City of Skopje

PROJECT APPRAISAL DOCUMENT

Reconstruction and rehabilitation of Boris Trajkovski street from Staklara factory to Pintija settlement

May 2015

I. PROJECT DESCRIPTION

A. GENERAL INFORMATION ON THE MUNICIPALITY CITY OF SKOPJE

1. Location map

2. General information

Area: 1,818 km^2 / 23 km length and 9 km width
Latitude: 42°00’ north
Longitude: 21°26’ east
Elevation: 245 meters
Average temperature: 13.5°C / 56°F

B. DEMOGRAPHIC AND ECONOMIC PROFILE

1. Demography of the City of Skopje

Table 1: Inhabitants, households, apartments in Skopje

Municipality	Inhabitants	Households	Apartments
Aerodrom	72,009	21,495	23,754
Butel	36,154	10,056	11,077
Gazi Baba	72,617	20,336	22,815
Gjorche Petrov	41,634	11,886	13,938
Karposh	59,666	19,680	22,849
Kisela Voda	57,236	17,577	20,237
Saraj	35,408	7,972	7,837
Centar	45,412	15,355	18,848
Chair	64,773	17,107	17,127
Shuto Orizari	22,017	5,102	5,263
City of Skopje	506,926	146,566	163,745

Source: 2002 Census, according to the administrative-territorial organization from 2004

Table 2: Total inhabitants in Skopje according to five years groups

Municipality	Total	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44
Skopje	506926	30097	32788	35942	38117	40111	39973	38700	36900	35361
Aerodrom	72009	3393	3458	4198	5668	6704	6091	5131	4705	5017
Butel	36514	2239	2557	2639	2740	3029	2844	2759	2659	2563
G.Baba	72617	4582	4913	5141	5280	5742	6090	5560	5240	4989
G.Petrov	41634	2248	2484	2869	3189	3109	3213	3075	2956	3192
Karposh	59666	2837	3142	3550	3760	3657	4030	4741	4671	4228
K.Voda	57236	2843	3361	3794	3886	4008	3933	4294	4440	4264
Saraj	35408	3317	3453	3737	3291	3269	3241	3023	2729	2216
Centar	45412	1677	1890	2476	3196	3463	3188	2810	2774	2997
Chair	64773	4812	5334	5320	5065	5072	5487	5644	5099	4322
S.Orizari	22017	2149	2169	2218	2042	2058	1856	1663	1591	1573
Municipality	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	Unknown age
Skopje	37152	37044	27497	24283	21500	14906	9906	4484	1916	249
Aerodrom	6462	7452	4586	3256	2489	1553	1115	485	190	29
Butel	2654	2576	1825	1669	1499	961	565	227	98	15
G.Baba	5226	5300	4077	3707	3190	1788	1071	443	239	39
G.Petrov	3410	3207	2389	2096	1724	1194	738	357	165	19
Karposh	4406	4328	3595	3674	3632	2672	1713	741	269	20
K.Voda	4324	4114	3288	3319	3000	2083	1379	636	253	17
Saraj	1768	1365	1045	945	818	577	296	163	133	22
Centar	3684	4256	2865	2211	2337	2215	2026	993	326	28
Chair	3863	3450	3104	2793	2338	1555	886	376	211	42
Sh.Orizari	1355	996	723	613	473	308	117	63	32	18

Source: 2002 Census

Table 3: Ethnic structure of the City of Skopje

Nationality	Population	Share (%)
Macedonians	338358	66.7
Albanians	103891	20.5
Turks	8595	1.7
Roma	23475	4.6
Vlachs	2557	0.5
Serbs	14298	2.8
Bosniacs	7585	1.5
Other	8167	1.6
TOTAL:	**506926**	**100**

Source: 2002 Census

Table 4: Ethnic structure of Shuto Orizari municipality

Nationality	Population	Share (%)
Macedonians	1438	6.5
Albanians	6675	30.3
Turks	56	0.3
Roma	13342	60.6
Vlachs	--	--
Serbs	67	0.3
Bosniacs	177	0.8
Other	262	1.2
TOTAL:	**22017**	**100**

Source: 2002 Census

Table 5: Education of the population over 10 years old by gender

Municipality	TOTAL		MALE		FEMALE	
	Educated	Non-educated	Educated	Non-educated	Educated	Non-educated
Skopje	433139	10902	215256	2143	217883	8759
Aerodrom	64656	475	31688	86	32968	389
Butel	30672	686	15477	129	15195	557

G.Baba	61156	1966	31137	385	30019	1581
G.Petrov	36308	594	18175	103	18133	491
Karposh	53002	685	25222	181	27780	504
K.Voda	50326	706	24730	146	25596	560
Saraj	27394	1244	14216	291	13178	953
Centar	41494	351	19423	65	22071	286
Chair	52241	2386	26692	396	25549	1990
Sh.Orizari	15890	1809	8496	361	7394	1448

Source: 2002 Census

a) Employment of the total inhabitants over 15 years old

Table 6: Employment of the total inhabitants over 15 years old

Municipality	TOTAL	Economically active			Economically not active
		All	Employed	Unemployed	
Skopje	406392	200937	143745	57192	205455
Aerodrom	60743	35448	28310	7174	25259
Butel	28632	13821	9824	3997	14811
G.Baba	57716	29326	19766	9560	28390
G.Petrov	33936	18584	13586	4998	15352
Karposh	49996	26212	21784	4428	23784
K.Voda	47104	25068	18582	6486	22036
Saraj	24487	7661	2891	4770	16826
Centar	39209	19967	16662	3305	19242
Chair	49099	19179	10433	8746	2990
Sh.Orizari	15470	5635	1907	3728	9835

Source: 2002 Census

According to the last Census data of 2002 there were 57,192 unemployed persons in Skopje. For the last 12 years this number was falling and in the end of April 2014 it was 17,034 only (Employment Agency data).

2. Density and housing

The population density varies in different urban areas of the City. The average density is 146 inhabitants/ha, but in the central city area it is up to 455 inhabitants/ha.

35% of the City is covered with housing. Significant areas of residential zones and complexes (built according to urban settings and standards) have a satisfactory level of infrastructure equipment, system of public functions and recreational areas. But there are also neighborhoods where there is neither appropriate infrastructure nor public functions in the housing area (characteristic of Topaana, Yaya Pasha, Shuto Orizari, etc.). A special problem of the City are the illegally built structures with buildings built on plots having different shapes and sizes, often unorganized, with uncompleted or poorly organized communal infrastructure.

3. Commercial facilities

Commercial facilities in Skopje occupy a total area of 1,373.17ha. Participation of the industry is dominant. There are four industrial zones set up in the City: Northeast part (zone

of non-ferrous metallurgy), Eastern part (zone of mechanical, automobile, pharmaceutical, leather industry, the industry for the production of beer), Southeast part (zone of electrical engineering, tobacco and chemical industry) and Western part (zone of chemical, lumber, construction metal industry and ferrous metallurgy). The total area of industrial buildings in the City covers 54.4% or 748.26ha.

This project is located in the municipality Kisela Voda that is one of the largest industrial zones in the City of Skopje. The numbers of economic entities by industries operating in the territory of the municipality are: 1.910 involved in production; 908 in construction; 490 in hotels and restaurants; 1492 economic entities involved in transport; 24 in finance; 1,092 in real estate; 26 involved in public administration and 868 in communications. The most important industries in the municipality are the chemical industry, transport and shipping, construction, food industry and production of soft drinks, commercial and service activity.

4. Transport and energy

Skopje is a major traffic junction where road, railway and air traffic intersect. The length of the planned road network in the City is 267.92 km (according to the GUPs of 2002). Public passenger transport is organized as distant, suburban and urban, and taxi passenger transport. Primary transport mean is the bus. The network includes 29 City and 26 suburban lines.

Energy infrastructure in Skopje includes electricity, heat and gas line infrastructure. Skopje is supplied with electricity from the power system of the Republic of Macedonia, connected through four primary substations. Thermal energy is obtained from the City central heating system (three thermal plants, three boiler room facilities, adequate central heating network with total length of 170km and more than 2350 reduction stations). Gas pipeline system consists of the main pipeline with total length of 98km and city gas pipeline network of 19.71km. To the natural gas system that is not completely built 13 customers are connected.

5. Green areas

The green and the other open areas are planned and implemented as a system of parks, squares, housing and linear greenery. The achieved standard in Skopje is by 16m^2/capita. The total green area is 667.9ha or 8.7% of the total area of the city and it is distributed as a public greenery (housing greenery - 276.7ha; area parks - 3.38ha; city parks - 54.82ha; children's playgrounds - 0.75ha; central amusement park - 2.97ha and sports fields - 17.47ha); foliage with limited use - 144.98ha and protected greenery - 166.83ha. The suburb green forest park (4573ha) consists of the forest park Zajchev Rid (7ha) the Monument to Nature, the Canyon Matka (5.442ha) and greenery in the suburban recreation centers.

C. GENERAL DESCRIPTION OF THE PROJECT

1. General description

The City Sustainable Development Study defines the strategic objectives for the development of urban transport system in the city as a contribution to sustainable environmental protection by minimizing the harmful emissions, noise and climate change and energy efficiency as well, contributing to economic development through enabling mobility and access to all parts of the city.

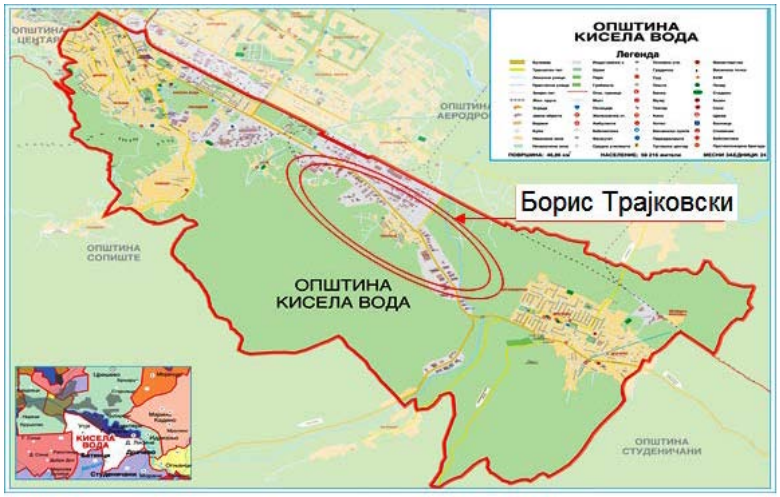
Based on the recommendations of the EU to implement the strategy on sustainable development in many sectors of human activity, and using the experience of developed European countries, the City of Skopje transport policy objectives and measures have been

planned and implemented in accordance with the economic, financial, environmental and social sustainability.

