# Project “Greening 2014 Sochi Olympics: A Strategy and Action Plan for the Greening Legacy”

Stage I – Situation Analysis

July 31st, 2012

## CONTENT

# 1 DESCRIPTION AND JUSTIFICATION OF PROJECT PROPOSALS

**Name of the project**

"GREENING 2014 Sochi Olympics: A Strategy and Action Plan for the Greening LEGACY"

**Subtask**

Quantitative assessment of the current Sochi Transport situation and the proven sustainable improvement steps on operational and technical levels

**Problem Statement on transportation & mobility related issues**

Transportation and especially motorized transport causes dramatic pollution and reduction of life quality in Sochi. This will get worse due to the impact of the delivery of the Olympic Winter Games in 2014 and radical measures need to be implemented on various fronts.

The collapse of individual traffic on the main corridors will force a change of philosophy of how mass mobility is handled in Sochi.

The project's targeted solutions will have a large impact in reducing GHG emission.

It is of high importance to visualize and state the current (2009 transport analysis) dramatic transport situation, including the anticipated outcome if no effective counter measures are taken.



It is necessary to have a close look at the current daily "driven km" in the Sochi region mainly caused by an inefficient public transport system and unlimited access for every individual vehicle to each part of the city.

Alternative, sustainable concepts have to be proposed to avoid complete traffic collapse.

# 2 PROJECT OBJECTIVES AND TASKS - STAGE I

## 2.1 IOC SUSTAINABILITY OBJECTIVES

The Olympic Movement constantly includes measures to make the Games a true example of sustainable development concept delivery and a powerful tool to spread the knowledge about its prospectively fruitful, beneficial and successful execution.

Agenda XXI (Olympic Movement's Agenda 21), adopted by the Olympic movement in 1999 inspires the Games organizers to put every effort towards a more profound integration of sustainable development and ecological responsibility principles into all aspects of preparations for the Games and during the Games.

Successful experience in implementing environment and sustainability programs within the framework of the Games organization already exists for 15 years since the first "green" Games in Lillehammer in 1994 were held.

This experience has enabled the IOC to provide the Games organizers with necessary methodological tool for planning and action – IOC Guide on sports, environment and sustainable development published in 2006.

*Agenda XXI is a component in the sustainable development concept. It is aimed at involving Olympic movement representatives into active care for sustainable development of our planet. It lays down main concepts and commonly recognized actions, general action plan for Olympic movement representatives for achieving this goal.

## 2.2 SOCHI 2014 ENVIRONMENTAL STRATEGY

Keeping to the Olympic Charter and the IOC guidelines, aspiring to embody the Olympic movement's motto: «Citius, Altius, Fortius!», Sochi 2014 organizers are preparing innovative Winter Games actualizing sustainable development concept in harmony with the unique nature of Sochi National Park Caucasian Black Sea coastal area and leaving a rich "green" legacy for Russia and its future generations.

It requires Game organizers not only to retain and carefully treat Sochi environment but also to improve its condition in Olympic capital simultaneously with a considerable economic growth of the whole Region, new opportunities for its people and turning it into a world class alpine climatic resort.

Sochi 2014 Environmental Strategy is a live and evolving framework instrument for planning, and it being improved and developed under changing conditions in pursuit of optimal solutions.

Sochi 2014 Environmental strategy:

- integrates environment protection sustainability principles into all phases of planned preparation for, and delivery of the Winter Games of 2014;
- creates an integrated basement to unite collaborative efforts of stakeholders and identifies a
- common vision of the final results Sochi 2014 Games are to demonstrate to the whole world;
- defines general strategic goals for Sochi 2014 regarding sustainable development in harmony with nature;
- outlines Sochi 2014 policies for implementing environment and sustainability principles in each functionality of preparation for, and delivery of the Games;
- specifies mission, role and responsibilities of Sochi 2014 Organizing Committee regarding enforced sustainability principles in unique natural conditions in order to ensure Sochi 2014 development in harmony with nature;
- describes main means and ways instrumental for Sochi 2014 to achieve strategic goals regarding sustainable development in harmony with nature;
- proposes fundamentals of planned approach towards formation of the Games 2014 «green» legacy.



Sochi 2014 Environmental Strategy is a general stakeholder engagement platform to commence dialogues with stakeholders on environment and sustainability issues and also is a communication tool to profile environmental commitments and projects.

Sochi 2014 Environmental strategy is the outline of the whole scope of Sochi 2014 commitments, responsibilities, main activities and prognosis results in the field of environment. Due to it's general character Sochi 2014 Environmental strategy is a cornerstone of further strategic planning.

Organizers of the Games are looking forward to take up the best, front-edge and accountable methods for the Olympic project's worthy implementation throughout the whole period of preparations for, and delivery of the Olympics. In doing so they take an open position for inviting all stakeholders and parties concerned ready to make contribution to sustainable development of Sochi in harmony with nature.

Sochi 2014 Environmental Strategy is based on existing plans and programs. It considers interests of all stakeholders and is instrumented through concrete decisions taken in the framework of comprehensive Olympic facilities' and infrastructure development projects.

Structure of Sochi 2014 Environmental Strategy is based on four main dimensions with a symbolic names: Games in harmony with nature; Climate neutral Games; Zero waste Games; Enlightenment Games.

The Strategy is furthering this concept in each of the three main phases of the Games project

(preparation, staging, post-Games period). For each of the mentioned stages we formulate clear vision of Sochi 2014 commitments, of the efforts towards fulfillment of those commitments and of the contemplated results that would form the Games' legacy.

Sochi 2014 Environmental strategy does not contain detailed plans for each of the dimensions. Instead it leaves room for in-depth detailed planning. Respective plans, as far as they are drawn up, shall piece out an indispensable addenda to Sochi 2014 Environmental strategic approach.

Winter Games of 2014 shall be delivered in keeping with strict limitations of environmental impacts:

- high quality organization of transport flows eliminating traffic jams and no normal air pollution;
- using transportation vehicles equipped with devices for exhaust gases cleaning;
- quality and accountable performance of engineering systems including generation of snow and ice, power supplies, water draining, sewage;
- organization of food catering, accommodation, other services employing low-waste and non-waste technologies;
- limited access of spectators to reserved territories of Sochi National Park;
- limited light and noise pollution
- In Post-Games period:
- following transformation of Olympic venues disturbed natural properties and complexes shall be rehabilitated, temporary structures dismantled, grass cover restored;
- technological systems at sports venues and engineering systems shall be adjusted to fail-safe and economic performance;
- all materials and equipment that are not to be used further shall be removed from the Games delivery territory

| Games Preparations | | |
|---|---|---|
| commitments | actions | legacy |
| • Environmental protection and resource-saving solutions in design<br>and construction of Olympic venues<br>• Strengthening Sochi SPNA system<br>• Introduction of up-to-date comprehensive approach to nature management and environmental management<br>• Improving quality of Sochi environment | • System of modern environmental protection and resource-saving requirements<br>• Development of the Region's ecological frame and upgrading SPNA infrastructure<br>• Development of urban districts, enhancing environmental safety of Sochi transport, uncovering potential of ecological tourism<br>• Action plan for environmental support during preparation for, and delivery of the Olympics<br>• Strict control and environmental monitoring | • Olympic venues – an example of environmentally efficient construction<br>• New standards for environmental protection and resource saving |
| **Games Staging** | | |
| commitments | actions | legacy |
| • Topmost quality organization of the<br>Games in order to minimize possible deleterious impacts on the<br>unique Sochi environment | • Realization of all the environment and sustainability solutions<br>embodied into Sochi 2104 functional areas plans;<br>• Strict control and environmental monitoring | •Up-to-date system for comprehensive environmental management |
| **Post-Games period** | | |
| commitments | actions | legacy |
| • Environment impact mitigation during project<br>dissolution<br>• Transfer of competitive and non-competitive venues and of the management systems | • Environment impact mitigation and disturbed<br>natural areas recultivation<br>during Olympic venues transformation and overlay dissolution | • Comprehensive sport and recreation infrastructure opening |

Sochi 2014 development is simultaneous with the development of Sochi' natural protected areas. An ornithological park is to be created in Imeretinskaya valley, Sochi national park is to expanded on new vast territories and Caucasian biosphere reserve is to receive needed science and awareness infrastructure. With the substantial support from the federal government and administration of Krasnodarsky region Sochi 2014 organization is paralleled with the enhancement of Sochi regional environmental framework.

## 2.3 CALCULATION OF GREENHOUSE GASES EMISSIONS

Successful delivery of competitions in winter sports in the open air directly depends on the condition of the environment (including condition of snow and low temperatures).

Neutral carbon balance concept assumes achieving zero balance of greenhouse gas emissions by reducing their volume and balancing the volume of emitted gases with the help of compensatory measures.

In order to control proper implementation of the neutral carbon balance concept, calculation of greenhouse gas emissions related to preparation and delivery of the Games will be performed.

The project to calculate greenhouse gas emissions in Sochi will be implemented on the basis of innovative experience of HECTOR program (Heritage Climate Torino program) gained by Organizing Committee of Olympic Games in Torino. That program made it possible to neutralize carbon balance during the Games in 2006. That Program made it possible to compensate more than 100.000 tons of carbon dioxide discharges during the Games.



The system for calculating greenhouse gas emissions in Sochi will have to achieve four main goals:

- to determine the sources and the volume of greenhouse emissions using as starting point, the volume of emissions in July 2007;
- to prepare forecast of greenhouse gas emissions for 2014 taking account of increasing transport flows and of built Olympic venues;
- to compensate greenhouse gas emissions by making a number of package arrangements
- (rehabilitation of forest lands, using renewable energy sources and rational use of energy);
- to draw attention of stakeholders to the problems of global climate change.

Calculation will cover all energy used (including electricity), air and land transport. Efforts related to calculation process, drawing up the concept and the program for reducing emissions and increasing absorption of greenhouse will be taken by Ministry of Natural Resources and Environment of Russian Federation, Federal Service for Hydrometeorology and Monitoring of Environment, by Administration of Krasnodar region, by City of Sochi administration and by the State Corporation «Olympstroy» (SC Olympstroy).

Realization of interventions aimed at reducing the number and the volume of emissions of pollutants into Sochi air should demonstrate adherence to the Kyoto Protocol.

## 2.4 SUSTAINABLE TRANSPORT FOR THE OLYMPIC GAMES AND BEYOND

Upon the assessment of the assumed results of the Sochi coastal cluster public transport operational scheme, its realization socio-economical effects for the society as a whole must be considered, that are:

- Economizing time for passengers
- Decreasing operational costs for ground transport
- Increasing the level of road safety
- Enhancing the ecological situation in the city
- Optimization of different levels budget expenses in terms of road maintenance

Nowadays the city of Sochi is one of the most popular resorts in Russia. At the same time, these years the City is being positioned and gradually moves towards the world-class tourist center. The changes became even more rapid after Sochi became the Host City for the 2014 XXII Olympic winter games and XI Paralympic winter games.

Nevertheless. the world experience in tourist center establishment shows, that one of the key factors of developing such centers must be the flawless operations of the transport complex, the basis of which is formed by the public transport.

And the city of Sochi must undergo a long and hard way in this sphere, in order to meet the international service standards.

The settling of this issue is the essential, principal stage on the way towards the creation of world class tourist center image for the city.



The study of the foreign experience and understanding of the Russian peculiarities allows to elaborate a systematic approach in solving these questions.

At the same time, it must not be forgotten that meeting the goals in quality has an economic measure, and that increases the aspiration and readiness towards cooperation of all the stakeholders.

The target of Sochi 2014 is to develop an optimized sustainable transport concept for Olympic and Paralympic Games time transport where people mass movements are achieved by public transport as the main part of the modal split. The transport system will operate with low emission and low-carbon technologies and delivers sustainable legacy to urban and mountain areas.

**The strategy consists of three main pillars:**

1. On one hand a strong back bone railway network which will be upgraded and extended, connecting the main urban areas of Sochi and Adler as well as the heart of the Mountain Cluster Krasnaya Polyana.
2. All necessary Games shuttle buses will be equipped with state of the art technology to minimize air pollution, noise and GHG-emissions to the lowest level.
3. Furthermore, a maximum of spectators, workforce and other clients are will travel by modern cable ways, with lowest transport-related energy input per person.

Sochi 2014 Organizing Committee is working on the most compact Games concept in Olympic Winter Games history to minimize total transport kilometers produced by the Games.

**Targets of the Sochi 2014 Sustainable Transport concept:**

- Change of long term modal split in favor of public transport along the coast and in the urban centers of Adler and Sochi.
- Improvement of traffic flows along the coast with optimized solutions for intersections and junctions
- Implementing a region wide traffic management system
- Design of barrier free accessible train / bus stations to increase comfort and acceptance of public transport in Sochi and mountain areas
- Alternative transport solutions for Games Time Transport Operations
- Assessment of transport alternatives along sustainability criteria
- Minimizing local environmental impacts (air quality, noise, demand for land use, impacts on natural resources and landscape)
- Low carbon transport system: reducing greenhouse gas emissions by changes of modal split and promoting alternative transport technologies
- Sustainable urban and regional development (public service, access, social barriers,...)
- Setting new standards for low-carbon vehicle technologies for sustainable urban transport
- Technical and management solutions to reduce congestions, noise and transport related air pollution in urban and mountain areas.

# 3 QUANTITATIVE BASELINE SCENARIOS

## 3.1 GENERAL INTRO

Overview of the current transport situation in terms of infrastructural, topographical and other constraints. Challenges of public and individual transport in the view of Olympic Games and Sochi City growth.

- Existing modes of transport (existing public transport systems, current modal split, and possible transport service capacities)
- Targeted modal split (private vehicles/public transport) for Games-related transport of clients and residents
- Targeted transport services for spectator and workforce
- Targeted transport service for residents during Games Time

The greater area of Sochi accommodates about 380.000 residents and during summer times the existing 65.000 hotel beds are fully booked. (about 580 hotels)

About 6.800 enterprises are located in the area, of which most of them are tourism related (42,7%). Only 17% industry and 17% Telecom and Transport enterprises.

The City of Sochi has grown dramatically in the past years and due to its topographical limitations the increasing traffic volume cannot be managed any more at several periods of the day. The extension of the district covers an area of 3.506km² which is divided into the districts (listed from southeast to northwest).



- Zentralniy with 132,000 inhabitants
- Lazarewskiy with 64,000 inhabitants
- Khostinskiy with 62,500 inhabitants
- Adlerskiy with 70,000 inhabitants

This means that the Municipality of Sochi needs to implement fundamental changes in the city in terms of intermodal public transport, traffic restrictions and parking management.

Sochi faces similar problems as hundreds of touristic cities of same size around the world. This report includes an explanation of latest international experiences, conclusions and possible recommendations for urban mobility and city management.

A summary of objectives and proven solutions should lead the Sochi city administration to an understanding of the necessary steps. Some of these steps will be unpopular and require good implementation, communication and education.

But Sochi will remain a tourism hot spot in the coming decades and the current (Olympic) city leaders need to design the future.

## 3.2 EXISTING TRANSPORT INFRASTRUCTURE

The Sochi Olympic Games Candidate File of 2006 lists all existing permanent infrastructure and the type of permanent upgrade that was planned then in order to adapt it for the Olympic Games. The Federal Target Program (FTP) incorporates that wide range of infrastructure projects necessary to establish Sochi as a world-class, all-seasons resort. These projects also have been selected in order to increase the sustainability of the Sochi transport system in the long-term.

| Type of transport infrastructure | | Length (km) + capacity (no. of traffic lanes or tracks) | | Construction/upgrade | | | | Source of financing |
|---|---|---|---|---|---|---|---|---|
| | | Within city boundary | From city boundary to outlying venues | Body responsible | Construction date | Date of upgrade | Cost of upgrade in USD$M 2006 | |
| 1 | Urban arterial network of Sochi | 394 km (2-4 lanes) | | Administration of Krasnodar region, Federal Roadway Agency (RosAvtoDor) | | 2006-2013 | 123.4 | Public |
| 2 | Federal Motorway M-27 "Dzhubga-Sochi" | 116 km (2-4 lanes) | | | 1926 | | 837.4 | Public |
| 2.1 | Upgrade of M-27 section Sochi-Adler (171–204 km) | 33 km (2-4 lanes) | | RosAvtoDor | | 2007-2009 | 38.2 | Public |
| 2.2 | Construction of Sochi bypass section | 13 km | | RosAvtoDor | | 1999-2009 | 638.7 | Public |
| 2.3 | Construction of Adler bypass section | 9 km | | RosAvtoDor | | 2007-2013 | 131.0 | Public |
| 2.4 | Construction of the multi-level transport junction at "Adler Ring" | | | RosAvtoDor | | 2007-2009 | 29.5 | Public |
| 3 | Motorway Adler-Krasnaya Polyana | 53 km (2-3 lanes) | | RosAvtoDor | 1904 | 2005-2009 | 24.2 | Public |
| 4 | Suburban Rail | 102 km (1-2 tracks) | | Federal Railway Agency (RosZhelDor), Russian Railways (RZhD) | 1928 | | 679.9 | Joint |
| 4.1 | Construction of the second track along the total length of the coast | 67 km | | RosZhelDor, RZhD | | 2006-2010 | 627.4 | Joint |
| 4.2 | Railway Track Extension to the Airport | 3 km | | RosZhelDor, RZhD | | 2007-2010 | 49.7 | Joint |
| 4.3 | Upgrade of railway terminals for passengers with disabilities | | | FTP Directorate, Federal Railway Agency (RosZhelDor) | | 2010-2013 | 2.8 | Public |

## Road

Currently the Sochi transport infrastructure is based on a main arterial 4 lane-road along the coast which connects the very south of Russia from the Abkhazian/Georgian boarder all the way to the north to the center of Sochi.

Only 10% of the buildings are high rise building and 90% cottage buildings which underlines the spread out urban structure of the coastal area. The result is many minor roads and crossings to enter the main road(s).

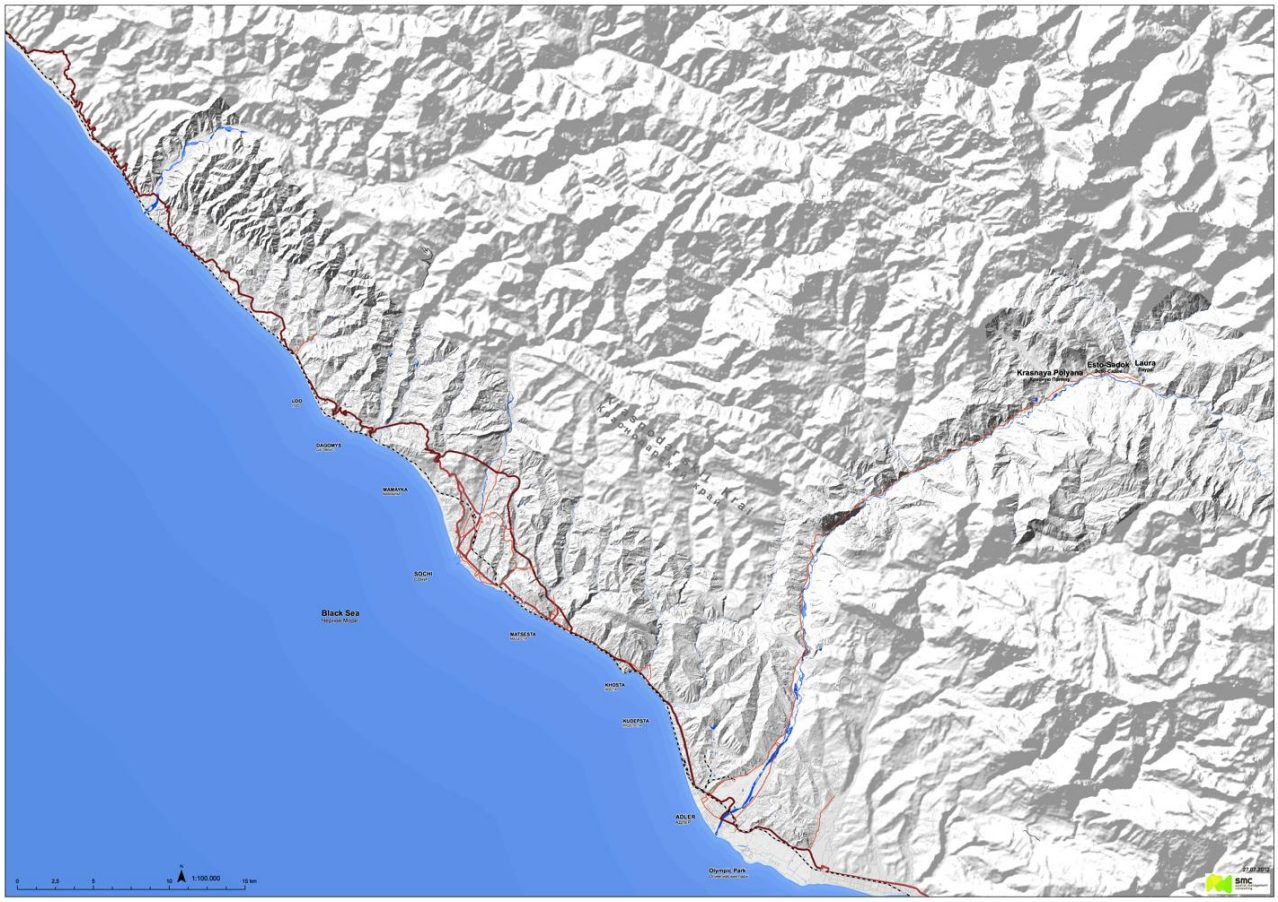
Vehicles (cars, minibuses and buses) are mainly of very old standard and alternative power fuel is not used on a broader basis.




