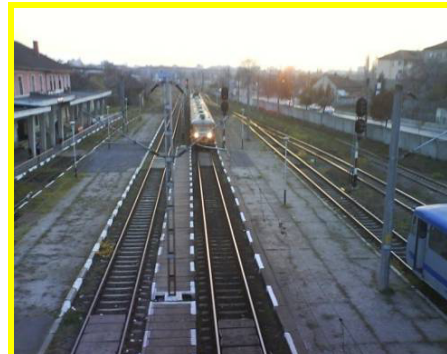
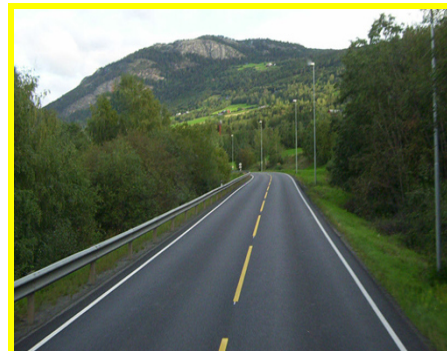


# General Transport Master Plan for Romania Environmental Report





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GUVERNUL ROMÂNIEI



Instrumente structurale  
2007-2013

Asistență tehnică pentru elaborarea unui  
Master Plan General de Transport  
CCI: 2007 RO 161 RO 003  
Cod Proiect: POST/2011/4/1/0



PROGRAMUL OPERATIONAL SECTORIAL TRANSPORT  
**TRANS**  
Mobilitate în România. Conexiuni cu Europa.

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Environmental report

Rev. nr.	Comments	Verified by	Approved by	Data
1	Draft version for the working group session	ID GS	MJB	29.04.2014
2	Revised according to the comments of the special constituted working group for the SEA procedure of the GTMP and according to the GTMP version available on 22.10.2014	ID GS	MJB	18.09.2014

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Activity no.: 60268467

Creation Date: April 2014

Ref: Strategic Environmental Assessment

Revision Date: October 2014

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## Glossary and Terminology

<b>M</b>	Motorway
<b>NEPA</b>	National Environmental Protection Agency
<b>RTCSC</b>	Road Technical and Computer Studies Center
<b>NRC/CFR</b>	National Railway Company, the entity responsible for managing and administering national railway infrastructure
<b>CLC</b>	Corine Land Cover
<b>NCMNR</b>	National Company of Motorways and National Roads in Romania, the entity responsible for the management and administration of national road infrastructure.
<b>CO</b>	Carbon Monoxide
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>DC</b>	Communal Road
<b>DJ</b>	County Road
<b>DN</b>	National Road
<b>DN/E</b>	National Road/European
<b>DRDP</b>	Regional Directorate of Roads and Bridges
<b>EA/AA</b>	Appropriate Assessment
<b>EEA</b>	European Environmental Agency
<b>EIA</b>	Environmental Impact Assessment
<b>ESM/SEA</b>	Strategic Environmental Assessment
<b>CF</b>	Cohesion Funds
<b>EFDR</b>	European Funds for Rural Development
<b>GES</b>	Greenhouse Gas Emission
<b>GIS</b>	Geographical Information System
<b>CF</b>	Railway
<b>GL</b>	Working Group
<b>GD</b>	Governmental Decision
<b>NIS</b>	National Institute of Statistics
<b>MECC</b>	Ministry of Environment and Climate Change
<b>NTM</b>	National Transport Model
<b>GTMP</b>	General Transport Master plan
<b>MT</b>	Ministry of Transport
<b>N<sub>2</sub>O</b>	Nitrogen dioxide
<b>NO<sub>x</sub></b>	Nitrogen oxides
<b>OUG</b>	Government Emergency Ordinance
<b>PM<sub>2,5</sub>/PM<sub>10</sub></b>	Particulate matter
<b>SOP-T</b>	Sectorial Operational Program Transport
<b>ER</b>	Environmental Report
<b>SCI:</b>	Site of Community Importance
<b>NWMS</b>	National Waste Management Strategy

<b>SPA</b>	Special Protection Area
<b>SO<sub>x</sub>:</b>	Sulphur oxides
<b>TEN-T</b>	Trans-European Transport Network
<b>TEU</b>	Equivalent Containers (20-foot equivalent)
<b>TDW</b>	Deadweight tonnes
<b>EU</b>	European Union

## 1. Introduction

The General Transport Master Plan (GTMP) is an integrated strategic document that will form the base of investment planning for the transport sector for the period 2014 to 2030 and represents a binding document without which Romania will not be able to access structural funds for the transport sector during 2014-2020 financing period.

GTMP is the document that sets out the priorities for investment in the TEN-T core and global network and secondary connectivity, expected to be completed through ERDF and CF financial instruments.

GTMP contributes to the development of the Single European Transport Area in accordance with Article 10 of Regulation (EU) No.1315 / 2013 of the European Parliament and Council.

The Strategic Environmental Assessment is a tool used consistently at the highest decision-making level that facilitates the integration of environmental considerations before making the final decision about the promotion of a plan, program or project development. Thus sustainable decisions are made, which minimize the negative environmental impacts, and specific measures to improve the effects are identified and a framework for the subsequent evaluation of projects in terms of environmental protection is established.

As stipulated by Strategic Environmental Assessment Directive (SEA) 2001/42 / EC on the evaluation of environmental effects of certain plans and programs, transposed into Romanian legislation by GD 1076/2004, all plans and programs which are prepared for a number of sectors and which set the framework for future approval processes of projects listed in Annexes I and II to Directive 85/337 / EEC of 27 June 1985 on the assessment of certain public and private projects on the environment (1), and all plans and programs which have been determined to require assessment under Directive 92/43 / EEC of 21 May 1992 on the conservation of natural habitats and wild fauna and flora (2), can have significant effects on the environment and must usually be subject to environmental assessment.

In accordance with decision no. 145790 / 23.10.2012 issued by Ministry of Environment and Climate Change - Impact Assessment and Pollution Control Department, the GTMP is subject to the environmental assessment process, in accordance with the GD 1076/2004 *on establishing the procedure for environmental assessment for plans and programs or appropriate assessment procedure*.

The methodology for Strategic Environmental Assessment of GTMP is presented in Annex 1.

The herein Environmental Report is elaborated by AECOM Ingineria, a company registered in the National Register of Environmental Studies Developers, according to Order no. 1026/2009 for developing environmental reports, environmental impact reports, environmental balance, reports of site evaluation and reports for security, at position 567.

The level of details included in the Environmental Report for the General Transport Master Plan and the assessment of GTMP significant effects were established within the „working group” (the working group structure is presented in Annex 1). SEA Directive states that the environmental report and the opinions expressed by the concerned authorities and the public should be taken into account during the preparation of the plan or program and before its adoption or submission to the legislative procedure.

The contents of the Environmental Report are provided in Annex 2 of GD 1076/2004 *establishing the procedure for environmental assessment for plans and programs and the appropriate assessment procedure*.

GTMP Appropriate Assessment was carried out by EPC Environmental Consulting and AECOM Ingineria and complies with the requirements of Order No. 19/2010 approving the Methodological Guide for the proper assessment of the potential effects of plans or projects on protected natural areas of interest. EPC Environmental Consulting is listed in the N National Register of Environmental Studies Developers, according to Order no. 1026/2009, for the



preparation of environmental reports, environmental impact reports, environmental balances, site reports, appropriate assessment studies and security reports, at position 209.

The Conclusions of the Appropriate Assessment Study, after approval by the MMSC (by address nr.16724 / AJ / 10.21.2014), were integrated into the present Environmental Report.

## 2. General Presentation of the Transport Master Plan

### 2.1. Current situation of transport in Romania

Romania plays a very important role in transport filed in that it holds a key position at the Eastern border of the European Union, being a transit area both on the East-West route (connection with Asia through the Black Sea) and the North-South route (Baltic Sea, the Mediterranean Sea).

The following two transport systems exist in Romania: freight and passenger. These transport systems include the following transport sectors:

- Road
- Rail
- Air
- Water (maritime and river)
- Intermodal

The following sub-chapter gives information on the current state of transport infrastructure and trends in the transport sector.

#### 2.1.1. Road sector

The road transport is the most important transport sector for passengers, as well as for the freight.

Romania's road network is classified in five categories (see. Table no 2.1):

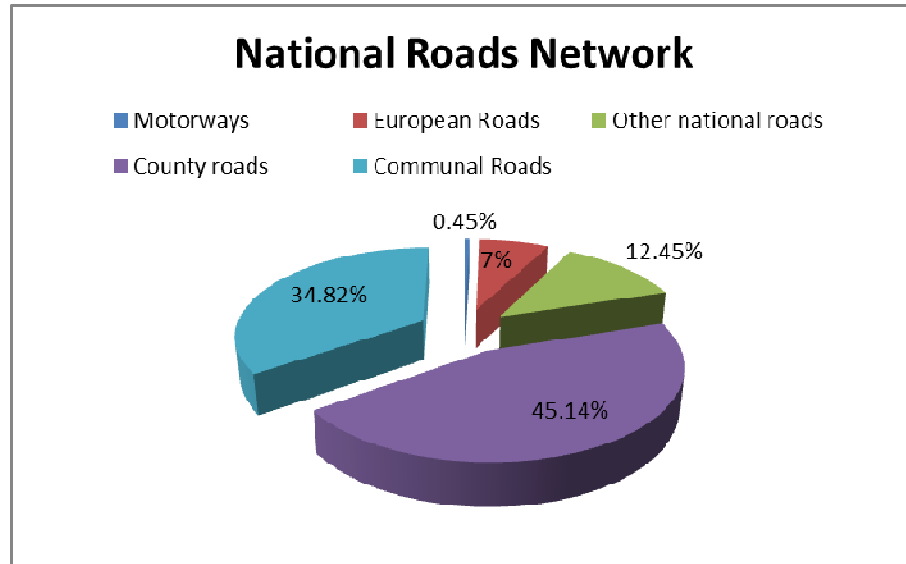
- Motorways - A;
- National and European roads – DN/E;
- National roads – DN;
- County roads – DJ; and
- Communal Roads – DC.

Motorways and national roads represent approximate 20 % of the national road network.

**Table 2.1 Length of the national roads (2011)**

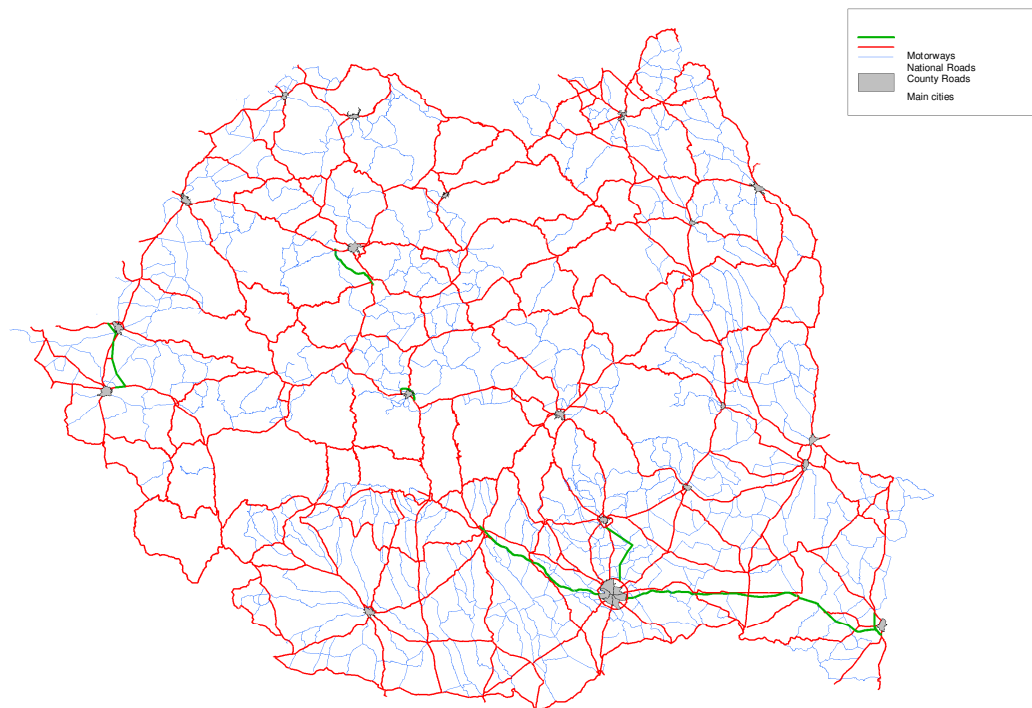
Road type	Kilometers	Proportion
Motorways	362,6	0,45%
National and European roads	5.697,7	7,14%
Other national roads	9.930,9	12,45%
County roads	36.009,8	45,14%
Communal roads	27.780,8	34,82%
Total	79.781,7	100 %

*Reference: DRDP*



**Figure 2.1 Road types percentage within the national network (2011)**

The National Company of Motorways and National Roads in Romania SA is the body responsible with the administration, operation, maintenance and development of the national roads and motorways in Romania.



**Figure 2.2 Map of Romania's road network**

The roads quality may be influenced by the type of constituent materials and the type of topography through which road segments pass. The proportion of the road network which is

considered of good, medium, and low quality, depending on type of the component layer, is shown in Table 2.2<sup>1</sup>. This information is available only for national roads.

**Table 2.2 National road network – Roads quality depending on component layer (2012)**

Quality	Asphalt	Concrete	Paved	Light bituminous coverage	Stone	Dirt road	Total
Good	49,4%	2,3%	0,1%	1,0%	0,1%	0,0%	<b>52,9%</b>
Medium	25,8%	2,2%	0,1%	2,3%	0,4%	0,0%	<b>30,8%</b>
Low	10,5%	1,8%	0,1%	2,7%	1,1%	0,1%	<b>16,3%</b>
Total	<b>85,7%</b>	<b>6,3%</b>	<b>0,2%</b>	<b>6,0%</b>	<b>1,6%</b>	<b>0,1%</b>	<b>100,0%</b>

Reference: CESTRIN

At the level of 2011<sup>2</sup>, in Romania, a bit more than 50 % from the total national network is classified as being of good quality in terms of the road surface, 30 % are roads of medium quality and about 20 % of low quality.

The Global Competitiveness Report (2011-2012)<sup>3</sup> of the World Economic Forum places Romania 137 out of 142 countries in terms of road infrastructure quality. Still, it must be noted that the reference is made on the entire road network and it is based on the interviewed people's opinion rather than on data.

The road transport is the most common and used way of transport in Romania (57% of the market in terms of tonnage and 48% in terms of tonnage kilometer in 2010). The long distance transport is generally done with vehicles that have a total admissible mass of 40 tons, while more deliveries at the national level are made with heavy trucks and vans. There are over 12,000 operators owning only one vehicle and only 60 transport operators owning more than 100 heavy goods vehicles.

The internal goods transport market owns 94% of the tones of loaded goods, of which 1% is cabotage.

The major share of passenger traffic is owned by car and bus transport. Modal distribution of the number of passengers in cars and buses (excluding journeys that take place entirely in urban areas)<sup>4</sup> was (in 2012)<sup>5</sup>:

- Passengers - km cars: 64.5%
- Passengers - km buses: 22.5%
- Passengers - km trains: 13%

The main deficiencies in the passenger road system are as follows:

- Poor quality of road infrastructure which causes the following effects:
  - Increasing the wear of vehicles and maintenance costs;
  - Increasing fuel and hence increasing emissions of pollutants into the atmosphere, with effects on human health and the environment;
  - An increased risk of accidents - due to the direct impact of poor quality roads (e.g. Potholes) or due to collisions when drivers try to avoid problem areas through dangerous and unexpected maneuvers;
  - Increasing noise levels for residents close to the road, because of hard surfaces.

<sup>1</sup> Information from Road and Computer Technical Studies Center (CESTRIN)

<sup>2</sup> Reference year for the analysis

<sup>3</sup> Global Competitiveness Report 2011-2012 © 2011 World Economic Forum

<sup>4</sup> Report problem definer - General Transportation Master Plan, 2013

<sup>5</sup> National Transport Model

- Reducing transit capacity (no. of cars, vehicles etc.) compared to an optimal level or designed level per unit of time by the impossibility of traffic flow optimization.
- Reduced number of motorways - approximately 0.45% of the total national road network length<sup>6</sup>;
- The high incidence of accidents, especially those with casualties - Romania faces a significant problem in terms of number of road accidents as shown in the comparative statistics of the EU;
- Reduced number of car owners compared to the rest of Europe;
- High travel times from one point to another - with significant negative economic impact by reducing opportunities for personal or business travel.
- Inadequate standards for roads on certain major routes - Approximately 90% of the national network are single lane roads. Current national network has a small number of roads considered to be at high standards compared to the rest of the EU.

The main deficiencies of the freight road system are:

- No logistics and storage conditions, leading to inefficient use of heavy freight vehicles;
- Poor quality of road infrastructure;
- The low number of motorways, lack of bypasses for towns and the mountainous area in some regions of Romania lead to low average speed, so that decreased travel times are registered;
- There is no national network of facilities for drivers' rest.

### 2.1.2. Railway sector

Railway infrastructure in Romania is managed by CFR SA in the name of the Ministry of Transport (MT), management delegated through a 49 year concession contract, starting in 1998. The total length of the railway is 10,818 km (see Figure 2.3). In Table 2.4 are presented some statistics related to railway network in Romania.

**Table 2.3 National railway infrastructure statistics**

<b>Length of the railway</b>	10,818 km	<b>Number of railway level crossings (including automated)</b>	5,119 (1,082)
<b>Double line</b>	2,909 (27%)	<b>Number of pins / switches</b>	20,868
<b>Simple line</b>	7,771 (72%)	<b>Infrastructure for guidance of trains (signaling):</b>	28
<b>Electrified line (suspended line 25 Kv)</b>	4,002 (37%)	<b>CE Systems</b>	618
<b>Non electrified liner</b>	6,816 (63%)	<b>CED Systems Non centralization plants</b>	354
<b>Stations</b>	965	<b>BLA pants: Number of plants</b>	577
<b>Tunnels</b>	177		
<b>Tunnels length</b>	6,809		

<sup>6</sup> Reference year 2011



<b>Bridges number</b>	4,216		
<b>Little bridges number</b>	13,961		
<b>Length of the railway</b>	10.818 km		

*Reference: CFR SA, CFR railway network declaration*

A significant percentage (72%) of the network is made up of a single line - EU27 average is 59%. The network is electrified at a rate of 37%, compared to an average of 52% EU27.

Just over 25% of the network is classified as "non-interoperable", managed by a single rail operator, thus increasing the opportunity for that line to be rented by CFR SA to the private sector which can take over the responsibility of dealing with infrastructure maintenance of the line in question. According to the latest information received from MT<sup>7</sup> the non-interoperable railway network length reaches a total of 2950 km. There are 88 stations located on rented non-interoperable railway infrastructure.

Around 40% of the network is electrified and about 60% is not electrified. The passenger railway services are operated by state-owned company CFR Calatori (CFR Passengers). There was an increase in the activity of the private passenger transport train operators, especially on the lines that are now called "non-interoperable".

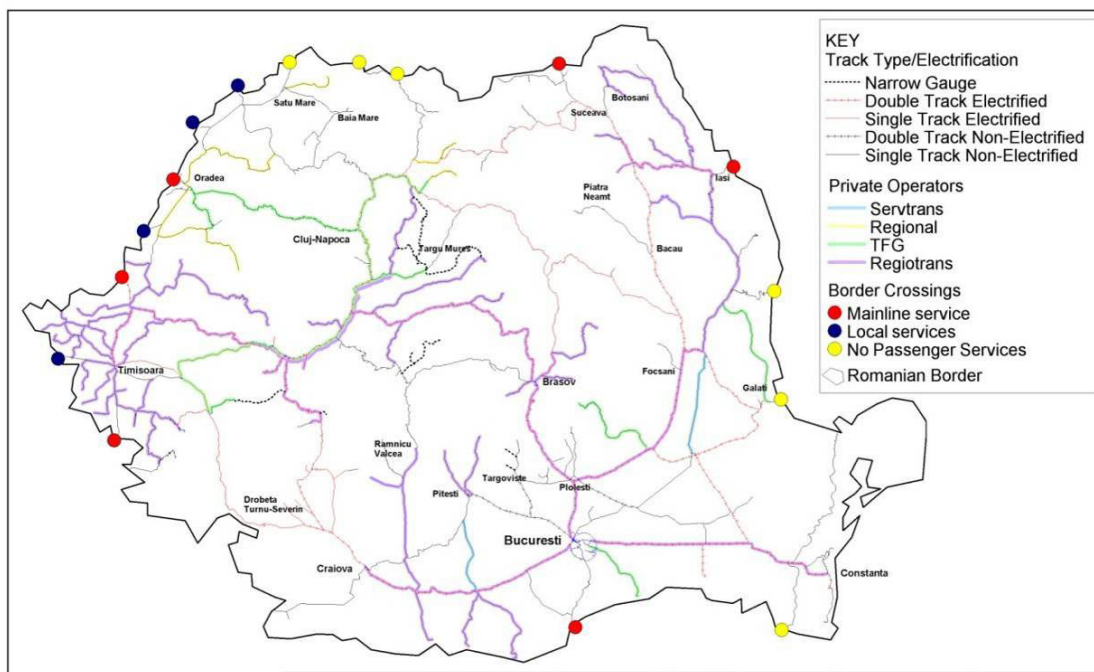
All passenger services are divided into three categories according to the type of service, which are: *Intercity*, *InterRegio* and *Regio*. This services classification is based on distance and number of stops. Also, these types of services are distinguished by the types of rolling stock material used (railway wagons and locomotives).

Currently, in Romania, there are a total of 2,950 km of non - interoperable railway lines (about 25% of the total network). These are lines with low traffic volume, for local traffic and leased to a private operator who has exclusive rights to operate on that line. Line maintenance will also become the responsibility of the operator concerned. CFR SA establishes through an open tender procedure what line will private operators circulate on.

Currently there are four private passenger railway operators in Romania, covering about 15% of rail passengers - mostly rural lines with low traffic.

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<sup>7</sup> Listing interoperable lines according to the Decision no. 643/2011 of 26 May 2012



**Figure 2.3 The railway network in Romania**

Private railway passenger transport operators have only started their activity in 2005. Private operators of railway freight provide about 40% of rail freight transport, expressed as carried freight. CFR Marfa, the railway freight transport state operator has about 60% of the rail freight transport market in Romania.

Railway freight transport has a relatively high market share compared to other EU Member States. Railway transport market share was 19% in 2011; however, the tonnage transported on Romania's railway network is decreasing. This is partly due to the economic downturn and the fact that many important traditional industries in Romania have experienced a period of decline, which contributed to a decrease in transport volume.

The large number of private railway freight transport operators offers a wide range of services to the customers, leading to increased competitiveness.

The railway infrastructure that required rehabilitation works is presented in Table 2.4. On certain routes, the railway lines' state of wear has determined speed limit restrictions. By 2011 maintenance works were performed on a total of 900 km.

**Table 2.4 Rehabilitated railway infrastructures**

Railway component	Percentage of the railway infrastructure that required rehabilitation works (year)		
	2001	2005	2012
Railway	30%	35%	55%
Bridges	73%	64%	44%
Culverts		78%	40%
Embankments	-	-	15%
Tunnels	-	-	60%
Electrical wires and rail track	66%	93%	74%
Traction substations	86%	92%	73%

Railway component	Percentage of the railway infrastructure that required rehabilitation works (year)		
	2001	2005	2012
Equipment for changing the switch	-	78%	83%

Main deficiencies of the passenger railway system:

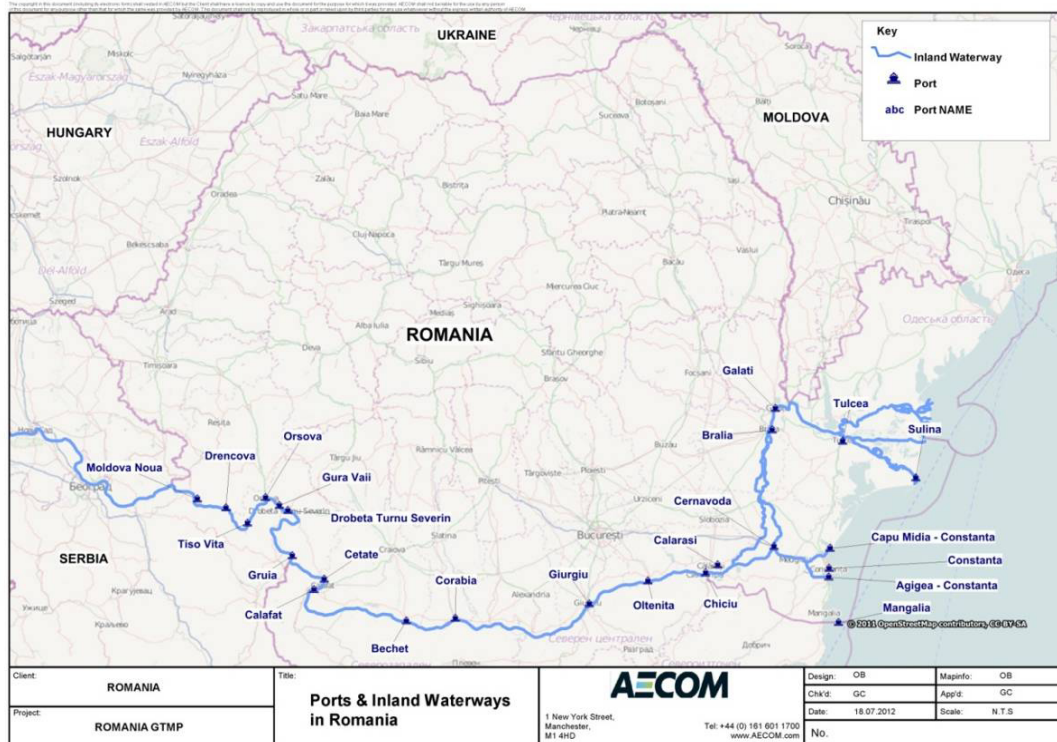
- High and non-competitive travel durations, speed restrictions on some routes;
- Old rolling stock (much of the rolling stock is over 30 years old);
- Use of rolling stock pulled by locomotives (provides less operating flexibility and is more costly to operate);
- For rail services to Moldova / Ukraine the track gauge must be changed at the border (according to Russian gauge - 5 ft and 1520 mm);
- Low investment in railway infrastructure compared to road infrastructure;
- The general trend for passenger transport is a steady decline of the number of passengers using railway, since 2007 being recorded a 39% reduction in the number of passenger-km;
- Low investment in upgrading facilities and services for passengers;
- High consumption of resources (energy, fuel) generated by the restriction of the default speed and high travel times.

Main deficiencies in railway freight transport system:

- In the last five years there has been a negative trend in terms of tonnage of railway freight transport in Romania;
- The maximum speed for freight trains of 80km/h is less than in many other EU countries;
- Limit of 20 tones maximum permissible mass per axle is lower than in many other EU countries, which means that the useful capacity/wagon is lower;
- There are several dangerous sectors on the transport routes which require speed restrictions.

### **2.1.3. Maritime Sector (bridges and inland waterways)**

The following figure shows the network of ports and inland waterways across Romania.



**Figure 2.4 Ports and inland waterways network in Romania**

(Reference: AECOM map - MT)

The Danube River ranks as the second longest river in Europe and covers a distance of 1075 km in Romania.

A 9% of the total freight in Romania is transported on the Danube (Source: NIS, in terms of tons of freight transported in 2011). According to the United Nations classification, the Danube River is a class VII river. Romania is responsible for the maintenance of the following sections of the Danube: Sector from km 375 to the mouth of the Black Sea and from km 610 to the border with Serbia. The sector between km 375 and km 610 km is managed and maintained by Bulgaria. One of the major waterways of the Danube is the Danube - Black Sea Channel, linking the river with the largest seaport in Romania - Constanta Port.

Maritime and river infrastructure is managed by the following organizations:

- Danube River: managed by AFDJ (Galati and Giurgiu);
- The Danube Channel - Black Sea: managed by ANC (Administration of Navigable Canals);
- Seaport of Constanta: Managed by Maritime Ports Administration Constanta;
- Other Seaports: managed by one of the institutions: AFDJ Giurgiu, APDM Galati and local municipal authorities.

Constanta Port is the main seaport in Romania located in the East side of the country, at the Black Sea. Being geographically close to the Danube River and connected to the Danube - Black Sea Channel, the port can operate both as a seaport and as a river port. It is also a transshipment point between river and sea ships. Constanta Port has terminals that are used for operate various goods such as: ore, coal, crude oil, petroleum products, grain, chemicals, metals, container, mixed cargo, dry bulk and liquid fertilizer.

Also, Romania has two satellite ports: Port of Midia, located at 25 km North of Constanta and Mangalia port, located at 38 km South of Constanta. Midia is used mainly for petrochemicals transactions/transport, but other type of cargo also can be handled through this port (e.g. animals).

Mangalia port is dedicated to smaller ships up to 10,000 dwt. This port handles about 250,000 tons per year of mixed cargo. This port has a warehouse of bitumen and a sizeable shipyard.

Galati Port is another major port, located on the Danube, where numerous seagoing vessels are operated directly. This port operates approximately 5.1 million tons per year (in 2011), serving as a transshipment port for barges on coaster, for goods to be transported to other Black Sea ports, mainly to Ukraine and Russia. Galati Port is the only one in Romania which has European and Russian gauge, so that the transport of goods in these areas is more flexible.

Danube - Black Sea Channel was built to form a shorter link between the Black Sea and the Danube River, bypassing the Danube Delta, which is hard to sail. The channel splits, with one branch towards south, to the port of Constanta from Agigea and a northern branch reaching the Black Sea in the port of Midia. On this channel are transported mainly agricultural products, ores, scrap metal and solid fuels. These three categories account for about 85% of the tonnage of goods transported on the Danube - Black Sea.

Since 2007, the volume of goods transported externally steadily increased from year to year. Internal traffic halved in 2009, then rose in 2010, reaching a value of only 70% of the annual average tonnage registered before 2009.

It should be noted that in 2010 in the port of Constanta were transported 10,600 tons of cargo by river. A volume of 12,200 tons was operated on the Danube - Black Sea. In conclusion, it appears that 87% of goods transported on the Danube - Black Sea Canal have transited the port of Constanta. Most likely, the remaining 13% was transported by canal route, to or from Medgidia and Murfatlar, both cities with river ports.

In Romania there are many river ports, most of them being located on the Danube River. On the Danube there are a total of 30 river ports, of which about 10 currently are used for freight transport. The list of river ports:

- Moldova Nouă
- Drencova
- Tisovița
- Orșova
- Drobeta-Turnu Severin
- Gruia
- Cetate
- Calafat
- Bechet
- Corabia
- Turnu Măgurele
- Zimnicea
- Giurgiu
- Oltenița
- Călărași
- Cernavodă
- Medgidia
- Basarabi
- Harșova
- Turcoaia
- Măcin
- Gura Arman
- Brăila



- Galați
- Isaccea
- Tulcea
- Mahmudia
- Chilia Veche
- Moldova Veche
- Chiciu

In 2011, approximately 8,000 tons of goods were transported on the Danube, to and from the river ports of Romania. In Bechet Port, Calarasi Port, Drencova Port, Gruia Port, Gura Valley Port, Moldova Noua Port and Tisovita Port, in the last years no significant quantities of goods have been operated.

With more than 15 ports, the Danube River corridor is included in the TEN-T VII corridor of the EU the river ports being: Calafat, Cernavoda, Giurgiu, Braila, Galati, Drobeta Turnu Severin Oltenia, Calarasi, Tulcea Sulina, Moldova Veche and Medgidia.

In 2011, a total of 29.4 million tons of cargo were transported on the Danube River.

Some sectors of the Danube, especially Zimnicea sector, may be affected by the presence of quicksand. The busiest sections of the waterways network in Romania are Danube - Black Sea navigation channel and the connections of the channel with the ports: Galati and Braila.

The Danube River is considered by UN as an international waterway, whose minimum depth should be 2.5 m, although it is preferred to have a depth of 2.8 m. The Danube River has seven sectors where the water regularly falls below 2.5 m, making navigation impossible in the lower watercourse for 38 days in September and October of 2011.

The Operators need to be ensured that the water depth is 2.5 m, because otherwise they cannot transport freight. In 2013, works have been implemented to achieve this goal through intensive dredging (Calarasi-Braila section). Maintaining a favorable depth means a lower annual cost. Romania currently spends 4 million annually for dredging of channels.

Between Romania and Bulgaria there are two bridges over the Danube (Calafat-Vidin and Giurgiu).

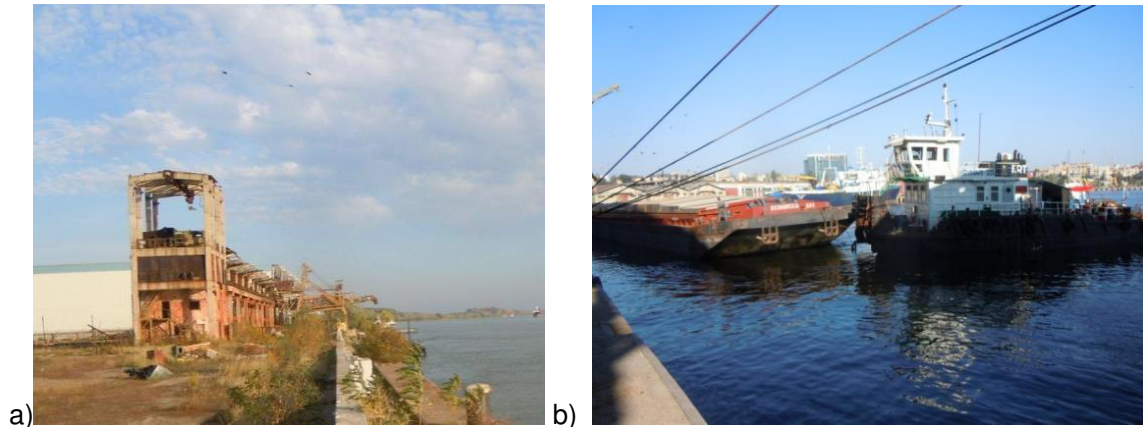
The main deficiencies of the maritime transport are:

- Part of Constanta Port infrastructure is old. Also Constanta Port development is threatened, because of restriction on the volume of cargo transported through the Bosphorus Strait imposed by managing the number of ships and their size;
- Given that the only deep sea port in Romania is the Constanta, problems related to national security and strategic supply networks may occur.

The main deficiencies of the river transport are:

- Lack of reliability and navigability: Fairway disadvantages in terms of reliability both in terms of breadth and its depth. There are two sections with such problems. The first is between km 345 and km 292, the Romanian section, having eight navigation problems highlighted. The second is between km 576 and km 528, the Bulgarian section, with seven navigation problems highlighted. At certain times of the year navigation on the Danube is difficult (either because low water level or due to occurrence of ice).
- Low multimodal connectivity: In many ports road and rail infrastructure is old, poorly maintained and in many cases, not large enough for the needs of the modern trucks of 40 tons or for operate trains with a length of 750 meters. Twelve of Danube ports in Romania do not yet have connections to the rail network.
- Increased Administrative costs for operating large barges.
- Obligation for the decomposition of the convoys - is necessary to improve navigability on the Danube, to avoid decomposition convoys.

- Old infrastructure leads to inefficiency of ports, leading in turn to an increase in costs.
- There are no appropriate links between major producers of goods, resulting in loss of opportunities that arise in this field.
- A serial of port does not operate significant volumes of goods and equipment, and needs upgrading in this respect. 10 ports, including Bechet, Calarasi, Drencova, Gruia, Gura Valley, Moldova Noua and Tisovita does not operate significant volumes of cargo.
- Lack of modern port infrastructure, such as the existence of abandoned piers, old cranes, conveyors outdated or no special equipment for bulk lead to slow loading and unloading operations.
- Many motorized pushers and barges are quite old (30-40 years).



**Figure 2.5 a) Old infrastructure including cranes and transporters from the port of Galati;**

**b) The image is showing a tug pushing a barge in Constanta**

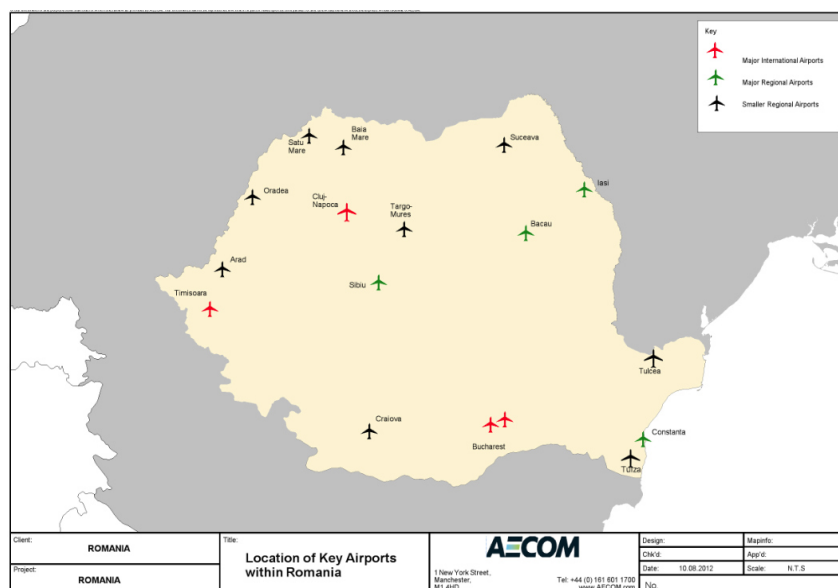
*(Reference: Report on identifying problems, AECOM, 2014)*

#### **2.1.4. Air sector**

In Romania there are airports in the towns of Bucharest, Constanta, Iasi, Bacau, Sibiu, Timisoara, Cluj Napoca, Arad, Oradea, Satu Mare, Baia Mare, Targu Mures, Craiova, Tulcea, Tuzla, Suceava. Of these, 13 have regular flight operations.

The main airport in Romania is Henri Coanda International Airport. In 2011, a total of 1.1 million people have used the services of airports in Romania (domestic flights).

Although Bucharest Aurel Vlaicu Airport is currently closed to commercial air traffic, it continues to operate private flights carried on by business means.



**Figure 2.6 Aviation sector infrastructure (Reference: AECOM)**

On the map above, red represents the main international airports, regional airports are green is large and black represents the smaller regional ones. This division is made according to the connections that each airport has and the number of people using the services provided by each of them in a year.

In Romania, there are eight air operators of which one state owned company - TAROM (the work being carried under the name: Romanian Air Transport, **TAROM**). **TAROM** is the airline with the greatest years of experience in Romania, being led to 95% by the Ministry of Transport. TAROM operates flights to 54 destinations in 26 countries (Europe, Middle East and North Africa) and flights to 12 national destinations.

**Table 2.5 Air companies in Romania**

Operator	Dimension of the air fleet	Location
TAROM <sup>8</sup>	23	Bucharest
Romavia <sup>9</sup>	2	Bucharest
Carpatair	13	Timisoara
Blue Air	9 (5 if needed)	Bucharest
Jetran Air	7	Bucharest
Tiriac Air <sup>10</sup>	5	Bucharest
Alfa Air Services <sup>11</sup>	3	Bucharest
Bucharest Air	1	Bucharest

Ref: Documents of AECOM

<sup>8</sup> State operator, Ministry of Transport

<sup>9</sup> State Operator, Ministry of Defence

<sup>10</sup> Private Air Company, VIP/cruise charter

There are also operators based outside the country, which have frequent flights to Romania.

**Table 2.6 Regional and international airports in Romania**

Item	Airport	Operator	Observations
International Airports	Henri Coandă International Airport	National Airports Company Bucharest SA	In 2010, have been recorded a total of 71,000 trips, carrying 4.8 million passengers, having an average of 1,374 flights per week; TAROM Cargo, DHL Aviation, TNT Airways and UPS Airlines (operated by Farnair Switzerland) are the major airlines dealing with freight transport outside the airport; In 2010, has operated over 21,000 tons of cargo.
	Aurel Vlaicu International Airport	National Airports Company Bucharest SA	Currently closed (in 2012) for commercial traffic, but operates flying business. Commercial flights were transferred to Henri Coanda International Airport.
	Timișoara International Airport	Municipal Authority Timisoara	Route 31: 7 domestic, 24 international; 206 weekly flights, 77 domestic, international 129; and 1.1 million passengers and 1,500 tons of cargo processed in 2010
	Cluj-Napoca International Airport	Cluj County Council	Route 31: 7 domestic, 24 international; 88 weekly flights, 28 domestic, 60 international 1 million passengers and 400 tons of cargo processed in 2010.
Regional Airports	Sibiu International Airport	Sibiu County Council	5 routes: one internal, 4 international 10 flights per week, five international 156,000 passengers in 2010.
	Constanța International Airport	Constanța SA	5 routes: one internal, 4 international 10 flights per week, 5 international 156,000 passengers in 2010.
	Iași International Airport	Iași County Council	Four routes: two internal, 2 international; 47 weekly flights, 38 domestic, 9 international; 164,000 passengers in 2010.
	Bacău International Airport	Blue Aero	10 routes: one internal, 9 international; 40 flights per week, five domestic international 35; 239,000 passengers in 2010.
	Târgu Mureș International Airport	Mureș County Council	9 routes, one internal, 8 international; 24 flights per week, three domestic international 21; 75,000 passengers in 2010.
	Oradea Airport	Oradea County Council	One domestic route; 12 weekly internal flights 40,000 passengers in 2010.
	Arad Airport	Arad County Council	One domestic route; 10 weekly internal flights 22,000 passengers in 2010.
	Satu Mare Airport	Satu Mare County Council	One domestic route; 7 weekly internal flights 19,000 passengers in 2010.

The airports in Suceava, Bacau and Iasi have planned improvement programs because some runways are too short for the modern airplanes to run on them. The terminal infrastructure in some airports is also old, having a reduced capacity to accommodate passengers compared to modern airports.

Construction of a new airport planned for Brasov (Brasov - Ghimbav) was recently postponed for unknown reasons.

The local airports are:

- Baia Mare Airport;
- Craiova Airport;
- Suceava Airport;
- Delta Dunării Airport;
- Măgura Airport;
- Gheorghe Valentin Airport;
- Tuzla Airport.

Heliports:

- Braşov (Ghimbav şi Cobrex); and
- Ploieşti (Aero Taxi).

With regard to international travel, the most popular routes are to Italy, Spain and Germany. The Airlines cooperates with several airports in these countries and elsewhere in Western Europe. In addition, longer paid trips are to Egypt, UAE - United Arab Emirates and Israel.

Except for flights to Hungary, the number of international air travels to neighboring countries such as Ukraine, Moldova, Bulgaria and Serbia, is relatively low.

In terms of air cargo in 2011 it is stated that have carried more than 28,000 tons of cargo, of which 76% of the city of Bucharest.

The main air sector deficiencies are:

- Infrastructure of the airports in Romania is old, in the last 20 years has never been built any other airport, investments were made only in terms of modernization of airports;
- Some regional airports do not provide consistent services;
- There is only one terminal for goods (in Bucharest), freight transport sector is underdeveloped;
- Romania's population does not perform frequent travel by plane nationally because of the few links that limit the power of the current internal transport market and due to the high costs.
- There are few airports that provide fast and quality public transport to population centers;
- There are limitations in terms of passenger flights of long duration.
- There is a mismatch between market requirements and buy power and ticket cost for the intern flights.

### **2.1.5. Intermodal freight transport**

Intermodal freight transport is the process by which goods are moved in containers through at least two modes of transport used successively without intermodal transport unit to change when changing the modality of transport.

What differentiates the multimodal transport and the intermodal transport is the cargo unit which in case of the intermodal transport remains the same throughout the transport route. For the multimodal transport is used more than one vehicle with continued route transport.

For the freight transport, the modal distribution is<sup>12</sup>:

- Goods tons - km roads 53.3%
- Goods tons - km railway 24.2%
- Goods tons - km waterways 22.5%

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<sup>12</sup> National institute of Statistic



Constanta is currently the largest seaport in the Black Sea and is strategically located at the mouth of the Danube Canal which sent goods to Central and Eastern Europe. Container trade illustrates the effect it has recession and possible competitors. In 2007, throughout Constanta port, were handled 1.41m TEU (twenty foot equivalent units) before the recession affecting the economy, thus causing a decrease in the volume of freight operated, at less than half in 2010 to 557.000 TEU, reaching in 2011 to 663,000, with a slight improvement of this decreasing trend, which means only 47% of the total recorded in 2007.

The port has 55 ITV sites (Internal transfer vehicles / vehicles internal transfer) for moving containers in the terminal area. The Port operation period is 364 days a year, 24 hours a day, in two shifts of 12 hours each, but like most ports has also busy periods throughout the day / week.

The use of intermodal freight transport reached its maximum in 2007, when 912,509 containers (1.41m TEU) were operated throughout the Port of Constanta

Constanta is the place of departure and the destination for about 80% of intermodal rail transport in Romania. Existing information shows that in 2011 throughout the port of Constanta were transported, in containers, 6.5m tones.

*The main deficiencies for intermodal transport are as follows:*

- Rail terminals and old equipment - most of the internal rail terminals are still open and operates for more than 30 years, having old equipment;
- The inefficient operations and restricting travels on the Danube River is affected by climatic conditions such as frost periods;
- Many of coastal ports have old equipment;
- Only Constanta port has the ability to operate maritime intermodal freight transport in Romania;
- Typically there are few intermodal trains currently operating in Romania;
- The internal intermodal market in Romania is not fully developed.

### **2.1.6.Current trends in transport sector**

The overall picture is that of a constant increase of the modal percentage for road transport, both passengers and cargo, and a decline of the market share of railway transport.

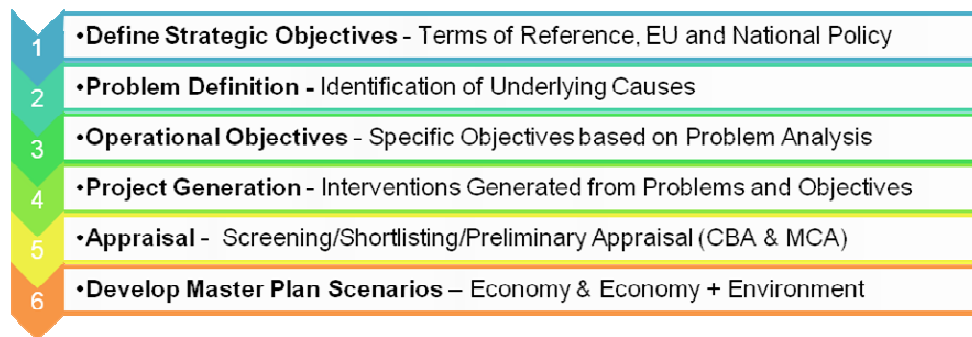
The position of the rail and waterway freight is better, both groups recorded positive developments during the last years. Both sectors are represented by private operators, but it is difficult to conclude that the best relative performances are results of the private management.

## **2.2. Master Plan Content**

The GTMP development process has been a very complex one. This process required the following steps:

- **Step 1:** The strategic objectives are the objectives defined at governmental or ministerial level and applicable in general as generic goals and objectives of the Government and the Ministry of Transport. For the Master Plan these objectives were defined using: the objectives defined in the Terms of Reference, the statements of the Ministry of Transport and Transport, White Paper of the European Union.
- **Step 2:** Defining the problems is the result of a diagnostic review of the transport system. The causes which are responsible for the manifestation of problems were identified and underlined; spatial problems were established to help identify specific objectives and interventions.
- **Step 3:** Operational objectives: these are the objectives related to the specific problems identified and represent a subset of the Strategic Objectives.

- **Step 4:** Generating projects: these are specific interventions that address operational objectives and problems.
- **Step 5:** Evaluate and Prioritize Projects: Requires a systematic process for evaluating projects for two main reasons. First, there may be several projects that meet a particular operational objective and thus a selection process becomes necessary. Second, a project can solve a problem, but may have a poor quality / price ratio. In a situation such as that of Romania, where the funds available for the transport sector are much lower than the identified needs, financial resources must be allocated in an efficient manner. Thus, a method for accurate and independent project evaluation is necessary. For this purpose a multi-criteria analysis was made.
- **Step 6:** The development of the GTPM scenarios; In the ToR is required the development of two scenarios, a scenario for Economic Sustainability and a Scenario for Environmental Sustainability. In the multi-criteria analysis every project received a score based on the degree to which it fulfilled the predefined evaluation criteria. Using different weights to score, each project received two scores, belonging to each scenario, resulting in a different set of priority projects for each different scenario.



**Figure 2.7 General process of the GTMP development**

The General Transport Master Plan provides a strategy for the Romanian transport sector development for the coming years and presents solutions that need to be implemented in order to solve the problems and needs of Romania's transport sector.

The GTMP identifies projects and policies considered to be the most suitable to meet the requirements of the National Transportation system in Romania for the next 5 to 15 years for all transport sectors, while providing a solid, analytical base when choosing those policies and projects.

The GTMP will contribute to the economic development of Romania in a sustainable manner. High-level results to be derived from the Master Plan are:

**1: Development of a plan on a *long period*, 2020 – 2030, which will contribute to Romania's sustainable economic development.**

The time horizon of the plan will be 15 years, but the entire program for implementing the projects will last longer than this period of time. This is happening due to the fact that the big infrastructure projects for transport sector are generally implemented on a period of 10 years from the starting period and the impact is over 50 years.

**2: Improved connections and thus an *improved trading with the neighborhood countries***

The plan underlines the fact that Romania is part of the EU (European Union) and the commercial connections with other counties which are not part of EU are also important. Romania also has other major commercial market needs (on their way to be developed) with countries like: Ukraine, Russia, Moldova and Turkey through Black Sea and Bulgaria.

### **3: Efficient use of financial resources for transport sector**

Every country in the EU has a deficit of "infrastructure", which means that the need to improve transport infrastructure exceeds available funds, and this deficit will not change in the next 15-20 years. Thus there must be a focus on projects and policies that address to real requirements with a high degree of utility for travelers and industry and ensuring greater economic return.

**4: An increased productivity for the industry and services in Romania** and also an economic increase and an improved standard of living.

Effective transportation systems reduce costs for both industry and individuals. This leads to increased productivity for economic activities in Romania, thereby improving living standards. The Cost Benefit Analyze covers most of the benefits of productivity.

### **5: A sustainable transport system**

The word sustainable (sustainable) involves more than environmental sustainability, although this is the context in which is often used. It includes economic and operational sustainability concepts and environmental sustainability. The Master Plan should ensure a balance between economic and environmental sustainability in the longer term. Economic Evaluation of the Master Plan and its components are based on the current assessment of travel time, fuel consumption and operating costs, including emissions and projected light variations of these indicators. Since the plan examines the next 15-20 years, and given the longevity of transportation infrastructure, it must take into account potential changes in how citizens will perceive and evaluate these issues in the future. In the present context, this involves giving increased weight to modes with higher energy efficiency such as rail and water transport in the overall evaluation of projects and programs.

Shortly, the Master Plan will identify projects and policies that will best meet the needs of the transport sector in Romania in the next 5-15 years, for all sectors of transport, providing a solid, analytical choice of policies and projects.

## **2.3.The objectives of the General Transport Master Plan**

In order to establish the main objectives of the General Transport Master Plan, a number of existing documents that relate with the objectives of Romania's national transport policy and also EU policy documents have been analyzed.

The General Objective of the Master Plan is:

***Ensuring conditions for creating an efficient, sustainable, flexible and secure transport system key concern for the economic development of Romania.***

This objective recognizes the vital importance of efficient transport system is the country's economic development. The development of transport network (including all the transport sectors: roads, rails, air, maritime, intermodal) should focus on:

- **Economic efficiency:** The transport network must be economically efficient in terms of transport operations and the users themselves. In particular, the benefits of the transport system must to exceed the cost of transportation.
- **Accessibility:** The transport network will help facilitate the access between all the regions of Romania. The transport network needs to be developed to help economic development at national and regional level.
- **Reduce the environmental impact:** the development of a modern transport infrastructure, taking into account the effects on Environment, minimizing the impact on air quality and noise reduction associated with transport activity.
- **Sustainability:** the sustainable transport modes that are more efficient in terms of energy consumption and producing less emissions should be developed first;
- **Security and Safety:** investment in transport sector must produce a safer transportation system.

The Specific Objective of the Master Plan is:

***The development of transport policy instruments to promote the development of a sustainable transport system, with balance between modes of transport which will be the base for the development of Transport SOP for 2014-2020 and other decisions related to optimal planning of investments in transport infrastructure.***

### **Environmental objectives of the GTMP**

For GTMP were established and approved, at the meeting of the working group constituted for an environmental assessment procedure, the general environmental goal (EO1) and four specific environmental objectives (EO1-1 - EO1-4), as follows:

- ***EO1. The development of a modern transport infrastructure, taking into account environmental effects***
- ***EO 1-1. Promoting investment in transport projects that contribute to a sustainable transport system, with measures to avoid and reduce adverse effects, such as pollutants in the atmosphere, noise pollution in urban areas and on roads with heavy traffic, pollution and soil due to diffuse sources, the impact on the landscape and cultural heritage;***
- ***EO 1-2. Reduction of greenhouse gas emissions from the transport sector;***
- ***EO 1-3. Protection of human health by improving the environment and the safety of transport;***
- ***EO 1-4. Reducing the impact on biodiversity by providing measures to protect and conserve biodiversity and ensure the coherence of the national network of protected areas.***

The main activities developed for the GTMP elaboration were:

1. Development of the National Transport Model (MTN) and associated databases;
2. Estimation of transport demand and traffic flows for a base year (2011) and three years of estimations: 2015, 2020 and 2030;
3. Identifying and prioritizing investment and transport policy measures required for the proper time frame forecast years;
4. Financial analysis of program implementation in the medium term (2015 and 2020) and long term (2030);
5. Preparing a development strategy for the national transport network on short, medium and long term;
6. Development of the Strategic Environmental Assessment for the proposed Master Plan and the associated implementation strategy.

### **2.4. Projects proposed by the GTMP**

Master Plan aims to identify projects and policies that will best meet the transport needs of Romania for the next 15-20 years for all modes of transport. Master Plan components, such as database, the National Transport Model, Evaluation Guide and other related reports are tailored to match this goal.

For the development of the GTMP have been developed the following time horizon scenarios:

- Short time period, year 2014 (2015);

- Medium time period, year 2020;
- Long time period, year 2030.

The time horizon of the Master Plan is 2030. Given the level of uncertainty associated with long-term forecasts, any recommendation beyond this timeframe will be reconfirmed by updating the plan (e.g. a review of the Master Plan in 2025).

The considered scenarios for the GTMP are as follows:

1. **"Zero Development" ("Do nothing")** Scenario - which does not propose any action or investment in transport infrastructure (DN);
2. **"Do minimum"** Reference Case Scenario - which takes into account projects already under construction / implementation or with funding agreed. (DM or Ref).

The first step in choosing projects to be included in the Master Plan was to determine the projects that were included in the "Reference case" ("Do Minimum") scenario - projects that are implemented or already under construction and for which the funding is already known.

The projects included in the "Reference Case" are those projects that will be implemented with certainty in the current circumstances. The "Reference Case" scenario is considered to be the present situation which will be compared with the candidate projects under the Master Plan. It is important to note that if a project is included in the "Reference Case" scenario, it is assumed that the entire funding is provided to complete, all necessary approvals are obtained and the implementation will be completed before the 2015. The "Reference Case" scenario projects have been already approved by the national responsible authorities and are listed in Appendix 2.

This scenario includes a total of 106 projects of which:

- 55 projects representing approximately 51% of all projects road sector projects and includes the following type of projects:
  - New alignments: 26 projects (4 connection roads, 5 motorways, 17 by passes);
  - Rehabilitation of bridges/bypasses – 12 projects;
  - Roads modernization – 5 projects;
  - Roads rehabilitation – 8 projects;
  - Other type of projects – 4 projects.
- 30 projects representing 28 % from the total identified projects for the railway sector which includes:
  - Rehabilitation of the railways – 3 projects;
  - Rehabilitation bridges/tunnels/bypasses/railway bridges – 8 projects;
  - Modernization of the railways and railways stations – 11 projects;
  - Current repairs – 2 projects;
  - Extension/development – 1 project;
  - Other types of projects (environmental protection/ equipment acquisition) – 5 projects.
- 21 projects representing approximately 19 % from the total identified projects for the river and maritime sector:
  - Development and modernization of the port infrastructure – 6 projects;
  - Improvement of the navigation conditions on the Danube: 9 projects;

- Other type of projects: 6 projects.
- 4 projects representing approximately 2 % from the total identified projects for the air transport sector:
  - Rehabilitation works – 1 project;
  - Modernization works – 1 project.

“Do minimum” Scenario does not propose any project for intermodal sector.

*Note: For the rehabilitation projects, the works are realized on the existing alignment of roads / railways. For the projects of modernization of the roads/railways works may include extensions of the rolling lanes of vehicles / local modifying of railway alignment in order to achieve the maximum design speed.*

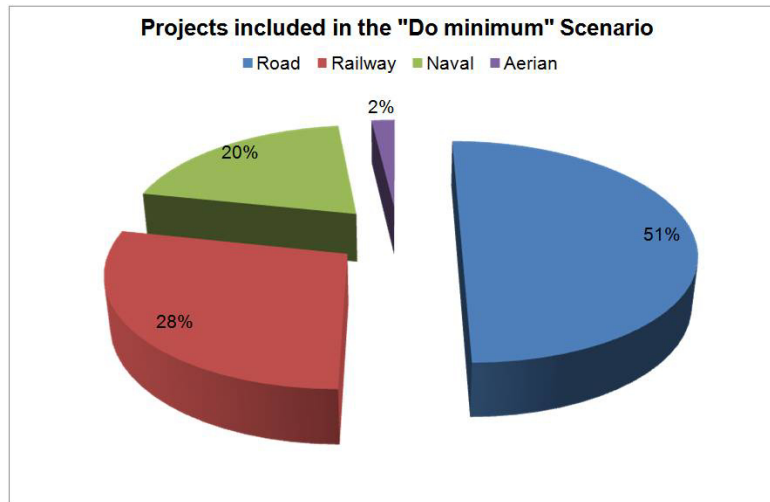


Figure 2.8 Identified projects for the GTMP – Do minimum Scenario

**3. “The Development Scenario”** required by the Terms of Reference considers the infrastructure projects in order to eliminate bottlenecks and to increase accessibility of regions and cities in Romania identified for time horizons 2014 (2015), 2020 (Strategy 2020), 2030 (Strategy 2030).

This scenario, called “**The Development Scenario**”, includes a number of assumed road projects that will help expand the network of motorways / expressways versus “Reference Case” scenarios and considerable investments in the railway sector by upgrading the main corridors of the TEN-T network, in order to achieve speed 160 km / h Including improvements to the rolling stock and station upgrades. The situation will improve for the waterways and ports sector which will also involve changes in the transport of goods and airports improvements on a smaller scale.

To define the initial development scenario the starting point has been a list of projects identified as potential projects to be included in the GTMP. The list of candidate projects for GTMP has been made available on 04/16/2014 by the GTMP beneficiary and included a number of 530 projects. By eliminating projects that were included in the “Reference Case” scenario, the projects that were repeated and those who did not have full name, a number of remaining 479 projects were considered (see Annex 3):

- 202 projects representing approx. 42% from the total potential projects that addresses to road transport sector, classified as follows:
  - New alignments - 100 projects (motorways – 28 projects, bypasses – 71 projects, connection roads – 1 project);
  - Rehabilitation/ bridges and road by passes consolidation - 21 projects;

- New bridges construction - 4 projects;
  - Rehabilitation/consolidation/repairs of the existing roads - 7 projects;
  - Modernization of the existing roads - 70 projects.
- 111 projects representing approx. 23% from the total of the potential projects that addresses to the railway transport sector, classified as follows:
    - Construction of new railways - 3 projects;
    - Rehabilitation of railway infrastructure - 14 projects;
    - Modernization of the railway infrastructure (railway, railway stations, level crossing) – 35 projects;
    - Signaling systems, electrification and rail safety – 17 projects;
    - Improving passengers services – 34 projects;
    - Maintenance and operation of the railway infrastructure – 7 projects;
    - Railway infrastructure – 1 project.
  - 71 projects representing approx. 14 % from the total of potential projects that addresses to the shipping transport sector (ports and waterways), classified as follows:
    - Development and modernization of ports infrastructure - 60 projects;
    - Improve existing navigation channels - 7 projects;
    - Construction of new navigation routes - 1 project;
    - Projects Safety, Environment and technical support - 3 projects.
  - 83 projects representing approx. 17% from the total of potential projects that addresses to the air transport sector, classified as follows:
    - Procurement of equipment - 5 projects;
    - Modernization / extension / construction of the terminals - 78 projects.
  - 12 projects representing approximately 2% of the projects identified that addresses to the intermodal transport sector;

Individual projects candidate for the GTMP have been tested by the National Transport Model (NTM) before their inclusion in the Development Scenario.

After testing the projects have been classified based on multi-criteria analyze, as follows:

- A hierarchical order for the implementation of projects aimed to help eliminate bottlenecks and to increase the accessibility of regions and cities in Romania, based on economic sustainability - "Development based on economic sustainability" or "Do Something" (ES).
- Another hierarchy that aimed to eliminate bottlenecks, increase accessibility of regions and cities in Romania, based on economic and environmental sustainability, promoting modal transport from road sector to alternative modes - "Development based on economic sustainability and average "or" Do Something Policy "(EES).

This approach is necessary due to a request of the EU, regarding the projects that will be included in the GTMP for which a clear analysis from economic and environmental point of view must be developed in order to justify the decision to include or not them on the list.

Thus, in the process of project selection for the development scenarios, the following were considered:

- Projects that have limited economic benefits and significant environmental impact will be excluded;
- Projects that bring great economic benefits but have a significant environmental impact projects will be considered for the inclusion in the scenario development based on economic sustainability;

- Projects that limited economic benefits, but have a positive impact on the environment will be considered projects to be included in the scenario development based on economic and environmental sustainability;
- Projects that bring great economic benefits, but have a neutral or positive impact on the environment will be considered projects to be included in both scenarios.

Thus, from the total of 530 projects, a number of 76 projects have been selected to be included in the development scenarios, after testing them with NTM (National Transport Model) – see last GTMP available version from 31.08.2014.

The list of projects included in this scenario, which was made available starting from 31.08.2014 is presented in the Environmental Report Investment Annexes - Annex 3A. The following table presents the proposed investment types.



Proposed investments for transport sectors	Development scenario requested by the ToR (ES/EES)	
	Total number of projects	Km
	<p><b>76 projects</b> from which:</p> <ul style="list-style-type: none"> <li>○ 32 projects addressing to road transport sector and includes the following categories of projects: <ul style="list-style-type: none"> <li>- 1 project related to safety issues (e.g. achieve continuous strip, pedestrian refuge, speed restrictions, traffic monitoring systems, safety guard rails, etc.);</li> <li>- 6 projects, level I (immediate intervention projects), motorway construction projects;</li> <li>- 15 projects, level II (priority level II);</li> <li>- 10 bypass construction projects.</li> </ul> </li> <li>○ 9 project are addressed to railway transport sector and are related to the improvement of the travel time, rehabilitation of the railway infrastructure and rolling stock acquisitions;</li> <li>○ 11 projects are related to intermodal transport sector;</li> <li>○ 11 projects related to shipping transport sector, classified as follows: <ul style="list-style-type: none"> <li>- Development and modernization of the port infrastructure: 9 projects;</li> <li>- Improvement of the navigation conditions on Danube Delta: 1 project;</li> <li>- Construction of a new navigable channel Bucharest – Danube: 1 project.</li> </ul> </li> <li>○ 13 projects for air transport sector.</li> </ul>	<p>2882 km of new roads</p> <p>2930 km rehabilitated railways</p> <p>104 km of new navigable channel</p> <p>595 km – works for improving the navigation conditions on Danube River</p>

In addition to the Terms of Reference and after discussions with EC representatives, AECOM team developed a second scenario called **"Core TEN-T" (CTT) Scenario**, which takes into account only road sector projects contributing to the completion / expansion of the network Core TEN-T (v. Annex 3B). This scenario proposes for the road sector a number of 10 for construction of motorways and 1 investment project related to transport safety.

**Table 2.8 Projects category for the proposed "Core TEN-T" (CTT) Scenario of GTMP (31.08.2014)**

Proposed Scenario "Core Ten-T" (CTT)	
Total number of projects	Total Km
<b>55 projects</b> from which: <ul style="list-style-type: none"> <li>11 projects addressing to road transport sector and includes the following categories of projects: <ul style="list-style-type: none"> <li>1 project related to safety issues (e.g. achieve continuous strip, pedestrian refuge, speed restrictions, traffic monitoring systems, safety guard rails, etc.);</li> <li>10 construction projects for the railway</li> </ul> </li> <li>9 project are addressed to railway transport sector and are related to the improvement of the travel time, rehabilitation of the railway infrastructure and rolling stock acquisitions;</li> <li>11 projects are related to intermodal transport sector;</li> <li>11 projects related to shipping transport sector, classified as follows: <ul style="list-style-type: none"> <li>Development and modernization of the port infrastructure: 9 projects;</li> <li>Improvement of the navigation conditions on Danube Delta: 1 project;</li> <li>Construction of a new navigable channel Bucharest – Danube: 1 project.</li> </ul> </li> <li>13 projects for air transport sector.</li> </ul>	1589 km of new roads  2930 km rehabilitated railways  104 km of new navigable channel 595 km – works for improving the navigation conditions on Danube River

The Environmental Report, for **"Do Something"** development scenario and for the **"Core TEN-T"** Scenario takes into account for the environmental assessment an extended version of projects (the so-called "worst-case scenario"), which includes, besides projects submitted in the GTMP version of 31.08.2014 (v. Annex 3A), also the projects requiring a further revaluation / testing using the National Transport model.

*"Do Something" Scenario* and *"Core TEN-T" Scenario* have for rail, air, sea (ports and railways) sectors the same category of investment and the same number. The two scenarios differ only in the proposed investment for the road sector. In scenario "Core TEN-T" for the road sector are taken into account only investments that contribute to extend / complete Core TEN-T network (ie construction of motorways).

The list of proposed investments for scenario "Do Something", that takes into account the observations / comments from the public during the public debate GTMP (1-15.10.2014) is presented in Appendix 3C.

The types/categories of investments proposed for each transport sector for the scenarios "Do Something" and "Core TEN-T" are presented in Table 2.9.

**Table 2.9 Types / categories of the proposed projects for development scenarios "Do Something" and "Core TEN-T" included in the GTMP (version available on 22.10.2014 and analyzed in the Environmental Report)**

"Do Something" (ES/EES) Scenario 22.10.2014	"Core TEN-T" Scenario 22.10.2014
Types / categories of the proposed projects	Types / categories of the proposed projects
<b>120 Projects</b> from which <ul style="list-style-type: none"> <li>64 projects addressing to road sector: <ul style="list-style-type: none"> <li>8 projects for motorway construction – 887 km;</li> </ul> </li> </ul>	<b>67 projects</b> din care: <ul style="list-style-type: none"> <li>11 projects addressing the road sector with following Categories: <ul style="list-style-type: none"> <li>1 project proposing investment for safety an</li> </ul> </li> </ul>

"Do Something" (ES/EES) Scenario 22.10.2014	"Core TEN-T" Scenario 22.10.2014
Types / categories of the proposed projects	Types / categories of the proposed projects
<ul style="list-style-type: none"> <li>- 17 projects for express road construction (including some alternatives and by passes) – 2241 km;</li> <li>- 15 projects for by pass construction – 182 km;</li> <li>- 24 projects for trans region and eurotrans roads rehabilitation – 3225 km.</li> <li>o 16 projects addressing rail sector and includes travel times improvement projects, rehabilitation of railway electrification and rolling stock purchases - 4536 km;</li> <li>o 12 projects addressing intermodal transport sector;</li> <li>o 14 projects addressing water transport sector (ports and waterways) and includes the following types of projects:               <ul style="list-style-type: none"> <li>✓ Development and modernization of port infrastructure - 11 projects;</li> <li>✓ Improvement of navigation on the Danube (585 km) - 1 project;</li> <li>✓ Creation of a new Bucharest-Danube waterway (104 km) - 1 project;</li> <li>✓ Works for bank protection of Sulina Canal (63 km) - 1 project.</li> </ul> </li> <li>o 14 projects addressing the air transport sector</li> </ul>	<ul style="list-style-type: none"> <li>„black points” (ie: Making road routes, refuge for pedestrians, speed restrictions, traffic monitoring systems, safety guardrails</li> <li>- 6 projects for motorway construction;</li> <li>o 16 projects addressing rail sector and includes travel times improvement projects, rehabilitation of railway electrification and rolling stock purchases - 4536 km;</li> <li>o 12 projects addressing intermodal transport sector;</li> <li>o 14 projects addressing water transport sector (ports and waterways) and includes the following types of projects:               <ul style="list-style-type: none"> <li>✓ Development and modernization of port infrastructure - 11 projects;</li> <li>✓ Improvement of navigation on the Danube (585 km) - 1 project;</li> <li>✓ Creation of a new Bucharest-Danube waterway (104 km) - 1 project;</li> <li>Works for bank protection of Sulina Canal (63 km) - 1 project.</li> </ul> </li> <li>o 14 projects addressing the air transport sector</li> </ul>

To determine the order of the implementation of the projects and the projects that will be part of the "Do Something" development scenario, the following criteria have been used:

- A. Economic impacts:
  - Economic value of the project (RIRE > 3%);
- B. Transport Policies:
  - An extension / addition TEN-T Core / Comprehensive;
- C. Environmental Impacts:
  - Noise pollution - by relating costs to the discomfort caused by noise and health costs due to exposure to high noise levels. The values were differentiated by the type of vehicles (cars, motorcycles, buses, commercial vehicles, passenger train, freight train) project location (urban, suburban, rural), the distance to the receiver, and exposure times exposure period (day, night).
  - Local air pollution (emissions of pollutants such as particulate matter, NO<sub>x</sub>, SO<sub>2</sub> and VOCs) - Human health costs, property damage, loss of crops and damage the ecosystem (representing cost vehicle \* km, train \* km, \* km airplane, ship \* km).
  - Climate Change - costs resulting from transport emissions are calculated based on the change regarding fuel consumption or mileage, emission factors for greenhouse gas emissions (g / km) following the implementation of these projects. Estimates were realized using TREMOVE model, used also by the European Union for studying the effects of different transport and environment policies on the transport sector in all European countries. The costs of climate change have a high level of complexity as they appear in the long term, global patterns of risk are very difficult to predict.
  - Natura 2000 network - costs induced by the impact on Natura 2000 implementation of transport projects.

- D. Sustainability:

- Transfer traffic from road to other modes of transport less polluting and more efficient in economic terms;

- E. Economic development:

- Increase accessibility and mobility between regions / areas that have problems related to transport routes.

For these projects was established hierarchy selected for implementation: "Development based on economic sustainability" or "Do Something" (ES) criteria A, B, D; "Development based on economic and environmental sustainability" or "Do Something Policy" (EES) criteria A, B, C, D, E.

**Table 2.10. Criteria considered for the development of "Do something" Scenario**

Criteria	Development based on economic sustainability" (ES)	"Development based on economic and environmental sustainability" (EES)
Economic efficiency	70%	50%
Trans-European Integration / TEN-T policy	30%	20%
Environmental Impact	-	20%
Sustainability	It doesn't have scoring, it is considered through modal distribution	
Balanced economic development	-	10%

Reference: AECOM / MT / Jaspers

Each project was scored for each scenario using weights above. Later it was developed a hierarchy of scenarios.

The GTMP scenario is chosen based on economic and environmental sustainability. This scenario *provides the best economic performance, with the best cost-benefit ratio.*

### 3.The relation of GTMP with other plans and relevant programs

Economic growth at national or regional level is amplified by a progressive and competitive transport system that is customer-driven and function as a sustainable network, providing affordable and high quality.

To achieve such a system requires coordination and harmonization of policies at all levels. This harmonization support economic development not only eliminates the additional costs of the transmission system, improves capital and labor productivity in the European Union also contributes miss reducing environmental impact.

From the multitude of plans and strategies, national / European for the transport sector have been analyzed the major plans, programs, strategies, policies and existing conventions elaborated at national and European level in order to identify problems, issues and themes that may influence the GTMP.

Further on this analyze, the following issues have been identified:

- The main national transport objectives are common with those of GTMP and follow the following;
  - Ensuring economic development: transport sector should contribute to the development of national economy and the economic benefits should exceed its costs;
  - Sustainable development: transport system must be efficient in terms of energy consumption, providing reserves for future generations;
  - Safety: transport network must be safe;
  - Providing funding: Master Plan should be able to absorb EU funds.
- GTMP objectives integrate the environmental objectives set at national/European level relevant for the transport sector. In the process of project selection of environmental criteria (climate change, air pollution, noise pollution, impact on Natura 2000 network, transport safety - protection of the population).;

Based on the strategies / plans related to environmental issues of the national transport sector, for GTMP have been proposed a number of relevant environmental objectives which take into account the targets set at national and European level (see also Chapter 8 of this report). These targets were set and agreed by the working groups.

The most relevant analyzed documents are:

- European regulations:
  - Regulation of EU no. 1315/2013 form 11 December 2013, regarding the orientation of the Union for the development of the transeuropean network and repealing the Decision no. 661/2010/UE<sup>13</sup>
- European and national policies:
  - EU White Paper on Transport 2011)<sup>13</sup>
  - Development programs for 2013-2016 – Transport policy proposed by the Romanian Government<sup>14</sup>
  - Strategic plan for transport sector – June 2009 (Transport Ministry Policy)<sup>15</sup>

<sup>13</sup> [http://ec.europa.eu/transport/themes/strategies/2011\\_white\\_paper\\_en.htm](http://ec.europa.eu/transport/themes/strategies/2011_white_paper_en.htm)

<sup>14</sup> <http://www.drp.gov.ro/download.php?6b3a2e12faf92184a320aeeaa3f853cf>

- Partnership agreements:
  - Partnership Agreement proposed by Romania for the period 2014-2020 (Ministry of European Funds)<sup>16</sup>
- European and National programs
  - Integrated European Action Program for Inland Waterway Transport - NAIADES I and II <sup>17</sup>
  - Operational Sectorial Transport Program (POST) 2007-2013, Revision 2<sup>18</sup>
  - Strategic program for the development of airport infrastructure at Bucharest Otopeni International Airport (1999-2015) - Law no. 220/2002 (MOF. No. 288 / 29.04.2002) approving GO no. 64/1999 (MOF. No. 405 / 26.08.1999)
  - Strategic program for the development of airport infrastructure SN International Airport Constanta SA between 2002-2015 - GD. 623/2002 (MOF. No. 458 / 27.06.2002)
  - Strategic program for the development of airport infrastructure SN International Airport SA between 2002-2015 - GD. 60/2003 (MOF. No. 76 / 06.02.2003) amending GD 615/2002 (MOF. 488 / 08.07.2002)
- National Plans
  - National Action Plan for Energy Efficiency (NAPs) - developed in 2007 under review;
  - National Spatial Plan (NSP) - Section 1 Transport Networks. Networks key rail and road transport (Law 363/2006);
  - Law no. 203 of 16 May 2003 on the construction, development and modernization of transport of national and European interest;
  - Management Plan for the National section of the Danube River Basin International - Synthesis management plans basin / basin areas;
  - Development Plan 2014-2020 Northeast Region, version June 2014<sup>19</sup>
  - Regional Development Plan for the South-East Region 2014-2020, consultative version <sup>20</sup>
  - Regional Development Plan for 2014-2020 of South Muntenia consultative version, July 2014<sup>21</sup>
  - Regional Development Plan for the South West Region 2014-2020, version June 2014<sup>22</sup>
  - Regional Development Plan for 2014-2020 West Region, consultative version <sup>23</sup>
  - Development Plan 2014-2020 Northwest region, consultative version <sup>24</sup>

<sup>15</sup> [http://www.mt.ro/strategie/plan\\_strategic/planul%20strategic%20integrat%20revizuit%202009.pdf](http://www.mt.ro/strategie/plan_strategic/planul%20strategic%20integrat%20revizuit%202009.pdf)

<sup>16</sup> [http://www.fonduri-ue.ro/res/filepicker\\_users/cd25a597fd-62/2014-2020/acord-parteneriat/Acord\\_de\\_parteneriat\\_01.10.2013.pdf](http://www.fonduri-ue.ro/res/filepicker_users/cd25a597fd-62/2014-2020/acord-parteneriat/Acord_de_parteneriat_01.10.2013.pdf)

<sup>17</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0006:FIN:EN:PDF>

<sup>18</sup> Programul Operațional Sectorial de Transport 2007 – 2013 (revizia 2 - aprobat la 26.07.2013) Ministerul transporturilor și infrastructurii. [http://www.ampost.ro/fisiere/pagini\\_fisiere/RO-POST\\_revizia\\_2.pdf](http://www.ampost.ro/fisiere/pagini_fisiere/RO-POST_revizia_2.pdf)

<sup>19</sup> <http://www.adrnrdest.ro/user/file/pdr/PDR%20NE%202014-2020%20-%20var%20mai%202014%20secured.pdf>

<sup>20</sup> [http://www.adrse.ro/DezvoltareRegionala/PDR\\_2014-2020.aspx](http://www.adrse.ro/DezvoltareRegionala/PDR_2014-2020.aspx)

<sup>21</sup> <http://www.adrmuntenia.ro/imagini/upload/pdr20142020draft31iulie.pdf>

<sup>22</sup> Regionala/00000125/mwawx\_Planul%20de%20Dezvoltare%20Regionala%202000-2002\_98043b.pdf

<sup>23</sup> <http://www.adrvest.ro/index.php?page=articol&aid=1106>

<sup>24</sup> <http://www.nord-vest.ro/planul-de-dezvoltare-regionala-2014-2020--eID1614.html>

- Regional Development Plan of the Central Region for 2014-2020, consultative version <sup>25</sup>
- Regional Development Plan of the Bucharest-Ilfov Region for 2014-2020, consultative version June 2014<sup>26</sup>
- Urban mobility plans
- European and National strategies
  - Europa Strategy 2020<sup>27</sup>
  - EU Strategy for the Danube Region <sup>28</sup>
  - EU strategy on adaptation to climate change (2013)
  - Marine Strategy Directive (Directive 2008/56 / EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for Community action in the field of marine environmental policy)
  - Sustainable Transport Strategy for 2007-2013 and 2020, 2030
  - Intermodal Transport Strategy in Romania - 2020
  - Romanian National Strategy on Climate Change 2013 - 2020
  - National Strategy for Sustainable Development of Romania Horizons 2013 - 2020 - 2030
  - National Strategy and Action Plan 2010 -2020 out biodiversity conservation
  - National Strategy for Road Safety 2011-2020 – consultative version
  - National Waste Management Strategy 2014-2020 approved by Government Decision no. 870/2013
- Conventions
  - Law no. 98/1992 ratifying the Convention on the Protection of the Black Sea against pollution, signed in Bucharest on 21 April 1992 (known as the "Bucharest Convention");
  - Convention on the regime of navigation on the Danube (Belgrade, 1948) ratified by Decree no. 298 of 30 October 1948 Additional Protocol of 26 March 1998 to the Convention of 18 August 1948 regarding the regime of navigation on the Danube\*);
  - Law no. 14/1995 ratifying the Convention for the Protection of the Danube River.
- Other documents
  - Preliminary report produced within the Transport sector: The operationalization of the national strategy and the development of climate component of the Operational Programs 2014-2020 ", developed by the MMSC
  - Working Document of the European Commission - "Adapting Infrastructure to Climate Change" <sup>29</sup>
  - Joint Declaration on the Guiding Principles for the development of navigation and environmental protection in the Danube basin (Joint Statement on Guiding

<sup>25</sup> <http://www.adrcentru.ro/Listea.aspx?t=ADElaborare%20PDR%202014-2020>

<sup>26</sup> <http://www.adrbi.ro/media/9437/PDR-BI%20varianta%2012%20iunie%202014.pdf>

<sup>27</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:RO:PDF>

<sup>28</sup> [http://ec.europa.eu/regional\\_policy/sources/docgener/panorama/pdf/mag37/mag37\\_ro.pdf](http://ec.europa.eu/regional_policy/sources/docgener/panorama/pdf/mag37/mag37_ro.pdf)

<sup>29</sup> [http://ec.europa.eu/clima/policies/adaptation/what/docs/swd\\_2013\\_137\\_en.pdf](http://ec.europa.eu/clima/policies/adaptation/what/docs/swd_2013_137_en.pdf)

Principles for the Development of Inland Navigation and Environmental Protection in the Danube River Basin)<sup>30</sup>.

The following table includes a brief description of the content of the most relevant EU policies, the reference period for actions to be taken and the relationship with the Master Plan.

**Table 3.1 The relation of the General Transport Master Plan with other relevant plans and programs**

Strategy/Plan/R elevant program for the GTMP	Main issues addressed	Referenc e period	Connection with the GTMP
<b>European regulations</b>			
Regulation (EU) no. 1315/2013 of 11 December 2013 on Union guidelines for the development of trans-European transport network and repealing Decision. 661/2010 / EU	<p>Regulation no.1315 / 2013 establishes guidelines for the creation of trans-European transport network that includes a two-tier structure, which consists of a global network and a core network based on established global network, identify projects of common interest and specific requirements to be observed for the trans-European transport infrastructure management, establishes priorities for the development of trans-European transport network, provides measures for the implementation of trans-European transport network. Implementation of projects of interest.</p> <p>The global network of transport will ensure full coverage of the EU and accessibility of all regions. Transport core network will prioritize the most important links and nodes of the trans-European transport network (<b>TEN-T</b>), to be fully operational by 2030. Both networks include all modes of transport: road, rail, air, river and sea transport and intermodal platforms.</p>	2050	<p>Relations with the EU's TEN-T is one of the evaluation criteria in the prioritization of projects.</p> <p>This reflects the fact that Romania has the same intentions common EU policy and to improve the quality of the most important routes. TEN-T routes have already been the subject of careful analysis and evaluation for the selection of projects that were included in GTMP. The GTMP prioritize projects that improve these routes. TEN-T concept includes connecting urban nodes (for Romania's urban core network nodes are trans Bucharest and Timisoara) the multi-modal corridors. The evaluation to select projects to improve network in the Master Plan took account of travel demand to and from these nodes as well as to other major centers.</p>
<b>European and National policies</b>			
White Paper on Transport Policy Community (2011)	<p>The Transport White Paper is "the roadmap" to a Single European Transport, a competitive transport system and also efficient.</p> <p>It examines developments in the transport sector, future challenges and policy initiatives that should be considered globally. The document presents both the vision of the European Commission related to transport, future challenges, and also the key measures which will allow the accomplishment of the</p>	2020-2050	<p>The General Transport Master Plan objectives are based on the provisions of the White Paper and are focused on ensuring sustainable transport, ensuring funding sources, transport safety, economic development and environmental protection.</p> <p>GTMP will help create an efficient transport system</p>

<sup>30</sup> www.icpdr.org



Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
	<p>proposed objectives.</p> <p>The vision for a SUSTAINABLE AND COMPETITIVE TRANSPORT SYSTEM refers to:</p> <ul style="list-style-type: none"> <li>- Increase of the transport and supporting mobility while reaching the goal of reducing emissions of greenhouse gases by 60%. This can be achieved by: <ul style="list-style-type: none"> <li>• <i>Development and implementations of the fuels and propulsion systems;</i></li> <li>• <i>Optimize performance of multimodal logistic chains, including wider use of more efficient modes of transport in terms of energy;</i></li> <li>• <i>Increase the efficiency of transport and infrastructure use with information systems and market-based incentives.</i></li> </ul> </li> <li>- An efficient core network for transport and long-distance journeys;</li> <li>- Multimodal;</li> <li>- Terms fair worldwide for long-distance travel and intercontinental freight transport;</li> <li>- A proper urban transport system.</li> </ul> <p>Achieving this vision involves the following:</p> <ul style="list-style-type: none"> <li>• Creating a Single European Transport: by developing rail services, development services, including quality improvement and airport capacity, further transforming the European maritime transport space, optimizing the internal market of inland waterway transport, improving road transport of goods, creating the framework for multimodal transport of goods;</li> <li>• Promoting employment and quality of working conditions;</li> <li>• Transport Safety;</li> <li>• The quality and reliability of services;</li> <li>• Strategies for Innovation and Implementation;</li> <li>• Promote more sustainable behavior;</li> <li>• Modern infrastructure and smart financing.</li> </ul>		<p>in terms of supporting economic competitiveness but also encourage the most efficient use of resources, reduce negative impacts that the transportation system has on the environment respectively on water, soil, air populations and natural ecosystems</p> <p>GTMP proposes to develop transportation infrastructure by creating new transport corridors (development of motorways, bypasses, road), rehabilitation of railway lines to achieve high speeds, improving navigation on the Danube and modernization of port infrastructure, modernize airports.</p>

Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
<p>Government Program - Government of Romania</p> <p>(Transport policy proposed by the Government)</p>	<p>Represents policy reference document most legitimacy in a democratic society which includes objectives to be achieved to ensure economic modernization, social and institutional Romania as a sustainable means to increase the standard of living and quality of life in the context of the country's integration into European Union.</p> <p>The government program has as general objective providing general transport infrastructure and services which will be able to support economic and social activity, for improving the quality of life.</p> <p>To achieve these overall general objectives, measures and obligatory actions are necessary, as: national intermodal points, upgrade road and rail infrastructure, modernization of national airports, infrastructure shipping, maritime and river.</p> <p>To finance the works, European and extra-budgetary funds will be used.</p>	2013-2016	<p>General Transport Master Plan proposes a strategic and coherent basis for investment planning transport for a period of 20 years.</p> <p>General Transport Master Plan will enable the development of transport policy instruments necessary to promote a sustainable transport system, including the balance between different modes of transport.</p> <p>Master plan aims to adjust and develop infrastructure and improve transport services taking into consideration:</p> <ul style="list-style-type: none"> <li>– expanding transport networks;</li> <li>– adjustment and modernization of existing networks;</li> <li>– estimate the role of infrastructure in economic development;</li> <li>– increasing the efficiency of the transport system.</li> </ul>
<p>Integrated Strategic Plan for Transport and Infrastructure - June 2009 (Policy of the Ministry of Transport)</p>	<p>Ministry of Transport policy aims to align ongoing national transport system of Community transport policy principles set out in the White Paper on transport (with corresponding updates) and the requirements of sustainable development in Romania. Medium-term priorities of the Ministry of Transport are:</p> <ul style="list-style-type: none"> <li>- Modernization and development of transport infrastructure (rail, road, sea, air) of European and national interest, with priority on the Pan-European transport IV, VII and IX crossing Romania, increasing the safety and quality of services;</li> <li>- Development and modernization of transport and facilities to improve the quality of service, traffic safety, security, environmental quality and ensuring interoperability of the transport system;</li> </ul>	2009-2013	<p>The National Transportation Model and the GTMP will form the basis of substantiation for planning activities in the transport sector. On this basis it will prioritize investments in the transport sector and will prepare and implement Sectorial Operational Transport Program (SOP-T) 2014-2020<sup>31</sup>.</p>

<sup>31</sup> The terms of reference - Technical Assistance for the development of the General Transport Master Plan

Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
	<ul style="list-style-type: none"> <li>- Strengthening social and territorial cohesion at national and regional level by providing connections between cities and increasing the population's accessibility to public transport, including in areas with low population density and / or dispersed locations;</li> <li>- Increasing competitiveness in the transport sector, liberalization of internal transport;</li> <li>- Improving transport behavior in relation to the environment, reducing global impacts of transport (climate change) and reduce degradation of environmental quality in natural and urban environment.</li> </ul>		
<b>Partnership Agreements</b>			
Partnership Agreement proposed by Romania for the 2014-2020 programming period (second version)	<p>This document sets out the funding priorities of the European Structural Funds and Investment to support competitiveness, convergence and cooperation, to encourage smart development based on economic growth and social inclusion. Indicates how the Romanian authorities have proposed to attract European funds in the period 2014-2020.</p> <p>The EU has not yet adopted regulations specifying how they will be implemented in future programming period the EU funds<sup>32</sup>.</p> <p>The main development needs provided in the partnership agreement for the transport sector are:</p> <ul style="list-style-type: none"> <li>• Improving accessibility in Romania regions and connectivity markets, thereby reducing significant barriers to their development and diversification in the context of the GTMP;</li> <li>• Improving sustainable mixt transport system in Romania and attractiveness of alternatives to road transport;</li> <li>• Improvement and modernization of urban transport, taking into account the congestion of urban agglomerations.</li> </ul> <p>The main challenges for the development of transport infrastructure have led to the selection of some thematic objectives.</p> <p>The Transport thematic objective</p>	2014-2020	<p>GTMP sets priorities for funding for the transport sector and it is an important document for the approval of the Partnership Agreement. For the period 2014-2020, the development projects in the field of transport shall be based on GTMP proposals, which present a vision for the development of the transport sector in Romania 2030.</p> <p>General Transport Master Plan is designed to provide a clear strategy for development of the transport sector in Romania for the next 20 years. The proposed investment by the GTMP will have following main results:</p> <ul style="list-style-type: none"> <li>• reduction of greenhouse gas emissions from the transport sector;</li> <li>• improve road safety and reduce road and rail accidents;</li> <li>• shortening the journey to rail and road routes;</li> </ul>

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<http://www.ziare.com/fonduri/fonduri-europene/documentul-care-ne-va-putea-aduce-banii-europeni-pentru-2014-2020-trimis-la-bruxelles-1262146>

Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
	<p>proposed by agreement is <b>"Promoting sustainable transport systems and removing bottlenecks in key network infrastructures."</b></p> <p>To achieve this will be proposed for funding priorities following:</p> <ul style="list-style-type: none"> <li>• Development of TEN-T road infrastructure;</li> <li>• Development of railway infrastructure of the TEN-T Core network, particularly by completing the TEN-T corridors;</li> <li>• Support the development of a sustainable transport system by improving traffic safety in the TEN-T network for all modes of transport;</li> <li>• Increased mobility and urban passenger services through the development of urban transport in Bucharest-Ilfov, focusing on the metro;</li> <li>• Upgrading and development of intermodal transport to streamline freight traffic transiting Romania, and reduce carbon emissions in urban areas;</li> <li>• Modernization and development of the Danube river and waterways to promote an environmentally friendly transport system;</li> <li>• Modernization and development of the Danube river and waterways to promote an environmentally friendly transport system;</li> <li>• Develop regional mobility by upgrading rail, including investment in infrastructure and rolling stock procurement;</li> <li>• Develop airports where warranted, to improve connectivity and to support regional mobility;</li> <li>• Improving customs infrastructure, increasing accessibility of urban areas located in the vicinity of the TEN-T by building and upgrading secondary and tertiary links to the network, including bridges, in order to eliminate congestion and traffic flow;</li> <li>• Rehabilitation and renewal of urban transport systems in an integrated and sustainable manner, which will help improve air quality;</li> <li>• Development and modernization of county roads and utilities to create opportunities as priorities in regional development plans.</li> </ul> <p>Also in the partnership agreement it is stated that this thematic objective should</p>		<ul style="list-style-type: none"> <li>• ensure good connectivity between regions and neighboring countries;</li> <li>• improving transport infrastructure and increase transport efficiency;</li> <li>• development of intermodal freight transport.</li> </ul> <p>Both the Master Plan objectives and constituent projects must meet certain benchmarks. To establish projects that are part of the development scenarios "Do something", "Do Something Policy", "TEN-T Core" were used three high-level evaluation criteria, namely economic, environmental and policies (including funding).</p>

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	be in synergy with the proposed priorities for the objectives of reducing carbon emissions and adapting to climate change, namely: thematic objective <b>OT7</b> - "Supporting the transition to a low carbon economy in all sectors" and thematic objective <b>OT5</b> - "Promoting climate change adaptation, prevention and risk management".		
<b>European and national Programs</b>			
Integrated European Action Program for Inland Waterway Transport NAIADES I and II	<p>I NAIADES Action Program has been adopted in 2006; its aim is to promote inland waterway transport benefits and address several obstacles that could prevent the use of this mode to its full potential. Some of the measures proposed by NAIADES were implemented with the support of funding instruments such as TEN-T, Marco Polo, Leonardo Da Vinci, IPA and the Seventh Framework Program.</p> <p>The NAIADES II objective is to create a good quality conditions for inland waterway transport so that will become: well-managed, efficient, secure, integrated intermodal chain with good quality jobs occupied by skilled workers and respecting high environmental standards. The program also needs to ensure that the objectives set in the EU Transport White Paper on redirecting the transport freight by rail and water and reducing emissions from inland waterways are fully complied.</p>	2014-2020	<p>Romania needs to align with EU standards and the national transport system must comply with the requirements of Community Transport Policy defined in the White Paper transport document (with all related completions).</p> <p>The General Transport Master Plan assesses a number of projects that can create optimal conditions for navigation (e.g. projects involving modernization of ports and provision of facilities / equipment specific) that can help increase the share of this sector in the total transport and makes the transport sector a competitive one.</p>
Sectorial Operational Program Transport 2007 - 2013 (Revision 2 - April 2013)	<p>SOP is an instrument based on the objectives of the National Strategic Reference, setting priorities and allocating funds for the development objectives of the transport sector in Romania. POST objectives are:</p> <ul style="list-style-type: none"> <li><i>Promoting the Romania international and transit transport for people and goods, providing effective connections for Constanta port and transit transport between the European Union to the south through the modernization and development of the TEN-T, applying necessary measures to protect the environment.</i></li> <li><i>Promoting efficient transport of people and goods between the regions of Romania, and transfer from different areas to priority transport axes by modernizing and developing the TEN-T and national networks, in accordance with the principles of sustainable development.</i></li> </ul>	2007-2013	<p>The General Transport Master Plan represents a continuity to the policy and objectives of the Sectorial Operational Transport Program 2007 – 2013.</p> <p>The General Transport Master Plan specifically aims to develop transport policy instruments to promote the development of a sustainable national transport system, that support the preparation of SOP Transport for the period 2014 - 2020, and also the development of other decisions regarding optimal planning of investments for the transport infrastructure.</p> <p>The General Transport</p>

Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
	<ul style="list-style-type: none"> <li>Promote the development of balanced transportation system modes on the competitive advantage of each mode of transport, encouraging the development of rail, water and intermodal transport sectors.</li> <li>Support sustainable transport development by minimizing adverse effects of transport activities on the environment and increase traffic safety and public health.</li> </ul> <p>Accomplishment of the above mentioned objectives needs the following actions to be taken:</p> <ul style="list-style-type: none"> <li>Modernization and development of TEN-T network in order to develop a sustainable transport system integrated with the EU transport networks;</li> <li>Modernization and development of national transport infrastructure in order to develop a sustainable national transport system;</li> <li>Modernization of the transport sector to improve environmental protection, human health and passenger safety.</li> </ul>		<p>Master Plan proposes a number of projects and policies that allow more efficient use of financial resources in the transport sector to contribute to Romania's economic development in a sustainable manner, to ensure better connection with neighboring countries and to create a sustainable transport system.</p> <p>The GTMP implementation will have a positive impact on the Romanian economy in terms of health and environmental impacts contributing to the reduction of air and noise impact generated by improving the transport infrastructure (for less polluting transport modes such as rail and water).</p>
Strategic development program of airport infrastructure Bucharest Otopeni International Airport (1999-2015) - Law no. 220/2002 (MOF. No. 288 / 29.04.2002) approving Ordinance no. 64/1999 (MoF. No. 405 / 26.08.1999).	The National Company "Bucharest-Otopeni International Airport" - SA holds the strategic program including the development of airport infrastructure for the period 1999-2015. For 2015 it is proposed to be developed the airport infrastructure necessary to process the cargo and mail traffic by creating a platform for multimodal cargo and implementing a "high tech" technology park for the development of aviation related activities.	2002-2015	<p>For the country's economic development is very important to have an efficient transport infrastructure and high quality also. For Romania it is essentially the direct transport between regions, and air transport which is the best way to facilitate this.</p> <p>Based on the proposed strategic development programs Bucharest International Airport, Constanta International Airport, Timisoara International Airport, the GTMP proposes the following investments:</p> <ul style="list-style-type: none"> <li>rehabilitation works of Bucharest International Airport rehabilitation and upgrading taxiways;</li> <li>construction of a passenger terminal and additional facilities, improving the system of signaling for</li> </ul>
Strategic development program of airport infrastructure at SN International Airport Constanta SA between 2002-2015 - GD. 623/2002 (MOF. No. 458 / 27.06.2002)	The National Society "Constanta International Airport" - SA holds strategic program including the development of airport infrastructure for the period 1999-2015. For the year 2015, the investment program proposes by nature independent facilities, and investment in new buildings: the terminal for domestic internal flights, Terminal services (equipment).	2002-2015	
Strategic		2002-2015	

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development program of airport infrastructure at SN International Airport SA between 2002-2015 - GD. 60/2003 (MoF. No. 76 / 06.02.2003) amending GD 615/2002 (MoF. 488 / 08.07.2002)	The National Society "International Airport" - SA holds the strategic program for the period 2015, which proposes investment to be made in the sector of new airport equipment.		International Airport of Constanta; – Timisoara International Airport - the construction of an intermodal terminal.
<b>National and regional plans</b>			
Law 363/2006 - Plan for National Spatial him (NSP) - Section 1 Networks Transport key rail and road transport.	Includes directions of development of networks of rail, truck, inland waterways and harbors, airports and network of combined transport network. The works covered by this law are of national interest being also a public interest issue.		The General Transport Master Plan takes into account the directions of development of transport networks approved by Law 363/2006 and directions of development of the TEN-T core network.
Law no. 203 of 16 May 2003 on the achievement, development and modernization of the national and European interest transport network (republished)	The Law approves guidelines for the design, development and modernization of national and European transport. The guidelines aim to establish objectives, priorities and main courses of action to achieve the envisaged network throughout the territory of Romania. These guidelines identify priority projects that should contribute to the development of the national and European context. The development of the priority projects has as main goal the followings: a) ensure the cohesion, interconnection and interoperability within the national network; b) access to the network; c) ensuring the access of the national network interconnection and interoperability to the trans-European transport network.	2003-2015	The General Transport Master Plan proposes a list of priority investments selected by specific criteria and also taking into account the provisions of Law 203/2003 (list of unrealized projects so far).