The rehabilitation and reconstruction of the street Boris Trajkovski was planned to be realized in four sections. The first section from Boulevard 11 Oktomvri (Stara rampa) to the Street “Narodni heroi” (1380m), the second from Boulevard Srbija to entrance of Staklara factory (1126m) , the third from entrance of Staklara factory to the Pintija settlement (the subject of this project) and the last from Pintija settlement until crossroad Dracevo - Markov Monastery. The first and second sections were realized in 2012-2013 with EBRD loan.

The Boulevard Boris Trajkovski with its service roads is the only road connecting the eastern parts of the city right from the river Vardar municipalities of Kisela Voda, Studenichani, Sopishte and Zelenikovo with the downtown area. Given its functional importance, Boulevard Boris Trajkovski is an important city artery categorized as Collector Street.

Figure 1: The location of Boris Trajkovski Street



The project on reconstruction of the Boris Trajkovski Street assumes the following activities:

Phase Street reconstruction: the newly-designed alignment for reconstruction of the Boris Trajkovski Street is within the frames of the General Urban Plan, whereas on certain crossroads, interventions have been made on the radii, that is, the existing crossroads have been expanded as envisaged with the Preliminary Traffic Design. The Boris Trajkovski street will be 13.75m width, or two lanes in one direction on the right in the direction of chainage in two lanes with a total width of 7m, and the left side by two lanes with a total width of 6.75m. With pedestrian line on the left side with the width of 1.5m, walkway on the right with a width of 2m and a two direction bicycle path from a left side with the width of 2.75m. Total width of the road is 20m. Roadway construction will consist of: asphalt concrete (AB16c d=6cm), bituminous bearing layer (BNS 22cA are d=6cm), bituminous bearing layer (BNS 32cA d=7cm) layer of crushed stone material (d=35cm), improved bed (material laboratory CBR≥ 20%), d=20cm.

Phase Hydraulic: newly planned storm drainage collector should accept partial drainage and urban areas on the right side of the street going to Drachevo. The alignment of storm drainage collector generally runs on the sidewalk of the street left going to Drachevo. Part of the route of the collector, from the lowest point to the outlet in the existing channel, passes through the urban area of the factory OHIS. The total length of the collector is L=2,284.31m. Field

conditions require keeping the level of the collector to the lowest point forming two branches as follows: the first part in length L1=524.89m and second one in length L2=1,542.96m.

From this point which accepts all storm water and drainage from urban areas on the right side of the street Boris Trajkovski will build a collector – part 3 foot length L3=216.46m, which will connect and discharge water in the existing sewage drainage channel in OHIS.

Phase Electricity: includes setting new street lighting and removal of the existing 10 wooden poles and 60 lamp posts. Project and construction works will be implemented according to the national standards or relevant EN and IEC standards for those parts where there are no national standards. The street light pools that will be installed are steel, hot galvanized, with height of H=8m located within a distance of 35m.

The light pool is placed on a concrete foundation with appropriate dimensions along with an anchor and anchor screws cast with hot bitumen. The foundation, that is, the foundation slab is at the level of the asphalt height. At the pole, at height of 1.7 meters from the base, there is an opening with a plate (terminal box) for the fuse and four terminal strips for the cables. The terminal box contains connection terminal strips for direct connection of two conductors with cross-section of 35mm^2 (entrance-exit of low voltage cable). In addition, there is a part for connection of the terminal box with the light due to the fact that the supply cable is of aluminum and has a significantly bigger cross-section than the cable from the terminal box to the light. The pole has an earthing nut at the height of the terrain of about 20cm. As installation, the light poles have a terminal box of the M3 type with fuse holders with cylindrical fuse-link washers with nominal current of 6A. The protective conductor of the current connection between the terminal plate and light shall have to be connected to the earthing nut on one side that is to the pole, at the terminal plate, on the other side.

Traffic Signalization Phase: Traffic signalization (procurement, transport and mounting for all items) will be realized according to adopted and approved traffic project with technical number 134/14.

Replacement of Installations: The work contains all things to complete dislocation of existing installations, such as: electricity cables, high and low voltage cables and phone lines. Full dislocation means the dismantling of existing installations and their move with all the things that are necessary to restore the full functionality of the related installation, i.e. the description of the activities content in the project for dislocation, and the instructions of the supervisory authority. The work includes the collection of all necessary documents and approvals from the relevant institutions or users of installations. Dislocation of existing installations is done carefully and observing all necessary technical measures for the installation and for the people who perform the dislocation. Control and security especially in power lines must be fully secured. Dismantled materials stored carefully for possible re-using. After dismantling existing installations it approaches into performance for dislocation. This work contains all the necessary things and materials to perform the dislocation and to re-establish the functioning of the corresponding installation. The way the works contractor determines, in accordance with the project for dislocation and instructions of the supervisory authority.

2. Mobility in Skopje

a) General description of the current situation

The quality of transport planning depends, to a large extent, on the quality of data and the actual information on the existing situation, as well as on the vision and strategic approach to the realization of the clearly defined objectives of the transport policy. Future transport

requirements should be in function of the designed demographic, urban, economic and social conditions within which the city shall develop in future.

The analysis of the existing situation of the transport and transport infrastructure is based on the existing planning and project documentation, and in particular on the study for transport planning of the City of Skopje prepared by the Spanish consulting company IDOM in 2010, relevant data from the State Statistical Office, the Ministry of Internal Affairs, AD Macedonian Railways and from the City of Skopje.

The number of registered motor vehicles in the Skopje region is continuously growing from 98.1 thousand in 1990 to 149.3 thousand motor vehicles in 2013.

Table 7: Number of registered motor vehicles in the Skopje region

Year	Motorcycles	Passenger cars (PC)	Buses	Freight and attached vehicles	Total
1990	412	88,899	905	7,927	98,143
1995	890	107,805	1,084	10,838	120,617
2000	1,673	116,194	1,080	11,982	130,929
2002	1,388	119,139	1,047	12,581	134,155
2009	3,804	121,880	862	13,399	139,945
2013	3,311	128,788	1,018	16,272	149,389

Source: State Statistics Office (Statistical Review – Transport and other services 2013)

The motorizing level in the Skopje region, expressed as a number of passenger cars per 1000 inhabitants was equal to 168 in 1991 and increased to 206 in 2002. The average growth of the number of motor vehicles from 2006 to 2010 in the Skopje region is 7.8% per year and has an almost linear tendency.

The forecast of the motorizing level envisaged in the General Urban Plan of the City of Skopje is presented below.

Table 8: Forecast of the motorizing level in the Skopje region from 2010 to 2030

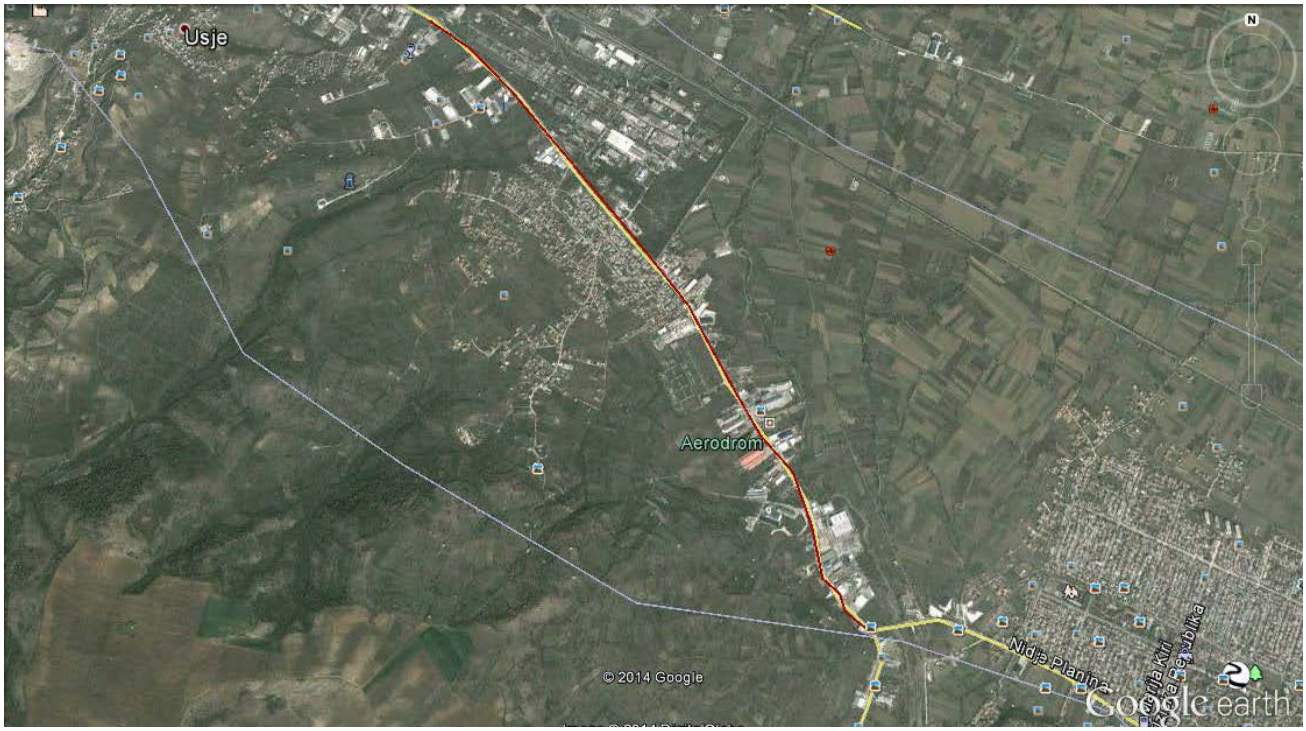
Year	Population forecast	Forecast of registered passenger cars	Forecast of the motorizing level (passenger cars/1000 inhabitants)
2015	621631	154536	249
2020	639233	170508	267
2025	657333	187425	285
2030	675946	205240	304

