measures are discussed in more detail in the relevant section below.

The following measures are proposed to ensure smooth operation of urban and rail infrastructure and support current quality of life standards in the vicinity of the Motorway:

- replacement of heat, electricity and gas pipelines, high pressure gas lines, water pipes, sewage systems, phone and other cables;

- rearrangement of high-voltage networks, contact railway and city transport nets, and a significant number of water courses, including the Ligovskiy Canal.

#### 4.10 ROAD SAFETY

Safe and easy traffic on the WHSD Motorway would be promoted through the following traffic management procedures:

- The Motorway will not be used by public transport.
- The Motorway will have the main road status with respect to all roads crossing or adjoining it.
- The number of crossings will be limited, and traffic flows will run through overhead crossings.
- In the event of changing weather, the traffic speed mode will be managed by special control signs.

To manage the traffic, the Motorway will be equipped with an automatic traffic control system which will ensure identification of potentially dangerous sections of the Motorway through the assessment of traffic level, road surface condition, meteorological forecasts, and an assessment of probable development of the current situation.

Automatic barriers and traffic lights with the light display “Accident” will be installed at the entrance of the tunnel. These technical means will be managed by the tunnel management station. Vertical dimensions of vehicles will be controlled using special sensors which will raise an alarm if a vehicle is more than 4.5 m in height. Data on excessive dimensions of vehicles will be transmitted to the ATCS.

Mitigation of accidents will be achieved through the following measures:

- prompt informing of emergency and medical care services;
- provision of access to the accident site;
- availability of barriers on the motorway edges and on the median strip;
- installation of information panels, traffic signs and markings;
- sweeping of the road bed in summer, removal of snow in winter and application of de-icing reagents during the cold seasons at regular intervals;
- availability of a barrier along the border of the Yuntolovsky Reserve to prevent entry of animals to the Motorway.

#### 4.11 DISRUPTION, HEALTH AND SAFETY

To comply with health and safety regulatory requirements adopted in Russia, the Design specifies the following principles:

- carrying out preparatory works involving the arrangement of accommodation for workers; the preparation of construction sites; the arrangement of auxiliary facilities and equipment to ensure safe construction and installation;
- division of works by process to ensure better application of selected technologies;
- making materials and assembling equipment on special sites with further installation in design places.

Sub-contractors will develop and approve safety instructions for every type of operations and make these instructions available to workers.

The Design provides for obligatory annual medical examination of workers involved in the construction. Medical examination of drivers will be performed on a daily basis.

No hazardous raw materials will be used in the course of construction works.

To manage the traffic in the tunnel being constructed under the Smolenka River, an automatic traffic control system will be installed.

An automatic fire alarm system and fire suppression system will be installed in the tunnel; fire-alarm signals will be transmitted to the control point on the round-the-clock basis.

#### **4.12 CONSISTENCY WITH POLICY AND PLANS**

Inasmuch as a Concessionaire has not been yet selected, policies and action plans have not been developed. These documents are expected to be developed by the Concessionaire in full compliance with the Russian legislation requirements.

#### **4.13 IMPLEMENTATION OF MANAGEMENT AND COMPENSATORY MEASURES**

General project management at the construction phase will be delegated to the selected Concessionaire. Therefore, detailed management programmes have only been developed for Phases 1 and 2. Those programmes include:

- obtaining all needed permits and approvals
- resolving all compensation issues with respect to the garages
- carrying out environmental, health and safety supervision
- reporting

In addition, a public consultation office for Phases 1 and 2 was established.

Since the existing federal legislation in Russia does not provide for adequate compensatory measures needed for this project, many compensation issues, particularly those related to the garages are settled through the regulations of the city administration or by court decisions.

For all phases, compensations for withdrawals of agricultural and forest lands, for damage to fisheries and for cutting of trees in the city areas within the project route are provided for. In addition, compensations for replacement of windows in the houses facing the proposed Motorway and for resettlement of residents are also envisaged. The selected Concessionaire will have to develop management programmes, including environmental, health and safety issues that will be discussed and agreed upon by the Supervisory Committee.

#### **4.14 MONITORING OF IMPACTS**

An Environmental Monitoring Plan was developed for all WHSD construction phases, in detail for Phase 1. The Plan provides for:

- monitoring of ambient air quality;

- monitoring of noise, vibration and infra-sound levels near the adjoining residential properties;
- monitoring of soil contamination caused by air emissions from vehicles and machinery;
- checking conformity with environmental regulatory requirements during the construction.