Due to the lack of convenient public transport the density of individual traffic is extreme and at all times of the day/night traffic jams occur in the wider center of Sochi and Adler.

The road connection to the mountain area Krasnaya Polyana was upgraded in recent years and a fairly convenient 2-lane road with 4 tunnels (2 of them built in the last years).

Figure 1: Existing road and rail infrastructure Sochi area in 2009






## Railway

The current railway track is running parallel along the coast and connects Adler and Sochi downtown and further to Krasnodar the capital of the region, which is 400km away, and has 1,5mill residents.

The challenge at this point is that the stations in between the 2 main stops (Adler, Sochi) are not well accessible which is one of the reasons why people are not using the trains for local short trips in a way as it would be desirable.

The following points can be seen as the “hard facts” of the rail infrastructure:

### 3.3 PARAMETERS OF THE SOCHI TRAFFIC NETWORK

The population is **421.500 people**. The overall road network consists of 1.640,80km. Thereof there are :

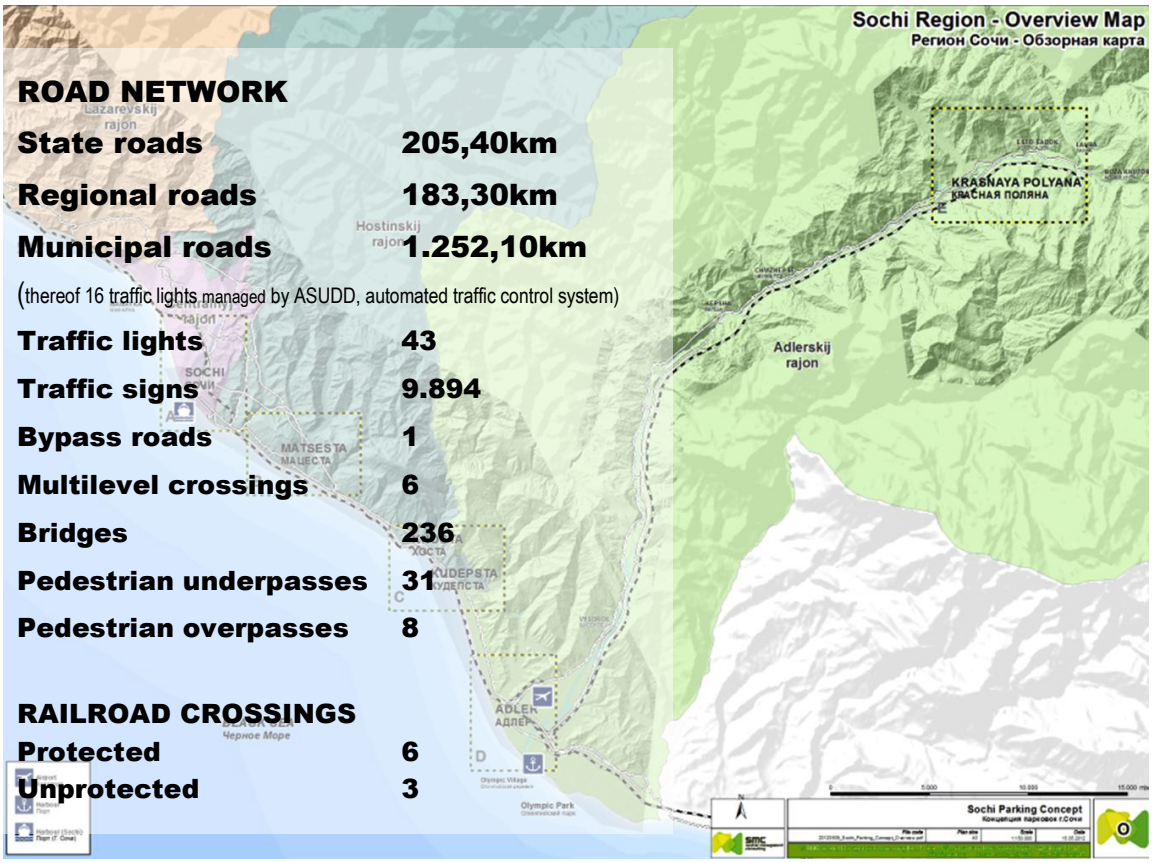
- State roads 205,40km
- Regional roads 183,30km
- Municipal roads 1.252,10km

Considering the infrastructure there can be listed the following information.

- Railroad crossings
  - Protected 6
  - Unprotected 3
- Traffic lights 43
  - (thereof 16 traffic lights managed by ASUDD, automated traffic control system)
- Traffic signs 9.894
- Bypass roads 1
- Multilevel crossings 6
- Bridges 236
- Pedestrian underpasses 31
- Pedestrian overpasses 8



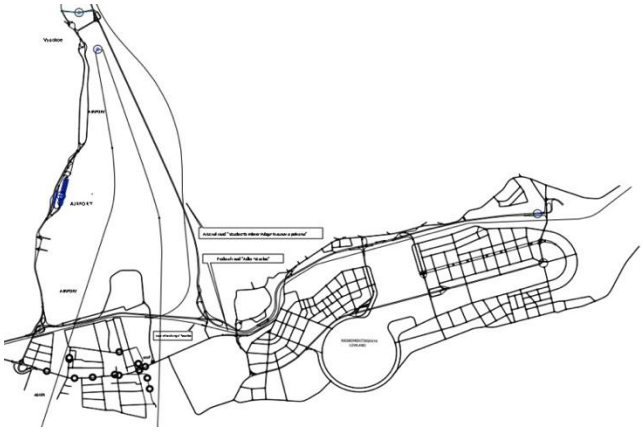
**Figure 2: Characteristics of road infrastructure Sochi area in 2009**



On a traffic model basis the parameters of the Sochi traffic network infrastructure are:

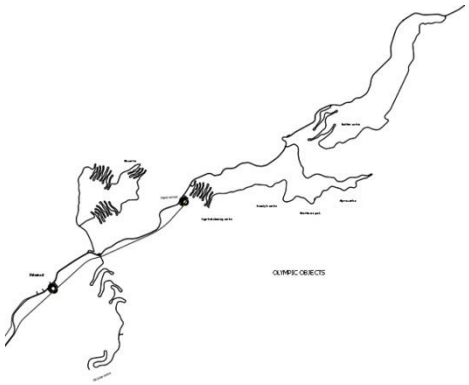
- 1.640.8 km
- 2.507 sections
- 714 intersections
- 61 zones (centroids)

Sochi / Adler
Olympic Park



-Sochi Centre

Krasnaya Polyana
(planned)



### 3.4 MOTORIZATION DEGREE OF THE SOCHI TRAFFIC NETWORK

The motorization degree of Sochi has grown extremely in the past years. In contrast to the average motorization degree of Russia of ~275 vehicles per 1.000 residents there are ~430 vehicles per 1.000 residents in Sochi Centre.

Vehicle ownership in the other areas is much lower, but also increasing.

**Figure 3: Car ownership in Sochi per area in 2009**

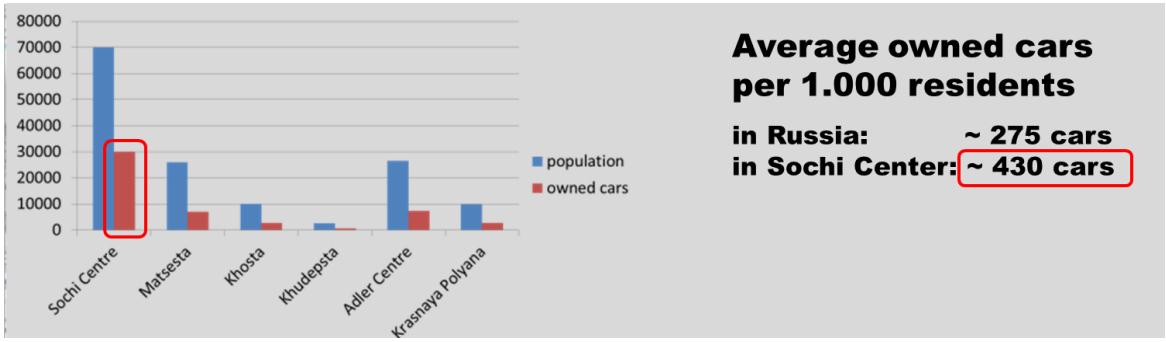



**Figure 4: Car ownership in Sochi per area and vehicle type in 2009**

| Vehicle type | Adlerskiy | Lazarevskiy | Zentralniy Khostinskiy | TOTAL |
|---|---|---|---|---|
| **Cars** | 41.971 | 29.434 | 72.904 | **144.309** |
| **Trucks** | 4.884 | 3.387 | 9.203 | **17.474** |
| **Buses** | 1.593 | 957 | 2.362 | **4.912** |
| **Motorbikes** | 785 | 540 | 1.499 | **2.824** |
| **Trailer** | 1.913 | 1.692 | 2.210 | **5.815** |
| **Semi-trailer** | 303 | 269 | 673 | **1.245** |
| **TOTAL** | **51.449** | **36.279** | **88.851** | **176.579** |

## 3.5 SOCHI CENTRE SITUATION

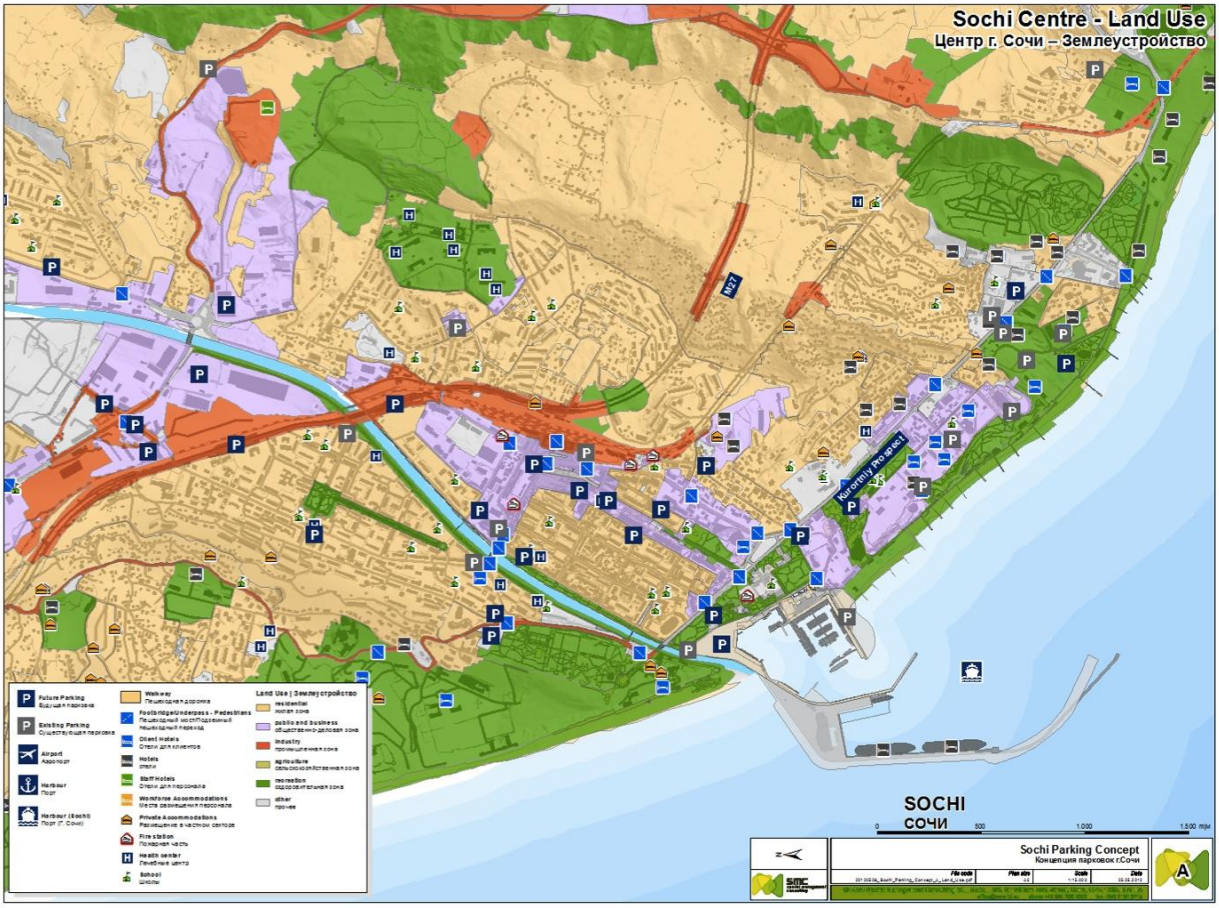
***Land Use & Road Network***

Wide areas of residential use mixed with public & business use characterize the Central district of Sochi. Especially the area around Sochi Main Station consists of a mix of land usage which is divided in small/medium areas. Especially the central area west of Sochi Main Station is characterized by high building-density and a mix of living and business (mainly on the 1st floor of buildings).

Small residential streets with a low number of highly frequented main roads mostly characterize the road network. Due to the use of a one-way-system the main roads have to absorb a high range of detour trips (one-ways lead to detour trips). Permanent traffic jams occur due to this situation based on a lack of road capacity.

Pedestrians are suffering the domination of motorized traffic in the whole area of Sochi Center.

**Figure 5: Sochi Centre – Land Use**



## 3.6 MATSESTA SITUATION

***Land Use & Road Network***

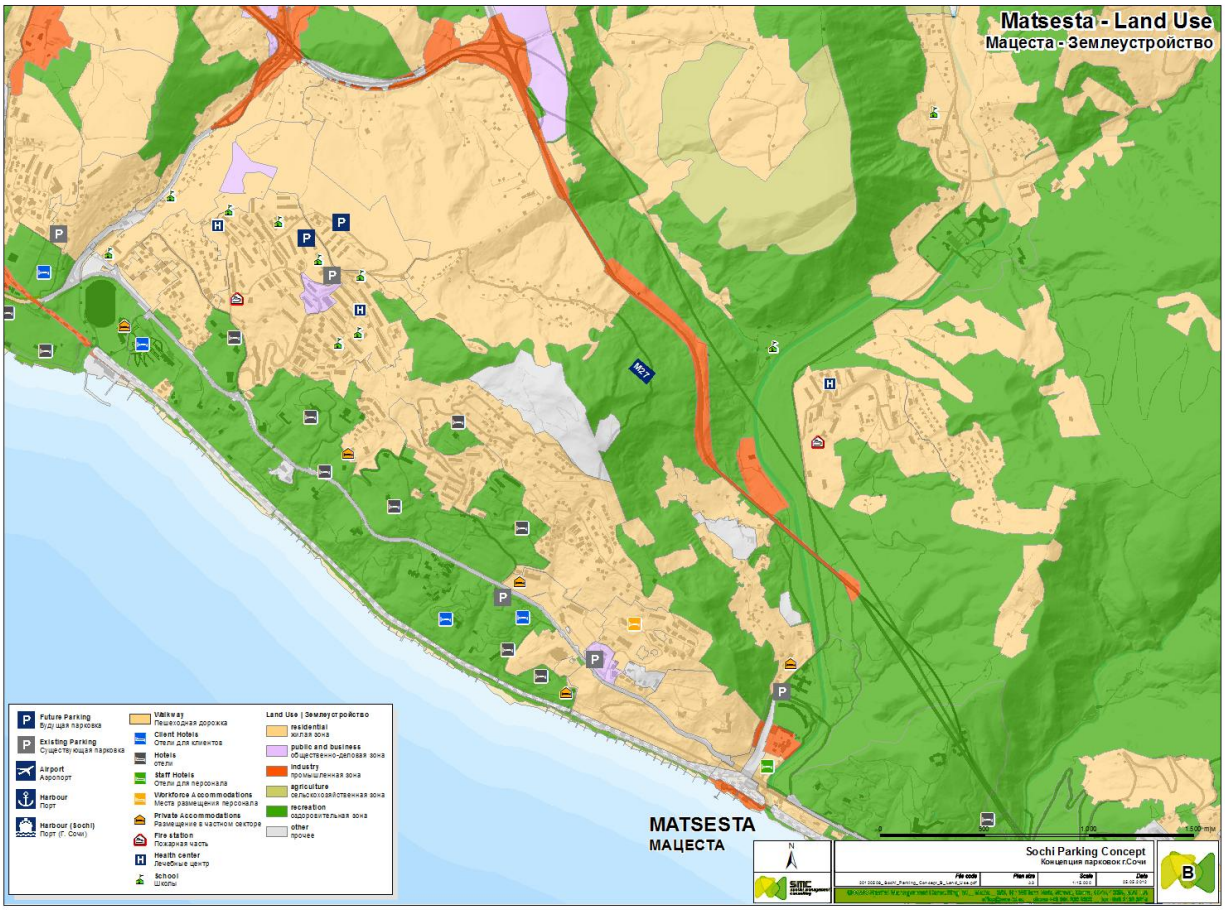
The area of Matsesta and Byhta is characterized by wide expanses of residential and recreational use. In some small areas public & business and industrial use can be found.

The residential areas are characterized by low building density but high resident density due to multi-level buildings with approximately 7 floors.

Medium sized streets (cat V) mostly characterize the road network. Only in some areas through-traffic can be found.

The offer of pedestrian infrastructures is unattractive due to damaged walkways, disadvantageous design and parking vehicles.

**Figure 6: Matsesta – Land Use**



## 3.7 KHOSTA & KHUDEPSTA SITUATION

### *KHOSTA*

***Land Use & Road Network***

The area of Khosta is characterized by wide expanses of residential and recreational use. In some small central areas near to the railway tracks there can be found public & business use.

The residential areas are characterized by low/medium building density but high resident density due to multi-level buildings with approximately 7 floors.

Small residential streets mostly characterize the road network. Only a few number of roads do have a connecting function between the inner living areas and the main road network. Through-traffic cannot be identified as relevant.

Based on the relative attractive design of public spaces, opposite to other areas of Sochi, the offer of pedestrian infrastructures can be stated as acceptable.

### *KHUDEPSTA*

***Land Use & General Structure***

Main part of the urban space of Khudepsta is characterized residential use. Only a small part of Khudepsta comprises public & business use. Mainly recreation use can be found in the wider area of Khudepsta.

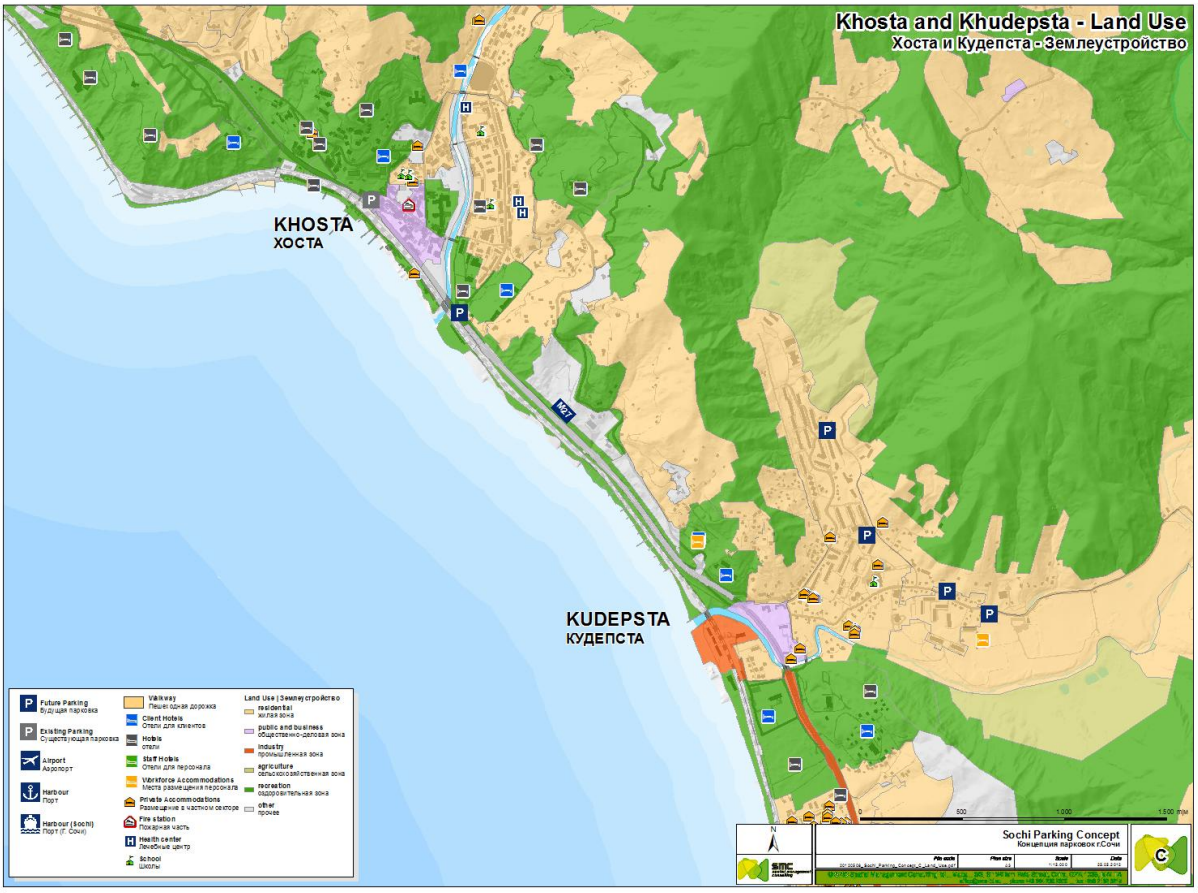


A mix of small apartment buildings and multi-level buildings with approximately 7 floors characterizes the residential areas. The building density is still low/medium; the resident's density is medium.