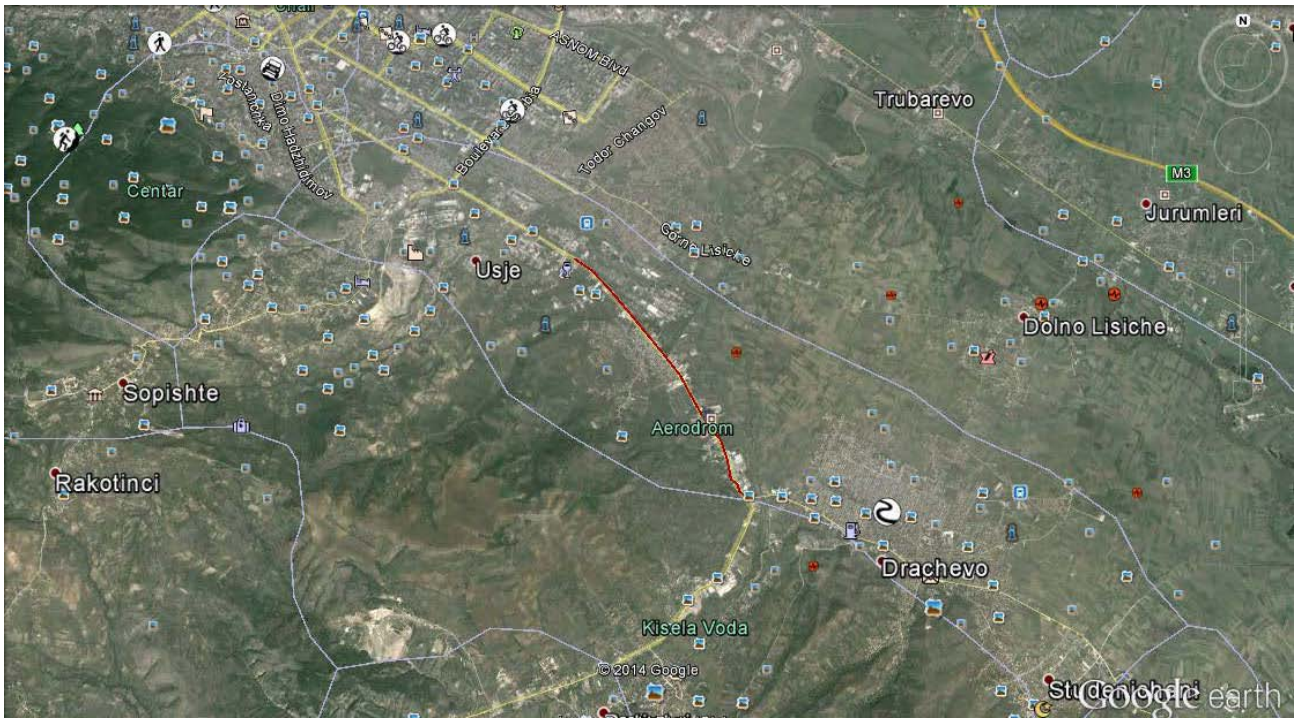
Source: own calculations based on State Statistical Office data

b) Existing situation on the Boris Trajkovski Street from the Staklara factory to the Pintija settlement

The Boris Trajkovski Street is located in the Kisela Voda municipality, to the southeast from the city centre. It is a collector street that connects the industrial zone and the inhabited places to the east of the City of Skopje, with the central city area and beyond.

The photos below provide satellite images (macro- and micro-location), of the wider and the more narrow area around the Boris Trajkovski Street and the position of this street against the centre of the City of Skopje.





As regards the surrounding facilities, the Boris Trajkovski Street borders with:

- to the West, the Staklara factory intersection;
- to the East, the Markova river bridge;
- to the North, residential buildings and individual houses, and
- to the South, residential buildings and individual houses.

In order obtain the actual picture on the needs for reconstruction and expanding of the Boris Trajkovski Street, from the entrance to the Staklara factory to the crossroads in the Pintija settlement, an analysis was performed of the existing situation, and especially of the transport network, within which the rather high traffic level was taken into consideration, in terms of both its intensity and structure.

The existing road on the direction Staklara – Pintija settlement has been in use for more than 30 years; the same is with width of about 7 meters, and is an asphalt pavement construction with damages of the type of pot holes, multiple repairs on various places, transverse and longitudinal cracks, as well as patches of the existing pavement construction.

In addition, the part relating to drainage of the existing alignment is in a rather poor state, that is, due to the significant damages and deflections of the asphalt construction, the water is not drained at multiple instances that has an impact on the transport safety.

Figure 2: Current situation of the Boris Trajkovski Street

The project on expansion and reconstruction of boulevard Boris Trajkovski is one of the biggest projects of the City of Skopje and is realized in a few phases. The first phase of reconstruction of the street previous named Prvomajska, and with current name Boris Trajkovski, was realized by using the loan of the European Bank for Reconstruction and Development, the first section from Boulevard 11 Oktomvri (Stara rampa), to the Street Narodni heroi and the second from the junction with Boulevard Serbia to entrance in the former factory Staklara. The Contract was signed in November 2011. The implementation of the reconstruction was realized in the period 2012-2013.

In October 2012 was opened the first section of the extended boulevard Boris Trajkovski, which was built on the section from "Rampa" to the crossroad with street Narodni heroi in length of 1380 meters. In May 2013 the second part of the boulevard Boris Trajkovski, the section from the junction with Boulevard Serbia to entrance in the former factory Staklara received a new shape. With the expansion of this part, the boulevard got 4 lanes, two in each direction, 2 junctions; on the right side of the road is built sidewalk covered with tiles, with a width of 2 meters, and the sidewalk with cycling track, width of 4 meters. Inserted sewer length of 1126 meters with variable profile from U500 to U800mm, the Usjanski bridge over canal was reconstructed, which he got 4 lanes with pedestrian and bicycle path. On both sides of the widened section 64 poles for street lighting were set.

3. Skopje street network

Each road has specific characteristics, which pertain to the great number of roles it has in the daily rhythm of activities. According to its position in the network, length, surrounding area, it should provide for the realization of several activities and create the capacity for a particular traffic volume.

Street network according to the hierarchical classification function comprises primary and secondary street network. The primary road network which is under the authority of the City of Skopje consists of main (trunk) and collector streets. At the moment, there are 28 trunk streets with length of above 100km and 77 collector streets. The secondary street network is under the responsibility of the municipalities.

According the Law of the City of Skopje (Official Gazette of RM No. 55/04) the construction, using, protection and maintenance of trunk and collector streets and other infrastructural facilities, maintaining the greenery at the trunk and collector streets, placement, protection, removal and maintenance of the traffic signs and protection equipment at the local streets and roads are upon the responsibility of the City of Skopje. Upon the municipalities responsibility is construction, maintenance, reconstruction and protection of service and residential streets and other infrastructural facilities as a secondary street network.

All this responsibilities of the City of Skopje for trunk and collector streets are passed to the CSE "Ulici i Patista". The relationship between the City of Skopje and CSE "Ulici i Patista" are regulated with contract. The range of activities is regulated in the Annual Programs on construction and maintenance of trunk and collector streets.

According to this categorization, the Boris Trajkovski Street is a collector street representing a connection element between the primary and secondary city road network. Collector streets collect the traffic from the secondary street network and vice-versa: distribute the traffic from the primary street network in the secondary street network. The task of the collector street is to distribute the target and source traffic within the frames of the compact urban zone. Terminals for surface types of public city transport and bicycles and pedestrians transport are organized on this type of streets.

4. Maintenance of the Skopje street network

City of Skopje is the founder of the CSE "Ulici i patista". CSE operates since 1958 and from 1992 operates as communal enterprise with a separate budget. CSE is controlled by the City of Skopje, specifically by the traffic department. The management body of the public company is the Management Board and the Supervisory Board for the financial control of operations established with a decision of the Council of the City of Skopje. The City Council approves the CSE Annual Work Program and Annual Operational Reports. City of Skopje and CSE "Ulici i patista" annually sign contracts for maintenance of Skopje's streets.

CSE "Ulici i patista" has an objective to provide the citizens with safe transport in both winter and summer conditions, with professional, quality and efficient maintenance of the streets in the City of Skopje. Within its responsibilities, CSE "Ulici i patista" performs the following activities:

- Construction, reconstruction and maintenance of streets, roads and other bicycle and pedestrian paths;

- Construction of the carriageway construction of streets, roads, overpasses, etc.

- Construction of sidewalks;

- Marking of roads and other markings;

- Installation of safety barriers, traffic signs, etc.

- Construction of airport runways;

- Maintenance of traffic signalization;

- Maintenance of streets and roads in winter conditions.

For the last three years the CSE operates with profits. Majority of revenues are received as transfer from the City of Skopje (about 90%). Transfers are divided into 5 categories: summer maintenance, winter maintenance, horizontal and vertical signalization, light signalization, other activities (including construction). Development of those transfers in time is presented below. The final report for 2014 has not been adopted yet by the managing board of the CSE and by the municipal Council, therefore the results for this year are preliminary. In 2011-2014 the average value of transfers from the City of Skopje to the CSE "Ulici i patista" was equal to EUR 3.3 million.

Table 9: Financial results of CSE "Ulici i patista" operations (MKD)

	2011	2012	2013	2014
Revenues	**232,119,904**	**259,200,417**	**227,907,020**	**230,979,047**
-City of Skopje	199,434,736	216,003,294	204,688,260	201,346,382
-regular summer maintenance	68,155,072	62,449,596.5	47,557,720	
-regular winter maintenance	18,368,206	27,872,591	25,768,458	
-horizontal and vertical signalization	19,914,437	17,212,858	15,127,769	
-light signalization	19,755,848	22,004,945	21,039,401	
-other (construction etc.)	73,241,173	86,463,303.5	95,194,912	
-municipalities	13,200	0	0	0
-other investors	8,108,179	27,477,674	15,917,226	22,977,714
-other revenues	24,563,789	15,719,449	7,301,534	6,654,951
Expenditures	**218,924,728**	**217,388,473**	**224,387,916**	**211,690,047**
-material	111,460,754	113,221,196	100,785,387	97,870,654
-non material	15,679,370.5	9,518,868	4,283,043	4,872,019
-wages	76,109,559	79,090,446	84,162,925	85,670,770
-interests	3,232,504	5,266,552	3,545,292	1,651,298
-other	12,442,540.5	10,291,411	31,611,269	21,625,306
Profit before taxation	**13,195,176**	**41,811,944**	**3,519,104**	**19,289,000**
Tax	688,089	637,832	1,278,274	
Profit after taxation	**12,507,087**	**41,174,112**	**2,240,830**	
Number of employees	217	218	227	

Source: CSE "Ulici i patista", annual implementation reports 2012, 2013. Data for 2014 are preliminary.

Besides transferring funds through CSE, the City of Skopje is investing itself. In 2013 it reconstructed and extended over 7km of streets and boulevards, including widening and reconstruction of the third part of Boulevard Ilinden, second section of Boulevard Boris Trajkovski (from Boulevard Srbija to the entrance to the factory Staklara), the roundabout on streets Lazo Trpovski and Vtora Makedonska Brigada and widening of the Treta Makedonska

Brigada Street. The total value of those investments was about MKD 348,000,000 (EUR 5,658,536).