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<p>The National Action Plan for Energy Efficiency (NAPs) - developed in 2007 under review</p>	<p>This plan sets national targets for the share of energy from renewable sources consumed in transport, electricity, heating and cooling in 2020, taking into account the effects of other policy measures relating to energy efficiency on final consumption of energy and measures to be taken to achieve those national global goals.</p> <p>In accordance with Article 4 (1) of Directive 2009/28 / EC, Member States should establish targets for the share of energy from renewable sources, for 2020, in the following sectors:</p> <ul style="list-style-type: none"> <li>- Heating and cooling;</li> <li>- Electricity;</li> <li>- transport</li> </ul> <p>It is encouraged the use of renewable fuels or biofuels derived from wastes, residues, non-food cellulosic material and lignocellulosic material.</p>	<p>2007-2012</p>	<p>The GTMP focuses predominantly on investments to improve transport infrastructure and does not propose restrictions on the use of a certain fuel type or types of vehicles used. But the development of transport infrastructure and creating fuel refill points can facilitate placing them on the market and encourage their use.</p> <p>The use of bio fuels must take into account a number of factors:</p> <ul style="list-style-type: none"> <li>- Standardization of fuels that can be used (information on the characteristics required to perform);</li> <li>- Use the available infrastructure and the need for investments;</li> <li>- The availability of means of transport that can use these fuels;</li> <li>- Availability for use on large scale (in different areas: local or regional level for all transport sectors: road, air, sea, rail).</li> </ul>
<p>The Management Plan for the National section of the International Danube River Basin - Summary of river basins management plans / hydrographic basins approved by GD 80/2011</p>	<p>According to art. 13 of the Water Framework Directive, Member States shall carry out a management plan for each river basin district, and if located in the international district must coordinate to produce a single management plan. Romania, located in the Danube River Basin contribute to the development of the Danube River Basin Management Plan.</p> <p>National Plan for Water Management of Romania is the synthesis of the 11 management plans developed in the basin / catchment areas.</p> <p>The National Management Plan for the National section of the International Danube River Basin aims to protect water resources in the long term, balanced and sustainable use and management of water resources and protection of aquatic ecosystems.</p>	<p>2009-2015</p>	<p>The GTMP aims to promote those projects which will help reduce the negative effects on environment: greenhouses gases emissions, noise pollution in urban areas and on the routes with intense traffic including the pollution of water and soil due to diffuse sources.</p> <p>The navigation is a significant pressure that can lead to change of Danube riverbed morphology and production of accidental water pollution. Must be considered the fact that the proposed investments for water</p>



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	<p>The general objective of the plan refers to achieving a good surface and underground water quality (chemical and ecological)</p>		<p>transport can lead to damage the water quality. Thus, when considering the proposed investments must consider all the necessary measures in order to prevent damaging the water quality.</p> <p>The investment proposed by the GTMP must have minimum effects on environment and on water courses, as mentioned in the Water Framework Directive.</p> <p>GTMP cover the period 2014-2030, so it will take into account all changes and measures that appear once the review of the River Basin Management Plans will be realized (According to the Water Framework Directive 2000/60 / EC which is reviewed every 6 years).</p>
<p>Regional Development Plan 2014-2020 South-Muntenia (consultative version February 2014)</p>	<p>Regional Development Plan (RDP) reflects the development policies consistent with the potential and needs at regional level, is the basis for the strategic foundation funding programs for the period 2014-2020.</p> <p>For the development of transport infrastructure it includes the following proposals and measures:</p> <p><u>Priority no 1. Sustainable Development of Local and Regional Infrastructure</u></p> <p><u>OBJECTIVE</u></p> <ul style="list-style-type: none"> <li>- Increasing the attractiveness and accessibility of the South Muntenia region by developing mobility and connectivity of people, goods and related services to promote sustainable development.</li> </ul> <p><b>Measure 1.1.</b> Development and modernization of the transport infrastructure</p> <p><u><b>Indicative actions:</b></u></p> <ul style="list-style-type: none"> <li>- Development, upgrading and rehabilitation of road infrastructure investments aimed at enhancing regional mobility and connection with neighboring regions, sustainability, reduction of greenhouse gas emissions (mainly: roads that provide</li> </ul>	<p>2014-2020</p>	<p>GTMP sets objectives and propose the list of priority projects for the transport sector at national level.</p> <p>Regional Development Plans (RDP) represents the main planning documents and regional programming. The Regional Development Strategies will be accompanied by lists of priority major projects proposed for implementation.</p> <p>The Development of RDP 2014-2020 was conducted in conjunction with the proposals of the European Commission regulations, particularly with investment priorities from the Proposal for a Regulation of the European Parliament and of the Council on specific</p>

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	<p>connectivity to the trans-European transport network - TEN-T roads providing connectivity between counties, ring roads, regional roads and modernization of urban streets making bike lanes);</p> <ul style="list-style-type: none"> <li>- Development, upgrading and rehabilitation of an interoperable modern and high quality railway system;</li> <li>- Development, upgrading and rehabilitation of transport infrastructure;</li> <li>- Investment on safety and transport efficiency;</li> <li>- Investment to modernize public transport by road, rail and water freight and passenger;</li> <li>- Investments to promote sustainable transport, efficient and environmentally friendly;</li> <li>- Creation of multimodal transportation centers (Pitesti, Giurgiu, Ploiesti, Titu);</li> <li>- Investments to create develop and upgrade lifts.</li> </ul>		<p>provisions applicable to the European Regional Development Fund and the Investment for growth economic and employment and repealing Regulation (EC) no. 1080/2006.</p> <p>GTMP proposed projects are priority projects for transport infrastructure development proposals PDR.</p> <p>GTMP proposed projects that come to support the development, modernization and rehabilitation of railway infrastructure, development and modernization of shipping, air, road and intermodal infrastructure.</p>
Regional Development Plan of Central Region (consultative version)	<p>The Regional Development Plan for the Central Region is the main planning and programming document developed regionally and assumed by policy makers in the Central Region. PDR aims to meet the need to have available a document - at regional framework that establishes the vision of development, the overall goal and specific objectives to be reached at the end of programming period, proposing courses of action necessary to achieve the objectives.</p> <p>The transport system in the Central Region will be improved until 2020, to a modern infrastructure, able to take a fast growing traffic, provide premises for economic and social development of all areas of the region and contribute to reducing the negative effects of transport on the environment. Among the investment proposals for the transport sector are: rehabilitation of national roads, improvement of transport county roads, construction of bypasses for European cities crossed by roads or major motorways and expansion of the current building of the international airport in the county Brasov, the foundations of intermodal transport in the Central Region.</p>	2014-2020	<p>In terms of location the most new proposed works for transport infrastructure (motorways, expressways, bypasses) included in the development scenarios (ES / EES and CTT) are proposed in the developing regions of south, southwest and north east.</p>
Regional Development Plan of the	The Development Plan of Bucharest-Ilfov proposes a strategic objective for the transport sector - sustainable urban and		

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Bucharest-Ilfov (version June 2014)	<p>rural development and as targets for the transport sector - 4 promoting sustainable transport and reducing bottlenecks in transport networks.</p> <p><i>Priority themes:</i></p> <p>4.1. Promoting environmentally friendly transport systems;</p> <p>4.2. Modernization and development of transport infrastructure especially in urban areas;</p> <p>4.3. Support shipping.</p> <p><i>Key actions:</i></p> <p>4.1.1. Development of public transport;</p> <p>4.1.2. Promoting alternative forms of transport;</p> <p>4.1.3. Upgrading the railway network;</p> <p>4.1.4. Implementing measures for sustainable transport plans;</p> <p>4.2.1. Improving transportation infrastructure;</p> <p>4.2.2. Development of regional intermodal transport systems;</p> <p>4.3.1. Spatial navigation infrastructure.</p>		
Regional Development Plan of 2014-2020 for South-East Region (consultative version)	<p>Development needs described in South-East PDR will be analyzed at national level phase of the operational programs for the programming period 2014-2020</p> <p>Among the priorities aims set for South East Region are:</p> <p><u>Priority no 2: Development of regional transport infrastructure</u></p> <p>The specific objective of this priority is: Improve accessibility, mobility and connectivity in the region, creating a multimodal transportation system based on principles of sustainability, innovation and safety, able to provide fast and effective links with international markets, harnessing geo-strategic importance region, with particular emphasis on optimal connection region adjacent territorial systems to streamline maximum movement of goods, people and information, providing a European standard of infrastructure.</p> <p><b>Area of Intervention 1: Construction / rehabilitation of transport infrastructure</b></p> <p><i>Indicative operations/activities:</i></p> <ul style="list-style-type: none"> <li>– Construction, rehabilitation, modernization of motorways, county and local linking TEN-T network and multimodal nodes;</li> <li>– Construction, modernization of the ring roads / bypasses to eliminate bottlenecks;</li> <li>– Construction, rehabilitation and</li> </ul>	2014-2020	

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	<p>strengthening the network of bridges for the county roads;</p> <ul style="list-style-type: none"> <li>– Extension, modernization and development of other multimodal transport nodes;</li> <li>– Stimulation of the regional mobility through connecting the road system to the pan-European transport networks;</li> <li>– Development of transport infrastructure for the Danube crossing by road and rail and connecting urban poles / metropolitan areas with the multi-modal transport structures;</li> <li>– Development / improvement of transport infrastructure having as main result low carbon dioxide and promoting local and regional mobility;</li> <li>– Improve conditions for crossing external borders especially with Moldova and Ukraine and Bulgaria;</li> <li>– Ensuring accessibility in rural areas / mountain to improve living conditions in the countryside and mountains and to support economic activities (including tourism activities) in those areas;</li> <li>– Improve infrastructure of the Black Sea region, at the South East border of Europe;</li> <li>– Development of the airport infrastructure;</li> </ul> <p><b>Area of intervention 2:</b>  <b>Development of the maritime/ fluvial transport on short distances, both freight and passenger</b>  <i>Indicative operations/activities:</i></p> <ul style="list-style-type: none"> <li>– Development of ports in order to integrate their logistics flows of goods and passengers, including the promotion of international cooperation;</li> <li>– Development of the terminal ports (multimodal / intermodal) access to logistic platforms and / or industrial parks.</li> </ul>		
Regional Development Plan of 2014-2020 for North-East Region (version June 2014)	<p>Regional Development Plan of North-East Region proposes for the transport sector: to develop a modern infrastructure, with the specific objective:</p> <ul style="list-style-type: none"> <li>– Increase accessibility, connectivity and mobility by investing in the transport infrastructure.</li> </ul> <p>There have been considered the following measures:</p> <ul style="list-style-type: none"> <li>– Modernization and development of airport infrastructure, modernization and development of railway</li> </ul>	2014-2020	

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	infrastructure, modernization and development of road infrastructure, the development of a sustainable urban transport system.		
Regional Development Plan for 2014-2020 for the West Region	Regional Development Strategy of the Western Region has among its specific goals and objective of the transport sector, the following: "Increasing connectivity and mobility in and from the region, whether we are talking about road, rail, air or water. Identification and development of multimodal transport points can help increase regional competitiveness. Internally, must be encouraged the use of the public transport.	2014-2020	
Regional Development Plan of the Northwest Region for 2014-2020 (June 2014 version)	Regional Development Plan of the North-West region proposes as a measure for the transport sector: support the work of rehabilitation, modernization and development of communication and telecommunication infrastructure in rural areas. This measure aims to upgrade rural roads and rail that provides access to outlying rural areas. Also the measure will aim to support other complementary programs of development of the central institutions and the other national responsible bodies.	2014-2020	
Regional Development Plan for South West Region 2014-2020 (2014 consultative version)	<p>South West Regional Development Plan for England 2014-2020 is the document that provides the basis for implementing key strategic projects in the region, regardless of their funding source (state budget, local budget, EU funds, private funds, etc.)</p> <p>The proposed priorities for funding under six priority axis include <b>P2 - Modernization and development of regional infrastructure</b>. This priority axis aims primarily on a better transport infrastructure which contributes to traffic flows, bypassing reducing pollution levels within cities. Also, purchasing ecological means of transport, protection and improvement of green areas, have the same effect, namely to reduce pollution in cities. Domain related to the <i>rehabilitation of the urban areas</i> support the development of some clean and aesthetic spaces, the rehabilitation of abandoned buildings and reduces the risk of outbreaks of infection in the cities.</p>	2014-2020	Regional Development Plan for South West Region includes in the list of priority projects also the projects proposed by GTMP (Craiova – Pitesti Motorway, Lugoj-Craiova Expressway, Sibiu - Pitesti expressway, Sighisoara, Filiasi and Ramnicu Valcea bypasses).
<b>European and national strategies</b>			
Europe 2020 Strategy – An European strategy for a	The Europe 2020 Strategy proposes three mutually reinforcing priorities: <ul style="list-style-type: none"> <li>– smart growth: developing an economy based on knowledge and innovation;</li> </ul>	2020	GTMP includes Romanian strategy for the transport sector in the short, medium and long term

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smart, sustainable and inclusive development	<ul style="list-style-type: none"> <li>– sustainable growth: promoting a more efficient economy in terms of resource use, greener and more competitive;</li> <li>– favorable growth to inclusion: promoting an economy with a high rate of employment, ensuring social and territorial cohesion.</li> </ul> <p>To ensure that each Member State of the Europe 2020 strategy to its particular situation, the Commission proposes that EU goals are translated into targets and trajectories.</p> <p>Romania proposes for the Energy Sector and transport the following:</p> <ul style="list-style-type: none"> <li>•Based on the current situation, namely that Romania has a low degree of competitiveness and energy efficiency in the transport is considered necessary to ensure the liberalization of gas and electricity prices, strengthen corporate governance and state regulatory bodies and to complete cross-border connections.</li> </ul> <p>In terms of infrastructure for broadband connections, now it is the least developed in the EU, which should be corrected. In the transport sector is necessary a long-term comprehensive plan.</p>		<p>and include integrated transport development projects that may be proposed for funding in the next phase of funding by 2014-2020</p> <p>Through its proposals in the transport sector, GTMP will contribute to effective and sustainable economic development of Romania, the creation of environmentally friendly transport systems and low greenhouse gas emissions, ensuring mobility and improve connections between different modes of transport.</p>
EU Strategy for the Danube region	<p>This strategy has been elaborated by the European Commission (EC), through the General Directorate for Regional Policies (REGIO). The strategy focuses on the following: Danube region interconnectivity (improving transport infrastructure, encouraging sustainable energies, culture and tourism promotion), environment protection (achieving the environment objectives included in the Danube management plan, nutrient pollution reduction, implementation of protection plans against floods, protection against floods risks, reduction of the areas affected by erosion and biodiversity protection), consolidation of the Danube region (institutional cooperation, security), increasing prosperity in the Danube region (socio-economic development, research, employment development, improving education).</p> <p>The objectives of this strategy in terms of the transport sector are the following:</p> <ul style="list-style-type: none"> <li>- 20% increase compared to 2010 of the freight transport on the river, 2020;</li> <li>- removing bottlenecks to navigation on the river, until 2052, to use the Vlb type vessels throughout the</li> </ul>	2010-2020	<p>General Transport Master Plan proposes a series of investments to improve waterways in the Romanian Danube, modernization of port infrastructure, development of intermodal freight transport.</p>

Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
	<p>year;</p> <ul style="list-style-type: none"> <li>- improved travel times for competitive rail connections between major cities;</li> <li>- implementing the 4 rail freight corridors crossing the Danube, as planned, within 3 or 5 years;</li> <li>- Development, by 2020, of efficient multimodal terminals at Danube River ports to connect inland waterways with rail and road transport.</li> </ul>		
Marine Strategy (Directive 2008/56 / EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for Community action in the field of marine environmental policy)	Framework Directive - the Marine Strategy sets out common principles on which Member States should develop their own strategies in cooperation with other Member States and third countries to achieve good environmental status of marine waters that are under their jurisdiction and to ensure the European protection and restoration of marine ecosystems and the ecological sustainability of economic activities linked to the marine environment.	2008-2020	<p>Navigation, loading, accidental pollution are among the impacts and pressures that cause various physical damage of the marine environment.</p> <p>It should be noted that the proposed investments for shipping / river can lead to deterioration of water bodies. Therefore the proposed development of transport infrastructure must take all necessary measures to prevent any further deterioration of water status.</p>
European Union (EU) Strategy on adaptation to climate changes (2013)	<p>The overall aim of the EU strategy on adaptation to climate change is to contribute to a more resilient Europe to climate change, thereby increasing the preparedness and capacity to respond to climate change impacts at local, regional and national levels as well as EU level, developing a consistent approach and improving coordination.</p> <p>The recommended tool globally in the context of the UN Framework Convention on Climate Change is the national adaptation strategies.</p>	2014-2020	<p>It is necessary to apply climate change adaptation measures in key vulnerable sectors such as the transport sector is. Thus, planning and prioritizing investments included in the Master Plan of Transportation has considered the climate component. It is expected that the projects proposed in the Master Plan of Transportation to lead to the reduction of greenhouse gas.</p>
The National Strategy on Climate Change (2013 - 2020) adopted by Government 529/2013	<p>The objective of climate change strategy in the transport sector is to develop a sustainable system to improve social cohesion, access to outlying areas, reducing environmental impact (including the reduction of emissions of greenhouse gases) to promote economic competitiveness by improving infrastructure, providing optimum fuel consumption and the use of technology and communications.</p> <p>In the year 2020 it is expected a decrease by 20% of the emissions of greenhouse</p>	2013 - 2020	<p>The directions of the General Transport Master Plan aim the reduction of the environmental impact by reducing emissions of greenhouse gas emissions from the transport sector. Thus, the proposed investments by GTMP:</p> <ul style="list-style-type: none"> <li>- Encourages less polluting transport modes such as rail and</li> </ul>



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	gases (GHG) compared to 2008 levels and by 60% in 2050 compared to 1990 emission levels.		<p>water.</p> <ul style="list-style-type: none"> <li>- Contribute to improving rail so that it becomes competitive and safe preferably at the expense of road.</li> <li>- Promote projects that will increase the use of naval transport mode (improving navigation conditions on the Danube, development / modernization of port infrastructure), to the detriment of road.</li> <li>- Contribute to the development of road infrastructure (construction of motorways, expressways, bypasses).</li> </ul>
Sustainable transport strategy	<p>Sets the priority projects in transport identified by Romania together with EU which should be achieved by 2015.</p> <p>The overall objective is to develop balanced national transportation system to provide infrastructure and transport services, sustainable development of economy and quality of life.</p> <p>The specific objectives envisaged for the overall objective are the following:</p> <ul style="list-style-type: none"> <li>- modernization and development of the transport network of European and national interest;</li> <li>- increase the safety and quality of services;</li> <li>- liberalization of internal transport;</li> <li>- stimulate economic development and competitiveness;</li> <li>- strengthening social and territorial cohesion at regional and national level;</li> <li>- Compatibility with the environment.</li> </ul>	2007-2013, 2020, 2030	<p>General Transport Master Plan will propose a list of priority investments selected by specific selection criteria taking into account the provisions of sustainable transport strategy. Proposed investments by GTMP consider the following:</p> <ul style="list-style-type: none"> <li>- development of transportation infrastructure</li> <li>- improvement and efficient rail infrastructure</li> <li>- development of intermodal transport improvement of air transport infrastructure</li> </ul>
Intermodal transport strategy in Romania, approved by OMTI (Order of the Minister of Transport and Infrastructure) no. 457 of 20.06.2011	<p>This strategy proposes courses of action in the short term (2010-2013) and medium term (2014-2020) for the development of intermodal transport.</p> <p>The overall objective is to develop a national system of intermodal freight transport to streamline and improve the environmental impact of transport and traffic safety in Romania.</p> <p>The specific objectives envisaged for the overall strategic objective are:</p> <ul style="list-style-type: none"> <li>- Upgrading and / or construction of intermodal terminals and related infrastructure;</li> <li>- Achieving quality intermodal</li> </ul>	2010-2020	<p>General Transport Master Plan proposes a list of investments for the development of intermodal transport that takes into account the provisions of the general objectives and specific directions for the development of intermodal sustainable transport strategy.</p>



Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
	<p>services;</p> <ul style="list-style-type: none"> <li>– Implementation of a tracking system, planning and management of intermodal freight transport using intelligent transport systems available on the market;</li> <li>– Boosting the promotion of the national intermodal transportation.</li> </ul>		
National Strategy for Sustainable Development of Romania Horizons 2013 - 2020 - 2030	This Strategy sets goals for transition in a reasonable timeframe and realistic development model generating high added value, driven by interest in knowledge and innovation-oriented continuous improvement of people's lives and their relationships in harmony with the natural environment.	2013–2020–2030	<p>The action directives of General Transport Master Plan took into account the provisions of this strategy. It will be considered in Romania to promote a transport system to facilitate the safe, fast and efficient, people and goods nationally and internationally.</p> <p>In making the list of priority projects will be considered, in the selection process, the sustainable development of transport in time.</p>
National Strategy and Action Plan for Biodiversity Conservation	<p>The main objectives of the Biodiversity Conservation Strategy are:</p> <ul style="list-style-type: none"> <li>– Conservation of biological diversity;</li> <li>– Sustainable use of components of biological diversity;</li> <li>– Fair and equitable sharing of benefits arising from the utilization of genetic resources.</li> </ul> <p>For the development of this strategy were considered the legal obligations of Member States in the field of nature protection included in the Council Directives 79/409 / EEC on the conservation of wild birds (briefly called "Birds Directive") and Directive 92/43 / EEC on the conservation of natural habitats and species of wild fauna and flora (briefly called "Habitats Directive") which has been transposed in the Romanian legislation.</p> <p>The National Strategy and The Action Plan for Biodiversity Conservation are in the process of approval.</p>	2013 – 2020	<p>Making investments in transport infrastructure development (road, rail, river and air.) without measures to reduce / eliminate impacts on biodiversity may create threats to biodiversity.</p> <p>It is recommended that transport infrastructure investments will be subject to environmental impact assessment (EIA) and / or appropriate assessment (EA). It is very important to consider the potential impact on biodiversity, to integrate mitigation measures (to provide elements sufficient to maintain the connectivity of natural habitats and wildlife movement) and also appropriate monitoring programs.</p>

Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
National Road Safety Strategy (consultative version)	<p>National Road Safety Strategy 2013 - 2020 is a coherent and unified policy document for road safety within long-term to be implemented by the institutions, specialized bodies of the central government and representatives of local government recognized by law.</p> <p>The priorities of the strategy are based on improving legislation on road safety infrastructure and the gradual reduction of the number of victims of traffic accidents. This document is still in the proposal phase.</p>	2013-2020	<p>One of the general objectives of the General Transport Master Plan refers to safety in transport.</p> <p>Investments proposed by the General Transport Master Plan will take into account the improvement of transportation, maintenance, repair, modernization and construction of infrastructure to a European quality and also for the increase of the safety freight transport on roads.</p>
National Waste Management Strategy approved by Government Decision no. 870/2013 (published in Official Gazette no. 750 of 4 December 2013)	<p>This document establishes policy and strategic objectives of Romania in waste management field in the short term (2015) and medium term (2020). The purpose of the National Waste Management Strategy is to help Romania to become a "recycling society" by:</p> <ul style="list-style-type: none"> <li>– Prioritizing efforts on waste management in accordance with the waste hierarchy;</li> <li>– Encouraging waste prevention and reuse for greater resource efficiency;</li> <li>– Development and extension of separate waste collection in order to promote high quality recycling;</li> <li>– Development / technology implementation / recycling facilities and / or obtain high efficiency of extraction and use of raw materials from waste;</li> <li>– Supporting energy recovery from waste that cannot be recycled, where appropriate;</li> <li>– Reduce the amount of waste disposed in landfills.</li> </ul>	2014-2020	<p>It is known that the construction / upgrading works of transport infrastructure are generating waste. Such projects are included on the list of proposed investments GTMP. Therefore it is important to consider the opportunities that occur throughout the life cycle of such a project even since the initial concept phase of a project</p>
<b>Conventions</b>			

Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
Law 98/1992 ratifying the Convention on the Protection of the Black Sea against Pollution, signed in Bucharest on April 21, 1992 (Known as "Bucharest Convention")	Known as "Bucharest Convention", the general aims is to prevent, reduce and control pollution of the Black Sea, to protect and preserve the marine environment. The Convention also provides the legal framework for cooperation and concerted actions to protect the Black Sea. Convention for the <i>Protection of the Black Sea Against Pollution</i> has three protocols: 1. Pollution from land-based sources; 2. Pollution by Dumping; 3. Oil pollution or other hazardous substances emergency; Technical body of the Convention is represented by the Committee for the Protection of the Black Sea Against Pollution, an executive body where all countries have a representative, assisted by a permanent secretary who is based in Istanbul <sup>33</sup> .	Starting with the date the convention was ratified	The development strategy proposed for the following 20 years includes projects that will have as main purpose the prevention and control of the accidental pollution for the port areas and Maritime sector of Danube river.
Convention regarding the regime of navigation on the Danube (Belgrade, 1948), ratified by Decree no. 298 of October 30, 1948 <b>Additional Protocol of 26 March 1998 to the Convention of 18 August 1948 regarding the regime of navigation of the Danube*)</b>	It is an international legal instrument governing navigation on the Danube. - Navigation on the Danube shall be free and open to trade and freight ships of all states on an equal footing in terms of port rights and duties of navigation, as well as the conditions which is subject to Merchant Shipping - All countries of the Danube will provide the necessary work to improve navigation conditions without hindering or impeding navigation on the Danube waterways Convention is coordinated by a "commission" which includes representatives of the Member States.	Starting with the date the convention was ratified	Romania must comply with the Convention regarding the regime of navigation on the Danube. The Danube Fairway must meet the internationally accepted standards as set by the Danube Commission  GTMP implementation will contribute to the improvement of navigation and refurbished port infrastructure.

<sup>33</sup> [www.mmediu.ro/afaceri\\_europene/conventii/18\\_Marea-Neagra.doc](http://www.mmediu.ro/afaceri_europene/conventii/18_Marea-Neagra.doc)

Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
Law 14/1995 for the ratification of the Convention for the Protection of the Danube River	<p>The main purpose of the Convention is to ensure the protection of water and ecological resources and their sustainable use in the Danube river basin. This will be achieved through a sustainable and equitable water management, including conservation, improvement and rational use of surface water and groundwater in the basin, to the extent that this is possible. The Contracting Parties shall endeavor to control hazards originating from accidents involving substances hazardous to water, floods and frost on the Danube. In addition, they will try to help reduce pollution loads of the Black Sea from sources in the catchment.</p> <p>The Contracting Parties shall establish appropriate priorities and strengthen, harmonize and coordinate measures taken and planned to be taken at national and international level throughout the Danube Basin, aiming the sustainable development and environmental protection of the river Danube. In particular, this objective aims to ensure a sustainable use of water resources for drinking water, industrial and irrigation, and for the preservation and reconstruction of ecosystems, responding also to other public health requirements. This Convention shall apply to fishing and inland navigation as far as problems are related to water protection against pollution caused by such activities<sup>34</sup>.</p>	Starting with the date the convention was ratified	<p>Prevention and control of transboundary pollution, sustainable water management, rational use and conservation of water resources, maintaining the objective of good status of water bodies are matters to be taken into account when implementing the proposed investments GTMP.</p> <p>Navigation on the Danube shall respect this convention. It will consider reducing transboundary impacts considering that the action of a state does not adversely affect other states' water.</p>
<b>Other reference documents</b>			
Preliminary report on the Transportation developed within the project: The operationalization of the national strategy and development of the Operational Programs 2014-2020, project of the MMSC	<p>This report was prepared by the World Bank for the Romanian Government, as part of a program of advisory services on climate change and greenhouse gas emissions.</p> <p>This report aims to identify and incorporate climate change action in the new operational programs 2014-2020, building a sound analytical basis for impact assessment and climate-related decisions, improve environmental practices and monitoring system.</p> <p>This report recommends a number of specific actions to reduce emissions of greenhouse gas from the transport sector.</p>	2014-2020	<p>For the adaptation of climate change, the proposed strategy of the GTMP should consider:</p> <ol style="list-style-type: none"> <li>1. Organization of the rail services, both passenger and cargo, so as to produce a change of the transport from the road sector to rail sector:</li> </ol> <ul style="list-style-type: none"> <li>- Comprehensive review of the rail network before investing further in any rail infrastructure outside the TEN-T</li> </ul>

<sup>34</sup> [http://www.mmediu.ro/gospodarirea\\_apelor/conventii.htm](http://www.mmediu.ro/gospodarirea_apelor/conventii.htm)

Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
			<p>priority; Prioritization of railway infrastructure projects in accordance with the results of the General Transport Master Plan (GTMP), an approach to improve the attractiveness of rail transport sector.</p> <p>2.Reduction of greenhouse gas emissions - passenger / km</p> <ul style="list-style-type: none"> <li>- improvement of transport: development of towns bypasses, motorways and express roads that will allow highest speeds and lower fuel consumption, reduction of GHG emissions; Railway electrification.</li> </ul> <p>3.Use of the shipping and not only road transport</p> <ul style="list-style-type: none"> <li>- Improvement of port infrastructure;</li> <li>- New facilities for freight transport, including improvement of road and rail access infrastructure;</li> <li>- Improvement of navigation conditions on Danube Delta River.</li> </ul> <p>4.Encourage public transport and not only the individual transport</p> <ul style="list-style-type: none"> <li>- Although the extension project in Bucharest metro network is not subject GTMP, this project will provide a more complete transportation network together with specific projects of the GTMP (chosen according to the criteria for prioritization).</li> </ul>
Commission working document	The document states that projects that are part of the trans-European transport network TEN-T co-financed under the	2014-2050	The selection criteria used to prioritize proposed investments by GTMP

Strategy/Plan/Relevant program for the GTMP	Main issues addressed	Reference period	Connection with the GTMP
„Adapting infrastructure to climate change” April 2013	"Connecting Europe Facility" will help promote the transition to a strong transportation infrastructure resistant to climate change and disasters. All modes of transportation are eligible for funding and co-financing rates could be increased by over 10% for the implementation of actions that optimizes climate resistance. The next step for adaptation to climate change for the TEN-T network is to find a basis for widespread deployment of new technologies and innovations, for example, can help to increase the overall efficiency of the European transport sector and reduce carbon footprint. This will contribute to the Europe 2020 strategy and to achieve the target set out in the Transport White Paper to 60% reduction in greenhouse gas emissions by 2050 (compared to 1990 emission levels), and at the same time, contribute to the objective of increasing fuel supply security in EU.		<p>represents the degree of contribution of each investment in emissions of greenhouse gases.</p> <p>GTMP has as the overall objective the reduction of the environmental impacts.</p> <p>By developing the proposed investment by the GTMP will be reduced the emissions of greenhouse gas generated by the transport sector.</p>
Joint Statement on Guiding Principles for the Development of Inland Navigation and Environmental Protection in the Danube River Basin)". The final document was adopted in December 2007 / January 2008	<p>Joint Declaration is a document guide to maintaining existing waterway and waterway infrastructure development future to consider environmental and coastal conditions and processes necessary to lead to a sustainable development of inland waterways (including the maintenance of existing infrastructure and the development of new navigation projects).</p> <p>This document outlines the types of measures required to ensure navigation safety conditions and compliance with environmental requirements.</p>	Starting with the date the declaration has been approved	<p>The Ministry of Transport of Romania took part in drafting the principles guiding the development of navigation and environmental protection in the Danube basin, ensuring the implementation of recommendations arising from the joint statement mentioned above.</p> <p>Investments included in GTMP for river transport sector will be considered to improve navigation on the Danube, prevention and control of accidental pollution.</p>

## 4.Relevant environmental aspects

### 4.1.Baseline status of the environment

The transport plays an important role for economic and social development of a society and the EU transport industry accounts for approximately 6% of gross domestic product (GDP) of the European Union (EU), which is reflected by 6% in power employment, 40% of Member States and 30% of EU energy consumption. The transport sector has been growing steadily over the past two decades, from 2.3% per year to transport goods and 3.1% for the passengers<sup>35</sup>.

Although useful in developing a society, transport activity has negative effects on the environment and human health by default. It was found after monitoring on many years of observations made not only in the EU but also around the world, that transport activity is mainly responsible for the high levels of air pollutants, with a significant contribution to the amount of greenhouse gas emissions. In the European Union nearly a quarter of total emissions of greenhouse gases is generated by the transport activity<sup>36</sup>.

The transport sector, in addition to the contribution that has it for the air pollution, generates also negative effects on environment, by:

- Noise and vibration pollution (in the areas of big cities, all along the roads, in the areas of the rail nodes and airports);
- Impact on soil (through accidental spills of petroleum products or various accidents involving freight transport);
- Water pollution (marine or river navigation, oil accidental leakages or different accidents involving ships carrying freight, rainwater that washes platforms running of vehicles contaminated with petroleum products, etc.);
- Occupation of land areas (development of new transport corridors, parking facilities, extension of infrastructure, etc.);
- Changing the natural landscape;
- Habitat fragmentation (development of new transport corridors, parking facilities, expansion of infrastructure, etc.);
- Generation of solid waste (tires, car batteries, scrapped vehicles, scrapped ships, oil waste generated during construction / rehabilitation / modernization / maintenance of transport infrastructure and related facilities, waste generated during the operation period - railway depots, road centers, parking lots, airports, ports, etc.).

To analyze the current state of the environment were used as input, the information existing at national level (e.g. the state of the environment reports, river basin management plans, statistics and various reports elaborated by public bodies responsible for assessing and monitoring the environmental factors; existing statistics at the National Institute of Statistics, available annual monitoring results) available at the time the environmental Report has been elaborated.

The area occupied by roads and railway is about 388,800 ha, representing about 1.63% of the country surface, and covers the whole country. Therefore, this analysis of the current state of the environment refers to the entire national territory.

Environmental factors considered relevant for the GTMP are: air, climate, water, soil, waste, biodiversity, population and human health, noise, natural landscape, cultural heritage, sustainable transport, energy efficiency, conservation / use of the renewable resources.

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<sup>35</sup>Policy in the transportation domain – European Institute of Romania, 2005

<sup>36</sup>The contribution of transport to air quality (TERM 2012: transport indicators tracking progress towards environmental targets in Europe ) – made by EEA

Analysis of the current state of the environment has as main scope to highlight the main influence of the transport sector on the environment.

#### 4.1.1.Air

It is well known the fact that the transport sector is the biggest energy consumer, being a sector dependent on oil consumption. The transport activity has a direct influence on air quality due to emissions NO<sub>x</sub>, SO<sub>x</sub>, NMCOV, particulate matter, heavy metals.

The national air quality can be estimated from the results of measurements made by the national monitoring network and also, from the annual inventory of pollutants emissions into the atmosphere.

Air quality monitoring is provided by the National Assessment and Management System for Integrated Management of Air Quality (SNEGICA) by the National Network for Air Quality Monitoring, hereinafter (RNMCA).

Law No. 104/2011 on ambient air quality regulates the ambient air quality assessment throughout the country on the basis of common methods and criteria established at European level (Article 2, b).

RNMCA comprises:

- 142 monitoring stations for air quality located all over the country territory, from which:
  - 24 traffic stations – *asses the influence of traffic on air quality, having a coverage of 10 – 100 m and monitors the following pollutants: sulphur dioxide (SO<sub>2</sub>), nitrous oxide(NO<sub>x</sub>), carbon monoxide (CO), ozone (O<sub>3</sub>), volatile organic compounds (VOCs) and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>);*
  - 57 industrial monitoring stations - assesses the impact of industrial activities on air quality;
  - 37 urban monitoring stations - assess the influence of "human settlements" on air quality;
  - 15 suburban monitoring stations - assess the influence of "human settlements" on air quality;
  - 6 regional stations - are reference stations for air quality assessment and the radius area of representativeness is 200-500 km;
  - 3 EMEP monitoring stations asses the air pollution in transbourday context at long distance.
- 17 mobile monitoring stations;
- 41 local centers which collects and transmit further to information panels, all the available data; after the first validation are send to be certified the National Laboratory for Air Quality (LNRCA) which is part of National Environmental Protection Agency (NEPA) <sup>37</sup>.

The program for air quality monitoring asses the concentration in air of the following pollutants:

- sulfur dioxide (SO<sub>2</sub>),
- nitrogen oxides (NO<sub>2</sub>, NO<sub>x</sub>),
- carbon monoxide (CO),
- benzene (C<sub>6</sub>H<sub>6</sub>), ozone (O<sub>3</sub>),
- particulate matter from aerosols (PM<sub>10</sub> and PM<sub>2.5</sub>).
- heavy metals, lead (Pb), cadmium (Cd), arsenic (As), nickel (Ni) of particulate matter and deposition (PM<sub>10</sub> and PM<sub>2.5</sub>).

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<sup>37</sup> <http://www.calitateaer.ro>



The results of air quality monitoring (air quality in relation to limit values, target values, alert thresholds or information set out in specific legislation for each pollutant) for the reference period 2011-2012, led to the conclusion that the urban traffic road is a major source of air pollution. *Most exceeding of the permissible limit values were recorded in the type traffic monitoring stations, located in the urban agglomeration areas in Bucharest, Brasov, Iasi, Craiova (v. Figure 4.1). The pollutants for which were recorded exceedances during the monitoring were: NO<sub>x</sub>, SO<sub>x</sub>, PM<sub>10</sub>.*

- for 2011<sup>38</sup> year:
  - exceedances of the limit for human health of the annual mean values of the concentration of nitrogen oxides (NO<sub>x</sub>) in Brasov;
  - exceedance of the hourly and daily average values of the concentration of sulfur oxides (SO<sub>x</sub>) for DJ1 in Craiova.
  - an annual limit value exceedances and daily concentrations of particulate matter (PM) in some of the urban traffic stations: Bucharest, Timisoara, Iasi, Baia Mare, Brasov.
- For 2012<sup>39</sup> year:
  - permissible exceedances of the daily limit for particulate matter in Bucharest, Iasi, Brasov. For urban exhaust, suspension of dust from the roadway and burning fossil fuels for domestic heating We represent significant local sources of particulate matter emissions.
  - Exceedances of the permissible limit values for nitrogen dioxide concentrations at traffic stations in Bucharest.

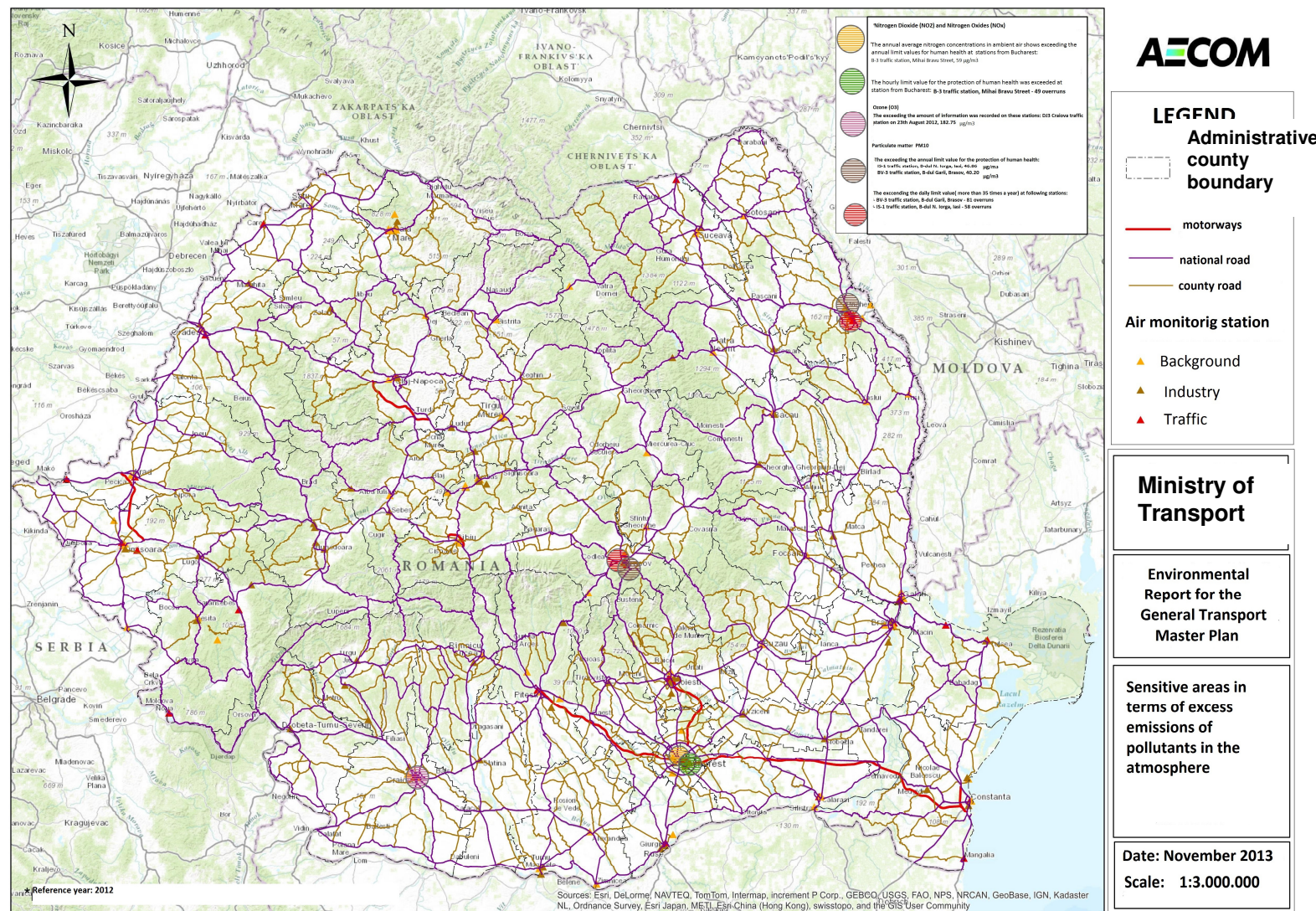
Sensitive areas, in terms of air emissions identified in the results recorded by urban traffic stations, may change from one period to another, because there are a number of factors that may influence variation in air pollutant emissions resulting from traffic. These factors are:

- the economic development zone;
- the cost associated fuels and car maintenance;
- the supply and demand for cars;
- the taxes levied on cars;
- the need for individual mobility;
- the existence variants bypass congested urban areas;
- an improved vehicle technology;
- the inefficiency or lack of public transport services;
- the average speed of traffic (the transition between locations in the village, etc.).

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<sup>38</sup> National Report on the environmental status, 2011, NEPA

<sup>39</sup> Annual Report – Air quality in Romania, 2012, NEPA,  
[http://www.anpm.ro/upload/96987\\_raport%20calitate%20aer%202012.pdf](http://www.anpm.ro/upload/96987_raport%20calitate%20aer%202012.pdf)



**Figure 4.1 Sensitive areas in terms of excess emissions of pollutants into the atmosphere due to road traffic – 2012 identified based on the results of monitoring analyzes annual traffic monitoring stations located in nearby urban**

Annual inventory of emissions into the atmosphere represent a control instrument for compliance with the limits set by national standards and allows additional measures (to prevent, reduce and control) if the compliance levels set are not full field.

Among the emission sources we can also mention the transport activity (road transport, shipping, rail, air transport). Reporting of the inventors for pollutants are developed in conformity with the methodology established by Order no. 3299/2012. *In conformity with article 15, lit g) of Law no. 104/2011 regarding air quality; the public central Authority for transport must make available annually, until 1 of March, by subordinate authorities, coordination or authority, as appropriate, public authorities and territorial environment CECA, all information required to prepare inventories of emissions from traffic, in accordance with the methodologies recommended by the European Commission and the European Environment Agency.*

*The main pollutants generated by transport sector and inventoried are: sulfur oxides, nitrogen oxides, particulates suspense, volatile organic compounds, heavy metals, oxides of carbon.*

The estimations of the contribution of air emissions from the transport sector are based on fuel consumption and existing national transport fleet for each transport mode separately.

For road transport, Autonomous - Romanian Auto Register conducted studies to determine the average speed of traffic<sup>40</sup> (e.g. speed of transition between large urban areas, between rural areas, urban areas and rural areas, motorway, etc.) and information concerning national fleet characteristics (structure of the national fleet, according to the technological characteristics of the emission over the annual average for each category of vehicles - passenger vehicles, heavy vehicles under 3.5 t capacity and over 3.5 t, buses and minibuses, mopeds and motorcycles with a capacity below 50 cm<sup>3</sup>, 50 cm<sup>3</sup> capacity motorcycles - annual average running speed for each category of road way). Information necessary for the preparation of a national inventory of emissions is using COPERT 4 model and emission factors related guide for estimating air pollutant emissions EMEP / EEA Air Emission Inventory Guidebook Pollutant 2013 (European Environment Agency)<sup>41</sup>.

The estimates regarding the contribution of the river transport sector are achieved using as input the combustible consumption necessary for the national navigation, excepting the fishing, including only naval activity and afferent emission factors. The estimations for the national inventories are developed based on the information made available by the National Institute of Statistic.

The estimates of the contribution of rail transport to total emissions in the atmosphere are achieved using, as input, fuel for track machines, representing an average of 70-80% of total diesel consumption used for this sector and related emission factors. For calculation protocol approach utilizes TIER 1<sup>42</sup>.

The estimates of the contribution of air transport is done according to the **EMEP/EEA**, using data input related to fuel for aircraft, aircraft technical data, activities (take-offs, landings, the flight) and associated emission factors.

From the analysis of national inventories of greenhouse gas emissions acidify and eutrophication and ozone precursor emissions (NO<sub>x</sub>, SO<sub>2</sub>, VOC, NH<sub>3</sub>) generated by all economic sectors can be concluded that for the period 2006-2011 annual dioxide emissions levels sulfur, nitrogen oxides, volatile organic compounds and ammonia were below the levels set by national emission levels. Regarding the transport sector's contribution to total greenhouse gas emissions with acidify and eutrophication effect and ozone precursors inventoried in 2011 the situation is as follows<sup>16</sup>:

- **Emissions of sulfur dioxide** – has been registered an increase of 27.5% compared to 2005 for "national waterway" and a significant decrease (about 95.63% compared to 2005)

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<sup>40</sup> Activity Report 2013 Romanian Auto Registry - [http://www.rarom.ro/cs-uploads/Raport\\_SEM\\_I\\_2013.pdf](http://www.rarom.ro/cs-uploads/Raport_SEM_I_2013.pdf)

<sup>41</sup> Activity Report 2013 Romanian Auto Registry - [http://www.rarom.ro/cs-uploads/Raport\\_SEM\\_I\\_2013.pdf](http://www.rarom.ro/cs-uploads/Raport_SEM_I_2013.pdf)

<sup>42</sup> TIER-1 - TIER-1 - is a calculation method which follows the approach IPCC Guidelines



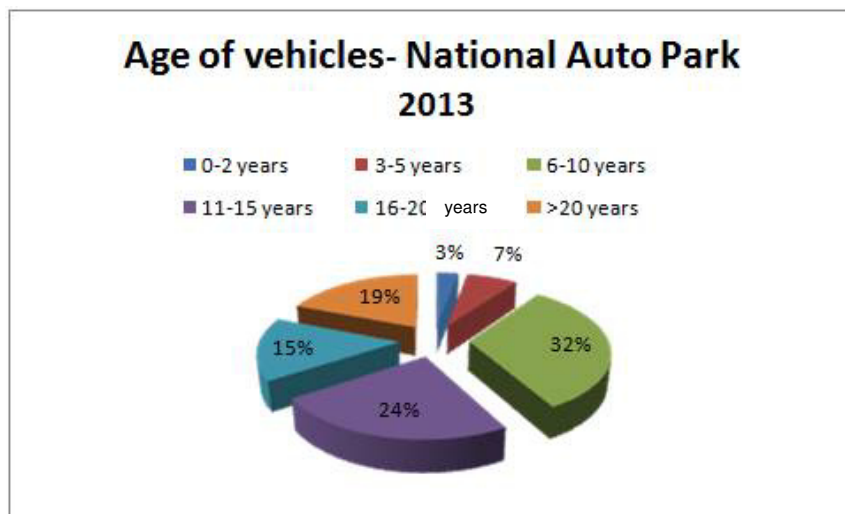
for "road", for all categories of vehicles. This is due to the fact that reduced sulfur content of fuel used for road transport.

- **NOx emissions** – contribution of the "road transport" on total emissions of NO is still high (36.18% of the total inventory emissions from road transport activity);
- **Emissions of non-methane volatile organic compounds (NMCOV)** - total emissions nationwide has increased by 4.85% since 2005. Road are among the main activities generating emissions NMCOV (30.96% of NMCOV total emissions from road transport).
- **Emissions of heavy metals:**
  - Although the amount of total emissions of lead decreased by 43.08% compared to 2005, the contribution of road transport is high (33.86% of the total emissions of lead inventoried nationally comes from road transport activities).
  - The total of Cadmium Emissions "domestic shipping" are among the activities that have most significant contribution to emissions of Cd (22.34%).

It can be seen that from all the transport modes, road transport has the highest contribution to air pollution, especially for NOx emissions, heavy metals emissions (Pb), NMCOV.

The main causes of the high contribution of the road transport sector to total emissions in the atmosphere are:

- volume of traffic - the road is the most important element of Romanian transport system in terms of passenger and freight transport, the road network is about 75% of the passenger \* kilometers and nearly 50% of the total goods \* kilometers.
- technical condition and age of vehicle – at the level of 2013 the Auto National Park consisted of a total of 5,985,085 vehicles of which about 58% older than 10 years<sup>43</sup>.



**Figure 4.2 Motor Vehicle Age of the National Park - the situation in the year 2013 (Age is calculated based on the date of first registration, regardless of state of origin)**

<sup>43</sup> Statistics 2013, Directorate for Driving and Vehicle Registration available at <http://www.drpciv.ro/info-portal/displayStatistics.do>. Auto National Park consists of: bus, car mixed autopropulsata works autoremorcher, caravans, autospecializata truck, tractor, car, van, vehicle atypical special self-propelled vehicle works, microbus, moped, motorcar, motorcycle, motorcycle special, motocvadriciclu, moped, mototriciclu, trailers, towed agricultural or forestry trailer slow, trailers, scooter, trailer, semitrailer special tractor, road tractor incomplete vehicle.

- Increased time to travel, low average speeds – the average speed on the national network is about 66 km / h; about 90% on the national network with a single lane;
- High consumption of fuel;
- Long distances traveled;
- Quality of transport infrastructure;
- The behavior of traffic participants (modality to drive the cars on the roads, non-compliance with the traffic rules, traffic jams, etc.).

To reduce the negative effects on air quality of transport activity is necessary for Romania to align with EU standards and the national transport system to conform to the requirements of Community Transport Policy defined in the White Paper Transport (with corresponding updates) and to the requirements for the sustainable development of Romania. The sustainable Development Strategy of the European Union in terms of transport, propose "to ensure that the current transport systems meets the economic, social and environmental needs, while minimizing unwanted effects on the economy, society and environment." At national level there have been developed a series of strategies, as: Strategy for sustainable transport, Strategy for intermodal transport.

Also were conducted programs for renewal of national parks and transport means and were developed action plans to improve air quality in large urban areas.

The stimulation of the national auto park can help improve the environment quality. So far, at the national the following programs have been developed:

- The program for renewal of the National Auto Park ("Jalopy program – End of live auto vehicles") was implemented under provisions of E.O. No. 217 from 4 December 2008, and the Order no. 89 of 10 February 2009 approving the Instructions on how to implement the Government Emergency Ordinance no. 217/2008 and Order no. 148 of 3 July 2009 and had the following objectives:
  - a decrease of the negative effects of air pollution on human health and the environment in urban areas, due to exhaust emissions from cars, with very high levels of pollution;
  - a classification of the emissions within the permissible limit values for ambient air in Europe;
  - the "waste prevention, following the abandonment of used cars and targets set by the environmental acquis for the collection / disposal and treatment of waste from end of life vehicles."
- In 2011, the program for renewal the national auto park for tractors and agricultural propelled equipment have been developed ("Jalopy" program for trucks - Order no. 1995 of 28 July 2011 approving the Program Guide for funding for Renewing National Park tractors and self-propelled agricultural machines).

For some urban areas have been elaborated some air quality management program which involves implementation of mitigation measures that are expected to have positive effects, contributing to the decrease of the concentrations of suspended particles.

#### **4.1.2.Climate change**

The climate change represents one of the most important problems at global level, the main aspect that contributes to climate change being the green gases emissions (GES): carbon dioxide, methane, halocarbons, aerosols, nitrous oxide, ozone, water vapor.

Romania has pledged to act to limit the quantity and reduction of greenhouse gas concentrations in the atmosphere by signing in 1992 the Framework Convention on Climate Change (UNFCCC) and in 1999, the Kyoto Protocol - the first part which is included in Annex I of the UNFCCC.

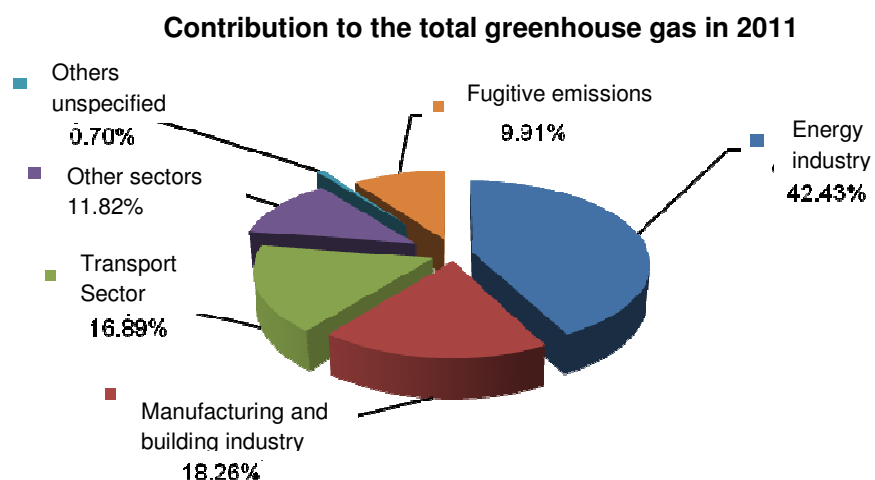
For the period 2008-2012, Romania has committed to reduce emissions of greenhouse gases by 8% compared to 1989 (year considered benchmark) and 20% by 2020.

Nations Framework Convention on Climate Change was ratified by Law No. 24/1994 and the Kyoto Protocol was ratified by Law No. 3/2001.

Since 2002, Romania sent to the secretariat of the UNFCCC the national inventory of greenhouse gases emissions under the reporting format that is common to all countries (CRF Reporter).

According to the latest national inventory submitted by Romania in 2013, which contains estimates of emissions / removals by sequestration of greenhouse gas emissions for the period 1989 to 2011, total emissions of greenhouse gases (excluding the contribution of the land use, changing land use and forestry) **decreased in 2011 by 54.86% compared to the emissions in 1989**. The decrease is mainly due to the economic regression of some sectors, which led to the reduction of the energy consumption during the period 1989-1992, and due to the existing economic crisis from all over the world from the last years.

The transport sector contributes significantly to emissions of greenhouse gases (GHG). According to the latest national inventory submitted by Romania in 2013, it is still high the contribution of energy sector to emissions of greenhouse - 69.98% (the highest percentage) of total GHG emissions in the energy industry subsector is 42.43% and transport sector 16.89% - see Figure 4.3.



**Figure 4.3 The contribution of various activity sectors to the total greenhouse gas emissions in 2011**

(Reference: National Inventory Greenhouse Gas Report, 2013)

The Estimates of emissions / removals by sequestration of greenhouse gas emissions for the period 1990 - 2011 generated by the national transport sector, on types of pollutants as reported in the national inventory of emissions of air pollutants transmission year 2013, are shown in the table below:

**Table 4.1 Estimates of emissions / removals by sequestration of greenhouse gas emissions in the period 1990 - 2011 for the transport sector**

Sector	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	NOx	CO	NMVOC	SO <sub>2</sub>	Total
	Gg							
	1990 (reference year)							
Air transport	24.7	0.0	0.0	0.0	0.0	0.0	0.0	24.7
Road transport	9986.8	2.1	0.1	93.7	772.9	145.5	11.1	11012.1
Railway transport	742.3	0.1	0.0	12.2	2.5	1.1	3.1	761.2

Sector	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	NO <sub>x</sub>	CO	NMVOC	SO <sub>2</sub>	Total
	Gg							
Navigation	1119.8	0.1	0.0	18.3	13.2	2.7	9.9	1164.0
Others	10.9	0.0	0.0	0.0	0.0	0.2	0.0	11.2
<b>Total</b>	<b>11884.4</b>	<b>2.2</b>	<b>0.1</b>	<b>124.2</b>	<b>788.6</b>	<b>149.5</b>	<b>24.1</b>	<b>12973.2</b>
<b>YEAR 2000</b>								
Air transport	26.4	0.0	0.0	0.0	0.0	0.0	0.0	26.4
Road transport	8023.9	1.4	0.1	78.7	486.6	92.0	10.7	8693.4
Railway transport	875.6	0.1	0.0	14.9	3.1	1.3	2.8	897.9
Navigation	344.1	0.0	0.0	6.6	2.8	0.6	1.9	356.0
Others	71.6	0.0	0.0	0.0	134.8	0.1	0.0	206.4
<b>Total</b>	<b>9341.6</b>	<b>1.5</b>	<b>0.1</b>	<b>100.2</b>	<b>627.3</b>	<b>94.0</b>	<b>15.5</b>	<b>10180.1</b>
<b>YEAR 2005</b>								
Air transport	358.6	0.0	0.0	0.0	0.0	0.0	0.1	358.7
Road transport	11701.5	2.8	0.4	96.0	349.8	54.4	2.0	12206.8
Railway transport	209.7	0.0	0.0	3.6	0.8	0.3	0.7	215.0
Navigation	126.4	0.0	0.0	2.9	0.3	0.1	0.1	129.9
Others	121.3	0.0	0.0	0.1	168.8	0.7	0.0	291.0
<b>Total</b>	<b>12517.5</b>	<b>2.8</b>	<b>0.4</b>	<b>102.6</b>	<b>519.7</b>	<b>55.5</b>	<b>2.9</b>	<b>13201.4</b>
<b>YEAR 2008</b>								
Air transport	387.5	0.0	0.0	0.0	0.0	0.0	0.1	387.7
Road transport	13652.7	2.0	0.5	90.4	234.6	36.9	0.4	14017.5
Railway transport	519.6	0.0	0.0	8.8	1.9	0.8	0.3	531.4
Navigation	215.7	0.0	0.0	5.0	0.5	0.2	0.1	221.6
Others	288.6	0.1	0.0	0.5	255.2	3.3	0.1	547.8
<b>Total</b>	<b>15064.2</b>	<b>2.13</b>	<b>0.47</b>	<b>104.73</b>	<b>492.12</b>	<b>41.23</b>	<b>1.14</b>	<b>15706.0</b>
<b>YEAR 2009</b>								
Air transport	249.5	0.0	0.0	0.0	0.0	0.0	0.1	249.5
Road transport	13938.1	2.0	0.5	89.1	203.7	34.3	0.1	14267.8
Railway transport	386.4	0.0	0.0	6.6	1.4	0.6	0.3	395.2
Navigation	166.2	0.0	0.0	3.9	0.4	0.1	0.1	170.8
Others	153.8	0.0	0.0	0.1	272.7	0.3	0.0	426.9
<b>Total</b>	<b>14894.0</b>	<b>2.07</b>	<b>0.46</b>	<b>99.66</b>	<b>478.19</b>	<b>35.30</b>	<b>0.54</b>	<b>15510.2</b>
<b>YEAR 2010</b>								
Air transport	329.3	0.0	0.0	0.0	0.0	0.0	0.1	329.4
Road transport	13137.3	1.7	0.4	82.4	172.8	28.2	0.1	13422.9
Railway transport	440.2	0.0	0.0	7.5	1.5	0.7	0.3	450.2
Navigation	182.4	0.0	0.0	4.2	0.5	0.2	0.1	187.4

Sector	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	NO <sub>x</sub>	CO	NM VOC	SO <sub>2</sub>	Total
	Gg							
Others	41.0	0.0	0.0	0.0	52.7	0.3	0.0	94.1
<b>Total</b>	<b>14130.2</b>	<b>1.8</b>	<b>0.4</b>	<b>94.2</b>	<b>227.5</b>	<b>29.3</b>	<b>0.6</b>	<b>14484.0</b>
<b>YEAR 2011</b>								
Air transport	297.9	0.0	0.0	0.0	0.0	0.0	0.1	298.0
Road transport	13316.8	1.7	0.4	80.2	159.0	26.2	0.1	13584.4
Railway transport	593.2	0.0	0.0	10.1	2.1	0.9	0.4	606.7
Navigation	157.4	0.0	0.0	3.7	0.4	0.1	0.1	161.7
Others	36.9	0.0	0.0	0.0	47.3	0.3	0.0	84.6
<b>Total</b>	<b>14402.1</b>	<b>1.7</b>	<b>0.4</b>	<b>94.1</b>	<b>208.8</b>	<b>27.5</b>	<b>0.7</b>	<b>14735.3</b>

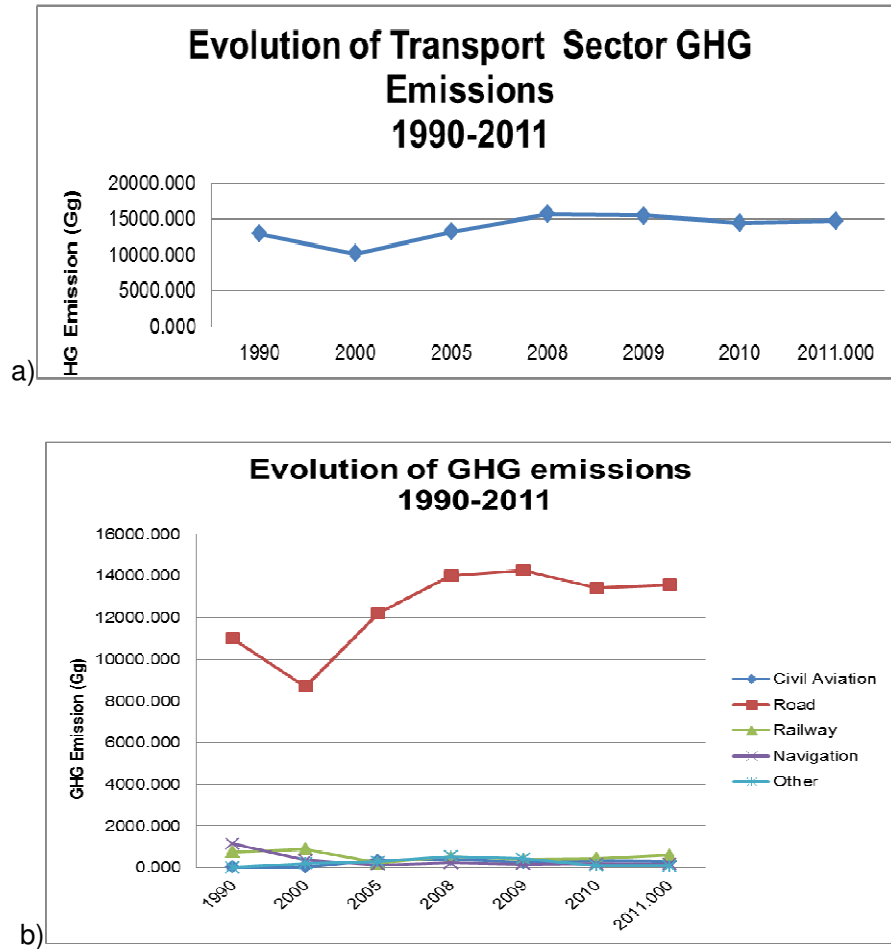
Reference: The national inventory of emissions of air pollutants, 2013

Comparing (Figure 4.5 vs Figure 4.6) with estimations levels of GHG emissions from 1990, for the transport sector, for the period 2000 to 2011, were noted the followings:

- A slight decrease in the total amount of NO<sub>x</sub> and CH<sub>4</sub>;
- A significant reduction in the total amount of NMCOV, SO, SO<sub>2</sub>;
- An increase in the total amount of CO<sub>2</sub> and N<sub>2</sub>O emissions;
- The total amount of GHG emissions from the transport sector is still high;
- Road transport has a significant contribution to the total amount of greenhouse gas emissions (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, NO<sub>x</sub>, NMCOV, CO);
- If up to year 2008, the road transport had a significant contribution to the emissions of SO<sub>2</sub>, after 2008, the situation has changed, the railway transport sector being the main generator of SO<sub>2</sub>;

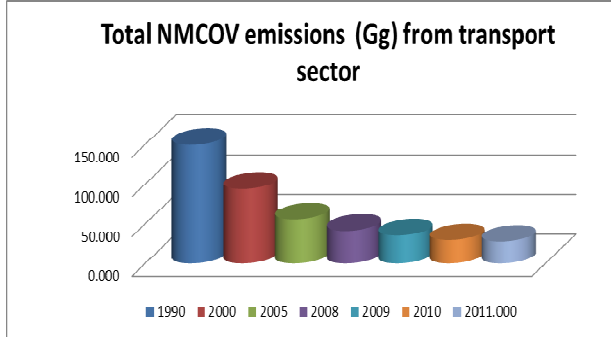
*The main reasons for the high level of road transport's contribution to total greenhouse gas emissions are: high demand for freight and passengers by road compared to other types of transport, the increase of the number of vehicles registered, high fuel consumption, urban expansion, increased mobility of citizens.*



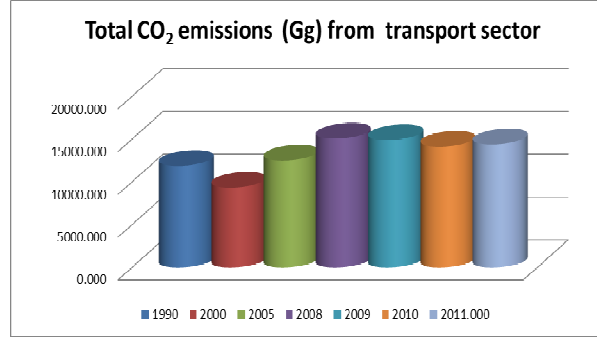


**Figure 4.4 a) The evolution of emissions / removals by sequestration of greenhouse gas emissions for the period 1990 - 2011 for transport b) The evolution of emissions / removals by sequestration of greenhouse gas emissions for the period 1990 - 2011 by modes of transport**

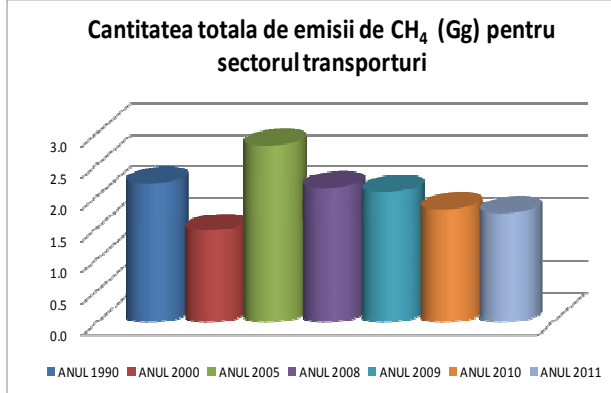
a)



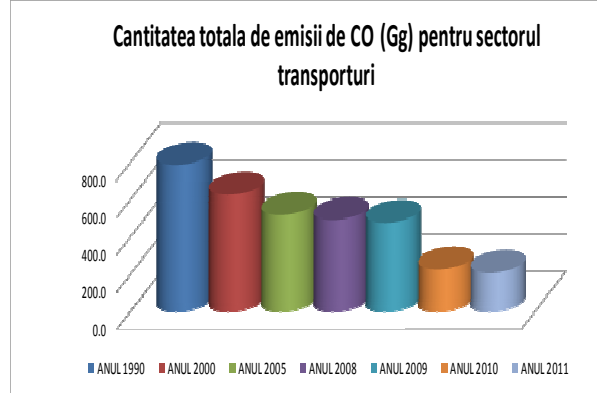
b)



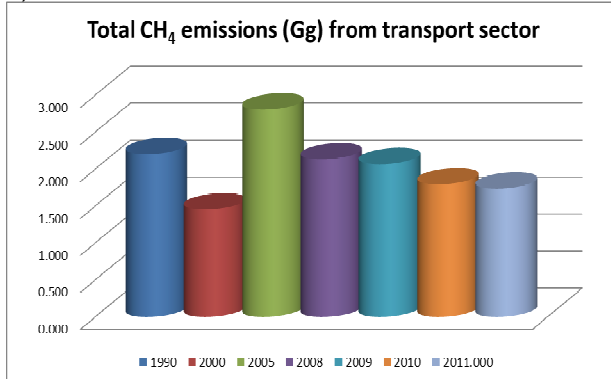
c)



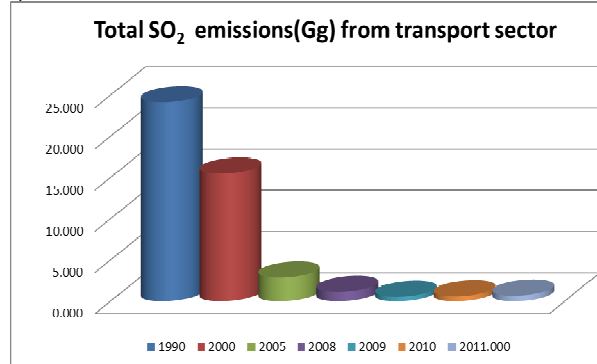
d)



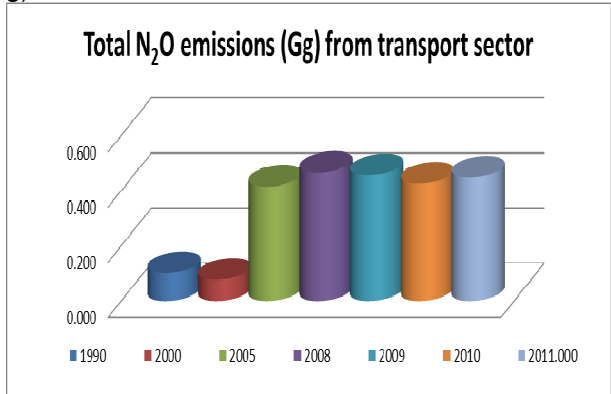
e)



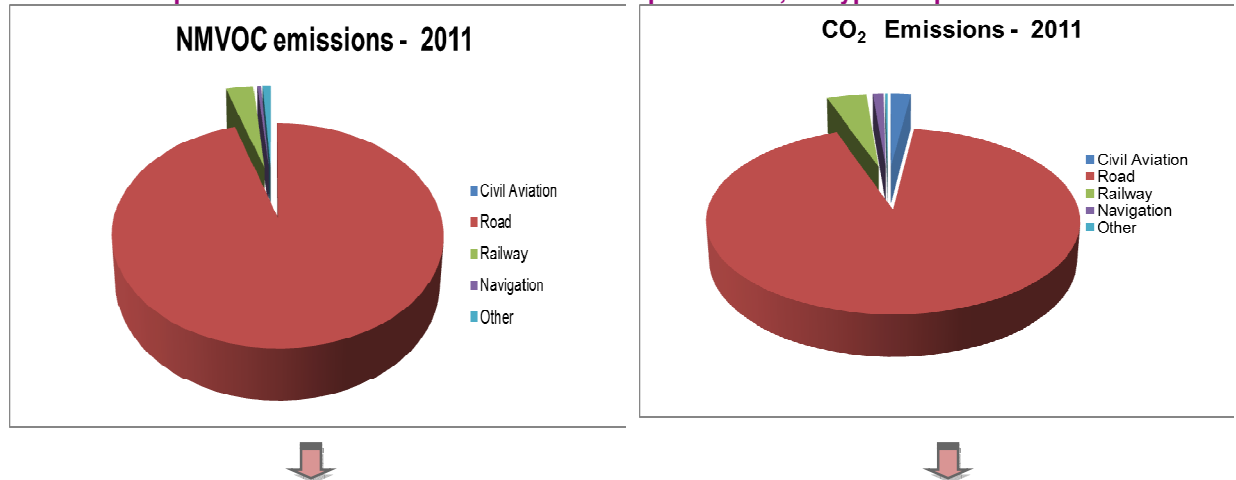
f)



g)



**Figure 4.5 a)-g) - The emission / removals by sequestration of greenhouse gas emissions for the period 2008 - 2011 for the national transport sector, on types of pollutants**

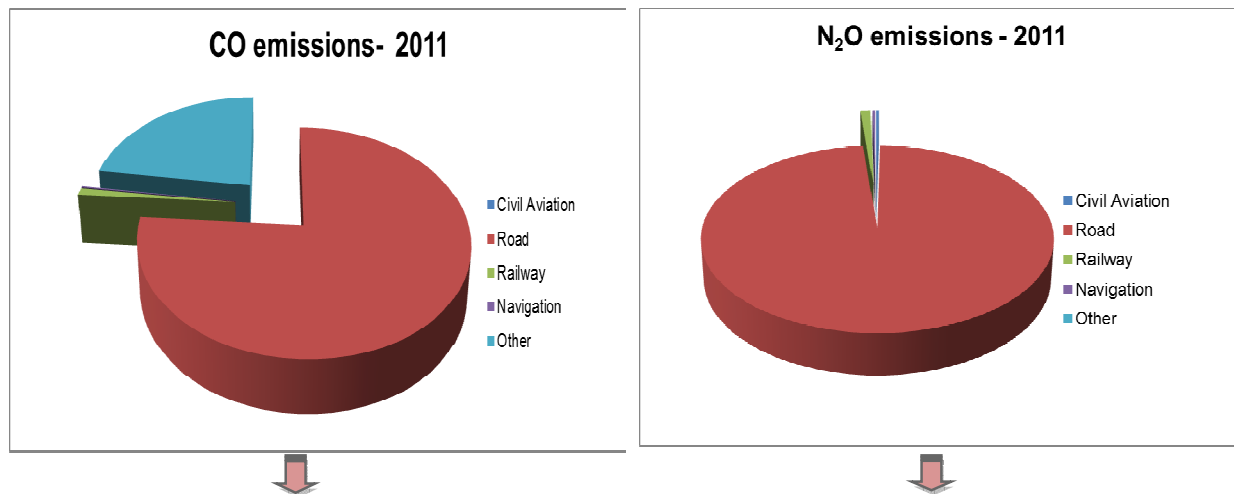


Road transport has the greatest contribution to total emissions NMVOC- representing 95% of total emissions generated by the transport sector. The lowest contribution has the air and water transport (<1% of total emissions from the transport sector).

Road transport has the greatest contribution to total CO<sub>2</sub> emissions - representing 93% of total emissions from the transport sector. Lowest contribution has navigation (1% of total emissions from the transport sector).

**a) Estimates of emissions / removals by sequestering CO<sub>2</sub> in 2011**

**b) Estimates of emissions / removals by sequestration for NMVOC in 2011**

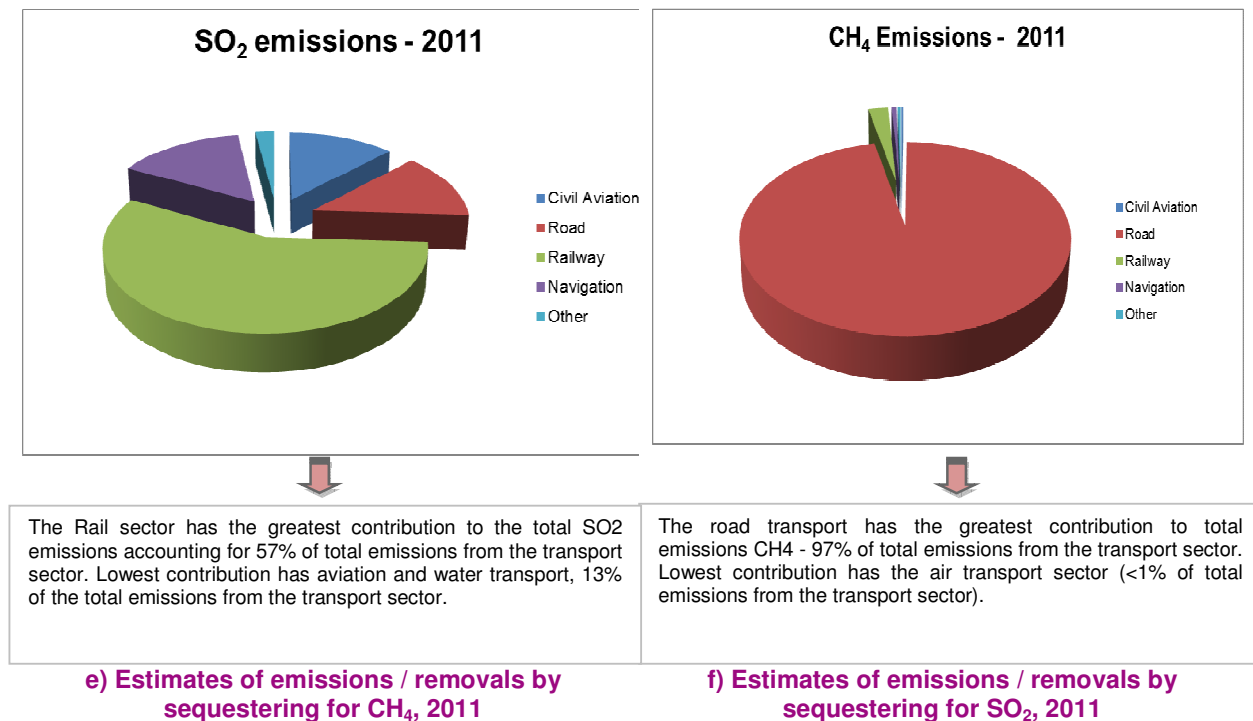


The road transport has the greatest contribution to total CO - representing 76% of total emissions from the transport sector. Lowest contribution has rail sector (1% of total emissions from the transport sector), while the Civil Aviation has no contribution.

The road transport has the greatest contribution to total N<sub>2</sub>O emissions - accounting for 98% of total emissions from the transport sector. Lowest contribution has the shipping transport sector and air transport (<1% of total emissions from the transport sector).

**c) Estimates of emissions / removals by sequestering N<sub>2</sub>O in 2011**

**d) Estimates of emissions / removals by sequestering CO 2011**



**Figure 4.6 (a-f) Estimates of emissions / removals by sequestration in 2011**

The transport sector's contribution to the total emissions of greenhouse gases from year to year, it is influenced by the quantity of fuel consumed and thus the development of national economy. According to data published by the European Environment Agency (EEA), the contribution of the "Transport" to the total emissions of greenhouse gases in Europe is 19.3%, excluding emissions from international aviation and maritime transport (generated by burning Sea fossils)<sup>44</sup>.

This, climate change may have an impact on the transport infrastructure, which is vulnerable to extreme weather conditions. Climate change impacts are manifested mainly by changes in the climate, giving rise to extreme meteorological conditions, as rainfall, increasing or decreasing temperature, winds, storms, flooding appearance, desertification, and increased instability of slopes. The potential effects of the climatic regime on transport infrastructure, may be:

- Fluctuations of the flow regime of rivers and streams that can affect water transport;
- Extreme temperatures and precipitation can damage transport infrastructure - lack of tread resistant to changes in temperature (in summer) may lead to tonnage banning under high temperatures or heavy goods vehicle speed limits for railways; high temperatures can affect passenger travel conditions; low temperatures can lead to cracks in asphalt pavements; bridges and tunnels are vulnerable to flooding and wind; sea level rise and coastal storms may affect the ports of the Black Sea; reduced precipitation and modification level may affect navigation on the Danube River Danube (which leads to restrictions in shipping).

Thus, two major problems need to be taken into account for climate change component in the transport sector: on the one hand the reduction of the emissions of greenhouse gases, on the other hand, the need to adapt to climate change<sup>45</sup>.

<sup>44</sup> Annual report on the state of the environment, 2012, NEPA

<sup>45</sup> Guide to adaptation to climate change approved by Order no. 1170/2008

The Component for Adaptation to climate change (ASC) 2013-2020 aims to create a framework for action and drawing guidelines enabling each sector (each responsible institutions at sectorial level) to develop their own plan of action in accordance with the national principles<sup>40</sup>.

The National policy to reduce GHG emissions follows the European approach, on the one hand to ensure that some operators participates in the scheme applying trading GHG emissions and on the other hand, the to adopt some sectorial policies and measures so that national GHG emissions for these sectors to meet the linear path emission limits established by Decision no. 406/2009 / EC. The National Strategy on Climate Change 2013 - 2020 was approved by Government 529/2013 and has the following targets for reducing GHG emissions from the transport sector:

- Development of a sectorial strategy to reduce emissions of greenhouse gases;
- Reduce use of road transport (the road transport has the biggest contribution to greenhouse gas emissions);
- Use of environmentally friendly vehicles;
- Intelligent Transport Systems (ITS);
- Improving the railway transport sector;
- Reduction of greenhouse gas emissions in the air - to reduce emissions from this sector in 2013, the air transport sector was included in the emissions trading through an amendment to Decision 2003/87 / EC which has been transposed into national law by HG 399/2010;
- Development of intermodal transport;
- Introduction of some fees (the charging of heavy goods vehicles for the use of cars, reducing taxes for those who purchase hybrid cars to encourage the purchase of such vehicles);
- Encouraging and promoting non-motorized transport;
- Stimulate research and development sectors to reduce emissions of greenhouse gases generated by the transport sector;
- Improve the performance of urban transport;
- Information and public awareness of environmental issues associated with transport.

To improve air quality and to comply with the limit values regulated by the community legislation in this area (the relevant CO<sub>2</sub>), national environmental taxes have been imposed on vehicles. These fees generate revenues in the budget of the Environment Fund and are used by the Environment Fund Administration to finance programs and projects for environmental protection according to GEO no. 9 of 19 February 2013 on environmental stamp for vehicles.

#### **4.1.2.1.Climate changes in Romania during 2001 – 2030**

Taking into consideration the above mentioned issues, it is important to follow which are the changes of the climate and also the evolution and prognosis.

The extreme climate events which can generate damages and natural disasters are: heavy rains / floods, landslides, hail, lightning, rain, avalanches, storms, blizzards, droughts, heat waves, cold waves.

According to the IPCC report, human activities are responsible for global warming. Industry and transport have an important contribution to global warming, so it is necessary to adapt to the climate change in planning future activities.

This chapter has as main purpose, the presentation of the changes of climate in Romania and of the sensitive areas identified to be located close to where infrastructure projects are proposed to be developed.

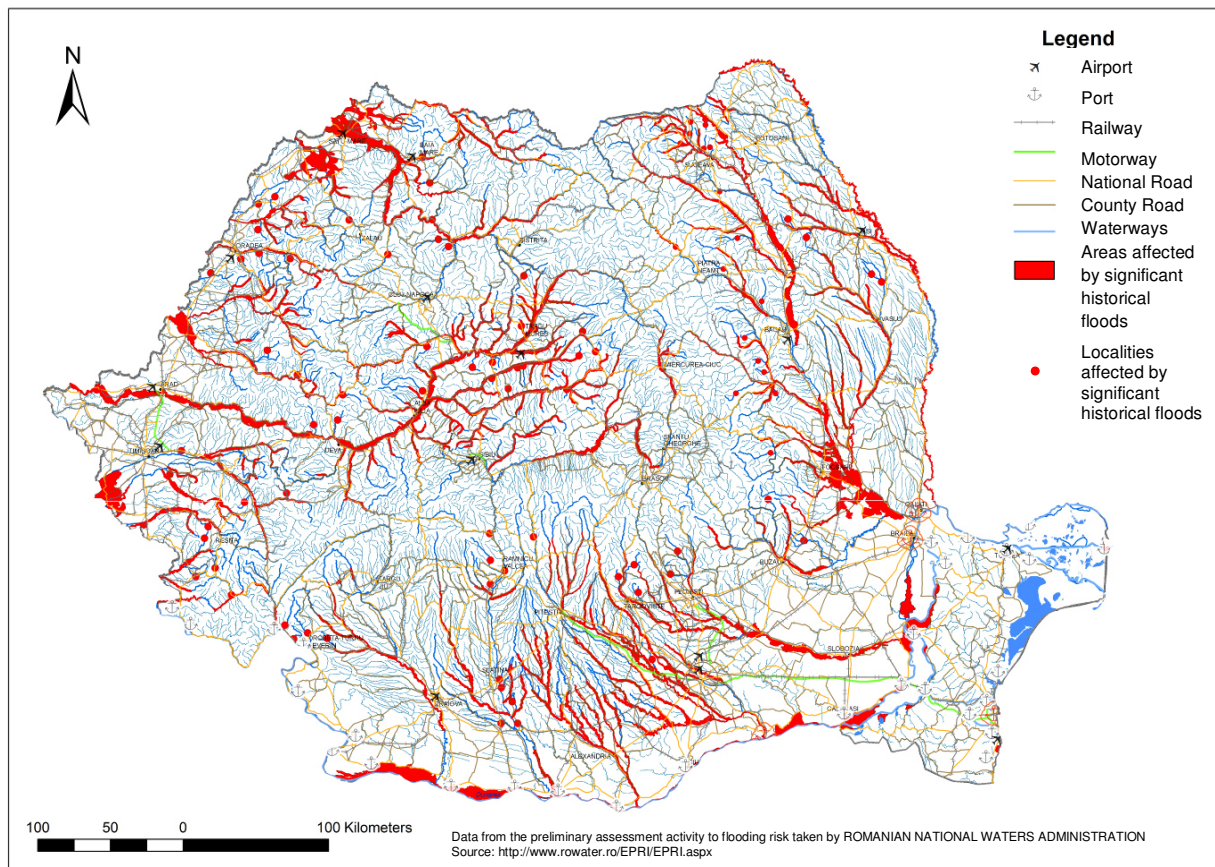
During 2001 – 2007 there were identified a series of changes of climate in Romania<sup>46</sup>:

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<sup>46</sup> National State of the Environment Report, 2012, NEPA

- *Annual temperature*: In summer it has been signaled a significant warming of about 2°C throughout the country, and in the Carpathian regions during winter and spring. In the autumn there is a slight cooling trend across the country, but it is not statistically significant.
- *Rainfalls*: During winter and spring were identified decreasing trends in precipitation in most parts of the country, but not significant. Also have been identified significant trends of rainfall increasing on larger areas in the autumn season.
- *Wind*: the average wind speed shows significant downward trends in all Carpathian regions and mountainous areas. In summer and autumn, fall trends are weaker or not statistically significant in most of the country.
- *Dryness*: A significant increase in the maximum duration of the period of consecutive days without rain has been identified, in the south side of the country during winter and summer period.

Below it is presented the map of significant flooding registered in Romania during the last 40 years<sup>47</sup>.



**Figure 4.7 Map of flooding registered in Romania during last 40 years**

Projections of the climate changes in Romania (air temperature and rainfall) for the period 2001-2030 were made by the National Meteorological Administration, under the IPCC emission scenario which assumes a weighted rate of growth of the greenhouse gas concentration for the 21st Century<sup>48</sup>. From these projections the following aspects have been identified<sup>49</sup>:

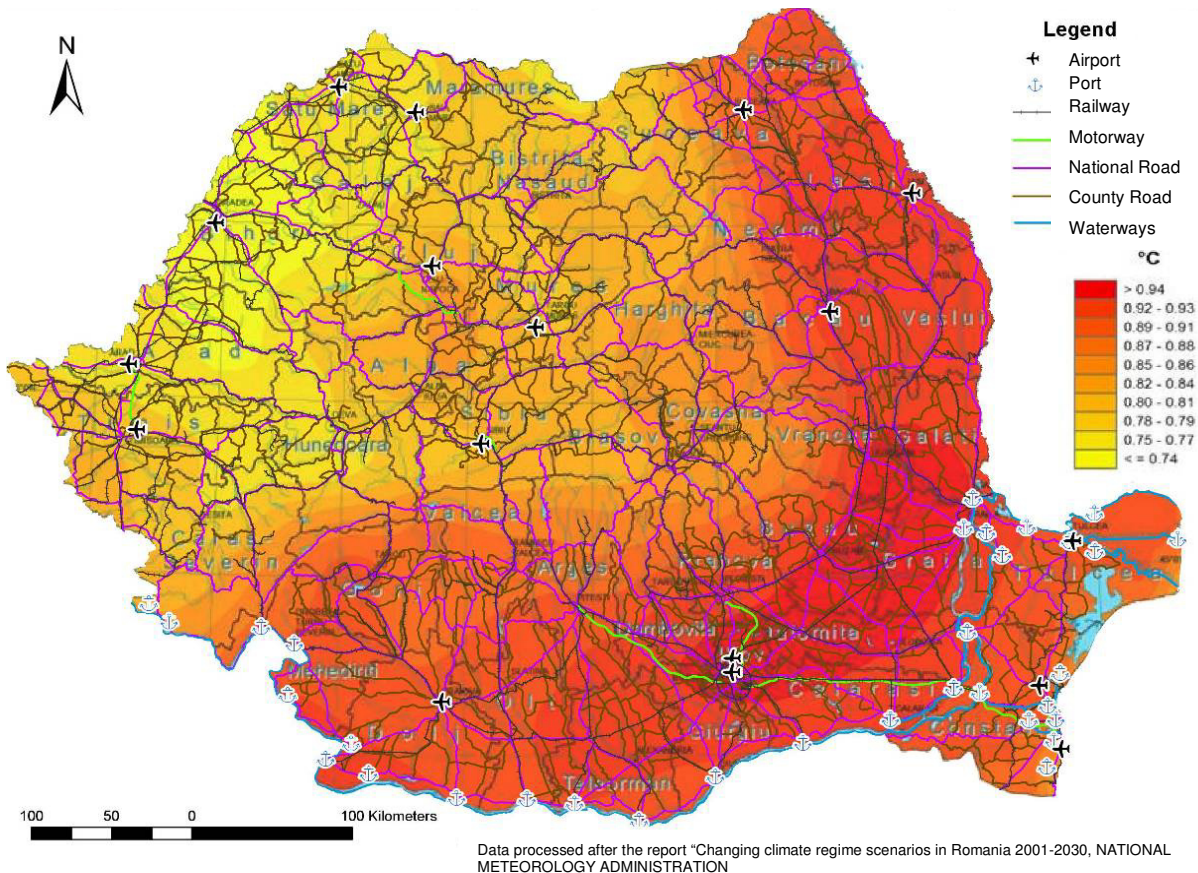
<sup>47</sup> <http://www.rowater.ro/EPRI/EPRI.aspx>

<sup>48</sup> National State of the Environment Report, 2012, NEPA

<sup>49</sup> National State of the Environment Report, 2012, NEPA

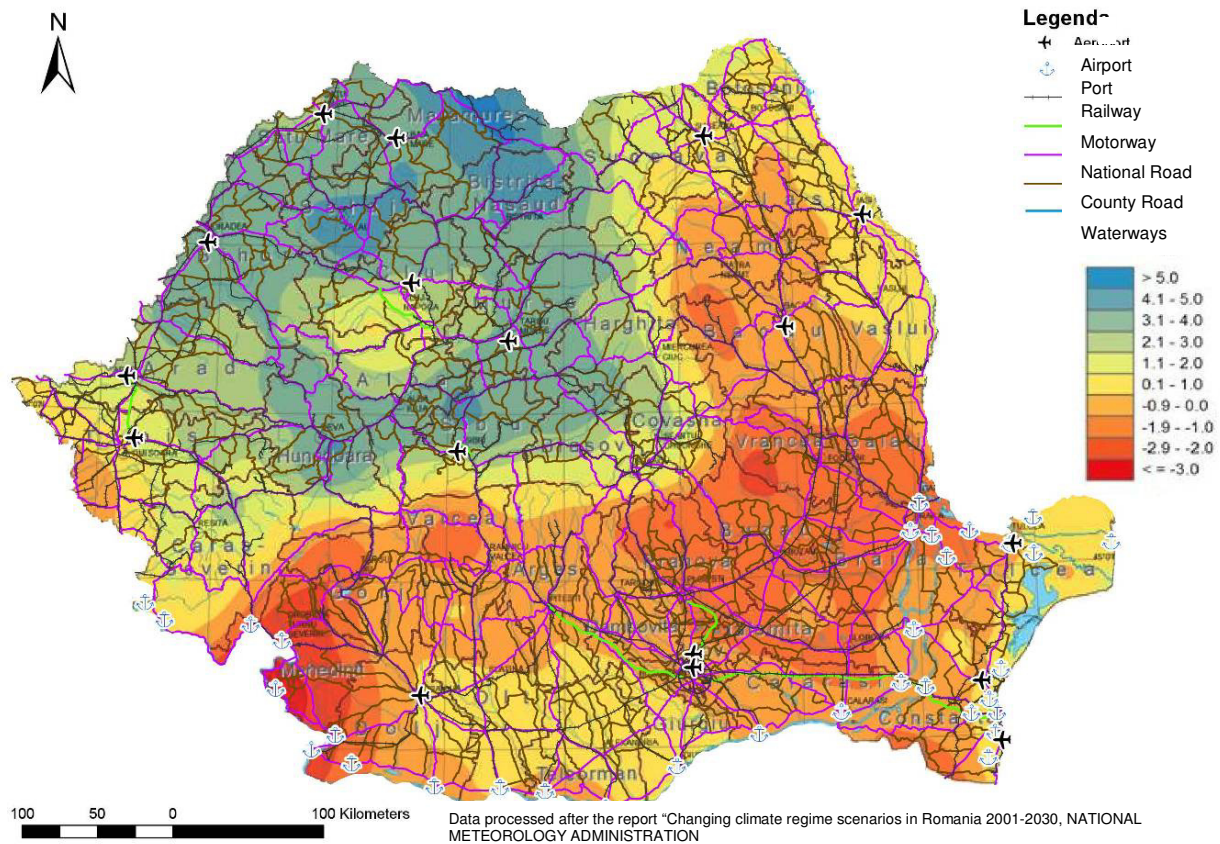


- global average temperature increase;
- increase of the average minimum winter temperatures in the Carpathian Mountains and their surrounding regions compared to the rest of the country;
- increase of the maximum temperature during summer in South and South East Side of the country comparing to the North side;
- more frequent droughts periods in summer, especially in the south and southeast side of the country;
- more frequent heat waves;
- more intense rainfall over short periods of time, which causes more frequent rapid floods;
- an overall decrease in the amount of precipitation in summer, especially in the south and southeast side of the country;



**Figure 4.8 Map of transport infrastructure in Romania and increase of the average multiannual temperature during 2001-2030, comparing to reference period of time 1961-1990)<sup>50</sup>.**

<sup>50</sup> Annual report on the state of the environment - Chapter 7 Climate Change 2012, NEPA;  
Rapid Assessment Report of the transport sector, January 2014 - The climate change and green growth with low carbon



**Figure 4.9 Transport infrastructure in Romania and differences in annual average amount of precipitation (in %) between 2001 to 2030 range and standard climatological normal (1961-1990)<sup>51</sup>.**

#### 4.1.2.2. Adapting to climate change

The transport activity is closely related to energy / fuel consumption and emissions of greenhouse gases. Also transport has an important role in supporting the economic development of Romania. It is necessary to adopt measures to reduce GHG emissions generated by the transport sector without compromising economic development in order to ensure sustainable development.

On the other hand should be considered also the vulnerability of the infrastructure of road, rail, water and air to extreme weather events. To prevent and combat these effects are required substantial investments and promoting a proper management.

Due to changes of the climate projections in Romania mentioned in the previous section, urgent measures are needed to adapt to climate change. The main actions proposed in the Guidance on adaptation to climate change (2008), for the **transport sector**, are:

- Reviewing regulations on infrastructure, such as storm water drainage, embankments, roads, railways, bridges, tunnels;
- Identification of alternative transport routes;
- Ensuring adequate storm water collection from the road network;

<sup>51</sup> National State of the Environment Report - Chapter 7 Climate Change 2012, NEPA



- Ensure the protection of communication network to withstand extreme weather conditions. The road construction should be provided sufficient bridges, culverts and channels where intense rainfall and flooding;
- Protection against erosion railway infrastructure;
  - Strengthen the structure of ports to meet storms becoming stronger (i.e. Using “stabilopozzi” – concrete hydro-technical soil retention structure);
- Replacing surface cables with underground cables;
- Construction of the road and rail network, a number of additional facilities to ensure transit of wild animals (green bridges, overpasses);
- Promoting new technologies for the clothing of the streets (asphalt concrete or cement concrete) and execution runtime layer based asphalt made with modified bitumen to prevent permanent deformation (due to temperature increase) and providing resistance to cracking (due to lower temperature );
- Reducing road transport, particularly freight traffic by combining with other modes of transport (rail, maritime, inland waterway, air), promotion of intermodal transport;
- Encourage alternative transport with reduced environmental impact;
- Improve traffic flow taxiways and effects of reducing fuel consumption and thus emissions of greenhouse gases;
- Limiting freight mass of transport means on certain sections with high exposure to population;
- Afforestation of areas affected by floods and landslides adjacent to communication lines.

#### 4.1.3. Energy efficiency and conservation / use of renewable natural resources

The resource consumption for the transport sector involves resources used for construction/modernization/rehabilitation of the transport sector (land areas, stones, sand, water, wood) and the resources used for the effective development of the transport activity.

Transport is a sector with a significant dependence on fossil fuels. Annual energy consumption in the transport sector has increased continuously during the period between 1990 and 2007 in EU countries. To achieve the European target of 60% reduction of CO<sub>2</sub> emissions by 2050 compared to 1990 is necessary to reduce oil consumption in the transport sector with about 70%. Currently, reliance on oil reaches a percentage of 96%<sup>52</sup>.

At the national level, during 2000-2011, the transport is placed on third place in the hierarchy of large energy consumers (tons oil equivalent), after domestic and industrial consumption. Thus, the road transport is the sector with the highest consumption of energy (in 2011 have been recorded a consumption of almost 86% of total consumption in the transport sector).

The national auto park has evolved rapidly during the period 1989-2010, compared to 1989, has increased the number of auto vehicles by 64% by the year 1995 with an average annual rate of 8.6% and 3.41 times till 2010, the average annual rate for the entire period 1989-2010 is 6%. The highest increase of the national auto park was registered during 1989-2010 when increased by 3.62 times with an average annual rate of 6.3%<sup>53</sup>.

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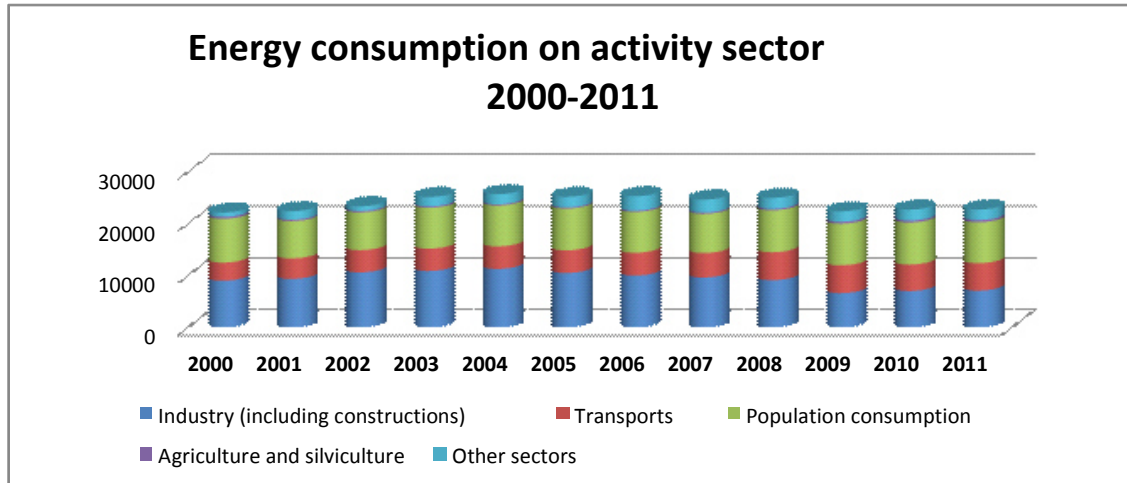
<sup>52</sup>European Agency for the Environment, Transport section - <http://www.eea.europa.eu/themes/transport/intro>

<sup>53</sup> General Transport Master Plan

Situation of the car sales market in Romania recorded an upward trend from 2005 to 2007-2008, followed by a collapse of the market in 2009-2010 (40% compared to the peak in 2007) during the financial crisis, leading to the years 2002-2003<sup>54</sup>.

Looking at the situation in terms of fuel type is observed an increase in the use of diesel cars from about 28% of total cars in 2005 to 44% in 2007, followed by stabilization around 33% in last years. In the year 2013, over 55% of the vehicles registered in the National Park car use gasoline as fuel.

At national level there were developed a series of programs to modernize the fleet of autonomous administration of public transport, which allowed primarily promoting electric vehicles, but also non-polluting alternative fuels<sup>55</sup>.



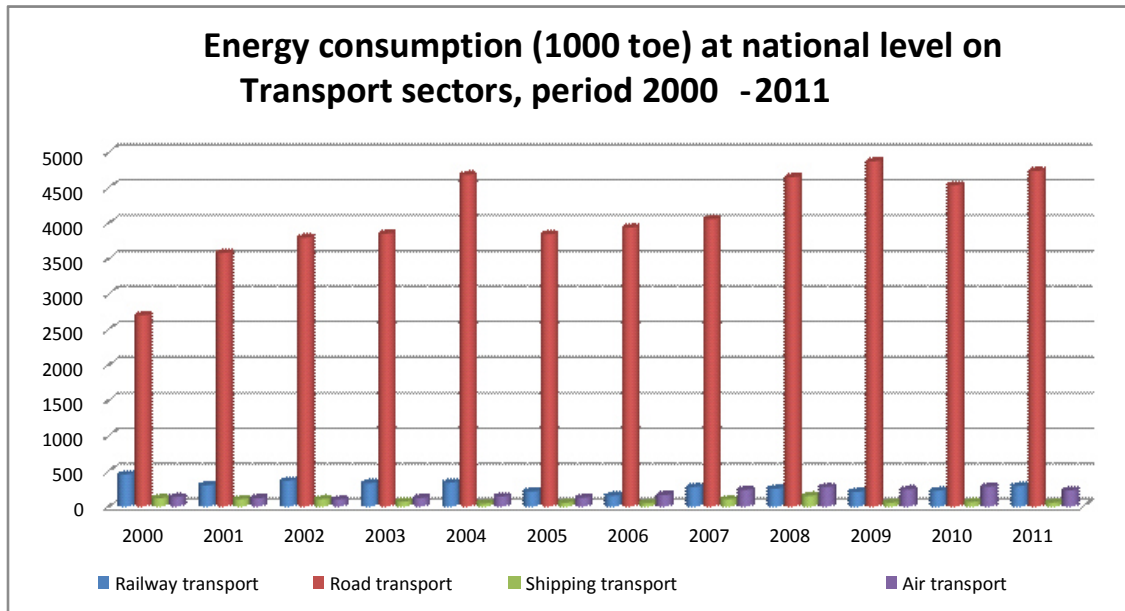
**Figure 4.10 Energy consumption for activity sectors – tones of equivalent oil (toe)<sup>56</sup>.**

<sup>54</sup> General Transport Master Plan

<sup>55</sup> Transport and environment, [http://www.anpm.ro/upload/16089\\_13%20TRANSPORTURI.pdf](http://www.anpm.ro/upload/16089_13%20TRANSPORTURI.pdf).

Programs such as CIVITAS "green alternatives for sustainable urban development of Europe" - Suceava, Ploiesti, Iasi, Craiova, "Reducing pollution with the use of public transport ecologic transport of alternative fuels" project COMMERCE (Creating Optimal Mobility Measures to Enable Reduced Commuter Emissions) - Bucharest

<sup>56</sup> Database - Statistical Indicators for sustainable development of the National Institute of Statistics available at [http://www.insse.ro/cms/files/Web\\_IDD\\_BD\\_ro/index.htm](http://www.insse.ro/cms/files/Web_IDD_BD_ro/index.htm)



**Figure 4.11 Energy consumption for each transport mode – 1000 tons equivalent oil (toe)<sup>59</sup>**

At the European level the renewable energy should be at least 10% of energy consumption in the transport sector by 2020. In Romania, the use of biofuels and other renewable fuels for transport is regulated by Government Decision no. 935 of 21 September 2011 on the promotion of biofuels and bio liquids as amended and supplemented.

To achieve the national targets for the share of energy from renewable sources used in transport sector, the fuel suppliers entered on the market only gasoline and diesel with a biofuel content as follows<sup>57</sup>:

- From the entry into force of this Decision, diesel fuel with a biofuel content of 5% by volume;
- From 1 January 2016, diesel fuel with a biofuel content of less than 6.5% by volume;
- From the entry into force of this Decision, gasoline biofuel content of 4% by volume and less than 5% by volume;
- From 1 January 2013, petrol with biofuel content of 5% by volume;
- From 1 January 2014, petrol with biofuel content of 4,5% by volume;
- From 1 January 2018 petrol with biofuel content of 8% by volume.

The transport infrastructure requires adaptation to the use of alternative fuels. At the national level does not exist sufficient supply points with such fuels or point which allow electrical charge.

The amount of biofuels used for transport sector in 2007-2011 is shown in the following table:

<sup>57</sup> According to GD. 1308 of 27 December 2012 and GD. 1121 of 18 December 2013 amending and supplementing Government Decision no. 935/2011 on the promotion of biofuels and bioliquids, and amending and supplementing Government Decision no. 928/2012 establishing the conditions for placing on the market of petrol and diesel and introducing a mechanism to monitor and reduce emissions of greenhouse gases

**Table 4.2 Quantity of biofuels use in transport sector during 2007-2011 (thousand toe - tons of oil equivalent)**

Year	2007	2008	2009	2010	2011
Biofuel quantity (thousand toe - tons of oil equivalent)	0.861	1.984	2.33	2.4	3.55

Source: Database - Statistical Indicators for sustainable development of the National Institute of Statistics available at [http://www.insse.ro/cms/files/Web\\_IDD\\_BD\\_ro/index.htm](http://www.insse.ro/cms/files/Web_IDD_BD_ro/index.htm)

#### 4.1.4. Waters

##### 4.1.4.1. Surface waters

Romania has a complex hydrographic network with a length of 79,567 km, which includes the following categories of waters:

- permanent rivers - 55,535 km, representing 70% of all water courses;
- perennial rivers - 23,370 km, representing 30% of all water courses;
- lakes - 117 with surface larger than 0.5 km<sup>2</sup>, of which 52% are in the Danube Delta;
- accumulations - 255 are larger than 0.5 km<sup>2</sup>;
- transitional waters - 781.37 km<sup>2</sup> (128 km marine transitional waters and Sinoe Lake);
- coastal waters - 571.8 km<sup>2</sup> (116 km).

Categories of the surface waters in Romania are represented in Figure 4.12.