There is no high weight on connecting functionality of the road network. The main functionality is living.

The offer of pedestrian infrastructures is not very attractive due to damaged walkways, disadvantageous design and parking vehicles.

## Figure 7: Khosta & Khudepsta – Land Use



## 3.8 ADLER SITUATION

***Land Use & Road Network***

The main center of Adler is characterized by residential use mixed with public & business use. Recreation areas to the coast and the river Mzymta and industrial areas in parts of the north and mainly in the east surround Adler.

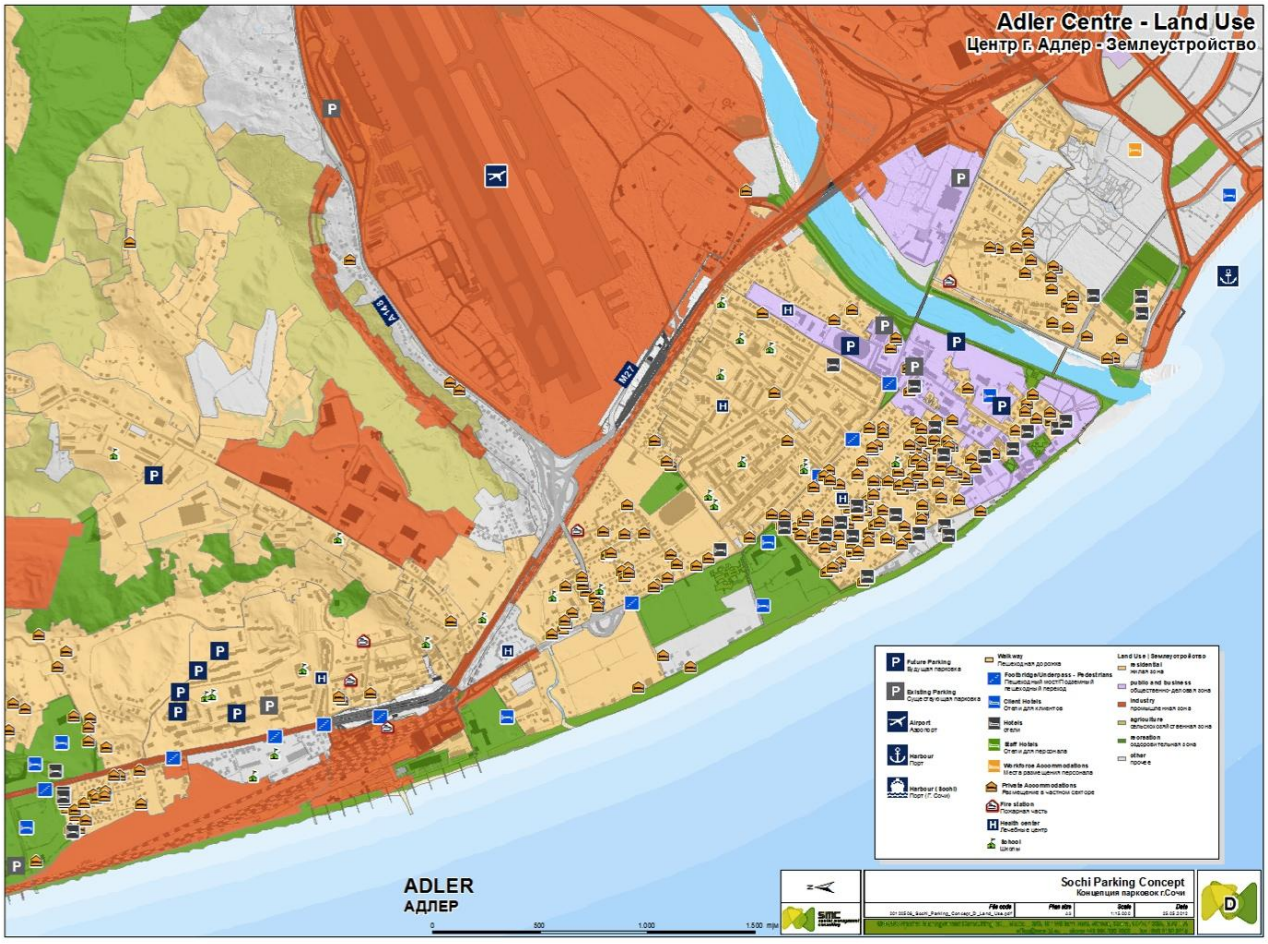
There is a high density of small and medium apartment buildings and additionally of private guest accommodations and hotels (approximately 4.100 beds & 860 hotel rooms on an area of 85ha).

There are some small fun parks located in Adler which lead to a additional parking demand.

Small living streets mostly characterize the road network. Additional there is a low number of medium/high frequented main roads which connect the boundary areas to the main road network.

Pedestrians are underlying the domination of motorized traffic in the area of Alder Center. Anyway the general situation for pedestrians is acceptable due to a relative good offer of walkways and pedestrian areas.

**Figure 8: Adler – Land Use**



## 3.9 KRASNAYA POLYANA SITUATION

***Land Use & Road Network***

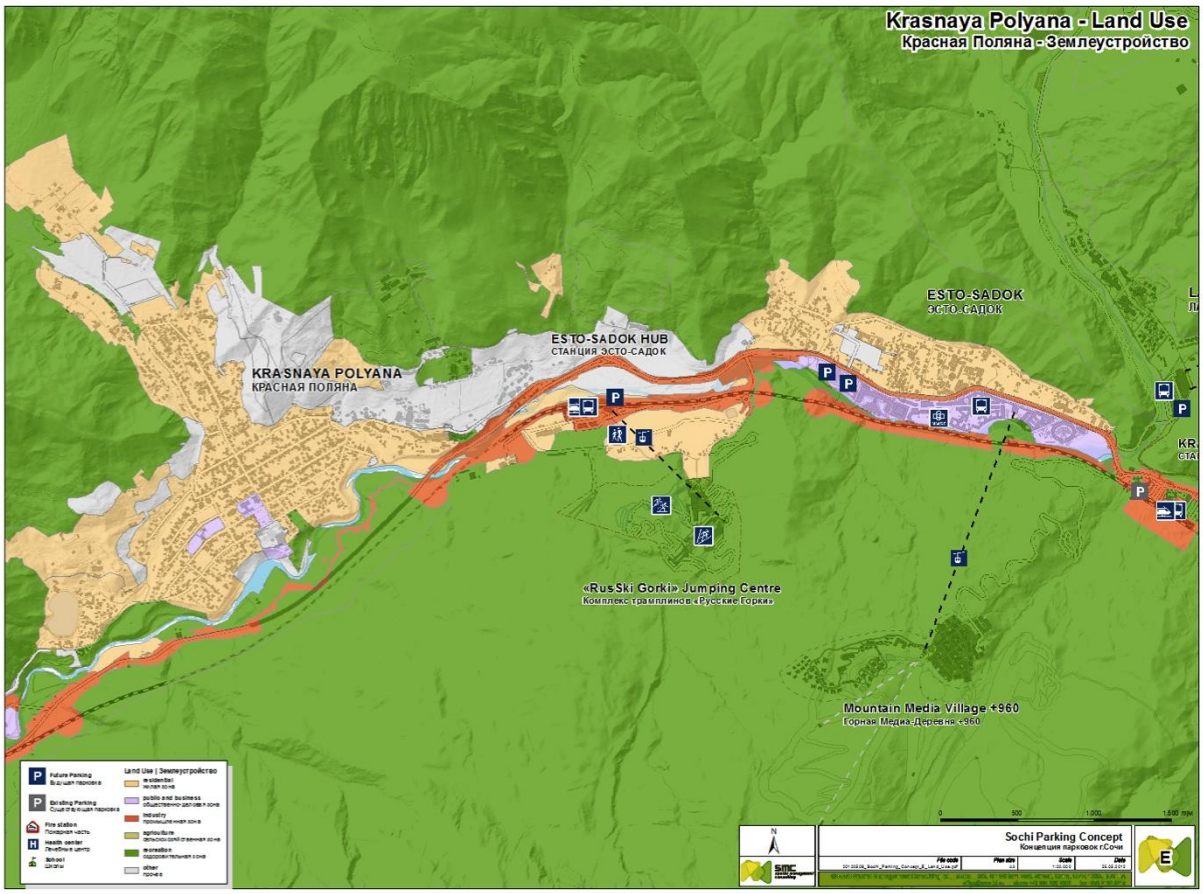
Due to its location in a national park the usage of the whole surrounding area of Krasnaya Polyana and Estosadok is specified as recreation area. The populated areas are dedicated to residential use. Small areas in the center of Krasnaya Polyana are used for public & business use as well as the whole area of Esto Sadok and the planned Mountain Media Sub Centre and village.

Krasnaya Polyana as well as Estosadok are characterized by a low density of buildings. The main share of buildings is single-family homes. In both places the populated area expands from the main road in the south to the north and along the access road (combined road). Without the mentioned main road there is no road with a connecting functionality. All other streets can be described as living streets with a secondary function.

Due to the minor priority of the main share of the roads in Krasnaya Polyana and Estosadok the pedestrian infrastructure has a low priority in a similar way to the road network. Generally only a minor offer of walkways and pedestrian areas exists. The condition of existing facilities is bad due to missing maintenance.

**Figure 9: Krasnaya Polyana – Land Use**





### 3.10 OLYMPIC INFRASTRUCTURE PROJECTS AND TRANSPORT NEEDS

The overview maps show the current status of all infrastructure projects (rail, road) as they will be realized for the Sochi Olympic and Paralympic Winter Games 2014.

*This infrastructure network is the basis for all simulations and calculations in this report.*

**Figure 10: Sochi 2014 Olympic Games Regional Overview Map – CTOMP 2010**

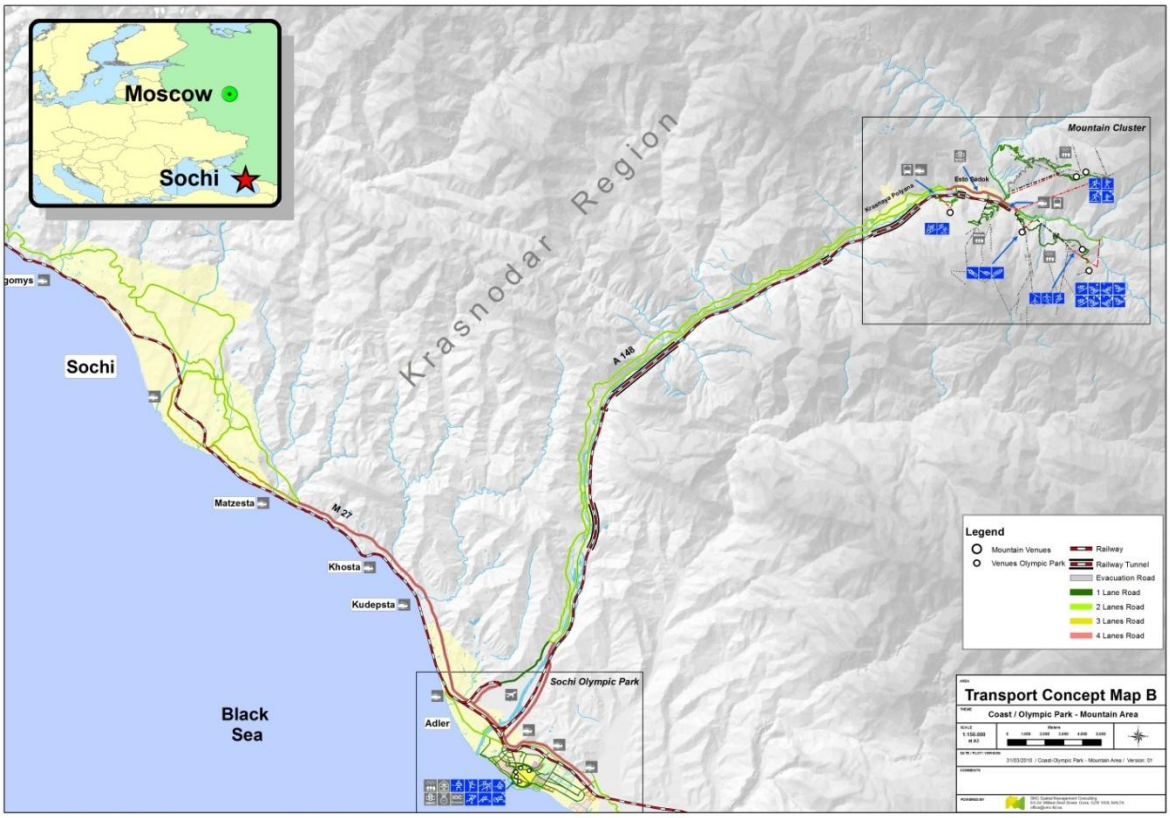
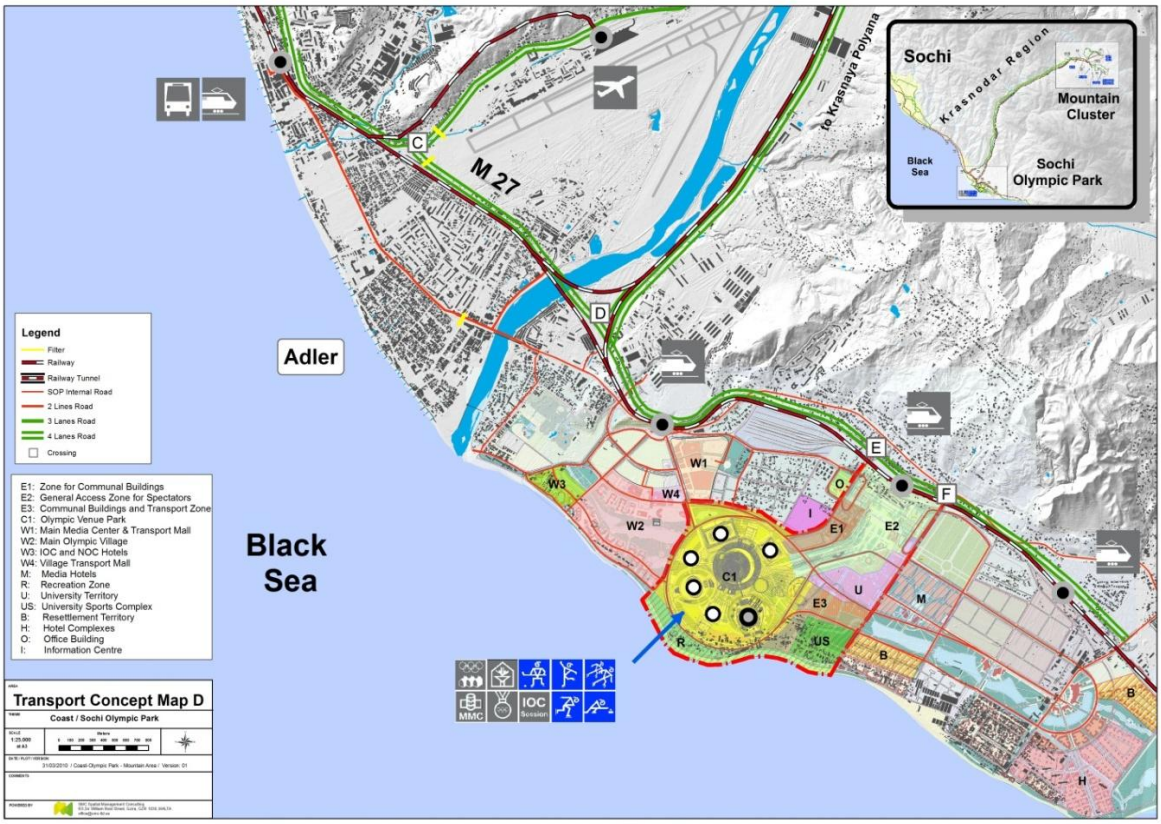


**Figure 11: Sochi 2014 Coastal Competition Cluster Overview Map – CTOMP 2010**






During the Olympic Games a total of 7,7 MILLION Trips will be conducted which equals 407 million person kilometers.

**Figure 12: Total Trips of Olympic Games Client Groups**

| client | total | number of trips per ticket | number of trips per day | number of days17 | Total Trips during Games |
|---|---|---|---|---|---|
| Spectator tickets | 1.421.500 | 2 | | | 2.843.000 |
| Sponsor Tickets | 304.100 | 2 | | | 608.200 |
| Workforce | 24.406 | | 2 | 17 | 829.804 |
| Security (new) | 50.000 | | 2 | 17 | 1.700.000 |
| Olympic Family | 3.500 | | 5 | 17 | 297.500 |
| Media | 12.000 | | 4 | 17 | 816.000 |
| Technical Officials | 4.847 | | 2 | 17 | 164.798 |
| Athletes & Officials | 6.100 | | 5 | 17 | 518.500 |
| | | | | | 7.777.802 |
| | | | | | total trips during OWG |

All passengers of the coastal transport system are considered Games Clients when they are travelling in direct relation to the Olympic Games, and a transport obligation exists for the Organising Committee according to the IOC Technical Manual. This definition includes both ticket holders and accreditation holders.

The Organizing Committee is obliged to guarantee free public transport for ticket holders and specific transport system arrangements for accreditation holders.

While the transport systems for accreditation holders need to be operational 24hrs a day, public transport for ticket holders needs to be guaranteed immediately before and after the event, for which the ticket is valid.

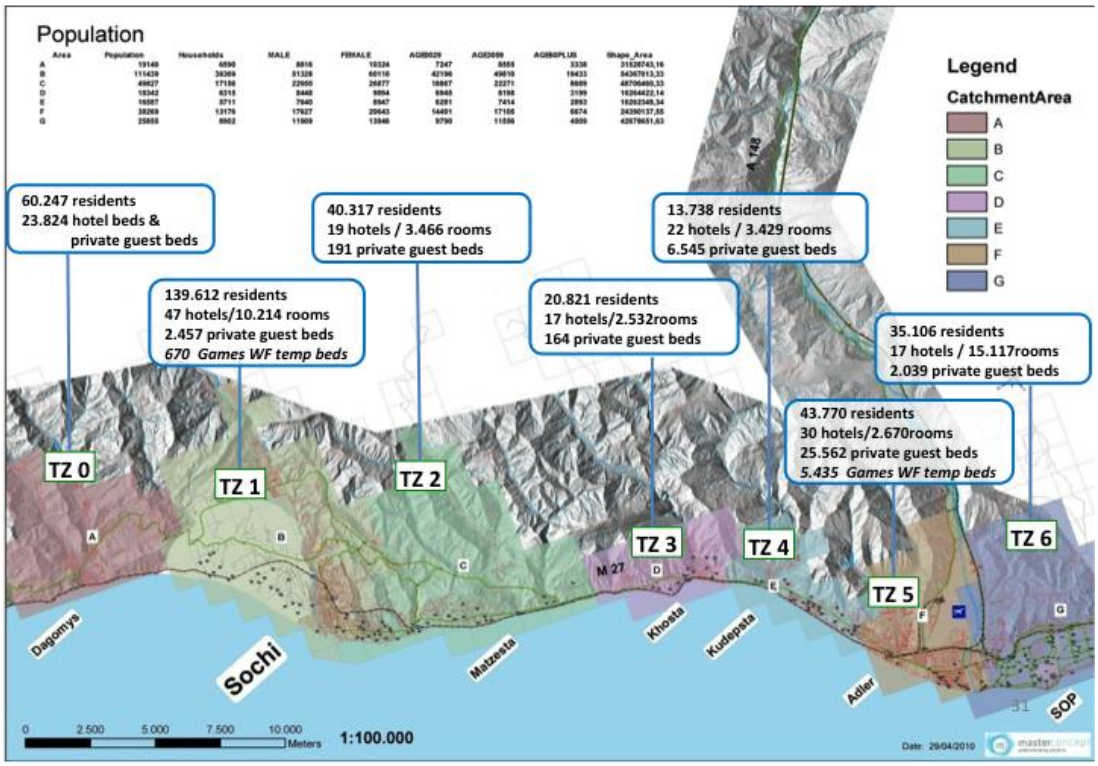
Games clients do have a highly predictable travel pattern that is consistent from Games to Games. Each group of Games Clients travels mostly on the same routes between set origin and destination points.