In 2014 the City of Skopje reconstructed and extended over 6km of streets and boulevards including: expanding and reconstruction of the first section of the street Treta Makedonska Brigada, which was turned into a wide boulevard, expanding the third part of Boulevard Mitropolit Theodosij Gologanov, expanding street Jordan Mijalkov, construction of the roundabout on Boulevard Partisanski odredi, the Gate Vlae, widening on crossroad at the Faculty of Forestry, reconstruction of lanes on bus stops. The total value of those investments was about MKD 350,000,000 (EUR 5,691,057).

5. Strategic goals

The reconstruction and expansion of the Boris Trajkovski Street from the entrance of the Staklara factory to the crossroads in the Pintija settlement represents part of the Program for planning of building land of the City of Skopje for 2015 and Program for building land of Kisela Voda for 2015 that are harmonized with the General Urban Plan of the City of Skopje 2012-2022. The realization of the plan for reconstruction and rehabilitation of the street is expected to increase the traffic flow and to improve the function of the primary network of the city's traffic, whereas the construction of the storm drainage collector and the street lighting installation is expected to improve the overall infrastructure in the Kisela Voda municipality.

The general objective for construction of such primary road with part of infrastructure systems along it, is to generate positive impulses and effects on the overall environment, on one side in the part relating to infrastructure equipping and organization of the space in the inhabited area, and the economic effects on the other side, which shall be demonstrated through the attracting of investments and new employment.

The main objective of the project is implementation of a sustainable, environmentally clean and energy-efficient urban transport system, which shall increase the quality of life of the citizens by reducing the environment pollution, reduction of the transport costs and energy consumption, increase in safety and accessibility of the transport systems to all categories of citizens.

The following objectives are set:

- Reduction of the traffic congestion through expanding of the street profile, that is, through increase in the number of traffic lanes;
- Increase in the capacity of the transport vehicles;
- Increase in the transport safety;
- Contribution for both the municipality and the city for development in the part relating to local economic development;
- Reduction of the pollution and greenhouse gas emissions;
- Improvement in the communal infrastructure.

II. SOCIAL IMPACT

A. SOCIOLOGICAL STUDY

1. Methodology

The social assessment anticipated field research in order to get available information on interests and attitudes of the population and stakeholders. The weakness of this approach lies in its indirectness as only the sample is questioned. More precisely, the indirect way of getting information on this issue, plus possibility of subjective approach decreases the level of accuracy of the public opinion in this respect.

2. Social diversity and gender

In the City of Skopje people are organized into various social groups based on status ascribed to them at birth, according to their ethnicity, gender, locality, language, etc. In this research we shall present statistical data that are of special importance for this particular social assessment. From the information presented in chapter I one can conclude:

- The age groups are almost regularly distributed: it means in the City of Skopje there are almost equal portion of age group represented in the total population;
- There is equal representation of male and female in the total population of about 50%;
- In relation to their ethnic affiliation, the prevailing population in the City of Skopje is Macedonian then Albanians, Roma, Serbs, Turks, Bosniacs and Vlachs;
- Each of the above ethnicities speaks its own languages in the informal communication. The officially used languages in Skopje are Macedonian and Albanian.

3. Institutions, rules and behavior

The reconstruction and rehabilitation of the second phase of the Boris Trajkovski Street shall provide for approaching the objective, which pertains to the transport safety increase, encouraging the local economic development and reduction of pollution along the alignment. The expansion of the part from Staklara factory to the Pintija settlement, improvement of the communal infrastructure through construction of a new storm water, sewerage and street lighting shall enable facilitated movement of the citizens from the City centre to the inhabited places and vice-versa along the alignment, and with that, reduction of costs due to the reduction of the traffic congestion, whereas due to the fact that there shall be no expenses for pot filling, the budget of the City of Skopje shall be relaxed.

The following regulations apply to this project:

- Law on the City of Skopje;
- Law on Local Self-Government;
- Law on Construction;
- Law on Public Roads, other norms and technical manuals.

4. Stakeholders

There are several important stakeholders in this project.

The most influential participants in the process of decision making at the municipal level are the mayor and political parties. The influential stakeholder in this municipality is the business sector, more precisely some of the businessmen. The nongovernmental organizations (NGOs)

are influential to some extent, but not as much as the former. Citizens, as an organized group of stakeholders, do not articulate their opinion directly to the council and mayor, but through the political parties representatives and they are not very influential stakeholder in the municipal decision making.

The project was supported by all political parties in the municipal councils (City of Skopje and Kisela Voda) because political consensus was achieved on this issue. In respect to citizens, the opinion of most interviewees is that all citizens support or will support the project because it is in the general interest. No opposition to the project is expected. Public meetings were organized with the mayor of Skopje and mayor of Kisela Voda with inhabitants of Kisela Voda who indicated that traffic safety, mobility of the citizens, environment and health as priority projects to be financed. The public expressed their concern on the current situation on section two and three of the street Boris Trajkovski and requested solution to be provided as soon as possible. Based on those consultations, both mayors initiated the project financed with MSIP funds.

Probably the most important stakeholder is the mayor. The success of this project for the general interest will improve his reputation and prestige among the future voters. The political parties are the second influential stakeholder because their members are represented in the council. But the political parties are not unanimous and have different and sometime opposing interests, which weakens their positions. Moreover, being councilors, they cannot have so active role in the whole political process at the local level: they can control the issues by taking decisions, but the initiative and execution of projects are not in their hands.

The council made a formal decision on approval of this project at its session of May 6, 2015. Out of 45 councilors, 32 were present and voted as follows: 25 in favor, 0 against, and 7 withdrawn.

The non-governmental organizations have some influence, and since this project should promote municipal economy and the health of population, they should be in favor of the project.

The citizens or the population as a whole can be an influential factor. Most of the citizens will be beneficiaries of the project therefore they should support it.

5. Participation

It is decided that the loan will be covered or repaid from the municipal budgets in the ensuing years. There is no need for any kind of voluntary participation or financial contribution of the citizens. The project does not require it, and should not require additional financial contribution of the citizens.

6. Social risks

High socials risks for carrying out of this project cannot be perceived. Special obstacles and difficulties cannot be anticipated or expected.

B. EXPROPRIATION AND LAND OWNERSHIP

As part of the mitigation measures for social economic impacts of the project to the community, the Abbreviated resettlement Action Plan (RAP) for Properties to be affected by reconstruction and rehabilitation of Boulevard Boris Trajkovski from Staklara factory to Pintija settlement is prepared, as separate document. This document is designed to meet the Macedonian Law and World Bank requirements including the Operational Policy 4.12, Involuntary Settlement in respect of minimizing impacts, consulting those likely to be

affected. There will be no cases of displacement and no impact on the livelihood. The aim is to ensure that those who will be affected by the project are adequately recompensed for their partly losses of assets in compliance with the policy. The City of Skopje, Unit for expropriation, together with unit for expropriation of the municipality Kisela Voda carried requisite studies, prepared valuation of properties and made plans for implementation and monitoring of the project activities to ensure project's compliance with the Land Regulations and World Bank social safeguard polices. Overall, the most important consideration in planning of the rehabilitation work is to minimize disruption and avoid the resettlement of the people. On the line of Boulevard Boris Trajkovski upon the reconstruction, there will not be resettlement of the people.

1. Overall estimates of land acquisition

The table below presents the effects that will influence all three classes that correspond with the legal status of the owners and users of the land, in accordance with Macedonian laws. In addition, a short summary has been given of the effects on each of these three sections of the planned part of Bul. Boris Trajkovski that is subject to reconstruction.

Table 10: Land acquisition effects

Description of the effects	Section Staklara factory to Pintija settlement
Length of the route	2.05km
Total land that is subject of expropriation by the City of Skopje, for the reconstruction and renovation of the road	50,753m^2
Land that belongs to the state - Republic of Macedonia (RM)	41,408m^2
Private land registered in the Cadastre of the Republic of Macedonia (thus legally recognized for compensation)	1,511m^2
Land that belongs to proprietors	7,834m^2

The categories of land are classified as follows: a) construction unbuilt plots: 628m^2, b) construction plots: 2,540m^2, c) fields: 19m^2, d) yards: 828m^2, e) street: 38,369m^2, f) pastures: 350m^2, g) orchards: 687m^2.

There will be neither displacement nor impact on the business activities located on the side of the road, because only a strip of the yard will be expropriated that does not affect at all production or warehouses of the businesses located by the road. There are no small business such a kiosks or any similar small business activities by the road.

There will be no displacement of the private houses as well. On this stretch there are no facilities that would be subject of demolition and moving of persons, and there would be no need to dislocate any temporary facilities. Some of the parcels have fences that the City of Skopje, as the investor in the construction, will dislocate and, following the completion of the works, will restore their original condition.

Having on mind the nivelation of the ground some changes of the axis route were developed. Specifically, to avoid the demolition of the fences and the access roads, the road on the chainage of 0+910.50km to 1+427.64km, was moved. Widening of the road for about 0.5km was moved from right side, direction from center towards periphery, to left side to avoid partial land take of yards of houses. Initial designs followed the old General Urban Plan whereby it would have impacted yards of 10-15 houses.

2. Categories of impacts

Table 11: Categories of impact of expriopriation

Category	m^2	% of total land
Physical persons who lose the yard	252	2.86
Physical persons who lose the pastures	45	0.51
Physical persons who lose the orchards	687	7.80
Physical persons who lose the fields	8	0.09
Physical persons who lose the construction land	1071	12.16
Physical persons who lose the part of access road	11	0.12
Firms which lose the pastures	18	0.20
Firms which lose the construction land	2868	32.58
Firms which lose the yard	3640	41.34
Firms which lose the part of access road	204	2.32
Total:	8804	100

The biggest impact of the expropriation is for firms which lose the part of their yards (41.34%).

3. Process of consultations of the results of the census surveys

The public consultation meetings involving all representatives of key stakeholders in the municipality Kisela Voda (i.e. mainly those who will be affected by the roadwork in one way or the other) were conducted along the road influence area. The key stakeholders included municipal leaders, working groups, service/utilities institutions, private sector, NGOs, and other community members. The main purpose of these meetings was to come together and discuss modalities of solving the problems likely to happen during and after rehabilitation of the highway sections. The aims were twofold:

a) to brief stakeholders on the intended works for rehabilitation of the road, identify the burning expropriation issues together, and get their views and inputs on the process;

b) to get some views on how those burning issues can be amicably resolved in feasible and economical ways.

The public meetings started on January 2015 and continued through to March 2015. The public consultations were participatory meetings, which involved exchange of ideas and discussions. Venues selected for meetings were as follows:

No.	Place	Date	Time
1	Neighborhood Association Kisela Voda	23.01.2015	17.00-18.00
2	General secretary of the City of Skopje	01.03.205	11.00-12.00
3	Neighborhood Association Pintija	18.03.2015	17.30- 19.00

The meetings and consultations included mayor of the City of Skopje, mayor of the municipality Kisela Voda, Councils representatives, and neighborhoods association representatives.