In terms of the management of the water system, Romania has been divided into the following 11 river basins:

**Table 4.3 River basins in Romania**

No.crt	River basin	Surface (km <sup>2</sup> )
1.	Someș-Tisa	22.380
2.	Crișurile	17.860
3.	Mureș	28.310
4.	Banat	18.393
5.	Jiu	16.713
6.	Olt	24.050
7.	Argeș-Vedea	21.479
8.	Ialomița-Buzău	23.874
9.	Siret	28.116
10.	Prut-Bârlad	20.267
11.	Dobrogea-Litoral	20.079

The water quality and quantity management and implementation of national policy strategy is responsibility of the **National Administration "Romanian Waters and Water Basin Administration"**. From the information presented in the national report on the state of the

environment developed by the National Environmental Protection Agency, for 2012, the assessment of the environmental / ecological potential basins is as follows:

**Table 4.4 Evaluation of the ecological potential for each river basin (year 2012)**

River basin	Ecological state	Ecologic potential
<b>Tisa</b>	Natural ecological status of surface water bodies of the 16 monitored natural water bodies - rivers totaling 989 km, is as follows:  - 897 km (90.70%) present in good ecological status,  - ecological status.	The two heavily modified water bodies assessed - rivers totaling 104 km reached the quality on good ecological potential.
<b>Crișurile</b>	Natural ecological status of surface water bodies of the 55 bodies of water - rivers, amounting to a total of 1396.77 kilometers, is as follows:  - 955.75 kilometers (68.43%) were classified as good environmental status  - 441.02 kilometers (31.57%) in moderate ecological status.	Ecological potential of surface water bodies heavily modified - monitored rivers in the catchment area for the 8 Cris heavily modified water bodies - rivers, on a length of 258.66 km is as follows:  - 243.54 kilometers (94.15%) were classified as good ecological potential,  - 15.12 kilometers (5.85%) in moderate ecological potential.
<b>Argeș</b>	Natural ecological status of surface water bodies - rivers monitored Arges River Basin for the 51 natural water bodies - rivers over a length of 1576.59 km monitored are as follows:  -941.65 kilometers (59.73%) in good ecological status  -634.98 kilometers (40.27%) in moderate ecological status.	Ecological potential of surface water bodies heavily modified - monitored rivers - September heavily modified water bodies - rivers over a length of 311.26 km:  -52.50 km (16.87%) were classified as good ecological potential  -258.76 kilometers (83.13%) in moderate ecological potential.  The two artificial water bodies, representing a total of 24.66 km, falls in good ecological potential.
<b>Vedea</b>	For the 15 natural water bodies assessed - rivers, on a length of 819.33 km, the situation is as follows: 94.01 km (11.47%) in good ecological status, 692.93 km (84.57%) in moderate ecological status, 10.94 kilometers (1.34%) in poor ecological condition and 21.45 kilometers (2.62%) in poor ecological status.	The 3 heavily modified water bodies representing 96.02 kilometers were classified as moderate ecological potential.  1 artificial water body representing 5.04 km, which was within moderate ecological potential.
<b>Ialomița</b>	For the 25 assessed water bodies - rivers over a length of 1008.00 kilometers, of which the results showed that:  -364.00 kilometers (36.11%) in good ecological status  -644.00 kilometers (63.89%) in moderate ecological status.	In terms of ecological potential, the 2 heavily modified water bodies - rivers, over a length of 67.00 km were classified as moderate ecological potential.  The two artificial water bodies, with a total length of 12.1 km, were classified as moderate ecological potential.
<b>Mureș</b>	For the 51 water bodies evaluate-rivers, totaling 1927.32 kilometers, the	Were evaluated:

River basin	Ecological state	Ecologic potential
	<p>results are as follows:</p> <ul style="list-style-type: none"> <li>-1454.07 kilometers (75.45%) in good ecological status</li> <li>- 473.25 kilometers (24.55%) in moderate ecological status.</li> </ul>	<ul style="list-style-type: none"> <li>-48 heavily modified water bodies - rivers, amounting to a total of 1901.68 kilometers. for which the results are as follows: 1 1230.52 kilometers (64.71%) in good ecological potential; 671.16 kilometers (35.29%) in moderate ecological potential.</li> <li>- three artificial water bodies, amounting to a total of 105.94 km results are as follows: 22.31 km (21.06%) in good ecological potential; 83.64 km (78.94%) in moderate ecological potential.</li> </ul>
<b>Someș</b>	<p>For the 42 natural water bodies - rivers, totaling a number of 2394 km, results are as follows:</p> <ul style="list-style-type: none"> <li>-1340 kilometers (55.97%) were classified as good environmental status,</li> <li>-1033 kilometers (43.15%) in moderate ecological status</li> <li>-21 km (0.88%) were classified as poor ecological status.</li> </ul>	<p>Were evaluated five heavily modified water bodies - rivers totaling a number of 302 km. Results are:</p> <ul style="list-style-type: none"> <li>- 73 km (24.2%) were classified as good ecological potential</li> <li>-229 km (75.8%) in moderate ecological potential.</li> </ul>
<b>Aranca</b>	-	<p>It was rated a heavily modified water body (Aranca + tributaries), with a length of 126.82 km, water body was classified as moderate ecological potential class</p>
<b>Bega – Timiș – Caraș</b>	<p>Were evaluated 25 natural water bodies - rivers, totaling 1005.89 kilometers. results</p> <ul style="list-style-type: none"> <li>-882.86 kilometers (87.77%) have good ecological status</li> <li>-123.03 kilometers (12.23%) had moderate ecological status.</li> </ul>	<p>The 13 heavily modified water bodies assessed, amounting to a total of 478.91 km has the following main characteristics: 257.56 km (53.78%) had good ecological potential and 221.35 km (46,22%) had moderate ecological potential .</p> <p>Artificial water body assessed, with a length of 43.98 km, was classified as moderate ecological potential.</p>
<b>Nera – Cerna</b>	<p>All 8 natural water bodies - rivers, on a length of 493.78 km were classified as good environmental status.</p>	<p>The 3 heavily modified water bodies assessed, having in total a length of 45.51 km, has the following distribution: 39.63 km (87.08%) in good ecological potential and 5.88 km (12.92%) in moderate ecological potential.</p>
<b>Jiu</b>	<p>The 41 natural water bodies - rivers, having a total length of 1293.7 kilometers which have been evaluated following distribution in relation to ecological status, were classified as: 915.1 km (70.74%) have good ecological status and 378.6 km (29.26%) have moderate ecological status.</p>	<p>The only heavily modified water body category rivers, with a length of 9 km, was classified within moderate ecological potential.</p>

River basin		Ecological state	Ecologic potential
<b>Olt</b>		For the 73 bodies of water - rivers monitored, with a total length of 2205 km, the division in relation to ecological status is as follows: 1553 km (70.43%) have good ecological status and 652 km (29.57%) have moderate ecological status.	For the 12 heavily modified water bodies in the category of rivers monitored with a total length of 533.5 km length, the distribution is as follows: 6 km (1.12%) in the maximum ecological potential, 175.5 km (32.89 %) in good ecological potential and 352 km (65.98%) in moderate ecological potential.  The two artificial water with a total length of 42 km, after the monitoring activities in 2012 were classified both in moderate ecological potential.
<b>Siret</b>	<b>Siret Hydrographic basin</b>	For the 51 rivers assessed with a length of over 4160.15 kilometers, with respect to the distribution of ecological status, were classified as follows: 3426.31 kilometers (82.36%) have good ecological status and 733.84 km (17.64%) were moderate ecological status.	For the 5 <sup>th</sup> heavily modified water bodies from the assessed rivers category, with a total length of 120.56 km, the distribution is as follows: 18.17 km (15.08%) have good ecological potential and 102.39 km (84.92 %) have moderate ecological potential.
	<b>Subdivision of the Hydrographic basin of Bârlad River</b>	Were assessed a total of six natural water bodies - rivers over a length of 374.8 kilometers. The monitoring results are as follows: 171.48 km (45.75%) have good environmental status and 203.33 km (54.25%) had moderate ecological status.	The 2 heavily modified water bodies monitored - rivers, with a total a length of 214.6 kilometers were classified as moderate ecological potential.
	<b>Subdivision of the Hydrographic basin of Buzău</b>	Were evaluated 14 water bodies - rivers with a total length of 585.5 kilometers. Ecological Status is: 244.5 km (41.76%) have good environmental status and 341.0 km (58.23%) have moderate ecological status.	The 2 heavily modified water bodies monitored - rivers have a length of 47 km. All were within 47 km in moderate potential.
<b>Prut</b>		Were evaluated 8 natural water bodies - rivers, totaling 498.05 kilometers. Distribution on the environmental status is as follows: 221.14 km (44.40%) have good environmental status and 276.91 km (55.60%) have moderate ecological status.	All 6 evaluated heavily modified water bodies - rivers, on a length of 628.12 km - were classified as moderate ecological potential.
<b>Dunăre</b>		After the evaluation of the 54 water bodies - rivers (water bodies located outside the main course of the Danube and the 3 main branches), about 715 km have been monitored, resulting 215 km (30.1%) which have ecological status good and 500 km (69.9%) with moderate ecological status.	The approximately 242 km (surface water bodies - heavily modified and artificial) monitored and evaluated in relation to ecological potential were classified as moderate ecological potential.
<b>Littoral</b>		The 12 evaluate natural water bodies - rivers, totaling 295.6 km has the following distribution in relation to ecological status: 15.6 km (5.28%) were classified as good environmental status, and 280 km (94.72 %) were	Were assessed two artificial water bodies - rivers, with a total length of 64.41 km. They have the following distribution in relation to ecological potential: 9.60 km (14.9%) have good ecological potential and 54.81 km (85.1%) have moderate



River basin	Ecological state	Ecologic potential
	classified as moderate ecological status	ecological potential.

In 2012, according to the same report by NEPA, ranking first in business areas where there were large volumes of untreated wastewater was: the collection and treatment of urban waste water. The largest share in the volume of inadequately treated wastewater has the electric and thermic energy generation sector (approx. 53% of the total volume of water treated improperly), followed by the collection and treatment of waste water (approx. 35% the total volume of water treated poorly).

*Of the total volume of wastewater, the transport sector is responsible for a percentage of 0.01%.<sup>58</sup>*

The intensity of the impact of pollution sources on natural receptors (surface water) depends on two main characteristics of wastewater: effluent flow and pollutant loading degree. Regarding the quantitative analysis of pollutants discharged in 2012, expressed by a set of physico-chemical, for the transport activity, the situation is as follows<sup>59</sup>:

- Suspended solids: 53.807716 tons (0.00028% of the total quantity of pollutants discharged in 2012);
- CBO5: 55.320720 tons (0.00086% of the total quantity of pollutants discharged in 2012);
- CCO-Cr: 129.956001 tons (0.00055% of the total quantity of pollutants discharged in 2012);
- Total nitrogen: 1.231490 tons (0.00006% of the total quantity of pollutants discharged in 2012);
- Total phosphorus: 2.524948 tons (0.00088% of the total quantity of pollutants discharged in 2012);
- Nitrogen: 0.082715 tons (0.00012% of the total amount of pollutants discharged in 2012);
- Nitrogen: 0.602207 tons (0.00004% of the total amount of pollutants discharged in 2012);
- Ammonia: 23.856145 tons (0.00121% total quantity of pollutants discharged in 2012);
- Filterable residue: 391.656606 tons (0.00029% of the total amount of pollutants discharged in 2012);
- Chlorides: 2.359631 tons (0.00001% of the total amount of pollutants discharged in 2012);
- Tone: 18.423813 tons (0.00009% of the total amount of pollutants discharged in 2012);
- Calcium: 5.34532 tons (0.00003% of the total amount of pollutants discharged in 2012);
- Magnesium: 0.679782 tons (0.00001% of the total amount of pollutants discharged in 2012);

<sup>58</sup> Summary of water quality in Romania in 2012 (extract), National Administration "Romanian Waters" <http://www.rowater.ro/Lists/Sinteza%20de%20calitate%20a%20apelor/Attachments/11/Sinteza%20PCA%202012%20extras%2028.10.pdf>

<sup>59</sup> Summary of water quality in Romania in 2012 (extract), National Administration "Romanian Waters" <http://www.rowater.ro/Lists/Sinteza%20de%20calitate%20a%20apelor/Attachments/11/Sinteza%20PCA%202012%20extras%2028.10.pdf>



- Synthetic Detergents: 1.418589 tons (0.00004% of the total amount of pollutants discharged in 2012);
- Extractable matter: 17.296089 tons (0.00116% of the total amount of pollutants discharged in 2012);
- Petroleum products; 0.032344 tons (0.00002% of the total amount of pollutants discharged in 2012).

### ***The transport sector and water quality***

*Transport sector's contribution to the total quantity of pollutants discharged is very small compared with the rest of economic activities.*

There is no detailed information on the contribution of transport, transport sector, the pollution of surface. Information on quantities of pollutants discharged in 2012, expressed through a set of physico-chemical transport activity were presented in the previous paragraphs.

The existing road and rail route crosses a large number of surface watercourses (see. Figure 4.12). At national level, information is not available to perform an analysis on how the activity of transport (transport modes) affect water quality, for each stream was in direct relation to transport infrastructure.

### **The activities that may cause pollution of surface associated transport sector are:**

- Hydraulic works (dredging, drainage, etc.) That can cause changes in hydrology and morphology;
- Various accidents occurring in the freight sector (loss of pollutants);
- Uncontrolled discharge of pollutants into water (rainwater contaminated with petroleum products, various substances used for snow removal)
- Navigation and work to ensure optimal conditions for navigation;
- Collecting rainwater contaminated improper oil on the roads.
- Emissions from traffic contribute to acidification atmosphere with direct and / or indirect effects on all components of the environment, including water quality.
- Building bridges / viaducts to ensure passage of roads, railways across the water can cause morphological changes or corrections require beds. Morphological characteristics of watercourses conditional status and ecological functioning aquatic environments.

### **Waterways in Romania**

The Danube River is the most important water course from Romania, representing also a source of water for different use, food source (fish fauna), hydroelectric energy source - Porțile de Fier I and II.

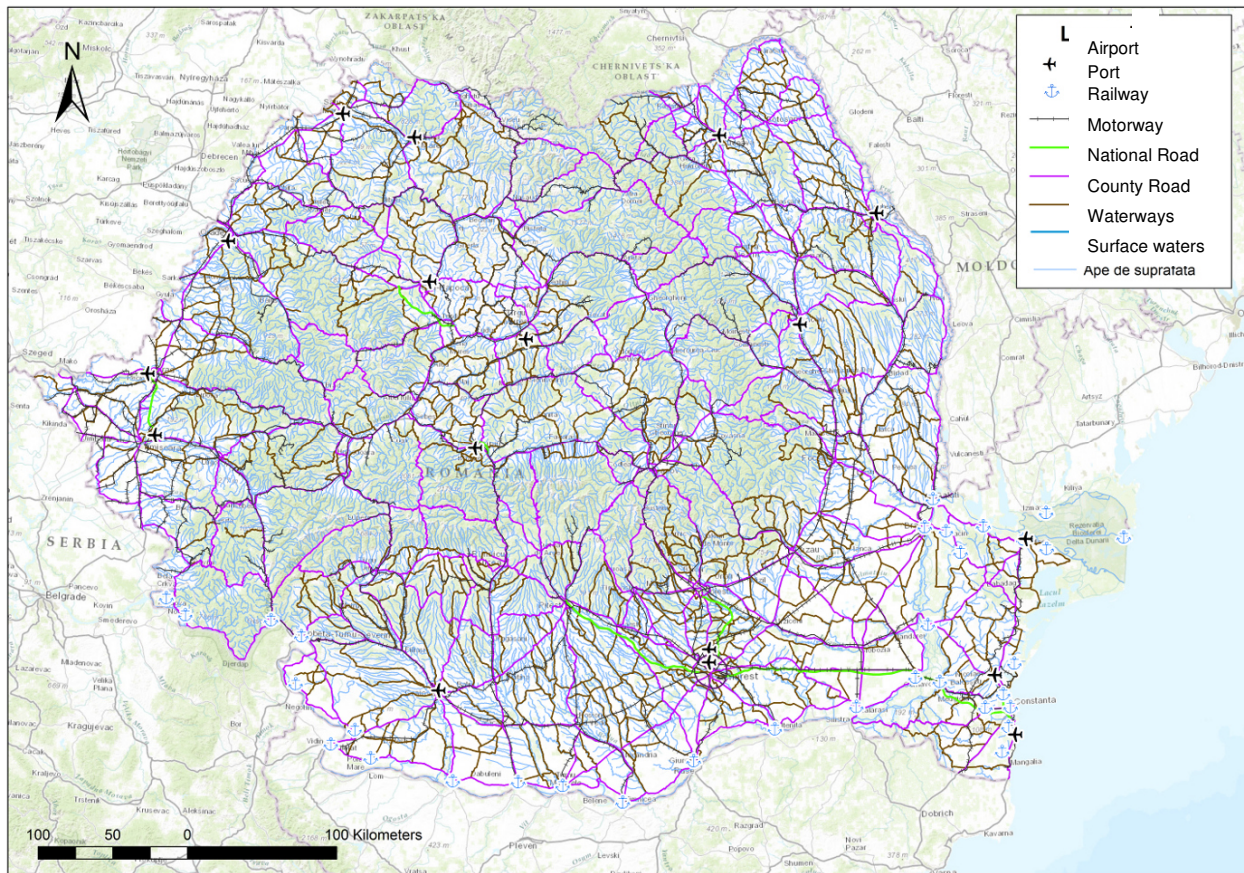
The waterway network has a total length of about 1.779 km, of which 1.075 km international Danube sector, 524 km navigable branches of the Danube, 91 km artificial navigation channels (Danube – Black Sea and Porta Alba – Midia Navodari).

The Danube waterway is divided into the Danube river (from entering on the country territory to Tulcea) and maritime Danube (from Tulcea to the shedding of the Black Sea). The minimum depth for navigation to be conducted safely on the Danube river is about 2.5 m, and for the maritime

Danube is about 7 m. Sulina Channel provides maritime traffic (25,000 DWT ships) from the Black Sea to the Danube, being the link between maritime Danube and Danube river<sup>60</sup>.

The Bega Channel is the only navigable route in Romania, but navigation on the channel was closed for passengers in 1967 and for freight in 1960. On this channel (sector Timisoara - Sanmihaiul Roman) currently are allowed only leisure craft activities.

The current regime of navigation on the Danube is regulated by the 1948 Belgrade Convention ratified by Decree no. 298 of 30 October 1948. Navigation on the Lower Danube and in the Iron Gates shall be made in accordance with rules set by the Administrations navigation areas indicated. In other sectors of the Danube Navigation is performed in accordance with rules established by the respective Danubian countries whose territory is crossed by the Danube and the Danube banks in areas belonging to two different states, according to the rules agreed between these states.



**Figure 4.12 Transport infrastructure in relation with the hydrographic network of Romania  
(surface waters)**

The rules of navigation on the Romanian Danube sector between 1075 km and exit into the sea, was developed based on the fundamental provisions regarding navigation on the Danube Commission developed and approved by OMT no. 859 / 07.06.2013. This regulation includes Chapter 10 Special provisions for preventing pollution of the Danube and eliminate waste on board.

<sup>60</sup> Management Plan of the Danube Delta, hydrographic Doborjea space and coastal waters

The quality of Danube River is influenced by the activities type which is being developed on Danube and also with the quality of waters which flows in Danube.

The Danube River runs for approximately 37.7% of its length on the territory of Romania and represents the collector, respectively the emissary of all discharges from the upstream areas to the Black Sea, affecting water quality of the Danube Delta and also the Black Sea coast area.

Most river ports in Romania are on the course of the Danube river. On the course of Danube are a total of 30 river ports, including 6 ports of the TEN-T network, of which currently about 10 operates a very little goods quantity. Some of these ports are not properly equipped to handle significant volumes of goods. Lack of proper facilities could increase the risk of accidents with effects on water quality.

On the Danube river, which is administrated by WMB (Water Management Basin) Jiu and WMB Dobrogea - Littoral, were identified and evaluated a total of 7 bodies of water (4 bodies of water on the main course and 3 bodies on the 3 arms, all with a total monitored length of 1,260 km). The 7 water bodies have been designated as being: 2 natural water bodies and 5 heavily modified water bodies. The evaluation of the data obtained revealed that the entire length monitored was classified as good ecological status or good ecological potential<sup>61</sup>.

The fairway sector has deficiencies both in terms of breadth and its depth. Variable water depth leads to hinder navigation on the Danube. A total of 7 sections of the Danube are regularly in standard 2.5 m depth needed for "international waterway", as defined by the United Nations Economic Commission in accordance with the recommendations of the Danube Commission. One of the most problematic areas is the Zimnicea, where a section of the 150 km trip can take between 6 hours and 2 days (due to the need to reorganize and doubling the race convoy tug in terms of reduced depths navigation). Deep problems can create difficulties and transport safety issues, increasing the risk of accidents.

The crossing points on Danube river, for the Romanian sector, are as follows:

- Railway and road crossing points:
  - Giurgiu – Ruse bridge, crossing point of the border Romania – Bulgaria (road and railway), Fetesti – Cernavoda bridges (road and railway) Calafat – Vidin bridge (road and railway), Giurgeni – Vadul Oii bridge (road and railway) and Portile de Fier I dam (road), crossing point Romania – Serbia.
- Ferry crossings:
  - At Moldova Noua, Svinita and Orsova at the crossing border between Romania and Serbia, at Calafat, Bechet, Turnu Magurele, Giurgiu, Oltenita and Calarasi, between Romania and Bulgaria and on Romania territory: at Braila, Galati and Tulcea.

Navigation activity can contribute to water pollution of the Danube in the following situations: accidental spillage during the loading and unloading of goods, accidental spillage during refueling maneuvers for ships, various accidents may be involved during transport or stationary vessels port (collisions with other vessels, fires / explosions on board, technical failures that can lead to failure, cracking vessel, etc.)

The competent authorities of the Danube countries are having rights and obligations on the implementation of the requirements for pollution prevention activity Danube navigation. Provisions to prevent pollution of the Danube are treated in Chapter II of the Danube Commission's recommendations.

Presently it has been observed a slightly improvement of the water quality of the coastal area, the main cause being the decrease after 1990 of the economic activity from the central and east-European countries from the Danube Basin and also the modernization of the waste water

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<sup>61</sup> National report regarding the state of the environment - Chapter 3, 2012 NEPA

treatment facilities of the urban conglomerations. However, the ecosystems have never achieved the improvement registered in 1973, which is considered to be reference year.

The impact on water caused by shipping sector is given mainly by the accidental leakages that occur during the loading and unloading, transport and handling of petroleum products and petrochemicals.

In the following table are presented: the accidents with minor effects which have been registered in the seaports and on Danube Channel Poarta Albă - Midia Năvodari, during 2011 – 2012, the cause and the measures that have been implemented at that time. During the mentioned period, no major environmental incidents have been registered.

**Table 4.5 Accidental pollution registered during 2011-2012**

Location	Source and pollutant substance	Incident cause	Measures
<b>2011</b>			
Port of Constanta, Dana 72 between the barge and the quay	Barge Patrick 1, Serbia pavilion – oil waste	Training slop of water tanker barge deck Patrick 1	Making a pollution control dam and spreading dispersants by the Oil Terminal SA
Port of Constanta, breakwater 30 sqm	Şalupa Olimp - hydrocarbons	Olympus sinking ship after collision with ship Gorkhan Kiran	Remediation measures applied by CN APMC SA
Port of Mangalia	Unknown sources - petroleum products	Accidental oil leakages - the presence of hydrocarbon thin films (iridescent) on the surface of the water	Constanta Maritime Coordination Centre has decided to send an intervention ARSVOM ships, but because of weather interference the intervention has not been accomplished.
<b>2012</b>			
Channel Danube Poarta Albă–Midia Năvodari, km 24+600	Oil products from SC CONPET SA	The presence of seepage of petroleum products	Representatives of CNACN SC CONPET SA and SA have taken steps to reduce or eliminate the effects of dams by installing anti-pollution and dust spread absorbent for water remediation.
CDMN upstream of the flood gate Cernavoda	Oil products – unknown source	Accidental spills of petroleum products - the presence of hydrocarbon thin films (iridescent) surface water	Neutralization upstream of the flooding gate by using absorbent powder.
CPAMN, km 19		Oil stains	Intervention with biodegradable absorbent substances (80 kg) to neutralize the iridescent.

*Reference: Annual Report 2011 State of the Environment developed by NEPA, and Annual Report on the state of the environment in 2011 and 2012 developed by EPA Constanta.*

#### 4.1.4.2. Underground waters

The transport sector is not directly related to changes in qualitative and quantitative status of groundwater.

In Romania have been identified 142 bodies of groundwater, of which 17 are transboundary.

The delineation of groundwater bodies was made only for areas where there are significant aquifers for water supply, i.e. exploitable flow higher than 10 cm / day. In the remaining area, even if local conditions underground water storage exists, there are not considered in water bodies, according to the Framework Directive 2000/60 / EC.

The assessment of chemical status of groundwater bodies is performed according to the Water Law no.107/1996 as amended and supplemented, HG no.53 / 2009 on the protection of groundwater against pollution and deterioration and Ministerial Order no.137 / 2009 which sets threshold values for groundwater bodies. For groundwater, according to preliminary methodology for assessing the chemical status of groundwater bodies developed by INHGA Bucharest, the following states are setting the quality: good chemical status, chemical status and poor local poor condition.

In Romania, in 2012, of the total 142 existing groundwater bodies, 130 bodies were monitored. Only two groundwater bodies could not be monitored because they were in inaccessible areas with few wells without water influx.

In order to evaluate the annual preliminary chemical status, in 1307 have been established a number of monitoring points (wells, springs, drains, wells):

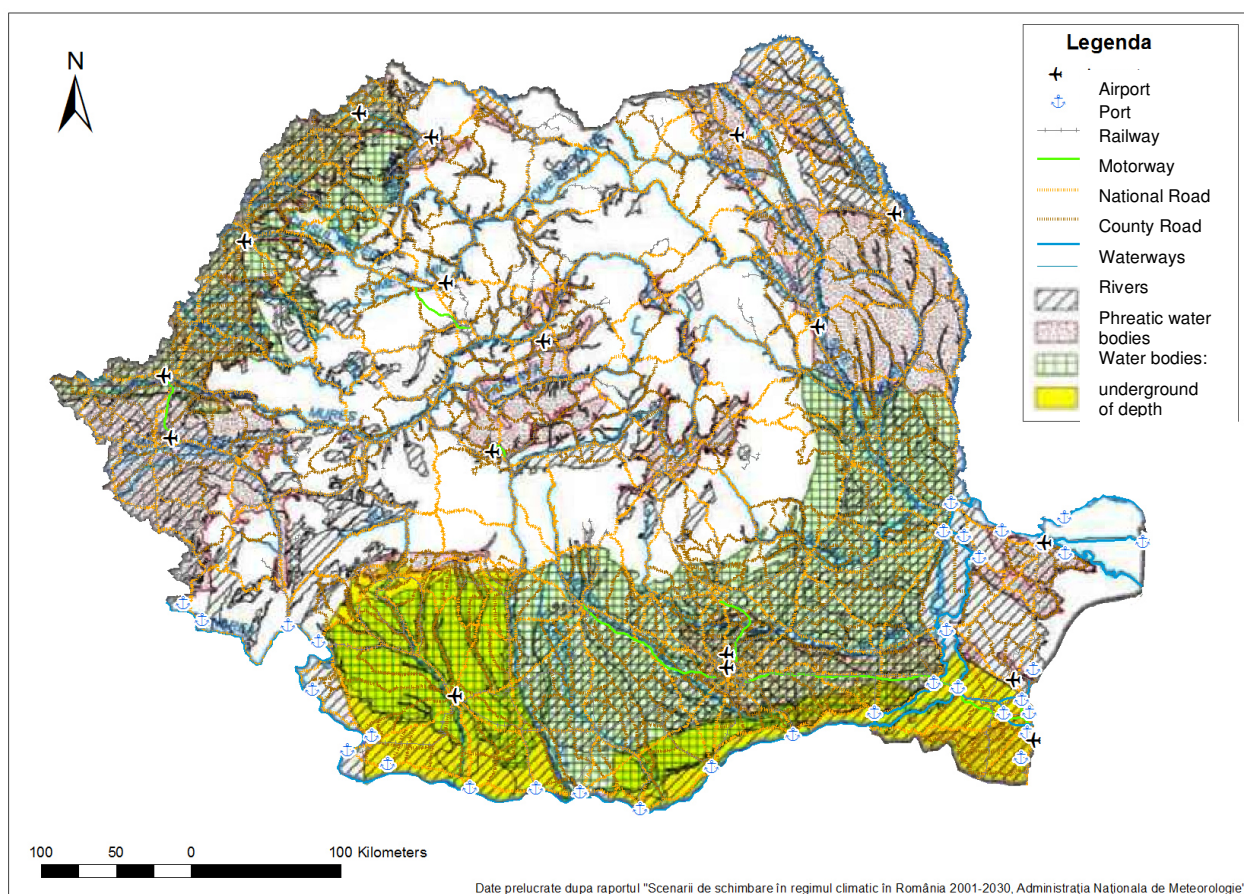
- 1119 monitoring points belong to the national network of hydrogeology:
  - 1050 drillings;
  - 66 springs;
  - 3 drains;
  - 25 wells for tracking nutrient pollution;
- 163 wells / operating springs of drinking water, belonging to third parties and to track pollution around large industrial sites located
- Following the assessment of the chemical status, groundwater bodies were presented as follows:
  - 122 bodies of underground water are in good chemical status (approx. 87%);
  - 18 bodies of groundwater chemical status is low (approx. 13%).

From the analysis of data obtained from monitoring the physical and chemical parameters from the drillings located in aquifers is observed that most exceedances are recorded for nitrates, nitrites isolated, ammonia, chlorides, sulfates and one exceeding for the Pb and phosphates. Regarding the contamination of groundwater with nitrates, exceeding the permissible concentration for this indicator were recorded for 181 wells representing 14.38% of the monitored wells.<sup>62</sup>

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<sup>62</sup> Summary of water quality in Romania in 2012 (extract), National Administration "Romanian Waters"  
<http://www.rowater.ro/Lists/Sinteza%20de%20calitate%20a%20apelor/Attachments/11/Sinteza%20PCA%202012%20extras%2028.10.pdf>





**Figure 4.13 Groundwater bodies and transport infrastructure**

There is no information about the contribution of transport to groundwater pollution. It is known that groundwater can be indirectly affected by soil pollution caused by accidents involving freight transport or during repairs and maintenance interventions.

Groundwater quality is regularly monitored by analysis of groundwater sampled by drillings located in the centers located in the regional railway operating, maintenance and repair, area airports and ports under environmental permits held by these objectives.

#### 4.1.5. Soil and underground

To assess the current status and influence on soil transport sector were pursued following issues: land use processes affecting soil quality and critical areas for soil degradation.

In the year 2012, Romania land use categories were divided as follows:

**Table 4.6 Land use categories in Romania – year 2012**

Land use	Surface	
	mii ha	%
Agricultural lands	14635.5	61,39
Forest and other lands with forestry vegetation, from which:	6757.6	28,35
Constructions	728.3	3.06
Roads and railways	388.8	1,63
Waters and ponds	833.6	3,50
Other surfaces (unproductive lands)	495.3	2.07
<b>Total</b>	<b>23.839,1</b>	<b>100</b>

Source: Annual Report 2012 State of the Environment, NEPA

It can be seen that the largest share is for the agricultural land (61.39%), a situation unchanged from previous years. The roads and railways occupy about 1.63% of the total area of the country.

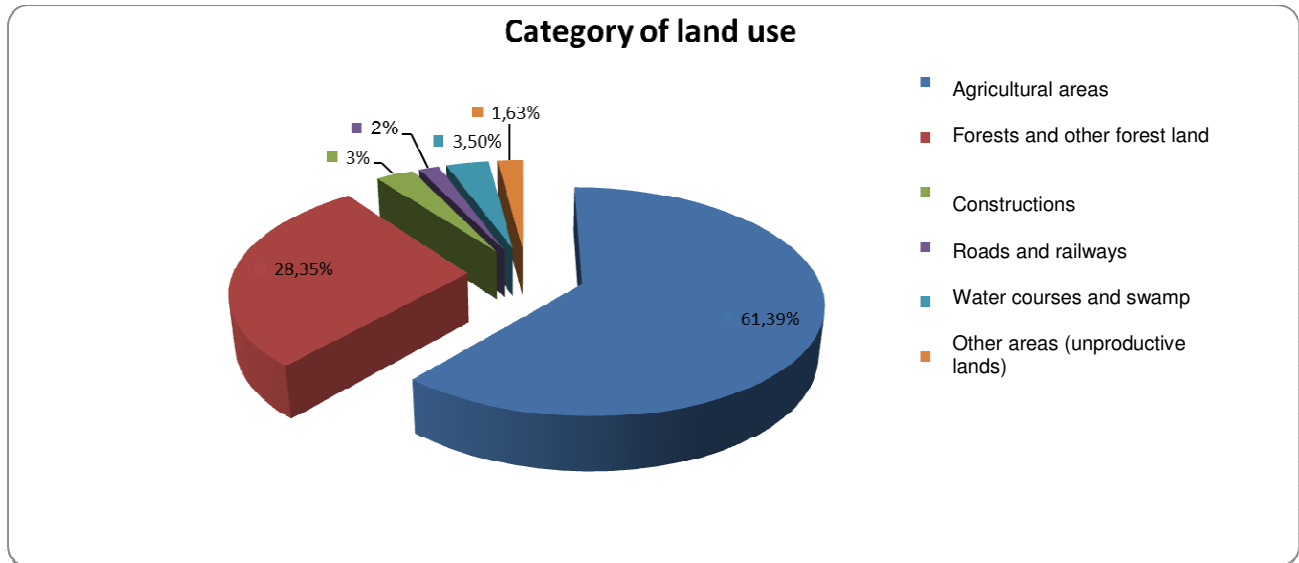


Figure 4.14 The distribution of land-use categories

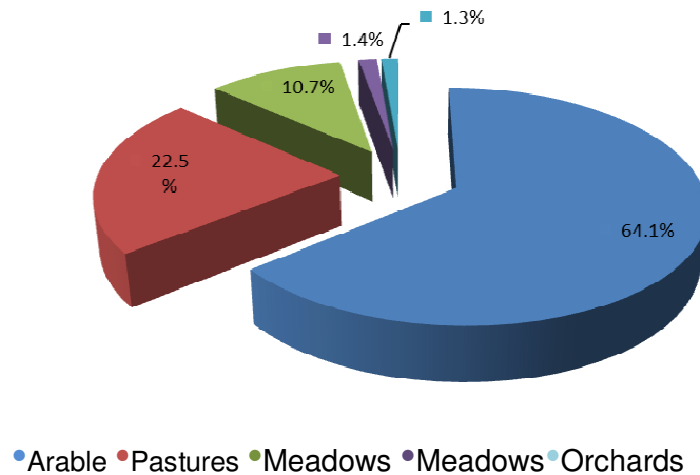
Regarding the distribution of land on types of use, the situation is as follows:

Table 4.7 Distribution of agricultural land-use types in 2012

Land use	Surface	
	Thousands ha	%
<b>Agricultural</b>	<b>14.590,9</b>	<b>100</b>
Arable	9352.3	64,1
Pastures	3277.7	22,5
Rough	1553,5	10,7
vineyards	211.3	1,4
orchards	196.1	1,3

Ref: State of the Environment Annual Report 2012, NEPA

### Distribution of agricultural land by use categories



**Figure 4.15 Distribution of agricultural land-use types in 2012**

At the end of 2012, private farm ownership represents about 93.72 % of the total land area (private property of the state, territorial administrative units, legal entities and individuals). It was found that over the past 82 years has experienced a notable decrease in the area of arable land per capita. The main factor is the increasing demographic index.

The transport sector can contribute to soil pollution by accidental spills of petroleum products and chemicals, the use of anti-freeze products / anti -snow products used on road surfaces in winter, the air emissions by rainwater that washes tread.

The development of transport infrastructure would lead to occupation of land areas and changes in their category of use. Currently, as mentioned in the previous paragraphs roads and railways occupies about 1.63% of the total area of the country. The following figure shows the current state of transport infrastructure versus land use category.

The future developments in transport infrastructure should take into account the efficient and sustainable use of the land.



### Land use – Corine Land cover2006

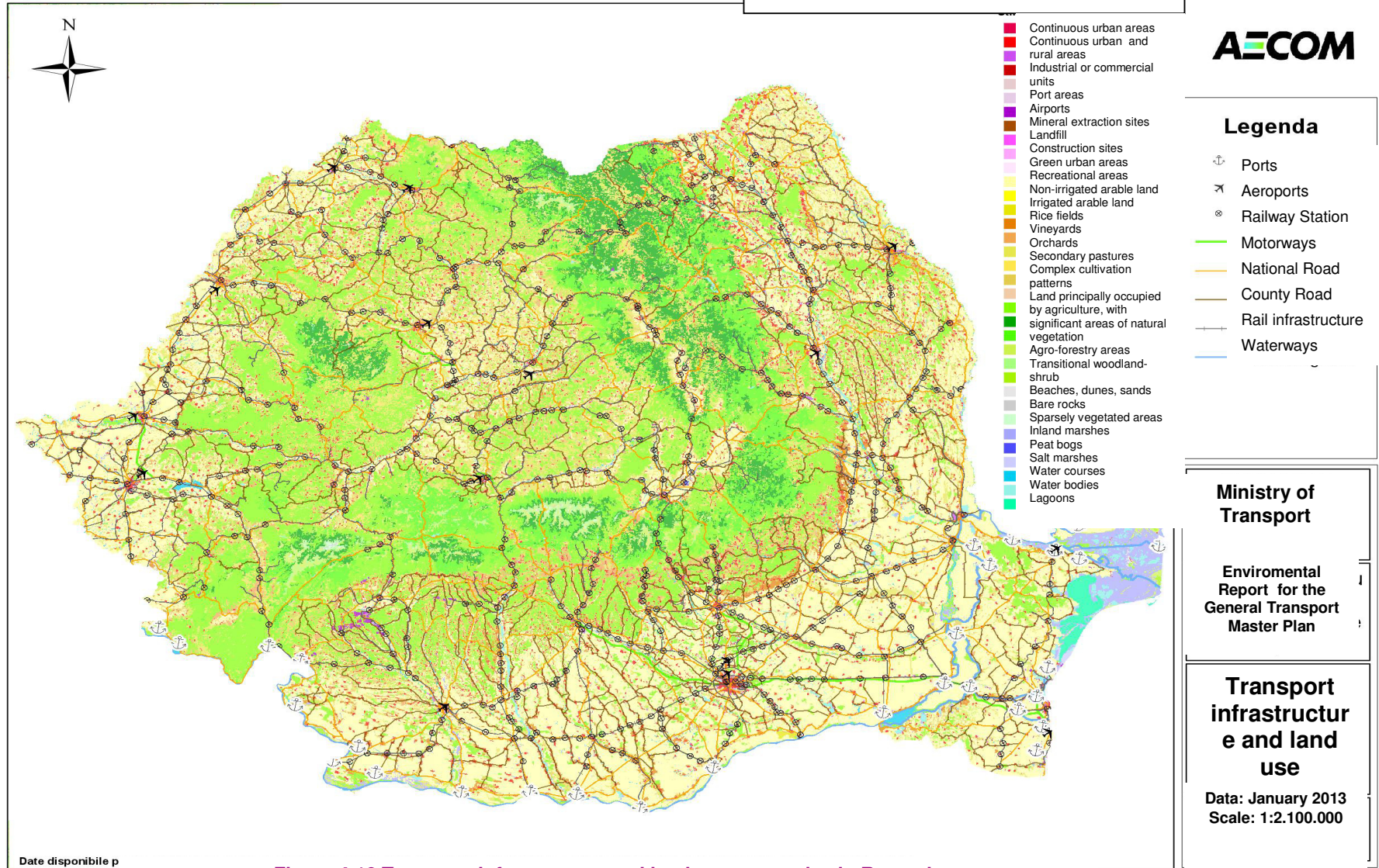


Figure 4.16 Transport infrastructure and land use categories in Romania

*No information on the contribution of transport activity or work for construction / modernization / expansion of transport infrastructure soil pollution. The records in the national soil quality is affected mainly by natural processes / or anthropogenic.*

Construction works for new transport corridors, modernization / rehabilitation of existing ones can lead to soil erosion when not taken / implemented optimal measures to prevent / reduce erosion. Soil erosion can be increased deforestation and forest works sometimes inevitable development of transport infrastructure.

Nationally, wind erosion occurs on about 0.4 million hectares, the risk of extension, knowing that in recent years have cleared some forests and protective curtains in areas with sandy soils susceptible to this degradation process.

Emissions to the atmosphere (such as sulfur dioxide, nitrogen oxides and ammonia) can lead to acidification of the soil. In the year 2011, transport is among the main sources of NO<sub>x</sub> emissions. Among the modes of transport, road transport has the highest contribution to NO<sub>x</sub> emissions and rail transport has the highest contribution to SO<sub>x</sub> emissions (according to national GHG inventory, in 2011, for the transport sector). The effect of these gases is soil acidification and pollution of surface water, impacts on ecosystems and erosion of buildings and archaeological sites and cultural degradation.

It is known that the embankments of CFR railway stations may be contaminated with petroleum products with risk of infiltration by aquifers (cases brought in discussion by contractors during the rehabilitation of railways). In the railway depots there are areas contaminated with hydrocarbons that will require remediation.

Examples of events associated to transport activity leading to local pollution of soil, surface and measures taken to remedy low soil contamination:

- In the area of Bucharest Branch CREIR thefts occurred from the tank cars containing petroleum products:
  - In 2011, between the railway station CF Bucharest Triaj and Baneasa, the soil polluted with petroleum hydrocarbons accidentally required pickling and treatment interventions for the embankment over an area of 3.8 sq.
  - In 2012 the soil accidentally polluted with petroleum hydrocarbons required for pickling and treatment interventions embankment on an area of approx. 3000 sq.

### **Critical areas related to soil degradation**

Nationally wide, the damaged soil characteristics and functions, i.e. their ability to change the bio productivity capacity is caused by various processes: natural processes (climate, landform, morphological) anthropogenic processes (agriculture, industry, transport, etc.), factors that can act both separately and synergistically:

- Drought - 7.1 million ha are affected by drought;
- Periodic excess soil moisture affects about 3.8 million ha. Periodically are flooded a number of blocks in the dam areas with old and inefficient areas due to changes in drainage system of watercourses (particularly the smallest;
- Water erosion is present on 6.3 million ha, with landslides (about 0.7 million ha), causing soil loss up to 41.5 t / ha / year;
- Wind erosion occurs on about 0.4 million hectares, with risk of extension due to massive deforestation in recent years;
- Soil salting affects almost 0.6 million ha, with some worsening trend in the irrigated or drained and irrational exploitation;

- Deterioration of soil structure and compaction secondary (plow sole) occurs on about 6.5 million ha; primary aggregation is present on about 2 million hectares of arable land and tend the soil surface crust formation on about 2.3 million ha. The largest areas are in the West (32.4%), Northeast (28.5%), South-Muntenia (14.7%) and Central (12.2%);
- Status of the agrochemical stage, analyzed for 66% of the agricultural land, presents the following negative aspects:
  - a strong and moderate acidity of the soil on about 3.4 million ha of agricultural land and moderate-strong alkalinity 0.2 million ha of agricultural land;
  - assurance poor to very poor soil mobile phosphorus on about 6.3 million ha of agricultural land;
  - a poor soil providing mobile potassium on about 0.8 million ha of agricultural land;
  - ensuring a low soil nitrogen on about 5.1 million hectares of agricultural land;
  - ensuring a very low to low soil humus on about 7.5 million ha of agricultural land;
  - a deficiency of micronutrients on large areas, especially zinc deficiency, strongly felt the maize crop on about 1.5 million ha.

At national level, the main types of pollution affecting soil quality are:

- Processes of pollution caused by industrial and agricultural activities - affects an area of 410 121 ha of land;
- Slope processes and similar processes affecting an area of 4,939,491 ha of land;
- Processes natural and / or anthropogenic (agriculture, industry, transport, etc.) affecting an area of 39,811,883 hectares ground.

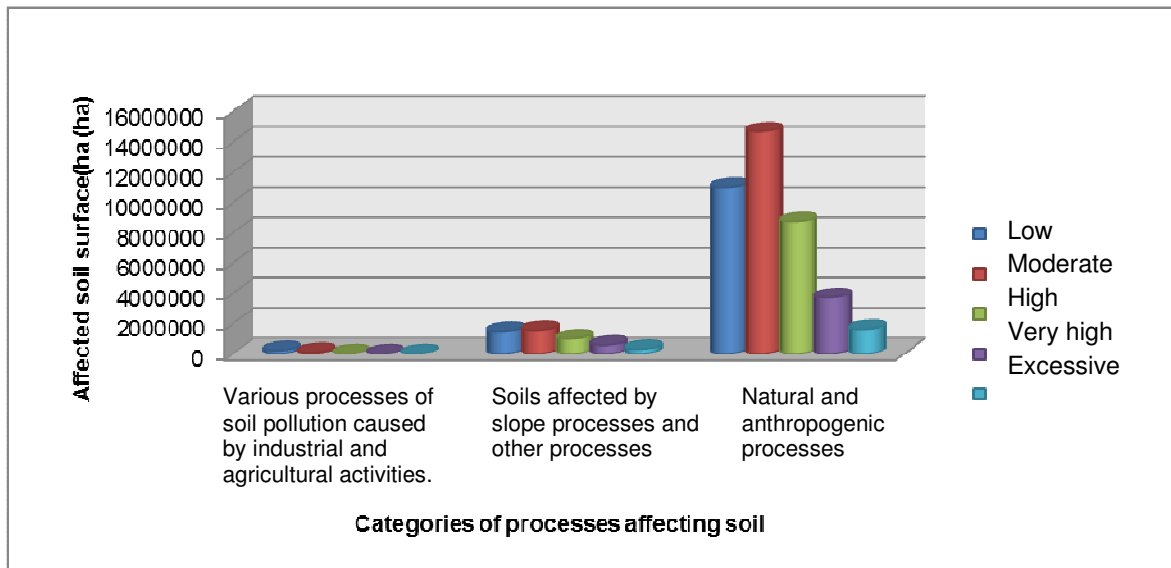
Physico-chemical and chemical pollution of the soil affects about 0.9 million hectares; very strong aggressive effects on soil causing pollution by heavy metals (Cu, Pb, Zn, Cd) and sulfur dioxide. In total, pollution substances carried by wind affects 0.363 million ha.

Table 4.8 Types of pollution affecting soil quality

Processes general title		Code	Surface (ha) and degree of damage					
			<i>week</i>	<i>moderate</i>	<i>strong</i>	<i>Very strong</i>	<i>excessive</i>	<i>Total</i>
I	Processes of diverse soil pollution generated by industrial and agricultural activities	1. Pollution by excavating work day (opencast mining, gravel pits, quarries, etc.)	2	16	255	519	2364	24432
		2. Scrapped soil, dumps, tailings ponds, the flotation tailings deposits, deposits of garbage, etc.	247	63	236	320	5773	6639
		3. Waste and inorganic residues (mineral, inorganic materials, including metals, salts, acids, bases) generated by the industry (including mining)	10	217	207	50	360	844
		4. Air substances	215737	99494	29436	1803	1615	364348
		5. Radioactive Materials		500			66	566
		6. Waste and organic waste generated by food and light industry and other industries	13	19	12	17	287	348
		7. Waste, agricultural and forestry waste	37	65	90	642	306	114
		8. Animal Manure	2883	993	363	265	469	4973
		9. Human Manure		689	11		33	733
		17. Pesticides	1058	650	224	77	67	2076
		18. Pathogens contaminants		505			117	617
		19. Saltwater (from oil extraction)	952	497	408	205	592	2654
		20. Petroleum Products		473	248	5	25	751
		<b>TOTAL I</b>	<b>220939</b>	<b>104176</b>	<b>3149</b>	<b>2013</b>	<b>3335</b>	<b>410121</b>
II	Soils affected by slope processes and other processes	10. Surface erosion, depth, landslides	944763	1013854	74942	45415	210729	3372916
		15. Primary Compaction and / or secondary	543371	544556	251268	125555	88526	1553276
		16. Pollution by sedimentation generated by erosion products (warping)	4088	2389	4808	1178	836	13299
		<b>TOTAL II</b>	<b>1492222</b>	<b>1560799</b>	<b>1005496</b>	<b>580883</b>	<b>300091</b>	<b>4939491</b>
III	Soils affected by natural	11. Salinity (salt and / or alkali)	264163	80639	52488	36867	50678	484835

Processes general title		Code	Surface (ha) and degree of damage					
			<i>week</i>	<i>moderate</i>	<i>strong</i>	<i>Very strong</i>	<i>excessive</i>	<i>Total</i>
processes and / or anthropogenic activities (agriculture, industry, transport etc.)	12. Acidic Soils	1766295	1926886	716794	186023	18132	4614130	
	13. Water Excess	640738	1075063	420208	199479	185785	2521273	
	14. Excess or deficiency of nutrients and organic matter	8358147	11604450	7549319	3306533	1373196	32191645	
	TOTAL III	11029343	14687038	8738809	3728902	1627791	39811883	
TOTAL		12742504	16352013	9775795	4329915	1961232	45161495	

*Ref: Annual Report 2012 State of the Environment, NEPA / original source: National Institute of Research - Development for Pedology, Agrochemistry and Environment Protection (ICPA) and County Offices for Soil and Agrochemical Studies (OJSPA))*



**Figure 4.17 Areas affected by pollution and soil pollution levels (processing information available In the Annual Report On The Current State Of The Environment, NEPA)**

The development of some economic activities in poor and lack of a legal framework to prevent pollution and soil and subsoil led to the emergence of land areas contaminated with various pollutants. The main economic sectors impacting the soil, subsoil and groundwater / surface are:

- Mining and Metallurgical Industry;
- Chemical industry;
- Oil industry;
- Deposits old pesticides;
- Other large-scale activities such as metalworking industry, domestic non-compliant landfills, military sites, wood processing industry, coal power stations, transmission, service activities, etc.

There are currently 1682 inventory of potentially contaminated sites entered in the database CoSIS 2.0 administered by NEPA, including national inventory of all potentially contaminated sites. It is expected that this number will increase once devised a compulsory declaration scheme. Most contaminated and potentially contaminated sites come from oil extraction activities and the oil industry. *One potentially contaminated site comes from transport activity (i.e. a related activity - storage and refueling).*

#### 4.1.6.Waste Management

The activity of transport and transport infrastructure can not be considered an important source of waste generation compared to industrial activities.

In the transport sector can be generated waste during construction / modernization / rehabilitation of transport infrastructure and also during operating phase (waste activity associated road, rail, sea, air and intermodal) respectively during maintenance phase.

The main groups of waste which can be directly related to transportation infrastructure are:

- waste generated during construction / rehabilitation / modernization / maintenance of transport infrastructure and related facilities: waste concrete, bricks, pottery; waste wood,



glass, plastic; waste asphalt, tar and tarred products; scrap metal; scrap cuttings - earth, stone, gravel; waste insulating materials; mixed construction and demolition waste; wastes from cleaning oil separators etc.

These types of waste may be inert, non-hazardous or hazardous substances and contaminated with various mandatory separate collection.

Construction and demolition waste classified as hazardous may include: asbestos, tar and paint, heavy metals (chromium, lead, mercury), adhesives, polyvinyl chloride, solvents, polychlorinated biphenyl compounds, treated, contaminated soil. Although these amounts are small compared to total waste of this type generators (manufacturers) must apply special measures to address them in an appropriate way without hurting the environment or public health.

At national level there is not a strictly record of the construction and demolition waste quantities. The main causes are:

- the lack of specific legal regulations for managing these types of waste;
- the lack of consistent deposits of inert waste and lack of recycling or reuse them effectively;
- "holders" of these types of waste are difficult to identify by environmental authorities, being the operators of whose activity profile does not require holding an environmental permit.

There are only data on the quantities of construction and demolition waste collected from households that are reported annually by sanitation operators. According to these data in 2011 was collected from the population an amount of 531,780 tons of construction and demolition waste from which was recovered a quantity of 253,550 tons. Construction and demolition waste generated by economic agents were used either to fill the pits or were taught to the operators in construction field for valorification.<sup>59</sup>

The objective that need to be achieved by the Member States, up to 2020, regarding the reuse and recycling of waste, including waste from construction and demolition activities in accordance with Directive 2008/98 / EC of 19 November 2008 on waste and repealing certain directives is: "Preparing for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other materials, waste non-hazardous construction and demolition waste at a minimum of 70% by weight "

According to the information provided on the website of the European Commission, in 2011 was conducted a study on "Management of construction and demolition waste in the EU - requirements arising from the Waste Framework Directive and assessing the situation in the medium term". According to this study, Romania is among the countries that did not report the quantities of construction and demolition waste.

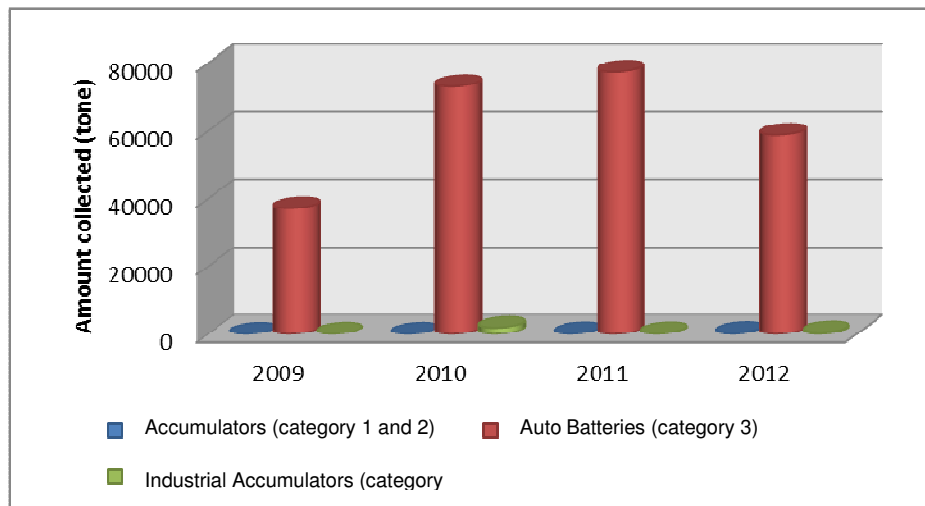
- Other waste resulting from transport.

#### ▪ **Spend car batteries**

The accumulators and waste batteries legislation is regulated by Government no.1132 / 2008 as amended by Government Decision no.1079/2011. According to art. 7 (1) of the H.G. no. 1132/2008, producers of portable batteries and accumulators are required to collect these products used / disposed of the minimum collection rate, since 2012, to 25%.

The car batteries are of two kinds: 3a-Lead Acid and Nickel Cadmium-3b-Nichel Cadmium (NiCd). In the period 2009-2012 has been put on the market a quantity of 84,844.61 tons (the largest of which being the lead-acid batteries). In the year 2012 the collection rate of batteries and accumulators was 11% and in the period 2009-2012 was collected an amount of 249,862.85 tons of batteries and accumulators from which aprox.99% represents car batteries<sup>59</sup>.





**Figure 4.18 Quantities of batteries and accumulators collected in 2009-2012**

#### ▪ End of life vehicles

Under Directive 2000/53 / EC, transposed into national legislation by GD nr.2406 / 2004 on the management of end of life vehicles, as amended and supplemented, the operators involved in the management of end of life vehicles are: manufacturers, distributors, collectors, insurance companies and operators the object of activity: treatment, recovery, recycling of end of life vehicles, including their components and materials. They, with effect from 1 January 2007, have the responsibility for achieving the following objectives:

- reuse and recovery of at least 75% of average weight per vehicle and year vehicles manufactured before January 1, 1980;
- reuse and recovery of at least 85% of average weight per vehicle and year of vehicles manufactured after January 1, 1980;
- reuse and recycling of 70% of average weight per vehicle and year vehicles manufactured before January 1, 1980;
- reuse and recycling of 80% of average weight per vehicle and year of vehicles manufactured as of January 1, 1980.

Since 1 January 2015, operators will be required to provide the following objectives, taking into account the average weight when empty:

- reuse and recovery of at least 95% of average weight per vehicle and year for all end of life vehicles;
- reuse and recycling of at least 85% of average weight per vehicle and year for all vehicles scrapped.

National Environmental Protection Agency is the authority responsible for monitoring achievement of these objectives.

For 2011, it is estimated that the total number of scrapped vehicles collected and for which they were issued certificates of destruction was only 124,299 units of which 1,288,396 were treated. The difference between the number of scrapped vehicles collected and the number of vehicles scrapped treated is because not all scrapped vehicles collected in previous years were treated, some remained in stock either collectively or authorized economic operators ELV treatment. Based on this information it is estimated that in 2011 the following objectives were achieved for end of life vehicles:

- reuse and recovery: 86,80% of average weight per vehicle;
- reuse and recycling: 82.90% of average weight per vehicle.

At the end of 2012, 445 operators were authorized to collect end of life vehicles, in a total number of 528 working points.

#### ▪ End of life ships

At the end of its life, most ships are scrapped and dismantled in facilities using methods which may have with significant environmental and human health effects.

The international waste shipment law regulates the fact that a ship may become waste as defined in art. 2 of the Basel Convention and at the same time can be defined as a ship under other international rules. Before being dismantled, ships need to be decontaminated or pre-cleaned so as not to be considered as hazardous waste. If a ship containing significant quantities of dangerous substances, which has not been emptied of hazardous materials shall be considered hazardous waste and its export as "junk" from EU Member States in developing countries non-OECD will be prohibited under the amendment of Basel and Regulation (EC) no. 1013/2007, its dismantling must take place under conditions of environmental protection in OECD countries.

The scrapping of ships flying under the Romanian flag must comply with the proposal Regulation (EU) No. 1257/2013 of the European Parliament and of the Council of 20 November 2013 on ship recycling and amending Regulation (EC) no. 1013/2006 and Directive 2009/16 / EC.

Romania currently has no navy, and all operators on the Danube are private companies. Nationally, there are only 1,500 registered ships (type barges, tugs and coaster pusher). Responsible for the scrapping of these ships are owners.

#### ▪ Waste Tires

According to GD no.140 / 2004 Art. 6 on the management of waste tires, legal persons placing on the market new tires and / or used tires intended for reuse shall:

- collect used tires in limited quantities placed them on the market in the previous year;
- reuse, reuse as such, retreaded, recycle and / or thermo exploit the entire amount of tires collected.

From the statistical data of the Ministry of Economy, in 2011 were collected 60,000 tons of used tires of which: 75% were coprocessor in cement, 20% were recovered by recycling material, and the remaining 5 % are reused as such (dams, pens, fences etc.).

#### ▪ Used oils

According to G.D. no. 235/2007 on the management of waste oil, oil producers and importers are obliged to ensure the organization of the management of waste oils, depending on the quantities and types of oils marketed. This obligation can be done individually or through third parties nominated to the central authorities for environmental protection by responsible persons.

The total quantity of fresh oils marketed nationally in 2011 was about 60,733.75 tons. The total amount of waste oil collected, recovered and disposed of in 2011 was about 20587.9364 tons.

No information strictly related to waste oils from transport activity are available.

#### ▪ Other types of waste generated during the operation of various objectives (CFR depots, road maintenance centers, car parks, airports, ports, etc.)

These goals, which generate different waste categories according to the specific activity shall comply with the provisions of Law no. 211/2011 on waste regime. Waste transportation is made only by operators who hold an environmental permit required by law for the collection / temporary storage / treatment / recovery / disposal.

Road, rail and ship hazardous and non-hazardous waste in Romania is regulated by GD no.1061 / 2008. Transportation of hazardous waste, regardless of the annual amount generated, is regulated by the Government Decision no. 1175/2007 for the approval of the conduct of the business of road transport of dangerous goods in Romania, Regulation concerning the International Carriage of Dangerous Goods by Rail RID - Appendix C to the Convention concerning International Carriage by Rail (COTIF), signed at Berne on 9 May 1980 with all subsequent amendments. Waste transportation is made only by operators who hold an environmental permit required by law for the collection / temporary storage / treatment / recovery / disposal.

The transport of hazardous substances in Romania is regulated by Government Decision no. 1326/2009 establishing a general framework for conducting unified transport of dangerous goods by road modes, rail or inland waterways, conducted wholly or partly in Romania, including the activities of loading and unloading, transfer / transshipment to or from another mode transport and the stops necessitated by the circumstances of transport.

The dangerous goods transport activity is regulated by:

- Regulations concerning the International transport of Dangerous Goods by Rail (RID), so now provides GEO no.49 / 1999, approved by Law No 788/2001;
- European Agreement concerning the international carriage of dangerous goods (ADR), to which Romania adhered by the Law no.31 / 1994, and the Government Decision no. 1175/2007 approving the rules for conducting the business of road transport of dangerous goods in Romania.
- Order of the Ministry of Transports, Constructions and Tourism nr.1044 / 2003 regarding the approval for the appointment, training and examination of safety advisers for road, rail or inland waterway transport of dangerous goods, as amended and supplemented.

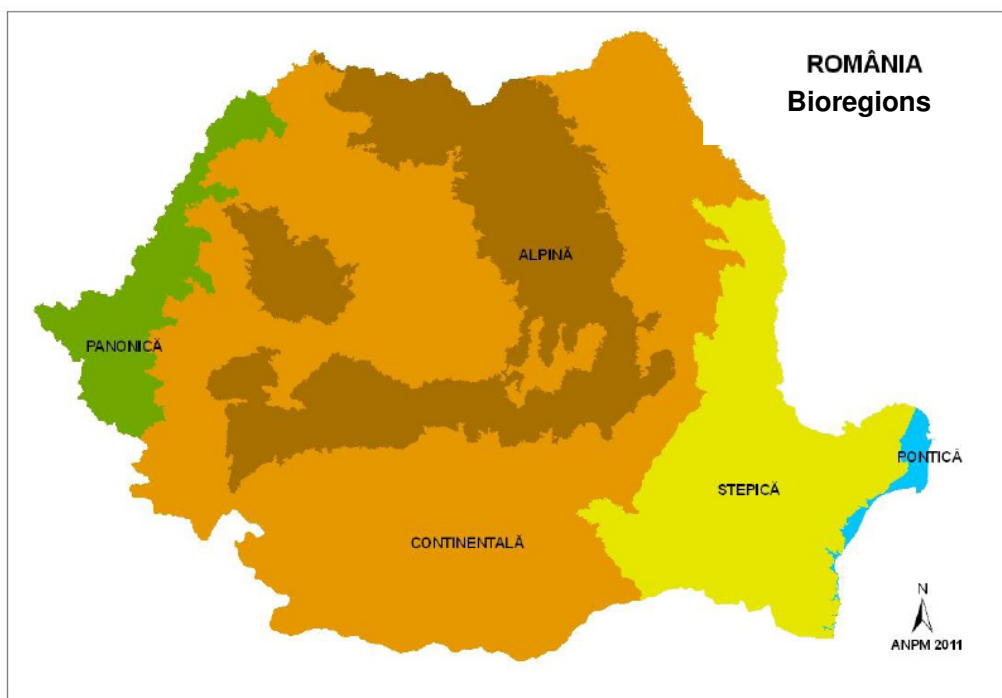
Transport of hazardous waste and hazardous substances has no impact on the environment than where accidents occur involving transport or in case of any accidental spills during transport. These types of accidents are unpredictable in terms of time, place, type or intensity. The main components are affected and, in certain circumstances, can have long-term negative effects, depending on the material / waste transported are: air, soil / subsoil and water (surface and underground).

#### **4.1.7.Biodiversity**

As a consequence of its geographical positioning, in Romania there are a variety of species of flora and fauna that presents a mediterranean, oceanic and continental influences being a natural heritage of aesthetic, scientific and cultural.

Romania territory is divided in 5 biogeographical regions:

- Continental bioregions (53%) - includes central areas south and northeast, mainly agricultural, with warm summers and cold winters.
- Alpine bioregions (23%) - includes the Carpathian Mountains, cold climate, forests and rocky peaks, where almost half the population lives large carnivore in Europe (bear, wolf, lynx).
- Pannonian bioregions (6%) - includes the arid plains of western Romania.
- Step 4. Bioregions (17%) - includes relief of the southeastern lowlands and wetlands in the Danube Delta and the Black Sea.
- Pontic bioregions (1%) - includes the western shores of the Black Sea and the eastern part of the Danube Delta host many species of fauna.



**Figure 4.19 Map of the bioregions in Romania**

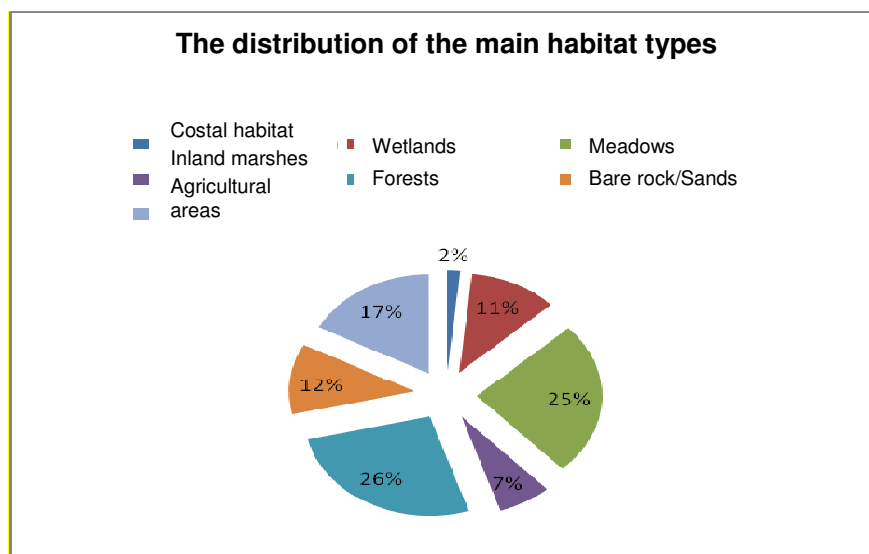
(ref: Annual State of the Environment Report, 2011, NEPA)

The semi-natural ecosystems represent about 47% of the country. As a result of studies developed by CORINE Biotopes Program have been identified 783 habitat types in 261 areas across the country:

**Table 4.9 Habitat types**

Main habitat types	Number	%
Coastal habitats	13	5,0
Wetlands	89	34,1
Meadows	196	75,1
Swamps	54	20,7
Forestry	206	78,9
Rocks / sand	90	34,5
Agricultural	135	51,7

Ref: Strategy for conservation of biological diversity



**Figure 4.20 The distribution of the main habitat types**

The high level of the habitat diversity also reflects a high level of species diversity of flora and fauna. Flora and fauna shows Mediterranean influences, oceanic and continental. Thus, were identified:

- 3700 plant species, of which only 23 are declared natural monuments, 74 are extinct, 39 endangered, 171 vulnerable and 1,253 rare. Characteristic species of grassland is about 37% of those existing in Romania. There are also a total of 600 species of algae and more than 700 species of marine and coastal plant. 4% endemic species, identifying a total of 57 taxa (species and subspecies) and 171 endemic taxa.
- 33,802 species, of which 33,085 invertebrate and 717 vertebrate. The vertebrates have been identified 191 species of fish (9 endangered species), 20 species of amphibians (9 endangered species), 30 species of reptiles (6 endangered species), 364 species of birds (of which 312 migratory species) and 102 species mammal.

In 2011 the Romanian national forest occupies an area of 6,519,000 ha and represents approximately 27.3% of the country. The forest in Romania occupies an area of less than 1/3 of the country, below the EU average, which is about 36%.

It is estimated that national forest formations are over 50 (30.4% are coniferous forests and 69.6% are deciduous). Within these are 58 species of trees, 118 shrubs, there are species of secular age (height 60 m spruce, fir 55 m to 45 m in beech, oak 40 m) glacial relict species (dwarf birch ) and numerous endemic species. Forests are home to a number of hunting animals with special value - the brown bear (50% from the EU), the wolf (40%), Carpathian deer, chamois, wild boar, lynx, wild cat, etc.

31% of the total forest area included in the network of protected natural areas. A special is the virgin forests that cover an area of approx. 225,000 ha of which 75% were included in the network of protected areas, and 18% are included in the strict protection zones (where exempt any human intervention) <sup>63</sup>.

### ***The situation of protected areas in Romania***

According to Article 5 of the Law no.49 / 2011 for the approval of GEO No.57 / 2007 on the regime of natural protected areas, conservation of natural habitats and of wild fauna and flora are the following categories of protected areas:

<sup>63</sup> Strategy for biodiversity conservation

- national interest: scientific reservations, national parks, natural monuments, nature reserves, parks;
- international interest: natural World Heritage sites, Geopark, wetlands of international importance, biosphere reserves;
- community interest and sites "Natura 2000" sites of Community importance, Special Areas of Conservation, Special Protection Areas Bird;
- county or local interest: set only on public / private administrative-territorial units, as appropriate.

**Table 4.9 Protected areas in Romania, 2012**

Categories of protected areas	Number	Total Area (ha)
Scientific reservations	44	24654
National Parks	13	316872
Natural monuments	206	15413
Nature Reserves	699	347320
Biosphere Reserves	3	664446
Wetlands of international importance (Ramsar sites)	12	804497
<i>Natura 2000 areas</i>		
Special Protected Areas (SPA)	148	3698732 (15,5% from total county area)
Sites of Community Importance (SCI)	383	4147368 (17,4% from total county area)

Ref: National Report on the state of the environment in 2012, NEPA

Natura 2000 areas have been declared by the Minister of Environment and Sustainable Development no. 1964/2007 on the creation of the natural area sites of Community importance as part of the European ecological network Natura 2000 in Romania completed by Order no. 2387 of 29 September 2011 and the Government Decision no. 1284/2007 regarding the establishment of bird protection areas as part of the European ecological network Natura 2000 in Romania complemented by Government Decision nr.971 of 5 October 2011.

Protected natural areas of national interest are declared under: Law no. 5/2000 on the national territory, section III, protected areas.

At the end of 2012, 50% of protected natural areas (978 and 531 areas of national interest Natura 2000 sites) in Romania were organized in a form of management, administration or custody.

The main anthropogenic pressures with significant impact on socio-economic development of activities are:

- residential and commercial development;
- agriculture and aquaculture (intensive);
- mining and energy production activities;
- **increased investment for infrastructure development (road, rail and river, tourism, energy production and transport, etc.);**
- tourism and recreation;
- use of natural resources;
- expansion and intensification of agriculture;
- **expansion and modernization of existing tourist ports: dredging activities;**
- petrochemical, refining;
- extractive industry: ore, sand in shallow coastal areas;

- power industry: wind farms, small hydropower etc.;
- military and defense activities (land-sea shooting, high-frequency antenna installation, etc.);
- Invasive species (to the people);
- pollution;
- climate change due to human activities;
- uncontrolled waste disposal;
- overgrazing;
- river regulation works, hydrotechnical works and flood protection works;
- overexploitation of natural forests and massive deforestation;
- expanding human settlements.

Also are to be mentioned the pressures of natural causes: various weather phenomena - high temperature / low, storms, hail, which may cause short-term (felling trees, destruction of vegetation, animal mortality, etc.), but also the ones on long term as global warming which can cause large changes and compromise final areas of plant and animal species.

Up to 25% of animal species are still endangered and even common species continue to suffer from a lack of suitable habitats outside the protected areas.

The urban sprawl, industrial development and new infrastructure continue to spread at a rapid rhythm, often to the detriment of the remaining natural areas.



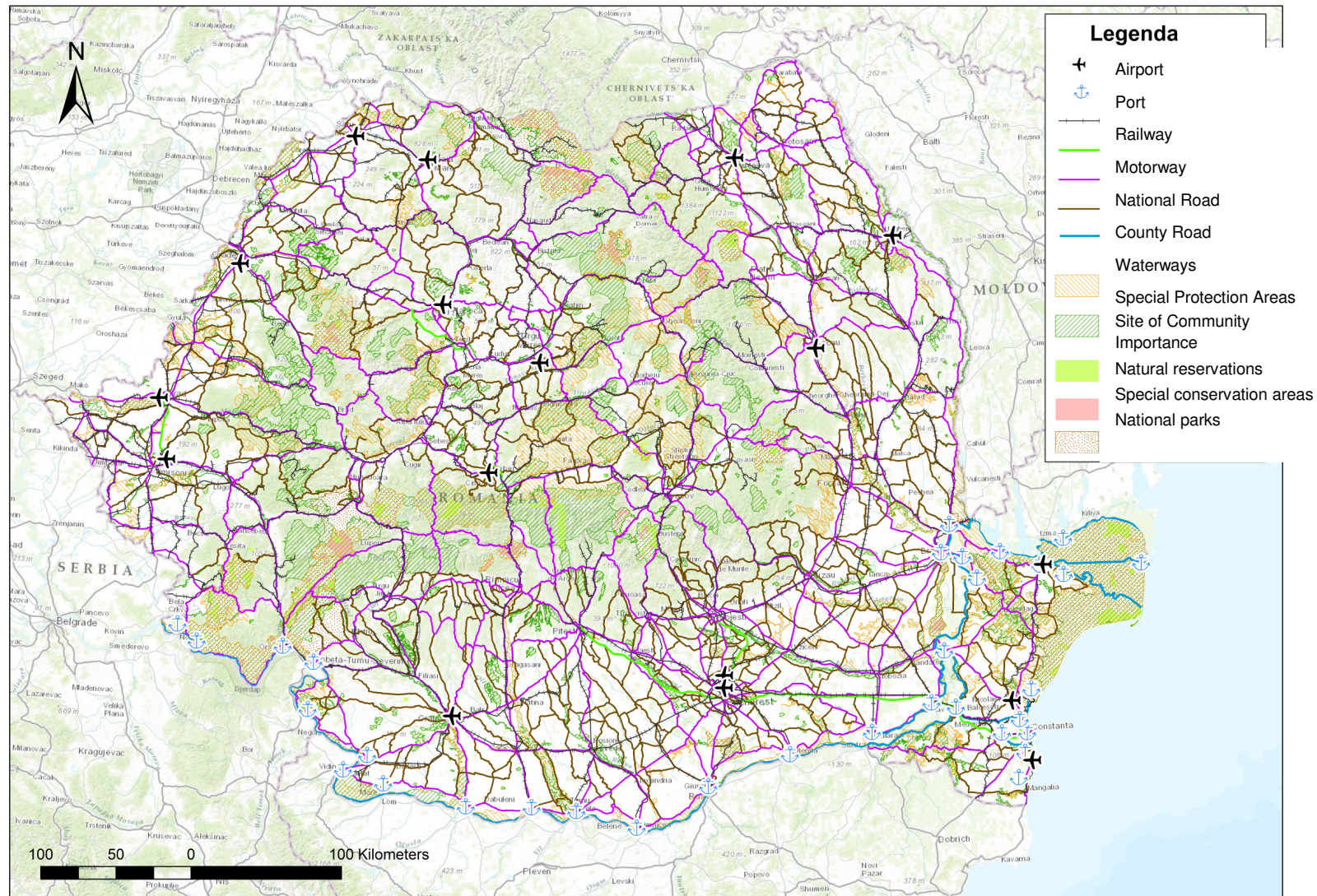


Figure 4.19 The transport infrastructure and natural protected areas in Romania

### ***The anthropogenic pressures exercised on biodiversity due to the transport sector***

A large number of road and rail traffic crosses or adjoins the protected natural areas (v. Figure 4.21 and Figure 4.16).

Of the total of 148 Special Protected Areas (SPA) designated at national level, on the surface of 129 SPAs already exists some transport infrastructure elements, within which 309 Special Bird Protected Areas are protected species, of the 310 species presented in the Birds Directive and present also in SPAs in Romania.

Of the 383 Sites of Community Importance (SCI) designated nationally, approximately 225 are already intersected by the current transportation infrastructure elements. 127 of SCIs intersected contain priority habitats and 68 of SCI sites containing priority species<sup>38</sup>.

According to the information included in the Natura 2000 standard data forms for the transport sector, the type of investments in the transport sector currently exercising pressure on national Natura 2000 network are: aerodromes, heliports; railway / railway lines; transport corridors; roads, motorways; roads, trails and railways; bridges, viaducts; noise pollution; tunnels; port areas.

The sector affecting SCI / SPAs mostly (64.81% of the total of impacts identified) is the “*Road and Motorway*” sector. This sector affects 140 SCI / SPAs, from which 100 SCI (52 in and 48 in the neighborhood) and 40 SPAs (23 in and 17 in the vicinity). The next sector is “*The Transport Corridors*” - 11.57%, with 25 sites affected (12 SCI and 13 SPAs), followed by *Railways / railways* - 6.48% (9 SCI and 5 SPAs).

As regards the SCI's, the road sector (Road and motorway) affects nearly half of them with a medium intensity (49 of 100 sites). The following two sectors with higher contribution in terms of the number of sites affected, are “*The Transport Corridors*” and “*Noise Pollution*”, affecting most sites, but with a low intensity. The sectors that affect the fewest SCIs are the *Tunnels And Port Areas* sector.

Regarding the SPAs, the *Roads and motorways* sector affects the majority of medium intensity (23 of 40 sites). *The Transport Corridors* sector affects 13 SPAs, of which 8 with a medium intensity and the *Roads, Paths And Railways* sector, affecting 8 SPAs, from which 5 with low intensity. The sectors that affect the fewest SPAs are the *Aerodromes, Heliports And Bridges, Viaducts* sector<sup>38</sup>.

Declared part of the Pan-European Transport VII EU, Danube is an important waterway that connects through the Rhine-Main-Danube between Constanta port, industrial centers of Western Europe and the port of Rotterdam. Danube crossing from entering the country to its mouth in the Black Sea region with varied biodiversity, areas that have been designated protected areas. The protected areas in the immediate vicinity or crossed by the Danube waterway, on the Romanian sector (v. Table 4.11), are:

- 25 SPAs;
- 15 SCIs;
- 4 Natural Reservations.

**Table 4.10 Protected areas in the immediate vicinity or crossed by the Danube waterway**

No.crt	Cod area	Name of the protected area
<b>Special Protection Areas</b>		
1.	ROSPA0005	Balta Mică a Brăilei
2.	ROSPA0011	Blahnița
3.	ROSPA0013	Calafat - Ciuperceni - Dunăre
4.	ROSPA0024	Confluența Olt - Dunăre
5.	ROSPA0026	Cursul Dunării - Baziaș - Porțile de Fier
6.	ROSPA0031	Delta Dunării și Complexul Razim - Sinoie



No.crt	Cod area	Name of the protected area
7.	ROSPA0038	Dunăre - Oltenița
8.	ROSPA0057	Lacul Siutghiol
9.	ROSPA0074	Maglavit
10.	ROSPA0102	Suhaia
11.	ROSPA0108	Vedea - Dunăre
12.	ROSPA0121	Lacul Brateș
13.	ROSPA0135	Nisipurile de la Dșbuleni
14.	ROSPA0136	Oltenița - Ulmeni
15.	ROSPA0039	Dunăre - Ostroave
16.	ROSPA0017	Canaralele de la Hârșova
17.	ROSPA0080	Munții Almăjului - Locvei
18.	ROSPA0002	Allah Bair - Capidava
19.	ROSPA0012	Brațul Borcea
20.	ROSPA0090	Ostrovu Lung - Gostinu
21.	ROSPA0060	Lacul Tașaul
22.	ROSPA0040	Dunărea Veche - Brațul Măcin
23.	ROSPA0021	Ciocănești - Dunăre
24.	ROSPA0023	Confluența Jiu - Dunăre
<b>Special Areas of Conservation</b>		
1.	ROSCI0006	Balta Mică a Brăilei
2.	ROSCI0131	Oltenița - Mostiștea - Chiciu
3.	ROSCI0012	Brațul Măcin
4.	ROSCI0044	Corabia - Turnu Măgurele
5.	ROSCI0039	Ciuperceni - Desa
6.	ROSCI0045	Coridorul Jiului
7.	ROSCI0088	Gura Vedei - Șaica - Slobozia
8.	ROSCI0105	Lunca Joasă a Prutului
9.	ROSCI0065	Delta Dunării
10.	ROSCI0206	Porțile de Fier
11.	ROSCI0022	Canaralele Dunării
12.	ROSCI0278	Bordușani - Borcea
13.	ROSCI0299	Dunărea la Gârla Mare – Maglavit
14.	ROSCI0319	Mlaștina de la Fetești
15.	ROSCI0398	Straja-Cumpăna
<b>Natural Reservations</b>		
1.		Balta Mică a Brăilei
2.		Porțile de Fier
3.		Lunca Joasă a Prutului Inferior
4.		Delta Dunării - zona marină

On the Danube river, the ships have access to the ports of Sulina, Tulcea, Galati and Braila, and from Braila, the technical parameters allow access for inland waterway vessels in 29 ports, of which the most important are: Drobeta Turnu Severin, Calafat, Turnu Magurele, Giurgiu, Oltenita, Calarasi, Cernavoda. There are also a number of ports inside or in the vicinity of protected natural areas.

**Table no. 4.11 Ports inside or in the vicinity of natural protected areas**

Seaport name	Natural protected area name	Code of the area
Moldova veche/ Moldova Nouă	Cursul Dunării - Baziaș	ROSPA0026
	Porțile de Fier	ROSCI0206
Baziaș,	Cursul Dunării - Baziaș - Porțile de Fier	ROSPA0026

Seaport name	Natural protected area name	Code of the area
	Porțile de Fier	ROSCI0206
Drencova (Orșova)	Cursul Dunării - Baziaș - Porțile de Fier	ROSPA0026
	Porțile de Fier	ROSCI0206
Gruia	Blahnița	ROSPA0011
	Jiana	ROSCI0306
Turcoaia	Măcin - Niculițel	ROSPA0073
	Munții Măcinului	ROSCI0123
Macin	Măcin - Niculițel	ROSPA0073
	Munții Măcinului	ROSCI0123
Isaccea	Delta Dunării și Complexul Razim - Sinoie	ROSPA0031
	Delta Dunării	ROSCI0065
Tulcea	Delta Dunării și Complexul Razim - Sinoie	ROSPA0031
	Delta Dunării	ROSCI0065
Chilia Veche Tatanir	Delta Dunării și Complexul Razim – Sinoie	ROSPA0031
	Delta Dunării	ROSCI0065
Mahmudia	Beștepe - Mahmudia	ROSPA0009
	Delta Dunării	ROSCI0065
Sulina	Delta Dunării și Complexul Razim - Sinoie	ROSPA0031
	Delta Dunării	ROSCI0065
Luminița	Delta Dunării și Complexul Razim - Sinoie	ROSPA0031
	Delta Dunării	ROSCI0065
Constanța Nord	Marea Neagră	ROSPA0076
Constanța Sud-Agigea	Marea Neagră	ROSPA0076

The consequences of transport activity on biodiversity translate into significant changes in the structure and functioning of natural ecosystems, leading to:

- loss and fragmentation of habitats - for example, conversion of land for building new transport corridors or expanding existing ones, the cause of biodiversity loss, leading to degradation, habitat destruction and fragmentation; fragmentation / barrier effect may cause adverse effects on ecosystems, resulting in the loss of biodiversity and ecosystem stability.
- changes in the population density of certain species of flora or fauna;
- wildlife mortality (through their involvement in various accidents);
- impairment of habitats and of wild flora and fauna.

It should be noted that some transport infrastructure dates from a time prior to the occurrence of specific legislation for protected natural areas and Natura 2000 sites.

The development of transport (road construction, railway, motorway, etc.) has a direct and often irreversible impact on flora, fauna or natural ecosystems.

#### 4.1.8. Population and human health

The transport can have both positive effects and negative effects on the population and human health. The effects of transport activity on population and human health are:

##### Positive effects on Social and economic development

The transport network is an important factor for the development of society and conducting various economic and social activities. Transport network allows accessibility, respectively mobility of goods and passengers in a particular region and between regions.

#### Distribution of the national transport network<sup>64</sup>:

- Public rail network covers virtually the entire country, with a density of operating lines of 46.1 km / 1000 sq. km and connects all rail networks of neighboring countries.
- The road network provides access motorized public in most localities of the country, the network density is 0.64 km / km
- The network of waterways lies entirely in the south and south-eastern Romania with a density of 6.5 km / 1000 sq.
- Air transport network consists of the Romanian airspace in which air routes are defined depending on traffic flows coordinated at European level by euro control.

More information about the structure and condition of transport infrastructure are presented in Chapter 2 of this report.

Demographic and economic characteristics at national level are as follows:

- According to the results of the 2011 census, the population of Romania is represented by 19 million (19,043,767) people. The female population is majority; it represents 51.3% of the resident population. More than half of men (51.8%) and among women (53.7%) live in towns and cities.
- At the national level, population density is 79.9 inhabitants per km<sup>2</sup>. Most densely populated counties are: Ilfov (230.1 inhabitants / km<sup>2</sup>), Prahova (156.0 inhabitants / km<sup>2</sup>), Iași (132.1 inhabitants / km<sup>2</sup>), Dâmbovița (123.8 inhabitants / km<sup>2</sup>), Galați (113.6 inhabitants / km<sup>2</sup>), Cluj (98.8 inhabitants / km<sup>2</sup>), Brașov (94.2 inhabitants / km<sup>2</sup>), Constanta (89.2 inhabitants / km<sup>2</sup>). Population structure by ethnicity: 90.6% Romanian; 6.7% Hungarians; 1.3% Roma; 0.3% Ukrainians; 0.1% Germans; 0.1% Turks; 0.1% Tatars; 0.1% Russians; 0.4% other ethnic.
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- In the context of economic transition, the labor market in Romania has undergone significant changes in the volume and structure of the main indicators of labor. If during the last half of the 90s, the working population is still high (11 million people), the new millennium began with a significant fall in value indicator. Later 2002 active population fluctuates around 10 million. In 2011, the working population is 9,868,000 people, of which 96.1% belong to the working age group (15-64 years).
- Unemployed - according to the international definition (ILO) - in 2011 was 730 thousand, increasing both compared to 2010 (0.7%) and compared to 2009 (7.3%). In 2011, from the total number of unemployed, 28.8% were young (15-24 years).
- The share of employees who worked in transport and storage sector was only 4.7% of total employment, down 0.1 percentage points from the previous years.
- In Romania, the average cost for shipping is 0.75 Euro / km, but can grow to about 1 euro / km for a vehicle to transport goods or freezing plant for the transport of grain during harvest.

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<sup>64</sup> Transport Ministry, <http://www.mt.ro/nou/index.php>

Salaries drivers of heavy goods vehicles in Romania are in 2nd place in the ranking of the lowest wages in the EU

- In the period 2008-2011, the main source of total household income was a money income, down from 83.1% in 2008 to 81.7% in 2011. The income in kind recorded in the same period an increasing trend, reaching in 2011 to 18.3% due mainly to counter consumption of agricultural products from own resources (up 2.7 percentage points from 2008).
- In recent years the contribution of the transport sector with trade, repair of motor vehicles and household goods, hotels and restaurants have a contribution to the GDP of about 20%.
- During 2011, compared to 2010, most transport modes decreases were recorded in terms of transport demand.
- Road transport has increased slightly in terms of quantities of goods, compared to 2010 and decreased with approx. 49.6% compared to 2008.
- The cost of fuel resources constitutes 59% of the total sales, while the average value of 67% gasoline and 65% diesel.
- The traffic evolution for the period 1985-2010 for which is known all the traffic, public road network is characterized by stages as follows:
  - The year 1990 has seen an increase in traffic compared to 1985, traffic increased on average by 23% on motorways, county roads by 8% and 3% on local roads;
  - In the period 2000-2005 was reported a moderate increase of the traffic to motorways and local roads;
  - A regular fixture in the period 2005-2010 has been a significant increase in traffic on motorways.
- The number of motor vehicle registrations in 2010 decreased by 18.5% compared to 2009. The structure of the automotive market in 2010 was: 90.7% cars, commercial vehicles 9.3%.

## **Negative effects on Population Health**

### **Air Pollution**

Human health is affected by environmental pollution and poor air quality which lead to respiratory and cardiovascular diseases. In Romania, the main sources of air pollution are considered to be the transport (road traffic) and industrial activities. The main pollutants from transport activity affecting human health are material particles, COx, NOx, SOx, VOC, heavy metals, benzene and other unburned hydrocarbons.

As described in chapter **Air**, the results recorded in air quality monitoring stations have shown that air pollution is higher in urban areas than in rural areas. More exposed to pollution is people living in large urban areas, near roads and industrial centers.

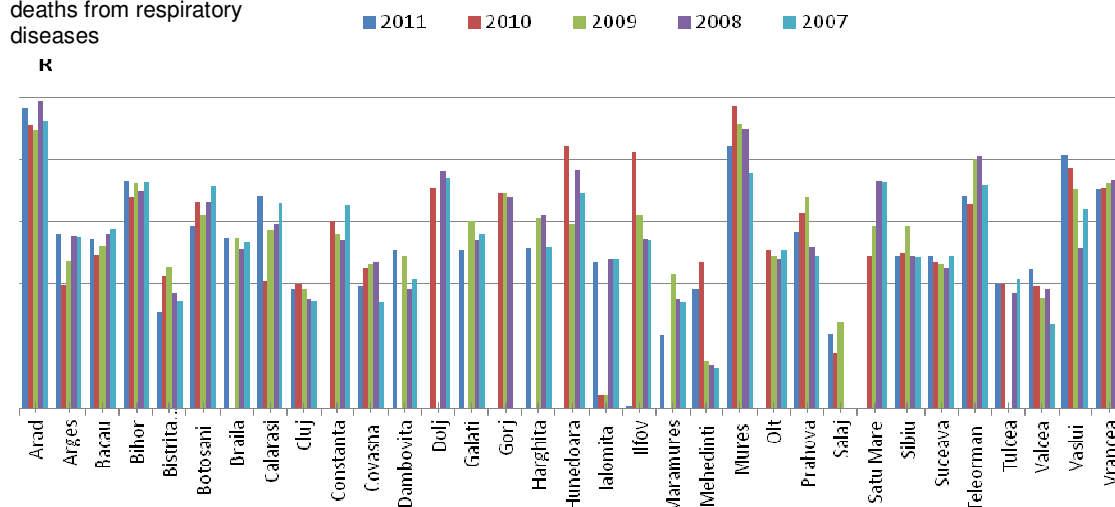
Mortality due to respiratory problems and cardiovascular disease mortality occupies a significant percentage of overall mortality. In urban areas the proportion is higher than in rural areas owing seen on account that is more polluted urban areas.

In the period 1997-2008, 13-62% of Europe's urban population was exposed to concentrations of particulate matter (PM10) in ambient air which exceeded the limit values for human health protection under EU legislation. In case of the suspended particles due to their different action by composition, size and exposure time, adverse health effects may also occur, and daily averages below the limit values for the protection of human health<sup>65</sup>.

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<sup>65</sup> State of the Environment Annual Report 2012, NEPA

R= rate calculated at 100000  
deaths from respiratory  
diseases

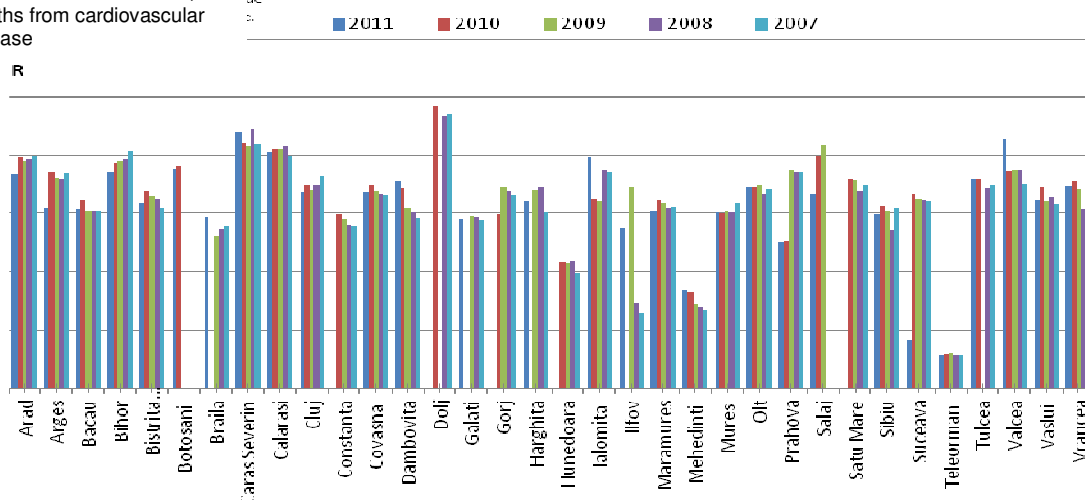


**Figure 4.20 Respiratory mortality nationally in 2007-2011 (source: Annual Report 2012 State of the Environment - Environment and Health chapter 8, NEPA)**

*Reference: National Institute of Public Health*

The highest mortality rate due to respiratory diseases in 2007-2011 was recorded in Mures and Arad Counties. The highest mortality rate due to cardiovascular diseases in 2007-2011 was recorded in Dolj County.

R= rate calculated at 100,000  
deaths from cardiovascular  
disease



**Figure 4.21 Cardiovascular disease mortality nationally in 2007-2011**

*(Reference: Annual Report 2012 State of the Environment - Environment and Health chapter 8, NEPA)*

*Original source: National Institute of Public Health*

*In Romania, there are no statistics on the number of cases of respiratory or cardiovascular number of diseases caused by air pollution or transport sector.*

### **Noise pollution**

Another stress factor that can worsen some diseases (deafness, mental illness, cardio-vascular, endocrine) is the noise, which is one of the most widespread threat to the health of the population in industrialized countries.



The transport sector has an important contribution to noise pollution, as evidenced by the study on the influence of noise on health conducted at national level in urban areas with population of over 250,000 inhabitants and confirmed information from strategic noise maps made under the provisions of Directive No 2002/49 / EC of the European Parliament and Council, transposed into national legislation by GD 321/2005 on the assessment and management of environmental noise for urban areas, airports and ports situated within them, as well as major roads and major railways.

In 2010-2011 was carried out a study on "The Impact of noise pollution on the health of the population", which aimed subjective perception of noise nuisances in 9 urban areas with population of over 250,000 inhabitants (Bucharest, Brasov, Cluj, Craiova, Constanta, Galati, Iasi, Ploiesti, Timisoara). In the study in 2011, "the sample" consisted of a total of 1669 people in 564 dwellings (apartment block 373 and 191 individual houses). The results of this report have shown that traffic has a great contribution to noise pollution.

- percentage of people disturbed by traffic noise hold first place with a frequency of 89%, interviewed residents accuse the annoyance of road transport cars and utility cars.
- in high traffic areas the percentage of people disturbed by road traffic is 66% compared to tenants with low traffic area (33%), car traffic accusing discomfort.
- landscaped car parks near residential buildings, but also the lack of parking space, creates discomfort in 41% of the population and in high-traffic areas a 31% people accuse the annoyance of the large number of improperly parked cars in the area .
- percentage of people disturbed by road traffic noise in residential areas with heavy traffic, is three times higher than in residential areas with low traffic.

Public transport (buses, trolleybuses, trams) is the main reason for creating nuisance through noise followed by rail, air, naval. The thermal rehabilitation measures of residential buildings increased also the acoustic comfort, in addition to heat, however in individual houses these features are present at a frequency higher by 10% compared to apartments in residential buildings (71.1% versus 68.8%).

At the national level, following to the provisions of Directive 2002/49 / EC of the European Parliament and Council, transposed into national legislation by GD 321/2005 on the assessment and management of environmental noise is necessary to achieve the strategic noise maps as follows:

- since 2007 has started the process of realization of maps for agglomerations with more than 250,000 inhabitants, major roads which have more traffic crossings 6,000,000 vehicles per year, major railways which have more traffic than 60,000 train passages per year civil airports which has more than 50,000 aircraft movements per year and ports in agglomerations with more than 250,000 inhabitants;
- since 2012 started the realization of these maps for all agglomerations, including airports and ports situated within them, as well as major roads and major railways.

Making strategic maps for transport infrastructure is the responsibility of subordinated units, or of the authority of the central public transport authority that manages road, rail, airport and port under their administration. Based on the information obtained from these noise maps are developed action plans that propose also measures to reduce and manage the generated noise. These documents are revised every 5 years.

The Railway Company "CFR" SA, as the manager of the railways, has the responsibility to make strategic noise maps for major railways with more than 30,000 train passages / year, conflict maps, including the related action plans.

To ensure / establish the management of noise reduction generated by rail transport, were made strategic noise maps and action plans for major railways that has more than 30,000 train passages / year. The rail segments which have more than 30,000 train passages / year, for which were carried out these noise maps are presented in the following table:

**Table 4.12 Railway sections with strategic noise maps**

Crt. no.	Sector name	Estimated traffic 2011	Length KM	Approximate maximum distance (from the center of the railway ax) in meters, occurring noise exceeding <sup>66</sup>	
				Lzsn day – midnight - night)	Ln (night)
1	București North – Post 5	81 560	2,9	300	250
2	Post 5 – Baneasa Depot Sector	62 756	1,4	400	250
3	Baneasa - București Triaj Depot Sector	56 954	3,4	450	400
4	București Triaj – Chitila Depot Sector	41 844	1,7	350	250
5	Chitila – Brazi Depot Sector	41 092	41,09	400	400

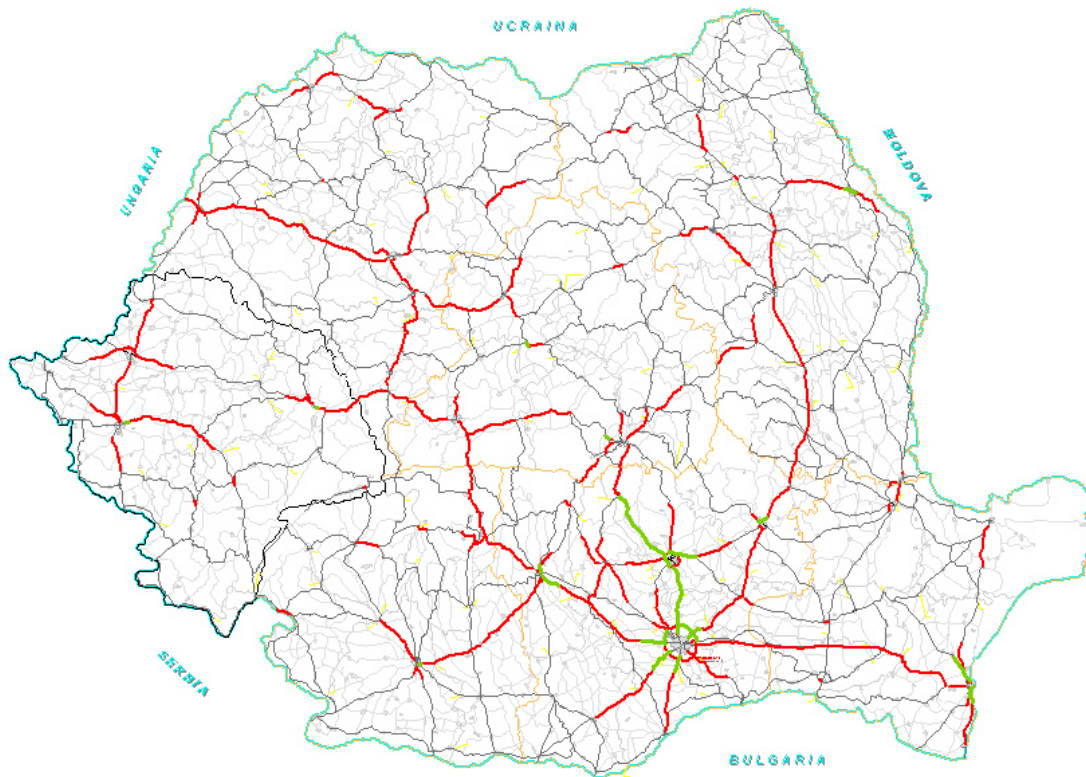
Ref: <http://www.cfr.ro/index.php/dispozitii-interne-de-mediu/629-harti-strategice-de-zgomot>

The National Company of Motorways and National Roads is responsible for the development of the strategic noise maps and action plans which have the role to help reduce the noise in the localities where were registered exceeding of the noise permissible limits for main roads with a higher traffic than 6,000,000 vehicles per year.

The editing and documentation of strategic noise maps for a minimum annual traffic of vehicles crossing 3000000 is ongoing.

The main roads with a higher traffic than 6,000,000 crossings vehicles per year, for which strategic noise maps were made in 2012 are shown in Figure 4.25.

<sup>66</sup> Refers to exceedances of noise above 55 dB (daytime) and 50 dB (at night)



**Figure 4.22 Map road sectors (highlighted in red and green) which were made from 2007 to 2012 strategic noise maps**

(Reference: [http://213.177.10.50:5555/Acoperire/Info\\_tool.aspx](http://213.177.10.50:5555/Acoperire/Info_tool.aspx))

NC Danube Maritime Ports Administration Galati (CN APDM SA Galati) and NC Maritime Ports Administration Constanta (NC MPA SA Costa) have the obligation to develop strategic noise maps and action plans for the seaports of Galati, Braila and Constanta.

The Airport Autonomous Regia is also responsible to develop strategic noise maps and action plans for airports.

The general conclusions drawn from the information provided by these strategic noise maps are:

- Noise source affecting large urban areas is road traffic (including public transport vehicles), followed by industrial areas. Percentage of people disturbed by road traffic noise in residential areas with heavy traffic is two times higher than in residential areas with low traffic.
- The rail traffic noise affects the population by exposure at a level above the maximum permissible daytime and nighttime limits along the runway, and also in the depots area. The maximum distance from the center of the track to where noise is experienced is between 250-400 m.
- The population is affected by air traffic noise due to an exposure to a level of 60 dB (A) during the day and over 50 db (A) at night.
- Noise level felt particularly in ports area, have no impact on public health (surfaces exposed to levels above 65 dB (A) (Lden) and 55 dB (A) (LN) are mostly within the area industry, where is not exposed the population).
- The lack of safe transport can have negative effects on human life and living environment.

The transport safety is a major societal issue. The main factors of maintaining a high level of traffic safety are: the education and training of road users, providing good technical condition of transport

infrastructure and vehicles used for transport, proper signaling transport routes, transport infrastructure sufficiently developed to allow traffic flow, use of intelligent transport systems to provide real-time traffic information.

In the followings are presented information on accidents occurring during the activity of road, rail, water and air transport and their consequences.

## Road Accidents

The road accidents is among the leading causes of mortality after myocardial infarction (report was based on World Health Organization statistics on road safety in 182 countries, 2013). The number of people who died in road accidents is very high (about 1.24 million people / year). About 60% of all deaths in road accidents are aged between 15-44 years<sup>67</sup>.

In Romania, die annually about 2,000 people as a result of road accidents.

Table 4.15 presents a summary of road accidents resulting in deaths and serious injuries in Romania for the last 5 years, classified according to the severity of the accident and Table 4.16 provides general information about accident victims for the same data set.

**Table 4.13 The number of accidents (only accidents with fatalities or seriously injured)**

Accident types	2007	2008	2009	2010	2011
Resulting in deaths	2.462	2.655	2.465	2.103	1.818
Severe accidents	6.043	7.990	7.749	7.150	7.472
Total	8.505	10.645	10.214	9.253	9.290

**Table 4.14 The number of casualties in road accidents (only accidents with fatalities or seriously injured)**

Types of casualty accidents	2007	2008	2009	2010	2011
Decease	2.800	3.065	2.797	2.377	2.018
Seriously Injured	7.091	9.403	9.097	8.509	8.768
Slightly Injured	2.659	3.504	3.393	3.209	3.362
Total	12.550	15.972	15.287	14.095	14.148

The Table 4.17 summarizes the number of injured persons at every 10 million people, during 2007-2011. The figures for the total population were calculated starting from data of the primary database report and consolidated by the GTMP in Romania.