These travel patterns are being considered for the design of the Games specific transport systems:

- **505,000 Vehicle Trips during the Games**
- **338.505 Railway Kilometres** (4.080 trips)
- **4,85 Million Olympic Bus System Kilometres**
- **1,73 Billion People Kilometres** (excluding car fleet)

The following is the main catchment area at the coast with the main places of residence of the Sochi population.

**Figure 13: Sochi Traffic Catchment Areas**

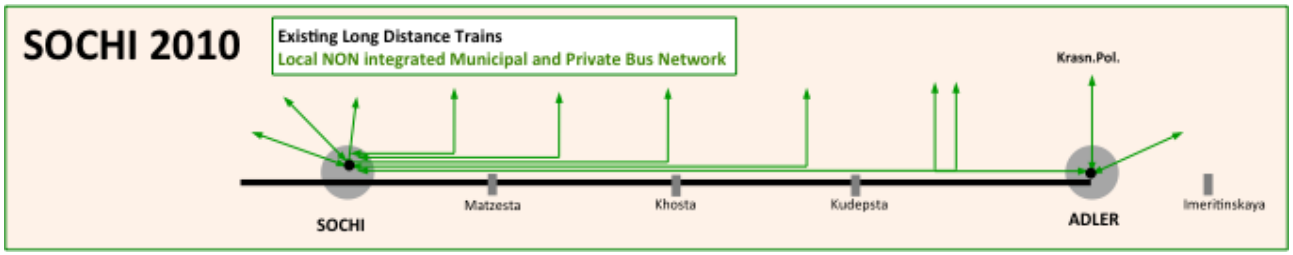



Based on the demographic analysis (accuracy 1 km2) we defined the residential catchment area (A-G) as well as the touristic accommodation density. The resident's mobility questionnaire (conducted in July 2010) showed the main places of work in Adler (35%) and the Sochi center/ Matsesta zone (65%).

### 3.11 DESCRIPTION OF EXISTING PUBLIC BUS SYSTEM

As of today the existing bus network is not integrated with the existing rail network and also there are no approved plans of integrating the bus network with the new rail line and stations currently under construction in the wider Sochi area.

**Figure 14: Sochi Existing bus and train scheme**




The current city bus network of Sochi has the following characteristics:

**Figure 15: Sochi Bus network characteristics**

| *CITY CONCEPT* | |
|---|---|
| ***NO. of lines*** | ***110**** |
| ***NO. of buses*** | ***568**** |
| 15m buses | *103** |
| 12m buses | *102** |
| medium buses | *230** |
| mini buses | *133** |
| ***service km peak day 24 hours*** | 51.528,8km/24 hours ** |
| | |

*SOURCE: SOCHI ADMINISTRATION Nr. 211/18-46
**SOURCE: SMC CALCULATION WITH DATA FROM THE SOCHI ADMINISTRATION



The bus system is not structured according to principles of a modern intermodal system:

- there are insufficient links of the bus lines to the railway and to the spine lines (to less intermodal links)
- the large number of existing, duplicated bus routes to Sochi Central Hub allows not traffic-jam
- free processing in the hubs- the high number and inefficiency of public buses increases the traffic-jam situation on the streets across Sochi

Figure 16: Sochi Bus terminal

## 3.12 SUMMARY OF TRAFFIC FLOW SURVEY 2009 AND GENERAL ASSUMPTIONS (UNIVERSITY ROSTOV AND MOSRDTI 2009)

### Factors which influence the way of movement choice - drivers of mobility behavior

Mobility behavior is dependent on a wide variety of parameters – demographical, social, spatial, economical, ideological, etc.

First of all, age is a crucial indicator for mobility behavior, as a large number of the population (children and adolescents) are not allowed to drive a personal car and so are bound to use public transport (PT) or non-motorized transport (nMT). As well, elderly people – when their perception and cerebral performance decline – refrain from using motorized individual transport (MIT).

Similar phenomena can be observed concerning gender. Women, esp. older females, often lack a driving license and thus are "captive (PT-) riders" (no alternative).

The number of persons in a household, as well as the number of children in a household, has a significant impact on the mobility behavior, as does the availability of a car, obviously.

The availability of a car and by that the motorization rate, however, is heavily dependent on income and settlement density. Obviously rich people can more easily afford a personal car and its usage, and people in peripheral areas are often dependent on a car as they have no alternatives ("captive drivers").

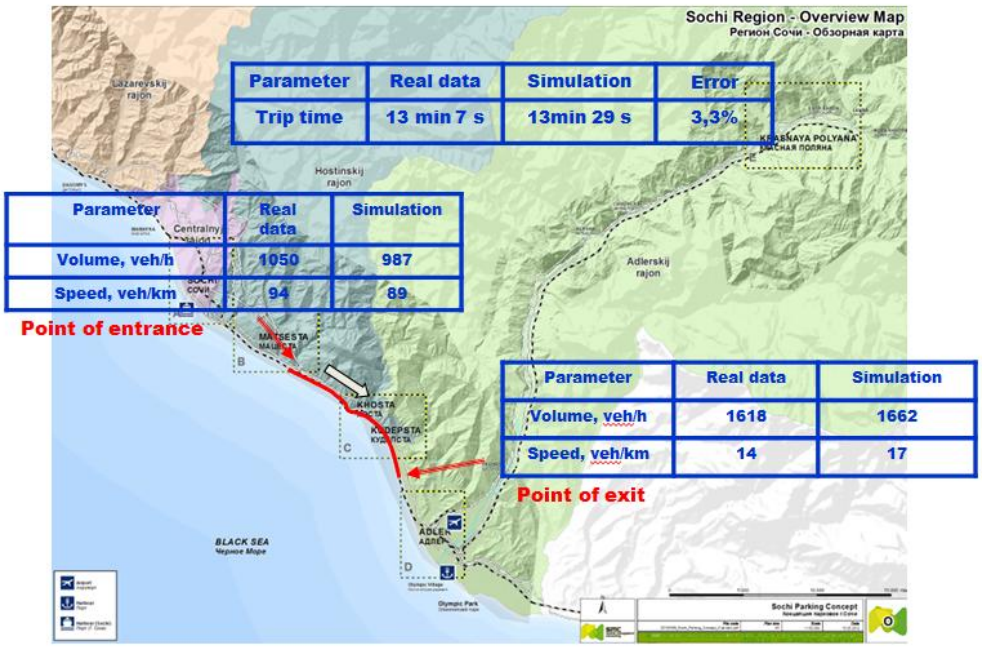
Finally there are external factors that influence the mobility behavior, like the fuel price or the physical structure of the transport system.



The physical structure affects the mobility behavior in a way that the elimination of bottlenecks, the expansion of the road network and the increasing of travel speed favors individual transport and thus leads to a massive growth of traffic with all its negative consequences (exhaust gases, noise, casualties).

A crucial part of the physical structure, which has a great influence on the mobility behavior, is the organization of stationary traffic.

Figure 17: Sochi Traffic – Estimation of Model Adequacy



### Structure of survey performed

- monitoring of characteristics of traffic flows (traffic intensity, traffic speed, traffic density and composition) at the sections of the network adjacent to the given hubs of Sochi transportation infrastructure;
- monitoring of public transport vehicles transportation modes;
- assessment of current system of traffic management in the city and identification of bottlenecks;
- using micro modeling methods determined capacity of all key hubs within the network with proposed plans and existing traffic patterns.

### Forecasting of traffic loads

Car traffic loads were measured for the actual situation and forecasted for the development with new road infrastructure. New public transport infrastructure effects were not considered.

**Figure 18: Forecasted traffic loads at key junctions and hubs**

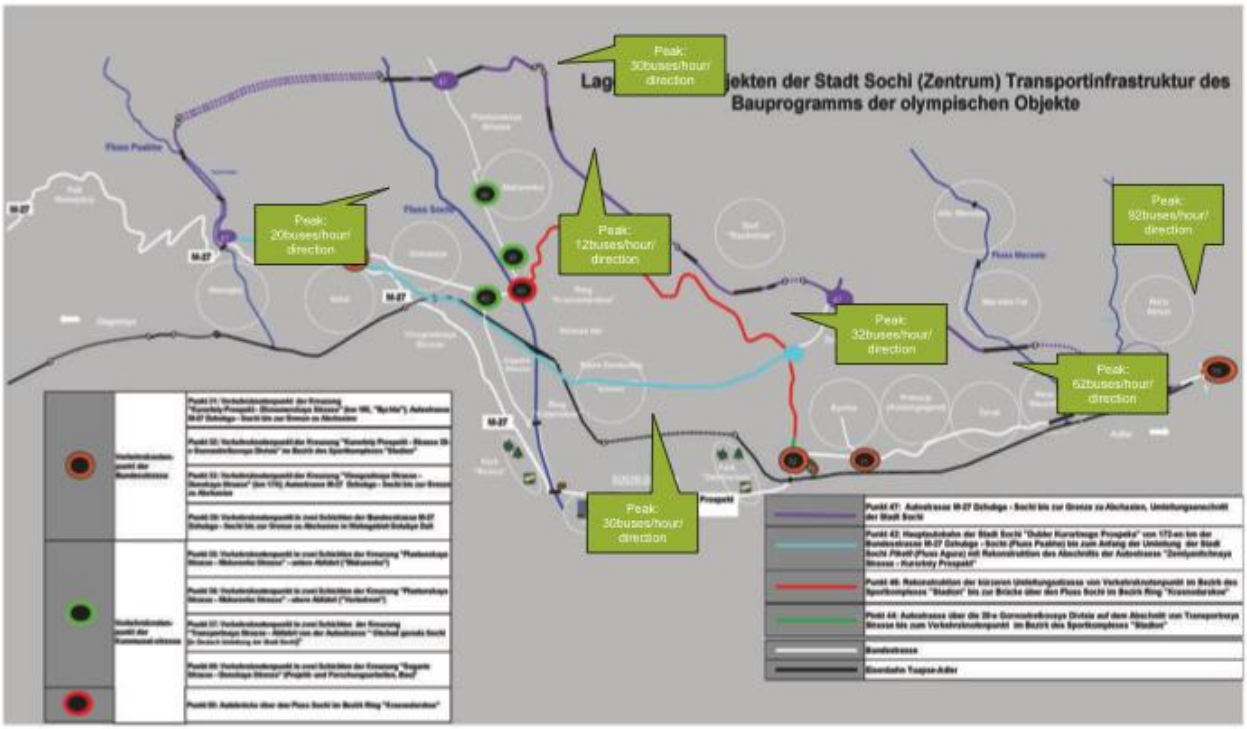


Figure 19: Sochi Change of traffic volume on a ring road of Sochi (2009)

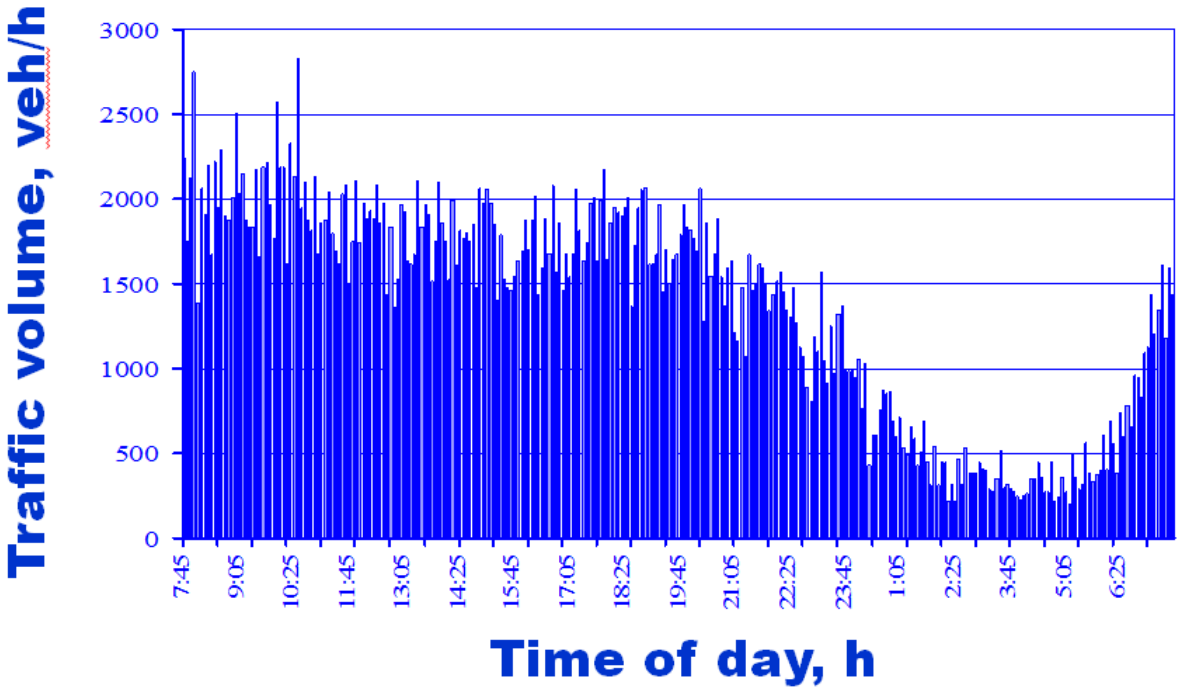





Figure 20: Change of traffic volume on a ring road of Sochi (2009)

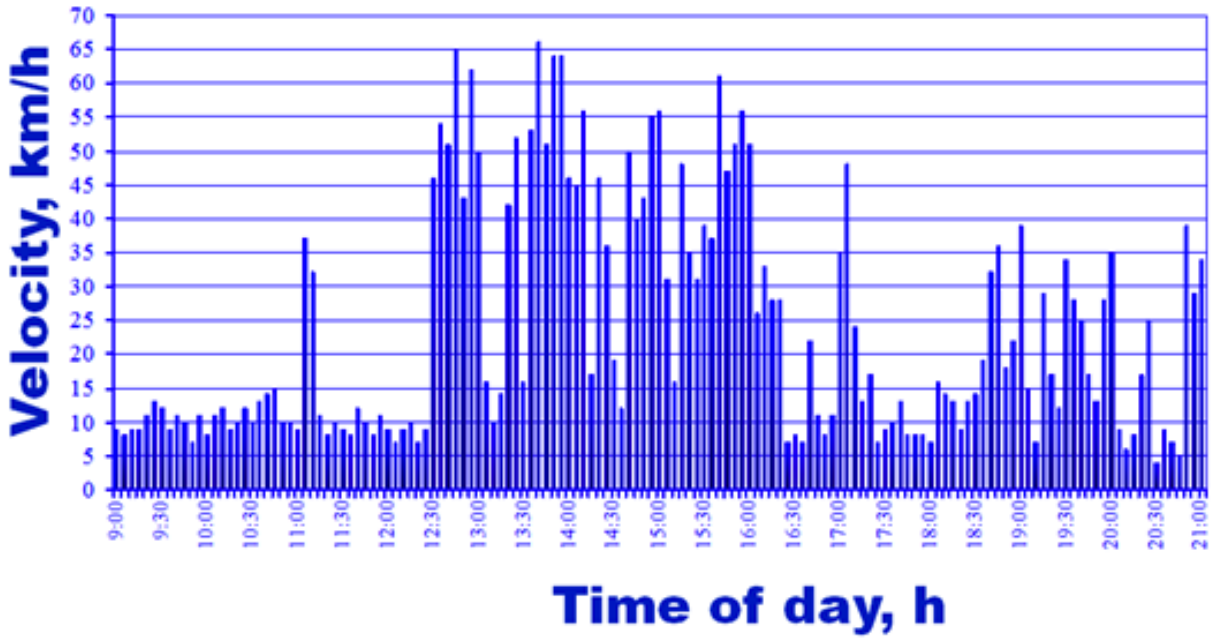


Figure 21: Chart of the volume of traffic moving from the center (2009)

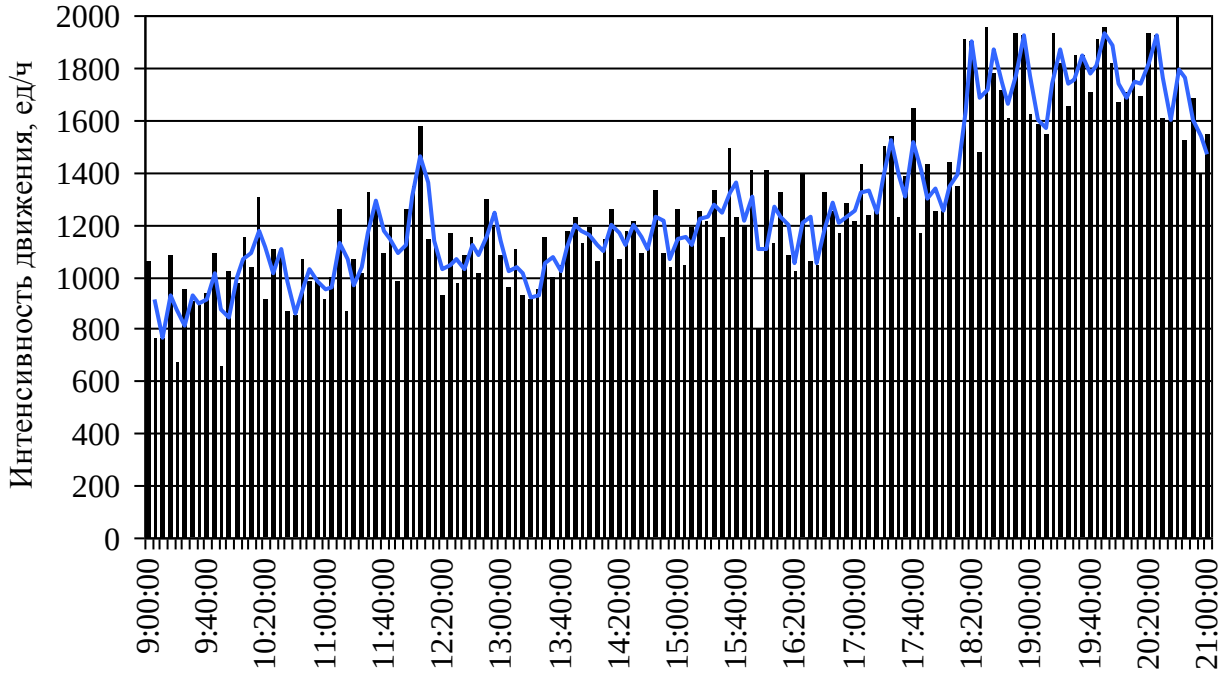





Figure 22: Chart of the volume of traffic moving to the center (2009)

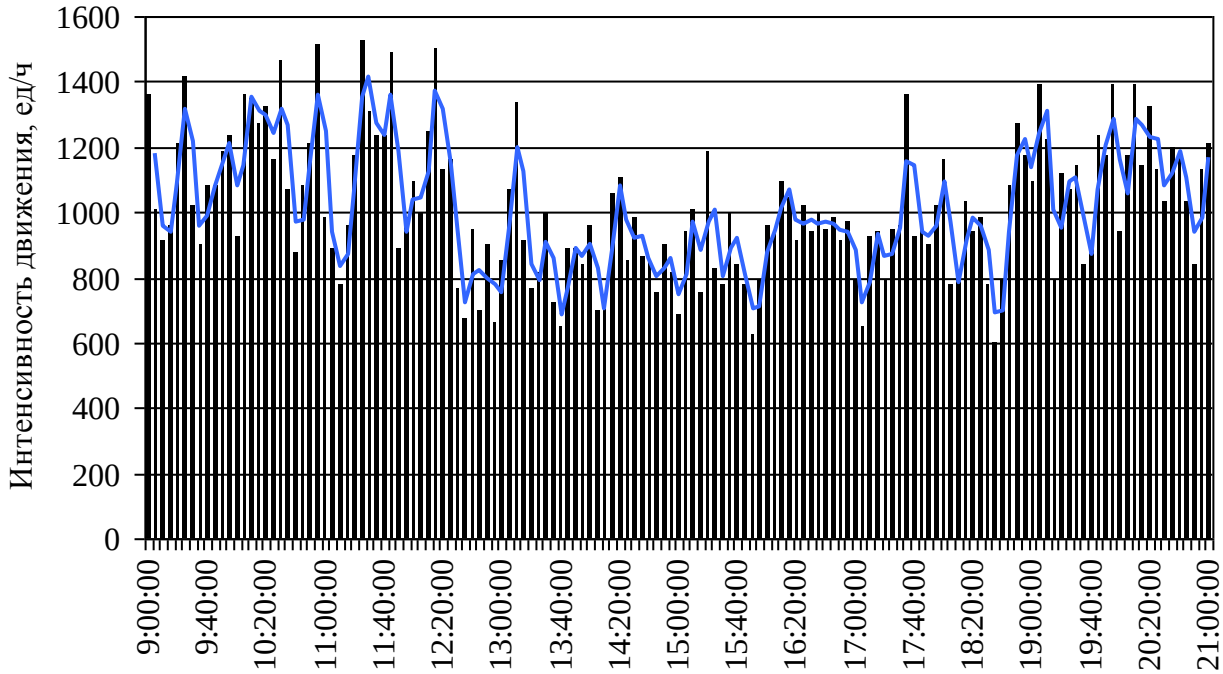


Figure 23: Chart of the volume of traffic moving from the center (2009)