Summarizing the concerns expressed during public participation process, the main issues are:

- Compensation for land, buildings and commercial activities at current market prices, which are within the road reserve,

- Time frame for the project works and time for moving the properties from the road reserve,
- Transparency in valuation and punctuality in paying compensations,
- Safety while crossing the road especially students/pupils is needed. They need road humps, and road signs in areas with concentrated settlements,
- The community needs contractor who will be familiar and respect their views.

According the Expropriation Law the face to face meetings were organized with the citizens involved in expropriation procedure.

4. Costs and Budgets

The presented financial costs apply only to the expropriation process, and they are provided in the budget of the City of Skopje in the total amount of MKD 2,433,121 (EUR 39,563) and this amount is going to be paid in accordance with the expropriation procedure by the end of 2015. The required personnel, resources and the administrative expenses for the implementation of the activities planned with the project will be provided by the City of Skopje and the municipality Kisela Voda.

5. Participation and Consultation

City of Skopje and the municipality Kisela Voda have to communicate effectively with all stakeholders in the project to provide accurate information about the road and reconstruction. Community level programs are essential elements in the communication strategy for providing important information to the public, to non-governmental organizations (NGOs) and to government agencies. Community liaison will provide the opportunity to the members of the community currently occupying the reconstruction to identify their support and concerns, it will also provide the forum of communication with project proponents and regulatory bodies and will facilitate anticipation and management of the project issues such as respect to the reconstruction and provision of traffic signs.

The major stakeholder groups are:

• The City of Skopje,
• The municipality Kisela Voda,
• Contractors and suppliers,
• Residents living in the project area and the daily commuters of the boulevard,
• Media.

Taking into consideration the positive side of including the citizens in the implementation of projects, the City of Skopje through the citizen information centre, i.e. through the citizen hotline, will enable consistent information on the project “Rehabilitation and reconstruction of Bul. Boris Trajkovski” and also information on the implementation will be posted on the Internet site of the City of Skopje.

From 2010, the City of Skopje enabled its citizens, within the Internet site, through the Geographic Information System, to view the current General Urban Development Plan of the City of Skopje. In addition, the City of Skopje introduced the GIS application for the citizens thus providing them with review of the spatial data classified by area and the application Citizens Initiative that enables the communication between the citizens and the city administration and provides the opportunity to pose questions or seeking opinions from the competent offices in the City of Skopje. The answers to the questions of public character are published on the Internet site, and the answers to the questions of private character are sent by emails to citizens. The GIS application represents another opportunity through which the

citizens are able to get informed about the process of implementation of the project on Bul. Boris Trajkovski.

6. Grievance Redress

Apart from the formal grievance mechanisms a committee for the grievance is formed. The committee comprises representative of city of Skopje, legal department, representative of the Kisela Voda municipality and a representative of the Neighborhood Unit, related to the section of the boulevard. The committee together with every particular affected person will try to resolve any issue including expropriation. This committee will be used as a last try to resolve any issue before address to the court. Information for the grievance application is available at the municipality Kisela Voda and the nearest office of Neighborhood Unit .

In cases the agreement cannot be reached at the first meeting, the expropriation body (Office) needs to issue a Decision on an expropriation proposal in accordance with the facts established in the case. The decision of the Office could be either positive or negative, meaning that it could assert the expropriation based on the public interest, or deny the request for expropriation. The affirmative decision could be disputed by the owner of the property or the holder of the rights within the Administrative Court. In case of an affirmative decision, the Office then convenes a second meeting between the user of the expropriation and the owner or the holder of the rights, for the purpose to agree on the compensation amount. If an agreement on the compensation cannot be reached at this meeting, the Office then brings the case before the competent court.

In exceptional cases, when the expropriation procedure will go into a court procedure, based on expert analysis ordered by the Court, prepared by a certified court forensics expert, will establish a price that is higher than the one offered by the City of Skopje, this price will be proposed to the council of the City of Skopje, and should it be adopted, i.e. accepted by the council, the higher amount will be paid for the expropriated property. At the moment, such voting by the city council is the only legal manner to increase the proposed amount of compensation to exceed the offered value, which is given in the proposal for expropriation and which is based on the described methodology.

a) Actual status of expropriation

The current status of expropriation is as follows:

Table 12: Status of expropriation as of 15.05.2015

Effective decisions – conducted in State Cadastre Agency	40
Effective decisions - provided for conducting in State Cadastre Agency	8
Effective decision which is waiting for decision for change the land category from construction plot to construction unbuilt plots	1
Decision against initiated an administrative dispute (2 cases rejected as unfounded and 2 cases are withdrawn by the owner)	6
Total:	55

For the Land expropriated with decisions against which is originated an administrative dispute, City of Skopje, Unit for expropriation delivered to the Government of Macedonia draft decision for transferring the real estate into possession of the City of Skopje. Procedure for its acceptance is in progress (on 13/05/2015 it was put as 42 items on the agenda of the session of the General College of state secretaries).

7. Monitoring and Evaluation

The Spatial Planning and Management Department will conduct the monitoring and update the database with the performed expropriation, while the Department of Finance will provide the data on the performed payments related to the expropriation. The municipality Kisela Voda will conduct the monitoring and keep record of the procedure.

The monitoring and the evaluation of the implementation of the Resettlement Action Plan will be implemented in accordance with the indicators given below.

Table 13: Monitoring indicators

Indicator	Source of information	Reporting period
Input indicator		
Funds spent on expropriation	Financial card	Monthly
Output indicator		
Number of resolved cases on expropriation	Report from the monitoring in the part of implementation of the expropriation	Monthly
REPORTS		
Monitoring Report	Monitoring Report to be submitted to MSIP	6 months
PRESENTATION		
Internet site	Internet site of the City of Skopje	Monthly

Implementation of the activities related to the indicators presented above, together with the activities that will be implemented during expropriation shall be included two times a year in the Monitoring Report submitted to MSIP. Parts of these reports will be posted on the Internet site of the City of Skopje.

C. CONCLUSION ON THE PROJECT SOCIAL IMPACT

The project should be socially successful for the following reasons:

- The project is useful for the health and traffic safety of the citizens;
- The project is a part of the municipal priorities and the majority of the citizens in the municipality Kisela Voda;
- The realization of the project will have possibly small but significant impact on the local economic development;
- Most of the stakeholders are motivated by this project;
- The population is not put into a position to contribute financially. The financial costs will be covered by the City of Skopje.

III. ENVIRONMENTAL IMPACT

The project on reconstruction and rehabilitation of "Boris Trajkovski" Street (section form Staklara factory to Pintija settlement) is part of the Program for planning of construction plots of the City of Skopje for 2015 and Program for planning of construction plots of the municipality Kisela Voda for 2015, which are in accordance with the General Urban Plan of the City of Skopje (2012-2022).

The project will include: extension of the carriageway of the Boris Trajkovski Street with total width of 20m in length of 2.2km, construction of storm water system, replacement of street light poles and placement a new street lighting, setting a traffic signalization and dislocation of some part of existing electricity cables, high and low voltage cables and phone lines.

A. CURRENT SITUATION

The "Boris Trajkovski" Street is the main traffic artery in the municipality Kisela Voda, which also presents a link between the settlements: Dracevo, Usje, Pintija and Kisela Voda with the center of the City of Skopje. Full reconstruction and extension of Boris Trajkovski Street was foreseen to be done at four sections:

- **Section I** from Street "11 Oktomvri" to the Street "Narodni heroi";
- **Section II** from Street "Srbija" to entrance of Staklara factory;
- **Section III from entrance of Staklara factory to the Pintija settlement;**
- **Section IV** from Pintija settlement until crossroad Dracevo - Markov Monastery.

The first two sections are already done. ***This Project envisages reconstruction and rehabilitation of the third section from entrance of Staklara factory to the Pintija settlement***. This section of the street is in terrible condition, the street has many holes on the asphalt, there are no sidewalks, the street is too narrow and makes the traffic slow because there is only one traffic line in each direction. There is no storm water system and the water remains on the street causing problems and potential safety risks to all participants to the traffic (drivers, pedestrian and bickers).

1. Project location

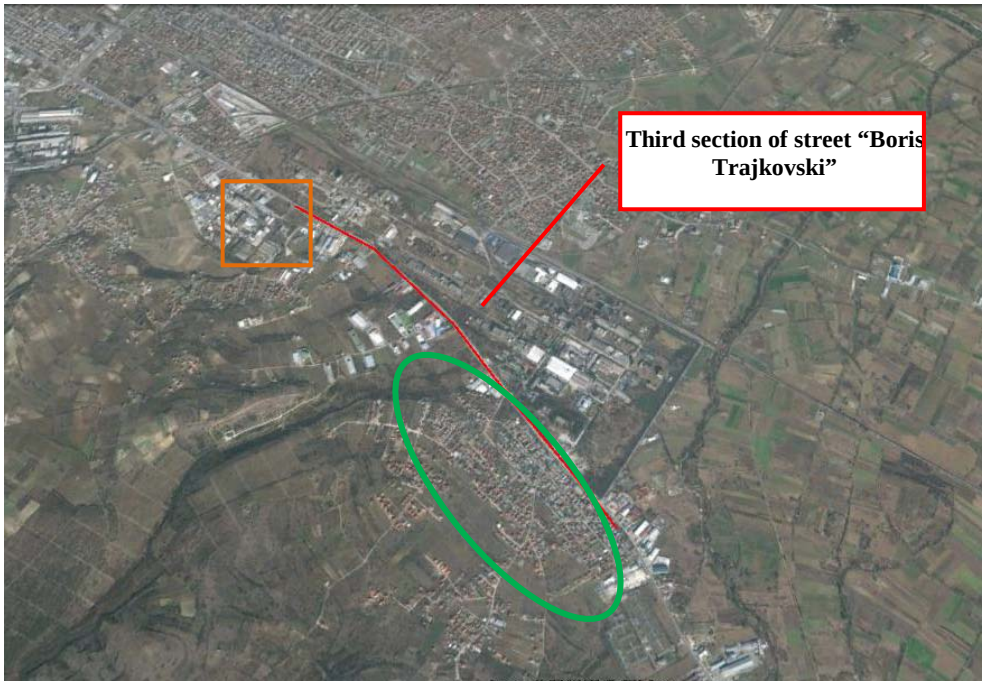
Boris Trajkovski Street is located in the municipality Kisela Voda (urban settlement Pintija), which covers the southeast part of the City of Skopje. The third section of the street begins from Staklara factory intersection up to the Pintija settlement and is surrounded with many family houses, commercial and industrial buildings. Location of the third section of the "Boris Trajkovski" Street is presented in Figure3.

a) Main project activities with environmental impact

All project activities for rehabilitation and reconstruction of "Boris Trajkovski" Street will be performed in 3 phases: preparatory work, reconstruction phase and operational phase. The preparatory work includes: organization, clearing and marking of the construction site, putting signs around and on the construction site and implementation of OH&S standards (e.g. mobile toilets for the workers and adequate containers for waste collection). The reconstruction phase of the street will consist of dislocation of existing electrical and phone cables, construction of pedestrian and bicycle path, putting layers of crushed stone and

bituminous material, placement of asphalt, construction of storm water collector, placement of street lighting and setting a vertical traffic signalization along the street.