**Table 4.15 Fatalities 10 million people in Romania between 2007-2011 (only accidents resulting in deaths and serious injuries)**

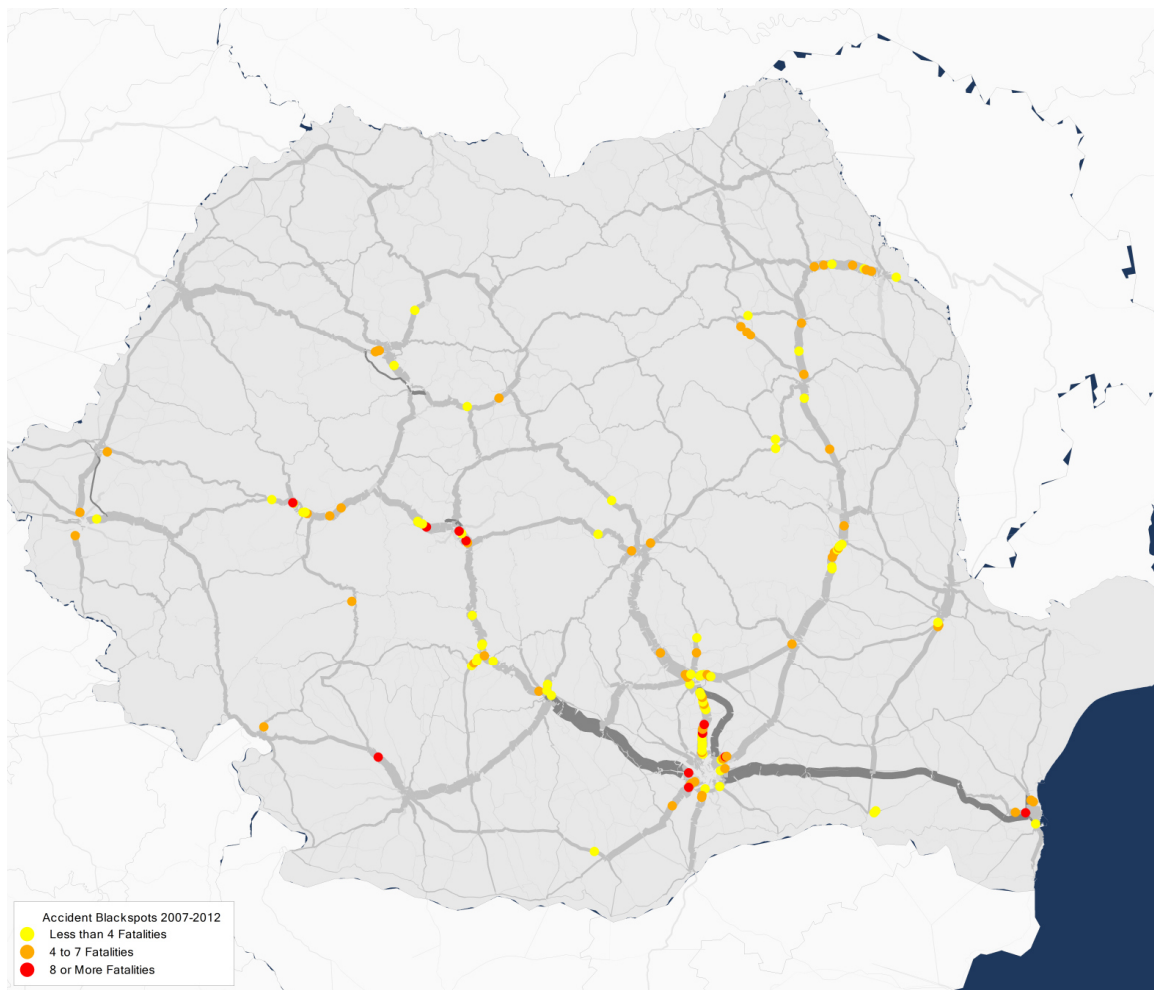
Types of casualty accidents	2007	2008	2009	2010	2011
Decease	1.298	1.424	1.301	1.108	942
Seriously Injured	3.288	4.368	4.231	3.965	4.095
Slightly Injured	1.233	1.628	1.578	1.495	1.570
Total	5.820	7.419	7.111	6.567	6.607

<sup>67</sup>Global Status Report on Road Safety,  
[http://www.who.int/violence\\_injury\\_prevention/road\\_safety\\_status/2013/en/](http://www.who.int/violence_injury_prevention/road_safety_status/2013/en/)

*Reference: Primary database and enhanced GTMP; Accidents 2007 - 2011*

Accidents involving a single vehicle have a high proportion of all accidents on the national road network and in 39% of these are involved pedestrians. In the period 2007-2012, 2,200 pedestrians were killed and 2,900 were seriously injured in road accidents on the national road network. More than half (52%) of accidents involving pedestrians case was illegal crossings, and 35% due to irregularities in the drivers. For the rest of accidents involving a single vehicle, major causes are excessive speed (48%) and other irregularities (31%).

"Black spots"<sup>68</sup> identified in the national road network which have been reported most accidents with fatalities are shown in Figure 4.25.

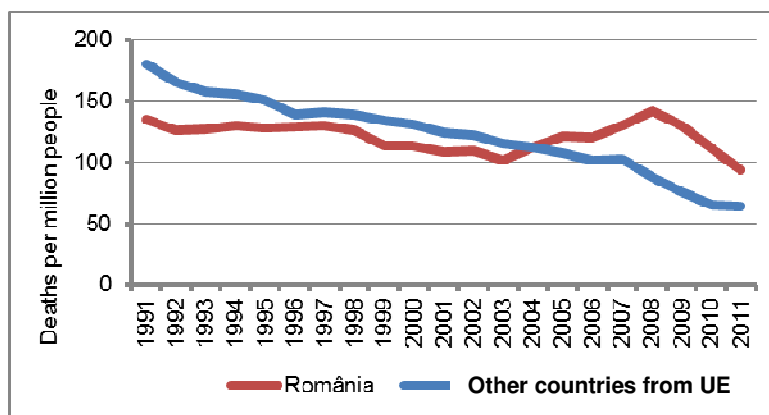


**Figure 4.23 Sensitive spots/areas identified for the national road network where have been reported most accidents**

*Reference: AECOM Analysis database accidents, traffic police, years 2007-2012*

The graphic below shows the total number of deaths from road accidents in Romania compared to the average of the other EU countries included in the group of 27 (excluding Romania).

<sup>68</sup> "Black Point" is a road segment with a length of 1 km that was recorded in 5 consecutive years at least 10 fatal accidents resulting in injury or very severe. Blackheads are grouped on the national road with one lane



**Figure 4.24 Number of deaths per 1 million people (Romania versus EU average)**

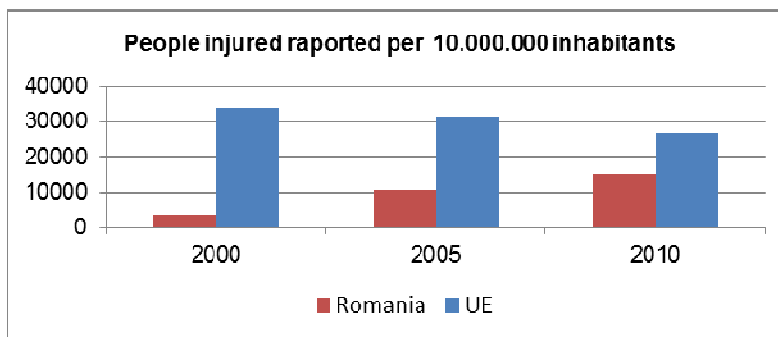
*Reference: CARE (database of EU road accidents) or national publications, European Commission / Directorate General for Energy and Transport*

The deaths from road accidents in the European countries (except Romania) registered a percentage decrease of 2.93% per annum. By 2003, the number of deaths from road accidents in Romania remained under the rest of the EU average, but after 2004, Romania began to record increases in the number of deaths over the average of all EU countries.

Over a period of 20 years from 1991 to 2011, long-term evolution of the number of deaths in Romania was the decrease by 1.5% per year, but this decrease is much smaller than that of the EU average of about 5% per year.

This figure must, however, be made in the context of multiplying the number of car owners. Based on World Bank statistics, the average increase in the number of car owners is approximately 15% in Europe in the period 2003-2011; for Romania this figure is 33%.

Also were analyzed the data from another database provided by UNECE which includes figures for all victims of traffic accidents (ex. The deaths, serious and slight) in Europe. Figure 4.27 compares Romania to the European average for three time periods: 2000, 2005 and 2010.



**Figure 4.25 Fatalities due to road accidents (fatalities, serious injuries and slight) - Romania versus EU average**

*Reference: UNECE Transport Statistics for Europe and North America*

From the above figure it can be concluded that:

- The total number of injuries (all galaxy) is, in absolute terms, lower than the European average; but
- The trend in the total number of injuries represents a significant increase in Romania compared to the European average downward trend; and
- Deaths from road accidents in Romania, are approximately 50% more than the European average.

### ***Railway Accidents***

In 2011, in Romania, less than 250 people were killed or seriously injured were on track - about 10% of deaths / serious accidents on the railway registered in the EU27. In Poland and Germany there was a greater number of deaths / serious accidents on the railway in 2011. In 2011 there were 100 deaths in Romania (compared to 140 deaths in 2010), of which 98 were been associated with people who were not part of the staff and passengers were not - in other words, people who were hit by rolling stock while crossing railway (76 deaths) or level crossings (22 deaths). The number of deaths that involved level crossings decreased from 42 in 2008 and 35 in 2010 to 22 in 2011 and now has almost reached the average for the EU27, about 25% of all deaths in the rail sector.

However, where rail systems have a large number of level crossing barrier, such as the UK, the percentage recorded on these types of deaths is around 10%.

In Romania there has been a higher percentage of accidents involving people hit by trains - which reflects the fact that most of the railway properties are not properly defined and marked and also that people are not informed enough about the dangers caused by the inadequate rail crossing.

### ***Naval Accidents***

According to the statistics developed by Navigation Safety and Coordination Service Port Captains (SSNCCP) of the Romanian Naval Authority, in 2011 the situation on waterways in Romania is as follows:

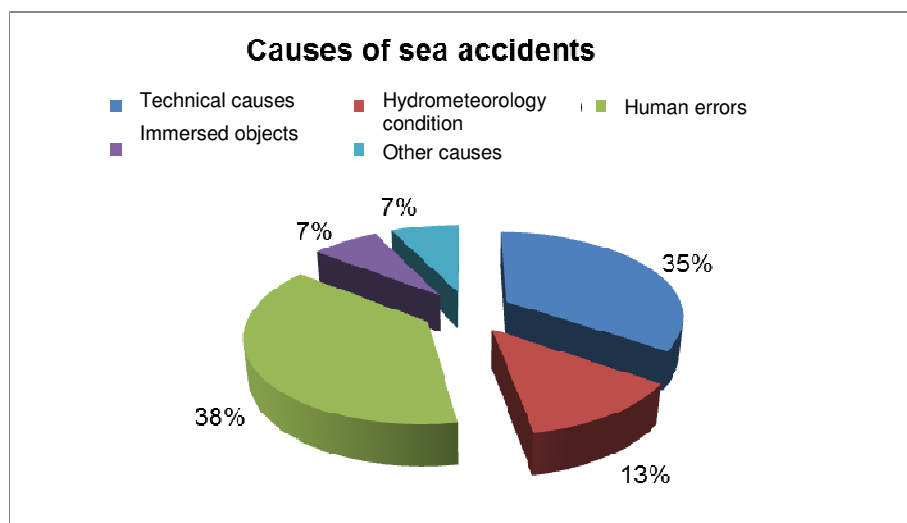
- Have entered in the Romanian ports 69 209 ships, of which 62 353 were inland waterway ships, representing 90.10% of the total, and 6856 ships, representing the remaining 9.90%.
- When out of the total number of Romanian ports was 68,154, of which 61,716 inland waterway vessels, representing 90.55% of the total and 6,438 ships, at a rate of 9.45%.
- The total number of ships in transit was 32,886, of which 30,115 were inland waterway ships and 2771 maritime ships, making the number of inland ships in transit to be 10.87 times higher than the maritime ships.
- In 2011 there were 55 shipping casualties from whom 89% (49 injuries) were classified as less serious accidents and incidents, and 11% (6 accidents) were classified as serious and less serious accidents.

The highest percentage was the one of the accidents involving inland waterway ships, an explanation is the fact that their traffic is much higher compared to the other. Thus, relative to the total number of inland waterway ships entered / exited / Romanian ports, out of 124,069 ships, 0,044% of them were involved in accidents, and in the case of maritime ships, from the total of 13,294 ships entering / outgoing in / Romanian ports, 0.414% ships were involved in accidents.

The causes that led to the production of these accidents were:

- Human error (38%) - misinterpretation of data from navigation instruments, failure signs and signals, inattention, stress;
- Technical reasons (35%) - engine shutdown, lock the rudder;
- Hydro meteorological conditions (13%) - fog, strong wind gusts, water levels;
- Immersed objects (7%) - logs and other materials immersed;
- Other causes (7%) - speed driving pleasure craft inappropriate conditions, drinking.





**Figure 4.26 Causes of accidents generated by naval sector**

Of the 55 accidents in 2011, 65% resulted in property damage (damage to engine failure in the steering system, electric fire, damage to the hull, etc.), 23% were injured resulting 8% had resulted in deaths, and the rest did not produce damage or casualties.

### **Air Accidents**

The number of air accidents that occurred in Romania in the period 1923-2012 is 59, in which 375 people died. The worst accident occurred in 1995, in the town Balotești, accident which resulted in 60 people fatalities. The main causes were human error and failure of the aircraft.

#### **4.1.9.Landscape and natural heritage**

##### **4.1.9.1.Landscape**

According to the European Landscape Convention adopted in Florence on 20 October 2000 transposed by Law no.451 / 2002, the landscape represents a part of the territory perceived as such by people, whose character is the result of the action and interaction of natural and / or human factors.

The main objectives of the Convention are to promote landscape protection, management and planning, and to organize European cooperation in this field.

In the recent decades, the natural conditions and landscapes of Romania were particularly influenced by the evolution of the economic activities, and the economic growth in recent years, based on an excessive exploitation of natural resources. Under these conditions, many plant and animal species are threatened with extinction, the changing of the landscape being an important indicator for environmental deterioration. Special attention should be paid to the impact on the landscape, at each of the 3 components: cultural elements (settlements, infrastructure, construction, human activities), biodiversity and geomorphological structure (relief, geological, hydrological).

The thematic strategy on the Urban Environment, adopted in 2006 at the European level, has the general objective to contribute to a better quality of life through an integrated approach to urban areas and contribute to a higher quality of life and social welfare of citizens by providing an environment where the level of pollution does not generate harmful effects on human health and the environment and by encouraging sustainable urban development.

According to this strategy, most cities face a common set of basic problems such as poor air quality, high levels of traffic and congestion, high levels of ambient noise, low quality built

environment, land abandoned gas emissions greenhouse, unorganized areas, generation of waste and wastewater.

The development of a society can contribute to meaning impact ("pollution") vision. The transport sector contributes to the deterioration of the landscape by fragmenting habitats, vegetation clearing, and construction of structures over water, over valleys etc.

The thematic strategy on the Urban Environment aims as a measure the integrated approach for the environmental management at the local level and transport in particular, based on effective consultation of all stakeholders and is a key element for the implementation of environmental legislation and achieves long-term improvements in terms of performance and environmental quality.

#### 4.1.9.2.Cultural heritage

In this chapter we will refer mainly to historical monuments, namely the real estate, construction and land located in Romania, that are significant for the history, culture and national and universal civilization, considering they could be related to the transport sector.

According to Law no. 5/2000 on the approval of the National Landscaping Plan (Section III a - Protected Areas), cultural heritage of national interest can be divided into the following typological monuments categories (typology which does not comply strictly with the categories established by Law no.422 / 2001 related to the protection of historical monuments, but it is a pragmatic approach to the field):

**Table 4.16 Monument types**

Monument type	Registered number
<b>Architectural Monuments</b>	
Fortresses	35
Princely courts archaeological sites	5
Fortified Churches - citadels	22
Castles, mansions, palaces	28
Urban civil buildings	11
"Cule" - fortified boyar mansions	70
Urban ensembles	20
Wooden churches	81
Outdoor museums	7
Rock churches	6
Churches and monasteries	197
Industrial architecture; communication paths	13
Monuments of rural architecture (rural housing);	15
Traditional rural ensembles	7
<b>Traditional rural monuments</b>	
Paleolithic complexes	6
Neolithic and Eneolithic settlements	11
Settlements and cemeteries of the Bronze Age	6
Fortifications and settlements in the first Iron Age (Hallstatt)	9
Dacian fortresses	35
Ancient Cities	8
Buildings	6
Medieval monuments identified on the basis of archaeological research	15
Reserves including sites of archaeological occupation levels for long periods - settlements and necropolises	6

Law no. 422/2001 on the legal regime governing the protection of historical monuments establishes measures for the protection of historical monuments. The historical monuments belong either to public or private domain of the state, the counties, towns or villages, or are private property of individuals or legal entities. For each historical monument, a protection area shall be established, bounded on the topographic, geographic or urban, depending on the

street network, features historical monument relief and, where appropriate, that ensure integrated conservation and enhancement of historical and its framework built or natural.

In 2005, the situation of the historical monuments is presented as follows: there are a total of 26,900 inventories of historical monuments, of which 75% are at risk, and 35% are degraded.

The activity of transport, especially road and rail transport, by air pollution and vibrations, can influence the built environment, including architectural and archaeological monuments located in the immediate vicinity of transport routes.

During the development of construction of transport infrastructure, as in case of other major projects involving excavation, there is the risk of discovery archaeological heritage objectives requiring the establishment of specific programs to protect.

A good example is the National Archaeological Research Program "Motorway" - Order 653 of 24 August 2010 for the establishment of the national program of archaeological research "motorway." The program is designed to protect archaeological heritage affected by road infrastructure projects in 2010-2020.

The authorization for the construction works in areas with archaeological objectives listed on the List of National Archaeological Monuments is being approved only on the basis and in accordance with the Ministry of Culture regulations.

At the national level there are no statistics on the effects of transport activity and the construction of transport infrastructure on the cultural heritage.

The well-developed and properly maintained transport infrastructure can play an important role in the recovery of national and natural historical monuments. The lacks of inter-sectorial approach for the transport-cultural heritage relation may affect the valuing process of historical monuments.

#### **4.1.10. Sustainable transport sector**

Since 1990, Romania has made efforts to improve transport infrastructure, ensuring sustainable development in terms of social and environmental protection, transport safety and efficiency to meet future demand corresponding for the transport at national level.

The Sustainable Development Strategy of the European Union in terms of transport is "to ensure that current transport systems to meet the economic, social and environmental issues, while minimizing undesired effects on the economy, society and the environment".

The National Strategy for sustainable transport for 2007-2013 and 2020, 2030, approved by the Order 508/2008, primarily aims balanced development of the national transport system, to ensure a modern transport infrastructure and services and sustainable development of the economy and the improvement of the quality of life.

In order to reduce the CO<sub>2</sub> emissions, has been developed a program of measures which to reduce the consumption of electricity and fuel at national level.

The measures implemented in order to mitigate environmental impacts, up to date, are:

- **Road Sector**

- Introduction of EURO 2 (1998), EURO 3 (2002), and EURO 4 (2008) and unleaded petrol which has led to a decrease of pollutant emissions from vehicles (especially SO<sub>2</sub> - sulfur dioxide, VOCs - volatile organic compounds, benzene, lead, CO - carbon monoxide).
- Introducing an incentive program for national car park renewal (the "piece"). The program was developed under O.U.G. no. 217 of 4 December 2008, Order no. 89 of 10

February 2009 approving the Instructions on how to implement the Government Emergency Ordinance no. 217/2008 and Order no. 148 of 3 July 2009

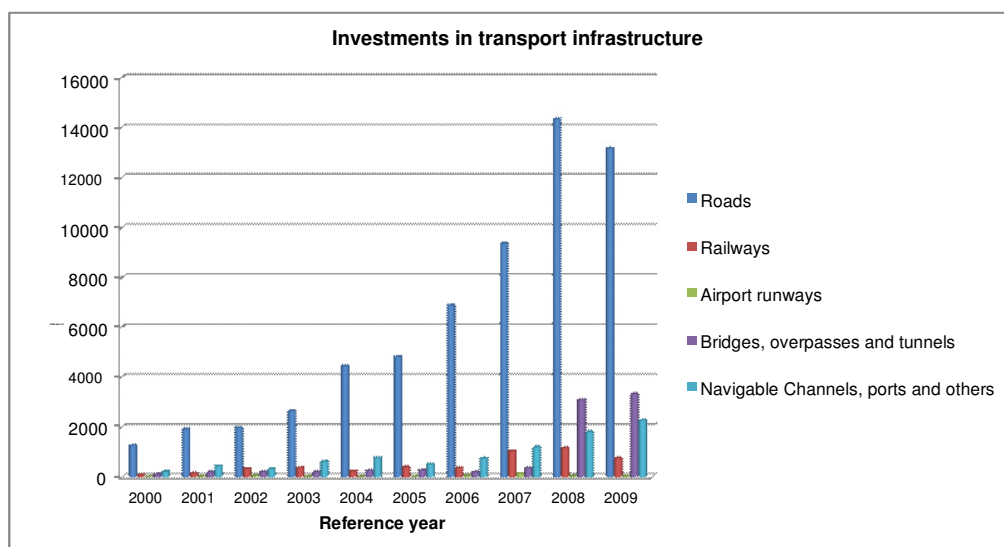
- Conducting a program to improve the quality of life and the urban environment, expanding the concept of low emissions - for example for the local public transport sector in the city of Suceava was held SMILE CIVITAS II project "Ecological Alternatives for sustainable urban development of Europe" and MIDAS "Measures influencing the transport demand for sustainable development "
- Investments for modernization and rehabilitation of roads and bypasses development for urban areas.

- **The rail sector**

- Upgrading the existing rolling stock;
- Development of the rehabilitation works for the railway lines;
- The fitting wagons improving with low-noise brakes;
- The rehabilitation of the facilities and collection systems, drainage and decantation / separation of oil residues;
- The purchase and installation of oil waste collection systems;
- The railway line electrification and rehabilitation;
- The repairs for the passageways.

- **River and maritime sector**

- Protections and consolidation of the sides, modernization of signaling;
- Works for the improvement of navigation on the Danube.



**Figure 4.27 Investment in transport infrastructure, for the reference period 2000-2009**

Reference: National Institute of Statistics, [http://www.insse.ro/cms/files/Web\\_IDD\\_BD\\_ro/index.htm](http://www.insse.ro/cms/files/Web_IDD_BD_ro/index.htm)

The present situation of the sustainable transport is not satisfactory because of the following:

- Lack of funding in national transport network development, makes progress to be very slow, the good results were recorded only for the road sector for projects related to modernization and rehabilitation of existing national roads (v. Figure 4.29);

- The infrastructure network has a limited capacity which leads to the decline in traffic acquisition of goods and passengers especially in the cities, at certain times of the year, which affected the traffic safety and worsened the quality parameters of transport, failure to comply with European transport policy objectives;
- The road accident rate is still high compared to the situation at European level;
- At National level, the transport is among the largest sources of air pollution.

#### 4.2. The state of the environment in case of non-implementation of the General Transport Master Plan

The SEA Directive 2001/42 EC of the European Parliament and the European Council on the effects of environmental plans and programs implemented in Romania by GD. 1076/2004 provides that within the Environmental Report will be presented an analysis of the current state of the environment and also the state of the environment without implementation of the plan.<sup>69</sup>

"Zero alternative" (not implemented GTMP situation) include:

- Existing infrastructure and Scenario "Do minimum" ("Reference Case" Scenario) – the projects included in the scenario "Do Minimum" are already under construction or are part of a funding program, leading to a clear commitment of funding, all necessary approvals being obtained and implementation being planned to be completed before beginning of 2015. projects included in the scenario "Do minimum" are projects that are already in the implementation phase, already ensured that funding will be made whether to approve the GTMP.

The results of the "Reference Case" Scenario will be used as benchmarks in evaluating the alternative "Do-Something" development scenario and "Core TEN-T" Scenario.

By implementing the "Do Minimum" Scenario, the total demand for travel on road infrastructure will increase by 20%, so obviously the road network will become a more attractive mode of transport. The improvement of the road network will lead to an increase of traveling by own car. There will be a large increase in the requirements for road freight transport (transport cargo traffic growth will be higher than transport by car - 33% versus 17%) and an increase in the attractiveness of bus travel as a way of transport in the detriment of the train travels.

The projects proposed for the road sector will have a significant increase in vehicle kilometers for motorways (206%) and a more modest increase of traffic on the national network (40%).

The rehabilitation of TEN-T Corridor IV North will lead to improvements in terms of travel times on specific railway lines (significantly reducing the travel time). However, by implementation of the "Reference Case" Scenario, the railway system remains uncompetitive compared to road and inland waterway system.

Without investments for maintenance and repairs, the railways travel times will continue to grow for the same distance.

By implementing the "Reference Case" Scenario are expected to be registered some decreases in the demand for the railway passenger transport with over 20% until 2020, thus the trains will record lower occupancy percentage.

The Danube River is an important and strategic "good" for Romania, but navigation on the Danube may face a number of obstacles, especially in the case of freight transport. The implementation of the projects included in the "Reference Case" scenario will not have as primary result the total elimination of this "impediment". The lack of proper maintenance regime leads to the impossibility to navigate on the Danube fairway in proper conditions. The projects proposed within the reference scenario will solve the problem on the Danube navigation conditions for the sector Braila - Calarasi.

The failure of implementation of the proposed investments by General Transport Master Plan, Romania will not align with EU requirements concerning the transport sector.

The development and approval of the General Transport Master Plan are essential conditions for the approval of the final projects needed for the Sectorial Operational Program for Transport Infrastructure and creates the appropriate framework for the absorption of structural funds.

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<sup>69</sup> Article 5 and Annex 1b - SEA Directive 2001/42 / EC of the European Parliament and the European Council on the effects of certain plans and programs on the environment; Article 15 - Government Decision 1026/2004 on establishing the procedure for environmental assessment for plans and programs.



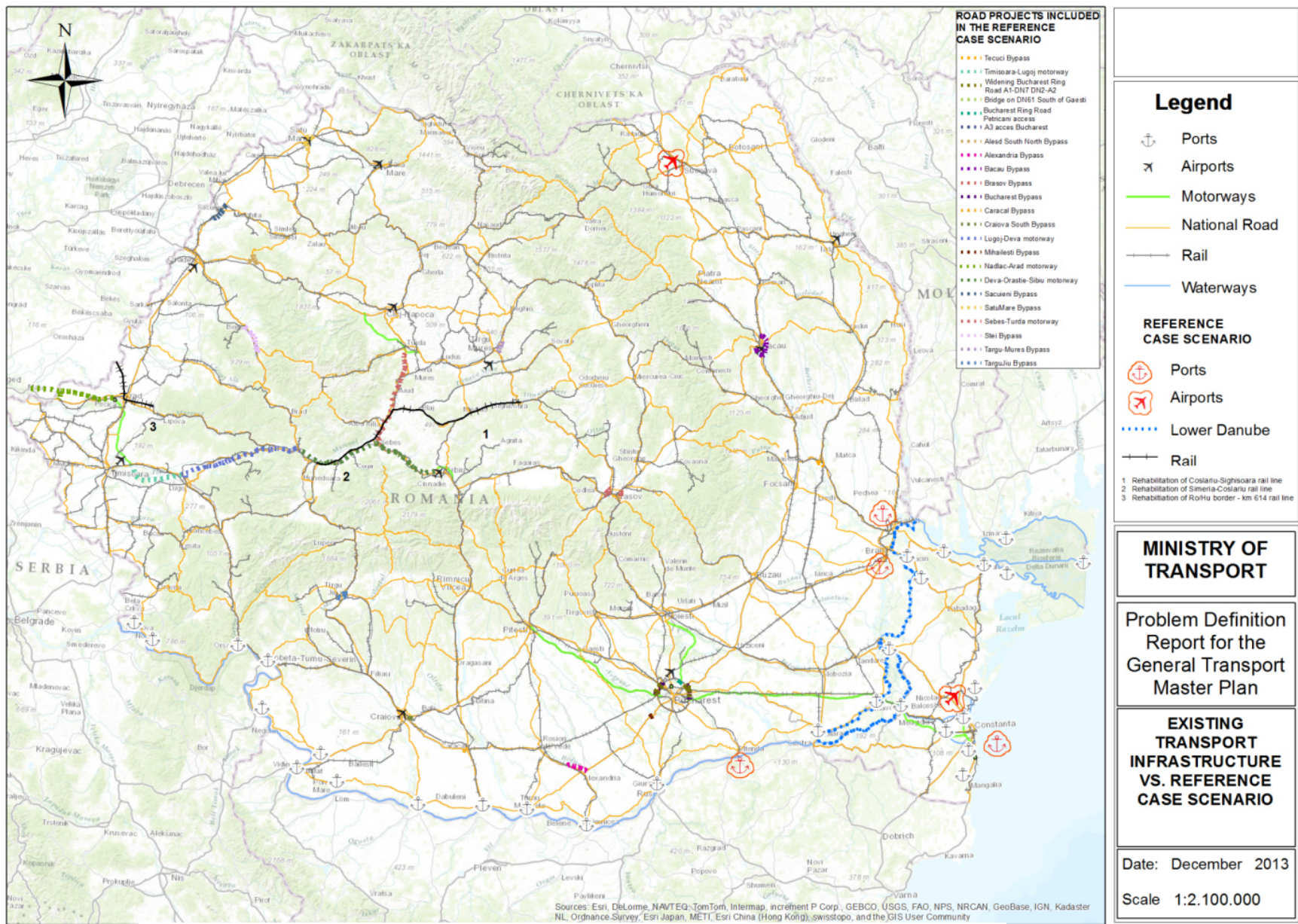
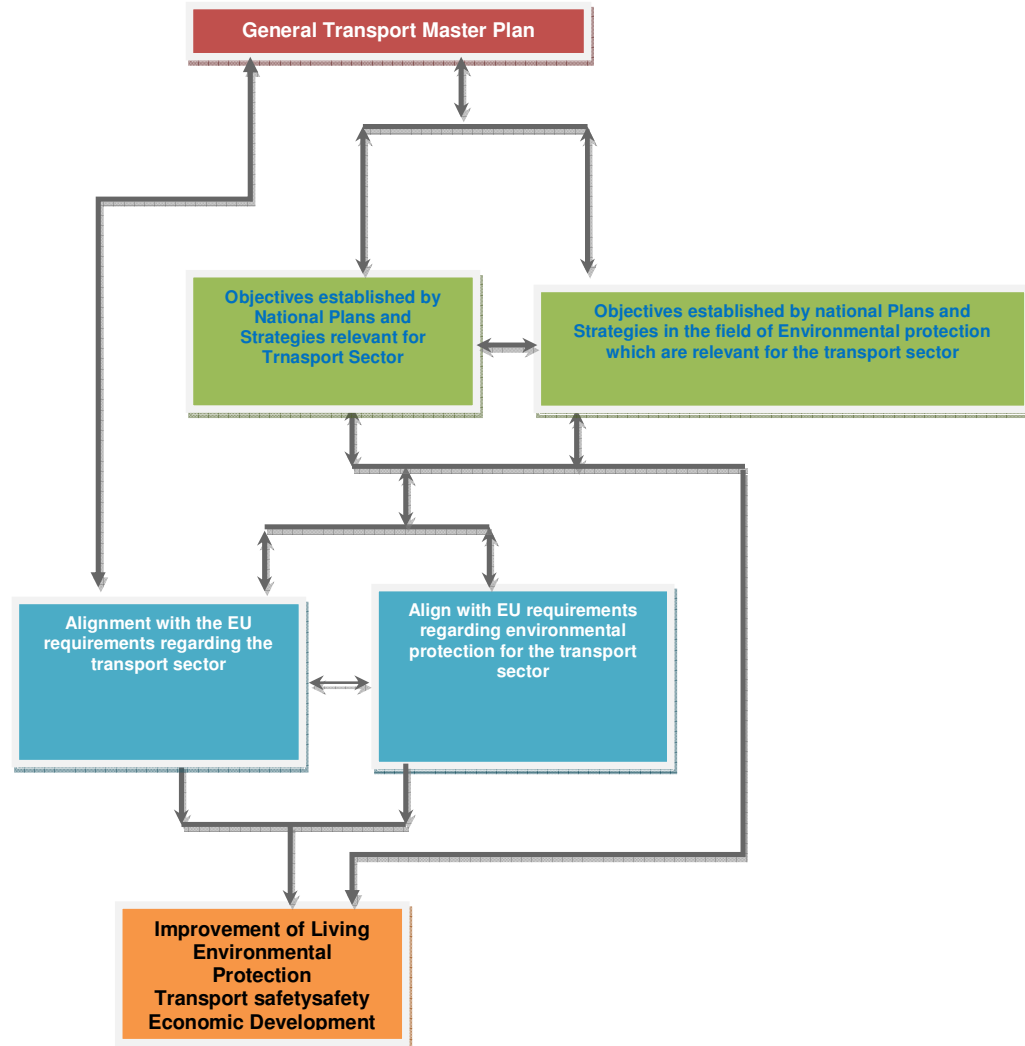


Figure 4.28 Projects included in the Baseline Scenario vs Existing Situation



The objectives and lines of action for the General Transport Master Plan are closely linked to the provisions of strategies / programs / plans major national (v. Chapter 3) and its non-implementation can lead to so-called "spiral of decline" (GTMP failure can lead to failure action objectives and measures established by other strategies / programs / national plans). It can be seen, in the following figure, the interdependence between the objectives set at national level, integration with the European Union, GTMP economic development and improvement of environmental conditions.



**Figure 4.31. Interdependence between the objectives set at national level, integration with the European Union, GTMP economic development and improvement of environmental conditions**

The following shows the status of the development of the environment conditions, in case the General Transport Master Plan is not elaborated and implemented. For this assessment, were taken into account the existing national information on the current condition of the environment and effects generated by the two scenarios regarding transport conditions. It is noted that such an estimate is difficult to make given the insufficient specific information on the transport sector's current influence on all environmental factors; the existing information is not detailed enough. The vast majority of information comes from estimates and not from direct monitoring so that there may be uncertainty regarding their accuracy.

**Table 4.1 Possible development of environment state in case the General Transport Master Plan is not being elaborated and implemented**

Environmental factors	Possible development of state of the environment in the event of failure General Transport Master Plan (Alternative Zero: The existing infrastructure + Scenario "Do minimum")
Air	<p>The trends will be the increase in the quantities of pollutants generated by the transport sector, especially in large urban areas and the sectors of road traffic.</p> <p>At that moment, in Romania, the road sector is the most important element of the Romanian transport system (including passenger and freight) and also the most polluting having a significant contribution to total atmospheric emissions (NO<sub>x</sub>, particulate matter, NMVOC, heavy metals).</p> <p>The current quality of the roads, the lack of bypass roads make average travel speeds low and journey times long, this contributes to high fuel consumption and emissions in large quantities in the atmosphere.</p> <p>The absence of investments for improving the quality of road infrastructure, of the works for the maintenance, modernization and overhaul of the railways, will generate the increase of the direct negative effects on air quality associated with the transport sector.</p> <p>The development of the scenario "Do Minimum" will have an effect on the total demand for travel on road infrastructure which will increase by 20%, comparing with implementing the scenario "Do nothing" and road transport will still have a much greater contribution to air pollution than rail and ship. Applying this scenario is expected to produce significant changes in the evolution of environmental factors compared to the current situation. Although this scenario includes a number of modernization projects, road rehabilitation roads, construction of new road corridors (bypass the settlements, sections of motorway corridor that are part of TEN-T), these are not sufficient to reduce current emissions trends of pollutants into the atmosphere generated by the road sector. These projects will allow, on the one hand, to reduce the amount of emissions into the atmosphere in large urban areas, by diverting heavy traffic and reduce congestion, increase travel speed, but, on the other hand, will encourage demand for road transport demand, which contributes to maintaining a high amount of total emissions of pollutants in the atmosphere at national level. The implementation of the proposed projects of the scenario "Do Minimum", for the road sector is having a significant increase in vehicle kilometers for motorways (206%) and also a modest increase of traffic on the national network (40%).</p> <p>The electrification of railway lines reduces emissions of pollutants in the atmosphere caused by using this mode of transport. However, other measures are needed for this time of transport to become competitive with road transport (increasing the speed of transport, reducing travel time, improve transport conditions, increasing accessibility for many regions of the country).</p> <p>"Do Minimum" Scenario does not propose investments for intermodal transport. This current trend maintains the actual trend of use for freight transport the road infrastructure.</p> <p>The air sector projects proposed by "Do Minimum" Scenario will not bring significant changes, in terms of air emissions generated by this sector, to the present situation. By the implementation of these projects are not expected changes in the demand and frequency of trips using domestic passenger transport in the aviation sector.</p> <p>The factors that may influence the variation of air pollutant emissions resulting from road traffic are:</p> <ul style="list-style-type: none"> <li>– the economic development of the area;</li> <li>– the associated cost with fuels and car maintenance;</li> <li>– the supply and demand for cars;</li> <li>– the tax / tax levied on cars;</li> <li>– the need for individual mobility;</li> </ul>

Environmental factors	Possible development of state of the environment in the event of failure General Transport Master Plan (Alternative Zero: The existing infrastructure + Scenario "Do minimum")
	<ul style="list-style-type: none"> <li>– The existence of the by passes for the urban areas;</li> <li>– The technological improvement of vehicles and the possibility of using alternative fuels;</li> <li>– The application of intelligent transport systems (advanced applications that, without embodying intelligence, aim to provide innovative services on transport modes and traffic management);</li> <li>– The inefficiency or lack of public transport services;</li> <li>– The average speed of traffic (the transition between localities in the locality).</li> </ul> <p>Given the above, it is imperative to implement measures to optimize the use of different modes of transport and to improve the transport infrastructure.</p>
Water	<p>The transport sector's contribution to failure of the environmental objectives for water quality is insignificant compared to the industry or urban areas.</p> <p>If no works will be done to improve and maintain the waterways, will still be maintained the risk of accidents that can lead to pollution of the Danube and Black Sea, and indirectly - Ship failures, loss of various substances in water loss fuel, etc.</p> <p>The number of environmental incidents in the port areas resulting in discharges of pollutants will not be reduced unless will be implemented the investments to modernize the ports, the control systems and the intervention and accidental pollution prevention centers.</p> <p>The implementation of the "Do Minimum" Scenario will improve: the navigation conditions on the Danube, the systems for monitoring water quality in waterways and control / prevention of the accidental pollution.</p> <p>In case of the project proposed for the improvement of navigation on the Danube, for the works done so far, have not been registered exceeding values for any quality indicator comparing to historical values reported TNMN - ICPDR (according to monitoring conducted by experts of INCDPM).</p>
Soil	<p>The significant pressure factors on soil quality will still remain: the current agricultural practices, the improper disposal of waste and the non-conforming industrial activities (due to pollution generated by airborne substances).</p> <p>The Scenario "Do Minimum" proposes projects for some new alignments or changing the existing alignments (modernization projects for roads and railways), which will change the utilities land, and will lead to the permanent occupation of some land areas. In the surrounding areas of new roads some changes in the quality of land can occur due to deposit of sediment particles and heavy metals.</p> <p>If transport infrastructure will not improve, the transport safety may decrease and increase the risk of road accidents involving rail freight transport and thus can appear a risk of accidental pollution.</p> <p>The transport sector, by its contribution to air pollution by generating pollutants such as NO<sub>x</sub>, Pb, Cd, non-methane volatile organic compounds, contribute indirectly to the soil pollution, especially in the areas of road arteries.</p>
Climate change	<p>It will keep the current trends of increasing emissions of greenhouse gases in the atmosphere due to the transport sector.</p> <p>The implementation of "Do Minimum" scenario will increase the demand for transport and increase the number of mileage compared to the current situation.</p> <p>Unless measures are taken to optimize the various modes of transport, emissions of greenhouse gases will still be high. The railway transport, which is less polluting than road transport, will be preferred compared to road transport without improvement of transport</p>

Environmental factors	<b>Possible development of state of the environment in the event of failure General Transport Master Plan (Alternative Zero: The existing infrastructure + Scenario "Do minimum")</b>
	<p>costs and the creation of new access routes to other regions of the country. The increase in the number of fleet and long travel routes will increase the share of greenhouse gases emissions.</p> <p>According to the IPCC Assessment Report, published in 2007 (available on <a href="http://www.ipcc.ch/">www.ipcc.ch/</a>), unless action is taken to reduce greenhouse gases emissions globally, the value in 2030 will be higher with 25-90% than the current level, this being the highest increase for the transport sector.</p> <p>At EU level, the transport sector remains the sector with the highest greenhouse gases emissions, with a tendency to increase by 26% between 1990 and 2007, respectively 0.5% between 2006 and 2007, mainly due to increased demand for passenger and goods, and preference for the use of roads as means of transport over other modes of transport less polluting.</p> <p>According to the latest published data at European level, the trend of greenhouse gases emissions, for the transport sector, is growing in the coming years, compared with growth dynamics of the emissions from other sectors such as industrial, residential or energy production.</p> <p>Based on recent estimates of the European Environment Agency, after a decrease of greenhouse gases emissions in 2009, due to the economic recession, the total emissions trading scheme - ETS increased in 2010 and remained at about 15,5%, below the year 1990 emissions (are taken into account for approximately 14% of emissions from aviation activities). For 2010, the emissions remained with 5% below those of 2008 year. Forecasts of Member States indicate that total emissions at EU level will be significantly reduced in the next period, until 2020. The following national measures adopted by each Member State, in 2020, the EU emissions are 19% below those registered in 1990, which represents only a minimum target of 20%. 1 percentage point gap could be filled and the target may be exceeded by 5 points if the Member States will implement additional measures currently envisaged, in particular those related to transport and residential sectors.</p> <p>According to calculations made for the development of the GTMP, through the implementation of the proposed projects for the "Do Minimum" Scenario, the tendency will be to increase the greenhouse gases emissions (see <i>Chapter 6. Environmental aspects of likely to be significantly affected areas</i> for which estimates for CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, NMCOV and Annex 4) are available. It is estimated that following the implementation of proposed projects by this scenario would be registered an increase in total greenhouse gases emissions for the scenario "Do nothing" (existing infrastructure).</p> <p>As mentioned above, in section related to the environmental aspect Air, keeping the transport sector in its current state will increase the volume of passenger and freight transport on road sector, which entails an increase in fuel consumption and, hence, an increase in greenhouse gas emissions.</p> <p>With the current inadequacy of transport infrastructure to climate change (extreme weather conditions) can exacerbate the damage to its condition. The climate change may have a negative impact on transport infrastructure (road and rail), higher temperatures, floods, landslides and can also cause damage and disruption to its transportation system. The fluctuations in the flow regime of the Danube can have a direct negative impact on the sector of shipping.</p> <p>During summer, in Romania, temperatures exceed 40 degrees Celsius. Such high temperatures could compromise the roads surface. In particular, heavy goods vehicles can exacerbate any potential damage caused by very large weights. As a result, in certain months of the year, there are prohibitions applied to these vehicles in terms of traffic on some roads.</p> <p>The "Reference Case" Scenario encourage the road sector, the proposed projects will</p>

Environmental factors	<b>Possible development of state of the environment in the event of failure General Transport Master Plan (Alternative Zero: The existing infrastructure + Scenario "Do minimum")</b>
	<p>contribute to the development / improvement of road transport network, will lead to increased requirement for road transport for both freight and passenger. The increase of traffic volume will also contribute to the increase of the amount of fuel used, which leads to increased emissions of greenhouse gases, maintaining high transport sector's contribution to total emissions of greenhouse gases.</p>
<b>Energy efficiency and renewable resource consumption</b>	<p>Reducing the energy consumption for transport depends, on the one hand, of the conditions of transport (road conditions road and railways), but on the other hand by the means of transport and technology (such as motors) and the placing on the market of alternative combustion.</p> <p>The energy efficiency depends, besides technical condition of transport infrastructure, on the vehicle laden, type of the used vehicles, weight / mass of the vehicle, the physical-geographical characteristics of the areas of transport infrastructure (hills, plains, mountains) and type of the additives present in the fuel.</p> <p>The road transport is responsible for a high consumption of fuel oil, if to take into account that 95% of vehicles belonging to the National Park Auto are using fuel as: gasoline and diesel type. None of these presented scenarios will solve the problem of the increased demand for these types of fuel.</p> <p>The increased use of road transport to the detriment of other modes of transport will increase fuel consumption, especially those derived from petroleum.</p> <p>The improvements in transport infrastructure (electrification of railways, modernization / rehabilitation of motorways and railways) proposed by "Do Minimum" Scenario will allow increasing energy efficiency and reducing fuel consumption, but not enough to reduce the dependence on oil for the transport sector.</p>
<b>Biodiversity</b>	<p>For this environmental aspect it will be maintain the current trend of increasing air emissions due to road traffic, which indirectly affects biodiversity. Moreover, the lack of transport development strategy that takes into account the impact on biodiversity, will lead to degradation of natural protected areas.</p> <p>It should be noted that the implementation of the proposed investments within the scenario "Do Minimum" may have significant negative effects on biodiversity component, unless specific measures are applied, for each zone, as they were established during the environmental impact assessment and appropriate assessment procedure.</p>
<b>Population and human health</b>	<p>The trend for the total number of traffic accidents with casualties will be to significant growing compared to the European average downward trend.</p> <p>In case of failure to improve transport infrastructure, the people will still be disturbed by noise from road traffic growth in urban areas (due to lack of motorways and bypasses determining driving traffic to peri-urban areas).</p> <p>The "Do Minimum" scenario will contribute to the increase of the road safety, will eliminate the congestion and traffic jams, but only for the rehabilitated areas and areas where the new motorways will be built. The safety still remains low, on the transport arteries where there are interventions to only improve the transport infrastructure.</p> <p>The development of the strategic noise maps for transport infrastructure (ports, airports, roads, road, rail) - projects included in "Do Minimum" scenario - will allow the identification of areas where the noise level exceeds the admissible limits and establish mitigation measures due to noise on sensitive receptors.</p> <p>It will be maintained the trend of increasing amounts of greenhouse gas emissions generated by the transport sector due to the growing trend of the national auto fleet number, and also duration and length of trip.</p>

Environmental factors	Possible development of state of the environment in the event of failure General Transport Master Plan (Alternative Zero: The existing infrastructure + Scenario "Do minimum")
<b>Waste and hazardous waste management</b>	<p>Improper maintenance of roads and the quality of their structure could increase the amount of waste associated to transport activity (especially waste resulting from repair work and maintenance of transport vehicles, such as waste oil, tires, used batteries etc.).</p> <p>The development and modernization of transport infrastructure will increase the volume of waste associated with transport activity (end of life vehicles, waste oil, used batteries, tires, etc.) and also will increase the amount of waste associated with construction and demolition activities for the transport infrastructure.</p>
<b>Sustainable transport</b>	<p>If there will be no new investment in infrastructure, Romania is likely to achieve the objectives set by the European Union in terms of sustainable transport, respectively:</p> <ul style="list-style-type: none"> <li>– A modernization and development of the transport network of European and national interest;</li> <li>– Increasing the safety and quality of services;</li> <li>– Development of intermodal transport;</li> <li>– A stimulating economic and competitiveness development;</li> <li>– A strengthening of the social and territorial cohesion;</li> <li>– Protection of the environment.</li> </ul> <p>Without the development of the General Transport Master Plan will not be solved a very important issue for infrastructure development, respectively: implementation of the investments that contribute to the creation of a single European Area.</p> <p>It also will not be solved the problem of traffic safety, being maintained the high rate of road accidents and will not be improved the quality of passenger service.</p> <p>Development only of the projects included in the "Do Minimum" Scenario will produce significant changes in terms of sustainable transport component. It is assumed that this scenario implementation will not encourage the increase of the less polluting transport demand and will keep the tendency to use road transport sector in principal.</p>
<b>Landscape and cultural heritage</b>	<p>The "Do Minimum" Scenario implementation can lead to a local change of the geomorphology of the natural ground through deforestation, scraping, digging, viaducts etc. The projects included in this scenario have provided architectural harmonization measures with the natural landscape. The improper of late identification and location of the archaeological sites during implementation period of the projects may create difficulties for the development of the measures for recovery and protection of the sites.</p> <p>The "Do Minimum" Scenario will allow the rehabilitation of some roads, railways and related facilities, allowing a slight improvement of the landscape damaged by the poor state of the infrastructure.</p>

The Zero Alternative (existing infrastructure + "Do Minimum " Scenario) will not lead to major changes in current trends of the evolution of state of the environment (will be difficult to achieve the objectives set at national level for each environmental aspect). The "Do Minimum" Scenario, particularly encourages road sector (proposed projects will increase the demand for road transport). At European level, the main cause of increasing road congestion and increased consumption of energy and a source of social and environmental issues, it is precisely this tendency to increase the requirements for road transport for both freight and passenger.

In this situation, it becomes absolutely necessary to develop a strategy for the development of the transport sector in order to maximize positive impact on economic growth, while minimizing negative environmental impacts.

On the other hand, must be taken into consideration the fact that there are currently European trends to create a framework "cross" for the transport sector that could help to reduce the effects caused by the transport sector on the environment, such as:

- Providing Intelligent Transport Systems

The expansion of existing infrastructure and improvement of road transport are not enough, we need to create intelligent transport systems (ITS) that integrate telecommunications, electronics and information technologies with transport engineering in order to plan, design, operate, maintain and manage transport systems. Thus, Directive 2010/40 / EU of the European Parliament and of the Council of 7 July 2010 on the implementation of intelligent transport systems in road transport and for interfaces with other transport modes establishes a framework to support the implementation and use of coordinated and consistent Intelligent Transport Systems (ITS) within the Union, particularly along the borders between the Member States.

- Use of alternative fuels

The "Study on clean transport systems" (Study on Clean Transport Systems) explored the possible contribution of alternative fuels to achieve the objective of 60% reduction of the greenhouse gases emissions established by the Transport White Paper document. "The study of implementation of common technical specifications for infrastructure for alternative fuels" (CTS Implementation Study on Alternative Fuels Infrastructure) evaluated different options for the development of an infrastructure for alternative fuels across the EU. The study entitled "greenhouse gases from transport in the EU: Measures 2050" (EU Transport GHG: Routes to 2050) specifically addressed the decarbonization issues that are relevant to this initiative and its conclusions have highlighted the crucial role of permanent technical improvements in vehicle efficiency, which, together with the alternative fuels must ensure cost effectiveness of the overall package.

The Directive on alternative fuels infrastructure installation provides the requirements for establishing national policy frameworks for the development of alternative fuels market (Directive pending) and the creation of infrastructure for alternative fuels and implementation of common technical specifications. Under this Directive, each Member State should establish a minimum number of recharging points for electric vehicles and 10% of them to be publicly available. Also have to be considered not only the TEN-T road equipment with refueling points for liquefied natural gas, but also equipping all seaports and inland.

- Use of clean vehicles and energy-efficient

This action is stated in Europe 2020. The use of such vehicles will allow mitigating the impact of road transport on the environment and boosting competition in the automotive industry.

The European strategy on clean vehicles and energy efficient should encourage the development and adoption of heavy vehicles (buses and trucks) and light vehicles (cars and vans) as well as two - and three-wheel vehicles and four-wheel vehicles, which are clean and efficient in terms of energy consumption (so-called "green vehicles"<sup>70</sup>) and works with conventional internal combustion engines and are equipped with cutting edge technology for very low carbon emissions.

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<sup>70</sup> Green vehicles, including those that can run on electricity, hydrogen, biogas and other mixtures with high liquid biofuels



## 5. Environmental features of areas with significant potential to be impacted

The General Transport Masterplan's (GTMP) complexity is obvious because:

- Has set transport objectives tightly connected to national and European policies and strategies;
- Includes projects for different modes of transport: road, railway, naval, air, intermodal;
- The investments proposed to develop the infrastructure are very diversified, from building new road transport corridors, renovate/modernize existing road transport corridors, renovate/modernize existing rail transport corridors, build new rail transport corridors, modernize the existing ports and airports, improving sailing conditions on the Danube until new channels will be built (Bucharest - Danube);
- It's a national plan - the proposed projects will be implemented in areas with different environmental features;
- The reference period is on a short, medium and long term: 2014(2015)-2020, 2021-2030, after 2030;
- Proposes 4 scenarios:
  - The scenario that will not include any measure – “*Do nothing*” – is the current situation of the transport infrastructure;
  - “Reference Case” scenario – “*Do minimum*” - that takes into consideration the project already being built and financed;
  - Development scenario (ES/EES);
  - Development scenario exclusively based on extending the Core TEN-T transport network – „Core TEN-T” (CTT) – proposed as extra by the AECOM team at the request of the European Commission (extra when compared to reference terms included in the awarding documentation).

The GTMP includes the entire national territory as a development area. The technical details of projects proposed in the GTMP are unknown and the field studies have not been made. Information is not available to point their exact spatial location.

This chapter analyzes the „*Do minimum*” and *Development scenarios (ES/EES and CTT)* that can modify the current environmental features due to the nature of proposed projects (type of construction works specific to that project).

The 2 development scenarios (*ES/EES* and *CTT*) include the same projects list for the rail, water (ports and sailing channels), air and intermodal sectors, the only difference being the number and type of projects proposed for the road sector.

To assess the effects and areas that could be affected by implementing the GTMP, the following was taken into consideration: type of proposed project (nature of investment and transport sector), general characteristics of areas that could be modified (sensitive or vulnerable areas to air, soil and water pollution, biodiversity areas, areas with landscape value, cultural value, those that are densely populated), risks to human and environmental health, the timeframe when these environmental and human health effects will be felt (the construction or operation period of the project).

### 5.1. Environmental features of areas with significant potential to be impacted - reference scenario "Do minimum"

To analyze the environmental features of areas with significant potential to be affected, the projects list in the „Do minimum” Scenario was extensively analyzed. The following can be concluded:

- 7 projects representing about 6.6% of the projects included in the reference scenario do not include construction (1 project - road sector; 2 projects - rail sector; 4 projects - naval sector). For these projects the environmental impact was not analyzed. These projects refer to implementing some conventions, making the noise maps, rail safety systems, purchasing equipment;
- 99 projects representing 93.3% of the projects included in the reference scenario include construction of which:
  - 31 projects representing about 29.2% of the total included in the reference scenario include construction (2 projects - road sector, 14 projects - rail sector, 15 projects - naval sector) could not be spatially located due to lack of information on the exact coordinates (an approximate location was used based on the project's title)
  - For 49 projects (representing about 39.6%) an approximate location was used based on information in the project's title of if they referred to existing roads/railways: 50 projects - road sector, 14 projects - railway sector, 2 projects - naval sector and 2 projects - air sector).
  - Only for 26 projects (representing about 24.5%) did the GTM's beneficiary supply indicative routes and they were spatially located.

The projects included in the „Do minimum” Scenario are financed and in the process of being implemented/built. By analyzing the information on the environmental impact assessment procedure for the „Do minimum” Scenario projects, the following can be concluded:

- For 29 projects (27% of total) the environmental impact was assessed and for 6 of them the appropriate assessment was undertaken;
- For 38 projects (36% of total) the environmental impact was not assessed, the procedure had stopped in scoping stage;
- For 33 projects (31% of total) information on the environmental impact assessment procedure is not available;
- For 6 projects (6% of total) the environmental impact assessment and appropriate assessment was not necessary;
- For similar works, in some cases, the procedure to assess the environmental impact was not made and in some cases it was simplified - both for projects in the naval sector (ports) and for projects in the rail and road sectors. Without detailed information, it can be said that the same type of project (same type of investment) has been differently treated related to the necessity of undergoing the environmental impact assessment procedure in order to obtain approvals, from one region to another;

For projects included in the “Reference Case” Scenario (called „*Do Minimum*”) in order to determine the environmental features of areas with significant potential to be affected, have been used the conclusions of assessment stages and/or appropriate assessment, where such information was available. Table 5.2 systematically lists the conclusions of environmental reports, developed in the environmental impact assessment procedure and/or appropriate assessment stage or in the scoping stage decisions, environmental agreements, for projects included in the reference scenario. Can be noticed a certain subjectivity or different interpretations of the environmental impact from one assessor to another for similar projects.

Only projects with available environmental information were analyzed (*Table 5.1 - Stage of environmental impact assessments/adequate assessments for projects included in the reference scenario*).

The main causes identified for the potential negative impact on environment, during implementation and/or operation period of the projects are:

- Placing projects in areas of the vicinity of sensitive areas from the fauna and flora point of view;
- Temporary or definite occupancy of large terrain surfaces both in the construction and operation phases that lead to changes of land use, massive stripping, deforestation, etc.
- Pollutants and gases in the atmosphere, in the construction period, in areas with large construction works;
- Quantitative and qualitative modifications of water resources, both underground and surface, especially during construction;
- Not passing proper environmental protection measures;
- Lack of environmental management plans and not applying them in the construction period;
- Environmental impact assessments based solely on analyzing their effects on restricted areas, not taking into account the cumulative impact;
- Delays (since 2010) in applying the appropriate assessment procedure - transport infrastructure projects created many problems as to the biodiversity impact and integrity of protected natural areas (e.g.: massive deforestation, habitat fragmentation, etc.)
- Different interpretations on the part of the authorities regarding scoping criteria for similar projects in appendix (list of projects that were environmentally assessed) or in appendix 2 (list of projects for which the necessity of an environmental impact assessment needs to be established) of HG 445/2009 on assessing the impact of certain public and private projects on the environment.
- There are many transport infrastructure investments where the environmental agreement was obtained in the feasibility stage (feasibility study) and not revised in the technical detailed project stage (affected surfaces, digging depths, position and way of working in the area of the borrow pits, raw materials quantities, work volumes, etc.)
- The appearance - in the construction period - of new elements that couldn't be predicted in the environmental agreement obtainment and that led to project changes and implicitly to reanalyze the environmental impact assessment and the need to propose extra measures to diminish/limit it.

**Table 5.1 Stage of environmental impact assessments/adequate assessments for projects included in the reference scenario**

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
<b>Air Sector</b>					
1.	019	Modernizing movement surfaces and lighting, control tower and landscaping to place the ILS navigation system for Suceava airport	Civil Air Authority	Ongoing	The project was not subject to the procedure of environmental impact assessment or appropriate assessment, screening stage decision no. 6/2011 issued by EPA Suceava.
2.	021	Rehabilitation of the M. Kogalniceanu airport in	Civil Air Authority	Ongoing	The project was not subject to the procedure of environmental

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
		Constanta			impact assessment or appropriate assessment procedure. Screening stage decision no. 5686RP/2008 given by APM Constanța
<b>Naval Sector</b>					
3.	065	Extending the pier in Port of Constanta	CN APM SA	Start date: 2011 End date: 2013	Unavailable information
4.	066	Southward extension of overall berth in Port of Constanta	CN APM SA	Start date: 2011 End date: 2013	The project was not subject to the procedure of environmental impact assessment or appropriate assessment procedure according to screening stage decision no. nr. 13186RP/2011 given by APM Constanța
5.	084	Rehabilitation and modernization of port infrastructure in Oltenita	CN APDF SA	Start date: 2012 End date: 2014	Underwent environmental impact assessment. Environmental agreement no. 3/18.08.2011 was given by APM Călărași
6.	090	Port infrastructure works: quay berth 23 and 25 partially in the Port of Braila	CN APDM SA	End date: 2013	Underwent environmental impact assessment, was not subject to appropriate assessment procedure according to EPA Braila, decision no. 7312/19.06.2009.
7.	097	Waterways administration complex Giurgiu	RA AFDJ Galați	Ongoing	Unavailable information
8.	098	NEWADA duo	RA AFDJ Galați	October 2012- September 2014	Not applicable
9.	099	CO-WANDA: Convention on managing waste disposed by ships sailing on the Danube	CN APDM SA	October 2012- September 2014	Not applicable
10.	102	Master Plan Port of Constanța	CN APM SA	Implementat ion ongoing.	Will undergo environmental impact assessment.
11.	103	Dahar - Developing inland Danube ports	CN APDM SA	Started April 2011 To be finalized	Not applicable
12.	104	GIFT- Intermodal freight green corridors in South Eastern Europe	CN APDM SA	Ongoing	Not applicable
13.	109	Modernizing port infrastructure by increasing depths of channels and basins and safety of navigation in	CN APM SA	Ongoing	Project obtained environmental agreement no. 6755 RP/10.08.2012 and Natura 2000 agreement no. 228/11.07.2012

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
		Constanta			
14.	120	Developing railway capacity in the river-sea sector of the Port of Constanta	CN APM SA	Financing contract was signed in September 2013. Project ongoing.	Unavailable information
<b>Rail Sector</b>					
15.	127	Rehabilitation works for bridges, culverts and railway tunnels - Craiova Regional Railways	CNCF CFR SA	Financing request submitted to AMPOST.	Unavailable information
16.	128	Rehabilitation works for bridges, culverts and railway tunnels - Cluj Regional Railways	CNCF CFR SA	Financing request submitted to AMPOST	Unavailable information
17.	129	Rehabilitation works for bridges, culverts and railway tunnels - Brasov Regional Railways	CNCF CFR SA	Financing request approved.	Unavailable information
18.	130	Rehabilitation works for bridges, culverts and railway tunnels - Bucharest Regional Railways	CNCF CFR SA	Financing request approved.  Construction timeframe 01.12.2013 - 01.01.2016	Unavailable information
19.	131	Rehabilitation works for bridges, culverts and railway tunnels - Iasi Regional Railways	CNCF CFR SA	Financing request approved.  Construction timeframe 01.10.2013 - 01.11.2015	Unavailable information
20.	132	Rehabilitation works for bridges, culverts and railway tunnels - Timisoara Regional Railways	CNCF CFR SA	Partially finalized	Unavailable information
21.	133	Renovation works for bridges, culverts and railway tunnels - Constanta Regional Railways	CNCF CFR SA	Implementation ongoing.	Unavailable information
22.	134	Rehabilitation works of bridges over the Danube - km 152+149 and km	CNCF CFR SA	Financing contract signed	Underwent environmental impact assessment, was not subject to appropriate assessment procedure.

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
		165+817, București - Constanța railway - Constanța Regional Railways		Construction timeframe 15.10.2013 - 15.10.2015	
23.	137	Modernizing railway level crossings - Stage 1 (112 crossings)	CNCF CFR SA	Ongoing	Unavailable information
24.	142	Current repair of public railway infrastructure - 2013 - 2020	CNCF CFR SA	Implementat ion ongoing.	Unavailable information
25.	144	Capital repairs of public railway infrastructure - 2013 - 2016	CNCF CFR SA	Implementat ion ongoing.	Unavailable information
26.	147	Bucharest - Constanta railway renovation	CNCF CFR SA	Implementat ion ongoing.	Project was not environmentally assessed, was not adequately assessed.
27.	150	Rehabilitation of Brasov – Simeria railway, component of Pan – European Corridor IV, section Sighișoara - Coșlariu	CNCF CFR SA	To be finalized	Underwent environmental impact assessment – Environmental Agreement no.SB4/2011 given by EPA Sibiu, underwent the appropriate assessment procedure.
28.	151	Rehabilitation of Brașov – Simeria railway, component of Pan – European Corridor IV, section Coșlariu – Simeria	CNCF CFR SA	To be finalized	Underwent environmental impact assessment – Environmental Agreement no.8/2010 given by NEPA, was not subject to appropriate assessment procedure.
29.	153	Modernizing Border-Curtici-Arad- Simeria, Section 1: Border-Arad-km 614	CNCF CFR SA	Ongoing	Project was not subject to environmental assessment procedure, was not adequately assessed. Screening stage decision no. 5915/2009 issued by EPA Arad
30.	170	Electrifying Doaga-Tecuci-Barboși railway	CNCF CFR SA	Ongoing	Project was not environmentally assessed, was not subject to appropriate assessment. Screening stage decision no.8.11.2013 given by EPA Galați
31.	200	Strategic noise maps and action plans for main railways with a larger traffic than 30,000 train crossings/year - stage I	CNCF CFR SA	Were made for: 1.Bucharest North-Post 5 2. Post 5 -- Băneasa branch 3. Băneasa branch - Bucharest triage depot 4. Bucharest triage depot – Chitila 5. Chitila - Brazi	Approved by EPA

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
32.	209	Modernizing railway stations in Romania - Slatina, Râmnicu Vâlcea, Reșița Sud	CNCF CFR SA	To be finalized	Project was not environmentally assessed, was not subject to appropriate assessment. Screening stage decision no.254/2010 given by EPA Vâlcea Screening stage decision no.46/2010 given by EPA Caraș-Severin Screening stage decision no. 4295/2010 given by EPA Olt
33.	210	Modernizing railway stations in Romania - Bistrița, Zalău	CNCF CFR SA	Ongoing	No information is available
34.	211	Modernizing railway stations - Giurgiu Oraș, Slobozia Veche and Călărași Sud	CNCF CFR SA	2011-2013	Project was not environmentally assessed, was not subject to appropriate assessment. EPA Giurgiu decision no. 6430/02.09.2009 EPA Ialomița decision no.194/03.08.2009 EPA Călărași decision no. 7602/27.08.2009
35.	212	Modernizing the railway stations SF Gheorghe, Targu Mures	CNCF CFR SA	2011-2013	The project „Modernization of the railway stations Sfântu Gheorghe” was not subject to the procedure of environmental impact assessment has not been subject to appropriate assessment procedure – Screening Phase Decision no. 1 / 28.05.2010 issued by EPA Covasna. The project of modernization of railway stations Targu Mures not subject to the procedure for assessing the environmental impact assessment procedure was not subject to appropriate assessment – Screening stage Decision No. 3405 / 08.06.2010 issued by EPA Mures
36.	213	Modernization of railway stations in Romania - railway station (CF) Pitești	CNCF CFR SA	In Progress Implementat ion period August 2011 - August 2014	The project was not subject to the procedure of environmental impact assessment.
37.	214	Modernization of railway stations in Romania - CF stations Piatra Neamt, Botosani, Vaslui, Braila	CNCF CFR SA	In Progress	No information is available
38.	217	Modernization CF Focsani	CNCF CFR SA	In Progress	No information is available
39.	236	Detection system for the overheated axle boxes and brake close	CNCF CFR SA	Financing contract was signed in	No information is available



No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
		- 21 locations		2011 In Progress	
40.	237	The pilot project for an application ECTS / ERTMS level 2 section CF-Input Signal trees branch Buciumeni	CNCF CFR SA	Ongoing project	The project was not subject to the procedure for assessing the environmental impact assessment procedure, was not subject to appropriate assessment. Letter no.1 / 1497 / MF / 30.04.2009 issued by NEPA
41.	238	Modernization of electromechanical interlocking the traffic section CEM 11 stations Craiova Bucharest STAGE II	CNCF CFR SA	Ongoing Project	No information is available
42.	239	Modernisation of electromechanical interlocking the traffic section CEM 16 Stations Brasov, Cluj, Craiova, Timisoara STAGE II	CNCF CFR SA	Ongoing Project	No information is available
43.	240	Centralization electronic railway station Videle	CNCF CFR SA	Ongoing Project	The project was not subject to the procedure for assessing the environmental impact assessment or appropriate assessment procedure according to the screening stage decision nr.2236 / 2012 issued by EPA Virginia
<b>Road sector</b>					
44.	252	Bridge on Route 2E km 57 + 400 to Clit	CNADNR SA	Completed	No information is available
45.	253	Bridge on Route 61 km 74 + 015, over the river Arges, the Ionești	CNADNR SA	Start Time: November 2011 Time Estimated completion: October 2013	No information is available
46.	254	Bridge on DN54 km 67 + 774 over the river Sai and route new version DN54 km 65 + 950 - km 70 + 600, at Turnu Magurele	CNADNR SA	Bridge work completed in March 2013	The project was not subject to the procedure for assessing the environmental impact or appropriate assessment procedure in accordance with the decision for the screening stage decision issued by EPA Teleorman
47.	255	DN66A link road, km 47 + 600 - km 66 + 204, Campu lui Neag-Cerna	CNADNR SA	On going	Was subjected to the procedure for assessing the environmental impact assessment procedure, was not subject to appropriate assessment Environmental Agreement no. 3 / 07.06.2011 issued by NEPA

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
48.	256	Road crossings on Arad ring road (DN 7 km 540 + 248) than CF Arad - Bucharest	CNADNR SA	Investment started after the period of 01.01.2009 completion after 31.12.2011	No information is available
49.	257	The bypass road crossing over lines Arad Brad CF - CF Courtyard - DJ709B	CNADNR SA	Investment started after the period of 01.01.2009 completion after 31.12.2011	No information is available
50.	264	Modernization DN 72, Găiești - Toronto km 0 + 000 - km 76 + 180	CNADNR SA	Completed (reception 2010)  <a href="http://www.mt.ro/evenimente/arhiva_comunicatie/deceembrie2009.html">http://www.mt.ro/evenimente/arhiva_comunicatie/deceembrie2009.html</a>	Was subjected to the procedure for assessing the environmental impact assessment procedure, was not subject to appropriate assessment.
51.	265	Modernizing of Bucharest ring road between A1 - DN7 and DN2 - A2	CNADNR SA	On going	Was subjected to the procedure for assessing the environmental impact, was not subject to appropriate assessment The environmental agreement issued by EPA Bucharest
52.	268	Objective 1 of the investment objective: Road bridge at km 0 + 540 over the Danube-Black Sea Channel and related works and access road infrastructure in Constanta	CN APM SA	Completion date 2014	Was subjected to the procedure of environmental impact assessment - Environmental agreement No.37 / 2008 issued by LEPA, not subject to appropriate assessment procedure.
53.	269	Road connection with DN39 - Subject 2 of the investment objective: Road bridge at km 0 + 540 over the Danube-Black Sea Channel and related works and access road infrastructure in Constanta	CN APM SA	On going	No information is available
54.	272	Bypass South and North Aleșd	CNADNR SA	On going	Was subjected to the procedure of environmental impact assessment, was subject to appropriate assessment procedure Environmental agreement was issued in 2010 by NEPA
55.	273	Alexandria bypass	CNADNR SA	Completed	Was not subject to the procedure

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
					of environmental impact assessment, was not subject to appropriate assessment procedure, as regulated by Decision no. 531/25.05.2009 for the screening stage, revised in 2013 and issued by NEPA
56.	274	Bacau Bypass	CNADNR SA	On going	No information is available
57.	280	Brasov Bypass	CNADNR SA	Project started in 2011	Was subjected to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure Environmental Agreement no.1/2009 revised in 04.04.2011, issued by EPA Brasov
58.	286	Caracal Bypass	CNADNR SA	Start date 04.05.2011	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure as regulated by Decision no. 531/25.05.2009, revised in 2013 issued by NEPA
59.	287	Carei bypass	CNADNR SA	Start date 2011	Was subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure.
60.	288	Bypass Cluj-Napoca East	CNADNR SA	Completed	No information is available.
61.	290	Craiova Sud bypass	CNADNR SA	Implementat ion period 30.05.2012 - 21.11.2013	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure, as regulated by Decision no. 3791/16.05.2012, issued by REPA Craiova.
62.	292	Deva-Orastie Motorway	CNADNR SA	Completed	Was subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure.
63.	304	Iasi City Bypass - Phase I - Southern Variant Object 4: Variant light traffic (Sector km 0 + 000 - km 8 + 175) and Penetration	CNADNR SA	-	Was subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure as regulated by Environmental Agreement no.6/01.08.2008 issued by REPA Bacau
64.	305	Lugoj – Deva Motorway	CNADNR SA	On going	Was subject to the procedure of environmental impact assessment, was subject to appropriate assessment procedure as regulated by the Environmental Agreement no

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
					9.09.2010, revised on 24.12.2013, issued by NEPA.
65.	308	Mihailesti by pass	CNADNR SA	On going	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure, as regulated by Decision issued by EPA Giurgiu for the screening stage.
66.	309	Nădlac-Arad Motorway	CNADNR SA	On going	Was subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure, Environmental Agreement no.4/04.08.2009 issued by NEPA.
67.	311	Ring Road in Oradea - Phase II	CNADNR SA	Completed	No information is available.
68.	312	Orastie-Sibiu Motorway	CNADNR SA	On going	Was subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure. Environmental Agreement no. 2/25.01.2010, revised in 2012, issued by NEPA.
69.	319	Sacuieni Bypass	CNADNR SA	Date of signature: 24.11.2011 Estimated date of completion 03/15/2013	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure.
70.	320	Satu Mare Bypass	CNADNR SA	Completed	Was subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure. Environmental agreement revision in 2013.
71.	321	Sebes-Turda Motorway	CNADNR SA	On going	Was subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure. Environmental agreement no.01/30.06.2009.
72.	325	Stei Bypass	CNADNR SA	On going	Was subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure. Environmental agreement

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
					no.02/07.10.2010.
73.	327	Suceava bypass	CNADNR SA	In progress	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure.
74.	330	Tg Jiu Bypass	CNADNR SA	On going	No information is available.
75.	331	Tg. Mures Bypass	CNADNR SA	On going	No information is available.
76.	333	Tecuci Bypass	CNADNR SA	On going	No information is available.
77.	338	Access road to lock Agigea sea and sea-river port CDMN, left bank, between 61 + 800 and 63 + 500, L = 1700 m	CNADNR SA	Completed	No information is available.
78.	342	Deviation of the DN 29D km 18 + 500 - km 20 + 816, Consolidation and road rehabilitation	CNADNR SA	Completed	No information is available.
79.	343	Traffic flow on DN1 between km 8 + 100 - km 17 + 100 and Belt Road in the north of Bucharest - Object 7 - Filling Bucharest ring road between DN7 by building sector - DN1A	CNADNR SA	Completed	No information is available.
80.	344	Rehabilitation of DN66 Filiasi - Petrosani, km 0 + 000 - km 131 + 000	CNADNR SA	On going	Was subject to the procedure of environmental impact assessment, was subject to appropriate assessment procedure.
81.	345	Rehabilitation DN 76 Deva - Oradea, km 0 + 000 - km 184 + 390	CNADNR SA	On going	Was subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure. Environmental agreement no. 2/04.04.2006 issued by EPA

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
					Bihor revised by the Decision no. 401/10.12.2013, issued by EPA Bihor.
82.	349	Modernization of DN 2N km 52+860 - km 60+000 and new bridge on Ramnicu Sarat River, km 53+300	CNADNR SA	On going	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure, as regulated by the Decision no. 1001/29.12.2008, issued by NEPA.
83.	350	Modernization DN5, Bucharest - Adunații Copăcenii sector	CNADNR SA	On going	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure, according to the decision no.1001 / 29,12,2008 issued by NEPA for the screening phase.
84.	354	Rehabilitation of DN 2D Focșani – Ojdula, km 0+000 - km 118+893	CNADNR SA	On going	Was subject to the procedure of environmental impact assessment, was subject to appropriate assessment procedure. Compensatory measures were necessary. Environmental Agreement no. 1/28.06.2012.
85.	355	Penetration A3 Bucharest	CNADNR SA	On going	It started the environmental assessment procedure for PUZ.
86.	356	Rehabilitation DN24 limit Galati / Vaslui-Krasna and DN24B Krasna-Albița Lot 1: km 51 + 000 (from Galati and Vaslui county limit-DN 24 km 90 + 000 Lot 2: DN 24 km 90 + 000 - 105 + 070 DN 24 km (town Krasna) and DN 24B km 22 + 000 Lot 3: DN 24B km 22 + 000 - km 47 + 881 DN 24B (Albita checkpoint)	CNADNR SA	Completed	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure, according to the screening decision no. 4262/31.10.2008.
87.	357	Rehabilitation of DN 6 Alexandria Craiova	CNADNR SA	On going	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure, according to the screening decision no.531/25.05.2009

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
88.	359	Rehabilitation of DN 56 Craiova Calafat, km 0+000 - km 87+047	CNADNR SA	In progress In December 2013 has been submitted for approval to the application form	Was subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure. Environmental Agreement no.3/03.02.2012, issued by REPA Craiova
89.	360	Rehabilitation of DN 1 H Zalau – Alesd, km 0+000 – km 69+334	CNADNR SA	On going	Was subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure. Environmental Agreement no. 3/15.03.2013 issued by REPA Craiova
90.	361	DN-way divider with four lanes	CNADNR SA		No information is available.
91.	362	Safety Modernization DN1 traffic in linear villages and blackheads	CNADNR SA	On going	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure, according to the screening decision issued by NEPA.
92.	338	Access roads to the Agigea Lock and river-sea port Agigea CDMN, left bank, between km 61 + 800 and 63 + 500, L = 1.700 m	CNADNR SA	On going	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure. Screening Decision no. 7439RP/12.07.2012, issued by EPA Constanta.
93.	406	Giurgiu bridge over the Danube at km 64 + 884 DN5	CNADNR SA	On going	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure.
94.	407	Road Bridge over River at Slatina, on DN6, km 48 + 570	CNADNR SA	Completed	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure.
95.	408	Overpass Oituz Poiana Salt DN 11 km 90 + 450	CNADNR SA	Completed	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure.
96.	409	Road Bridge at Arginești over Jiu, DN6 km 268 + 371	CNADNR SA	Completed	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment



No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
					procedure.
<b>Waterways</b>					
97.	371	Iris Europe 3	RA AFDJ Galați	On going	Not applicable
98.	373	Front waiting for sales / recovery convoys at the confluence of waterways Danube - Black Sea Gate Alba - Midia Năvodari	CN ACN SA	On going	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure, as regulated by the Screening Decision no. 8620RP/27.11.2008, issued by EPA Constanta revised in 02.05.2011.
99.	376	Modernizing water quality management waterways by installing automatic monitoring station of water quality	CN ACN SA	Execution works completed  Execution period 29.08.2012-29.12.2013, being followed by a period of warranty between 30.12.2013-30.12.2015.	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure.
100.	377	Modernization locks. Equipment and installations	CN ACN SA	On going	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure.
101.	378	System reception and processing waste from ships and response to pollution on the Danube run CN APDF SA Giurgiu	CN APDF SA	Completed Execution period 01.08.2012 – 30.07.2013, being followed by the warranty period 01.08.2013 – 30.07.2014	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure, as regulated by Screening Decision no. 1791/31.08.2010, issued by EPA Constanta.

No.	Index	Project title	Authority responsible for Implementation	Project stage	Environmental impact assessment / adequate assessment
102.	381	Monitoring of the environmental impact of execution works for the Danube, between Calarasi and Braila, km 375-km 175, Phase II.	RA AFDJ Galați	Phase II Completed - monitoring during execution  implementing Phase III - execution monitoring post	Monitoring is required by the Environmental Agreement for the works to improve navigation conditions on the Danube between Calarasi and Braila, km 375-km 175 The environmental agreement no.3 / 02.04.2007 issued by the Regional Agency for the Environmental Protection Galați, Natura 2000 agreement no. 102774 / 16.03.2007, issued by the Authority responsible for monitoring Natura 2000 sites.
103.	384	Bank protection of Sulina Channel - Phase I	RA AFDJ Galați	Completed	Was subject to the procedure of environmental impact assessment.
104.	403	Improvement of navigation on the Calarasi-Braila sector	RA AFDJ Galați	Execution works completed Ongoing monitoring activities post execution	Was subject to the procedure of environmental impact assessment. Environmental Agreement for the works to improve navigation conditions on the Danube between Calarasi and Braila, km 375-km 175 The environmental Agreement no.3 / 02.04.2007 issued by the Regional Agency for the Environmental Protection Galați, Natura 2000 agreement no. 102774 / 16.03.2007, issued by the Authority responsible for monitoring Natura 2000 sites.
105.	404	Vertical quay berth 31 of port docks Outdoor Galați	CN ACN SA	Completed	Was not subject to the procedure of environmental impact assessment, was not subject to appropriate assessment procedure, as regulated by Screening Decision no.667d / 16.09.2011 revised on 04.11.2011 issued by REPA Galați.
106.	405	Creating a support system for the works on the Danube river in order to ensure minimum depth navigation	CN ACN SA	On going	Was not subject to the procedure of environmental impact assessment, as regulated by Screening Decision no. 11/18.07.2011, issued by NEPA.

Ind ex	Project type	Name of the project	Table 5.2 Environmental features likely to be affected by the projects included in the “Reference Case” scenario							
			Environmental features likely to be affected by the projects included in the “Reference Case” results by analyzing environmental agreements conclusions / framing decisions stages.							
			Natural protected areas which are crossed or located at a distance up to 5000 m	Noise and vibrations	Air emissions	Water courses	The project will lead to the risk of soil contaminati on	The project will create changes in the landscape (Changes in land use categories, deforestation, demolition)	Population and human health	Archaeologica l sites affected / damaged historical monuments
Air sector										
019	Extension and modernization	Modernization of movement surface and lighting, control tower and landscaping for the location system ILS navigation type in Suceava Airport	The site is not located within the perimeter or in the vicinity of protected natural areas.  The project may directly or indirectly affect any protected natural area	To reduce noise will consider scheduling flights in order to avoid possible discomfort to residential areas  During construction shall comply with the maximum limits	No significant changes are expected in terms of air quality  Emissions of pollutants into the atmosphere during construction will be in the maximum limits	n.a.  The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality. Wrong?	N.a.	Not required demolition or clearing  The land on which buildings they use will be placed - runway, taxiways, platforms.	The project is at a distance of 1700 m from inhabited areas.  Do not have an effect on health.	There will be affected archaeological sites or historic monuments.  The project is outside protected areas.
021	Rehabilitation	Rehabilitation of aircraft ramp for M. Kogalniceanu Airport in Constanta	The site is not located within the perimeter or in the vicinity of protected natural areas.  The project may directly or indirectly affect any protected natural area.	The project is outside inhabited areas  During construction shall comply with maximum limits.	No significant changes are expected in terms of air quality.  Emissions of pollutants into the atmosphere during construction will be in the maximum limits	n.a.  Nearest body of water is at a distance of 1.5 km west of the site boundary  The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	n.a.	No work is required deforestation  It will carry out demolition and reconstruction of existing platforms fully rehabilitated platform  The land on which buildings they use will be placed - the airplane stationary	There will be affected residential areas  Do not have an effect on health	There will be affected archaeological sites or historic monuments  The project is outside protected areas
Ports sector										
065	Extension	Extension of the breakwater of the Port of Constanta	0076 ROSPA Black Sea is over 1 km away, and the protected area of Community interest ROSCI 0197 Plaja submersă Eforie Nord – Eforie Sud is located at a distance of over 4 km and protected area community interest ROSCI0073 Dunele Marine de la Agigea located less than 200 m from the port precinct, at distances of less than 200 m is Rezervația naturală Lacul Agigea (national code 2368).  The project does not affect areas protected natural areas; this work is within the harbor.	The project does not affect residential areas; the works are developed within the port Noise and vibration are generated by specific equipment during execution, are reduced, temporary and intermittent.	No significant changes are expected in terms of air quality.  Emissions of pollutants into the atmosphere during the construction period will be in the maximum limits	The work is carried out on the Black Sea surface.  The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality .	n.a.	n.a.	Do not have an effect on human health.  The project is conducted within the harbor outside populated areas.	There will not be affected archaeological sites or historic monuments
066	Extension	Extending to south of the dimension berth in Constanta port	0076 ROSPA Black Sea is over 1 km away, and the protected area of Community interest ROSCI 0197 Plaja submersă Eforie Nord – Eforie Sud is located at a distance of over 4 km and protected area community interest ROSCI0073 Dunele Marine de la	The project does not affect residential areas - takes place inside the port  Noise and vibration are the products of specific	No significant changes are expected in terms of air quality.  Emissions to the atmosphere are the products of specific	The work takes place in the Black Sea  The proposed works will not affect water uses and aquatic ecosvstems.	n.a.	Not required demolition No work is required deforestation It provides a front extending south by 85 m mooring and	Do not have an effect on health  The project is conducted within the harbor outside populated areas.	There will not be affected archaeological sites or historic monuments

			Agigea remote less than 200 m from the harbor precinct, at distances of less than 200 m is Rezervația naturală Lacul Agigea (national code 2368). The project does not affect areas protected natural areas; this work is within the port.	equipment during execution are reduced and temporary and intermittent.	equipment during execution	No changes are expected in terms of water quality.		heading southeast for another 85 m.		
084	Rehabilitation and modernization	Rehabilitation and modernization of Oltenița Port	The nearest protected areas are at about 1.2-1.3 km within the site works: -ROSPA0038 Dunăre-Oltenița (upstream of the site) and -ROSCI 0131 Oltenița - Mostiștea - Chiciu (downstream of the site).  The project does not affect natural protected areas.	The project does not affect residential areas - takes place inside the port.  Noise and vibration are the products of specific equipment during execution are reduced and temporary and intermittent.	No significant changes are expected in terms of air quality.  Emissions to the atmosphere are the products of specific equipment during execution.	Developing of the designed work hydro morphological impacts reduced, strictly local and does not affect the dynamic process of the Danube in the analyzed site. No changes are expected in terms of water quality.	n.a.	No deforestation work is required  The land on which it will carry out the works are hydraulic structures	Do not have an effect on health  The project is conducted within the harbor outside populated areas.	There will not be affected archaeological sites or historic monuments
090	Modernization	Quay port infrastructure works for for berth no 23 and 25, part of Braila port	The project does not affect natural protected areas zones.	The project does not affect residential areas, takes place inside the port. Noise and vibration are the products of specific equipment during execution are reduced and temporary and intermittent.	No significant changes are expected in terms of air quality.	The work is done on the Danube. The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	n.a.	n.a.	Do not have an effect on health  The project is conducted within the harbor outside populated areas.	There will not be affected archaeological sites or historic monuments
097	New investment	Complex for the waterway management in Giurgiu	It is not in the vicinity or within any protected areas.	The project does not affect residential areas  Noise and vibration are the products of specific equipment during execution are reduced and temporary and intermittent.	No significant changes are expected in terms of air quality.  Emissions to the atmosphere are the products of specific equipment during execution, are insignificant and temporary	n.a. The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	n.a.	n.a.	Emissions to the atmosphere are the products of specific equipment during execution. It will feel local, short-term and will not have significant effects.  Do not have an effect on human health	There will not be affected archaeological sites or historic monuments
109	Modernization	Modernization of port infrastructure by providing increasing depths of channels and basins and safety of navigation in Constanta	Near the port is 0076 ROSPA Black Sea.  The project does not affect natural protected areas.	The project does not affect any residential areas, the works are being developed inside the port	No significant changes are expected in terms of air quality.  Emissions to the atmosphere are the products of specific equipment during execution, are insignificant and temporary	Not  The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	n.a.	n.a.	The project is conducted within the harbor outside populated areas.  Emissions to the atmosphere are the products of specific equipment during execution. It will feel local, short-term and will not have significant effects.  Do not have an effect on human health	There will not be affected archaeological sites or historic monuments
120	Modernization	The development of rail capacity in	Near the Port of Constanta is located ROSPA 0076 Marea Neagră	The project does not affect residential areas, this work is within the	No significant changes are expected in terms of air quality.	not The proposed works will not affect water	n.a.	n.a.	The project is conducted within the harbor outside populated areas.	There will not be affected archaeological

		the river-maritime sector of Constanta Port	The project does not affect natural protected areas.	harbor	Emissions to the atmosphere are the products of specific equipment during execution, are insignificant and temporary.	uses and aquatic ecosystems.  No changes are expected in terms of water quality.			Emissions to the atmosphere are the products of specific equipment during execution. It will feel local, short-term and will not have significant effects. Do not have an effect on human health.	sites or historic monuments
<b>Railway sector</b>										
147	Rehabilitation	București-Constanța railway rehabilitation	Do not cross the protected natural areas or Natura 2000 network	Noise and vibration are the products of specific equipment during execution are reduced and temporary and intermittent.	No significant changes are expected in terms of air quality. Emissions to the atmosphere are being generated by specific equipment during execution, are insignificant and temporary.	Yes The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	n.a.	n.a.	The project does not affect residential areas, work is carried out on the current route Emissions to the atmosphere are the products of specific equipment during execution. It will feel local, short-term and will not have significant effects	There will not be affected archaeological sites or historic monuments
150	Rehabilitation	Rehabilitation of railway Brasov - Simeria, part of Corridor IV Pan - European to run trains with speed of 160 km / h, section Sighisoara - Coșlariu	ROSCI0227 - Sighisoara - Târnava Mare (crossed by the railway on a stretch of 450 m - in this area a viaduct will be built over the part in the town limits). ROSPA0099 - Podișul Hârtibaciului lies at a distance of about 157 m from the project boundary.  The project does not affect protected natural areas.	The project will cause changes in noise levels in areas where rail is coming to distances less than about 200 m. Measures have been proposed for reducing noise from location sound absorbing panel to apply the various technical solutions.	No changes will occur in terms of air quality.  Emissions to the atmosphere are the products of specific equipment during execution	Yes The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	n.a.	The total area occupied by protected area will be 700 sq. ROSCI0227.	The project will cause changes in noise levels in areas where the railroad is coming to distances less than about 200 m. Measures have been proposed for reducing noise, like absorbing panels.  Emissions to the atmosphere are the products of specific equipment during execution. It will feel local, short-term and will not have significant	There will not be affected archaeological sites or historic monuments
151	Rehabilitation	Rehabilitation of railway Brasov - Simeria, part of Corridor IV - European to run trains with speed of 160 km / h, section Coșlariu - Simeria	ROSCI0211 - Rapa Rosie is at a distance of about 5000 m.  ROSCI0187 - Pajiștea Suciului is at a distance of about 3432 m.  The project does not affect natural protected areas.	The project will cause changes in noise levels in areas where the approach path distances less than about 500 m.	No changes will occur in terms of air quality.  Emissions to the atmosphere during the works are felt locally, in the short term and will not have significant effects.	Yes Railway route takes place in most of the left and right bank of the river Mures Numerous rivers it crosses the bridges (31 bridges and 45 culverts) The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	It will demolish platforms, warehouses, ramps, canopies, bridges / culverts under obsolete.	The project will cause changes in noise levels in areas where the distances is less than about 500 m.  Emissions to the atmosphere are the products of specific equipment during execution will affect local, short-term and will not have significant effects.	There will not be affected archaeological sites or historic monuments
153	Modernization	Modernization of rial line Border-Curtici-Arad-Simeria, Section 1: Border-Arad-	ROSPA001 - Câmpia Crișului Alb și Crișului Negru is located at about 500 m away from the project limits.  The project does not affect natural	The project will cause changes in noise levels in areas where the railroad is coming to distances less than	Emissions to the atmosphere during the making works are felt locally, in the short term and will not	n.a. The proposed works will not affect water uses and aquatic ecosystems.	N.a	Not required demolition and clearing	It will not affect human health. The project will cause changes in noise levels in areas where the railroad is	There will not be affected archaeological sites or historic monuments

		km 614	protected areas.	about 200 m. Measures have been proposed for reducing noise absorbing panels from location to apply the various technical solutions.	have significant effects.  The project does not lead to changes in traffic CF does not change the current situation.	No changes are expected in terms of water quality.			coming to distances less than about 200 m. Measures have been proposed for reducing noise absorbing panels from location to apply the various technical solutions. Emissions to the atmosphere during the works are felt locally, in the short term and will not have significant effects. The project does not lead to changes in traffic and does not change the current situation.	
170	Modernization	The electrification of the railway line Doaga-Galati-Barboși	It is not located in the vicinity and does not cross any natural protected areas.	The project will not cause changes in noise levels from the current situation.	Emissions to the atmosphere during the works are felt locally, in the short term and will not have significant effects.	n.a. The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	N.a.	Current use of land - arable land Not required demolition, clearing unnecessary work.	It will not affect human health	There will not be affected archaeological sites or historic monuments
209	Modernization	Modernization of railway stations in Romania - rail stations Slatina, Râmnicu Vâlcea, South Reșița	It is not located in the vicinity and does not cross any natural protected areas.	Noise and vibration are reduced. Measures have been proposed to reduce noise at source.	Emissions to the atmosphere will be insignificant. The project does not lead to changes in traffic CF does not change the current situation.	N. a. The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	N.a.	No deforestation work is required  The work is done on the actual location of the stations.	During the execution of works, noise and vibration will be reduced air emissions will be insignificant, manifesting temporary and intermittent. Measures have been proposed to reduce noise at source. During operation there will be no changes in air quality.	There will not be affected archaeological sites or historic monuments
211	Modernization	Upgrading the railway stations Giurgiu City, Slobozia and Calarasi Old South	It is not located in the vicinity and does not cross any natural protected areas.	Noise and vibration are reduced. Measures have been proposed to reduce noise at source.	Emissions to the atmosphere will be insignificant. The project does not lead to changes in traffic CF does not change the current situation.	n.a. The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	n.a.	No deforestation work is required  The work is done on the actual location of the stations.	Noise and vibration are reduced. Measures have been proposed to reduce noise at source. Emissions to the atmosphere will be insignificant. The project will not have adverse effects on human health.	There will not be affected archaeological sites or historic monuments
212	Modernization	Upgrading the railway stations Sfântu Gheorghe, in Targu Mures	It is not located in the vicinity and does not cross any natural protected areas.	Noise and vibration are reduced. Measures have been proposed to reduce noise at source.	Emissions to the atmosphere will be insignificant. The project does not lead to changes in traffic CF does not change the current situation.	n.a. The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	N.a.	No deforestation work is required  The work is done on the actual location of the stations. Work is needed to abolish the line 4 and the corresponding switches.	The project will not have adverse effects on human health. During the execution will be insignificant air emissions, noise and vibration will be reduced.	Buildings that are being modernized are not on the list of historical monuments
213	Modernization	Modernization of	It is not located in the vicinity and does	Noise and vibration are	Emissions to the	n.a.	N.a.	No deforestation work	Noise and vibration are	There will not

		railway stations in Romania - Pitesti railway station	not cross any natural protected areas.	reduced. Measures have been proposed to reduce noise at source.	atmosphere will be insignificant. The project does not lead to changes in traffic CF does not change the current situation.	The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality		is required  The work is done on the actual location of the stations.	reduced. Measures have been proposed to reduce noise at source. Emissions to the atmosphere will be insignificant. The project will not have adverse effects on human health.	be affected archaeological sites or historic monuments
237	Modernization	The pilot project for an application ECTS / ERTMS level 2 section CF-Input Signal trees branch Buciumeni	Protected area in the neighboring forest ROSCI0224 Padurea Scrovistea. The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	All work is done manually. Noise and vibration are reduced.	Emissions to the atmosphere will be insignificant. The project does not lead to changes in traffic CF does not change the current situation.	N.a.  The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	Work will be performed at the site of existing and new tracks in existing premises. Not affected neighboring lands.	No deforestation work is required.  The work is done on the actual location of the stations.	Noise and vibration are reduced. Measures have been proposed to reduce noise at source. Emissions to the atmosphere will be insignificant. The project will not have adverse effects on human health.	There will not be affected archaeological sites or historic monuments
240	Modernization	Centralization electronic railway station Videle	It is not located in the vicinity and does not cross any natural protected areas.	Noise and vibration in the premises plus rail traffic noise. They will be temporary and intermittent.	Emissions to the atmosphere will be insignificant during execution and will be temporary.	N.a. The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	N.a.	Works will take place at railway stations on Videle site	During execution works as a source of discomfort for the population could be noise and vibration in the premises plus rail traffic noise. They will be temporary and intermittent. Inhabited areas are a considerable distance from the place where the work will be done. Emissions to the atmosphere will be insignificant during execution and will be temporary.	There will not be affected archaeological sites or historic monuments
<b>Road sector</b>										
254	Rehabilitation	Bridge on DN54 km 67 + 774 over the River Sai and the new alignment of DN54 km 65 + 950 - km 70 + 600, at Turnu Magurele	It is not located in the vicinity and does not cross any natural protected areas	Noise and vibrations generated at working points.	Emissions to the atmosphere will be insignificant, will manifest temporary period of execution. This project will increase traffic volume, an increase in emissions in the atmosphere. However air emissions will be reduced due to traffic conditions, higher transport speeds, low fuel consumption.	Sai River The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	n.a.	The land to be taken for execution of the work area is 70,000 square meters.	The works provided do not amplify noise, achieving even its mitigation through improved conditions of rolling on a flat, semi-rigid infrastructure.	The bridge was declared a historical monument. The only possible solution is agreed and implementation of a new bridge to another site to protect the bridge as "historic" with a new version of route for DN 54 in the bridge.
255	New alignment	DN66A link road, km 47 + 600 - km 66 + 204, Campu lui	The trail crosses the Parcul Național Domogled - Valea Cernei, ROSCI0069 Domogled - Valea Cernei, ROSPA0035 Domogled - Valea Cernei, ROSCI0129	For the period of execution have taken steps to reduce noise at source,	Emissions to the atmosphere will be insignificant, will manifest temporarily	Cerna River  The proposed works will not affect water uses and	N.a.	17 ha area needed to be deforested	The project will decrease emissions of pollutants and noise in towns and increase safety.	There will not be affected archaeological sites or historic



		Neag-Cerna	Nordul Gorjului de Vest. To protect wildlife are provided 6viaducts crossing the road by the sea fauna, four level crossings and one bridge in animal breeding area for amphibians; crossing warning signs; reduction speed indicator. Also, compensatory measures have been proposed to restore and / or enhance habitats of protected natural areas ROSCI0129 Nordul Gorjului de Vest and ROSCI0069 Domogled - Valea Cernei affected by the project.	The operating periods will reduce the noise level of the towns by diverting traffic to the new link road	during performance. This project will increase traffic volume, an increase of emissions to the atmosphere. However air emissions will be reduced due to traffic conditions, higher transport speeds, low fuel consumption, deflections of the towns.	aquatic ecosystems.  No changes are expected in terms of water quality.				monuments.
264	Modernization	Modernization of DN 72, Găiești - Toronto km 0 + 000 - km 76 + 180	It is situated at a distance higher than 700 m from the limits of the protected area ROSCI0014 Bucșani The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	For the period of execution have taken measures to reduce noise at source	Emissions to the atmosphere will be insignificant, will manifest temporarily during performance. During operation air emissions will be reduced due to traffic conditions, higher transport speeds, lower fuel consumption	Several rivers and pârauri22 bridges were proposed for rehabilitation / modernization. The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	No, keep the current alignment of the road	The project will decrease emissions of pollutants and noise in localities and increase road safety by improving transport conditions.	There will not be affected archaeological sites or historic monuments.
265	Modernization	Upgrading of Bucharest road ring between A1 - DN7 and DN2 - A2	It is in the vicinity ROSCI0308 - Lacul și Pădurii Cernica and ROSPA0122 - Lacul și Pădurea Cernica.  The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	Noise will be felt by people living closer than limit road route (areas inhabited localities: Afumați, screening, Glina, Popești-Leordeni, Jilava, Magurele, Chiajna, Dragomirești, Chitila) - measures are needed noise reduction.	Emissions to the atmosphere will be insignificant during execution, having temporarily.  This project will increase traffic volume, an increase of emissions to the atmosphere. However air emissions will be reduced due to improved traffic conditions, higher transport speeds, lower fuel consumption	Yes The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	N.a.	Deforestation works will be needed.	Noise will be felt by people living closer than limit road route.	There will not be affected archaeological sites or historic monuments
268		Objective 1 of the investment objective: Road bridge at km 0 + 540 over the Danube-Black Sea Canal and related works and access road works for the infrastructure in Constanta	Does not affect national network of protected areas It does not affect Natura 2000 network	For the period of execution have taken steps to reduce noise at source.	Emissions to the atmosphere will be insignificant during execution, having temporarily.  Reducing emissions to the atmosphere during operation due to reduced waiting time of vehicles at entry / exit port	Danube-Black Sea Canal The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	N. a.	N.a.	The project will not have adverse effects on human health.	There will not be affected archaeological sites or historic monuments
272	New alignment	Bypass Aleșd South and North	It crosses ROSCI0050 - Crișul Repede upstream of Oradea. The rest of the route is parallel to ROSCI0050 at a distance of 200-800 m from its southern boundary.	The project will cause changes in noise levels in areas where the approach path distances less than about 500 m.	No significant changes are expected in terms of air quality. Emissions to the atmosphere will be insignificant during	Yes. The proposed works will not affect water uses and aquatic ecosystems.  No changes are	N.a.	Land in the project area has use: arable, pasture, orchard, forest and other categories. Bypass occupies	The project will cause changes in noise levels in areas where the approach path distances less than about 500 m. Emissions to the	There will not be affected archaeological sites or historic monuments

			The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.		execution, having temporarily. This project will increase traffic volume, an increase of emissions to the atmosphere. However air emissions will be reduced due to traffic conditions, avoiding the settlements, higher transport speeds, low fuel consumption.	expected in terms of water quality.		about 0.85 ha of protected area ROSCI0050 and about 0.3% of habitat 92A0 to be cleared in about 50 willow (on an area of 3000 square meters).	atmosphere will be insignificant during execution, having temporarily. During operation, air emissions will be reduced due to traffic conditions, avoiding the settlements, higher transport speeds, low fuel consumption.	
273	New alignment	Alexandria By Pass	It crosses ROSCI0386 – Vedea River on a length of about 200 m in the km 10 + 060 (bridge over the river See)  The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	The project will cause changes in noise levels in areas where the approach path distances less than about 500 m. Take measures to reduce noise in areas potentially affected.	It is expected to reduce emissions of air pollutants in urban areas.	Yes The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	N.a.	To achieve the construction of the bypass Alexandria clearing work is required on an area of 4000 square meters. Deforestation is done in the protected areas.  The project will be changes in land use category.  Permanent occupation of land area.	The project will cause changes in noise levels in areas where the approach path distances less than about 500 m. Take measures to reduce noise in areas potentially affected. During the operation is expected to reduce emissions of air pollutants in urban areas. During the execution of specific air emissions machinery and equipment and noise will be reduced and will be temporary.	There will not be affected archaeological sites or historic monuments
274	New alignment	Bacău Bypass	ROSPA0063 - Lacurile de acumulare Buhuși-Bacău-Bereș at about 2.3 km of the project boundary  The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	The project will cause changes in noise levels in areas where the approach path distances less than about 500 m.	It is expected to reduce emissions of air pollutants in urban areas.	Yes. The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	N.a.	No work is required deforestation Land in the project area is predominantly arable use The project will be changes in land use category.  Permanent occupation of land area.	It is expected to reduce emissions of air pollutants in urban areas. The project will cause changes in noise levels in areas where the approach path distances less than about 500 m. During the execution of specific air emissions machinery and equipment and noise will be reduced and will be temporary.	There will not be affected archaeological sites or historic monuments
280	New alignment	Brașov Bypass	4.1 km from ROSCI0120 - Muntele Tâmpa and Rezervația Naturală Tâmpa; 1.6 km from Dealul Cetății Lempeș-Mlaștina Hărman 4.6 km from Rezervația Stejărișul Mare  The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	Bypass Brașov approach in certain residential areas at distances less than 200 m, being necessary to take measures for protection against noise (sound absorbing panels located on a length of 670 m)	It is expected to reduce emissions of air pollutants in urban areas.	Yes. The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	N.a.	No clearing or demolition work is required The project will be changes in land use category. Permanent occupation of land area.	The alignment approaches in certain residential areas at distances less than 200 m, being necessary to take measures for protection against noise During the operation is expected to reduce emissions of air pollutants in urban areas.	There will not be affected archaeological sites or historic monuments
286	New alignment	Caracal By pass	Does not cross and is not located in the vicinity of any Natura 2000 site	For the period of execution have taken steps to reduce noise at source.	It is expected to reduce emissions of air pollutants in urban areas.	N.a. The proposed works will not affect water uses and aquatic ecosystems.	N.a.	No clearing or demolition work is required The project will be	During the operation is expected noise reduction, emissions of air pollutants in urban areas.	