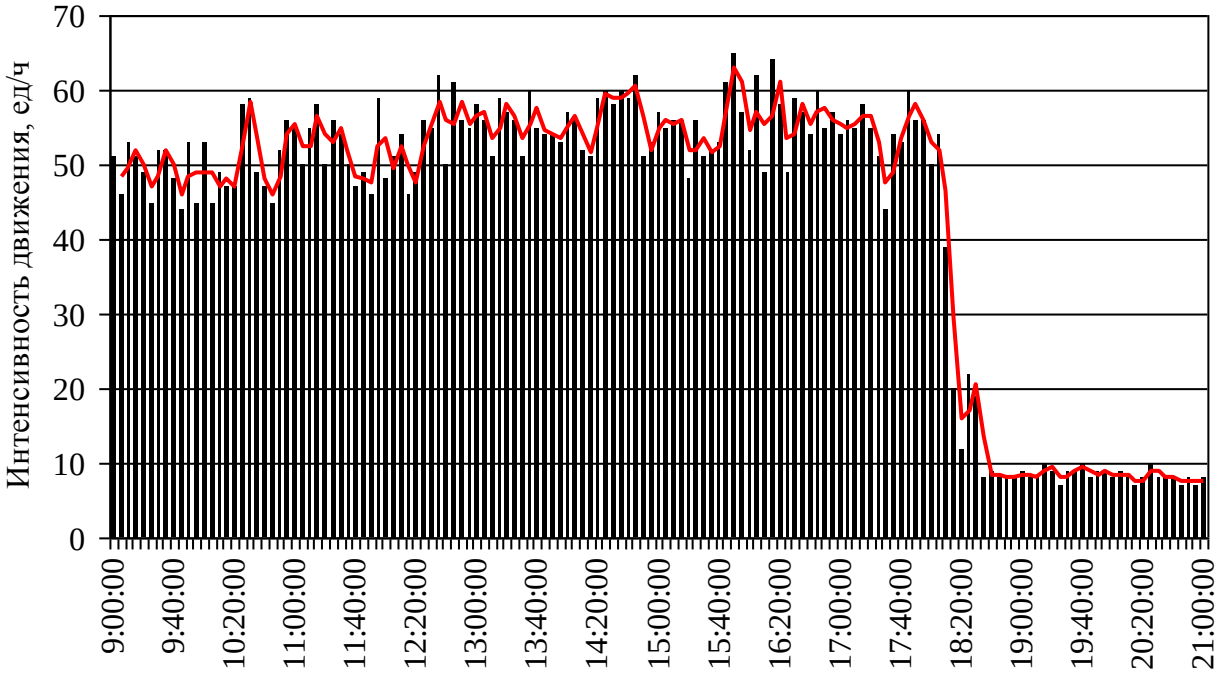





Figure 24: Chart of the volume of traffic moving to the center

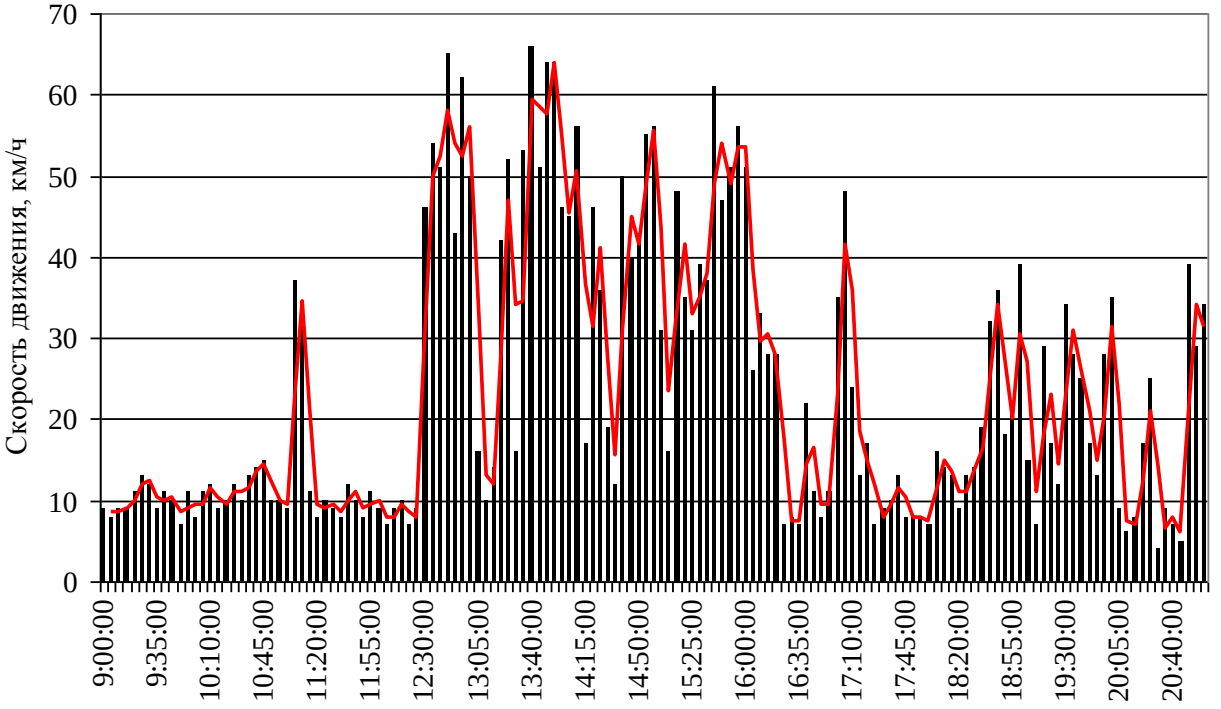
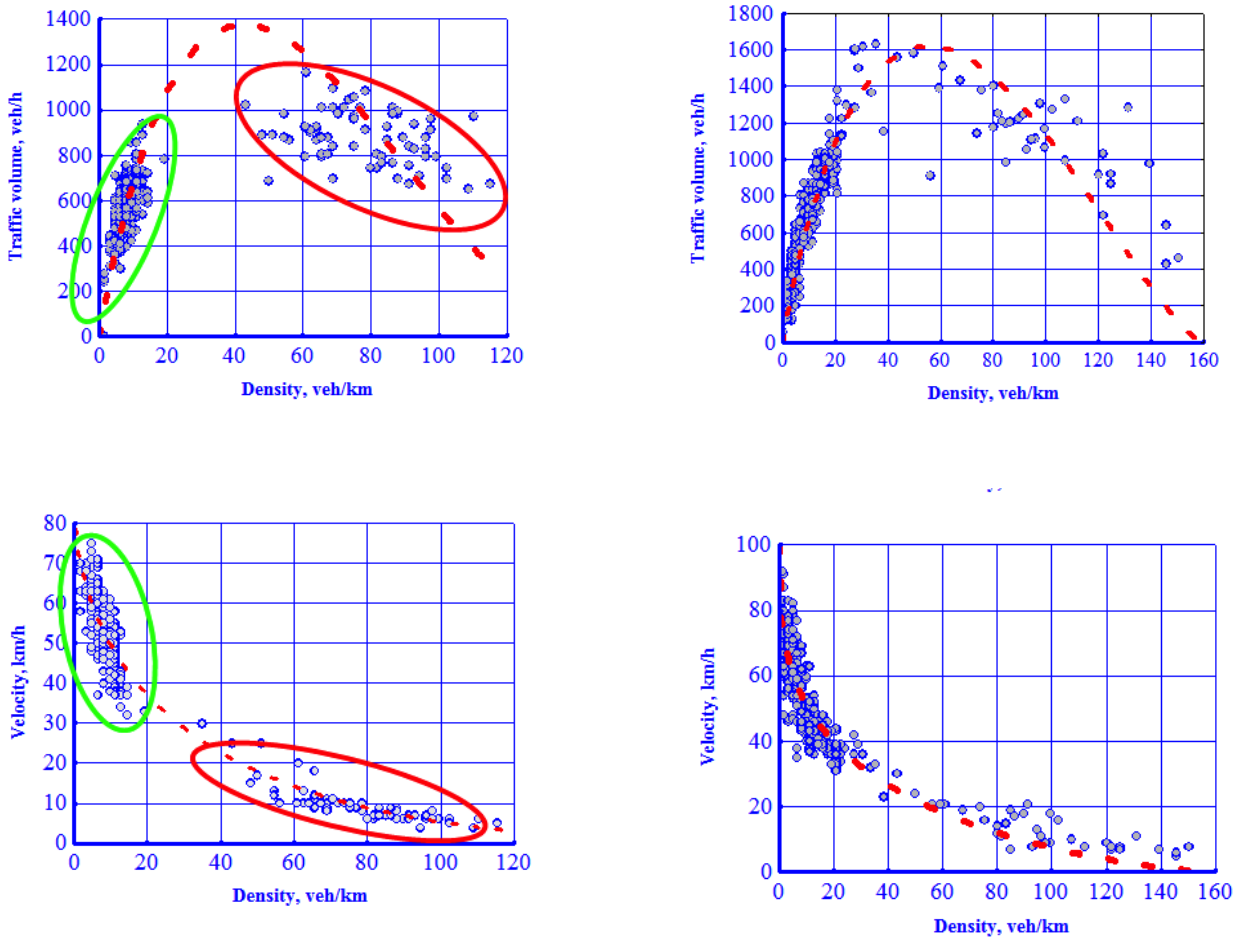


Figure 25: Forecasted capacity





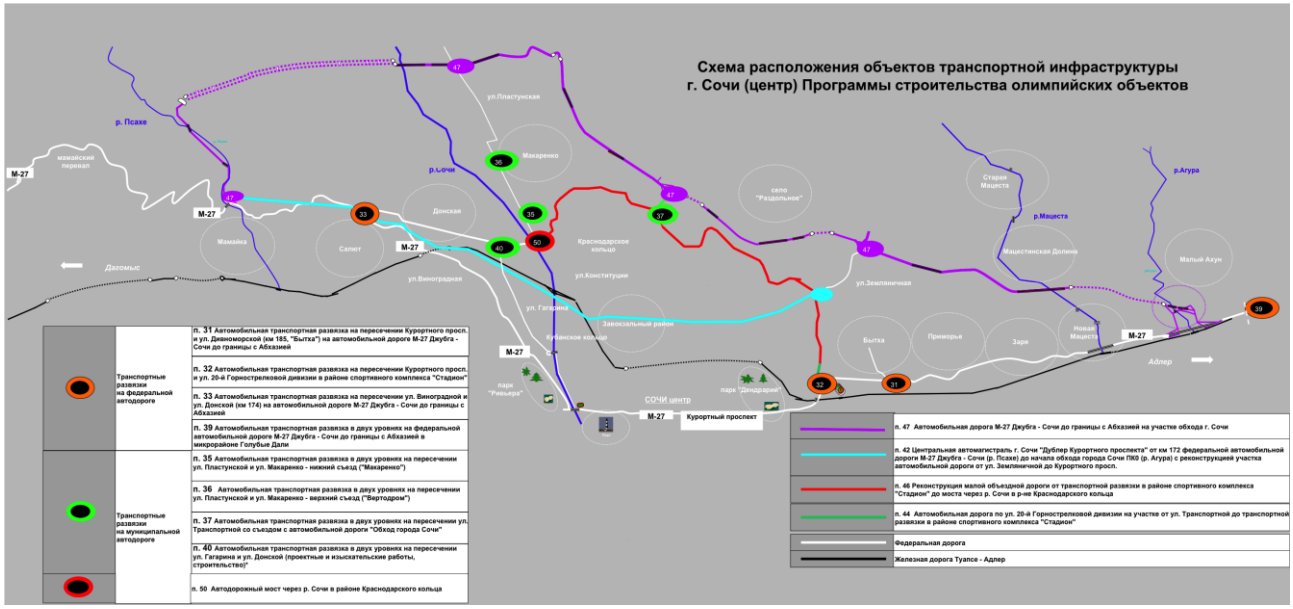

In 2009 traffic flows were measured and counted at critical and representative points throughout the wider Sochi area in order to obtain a realistic picture of actual traffic volumes.

Now the average public transport speed fluctuates between 10,1 to 12,6 km per hour by the season (lower in spring, summer and autumn, higher in winter). The measured traffic flow results are indicated with a red circle in above Figure.

With the new road infrastructure improvements at key intersections the traffic flow initially will improve according to the forecast model. Indicated by the green circles in above figure. Car density initially will half and average travel speed more than double.

However, in the mid-term period this indicator will not improve, because the car numbers in Sochi are also growing rapidly, and the possibilities for further road network expansion within the city limits are either depleted, or requires the actions, that will cost comparatively more than the benefits associated with them.

## Figure 26: Key route and intersections

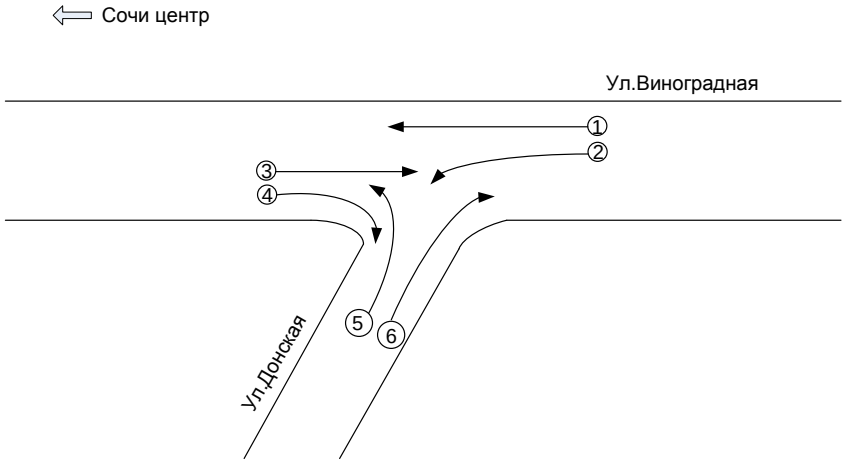


### 3.13 TRAFFIC FLOW SURVEY 2009 – DETAIL OF INFRASTRUCTURE IMPROVEMENTS

With the traffic survey the current traffic situation at critical intersections was monitored and also simulated for the same intersection with the new design being planned for the Olympic Games.

**Vinogradnaya-Donskaya Intersection**

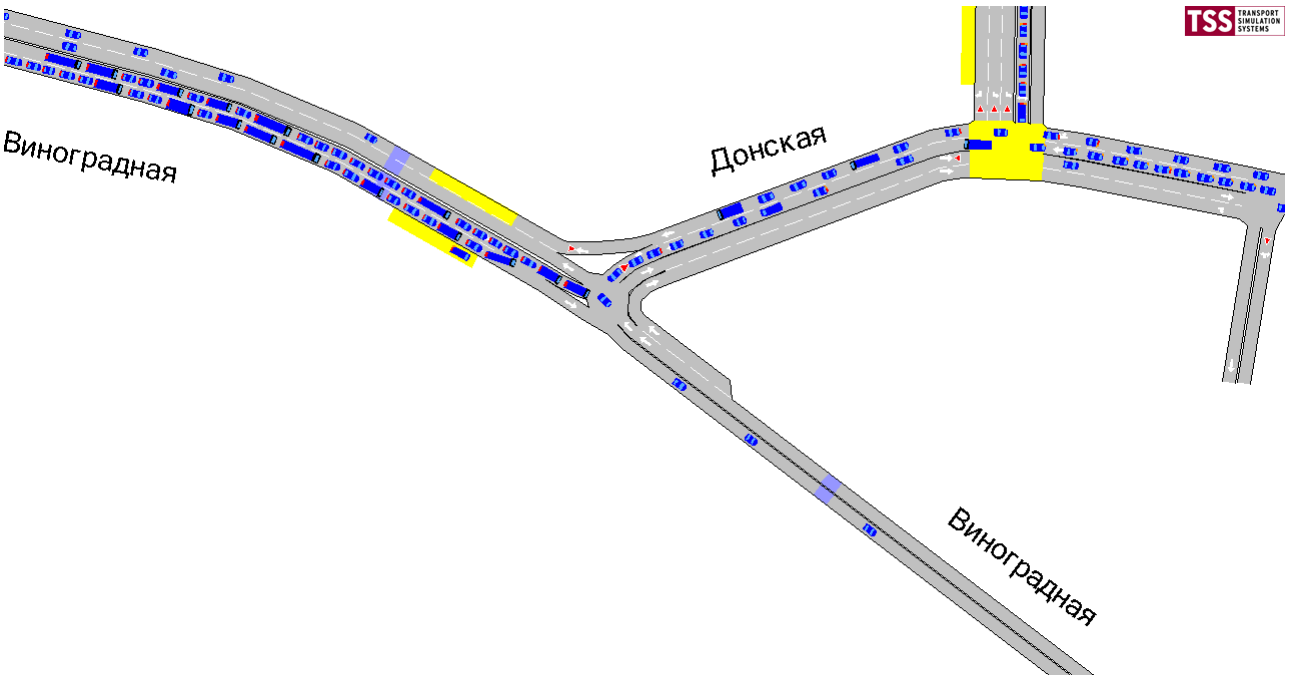
Current traffic volume is at saturation point.






| № exam | Л/ч | Г<2 | Г<6 | Г<8 | Г>8 | МА | СА | БА | Прив |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 456 | 30 | 4 | 16 | - | 48 | - | 4 | 585 |
| 2 | 396 | 52 | 14 | 38 | 14 | 20 | 2 | 4 | 625 |
| 3 | 320 | 20 | 2 | 12 | - | 26 | 8 | 6 | 422 |
| 4 | 126 | 18 | 4 | 2 | - | 32 | 8 | - | 200 |
| 5 | 160 | 2 | 4 | 2 | - | 20 | - | - | 142 |
| 6 | 422 | 68 | 24 | 24 | 4 | 60 | 2 | - | 656 |

Figure 27: Current traffic volume






Even though forecasted density for this intersection does increase for the Olympic Games and beyond the new infrastructure measures do provide sufficient capacity on this intersection for the midterm future.