Figure 3: Location of the third section of the “Boris Trajkovski” Street



The activities that will be performed in the operational phase will incude: daily use and appropriate maintenance of the street and also maintenance and repair of the storm water collector. All project activities are divided in five phases and are presented below.

Table 14: Project activities by phase

Reconstruction phase	Hydro-technical phase	Electricity phase	Traffic signalization phase	Replacement of (electrical and phone connections) installations
Extension of the carriageway (two lines in each direction), sidewalks on both sides and two direction bicycle path on the left side with total width of 20m	Construction of storm water collector in total length of 2,284.31m	Replacing the old wooden poles and 60 lamp posts and setting new street lighting	Procurement, transport and mounting of horizontal and vertical signalization	Displacement of some existing electricity cables, high and low voltage cables and phone lines
• Scraping of the existing asphalt layer; • Placing the new layer asphalt; • Excavation of soil and plants; • Placing improved bedding, road-base layer of crushed stone, • Installation of bituminised base, • Compaction of the sub base, • Placement of new kerbstones and sidewalks on both sides of the section.	• Construction of open channels, • Installation of pipes for storm water system which would capture the storm water and take it to the current channel in the yard of factory OHIS (Organic Chemical Industry Skopje)	• Dissembling of the wooden poles, • Excavation of soil, • Installation of concrete foundation, • Installation of steel, hot-galvanized, three-segment poles, • Installation of electricity cabinets.	• Excavation, • Backfilling, • Installation of the vertical signalization (traffic light, traffic signs), • Setting concrete base, • Designation of the vertical signalization	• Excavation, • Dislocation of some existing installations, • Re-establish the functioning of the installation.

b) Main environmental impacts and sensitive receptors

The implementation of all activities will take place in urban area of the settlement Pintija, in the municipality Kisela Voda, in the City of Skopje. The environmental impacts are expected to be medium-term with major local significance. Before the start of the reconstruction phase the Contractor should fulfill the OH&S requirements and imply good construction practice (preparation of **OH&S Plan**) to reduce/minimize the risks for workers, local citizens who live near the construction site and drivers passing the street. The contractor should provide

adequate protective equipment for workers, ensuring the reconstruction site by marking and fencing them and putting alert signs. Preparation of the **Traffic Management Plan (TMP)** before the beginning of the reconstruction activities is required in order to enable access of local citizens to their homes as well as entrance to the workers into the commercial buildings located along the street. The Plan should include the re-routing directions and works time schedule. Ensuring regular transportation of goods and people across the municipality Kisela Voda and beyond is also essential. **The Information note/Press release** about the project activities (start, timeframe and re-routes of traffic) need to be prepared by the municipal staff and announced via municipality board, web page or municipality newspaper "Kisela Voda" and web page of the City of Skopje and newspaper "Information News" (*Informativno glasilo na Grad Skopje*) issued by the City of Skopje.

The sensitive receptors that will be exposed on **increased level of noise and vibrations** during reconstruction period are citizens who live in the settlement Pintija and peoples who work in the commercial and industrial buildings along the third section of the street. The project location has been identified to the area with different/mixed degree of noise protection: III degree (around settlement Pintija-individual housing facilities) and IV degree (around Staklara factory and other commercial and industrial buildings) of noise protection according to the Law on noise sensitive protection (Official Gazette No. 79/07, 124/10, 47/11 *и* 163/13). This implies that the maximum allowed noise level should be 55dBA for night and 60dBA for evening and day (III degree) and 60dBA for night and 70dBA for evening and day (IV degree).

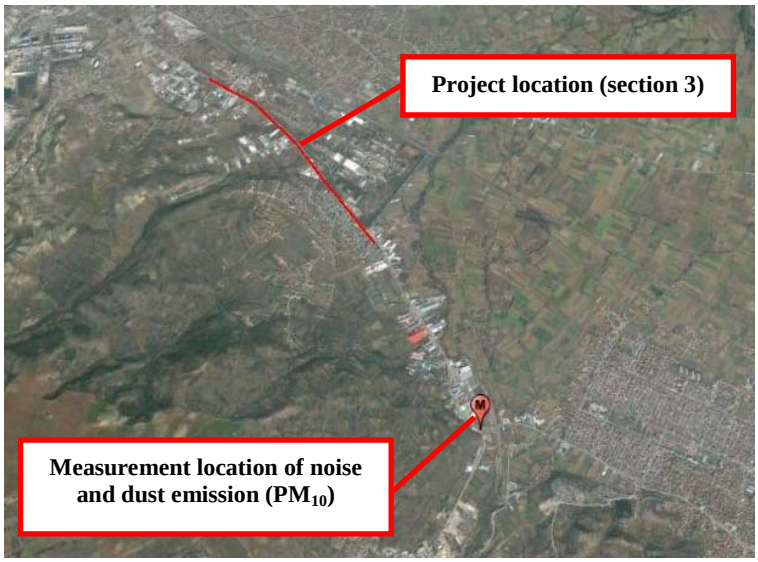


Figure 4: Location of the distance between the project and measurement location of noise and dust emission

In March 2014, noise and dust emissions (PM_{10}) measurements were performed by the laboratories of "Geing Krebs und Kiefer International & others" Ltd, Skopje and "Pharmachem" Ltd, Skopje on the location of fourth section of "Boris Trajkovski" Street (about 1.7km from the third section). In Figure 4 is presented location of project activities and measurement location of noise and dust emission.

The testing results have shown concentrations above the limit values of noise and dust emission (noise level result 70.5**dBA** - max. value 70dBA; **PM_{10} concentrations 55μg/m^3**-max.value 50 μg/m^3) as result of currently intensive and frequent road traffic in this part of the street. Due to the fact that the whole street (all four sections) have intensive road traffic these measurements performed on fourth section could be representative also for the third section. **This indicates that the project location (third section) has been characterized as sensitive noise and dust emission area as result of the frequent traffic flow and** densely populated area (settlement Pintija) and special attention should be given to set up and implement the preventive and mitigation measures by the contractor.

In the vicinity of the project activities the Markova River flows (around 330m east from project location). Markova River is right tributary of the Vardar River. According to the Regulation on Classification of waterways, lakes, reservoirs and groundwater ("Official Gazette of RM" No. 18/99) the water characterization of Markova River is II class (mezotrophic, with low degree of pollution, which means that can be used for fish growing, bathing, water sports and recreation; with appropriate method of treatment this water can also be used for drinking; large organic load could cause increase in primary production). The vicinity of the river should be taken into account due to potential adverse impacts of the project activities on the water quality (improper waste management – disposal of waste streams along the Markova River bank). The proper waste management could prevent the additional pollution of Markova River and River Vardar.

According the Project Main Design, the storm drainage collector with length of 2,284.31m is planned to be constructed (two branches – I branch with length of 524.89m in the direction from Skopje towards Dracevo, the II branch with length of 1,542.96m from the opposite direction and III branch as a joint collector with length of 216.46m). Through the III branch, the collected storm drain waters will be directed through the sedimentation tank/chamber with overflow weir to the existing channel in the industrial facility OHIS (Organic Chemical Industry Skopje) where there is a WWTP (the larger part of the industrial facility is not functioning). No impact on the Markovska River is expected with the project implementation neither during operational phase due to storm water drainage.

During reconstruction period of the street different waste streams will be generated such as communal waste, excavation of soil, construction and demolition waste (dismantling of the existing 7 wooden poles and 60 candelabras), contaminated soil from oil leakage (from construction machinery), etc. In order to provide proper waste management the contractor should perform on site proper selection, recycling (if possible), transportation and final disposal of waste to the landfill "Drisla" (located by the basin of the Markova river, on the opposite downhill side of the village Batinci, about 3km southwest from the project location). Before the start of the project activities, the **Waste Management Plan should be prepared.** Keeping records of temporary and final disposal of waste is also important. The main responsibility for waste management lays to the contractor who need to sign a contract with the communal public utility company. The responsibility for transportation and final disposal of waste lays on CSE "Communal hygiene" from Skopje. The preliminary estimation on waste generation quantities (various waste streams) have been presented in table below (based on the Main project design).

Table 15: Estimated values of the generated different waste streams during reconstruction activities

Type of waste	Quantity	Measurement unit
Reconstruction phases		
Asphalt	19,343	m^2
Excavated soil and demolition waste	44,927	m^3
Paving tiles	1,560	m^2
Excavated vegetation	3,270	m^2
Concrete	100	m^3
Gutters and grate	7	piece
Wooden poles	7	piece
Hydro-technical phase		
Asphalt/concrete	23.93	m^3

Type of waste	Quantity	Measurement unit
Excavated soil	3,937	m^3
Waste from sewage system	12	m^3
Electricity phase		
Excavated soil	425	m^3

Air emissions that may occur during the implementation of the project activities are result of the reconstruction phase (construction machinery-trucks and excavators) and mobile sources of air emission-emissions from vehicles in the operational phase of the street. The heavy construction machinery will be used for supply of raw material, excavation of soil, scrape the asphalt, etc. Therefore, in order to prevent the adverse environmental impact, dust management measures should be implemented, especially if the project activities are performed in dry, windless time.

In or near the project area there are no registered endemic, protected and endangered animal or plant species or protected areas and habitats that will be negatively affected by the construction activities. There is no cultural heritage protected structures in the close vicinity or under the reconstruction area.

In April 2014, the measurements of noise level and dust concentration were conducted and EIA Report for rehabilitation and reconstruction of the third and fourth sections of the “Boris Trajkovski” Street was prepared by the company “GeingKuk International&others” Ltd from Skopje in accordance to the national legislation. The EIA Report was adopted by the mayor of the City of Skopje, Mr. Koce Trajanovski. The Report contains the main project goals, main project activities, photos of the location where the construction activities will be performed, reports from the noise and dust emission measurements and the environmental mitigation measures. The detailed relevant Environmental Mitigation Plan and Monitoring Plan for all project activities are given in the following tables. The main responsibility lay to the contractor to implement the measures and to the supervisor to monitor the implementation of measures.