				It forecast a reduction in noise levels in urban areas by improving traffic conditions and deflections in the village.		No changes are expected in terms of water quality.		changes in land use category. Permanent occupation of land area.	During the execution of specific air emissions machinery and equipment and noise will be reduced and will be temporary	
287	New alignment	Carei By pass	At a distance of about 230 m ROSPA0016 - Câmpia Nirului-Valea Ierului (Valea Bobaldului).  The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	For the period of execution have taken steps to reduce noise at source.  The project will cause changes in noise levels in areas where the approach path distances less than about 500 m. Measures are needed due to noise mitigation.	No significant changes are expected as regards its air quality.  It is expected to reduce emissions of air pollutants in urban areas.	Yes The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	N.a.	No clearing or demolition work is required. Land in the project area is predominantly arable use. The project will be changes in land use category. Permanent occupation of land area.	During the operation is expected noise reduction, emissions of air pollutants in urban areas. During the execution of specific air emissions machinery and equipment and noise will be reduced and will be temporary	There will not be affected archaeological sites or historic monuments
290	New alignment	Craiova Sud bypass	Does not cross and not located in the vicinity of any Natura 2000 site	For the period of execution have taken steps to reduce noise at source. It forecast a reduction in noise levels in urban areas by improving traffic conditions and deflections outside the village	It is expected to reduce emissions of air pollutants in urban areas.	Bridge crossing a canal which serves city of Craiova The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	Current use and land use - agricultural land and construction yards. No clearing or demolition work is required. Land in the project area is predominantly arable use.	During the operation is expected noise reduction, emissions of air pollutants in urban areas. During the execution of specific air emissions machinery and equipment and noise will be reduced and will be temporary	There will not be affected archaeological sites or historic monuments
312	New alignment	Orastie-Sibiu motorway	ROSCI 0187 - Pajiștile lui Suci , at a distance of 3.5 km; The protected area of national interest Rapa Rosie at a distance of 1 km; ROSCI0211 - Podișul Secașelor at a distance of 3 km; ROSCI0093 - Insula Stepică Șura Mică - Slimnic at a distance of 2.2 km; The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	For the period of execution have taken steps to reduce noise at source. The project will cause changes in noise levels in areas where the route approaches at distances less than 500 m from houses. Sensitive areas in terms of noise where necessary safeguards to reduce noise: the houses at a distance less than 500 m from the highway route (Șibot localities, Balamiru Field, tartaric, Vințu the Netherlands, Lancrăm, quantum Baile Miercurea Sibiu, Sibiu Wednesday, Apodu Lower Săcel Cristian).	No significant changes are expected in terms of air quality.	Are proposed for crossing bridges crossing watercourses The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N. a.	Land use in the project area: arable land, orchards, pastures, forests. To achieve the required deforestation works on an area of about 45.80 ha - Forest Hill Bucium.	During operation the project will cause changes in noise levels in areas where the route approaches at distances less than 500 m from houses. For these areas have been proposed absorbing panels / windbreaks. During the execution period are generated specific air emissions by the machinery and equipment and noise will be reduced and will be temporary.	There will not be affected archaeological sites or historic monuments
304	New alignment	Iasi City Bypass - Phase I - Southern Variant Object 4: Variant light	Iași bypass, south stage, passes close to the protected area included in the ecological network Natura 2000 - ROSCI0181 Padurea Uricani	For the period of execution have taken steps to reduce noise at source.	During execution are projected emission reductions of pollutants into the atmosphere in urban areas by	N.a.  The proposed works will not affect water uses and aquatic ecosystems.	N.a.	No clearing or demolition work is required.	During the operation is expected a noise reduction, emissions of air pollutants in urban areas.	There will not be affected archaeological sites or historic monuments

		traffic (Sector km 0 + 000 - km 8 + 175) and Penetration	The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	To protect natural areas included in the Natura 2000 network during the exploitation of ring road will be provided soundproofing panels.	deflections in the village.	No changes are expected in terms of water quality.			During the execution of specific air emissions machinery and equipment and noise will be reduced and will be temporary.	
305	New alignment	Lugoj-Deva Motorway	Crosses the following protected areas included in the Natura 2000 ecological network: ROSPA0029 – Defileul Mureșului Inferior - Dealurile Lipovei; ROSCI0355 – Lipovei Plateau - Poiana Ruscă ROSCI0064 – Defileul Mureșului ROSCI0373 – Râul Mureș între Branișca și Ilia The route is in the vicinity of protected natural areas included in the Natura 2000 ecological network: ROSCI0338 – Pădurea Paniova ROSCI0109 – Lunca Timișului ROSCI0054 – Dealul Cetății Deva Measures have been proposed to ensure connectivity in the area for the animal species specific to these protected areas. Measures have been proposed for reducing noise in the protected areas.	For the period of execution have been taken steps to reduce noise at source.  The project will cause changes in noise levels in areas close to the highway route distances less than 600 m from the house. (Marginea, Zorano, Ohaba, Grind, Câmpuri Surduc, Gothata, Bacea, Bretea Mureșeană, Balint, Susani, Traian Vuia, Branișca, Rovina, Șoimuș, Pâru)	No significant changes are expected in terms of air quality.	Yes The project proposes bridges crossing watercourses.  The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.	Nu	Land use in the project area: arable land, forests, orchards, pasture construction. Permanent occupation of land surfaces, changing land use category. Changes in landscape characteristics appear - deforestation will be conducted on an area of about 38.74 ha of which 28.8 ha of natural protected areas of the Natura 2000 network (ROSCI0064, ROSCI0373, ROSCI0355, ROSPA0029). Demolition work is needed homes near Șoimuș. Compensatory measures have been proposed for areas affected by deforestation, replanting with species of the same category as the cleared area of about 50 ha.	The project will cause changes in noise levels in areas close to the highway route distances less than 600 m from the house. For these areas have been proposed absorbing panels / windbreaks.  No significant changes are expected in terms of air quality during operation.	There will not be affected archaeological sites or historic monuments
309	New Alignment	Nădlac-Arad Motorway	It is situated in the vicinity of Natura 2000 sites: ROSCI0108 Lunca Mureșului Inferior și ROSPA0069 Lunca Mureșului Inferior.  The project is likely to have significant effects on Natura 2000. The works do not adversely affect the Natura 2000 network, as takes place outside the network.	For the period of execution have taken steps to reduce noise at source. The project will cause changes in noise levels in areas close to the highway route distances less than 500 m of protected areas / residential areas. Absorbing panels have been proposed for noise reduction.	No significant changes are expected in terms of air quality.	Yes  Are proposed bridges for crossing water courses. The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	Land use in the project area: arable land, forests, orchards, pasture construction. Permanent occupation of land surfaces, changing land use category. No work is required deforestation. Building demolition is required.	The project will cause changes in noise levels in areas close to the highway route distances less than 500 m of protected areas / residential areas. For the noise reduction have been proposed for these areas absorbing panels / forest breaks. No significant changes are expected in terms of air quality during operation.	There will not be affected archaeological sites or historic monuments
308	New	Mihăilești	Does not cross any protected area nor	For the period of	No significant changes	N.a.	Nu	The objectives of	Population and settlements	There will not

	alignment	Bypass	is near such areas	execution have taken steps to reduce noise at source.	are expected in terms of air quality.	The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality.		the "Bypass Mihăilești" will have major changes in the landscape analysis.  Permanent occupation of land surfaces, changing land use category.	located near the road, will be directly affected little during the execution of the project, air emissions and noise levels of specific tools and equipment used in construction. These are temporary. During the operation is expected noise reduction, emissions of air pollutants in urban areas by diverting heavy traffic in the village.	be affected archaeological sites or historic monuments
320	New alignment	Satu Mare Bypass	Does not cross any protected areas nor is near such areas.	For the period of execution have taken steps to reduce noise at source.	No significant changes are expected in terms of air quality.	Yes  The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	Permanent occupation of land surfaces, changing land use category.	During the operation is expected a noise reduction, emissions of air pollutants in urban areas by diverting heavy traffic outside the village.	There will not be affected archaeological sites or historic monuments
319	New alignment	Săcuieni Bypass	Does not cross any protected area, but is near the following protected areas: ROSCI00021 – Câmpia Ierului at a distance less than 20 m; ROSCI0220 – Săcuieni Rezervația Lacul Cicoș at a distance less than 600 m.  The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	The project will cause changes in noise levels in areas where road building approach at distances less than 250 m from the house. If during operation are exceeding the noise level will be necessary to apply noise reduction measures (sound absorbing panels).	No significant changes are expected in terms of air quality.	Yes.  The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	Permanent occupation of land area, land use change category	During the operation is expected a noise reduction, emissions of air pollutants in urban areas by diverting heavy traffic outside the village	There will not be affected archaeological sites or historic monuments
321	New alignment	Sebeș-Turda motorway	Do not cross any protected area, but is near the following protected areas: ROSCI0211 - Podișul Secașelor at a distance less than 850 m Reservation Râpa Roșie included in ROSCI0211 at a distance less than 3200 m ROSPA0139 Piemontul Munților Metaliferi și Vințului at a distance less than 3200 m Râul Târnava Mare între Copșa Mică și Mihalț at a distance less than 3200 m ROSCI0187 Pajiștile lui Suciu at a distance less than 2700 m ROSCI0253 - Trascău at a distance less than de 880 m ROSCI0004 - Bagău at a distance of aprox. 650 m Reservation - Tău fără at a distance of aprox.4800 m ROSCI0147 Pădurea de stejar stufos de la Mirăslău at a distance of aprox.750 m ROSPA0113 Cânepișt at a distance of aprox. 6000 m ROSCI0223 Sărăturile Ocna Veche at	The project will cause changes in noise levels in areas where road building approach at distances less than 400 m from the house. Because of the potential future development of urban areas and the monitoring of noise absorbing panels will be placed next to residential areas at a distance less than 400 m and where will surpass the levels allowed by law. Where were provided sound absorbing panels if after monitoring are exceeding the noise level will take additional measures to protect the receiver. During construction noise and vibration are	No significant changes are expected in terms of air quality. Projected reductions in emissions to the atmosphere by avoiding local communities, travel speeds and lower fuel consumption. During construction air emissions are insignificant, of a temporary nature.	Yes  It will make bridges for crossing watercourses crossed the highway route.  The proposed works will not affect water uses and aquatic ecosystems.  No changes are expected in terms of water quality	N.a.	Permanent occupation of land surfaces, changing land use category.	Population and settlements located near the road, will be directly affected little during the execution of the project, air emissions and noise levels of specific tools and equipment used in construction. These are temporary. During the operation, no significant changes are expected in terms of air quality. Is expected to improve local air quality in terms of the creation of a route that allows rolling speeds, default use of fuel and lower emissions into the atmosphere, the possibility of bypassing the settlements.	There will not be affected archaeological sites or historic monuments.

			a distance of aprox. Reservation Ocna Veche at a distance of aprox. 550 m Reservation Sărătura at a distance of aprox. 5500 m The motorway offers a high degree of permeability through the number and lengths of works of art, and the large number of proposed culverts (279 pcs) by allowing amphibians and animals in these areas.	insignificant, of a temporary nature.						
325	New alignment	Stei Bypass	Do not cross any protected area, but is near the following protected areas: 5 km from the limit with ROSPA0081 – Munții Apuseni, Vlădeasa, 9,2 km from the limit with ROSCI0084 - Ferice plai 3,5 km from the limit with ROSCI0042 – Codru Moma Were proposed measures like: bridges and overpasses for the fauna transit. The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	During construction noise and vibration are insignificant, of a temporary nature. By constructing the bypass will reduce noise pollution from existing national road crossing Stei și Beiuș localities.	During construction air emissions are insignificant, of a temporary nature. Projected reductions in emissions to the atmosphere by avoiding local communities, travel speeds and lower fuel consumption.	Yes  Are proposed a series of bridges crossing watercourses. The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	No	Permanent occupation of land surfaces, changing land use category.  Deforestation works are proposed.  None demolition works will be needed.	Is expected to be improved local air quality in terms of the creation of a route that allows rolling speeds implicit use of fuel and lower emissions into the atmosphere, the possibility of bypassing the urban area. By making the bypass will be reduced the noise pollution from existing national road crossing Stei and Beius. During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.	There will not be affected archaeological sites or historic monuments
327	New alignment	Suceava Bypass	The proposed route does not cross and not in the vicinity of protected areas or areas of any Natura 2000	During construction noise and vibration are insignificant, of a temporary nature  By making the detour will reduce noise pollution in urban areas	During construction air emissions are insignificant, of a temporary nature.  Are projected reductions in emissions to the atmosphere in the local area.	yes  Are proposed a series of bridges crossing watercourses. The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	Permanent occupation of land surfaces, changing land use category.  Deforestation works are proposed.  No demolition works will be needed.	Is expected to be improved local air quality in terms of the creation of a route that allows rolling speeds implicit use of fuel and lower emissions into the atmosphere, the possibility of bypassing the urban area. During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.	There will not be affected archaeological sites or historic monuments
330	New alignment	Târgu Jiu Bypass	The proposed route does not cross and is not in the vicinity of protected areas or areas of any Natura 2000	During construction noise and vibration are insignificant, of a temporary nature	During construction air emissions are insignificant, of a temporary nature.	yes  Are proposed a series of bridges crossing watercourses.	N.a.	Permanent occupation of land surfaces, changing land use category.	Is expected to be improved local air quality in terms of the creation of a route that allows rolling speeds implicit use of fuel and	There will not be affected archaeological sites or historic monuments

				Due to the project development the noise in urban areas will be reduced.	Projected reductions of the emissions to the atmosphere in the local area.	The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.		No demolition or deforestation works will be needed.	lower emissions into the atmosphere, the possibility of bypassing the urban area. During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.	
331	New alignment	Bypass Târgu Mureș	<p>The project crosses ROSCI0342 Pădurea Târgu Mureș</p> <p>Proposed measures like: bridges and over passages for the fauna transit.</p> <p>The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.</p>	<p>During construction noise and vibration are insignificant, of a temporary nature</p> <p>Due to the project development will be reduced the noise in urban areas.</p>	<p>During construction air emissions are insignificant, of a temporary nature.</p> <p>Estimated reductions of the emissions into the atmosphere in the local area.</p>	<p>yes</p> <p>Are proposed a series of bridges crossing watercourses. The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.</p>	N.a.	<p>Permanent occupation of land surfaces, changing land use category.</p> <p>No demolition or deforestation works will be needed.</p>	<p>Is expected to be improved local air quality in terms of the creation of a route that allows rolling speeds implicit use of fuel and lower emissions into the atmosphere, the possibility of bypassing the urban area. During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.</p>	There will not be affected archaeological sites or historic monuments
333	New alignment	Tecuci Bypass	The proposed route does not cross and not in the vicinity of protected areas of any Natura 2000 ecological network.	<p>During construction noise and vibration are insignificant, of a temporary nature</p> <p>Due to the project development will be reduced the noise and pollution in urban areas.</p>	<p>During construction air emissions are insignificant, of a temporary nature.</p> <p>Estimated reductions of the emissions to the atmosphere in the local area.</p>	<p>Yes</p> <p>Are proposed a series of bridges crossing watercourses. The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.</p>	N.a.	<p>Permanent occupation of land surfaces, changing land use category.</p> <p>No demolition or deforestation works will be needed.</p>	<p>Is expected to be improved local air quality in terms of the creation of a route that allows rolling speeds implicit use of fuel and lower emissions into the atmosphere, the possibility of bypassing the urban area. During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.</p>	There will not be affected archaeological sites or historic monuments



344	Rehabilitation	Rehabilitation of DN66 Filiași - Petroșani, km 0+000 - km 131+000	<p>Crosses the Natura 2000 area ROSCI0063 - Defileul Jiului</p> <p>Were proposed measures like: bridges and overpasses for the fauna transit.</p> <p>The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.</p>	<p>During construction noise and vibration are insignificant, of a temporary nature</p> <p>Due to the project development will be reduced the noise in the area crossed by DN66</p>	<p>No significant changes are expected in terms of air quality. Is expected to improve local air quality in terms of improving the technical conditions of the road allowing higher speeds running implicit use of fuel and lower emissions into the atmosphere. During project execution, air emissions are the ones generated by the tools and equipment used in construction. These are temporary and intermittent, shall not exceed the admissible limits.</p>	<p>Yes</p> <p>The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.</p>	N.a.	<p>Permanent occupation of land surfaces, changing land use category.</p> <p>Deforestation works will be needed on a surface of 5181 sqm, approximately 0,004% from the total surface of the protected area. Are not proposed demolition works.</p>	<p>Is expected to be improved local air quality in terms of the creation of a route that allows rolling speeds implicit use of fuel and lower emissions into the atmosphere, the possibility of bypassing the urban area. By improving transport conditions will reduce noise pollution in the area crossed by DN66. During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.</p>	There will not be affected archaeological sites or historic monuments
345	Rehabilitation	Rehabilitation of DN 76, Deva - Oradea, km 0+000 - km 184+390	<p>The projects crosses the following protected areas: ROSCI0008 - Betfia ROSCI0240 - Tășad ROSCI0324 – Munții Bihor ROSCI0291 – Coridorul Munții Bihorului – Codru Moma</p> <p>The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.</p>	<p>During construction noise and vibration are insignificant, of a temporary nature</p> <p>Due to the project development will be reduced the noise in the area crossed by DN 76</p>	<p>No significant changes are expected in terms of air quality. Is expected to improve local air quality in terms of improving the technical conditions of the road allowing higher speeds running implicit use of fuel and lower emissions into the atmosphere. During project execution, air emissions are the ones generated by the tools and equipment used in construction. These are temporary and intermittent, shall not exceed the admissible limits.</p>	<p>yes</p> <p>The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.</p>	N.a.	<p>No demolition works will be needed. Deforestation works will be needed. Hunedoara County: 28289 sqm; Arad County: 60028 sqm; Bihor County: 130508 sqm; In the area ROSCI0008 Betfia are proposed deforestation works on a surface of 3906 sqm). For the areas ROSCI0324 – Munții Bihor și ROSCI0291 – Coridorul Munții Bihorului – Codru Moma the proposed deforested area is approx. 2,141 ha.</p>	<p>Is expected to improve local air quality in terms of improving the technical conditions of the road allowing higher speeds running implicit use of fuel and lower emissions into the atmosphere.</p> <p>During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.</p>	There will not be affected archaeological sites or historic monuments
349	Modernization	Modernization DN 2N km 52+860 - km 60+000 Jitia - Bisoca and new bridge over Râmnicu Sărat at km 53+300	<p>The proposed route does not cross and not in the vicinity of protected areas.</p>	<p>During construction noise and vibration are insignificant, of a temporary, locally and discontinuous nature.</p> <p>Due to the project</p>	<p>There may be temporary low quantity of emissions during decommissioning and new bridge construction from the means of transport During project</p>	<p>yes</p> <p>The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of</p>	Nu	<p>No demolition works will be needed. No deforestation works will be needed.</p>	<p>Is expected to improve local air quality in terms of improving the technical conditions of the road allowing higher speeds running implicit use of fuel and lower emissions into the atmosphere.</p>	There will not be affected archaeological sites or historic monuments

				development will be reduced the noise in the area crossed by DN2N	execution, air emissions are the ones generated by the tools and equipment used in construction. These are temporary and intermittent, shall not exceed the admissible limits.	water quality.			By improving transport conditions will reduce noise pollution in the area traversed by DN2N  During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.	
350	Modernization	Modernization of DN5, București-Adunații Copăcenii sector	The proposed route does not cross and not in the vicinity of protected areas.	During construction noise and vibration are insignificant, of a temporary, locally and discontinuous nature.  Due to the project development will be reduced the noise in the area crossed by DN5	There may be temporary low quantity of emissions during decommissioning and new bridge construction from the means of transport During project execution, air emissions are the ones generated by the tools and equipment used in construction. These are temporary and intermittent, shall not exceed the admissible limits.	yes  The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	No demolition works will be needed. No deforestation works will be needed.	Is expected to improve local air quality in terms of improving the technical conditions of the road allowing higher speeds running and use of fuel and lower emissions into the atmosphere. By improving transport conditions will reduce noise pollution in the area traversed by DN5  During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.	There will not be affected archaeological sites or historic monuments

354	Rehabilitation	Rehabilitation of DN 2D Focșani - Ojdula km 0+000 - km 118+893	Protected areas that are being crossed: Parcul Natural Putna-Vrancea ROSCI0208-Putna Vrancea ROSCI0130-Oituz Ojdula ROSPA0088-Munții Vrancei Affect the integrity of the protected area, the compensatory measures were necessary.  It required the application of compensatory measures for affected areas	During construction noise and vibration are insignificant, of a temporary, locally and discontinuous nature.  Due to the project development will be reduced the noise in the area crossed by DN 2D	No significant changes are expected in terms of air quality.	Yes  The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	Are needed deforestation works for the following surfaces: 14,97 ha in Vrancea County 16,23 ha in Covasna County The total surface is of 31,20 ha from which 23,46 ha in the protected areas (11,90 ha ROSCI208 and 11,56 ha ROSCI130) No demolition works will be needed.	Is expected to improve local air quality in terms of improving the technical conditions of the road allowing higher speeds running and use of fuel and lower emissions into the atmosphere. By improving transport conditions will reduce noise pollution in the area traversed by DN 2D During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.	There will not be affected archaeological sites or historic monuments
356	Rehabilitation	Rehabilitation of DN24, Galați/Vaslui-Crasna and DN24B Crasna-Albița Lot 1: km 51+000 (Galați County limit and Vaslui –DN 24 km 90+000 Lot 2: DN 24 km 90+000 – DN 24 km 105+070 (Crasna locality) and DN 24B km 22+000 Lot 3: DN 24B km 22+000 – DN 24B km 47+881 (Albița border point)	DN 24 Crasna - Iași, between km 105+700 – 197+040 crosses the following protected areas:  Vaslui County : Natura 2000 ROSPA0096 Pădurea Miclești, close to the road from km 144+590 to km 151+960 Iași County : Natura 2000 sit ROSPA0096 Pădurea Miclești, close to section km 151+960 - km 152+100 and km 152+500 - km 153+200; DN 24 crosses Natura 2000 ROSPA0092 Pădurea Bârnova and ROSCI0135 Pădurea Bârnova - Repedea from km 177+800 to km 183+700.  The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	During construction noise and vibration are insignificant, of a temporary, locally and discontinuous nature.  Due to the project development will be reduced the noise in the area crossed by DN 24	No significant changes are expected in terms of air quality.	yes  The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	Nu	No demolition works are needed	Is expected to improve local air quality in terms of improving the technical conditions of the road allowing higher speeds running and use of fuel and lower emissions into the atmosphere. By improving transport conditions will reduce noise pollution in the area traversed by DN 24  During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.	There will not be affected archaeological sites or historic monuments
357	Rehabilitation	Rehabilitation of DN6 Alexandria Craiova	At a distance of 2,86 km from ROSPA 0148 Vitănești – Râsmirești. Crosses: ROSCI0386 Râul Vedea	During construction noise and vibration are insignificant, of a temporary, locally and	No significant changes are expected in terms of air quality.	yes  The proposed works will not affect water uses and	Nu	Deforestation works are needed for the rehabilitation works on DN 6 on a	Is expected to improve local air quality in terms of improving the technical conditions of the road	There will not be affected archaeological sites or historic

			ROSCI0376 Râul Olt ROSPA0106 Valea Oltului Inferior ROSPA0137 Pădurea Radomir	discontinuous nature.  Due to the project development will be reduced the noise in the area crossed by DN 6		aquatic ecosystems. No changes are expected in terms of water quality.		total surface of 7071,87 sqm between km 94+186 and km 95+163 and DN6 (2953,94 sqm/right side and 4117,93 sqm left side). The surface of 7071,87 sqm which is not part of the forestry administration  The 7071.87 m2 surface taken out of the forest area is part of Nanov forest's edge near Nanov town; the width of deforested surface being 3 m on both sides of the road. No demolition works are needed.	allowing higher speeds running and use of fuel and lower emissions into the atmosphere. By improving transport conditions will reduce noise pollution in the area traversed by DN 6  During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.	monuments
359	Rehabilitation	Rehabilitation of DN 56, Craiova - Calafat, km 0+000 - km 87+047	The project is carried out near protected areas ROSPA0074 Maglavit and ROSCI0045 Coridorul Jiului, on a length of 293 m from the second named protected area  The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	During construction noise and vibration are insignificant, of a temporary, locally and discontinuous nature.  Due to the project development will be reduced the noise in the area crossed by DN 56	No significant changes are expected in terms of air quality.	yes  The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	No demolition works are needed No deforestation works are needed		
360	Rehabilitation	Rehabilitation of DN 1H Zalău - Aleșd, km 0+000 - km 69+334	Crosses Natura 2000 sit ROSCI0322 Muntele Șes.  The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	During construction noise and vibration are insignificant, of a temporary, locally and discontinuous nature.  Due to the project development will be reduced the noise in the area crossed by DN 1H	No significant changes are expected in terms of air quality.	yes  The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	Clearing works are proposed on the administrative territory of Salaj and Bihor counties located adjacent to and within the protected area ROSCI0322 Aleșd – 5,9316 ha permanent employment 0,2492 ha – temporary employment, Forest Department Silvaniei and Blidari - 2.9082 ha permanent employment.	Is expected to improve local air quality in terms of improving the technical conditions of the road allowing higher speeds running and use of fuel and lower emissions into the atmosphere. By improving transport conditions will reduce noise pollution in the area traversed by DN 1H  During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the	There will not be affected archaeological sites or historic monuments

									maximum admissible limits.	
338	Rehabilitation	Acces roads at Ecluza Agigea and at fluvial-maritime Agigea port CDMN, left bank, between km 61+800 and 63+500, L=1.700 m	The proposed route does not cross and not in the vicinity of protected areas.	During construction noise and vibration are insignificant, of a temporary, locally and discontinuous nature.	No significant changes are expected in terms of air quality.	The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality	N.a.	The designed road has the same red line with the existing road. There will be no changes for the occupied surfaces. There will be no demolition works or deforestation works.	During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits. During the operation is expected to be improved the local air quality in terms of reducing noise and improving technical conditions of the road.	There will not be affected archaeological sites or historic monuments
406	Rehabilitation	Giurgiu Bridge over the Danube on DN5 km 64+884	The proposed route does not cross and not in the vicinity of protected areas.	During construction noise and vibration are insignificant, of a temporary, locally and discontinuous nature.	No significant changes are expected in terms of air quality.	Yes - Danube  The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality	N.a.	There will be no changes for the occupied surfaces. There will be no demolition works or deforestation works.	During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.  During the operation is expected to be improved the local air quality in terms of reducing noise and improving technical conditions of the road.	There will not be affected archaeological sites or historic monuments
407	Rehabilitation	Bridger over Olt River, on DN6 - Slatina, km 48+570	The project is located in Natura 2000 sit – Valea Oltului Inferior – ROSPA0106.  The project will not have significant effects on the integrity of protected areas and the species for which the area was designated.	During construction noise and vibration are insignificant, of a temporary, locally and discontinuous nature.	No significant changes are expected in terms of air quality.	Yes - Olt River  The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality	N.a.	There will be no demolition works or deforestation works.	During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.  During the operation is expected to be improved the local air quality in terms of reducing noise and improving technical conditions of the road.	There will not be affected archaeological sites or historic monuments
408	Rehabilitation	Road bridge over Oituz at Poiana Sărată on DN11, km 90+450	The proposed route does not cross and not in the vicinity of protected areas.	During construction noise and vibration are insignificant, of a temporary, locally and discontinuous nature.	No significant changes are expected in terms of air quality.	Yes –Olt River  The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality	N.a.	There will be no demolition works or deforestation works.	During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.	There will not be affected archaeological sites or historic monuments

									During the operation is expected to be improved the local air quality in terms of reducing noise and improving technical conditions of the road.	
409	Rehabilitation	Road bridge at Arginești over Jiu on DN6, km 268+371	The project will be located in the ROSCI0045 Jiu Corridor community important site, but very close to its limit. The project will not impact this protection area because the rehabilitation works will be done in the existing location without affecting the species and habitats protected by this site.	The project is located outside of residential areas, so that local people will not be adversely affected by the development of the works	No significant changes are expected in terms of air quality. Air emissions will be insignificant, they'll manifest only on the project's location and up to 30 m from its limit.	Yes – Jiu River  The proposed works will not affect water uses and aquatic ecosystems. No changes are expected in terms of water quality.	N.a.	For the rehabilitation of the existing bridge there are not necessary deforestation or removal of additional areas aside.	The project is located outside of residential areas, so that local people will not be adversely affected by the performance of the work.	There will not be affected archaeological sites or historic monuments.
<b>Waterways</b>										
373	Extension	Front waiting for sales/ recovery convoys at the confluence channel of Danube - Black Sea and Poarta Albă-Midia	The proposed route does not cross and not in the vicinity of protected areas.	During construction and operation shall be respected the admissible limits.	No significant changes are expected in terms of air quality.	The project is located on the left arm of the Danube - Black Sea Channel , upstream of the confluence with the channel Poarta Albă - Midia Năvodari, between km 29+720 și 30+020 No changes are expected in terms of water quality.	N.a.	Even if targeted the entire waterway, the proposed work does not change constructive characteristics (length, width waterway).	During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.  The project will have no negative impact on the population and human health.	There will not be affected archaeological sites or historic monuments
377	Modernization	Modernization of locks, equipment and installations	The distances to the nearest Natura 2000 sites are: Approx. 2,1 km from the limit of ROSPA 0039 Dunăre-Ostroave Approx. 1,1 km from the limit of ROSPA 005 Lacul Siutghiol Approx. 1 km from the limit of ROSPA0060 Lacurile Tașaul Corbu Approx. 1 km from the limit of ROSPA 0076 Marea Neagră Approx. 400 m from the Natural Reservation, cod 368 Agigea lake Implementation of the proposed project works will not affect the natural habitats and species for which they have been designated as protected areas of national and community levels.	During construction and operation shall be respected the admissible limits.	No significant changes are expected in terms of air quality.	The project is located on the left arm of the Danube - Black Sea Channel , upstream of the confluence with the channel Poarta Albă - Midia Năvodari, between km 29+720 și 30+020  No changes are expected in terms of water quality.	Nu	Even if all concerned waterway, the proposed work does not change constructive characteristics (length, width waterway).	During project execution, air emissions and noise levels are the ones generated by the specific tools and equipment used in construction. These are temporary and intermittent, shall not exceed the maximum admissible limits.  The project will have no negative impact on the population and human health.	There will not be affected archaeological sites or historic monuments
378	Modernization	System for reception and processing of waste from ships and emergency response in case of pollution on the Danube sector administrated	The proposed route does not cross and not in the vicinity of protected areas.	Noise and vibrations are generated by the operation of specific construction equipment. This will be within the maximum admissible limits having a temporary nature.	Emissions to air are generated by the operation of specific construction equipment. This will be within the maximum admissible limits.	The project's overall objective is reducing negative environmental impacts caused by river transport activities and responding to the urgent needs already identified for the Danube River protection by improving	N.a.	N.a.  Works are made within the port precinct.	The project will have no negative impact on the population and human health. The work is performed inside the port.	There will not be affected archaeological sites or historic monuments

		by CN APDF SA Giurgiu				the acquisition and processing waste from ships and response to pollution on the Danube run by CNAPDF Giurgiu, in ports belonging to the Trans European Transport Network				
381	Monitoring	Monitoring the environmental impact of works to improve navigation conditions on the Danube between Calarasi and Braila, km 375- km 175-Stage II.	<p>The area where the work will be done partially overlaps sites belonging to the Natura 2000 network:</p> <p>ROSCI0006 - Balta Mică a Brăilei, ROSCI0022 -Canaralele Dunării, ROSPA0039- DUNĂRE OSTROAVE, ROSPA0017 Canaralele de la Hârșova, ROSPA005 - Balta Mică a Brăilei.</p> <p>Has been proposed an extensive program of monitoring both for fauna and flora during the works and post-implementation period (36 months). This program is ongoing. Conclusions monitoring results achieved during 24 months for the years 2011-2013 in August showed that:</p> <p>During the construction phase the ecological status of the Danube water was analyzed, in the analyzed points was concluded to be between high and good, meaning no additional pressure comparing to the preconstruction phase.</p> <p>No protected flora species have been identified in the area of investigation. Bird species are not affected by hydraulic works, because there is no nest and feed in areas where there are jobs, their range is much wider. The impact of construction works in the short term can only be local and insignificant;</p> <p>Negative changes in the number and ring species flocks / observed are not caused by work carried out since the fall of 2012 the low number of birds was an immediate consequence of drought. Regarding terrestrial flora - diversity decreased in 2013 compared to 2012, especially among less of herbal plants and trees or shrubs. The changes are primarily due to water fluctuations and frequent flooding areas analyzed.</p>	Regarding the noise level from the analysis it was found that not any monitored parameter is exceeding the admissible values	With regard to emissions into the atmosphere from the analysis developed, it was concluded that no exceeding on any monitored parameter has been registered.	Regarding water pollution and sediment, the experts of INCDFM did not found exceeding of any indicator values reported by historical TNMN -ICPDR.	Regarding the soil pollution, following the sampling and analyses, it was concluded that there is no monitored element for which are registered exceeding of the admissible limits.	-	<p>The project will have no negative impact on the population and human health.</p> <p>The emission levels in the atmosphere for noise were within the maximum admissible limits.</p>	-



			<p>Out of the information held by experts INCDDPM conjunction with measurements within 5 investigation campaigns sturgeon migration route that we can say with a high level of trust that sturgeon, sturgeon and beluga namely, overcome by various methods (still unsolved ) speed stream between 2.2-2.5 m / s.</p> <p>The data held is not known maximum speed counter-current swimming (critical speed) sturgeon, which is why science is not possible to assess the impact of obstacles on the path of migratory Danube. Experts INCDDPM will eliminate this uncertainty during the period September to December 2013 by making determinations speed counter-current swimming sturgeon above the bottom of the arm Bala.</p>							
403	Improvement of the transport conditions	Improvement of navigation conditions on the sector Calarasi-Braila	<p>The area where the work will be done partially overlaps sites belonging to the Natura 2000 network:</p> <p>ROSCI0006 - Balta Mică a Brăilei, ROSCI0022 -Canaralele Dunării, ROSPA0039- DUNĂRE OSTROAVE, ROSPA0017 Canaralele de la Hârșova, ROSPA005 - Balta Mică a Brăilei.</p> <p>It was provided an extensive program of monitoring of fauna and flora, both during the execution of works and post-implementation (36 months). Compensatory measures are needed (restocking with various fish - sturgeon, carp, catfish and other species based on monitoring results).</p>	It manifests about 200 m inward and toward the dry, temporary area (during construction works).	<p>Impacts due to reduced air emissions temporarily manifested during construction works.</p> <p>For the post-execution period using freight shipping to the detriment of road are expected emission reductions of pollutants into the atmosphere.</p>	<p>The works will be developed on the Danube, on the sector Călărași-Brăila.</p> <p>Effects on water quality of the works are local and temporary.</p> <p>The effects of the works fall within the natural variability of parameters turbidity, alluvial erosion.</p> <p>Water quality will not be affected.</p>	N.a.	<p>The project will have negative impact on the landscape. Natural sites characterized by abundant riparian vegetation will be replaced by local shore protection or control dams made of stone.</p> <p>Bottom thresholds represented by the stone building will pause / Section the body water.</p> <p>Measures have been proposed to mitigate the impact on the landscape - planting "hedge" behind the defense sides.</p>	<p>The location of all the works for the improvement of navigation is at distances greater than 2 km from the inhabited areas.</p> <p>The proposed works will not affect or will affect in the acceptable limits, the people from neighboring villages and economic activities in the area. Some effects of the site will be felt by the population (increased traffic during execution, increased noise and air emissions concentrations associated with transportation). It is estimated that the population impact will be minor and temporary.</p>	There have not been identified archaeological sites / historical monuments located on the left bank of the Danube and on the banks arms of Bala and Borcea or minor beds of these arms.
404	Modernization	Vertical quay berth 31 of port docks Outdoor of Galati	The proposed route does not cross and not in the vicinity of protected areas.	Noise and vibrations are generated by the operation of specific construction equipment. This will be within the maximum admissible limits having a temporary nature.	Emissions to air are generated by the operation of specific construction equipment. This will be within the maximum admissible limits.	<p>The work is done in the port Basin Docuri Galați, on the Danube.</p> <p>No changes are expected in terms of water quality.</p>	N.a.	The work is performed inside the port.	The works are not carried out in the vicinity of residential areas.	There will not be affected archaeological sites or historic monuments

405	Modernization	Creating a support system works on the Danube river in order to ensure minimum depth navigation	<p>Protected natural areas lying to the execution of works:</p> <p>ROSPA005 Balta Mică a Brăilei  ROSCI006 Balta Mică a Brăilei  ROSPA0011 Blahnița  ROSCI0173 Stârmina  ROSPA0046 Gruia- Gârla Mare  ROSPA0074 Maglavit  ROSCI0039 Ciuperceni-Desa  ROSPA0013 Calafat-Ciuperceni-Dunăre  ROSPA0012 Brațul Borcea  ROSPA0026 Cursul Dunării-Baziaș-Portiile de Fier  ROSCI0206 Portiile de Fier  ROSPA0040 Dunărea Veche-Brațul Măcin  ROSCI0012 Brațul Măcin  ROSPA0022 Comana  ROSCI0043 Comana  ROSCI0044 Corabia Turnu Măgurele  ROSPA0024 Confluența Olt Dunăre  ROSCI0131 Oltenița – Mostiștea – Chiciu  ROSPA0021 Ciocănești Dunăre  ROSPA0031 Delta Dunării și Complexul Razim Sinoe  ROSCI0045 Coridorul Jiului  ROSCI0065 Delta Dunării  ROSPA0023 Confluența Jiu-Dunăre  ROSCI022 Canaralele Dunării  ROSPA0002 Allah Bair – Capidava  ROSPA0017 Canaralele de la Hârșova  ROSPA0039 Dunăre Ostroave  ROSCI0071 Dumbrăveni - Valea Urluia - Lacul Vederoasa  ROSCI0149 Pădurea Esehioi - Lacul Bugeac</p> <p>On the Project site and its immediate proximity to natural habitats have been identified and / or wild species of Community interest that could be affected by the implementation.  The project does not cause significant damage or loss of natural habitats of Community interest.  Implementation of the project will not cause significant changes in natural protected areas identified.</p>	Noise and vibrations are generated by the operation of specific construction equipment. This will be within the maximum admissible limits having a temporary nature.	Emissions to air are generated by the operation of specific construction equipment. This will be within the maximum admissible limits and will be temporary,	The works are developed on the Danube.  No changes are expected in terms of water quality.	N.a.	The work is done on the Danube navigable channel.  There are not required demolition or deforestation works.	The works are not carried out in the vicinity of residential areas.	There will not be affected archaeological sites or historic monuments
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**Conclusions – Reference case Scenario (“Do minimum” scenario):**

- For the projects included in the reference case scenario, for which was developed the environmental impact procedure, the early identification and assessment of potential environmental impacts was allowed, and measures were proposed to prevent environmental impact reduction. Situation procedure for environmental impact assessment / evaluation appropriate for projects included in the scenario "Do Minimum" is shown in Table 5.1.
- The identification of the environmental effects has been done both for the implementation phase and the operational phase;
- In terms of the developing regions of the country, can be seen that the proposed works, especially for the road sector infrastructure (motorways, the by-passes), are proposed in the development areas in central, western and north-west country.
- The environmental studies (memories of presentation, environmental impact assessment studies Appropriate assessment studies) and all the regulatory acts, in terms of environmental protection, (environmental agreements, decisions stages of employment) that have been made available to AECOM emphasize that, for all projects, regardless of the mode of transport, environmental effects are insignificant during execution, occurs locally and temporary in the front line work. Basically, the environmental consultants' opinion which elaborated the environmental studies is that the environmental impact during the construction and operation period of the proposed investments is insignificant.
- The projects involving the development of new transport corridors (motorways, bypass roads linking) or extending the existing highways (modernization projects) will cause permanent changes in the occupied land areas and land use category. The „Do minimum” Scenario will have the following impact on the highway network, comparing to the situation of 2011: 934 km of motorways compared to 501 km; 15.649 km of national roads compared to 15.479 km.
- In terms of land use category which will be permanently occupied by the proposed projects within the "Do Minimum" scenario, according to Corine Land Cover 2006, most of them fall into the category "arable areas" - 47%, "localities - discontinue build areas"- 13%.
- For some road and railway projects which proposes new route alignments or for which the modernization / rehabilitation activities required expansion / modification of existing route, clearing works were necessary - for about 9.4% of the total number of projects included in the Scenario "Do minimum "(10 projects proposed for the road sector). There were not provided information on compensatory measures proposed in accordance with forest legislation in force (reforestation - areas, surfaces).
- According to information provided by the appropriate assessment study for the GTMP, there is a number of projects included on this scenario that is very close to Natura 2000 network(v. Annex 5 BC):
  - From the total number of projects included in the "Do Minimum" Scenario, 30 projects intersect the SCIs (2 naval sector projects, 5 projects proposed for the rail sector, 23 projects proposed for the road sector) and 20 projects intersect SPAs (2 naval sector projects, 4 projects proposed for the rail sector, 14 projects proposed for the road sector).
  - From the total number of projects included in the Scenario "Do minimum" , 3 projects are located at a distance less than 1 km from the limit of SCIs (2 railway projects, one project road sector) and 7 projects are closer than 1 km from the limit of SPAs (4 projects rail, road sector 3 projects).

- Most projects which are crossing the Natura 2000 sites belong to road sector.
- Only for a total of 29 projects (27% of projects) of the projects included in the scenario "Do Minimum", was developed the procedure for assessing the environmental impact, while for 6 of them also was developed the appropriate assessment procedures;
- To ensure the connectivity of the fauna, according to information available, the site of the project were provided passages / culverts / bridges (they allow wildlife crossing from side to side). It is not known how to determine their position in the absence of proper evaluation of study for all projects that intersect or are contiguous area of protected areas.
- Where it was found that the proposed projects are affecting the protected areas, have been proposed, as measures, restoration and / or improvement of habitats for the protected natural areas, replanting with species of the same category as those cleared. It is not known how to determine their position and type of habitat affected and subsequently recovered in the absence of proper evaluation of study for all projects that intersect or are contiguous area of protected areas. For one project in the road sector (index 349-Rehabilitation DN 2D Focsani - Ojdula - intersection with DN 11 km 0 + 000 - km 118 + 873) were necessary to establish compensatory measures required as a result of the impact assessment on the integrity of Natura 2000.
- For the road projects, provisions are made related to increases in noise levels, in the areas where road routes (including both new and those that are modernized / rehabilitated) approaches closer than 500 m from residential areas or protected areas, both during execution and during operation. For these areas were necessary measures to reduce the impact of noise: installing absorbing panels or planting forest belts.
- For the road and rail sector, are necessary investments in construction or rehabilitation of bridges, bridges, viaducts, watercourse crossing (see Figure 5.2). As regulated by the permits and approvals issued by the environmental agencies for these projects, all the required measured will be taken, so that no impact on water flow, minor beds and banks of surface waters will be registered and to prevent pollution.
- There will be no impact on archaeological sites and historical monuments. In order to protect archaeological sites archaeological investigations and removal of any findings are necessary before starting the execution works.
- No significant changes are expected in terms of air quality. It is estimated that will be reduced the emissions of pollutants into the atmosphere in large urban areas, due to diverting heavy traffic outside localities. By improving the technical conditions of road transport, the average speeds are higher, shorter journey times, fuel consumption will decrease and thus the emission of pollutants into the atmosphere will be reduced.
- Some road and railway projects proposed new route alignments or the modernization / rehabilitation required expansion / modification of the landscape route changes occur through permanent occupation of land surfaces by creating works of deforestation.
- It specifies that information on environmental impact, made available by the contracting authority are reduced compared to the number of projects implemented (no information was available for all projects included in the scenario "Do Minimum"). In addition, this information is at the environmental obtaining necessary to obtain the Construction Permit and it is unknown whether the proposed measures have been implemented in the execution phase and the operational phase. No data were available on the Environmental Management Plans and their implementation during execution.
- AECOM Technical Team has not proposed to make an assessment of the current funding program for transportation infrastructure, such as have been taken into account

environmental data made available by the Contracting Authority, the data representing different conclusions environmental consultants and environmental authorities issuing environmental agreements / employment decisions;

- For "Do Minimum" Scenario, greenhouse gases emissions were estimated based on the number of km / vehicle using emission factors (g / km) for each of greenhouse gases (CO<sub>2</sub>, NO<sub>x</sub>, N<sub>2</sub>O, NMCOV , SO<sub>2</sub>) by AECOM technical team. TREMOVE model was used to estimate, which is a model for policy assessment coordinated by the European Union to study the effects of different transport and environment policies on the transport sector in all European countries. The of greenhouse gases emissions estimated for the period 2011-2030 refer only to the exploitation phase of the proposed investments. For "Do Minimum" Scenario total greenhouse gases emissions will be:

**Table 5.3 Greenhouse gas emissions for "Do Minimum" Scenario - estimates for the period 2014-2030**

Greenhouse Gases	The total amount on tons estimated for the period 2014-2030		
	„Do minimum”	„Do nothing”-	„Do minimum” vs. „Do nothing” (%)
CO <sub>2</sub>	301,603,184	296,299,480	1.79%
N <sub>2</sub> O	19,257	19,106	0.79%
CH <sub>4</sub>	90,437	89,969	0.52%
SO <sub>2</sub>	363,206.918	355,760	2.09%
NMCOV	215,612.294	213,434	1.02%
NO <sub>x</sub>	986,394.185	982,422	0.40%

*Note: was used (,) for the separation of 1000*

- It is estimated that after the implementation of the "Do Minimum" Scenario, will be registered an increase in total greenhouse gases emissions comparing to "Do nothing" Scenario (see Table 5.3 and Annex 4 of the Environmental Report). The road sector will remain the main contributor to the total greenhouse gases emissions, followed by rail, air and water.

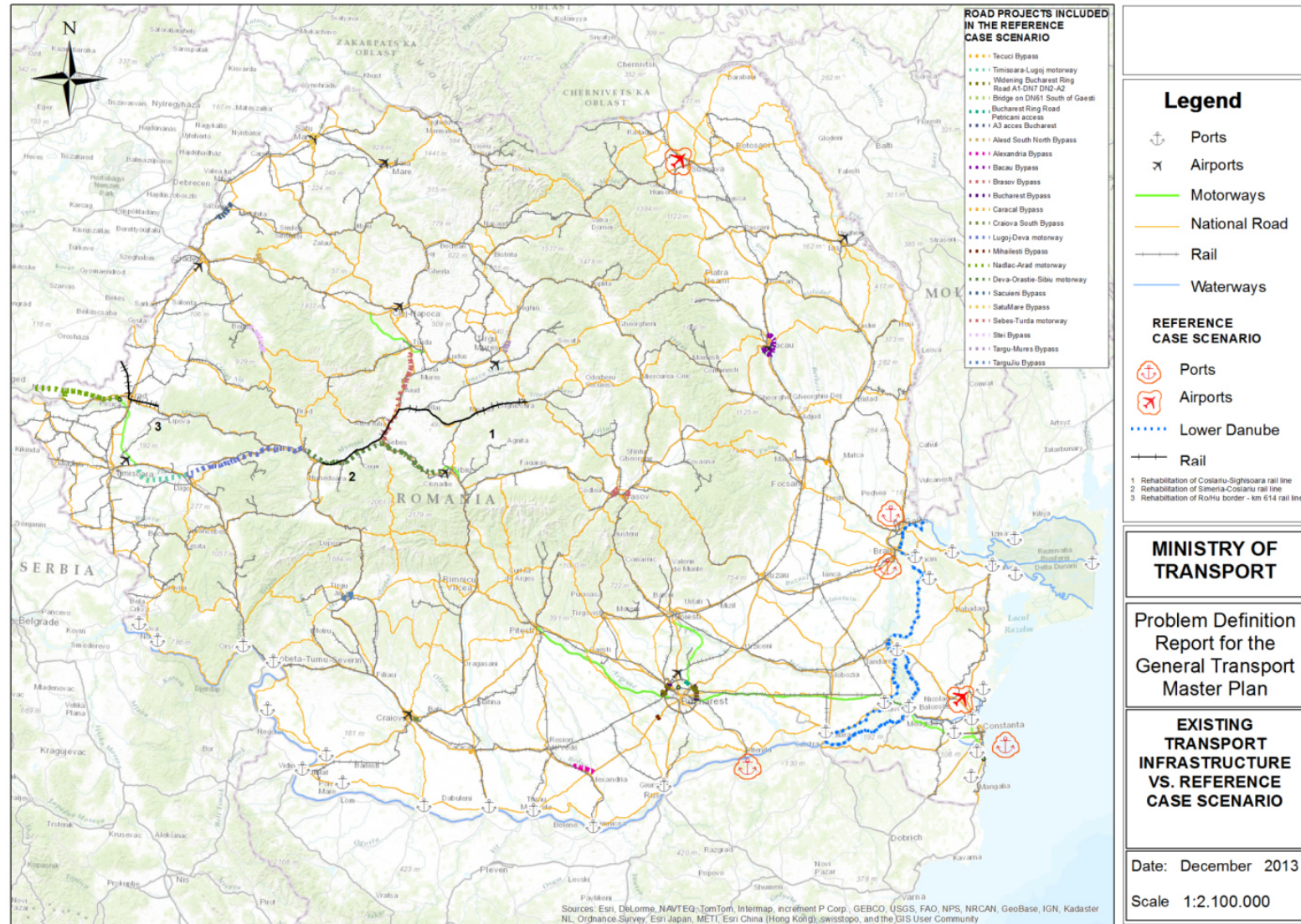


Figure 5.1 The limit of the areas of infrastructure projects location included in the “Reference Case” Scenario (Do minimum) and the limits of natural protected areas







## 5.2. The environmental characteristics of areas likely to be significantly affected - development scenarios ("Do Something" - ES / EES and "Core TEN-T" - CTT)

The analysis of the environmental aspects likely to be affected by proposed projects through the scenarios **"Do Something" - ES / EES** and **"Core TEN-T" - CTT** was made taking into account the spatial location of the proposed project, the type of project, the nature of the proposed investment category of construction and analysis of the environmental results may be affected by similar projects included in the baseline scenario. Were analyzed the main changes that may occur both in the execution phase and the operational phase. The magnitude of environmental effects depends upon the specific of the site project, the execution period, the type of works that is done, the size of the project.

The list of proposed investments for the GTMP comprises a large number of projects (479 projects) for different modes of transport (road, rail, air, sea and intermodal):

- A total of 62 projects representing approximately 12.9% of all projects included in the scenario of "Do Something" does not include construction works: 32 projects – rail sector; 7 projects - the naval sector, 13 projects - the air sector and 10 projects for intermodal sector;
- A total of 417 projects representing 87.1% of all projects included in "Do Something" Scenario include construction works: 204 projects - road sector, 80 projects – rail sector; 61 projects - the naval sector, 70 projects - the air and 2 - intermodal sector;

The Environmental Report for the development scenario "Do Something", takes into account for the environmental assessment, an extended version of projects (the so-called "worst-case scenario"), which includes, besides the projects submitted in the GTMP version of 31.08.2014 (v. Annex 3A) also projects requiring a further revaluation / testing using National Transport Model. The list of proposed investments for this variant, which takes into account the observations / comments from the public during the public debate GTMP (1-15.10.2014) is presented in Appendix 3C.

The „maximum version" (referring to the number of projects) of the development scenario "Do Something" includes a number of 120 projects:

- 64 projects for the road sector representing about 53% of selected projects - of which 40 projects include the development of new road corridors (construction of motorways, expressways, bypasses) and 24 projects include rehabilitation of roads.
- 16 projects addressing rail transport sector representing about 13% of selected projects - projects proposed to improve travel times, rehabilitation of the railway, electrification of the railway line.
- 12 projects for intermodal sector representing about 10% of selected projects - including new terminal construction works and construction works for the development of existing terminals.
- 14 projects for the naval sector representing about 12% of selected projects - 1 project includes works to improve navigation on the Danube project, 11 projects are related to the development of port infrastructure, 1 project for the creation of a new Bucharest-Danube waterway, 1 project for sides defense works for Sulina Channel banks;
- 14 projects for the aviation sector representing about 12% of selected projects - including terminal building works, extensions running platforms;

Among these projects, were selected for inclusion in the "Core TEN-T '(CTT) development scenario, a number of 67 projects, of which 66 projects include construction works and 1 project includes measures to ensure transport safety.

Among the projects that include construction works:

- A total of 10 projects for the road sector representing about 15% of selected projects - including construction work for motorways;
- A total of 16 projects addressing to rail transport sector representing about 24% of selected projects - projects to improve travel times, rehabilitation of railway electrification railway line.
- A total of 12 projects for intermodal sector representing about 18% of selected projects - including new terminal construction works and construction works for the development of existing terminals.
- A total of 14 projects for the naval sector representing about 21% of selected projects - 1 project includes works to improve navigation on the Danube project, 11 projects for the development of port infrastructure, one project for the creation of a new Bucharest-Danube waterway, 1 project for side defense works for Sulina Channel banks;
- A total of 14 projects for the aviation sector representing about 21% of selected projects - including terminal building works, extensions running platforms;

In terms of the project location, most new transport infrastructure works included in the development scenarios (ES / EES and CTT) are proposed in southern southwest and northeast development areas of Romania.

In Chapter 8, "The potential significant environmental effects" of this Environmental Report are presented the results of the assessment of the effects of environmental GTMP scenarios, based on the type of work proposed by each project, the changes that might occur in transport demand conditions transport as a result of development and modernization of transport infrastructure.

Most of these projects fall into the category of projects subject to EIA procedure, according to GD no. 445/2009. In this stage will be identified and analyzed detailed environmental characteristics that may be affected significantly, it will be presented the physical and qualitative changes arising from the implementation of each project.

**Table 5.4 Environmental features likely to be affected by the projects selected for inclusion in development scenarios (ES / EES and CTT) - General considerations for the investment categories**

Categories of the proposed investment / Number of proposed projects	Environmental features likely to be affected
<b>Road sector</b>	
<b>New alignments</b> Development Scenario (ES / EES) proposes: 40 projects (motorways - 8; expressways - 17 projects; bypasses - 15 projects) Scenario "Core TEN-T" (CTT) proposed 10 projects motorway	The main types of work for such projects include: <ul style="list-style-type: none"> <li>• works for spatial organization of the site;</li> <li>• works for geotechnical investigations;</li> <li>• works for building slopes, embankments;</li> <li>• works for stripping, excavation, filling;</li> <li>• works for the collection and drainage;</li> <li>• specific works of roads designed for making structures;</li> <li>• relocation works intersecting roads, utility networks crossing</li> <li>• works for traffic safety, signage, lighting;</li> <li>• works facilities: service areas, parking lots, maintenance centers</li> <li>• hydraulic works;</li> <li>• works for environmental protection;</li> </ul> This type of projects will cause temporary change of land use (associated to site organization, storage of construction materials, borrow pits, temporary access roads, etc.) and changes in land use (associated to the working front and caused by the construction of roads and related facilities). The implementation of the <b>CORE TEN – T Scenario</b> will have the followings results: <ul style="list-style-type: none"> <li>• Approximately 539 km of motorway with a platform of approximately 26 m;</li> </ul>

	<ul style="list-style-type: none"> <li>• Approximately 2208 km of expressways, the transverse profile of high-speed expressway in current section in alignment is 22 m;</li> <li>• Approximately 135 km of bypasses.</li> </ul> <p><b>„DO something” Scenario (ES/EES)</b> proposes the followings:</p> <ul style="list-style-type: none"> <li>• Approximately 887 km of motorway with a platform of approximately 26 m;</li> <li>• Approximately 2241 km of expressways, the transverse profile of high-speed expressway in current section, in alignment is 22 m;</li> <li>• About 182 km of bypasses ( part of the by-passes are included in expressways).</li> </ul> <p>These projects will be achieved in different time periods. The Development Strategy of transport infrastructure is covering a period of 5-15 years (2014, 2020, 2030). Currently have not been established, with certainty, the timing of implementation of these projects.</p> <p>Development of new design elements will cause changes in the physical and aesthetic landscape locally.</p> <p>Environmental effects of the construction work will be felt locally (in the front of it) and will be temporary. Quantifying the effects, will depend on the type and amount of work done, the field conditions and methods of construction adopted.</p> <p>Soil pollution and soil quality changes, pollution of surface and groundwater which will change the physical, chemical and biological characteristics could be determined for these types of projects: uncontrolled spills / pollutants on the ground or in water, deposits on soil of some particulates matters (PM) potentially contaminated with other air pollutants resulting from excavation, transportation of materials and personnel, asphalt plants, concrete plants, the activities of loading and unloading of the raw materials, the improper disposal of waste, the improper disposal of wastewater, soil subsidence, the increase of surface water resources turbidity by rainwater leach of the uncovered areas and training of particulates matters in rivers, lakes etc.</p> <p>The works for bridges / culverts can cause a temporary disruption of morphological elements and / or of the water flow characteristics.</p> <p>The air quality can be affected by the emissions of air pollutants (such as nitrogen oxides, sulfur oxides, carbon oxides, volatile organic compounds, heavy metals) generated by the transport activities and machinery used for construction activities. To this can be added the dust from excavation, the asphalt concrete plants and activities of loading and unloading of construction materials.</p> <p>The construction works and traffic of vehicles will cause an increase in noise and vibration. This increase may occur locally in the work fronts and on their surroundings.</p> <p>It is recommended that the choice of routes/alignments will consider also identifying and avoiding sensitive areas as possible: densely inhabited areas, protected natural areas, ecological corridors, archaeological sites, wetlands, areas with landslides, flooding risk areas.</p> <p>Projects for the construction of motorways and express roads stretch over long distances and may have a significant influence area, much higher than for other infrastructure projects. Some of the projects proposed for road sector, crosses or adjoins with protected natural areas of national or local interest, included in the Natura 2000 network (see Figure 5.3 and 5.4, Annex 5 BC). Appropriate assessment carried out for GTMP aimed to identify sensitive protected natural areas likely to be affected by the implementation of transport projects proposed by GTMP, the conclusions of this study are presented in Chapter 8.5 of this Environmental Report.</p> <p>During the roads construction works, may appear the risk of discovery some unknown archaeological heritage.</p> <p>New road construction projects will have direct effects on the consumption of natural resources: on water resources, mineral aggregates, wood, energy (including electricity and fuel), and others. Natural resources needed to implement each project will be detailed in the EIA procedures / AA, being different from project to project and from one mode transport to another.</p> <p>During operation period it is expected a decrease of air and noise pollution in</p>
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	<p>residential areas where traffic will be taken by these new variants route. Development of new and much faster transport routes can have positive effects on the economic development of the concerned regions; the possibility of investment and social development in the less polluted the towns.</p> <p>Although these new alignments intend to bypass towns, there may be some areas where these routes route will approach to the inhabited areas, being necessary to apply measures to reduce noise produced by road traffic.</p>
<p><b>Rehabilitation / modernization of roads</b></p> <p>Development Scenario "Do Something" (ES / EES) proposes 14 projects</p> <p>Development Scenario "Core TEN-T": 0 projects</p>	<p>For the rehabilitation projects the existing road alignments will be maintained. Upgrading projects are carried out on existing alignments but can include works by expanding the tread of motor vehicles.</p> <p>For such projects may occur temporary land use changes (associated with the work front, site organization, storage of construction materials, borrow pits, temporary access roads, etc.) and final land use changes may also occur as a result of construction of some new lanes, widening existing bands (their expansion could result, in certain situations, depending on the field specific, to the need of demolition or clearing work).</p> <p>During the execution period environmental effects are temporary, local and discontinuous.</p> <p>Soil pollution and soil quality changes, pollution of surface and groundwater which will change the physical, chemical and biological characteristics could be determined for these types of projects: uncontrolled spills / pollutants on the ground or in water, deposits on soil of some particulates matters potentially contaminated with other air pollutants resulting from excavation, transportation of materials and personnel, asphalt plants, concrete plants, the activities of loading and unloading of the raw materials, the improper disposal of waste, the improper disposal of wastewater, soil subsidence, the increase of surface water resources turbidity by rainwater leach of the uncovered areas and training of particulates matters in rivers, lakes etc.</p> <p>The works for bridges / culverts can cause a temporary disruption of morphological elements and / or of the water flow characteristics.</p> <p>The air quality can be affected by the emissions of air pollutants (such as nitrogen oxides, sulfur oxides, carbon oxides, volatile organic compounds, heavy metals) generated by the transport activities and machinery used for construction activities. To this can be added the dust from excavation, the asphalt concrete plants and activities of loading and unloading of construction materials.</p> <p>The construction works and traffic of vehicles will cause an increase in noise and vibration. This increase may occur locally in the work fronts and on their surroundings.</p> <p>In the working areas located close to protected natural areas of forest areas, the fauna can be disturbed by the activities generating noise, vibration, emissions of pollutants. Being works that are executed on the existing alignments, the risk of habitat fragmentation are reduced.</p> <p>Flora may be directly affected if the rehabilitation works are accompanied by deforestation and indirectly through air emissions generated by transport and machinery used for construction, spills of pollutants in water and soil discharges exhaust streams. This could be possible only in areas where are needed works for widening the roads.</p> <p>It is possible that in the project area to be present protected areas or protected areas proposed later after the roads construction. The modernization works does not generate the effects of a new road construction, this type of works will lead to an increase in temporary and short-term stress factors on vegetation and fauna of the area and locally manifested in the working front. The separation effects of the pre-existing natural habitats and the differences induced by such works have no significant effects.</p> <p>The noise, vibration and air pollution associated with construction works may cause discomfort and disrupt the population living in the vicinity of the sites, if we will consider the existing motorways that crosses on large distances the localities.</p> <p>This type of projects will cause significant changes on the physical and aesthetic landscape. The works will be carried out on existing roads.</p>

	<p>Upgrading projects will have direct effects on the consumption of natural resources on water resources, mineral aggregates, fuel, others.</p> <p>During operation period it is estimated that the modernization works will have positive effects on the environment and human health. The improvement of the technical conditions of roads and traffic will reduce stationary traffic, eliminating congestion, reduce journey time, increase the average speed of transport, and reduce fuel consumption. This is expected to improve air quality and reduce air and noise pollution in residential areas where traffic was reduced or improved traffic conditions.</p>
<b>Railway sector</b>	
<p><b>Rehabilitation of railway infrastructure</b></p> <p>Development Scenario "Do Something" (ES / EES) and scenario "Core TEN-T" (CTT) and include 16 projects</p>	<p>The main types of works that can be done for such projects include:</p> <ul style="list-style-type: none"> <li>• Works for spatial organization of the site;</li> <li>• Works building embankments;</li> <li>• Works for geotechnical investigations;</li> <li>• Bridges rehabilitation works;</li> <li>• Demolition;</li> <li>• Electrification Works:</li> <li>• Works for upgrading railway stations;</li> <li>• Works for the collection and drainage;</li> <li>• Works for traffic safety, signage, lighting;</li> <li>• Works for environmental protection.</li> </ul> <p>This type of projects will not produce significant changes in environmental characteristics. The work will be done on existing sites. It proposes to rehabilitate approximately 4536 km of railways. The rehabilitation works will be carried out in stages, on different time periods.</p> <p>Will cause temporary changes in land use (associated with the work front, site organization, storage of construction materials, temporary access roads, etc.).</p> <p>During the execution period, the environmental effects will be felt locally and will have a temporary character. The air quality can be affected by emissions of air pollutants (nitrogen oxides, sulfur oxides, carbon oxides, volatile organic compounds, heavy metals, various other hazardous air pollutants) generated by means of transport and equipment used in construction. Add to this the dust from excavation, demolition, loading unloading activities building materials.</p> <p>Construction works, traffic of vehicles will cause an increase in noise and vibration. They manifest themselves locally in working points and in their vicinity and have direct effects on the consumption of natural resources and materials: on water resources, mineral aggregates, wood, energy including electricity and fuels other. Natural resources needed to implement each project will be detailed in the EIA procedures / AA, as the impact being different from project to project and from one mode to another.</p> <p>The new rolling stock (locomotives and wagons) will provide a significant improvement in quality of service in terms of ride comfort of passengers who use the trains as mean of transport. In addition, there is the likelihood of improvements in reliability, which will reduce delays. Moreover, we can talk about reducing travel times from station to station in terms of improving the operations of acceleration / braking, and if already rehabilitated, will be possible for the trains to go at a rate even higher (100-160 km / h).</p> <p>Some of the projects for the rehabilitation of the railway can cross protected natural areas included in the Natura 2000 network (see Figure 5.3 and 5.4, Annex 5 BC). It should be noted that the proposed projects for the railway sector will be carried out on existing alignments, thus effects on the physical characteristics of protected areas will be insignificant. Appropriate assessment carried out for GTMP aimed to identify sensitive protected natural areas likely to be affected by the implementation of transport projects proposed by GTMP, the conclusions of this study are presented in Chapter 8.5 of this Environment Report.</p> <p>Also, replacement of rolling stock and rehabilitation of railway lines will increase transport safety and reduce noise level in motion.</p>
<b>Aviation sector</b>	
<b>Modernization /</b>	They will not produce significant changes in the characteristics of the environment.

<p><b>extension / new terminal construction / rehabilitation and modernization of taxiways, runways parking</b></p> <p>"Do Something"</p> <p>Development Scenario (ES / EES) and "Core TEN-T" (CTT) Scenario include 14 projects</p>	<p>This type of projects will cause temporary change of land use (associated with the work front, site organization, storage of construction materials, etc.) and permanent changes in land use by building new objectives. The work will be done on existing sites, the airports of Craiova, Sibiu, Bucharest (Otopeni), Iasi, Oradea, Timisoara, Constanta, Bacau, Baia Mare, Constanta, Cluj, Targu Mures.</p> <p>During the execution period, the environmental effects will be felt locally and will be temporary. The effects are specific to the construction activities (air emissions, noise and vibration from equipment and vehicles used for construction, generation of waste, wastewater and technological saver).</p> <p>Natura 2000 sites will not be intersected.</p> <p>These projects will have a direct effect on the consumption of natural resources. Natural resources needed to implement each project will be detailed in the EIA procedures / AA, being different from project to project and from one mode to another.</p>
<p><b>Ports and waterways</b></p>	
<p><b>Improved navigation on the fairway (dredging, protection and consolidation sides, bottom sills, dikes routing)</b></p> <p>"Do Something"</p> <p>Development Scenario (ES / EES) and "Core TEN-T" (CTT) scenario include: 1 project for bank protection of Sulina Canal, 1 project to improve navigation conditions on the Romanian-Bulgarian joint.</p>	<p>This type of projects will cause temporary change of land use (associated with the work front, site organization, storage of construction materials, etc.). The works needed to improve navigation will be made mostly of water (Danube) over a length of about 595 km; there will be only land points of temporary work, for arranging banks.</p> <p>Such works will cause changes to the physical characteristics of the landscape. Natural shores covered with vegetation will be replaced by local protection works and strengthen banks.</p> <p>Also, there will be changes in the quantity of water leaking into the widening section of channels (changing bed morphology), the execution of various works to prevent clogging, changing currents flow etc.</p> <p>Danube is crossing, from entering the country until it flows into the Black Sea, regions with varied biodiversity, areas that have been designated as protected areas (see Figure 5.3 and 5.4, Annex 5 BC). This type of work can have an effect on local biodiversity. Fauna may be affected by the noise of machinery and equipment used for the execution of local damage to areas in which it unfolds. The effects will be local and temporary. Appropriate assessment carried out for GTMP aimed to identify sensitive protected areas likely to be affected by the implementation of transport projects proposed by GTMP, the conclusions of this study are presented in section 8.5 of this Environmental Report.</p> <p>Surface water quality will be affected local and temporary (turbidity change, alluvial erosion) and will be within the maximum permissible variation of parameters. Groundwater quality will not be affected, may be changes in the level or flow regime due to changes in their water regime of the Danube.</p> <p>During the execution of the proposed work can be caused discomfort to population in certain areas, in the vicinity of the working points, by increasing traffic during execution, increased noise and air emissions associated with transport levels.</p> <p>The projects will have a direct effect on the consumption of natural resources. The natural resources needed to implement each project will be detailed in the EIA procedures / AA, as being different from project to project and from one mode to another</p>
<p><b>Port infrastructure on the Danube river, (existing port infrastructure development)</b></p> <p>"Do Something"</p> <p>Development Scenario (ES / EES) and "Core TEN-T" (CTT) scenario include 11 projects</p>	<p>They will not produce significant changes in environmental characteristics. The work will be done on existing sites. Works are proposed to develop the following ports: Galati, Giurgiu, Drobeta-Turnu Severin, Cernavoda, Oltenia, Orșova, ship, Constanta, Moldova Veche.</p> <p>Development of port infrastructure can have direct impact on protected natural areas (see Figure 5.3, 5.4 and Annex 5 BC) and populated areas in the immediate vicinity of ports through air emissions, noise and vibration caused by equipment, machinery and vehicles during the construction phase.</p> <p>Also, there will be changes in the quantity of water leaking into the widening section of channels (changing bed morphology), the execution of various works to prevent clogging, changing currents flow etc.</p> <p>The projects will have a direct effect on the consumption of natural resources.</p>



	<p>Natural resources needed to implement each project will be detailed in the EIA procedures / AA, as different from project to project and from one mode to another. Development of port infrastructure can lead to intensification of traffic on water. This implies an increase in emissions in the atmosphere, and also an increase in noise in the ports.</p>
<p><b>Construction of new waterways</b></p> <p>(ES / EES) Development Scenario and scenario "Core TEN-T" (CTT) include 1 project</p>	<p>The focus is on Dâmbovița River and the Arges River (Arges, Calarasi and Giurgiu). The new waterway will have a length of about 104 km; the proposed implementation period is after year 2030.</p> <p>The project will be implemented in the protected natural areas included in the Natura 2000 network: Danube, ROSPA0038 Oltenița, ROSCI0043 Comana, and ROSPA0022 Comana.</p> <p>The works will produce changes to the physical characteristics of the landscape. Such works include the construction and operational actions that can lead to physical changes in protected natural areas of Community interest (topography, land use, changes in the courses of rivers, etc.) above.</p> <p>The works of waterways will directly influence the protected natural areas and populated areas in the immediate vicinity through air emissions, noise and vibration caused by equipment, machinery and vehicles during the construction phase. Maintenance of the banks may include vegetation clearing works that may affect biodiversity in protected natural areas.</p> <p>The execution of these works will be protected against floods villages, individual households and socio-economic objectives under the influence area of watercourses proposed arrangement.</p>
<b>Intermodal Transport</b>	
<p><b>Construction and development of intermodal terminals</b></p> <p>Development Scenario "Do Something" (ES / EES) and scenario "Core TEN-T" (CTT) include 12 projects</p>	<p>To achieve these types of projects will need the following types of work:</p> <ul style="list-style-type: none"> <li>• Works for spatial organization of the site;</li> <li>• Earthworks •;</li> <li>• Railway construction works;</li> <li>• Works building roads and pavements;</li> <li>• Works construction / demolition buildings;</li> <li>• Works for the collection and drainage;</li> <li>• Works for traffic safety, signage, lighting;</li> <li>• Work to ensure utilities;</li> </ul> <p>This type of projects will cause temporary change of land use (associated with the work front, site organization, storage of construction materials, etc.) and permanent change of land use by building new objectives. It will house about 9230 m Railway and approximately 286,875 sqm roads and pavements.</p> <p>Investments will be made in: Timisoara, Galati, Suceava, Oradea, Cluj Napoca, Bucharest, Iasi, Craiova, Bacau, Drobeta Turnu Severin, Turda.</p> <p>Construction will have direct influence on the immediate vicinity of residential areas by air emissions, noise and vibration caused by equipment, machinery and vehicles during the construction phase and the consumption of natural resources.</p> <p>These projects do not intersect the boundaries of protected natural areas.</p>

The figures 5.3, 5.4 shows the location of the proposed projects by the GTMP and development scenarios (ES / EES and CTT) compared with the limits of protected natural areas. As presented in the table above, transport infrastructure projects, bet on the type of work proposed, can generate a number of negative effects on the environment, both during execution and operation period. By establishing and implementing a system of prevention, reduction and control of these effects is reduced the magnitude of manifestation (v. Chapter 10).

The figures 5.5, 5.6 shows the location of the proposed projects within the GTMP for the development scenarios (ES / EES and CTT) compared with land use category. The following tables are given the land areas to be occupied by permanent and temporary projects included in the four scenarios, depending on the code on the land use category, according to Corine Land Cover 2006.



**Table 5.5 The land areas permanently or temporarily occupied, by code and category of land use, Do Minimum scenario**

Code and category of land use	Permanently Occupied Area (ha)	Temporarily Occupied Area (ha)
112 - Localities – Constructed areas	654.26	775.10
121 - Industrial or commercial areas	275.29	238.80
122 - Roads, railways and other areas	197.13	139.30
123 - Seaports	1.10	1.68
131 - Mineral exploitations	3.46	5.84
132 - Waste deposit areas	13.35	16.47
141 - Green areas	1.82	2.78
142 - Sports and Leisure Facilities	4.48	5.90
211 – Not Irrigated arable areas	2359.74	2069.44
221 - Vine areas	87.60	96.46
222 - Orchards	35.27	31.35
231 - Pastures	348.14	327.75
242 - Complex culture patterns	137.38	146.83
243 - Areas largely occupied by agriculture with significant areas of natural vegetation	226.87	197.28
311 - Hardwood Forest	242.82	318.46
312 - Coniferous Forest	12.60	21.40
313 - Mixed Forest	36.03	45.02
321 - Natural Grassland	0.90	5.03
324 - Transition areas between forest and shrubs	45.62	39.25
331 - Beaches	1.81	2.03
411 - Swamps	80.67	93.34
511 - Rivers	189.96	3607.58
512 - Lakes	22.58	18.04
523 – Sea, Oceans	0.62	0.69
<b>Total</b>	<b>4979.51</b>	<b>8205.82</b>

Source: GTMP Appropriate Assessment Study, developed by EPC Environment, version September 2014

**Table 5.6 The land areas permanently or temporarily occupied, by code and category of land use, for ES and EES scenarios**

Code and category of land use	Permanently Occupied Area (ha)	Temporarily Occupied Area (ha)
112 Localities – Constructed areas	1477.77	3915.58
121 - Industrial or commercial areas	373.41	1125.39
122 - Roads, railways and other areas	21.46	236.84
123 - Seaports	15.44	1263.00
124 - Airports	12.78	7.84
131 - Mineral exploitations	10.86	34.93
132 - Waste deposit areas	10.27	20.02
133 – Construction areas	9.02	9.11
141 - Green areas	3.61	62.51
142 - Sports and Leisure Facilities	13.86	35.74

211 - Not Irrigated arable areas	7312.18	11661.96
213 - Rice fields	22.81	6.56
221 - Vine areas	378.72	380.08
222 - Orchards	382.79	403.93
231 - Pastures	1582.20	2162.85
242 - Complex culture patterns	556.32	1174.90
243 - Areas largely occupied by agriculture with significant areas of natural vegetation	693.47	1258.76
311 - Hardwood Forest	2130.39	2249.45
312 - Coniferous Forest	215.56	250.94
313 - Mixed Forest	403.55	373.18
321 - Natural Grassland	51.67	36.16
324 - Transition areas between forest and shrubs	192.74	324.67
331 - Beaches	16.41	15.16
333 - Areas with poor vegetation cover	-	0.01
411 - Swamps	141.68	281.60
511 - Rivers	277.72	5240.98
512 - Lakes	202.53	142.02
523 - Sea, Oceans	0.14	48.23
<b>Total</b>	<b>16509.38</b>	<b>32722.39</b>

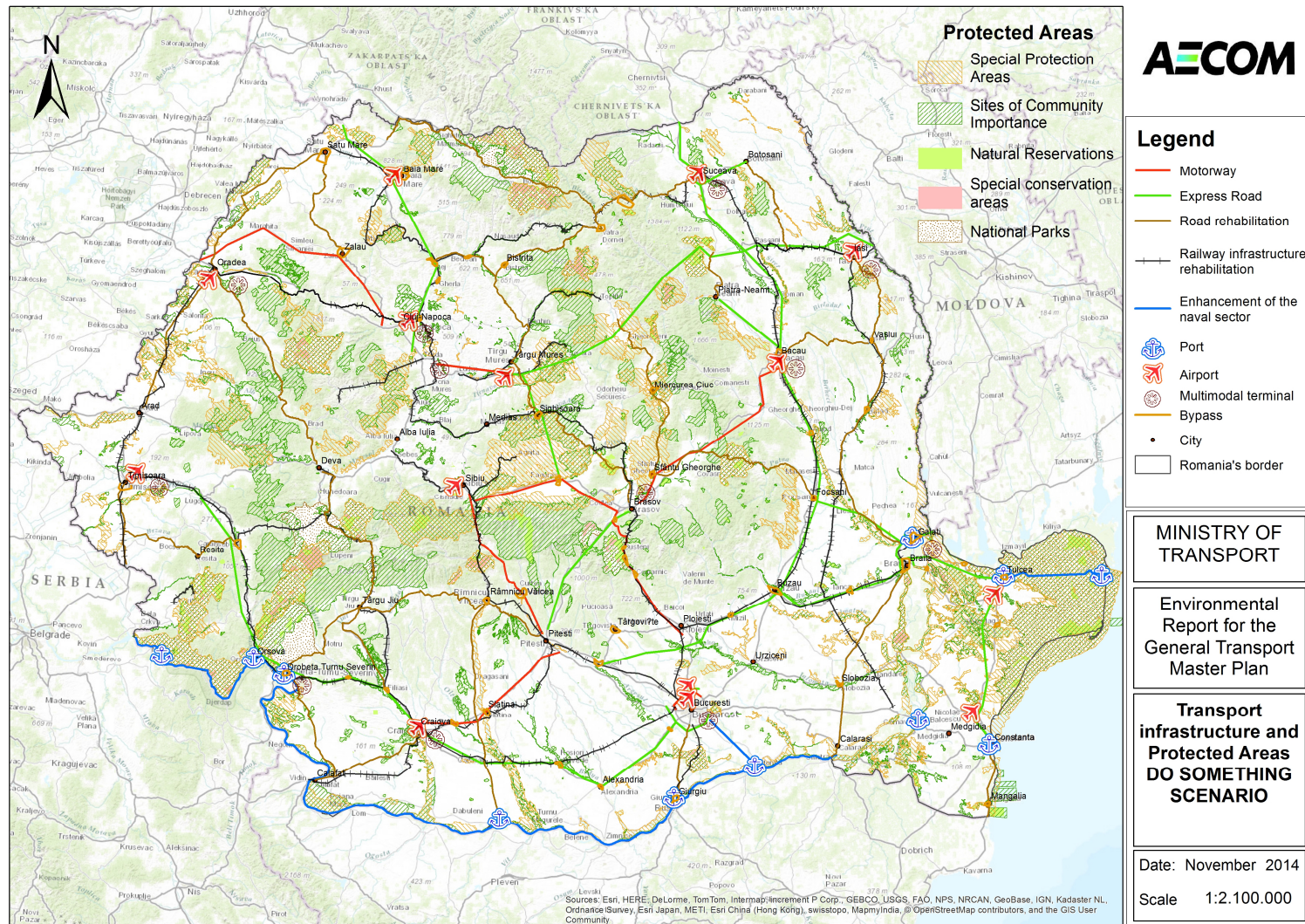
Source: GTMP Appropriate Assessment Study, developed by EPC Environment, version October 2014

**Table 5.7 The land areas permanently or temporarily occupied, by code and category of land use, CTT scenario**

Code and category of land use	Permanently Occupied Area (ha)	Temporarily Occupied Area (ha)
112 - Localities – Constructed areas	821.85	2361.03
121 - Industrial or commercial areas	230.14	944.64
122 - Roads, railways and other areas	12.24	209.32
123 - Seaports	15.19	1262.14
131 - Mineral exploitations	-	23.84
132 - Waste deposit areas	7.38	11.28
133 - Construction area	9.92	8.15
141 - Green area	1.55	55.62
142 - Sports and Leisure Facilities	1.75	19.03
211 - Not Irrigated arable areas	4428.67	8871.32
213 - Rice fields	22.81	6.56
221 - Vine areas	196.54	229.26
222 - Orchards	254.65	290.58
231 - Pastures	733.97	1478.25
242 - Complex culture patterns	229.61	803.65
243 - Areas largely occupied by agriculture with significant areas of natural vegetation	323.74	919.01
311 - Hardwood Forest	993.24	1384.85
312 - Coniferous Forest	128.84	165.22

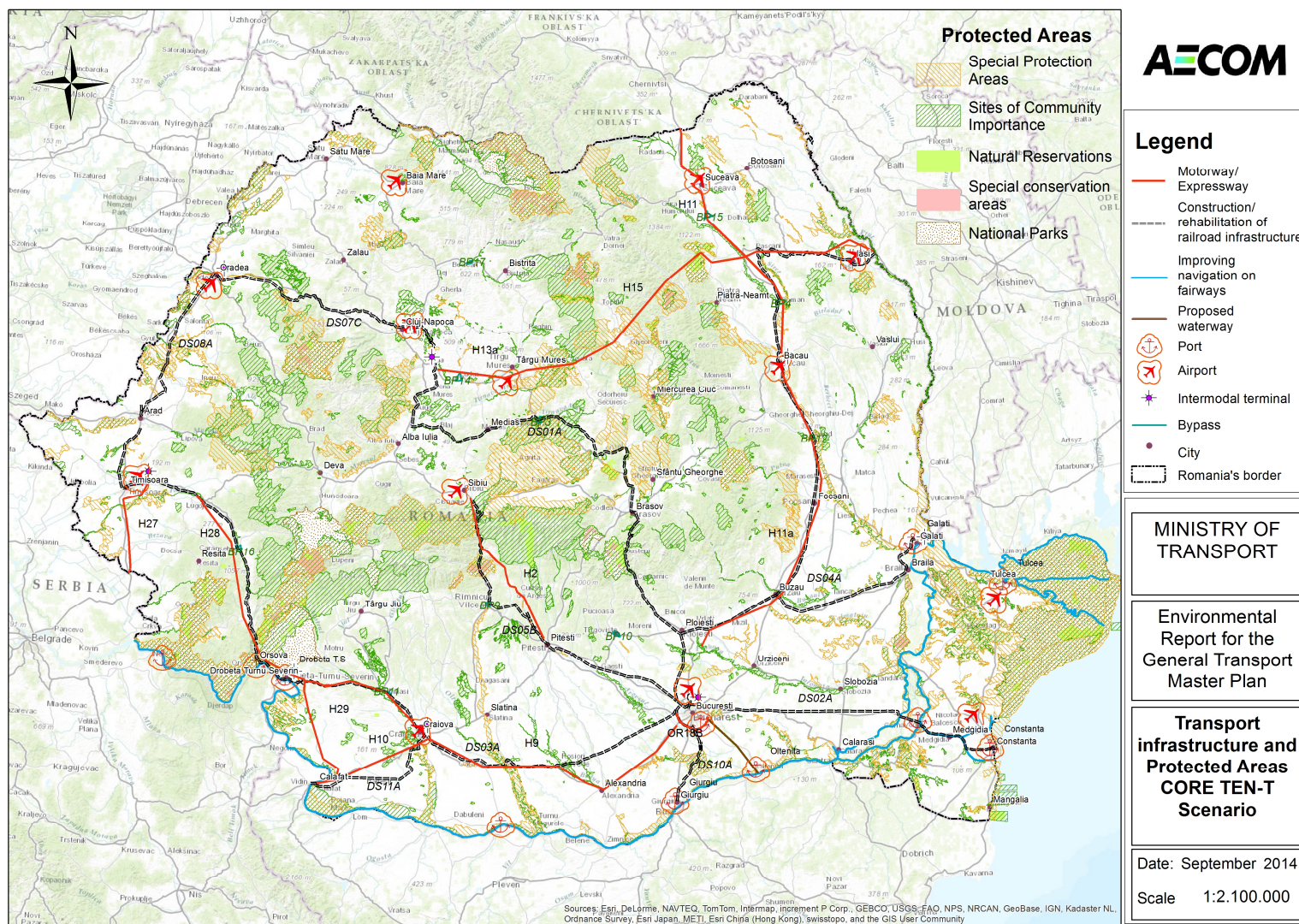
313 - Mixed Forest	216.50	235.62
321 - Natural Grassland	20.50	12.52
324 - Transition areas between forest and shrubs	112.18	237.56
331 - Beaches	13.35	10.99
333 - Areas with poor vegetation cover	-	0.01
411 - Swamps	73.27	225.04
511 - Rivers	189.39	5151.89
512 - Lakes	97.53	77.68
523 - Sea, Oceans	0.14	48.23
<b>Total</b>	<b>9134.94</b>	<b>25043.29</b>

Source: GTMP Appropriate Assessment Study, developed by EPC Environment, version October 2014



**Figure 5.3 Spatial location of the major infrastructure projects included in the development scenario (ES / EES) compared with the location of the natural protected areas**





**Figure 5.4 Spatial location of major infrastructure projects included in the scenario "Core TEN-T" compared with the natural protected areas location**



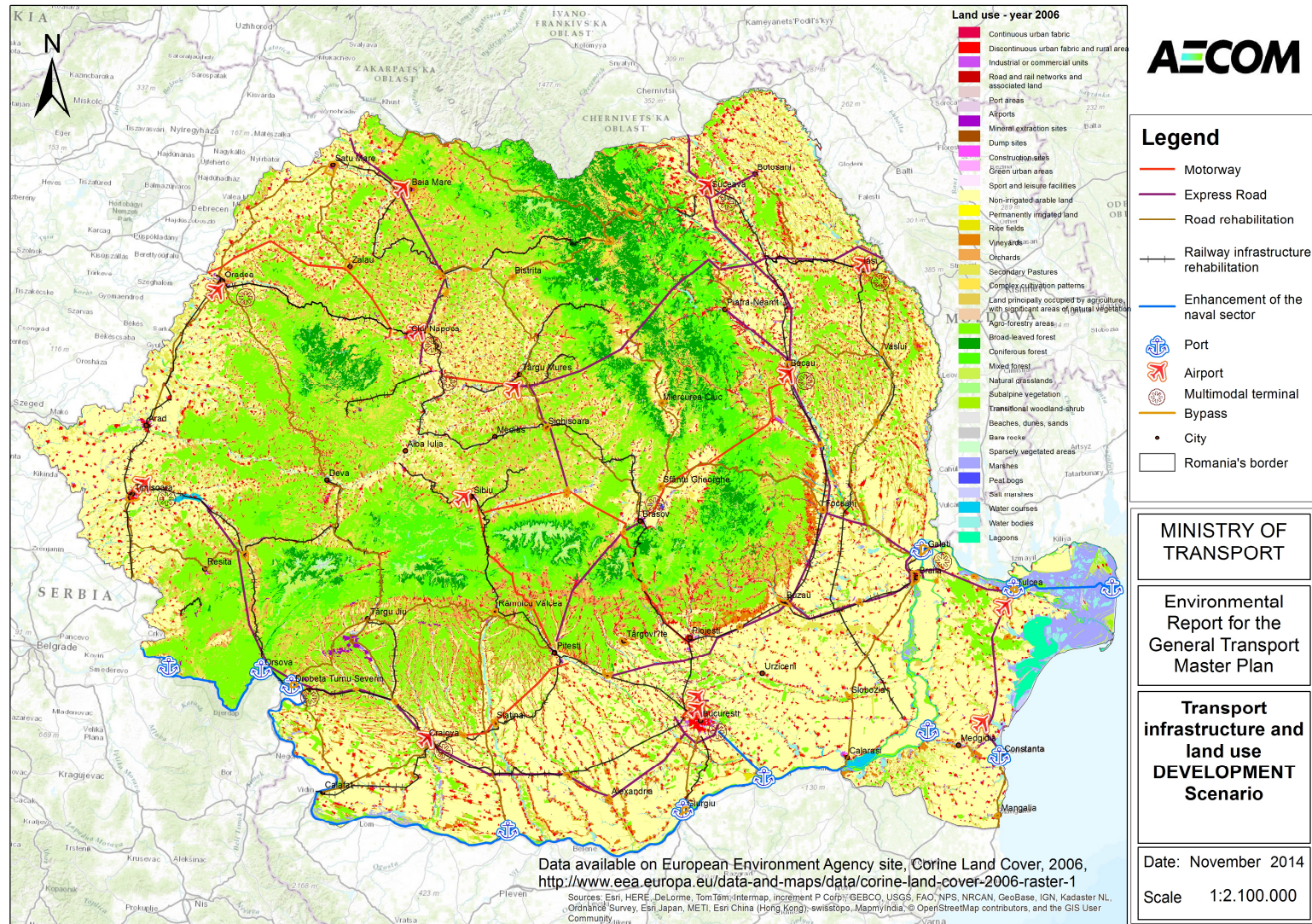


Figure 5.5 Location of transport infrastructure projects included in the development scenario (ES / EES) and the categories of land use



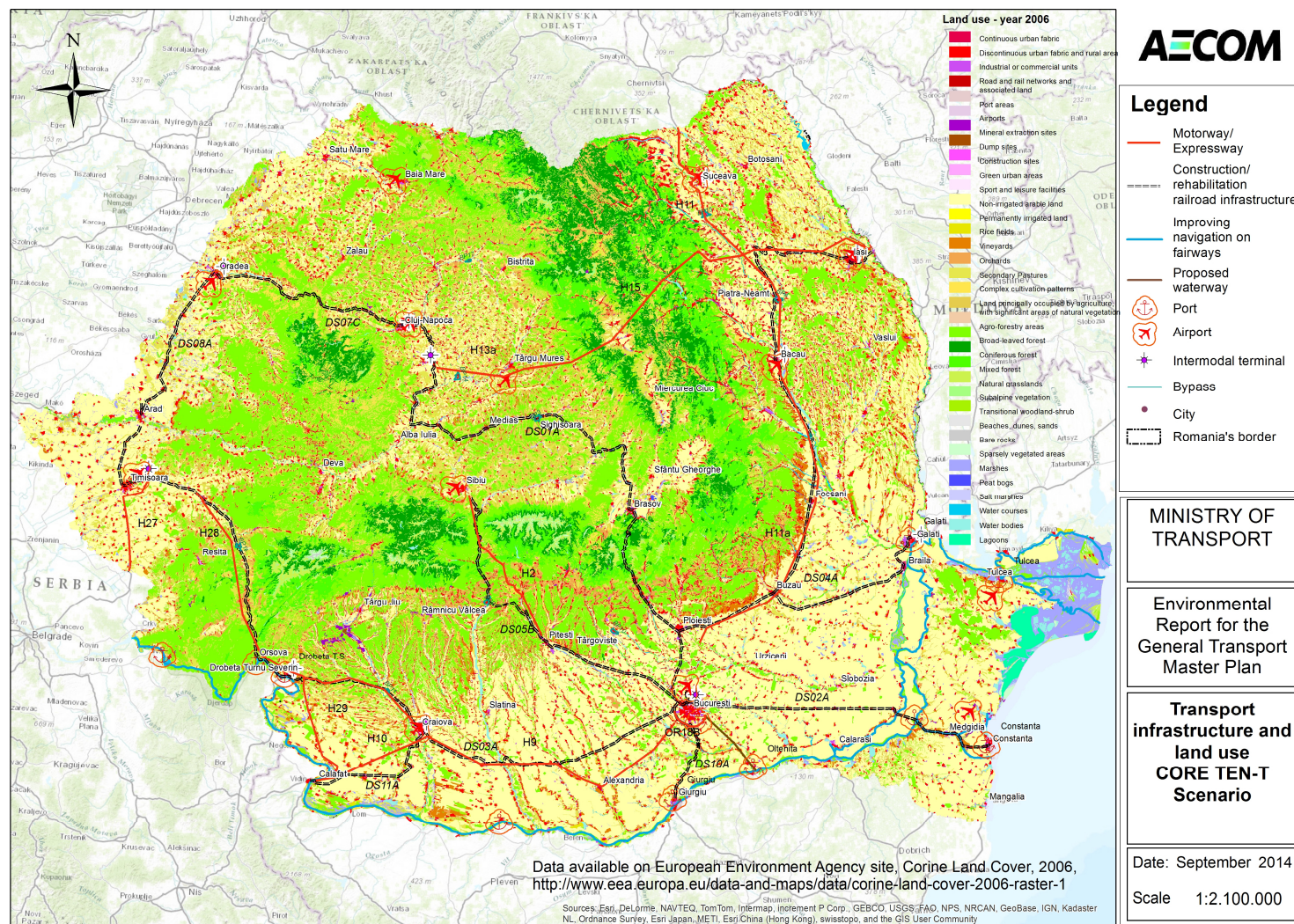


Figure 5.6 Location of transport infrastructure projects included in the development scenario „Core TEN-T” (CTT) and the categories of land use

The number of projects crossing Natura 2000 sites for each transport sector and for each development scenario (ES / EES and CCT) is presented in the following tables. Most projects that cross / approaches Natura 2000 sites are projects related to the road sector. It is also worth mentioning that for air sector, both the „Do Minimum” Scenario and the development scenarios (ES / EES and CCT), are not proposing that crosses/intersect Natura 2000 sites.

**Table 5.5. Number of projects which intersects the site Natura 2000 for development scenarios ES/EES and CCT**

Scenario	No of projects crossing Natura 2000 sites					Total number
	Naval	Rail	Road	Air	Intermodal	
	(SCI's)					
ES/EES	6	15	43	0	0	64
CTT	6	15	10	0	0	30
	(SPA's)					
ES/EES	5	14	35	0	0	54
CTT	5	14	9	0	0	28

Source: Appropriate assessment study for the GTMP, September 2014, AECOM – EPC Consultancy

List of projects that intersect special protected areas- (SPA's) and sites of community importance - (SCI's) are presented in Appendix 5B-C.

In prioritizing the projects selected for the two scenarios (EES and CCT), as presented in Chapter 2 of the environmental report were considered, in the cost-benefit analysis of environmental, following criteria:

- Noise pollution - costs relating to the discomfort caused by noise and health costs due to exposure to high noise levels. Values were differentiated by the type of means of transport (car, motorcycle, bus, vans, passenger train, freight train) and location (urban, suburban, rural) and time of day (day, night) .

The projects proposed by GTMP will lead to the reduction of noise nuisances from road transport especially in the urban environment by diverting heavy traffic outside localities.

- Local air pollution (emissions of pollutants such as particulate matter, NOx, SO2 and COVs) - Human health costs, property damage, loss of crops and damage the ecosystem (representing cost vehicle \* km \* km train, plane \* km, ship \* km).

As regards the impact on air quality through projects proposed by development scenario ES / EES proposed by GTMP there is a reduction thereof for all transport modes (both in terms of passenger and freight) locally.

- Climate change - greenhouse gas emissions were estimated taken into consideration the vehicle miles traveled using emission factors (g / km) for each of greenhouse gases. The TREMOVE is a policy assessment model coordinated by the European Union for studying the effects of different transport and environment policies on the transport sector of all European countries. Changes in the volume of emissions are independent of where they appear. Calculation of monetary costs of changes in emissions was achieved in terms of changes in the number of tons equivalent of greenhouse gases as a result of project implementation. This is done by adding various gas emissions greenhouse gas emission equivalent total CO2 greenhouse using Global Warming Potential (GWP). (Recommended values are presented in Table 5.9). Rates of greenhouse emissions (kg CO2 per liter consumed) are shown in Table 5.10.

**Table 5.6 Global potential emission effect**

Greenhouse Gases	Tons of CO2 equivalent per ton of greenhouse gases emitted
CH <sub>4</sub>	23
N <sub>2</sub> O	296

The overall potential emissions (PGE), is expressed in CO2 equivalent CO2 with PGE by definition equal to 1, multiplying by 296 N2O and CH4 23.

Source: Handbook on estimation of external costs in the transport sector in 2008 as part of the impact assessment (internalization measures and policies applied to all external costs of transport).

**Table 5.7 Rates for the greenhouse emissions (kg CO2 per liter consumed)**

Year	Gasoline	Diesel
2010	2.2317	2.5339
2011	2.2128	2.5387
2012	2.2013	2.5255
2013	2.1898	2.5123
2014	2.1670	2.4981
2015	2.1441	2.4840
2016	2.1213	2.4699
2017	2.0985	2.4558
2018	2.0757	2.4416
2019	2.0528	2.4275
2020+	2.0300	2.4134

Source: WebTAG, Volume 3.3.5 (Table 1)

In Annex 4 are presented the detailed estimates greenhouse gases emissions (CO2, NOx, N2O, SO2, NMCOV, CH4) in tons / year obtained using TREMOVE program included projects proposed scenarios in GTMP, transport sectors road, sea, air, rail and by transport (freight and passenger). In Table 5.11 presents the estimation of greenhouse gases emission, synthesized for the period 2014-2030, taken into account by the GTMP.

**Table 5.8 The greenhouse gases emission for the period 2014- 2020, 2021-2030 for development scenarios (ES / EES, Core TEN-T) versus Do minimum and Do nothing scenarios**

% Changes		Period 2014- 2020	Period 2021- 2030
Vehicle mileage *	Ref vs. DN	3.2%	3.7%
	ES/EES vs. Ref	1.5%	3.6%
	CTT vs. Ref	0.4%	-0.7%
Total emissions of CO <sub>2</sub>	Ref vs. DN	1.7%	1.9%
	ES/EES vs. Ref	0.8%	1.1%
	CTT vs. Ref	1.1%	0.9%



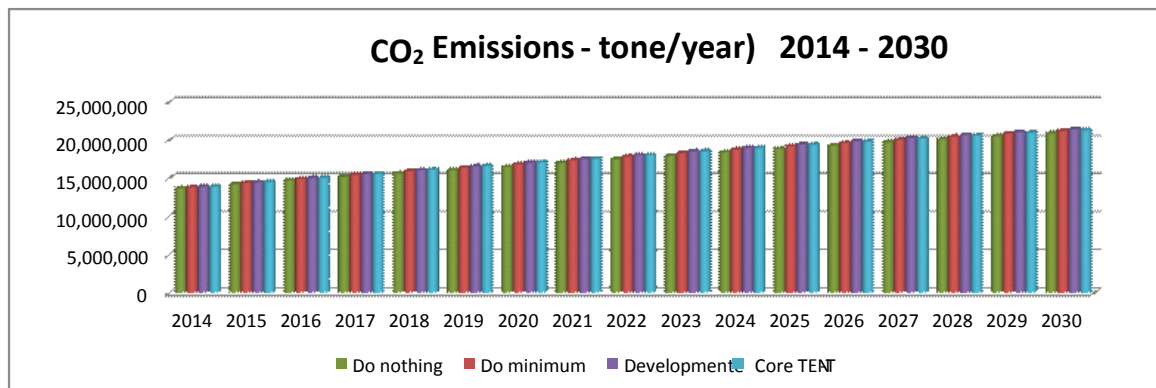
% Changes		Period 2014- 2020	Period 2021- 2030
Total emissions of CH <sub>4</sub>	Ref vs. DN	0.8%	0.8%
	ES/EES vs. Ref	-0.6%	-1.6%
	CTT vs. Ref	-0.4%	-1.4%
Total emissions of N <sub>2</sub> O	Ref vs. DN	0.4%	0.6%
	ES/EES vs. Ref	3.2%	6.5%
	CTT vs. Ref	3.5%	7.6%
Total emissions of NO <sub>x</sub>	Ref vs. DN	0.4%	0.4%
	ES/EES vs. Ref	-0.8%	-2.9%
	CTT vs. Ref	-0.7%	-2.7%
Total emissions of SO <sub>2</sub>	Ref vs. DN	2.0%	2.2%
	ES/EES vs. Ref	0.5%	1.1%
	CTT vs. Ref	0.9%	0.8%
Total emissions of COVNM	Ref vs. DN	1.0%	1.0%
	ES/EES vs. Ref	-0.2%	-0.9%
	CTT vs. Ref	0.5%	-0.4%

Source: National Transport Model, GTMP, AECOM

Legend \* Vehicle, refer to sector specific transport by road, rail, water and air

ES / EES - Scenario Development, Reference Scenario "Do Minimum", DN - "Do Nothing" Scenario

The figures 5.7 - 5.12. present the relative contribution of each scenario to the total of greenhouse gases emissions, analysis performed for the period 2014-2030. The estimates of the quantities of greenhouse gas emissions cover the period of operation for the proposed investments.