Figure 28: Current traffic density

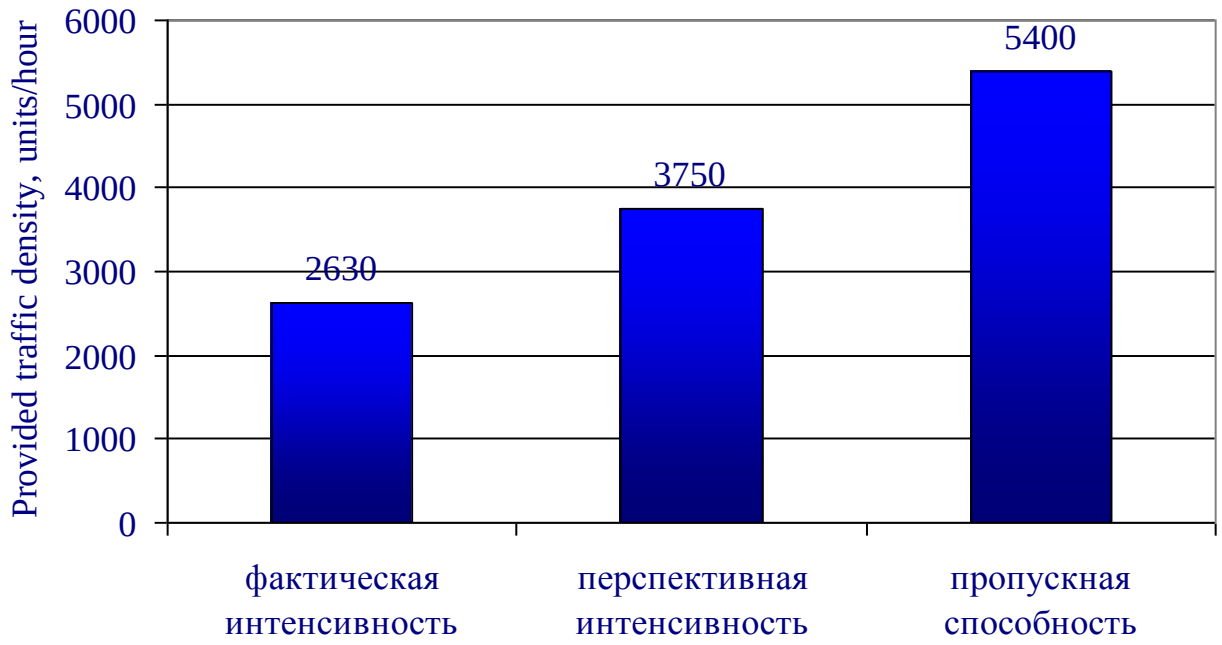
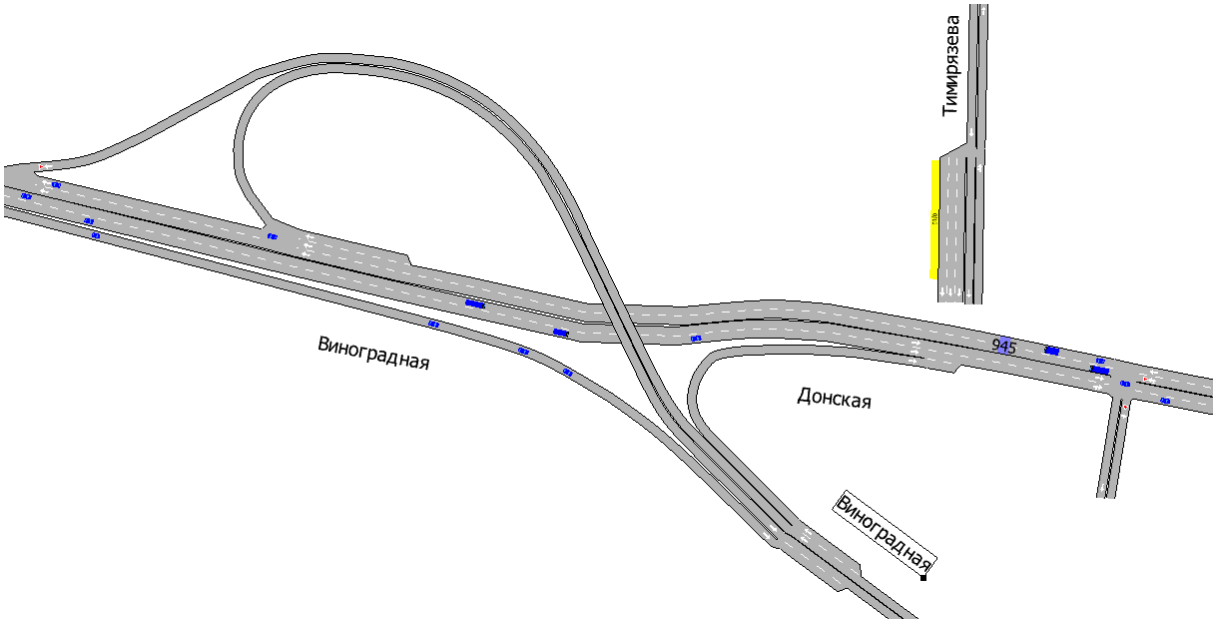


Figure 29: Situation after planned infrastructure upgrade

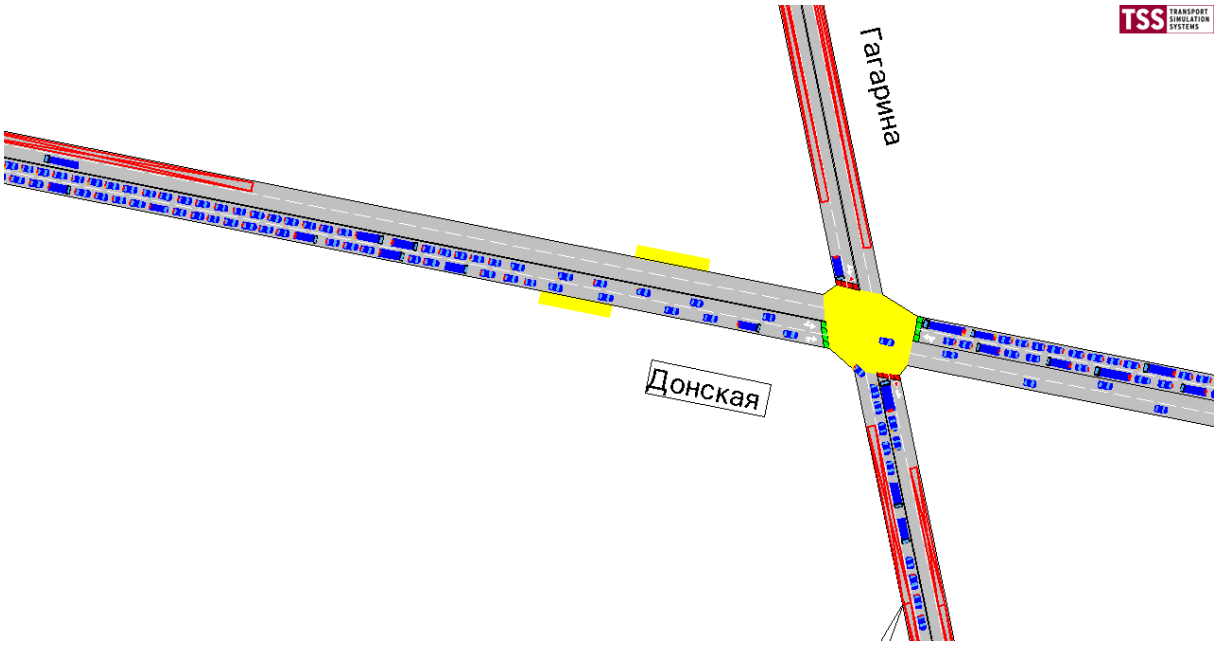





**Gagarina-Donskaya Intersection**

Also at this intersection traffic loads are at saturation point.

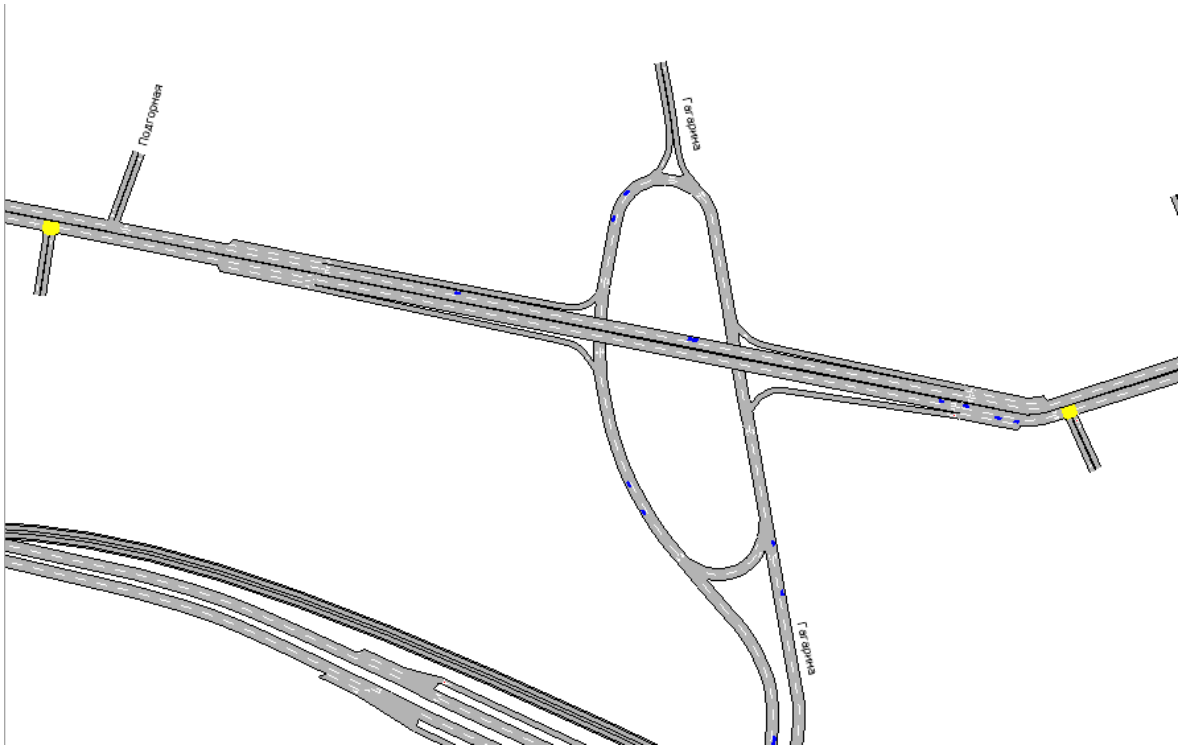
Figure 30: Current traffic volume



Again, even though forecasted density for this intersection does increase for the Olympic Games and beyond the new infrastructure measures do provide sufficient capacity on this intersection for the midterm future.

**Figure 31: Current traffic density**

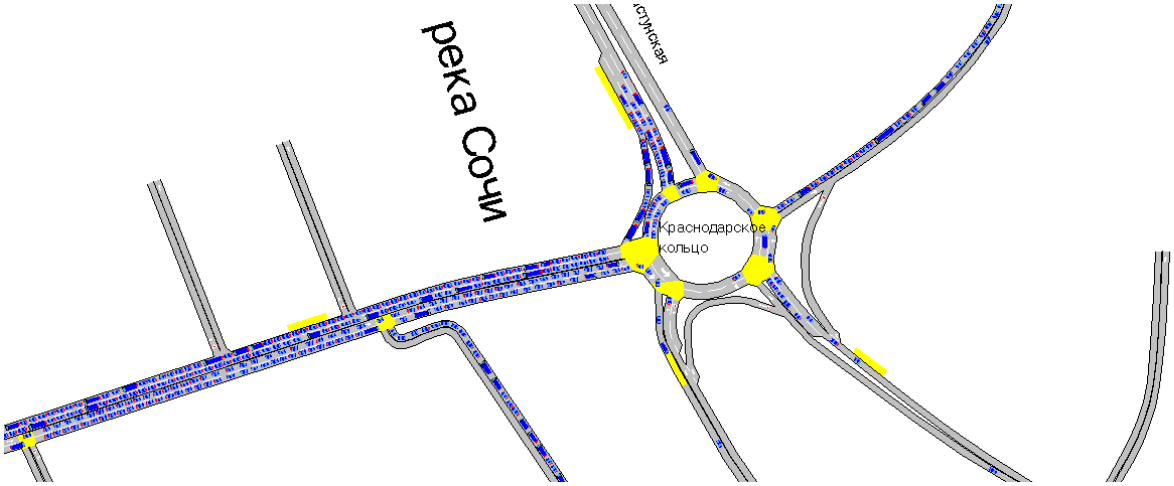

**Figure 32: Situation after planned infrastructure upgrade**



**Krasnodar Circle**

Also at this intersection traffic loads are at saturation point at current situation.

**Figure 33: Lay out**




Forecasted density for this intersection does increase for the Olympic Games and beyond almost to the capacity level of the new infrastructure. Additional measures are required to provide sufficient capacity on this intersection for the midterm future.



**Figure 34: Current traffic density**

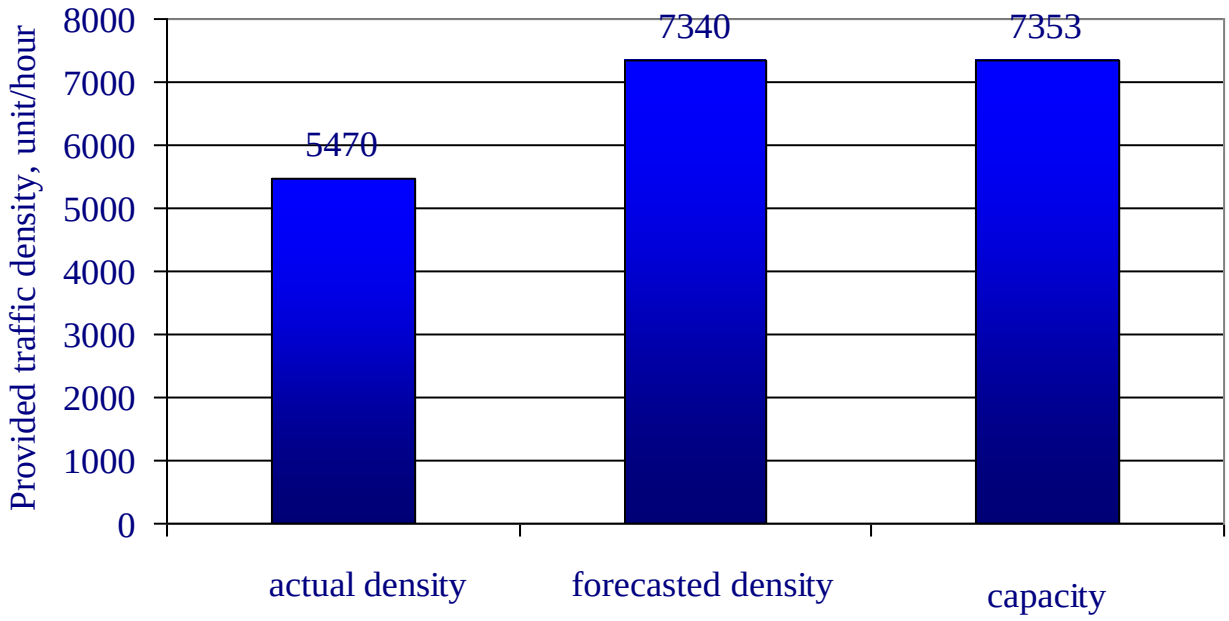
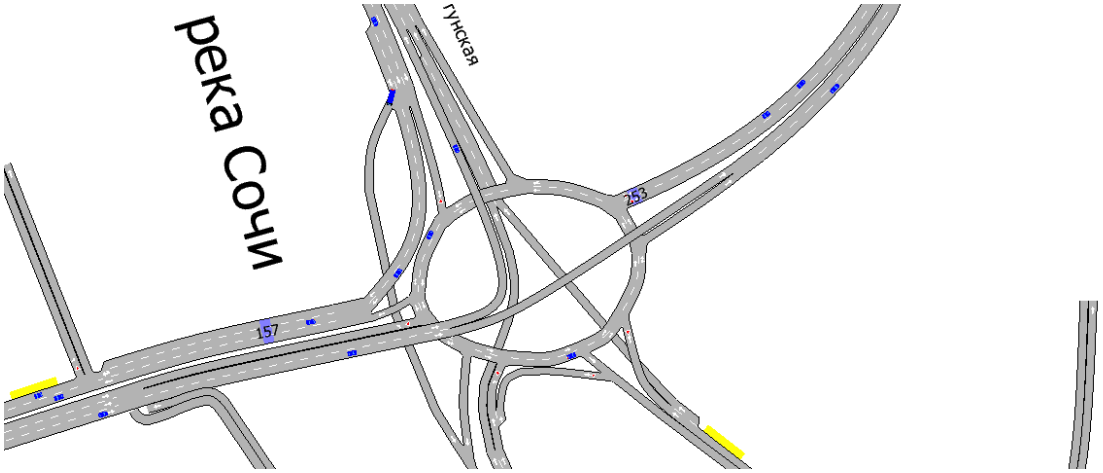


Figure 35: Planned infrastructure upgrade




**Golubye Dali – Adler Area**

The Adler Area is of specific critical importance as the coastal corridor and the transport corridor to the mountains intersect. Adler is also a thriving community and tourism resort and the airport is located here also.



In the traffic survey the situation of this area has been identified as the most important.

Figure 36: Existing Adler rod infrastructure

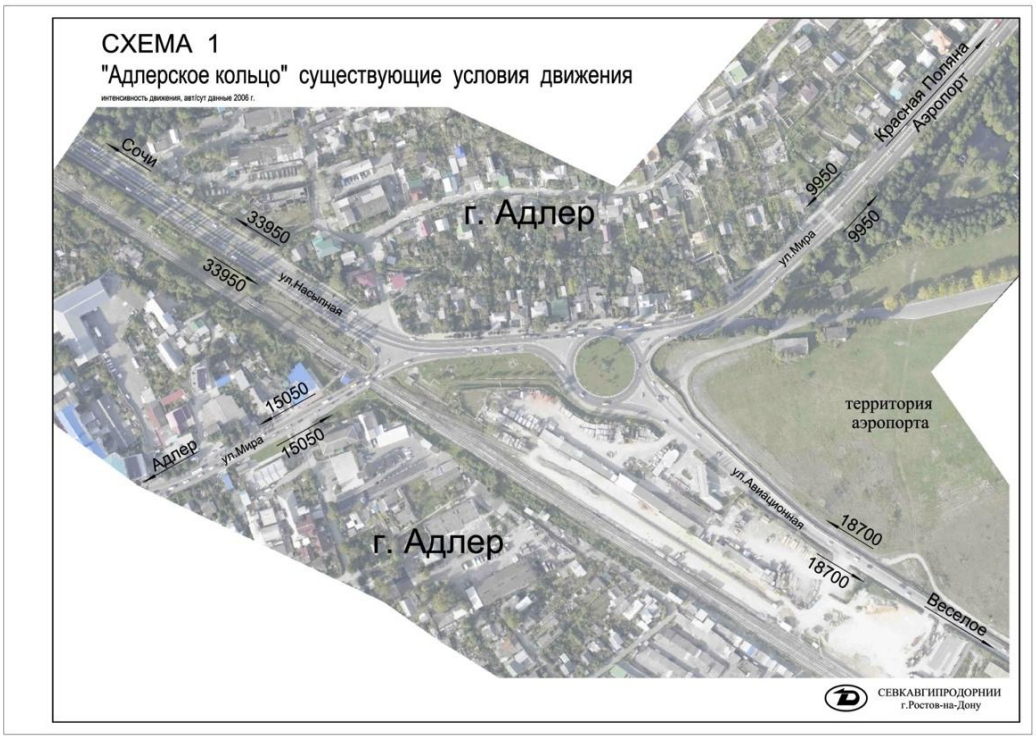
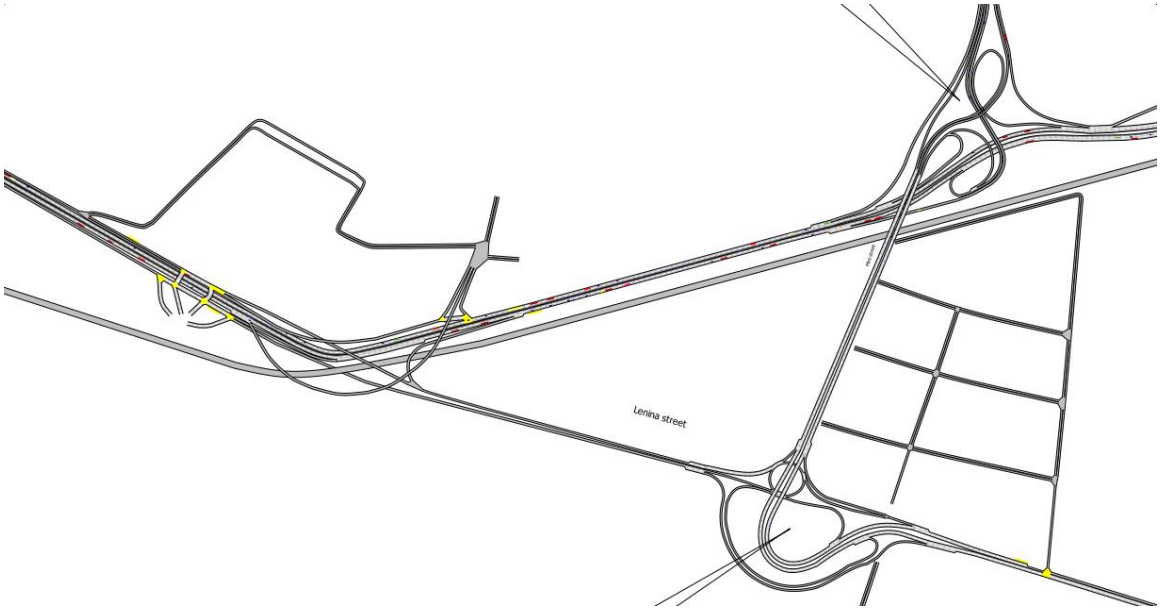


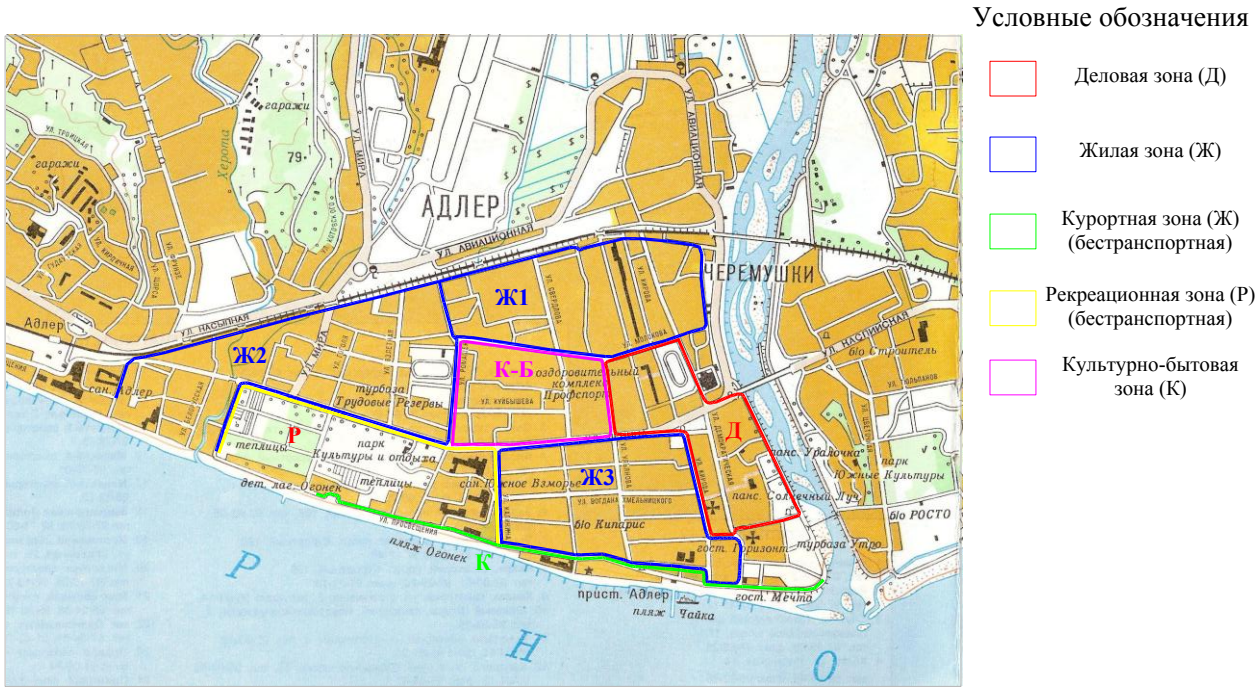
**Figure 37: Planned improvement**




An understanding of the functional zoning of the urban territory is essential for the analysis of the current traffic situation.