B. MITIGATION PLAN

Project activity	Potential impact	Impact scale	Proposed mitigation measures	Responsibility
Reconstruction and rehabilitation of the third section of the "Boris Trajkovski" Street, construction of storm water system, placing street lighting along the third section of the "Boris Trajkovski" Street in the municipality Kisela Voda in the City of Skopje				
Preparation activities before reconstruction works start Marking out the route and reconstruction and rehabilitation of the third section of the "Boris Trajkovski" Street Construction of storm water system, placing of street lighting along the third section of the street	**Possible adverse social and health impacts to the population, drivers and workers due to:** – Lack of ensured safety measures at the start of reconstruction works – Injury passing near by the reconstruction site and open trench and manholes – Not compliance with strict OH&S standards and work procedure – Inappropriate public access within the	Local/ within the settlement Pintija Medium term during the reconstruction period (2.04km length) Significance - major	➢ Preparation, approval and implementation of the OH&S Plan; ➢ Preparation, approval and implementation of the Traffic Management Plan together with the municipal staff prior start up activities; ➢ Provision of the information via municipal newspaper "Kisela Voda", "Information News" issued by City of Skopje, TV, radio and municipality web site and web site of the City of Skopje about the reconstruction activities – start and finish of work for each day and location of activities, duration of work and traffic access on other streets; ➢ Application of good construction practice for marking out the reconstruction site including: • Ensure the appropriate marking out the reconstruction site /section by section along the street; • Placement of attention signs especially for limitation of speed driving near the reconstruction site; • Warning tapes and signage need to be provided; • Installation of Notice board with general information about the project, Contractor and Supervisor at the reconstruction site; • During reconstruction activities access to the commercial and houses should be provided; • Forbidden entrance of unemployed persons within the warning tapes; • Community and Worker's OH&S measures should be applied (first aid, protective clothes for the workers, appropriate machines and tools); • The reconstruction site should be kept clean; • The mobile toilet should be placed on the reconstruction site; • Machines should be handled only by experienced and trained personnel, thus reducing the risk of accidents; • Constant presence of fire fighting devices should be ensured in case of fire or other	• Contractor – Bidder • Supervisor • City of Skopje staff (Communal Inspector and Environmental Inspector)

Project activity	Potential impact	Impact scale	Proposed mitigation measures	Responsibility
	district		damage; • All workers must be familiar with the fire hazards and fire protection measures and must be trained to handle fire extinguishers, hydrants and other devices used for extinguishing fires; • Larger quantities of flammable liquids should not be kept on the site along the reconstruction site.	
	Possible impacts on landscape and visual aspects	Local/within the settlement Pintija short term /minor	• Good construction practices have to be implemented – including fencing and protection of reconstruction site according to national legislation; • Minimization of the reconstruction area as much as possible (careful planning and designing of the project activities according to the Traffic Management Plan for a certain period of time); • Fully clean-up of the reconstruction site immediately after accomplishment of reconstruction activities (section by section); • Collection of the generated waste on daily basis, selection of waste, transportation and final disposal on appropriate places (according the type of waste – more details under Waste management issue).	• Contractor – Bidder • Supervisor
	Possible emissions by transportation vehicles and impact on air quality in the Municipality of Kisela Voda due to: – Gases emissions of dust-suspended particulates – Traffic congestion will be caused as well causing	Local/ within the settlement Pintija short term/ major	• Reconstruction site, transportation routes and materials handling site should be water-sprayed on dry and windy days; • Construction materials should be stored in appropriate places covered to minimize dust; • Vehicle loads likely to emit dust need to be covered; • Usage of protective masks for the workers if the dust appears; • Restriction of the vehicle speed within the reconstruction site; • Perform regular maintenance of the vehicles and construction machinery in order to reduce the leakages of motor oils, emissions and dispersion of pollution; • Burning of debris from ground clearance not permitted.	• Contractor – Bidder • Supervisor

Project activity	Potential impact	Impact scale	Proposed mitigation measures	Responsibility
	changes in existing traffic flow			
	Possible noise disturbance as a result of outdoor equipment usage and transportation vehicles driving around the site	Local/within / within the settlements Pintija short term /minor	• Two noise area are relevant a) Pintija settlement-third level of protection (the noise should be 60dB per day and evening and 55dB during the nights) and b) industrial area–fourth level of protection where the level of noise should not exceed 60dB during the day and evening and 70dB during the nights • The control of noise level should be performed during work peaks; • The temporary noise protection barriers should be installed around the reconstruction site because the high level of noise is already exceeded; • The construction work should be not permitted during the nights; the operations on site shall be restricted to the hours 7.00 -19.00.	• Contractor – Bidder • Supervisor
	Possible impact on water courses – Markova river near the project site in the municipality Kisela Voda	Local/ short term/ minor due to the distance from the project site	• Minimize storage or disposal of substances harmful to water –Markova river (e.g. fuels for construction machinery) on the reconstruction site; Organize proper handling and storage; • The street should be kept clean and tidy to prevent the build-up of oil and dirt that may be washed into a water course or drain during heavy rainfall.	• Contractor – Bidder • Supervisor

Project activity	Potential impact	Impact scale	Proposed mitigation measures	Responsibility
	Possible adverse environmental impact and health effects could occur as a result of generation of the different waste streams The inappropriate waste management and not in time collection and transportation of waste streams could generate direct and indirect pollution on waters, soil and will impact the air quality	Local within the settlement Pintija short term/ major	• Preparation, approval and implementation of the Waste Management Plan - WMP (type of waste streams expected, waste codes, separation of waste on spot, responsible person/s for implementation of WMP plan, taking care about the waste collection, transportation and temporary and final waste disposal, define the sites for temporary disposal of waste before final disposal, agreements with authorised waste collection companies, check lists with keeping records on generated waste, records on transported waste etc.); • Identification of the different waste types at the reconstruction site (soil, sand, asphalt, bottles, food, etc.); • Classification of waste according the national List of Waste (Official Gazette no.100/05); • The main waste would be classified under the Waste Chapter 17 "Construction and demolition wastes (including excavated soil from contaminated site)" with the waste code 17 01 – Waste from concrete, 17 05 04 – Excavated soil, 17 09 04 – Mixed waste from reconstruction site; • Small amount of solid municipal waste could be found (food, beverages), as well as packaging waste (paper, bottles, glass, etc.). • Collection, transportation and final disposal of the inert and communal waste by CSE "Communal hygiene" from Skopje; • Possible hazardous waste (motor oils, vehicle fuels) should be collected separately and authorized collector and transporter should be sub-contracted to transport and finally dispose the hazardous waste; • The materials should be covered during the transportation to avoid waste dispersion; • Burning of construction waste should be prohibited.	• Contractor - Bidder • Supervisor • City of Skopje staff (Environmental Inspector and Communal Inspector) • Mayor of the City of Skopje • CSE "Communal hygiene" from Skopje
Operational phase				
• ***Reconstruction of third section of the "Boris Trajkovski" Street with sidewalks, bicycle path and street lighting will have positive impact in terms to provide a traffic link with the settlements "Pintija", "Usje", "Dracevo" and Canter of Skopje City and will ensure safe and quality traffic,*** • ***Regular maintenance of the street is needed (check up the horizontal and vertical signalisation, damages on the street or sidewalks),***				

Project activity	Potential impact	Impact scale	Proposed mitigation measures	Responsibility
• ***Regular maintenance of the storm water network and street lighting.***				

C. MONITORING PLAN

What parameter to be monitored?	**Where** is the parameter to be monitored?	**How** is the parameter monitored?	**When** is the parameter monitored (frequency of measurement)?	**Why** is the parameter monitored?	**Cost**		**Responsibility**	
					Construction	Operations	Reconstruction and rehabilitation of street "Boris Trajkovski" from Staklara factory to settlement Pintija	Operation of "Boris Trajkovski" Street
Project stage: Preparation activities/ Start-up of the reconstruction work (site clean-up, and marking out the route along the reconstruction site – third section, "Boris Trajkovski" Street)								
The safety protection measures applied for the workers and local citizens who work and live along the project location	On the reconstruction site	Visual checks	During the clean-up activities At the beginning of each working day during the project activities	To prevent health and safety risks – mechanical injuries To be in compliance with national communal health regulation and OH&S standards			Contractor - Bidder Supervisor Communal Inspector at the City of Skopje	
Preparation and implementation of the OH&S Plan	On the site along the street	Documentation review and visual monitoring	Monitoring regularly during the Project activities, determining the state of visits/ activities before the start of operational activities	To provide good construction practices refer to workers and community health and safety			Contractor – Bidder Supervisor	
Preparation and implementation of Waste Management Plan	On the site along the street	Documentation review and visual monitoring	Monitoring regularly during the Project activities, determining the state	To ensure environmental protection through proper waste			Contractor – Bidder Supervisor Environmental	

What parameter to be monitored?	**Where** is the parameter to be monitored?	**How** is the parameter monitored?	**When** is the parameter monitored (frequency of measurement)?	**Why** is the parameter monitored?	**Cost**		**Responsibility**	
					Construction	Operations	Reconstruction and rehabilitation of street "Boris Trajkovski" from Staklara factory to settlement Pintija	Operation of "Boris Trajkovski" Street
			of visits/ activities before the start of operational activities	management (according the waste streams management hierarchy)			Inspector at City of Skopje	
Project stage: Reconstruction and rehabilitation of the third section of the "Boris Trajkovski" Street, construction of storm water system, placing street lighting along the third section of the street in the municipality Kisela Voda								
Safety traffic flow and regular transportation of goods through the project location (third section)	On the site	Visual monitoring	During the working day	To ensure the coordinated traffic flow through the municipality Kisela Voda			Contractor - Bidder Supervisor Communal Inspector at the City of Skopje	
Disposal of the different waste streams near the Markova river	In settlement Pintija near the project area	Visual check if the waste is disposed near the Markova river	During the reconstruction period (once per week)	To ensure good status of water quality			Contractor - Bidder Supervisor	
Primary selection of the different waste streams	On the site	Review the documentation	At the beginning of project activities	To separate hazardous from the non-hazardous waste as well as inert from biodegradable waste			Contractor – Bidder Supervisor	
Collection and transport as well storage of hazardous waste (if any occurs)	On safety temporary storage	Review the transportation list and conditions at the storage facility	Before the transportation of the hazardous waste (if there is any)	To improve the waste management practice on municipality and national level/ Not to dispose the hazardous waste on the waste disposal spots			Authorized Contractor for collection and transportation of hazardous waste (if any occurs)	
Collection transportation and final disposal of the solid waste	On the site and around the site	Visual monitoring and reviewing the transportation and	After the collection and transportation of the solid waste on	Not to leave the waste on the spot to avoid the environmental and			Contractor – Bidder Supervisor	