**Figure 5.7 Estimated CO<sub>2</sub> emissions for the period 2014-2030**

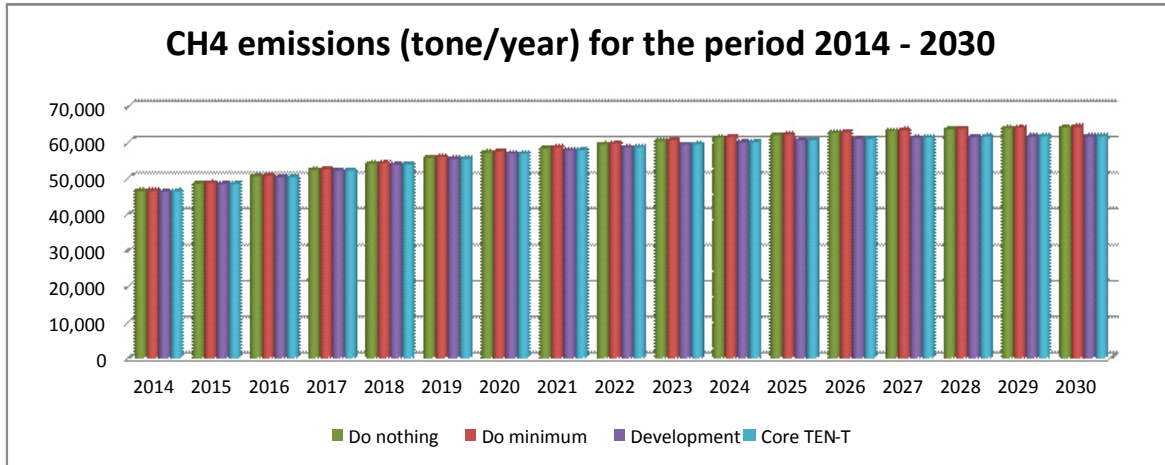


Figure 5.8 CH<sub>4</sub> emission estimates for the period 2014-2030

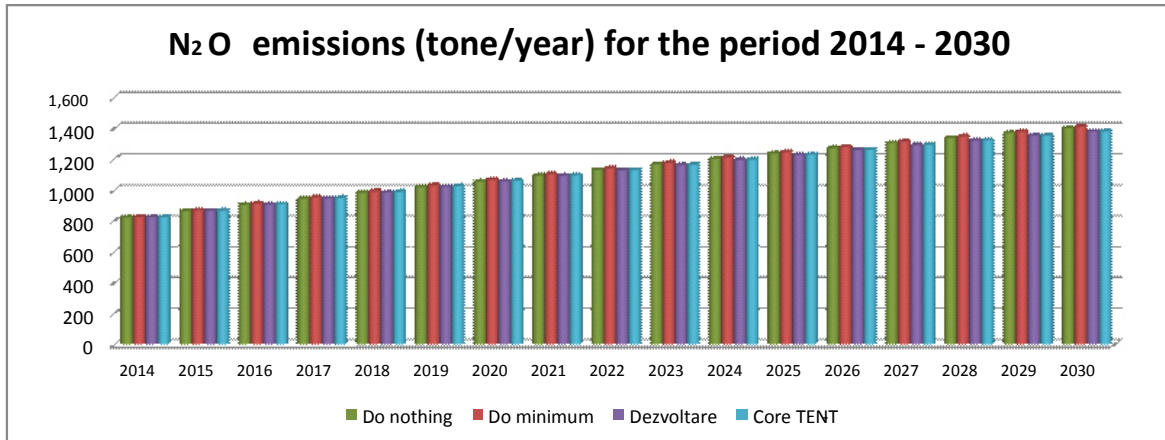


Figure 5.9 N<sub>2</sub>O emission estimates for the period 2014-2030

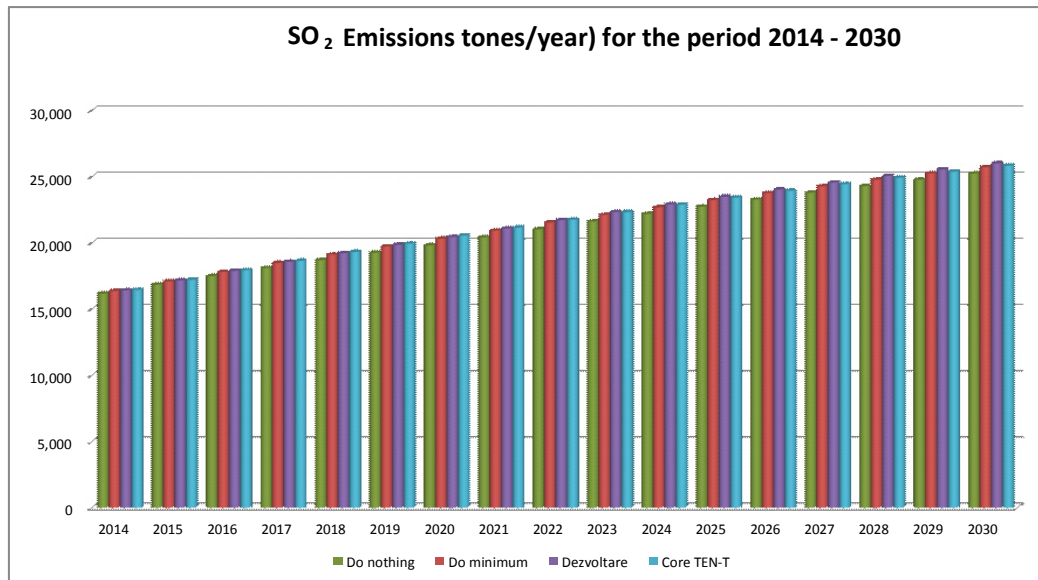


Figure 5.10 SO<sub>2</sub> emission estimates for the period 2014-2030

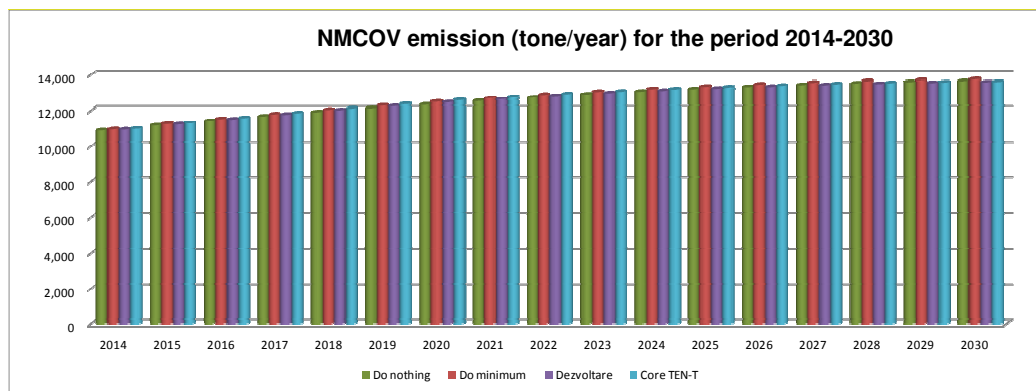
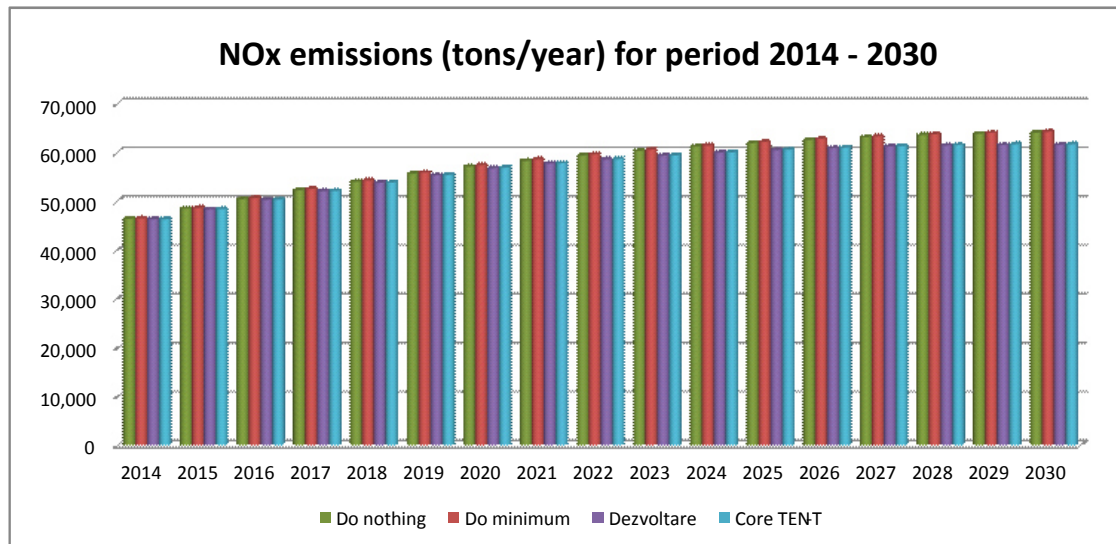


Figure 5.11 Emission estimates for the period 2014-2030 NMCOV





**Figure 5.12 NOx emissions estimates for the period 2014-2030**

Following the estimates developed for the greenhouse gases emissions, can be drawn the following conclusions:

- For all scenarios, the GTMP it is registered the current trends of increasing for the greenhouse gases emissions, this being caused by the increase of the number of kilometers traveled, the general increase in demand for transport and fleet growth increase trend.
- For all scenarios analyzed by the GTMP, the road sector will have the higher contribution to the total greenhouse gases emissions, followed by rail, air and water sector. The proposed investments within the (ES / EES) "Development Scenario" will help develop the roads network with about 3310 km and the "Core TEN-T" Scenarios will help develop the road network with approximately 1589 km, both situations causing an increase in traffic volume comparing to the current situation, an increase in the number of kilometers traveled, a greater amount of fuel consumed and thus a larger amount of greenhouse gases emissions results.
- The implementation of the (ES / EES) "Development Scenario" and "Core TEN-T" Scenario, contributes to the decrease of the emissions of NOx, N2O, NMVOC compared to scenarios "Do Minimum" and "Do nothing". The implementation of "Development Scenario" (ES / EES) and "Core TEN-T" Scenario are expected to generate an increase of the emissions of SO2, CO2, CH4 compared to the situation of the implementation of "Do Minimum" and "Do nothing" Scenarios. A possible explanation for these results could be that the proposed investments will entail changes in GTMP about the direction freight transport demand from road to rail or water transport and passenger transport demand from road to rail. The emission estimates were used as input to a number of mileage or other infrastructure for the type of vehicle used (if such vehicle, heavy vehicle, aircraft, ship, train, etc.), type of fuel (diesel, gasoline, kerosene) emission rate (g / km) and emission factors. Thus any change in the demand for transport to a sector or other, causes changes related to the estimated quantity of greenhouse gas emissions for each transport sector. Changing the orientation of transport demand, traffic volumes are influenced on the other side of the order being implemented and bet on data mining investment scenario proposed by each sector and bet on hand.
- Among all analyzed scenarios, the "Core TEN-T" Scenario will have the greatest contribution to greenhouse gases emissions, followed by "Development Scenario ". A

possible explanation for these results could be that the proposed investments by the "Core TEN-T" scenario, although propose an extension of the road transport network with about 1300 km, the order of implementation of the projects changing the orientation for the demand of the transport sectors. In case of this Scenario, the demands for the road sector being still high.

- The Natura 2000 network - the costs of transport projects effects on Natura 2000. Locating projects included the development scenarios (ES / EES and CTT) compared to bet on sites included within the Natura 2000 network, are shown in Figures 5.1 and 5.2. List of projects intersecting sites included in Natura 2000 are presented in Annexes 5B-C.

### **Conclusions - Development Scenarios ("Do Something" - ES / EES and "Core TEN-T" - CTT)**

After analyzing the influence of proposed investments for each development scenarios (ES / EES and CTT) on the environmental changes, can be drawn the following conclusions:

- The proposed project implementation from the scenarios developed for the GTMP, the physical changes that occur are due to construction (building highways, expressways, bypasses, railways, modernization / rehabilitation railways, airports modernization, modernization / development ports, navigation channels achievement etc.)
- The specific nature of the construction of the proposed investment by the two development scenarios (ES / EES and CTT), will cause permanent changes in the occupied land areas and land use category. For the *ES / EES Scenario* are proposed around 3310 km of new roads, rehabilitation of 3225 km of existing roads and upgrading / rehabilitation of about 4536 km railway. The CTT Scenario re proposes around 1589 km of new roads and rehabilitation of about 4536 km railway.
- For all projects, regardless of the transport sector, the environmental effects are insignificant during execution period and manifested locally and temporary in the front line work.
- The routes proposed for some of the projects included development scenarios bet on ES / EES and CTT intersecting Natura 2000 (v. Figure 5.3 and 5.4).
- List of projects that intersect bird protection areas and sites of community importance are presented in Appendix 5B-C.
- The impact of the proposed project implementation on the Natura 2000 network were analyzed in the GTMP Appropriate assessment, the conclusions of this study being presented in Chapter 8.5 of this Environmental Report.
- By implementing the proposed projects through the development scenarios (ES / EES and CTT) are estimated changes in air quality and noise levels at the local level. It is expected to reduce pollutant emissions into the atmosphere and noise level in the towns crossed by national roads by taking over existing heavy traffic by proposed new roads.
- For all the GTMP development scenarios (ES / EES and CTT), the current trends is of increasing the total greenhouse gases emissions. For all scenarios analyzed in the GTMP, the road sector will have the highest contribution to the total greenhouse gases emissions, followed by rail, air and water. The largest contribution to total greenhouse gases emissions will have the implementation of CTT scenario.

## 6. Identified environmental problems for the GTMP

Based on the analysis of the current state of the environment (presented in Chapter 4 of the Environmental Report) and the current situation of transport infrastructure (presented in Chapter 2.1 of the Environmental Report) have been identified the relevant environmental issues for the transport sector and for the General Transport Master Plan:

**Table 6.1 Relevant environmental problems for the GTMP**

Environmental aspect	Relevant environmental problems	Associated aspects
<b>Air</b>	Local overruns of the admissible limit values for certain pollutants emitted into the atmosphere (NO <sub>x</sub> , SO <sub>x</sub> , PM <sub>10</sub> , NMCOV, heavy metals)	<p>Transport sector's contribution to the total amount of pollutants is high even if in 2012 there were decreases in the total amount of pollutants emitted into the atmosphere compared to 2005.</p> <p>Road traffic is an important local source of air pollution in urban areas.</p> <p>Among the modes of transport, road transport has the highest contribution to air pollution, especially in NO<sub>x</sub> emissions of heavy metals (Pb), NMCOV, particulate matter.</p> <p>The results of monitoring conducted for air quality monitoring stations show that in the urban areas road transport is a major source of air pollution.</p> <p>Means of transport obsolete (58% of all vehicles registered in Romania are older than 10 years), type of fuel used (about 94% of registered vehicles using fossil fuels, diesel and benzină1 type), increase traffic leading sometimes congestion, lack of adequate infrastructure leading to increasing the amount of pollutants emitted into the atmosphere.</p> <p>Lack of competitiveness between transport modes and the growing demand for road transport.</p> <p>Lack of settlements and bypasses the low number of motorway driving at an average speed low overhead, so it is recorded increased time travel and high levels of emissions into the atmosphere.</p>
<b>Climate change</b>	High contribution of the transport sector to total of greenhouse gases emissions (GHG).	<p>Among the modes of transport, road transport produces the most significant adverse effects on air quality.</p> <p>Road transport has the highest contribution to GHG emissions, followed by air, rail and sea.</p> <p>The reasons for road transport is the greatest contribution to the total emissions of greenhouse gases are increasing the demand for freight and passengers by road preponderant compared to other types of transport, increasing the average length of a journey, increasing numerical fleet, the current state of transport infrastructure, vehicles and state type of fuel used (see chapter - relevant aspects of the current state of the environment and its likely evolution of the situation is not implemented General Transport Master Plan, section - climate change, Table 4.6.2 estimates of emissions / removals by sequestering greenhouse gases for the period 2008-2011 for the transport sector).</p> <p>It is necessary to adopt measures aimed at reducing</p>

Environmental aspect	Relevant environmental problems	Associated aspects
		GHG emissions in the transport sector. As states and Romania's National Strategy on Climate Change 2013 - 2020, measures necessary for the transport sector to reduce GHG emissions are presented in Chapter 4 - Relevant aspects of the current state of the environment and its likely evolution of the situation of not implementing the Master Plan General Transportation, climate Change section.
	Low vulnerability of transport infrastructure in the events of the extreme weather events	The climate change can have a direct impact on transport infrastructure. For example, on the shipping sector can occur, fluctuations in the flow regime of rivers and streams, on road and rail transport sector by deteriorating infrastructure and lack of thermal comfort for the passengers.
<b>Energy efficiency</b>	Dependence on fossil fuels	<p>The Transport is almost entirely dependent on fossil fuels. Nationally, in 2000-2011, transport handle third place in the hierarchy of large energy consumers (toe), as domestic and industrial consumption. Status national transport network, maintaining inefficient transport infrastructure systems, fleet obsolete, railway rolling stock age (20 years old) did not increase energy efficiency in the transport sector. World Economic Forum, in their document "Global Competitiveness Report (2011-2012)", Romania ranked 137 of 142 countries surveyed in terms of quality road infrastructure. Just over half of the national road network road condition is considered to be "good".</p> <p>Around 37% of the railway network is electrified, compared to the EU27 average of 52% 6 speed transmission medium is below 100 km / h.</p> <p>Lack of competitiveness between transport modes leads to a high demand for road transport for both freight and passengers. Road transport is the sector with the highest energy consumption.</p> <p>Among the modes of transport, road transport is the branch with the highest consumption of energy (in 2011 accounting for nearly 86% consumption of total consumption for the transport sector).</p> <p>According to data provided by the Romanian Auto Registry, during 2008-2011, were recorded increases in the number of fleet (cars, light vehicles, heavy vehicles, buses, mopeds and motorcycles), the increase being significant in cars and light vehicles sectors.</p>
<b>Conservation / natural renewable resource</b>	The transport infrastructure is underdeveloped and lacks the necessary facilities to enable the use of alternative fuels or electricity.	<p>The use of alternative fuels, which are cleaner, faces a number of problems, in addition to the high cost of vehicles and the low level of consumer acceptance, adding also the low autonomy and lack of alternative fueled vehicles with electricity charging stations and refueling with alternative fuels.</p> <p>In Romania, the potential of renewable usable is low due to technological limitations, economic efficiency and environmental restrictions. Are still required technological developments and marketing investments towards alternative fuels and their use in</p>

Environmental aspect	Relevant environmental problems	Associated aspects
		<p>all modes of transport. What is important, is the need to adapt the transport infrastructure and vehicles to alternative fuels.</p> <p>At national level there is a relatively small number of vehicles equipped with conventional engines, internal combustion, using part or all alternative fuels. Over 94% of vehicles registered in the National Park Auto petrol and diesel used as fuel.</p> <p>Use of alternative fuels has made progress in terms of public transport. At the national level, have been developed a number of programs to modernize the fleet of autonomous administration of public transport, which allowed primarily promoting electric vehicles, and non-polluting alternative fuels - for example in cities like Bucharest, Craiova, Ploiesti , Suceava, Iasi.</p>
<b>Water (surface waters)</b>	Deterioration of water quality	<p>The transport sector can contribute to the pollution of surface water through rainwater that washes pollutants deposited on roads platform, if not properly collected and treated before their discharge to natural emissaries.</p> <p>Many roads have inadequate traffic capacity, leading to congestion and increased risk of accidents, thus the occurrence of accidental pollution.</p> <p>The problems in depth of the fairway can create difficulties for the transport safety, increasing the risk of accidents.</p> <p>The human error, various accidents during handling operations, loading and unloading the cargo may also lead to the occurrence of accidental pollution in the ports area.</p>
	The degradation of aquatic ecosystems	<p>The activities that may cause pollution of surface waters associated with transport sector are:</p> <ul style="list-style-type: none"> <li>➤ Hydraulic works (dredging, drainage, etc.) that can cause changes in hydrology and morphology;</li> <li>➤ Various accidents occurring in the freight transport sector (loss of pollutants);</li> <li>➤ Uncontrolled discharge of pollutants into water (rainwater contaminated with petroleum products, various substances used for snow removal)</li> <li>➤ Navigation and work to ensure optimal conditions for navigation;</li> <li>➤ Collecting rainwater contaminated improper oil on the roads.</li> </ul> <p><i>There is insufficient information on the contribution of each of these activities to the degradation of aquatic ecosystems.</i></p>
<b>Soil and underground</b>	Damage to soil characteristics and functions, i.e. changing their bio capacity.	<p>Transport has a high contribution to emissions of pollutants into the atmosphere, which in turn can contribute to soil pollution from roads surrounding areas.</p> <p>Intensification of soil erosion - Failure or lack of works to combat erosion and deposition of sediment during construction of transport infrastructure. The soil erosion can be increased by the deforestation works, sometimes these being inevitable for the development of transport infrastructure.</p>

Environmental aspect	Relevant environmental problems	Associated aspects
		<p>Changes in land use due to construction works. Currently, as mentioned in previous chapters, the roads and railways occupies about 1.63% of the total area of the country.</p> <p>The railway embankments and ground stations CFR depot area may be contaminated with petroleum products from accidental leaks generated by the stationary type locomotives with risk of seepage to aquifers (issue identified by entrepreneurs working on the railways routes rehabilitation).</p> <p>There is empirical evidence that the topography and the alignment identified by railway contractors, the topography and road alignment, but also very tight curves on major motorways create hazardous conditions for goods transport vehicles during the winter months and the risk of collision and increase the risk of accidental pollution.</p>
<b>Waste and hazardous substances management</b>	Inefficient waste management of the transport sector (including those resulting from construction and demolition)	<p>The main groups of waste which can be directly related to the activity of transport and transport infrastructure are: waste generated during construction / rehabilitation / modernization / maintenance period of transport infrastructure and related facilities; spent automotive batteries; waste oils; tires; motor vehicle scrapping; vessels used.</p> <p>Existing national records of the quantities of waste generated does not provide information by industry and transport modes.</p> <p>The construction, rehabilitation, modernization of the transport network is leading to the generation of high volumes of waste. The lack of specific legislative regulations of construction and demolition waste are creating difficulties for the properly management of waste.</p>
<b>Biodiversity</b>	Loss, destruction or fragmentation of habitats through land conversion for the development / modernization of transport infrastructure.	<p>The final use of the land area in the protected areas due to the development of transport infrastructure.</p> <p>The poor planning of transport corridors leading to fragmentation of natural habitats, affecting their conservation status and performance of deforestation in protected areas.</p> <p>The lack or failure to implement effective measures to prevent / reduce impacts of transport infrastructure projects contributing to the loss, destruction or fragmentation of habitats.</p>
	Reducing of the population density of species of flora or fauna	<p>The water pollution, soil and atmosphere associated transport activity and the lack or failure to protect biodiversity measures required for transport infrastructure projects that reduce population density of species of flora and fauna.</p> <p>The work of clearing required for the transport infrastructure development can also contribute to reducing the density of flora and fauna.</p>
<b>Population and human health</b>	Increasing environmental pollution in urban areas	Among the effects that transport sector can have on human health, the most important are related to traffic emissions: NOx, CO, CO2, VOCs, SO2, particulates



Environmental aspect	Relevant environmental problems	Associated aspects
		<p>on the surface which can be adsorbed heavy metals (Pb, Cr, Ni, Zn, Cd).</p> <p>Increase of pollution can affect the health of the population, can trigger / exacerbate a number of respiratory or cardiovascular diseases.</p> <p>Transport sector has a significant contribution to total emissions of pollutants into the atmosphere.</p> <p>Another stressor that can worsen some conditions (deafness, mental illness, cardio-vascular, endocrine) is noise generated by the transport activity. The state of transport infrastructure wear, missing or faulty implementation of measures to reduce noise action of various modes of transport make the number of people affected to be high. At the national level, pursuant to the provisions of Directive 2002/49 / EC of the European Parliament and Council, transposed into national legislation by GD 321/2005, on the assessment and management of environmental noise, is necessary to develop the strategic noise maps (for more information on the areas where were made so far these noise maps and the authorities responsible for their implementation are presented in <i>Chapter 4 - Relevant aspects of the current state of the environment and its likely evolution of the situation is not implemented General Transport Master Plan, section - Population and human health</i>).</p> <p>Transport activity can cause direct and indirect effects on the environmental components and water, soil and biodiversity.</p> <p>The pollution of surface water, groundwater and soil with various toxic substances due to traffic (continuous and accidental pollution) may affect the health of the population.</p>
	The lack of studies on the human health impacts of transport sector	So far, at national level, no studies have been done on the influence of the transport sector, or of the modes of transport on the environment and human health default.
	Low safety transport	<p>Status wear suitable road transport infrastructure (see section 2.1 of the Environmental Report) and lack of bypasses of settlements led an increased risk of accidents involving transport of human casualty and hence the increased mortality rates. In Romania, die annually about 2,000 people as a result of road accidents.</p> <p>Many railway properties are defined and appropriately marked and the population is not sufficiently informed about the dangers they expose inadequate railway crossing. This explains why remains high number of people killed on the railroad. In 2011, in Romania, less than 250 people were killed or seriously injured were on track - about 10% of deaths / serious accidents on the railway registered in the EU27.</p>
	Underdeveloped transport network and modernized	The current state of the transport network, the lack of bypasses of settlements in certain areas makes the average speed is reduced transport and lift travel times, both in terms of freight and passenger

Environmental aspect	Relevant environmental problems	Associated aspects
		<p>transport.</p> <p>Romania has a very limited network of motorways; In addition, only a small proportion of the road network is built to European standards.</p> <p>Fairway deficient both in terms of breadth and its depth. Deep problems may embarrass and transport safety, increasing the risk of accidents.</p> <p>Rail lines need to be rehabilitated and rolling stock must be replaced (some with a history of over 30 years). On certain routes, state of wear of railways led to take measures regarding the restriction of the speed limit, thus increasing the duration of the journey.</p>
<b>Landscape and cultural heritage</b>	Reduction and degradation of natural areas	<p>Development of new transportation corridors lead to permanent occupation of land areas and changes in land use category, sometimes accompanied by massive deforestation and landscape fragmentation.</p> <p>Construction works left unfinished for lack of funds or derelict transport infrastructure (e.g. railway stations, ports, etc.)</p> <p>The low level of development of transport infrastructure (lack of facilities in local airports and stations, motorways failure, lack of ring roads, the wear of existing roads) may have effects on the efficient use of natural and cultural potential of the country.</p>
<b>Sustainable transport</b>	<p>Increased demand for road transport</p> <p>Energy consumption, pollutant emissions into the atmosphere and greenhouse gas emissions remain high</p> <p>Reduced due to wear safety transport network</p>	<p>The lack of competitiveness between transport modes makes the demand trend to be maintained high for road transport for both freight and passenger. Among the modes of transport, road transport has the highest contribution to total emissions of pollutants into the atmosphere, greenhouse gas emissions and is the largest consumer of energy.</p> <p>The road accident rate is still high compared to the situation at European level.</p>
<b>Public awareness related to environmental protection aspects in relation with transport sector</b>	<p>The use of road transport as the main means of transport.</p> <p>Using the own vehicles rather than public transport.</p>	<p>The lack of public information regarding the effects of transport on the environment, the importance of using public transport, reducing unnecessary travel, the use of less polluting transport alternatives, the importance of using alternative fuels.</p> <p>The existence of a low degree of involvement of civil society in making decisions on development options of transport sector.</p>

## 7. Environmental objectives established at National, Community and International level relevant to the General Transport Master Plan

The environmental protection objectives, relevant to the environmental assessment (EA) of GTMP were based on:

- Environmental objectives established through policies, strategies, plans, programs and regulations existing at national and European level;
- Environmental issues and trends relevant to GTMP and current development state of the environment and environmental issues identified at national level;
- Relationship with the objectives and proposals of GTMP with policies, strategies, plans, programs and regulations relevant to the transport sector existing at national and European level

The relevant environmental objectives were presented and finalized in the working group. These are shown in Table 7.1.

Based on the relevant environmental objectives identified, indicators were defined (or criteria for assessment) to assess the impact and establish benchmarks for monitoring and verifying whether or not they will be met / achieved. These indicators are presented in Chapter 13 of the Environment Report.

For GTMP were established and agreed, in the meeting of the working group, established for strategic environmental assessment procedure, a general environment objective (EO1) and 4 specific environmental objectives (EO1-1 - EO1-4) as follows:

- **EO 1. Development of a modern transport infrastructure, taking into account environmental effects.**
- **EO 1-1. Promoting investments for the transport projects that contribute to a sustainable transport system with measures to avoid and reduce adverse effects, such as pollutants in the atmosphere, noise pollution in urban areas and on roads with heavy traffic, pollution and soil due to diffuse sources, the impact on the landscape and cultural heritage;**
- **EO 1-2. Reduction of greenhouse gas emissions generated by the transport sector;**
- **EO 1-3. Protection of human health by improving the environment and transport safety;**
- **EO 1-4. Reducing the impact on biodiversity by providing measures to protect and conserve biodiversity and ensure consistency of the national network of protected areas.**

**Table 7.1 Relevant Environmental Objectives (REO) for environmental impact assessment (EIA)**

Environmental factors	Relevant Environmental Objectives (REO) for Strategic Environmental Assessment (SEA)	Targets	Environmental objective for the GTMP
<b>Air</b>	REO 1. The reduction and limitation at national level of the pollutants emissions into the atmosphere generated by the transport sector (CO <sub>x</sub> , NO <sub>x</sub> , SO <sub>2</sub> , suspense particulates, heavy metals, VOCs, PAHs).	Maintain emissions within permissible limits, according to Law 104/2011 on ambient air quality.	EO 1 EO 1-1 EO 1-3 EO 1-4
	REO 2. Minimization of the transport impact on the air quality in urban and rural areas.	Maintain emissions within permissible limits according to Law 104/2011 on ambient air quality.	
<b>REO air source documents:</b> <ul style="list-style-type: none"> <li>•Transport White Paper;</li> <li>•National and regional environmental objectives for 2007-2012;</li> <li>•Sustainable Transport Strategy 2007-2013 and 2020, 2030;</li> <li>•Law 104/2011 on ambient air quality.</li> </ul>			
<b>Climate Change</b>	REO 3. Reduction of greenhouse gas emissions from the transport activity	Achieving the objectives set at European level, namely reducing emissions of greenhouse gases by 20% until 2020 compared to 1990 levels.  Achieving the targets set for the transport sector, by 2050, in the Transport White Paper (for the year 2030, a 20% reduction in GHG emissions compared to 2008 levels and for the year 2050, a 60% reduction compared with emissions in 1990).	EO 1 EO 1-2
	REO 4. Improving the efficiency of the fuel used	Achieving the objectives set by Directive 2009/33 / EC and Regulation 443/2009 / EC on CO <sub>2</sub> emissions from cars, Regulation 510/2011 / EC.  Increasing the use of alternative fuels (LPG, biogas, hydrogen, electricity) for transport and introduction of more efficient technologies in terms of fuel consumption.	
	REO 5. Reducing vulnerability of transport infrastructure to climate change (floods, extreme weather conditions, high temperature / low, landslides etc.).	Protecting existing transport infrastructure and its development taking into account the need to adapt it to climate change.	
<ul style="list-style-type: none"> <li>• <b>REO source documents for climate change:</b></li> <li>• Romania's National Strategy on Climate Change 2013 - 2020;</li> <li>• Sustainable Transport Strategy 2007-2013 and 2020 - 2030;</li> <li>• National and regional environmental objectives for 2007 - 2012;</li> <li>• Guide on adaptation to climatic conditions.</li> </ul>			
<b>Water</b>	REO 6. Preventing damage to surface water bodies and groundwater	Compliance with the Water Framework Directive of the European Union.	EO 1 EO 1-1

**Table 7.1 Relevant Environmental Objectives (REO) for environmental impact assessment (EIA)**

Environmental factors	Relevant Environmental Objectives (REO) for Strategic Environmental Assessment (SEA)	Targets	Environmental objective for the GTMP
		Achieving the environmental objectives established for each water body.	
	REO 7. Reducing changes in morphology and hydrology of surface water bodies	Implement measures to reduce the occurrence and morphological changes in the hydrological regime due to construction activity by limiting their impact and eliminating the need to propose additional measures to comply with the Water Framework Directive.	
	REO 8. Prevent / limit intake of pollutants into surface water and groundwater	Reducing the volume of wastewater generated by the transport sector. Reducing quantities of pollutants emissions into surface water and groundwater. Maintaining the permissible limits for quality indicators of wastewater when discharge into the natural emissary or the sewage system.	
<b>REO water source documents:</b> <ul style="list-style-type: none"><li>• Water Framework Directive 60/2000 / EC;</li><li>• National and regional environmental objectives for 2007-2012;</li><li>• River Basin Management Plans.</li></ul>			
<b>Soil and subsoil</b>	REO 9. Reduce consumption of natural resources	Proper planning of construction activities for projects proposed by GTMP to meet basic needs, avoiding waste and efficient use of natural resources	EO 1 EO 1-1
	REO 10. Preventing and reducing pollution of soil and subsoil	Reducing air pollutant emissions in the transport sector  Significantly reducing polluted areas	
	REO 11. The transport infrastructure development correlated with improved of the efficient use of land	Support the development on land reclaimed and sustainable land use (having bet on the fact that the development of a certain infrastructure, such as bypasses, can cause adjacent area development and employment of new land).	
<b>REO source documents for soil and subsoil:</b> <ul style="list-style-type: none"><li>• National and regional environmental objectives for 2007-2012;</li><li>• National Strategy for Energy Efficiency.</li></ul>			
<b>Waste and hazardous substances management</b>	REO 12. Reducing the amount of waste generated.	Taking into account for the GTMP proposed projects the issues of reducing the amount of waste generated during construction activity. Achieving the objectives of the National Waste Management	EO 1 EO 1-1

**Table 7.1 Relevant Environmental Objectives (REO) for environmental impact assessment (EIA)**

Environmental factors	Relevant Environmental Objectives (REO) for Strategic Environmental Assessment (SEA)	Targets	Environmental objective for the GTMP
		Strategy 2014-2020.	
	REO 13. Increasing the amount of waste recycled and recovered generated by the transport sector	Taking into account for the GTMP the proposed projects, the issues of reducing the amount of waste generated during construction activity. Achieving the objectives of the National Waste Management Strategy 2014-2020. Achieving the objectives of the National Waste Management Strategy 2014-2020.	
<b>REO waste source documents:</b> <ul style="list-style-type: none"><li>National and regional environmental objectives for 2007-2012</li><li>National Waste Management Strategy 2014-2020</li><li>National, County and Regional waste management plans</li></ul>			
<b>Biodiversity</b>	REO 14. Reducing pressure due to transportation infrastructure leading to damage of natural habitats and biodiversity.	Planning transport projects in view of reducing the impact on natural habitats and biodiversity, to avoid as much as possible the natural protected areas. Reducing land conversion in the protected areas for the development of transport infrastructure. Sustainable development of infrastructure and vehicles by reducing the impact on biodiversity.	EO 1 EO 1-1 EO 1-4
	REO 15. Limitation of the deforested areas.	Reduction of the deforested area due to the development of transport infrastructure. Establish and implement compensatory measures for affected areas (e.g. compensating land surfaces affected by deforestation with lands capable to be afforested).	
<b>Source Documents for REO biodiversity:</b> <ul style="list-style-type: none"><li>National and regional environmental objectives for 2007-2012;</li><li>Directive on the conservation of natural habitats and of wild fauna and flora 92/43 / EEC;</li><li>Directive on the conservation of wild birds 79/409 / EEC;</li><li>GEO 57/2007 regarding natural protected areas regime, conservation of natural habitats and of wild fauna and flora approved with amendments by Law no. 49/2011.</li></ul>			
<b>Population and Human Health</b>	REO 16. Population protection against associated risks with road and rail accidents, increased passenger and freight transport safety.	Halve deaths generated by road accidents compared to the European average. Improving the quality of transport infrastructure.	EO 1 EO 1-1 EO 1-2 EO 1-3



**Table 7.1 Relevant Environmental Objectives (REO) for environmental impact assessment (EIA)**

Environmental factors	Relevant Environmental Objectives (REO) for Strategic Environmental Assessment (SEA)	Targets	Environmental objective for the GTMP
	REO 17. Protection of human health by improving the conditions of the environment by reducing the effects of transport on air quality.	Maintain emissions within limits according to Law. 104/2011 on ambient air quality. Reducing air pollution associated with road traffic on the main arteries from localities.	
	REO 18. Reducing noise generated by transport sector both at source and through mitigation measures so that overall exposure levels have minimal impact on human health	Implementation of measures included in the action plans developed for different transport modes (GD no. 321/2005) and compliance with limit values for noise indicators L (zsn) and L (night) established by OM no. 152/558/1119/532 in 2008. Making bypasses settlements.	
	REO 19. Increased mobility and accessibility.	Traffic decongestion. Improving interconnectivity between areas. Increasing competitiveness between transport modes.	
<b>Source documents REO population and human health:</b> <ul style="list-style-type: none"><li>Sustainable Transport Strategy 2007-2013 and 2020 - 2030;</li><li>National and regional environmental objectives for 2007-2012;</li></ul>			
<b>Landscape and National Cultural Heritage</b>	REO 20. Protection of cultural and natural national heritage.	Establish and implement, for the transportation infrastructure, projects proposed by GTMP and measures to protect the cultural and natural heritage. Reducing emissions of acidifying gases from transport sector.	EO 1 EO 1-1
	REO 21. Development of transport infrastructure taking into account policies of management, landscape protection and planning	Reducing effects on natural landscape and landscape integration of infrastructure works. Ensuring a sustainable urban transport.	
<b>Documents REO source for landscape and cultural Patrimony:</b> <ul style="list-style-type: none"><li>Thematic Strategy on the Urban Environment European</li><li>National Strategy for Cultural Heritage</li><li>National and regional environmental objectives for 2007-2012</li><li>Local Environmental Action Plans</li></ul>			
<b>Sustainable Transport</b>	REO 22. Modernization and development of national transport system so as to ensure the achievement of sustainable transport.	Achieving the established objectives through the sustainable transport strategy.	EO 1 EO 1-1 EO 1-2
	REO 23.Improvment of transport behavior in relation to the environment.	Reducing pollution caused by transport activity.	
<b>Source Documents REO for sustainable transport:</b> <ul style="list-style-type: none"><li>Transport White Paper</li><li>Sustainable Transport Strategy 2007-2013 and 2020 2030</li><li>National and regional environmental objectives for 2007-2012</li><li>National Strategy for Sustainable Development of Romania 2013-2020-2030 Horizons</li></ul>			

**Table 7.1 Relevant Environmental Objectives (REO) for environmental impact assessment (EIA)**

Environmental factors	Relevant Environmental Objectives (REO) for Strategic Environmental Assessment (SEA)	Targets	Environmental objective for the GTMP
Energy Efficiency	REO.24. Improving energy efficiency in the transport sector by increasing the use of renewable energy resources and significantly reduces oil dependence.	Reducing energy consumption and fossil fuels. Promoting the use of renewable energy in the transport sector.	EO 1 EO 1-2
	REO.25 Reducing the energy consumption in the transport sector.	Improvement of transport conditions and reduces journey times. Start actions to reduce with at least 10% energy consumption, specific energy consumption for passenger-km and tons-km in the transport sector by 2015 and achieving a progressive reduction of up to 15% in 2020 and up to 20% in 2030.	
Conservation of the finite natural resources / use of renewable resources	REO.26. Reducing exploitation of exhaustible resources and facilitate the use of the renewable ones.	Starting the actions of introducing alternative fuels to the conventional ones in the transport sector, according to the EU objectives and target of increasing the use of biofuels to 10% in energy consumption for transport by 2020.	EO 1
Source documents for REO transport energy efficiency and conservation/use of renewable natural sources: <ul style="list-style-type: none"><li>• White Paper of Transportation;</li><li>• Sustainable Transport Strategy 2007-2013 and 2020, 2030;</li><li>• Energy Strategy of Romania updated for 2011-2020;</li><li>• European Directive: Clean energy for transport: an European strategy on alternative fuels (under approval);</li><li>• Romania's National Strategy on Climate Change 2013 – 2020;</li><li>• Sustainable Transport Strategy 2007-2013 and 2020, 2030.</li></ul>			
Raising awareness of environmental issues in the transport sector	REO 27. Informing and raising awareness about the environmental effects of transport activity.	Raising transport users awareness on aspects of transport effects on the environment. Improving behavior towards the environment through the use of less polluting resources and modes of transport.	-
	REO 28. Involvement and consultation of stakeholders throughout the decision-making process in establishing and implementing the proposed measures to reduce environmental impact.	Establishing optimal measures to reduce environmental impact in the transport sector.	
Source documents for REO raising awareness: <ul style="list-style-type: none"><li>• Directive 2001/42 / EC of the European Parliament and of the Council, which concerns the assessment of the effects of certain plans and programs on the environment ("SEA Directive");</li><li>• Government Decision 1076/2004 establishing the procedure of environmental assessment for plans and programs;</li><li>• National and regional environmental objectives for 2007-2012.</li></ul>			

### 7.1 Assessment of the compatibility with the objectives of GTMP

The purpose of this section is to assess the compatibility between the objectives of the GTMP and relevant environmental objectives for environmental assessment on the aspects: air, climate, soil, waste management and hazardous substances, biodiversity, population and human health, energy efficiency and conservation of natural resources, sustainable transport, raising awareness of environmental issues in the transport sector.

For GTMP were developed the environmental objectives (environmental objectives and targets) which facilitated the assessment of compliance with the relevant environmental objectives. Assessment of the compatibility between the relevant environmental objectives and targets GTMP was performed using a matrix in which the following symbols were used:

- + objectives are compatible;
- ? compatibility depends on certain assumptions;
- 0 goals do not affect each / there is no link between the objectives set;
- X incompatibility.

No discrepancies were found between the relevant environmental objectives and environmental objectives GTMP. Achieving the targets depend upon the compliance measures proposed in chapter 11.

The strategic vision of the transport sector for 2014-2020 involve consideration of investment policies and programs that lead to the development of an efficient transport system in economic terms both in terms of transport operations and users, taking into account issues like efficiency in terms of energy consumption and safe.

Environmental objectives for MPGT	Environmental objectives relevant to the Strategic Environmental Assessment for:																										Observations	
	Air		Climate Change			Water			Soil and underground			Waste Management		Biodiversity		Population and Human Health			Landscape and cultural heritage		Sustainable transport		Energy efficiency		Conservation of exhaustible natural resources / use of renewable resources	Raising awareness of environmental issues in the transport sector		
	REO 1	REO 2	REO 3	REO 4	REO 5	REO 6	REO 7	REO 8	REO 9	REO 10	REO 11	REO 12	REO 13	REO 15	REO 16	REO 17	REO 18	REO 19	REO 20	REO 21	REO 22	REO 23	REO 24	REO 25	REO 26	REO 27		REO 28
EO1 Development of a modern transport system, taking into account the environmental effects	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	+	+	?	?	?	?	+	The overall objective of GTMP is compatible with most relevant objectives of the environmental assessment. For projects proposed by GTMP is necessary to establish and implement measures to reduce environmental impact. Proposed projects must undergo the procedure for assessing environmental impacts and appropriate assessment, as appropriate, in order to minimize the environmental impacts. The objective of reducing emissions of pollutants in atmosphere depends not only on the development of transport infrastructure. Development of transport infrastructure may entail an increase in demand for transport and hence an increase in emissions.. Side measures are needed to implement such approaches to the widespread use of alternative fuels, improving vehicle operating technology. Achieving the "Increase awareness on environmental issues in the transport sector" can be difficult. Although the purpose of public involvement in the environmental assessment procedure for GTMP is to be aware of some environmental issues and environmental responsibilities entail improving behavior towards the environment through the use of resources and less polluting modes of transport is influenced by economic development at national and default charges for using a transmission type or another.

Environmental objectives for MPGT	Environmental objectives relevant to the Strategic Environmental Assessment for:																											Observations	
	Air		Climate Change			Water			Soil and underground			Waste Management		Biodiversity		Population and Human Health			Landscape and cultural heritage		Sustainable transport		Energy efficiency		Conservation of exhaustible natural resources / use of renewable resources	Raising awareness of environmental issues in the transport sector			
	REO 1	REO 2	REO 3	REO 4	REO 5	REO 6	REO 7	REO 8	REO 9	REO 10	REO 11	REO 12	REO 13	REO 15	REO 16	REO 17	REO 18	REO 19	REO 20	REO 21	REO 22	REO 23	REO 24	REO 25	REO 26	REO 27	REO 28		
EO1-1.Promoting transport investment projects that contribute to a sustainable transport system with measures to avoid and reduce adverse effects, such as pollutants in the atmosphere, noise in residential areas and on roads with heavy traffic , water and soil pollution caused by diffuse sources, the impact on the landscape and cultural heritage	+	+	0	0	+	+	+	+	+	0	+	0	0	?	?	+	+	+	+	+	+	+	+	?	?	?	?	+	The specific objective of GTMP environment is compatible with most relevant objectives of the environmental assessment, but does not refer directly to the objectives for waste management. For projects proposed by GTMP is necessary to establish and implement measures to reduce environmental impact. By establishing and implementing a program of measures for avoiding / reducing environmental impact GTMP may help maintain / achieve environmental objectives established at national and European environmental aspects considered for evaluation. An important role in the correct assessment of these measures it is the degree of involvement of the stakeholders represented in the working group.
EO1-2 Reduction of greenhouse gas	0	0	+	0	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+	?	?	?	?	+	Improvement of transport infrastructure and encouraging less polluting modes of transport (rail, water) will help reduce air pollutant emissions and reduce emissions of greenhouse gases.	
EO1-3 Protection of human health and the environment by improving the safety of transport	+	+	+	0	?	0	0	0	0	0	0	0	0	0	0	+	+	+	0	0	0	+	?	?	?	?	+	The projects proposed by GTMP aim to reduce transport-related issues: the wear degree of road infrastructure, lack of motorways, reduce congestion, bypassing urban areas, lack of connectivity between certain areas, and improving rail and reduce travel times. This is expected to improve	

Environmental objectives for MPGT	Environmental objectives relevant to the Strategic Environmental Assessment for:																										Observations	
	Air		Climate Change			Water			Soil and underground			Waste Management		Biodiversity		Population and Human Health			Landscape and cultural heritage		Sustainable transport		Energy efficiency		Conservation of exhaustible natural resources / use of renewable resources	Raising awareness of environmental issues in the transport sector		
	REO 1	REO 2	REO 3	REO 4	REO 5	REO 6	REO 7	REO 8	REO 9	REO 10	REO 11	REO 12	REO 13	REO 15	REO 16	REO 17	REO 18	REO 19	REO 20	REO 21	REO 22	REO 23	REO 24	REO 25	REO 26	REO 27		REO 28
																												environmental conditions (air quality, reduce air pollution) and safe transport making environmental objective OM 1-3 of GTMP be compatible with environmental objectives for air, climate change, population and human health. Improved environmental choice also depends on the population for a particular mode of transport is known that the choice of transport mode or the other depends on economic criteria, followed by time.
EO1-4 Reducing the impact on biodiversity by providing measures to protect and conserve biodiversity and ensure consistency of the national protected areas network	0	0	0	0	0	0	0	0	0	0	0	0	0	+	+	0	0	0	0	0	0	0	0	0	?	?	+	Still from the planning stage will be avoided all possible projects location closed or near protected natural areas. Establish the measures for reduction / elimination of the impact on biodiversity will be realized when developing appropriate assessment procedure. Where appropriate assessment reveals significant negative effects on the protected area and in the absence of alternative solutions, the project must be carried out nevertheless imperative reasons of overriding public interest, including social or economic will be established compensatory measures to protect the global network "Natura 2000".



## 8.The potential significant environmental effects

In determining the potential significant impact, environmental effects were considered to identify how the proposed scenarios GTMP (both for each sector separately and cumulatively transport) lead to relevant environmental objectives established for each environmental aspect.

To quantify the effects of each scenario, the sectors of transport (road, rail, air, naval, intermodal) has been used a numerical scoring system and a coding system based on colors.

**Table 8.1 Proposed scoring system for assessing potential environmental impacts for projects proposed by GTMP**

Note/ Color code	Impact amplitude	Description
+2	Positive significant impact	Refers to the major effects (significant) of positive nature that manifests on long-term or permanent, have extensive coverage and contribute to the achievement the established environmental objective.
+1	Positive impact	Refers to minor effects (reduced) of positive nature, direct or indirect, that are felt locally and may partly contribute to achieve the established environmental objective.
0	No impact/ the effect cannot be determined	No effects, extremely low or no accurate predictions can be made; further details are needed about the characteristics of projects and their size.
-1	Negative impact	Refers to minor effects (reduced) of negative nature, direct or indirect, which are felt locally and make it difficult to achieve the established environmental objective.
-2	Significant negative impact	Refers to the major effects (significant) of negative nature, which manifest on long-term or permanent, have extensive coverage and do not allow achieving the established environmental objective.

The scoring was done by evaluating and assessing the effects of the relevant environmental impacts of each scenario and transport sector, in correlation with the results of a technical nature of the Master Plan, such as:

- Improvement and development of transport infrastructure;
- Increase the safety and reliability of travel time;
- Increased competitiveness between transport modes;
- Change the average speed of transport and the journey;
- Improved transport services (investment for rolling stock, modernization of railway stations, airports and ports modernization etc.);
- Improving develop the traffic on the Danube;
- Development / improvement of the intermodal freight transport and travel;
- Social and economic development at local, territorial and national levels.

It believes that the above technical nature results can lead directly to achievement of the relevant environmental objectives identified and targets proposed, to decrease the overall environmental impacts associated with transportation.

For each scenario, is shown the motivation of the identified effects on the established relevant environmental objectives, by environmental issues.

This evaluation methodology allows quick viewing on the one hand the effects of environmental objectives and creates the opportunity to understand the type, nature and duration of effect, and on the other hand allows rapid identification of environmental objectives cannot be achieved without applying appropriate measures to minimize / reduce damage.

The cumulative effect was evaluated by summing the scores for each objective for each sector of transport (road, rail, water - ports and waterways, intermodal) and for each of the four scenarios:

- Do nothing;
- Do minimum;
- Development Scenario "Do Something" (ES / EES);
- Core TEN-T Scenario.

By comparing scores for the four scenarios proposed by GTMP it was possible to determine which scenario has the most positive long-term effects and can lead to achieving the established environmental objectives.

The evaluation results are detailed below and summarized in *Annex 6 matrix*.

### **8.1 Potential significant environmental effects - Scenario "Do nothing"**

This scenario takes into account current developments in transport infrastructure and transport activity without applying any measure.

In assessing the potential significant effects of the scenario "Do nothing" and "Do Minimum" on the relevant environmental objectives established for each environmental aspect separately taken into account environmental issues identified at national level for the transport sector that the conclusions of the analysis of the current state of environment and its likely evolution if not implemented GTMP.

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Tabel 8.2. The potential significant environmental effects - Scenario "Do nothing"**

Environmental factor	Justification of the potential significant environmental effects identified - Scenario "Do nothing"	Points																								
Air	<p>Failure to implement GTMP will have major negative effects on the relevant environmental objectives for air effects that manifest themselves in the long run.</p> <p>Between transport modes, with significant share, the road transport will significantly influence the environmental objectives established for the environmental factor "Air". In Romania, the road sector is the most important element of the Romanian transport system, in terms of passenger transport (50% of all journeys) and goods (75% of total shipments). The road transport sector makes a significant contribution to the total air emissions (NOx, particulate matter, COVNM, heavy metals) as a result:</p> <ul style="list-style-type: none"><li>- The current state of roads (only 52% of road shows good condition)</li><li>- The old national auto park (58% of all vehicles registered in Romania are older than 10 years)</li><li>- The type of fuel used (only 6% of vehicles using alternative fuels while 94% of vehicles use diesel and gasoline use)</li><li>- Travel speed,</li><li>- Reduced number of detours to cities.</li></ul> <p>Lack of infrastructure, coupled with poor public transport supply lead to changes in transport practices by increasing the share of private cars. Is expected to increase the number of car trips by more than 15% from the current situation. An inadequate infrastructure can influence / slow and tend scrapping. The fleet has evolved during 1989-2010, compared to 1989 and increased by 64% comparing to auto park in 1995.</p> <p>Analyzing the situation in terms of the type of fuel can be observed an increase in the share of diesel cars, of about 28% of all cars in 2005 to 44% in 2007, followed by a stabilization around 33% in recent years.</p> <p>With regard to rail transport due to lack of investments for maintenance, modernization and repairs of railway travel times will continue to worsen, the average delay per train will increase, which will contribute to increase the demand for road transport.</p> <p>By applying this scenario, the total increase in the number of trips for all modes of transport will increase by 11%, which will increase traffic volume, an increase in fuel consumption and an increase in the amount of emissions into the atmosphere.</p> <p>Intermodal transport is the operation of combined transport (rail, road, rail, marine, road, water). In Romania, mainly using container combined transport through a supply chain which is headed haulers who take intermodal transport units from senders and transporting them to the intermodal terminal. Scroll long times, the ability of rail transport have led to less activity in rail freight (containerized freight shipments over long distances) for the road sector, more polluting transport with major contributions to pollutants in the atmosphere.</p> <p>Road freight transport is mainly realized on national roads and the road transportation network has insufficient routes bypassing the urban areas. The growth of traffic in urban</p>	<table><tr><th>Objective environmental / transport sector</th><th>REO1</th><th>REO2</th></tr><tr><td></td><td></td><td></td></tr><tr><td>Road transport</td><td>-2</td><td>-2</td></tr><tr><td>Railway transport</td><td>-1</td><td>-1</td></tr><tr><td>Shipping transport (ports and navigation channels)</td><td>-2</td><td>0</td></tr><tr><td>Air transport</td><td>-1</td><td>-1</td></tr><tr><td>Intermodal Transport</td><td>-1</td><td>-1</td></tr><tr><td>Total</td><td>-7</td><td>-5</td></tr></table>	Objective environmental / transport sector	REO1	REO2				Road transport	-2	-2	Railway transport	-1	-1	Shipping transport (ports and navigation channels)	-2	0	Air transport	-1	-1	Intermodal Transport	-1	-1	Total	-7	-5
		Objective environmental / transport sector	REO1	REO2																						
		Road transport	-2	-2																						
		Railway transport	-1	-1																						
		Shipping transport (ports and navigation channels)	-2	0																						
		Air transport	-1	-1																						
		Intermodal Transport	-1	-1																						
		Total	-7	-5																						
		<p>REO.1. Reducing national pollutant emissions into the atmosphere generated by the transport sector (COx, NOx, SO2, particulates, heavy metals, VOCs, PAHs)</p> <p>REO.2 Minimization of the impact of transport on air quality in urban and rural areas.</p>																								

**Tabel 8.2. The potential significant environmental effects - Scenario "Do nothing"**

Environmental factor	Justification of the potential significant environmental effects identified - Scenario "Do nothing"	Points																												
	areas will cause the emission of pollutants whose concentrations will continue to maintain the values that exceed the maximum limits.																													
Climate change	<p>As mentioned for the environmental aspect air, keeping the transport network on the current state will increase the volume of passenger and freight transport by road sector which entails an increase in fuel consumption and, hence, an increase in greenhouse gas emissions.</p> <p>The fuel efficiency is indirectly influenced by the state of development of transport infrastructure and the age and efficiency of the fleet. The environmental taxes imposed on new vehicles, the large number of vehicles that are tailored just for petroleum-fuel use, lack of modernization or un-extending transport infrastructure, the small number of supply points for alternative fuels / infrastructure that does not allow the development of such points will lead to increased use of fossil fuels with minimal effectiveness.</p> <p>In these circumstances it will be difficult to achieve the proposed target to reduce emissions of greenhouse gases by 2020 (approximately 20% compared to 1990) or for the transport sector until the 2030 an emissions reduction of 20% GHG compared to 2008 levels and by 60% in 2050 compared to 1990 emission levels.</p> <p>In the absence of properly designed investments can not be ensure the adaptation to climate change of the transport infrastructure, currently the infrastructures for roads, rail, water and air are especially vulnerable to extreme weather events.</p> <p>The climate change may have a negative impact on transport infrastructure (road and rail), higher temperatures, floods, landslides can also lead to damaging and disturbing transport regime. Fluctuations in the flow regime of the Danube can have a direct negative impact on the sector of shipping. Applying this scenario will have a material adverse effect directly to the objective of reducing transport infrastructure vulnerability to climate change. It is necessary to apply measures regarding works, materials and technologies used for the rehabilitation, modernization and maintenance of transport infrastructure so as to reduce the effects of climate change.</p> <p>Failure to implement the GTMP will have major negative effects on the relevant environmental objectives for climate change, respectively: REO3, REO5.</p>	<table><tr><th>Environmental objective</th><th>REO 3</th><th>REO4</th><th>REO5</th></tr><tr><td>Road transport</td><td>-2</td><td>0</td><td>-2</td></tr><tr><td>Railway transport</td><td>-2</td><td>0</td><td>-2</td></tr><tr><td>Water transport (ports and navigation channels)</td><td>-2</td><td>0</td><td>-2</td></tr><tr><td>Air transport</td><td>-1</td><td>0</td><td>-2</td></tr><tr><td>Intermodal transport</td><td>-1</td><td>0</td><td>0</td></tr><tr><td>Total</td><td>-8</td><td>0</td><td>-8</td></tr></table> <p>REO.3. Reduction of greenhouse gas emissions from transport</p> <p>REO.4. Improving the efficiency of the fuel used</p> <p>REO.5. Reducing vulnerability of transport infrastructure to climate change (floods, extreme weather conditions, high temperature / low, landslides etc.).</p>	Environmental objective	REO 3	REO4	REO5	Road transport	-2	0	-2	Railway transport	-2	0	-2	Water transport (ports and navigation channels)	-2	0	-2	Air transport	-1	0	-2	Intermodal transport	-1	0	0	Total	-8	0	-8
Environmental objective	REO 3	REO4	REO5																											
Road transport	-2	0	-2																											
Railway transport	-2	0	-2																											
Water transport (ports and navigation channels)	-2	0	-2																											
Air transport	-1	0	-2																											
Intermodal transport	-1	0	0																											
Total	-8	0	-8																											
Water	<p>This scenario has significant adverse effects on the environmental objectives established for the water and related to sea and river transport.</p> <p>The lack of modern port infrastructure, such as: the existence of abandoned piers, old cranes, conveyors outdated or no special equipment for bulk goods leads to slow loading and unloading operations, amplifying the risk of accidental pollution.</p>	<table><tr><th>Environmental objective</th><th>REO6</th><th>REO7</th><th>REO8</th></tr><tr><td>Road transport</td><td>0</td><td>0</td><td>-1</td></tr><tr><td>Railway transport</td><td>0</td><td>0</td><td>-1</td></tr><tr><td>Water transport</td><td>-2</td><td>-2</td><td>-1</td></tr></table>	Environmental objective	REO6	REO7	REO8	Road transport	0	0	-1	Railway transport	0	0	-1	Water transport	-2	-2	-1												
Environmental objective	REO6	REO7	REO8																											
Road transport	0	0	-1																											
Railway transport	0	0	-1																											
Water transport	-2	-2	-1																											

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Tabel 8.2. The potential significant environmental effects - Scenario "Do nothing"**

Environmental factor	Justification of the potential significant environmental effects identified - Scenario "Do nothing"	Points			
	In the absence of investment work for waterways, maintenance to maintain optimal conditions for navigation on the Danube will be a more extensive, expensive; will increase water turbidity, sediment suspension quantities of the riverbed, with influences on aquatic habitats and semi-aquatic.	(ports and navigation channels)			
		Air transport	0	0	-1
		Intermodal transport	0	0	0
		<b>Total</b>	-2	-2	-4
		REO.6. Preventing damage to surface water bodies and groundwater REO.7. Reducing changes in morphology and hydrology of surface water bodies REO.8. Prevent / limit intake of pollutants into surface water and groundwater			
<b>Soil and underground</b>	<p>This scenario has minor adverse effects on the environmental objectives established for the soil and subsoil.</p> <p>Changes in soil quality may be caused by pollutants in the atmosphere mainly from road transport. Pollutants such as NO<sub>x</sub>, SO<sub>2</sub> and heavy metals can reach the soil by rainfall washing the atmosphere.</p> <p>The current quality of transport infrastructure (roads, railways) does not ensure a high degree of safety in transport and can lead to accidents that can generate accidental pollution of the soil.</p> <p>There is empirical evidence that the topography and road alignment, but also very tight curves on major roads create hazardous conditions for heavy goods vehicles during the winter months and the risk of collision leading to risks of accidental pollution.</p> <p>The failure of the upgrading or creating new transport corridors, the transport sector will contribute to changes related to occupancy of the land. The consumption of natural resources, especially oil, will still be high, the lack of adequate transport infrastructure will maintain the current trend of using the means of transport petrol and diesel.</p>	<b>Environmental objective</b>	<b>REO 9</b>	<b>REO 10</b>	<b>REO 11</b>
		Road transport	-1	-1	0
		Railway transport	0	-1	0
		Water transport (ports and navigation channels)	0	-1	0
		Air transport	0	0	0
		Intermodal transport	0	0	0
		<b>Total</b>	-1	-3	0
		REO.9. Reduce consumption of natural resources REO.10. Preventing and reducing pollution of soil and subsoil REO.11 transport infrastructure development correlated with improved efficient use of land			
<b>Waste management</b>	The analyzed scenario has a reduced indirect negative effect on the environmental objectives established for the management of wastes and hazardous substances, especially	<b>Environmental objective</b>	<b>REO 12</b>	<b>REO 13</b>	

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Tabel 8.2. The potential significant environmental effects - Scenario "Do nothing"**

Environmental factor	Justification of the potential significant environmental effects identified - Scenario "Do nothing"	Points				
and hazardous substances	for road and rail sectors. Improper maintenance of roads, the quality of their composition could increase the amount of waste associated transport activity (especially waste resulting from repair work and maintenance of transport vehicles, such as waste oil, tires, used batteries etc.). Maintain high accident risk associated with the transport of waste and dangerous goods by rail, road and sea.	Road transport	-1	0		
		Railway transport	-1	0		
		Water transport (ports and navigation channels)	0	0		
		Air transport	0	0		
		Intermodal transport	-1	0		
		Total	-3	0		
		REO.12. Reducing the amount of waste generated. REO.13. Increasing the amount of waste recycled and recovered in the transport sector				
Biodiversity	Analyzed scenario analysis is not adversely affect the integrity of protected areas, no other work will be required to grub and will not appear fragmentation of natural habitats. Increased demand for road transport may have negative effects on biodiversity by increasing traffic, fuel consumption and hence emissions into the atmosphere, affecting air quality. The emissions of acidifying gases can contribute to the acidification of soils indirectly influencing the structure and functioning of ecosystems which are the most exposed areas near motorways or the areas where the roads crosses the protected areas. The dredging works needed to maintain optimal conditions for sailing, accidental pollution on the Danube and Black Sea possible caused by uncontrolled discharge of vessels and / or shipping casualties may have negative effects on aquatic ecosystems.	Environmental objective	REO 14	REO 15		
		Road transport	-1	0		
		Railway transport	-1	0		
		Water transport (ports and navigation channels)	-1	0		
		Air transport	0	0		
		Intermodal transport	0	0		
		Total	-3	0		
		REO.14. Reducing pressure due to transportation infrastructure leading to impairment of natural habitats and biodiversity REO.15.Limitatation of deforested areas				
Population and human health	The analyzed scenario has major negative effects on the environmental objectives established for the population and human health. Maintaining the current transport system will not allow achieving safety, limiting noise and emissions into the atmosphere. Transport safety depends on the quality of transport routes and the degree of their equipment with signaling means, adequate lighting. The low number of bypasses of cities that allow diversion of heavy traffic outside the cities,	Environmental objective	REO 16	REO 17	REO 18	REO 19
		Road transport	-2	-2	-1	-1
		Railway transport	-2	-1	-1	-1

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



**Tabel 8.2. The potential significant environmental effects - Scenario "Do nothing"**

Environmental factor	Justification of the potential significant environmental effects identified - Scenario "Do nothing"	Points			
	<p>the traffic jams will lead to maintaining high emissions of pollutants into the atmosphere and noise level within communities.</p> <p>The underdeveloped railways / upgraded road transport demand will increase as a means of transport for passengers and freight. Road transport is one of the main reasons for creating nuisance through noise and emissions into the atmosphere. High levels of noise and air emissions may affect the health of people living in the vicinity of these objectives.</p> <p>Achieving the objective of improving the mobility and ease of accessibility to certain areas will be challenging, if the GTMP will not be implemented.</p>	Water transport (ports and navigation channels)	-1	-1	0
		Air transport	0	0	-1
		Intermodal transport	0	0	-1
		<b>Total</b>	<b>-5</b>	<b>-5</b>	<b>-3</b>
		<p>REO.16. Population protection against risks associated with road and rail accidents, increased passenger and freight transport safety</p> <p>REO.17. Protection of human health by improving environmental conditions by reducing the effects of transport on air quality</p> <p>REO.18. Reducing transport noise both at source and through mitigation measures so that overall exposure levels have minimal impact on human health</p> <p>REO.19. Increased mobility and accessibility</p>			
<b>Landscape and cultural heritage</b>	<p>The direct effects on the landscape and cultural heritage are difficult to estimate. The negative effects could be air emissions (greenhouse emissions of acidifying pollutants: SO<sub>x</sub>, NO<sub>x</sub>, CO<sub>x</sub>) from road traffic. The effects of acidification caused by these pollutants can affect the state of historical monuments in the vicinity of the roads. But specific studies are needed to determine and confirm the effect of emissions from the transport sector on historical monuments.</p>	<b>Environmental objective</b>	<b>REO 20</b>	<b>REO 21</b>	<p>REO.20. Protection of national cultural and natural heritage</p> <p>REO.21. Development of transport infrastructure taking into account management policies, landscape protection and planning</p>
		Road transport	0	0	
		Railway transport	0	0	
		Water transport (ports and navigation channels)	0	0	
		Air transport	0	0	
		Intermodal transport	0	0	
		<b>Total</b>	<b>0</b>	<b>0</b>	

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Tabel 8.2. The potential significant environmental effects - Scenario "Do nothing"**

Environmental factor	Justification of the potential significant environmental effects identified - Scenario "Do nothing"	Points																							
Sustainable Transport	<p>Applying this scenario, will have major negative effects on the relevant environmental objectives established for the sustainable transport.</p> <p>This scenario will lead to accomplish of the specific objectives of sustainable transport strategy for 2007-2013 and 2020 2030</p> <ul style="list-style-type: none"><li>modernization and development of the transmission of European and national interest, increasing the safety and quality of services;</li><li>liberalization of the internal transport market;</li><li>stimulate economic development and competitiveness;</li><li>strengthening social and territorial cohesion at regional and national level;</li><li>environmental compatibility.</li></ul> <p>Predominant use of road transport for passengers and cargo in the detriment of other modes of transport will maintain high the contribution of transport sector's to total emissions into the atmosphere.</p> <p>The transport sector will not align with EU standards in terms of transport infrastructure, technological regulatory standards on vehicle emissions, alternative fuels, reducing energy consumption.</p>	<table><tr><th>Environmental objective</th><th>REO 22</th><th>REO 23</th></tr><tr><td>Road transport</td><td>-2</td><td>-2</td></tr><tr><td>Railway transport</td><td>-2</td><td>-2</td></tr><tr><td>Water transport (ports and navigation channels)</td><td>-2</td><td>-2</td></tr><tr><td>Air transport</td><td>-2</td><td>-1</td></tr><tr><td>Intermodal transport</td><td>-1</td><td>-1</td></tr><tr><td>Total</td><td>-9</td><td>-8</td></tr></table>			Environmental objective	REO 22	REO 23	Road transport	-2	-2	Railway transport	-2	-2	Water transport (ports and navigation channels)	-2	-2	Air transport	-2	-1	Intermodal transport	-1	-1	Total	-9	-8
		Environmental objective	REO 22	REO 23																					
		Road transport	-2	-2																					
		Railway transport	-2	-2																					
		Water transport (ports and navigation channels)	-2	-2																					
		Air transport	-2	-1																					
		Intermodal transport	-1	-1																					
		Total	-9	-8																					
		REO.22. Modernization and development of national transport system so as to ensure the achievement of sustainable transport																							
		REO.23. Improving transport behavior in relation to the environment																							
Energy efficiency	<p>"Do nothing" Scenario will have major negative effects on the environmental objectives established for energy efficiency. Reducing energy consumption for transport depends on the conditions of carriage for passengers and freight, road conditions roads and railways. Reducing energy consumption for transport depends on the Conditions of Carriage for Passengers and freight, road and railways roads Conditions.</p> <p>Road transport is responsible for a high consumption of fuel oil, if we were to take into account that 95% of vehicles belonging to the National Park Auto uses as fuel, gasoline and diesel type.</p> <p>The lack of adequate infrastructure will delay the decision to purchase new vehicles more efficient both in terms of emissions of pollutants and in terms of energy efficiency.</p>	<table><tr><th>Environmental objective</th><th>REO 24</th><th>REO 25</th></tr><tr><td>Road transport</td><td>-2</td><td>-2</td></tr><tr><td>Railway transport</td><td>-2</td><td>-2</td></tr><tr><td>Water transport (ports and navigation channels)</td><td>-2</td><td>-2</td></tr><tr><td>Air transport</td><td>-1</td><td>-1</td></tr><tr><td>Intermodal transport</td><td>0</td><td>0</td></tr><tr><td>Total</td><td>-7</td><td>-7</td></tr></table>			Environmental objective	REO 24	REO 25	Road transport	-2	-2	Railway transport	-2	-2	Water transport (ports and navigation channels)	-2	-2	Air transport	-1	-1	Intermodal transport	0	0	Total	-7	-7
		Environmental objective	REO 24	REO 25																					
		Road transport	-2	-2																					
		Railway transport	-2	-2																					
		Water transport (ports and navigation channels)	-2	-2																					
		Air transport	-1	-1																					
		Intermodal transport	0	0																					
		Total	-7	-7																					
		REO.24. Improving energy efficiency in the transport sector by increasing the use of renewable energy resources and significantly reduce oil dependence																							
		REO.25. Reducing energy consumption in the transport sector.																							

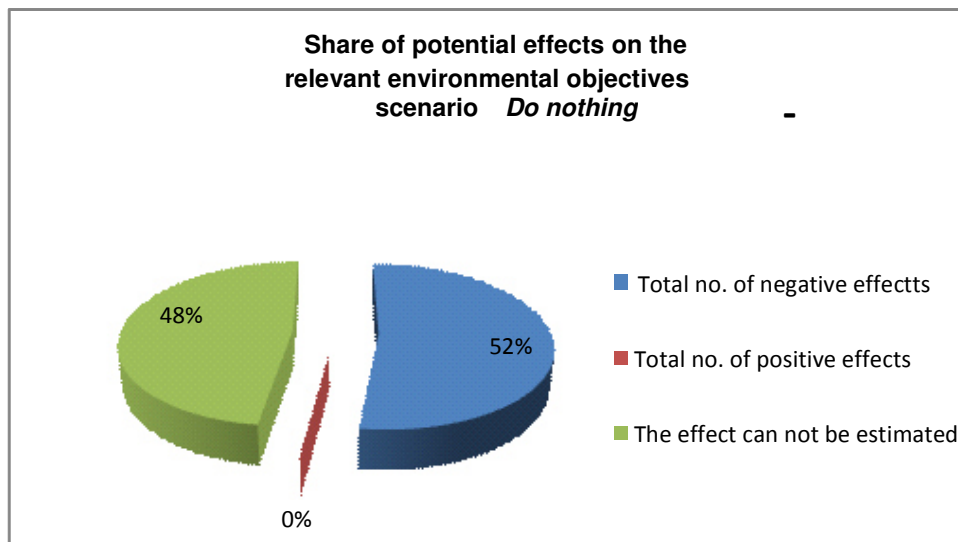
<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Tabel 8.2. The potential significant environmental effects - Scenario "Do nothing"**

Environmental factor	Justification of the potential significant environmental effects identified - Scenario "Do nothing"	Points			
Conservation and efficient use of natural resources / use of renewable resources	This scenario will not allow providing the basic infrastructure for alternative fuels and alignment with European technical standards. Increased use of road transport to the detriment of other modes of transport will increase fuel consumption, especially those derived from petroleum. As discussed previously and environmental aspect, lack of adequate infrastructure can influence fleet renewal, which can affect the use of natural resources.	Environmental objective		REO 26	
		Road transport		-2	
		Railway transport		-2	
		Water transport (ports and navigation channels)		-2	
		Air transport		-1	
		Intermodal transport		0	
		Total		-7	
		REO.26. Reducing exploitation of exhaustible resources and facilitate the use of renewable			
Raising awareness	Maintaining the current system of transport infrastructure will improve behavior towards the environment. The lack of investment for improving conditions for public transport, people will still prefer for transport using their own cars / buses.	Environmental objective		REO 27	REO 28
		Road transport		-1	0
		Railway transport		-1	0
		Water transport (ports and navigation channels)		0	0
		Air transport		0	0
		Intermodal transport		0	0
		Total		-2	0
		REO.27. Informing and raising awareness about the effects of transport activities on the environment and human health risks. REO.28. Involvement and consultation of stakeholders throughout the decision-making process in establishing and implementing the proposed measures to reduce environmental impact			

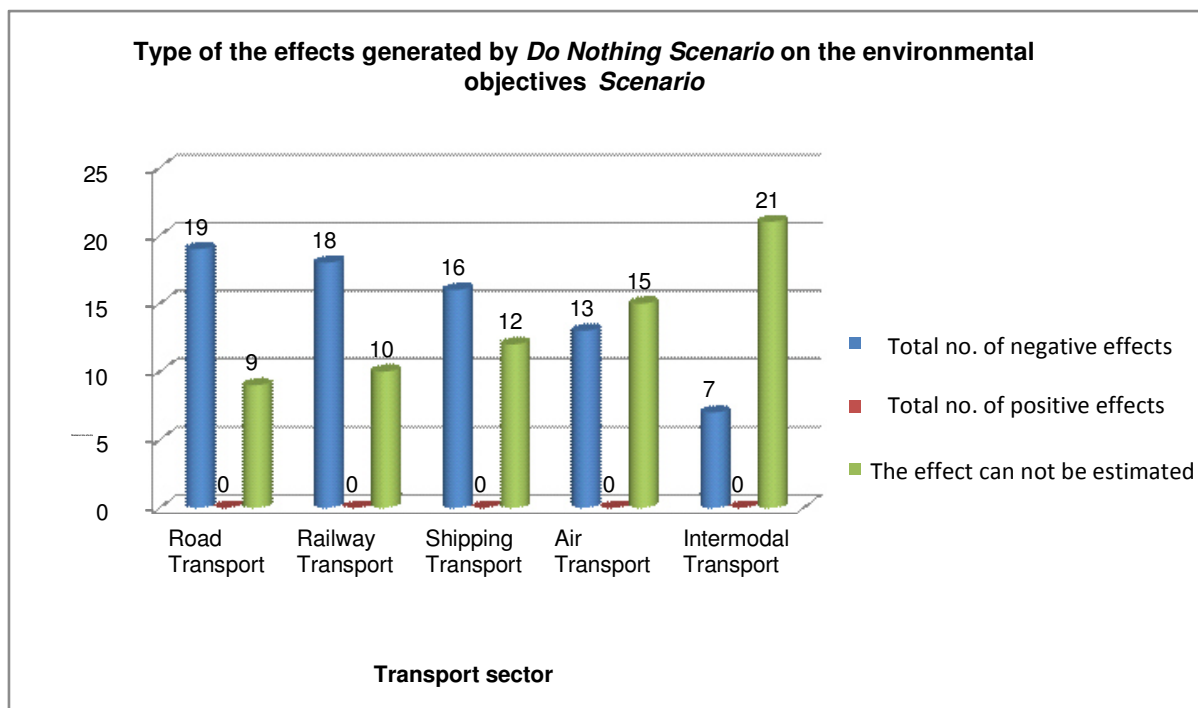
<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

The weights of the potential effects of this scenario on the relevant environmental objectives are: 52% negative, 48% will not have significant effects, 0% positive effects (v. Figure 8.1).



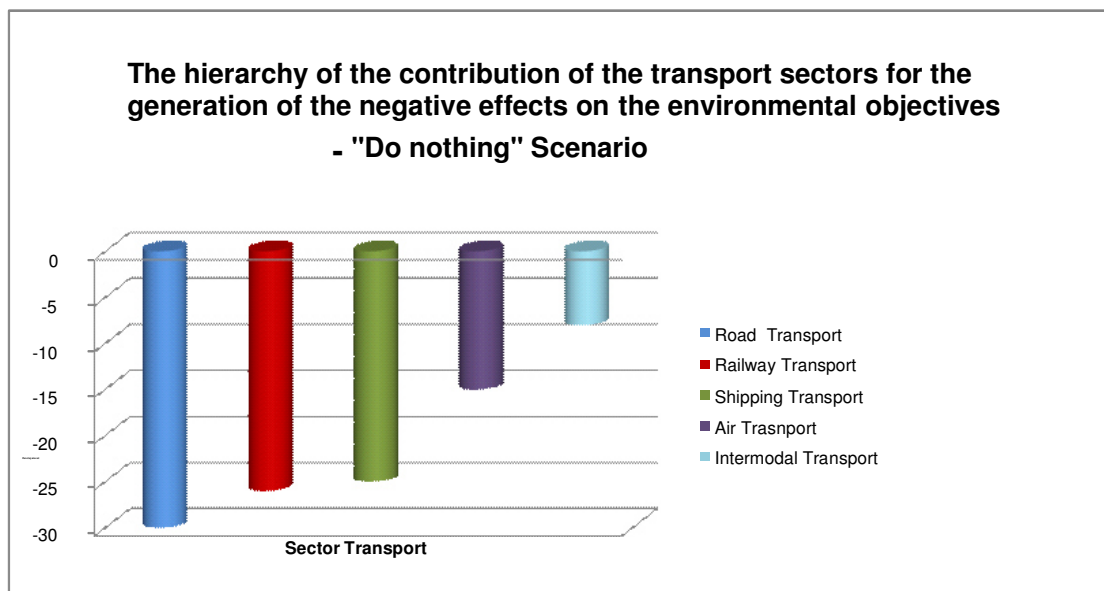
**Figure 8.1 Share potential effects on environmental objectives - *Do Nothing Scenario***

The road transport will have the most negative effects on the relevant environmental objectives, followed by railway sector (Figure 8.2 and Figure 8.3). The intermodal transport is not so developed, its effects on environmental objectives is manifested mainly in making use of road freight transport (containers) in expense of other modes of transport. The rail intermodal has difficulties regarding travel times and transport deadlines failure. The negative effects associated with the transport sector on the related environmental objectives established (climate change, air, waste management and hazardous substances) are reduced.

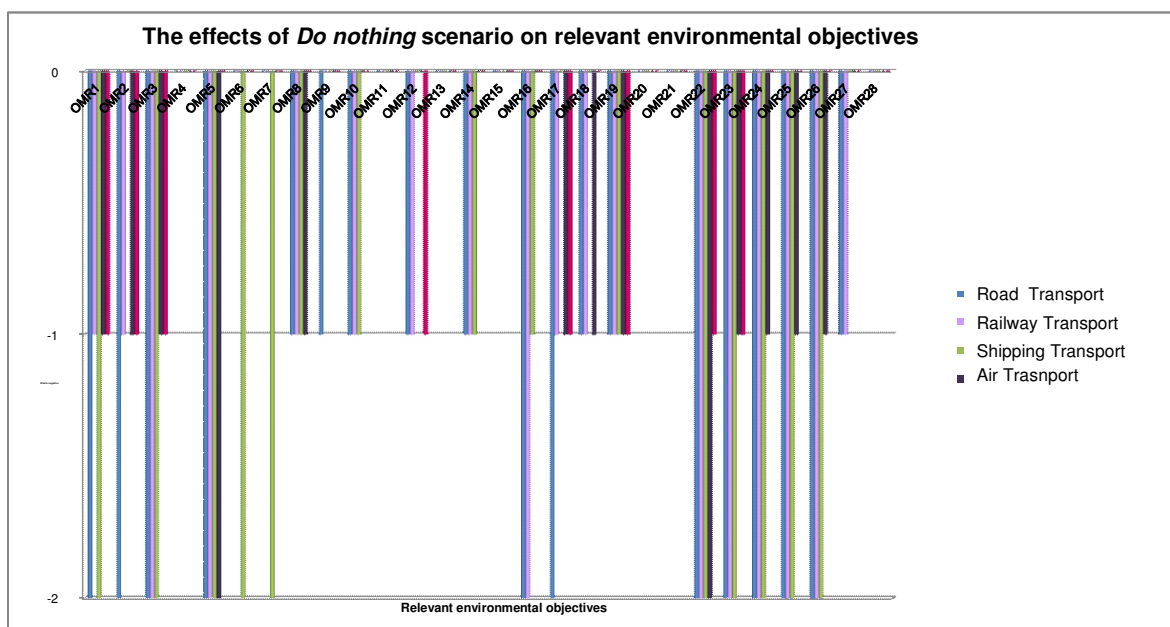


**Figure 8.2 Type of effects generated by *Do nothing Scenario* on environmental objectives**

The following chart shows the hierarchy based on their score bet on the contribution of each sector of transport on the degree of accomplishment of the environmental objectives (in this case are just the negative effects of transport sectors on the relevant environmental objectives).



**Figure 8.3 Hierarchy of the contribution of the transport sectors on the environmental objectives – „Do nothing” Scenario**

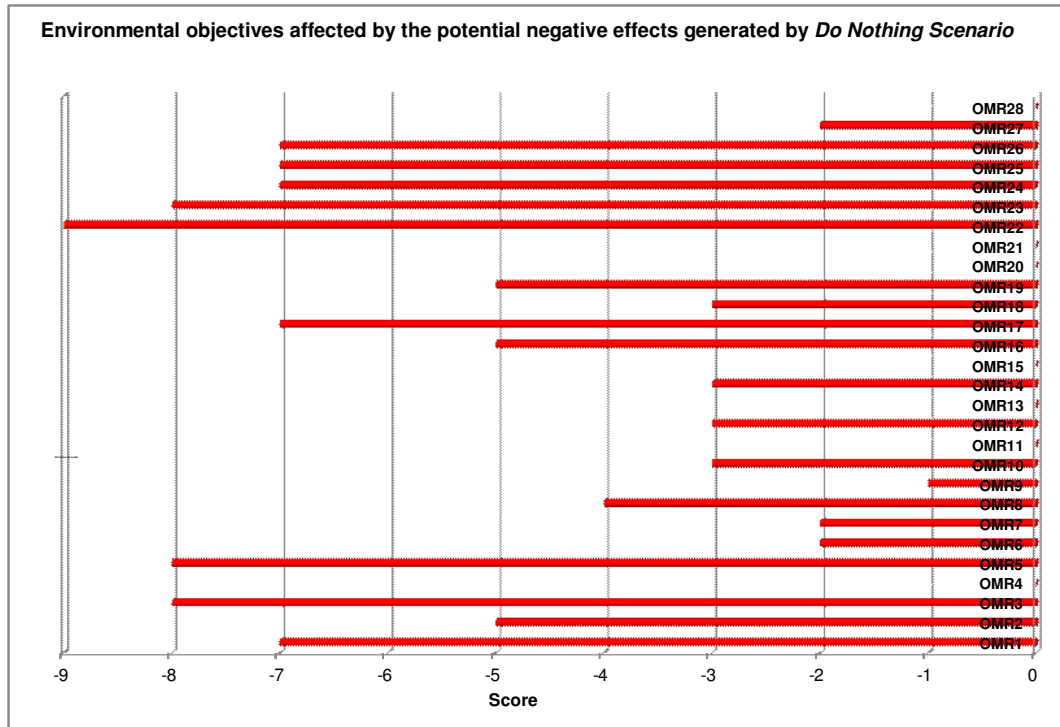


**Figure 8.4 The effects of „Do nothing” Scenario on the environmental objectives, on modes of transport**

By no interference, the *“Do nothing” Scenario* will have the most significant negative effects on the environmental objectives established for air, climate change, water, population and human health protection, sustainable transport, energy efficiency and conservation of natural resources (REO1, REO 2, REO 3 REO 5 REO 6, REO 7, REO 16, REO 17 REO 22, REO 23, REO 24, REO 25, REO 26) both for each transport sector and also cumulative (cumulative effect was evaluated by

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

summing the scores for each objective separately for each mode of transport - road, rail, water, intermodal) - see Figure 8.4 and Figure 8.5.



**Figure 8.5 Cumulative effect on the environmental objectives - „Do nothing” Scenario**

## 8.2. Potential significant environmental effects - "Do Minimum" (Reference Case) Scenario

This scenario takes into account projects that are being implemented and have already funding sources. The *"Do Minimum" (Reference Case) Scenario* does not propose projects for intermodal transport (in this case intermodal transport sector will have no effect on environmental objectives).

For the vast majority of these projects was already developed the procedure of environmental impact assessment (there are already issued by the competent environmental authority the decisions or environmental agreements, establishing the conditions for implementation).

The allocation of the score for each objective took into account the fact that for the potential negative effects on environmental aspect, were established measures to reduce / limit / avoid impact. By implementing these measures is considered that negative effects are diminished.

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



**Table 8.3. The potential significant environmental effects – Do minimum Scenario**

Environmental factor	Justification of the potential significant environmental effects identified - "Do minimum" Scenario	Score			
Air	<p>The "Do Minimum" (Reference Case) Scenario induced changes are favorable, but they are not major comparing to "Do nothing" Scenario related to adverse effects on the environmental objectives established for air.</p> <p>Reference Case Scenario encourages the development / improvement of road infrastructure and road transport demand remains high for both passenger and freight. This scenario includes a number of modernization projects, road rehabilitation roads, construction of new road corridors (bypass the settlements, sections of motorway).</p> <p>The construction of settlements and bypass motorway sections will help to reduce the amount of emissions into the atmosphere in large urban areas, by diverting heavy traffic and reduce congestion, increase travel speed. Increasing interconnectivity between cities by road sector, increasing travel long distances using road transport sector will maintain a high contribution of the transport sector to total emissions of pollutants in the atmosphere at a national level. The availability of improved transport routes quality induce increased emissions to atmosphere compared to "Do Minimum" Scenario, following the mileage of the vehicle, but at the localities level it is expected to be reduced the air pollutant emissions due to the takeover by new routes on existing traffic.</p> <p>By developing the reference scenario it is expected to be registered an increase in total daily travels for road transport. The proposed projects in the Baseline Scenario and the competitiveness of rail will not grow enough in comparison with that of road transport. Travel times are not significantly improved or transport conditions nationwide. Instead, the electrification of railway lines will reduce emissions of pollutants into the atmosphere produced by using this mode of transport.</p> <p>The modernization and rehabilitation of transport infrastructure can lead to increased air traffic contributing in this way to increase of the emissions of pollutants into the atmosphere while maintaining negative effect on air quality.</p> <p>By the development of the reference scenario is projected a significant increase, compared to 2011, of the total number of domestic air passengers. The air transport contribution to total emissions of pollutants in the atmosphere will continue grow.</p>	<b>Objective environmental / transport sector</b>	<b>REO1</b>	<b>REO2</b>	
		Road transport	-2	-2	
		Railway transport	-1	-1	
		Shipping transport (ports and navigation channels)	-2	0	
		Air transport	-1	-1	
		Intermodal Transport	-1	-1	
		Total	-7	-5	
		REO.1. Reducing national pollutant emissions into the atmosphere generated by the transport sector (COx, NOx, SO2, particulates, heavy metals, VOCs, PAHs)			
		REO.2 Minimization of the impact of transport on air quality in urban and rural			
Climate change	Reference case scenarios encourage road sector, the proposed projects will contribute to the development / improvement of road transport network, will lead to increased requirement for road transport for both freight and passenger. The increase in traffic will also increase the amount of fuel used, which leads to increased greenhouse gases emissions, maintaining high transport sector's contribution to total emissions of greenhouse gases.	<b>Environmental objective</b>	<b>REO 3</b>	<b>REO4</b>	<b>REO5</b>
		Road transport	-2	0	-2
		Railway transport	-2	0	-2
		Water transport (ports and navigation channels)	-2	0	-2

**Table 8.3. The potential significant environmental effects – Do minimum Scenario**

Environmental factor	Justification of the potential significant environmental effects identified - "Do minimum" Scenario	Score																															
	<p>It is difficult to estimate the effect of this scenario the goal of increasing the use of alternative fuel. Improvement and development of road transport network will facilitate transport and thus increase the demand for fuel, but the introduction of alternative fuels depends on other factors: economic, legal means of stimulating, facilitating the introduction of alternative fuels and vehicles that permit the use of these fuels and so on.</p> <p>It is considered that this scenario could have minor adverse effects on the objective of reducing the vulnerability of transport infrastructure to the effects of climate change. Projects for modernization, rehabilitation, expansion of road transport infrastructure, i.e. rail to improve Danube navigation conditions proposed in this scenario include measures to adapt to climate change conditions. For example, measures to reduce erosion, flood protection, water run, rehabilitation of port structures, improving transport routes and traffic flow etc. These measures may not be sufficient, so research studies are needed to determine the impact of climate change on various sectors of transport, identifying vulnerable areas and the subsequent application of the best available measures and regulations regarding standards in design and type of materials used for construction of transport infrastructure, thus making them more resistant.</p>	<table><tr><td>Air transport</td><td>-1</td><td>0</td><td>-2</td></tr><tr><td>Intermodal transport</td><td>-1</td><td>0</td><td>0</td></tr><tr><td><b>Total</b></td><td>-8</td><td>0</td><td>-8</td></tr></table> <p>REO.3. Reduction of greenhouse gas emissions from transport</p> <p>REO.4. Improving the efficiency of the fuel used</p> <p>REO.5. Reducing vulnerability of transport infrastructure to climate change (floods, extreme weather conditions, high temperature / low, landslides etc.).</p>				Air transport	-1	0	-2	Intermodal transport	-1	0	0	<b>Total</b>	-8	0	-8																
Air transport	-1	0	-2																														
Intermodal transport	-1	0	0																														
<b>Total</b>	-8	0	-8																														
Water	<p>Navigation can have potential negative effects on watercourses and waterways causing hydromorphological alterations, requiring monitoring programs for the development of some mitigation measures.</p> <p>The proposed projects for waterways and ports (ports modernization, improvement of navigation, water quality monitoring systems, systems acquisition and processing waste from ships and port areas interventions) will help to mitigate the effects of the transport sector on water quality.</p> <p>For the proposed projects for road, rail, air, according to information provided in regulatory documents that establish the conditions of implementation (environmental agreements, decisions framing stages), were taken all necessary measures to achieve their effect on surface water quality and underground or on the hydrological regime and morphological, so that can be minimal.</p> <p>Improving the navigation conditions, modernization of ports may lead to increased shipping traffic and increased risk of accidents (accidental pollution). Providing navigation channel and appropriate signs actions will help reduce the risk of accidents during freight transportation.</p>	<table><tr><th>Environmental objective</th><th>REO6</th><th>REO7</th><th>REO8</th></tr><tr><td>Road transport</td><td>0</td><td>0</td><td>-1</td></tr><tr><td>Railway transport</td><td>0</td><td>0</td><td>-1</td></tr><tr><td>Water transport (ports and navigation channels)</td><td>-2</td><td>-2</td><td>-1</td></tr><tr><td>Air transport</td><td>0</td><td>0</td><td>-1</td></tr><tr><td>Intermodal transport</td><td>0</td><td>0</td><td>0</td></tr><tr><td><b>Total</b></td><td>-2</td><td>-2</td><td>-4</td></tr></table> <p>REO.6. Preventing damage to surface water bodies and groundwater</p> <p>REO.7. Reducing changes in morphology and hydrology of surface water bodies</p>				Environmental objective	REO6	REO7	REO8	Road transport	0	0	-1	Railway transport	0	0	-1	Water transport (ports and navigation channels)	-2	-2	-1	Air transport	0	0	-1	Intermodal transport	0	0	0	<b>Total</b>	-2	-2	-4
Environmental objective	REO6	REO7	REO8																														
Road transport	0	0	-1																														
Railway transport	0	0	-1																														
Water transport (ports and navigation channels)	-2	-2	-1																														
Air transport	0	0	-1																														
Intermodal transport	0	0	0																														
<b>Total</b>	-2	-2	-4																														

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 8.3. The potential significant environmental effects – Do minimum Scenario**

Environmental factor	Justification of the potential significant environmental effects identified - "Do minimum" Scenario	Score																												
	Periodic maintenance works required to accommodate navigation (dredging) have minor negative effects on water quality, on a short period of time, are reduced in size compared to the usual size of the bed, manifests usual limited in space and are usually reversible.	REO.8. Prevent / limit intake of pollutants into surface water and groundwater																												
Soil and underground	<p>This scenario generates less negative impacts on the environmental objectives established for the soil and subsoil.</p> <p>The projects of modernization and construction of new road corridors, will lead to changes in the land use category. The type of land on which these investments are generally proposed for use: arable land, pastures, orchards, forests.</p> <p>By improving transport infrastructure, increase transport safety will be reduced the risks of accidental pollution.</p> <p>It is considered that the effects of this scenario on improving the efficiency of land will not be noticeable. The proposed projects consist of rehabilitation / modernization of existing and proposed alignments us (bypasses, motorway), whose routes are already established and approved.</p>	<table><tr><th>Environmental objective</th><th>REO 9</th><th>REO 10</th><th>REO 11</th></tr><tr><td>Road transport</td><td>-1</td><td>-1</td><td>0</td></tr><tr><td>Railway transport</td><td>0</td><td>-1</td><td>0</td></tr><tr><td>Water transport (ports and navigation channels)</td><td>0</td><td>-1</td><td>0</td></tr><tr><td>Air transport</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Intermodal transport</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Total</td><td>-1</td><td>-3</td><td>0</td></tr></table> <p>REO.9. Reduce consumption of natural resources</p> <p>REO.10. Preventing and reducing pollution of soil and subsoil</p> <p>REO.11 transport infrastructure development correlated with improved efficient use of land</p>	Environmental objective	REO 9	REO 10	REO 11	Road transport	-1	-1	0	Railway transport	0	-1	0	Water transport (ports and navigation channels)	0	-1	0	Air transport	0	0	0	Intermodal transport	0	0	0	Total	-1	-3	0
Environmental objective	REO 9	REO 10	REO 11																											
Road transport	-1	-1	0																											
Railway transport	0	-1	0																											
Water transport (ports and navigation channels)	0	-1	0																											
Air transport	0	0	0																											
Intermodal transport	0	0	0																											
Total	-1	-3	0																											
Waste and hazardous waste management	<p>The Analyzed Scenario has insignificant negative effects on the objective of reducing the amount of waste generated (REO12). These effects are manifested especially during project development, requiring proper waste management programs (the fraction collection and disposal of waste, reuse where circumstances permit).</p> <p>Encouraging road transport sector may generate a volume of waste associated with such activities (waste such as end of life vehicles, waste oil, used batteries, tires etc.). Improving the transport infrastructure can help reduce expenses on repair of vehicles and the amount of waste resulting from the activity of maintenance.</p> <p>Improvement of the transport conditions for the road sector will increase demand for road transport freight default. Increasing traffic volumes can lead to congestion, safety</p>	<table><tr><th>Environmental objective</th><th>REO 12</th><th>REO 13</th></tr><tr><td>Road transport</td><td>-1</td><td>0</td></tr><tr><td>Railway transport</td><td>-1</td><td>0</td></tr><tr><td>Water transport (ports and navigation channels)</td><td>0</td><td>0</td></tr><tr><td>Air transport</td><td>0</td><td>0</td></tr><tr><td>Intermodal transport</td><td>-1</td><td>0</td></tr></table>	Environmental objective	REO 12	REO 13	Road transport	-1	0	Railway transport	-1	0	Water transport (ports and navigation channels)	0	0	Air transport	0	0	Intermodal transport	-1	0										
Environmental objective	REO 12	REO 13																												
Road transport	-1	0																												
Railway transport	-1	0																												
Water transport (ports and navigation channels)	0	0																												
Air transport	0	0																												
Intermodal transport	-1	0																												

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 8.3. The potential significant environmental effects – Do minimum Scenario**

Environmental factor	Justification of the potential significant environmental effects identified - "Do minimum" Scenario	Score				
	or security conditions affecting the transport of freight and risks of accidents occurrence.	Total		-3	0	
		REO.12. Reducing the amount of waste generated. REO.13. Increasing the amount of waste recycled and recovered in the transport sector				
Biodiversity	<p>The analyzed scenario has negative effects on protected natural areas. From the Reference Case Scenario list we can mention: modernization projects of roads, construction of bypasses or sections of motorway, railway rehabilitation projects crossing protected areas is needed in certain situations and clearing works (see also chapter features environment likely to be affected).</p> <p>According to information from the appropriate assessment study for DO Minimum Scenario, at least 30 projects intersect Sites of Community Importance (SCI) of Natura 2000 network, of which 2 naval projects, 5 railway projects and 23 road projects. If case of SPA's, 20 projects overlap with protected sites, and 2 naval projects, 4 railway projects and 14 road projects. The air infrastructure projects included in this scenario does not affect Natura 2000 sites.</p> <p>This projects proposes construction of crossing watercourses, which could adversely affect aquatic ecosystems (especially during construction).</p> <p>The negative effects on the environmental objectives established for this component have been identified in detail at project level. These projects were subjected to environmental assessment and / or appropriate assessment taking measures that impact on protected natural areas and biodiversity is minimal (measures have been proposed to facilitate the transition fauna, noise reduction, collection and treatment sewage, waste management, etc.). For the period of execution and operation are proposed, for biodiversity, monitoring programs applicable to crossed protected areas.</p>	Environmental objective	REO 14		REO 15	
		Road transport	-1		0	
		Railway transport	-1		0	
		Water transport (ports and navigation channels)	-1		0	
		Air transport	0		0	
		Intermodal transport	0		0	
		Total	-3		0	
		REO.14. Reducing pressure due to transportation infrastructure leading to impairment of natural habitats and biodiversity REO.15.Limitatation of deforested areas				
Population and human health	<p>The analyzed scenario may have minor positive effects on the environmental objectives established for the population and human health.</p> <p>By developing, modernizing and improving the transport network, transport will become safer, will increase the population mobility to certain areas. It will be reduced the number of road and rail accidents, but will still remain areas where the risk of accidents remains high.</p> <p>For the road sector, development of bypasses and motorway sections will allow diversion of heavy traffic outside localities, will reduce congestion, increase travel speeds, reduce fuel consumption. This will reduce emissions of pollutants into the</p>	Environmental objective	REO 16	REO 17	REO 18	REO 19
		Road transport	-2	-2	-1	-1
		Railway transport	-2	-1	-1	-1
		Water transport (ports and navigation channels)	-1	-1	0	-1

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 8.3. The potential significant environmental effects – Do minimum Scenario**

Environmental factor	Justification of the potential significant environmental effects identified - "Do minimum" Scenario	Score				
	<p>atmosphere and noise level within communities.</p> <p>The encouragement of the development of the road transport will also cause a greater volume of traffic and thus increased fuel consumption, which can increase the amount of pollutants in the atmosphere at a national level.</p> <p>By the development of the strategic noise maps for railways (one of the projects proposed in the reference case) will be possible to determine the areas most exposed to noise and may be proposed measures to reduce noise and protect public health.</p>	Air transport	0	0	-1	-1
		Intermodal transport	0	0	0	-1
		Total	-5	-5	-3	-5
		REO.16. Population protection against risks associated with road and rail accidents, increased passenger and freight transport safety REO.17. Protection of human health by improving environmental conditions by reducing the effects of transport on air quality REO.18. Reducing transport noise both at source and through mitigation measures so that overall exposure levels have minimal impact on human health REO.19. Increased mobility and accessibility				
Landscape and cultural heritage	<p>The transport infrastructure has a negative impact on the landscape; the construction of new alignments can lead to changes in the landscape (permanent occupation of areas of land clearing works, demolition, etc.). The proposed projects in the Reference Case Scenario comply with spatial plans, zoning plans and general urban plans. The Analyzed Scenario does not have adverse environmental effects on the established objectives for the landscape and cultural heritage. The proposed projects of the Reference Case Scenario do not affect cultural heritage and archaeological sites (according to decisions and environmental agreements issued by EPA's).</p> <p>Improving transport infrastructure may result in potential positive effects for valorization of the cultural and natural areas, facilitating access to certain heritage objectives. The increase of traffic for the road sector can increase greenhouse gas emissions of acidifying gases that could contribute to the deterioration of heritage objectives located close to transport routes.</p>	Environmental objective	REO 20	REO 21		
		Road transport	0	0		
		Railway transport	0	0		
		Water transport (ports and navigation channels)	0	0		
		Air transport	0	0		
		Intermodal transport	0	0		
		Total	0	0		
		REO.20. Protection of national cultural and natural heritage REO.21. Development of transport infrastructure taking into account management policies, landscape protection and planning				
Sustainable transport sector	<p>Applying this scenario would generate minor positive environmental effects on the established objectives for sustainable transport. The Reference Scenario will lead to the modernization and development of national transport infrastructure, the</p>	Environmental objective	REO 22	REO 23		

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 8.3. The potential significant environmental effects – Do minimum Scenario**

Environmental factor	Justification of the potential significant environmental effects identified - "Do minimum" Scenario	Score		
	development of the European network TEN-T, and increase of the safety requirements. It should however be noted that this scenario mainly proposes the development of road transport network, other modes of transport becoming less competitive. Encouraging the road transport will allow improvement of behavior in relation to the environment. The increasing demand for road transport for both passengers and freight, will remain high transport sector's contribution to total national emissions to the atmosphere.	Road transport	-2	-2
		Railway transport	-2	-2
		Water transport (ports and navigation channels)	-2	-2
		Air transport	-2	-1
		Intermodal transport	-1	-1
		<b>Total</b>	<b>-9</b>	<b>-8</b>
		REO.22. Modernization and development of national transport system so as to ensure the achievement of sustainable transport		
		REO.23. Improving transport behavior in relation to the environment		
<b>Energy efficiency</b>	Do Minimum Scenario will have reduced positive effects on the objective of reducing energy consumption. By upgrading, rehabilitation and development of the road transport network, the running speed will increase, thus the energy consumption will be reduced. The Improvement of the energy efficiency is related to the effects of climate change. The development of road transport will increase the demand for the use of road transport, which is responsible for high fuel consumption, particularly fossil fuels. Electrification of railway lines is a necessary step but in the current situation this approach will considerably reduce fossil fuel consumption since the electricity is produced using fossil fuels largely all. With the gradual change of energy sources, the overall effects will manifest to all electricity users.	<b>Environmental objective</b>	<b>REO 24</b>	<b>REO 25</b>
		Road transport	-2	-2
		Railway transport	-2	-2
		Water transport (ports and navigation channels)	-2	-2
		Air transport	-1	-1
		Intermodal transport	0	0
		<b>Total</b>	<b>-7</b>	<b>-7</b>
		REO.24. Improving energy efficiency in the transport sector by increasing the use of renewable energy resources and significantly reduce oil dependence		
		REO.25. Reducing energy consumption in the transport sector.		
<b>Conservation and efficient use of natural resources /</b>	Increased use of road transport to the detriment of other modes of transport will increase the consumption of fossil fuels, which will have a negative impact on the environmental objective set for this component.	<b>Environmental objective</b>	<b>REO 26</b>	
		Road transport	-2	
		Railway transport	-2	

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



**Table 8.3. The potential significant environmental effects – Do minimum Scenario**

Environmental factor	Justification of the potential significant environmental effects identified - "Do minimum" Scenario	Score		
<b>use of renewable resources</b>	In order to achieve the target set for this goal, will be necessary to be established measures for the marketing of alternative fuels, their use for other modes of transport and technological adaptation of vehicles for the use of these fuels.	Water transport (ports and navigation channels)	-2	
		Air transport	-1	
		Intermodal transport	0	
		<b>Total</b>	-7	
		REO.26. Reducing exploitation of exhaustible resources and facilitate the use of renewable		
<b>Raising awareness</b>	The development of road transport network will allow improving environmental behavior. It is estimated that the population will still prefer the use of road transport sector, having no other effective alternatives in terms of cost and travel time. Road transport is one of the activities that contribute significantly to total emissions of pollutants into the atmosphere and to the greenhouse gases emissions. Through this scenario implementation it is expected to be maintained the high demand for transport by car, which will cause a reduction in the use of public transport and rail transport. The public awareness on the effects on the environment and human health of proposed projects under this scenario was made also during the environmental impact evaluation procedure.	<b>Environmental objective</b>	<b>REO 27</b>	<b>REO 28</b>
		Road transport	-1	0
		Railway transport	-1	0
		Water transport (ports and navigation channels)	0	0
		Air transport	0	0
		Intermodal transport	0	0
		<b>Total</b>	-2	0
		REO.27. Informing and raising awareness about the effects of transport activities on the environment and human health risks and risks to human health .. REO.28. Involvement and consultation of stakeholders throughout the decision-making process in establishing and implementing the proposed measures to reduce environmental impact		

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

The share of the potential effects arising from the Reference Case Scenario on the relevant environmental objectives is: 32% negative effects (of which 36% are caused by the road transport sector, 27% are produced by the rail transport sector, 24% are produced by naval sector, 13% are produced by the air sector), 11% positive effects (of which 40% are generated by the road transport sector, 33% by the rail transport sector, 20% by naval sector, 13% by the air).