Both progress (quarterly) and final (annual) environmental monitoring reports over the period of 2007 through 2008 will be submitted to the WHSD.

Environmental Monitoring Programmes for the next phases of construction will be elaborated on the bases of similar approaches but in due account for specific operations in the Neva Bay water area.

Inspections of environmental performance of subcontractors' activities will be carried out in compliance with the requirements specified by the Russian environmental and sanitary legislation. WHSD will be notified on any non-compliance issues should they be found.

The following environmental aspects and parameters will be monitored at regular intervals during the Motorway operation:

- the content of lead, zinc, hydrocarbons, and oils in soil samples to be obtained along the Motorway adjacent areas;
- concentrations of oils in treated and not treated storm water;
- noise levels on the boundary of the nearest residential areas;
- the content of chlorides in snow and melted water.

A comprehensive monitoring programme will be developed prior to the Motorway commissioning.

#### *4.15 SOLICITATION OF FURTHER COMMENTS AND ADDRESS*

Further comments can be sent to the WHSD's office:

Joint Stock Company Western High Speed Diameter  
44 Nevski Pr,  
191186 St. Petersburg  
Russian Federation

## Figures

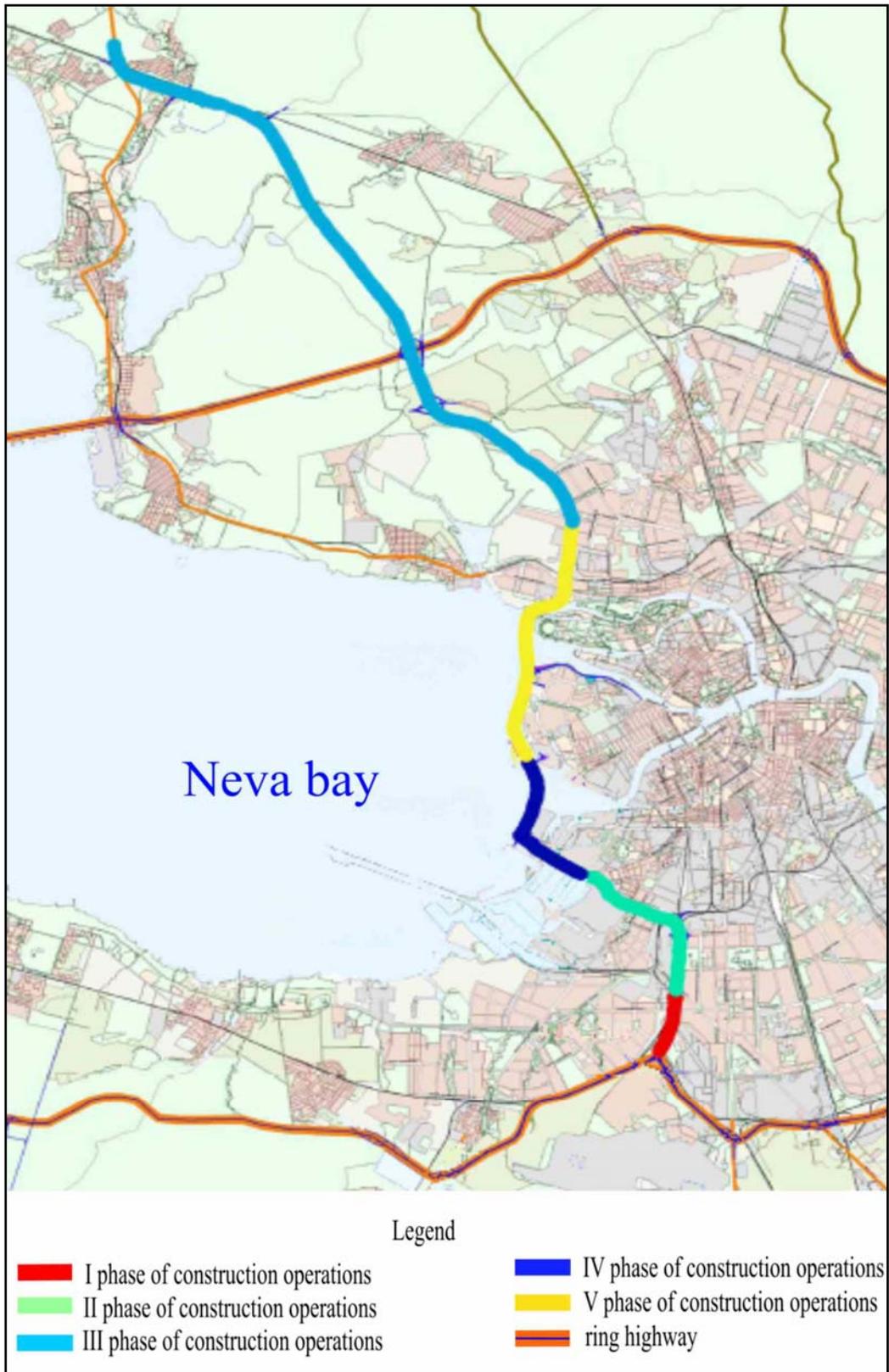
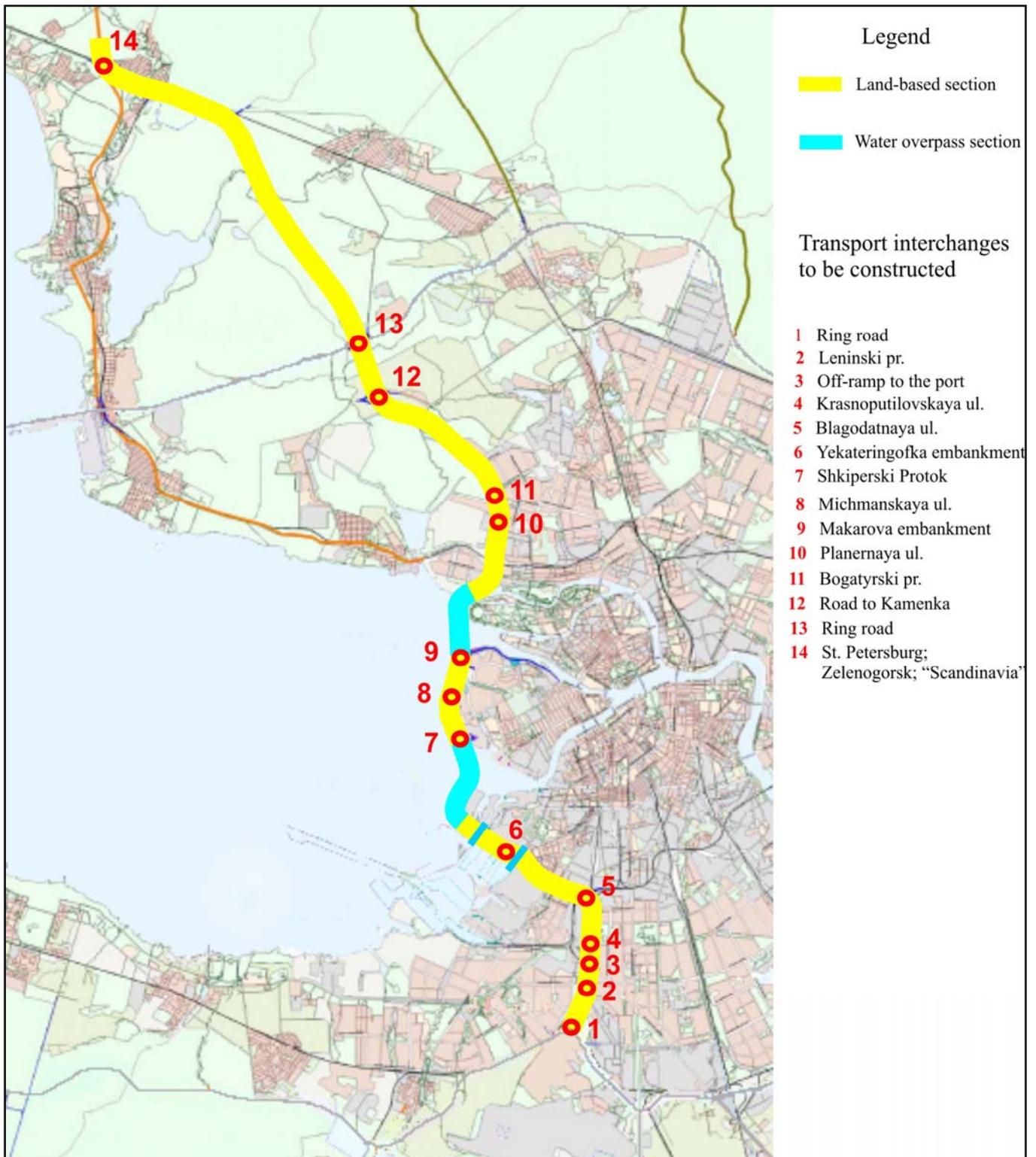