**Figure 38: Functional Zoning Adler**



## 3.14 CONCLUSIONS OF THE 2009 TRAFFIC SURVEY

**Vehicle junction in two levels on the federal motor road M-27 Dzhubga - Sochi to the border of Abkhasia in the district of Golubye Dali**

Construction of the junction will make the central part attractive for transit traffic, which will increase the load on these parts of the network and therefore deteriorate the environmental situation. Besides, it will form heavy traffic flows which will divide Adler into two parts. In the future traffic jams will form in this part of Adler, creating problems for pedestrians crossing Lenina street, number of accidents with pedestrians will increase, as well as gas pollution. All this will result in Adler becoming unsafe and unattractive place for life and recreation. If this concept is effective, and conclusions are justified, then traffic junction at the crossroad of Mira street with Lenina street in Adler with the absence of Golubye Dali junction is also inadvisable.

**Krasnodar Circle**

On the basis of modeling we establish that capacity of planned Krasnodar circle is comparable to forecasted density of traffic in this hub. There is no significant reserve capacity.

**Sochi bypass Akhun, Sputnik**

Univocal conclusion can be made about need to construct traffic junction in the hub where current Sochi bypass begins (road to Akhun, Sputnik). It is related to the fact that capacity of this hub is not sufficient for passage of forecasted traffic volumes after construction of all traffic junctions and roads in the central part of the city. Implementation of Olympic transport plans without reconstruction of this hub is not possible.



**Intersection Micro-modelling**

During assessment of efficiency and advisability of the construction of road junctions using methods of micro modeling, we came to a conclusion that, taking into consideration limitations set out in information provided officially, we can preliminary elect not to construct two traffic junctions, namely:a) Vehicle traffic junction at the crossroads of Kurortny avenue and Divnomorskaya st. (km 185, Bytkha) at M-27 motor road Dzhubga - Sochi to the border with Abkhasia. According to performed forecast change of traffic volume in the street and road network, in this hub density of traffic will fall by 29% due to reallocation of traffic flows, and traffic speed in the hub will increase from 31 to 42 km/hour.

## 3.15 IDENTIFYING THE CHALLENGES FOR TRANSPORT PLANNING AND TRAFFIC MANAGEMENT

a. Main challenges of Sochi regional transport
   - Infrastructure
   - Public Transport
   - Parking
   - Behaviour & individual traffic patterns

### Challenges related to Parking and Lack of Multimodal Transport Options

Parking planning is undergoing a paradigm shift, a fundamental change in how a problem is perceived and solutions evaluated. The old paradigm assumes that parking should be abundant and free at most destinations. It strives to maximize supply and minimize price.

The new paradigm strives to provide optimal parking supply and price. It considers too much supply as harmful as too little, and prices that are too low as harmful as those that are too high. The new paradigm strives to use parking facilities efficiently. Figure 35 compares the old and new parking paradigms.

Parking Management can be realized using different strategies. Each strategy is useful in a different way and its efficiency depends on the local conditions, current parking supply, user groups and area types. It also shows general parking management strategies that can also be used for local situations in the districts of the city of Sochi.



**Figure 39: Old and New Parking Paradigms**

| Old Parking Paradigm | New Parking Paradigm |
|---|---|
| "Parking problem" means inadequate parking supply | There can be many types of parking problems, including inadequate or excessive supply, too low or high prices, inadequate user information, and inefficient management. |
| Abundant parking supply is always desirable. | Too much supply is as harmful as too little. |
| Parking should generally be provided free, funded indirectly, through rents and taxes. | As much as possible, users should pay directly for parking facilities. |
| Parking should be available on a first-come basis. | Parking should be regulated to favor higher priority uses and encourage efficiency. |
| Parking requirements should be applied rigidly, without exception or variation. | Parking requirements should reflect each particular situation, and should be applied flexibly. |
| Innovation faces a high burden of proof and should be applied if proven and widely accepted. | Innovations should be encouraged, since even unsuccessful experiments often provide useful information. |

| | |
|---|---|
| Parking management is a last resort, to be applied only of increasing supply is infeasible | Parking management programs should be widely applied to prevent parking problems. |
| "Transportation" means driving. Land use dispersion (sprawl) is acceptable or even desirable. | Driving is just one type of transport. Dispersed, automobile-dependent land use patterns can be undesirable. |

**Figure 40: Parking Situation in Sochi**

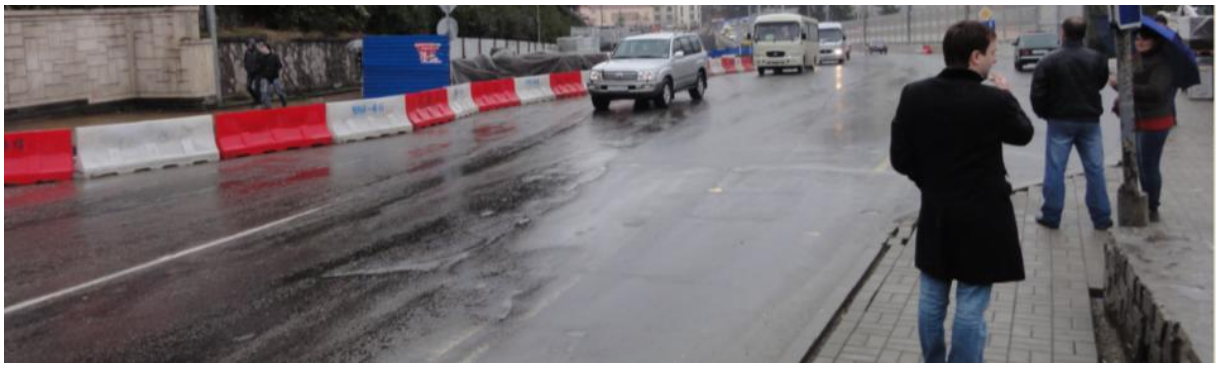


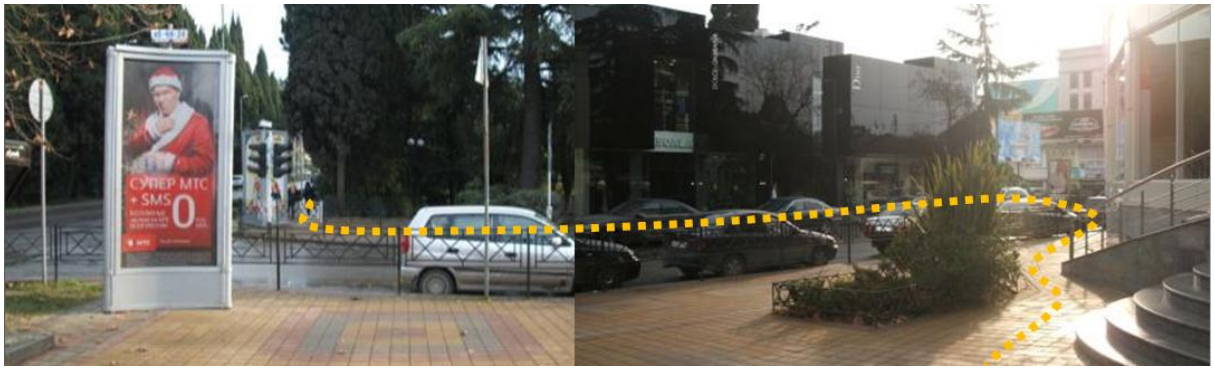


In addition to ineffective parking and access restrictions, ineffective organization of the public spaces and a problematic parking behavior of the local people the high number of vehicles leads to an unacceptable situation on the roads. The current situation in Sochi Centre and many other areas of Sochi districts is characterized by driving and parking vehicles in every free and accessible space. Blocked areas are used for parking as well as pedestrian crossings. Pedestrians are seconded to domination of vehicles.

In many areas the design of the public space leads to a very unattractive pedestrian network. At crossings pedestrians have to endure extremely long detours and there are very disadvantageous under-/overpasses. The design of these crossings leads to so called "fear spaces" which strictly have to be avoided in today's state of art of infrastructure planning.

**Figure 41: Unattractive Pedestrian Areas – Detours & fear spaces**








The main part of the area of Sochi is characterized by a low quality of infrastructure of the public space. It is of high importance to restructure the public space to be able to provide the necessary space for each user group – pedestrians & cyclists as well as motorized & parking traffic.

*Residential Parking*

The main share of the central area of Sochi Center is characterized the same way. The main usage, which is living, requests a high amount of parking spaces for local residents. Additionally there is a high demand on parking spaces due to located small and big business facilities.


*Parking Facilities*

Sochi has the highest number of existing and planned parking facilities. The main share is used for public or commercial parking. Generally there is a lack of private parking in the central living districts for residential use.



*Pedestrian Areas*

Within and surrounding the central district of Sochi Centre there are a few areas which are very attractive. Due to unattractive connections to the residential areas by pedestrian infrastructure they are used in a very minimal degree.




MARINA RINALDI

## Railway Challenges

Because of the single track line between Adler and Esto Sadok village (Krasnaya Polyana Hub) and the dense schedule it is highly necessary not to create delays for the operation of the trains. If the trains are already starting in Sochi and running through to Esto Sadok village (Krasnaya Polyana Hub), the potential of delays is very high. All problems concerning the quality of operation between Sochi and Adler (such as the interchange of passengers with the feeder bus system at the stations) can lead to delays and are going to be imported in the sensitive Adler-Krasnaya Polyana Hub system. These principles are the same as for the Adler - Sochi Airport railway line.



At the end of events thousands of people are using the train to go from Esto Sadok village (Krasnaya Polyana Hub) to the coast. In that case the stations in Krasnaya Polyana village and Estosadok village are operating at their capacity limit. It will be **nearly impossible** to **separate the people flows** to trains to Adler and trains to Olympic park. There will be a high risk that passengers would use the wrong trains.

Having **two different starting points** (Olympic Park and Adler) to go to the mountains it is **impossible to operate both trains** with the maximum degree of the load factor, which is of vital importance to guarantee the capacity needed in peak hours in the Mountain Cluster.

## Challenges and Issues of Existing Public Bus System

The current public bus system is very inefficient and also unattractive in comparison to modern intermodal transport systems.

**Figure 42: Current Sochi bus main station Terminal**



**Figure 43: Public buses caught in traffic jam caused by the very same public buses**

The public bus system resembles a taxi system on demand, as a very large number of small vehicles with low capacity, run one fixed route and stop wherever the client wishes.

Buses are caught up in traffic jams with individual motorized traffic and have no level of priority.

There is no type of information system on routes, lines or time tables.

The quality of vehicles and stops/terminals is poor.

**Figures 44: Public terminals**


### 3.16 INITIAL ANALYSIS OF EXISTING INFRASTRUCTURAL AND TECHNICAL BARRIERS TOWARDS SUSTAINABLE TRANSPORT SOLUTIONS

One of the barriers to sustainable transport in Sochi is the gap between parking spaces and cars in Sochi Center. This gap results in an extensive use of urban space for parking, which in an improvement scenario could be transformed into space for other use.




A second barrier to sustainable transport in Sochi is the lack of interconnectivity among the different transport modes. All transport modes, individual motorized traffic, individual non-motorized traffic and public mass transit systems need to be integrated into one network. This is currently not the case. The barrier is the lack of hubs and interchange nodes among train and car, bus and train and also train and car, as well as accessibility of stations and terminals on foot.

As examples for the lack of interconnectivity the bus terminal in front of the Sochi Center Train Station can be mentioned. The design of the bus hub does not allow for free-flowing and safe bus traffic and neither does it allow high volume pedestrian flows.

## 3.17 QUANTITATIVE CHARACTERISTICS OF THE EXISTING TRANSPORT INFRASTRUCTURE NEEDED TO ASSESS TRANSPORT-RELATED GHG EMISSIONS

### Decrease in fuel expenses

Nowadays the public transport in Sochi operates mainly in low-capacity "Gazelle"-type buses, that account for more than a thousand units. Apart from that, about 500 units – higher capacity buses, but also morally and physically obsolete in overwhelming numbers.

The average fuel consumption for a "Gazelle"-type buses makes about 19 litres of gasoline per 100 km[1], for modern Russian LiAZ-type buses – about 35 litres diesel fuel per 100 km[2]. Average gasoline price in 2010 is about 26 roubles per litre, diesel fuel – about 20 roubles per litre.

Average day haul per unit now accounts for about 300 km. By means of higher capacity bus operations and optimized route organization there are grounds to expect that an average day haul will make 200 km.

Thereby, if a transfer will be done from the existing bus fleet structure to a proposed organized system with more environment-friendly, comfortable and contemporary higher-capacity buses, that will result in estimated 33% decrease, it will have an effect of **300,4 mln roubles** a yer (in 2010 prices):

The difference between **1,5 thousand units** X 300 km X (19 l /100 km) X 26 roubles X 1 year and **1 thousand units** X 200 km X (35 l / 100 km) X 20 roubles X 1 year.



[1 5] Fuel and lubricants consumption normative for automobile transport, approved by the Ministry of Transport of Russian Federation

## 4. LIST OF FIGURES

## 5. APPENDIX – LIST OF EXISTING BUS LINES SOCHI

**Table 1**

| | | Протяженность | | Начало, конец работы | | Кол-во автобусов | Тип автобусов | Вместимость | Время оборотного рейса | интервал | кол-во остановок | кол-во остановок обратно | Средняя скорость | Кол-во рейсов | час пик |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | прямо | обратно | начало | конец | | | | | | | | | | |
| | ***Магистральные*** | | | | | | | | | | | | | | |
| 1 | Ж/д вокзал Сочи - с/х Россия | 39 600 | 40 700 | 05.00 | 01.00 | 25 | Большой | 21/97 | 180 | 4-8 | 48 | 51 | 26,4 | 150 | 3121,4 |
| 1-С | Ж/д вокзал Сочи - с/х Россия (полуэкспресс) | 37 700 | 39 000 | 05.00 | 01.00 | 10 | Большой | 21/97 | 140 | 10-20 | 10 | 10 | 32,3 | 100 | |
| 1-Э | Ж/д вокзал Сочи - с/х Россия (экспресс) (постолимпийский) | 37 700 | 39 000 | 05.00 | 01.00 | 15 | Большой | 21/97 | 120 | 6-12 | 2 | 2 | 37,7 | 150 | 776,0 |
| 2a | Ж/д вокзал Сочи - Аэропорт | 28 900 | 27 700 | 05.00 | 01.00 | 20 | Большой | 21/97 | 110 | 5-16 | 28 | 31 | 31,5 | 240 | 937,2 |
| 2b | Аэропорт - Красная Поляна (Альпика-Сервис) | 48 400 | 48 200 | 05.00 | 01.00 | | | | 160 | | 22 | 21 | 36,3 | 160 | 218,6 |
| 4 | Адлер, а/с Труд - Аэропорт - Красная | 53 900 | 55 500 | 05.00 | 01.00 | 10 | Большой | 21/97 | 180 | 18-36 | 29 | 31 | 35,9 | 60 | 518 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Поляна (Альпика-Сервис)* | | | | | | | | | | | | | | |
| | ***Фидерные Хаб Сочи*** | | | | | | | | | | | | | | |
| *6-к* | *сан. Салют - Ж/д вокзал Сочи* | *7 900* | *8 000* | *07.25* | *22.01* | *4* | *Средний* | *27/56* | *62* | *16-32* | *15* | *14* | *15,3* | *80* | *260,5* |
| *9* | *Мамайка, ул. Крымская - Ж/д вокзал Сочи* | *10 200* | *10 600* | *06.20* | *22.05* | *4* | *Средний* | *27/56* | *80* | *20-40* | *20* | *18* | *15,3* | *64* | *291,3* |
| *13* | *Детский сад № 44 - Платановая аллея* | *6 300* | *6 700* | *07.05* | *20.24* | *10* | *Большой* | *21/97* | *59* | *4-8* | *14* | *15* | *12,8* | *220* | *1560* |
| *14* | *Автовокзал - ул. Л. Чайкиной* | *6 600* | *5 200* | *06.42* | *21.08* | *2* | *Средний* | *27/56* | *51* | *26-52* | *15* | *11* | *15,5* | *48* | *136,4* |
| *15* | *Морвокзал - Видовая башня (кольцевой)* | *7 400* | *-* | *07.20* | *20.57* | *2* | *Средний* | *27/56* | *32* | *16-32* | *17* | *-* | *27,8* | *80* | *76,2* |
| *17-1* | *Ж/д вокзал Сочи - Новая Заря (прямое направление) (кольцевой)* | *11 900* | *-* | *05.00* | *24.00* | *10* | *Большой* | *21/97* | *60* | *5-10* | *21* | *-* | *23,8* | *200* | *224,7* |
| *17-2* | *Новая Заря - Ж/д вокзал Сочи (обратное направление) (кольцевой)* | *11 900* | *-* | *05.00* | *24.00* | *10* | *Большой* | *21/97* | *60* | *5-10* | *24* | *-* | *23,8* | *200* | *224,7* |
| *20* | *ул. Есауленко - Автовокзал* | *8 800* | *9 700* | *06.00* | *22.00* | *4* | *Средний* | *27/56* | *90* | *23-46* | *17* | *17* | *11,7* | *56* | *161,3* |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | Морвокзал - Мемориал - ул. Докучаева | 5 100 | 4 300 | 06.00 | 22.00 | 2 | Средний | 27/56 | 38 | 19-38 | 12 | 8 | 16,1 | 64 | 94,8 |
| 26 | Морвокзал - ул. Туапсинская - ул. Докучаева | 4 800 | 4 500 | 06.00 | 22.00 | 2 | Средний | 27/56 | 38 | 19-38 | 8 | 13 | 15,2 | 64 | 144,6 |
| 29 | Ж/д вокзал Сочи - Питомник | 9 100 | 9 000 | 06.00 | 22.00 | 4 | Средний | 27/56 | 60 | 15-30 | 19 | 17 | 18,2 | 80 | 143,6 |
| 30 | сан. Фазатрон, Школа-интернат № 2 - ж/д вокзал Сочи | 6 700 | 8 700 | 06.05 | 23.46 | 6 | Средний | 27/56 | 60 | 10-20 | 13 | 15 | 13,4 | 120 | 522,6 |
| 34 | Платановая аллея - ул. Вишнёвая, 34 | 7 500 | 7 500 | 06.00 | 22.00 | 4 | Средний | 27/56 | 58 | 15-30 | 16 | 16 | 15,5 | 88 | 293,3 |
| 45 | Автовокзал - ул. Буковая | 8 500 | 7 900 | 06.20 | 23.00 | 10 | Малый | 18 | 65 | 5-10 | 13 | 13 | 15,7 | 200 | 280,0 |
| 92 | ул. Ландышевая - Платановая аллея | 9 900 | 10 600 | 06.00 | 23.00 | 8 | Малый | 18 | 60 | 8-16 | 17 | 20 | 19,8 | 160 | 196,1 |
| 101 | Сочи, морвокзал - с. Верхний Юрт | 11 900 | 12 200 | 06.14 | 23.24 | 6 | Средний | 27/56 | 100 | 17-34 | 26 | 28 | 14,3 | 72 | 110,9 |
| 102 | Сочи, морвокзал - с. Ореховка | 15 800 | 15 900 | 06.20 | 22.00 | 2 | Большой | 21/97 | 102 | 50-100 | 25 | 27 | 18,6 | 24 | 89,8 |
| 103 | Сочи, ж/д вокзал - с. Богушевка | 12 400 | 11 700 | 06.35 | 21.40 | 2 | Средний | 27/56 | 76 | 40-80 | 20 | 17 | 19,6 | 32 | 84,4 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *104* | *Сочи, морвокзал - с. Барановка* | *13 200* | *13 600* | *06.15* | *21.00* | *3* | *Средний* | *27/56* | *60* | *20-40* | *20* | *16* | *26,4* | *60* | *136,8* |
| *111* | *Морвокзал - Дамба (ул. Джапаридзе)* | *11 600* | *11 600* | *06.00* | *23.00* | *10* | *Большой* | *21/97* | *77* | *8-16* | *20* | *22* | *18,1* | *160* | *814,8* |
| *113* | *Сочи, 4-я бол-ца - с. Раздольное, 3-я бригада* | *12 500* | *11 000* | *07.20* | *20.10* | *1* | *Малый* | *18* | *80* | *80-160* | *15* | *14* | *18,8* | *16* | *14,3* |
| *114* | *Сочи, морвокзал - ул. Леселидзе* | *11 700* | *11 800* | *06.06* | *22.30* | *9* | *Средний* | *27/56* | *90* | *10-20* | *21* | *24* | *15,6* | *144* | *268,8* |
| | ***Фидерные Хаб Мацеста*** | | | | | | | | | | | | | | |
| *3* | *ул. Чекменева, мост - сан. Мац.долина - Ж/д вокзал Сочи* | *15 900* | *16 300* | *06.00* | *21.50* | *15* | *Большой* | *21/97* | *100* | *5-10* | *30* | *30* | *19,1* | *180* | *1282,5* |
| *12* | *к/т Аэлита - Мацестинская Долина* | *8 200* | *6 700* | *06.20* | *20.24* | *1* | *Средний* | *27/56* | *54* | *54-108* | *14* | *11* | *18,2* | *24* | *41* |
| *110* | *Сочи, кладбище - п. Малый Ахун* | *14 500* | *14 700* | *06.00* | *22.00* | *7* | *Средний* | *27/56* | *65* | *10-20* | *21* | *23* | *26,8* | *140* | *49,6* |
| *112* | *Сочи, ж/д вокзал - п. Малый Ахун* | *14 300* | *12 900* | *06.04* | *20.56* | *1* | *Средний* | *27/56* | *65* | *65-130* | *20* | *21* | *26,4* | *20* | *44,8* |
| *120* | *Сочи, автовокзал - Чайсовхоз - с. Семеновка, пер.* | *25 000* | *26 700* | *05.41* | *22.50* | *5* | *Большой* | *21/97* | *126* | *25-50* | *26* | *31* | *23,8* | *50* | *389,6* |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Калиновый* | | | | | | | | | | | | | | |
| *121* | *Сочи, автовокзал - с. Абадзинка* | *23 800* | *23 100* | *05.50* | *22.52* | *5* | *Большой* | *21/97* | *120* | *25-50* | *32* | *33* | *23,8* | *50* | *235,2* |
| *139* | *Сочи, ж/д вокзал - п. Малый Ахун, гора Ахун* | *19 500* | *19 400* | | | | | | | | | | | | |
| | ***Фидерные хаб Хоста*** | | | | | | | | | | | | | | |
| *122к* | *ул. Искры - ул. Дарвина* | *3 500* | *3 500* | *07.00* | *22.00* | *3* | *Малый* | *18* | *25* | *8-16* | *8* | *8* | *16,8* | *156* | *126* |
| *127* | *п. Хоста - с. Калиновое озеро - с. Воронцовка* | *20 000* | *19 400* | *06.00* | *21.15* | *2* | *Средний* | *27/56* | *100* | *50-100* | *20* | *19* | *24,0* | *24* | *42,4* |
| *128* | *п. Хоста - с. Красная воля* | *10 200* | *10 200* | *06.30* | *20.45* | *2* | *Средний* | *27/56* | *45* | *23-46* | *12* | *12* | *27,2* | *56* | *21,2* |
| *129* | *п. Хоста - с. Каштаны* | *8 700* | *8 700* | *06.00* | *20.00* | *2* | *Средний* | *27/56* | *55* | *28-56* | *10* | *10* | *19,0* | *48* | *14,8* |
| *136* | *п. Хоста - с. В. Николаевка* | *11 700* | *11 700* | *06.10* | *21.10* | *2* | *Средний* | *27/56* | *80* | *40-80* | *15* | *15* | *17,6* | *32* | *21,2* |
| *175* | *с/х Приморский - Ж/д вокзал Адлер* | *15 000* | *15 000* | *06.00* | *22.00* | *6* | *Малый* | *18* | *95* | *16-32* | *23* | *23* | *18,9* | *84* | *54* |
| | ***Фидерные Хаб Адлер*** | | | | | | | | | | | | | | |
| *55* | *ул. Голубая - Голубые* | *12 400* | *11 600* | *07.00* | *21.30* | *3* | *Малый* | *18* | *80* | *27-54* | *15* | *18* | *18,6* | *48* | *28,8* |