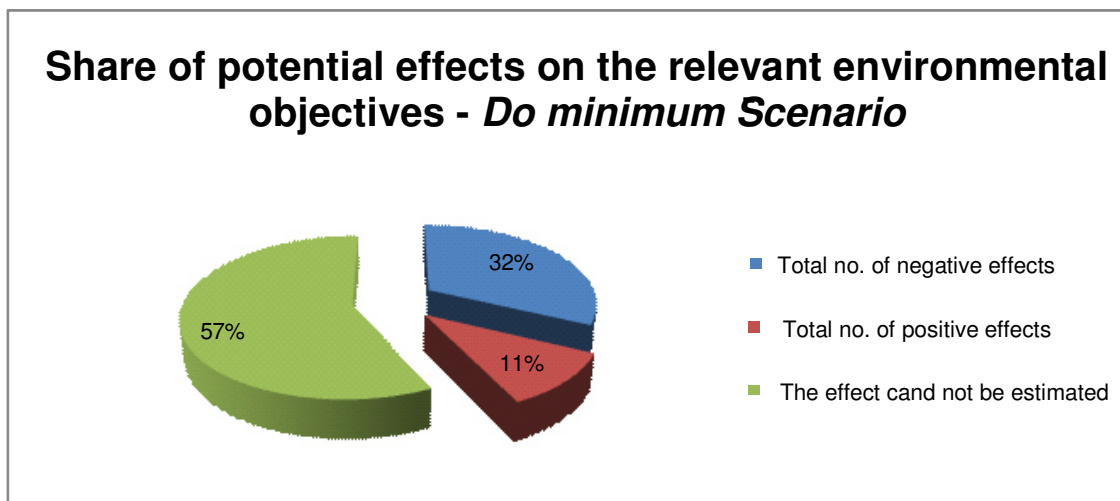


Figure 8.6 Share of potential effects on environmental objectives – *Do minimum Scenario*

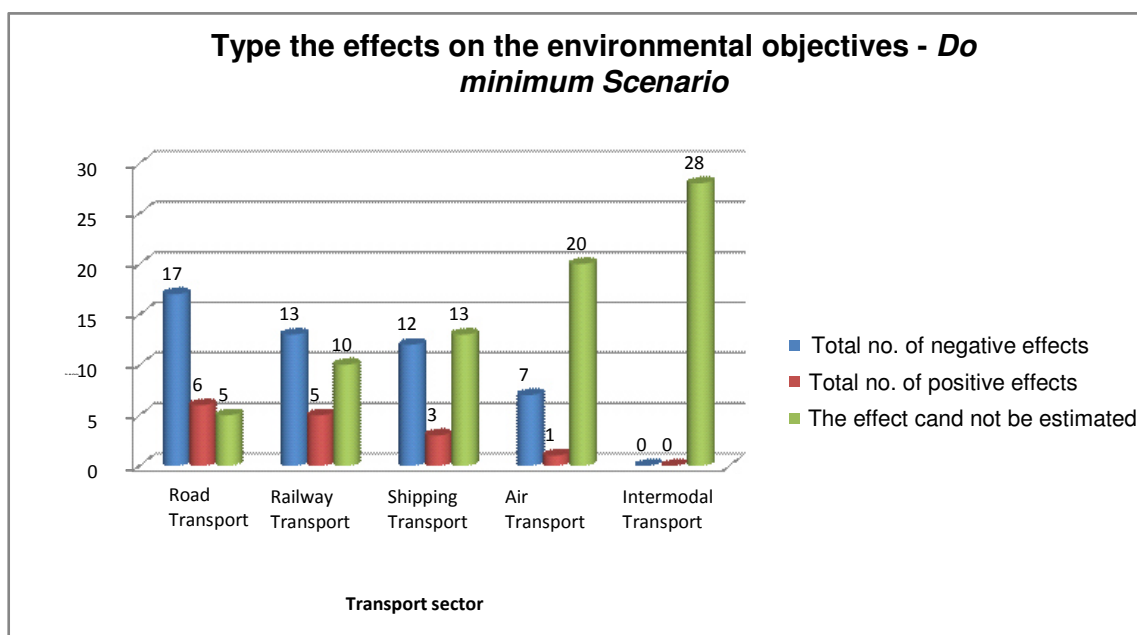
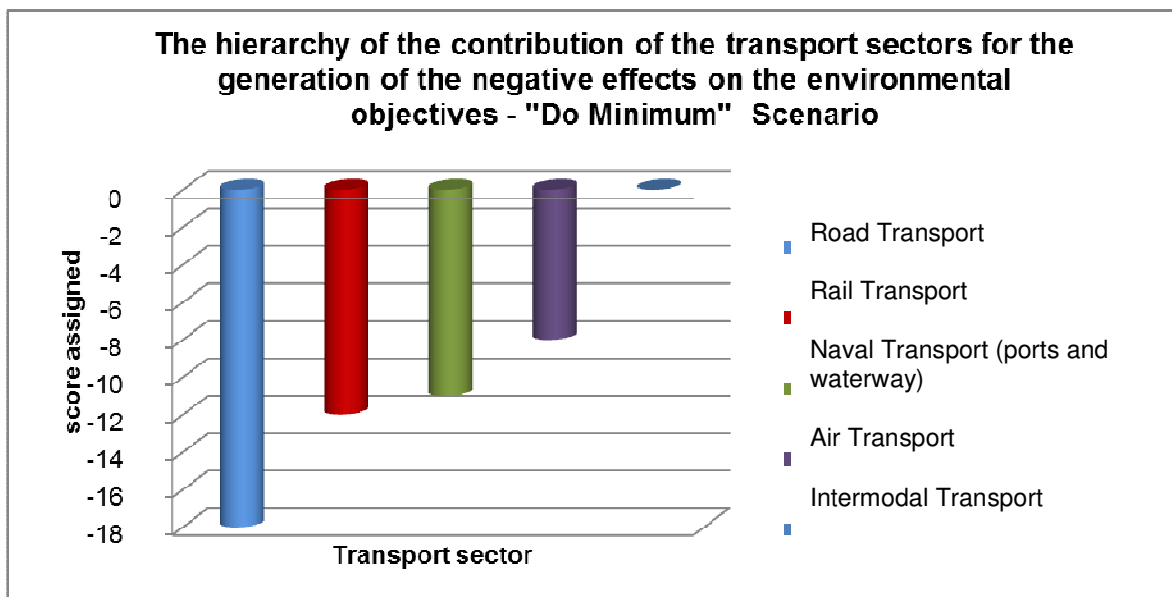


Figure 8.7 Type the effects on the environmental objectives - *Do minimum Scenario*

The Reference Scenario (does not propose projects for intermodal transport, so it can be considered that this transport mode is having no effect on the relevant environmental objectives).

The Reference Case Scenario (*Do minimum Scenario*) encourages the development of road transport sector, sector which will have potential negative effects on the environmental objectives established for air, climate change, energy efficiency, conservation of exhaustible resources. This

scenario, especially through the road sector, make it difficult to achieve the environmental objectives established without proposing additional measures to those already established in the design phase of the projects.

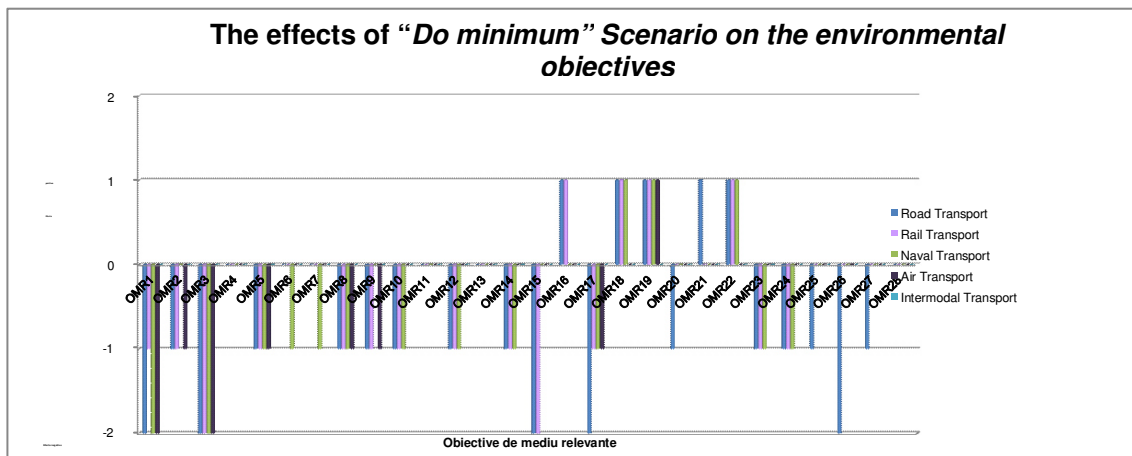


**Figure 8.8 Hierarchy contribution of the transport sectors on the environmental objectives – „Do minimum” Scenario**

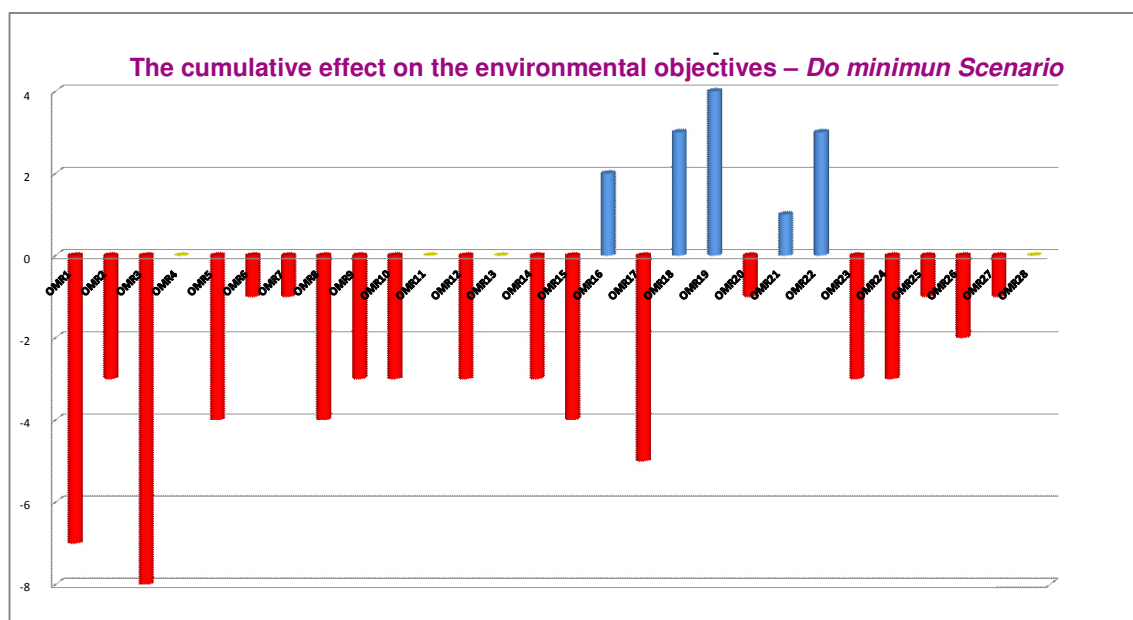
The share of potential negative effects will be much lower than in case of *Do Nothing Scenario* (32% versus 52%). The *"Do Minimum" Scenario* will have positive effects on the following environmental components:

- Population and human health (improving transport safety, reduce emissions of pollutants into the atmosphere locally, noise reduction, facilitating accessibility and enhance mobility between regions) - REO16, REO 17 - for road and rail sectors; REO 18, 19 - for the road, rail, water.
- Sustainable Transport (road improvements) - REO 22, road sector.
- Energy efficiency (fuel economy) - REO 25, for all modes of transport.
- Landscape and cultural heritage (development projects taking into account spatial plans, general urban plans and zoning) - REO 21, road sector.

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



**Figure 8.9 The effects of “Do minimum” Scenarios on the environmental objectives**



**Figure 8.10 The cumulative effect (for all type of transport sectors) of “Do minimum” Scenario on the environmental objectives**

For the "Do Minimum" Scenario cumulative effect has been evaluated by summing the scores for each objective, for each sector of transport (road, rail, and water, intermodal), the results being as follows:

- negative effects on environmental issues will air (REO1, REO 2), climate change (REO 3, REO 4, REO 5), water (REO 6, REO 7, REO 8), soil and subsoil (OMR9, OMR10), waste management and hazardous substances (REO12), biodiversity (REO 14, REO 15), landscape and national heritage (REO 20), sustainable transport (REO 23), energy

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

efficiency (REO 24), conservation and efficient use of natural resources / use of renewable resources (REO 26)

- Will have positive effects on environmental issues and human health population (REO 16, REO 18, REO 19), sustainable transport (REO 22), energy efficiency (REO 25), landscape and cultural heritage (REO 21).

### 8.3 Potential significant effects on the environment - development scenarios of the GTMP

These scenarios of the GTMP propose projects that will lead to:

- development of road transport infrastructure, extension of the motorways and expressways network;
- rail infrastructure development and improvement of rail transport (railway lines rehabilitation, modernization / replacement of rolling stock);
- increasing the competitiveness of rail transport sector;
- unlocking movement in Europe through the development of ports infrastructure in Romania, TEN-T, for optimal high quality;
- improvement of navigation on the Danube;
- development of intermodal transport sector;
- Improvements/rehabilitation of the airports.

The two development scenarios, analyzed by GTMP, are presented on this environmental report are:

- **"Do Something" (ES / EES) Development Scenario** was developed according to the requirements of the Tor's. This scenario includes a number of 120 projects (64 projects for the road sector - 8 motorway projects - 887 km, 17 projects including expressways and related variants bypass - 2241 km, 15 projects for implementation of bypass - 182 km, 24 projects for rehabilitation of existing roads - 3225 km; 16 projects for rail sector – improvement of the transport conditions on about 4536 km rail, intermodal sector 12 projects, 14 projects for the modernization of ports and naval -11 for 3 projects for inland navigation; 14 projects for the aviation sector). Implementation of these projects will be carried out on different time horizons, i.e. 2014 -2020, 2021-2030, by 2030.
- **"Core TEN-T" (CTT) Scenario** In addition to the terms of reference, AECOM team, at the request of the European Commission, conducted a further development scenario called "Core TEN-T" (CTT). This scenario, proposes, for the road sector, 10 motorway projects (1589 km of motorways) and 1 project regarding transport safety. For other sector of transport (rail, water, air and intermodal), prioritizing investments is similar to that developed in the proposed development scenario. Implementation of these projects will be carried out on different time horizons, i.e. 2014 - 2020, 2021-2030, by 2030.

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 8.4. The potential significant environmental effects - Scenario Development "Do Something" (ES / EES)**

Environmental aspect	The potential significant environmental effects Scenario Development "Do Something" (ES / EES)	Score																					
<b>Air</b>	<p>This scenario would have positive effects on the environmental objectives established for air.</p> <p>This scenario includes a number of 120 projects: 64 projects for the road sector - 8 motorway projects - 887 km, 17 projects including expressways and related bypasses - 2241 km, 15 bypass projects - 182 km, 24 projects for the rehabilitation of existing roads - 3225 km; 16 projects for railway sector – improvement of the transport conditions for about 4536 km; Intermodal sector 12 projects, 14 projects for the modernization of ports and naval -11 for 3 projects for inland navigation; 14 projects for the aviation sector.</p> <p>Extension of the network of motorways, express roads and by-passes will allow the detour of the settlements, which will determine a reduction in emissions of pollutants into the atmosphere locally, within the communities.</p> <p>We also have considered the fact that extension of motorways, express roads and by-passes will lead to reduced travel times, but also contributes to increasing the number of kilometers traveled (making longer trips,) as it becomes available a wider range of alternatives (as confirmed by the experiences and situations in other countries). Thus, it is estimated that the emissions of pollutants into the atmosphere will remain at a high level in particular for the road sector.</p> <p>During the construction phase, the proposed projects will have a direct negative effect on short-term on air quality caused by the emissions of the machinery / vehicles and construction equipment used.</p> <p>Improving the rail infrastructure (investment for the rehabilitation of railway lines, replacement of the rolling stock, electrification) will increase the competitiveness of the rail sector, facilitating growth of freight and passengers (especially for those without a car). By implementing the investments proposed within the development scenario is expected to be increased the average distances traveled, the number of passenger-km increases due to the improvement of the travel time go. The railway induces a specific lower emissions compared to road transport.</p> <p>Upgrades proposed for TEN-T related railway networks and developing network of motorways and express roads may induce a decrease in the requirement for air transport. It is expected therefore a decrease in the share of this sector in the amount of emissions into the atmosphere.</p> <p>By applying this scenario will increase the availability of freight on waterways.</p> <p>The proposed upgrades for TEN-T networks related to railway networks and developing network of motorways and express roads may induce a decrease in the requirement for air transport. Therefore, it is expected a decrease in the share of this</p>	<table> <tr> <th>Objective environmental / transport sector</th><th>REO1</th><th>REO2</th></tr> <tr> <td>Road transport</td><td>-2</td><td>2</td></tr> <tr> <td>Railway transport</td><td>-2</td><td>1</td></tr> <tr> <td>Shipping transport (ports and navigation channels)</td><td>-2</td><td>1</td></tr> <tr> <td>Air transport</td><td>-2</td><td>1</td></tr> <tr> <td>Intermodal Transport</td><td>0</td><td>1</td></tr> <tr> <td><b>Total</b></td><td><b>-8</b></td><td><b>6</b></td></tr> </table> <p>REO.1. Reducing national pollutant emissions into the atmosphere generated by the transport sector (COx, NOx, SO2, particulates, heavy metals, VOCs, PAHs)  REO.2 Minimization of the impact of transport on air quality in urban and rural</p>	Objective environmental / transport sector	REO1	REO2	Road transport	-2	2	Railway transport	-2	1	Shipping transport (ports and navigation channels)	-2	1	Air transport	-2	1	Intermodal Transport	0	1	<b>Total</b>	<b>-8</b>	<b>6</b>
Objective environmental / transport sector	REO1	REO2																					
Road transport	-2	2																					
Railway transport	-2	1																					
Shipping transport (ports and navigation channels)	-2	1																					
Air transport	-2	1																					
Intermodal Transport	0	1																					
<b>Total</b>	<b>-8</b>	<b>6</b>																					

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



**Table 8.4. The potential significant environmental effects - Scenario Development "Do Something" (ES / EES)**

Environmental aspect	The potential significant environmental effects Scenario Development "Do Something" (ES / EES)	Score																												
	sector in the amount of emissions into the atmosphere.																													
Climate change	<p>The development of road transport infrastructure (Motorways, express roads, bypasses) will favor an increase in the volume of traffic to serve the needs of the economy and population, with a corresponding increase in fuel consumption leading to an increase in greenhouse gas emissions. It is estimated that compared with the present situation, the amount of greenhouse gases emissions will increase, the improvement of road transport will reduce considerably the stops, increasing running speed, causing a decrease in fuel consumption for the same distance traveled by increasing efficiency fuel. The development of road transport infrastructure will facilitate the longer trips due to increased accessibility between the regions and thus increase the volume of transport for this sector compared to Reference Case Scenario.</p> <p>The improvement of rail transport and modernization of rolling stock (wagons, locomotives) will facilitate the growth of the transport sector for both passenger and freight sector. The contribution of this sector to the greenhouse gases emission is lower than the road sector.</p> <p>It is estimated that the availability of a more efficient land and sea transportation network, will induce a slight decline in demand for air transport, which will generate a positive effect on the objective of reducing greenhouse gases emissions. Air transport is generally an important consumer of fuel and can make a significant contribution to greenhouse gases emissions. Since 2013, the airline industry was included in the Emissions Trading through an amendment to Decision 2003/87 / EC was transposed into national legislation by GD nr.399 / 2010 which led involvement aviation operators in Romania in the implementation of measures and actions to reduce emissions of greenhouse gases.</p> <p>Although the general trend of energy consumption even for transport is rather dictated by economic development as a whole, than the quality of transport infrastructure, however improving intermodal transport can provide competitive conditions appropriate to all modes of transport, ensuring sustainable modes of transfer to transport, contributing to some extent to the Romanian and European objectives on climate change.</p> <p>An important role for the minimization of the effects on the REO 4, has the fuel suppliers who needs to be stimulated to introduce on the market fuels containing biofuels, the vehicles providers, which must adapt the technology of the vehicles to the fuels introduced on the market and, also the improvement of the transport infrastructure. Policy measures are needed to increase the efficiency of fuel use in</p>	<table><tr><th>Environmental objective</th><th>REO 3</th><th>REO4</th><th>REO5</th></tr><tr><td>Road transport</td><td>-2</td><td>0</td><td>1</td></tr><tr><td>Railway transport</td><td>-2</td><td>0</td><td>1</td></tr><tr><td>Water transport (ports and navigation channels)</td><td>-2</td><td>0</td><td>1</td></tr><tr><td>Air transport</td><td>-2</td><td>0</td><td>1</td></tr><tr><td>Intermodal transport</td><td>0</td><td>0</td><td>1</td></tr><tr><td>Total</td><td>-8</td><td>0</td><td>5</td></tr></table> <p>REO.3. Reduction of greenhouse gas emissions from transport REO.4. Improving the efficiency of the fuel used REO.5. Reducing vulnerability of transport infrastructure to climate change (floods, extreme weather conditions, high temperature / low, landslides etc.).</p>	Environmental objective	REO 3	REO4	REO5	Road transport	-2	0	1	Railway transport	-2	0	1	Water transport (ports and navigation channels)	-2	0	1	Air transport	-2	0	1	Intermodal transport	0	0	1	Total	-8	0	5
Environmental objective	REO 3	REO4	REO5																											
Road transport	-2	0	1																											
Railway transport	-2	0	1																											
Water transport (ports and navigation channels)	-2	0	1																											
Air transport	-2	0	1																											
Intermodal transport	0	0	1																											
Total	-8	0	5																											

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 8.4. The potential significant environmental effects - Scenario Development "Do Something" (ES / EES)**

Environmental aspect	The potential significant environmental effects Scenario Development "Do Something" (ES / EES)	Score			
	the transport sector, which will have indirect effects of reducing greenhouse gases emissions. In addition, increasing the share of electric vehicles will have significant positive effects only in conjunction with measures to ensure the increase of the renewables energy share in the energy industry. Implementing this scenario would have positive effects also on environmental objective REO 5 For new projects can be proposed, since the planning stage, constructive measures for adaptation to climate change (these will be presented in Chapter <i>Measures</i> ).				
<b>Water</b>	The works for the improvement of navigation conditions, modernization / development of port infrastructure can help reduce the risk of accidents during transport or during handling goods. Although these works are estimated by an increase in shipping traffic, increasing safety due to better navigation conditions are expected to reduce the incidence of accidents. Improving navigation conditions will not eliminate all required maintenance dredging works of the fairway, but it is estimated that this will be reduced in terms of the volume and range of achievement. These types of works can have negative effects on water quality and aquatic ecosystems, which occur on short time, on some restricted areas. The works for Bucharest-Danube navigation canal may have effects on aquatic ecosystems and can lead to changes in the morphology and hydrology of the surface waters. Development of transport infrastructure will improve road and rail transport safety, reducing the risk of accidents during freight transport. To reduce and control pollution is necessary, at the completion of these projects, to establish and implement environmental measures: discharge, treatment and disposal of storm water, technological wastewater discharge from maintenance activities etc.	<b>Environmental objective</b>	<b>REO6</b>	<b>REO7</b>	<b>REO8</b>
		Road transport	1	-1	0
		Railway transport	1	-1	0
		Water transport (ports and navigation channels)	1	-2	0
		Air transport	1	0	0
		Intermodal transport	1	0	0
		<b>Total</b>	<b>5</b>	<b>-4</b>	<b>0</b>
		REO.6. Preventing damage to surface water bodies and groundwater REO.7. Reducing changes in morphology and hydrology of surface water bodies REO.8. Prevent / limit intake of pollutants into surface water and groundwater			
<b>Soil and underground</b>	This scenario has negative effects on objective related to the reduction of the degree of damage to the ecological functions of soil, but it is estimated that the effects will be reduced. The proposed projects will increase permanent occupancy of land (due to new road construction road corridors, features and objectives related to transport infrastructure). By improving transport infrastructure and transport conditions will improve safety of transport activities and therefore will reduce the risks of accidental pollution. By increasing the competitiveness of all sectors of transport, will increase the growth of potential emissions of pollutants into the atmosphere, in relation to economic development, having positive impact on pollutant emissions and hence the tendency	<b>Environmental objective</b>	<b>REO 9</b>	<b>REO 10</b>	<b>REO 11</b>
		Road transport	-1	1	1
		Railway transport	-1	1	1
		Water transport (ports and navigation channels)	0	0	0

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 8.4. The potential significant environmental effects - Scenario Development "Do Something" (ES / EES)**

Environmental aspect	The potential significant environmental effects Scenario Development "Do Something" (ES / EES)	Score																					
	induced by soil acidification. By developing these projects, taking into account spatial plans, general urban plans and zoning, can be optimized the efficient use of land in the targeted areas.	<table><tr><td>Air transport</td><td>-1</td><td>1</td><td>1</td></tr><tr><td>Intermodal transport</td><td>0</td><td>1</td><td>1</td></tr><tr><td><b>Total</b></td><td>-3</td><td>4</td><td>4</td></tr></table> <p>REO.9. Reduce the consumption of natural resources REO.10. Preventing and reducing pollution of soil and subsoil REO.11 Transport infrastructure development correlated with improved efficient use of land</p>	Air transport	-1	1	1	Intermodal transport	0	1	1	<b>Total</b>	-3	4	4									
Air transport	-1	1	1																				
Intermodal transport	0	1	1																				
<b>Total</b>	-3	4	4																				
<b>Waste and hazardous substances management</b>	Development of transport infrastructure and transport increased activity may have adverse effects on the objective of reducing the amount of waste generated (REO12). These effects are manifested especially during project development, requiring appropriate waste management programs (limitation of waste, recycling, reuse of waste where the situation permits, collection and disposal selective). Enhancing transport activity can lead to the generation of waste associated with this activity. By serving the needs of economic development and transport, induced by population needs, the improving of transport infrastructure will facilitate an increase of the volume of traffic and hazards associated with the accidents involving transport of hazardous substances. In exchange, the likelihood of accidents reported to the mileage, is reduced in proportion to the increase in the safety provided by the proposed transport infrastructure. Modernization and improvement of transport infrastructure will increase the safety and security of transport and also the transport of dangerous goods (for all transport sectors).	<table><tr><th>Environmental objective</th><th>REO 12</th><th>REO 13</th></tr><tr><td>Road transport</td><td>-1</td><td>0</td></tr><tr><td>Railway transport</td><td>-1</td><td>0</td></tr><tr><td>Water transport (ports and navigation channels)</td><td>-1</td><td>0</td></tr><tr><td>Air transport</td><td>-1</td><td>0</td></tr><tr><td>Intermodal transport</td><td>-1</td><td>0</td></tr><tr><td><b>Total</b></td><td>-5</td><td>0</td></tr></table> <p>REO.12. Reducing the amount of waste generated. REO.13. Increasing the amount of waste recycled and recovered in the transport sector</p>	Environmental objective	REO 12	REO 13	Road transport	-1	0	Railway transport	-1	0	Water transport (ports and navigation channels)	-1	0	Air transport	-1	0	Intermodal transport	-1	0	<b>Total</b>	-5	0
Environmental objective	REO 12	REO 13																					
Road transport	-1	0																					
Railway transport	-1	0																					
Water transport (ports and navigation channels)	-1	0																					
Air transport	-1	0																					
Intermodal transport	-1	0																					
<b>Total</b>	-5	0																					
<b>Biodiversity</b>	Activity of transport and the works for development of transport infrastructure may have a negative impact on protected natural areas, biodiversity. The effects are manifested in particular by: <ul style="list-style-type: none"><li>- Conversion of land (occupation of land areas of the protected areas, the objectives of transport infrastructure);</li><li>- Fragmentation of natural protected areas and connectivity interruption (through new alignments transport);</li><li>- Restriction or elimination of certain types of habitats or ecosystems in areas where developing transport infrastructure;</li><li>- Changes in terms of population density and distribution of wild fauna and flora</li></ul>	<table><tr><th>Environmental objective</th><th>REO 14</th><th>REO 15</th></tr><tr><td>Road transport</td><td>-2</td><td>-1</td></tr><tr><td>Railway transport</td><td>-1</td><td>-1</td></tr><tr><td>Water transport (ports and navigation channels)</td><td>-2</td><td>0</td></tr><tr><td>Air transport</td><td>0</td><td>0</td></tr><tr><td>Intermodal</td><td>0</td><td>0</td></tr></table>	Environmental objective	REO 14	REO 15	Road transport	-2	-1	Railway transport	-1	-1	Water transport (ports and navigation channels)	-2	0	Air transport	0	0	Intermodal	0	0			
Environmental objective	REO 14	REO 15																					
Road transport	-2	-1																					
Railway transport	-1	-1																					
Water transport (ports and navigation channels)	-2	0																					
Air transport	0	0																					
Intermodal	0	0																					

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 8.4. The potential significant environmental effects - Scenario Development "Do Something" (ES / EES)**

Environmental aspect	The potential significant environmental effects Scenario Development "Do Something" (ES / EES)	Score				
	<p>(due to traffic noise, emission of pollutants and gases in the atmosphere);</p> <ul style="list-style-type: none"><li>- Accidental pollution, particularly on the Danube and the Black Sea caused by the uncontrolled discharge of ships and / or shipping accidents;</li><li>- Increasing the volume of waste associated with construction activity of transport infrastructure and enhancing transport activity.</li></ul> <p>Appropriate assessment study shows, that a part of the projects included in the Development Scenario (ES / EES) intersects protected natural areas belonging to the Natura 2000 network. The list of the projects that cross these protected areas are presented in <i>Appendix 5B -C</i>.</p> <p>The Individual assessment of the projects is required, and also detailed planning of the projects and specific measures to prevent and reduce the impact caused by transport infrastructure development as due to increased transport activity (these are described in <i>Chapter Measures</i>). Setting the alignments we must do so to avoid possible crossing of protected natural areas and to limit the percentage of land affected, as the deforested areas.</p> <p>Without applying appropriate measures without imposing restrictions (described in <i>Chapter Measures</i>), this scenario can have a negative impact on the environmental objectives established for this component.</p> <p>Effects may occur in case of road, rail (which are proposed alignments for us), water (maintenance and improvement of navigation conditions) and intermodal sector (the last sector indirectly by combining modes of transport and their transfer potentiation). Taking into account the issues rose for the environmental air, climate change, waste management and hazardous substances, water, from this perspective it is estimated that projects proposed under this scenario will improve the current state of the environment.</p>	transport				
		Total	-5	-2		
		REO.14. Reducing pressure due to transportation infrastructure leading to impairment of natural habitats and biodiversity				
		REO.15.Limitation of deforested areas				
Population and human health	<p>The scenario analyzed will have positive effects on all direct environmental objectives established on population and human health.</p> <p>Transport will become safer by improving conditions and transport infrastructure, so that a decline in the incidence of accidents. By making the bypass, motorways, railways high speed, improve navigation conditions, modernization of ports, these measures of development and modernization of transport infrastructure will improve mobility and accessibility in different regions.</p> <p>Accidents that occur on the road network and the distribution of passenger traffic depend on different types of roads. For example, the accident rate, expressed as the number of accidents per million vehicle kilometers traveled is significantly lower on motorways / expressways than on motorways, especially due to the high degree of</p>	Environmental objective	REO 16	REO 17	REO 18	REO 19
		Road transport	2	2	2	2
		Railway transport	2	1	2	2
		Water transport (ports and navigation channels)	2	2	2	2
		Air transport	1	1	2	2

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 8.4. The potential significant environmental effects - Scenario Development "Do Something" (ES / EES)**

Environmental aspect	The potential significant environmental effects Scenario Development "Do Something" (ES / EES)	Score				
	<p>protection of the meanings given away and separated intersections uneven. In case of a scenario with an increased number of kilometers, is expected to reduce the risk of accidents and hence the number of traffic accidents by taking the county and national roads less safe, safer roads: motorways / expressways.</p> <p>The significant increase of the running speeds on motorways, on a number of corridors through doubling the major motorways and expressways network in 2020 will favor a greater interaction between major cities and will increase the number of long distance travel (general increase mileage of vehicles). Increase of the revenue and reduce operating costs of cars will increase travel distances which may contribute to higher levels of noise and air pollution at regional level in parallel with a decrease in these forms of pollution within communities.</p> <p>The implementation of this scenario will reduce these forms of pollution comparing to the present situation at existing national level through improved infrastructure, transport conditions and shortening of the time needed to arrive to destination, and reducing specific fuel consumption.</p> <p>The positive effects on human health by improving air quality are favored by:</p> <ul style="list-style-type: none"> <li>– Rehabilitation of railway lines, replacing old rolling stock (wagons, locomotives) will increase the share of rail transport for passengers and cargo, the rail transport being less polluting than road transport.</li> <li>– Waterways will be a more efficient way to transport goods in bulk or volume of containers over long distances at low cost. The advantages of inland waterway transport are given by the reduced impact on air emissions.</li> </ul> <p>The projects proposed by this scenario should provide measures for reducing noise in areas likely to be affected mainly by road and rail traffic. Measures are needed to maintain the level of noise in areas adjacent to existing transport infrastructure (roads, railways, ports, airports, intermodal hubs).</p> <p>The proposed investments in this scenario will have a significant positive effect on increasing accessibility and mobility (objective REO 19). It will increase accessibility to peripheral areas of Romania, such as the north-east, along the corridor Buzau, Iasi. The same can be observed for areas in the northeast side of the country, Cluj / Targu Mures, and in the western area in the vicinity of Timisoara. The western and central areas of Romania will benefit from significant increases in accessibility to markets and job opportunities outside, demonstrating success in helping Romania to improve the competitiveness on the regional and European markets.</p>	<b>Total</b>	7	6	10	10
<b>Landscape and cultural heritage</b>	Development of transport infrastructure can have a negative impact on the landscape. Construction of new road alignments or various objectives related to	<b>Environmental objective</b>	<b>REO 20</b>	<b>REO 21</b>		

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 8.4. The potential significant environmental effects - Scenario Development "Do Something" (ES / EES)**

Environmental aspect	The potential significant environmental effects Scenario Development "Do Something" (ES / EES)	Score																					
	<p>transport infrastructure (parking, terminal, maintenance centers service areas, railway stations) may lead to changes in the landscape (permanent occupation of areas of land clearing works, works demolition etc.). It is necessary to provide measures to mitigate the effects that should be implemented in parallel with the planning and construction of transport infrastructure. It is also necessary to provide measures to enable the development of transport infrastructure taking into account management policies, landscape protection and landscaping.</p> <p>The implementation of this scenario is expected to generate the improvement of the trend of increasing emissions of acidifying gases and thus improve the deterioration of heritage objectives located on the routes or in the vicinity of the transport infrastructure.</p> <p>In terms of sustainable management by facilitating access to certain areas, improving the transport infrastructure can generate potential positive effects, in terms of cultural and / or natural heritage recovery targets.</p>	<table> <tr> <td>Road transport</td><td>0</td><td>0</td></tr> <tr> <td>Railway transport</td><td>0</td><td>0</td></tr> <tr> <td>Water transport (ports and navigation channels)</td><td>0</td><td>0</td></tr> <tr> <td>Air transport</td><td>0</td><td>0</td></tr> <tr> <td><b>Total</b></td><td><b>0</b></td><td><b>0</b></td></tr> </table> <p>REO.20. Protection of national cultural and natural heritage</p> <p>REO.21. Development of transport infrastructure taking into account management policies, landscape protection and planning</p>	Road transport	0	0	Railway transport	0	0	Water transport (ports and navigation channels)	0	0	Air transport	0	0	<b>Total</b>	<b>0</b>	<b>0</b>						
Road transport	0	0																					
Railway transport	0	0																					
Water transport (ports and navigation channels)	0	0																					
Air transport	0	0																					
<b>Total</b>	<b>0</b>	<b>0</b>																					
<b>Sustainable transport sector</b>	<p>The implementation of this scenario would have positive effects in terms of the environmental objectives established for sustainable transport.</p> <p>The proposed projects will contribute to the modernization and development of transport services, increasing competitiveness between transport sectors, will facilitate economic and social development at local, regional and national level, will help reduce the environmental impact (reducing emissions of pollutants and gas greenhouse), reducing overall impacts of transport</p>	<table> <tr> <th>Environmental objective</th><th>REO 22</th><th>REO 23</th></tr> <tr> <td>Road transport</td><td>2</td><td>-1</td></tr> <tr> <td>Railway transport</td><td>2</td><td>1</td></tr> <tr> <td>Water transport (ports and navigation channels)</td><td>2</td><td>1</td></tr> <tr> <td>Air transport</td><td>2</td><td>1</td></tr> <tr> <td>Intermodal transport</td><td>2</td><td>1</td></tr> <tr> <td><b>Total</b></td><td><b>10</b></td><td><b>3</b></td></tr> </table> <p>REO.22. Modernization and development of national transport system so as to ensure the achievement of sustainable transport</p> <p>REO.23. Improving transport behavior in relation to the environment</p>	Environmental objective	REO 22	REO 23	Road transport	2	-1	Railway transport	2	1	Water transport (ports and navigation channels)	2	1	Air transport	2	1	Intermodal transport	2	1	<b>Total</b>	<b>10</b>	<b>3</b>
Environmental objective	REO 22	REO 23																					
Road transport	2	-1																					
Railway transport	2	1																					
Water transport (ports and navigation channels)	2	1																					
Air transport	2	1																					
Intermodal transport	2	1																					
<b>Total</b>	<b>10</b>	<b>3</b>																					
<b>Energy efficiency</b>	<p>Developing and improving transport infrastructure will facilitate the installation of infrastructure for alternative fuels, proposal aimed predominantly for two modes of transport: road and naval, but actions are also needed to encourage market entry of vehicles and ships propelled by engines operating on alternative-fuel.</p> <p>By upgrading, rehabilitation and development of road transport, railway sector, will be satisfied better the needs of transport as far as may promote an increase in transport volume and thus tend to make longer trips. By facilitating transportation,</p>	<table> <tr> <th>Environmental objective</th><th>REO 24</th><th>REO 25</th></tr> <tr> <td>Road transport</td><td>-1</td><td>-1</td></tr> <tr> <td>Railway transport</td><td>-1</td><td>1</td></tr> <tr> <td>Water transport (ports and navigation)</td><td>-1</td><td>1</td></tr> </table>	Environmental objective	REO 24	REO 25	Road transport	-1	-1	Railway transport	-1	1	Water transport (ports and navigation)	-1	1									
Environmental objective	REO 24	REO 25																					
Road transport	-1	-1																					
Railway transport	-1	1																					
Water transport (ports and navigation)	-1	1																					

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



**Table 8.4. The potential significant environmental effects - Scenario Development "Do Something" (ES / EES)**

Environmental aspect	The potential significant environmental effects Scenario Development "Do Something" (ES / EES)	Score																					
	<p>economic development needs and recreational activities may increase in terms of overall consumption of fuel for the transportation sector.</p> <p>The time to travel for the same distance will decrease and thus the specific fuel consumption. Therefore, can be considered that the positive effects of this scenario are not significant in terms of reducing overall energy consumption in the transport sector, but with positive influence on the specific energy consumption (fuel or from alternative sources) compared to mileage.</p>	<table><tr><td>channels)</td><td></td><td></td></tr><tr><td>Air transport</td><td>0</td><td>0</td></tr><tr><td>Intermodal transport</td><td>0</td><td>1</td></tr><tr><td>Total</td><td>-3</td><td>2</td></tr></table> <p>REO.24. Improving energy efficiency in the transport sector by increasing the use of renewable energy resources and significantly reduce oil dependence</p> <p>REO.25. Reducing energy consumption in the transport sector.</p>	channels)			Air transport	0	0	Intermodal transport	0	1	Total	-3	2									
channels)																							
Air transport	0	0																					
Intermodal transport	0	1																					
Total	-3	2																					
Conservation and efficient use of natural resources / use of renewable resources	<p>To achieve this objective is needed to facilitate market penetration of alternative fuels and means of transport based on alternative fuels. The improvement and development of transport infrastructure will take into account the need to adapt to European ports, roads equipping all TEN-T plants with alternative fuel refueling points define common technical specifications for this infrastructure.</p> <p>Influence on the natural environment will be controlled by way of designing routes transport by the way of implementation in conjunction with assessment of each planned project.</p>	<table><tr><th>Environmental objective</th><th>REO 26</th></tr><tr><td>Road transport</td><td>0</td></tr><tr><td>Railway transport</td><td>0</td></tr><tr><td>Water transport (ports and navigation channels)</td><td>0</td></tr><tr><td>Air transport</td><td>0</td></tr><tr><td>Intermodal transport</td><td>0</td></tr><tr><td>Total</td><td>0</td></tr></table> <p>REO.26. Reducing exploitation of exhaustible resources and facilitate the use of renewable</p>	Environmental objective	REO 26	Road transport	0	Railway transport	0	Water transport (ports and navigation channels)	0	Air transport	0	Intermodal transport	0	Total	0							
Environmental objective	REO 26																						
Road transport	0																						
Railway transport	0																						
Water transport (ports and navigation channels)	0																						
Air transport	0																						
Intermodal transport	0																						
Total	0																						
Raising awareness	<p>It is estimated that this scenario will have direct positive effects for the objective of improving the people behavior towards the environment. Development, modernization and expansion of transport networks and increasing competitiveness between transport modes will allow moving the demand towards less polluting transport sectors. But more action is needed to raise transport users awareness and their understanding of the effects of transport on the environment.</p> <p>The involvement of stakeholders and the public in decision-making both in the strategic assessment and in the evaluation of the environmental impact for each individual project will allow optimal measures to reduce environmental impact, taking into account previous experiences implementing these types of projects, concerns, needs population, objectives and action plans in other sectors of the transport sector collateral or directly related to it.</p>	<table><tr><th>Environmental objective</th><th>REO 27</th><th>REO 28</th></tr><tr><td>Road transport</td><td>0</td><td>2</td></tr><tr><td>Railway transport</td><td>0</td><td>2</td></tr><tr><td>Water transport (ports and navigation channels)</td><td>0</td><td>2</td></tr><tr><td>Air transport</td><td>0</td><td>2</td></tr><tr><td>Intermodal transport</td><td>0</td><td>2</td></tr><tr><td>Total</td><td>0</td><td>10</td></tr></table> <p>REO.27. Informing and raising awareness about the effects of transport activities on the</p>	Environmental objective	REO 27	REO 28	Road transport	0	2	Railway transport	0	2	Water transport (ports and navigation channels)	0	2	Air transport	0	2	Intermodal transport	0	2	Total	0	10
Environmental objective	REO 27	REO 28																					
Road transport	0	2																					
Railway transport	0	2																					
Water transport (ports and navigation channels)	0	2																					
Air transport	0	2																					
Intermodal transport	0	2																					
Total	0	10																					

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 8.4. The potential significant environmental effects - Scenario Development "Do Something" (ES / EES)**

Environmental aspect	The potential significant environmental effects Scenario Development "Do Something" (ES / EES)	Score
		<p>environment and human health risks and risks to human health ..</p> <p>REO.28. Involvement and consultation of stakeholders throughout the decision-making process in establishing and implementing the proposed measures to reduce environmental impact</p>

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

Share potential effects arising from the Development Scenario (ES / EES) on the relevant environmental objectives is: 22% negative (modal distribution: 33% of road transport, rail transport 27%, 20% shipping, air transport 13% 7% intermodal transport), 47% positive effects (modal distribution: 18% of road transport, rail transport 23%, 18% shipping, 18% air transport, intermodal transport 23%), the remaining 31% are effects null / who cannot estimate - see Figure 8.11 and Figure 8.12.

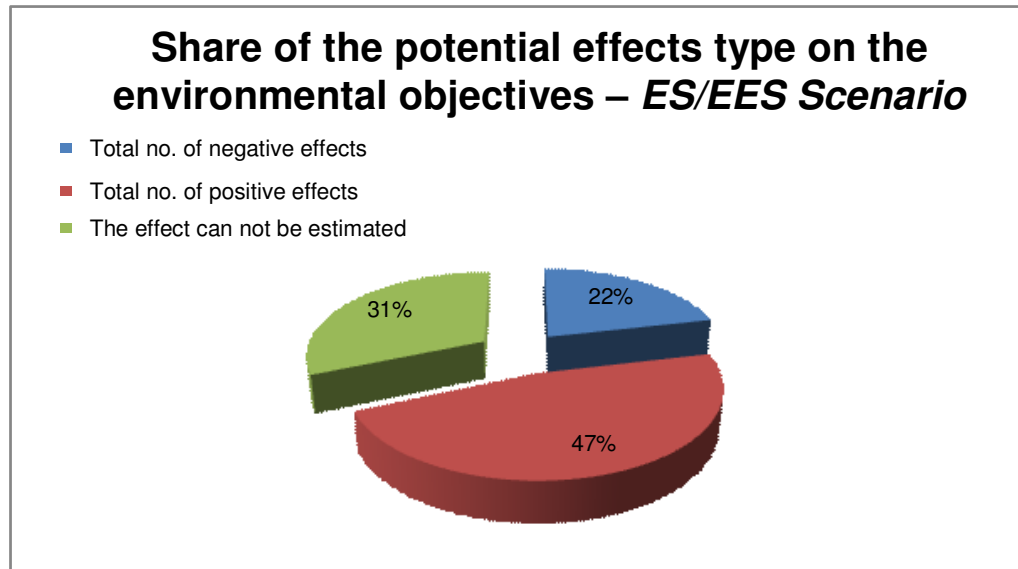


Figure 8.11 Share of potential effects on environmental objectives of (ES/EES) Development Scenario

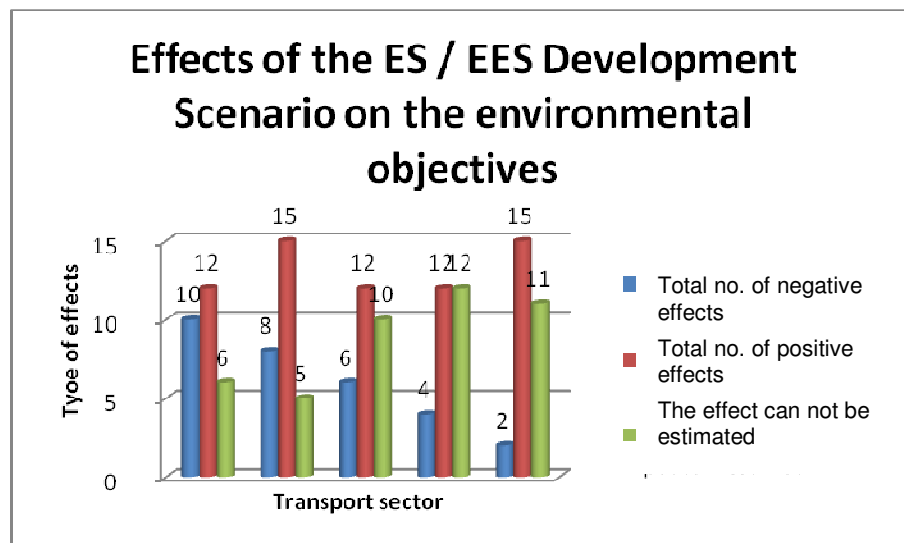
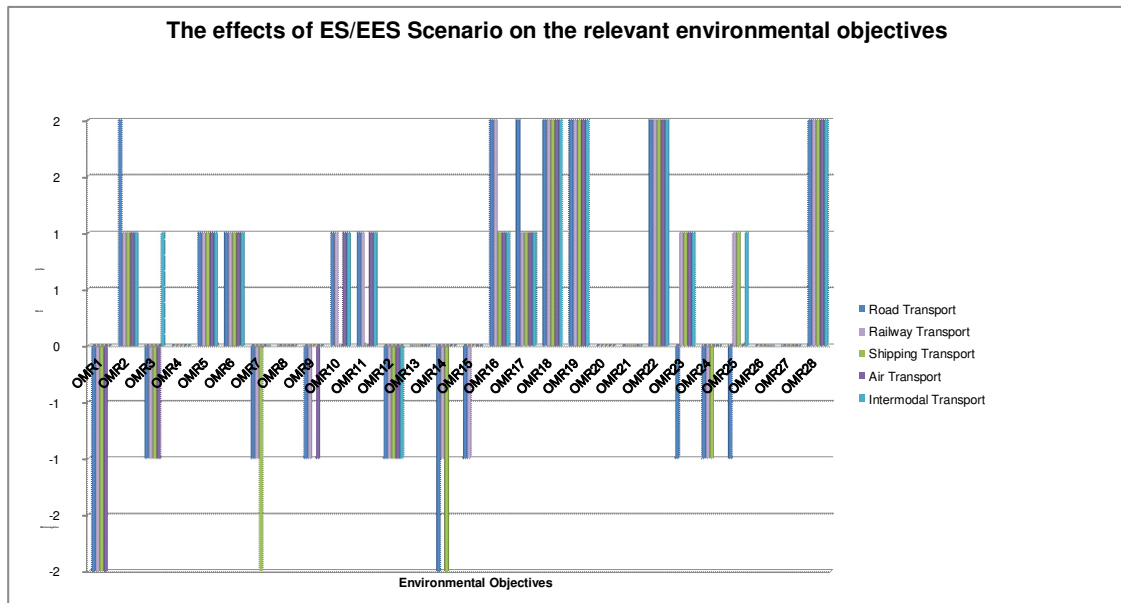


Figure 8.12 Type the effects of the ES / EES Development Scenario on the environmental objectives

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



**Figure 8.13 Effects of the development scenario on the environmental objectives**

Share potential positive impacts will be much higher compared to „Do minimum” Scenario (accounting for 47% to 11%). The *ES / EES Development Scenario* will have positive effects on the following environmental objectives:

- Air (REO 1, REO2) - air and intermodal sectors (determined by indirect effects of the proposed investment in road and rail sectors)
- Climate change (REO5) - for all transport sectors.
- Water (REO 6) - for all transport sectors
- Soil and subsoil (REO 10, REO 11) - road, rail, intermodal, air;
- Population and human health (REO 16, REO 18, REO 19) - for all transport sectors;
- Sustainable Transport (REO 22, REO 23) - for all transport sectors;
- Energy efficiency (REO 25) - road, rail, intermodal shipping.
- Raising awareness of environmental issues in the transport sector (REO 28) - for all modes of transport

*ES / EES Development Scenario* will have potential adverse effects on the environment following objectives:

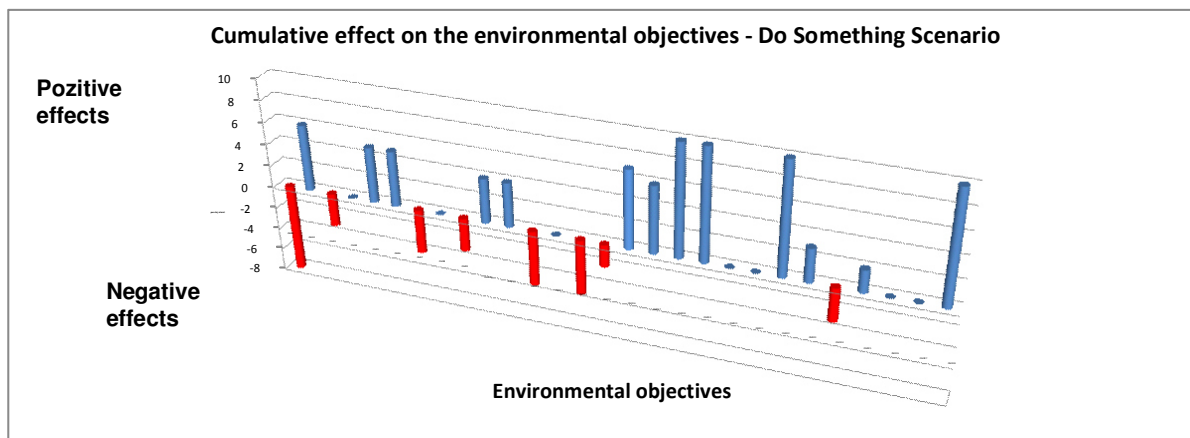
- Air: (REO 1) - for all the road, sea, rail, air;
- Climate change (REO 3) - the sectors of road, rail, water and air;
- Water (REO 7) - for all sectors of road, rail, water;
- Biodiversity: (OMR14) - for the road, rail and water; (REO 15) - for road and rail sectors;
- Waste management (REO 12) - for all transport sectors;
- Soil and subsoil (REO 9) - sector of road, rail, intermodal, air;
- Sustainable Transport (REO 23) - for the road transport sector;

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

- Energy efficiency (REO 24) - for sector road, rail, water; (REO 25) - for the road transport sector.

For the Development Scenario, cumulative effects have been evaluated by summing the scores for each objective, for each sector of transport (road, rail, air, shipping, intermodal) and the results are as follows:

- negative effects will have on environmental issues: air (REO 1), climate change (REO 3), water (REO 7), soil and subsoil (REO 9), waste management and hazardous substances (REO 12), biodiversity (REO 14, REO 15), efficiency energy (REO 24).
- positive effects on environmental issues: climate change (REO 5), water (REO 6), soil and subsoil (REO 10, REO 11), population and human health (REO 16, REO 17, REO 18, REO 19), landscape and cultural heritage (REO 20, REO 21), sustainable transport (REO 22, REO 23), energy efficiency (REO 25), raising awareness on environmental issues arising from the transport sector (REO 28).



**Figure 8.14 Cumulative effects of the Development Scenario (for all transport sectors) on environmental objectives**

Regarding the Core TEN-T Scenario, the potential effects of environmental objectives are similar to those of the Development Scenario.

The Core TEN-T (CTT) Scenario differs from the ES/EES Development Scenario only by the number of projects, the nature of investments being similar (include projects for new road alignments, railway rehabilitation projects, projects for modernization of airports, projects for development / modernization of ports, improvement of navigation on the Danube, Bucharest-Danube waterway achievement) - see Appendix 3B. This scenario proposes, for the road, 10 motorway projects and 1 investment project related to transport safety. Of these, 2 projects are also included in the Development Scenario (ES and EES).

The Core TEN-T Scenario proposes, for the road sector, achieving a total of 1589 kilometers of motorways compared with ES / EES Development Scenario which proposes 887 km of motorways, expressways 2241 km and 182 km bypass.

The lack of some bypass roads or express roads makes heavy traffic to be carried further through localities maintaining the high level of noise and air pollutant emissions locally.

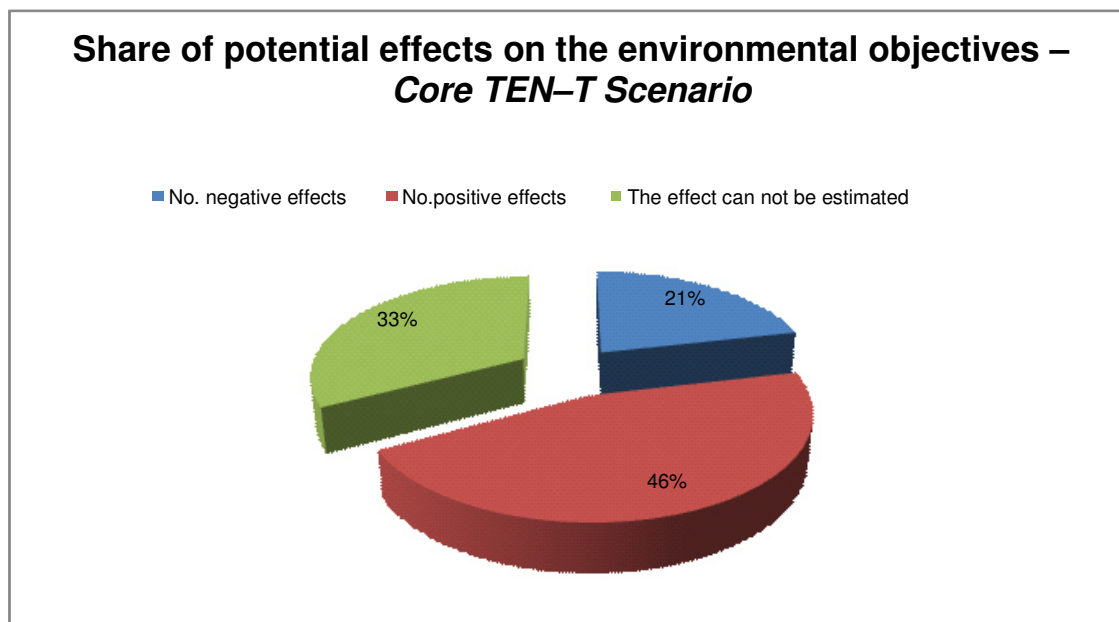
Considering the estimates of greenhouse gases emissions, developed using TREMOVE program, for this scenario, for the period 2014 -2030, are estimated to be generated an increased quantity of emissions compared to ES / EES Development Scenario.

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

To this scenario was given a lower score compared to Development Scenario ES / EES for:

- Environmental objectives for climate change - the amount of greenhouse gases emissions generated by the proposed projects will increase both locally and nationally. This is due to the general increase in demand for road transport sector and growth trend of the fleet;
- objectives for human health - this scenario implementation will generate an increase of the amount of pollutant emissions in atmosphere, increase of noise and a less mobility and accessibility for certain areas;
- The objective sets for energy efficiency - this scenario will generate a higher fuel consumption for the same mileage as a result of using a higher frequency of existing road infrastructure.

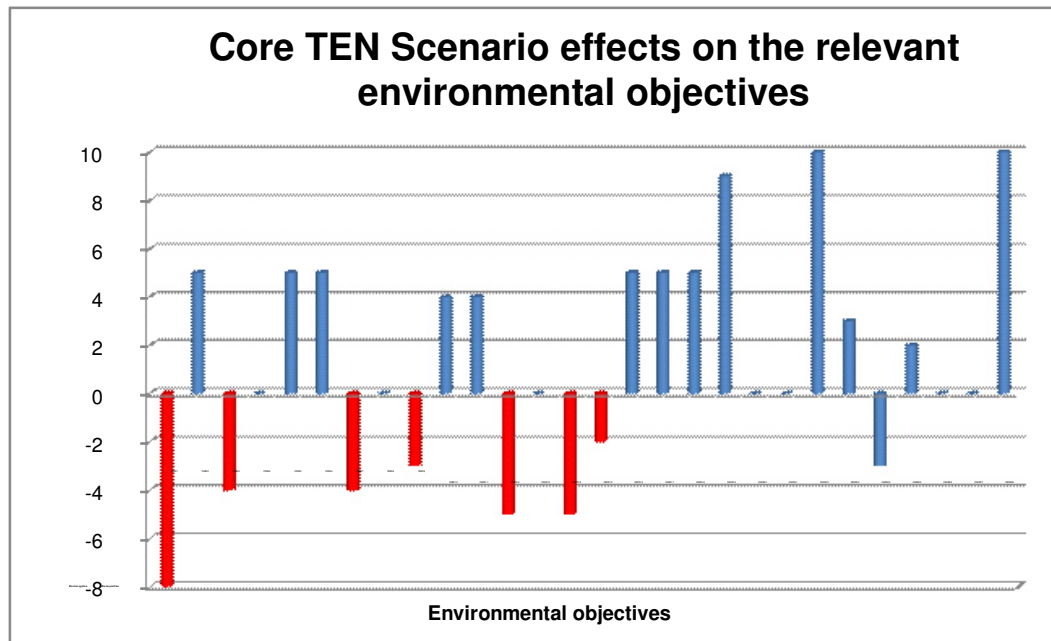
The share of potential effects arising from the Core TEN-T Scenario on the relevant environmental objectives is: 46% negative effects, 33% positive effects, 21% null effects / or which cannot be estimated - see Figure 8.15 and 8.16.



**Figure 8.15 Share of the potential effects on the environmental objectives for Core TEN-T Scenario**

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



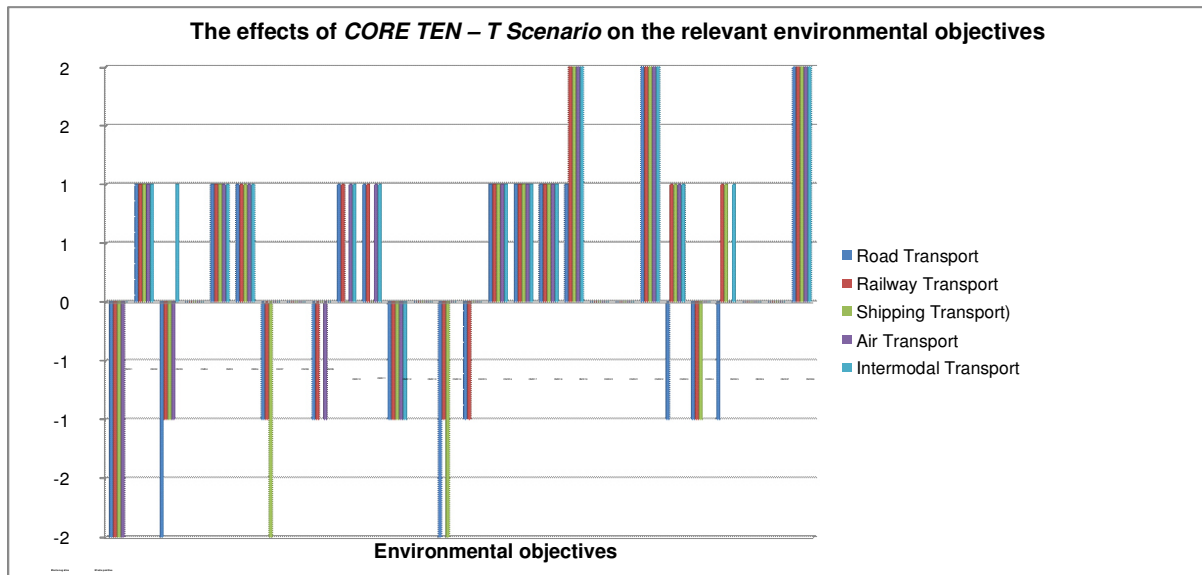


**Figure 8.16 The type of effects of the Core TEN-T scenario on the environmental objectives**

The share of potential positive impacts will be much higher compared to Do minimum Scenario (accounting for 46% to 11%). The Core TEN-T Scenario will have positive effects on the following environmental objectives:

- Air (REO2) - for all transport sectors;
- Climate change (REO 5) - for all transport sectors;
- Water (REO 6) - for all transport sectors;
- Soil and subsoil (REO 10, REO 11) - road, rail, intermodal, air;
- Population and human health (REO 16, REO 18, REO 19) - for all transport sectors;
- Sustainable Transport (REO 22, REO 23) - for rail, sea, air and intermodal;
- Energy efficiency (REO 25) - rail, intermodal shipping;
- Raising awareness of environmental issues in the transport sector (REO 28) - for all modes of transport.

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



**Figure 8.17 The effects of Core TEN-T Scenario on the environmental objectives for each transport sector**

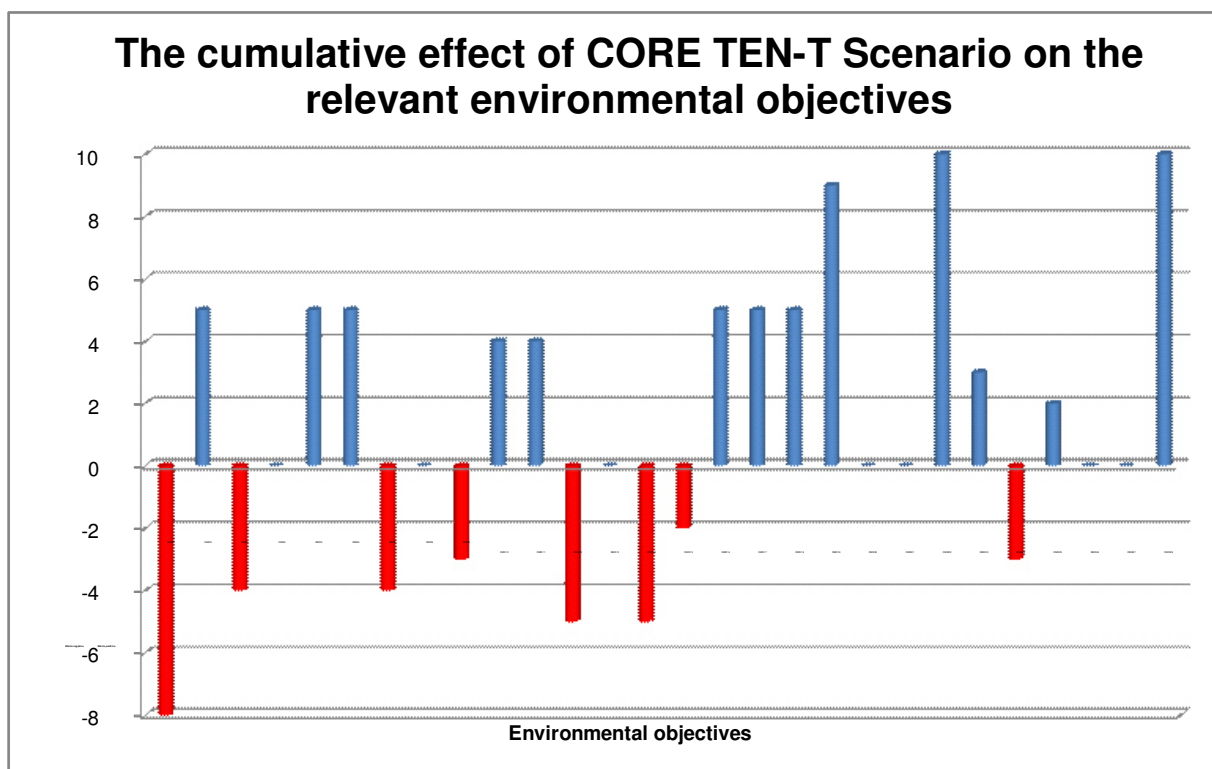
TEN-T Core scenario would have potential negative effects on the environment following objectives:

- Air: (REO 1) - for all sectors of transport: road, sea, rail, air;
- Climate change (REO 3) - for all sectors of road, rail, water and air.
- Water (REO 7) - the sectors of road, rail, water;
- Biodiversity: (REO 14) - for the road, rail and water; (REO 15) - for road and rail sectors;
- Waste management (REO 12) - for all transport sectors;
- Soil and subsoil (REO 9) - for sectors road, rail, intermodal, air;
- Sustainable Transport (REO 23) - for the road transport sector;
- Energy efficiency (REO 24) - the sectors of road, rail, water; (REO 25) - for the road transport sector.

For Core TEN-T Scenario, cumulative effect impact was evaluated by summing the scores for each objective for each sector of transport (road, rail, air, shipping, and intermodal) and the results are as follows:

- negative effects on environmental aspects: air (REO 1), climate change (REO 3), water (REO 7), soil and subsoil (REO 9), waste management and hazardous substances (REO 12), biodiversity (REO 14, REO 15), efficiency energy (REO 24).
- positive effects on environmental aspects: climate change (REO 5), water (REO 6), soil and subsoil (REO 10, REO 11), population and human health (REO 16, REO 17, REO 18, REO 19), landscape and cultural heritage (REO 20, REO 21), sustainable transport (REO 22, REO 23), energy efficiency (REO 25), raising awareness on environmental issues arising from the transport sector (REO 28).

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



**Figure 8.17 The cumulative effects on the environmental objectives (for each transport sector) of Core TEN-T Scenario**

#### 8.4 Comparative analysis of potential environmental impacts for the 4 scenarios of the GTMP

Compared to the other analyzed scenarios (*"Do nothing"*, *"Do Minimum"*), the Development Scenario and Core TEN-T Scenario will reduce the overall impact of transport sector on the environment.

**Table no. 8.5. Comparative analyze of the proposed scenarios**

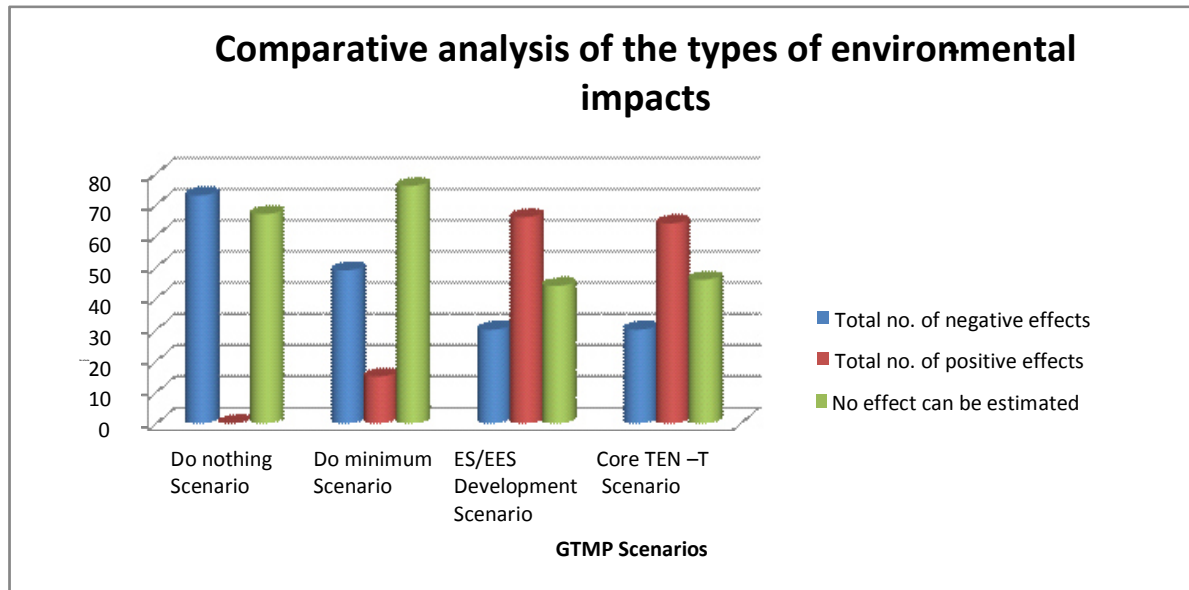
Sector	Score			
	Do nothing Scenario	Do minimum Scenario	Development Scenario	Core TEN-T Scenario
Road transport	-30	-17	6	0
Railway transport	-26	-11	9	7
Naval Transport	-25	-11	7	5
Air Transport	-15	-8	11	10
Intermodal Transport	-8	0	17	16
<b>Total</b>	<b>-104</b>	<b>-49</b>	<b>49</b>	<b>38</b>

The analysis of potential impacts on environmental objectives showed that ES / EES Development Scenario is the best scenario for implementation. The negative effects of this scenario are offset by the positive effects. The establishment and implementation of optimal measures to prevent, reduce and control the environmental impact (both execution phase and

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

the operational phase) estimates that the negative effects of the implementation of projects proposed in this scenario will be insignificant and will achieve the environmental objectives established.

The proposed measures are presented in Chapter 10 of the Environmental Report.



**Figure 8.18 Comparative analysis of the types of environmental impacts for the 4 scenarios**

## 8.5 Conclusions of the appropriate assessment related to potential effects of the GTMP implementation on Natura 2000 Network

In accordance with decision no. 145790 / 23.10.2012 issued by the Ministry of Environment and Climate Change - Impact Assessment and Pollution Control Directorate, the GTMP is subject to environmental assessment procedure, according to GD 1076/2004 establishing the procedure for environmental assessment for plans and programs or appropriate assessment procedure.

The study of appropriate assessment of potential impacts on Natura 2000 sites of the General Transport Master Plan (GTMP) was developed under national law or as required by methodological guide for the appropriate assessment of the potential effects of plans or projects on protected natural areas of Community Interest (MMP Order no. 19/2010). Appropriate Assessment Study was developed by AECOM in collaboration with the EPC Environment Consultancy.

The Appropriate Assessment Study analyzes effects of the GTMP proposed development scenarios for the transport infrastructure ("Do Minimum" ES / EES, CTT) described on Chapter 2 of the Environmental Report.

The results of the appropriate assessment represents only a "first overview" on the impact of transport infrastructure projects on Natura 2000 network and not a detailed assessment of the impact on habitat types and species of Community interest. The main limitations of the study are:

1. Inability to locate the exact spatial habitat types and species of community interest (process mapping and inventory of habitats and species Natura 2000 is currently underway and will still take a number of years to be finalized);

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

2. The alignments are only indicative, most of them can suffer in the next period, significant changes;
3. In the analysis performed could not take into account the temporal dynamics of impacts because at this time, there is no calendar approved for the GTMP project implementation;
4. Assessment of Natura 2000 sites and territories sensitivity was achieved by considering the percentage of habitats and species present in each type of land used compared to the total number of habitats and species of community interest for each site. The method chosen is the best approach used to provide a more extensive understanding on the impacts of subsequent project implementation of the GTMP on the national network of Natura 2000 sites, but cannot capture territories importance of sites for each habitat type and community interest species. The methodology used, have been considered that a site affected on an area of 5% corresponds to an insignificant impact, without knowing whether within those 5% within the site could not be found throughout an entire habitat of a specie and thus the impact is considered to be significant. Such analysis can be achieved only at a site or project level;
5. Conventional spatial location of habitats and species (depending on the type of land use) represents a precautionary approach (i.e. not taken into account the spatial extent of habitats indicated in the standard considering such that any grassland habitat can be found on all areas of grassland in the site), but ineffective in accurately locating the areas that are really critical for the maintenance of the habitats and species for which the site was designated;
6. The GIS analysis was based on the use of standard sizes of the projects (e.g. all motorways were considered to have the same width) and the impact distances (e.g. for all road projects was considered that noise affects an area of 700 m calculated from the center of the road). It is obvious that such an approach can, in some cases, cause overestimation and underestimation of the impact in other cases generated.

The present limitations make it impossible to estimate the impact of each type of habitat and species of community interest. However, at this level of analysis, the study cannot propose alternative for the projects analyzed, but may suggest areas where must intervene at project level to avoid the occurrence of an impact.

The role of the appropriate assessment was to make a preliminary identification of the potential significant impact on Natura 2000 network in Romania.

**The conclusions of the appropriate assessment are:**

The analysis developed within the present study allows us to formulate the following conclusions:

- General Transport Master Plan does not generate a significant impact on the national network of Natura 2000 sites as a whole, given the reduced spatial extent of the proposed projects.
- The study shows a maximum alternative of scenarios included in the General Transport Master Plan (En. "Worst-case scenario") being possible that not all projects included in the scenarios analyzed to be implement in the proposed time period.
- The main limitations of appropriate assessment methodology have been presented in the study of appropriate assessment. It is important to note that for a significant part of a project, the available routes are only indicative and that significant changes can appear during the detailed design phase. Location of projects (for which were

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

not provided data in vector format by the developer of the GTMP) made in this study, on the basis of the titles projects are approximate location, in this case significant changes may occur when implementing the individual projects.

- Do Minimum Scenario contains a list of 106 distinct projects of which 7 does not include construction, 31 projects including construction work could not be located spatially, and 68 projects including construction works are located spatially and were used in the analysis.
- (ES / EES) Development Scenario comprises 119 different projects, including construction works and were used for the analysis.
- CTT Scenario consist of 65 distinct projects and include construction works being used for analysis.
- The Do Minimum Scenario, 30 projects intersect sites of community importance (SCI) of the Natura 2000 network, of which 2 are naval projects, 5 railway projects and 23 road projects. In case of the bird and fauna protection network sites (SPA), 20 projects overlap with the sites, respectively 2 naval projects, 4 railway projects and 14 road projects. The Air infrastructure projects included in this scenario does not affect Natura 2000 sites.
- In the (ES / EES) Development Scenario, 64 projects intersect Sites of Community importance (SCI) of the Natura 2000 network, of which 6 are naval projects, 15 are railway projects and 43 road projects. In case of bird and fauna protection network sites (SPA), 54 projects overlap with sites, respectively 5 naval projects, 14 railway projects and 35 road projects. Air and intermodal infrastructure projects included in this scenario does not affect Natura 2000 sites.
- In CTT Scenario, 30 projects intersect sites of Community Importance (SCI) of the Natura 2000 network, of which 6 naval projects, 15 railway projects and 9 road projects. In case of bird and fauna protection sites (SPA), 28 projects overlap with sites, 5 being naval projects, 14 railway projects and 9 road projects. Air and intermodal infrastructure projects included in this scenario does not affect Natura 2000 sites.
- In this phase cannot be assessed potential areas of natural ecological corridor, this assessment is required to take place within the individual studies for each proposed project. High probability of ecological corridors to be crossed occurs if the projects are located in the vicinity of Natura 2000 Sites or intersects the protected areas and when proposed projects crosses large areas occupied with Natura 2000 habitats.
- Most of the potential significant impacts can be avoided by reconsidering the alignments of the projects and their positioning outside the boundaries of Natura 2000 sites (preferred option for the sites with small areas) or, where applicable, outside the occupied areas of habitats and species of community interest (option required for sites which occupy large areas and already incorporates a considerable anthropogenic presence).
- To avoid situations where the crossing of Natura 2000 sites or areas is critical is necessary to consider possible measures to reduce and, where appropriate, compensate the potential significant impacts.
- It is estimated that for the current configuration of the proposed projects for (ES / EES) development scenario and CTT scenario, some Natura 2000 areas (SCI / SPA overlapping) should be subject to measures, to prevent or reduce the potential significant impacts.

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



- Measures to reduce negative impacts should focus on increasing the permeability of transport infrastructure (mainly for road and rail sectors) and reducing noise levels. These concerns should also cover new projects proposed and existing infrastructure.
- The compensation measures should be considered for all projects that will lead to loss of critical habitats for Natura 2000 habitats or species of community interest within Natura 2000 sites.
- The impact assessment and measures to avoid, reduce and compensate must be based on each project level based on rigorous studies that include significant components of field investigations. It is recommended that appropriate assessment studies to be developed for all projects of the GTMP proposing construction work within or in close proximity (<1 km) of Natura 2000 sites.
- The Transport projects can generate impacts on long distance and therefore monitoring their effects and the success of measures to reduce and offset is needed to ensure a level as low as possible for the potential impact.
- It is recommended to minimize service areas (parks, filling stations, accommodation and food, etc.) along the proposed road projects in and the immediate vicinity (1 km) of Natura 2000 sites and avoid their proposal within the sensitive areas (Natura 2000 habitats, critical areas for protected species).
- The environmental assessment of each proposed project will also consider areas outside sites, but which are important for species of community interest (feeding areas, areas of migration, breeding areas, etc.). In accordance with national legislation, species of conservation interest enjoy protection both inside and outside the protected natural areas. For this reason, concern related to the identification of potential conflicts with species of conservation interest and their habitats must be present in all stages of the design and the whole complexity of these projects. Attention should be focused, predominately, on identifying and protecting areas of migration / displacement of wildlife conservation interest outside the Natura 2000 sites which can be intersected by transport projects, but this concern should not be neglected for small projects where, for example a station building rehabilitation can affect nesting areas of some species of birds or bats.

The proposed measures to avoid / minimize / reduce the potential effects of GTMP on Natura 2000 network are presented in *Chapter 11 - Proposed measures to prevent reduce and offset as completely as possible any adverse environmental impact resulting from the implementation of the General Transport Master Plan* of the Environmental Report.

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

## 9. Potentially significant environmental effects, including health, trans boundary

The development and modernization of transport infrastructure networks are important for connecting a country with neighbors and valorization of its economic, tourism and cultural resources.

### 9.1 The existing situation - national transport network integration European transport networks

By its geographical position, Romania has an important role in continental and intercontinental transit on main geographic tracks North West and South East. Romania has developed a complex network infrastructure (roads, railways, waterways, canals, sea and river ports, airports, airways) that connect all localities to the national and international transport systems. In terms of technical conditions, this network does not fully meet European standards, being underdeveloped.

Europe is crossed by 10 Pan-European Transport Corridors and has defined 4 Pan-European Transport Areas: Pan-European Transport Area of the Black Sea Pan-European Transport Area Arctic Barents Pan-European Transport Area Mediterranean, Pan-European Transport area Ionian-Adriatic.

The role of the 10 corridors is to create links between Western and Eastern Europe and between states in Eastern Europe.

Romania has ensured integration with the European transport networks by:

#### **-Pan-European Transport Corridors, three corridors crossing and Romania:**

- IV. Berlin / Nuremberg-Prague-Budapest-Constanta-Istanbul-Thessaloniki,
- IX.Helsinki-St.Petersburg-Moscova-Pskov-Kiev-Ljubasevka-Chişinău-Bucureşti-Dimitrovgrad-Alexandroupolis,
- VII. Danube: the Danube, with Sulina and Danube-Black Sea Canal.

Each corridor has a railway and a road component, with the exception of Corridor VII, which is represented by the Danube segment downstream of Vienna<sup>109</sup>.

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



Figure 9.1 Map of Pan-European transport corridors (Source: Ministry of Transport)

#### - European roads

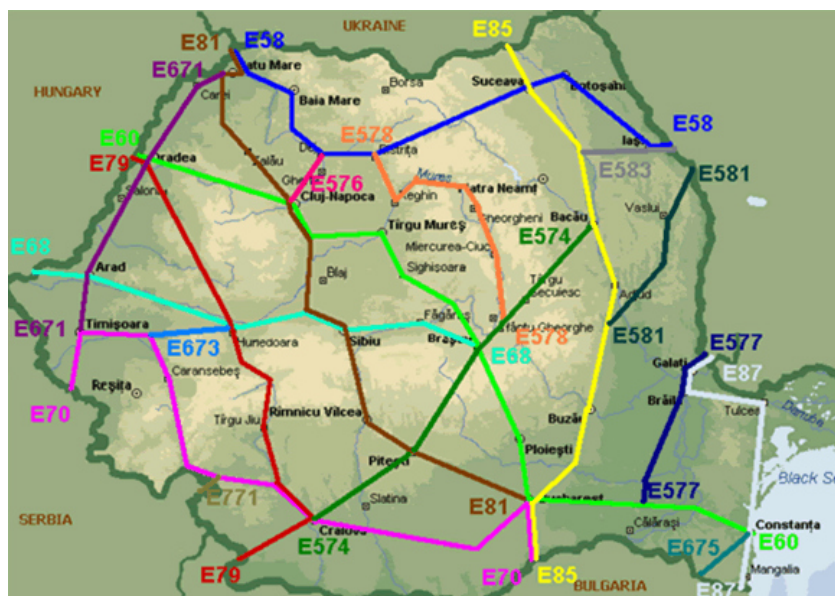
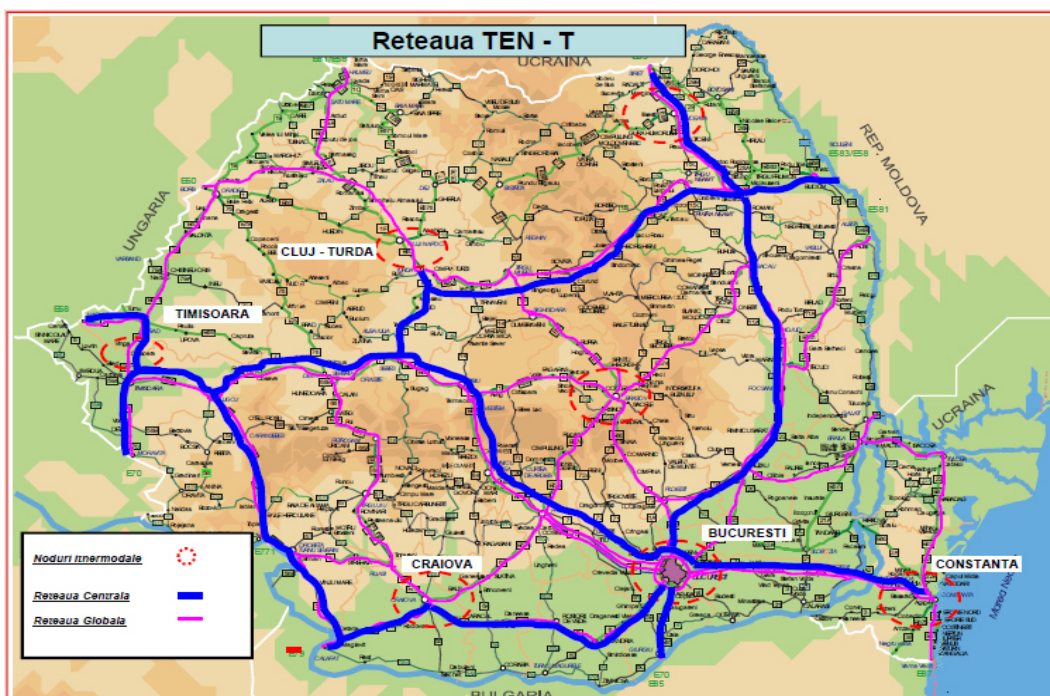


Figure 9.2 Map of European road transport (Source: Ministry of Transport)

- TEN-T network, global and central (roads, ports, waterways, railway terminals, road, intermodal)

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



The TEN-T road network for the central area of Romania will be completed at level of the motorway or expressway until the end of 2030. The TEN-T road network in Romania will have to be completed by the end of 2050<sup>71</sup>.

The border points open to international traffic are shown in the following figure.

<sup>71</sup> REZULTATELE ANALIZEI DOCUMENTARE Sectorul TRANSPORT (proiect), [http://www.fonduri-ue.ro/res/filepicker\\_users/cd25a597fd-62/2014-2020/Dezbateri%20parteneriale/Rezultatele%20analizei%20documentare/03.06.2013/1.Transport\\_22%20mai.pdf](http://www.fonduri-ue.ro/res/filepicker_users/cd25a597fd-62/2014-2020/Dezbateri%20parteneriale/Rezultatele%20analizei%20documentare/03.06.2013/1.Transport_22%20mai.pdf)

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>





**Figure 9.4 Border crossing points open to international traffic**

(Source: <http://www.politiadefrontiera.ro/puncte.php>)

**Table 9.1 Border crossing points open to international traffic**

Air border crossing points	Maritime and naval border crossing points	Road and railway border crossing points
<ol style="list-style-type: none"> <li>Henri Coandă, București (*);</li> <li>Cluj-Napoca (*);</li> <li>Sibiu (*);</li> <li>Traian Vuia, Timișoara (*);</li> <li>Transilvania, Târgu Mureș (*);</li> <li>George Enescu, Bacău (*);</li> <li>Mihail Kogălniceanu, Constanța (*);</li> <li>Satu Mare (**);</li> <li>Suceava (**);</li> <li>Iași (**);</li> <li>Arad (**);</li> <li>Baia Mare (**);</li> <li>Craiova (**);</li> <li>Tulcea (**);</li> <li>Aurel Vlaicu, București, Băneasa (***);</li> <li>Oradea (***).</li> </ol> <p>(*) Certified as international airport. (**) Certified as airport opened for international traffic.</p>	<p><i>Maritime crossing points:</i></p> <ol style="list-style-type: none"> <li>Constanța;</li> <li>Constanța Sud-Agigea;</li> <li>Mangalia;</li> <li>Midia.</li> </ol> <p><i>Porturi pe Dunăre</i></p> <ol style="list-style-type: none"> <li>Sulina (*);</li> <li>Tulcea (*);</li> <li>Galați (*);</li> <li>Brăila (**);</li> <li>Cernavodă (**);</li> <li>Călărași;</li> <li>Olteneța;</li> <li>Giurgiu;</li> <li>Zimnicea;</li> <li>Turnu Măgurele;</li> <li>Corabia;</li> <li>Bechet;</li> <li>Calafat;</li> <li>Orșova;</li> <li>Drobeta Turnu Severin;</li> <li>Moldova Veche.</li> </ol> <p>(*) Maritime Danube.</p>	<p><b>Ungaria</b></p> <ol style="list-style-type: none"> <li>Petea, road;</li> <li>Urziceni, road;</li> <li>Carei, rutieră;</li> <li>Valea lui Mihai, railway and road;</li> <li>Săcuieni, road;</li> <li>Borș, railway;</li> <li>Episcopia Bihor, road;</li> <li>Salonta, railway and road;</li> <li>Vârșand, road;</li> <li>Curtici, railway;</li> <li>Turnu, road;</li> <li>Nădlac, road;</li> <li>Cenad, road;</li> <li>Tudor Vladimirescu, road (RO-LA).</li> </ol> <p><b>Bulgaria:</b></p> <ol style="list-style-type: none"> <li>Giurgiu, railway and road;</li> <li>Ostrov, road;</li> <li>Negru Vodă, railway and road;</li> <li>Vama Veche, road;</li> <li>Calafat, railway and road;</li> </ol> <p><b>Serbia:</b></p> <ol style="list-style-type: none"> <li>Jimbolia, railway and road;</li> <li>Stamora Moravița, railway and</li> </ol>

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

Air border crossing points	Maritime and naval border crossing points	Road and railway border crossing points
(***) Yet uncertified (8).	(**) Inner Danube..	road; 3. Naidăș, road; 4. Porțile de Fier I, road; 5. Porțile de Fier II, road. <b>Republica Moldova:</b> 1. Galați, railway and road; 2. Oancea, railay; 3. Fălciu, road; 4. Albița, road; 5. Iași (Ungheni), railway; 6. Sculeni, road; 7. Stâncă, road; 8. Rădăuți Prut, road. <b>Ucraina:</b> 1. Siret, road; 2. Vicșani, railway; 3. Valea Vișeuului, railway; 4. Câmpulung la Tisa, railway; 5. Halmeu, railway and road; 6. Sighetul Marmăției, road.

## 9.2 The potential significant effects on the environment, including health, transboundary, when implementing GTMP

The development and improvement of transport infrastructure is an important issue for the Romanian economy and contributing to the foundation of European trans-boundary opportunities.

States that may be affected by trans-boundary plans / programs approved in Romania are neighboring countries: Bulgaria, Hungary, Moldova, Serbia, Ukraine and countries that Black Sea coast, namely Russia, Georgia and Turkey.

In terms of GTMP trans-boundary effects on the environment and human health, are relevant the projects which will be developed at the border, crossing the rivers, especially those related to navigation on the Danube. Analysis for the significant potential effects has been developed for the Reference Case Scenario ("Do Minimum") and Development Scenarios for projects which include construction works and for which indicative alignments are already planned.

Projects included in GTMP which will be implemented near the border line included in the Reference Case ("Do Minimum") or which could be related to border crossings points for international traffic are shown in Table 9.2.

**Table 9.2 Projects located in the vicinity of the border proposed in the Reference Case Scenario "Do Minimum"**

Transport Sector	Project type	Name	Country
Road	Modernization of the road infrastructure	Rehabilitation of DN 24 - Galați/Vaslui-Crasna and DN 24 B Crasna-Albița Lot 3: DN 24B km 22+000 – DN 24B km 47+881 (Albița border)	Republic of Moldova
Road	Bridges	Bridge over Danube in Giurgiu	Bulgaria

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



Transport Sector	Project type	Name	Country
		County on DN5 km 64+884	
Railway	Modernization of the railway infrastructure	Modernization of the Railway Border-Curtici-Arad-Simeria, Section 1: Border-Arad-km 614	Hungary
Naval	Improved navigation on the fairway	Improvement of the navigation conditions for Călărași-Brăila sector	Bulgaria
Naval	Rehabilitation / modernization of port infrastructure	Rehabilitation and modernization of Oltenița port infrastructure	Bulgaria

Among the projects included in the Reference Case Scenario ("Do Minimum"), located at the stage of realization/ implementation, have been identified 5 projects taking place near the border or relating to navigation on the Danube:

- 2 road transport infrastructure projects, including a project for the rehabilitation of an existing road, a project for the rehabilitation of a bridge over the Danube;
- 1 project for rail infrastructure project - upgrading existing railway line;
- 2 projects for naval transport - 1 project for improvement of the navigation conditions on the Calarasi-Braila sector, 1 project to improve port infrastructure.

These projects can be divided into three categories:

- Projects that include construction work and involves the development of new transport corridors (motorway construction).
- Projects that include rehabilitation / modernization and are carried on the existing transport corridors.
- Projects to improve navigation conditions on the Danube or involving the development of construction works in the Danube River area.

Natura 2000 sites in the border area, identified in the vicinity of the projects that are included in "Do Minimum" Scenario are shown in Table 9.3. Of the two identified Natura 2000 sites, one is part of Hungary (HUKM20010) being situated at a distance higher than 1000 m from the above mentioned projects, and the other one, part of Bulgaria (BG0000534), located at a distance of about 7000 m. Given the distances of the Natura 2000 sites from the projects proposed in the "Do minimum" Scenario, located near the border or in connection with navigation on the Danube, can be consider that it is unlikely to have significant negative impact on above mentioned sites.

The projects of this scenario are already in the implementation phase, for this was already developed the procedure for environmental impact assessment: for the project to improve navigation conditions on the Braila Calarasi sector was already issued the environmental agreement and for the other projects has been issued a scoping phase decision.

From the analysis of environmental information available at this stage (environmental agreements, decisions and others) it can be concluded that none of these projects generate a significant trans-boundary negative impact on environmental and human health.

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 9.3 Projects located in the vicinity of the border of the Reference Case ("do minimum" scenario), code name and approximate distance to the Natura 2000 sites located in neighboring countries**

Transport mode	Project Type	Name	Neighbor country	Natura 2000 sit code	Natura 2000 name	Approximate distance (m)
Railway	Modernization of railway infrastructure	Modernization of Railway Border-Curtici-Arad-Simeria, Section 1: Border-Arad-km 614	Hungary	HUKM20010	Gyula-Szabadkígyósi Gyepek	3500
Naval	Improved navigation on the fairway	Improvement of navigation on the Calarasi-Braila sector	Bulgaria	BG0000534	Ostrov Chayka	7000

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

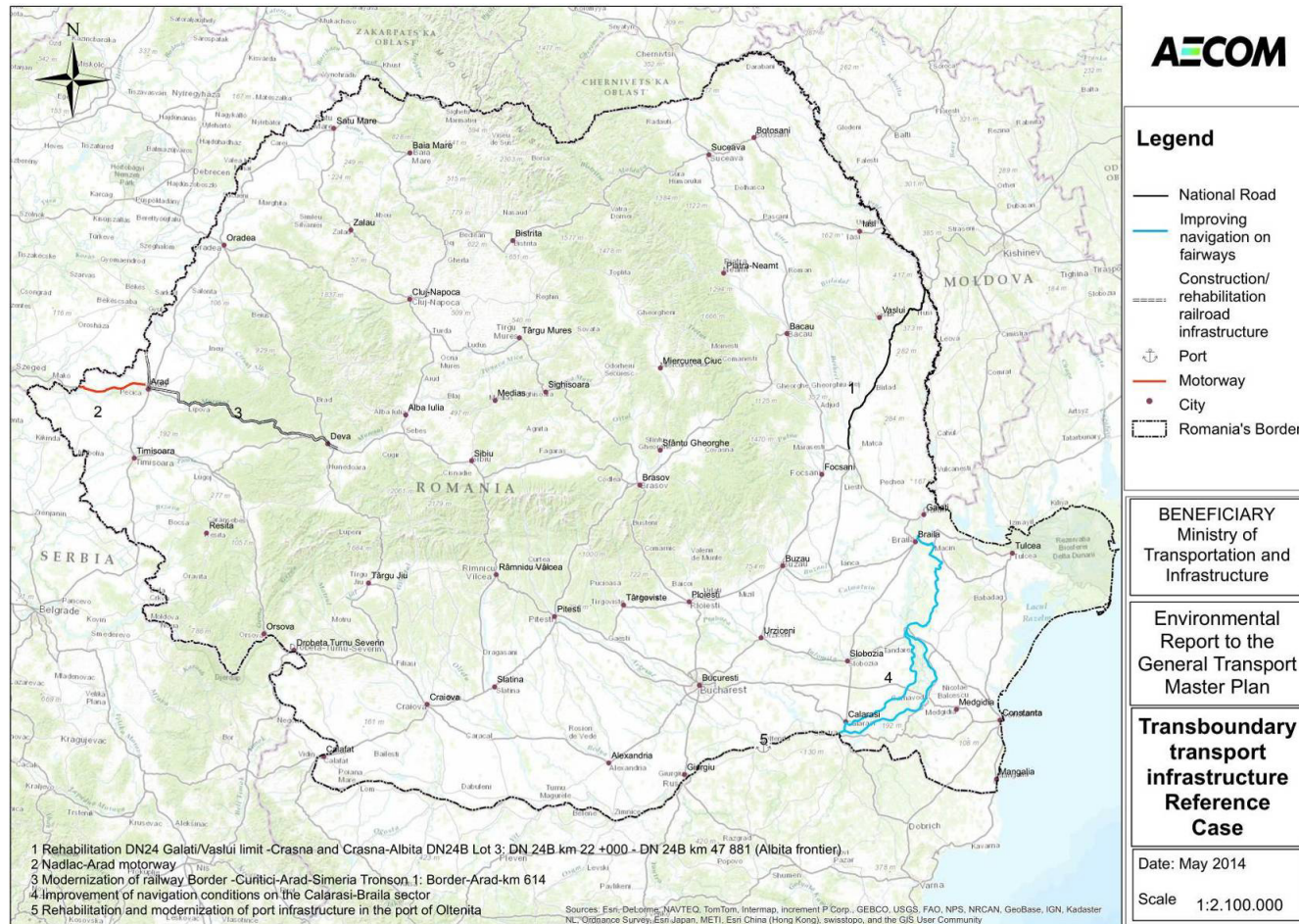


Figure 9.5 Proposed transport infrastructure projects in the vicinity of the border line - „Do minimum” scenario/Reference Case scenario

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

For the development scenarios, in order to analyze the trans-boundary effects, were considered projects located in the vicinity of the border, crossing the border rivers or related to navigation on the Danube. In this way have been identified 20 investment projects for ES / EES Development Scenario and 15 projects for the "Core TEN-T" Scenario which are presented in Table 9.4, Figure 9.6, respectively.

Depending on the type of investment, these projects can be divided into three categories:

- Projects including construction work and involving the development of new transport corridors (construction of motorways and express roads);
- Projects including rehabilitation and implemented on the existing transport corridors (existing railway rehabilitation);
- Projects to improve navigation conditions on the Danube or involving the development of construction works in the Danube River.

Core TEN-T Scenario is different from Do Something Scenario only by the proposed projects for the road sector.

**Table 9.4 a) Projects adjacent to border areas - "Core TEN-T" Scenario**

Transport mode	Project type	Name of the project	Country
		„Core TEN-T” Scenario	
Road	Construction road infrastructure	Bacău-Suceava-Siret Motorway (H11)	Ukraine
Road	Construction road infrastructure	Târgu Mureș- Pașcani- Iași- Ungheni Motorway (H15)	Moldova Republic
Road	Construction road infrastructure	Craiova – Calafat Motorway (H10)	Bulgaria
Road	Construction road infrastructure	Timișoara-Moravița Motorway (H27)	Serbia
Railway	Similar with „Do something” Scenario		
Naval	Similar with „Do something” Scenario		

**Table 9.5 b) Projects adjacent to border points - scenario "Do something"**

Transport mode	Project type	Name of the project	Country
		„Do something” Scenario	
Road	Modernization / rehabilitation of road infrastructure	Timisoara- Moravița (R1)	Serbia
Road	Modernization / rehabilitation of road infrastructure	București – Giurgiu (R2)	Bulgaria

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

Transport mode	Project type	Name of the project	Country
		"Do something" Scenario	
Road	Modernization / rehabilitation of road infrastructure	Craiova – Calafat (R3)	Bulgaria
Road	Modernization / rehabilitation of road infrastructure	Drobeta Turnu Severin - Calafat (R4)	Bulgaria
Road	Construction activities for road infrastructure	Gilău – Borş Motorway (OR12)	Hungary
Road	Construction activities for road infrastructure	Suceava – Siret express road (OR7B)	Ukraine
Road	Construction activities for road infrastructure	Paşcani- Iaşi-Ungheni express road (OR13A)	Moldavia Republic
Road	Construction activities for road infrastructure	Bacău – Focşani – Galaţi - Brăila – Giurgiu (OR6B)	Moldavia Republic Ukraine
Road	Construction activities for road infrastructure	Turda – Halmeu Expressway and connection road Livada – Petea (OR9B)	Ukraine Hungary
Railway	Rehabilitation of the railway in order to achieve the designed speed	Bucureşti – Iaşi via Bacău + Buzău – Galaţi + Paşcani - Ukraine (DS04A)	Ukraine
Railway	Rehabilitation of the railway in order to achieve the designed speed	Bucureşti - Giurgiu (DS10A)*	Bulgaria
Railway	Rehabilitation of the railway in order to achieve the designed speed	Craiova - Calafat (DS11A)*	Bulgaria
Railway	Rehabilitation of the railway in order to achieve the designed speed	Oradea Timişoara – Stamora Moraviţa (DS12)	Serbia
Naval (Ports)	Development of seaport infrastructure	Drobeta Turnu Severin Seaport (Sea Port P-DB-S)	Bulgaria
Naval (Ports)	Development of seaport infrastructure	Seaport Moldova Noua (P-MV-S)	Bulgaria
Naval (Ports)	Development of seaport infrastructure	Giurgiu Seaport (P-GR-S)	Bulgaria
Naval (Ports)	Development of seaport infrastructure	Olteniţa Seaport (P-OT-S)	Bulgaria
Naval (Ports)	Development of seaport infrastructure	Corabia Seaport (P-CB-S)	Bulgaria
Naval (Ports)	Development of seaport infrastructure	Orşova Seaport (P-OV-S)	Bulgaria

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



Transport mode	Project type	Name of the project	Country
		"Do something" Scenario	
Naval (Waterways)	Improved navigation on the fairway	Improvement of the navigation conditions of sector Danube Porțile de Fier II - Călărași (W1)	Bulgaria Serbia
Total number of projects proposed for each scenarios of the GTMP – "Do something" Scenario	<ul style="list-style-type: none"> <li>• 9 road transport infrastructure projects, including motorway construction project 1 project for building expressways, 4 projects for modernization / rehabilitation of existing roads;</li> <li>• 4 infrastructure projects for rail sector, railway rehabilitation projects in order to achieve the designed speed;</li> <li>• 7 shipping infrastructure project - one project for the improvement of navigation on the Danube, the Romanian-Bulgarian common sector (Porțile de Fier II – Călărași) and 6 port infrastructure projects on the Danube River.</li> </ul>		
	<b>20 Projects</b>		

The potential projects likely to have significant adverse effects on the environment are shown in red in Table 9.4 (a, b)

As can be seen from Table 9.4 (a, b), regardless of the selected scenario, proposed projects will be implemented in different time periods and in different locations. The potential adverse effects on the environment, including human health, which could occur due to the implementation of projects proposed by GTMP (for all scenarios considered), were analyzed in the previous chapter (Chapter 9). The transport infrastructure projects involving construction work may have the following potential environmental effects on human health including:

- Changes in soil mainly determined by:
  - Temporary change of land use (associated with the work front, site organization, storage of construction materials, borrow pits, temporary access roads, etc.) and final change of land use through final occupation of land area (for projects motorway construction, the road and rail infrastructure modernization and expansion requiring or modifying existing route alignment for meeting certain technical requirements for safety). These issues will be felt only on the national territory. Changing the land use category by creating new design elements will cause changes in the physical and aesthetic landscape locally, Romania. There will be no trans-boundary impacts.
  - Soil pollution could be determined only by the occurrence of accidental releases / uncontrolled pollutants on the ground or in water, dust deposition on soil contaminated with other air pollutants from the construction period generated by the specific activities of construction and transport activity, improper storage of waste, improper disposal of wastewater. To prevent and limit these effects will be proposed a series of measures to reduce the impact of both, the planning phase and construction and operation phase (see Chapter 10).
- Effects on natural protected areas and biodiversity:
  - Motorway projects can cross or can be located close to natural protected areas of national or local interest, with sites included in the Natura 2000 network. The

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>



Appropriate Assessment carried out for GTMP aimed to identify sensitive protected areas likely to be affected by implementation of proposed transportation projects. These types of projects will not have significant impact on protected areas in the border area.

Table 9.6 presents the nearest Natura 2000 sites located within the territories of neighboring countries.

According to the Appropriate Assessment Study in the territories of neighboring countries were identified 23 Natura 2000 sites, including one belonging to Hungary (HUHN20014), and the remaining 22 being located in Bulgaria. Most of the projects of this scenario, taking place in the vicinity of the border, crossing the border rivers or related to navigation on the Danube, are located at considerable distances (more than 3000 m) to Natura 2000 sites identified on the territories of neighboring countries. The exception is the project "Improvement of navigation on the Danube - Porțile de Fier II - Calarasi" crossing 21 Natura 2000 sites located in Bulgaria).

As mentioned previously for the project "Improvement of navigation on the Danube Porțile de Fier II - Calarasi", the procedure for environmental impact assessment is under way, and in this context trans-boundary consultation process began neighboring countries. In the "Craiova – Calafat Motorway" case a significant negative impact on BG0000552 site is considered unlikely.

The projects "Nădășelu – Bors Motorway", "Rehabilitation of Craiova-Calafat railway", "Rehabilitation of Bucharest North - Giurgiu railway" will not have significant adverse impacts on Natura 2000 network.

Given that projects routes taken into account are indicative trails that can suffer significant changes in the design, and that the projects included in the GTMP development scenarios will be developed in different time periods, detailing the effects generated and their magnitude can be achieved at a later stage of each project, when the potential trans-boundary effects will be, if needed, notified to neighboring states concerned.