FIGURE 1. FINAL LAYOUT OF THE WHSD ROUTE



**FIGURE 2. MAIN TRANSPORT INTERCHANGES TO BE CONSTRUCTED UNDER THE WHSD PROJECT**

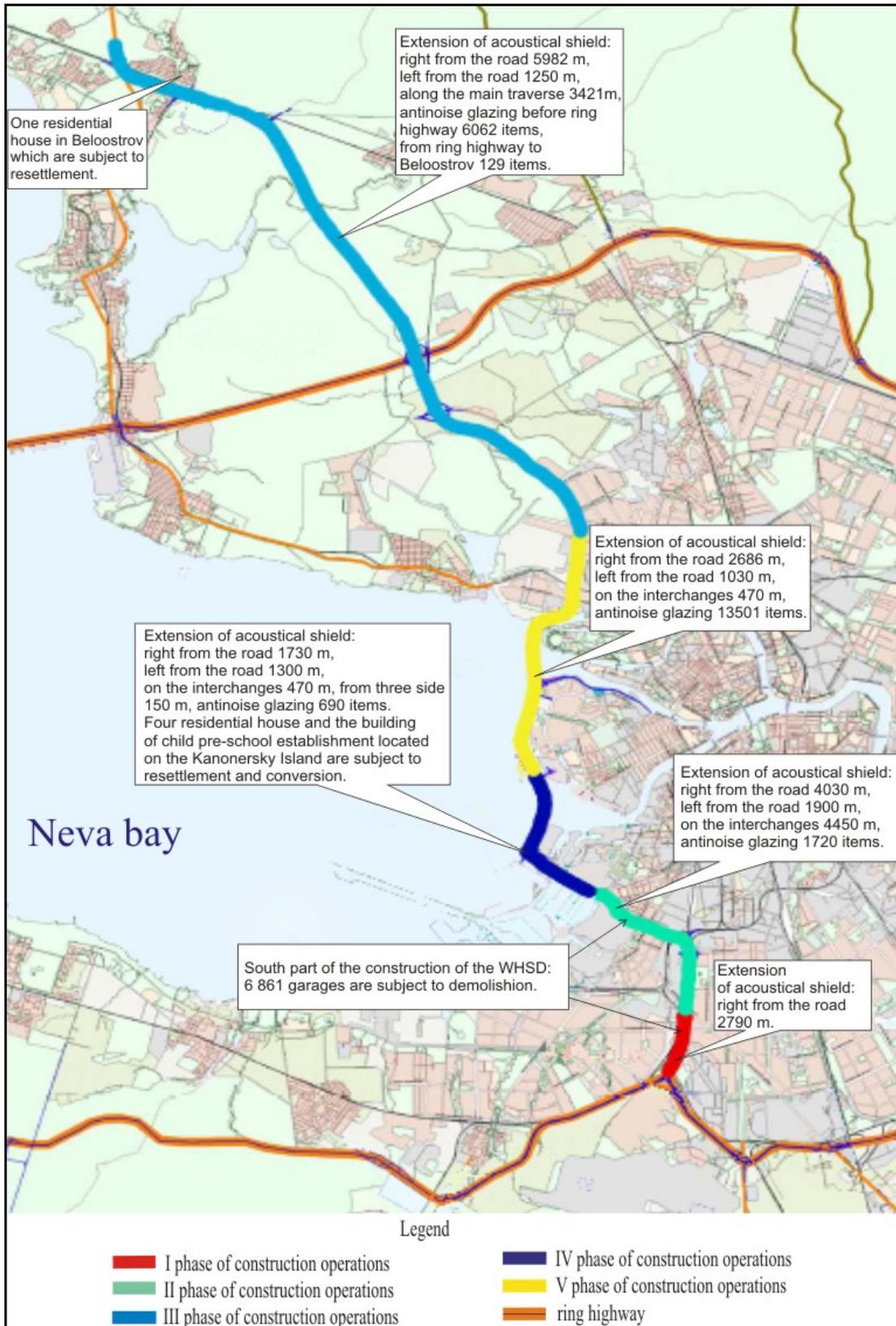


FIGURE 3. LAND USE LIMITATION AND ACTIVITIES PLANNED FOR REDUCTION OF THE IMPACT ON PEOPLE.