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| | *дали* | | | | | | | | | | | | | | |
| *59* | *Адлер, а/с Труд - дачи - с/о Золотой гребешок* | *5 500* | *6 600* | *06.16* | *20.15* | *2* | *Средний* | *27/56* | *60* | *30-60* | *7* | *7* | *11,0* | *40* | *48,4* |
| *109* | *Адлер, а/с Труд - с. Верхнее Веселое* | *8 900* | *10 400* | *06.40* | *21.35* | *1* | *Малый* | *18* | *60* | *60-120* | *10* | *10* | *17,8* | *20* | *15* |
| *131* | *Адлер, а/с Труд - с. Галицино* | *27 000* | *27 100* | *05.10* | *20.07* | *2* | *Средний* | *27/56* | *130* | *65-130* | *25* | *21* | *24,9* | *20* | *20,4* |
| *132* | *Адлер, а/с Труд - с. Социализм* | *14 800* | *14 700* | *05.25* | *20.25* | *2* | *Средний* | *27/56* | *80* | *40-80* | *18* | *16* | *22,2* | *32* | *27,8* |
| *137* | *Адлер, а/с Труд - с. Липники* | *20 100* | *18 600* | *06.10* | *21.10* | *1* | *Средний* | *27/56* | *120* | *120* | *21* | *21* | *20,1* | *10* | *16,5* |
| *138* | *Адлер, ТЦ Новый век - с. Молдовка, кладбище* | *15 300* | *17 000* | *06.15* | *21.16* | *1* | *Средний* | *27/56* | *106* | *106* | *21* | *21* | *17,3* | *12* | *12,4* |
| *140* | *Адлер, а/с Труд - с. Верино* | *14 600* | *14 100* | *06.10* | *20.09* | *1* | *Средний* | *27/56* | *118* | *118* | *24* | *23* | *14,8* | *10* | *11,2* |
| | ***Маршруты*** | | | | | | | | | | | | | | |
| *1* | *Мамайка, ул. Полтавская - Цирк* | *12 200* | *12 100* | *05.30* | *23.55* | *20* | *Большой* | *21/97* | *100* | *5-10* | *22* | *23* | *14,6* | *240* | *3276* |
| *4* | *ул. Вишневая, д. 34 - сан. Русь* | *12 600* | *12 600* | *06.30* | *23.00* | *10* | *Средний* | *27/56* | *80* | *8-16* | *25* | *24* | *18,9* | *160* | *312,5* |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | сан. Русь - к/т Аэлита | 10 500 | 10 300 | 06.42 | 21.10 | 5 | Большой | 21/97 | 84 | 17-34 | 19 | 18 | 15,0 | 80 | 323,4 |
| 16 | Новая заря - ул. Донская - ЗСМ | 8 400 | 8 500 | 06.07 | 19.59 | 4 | Большой | 21/97 | 63 | 16-32 | 16 | 19 | 16,0 | 80 | 348,8 |
| 18 | Морвокзал - с. Н. Юрт | 6 800 | 8 200 | 07.05 | 21.55 | 1 | Малый | 18 | 80 | 80-160 | 16 | 19 | 10,2 | 16 | 29 |
| 19 | ул. Вишневая, д/сад № 44 - Платановая аллея | 9 000 | 5 900 | 06.27 | 23.17 | 6 | Большой | 21/97 | 70 | 12-24 | 17 | 15 | 15,4 | 108 | 623 |
| 22 | Кооперативные гаражи - к/т Аэлита | 10 000 | 9 100 | 06.30 | 23.40 | 10 | Средний | 27/56 | 72 | 7-14 | 19 | 18 | 16,7 | 180 | 322,6 |
| 25 | Юбилейная - ул. Пасечная | 2 500 | 2 500 | 07.00 | 22.22 | 2 | Средний | 27/56 | 20 | 10-20 | 6 | 6 | 15,0 | 120 | 268,8 |
| 28 | пер. Теневой - Новая Заря | 4 100 | 4 000 | 06.00 | 21.00 | 1 | Малый | 18 | 30 | 30-60 | 8 | 9 | 16,4 | 40 | 25,0 |
| 36 | Юбилейная - ул. Целинная | 4 600 | 6 600 | 06.00 | 22.00 | 2 | Средний | Средний | 30 | 15-30 | 10 | 12 | 18,4 | 80 | 40,4 |
| 39 | Макаренко, Лесная - Новая Заря | 5 700 | 5 700 | 06.41 | 23.10 | 6 | Малый | 18 | 40 | 7-14 | 12 | 12 | 17,1 | 192 | 162,0 |
| 44 | 4-я больница - ул. Дмитриевой | 6 900 | 5 900 | 06.00 | 23.00 | 5 | Средний | 27/56 | 55 | 11-22 | 14 | 13 | 15,1 | 120 | 224,0 |
| 44-к | Маг. "Патерсон" - ул. Дмитриевой | 3 100 | - | 07:00 | 23.18 | 4 | Малый | 18 | 30 | 8-16 | 7 | - | 12,4 | 160 | 126,5 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (кольцевой) | | | | | | | | | | | | | | |
| 46 | ул. Тимирязева, д/с № 110 - 4-я больница | 9 600 | 8 400 | 06.24 | 22.22 | 6 | Малый | 18 | 60 | 10-20 | 18 | 14 | 19,2 | 120 | 178,8 |
| 46-к | ул. Тимирязева, 34 - 4-я больница | 7 000 | 8 000 | 06.36 | 21.38 | 6 | Малый | 18 | 60 | 10-20 | 14 | 14 | 14,0 | 120 | 177,0 |
| 47-к | Ж/д вокзал Сочи - ТЦ "Олимп" | 3 600 | 4 200 | 07.00 | 22.00 | 4 | Малый | 18 | 40 | 10-20 | 5 | 5 | 10,8 | 80 | 86,4 |
| 50 | ул. Пирогова, 40/4 - ул. Клубничная | 3 300 | 3 300 | 06.20 | 23.14 | 4 | Малый | 18 | 20 | 5-10 | 5 | 5 | 19,8 | 240 | 214,0 |
| 56-к | Адлер, п. Блиново - Лазурная долина | 13 900 | 12 400 | 06.10 | 22.20 | 10 | Средний | 27/56 | 70 | 7-14 | 19 | 20 | 23,8 | 180 | 251,2 |
| 57 | пос. Мирный - Н. Имеретинская бухта - с. Некрасовка - с/х Россия | 5 000 | 5 000 | 06.05 | 22.00 | 2 | Малый | 18 | 30 | 15-30 | 6 | 6 | 20,0 | 80 | 72,0 |
| 83 | Мамайка, ул. Крымская - Ж/д вокзал Сочи | 8 700 | 9 000 | 05.45 | 24.00 | 15 | Малый | 18 | 60 | 4-8 | 17 | 17 | 18,0 | 0 | 300,0 |
| 86 | ул. Труда - мкр. Искра | 16 400 | 14 300 | 05.30 | 23.50 | 8 | Малый | 18 | 78 | 10-20 | 26 | 21 | 25,2 | 128 | 376,6 |
| 87 | ЗСМ - ул. Бытха | 15 200 | 14 500 | 06.30 | 23.00 | 14 | Малый | 18 | 100 | 6-12 | 16 | 16 | 18,2 | 168 | 206,0 |
| 90-к | ул. Бытха, 46 - Цирк | 3 000 | 3 100 | 07.00 | 23.00 | 3 | Малый | 18 | 25 | 8-16 | 5 | 7 | 14,4 | 156 | 135,0 |
| 94 | Институт цветоводства - ул. | 12 300 | 12 000 | 06.30 | 22.55 | 12 | Малый | 18 | 55 | 5-10 | 18 | 23 | 26,8 | 264 | 236,8 |

| | | | | | | | | | | | | | | | |
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| | *Донская - школа № 4* | | | | | | | | | | | | | | |
| *95* | *ул. Вишневая, 27 - ул. Бытха* | *12 500* | *11 300* | *05.35* | *23.30* | *15* | *Малый* | *18* | *80* | *5-10* | *24* | *24* | *18,8* | *240* | *225,4* |
| *133* | *Казачий рынок - Обез. питомник - с. Примерное* | *11 800* | *13 400* | *06.20* | *22.10* | *6* | *Средний* | *27/56* | *70* | *12-24* | *10* | *10* | *20,2* | *108* | *90,5* |
| | ***Лазаревский район*** | | | | | | | | | | | | | | |
| *67* | *ВИЗР - Кольцевая* | *6400* | *6400* | *06.40* | *20.35* | *2* | *Средний* | *27/56* | *44* | *30* | *14* | *14* | | *44* | |
| *68* | *ТВС - в/с Янтарь* | *8700* | *8700* | *06.25* | *20.20* | *2* | *Средний* | *27/56* | *50* | *30* | *16* | *16* | | *44* | |
| *69* | *Казачий Хутор - ул. Свирская* | *5400* | *5400* | *06.25* | *21.50* | *3* | *Средний* | *27/56* | *50* | *30* | *14* | *14* | | *64* | |
| *70* | *Казачий Хутор - кафе Минутка* | *5900* | *5900* | *06.40* | *21.40* | *2* | *Средний* | *27/56* | *54* | *30* | *15* | *15* | | *44* | |
| *119* | *Сочи, автовокзал - с. Васильевка* | *17 000* | *17 000* | *06.30* | *20.50* | *1* | *Средний* | *27/56* | *105* | *135-210* | | | | *11* | *23,9* |
| *141* | *Сочи, автовокзал - п. Головинка* | *47 700* | *47 700* | *05.20* | *23.50* | *15* | *Средний* | *27/56* | *210* | *10-15* | *32* | *31* | | *120* | *102,2* |
| *143* | *п. Дагомыс - с. Красная гора* | *10 250* | *10 250* | *05.45* | *21.59* | *1* | *Средний* | *27/56* | *60* | *60-215* | | | | *20* | *22,8* |
| *144* | *п. Дагомыс - с. Разбитый котел* | *12 500* | *12 500* | *06.30* | *21.20* | *1* | *Средний* | *27/56* | *65* | *70-180* | | | | *16* | *30,4* |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 145 | п. Дагомыс - п. Солох-аул | 30 000 | 30 000 | 06.00 | 22.58 | 2 | Средний | 27/56 | 118 | 85-195 | | | | 16 | 36,9 |
| 146 | п. Дагомыс - 3-я рота | 13 000 | 13 000 | 05.40 | 21.15 | 1 | Средний | 27/56 | 60 | 40-137 | | | | 28 | 39,8 |
| 147 | п. Дагомыс - с. Барановка | 9 750 | 9 750 | 05.45 | 21.55 | 1 | Средний | 27/56 | 45 | 50-95 | | | | 30 | 61,1 |
| 148 | п. Головинка - п. Лоо - п. ВерхнееЛоо | 13 500 | 13 500 | 05.10 | 22.35 | 2 | Средний | 27/56 | 40/95 | 50-165 | 32 | 32 | | 44 | 70,8 |
| 149 | п. Головинка - п. Лоо - п. ВерхнееБуу | 18 300 | 18 300 | 05.15 | 21.05 | 1 | Средний | 27/56 | 65 | 65-180 | 25 | 25 | | 22 | 31,8 |
| 150 | п. Головинка - п. Верхняя Беранда | 18 000 | 18 000 | 05.00 | 20.05 | 1 | Средний | 27/56 | 85 | 85-220 | 30 | 30 | | 20 | 33,8 |
| 151 | п. Головинка - п. Горный воздух - п. В. Хобза | 11 300 | 11 300 | 04.50 | 22.20 | 1 | Средний | 27/56 | 50 | 60-130 | 31 | 31 | | 22 | 38,7 |
| 152 | Сочи, Автовокзал - п. Разбитый котёл | 17 550 | 17 550 | 06.10 | 20.35 | 1 | Средний | 27/56 | 102 | 125-220 | | | | 11 | 60,0 |
| 153 | Сочи, Автовокзал - п. Дагомыс | 14 400 | 14 400 | 05.35 | 23.30 | 7 | Средний | 27/56 | 110 | 5-91 | 14 | 14 | | 89 | |
| 154 | Сочи, Автовокзал - п. Солох-Аул | 45 200 | 45 200 | 05.10 | 21.03 | 2 | Средний | 27/56 | 213 | 275-635 | | | | 6 | 24,6 |
| 155 | п. Лоо - п. Лазаревское | 72 550 | 72 550 | 05.20 | 23.00 | 34 | Средний | 27/56 | 300 | 5-88 | 39 | 39 | | 29 | 301,4 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 155-к | Сочи, Автовокзал - п. Лоо | 27 200 | 27 200 | 06.15 | 00.13 | | | | 180 | 5-15 | 26 | 21 | | 314 | 496,0 |
| 156 | Лазаревское - Татьяновка | 13700 | 13700 | 05.50 | 20.20 | 1 | Средний | 27/56 | 65 | 95-310 | 16 | 16 | | 12 | |
| 157 | Лазаревское - аул - Тхагапш - Марьино | 19600 | 28200 | 05.40 | 20.40 | 1 | Средний | 27/56 | 105 | 110-150 | 20 | 20 | | 10 | |
| 158 | БольшойКичмай (Головинка) - Лазаревское | 32000 | 32000 | 05.20 | 21.45 | 3 | Средний | 27/56 | 140 | 60-145 | 29 | 29 | | 30 | |
| 159 | Лазаревское - аул Калеж | 23000 | 23000 | 06.30 | 20.45 | 2 | Средний | 27/56 | 110 | 60-170 | 20 | 20 | | 16 | |
| 160 | Лазаревское - Магри | 26300 | 26300 | 05.20 | 22.25 | 6 | Средний | 27/56 | 130 | 25-45 | 28 | 28 | | 48 | |
| 161 | Лазаревское - аул Наджиго | 24700 | 24700 | 06.10 | 20.35 | 2 | Средний | 27/56 | 130 | 55-190 | 24 | 24 | | 16 | |
| 162 | Лазаревское - ВерхняяМамедка | 7500 | 7500 | 06.25 | 19.40 | 1 | Средний | 27/56 | 50 | 70-225 | 14 | 14 | | 12 | |
| 163 | Лазаревское - Тихоновка | 10700 | 10700 | 06.10 | 20.00 | 1 | Средний | 27/56 | 60 | 70-300 | 16 | 16 | | 12 | |
| 164 | Лазаревское - Новые дома | 7400 | 7400 | 05.50 | 19.45 | 1 | Средний | 27/56 | 50 | 60-145 | 9 | 9 | | 18 | |
| 165 | Лазаревское - Мирный | 7700 | 7700 | 06.40 | 18.55 | 1 | Средний | 27/56 | 40 | 50-250 | 9 | 9 | | 12 | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *166* | *Лазаревское - Госсортучасток* | *11750* | *11750* | *06.00* | *20.05* | *1* | *Средний* | *27/56* | *60* | *70-170* | *13* | *13* | | *34* | |
| *169* | *Сочи, автовокзал - с. Варваровка* | *24 500* | *24 500* | *06.00* | *20.55* | *1* | *Средний* | *27/56* | *124* | *125-255* | | | | *10* | *22,0* |
| *170* | *Лазаревское - Малый Кичмай* | *34600* | *34600* | *06.35* | *20.15* | *1* | *Средний* | *27/56* | *160* | *190-360* | *29* | *29* | | *8* | |
| *181* | *п. В. Лоо - п. Дагомыс* | *19 100* | *24 500* | *06.20* | *21.00* | *2* | *Средний* | *27/56* | *95* | *48* | | | | *20* | *10,0* |
| *182* | *Лазаревское - м/н "Череповецкий"* | *34200* | *34200* | *06.00* | *19.25* | *1* | *Средний* | *27/56* | *140* | *185-300* | *31* | *31* | | *8* | |
| | | | | | | | | | | | | | | | |
| ***Все го*** | ***110 маршрутов*** | | | | | ***568*** | | | | | | | | | |
| | | | | | *Малый* | *118* | | | | | | | | | |
| | | | | | *Средний* | *253* | | | | | | | | | |
| | | | | | *Больш ой* | *182* | | | | | | | | | |

***Developer:***

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***In cooperation with:***

*Spatial Management Consulting Ltd*

*The **Traffic Flow Survey 2009** whose results are the basis for chapter 3.13 and 3.14 was conducted in cooperation with: M(os)RDIT&RD, ITS Center, CENIT and the University of Rostov.*

*July 30th, 2012 – Masterconcept Consulting GmbH*