Almost all projects with possible trans-boundary impact are located at a considerable distance from the Natura 2000 sites located within the territories of neighboring countries (those that have been identified by database available on the website of the European Environment Agency), except the "Improvement of navigation on the Danube - Porțile de Fier II - Calarasi" for which the procedure of environmental impact assessment is ongoing and in this situation it had begun the trans-boundary consultation process of the neighboring countries).

It is considered that, due to the fact that the alignments are only indicative, it is unlikely that there will be generated a negative impact on those natural protected sites.

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

**Table 9.6 Projects of the development scenarios, located in the vicinity of the border crossing points, code, name and approximate distance to the Natura 2000 sites located within the territories of neighboring countries**

Transport mode	Project Type	Name	Country	Natura 2000 code	Natura 2000 name	Approximate distance (m)
Road	Construction of road infrastructure	Gilău – Borș Motorway	Hungary	HUHN20014	Kismarjai Nagyszik	7000
Railway	Modernization of the railway infrastructure	Craiova-Calafat Railway rehabilitation	Bulgaria	BG0000552	Ostrov Kutovo	3400
Railway	Modernization of the railway infrastructure	Railway rehabilitation București Nord-Giurgiu	Bulgaria	BG0000529	Marten - Ryahovo	8700
Naval	Improvement of the navigation conditions on the fairway	Improvement of the navigation conditions for the sector Danube Porțile de Fier II – Călărași	Bulgaria	BG0000199	Tsibar	0
				BG0000232	Batin	0
				BG0000237	Ostrov Pozharevo	0
				BG0000241	Srebarna	0
				BG0000334	Ostrov	0
				BG0000335	Karaboaz	0
				BG0000377	Kalimok - Brashlen	0
				BG0000396	Persina	0
				BG0000529	Marten - Ryahovo	0
				BG0000530	Pozharevo - Garvan	0
				BG0000532	Ostrov Bliznatsi	0
				BG0000533	Ostrovi Kozloduy	0
				BG0000534	Ostrov Chayka	0
				BG0002007	Ostrov Ibisha	0
				BG0002008	Ostrov Do Gorni Tsibar	0
				BG0002017	Kompleks Belenski Ostrovi	0
				BG0002018	Ostrov Vardim	0
				BG0002024	Ribarnitsi Mechka	0
				BG0002030	Kompleks Kalimok	0
				BG0002067	Ostrov Golya	0
				BG0002091	Ostrov Lakat	0

<sup>109</sup> <http://www.mt.ro/domenii/transporturi/coridoare%20pan%20europene.html>

- Change water quality

Pollution of surface waters and groundwater contamination by modifying the physical, chemical and biological characteristics - could be determined only if occurring uncontrolled spills of pollutants on the ground or in water, dust deposits on soil contaminated with other air pollutants, improper disposal of waste, improper disposal of wastewater. For crossing the watercourses the design and construction of bridges / viaducts / bridges will be required. During construction works temporary disturbance may occur in the local morphological elements and / or water flow characteristics and possible temporary influences on groundwater. The rivers in the border area will not be affected.

For the project "Improvement of navigation conditions on the sector Danube - Porțile de Fier II Calarasi" the procedure for environmental impact assessment is ongoing and, in this context has been started the trans-boundary consultation process to neighboring states.

- Change air quality

The air quality during construction can be affected by emissions of air pollutants (such as particulate matter, nitrogen oxides, sulfur oxides, carbon oxides, volatile organic compounds, heavy metals, and other hazardous air pollutants, including benzene) from means of transport and equipment used in construction activities. Add to this, the dust from excavation, the asphalt concrete plants and activities of loading and unloading of construction materials. During operation it is expected to be reduced the air pollution in residential areas where traffic will be taken by the new variants route. The development of new transport routes which are much faster can have positive effects on the economic development of the regions concerned and on the possibility of investment and social development in the less polluted towns.

- Increased noise and vibration

The construction works, traffic of vehicles will cause an increase in noise and vibration. These are manifested locally in working fronts and around and not have transboundary effects. During operation period it is expected to reduce noise pollution in residential areas where traffic will be taken by these new variants route. The development of new transport routes which are much faster can have positive effects on the economic development of the regions concerned, the possibility of investment and social development in the less polluted towns.

- Generation of waste

During construction the type of waste generated are the results of excavation materials which cannot be reused as fillers, household waste, waste resulting from construction or demolition. Environmental Report has provided measures to prevent / reduce the amount of waste generated, and appropriate measures to eliminate these quantities. Thus, it is expected that the environmental impact will be insignificant and will not be felt across borders.

- Effects on human health are closely related to changes in air quality and noise.

As noted above these changes caused by the implementation of these projects will be local and will not extend across borders. Improvement of transport infrastructure will reduce the risk of accidents during transport.

For railway infrastructure projects (railway rehabilitation projects) and road rehabilitation, works will be carried out on existing alignments; these works will not have significant environmental effects to be felt in a trans-boundary context.

The construction projects involving the development of new road transport corridors (express roads, motorways) that will allow considerable improvement of conditions and transport safety, facilitates active connections between communities living on both sides of the border and contribute directly to modernization/expansion of the trans-European Network (TEN-T) and pan-European corridors, helping to improve the connection between Romania and neighboring countries.

Since for this phase no information is available on the final alignments of motorways and express roads proposed and the specific conditions of terrain are not known, analysis for these projects was made related to the indicative corridor and based on preliminary information. The role of strategic environmental assessment is to analyze the groups and types of projects while detailing the effects generated and the magnitude of each individual project will be done at the project level, in a subsequent step, when the potential trans-boundary effects will be notified to the concerned neighboring states.

To prevent, reduce the magnitude of these effects, from the planning phase, the GTMP proposes a series of measures to enable, in detail, further analysis, to avoid, prevent and reduce environmental impacts due to the proposed projects and a monitoring of potential effects (see Chapters 10 and 12).

In the table below are presented the additional information following the request of the Ministry of Environment and Water, in the letter no. 99-00-222/8,12,2014.

Observation	Request
<p><i>A detailed assessment of Impact of the Master Plan on the surface water and the hydro-morphology of the Danube river (including the "do Something" projects envisaged in the scenario Improvement of infrastructure of six Danube ports in trans-border areas with Bulgaria and Improvement of navigation conditions on The Danube sector Portile de Fier II – Călărași)</i></p>	<p>On the common sector Romania - Bulgaria (km 845.5 - km 375) there are 30 critical points for navigation in the minimum water depths fall below 2.5 m, minimum depth recommended by the Danube Commission.</p> <p>The works on improving navigation will be made mostly on water surface (Danube) over a length of about 595 km, on the land there will be only points of temporary work, for arranging banks (protection and consolidation).</p> <p>At this level of the Strategic Environmental Assessment, the technical details on how to execute these works are not known. The Technical solutions will be analyzed in detail within the technical project. In addition in the phase of the design the environmental impact assessment will be detailed.</p> <p>The role of strategic environmental assessment is to analyze the groups and types of projects, while detailing the effects generated and the magnitude of expression of each individual project will be done at a later project phase, when the potential trans boundary effects will be notified to the neighboring states concerned.</p> <p>Improving navigation conditions will not eliminate all required maintenance dredging of the fairway, but it is estimated that this will be reduce as the volume and range of achievement.</p> <p>It is known the fact that such works may produce changes water flows determined by an increase of the fairway depth (changes in the river bed morphology), the execution of various works to prevent silting, changing of flow direction and velocity etc. These effects occur on a short period of time, for some narrow areas.</p> <p>Groundwater quality will not be affected. From the quantitative point of view there will be no impacts</p>

	<p>on ground water resources.</p> <p>The works on development of port infrastructure Oltenița, Moldova Noua, Giurgiu, Corabia, Orșova. may include: rehabilitation of piers, rehabilitation of roads and railways inside ports area, quay and berth modernization.</p> <p>The works will be performed mainly inside the port, on the quay platform, at a distance of approximately 900-1000 m of the Bulgarian bank of the Danube and it is expected that they will not affect the Danube riverbed and will not significantly impact the water quality of the Danube.</p> <p>The works needed to improve navigation conditions on the Danube and modernization of port infrastructure will be carried out on different time periods. One cannot speak of a cumulative impact during execution.</p> <p>Works to improve navigation conditions on Danube and the development of port infrastructure may lead to an increase in naval traffic on the Danube. This growth also depends on economic development.</p> <p>The development of port infrastructure and modernization of ports will increase the safety of cargo handling operations, mooring barges in the quays and reducing the risks of accidents leading to pollution of the Danube.</p>
<p><i>With regard to human health a detailed information, analysis and conclusion on the extent of the possible impact on the nearest settlements on Bulgaria territory-of projects related to the expansion of the activities of Danube ports, the dredging of the river and the construction of a second bridge near Giurgiu (including with respect to air pollution, noise impact and water pollution of the Danube, hence potentially affected by water intake facilities located in the terrace of the Danube used for drinking water) shall be presented</i></p>	<p>Specific construction work for these types of projects can create discomfort to population from areas around the working site. Road traffic / naval traffic used for carrying materials, operation of machines and equipment, floating cranes required for construction works can lead to increased noise level and air emissions concentrations on the work site. These effects have a local and temporary effect and will have an insignificant impact on health.</p> <p>During the execution period the surface water quality could be affected only if accidental/uncontrolled spills of pollutants occur on ground or in water, improper disposal of waste or improper disposal of wastewater.</p> <p>The materials used for specific bank consolidation works or for bottom thresholds will not affect the quality of surface water, they fall within the category of inert material.</p> <p>Projects included in the two scenarios will be implemented in different periods of time, the cumulative impact during the execution period in terms of air emissions, noise level, pollutants in surface water is zero.</p>

	<p>Improvement of navigation conditions on Danube and port infrastructure development can lead to intensification of naval traffic. This growth also depends on the economic development in the next period. Intensification of naval traffic may lead to an increase in emissions in the atmosphere and increase the noise level in ports area. The generated impact will be insignificant and will not affect the population of the neighboring states.</p> <p>Works to improve navigation conditions works for the development of port infrastructure can help reduce the risk of accidents during transport or when handling goods. Although through achieving these works we estimate an increase in naval traffic, by increasing safety due to better navigation conditions is expected a reduction of the incidence of accidents and reduce the occurrence of possible pollution in the Danube.</p>
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**Figure 9.6 Proposed transport infrastructure projects in vicinity of the border line - "Do something" Scenario (ES/EES) and "Core TEN-T" – CTT Scenario**



By respecting the existing national and European regulations, assessing projects at the level of detail and implementing the proposed measures, it is expected that the potential negative effects on the environment and human health caused by infrastructure transport projects will not have a significant magnitude in trans-boundary context.

On the other hand it is considered that projects in border areas, aimed to developed the transport infrastructure, will contribute to the overall improvement of the public infrastructure and thus to better coordination and collaboration in the border areas in the spirit of border cooperation programs (programs that provide interventions to ensure correlation on development strategies across borders and consistency of interventions and investment programs for the transport sector).

Trans-boundary cooperation between Romania and neighboring countries there will be continued, as demonstrated both by the existence of agreements signed and the proposals to develop projects and programs aimed at solving problems in general areas of interest, including infrastructure development shipping:

**Table 9.7. Cross-border Cooperation Programs**

<b>Transboundary cooperation between Romania and neighboring countries</b>	<b>Program description and relation to the transport sector</b>
European Neighborhood and Partnership Instrument " Operational Program Romania-Ukraine-Moldova 2007-2013" <sup>72</sup>	Counties of Romania, included in the program: Botosani, Galati, Iasi, Suceava, Tulcea and Vaslui ENPI CBC Program Romania-Ukraine-Moldova 2007-2013 provides the framework for cross-border cooperation in the context of the European Neighborhood Policy that aims to avoid creating new dividing lines between the EU and its neighbors and also to enable them to participate various EU activities through closer political, economic, cultural and security cooperation. Priority measures of the program include: Measure 1.2 Cross-border initiatives in transport, border infrastructure and energy networks - rail network needs modernization program area, to improve interoperability between the three countries. Small-scale schemes to improve roads and railways, where it can be shown an increase in traffic across the border;
Border cooperation program between Romania and - Bulgaria <sup>73</sup> ;	Counties of Romania concerned are: Giurgiu, Virginia, Calarasi, Constanta, Olt, Dolj County. The program supports the development of border areas eligible, both in Romania and in Bulgaria. It aims to create a "bridge" between the two countries in order to support border regions bet on solving similar problems of development through cooperation and promote common solutions. The border will unite regions on both sides of the Danube, place bet on them asunder. The major areas of intervention proposed improving conditions for crossing the border and transport and communications infrastructure development in border area and transport facilities improving land and river borders.
Border cooperation program between	Counties of Romania concerned: Satu Mare, Bihor, Arad. County The overall strategic goal of the Cooperation Program is close to people, communities and businesses in the border area to facilitate the joint development of a cooperative area, based on the key strengths of the border region. Among the major areas of

<sup>72</sup>[http://www.fonduri-structurale.ro/Document\\_Files/transfrontaliera/00000041/yujkx\\_POC\\_Ro-Ua-Md\\_feb\\_romana.pdf](http://www.fonduri-structurale.ro/Document_Files/transfrontaliera/00000041/yujkx_POC_Ro-Ua-Md_feb_romana.pdf)

<sup>73</sup> <http://www.spirituldunarii.ro/files/Plan-stimulare.pdf>

Transboundary cooperation between Romania and neighboring countries	Program description and relation to the transport sector
Romania and Hungary; <sup>74</sup>	intervention include: Improving cross-border transport facilities or road development and railway development.

At this stage, based on available information and analyzing strategic alternatives proposed by the GTMP related to the objectives set at European and national level, it can be said that has not been identified potentially trans-boundary significant environmental effects on human health.

There are all prerequisites for implementation effects GTMP to generate a positive impact having cross because:

- Contribute directly to upgrade / extension of the TEN-T and Pan-European corridors, enabling a better link between countries in Western European and Eastern Europe.
- Allows traffic decongestion in Europe through the development of TEN-T ports transport infrastructure in Romania, high quality in proper economic conditions;
- Contribute to the improvement of environment;
- Stimulates economic competitiveness and sustainable development;
- Enables the development of a sustainable transport system, with considerable improvement of the conditions and transport safety by reducing travel time, reduce energy consumption, passenger and freight transport safety, both nationally and on the regions of our country and in the neighboring countries);
- Create the proper context for adaptation to climatic conditions of the transport sector;
- Facilitate active connections between communities located along the border and not only by improving cultural relations, social, economic, cultural and natural heritage of the country.

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<sup>74</sup> <http://www.huro-cbc.eu/ro/>

## **10. Proposed measures to prevent, reduce and offset as completely as possible any adverse environmental impact resulting from the implementation of the General Transport Master Plan**

As presented in *Chapter 9 - Potential significant negative environmental effects*, the proposed scenarios for GTMP can have negative effects on the environmental objectives established for certain environmental components, namely air, climate change, water, soil and subsoil management wastes and hazardous substances, biodiversity, energy efficiency. Thus, it was necessary to propose appropriate measures to eliminate, prevent, reduce and / or offset the likely adverse effects of these and additional measures to potentiate (strengthen) GTMP positive effects on the environment. In establishing these measures were taken into account legal provisions and the measures set out by the national strategies / action plans.

The proposed measures cover all stages of a project (planning phase, construction phase and operation phase) and also covers all aspects of environmental analysis (air, climate change, water, soil, biodiversity, population and human health, waste management and hazardous substances, energy efficiency and consumption of renewable resources, landscape and cultural heritage, sustainable transport).

These measures refer to:

- Avoid the sensitive areas (protected natural areas, densely populated, obstacles and natural barriers such as rivers, mountain areas, etc.) by choosing the best route alternative for projects included in GTMP, prevention and reduction measures for the environmental impacts where these areas cannot be avoided, compensation measures where significant impacts cannot be avoided;
- Environmental impact assessment and appropriate assessment from the early stages of planning and design phase of the projects;

The projects included in GTMP, which may have significant effects on the environment, due to the nature, size or location, will be subject to environmental impact assessments before issuing development consent (List of projects subject to EIA are listed in Annex 1 of GD 445 / 2009 on the impact assessment of public and private projects on the environment).

Types of projects falling under this Annex: Construction of motorways and express roads, inland waterways and river ports that provide traffic or operation of ships over 1350 tons, commercial ports, piers for loading and unloading connected to land that allow operation of ships of at least 1350 tons.

At this stage will be identified, in detail, the environmental impacts, will be quantified their intensity, will be clearly define the extension of the project, proposing specific measures to reduce significant adverse effects generated.

For a project, not directly connected with the management of the protected area of Community interest, but which can significantly affect the area, alone or in combination with other projects, will be assessed potential impacts on protected natural area of Community Interest according to GEO no. 57/2007 on the regime of natural protected areas, conservation of natural habitats and of wild fauna and flora, as amended and supplemented.

Environmental impact assessment and appropriate assessment should take into account the cumulative effects of these projects, both in relation to existing and those proposed in the same sector or other sectors.

- Selecting the best methods of design and construction in order to prevent and reduce the environmental impact (reduction of the direct / indirect environmental impacts);
- Limiting the amount of land occupied temporarily or permanently by GTMP proposed projects;
- Prevention and control of pollution both in the construction phase and the operation phase;
- Reduce impact on the transport sector emissions in the atmosphere;
- Reduced noise;
- Improving energy efficiency;
- Limitation of the effects on Natura 2000 sites;
- Taking into consideration the environmental impact assessment and appropriate assessment of cumulative impacts of proposed projects by GTMP with other projects undertaken/proposed target area for placement.
- Reducing the vulnerability of transport infrastructure to climate change and mitigation of the transport sector on climate change;
- Awareness of population on environmental issues associated with the transport sector.

It is recommended to implement these measures for development projects proposed by GTMP. It is also recommended that project implementation schedule developed by GTMP to take into account the time necessary to achieve adequate assessment and / or environmental impact assessment.

The Strategic Environmental Assessment role is to ensure proper measures for their protection of the environment and contribute to the integration of environmental aspects into the preparation and adoption GTMP.

**Table 10.1. Proposed measures to prevent, reduce and offset any adverse environmental impact resulting from the implementation of the General Transport Master Plan**

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
<b>Air</b>	1. Establishing new transport corridors routes so as to avoid possible sensitive areas (areas with high population density, protected natural areas, historic monuments, etc.)	Road Railway	Additional measures to boost the positive effects	Planning / Feasibility	State authority in transport and transport infrastructure Consultant
				Design	Designer
	2. Application of the "polluter pays" principle - fees for emissions from the transport sector.	Road Air Naval Railway		Operation	State authority in transport and transport infrastructure (for the supplied means of transport )
	3. The proposal and implementation of air quality monitoring programs for both new alignments's transport network and for the existing ones.	Road	Control and prevention measures	Operation	State authority in transport and transport infrastructure
	4. Proper maintenance of transport infrastructure and related facilities (during operating / service)	Road Railway Air Naval	Control and prevention measures	Operation	State authority in transport and transport infrastructure
	5. Use of cleaner equipment / machinery and transport vehicles the completion of the construction	Road Railway Air Naval	Control and prevention measures	Construction	State authority in transport and transport infrastructure Constructor
<b>Climate Change</b>	<i>From the estimates made using TREMODE model, the proposed investments of the GTMP, namely the development of transport infrastructure will reduce the GHG emissions. A series of common steps are needed between state authorities for component targets for climate change objectives to be achieved.</i>				

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
	6. Introduce measures to improve fuel efficiency and facilitating market access for suppliers of alternative fuels.	Road Railway Air Naval	Additional measures to boost the positive effects/ advice  Recommendations	In parallel with the development of transport infrastructure	Romanian Government
	7. Encouraging and promoting renewal programs of the National Park Auto	Road		In parallel with the development of transport infrastructure	Romanian Government Ministry of Environment and Climate Change
	8. Upgrade the equipment used for maintenance activities of transport infrastructure.	Road Railway		In parallel with the development of transport infrastructure	State authority in transport and transport infrastructure
	9. Transport infrastructure projects must consider the possible use of renewable energy technologies in space heating or for the production of electricity (we refer to projects that provide building construction works related transport infrastructure - space services , maintenance centers, office buildings, railway stations etc.)	Road Railway Air Naval		Design Operation	State authority in transport and transport infrastructure Consultant  Designer
	10. Promotion and implementation of intelligent transport systems to optimize passenger and freight traffic	Road Railway Intermodal		Operation	State authority in transport and transport infrastructure
	11. Development of national studies on the impact of different modes of transport: rail, road, sea, air, climate change	Road Railway Air Naval		In parallel with the development of transport infrastructure	State authority in transport and transport infrastructure  Ministry of Environment and Climate Change (MMSC)



Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
	12. Development of studies to assess the vulnerability of different modes of transport to climate change and developing adaptation plans of transport infrastructure to climate change, development of risk maps.	Road Railway Air Naval		In future stages of development	State authority in transport and transport infrastructure  National Meteorological Agency
	13. Steps taken to promote new technologies for road surfacing (asphalt or cement concrete) and runtime execution layer based on modified bitumen asphalt made to prevent permanent deformations caused by temperature increase) and providing resistance to cracking influenced by lowering the temperature and the use of these technologies for new infrastructure projects for transport;	Road		Planning Design Construction	State authority in transport and transport infrastructure  Consultant Designer
	14. The inclusion of measures to ensure the protection transport network to withstand extreme weather conditions. In road construction this can be done by providing adequate bridges, culverts and channels where intense rainfall, so as to avoid flooding	Road		Planning Design	State authority in transport and transport infrastructure  Designer
	15. Imposing restrictions of transport (e.g. imposing the maximum occupancy of a vehicle / introduction of lift-sharing schemes, tonnage restrictions)	Road		Operation	State authority in transport and transport infrastructure
	16. Awareness programs to determine the use of less polluting transport	All modes of transport		Periodically – in the implementation phase of the projects proposed	State authority in transport and transport infrastructure
	17. Compliance with the proposed measures for energy efficiency and conservation of exhaustible natural resources / use of renewable resources	All modes of transport	Additional measures to boost the positive effects		State authority in transport and transport infrastructure  Romanian Government MMSC

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
<b>Water</b>	18. Transport infrastructure projects must include measures to prevent / reduce water pollution, measures for the collection, treatment of rainwater contaminated with petroleum products and discharge of treated effluent.	All modes of transport	Measures to prevent and reduce	Planning Design Construction	State authority in transport and transport infrastructure  Consultant  Designer  Constructor
	19. The projects proposed by GTMP should adopt best practices for design and construction in order to limit / restrict activities that lead to change / disruption of watercourses	All modes of transport	Measures to prevent and reduce	Planning Design Construction Operation	State authority in transport and transport infrastructure  Consultant  Designer
	20. When choosing the optimum solution works to improve navigation on the Danube to take into account the criteria of environmental protection with special attention to protecting biodiversity.	Naval	Measures to prevent and reduce	Planning Design Construction	State authority in transport and transport infrastructure  Consultant  Designer
	21. The projects proposed for GTMP must provide measures for proper waste management both during construction and in the operation.	All modes of transport	Measures to prevent and reduce	Construction Operation	State authority in transport and transport infrastructure  Consultant  Designer
	22. The location of new corridors / extensions / annex building so as not to affect the sanitary protection zones	All modes of transport	Measures to prevent and reduce	Planning Design phase	State authority in transport and transport infrastructure  Consultant  Designer

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
	23. The projects proposed by GTMP to provide measures to reduce consumption of water resources	All modes of transport	Measures to prevent and reduce	Construction Operation	State authority in transport and transport infrastructure  Constructor
	24. Execution of projects proposed by GTMP which have contact with water or that are built on water	All modes of transport	Measures to prevent and reduce	Construction	State authority in transport and transport infrastructure
<b>Soil and subsoil</b>	25. When planning projects proposed by GTMP to take account the limitation of land occupied temporarily or permanently	All modes of transport	Measures to prevent and reduce	Design phase	State authority in transport and transport infrastructure  Designer
	26. Assessment of soil quality in the site of the project, identification of sensitive areas in terms of pollution.	Road  Air  Railway	Measures to prevent and reduce	Planning	Consultant State Authority in transport and transport Infrastructure
	27. The provision of safeguards against landslides / land erosion and soil and water pollution through collection and treatment facilities for water leakage from the surface platforms running vehicles.	Road  Air  Railway	Measures to prevent and reduce	Construction	State authority in transport and transport infrastructure  Constructor
	28. The provision of measures to collect and treat the polluted water (rainwater contaminated with petroleum products leaking platforms running of vehicles, sewage and technological maintenance centers, car parks, railway stations, airports, ports , depots, resulting in the construction period, etc.) in appropriate facilities and disposal of treated effluent according to the law.	Road  Air  Railway	Measures to prevent and reduce	Construction Exploitation	State authority in transport and transport infrastructure  Constructor

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
	29. The provision of waste management measures for both the construction period and for the period of operation	All modes of transport	Measures to prevent and reduce	Construction Exploitation	State authority in transport and transport infrastructure  Constructor
	30. The provision of measures to prevent resource consumption, reuse materials where possible	All modes of transport	Measures to prevent and reduce	Construction	State authority in transport and transport infrastructure  Constructor
	31. The provision of measures for ecological reconstruction of all land affected temporarily during execution and land restoration	All modes of transport	Measures to prevent and reduce	Construction	State authority in transport and transport infrastructure  Constructor
	32. Proposal of soil quality monitoring programs in the project sites both during construction and during operation	All modes of transport	Measures to prevent and reduce	Construction Operation	State Authority in transport and transport Infrastructure Constructor
<b>Waste and hazardous substances management</b>	33. The application of the waste hierarchy in order of priority (encouraging actions for the prevention of waste generation and management through effective preparation for reuse, recycling, energy recovery, disposal)	All modes of transport	Measures to prevent and reduce	Construction Operation	State Authority in transport and transport Infrastructure Constructor
	34. Using, wherever possible, for example in the construction of road infrastructure and railway, of wastes that are suitable for this purpose (carpet waste asphalt concrete)	Road  Railway	Measures to prevent and reduce	Construction	State Authority in transport and transport Infrastructure  Constructor
	35. The provision of appropriate management measures for hazardous substances both during construction and operation phase	All modes of transport	Measures to prevent and reduce	Construction Operation	State Authority in transport and transport Infrastructure  Constructor
<b>Biodiversity</b>	36. Choice of locations for transport infrastructure projects, including site management, manufacturing bases, concrete plants etc. necessary for	All modes of transport	Measures to prevent and reduce	Planning	Measures to prevent and reduce Consultant

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
	carrying out construction works in order to avoid possible bird protection areas and natural habitats included in the Birds Directive and the Habitats Directive and those protected by international conventions including ecological corridors.				
	37. Avoiding the forested areas when choosing the location of the transport infrastructure projects or extension of existing infrastructure planning	Road Railway	Measures to prevent	Planning	State Authority in transport and transport Infrastructure Consultant
	38. The provision of measures to prevent / reduce direct impacts on surface water and groundwater, soil, vegetation, air quality and noise mitigation measures, waste management and hazardous substances, climate change (see also proposed measures for these components )	All modes of transport	Measures to prevent and reduce	Planning Design	State Authority in transport and transport Infrastructure Designer
	39. The provision of biodiversity monitoring programs in the location of infrastructure projects before the stage of construction, during construction, during operation	All modes of transport	Measures to prevent and reduce	Planning Design Construction Operation	State Authority in transport and transport Infrastructure Designer Constructor Consultant
	40. Provision of the corridors / passages for wildlife movement (ecoducts for large mammals, reptiles and mammals green corridors for small - drainage culverts can be designed to allow the use for this purpose - routing corridors bats, protective screens for animals )	Road Railway	Measures to prevent and reduce	Planning Design Construction Operation	State Authority in transport and transport Infrastructure Designer Constructor Consultant

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
	41. The provision of measures to ensure the safety of animals (fences lateral portions that are built new bridges, protective fence on the side portions of the road)	Road	Measures to prevent and reduce	Planning Design Construction Operation	State Authority in transport and transport Infrastructure Designer  Constructor  Consultant
	42. The use of best available techniques for construction work	All modes of transport	Measures to prevent and reduce	Construction	Constructor  State Authority in transport and transport Infrastructure
	43. The provision of measures for ecological reconstruction of all land affected temporarily execution and completion of the utilities playing their initial	All modes of transport	Measures to prevent and reduce	Design  Construction	State Authority in transport and transport Infrastructure  Designer  Constructor  Consultant
	44. The provision of compensatory measures for potential natural areas affected: protected areas, forests.	All modes of transport	Compensatory measures	Planning  Design Construction	State Authority in transport and transport Infrastructure  Consultant  Designer  Constructor



Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
	45. Monitoring functionality / performance of environmental measures implemented for transportation infrastructure projects and review of such measures where appropriate	All modes of transport	Measures to prevent and reduce	Operation	State Authority in transport and transport Infrastructure
	46. For projects to improve navigation conditions is advisable to take when determining measures to take into account the cumulative impacts on biodiversity and natural protected areas of proposed works on the Calarasi-Braila (new solution to be determined) the proposed work Iron Gates sector Calarasi.	Naval	Measures to prevent and reduce	Planning Execution Operation	State Authority in transport and transport Infrastructure
	47. Compliance with the specific measures proposed by GTMP appropriate assessment (see Table 10.2)	All modes of transport	Measures to prevent and reduce Compensatory measures	Planning Design Construction Operation	State Authority in transport and transport Infrastructure Consultant Designer Constructor
<b>Population and human health</b>	48. Avoiding possible areas with high population density in siting transport infrastructure projects, the site organization, production bases, concrete plants etc. necessary for the carrying out of construction	All modes of transport	Measures to prevent and reduce	Planning	State Authority in transport and transport Infrastructure  Consultant

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
	49. The provision of measures to ensure the crossing road / railway safe (making walkways and / or subways, etc.)	Road Railway	Measures to prevent and reduce	Planning Design	State Authority in transport and transport Infrastructure  Consultant  Designer
	50. Achieving strategic noise maps and action plans according to GD. 321/2005 on the assessment and management of environmental noise - republished for: - main roads have higher traffic crossings 6,000,000 vehicles per year; - major railways which has more than 60,000 train passages per year; - civil airports who has more than 50,000 aircraft movements per year; - ports in agglomerations with more than 250,000 inhabitants	Railway Road Naval Air	Measures to prevent and reduce	Operation	Units subordinated to or under the authority of the central public authority which administers transport infrastructure road, rail, port and airport noise mapping done and develop strategic noise maps and action plans for major railways, roads and major civil airports are their administration, namely: -- Road National Company of Motorways and National Roads -- Railways Railway Company "CFR" SA, manager of railways -- Airports - Airport managing unit -- Port - port unit that manages the port - Environmental Protection Agencies are responsible for approving the strategic noise maps

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
	51. Implementation of the measures proposed in the action plans made according to GD. 321/2005 on the assessment and management of environmental noise - republished	Railway Road Naval Air	Measures to prevent and reduce	Operation	Units subordinated to or under the authority of the central public transport infrastructure that manages road, rail, port and airport
	52. The provision of measures to reduce the noise (windbreaks, sound-absorbing panels) in areas where new transport infrastructure projects is approaching to inhabited areas	Railway Road Air	Measures to Prevent and reduce	Exploiting	State Authority in transport and transport Infrastructure
	53. The provision of measures to prevent / reduce direct impacts on surface water and groundwater, soil, vegetation, air quality, waste management and hazardous substances, climate change (see also proposed measures for these parts)	All modes of transport	Measures to prevent and reduce	Planning Design	State Authority in transport and transport Infrastructure Designer
	54. The provision of programs for monitoring air quality, water, noise location area both during construction and operation period to allow the adoption of the best measures to reduce the impact on the population.	All modes of transport	Measures to prevent and reduce	Construction Operation	Constructor State Authority in transport and transport Infrastructure
	55. Monitoring functionality / performance of environmental measures implemented for transportation infrastructure projects and review of such measures where appropriate.	All modes of transport	Measures to prevent and control	Operation	State Authority in transport and transport Infrastructure

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
	56. The provision of recommendations for the use of machinery / equipment we achieve very efficient and reliable construction works	All modes of transport	Measures to prevent and reduce	Design Construction	Designer  Constructor  Sate Authority in transport and transport Infrastructure
<b>Landscape and cultural heritage</b>	57. Avoiding possible areas of significant landscape values of protected areas, areas with archaeological sites choice of transport infrastructure projects including supervisors, production bases, stations, concrete etc.	All modes of transport	Measures to prevent and reduce	Planning	Consultant  Sate Authority in transport and transport Infrastructure
	58. Compliance with the provisions of the regional landscaping plans, general and zoning urban plans.	All modes of transport	Measures to prevent and reduce	Planning	Consultant  Sate Authority in transport and transport Infrastructure
	59. In areas where archaeological sites will be identified if it interferes with excavation works (such as in the case of works for the construction of roads, railways, intermodal terminals) must be made prior to their development some archaeological research 60. Establish, through the investment feasibility study and the technical project of the measures to be detailed and the necessary funds for preventive research or archaeological supervision and protection of archaeological heritage.	All modes of transport	Measures to prevent and reduce	Planning Design	Sate Authority in transport and transport Infrastructure
	61. The provision of measures to highlight the landscapes of special value under the user's view of the railway, and roads.	Road  Railway	Measures to prevent and reduce	Planning Design	Consultant  Designer  Sate Authority in transport and

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
					transport Infrastructure
	62. The inclusion of landscaping projects, including planting adjacent areas of transport infrastructure.	All modes of transport	Measures to prevent and reduce	Planning Design	Consultant Sate Authority in transport and transport Infrastructure
	63. The provision of measures for ecological restoration of all land affected temporarily, the execution and completion of the utilities playing their initial	All modes of transport	Measures to prevent	Design Construction	Sate Authority in transport and transport Infrastructure Designer Constructor Consultant
<b>Energy efficiency</b>	64. Start actions by introducing alternative fuels at the expense of conventional ones for the transport sector, in accordance with the objectives of the European Union	All modes of transport	Additional measures to boost the positive effects	Parallel with the implementation phase of the projects included in GTMP	Ministry of Economy and Finance (MEF) Ministry of Agriculture and Rural Development (MARD)
	65. The provision of appropriate measures for the maintenance of transport infrastructure, improving the efficiency of the transport system	All modes of transport		Operation	Sate Authority in transport and transport Infrastructure
	66. Imposing restrictions of transport (e.g. imposing the maximum occupancy of a vehicle / introduction of lift-sharing schemes, tonnage restrictions).	Road		Parallel with the implementation phase of the projects included in GTMP	Sate Authority in transport and transport Infrastructure

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
	67. Encourage projects for the modernization of the rail (modernization of passenger and freight rolling stock - wagons, locomotives, electrification of railway lines)	Railway	Measures to reduce	Selection of priority projects	Sate Authority in transport and transport Infrastructure
	68. Encourage projects for the modernization of sea and river transport sector;	Naval		Selection of priority projects	Sate Authority in transport and transport Infrastructure
<b>Conservation of exhaustible natural resources / use of renewable</b>	69. Compliance with the proposed measure No. 1 for the environmental aspect "energy efficiency"	All modes of transport	Additional measures to boost the positive effects		Ministry of Economy and Finance (MEF) Ministry of Agriculture and Rural Development (MARD)
	70. The possible use of renewable energy technologies for space heating or electricity production buildings associated transport infrastructure: service areas, maintenance centers, office buildings etc.	All modes of transport		Design Operation	Sate Authority in transport and transport Infrastructure  Constructor  Designer
<b>Sustainable Transport</b>	71. Tax Reform in terms of transport costs: costs of transporting goods, passengers, transport infrastructure so as to create competitiveness between transport modes	All modes of transport	Additional measures to boost the positive effects	Operation	Romanian Government  Sate Authority in transport and transport Infrastructure
	72. The implementation of environmental policy and sustainable development in the transport sector	All modes of transport	Additional measures to boost the positive effects	Operation	Sate Authority in transport and transport Infrastructure
	73. Compliance with the proposed measures for environmental components: air, water, soil and subsoil, climate change, biodiversity, population and human health, landscape and cultural heritage	All modes of transport	Measures to prevent, reduce, control	Construction Operation	Constructor  Sate Authority in transport and transport Infrastructure

Environmental aspect	Recommended measures	Applicable sector	Measures type	Period/Implementation phase	Responsible
<b>Raising awareness of environmental issues in the transport sector</b>	74. Develop a system of public information, updated and easily accessible, including issues such as the state of roads and railways, public transport, environmental information, environmental factors monitoring results.	All modes of transport	Additional measures to boost the positive effects	During the implementation GTMP	Sate Authority in transport and transport Infrastructure
	75. Ensuring adequate participation of the interested public and local community in the decision-making process by organizing public debates and create a database for access to information on transport infrastructure projects.	All modes of transport	Additional measures to boost the positive effects	Design Construction	Sate Authority in transport and transport Infrastructure
	76. Develop awareness programs that have considered the transport activity impact on environment and encouraging changes in attitudes regarding the use of a particular sector of transport and means of transport used	All modes of transport	Additional measures to boost the positive effects	During the implementation GTMP	Sate Authority in transport and transport Infrastructure
	77. Maintenance of programs to encourage the purchase of environmentally friendly cars	Road	Additional measures to boost the positive effects	During the implementation GTMP	Romanian Government MMSC Sate Authority in transport and transport Infrastructure

\* The critical areas for protected species means: shelter areas, wintering, breeding, feeding, that are found within highly favorable habitats for species under the Natura 2000 conservation in that site.



## 11. Statement of reasons which led to the selection of the chosen GTMP alternative

### 11.1 Proposed alternatives for the General Transport Masterplan

The GTMP development process has been very complex. This process required the following steps:

- Step 1: The strategic objectives are the objectives defined at governmental or ministerial level and applicable, in general, as generic goals and objectives of the Government and the Ministry of Transport. For the GTMP these objectives were defined using the specifications, statements of the Ministry of Transport and Transport and the White Paper of the European Union.
- Step 2: Define the problems is the result of a diagnostic review of the transport system. We have identified the underlying causes which are responsible for the manifestation of problems and have been established the spatial problems to help identify specific objectives and interventions.
- Step 3: Operational objectives: these are the objectives related to the specific problems identified and represent a subset of the Strategic Objectives.
- Step 4: Generate the projects: these are specific interventions that address operational objectives and problems.
- Step 5: Evaluate and Prioritize Projects: Requires a systematic process for evaluating projects for two main reasons. First, there may be several projects that meet a particular operational objective and thus becomes necessary selection process. Second, a project can solve a problem but may have a poor ratio quality / price. In a situation such as that of Romania, where the funds available for transport are much lower than the identified needs, financial resources must be allocated in an efficient manner. Such a method requires the use of accurate and independent project evaluation. Thus, a multi-criteria analysis was developed (MCA).
- Step 6: Development of the GTMP Scenarios; In the ToR's for the GTMP it is required the development of two scenarios, a scenario for Economic Sustainability and a scenario for Environmental And Economic Sustainability. In the multi-criteria analysis, every project received a score based on the degree to which fulfilled the predefined evaluation criteria. Using different weights to score, each project received two scores, belonging to each scenario, resulting in a set of different priority projects for each scenario.

For the preparation of the General Transport Master Plan and Transport Strategy, it was necessary to develop a National Model for Multimodal Transport Romania (MNT), together with an evaluation system. The model developed by AECOM can test the impact of various transportation projects and policies and the proposed evaluation system allows selecting the most sustainable projects to be included in the list of priority investments.

The National Transport Model for Romania include the following representations of human and goods transport networks:

- Road network - cars, buses, heavy goods vehicles and light trucks;
- The rail network - trains people (Regio, Interregio and InterCity) and freight trains;
- Airline Network - services for air transport of persons and goods;
- Network shipping - transport of goods.

The Necessary data underlying the development of MNT is covering several areas:

- Travel patterns and modal freight categories:
  - Data from traffic interviews, CESTRIN investigations and also new travel interviews;
  - Data on the sale of tickets to determine the demand for each station;
  - Data on the sale of bus tickets where available; where there are no new data available to be used on the user to determine the travel patterns;
  - Interviews with passengers using train and bus travel in order to be determined travel characteristics and to facilitate the separation of data on ticket sales by purpose and socio-economic status;
  - A passenger plane displacements in terms of point of origin / destination in Romania and foreign country of origin or destination;
  - Movement of freight transported by VTMU categories (LGV) and VTMG (HGV), depending on the type and tons shipped;
  - Rail freight movement by type of goods categories;
- Demand for freight transport from the port of Constanta, depending to the type of cargo;
  - Transport demand for freight in the ports of Danube, depending on the type of goods;
  - The demand related to travels, depending on the transport mode;
  - Traffic metering classified, recorded along the national and county road network;
  - Monitoring of the traffic, along the national and county road transport network;
  - A permanent automatic traffic monitoring to determine seasonal variations covering a representative sample of national and county roads;
  - Monitoring of occupancy degree of buses on the routs developed around the main cities;
  - Passenger plane displacements in all airports of Romania;
  - Monitoring of railway stations embarkation or freight, on trains, in order to get daily schedules and demand profiles for model validation.
- Demographic information in the big cities, small towns and villages;
  - Population;
  - Active Population;
  - Jobs for each sector;
  - The type and structure of households.
- Socio-economic data;
  - The income and the amount of time spend by different types of people;
  - A GDP per sector and region, at least at the county level.
- Attributes of the transport system;
  - Information provided by GIS including county boundaries, roads and public transport links and physical geometrical characteristics;
  - Classification and technical condition of the national roads network;

- A routes / schedules for flights and passenger rail operational speeds;
- A path / racing schedules for bus passengers;
- A path / flight hours for transport by air;
- A path / hour racing passenger ferry transport;
- Location and nature of existing facilities in intermodal terminals and distribution centers;
- A charging system according to each mode of transport.
- Accident data
  - An accident data for a period of five years to calibrate their incidence rates according to the type of road;
  - One incident on the rail network information were obtained from CFR.
- Data length / speed trip in a cross section of the route verification flow relationship - speed;
  - A data on the average speed recorded in connection with travel flows will be used to calibrate the flow-rate curves considered depending on the type of road, which will be defined based on geometric characteristics;
  - A journey times on routes will be used to validate the model results; and
  - A behavioral characteristics during travel based on surveys declaring preferences.

Depending on the fundamental issues identified for each transport sector, were established a number of projects / investments that could lead to solving them. Individual projects identified candidate for inclusion in the GTMP, were tested by the National Transport Model before their inclusion in the development scenario. This is necessary due to strong demands from the EU, which requires that each project included in the GTMP will have to be economically and environmental justifiable, before its inclusion in one of the Development Scenarios.

In selecting the projects, have been considered the following aspects:

- Projects with limited economic benefits and significant environmental impacts will be excluded;
- Projects that bring great economic benefits, but have a significant impact on the environment will be considered projects that can be included in the development scenario based on economic sustainability;
- Projects that bring limited economic benefits, but positive impact on the environment will be considered projects that can be included in the development scenario based on economic and environmental sustainability;
- Projects that bring great economic benefits, but have a neutral or positive impact on the environment will be considered projects that can included in both scenarios.

In principle, both the objectives of the GTMP and its constituent projects must meet certain well-defined evaluation criteria which also will have to meet the requirements of the European Commission. For the GTMP were used three high-level evaluation criteria: Economic, Environmental and Policies (including funding). Thus in the process of selecting projects and establish order in the hierarchy of priority, the following aspects were taken into account in the cost-benefit analysis:

- A. Economic impacts

- Economic value (RIRE > 3%);
- B. Transport policies
- An extension / addition TEN-T Core / Comprehensive;
- C. Environmental impacts
  - noise pollution - by relating costs to the discomfort caused by noise and health costs due to exposure to high noise levels. Values were differentiated by the type of vehicles (cars, motorcycles, buses, commercial vehicles, passenger train, freight train) and location (urban, suburban, rural) and time of day (day, night).
  - local air pollution (emissions of pollutants such as particulate matter, NO<sub>x</sub>, SO<sub>2</sub> and VOCs)
    - the costs to human health, property damage, crop losses and damage to the ecosystem (representing cost vehicle \* km, train \* km, \* km airplane, ship \* km).
- D. Sustainability
  - a transfer of traffic from road transport by other means less polluting and more efficient in economic terms;
- E. balanced economic development
  - Increase accessibility and mobility.

**The first version of the General Transport Master Plan for Romania** was developed in 2012, representing a summary of the steps taken to prepare the Master Plan, the investment categories that have been considered view for the development of transport infrastructure, listing the general, specific and context strategic objectives. The purpose of this version was to provide the information necessary to initiate the environmental assessment process.

The **Draft General Transport Master Plan on short, medium and long term, basically a first draft of the Master Plan was published in August 2013**. This version was the basis for the final phase of the Environment Report development and the basis for discussion for the working groups of the SEA procedure.

In the period August 2013 - August 2014, the draft version of GTMP was analyzed, debated and refined. An important role for the completion of the GTMP have had the consultations with stakeholders (Ministry of Transport, carriers and other third parties). These consultations helped to identify root causes of problems for the transport system, detailed investigation of fundamental problems for each transport sector, further information necessary for the preparation GTMP. Alongside technical consultations were also held consultations for the Strategic Environmental Assessment for GTMP.

Consultations of the special working group established for Strategic Environmental Assessment (list of authorities involved in consultative process is presented bet on Annex 1 of the Environmental Report) allowed to establish specific environmental objectives, environmental objectives relevant to the plan, identify potential environmental impacts generated by the proposed project implementation, prevention, mitigation / compensation significant environmental effects, the monitoring of the significant environmental effects of implementing the plan.

GTMP first version was based on a total of 403 possible candidate projects, submitted for consideration by the authorities promoters. Of these 201 were selected for analysis of projects, which were subsequently tested in the National Transport Model (DTM) and subject to the assessment procedure based on the guidelines proposed by AECOM. Bet on the obtained results and using MNT, the GTMP scenarios were established.

The Draft GTMP for short, medium and long included four major scenarios:

- "Do nothing" - zero measures to develop transport infrastructure,
- Reference Case scenario ("Do Minimum") consider projects that are already under construction or for which funding is secured. For this scenario were identified and included a number of 117 projects. Most projects included in this scenario, belong to the road sector (68 of 117), being fully implemented by NCMNR, followed by investments in the railway sector (26 of 117), of which 25 will be financed by CNCF CFR SA and one by the NC MPA SA.
- Scenario 2020 - this scenario included a total of 86 projects.

This scenario included a total of 11 projects for the road sector in which 2 projects to modernize existing roads and 9 projects for new roads alignments extend the motorway network by 40% compared to the Reference Case Scenario ("Do Minimum"). The 18 projects proposed for rail corridors allow the upgrading of the TEN-T Core network from Bucharest to Arad and Timisoara, in order to reach 160 km / h and improvement of the transport conditions by modernizing rolling stock (wagons and locomotives) and railway stations (stations). In terms of waterways and ports sector, the investments proposed in this scenario brings some changes for the freight transport sector. Although for aviation sector are proposed a number of 23 projects, they are at a smaller scale.

**Table 11.1. Number of projects depending on the nature of the investment and the transport sector strategy proposed in 2020 (preliminary version GTMP)**

<b>Sector</b> <b>Investment sector</b>	<b>Air</b>	<b>Intermodal</b>	<b>Ports</b>	<b>Railway</b>	<b>Road</b>	<b>waterways</b>	<b>Total</b>
Freight Terminals	2	2	1				5
Information systems and ticketing	1						1
Infrastructure	6	4	1	1		1	13
Maintenance / Capital repairs				1			1
Modernizations	2		12	6	2		22
New alignments					9		9
Other investments				5			5
Passenger terminals	5						5
Transport policy				1			1
Railways	5					1	6
Rehabilitations				1			1
Rolling stock (wagons)				1			1
Rolling stock (DMUs)				1			1
Rolling stock (emu)						10	10
Rolling stock (locomotives)	2			1		1	4
Safety						1	1
<b>Total</b>	<b>23</b>	<b>6</b>	<b>14</b>	<b>18</b>	<b>11</b>	<b>14</b>	<b>86</b>

Source: AECOM Analysis on project fiches

Scenario 2030 - this scenario included a list of 45 investment projects proposed for this scenario are presented bet on the Environment Report Appendix 3B.

Bet on the preliminary version of the Master Plan on short, medium and long term, the scenario for 2030 was not addressed in detail. in the presented preliminary version, the 2030 scenario

proposes "26 projects for the railway sector (rehabilitation / modernization of railway line, and repair maintenance capital investment replacement rolling stock), 11 projects for the road sector projects (projects for construction of motorways, roads expressly bypass); 3 projects for the naval sector (1 project for the rehabilitation of the port waiting Front Mission, 1 project for setting Argeş and Dâmbovița River for navigation and other uses (Danube-Bucharest Canal), 1 project to purchase equipment).

**Table 11.2. Number of projects, on type of the proposed investments and transport sectors included in 2020 strategy (preliminary version of the GTMP)**

Investment type	Air	Intermodal	Ports	Railway	Road	Waterways	Total
National importance Projects/Programs	1	4	1	14	11	1	32
Maintenance and repair of existing assets	-	-	-	10	-	-	10
Investment in equipment	-	-	-	2	-	1	3
<b>Total</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>26</b>	<b>11</b>	<b>2</b>	<b>45</b>

All four scenarios were compared over the entire modal analysis, with the reference case scenario (base year 2011). Was chosen as the base year - 2011 since at this year, there is complete data relating to road transport, air transport, rail transport of passengers and cargo, including data from each station for passenger, cargo-related data that are carried on Danube in 2011, the most recent national census was held in 2011, which means that the most accurate data for the transport mode of the base year is corresponding to base year of 2011.

On 04.16.2014, the Managing Authority for Sectorial Operational Program Transport, published list of projects eligible for testing GTMP, comprising a total of 530 projects, of which 42% belong to the road sector, 26% of the railway sector, naval sector 14%, 16% and 2% air sector intermodal transport. Some of the projects included in this list are the reference case ("Do Minimum") included in the draft Master Plan on short, medium and long term. Projects from reference case were approved by the promoter and are listed in Annex. 2 of this study. Of the 530 candidate projects (489 projects actually left after removing duplicated bet on the list of projects) were selected after testing with the National Transport Model projects to be included in the final revised Master Plan short-term medium and long term bet on what was available on 31/08/2014.

After the public debate stage of the GTMP performed in October 2014, taking into account the comments and the interested public, was necessary a review of the projects included in the scenario "Do Something".

**Version chosen for the Master Plan of Transportation and analyzed in the Environmental Report was available on 22/10/2014.**

The final revised Master Plan Report on short, medium and long term includes 4 scenarios:

- **Reference Case Scenario ("Do nothing")** - which does not propose any measures or investment in transport infrastructure - (DN);
- **Development Scenarios ("Do Minimum")** - which takes into account projects already under construction / implementation or is funding (or DM Ref.);
- **Development scenario ("Do Something")** - requested by specifications that takes into account infrastructure projects needed to eliminate bottlenecks and increase the accessibility of regions and cities in Romania identified for the time horizons 2014 2020

2030 Projects individual candidates to be included in the Master Plan, were tested by the National Transport model (DTM) before their inclusion in scenario development. After testing, the same projects were ranked bet on the basis of a multi-criteria analysis as follows:

- hierarchy of policy implementation that aimed to eliminate bottlenecks, increasing accessibility of regions and cities in Romania based on economic sustainability - "Development based on economic sustainability" or "Do Something" (ES);
- hierarchy of policy implementation that aimed to eliminate bottlenecks, increasing accessibility of regions and cities in Romania based on economic and environmental sustainability, promoting modal shift from road transport to alternative transport modes - "Development based on economic sustainability and medium "or" Do Something Policy "(EES).
- In addition to the terms of reference, AECOM team conducted a second development scenario called **"Core TEN-T" (CTT) Scenario**, which differs from previous scenario only due to the proposed projects for the road sector projects - in this sector are taken into consideration only projects that contribute to the completion / expansion of TEN-T Core Network. For other modes of transport (rail, water, air and intermodal), the list is similar to that proposed in the Development Scenario elaborated as requested by the ToR's.

Projects included in the 3 scenarios of the GTMP are presented in Appendix 2 and 3 B, C, and synthesized depending on the transport sectors in the table below:

**Table nr. 11.3 Number of projects proposed by the three scenarios, on the transport sectors**

No. crt.	Transport sector	Number of projects		
		Do Minimum (Reference Case)	Development Scenario (ES/EES)	Core TEN-T (CTT) Scenario\
1	Road	54	64	11
2	Railway	30	16	16
3	Sea	22	14	14
4	Air	2	14	14
5	Intermodal	-	12	12
<b>Total</b>		<b>108</b>	<b>120</b>	<b>67</b>

"Do Minimum" Scenario is the starting point for scenario development. Projects included in this scenario are projects that are already in the implementation phase, which has already secured funding and will be made whether to approve the GTMP.

Scenario selected by the GTMP and proposed for implementation is oriented to the "development based on economic and environmental sustainability" or "Do Something Policy".

In addition to overall economic efficiency and policies of transport (criteria listed in paragraph A, B, D, E) in establishing the hierarchy of project implementation as part of the development scenario, have been considered also the environmental criteria listed above in paragraph C. The investment proposals for development scenarios are presented in Appendices 3B.

The weight of evaluation criteria (listed in the previous pages) in determining the final score assigned to each project is presented in the following table:



Criteria	„Development based on economic and environmental sustainability” (EES)
Economic efficiency	50%
Trans-European Integration / TEN-T policy	20%
Environmental impact	20%
Sustainability	There is not a score granted but it is considered by the modal distribution
Economic development	10%

The projects chosen represents the best alternative in terms of economic and environmental.

The Development Scenario oriented "development based on economic and environmental sustainability" or "Do Something Policy" compared to the Reference Case ("Do Minimum") provides the following economic and environmental benefits:

- Improvement of the transport infrastructure:
  - The connection and extension with the TEN-T core network expansion – the selected scenario proposes an assumed number of road projects that will help extend the network of motorways, expressways and bypasses (approximately 2882 km of new roads). Is expected to have an improvement of transport conditions by 6% and 22% for the entire roads network;
  - The modernization of main railway corridors from Bucharest to Arad and Timisoara, in order to reach 160 km / h (2930 km are proposed for rehabilitation of railway lines), modernization / replacement of the rolling stock and station upgrades;
  - The improvement of navigation conditions on the Danube and modernization of the ports.
- Increases the competition between modes of transport - Investment in maintenance, rehabilitation and modernization of railway services can lead to significant increases in passenger numbers. A feature of the projected impacts is to increase the average distances traveled - increase the number of passenger-km, increasing the number of tons-kilometers transported. Historical trend in Romania was to reduce the speed of movement of trains. The combined effect of improved system maintenance and repair and restoration design speeds rehabilitated corridors leading to increase travel speeds 16% in 2020 and 32% in 2030. These are improvements across the network and demonstrates the scale of progress possible for an integrated approach to maintenance and investment in rail.
- will reduce the journey time - increasing the average speed for the road sector, reducing travel times;
- contribute to the development of intermodal transport (intermodal terminal building new modernization / existing);
- contribute to national economic development (projects included in the GTMP benefits are considerable, we can expect that they will equate to 2% of Romania's GDP in the period 2020-2050);
- contribute to reducing the pollutant emissions in the atmosphere and local noise (especially by making bypasses of Motorways and express roads).

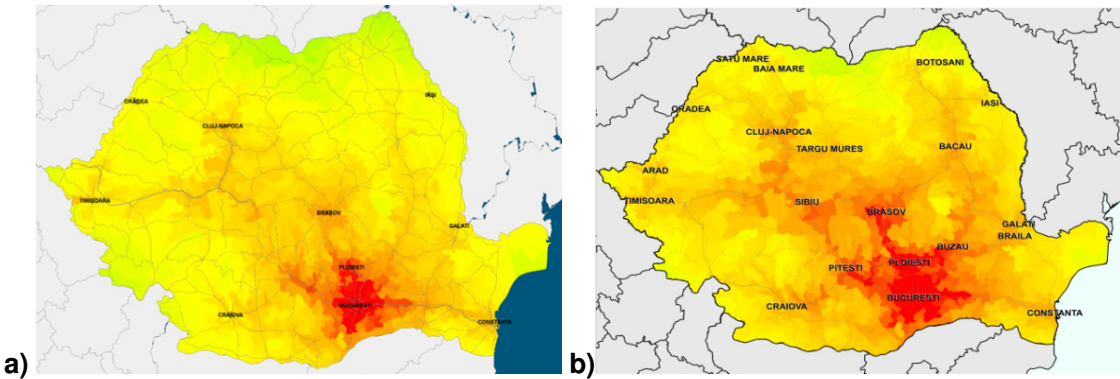


Fig.11.1 Accessibility in the base year 2011 (a) and forecast for year 2030 (b) intern travel

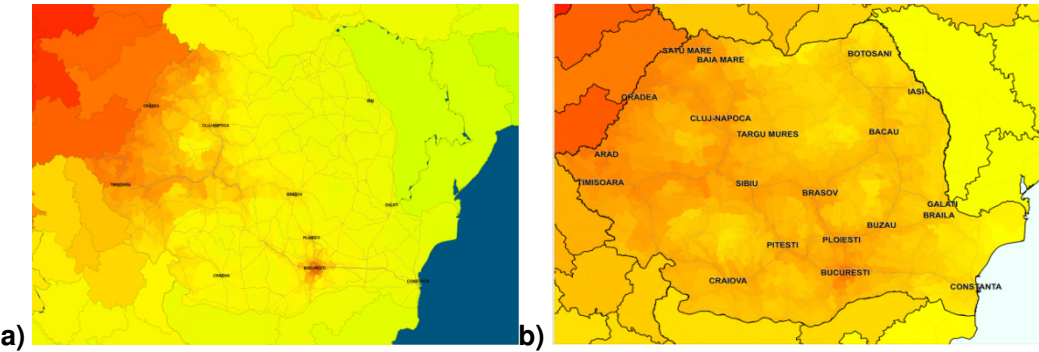


Fig.11.2. Accessibility to the 2030 (b) compared to the year 2011 (a) international travel

## 11.2 Difficulties

The difficulties that have been identified all the way of the development process of the strategically environmental assessment for GTMP are the followings:

1. The GTMP proposed a certain number of investment, all over the national territory. For the investments proposed by the GTMP, the routes are only indicative, at corridor level, part of them being in a position to suffer changes during the implementation period. There are not known the type of works that are specific to every project, their volume, implementation period or execution details in order to achieve a quantification of the impacts of each project. Considering these aspects concerning the determination of the environmental analysis likely to be affected and the potential effects on the environment caused by GTMP were made based on the nature of the proposed investment.
2. Environmental Report did not include fieldworks to collect data and information on the exact characteristics of the location areas for the proposed investments, the evaluation was performed using existing national statistical data and GIS analysis.
3. Lack of quantitative and spatial data on the current contribution of each sector of transport to the generated impact on human health and environmental components.
4. Quality of information and existing public data - for example, there are contradictions between information available for the same data set.

## 12. Measures envisaged for monitoring the significant effects of the implementation of the General Transport Master Plan

The monitoring program of the effects of the General Transport Master Plan entails identifying or preventing negative effects on the relevant environmental objectives and allows proposing additional protection measures to reduce environmental impact and to address areas likely to be affected.

The monitoring program tracks:

- How the relevant environmental objectives are met through the implementation of General Transport Master Plan - acquiring and recording information about significant environmental impacts, implementation and monitoring of all types of effects: positive, negative, direct, indirect, cumulative;
- The validity of predictions on the assessment of potential environmental effects and conclusions of the Strategic Environmental Assessment or of Adequate Assessment;
- Identifying the possibility of unforeseen adverse effects and appropriate remedial actions that may be taken;
- If the proposed measures to mitigate / reduce environmental effects are implemented and verifying their effectiveness;
- The monitoring program includes all environmental aspects and defines the following:
  - Items that will be monitored taking into account the relevant environmental objectives for the General Transport Master Plan;
  - Indicators that should be followed (these indicators allow to control how efficient the mitigation measures are and reaching proposed objectives and targets);
  - Implementation period / frequency of monitoring (frequency of monitoring depends on the problem identified, sometimes it takes a single monitoring, sometimes regular and long lasting monitoring);
- Responsible (who is responsible for organizing and coordinating the monitoring system).

The reference period for the application of monitoring measures includes four phases: planning, design, construction and operation.

To have a good control in terms of monitoring the effects of implementation of the GTMP it's recommended that within the Managing Authority for GTMP a monitoring department be created. It will have to follow up and systematically check whether GTMP targets are met (strategic, operational, general, specific and environmental objectives) based on financial, environmental or other indicators established, how the proposed investments are implemented, if and how the GTMP proposed environmental measures are taken into account and what are the results of such measures.

At the end of the implementation period a report should be developed to include information on environmental monitoring, monitoring methods, monitoring results and measures to reduce the environmental impact of investments proposed by GTMP. The environmental information shall be presented on environmental components, using the indicators in Tables 12.1, 12.2 and other indicators recommended by the competent environmental authority for each project.

This report will be prepared at the end of the implementation period, after information is available for each investment proposed and implemented.

It should be considered that it is necessary to ensure transparency and access to environmental information for GTMP. This can be accomplished by posting the information on the Environmental Management Authority's website.

**Table 10.1 Monitoring and control of environmental impacts of General Transport Master Plan**

<b>Environmental Aspects</b>	<b>Relevant Environmental Objectives (REO)</b>	<b>Monitoring indicator</b>	<b>Frequency/Implementation period</b>	<b>Description/Observations</b>	<b>Responsible</b>
<b>Air</b>	REO 1. Reducing national pollutant emissions into the atmosphere generated by the transport sector in relation to the amount of traffic modes	<p>Emissions of pollutants in the atmosphere (CO<sub>x</sub>, NO<sub>x</sub>, SO<sub>2</sub>, particulates, heavy metals, VOCs, PAHs) in results during construction of the projects proposed by GTMP.</p> <p>Emissions of pollutants in the atmosphere (CO<sub>x</sub>, NO<sub>x</sub>, SO<sub>2</sub>, particulates, heavy metals, VOCs, PAHs) - based on traffic volume for each transport sector and no. mileage (tons / year / 100,000 vehicles / 1000 km road network - rail - shipping - air).</p>	<p>Carry out measurements of the emissions into the atmosphere during performance in quarterly frequency and operating in biannual period.</p> <p>In addition to the twice-yearly measurements that are instantaneous, estimates of the volume of traffic in linked to fuel consumption will be made.</p>	Through the development of the projects proposed within the GTMP is possible that the total emissions from the transport sector will grow due to a general increase in demand for transport, but pollutant emissions reported in the same unit (no. Cars, mileage, etc.) should decrease to the Reference Case scenario.	State Authority in transport and transport infrastructure through its subordinate units.
	REO 2. Minimizing the impact of transport on air quality in urban and rural	<p>Emissions of pollutants in the atmosphere (CO<sub>x</sub>, NO<sub>x</sub>, SO<sub>2</sub>, particulates, heavy metals, VOCs, PAHs) results in construction projects proposed by GTMP.</p> <p>Emissions of pollutants in the atmosphere (CO<sub>x</sub>, NO<sub>x</sub>, SO<sub>2</sub>, particulates, heavy metals, VOCs, PAHs) - related to the volume of traffic and transport sectors no. kilometers (tons / year / 100,000 vehicles / 1000 km road network - rail - shipping - air)</p>	<p>Carry out measurements of emissions of pollutants into the atmosphere during performance in quarterly frequency and operating in biannual period.</p> <p>Making a bet on annual estimates based on the volume of traffic and fuel consumption by both the proposed investment scenario for the proposed development and the Reference Case scenario</p>	<p>It will also estimate annual emissions of pollutants in atmosphere for both proposed investments by development scenario and for the Reference Case scenario, which will relate to the amount of fuel consumed, no. Vehicle / mileage.</p> <p>It is expected that locally to reduce emissions of pollutants into the atmosphere. It is also expected that emissions of pollutants reported in the same unit (no. Cars, mileage, etc.) should decrease to Reference Case.</p>	State Authority in transport and transport infrastructure through its subordinate units.
<b>Climate change</b>	REO 3. Reduction of greenhouse gas	Emissions of greenhouse gases (CH <sub>4</sub> , N <sub>2</sub> O, NO <sub>x</sub> , CO,	There will be realized estimates of the amount of	It will also estimate annual emissions of pollutants in the	State Authority in transport

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
	emissions from the transport activity related to the volume of freight traffic modes, the change will be lasting fuel, etc.	CO <sub>2</sub> , NMVOC) in relation to the volume of traffic transport sectors reported no. miles traveled (tons / year / 100,000 cars / 1000 km road network rail - shipping - air).	emissions according to traffic volume correlated with fuel consumption in the operation period.	<p>atmosphere both for proposed investments by development scenario and for the Reference Case scenario, which will relate to the amount of fuel consumed, no. Vehicle / mileage.</p> <p>The data obtained are compared with each other.</p> <p>General transport demand growth will lead to an increase in emissions of greenhouse gases. Emissions of pollutants reported in the same unit (no. Cars, km traveled, etc.) should decrease to Reference Case.</p>	and transport infrastructure through its subordinate units.
	REO 4. Improving the efficiency of the fuel used - Increasing the use of alternative fuels (LPG, biogas, hydrogen, electricity) for transport and introducing more efficient technologies in terms of fuel consumption	The amount of alternative fuels used for transport (tons oil equivalent)	Once per year	<p>Achieving this depends more on facilitating the marketing of alternative fuels, infrastructure development for alternative fuels, improving vehicle operating technology than the development / modernization of transport infrastructure.</p> <p>It will compare the situation before project implementation</p>	<p>Data will be provided by the National Institute of Statistics</p> <p>State Authority in transport and transport infrastructure through its</p>



Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
					subordinate units.
	REO. 5 Reducing vulnerability of transport infrastructure to climate change (floods, extreme weather conditions, high temperature / low, landslides etc.).	<p>Number proposed and implemented measures to reduce vulnerability to climate change of transport infrastructure projects developed by GTMP</p> <p>The number of incidents happened due to extreme weather conditions (floods, low temperature / high, etc.), landslides in the project area. Number of roads, railways, ports, airports affected by extreme weather conditions</p>	<p>Once per year</p> <p>During first year of operation</p>	Research studies are needed to determine areas of risk and vulnerability studies to determine the effects of transport infrastructure climate (temperature influence of the precipitate on the technical structure of transport infrastructure). It is also necessary to modify the design standards to increase resistance to weather conditions.	State Authority in transport and transport infrastructure through its subordinate units.
<b>Water</b>	REO 6. Preventing damage to surface water bodies and groundwater	The volume of wastewater and concentration of pollutants - heavy metals, BOD5, COD, oil) in waters collected from the roadway, parking areas, service areas, ports, airports, railway stations, etc.	Twice a year, during the execution of the projects proposed by GTMP by direct measurements on water samples taken from the discharge points.	<p>It aims to verify the effectiveness of the proposed measures</p> <p>Maintaining the admissible limit values for wastewater discharge depending on the situation (sewer - NTPA002, natural emissary - NTPA001)</p>	State Authority in transport and transport infrastructure through its subordinate units. Romanian Waters National Administration
	REO 7. Reducing changes in morphology and hydrology of	These changes in the hydrological and morphological associated	During the planning period	There may be changes in the morphology of the riverbed and banks, the dynamics of runoff as	State Authority in transport and transport

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
	surface water bodies	transport sector - no. watercourses crossed by bridges / passages / viaducts which required adjustments, deviations; no. Temporary Works bet on the river beds required during the execution of investments - correlated with the effectiveness of the proposed measures		<p>a result of the works to build bridges / culverts / viaducts (piles and abutments, River engineering and consolidation of banks).</p> <p>It will also check whether the projects included in GTMP were proposed and implemented measures to prevent the occurrence of changes in the morphology and hydrology of surface water bodies.</p>	infrastructure through its subordinate units.
	REO 8. Prevent / limit intake of pollutants into surface water and groundwater	The volume of wastewater and concentration of pollutants - heavy metals, BOD5, COD, oil) in waters collected from the roadway, parking areas, service areas, ports, airports, railway stations, etc.	Twice a year, during the execution of the projects proposed by GTMP by direct measurements on water samples taken from the discharge points	<p>It aims to verify the effectiveness of the proposed measures</p> <p>Maintaining the admissible limit values for wastewater discharge depending on the situation (sewer - NTPA002, natural emissary - NTPA001))</p>	<p>State Authority in transport and transport infrastructure through its subordinate units.</p> <p>Romanian Waters National Administration</p>
<b>Soil and subsoil</b>	REO 9. Reduce consumption of natural resources related to the area built	Surface of land for temporary and permanent projects proposed by GTMP in relation to the total area of the country	in the design, execution and operating phases	The purpose is to verify that the proposed measures bet on the design (areas occupied by work sites, access roads etc. to be as low - relative to what is necessary, temporarily occupied	State Authority in transport and transport infrastructure through its subordinate

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
				areas must be brought to its original state after completion, etc.).	units.
		The types of land use on which projects proposed by GTMP will be located	during design phase, implementation phase and operating phase	The project planning phase will take into account the Local and General Urban Plans. Areas occupied by site organization, access roads, etc., will be as small as possible. These types of works will occupy if possible anthropogenic or unproductive land and will require remediation measures to make this land productive again.	State Authority in transport and transport infrastructure through its subordinate units.
		The amount of natural resources used for projects proposed for GTMP, based on unit (ex. Km road, km railway, building area)	Annually during execution and operation period	Measures to use recyclable materials will be proposed since the design phase (e.g. Waste from demolition debris, earth moving topsoil stripping result of other work resulting from other works in the project area). Ensure implementation of these measures.	State Authority in transport and transport infrastructure through its subordinate units.
	REO 10. Preventing and reducing pollution of soil and subsoil	Emissions of pollutants in the atmosphere (CO <sub>x</sub> , NO <sub>x</sub> , SO <sub>2</sub> , particulates, heavy metals, VOCs, PAHs) results in construction projects proposed by GTMP. Emissions of pollutants in the atmosphere (CO <sub>x</sub> , NO <sub>x</sub> , SO <sub>2</sub> , particulates, heavy metals, VOCs, PAHs) - based on the	Carry out measurements during the execution will be carried out quarterly frequency estimates and bet on a biannual operating period.  In addition to the twice-yearly measurements are instantaneous will be made	The emission of pollutants in the atmosphere can lead to an estimate of soil quality evolution and a determination of the influence of transport activity.	State Authority in transport and transport infrastructure through its subordinate units.

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
		amount of traffic in each sector of transport and no. mileage (tons / year / 100,000 vehicles / 1000 km road network - rail - shipping - air).	to the emissions estimates of the volume of traffic linked to fuel consumption.		
		The number of accidental pollution recorded and the affected areas (due to the implementation of projects proposed by GTMP) The type and amount of substances that caused accidental pollution	Annually, during execution  In the first year of operation	The goal is to verify the effectiveness of measures designed, built and operating made to prevent / limit intake of pollutants bet on soil / subsoil (e.g. Sealing gutters to collect rainwater from the road and mechanical installations for filtering / pre; propose measures equipped with means of intervention and operative intervention in case of accidental pollution etc.)  This indicator is relative, not the number of accidental pollution depends entirely on the quality of the work proposed by GTMP, they may be caused by human error, faulty various means of transport etc.	
	REO 11. Development of transport infrastructure linked to improving the efficiency of land use	The type and land areas occupied by permanent and temporary projects proposed by GTMP compared to the Reference Case reported lengths, surfaces permanently or temporarily occupied land	At the planning stage, during execution and during operation	This indicator correlates with indicator 1 and 2 for the OMR 9	State Authority in transport and transport infrastructure through its subordinate units.

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
<b>Waste and hazardous substances management</b>	REO 12. Reducing the amount of waste generated	The amount of waste generated (tons / year) - for projects proposed by GTMP calculated the surface structure.	Quarterly and annual performance during the operating period	There will be reports of both the amount of waste generated during construction and operation period.  During the design stage, particular attention will be given to this issue by making optimal estimates ante-measurements and so losses are minimized in production. Also bet on the execution phase, the contractor may be imposed limitations on the amount of waste generated real.	State Authority in transport and transport infrastructure through its subordinate units. Entrepreneurs designated for project execution.
	REO 13. Increasing the amount of waste recycled and recovered in the transport sector	The amount of waste reused or recovered by recycling (tons / year) - for projects proposed GTMP calculated the surface structure.	Quarterly and annual performance during the operating period		
<b>Biodiversity</b>	REO 14. Reducing transport infrastructure due to pressures that lead to impairment of natural habitats and biodiversity	Number of protected areas crossed by the proposed projects GTMP based on proper assessment of the situation in GTMP	During the planning phase	The route of new corridors will avoid possible crossing protected natural areas or where the occupancy is not possible to be minimal and will not affect habitats. It will compare the data presented in appropriate assessment study GTMP	State Authority in transport and transport infrastructure through its subordinate units.
		Percentage of protected areas affected by proposed projects by GTMP (relative to the total area affected area protected area)	Planning phase	The route of new corridors will avoid possible crossing protected natural areas or where the occupancy is not possible to be minimal.  It will compare the data presented in appropriate assessment study GTMP	State Authority in transport and transport infrastructure through its subordinate units.

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
				It shall satisfy themselves that the proposed measures by appropriate assessment of GTMP. It will compare the data presented in appropriate assessment study GTMP	
		Habitats within Natura 2000 sites of Community lost / altered as a result of implementing transport projects in GTMP	In the execution phase and the operational phase measurements specific annual	It shall satisfy themselves that the proposed measures by appropriate assessment of GTMP.  It will compare the data presented in appropriate assessment study GTMP	State Authority in transport and transport infrastructure through its subordinate units.
		Natura 2000 habitat areas (ha) within the sites of Community reversibly affected by construction works related to transport projects in GTMP	In the execution phase and the operational phase measurements specific annual	It shall satisfy themselves that the proposed measures by appropriate assessment of GTMP  It will be compared with the data presented in the appropriate assessment study GTMP	State Authority in transport and transport infrastructure through its subordinate units.
		Mortality fauna / flora of Community interest within Natura 2000 sites arising from the operation of infrastructure projects in GTMP (no. Copies affected)	In the execution phase and operation phase measurements bet on specific annual	It shall satisfy themselves that the proposed measures by appropriate assessment of GTMP  Mortality must be "zero"	State Authority in transport and transport infrastructure through its subordinate units.
	REO 15. Limitation of deforested areas / stripped	Cleared forest area (ha) and land areas uncovered for carrying out the works related	In determining routes for new transport corridors	Depending on the deforested area / despoiled compensatory measures must be provided.	State Authority in transport and transport

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
		to projects proposed by GTMP relative to the Reference Case scenario		Areas occupied by temporary work will be brought to its original state or even improved from Reference Case	infrastructure through its subordinate units.
<b>Population and human health</b>	REO 16. Protecting the public from risks associated with traffic accidents and enhance safety rail passenger and freight transport relative to baseline	Number of accidents and number of people affected national roads compared to the previous implementation of projects proposed by GTMP (serious accidents / million passenger-km) (fatalities / million passenger-km)	Once per year	In the design phase measures will be taken to protect the public against the risks associated with road and rail accidents, measures to be implemented by contractors. It is estimated that it will reduce the number of accidents / rail  The data are compared to the Reference Case	Ministry of Internal Affairs  State Authority in transport and transport infrastructure through its subordinate units.  Ministry of Health
	REO 17. Protection of human health by improving environmental conditions by reducing the effects of transport on air quality	Emissions of pollutants in the atmosphere (COx, NOx, SO2, particulates, heavy metals, VOCs, PAHs) in results during performance of proposed projects for GTMP. Emissions of pollutants in the atmosphere (COx, NOx, SO2, particulates, heavy metals, VOCs, PAHs) compared to the situation without project implementation based on the amount of traffic modes, no. miles traveled (tons / year / 100,000 cars / 1000 km network / 1000 km on railway	Carry out measurements during the execution of quarterly frequency and operating in biannual period.  In addition to instantaneous measurements are to be made to the emissions estimates of the volume of traffic linked to fuel consumption.	Emissions will be monitored by direct measurement, the measurement results and their interpretation will be reported to the Environmental Protection Agency  Emissions of pollutants is expected to rise while emissions per unit of measure (no. Cars, miles, etc.) would decrease	State Authority in transport and transport infrastructure through its subordinate units.



Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
		network - Marine - air)			
		Number of persons likely to be exposed to high concentrations of pollutants in the atmosphere of the project implementation.	When choosing alternative route for new transport corridors	In determining the final alternative route for new transport corridors will be avoided as much as possible densely inhabited areas	State Authority in transport and transport infrastructure through its subordinate units. Ministry of Environment and Climate Change
	REO 18. Reducing transport noise both at source and through mitigation measures, that overall exposure levels have minimal impact on human health	The number of locations linear paths traversed by the proposed road. Environment and Climate Change	When choosing alternative route for new transport corridors	In determining the final alternative route for new transport corridors will be avoided as much as possible densely inhabited areas	Units subordinated to or under the authority of the central public transport infrastructure that manages road, rail, port and airport noise mapping done strategic noise maps and draw up action plans for major railways, roads
		Noise registered	Making noise measurements before project implementation during execution bet on the quarterly and half-yearly frequency during operation.	Direct measurements of noise in the site of the project (the type of construction, during operation) in areas where measures have been proposed to reduce noise to verify the effectiveness of	
		Number of people likely to be exposed to noise in the area of project implementation			

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
		Surface absorbing panels / curtain made by forestry projects proposed by GTMP  Other noise reduction measures implemented		these measures.  Achievement / revising strategic noise maps and action plans according to GD. 321 of 14 April 2005 on the assessment and management of environmental noise *) - Republished	and civil airports large under their administration Strategic noise maps and action plans are approved by the Environmental Protection Agency
	REO 19 Increased mobility and accessibility	Number and type of projects proposed by GTMP implemented relative to Reference Case	Once per year	Influence of GTMP proposed projects on transport demand and transport conditions	State Authority in transport and transport infrastructure through its subordinate units.
		Changes in transport demand compared to the situation without the project (%) - attracted travelers from the road to rail freight volumes drawn from the road to rail and sea	Once per year	The goal is to see the influence of the implementation of projects on transport demand compared to the situation without project	State Authority in transport and transport infrastructure through its subordinate units.
		Number of km of roads made	Once per year	Influence road project implementation project to the situation without the change in average speed, travel time and road transport demand	State Authority in transport and transport infrastructure through its subordinate

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
					units.
		Number of km of railways rehabilitated	Once per year during operation period	Influence railway project implementation project to the situation without the change in average speed, travel time and transport modes	State Authority in transport and transport infrastructure through its subordinate units.
		The number and frequency of passengers	The number and frequency of passengers carried	Influence of project implementation road, rail, air compared to the situation without the project on transport demand different types of transport	State Authority in transport and transport infrastructure through its subordinate units.
<b>Landscape and cultural heritage</b>	REO 20. Protection of national, cultural and natural heritage	Affected protected areas (ha) of projects proposed by GTMP) relative to the total area of the Natura 2000 network	In the execution phase and the operational phase measurements at the execution stage specific annual and annual operating phase specific measurements. in the design phase will be taken to limit negative effects on Natura 2000 habitats will be implemented both in the execution phase and the operational phase. If the implementation is not expected outcomes measures, they will be permanently adjusted	Permanently occupied land area of proposed projects by GTMP In the execution phase and the operational phase specific annual measurements. in the design phase will be taken to limit negative effects on Natura 2000 habitats will be implemented both in the execution phase and the operational phase. If the implementation is not expected outcomes measures, they will be permanently adjusted according to the situation of land Upon completion of execution will be restored habitats including compensatory measures	State Authority in transport and transport infrastructure through its subordinate units.

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
			according to the situation of land Upon completion of execution will be restored habitats including compensatory measures		
		The number of archaeological sites open to various sections of the proposed investments due discovery of remains	During the period of construction works	Assessments are needed to determine the theoretical and field presence or absence of archaeological  The design phase will establish concrete measures in case of archaeological discovery and execution phase in application will be made.	
	REO 21. Development of transport infrastructure taking into account management policies, landscape protection and planning	The total transformation of the landscape which may arise as a result of the transport infrastructure projects contained in GTMP (surfaces of permanent and temporary occupied land, cleared areas, uncovered, number disused buildings)	In the design, construction and operation.	Situation analysis to establish new transportation route for corridors	State Authority in transport and transport infrastructure through its subordinate units.
<b>Sustainable transport</b>	REO 22. Modernization and development of national transport system so as to ensure the achievement of sustainable transport	Number of proposed projects implemented by GTMP	Throughout the reference GTMP (2015, 2020, 2030)		State Authority in transport and transport infrastructure through its subordinate units.

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
	REO 23. Improving transport behavior in relation to the environment	Emissions of pollutants in the atmosphere (CO <sub>x</sub> , NO <sub>x</sub> , SO <sub>2</sub> , particulates, heavy metals, VOCs, PAHs) compared to the situation without project implementation based on traffic volume transport sector, no. miles traveled (tons / year / 100,000 cars / 1000 km network / 1000 km on railway network - shipping - air)	<p>Measurements will be carried out during the implementation period estimates will be made quarterly and operating frequency during semester.</p> <p>In addition to instantaneous measurements are to be made to the emissions estimates of the volume of traffic linked to fuel consumption.</p>	<p>Emissions will be monitored by direct measurement, the measurement results and their interpretation will be reported to the Environmental Protection Agency</p> <p>Will be made to the emissions estimates based on traffic volume. It is likely that the sections that will make investments which will be put into operation will be felt a reduction in emissions relative to the volume of traffic but reported nationally, this corridor will focus on some of the traffic and the many other sections traffic will decrease and the amount of emissions implicitly.</p> <p>It is possible that total emissions to grow but emissions per unit of measure (no. Cars, km, etc.) should fall</p>	<p>State Authority in transport and transport infrastructure through its subordinate units.</p> <p>Ministry of Environment and Climate Change</p> <p>Units subordinated to or under the authority of the central public transport infrastructure that manages road, rail, port and airport noise mapping done strategic noise maps and draw up action plans for major railways, roads and civil</p>

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
		The number of areas where action was needed for noise reduction proposed projects implemented by GTMP and noise level (dB) after implementation of these measures registered	Making noise measurements before project implementation during execution bet on a quarterly basis and bet on a quarterly basis during operation.	Direct measurements of noise in the site of the project (the type of construction, during operation) in areas where measures have been proposed to reduce noise to verify their effectiveness. Achievement / revising strategic noise maps and action plans according to GD. 321 of 14 April 2005 on the assessment and management of environmental noise *) - Republished	airports large under their administration  Strategic noise maps and action plans are approved by the Environmental Protection Agency
<b>Energy efficiency</b>	REO.24. Improving energy efficiency in the transport sector by increasing the use of renewable energy resources and significantly reduce oil dependence.	Average speed transmission (km / h) on new roads created	Annual	Increase average speed of transport and reduce travel times will reduce fuel consumption based on distance traveled and greenhouse gas reduction.	State Authority in transport and transport infrastructure through its subordinate units.
		Average speed transmission (km / h) on railways rehabilitated		Traffic volume attracted new routes will have a positive impact especially when increasing percentage in freight rail transport, maritime and intermodal.	State Authority in transport and transport infrastructure through its subordinate units.
		Changes in travel times (no. Hours traveled) for the same mileage	Annual	Data will be compared with the situation before project implementation	State Authority in transport and transport infrastructure through its subordinate units.
		Traffic volume attracted new routes created			

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
	REO 25. Reducing energy consumption in the transport sector	The number of projects for modernization / rehabilitation / extension proposed by GTMP implemented km electrified railway km of roads rehabilitated	Throughout the reference period of the GTMP (2015, 2020, 2030)	<p>Increase average speed of transport and reduce travel times will reduce fuel consumption based on distance traveled and greenhouse gas reduction.</p> <p>Traffic volume attracted new routes will have a positive impact especially when increasing percentage in freight rail transport, maritime and intermodal.</p> <p>Moving from Diesel electric locomotives by electrification of the railway lines will reduce fossil fuel consumption.</p>	State Authority in transport and transport infrastructure through its subordinate units.
		Percentage of change in demand for transport as a result of implementing the proposed projects by GTMP	Annual	Travel surveys	State Authority in transport and transport infrastructure through its subordinate units.
		Traffic volume attracted new routes created	Annual	<p>Increase average speed of transport and reduce travel times will reduce fuel consumption based on mileage and reduce emissions.</p> <p>Traffic volume attracted new routes will have a positive impact especially when increasing the percentage of freight to rail, and</p>	State Authority in transport and transport infrastructure through its subordinate units.



Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
				intermodal shipping.	
<b>Conservation of exhaustible natural resources / use of renewable resources</b>	REO 26. Reducing exploitation of exhaustible resources and facilitate the use of renewable	The amount of alternative fuels used (tons oil equivalent)	Annual	<p>In the design of equipment may require measures of roads with power systems of vehicles with alternative fuels</p> <p>The data are compared with the previous period of project implementation</p>	<p>State Authority in transport and transport infrastructure through its subordinate units.</p> <p>Data on the amount of fuel used can be provided by the National Institute of Statistics</p>
<b>Raising awareness of environmental issues in the transport sector</b>	REO 27. Informing and raising awareness about the effects of transport activities on the environment and human health risks and risks to human health.	<p>Number and type of information made public</p> <p>Number of events organized</p> <p>communication and promotion</p> <p>Number of hits on the website of the project's environmental information</p>	Annual		<p>State Authority in transport and transport infrastructure through its subordinate units.</p> <p>Ministry of Environment and Climate Change</p>
	REO 28. Involvement and consultation of	Number of consultations and public debates	Annual	During the Strategic Environmental Assessment	State Authority in transport

Environmental Aspects	Relevant Environmental Objectives (REO)	Monitoring indicator	Frequency/Implementation period	Description/Observations	Responsible
	stakeholders throughout the decision-making process in establishing and implementing the proposed measures to reduce environmental impact			Stage and Environmental Impact Assessment Stage	and transport infrastructure through its subordinate units. Ministry of Environment and Climate Change

## 13. General Conclusions

The General Transport Master Plan is a comprehensive document prepared by AECOM based on experience and national and international technical background and offers a development strategy of Romania's transport sector for the coming years. This document presents implementable solutions to the problems and requirements of the transport sector in Romania and will be the basis for infrastructure development projects funded by various European programs.

GTMP is a strategic document that will underpin integrated investment planning and transport for the period 2014-2030 and is a binding document without which Romania will not be able to access structural funds for transport for the period 2014-2020.

GTMP is the document that sets out the priorities for investment in the TEN-T CORE and comprehensive network and secondary connectivity, expected to be completed by ERDF and CF.

GTMP will contribute to the development of the Single European Transport Area in accordance with Article 10 of Regulation (EU) Nr.1315 / 2013 of the European Parliament and of the Council.

GTMP identifies projects and policies considered to be the most suitable to meet the requirements of Romania's National Transportation system for the next 20 years for all transport modes, while providing a solid, analytical basis for choosing those policies and projects, taking into account the need for balanced development of the country's regions.

To devise the GTMP scenarios were developed for the following timelines:

- short term for 2015;
- medium term, 2020;
- Long-term 2030.

The scenarios developed and analyzed in GTMP are:

- "Zero Development" ("Do nothing") Scenario - which does not propose any measures or investment in transport infrastructure - (DN)
- "Reference Case" ("Do Minimum") Scenario - which takes into account projects already under construction / implementation or funding (or DM Ref.)
- "Do Something" Scenario was developed as required by the ToR's and takes into account infrastructure projects needed to eliminate bottlenecks and increase the accessibility of regions and cities in Romania identified for the time horizons 2014, 2020, 2030. The individual candidate projects for the Master Plan (covering the fields of road, rail, water, air and intermodal), were tested by the National Transport model (DTM) before their inclusion in scenario development. To determine the hierarchy of project implementation we used high-level evaluation criteria, such as economic impacts, transport policy, environmental impacts (safety, climate change, air pollution, noise pollution, Natura 2000 areas protected natural impacts on soil and water resources), sustainable, balanced economic development. Two situations were considered "development based on economic sustainability" and "development based on environmental and economic sustainability."

The Environmental Report for the development scenario "Do Something", takes into account for the environmental assessment an extended version of projects (the so-called "worst-case scenario"), which includes, besides the projects submitted in the GTMP version of 31.08.2014 (v. Annex 3A), also the projects requiring a further revaluation / testing using the National Transport model (v. Appendix 3C).

In addition to the terms of reference in the Tender Book, AECOM team developed a second development scenario called "Core TEN-T '(CTT) which differs from previous scenario only by the number of projects proposed and the nature of proposed investments for the road sector - for this

sector only projects that complement/expand the Core TEN-T network will be taken into account (highways).

*The scenario supported by GTMP is the development scenario based on economic and environmental sustainability.*

**General Transport Master Plan for Romania** is part of the plans that are subject to strategic environmental assessment (SEA). In accordance with decision no. 145790 / 23.10.2012 issued by the Ministry of Environment and Climate Change - Impact Assessment and Pollution Control Directorate, the Master Plan is subject to environmental assessment procedure or the procedure for proper evaluation.

Establishing the level of information detail contained in the Environmental Report for General Transport Master Plan and the analysis of significant effects of GTMP were done within the Special Working Group established.

The overall objective of GTMP is: **Ensure the creation of an efficient, sustainable and safe transport system, which is essential for Romania's economic development.**

The specific objective of GTMP is: **Devising transport policy instruments that promote the development of a sustainable and mode-balanced transport system, which will form the base of SOP Transport 2014-2020 and other decisions and optimal investment planning in the transport infrastructure.**

#### ***The Environmental objectives of the GTMP***

A general environmental objective (OM1) and four specific environmental objectives (OM1-1 - OM1-4) were established and agreed upon in the working group constituted for the environmental assessment procedure:

- **OM1. Development of a modern transport infrastructure, taking into account environmental effects;**
- **OM1-1. Promoting investment in transport projects that contribute to a sustainable transport system with measures to avoid and reduce adverse effects, such as pollutants in the atmosphere, noise pollution in urban areas and on roads with heavy traffic, pollution and soil due to diffuse sources, the impact on the landscape and cultural heritage;**
- **OM 1-2. Reduction of greenhouse gas emissions from the transport sector;**
- **OM 1-3. Protection of human health by improving the environment and transport safety;**
- **OM 1-4. Reducing the impact on biodiversity by providing measures to protect and conserve biodiversity and ensure consistency of the national protected areas**

The Environmental Assessment and Appropriate assessment of the GTMP were made globally and not through a project by project approach. Given Romania's extensive area, both environmental assessment and appropriate assessment did not involve field work to collect data and information.

For some projects included in the transport development strategy the exact spatial location was not available at this stage. At the time of the Environment Report information on the type and volume of construction for each project was not available, and the evaluation was made using data and forecasts on environmental effects of other similar projects.

The role of strategic environmental assessment is to analyze groups and types of projects, while detailing the effects generated and the magnitude of expression of each individual project will be done at project level in a subsequent step.

The starting point for environmental assessment was existing national information regarding the transport sector's impact on the environment (e.g. statistics of the National Environmental Protection Agency, the National Institute of Statistics).

Relevant environmental components taken in account to achieve the Strategic Environmental Assessment for General Transport Master Plan are: air, climate change, water, soil, waste, biodiversity, population and human health, noise, natural landscape, cultural heritage, sustainable transport, energy efficiency, conservation / natural renewable resource use, increase awareness of environmental issues from transport. For these components 28 relevant environmental objectives have been established in the working group, GTMP effects were analyzed in relation to these objectives (examined whether GTMP can lead to these objectives and the targets proposed for these).

Based on the analysis of the environmental objectives set through policies, strategies, plans, programs and regulations at national and European level, environmental aspects relevant to GTMP and current environmental trends, the relationship between policies, strategies, plans, programs and relevant regulations for the national and European transport sector with GTMP objectives and proposals GTMP, a series of environmental objectives were defined. These objectives allowed GTMP environmental impact assessment and the establishment of benchmarks for monitoring and verifying the implementation period of GTMP.

The conclusions drawn from the Strategic Environmental Assessment are the following:

- Of the four scenarios proposed by the GTMP the scenario focused on the "development based on economic and environmental sustainability" (EES scenario) was chosen. Compared with the other scenarios "Do nothing", "Do minimum" and Core TEN-T Scenarios, the ES/EES development scenario will help to reduce the overall impact of transport on the environment sector.
- Investments proposed by the General Transportation Master Plan (GTMP) for the development scenarios can generate potential negative effects on the environmental objectives established for certain environmental components, namely air, climate change, water, soil and subsoil, waste and hazardous substances management, biodiversity, energy efficiency.
- The analyzed "Do Minimum" Scenario (Reference Case) considers projects that are being implemented and have secured funding sources. From the available environmental information provided by the contracting authority (MT) we conclude that the vast majority of these projects went through the procedure for assessing the environmental impact (there are decisions of the employment steps or environmental agreements issued by the competent environmental authority, which determine the conditions for implementation only for a small number of projects have undergone the procedure for assessing the environmental impact and have been conducted environmental impact assessment and / or appropriate assessment studies).
- "Do Minimum" Scenario encourages the development of road transport. This transport sector will have potential negative effects on the environmental objectives established for air, climate change, energy efficiency, conservation of exhaustible resources. This scenario, especially in the road sector, makes it difficult to achieve the environmental objectives without proposing additional measures to those already established in the design phase. At European level, this precise tendency to increase transport demand for freight and passengers is the main cause of increase in traffic congestion and energy consumption.
- "Core TEN-T" Scenario differs from ES / EES development scenario by number and type of projects proposed for the road sector. "Core TEN-T" Scenario offers only road sector

projects that extend / complete the TEN-T core network. By implementing the GTMP proposed projects in the development scenarios (Core TEN-T, ES/EES), the physical changes that occur are due to construction works (building motorways, expressways, bypasses, rehabilitation of railways, modernization of airports, ports modernization / development, navigation channel realization, works for the improvement of navigation on the Danube);

- The specific nature of the construction of the proposed investment by the two development scenarios (ES / EES and CTT) will cause permanent changes in terms of land area occupied, the category of land use and landscape. For ES / EES Scenario are proposed about 887 km of motorways, 2241 km expressways, bypasses 182 km, 3225 km of roads rehabilitated and modernization / rehabilitation of about 4536 km railway will be modernized / rehabilitated. CTT scenarios are proposed around 1589 km of new roads.
- For all types of projects, regardless of the transport sector, the environmental effects are insignificant during construction, manifest locally on site and are temporary.
- The impact of GTMP development scenarios (ES / EES and Core TEN-T) on Natura 2000 network was analyzed in the Appropriate Assessment Study; conclusions of this study are presented in Chapter 8.5 of this Environmental Report.
- In terms of ecological corridors intersection it's stated that at this stage areas with potential of becoming natural ecological corridors cannot be assessed, this assessment is required to take place within the individual studies for the proposed projects. High probability of ecological corridors crossing occurs if the projects are located in the vicinity of Natura 2000 sites or intersect with their surface and when projects cross many natural habitats.
- The list of projects that cross Natura 2000 sites is given in the environmental report's Annexes and the adequate assessment study.
- By implementing the projects proposed through development scenarios (ES / EES and CTT) changes are projected in air quality, noise level and local landscape. It is expected that the proposed new roads will help to reduce emissions of pollutants into the atmosphere and noise level in the towns crossed by the existing national roads.
- Development of transport infrastructure and transport increased activity may lead to an increase in the quantity of waste. These effects are manifested especially during project development, requiring appropriate waste management programs (limitation of waste, recycling, reuse of waste where the situation allows it, selective collection and disposal). Enhancing transport activity in itself can lead to the generation of waste associated with this activity.
- The projects will have a direct effect on the consumption of natural resources. Natural resources needed to implement each project will be detailed in the procedures of environmental impact assessment (EIA) as different from one project to another and from one sector of transport.
- For all GTMP development scenarios (ES / EES and CTT) the current trends of increase in total emissions of greenhouse gases are maintained. For all scenarios analyzed by GTMP the road sector will have the highest contribution to the overall emissions of greenhouse gases, followed by rail, air and water. This is due to the increased demand for transport and hence the number of kilometers driven, the national fleet growth. The CTT scenario implementation will have the largest contribution to total emissions of greenhouse gases.

- Development of transport infrastructure can lead to increased emissions of greenhouse gas and air pollutant emissions at national level compared with the reference year 2011. Taking into account traffic estimations and weather forecast we can conclude that the transport sector will enable achieving the objectives and targets set for air and climate change component. Achieving these objectives does not depend entirely on improving the state of transport infrastructure. There are other factors that may influence variation in air pollutant emissions and emissions of greenhouse gases. These factors are:
  - Improving the marketing of alternative fuels and vehicles to allow the use of these fuels;
  - Developing facilities to fuel vehicles with alternative fuels especially for road and rail sectors;
  - Economic development at a regional and national level;
  - Cost associated to used fuels and vehicle maintenance;
  - Types of fuel used;
  - Supply and demand for cleaner performance vehicles;
  - Tax / tax levied on vehicles;
  - Pollution taxes;
  - Need for individual mobility;
  - Technological improvement of vehicles;
  - Behavior of road users;
  - Inefficiency or lack of public transport services;.
  - Average speed of traffic (the transition between localities, inside the locality, etc.).
  - Application and enforcement of measures to prevent, reduce the environmental impact GTMP proposed;
  - Increasing amount of freight and number of passengers on railway/naval /air sector detrimental road sector;
- Energy efficiency in the transport sector is not entirely dependent on the technical conditions of rolling track of vehicles, depends also on the degree of loading of vehicles, physico-geographical characteristics of areas where transport infrastructure is located (mountains, plains, hills), vehicle weight.
- Projects included the development scenario chosen for GTMP will not happen all at the same time and in the same areas. There is a schedule for their implementation on a time horizon of short, medium and long term, from 2014 and containing up after 2030.
- Although the current trend tends to lean predominantly toward traffic road, which is not necessarily the most efficient mode of transport in terms of climate impacts, alternatives proposed in the Master Plan have tried to support the balanced all transport sectors, to improving competitiveness and keeping open all manners of transportation alternatives and to serve the needs of the economy and population.
- To reduce the potential negative effects on the environment, both during execution and during operation, it is necessary to propose appropriate measures to eliminate, prevent, reduce and / or offset the likely adverse effects of these and additional measures to potentiate (strengthen) the GTMP positive effects on the environment. These measures include:
- Avoid sensitive areas (protected natural areas, densely populated, obstacles and natural barriers such as rivers, mountain areas, etc.) by choosing the best alternative route for projects included in GTMP and provision of measures to prevent and reduce effects on



the environment where these areas cannot be avoided. This is necessary since the planning stage (feasibility).

- Environmental impact assessment and appropriate assessment of the earliest stages of planning and design;
- Correlation proposed measures for GTMP proposed measures programs, strategies and other national and European plans aimed at the transport sector.
- An accurate evaluation of the effectiveness of environmental protection measures proposed and implemented and proposing additional safeguards if the situation requires;
- Taking a consider the environmental impact assessment of the cumulative impacts of proposed projects by GTMP with other projects undertaken / proposed target area for placement.
- Selection of the best methods of design and construction in order to prevent and reduce environmental impact (reduction of the direct / indirect environmental impacts);
- Limitation of land areas temporarily or permanently occupied by GTMP proposed projects;
- Pollution prevention and control both the construction phase and the operation phase of the proposed investment;
- Limitation effects on Natura 2000 sites. According to the survey conclusions of the appropriate assessment:
  - Most of the potential significant impacts can be avoided by reconsidering project routes and their positioning outside the boundaries of Natura 2000 sites (preferred option for sites with small areas) or, where applicable, outside the occupied areas by habitats and species of community interest (option required for sites which occupy large areas and already incorporates a considerable anthropogenic presence). For situations where avoidance of Natura 2000 sites intersection or of critical areas within them is not possible, it is necessary to consider possible measures to reduce and, where appropriate, compensate significant impacts;
  - For current configuration of the projects proposed by the development scenario (ES / EES) and CTT Scenario, some Natura 2000 areas (SCI / SPA overlapping) should be subject to measures to avoid or reduce impacts to prevent significant.
  - Measures to reduce negative impacts should focus on increasing the permeability of transport infrastructure (mainly for road and rail sectors) and reducing noise levels. These concerns should also cover new projects proposed and existing infrastructure today.
  - Compensation measures should be considered for all projects that will lead to loss of critical habitats Natura 2000 habitats or species of Community interest within Natura 2000 sites.
  - Impact assessment and measures to avoid, reduce and offset must be based on the project level based on rigorous studies that include significant components of field investigations. It recommends that appropriate assessment studies for all projects GTMP proposing construction work within or in close proximity (<1 km) Natura 2000 sites.
  - Transport projects can generate impacts and long distance and therefore monitoring their effects and the success of measures to reduce and offset is needed to ensure a level as low residual impact.
  - Environmental assessment of each project proposed will also consider areas outside sites but which are important for Species of Community Interest (feeding

areas, areas of migration, breeding areas, etc.). In accordance with national legislation, species of conservation interest enjoy protection both inside and outside the protected natural areas. For this reason, concern disclose potential conflicts species of conservation interest and their habitats must be present in all stages of design and the whole complexity of these projects. Attention should be focused primarily on identifying and protecting areas of migration / displacement of wildlife conservation interest outside Natura 2000 sites can be intersected by transport projects but this concern should not be neglected for small projects where such a station building rehabilitation can affect nesting areas of some species of birds or bats hibernacule.

- A number of recommendations for the transport sector to climate change adaptation;
- Complying with the existing national and European regulations, assessing the level of detail and the implementation of the proposed measures is expected that the potential negative effects on the environment and human health caused by transport projects will not have significant impact in trans boundary context.
- The scenario proposed by GTMP is focused on "Development based on economic and environmental sustainability" (EES scenario), this scenario compared to the Reference Case scenario ("Do Minimum") provides the following economic and environmental benefits:
  - Improvement and development of transport infrastructure will allow increasing the average transport speed, decreasing travel time and thus reducing fuel consumption and emissions of pollutants into the atmosphere;
  - The projects proposed by GTMP will increase the safety and reliability of travel time, reducing the risk of accidents involving casualties and property damage;
  - Decrease of transport infrastructure vulnerability to climate change – through the possibility of introducing for the proposed investments specific execution conditions;
  - The projects proposed by GTMP will enable increasing competitiveness between modes of transport, the possibility of using less polluting modes of transport;
  - Improvement transport services (investment in rolling stock, modernization of railway stations, airports modernization, modernization of ports etc.);
  - Circulation improvement on the Danube or on internal channels;
  - Development /improvement of intermodal freight transport;
  - Balanced economic and social development at local, territorial and national level.
  - Will reduce the journey time - increasing the average speed for the road sector, reducing travel times.
  - Will contribute to the national economic development (projects included in the Master Plan benefits are considerable, we can expect that they will amount to 2% of Romania's GDP in the period 2020-2050).

## 14. Appendices

1. Certificate of registration in the national register of environmental protection studies developers;
2. Appendix 1 - Methodology for Strategic Environmental Assessment for Transport Master Plan General (GTMP);
3. Annex 2 - List of projects included in the Reference Case "Do Minimum";
4. Appendix 3 - List of candidate projects GTMP;
5. Appendix 3A - B List of projects proposed for GTMP version 8.31.2014;
6. Appendix 3C - List of proposed projects for GTMP consolidated version 10.22.2014;
7. Appendix 4 - Weather emissions of greenhouse scenarios analyzed period 2014-2030;
8. Appendix 5A - Estimation and neighborhood areas within Natura 2000 sites potentially affected by the proposed project implementation GTMP;
9. Appendix 5B - C lists projects that intersect / approaches the Natura 2000 sites;
10. Annex 6 - evaluation matrix of potential impacts of environmental GTMP;
11. Appendix 7 - MMSC address approving Suitable Assessment Study.