What parameter to be monitored?	**Where** is the parameter to be monitored?	**How** is the parameter monitored?	**When** is the parameter monitored (frequency of measurement)?	**Why** is the parameter monitored?	**Cost**		**Responsibility**	
					Construction	Operations	Reconstruction and rehabilitation of street "Boris Trajkovski" from Staklara factory to settlement Pintija	Operation of "Boris Trajkovski" Street
		disposal lists from the sub-contractor	regular base each day	health impact on local population.				
Fulfilled Annual Report on collection, transportation and disposal of waste	Local self-government administration	Review of documentation – Identification of waste list	After the accomplishment the task of collection, transportation, temporary disposal and final disposal of waste	To improve the waste management on local and national level To be in compliance with national legal requirements			Mayor of the municipality Kisela Voda/ Ministry of Environment and Physical Planning	
Noise measurements	On the site	Monitoring of the noise levels dB (A) with appropriate monitoring devices	During the work peaks	To ensure noise level limits according to regulation			Contractor – Bidder Supervisor	
Implementation of the Traffic management Plan to avoid creating of traffic jams	On the site along the street	Visual monitoring	Monitoring regularly during the Project activities, determining the state of visits/ activities before the start of operational activities	To provide good construction practices			Contractor – Bidder Supervisor City of Skopje staff (sector for environmental protection)	
Project stage: Operation of street "Boris Trajkovski" from Staklara factory to settlement Pintija in the municipality Kisela Voda								
Preparation of the Preventive and maintenance Plan including all sub-projects (street operation, storm water	Along the third section of the street "Boris Trajkovski"	Review of the Preventive and maintenance Plan and proposed measures for proper operation	Regularly on 6 months within the operational phase	To prevent or minimize the risks to human health (traffic injuries) as a result of street damage, floods caused by damage of storm				Mayor of City of Skopje and the technical staff responsible for maintenance of roads and streets

What parameter to be monitored?	**Where** is the parameter to be monitored?	**How** is the parameter monitored?	**When** is the parameter monitored (frequency of measurement)?	**Why** is the parameter monitored?	**Cost**		**Responsibility**	
					Construction	Operations	Reconstruction and rehabilitation of street “Boris Trajkovski” from Staklara factory to settlement Pintija	Operation of “Boris Trajkovski” Street
collector and network, electricity supply and street lighting) Regular maintenance of the streets, water supply network, storm water system and street lighting		of all constructed elements		water network, etc.				

IV. TECHNICAL SOLUTION

A. DESCRIPTION

For the purposes of reducing the traffic congestion, increasing the traffic safety, supporting the development of local economy, reducing the pollution and greenhouse gas amount, as well as improving of the communal infrastructure in the city, that is in the Kisela Voda municipality, the following activities shall be realized:

- Street reconstruction phase,
- Hydro-technical phase,
- Electricity phase,
- Traffic signalization phase,
- Replacement of installations.

1. Street reconstruction phase

The newly-designed alignment for reconstruction of the Boris Trajkovski Street is within the frames of the General Urban Plan, whereas on certain crossroads, interventions have been made on the radii, that is, the existing crossroads have been expanded as envisaged with the Preliminary Traffic Design.

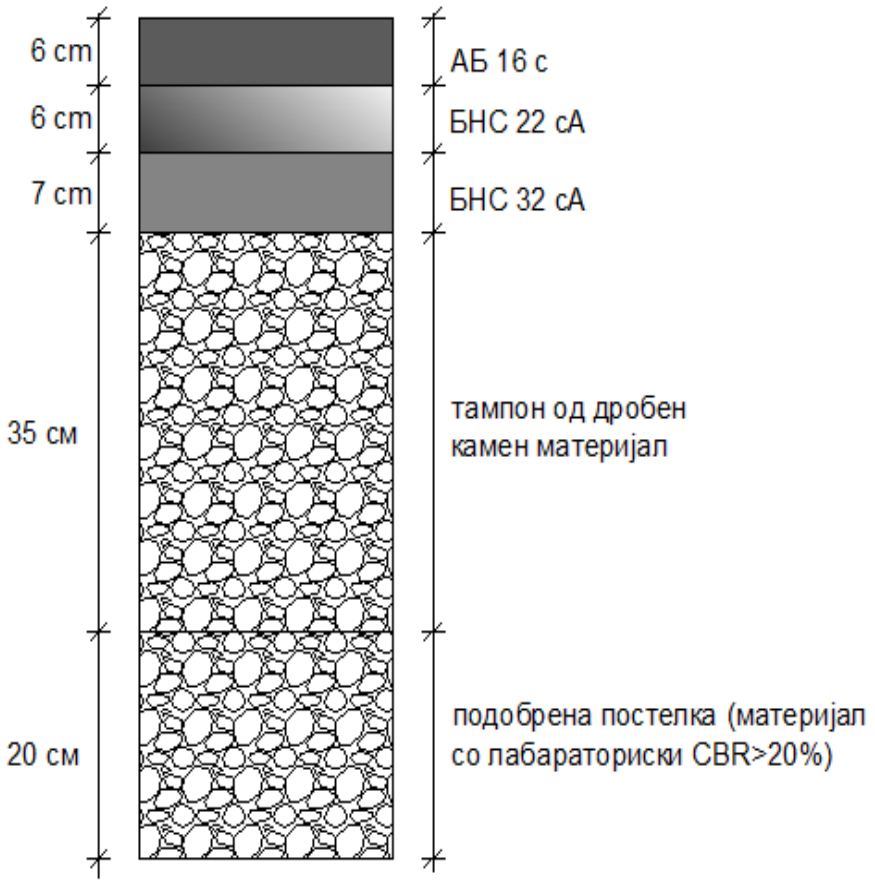
The carriageway surface on the Boris Trajkovski Street is edged with street kerbs, the pedestrian paths have been made of paving interlock tiles edged with kerbs, whereas the bicycle path is made of bituminized wearing course BNHS 16.

The width of the carriageway on the Boris Trajkovski Street is 13.7m, or two traffic lanes in one direction, that is from the right side in the direction of increase of chainage, two traffic lanes with total width of 7m, and on the left side, two lanes with total width of 6.75m, with pedestrian path on the left side with width of 1.5m, pedestrian path on the right side with width of 2.0m and one two-way bicycle path on the left side with width of 2.75m, resulting into total width of the road of 20m, or

- Carriageway lanes..…….....13.75m
- Pedestrian path on the left side 1.50m
- Pedestrian path on the right side 2.00m
- Two-way bicycle path on the left side …….....2.75m
  - Total.....20m

The carriageway construction shall consist of:

- Asphalt concrete: …..... AB16c d=6cm
- Bituminised bearing course: ..... BNS 22 cA d=6cm
- Bituminised bearing course: .....BNS 32cA d=7cm
- Road-base layer of crushed stone: ..... d=35cm
- Improved bedding (material with laboratory CBR≥ 20%).. d=20cm



(text on image: road-base of crushed stone, improved bedding (material with laboratory CBR>20%)
Adopted specific cross-section of the carriageway construction (superstructure) for a 20 years project period

2. Hydro-technical phase

The newly-envisaged storm drainage collector shall accept and drain the partially urbanized areas on the right side of the street in the direction towards Drachevo.

The storm water will be accepted with storm drainage collector on this part of the boulevard and is planned to be released in the current channel in the yard of factory OHIS. Due to the limited bandwidth of the existing channel, a technical solution defined that it can be discharged only part of the storm water accepted by the belt with a width of 30 meters along this stretch of the boulevard. It should be stresses that connection of storm water from urbanized area is not allowed until the drainage collector of the outlet channel to the existing recipient Vardar should be constructed.

The alignment of the storm drainage collector is generally on the sidewalk of the left side of the street towards Drachevo. Part of the alignment of the collector, from the lowest point to the outlet in the existing channel, passes through the urbanised zone of OHIS. The total collector length is L=2,284.31m.

The total length of the storm drainage collector on the Boris Trajkovski Street is L=2,284.31m. Field conditions require directing of the collector's grade level to the lowest point by which 2 branches are formed:

- branch 1 with length L_1=524.89m and,

- branch 2 with length L_2=1,542.96m.

From this point, in which all storm waters are received and the drainage from the urbanised areas from the right side of the Boris Trajkovski Street, a joint collector shall be built – branch 3 with length L_3=216.46m through which the waters shall be directed and discharged in the existing channel within the area of the OHIS factory.

The minimal pipe diameter of the storm drainage collector is DN300, whereas the maximum diameter is DN1000.

The storm drainage collector, branch 1 and branch 2, shall be performed from corrugated polypropylene pipes PP – HN with bearing (stiffness) class SN8 and SN10.

In addition, the following facilities shall be built on the storm drainage collector:
a) Inspection shafts,
b) Road gully,
c) Collected manhole,
d) Discharge manhole.

The pipes of the storm drainage are mounted in the trench with variable depth and variable width. The depth is conditioned by the terrain and the grade level of the storm drainage, whereas the width is in function of the diameter of the pipes and is between B=1.2m for pipes with diameter DN300 and B=1.8m for pipes with diameter of DN1000. In general, the alignment of the storm drainage runs along the sidewalk (bicycle path) on the street. The excavation depth for mounting of the storm drainage is calculated on the lower sub-base level under the sidewalk processing.

The level of the storm drainage collector complies with the level of the boulevard that on this section is variable; from the beginning of the section going to Dracevo first is in decline, and then uncline. This entails the construction of storm drainage collector to the lowest point, building of 2 branches. Longitudinal level of branch 1 is within the slope J=0.2% and J=0.51%. Longitudinal level of branch 2 is from J=0.2% to 1.18%. The third branch of storm drainage collector occurs from the joint point of both branches on the boulevard up to the existing outlet channel in OHIS factory. Branch 3 is a longitudinal level of J=0.39%.

During the course of the level of the storm drainage collector the existing underground installations are protected, the set of elevations that avoids clash between the collector and existing installations.

The belonged area of 115ha, the amount of storm water that has to be accepted and drainage will be Q=1,844.39l/s=1,844m^3/s.

Prior to mounting the pipes, the trench bottom is planned and a layer of sand is placed on it with thickness of 15cm for pipes with diameter up to DN500 and a layer of sand with thickness of 20cm for pipes with diameter up to DN1000. Up to 30cm over the vertex of the pipes, the filling is performed with sand, whereas the remaining part of the trench is filled with gravel by compacting until reaching the required compactness.

3. Electricity phase

The electricity phase includes mounting of new street lighting and disassembly of the existing 10 wooden poles and 60 candelabras. The project and the works shall be realized in accordance with the Macedonian standards, that is, the relevant EN and IEC standards for those parts in which there are no MKS standards.
Then street light poles, which shall mounted are of steel, hot-galvanized, three-segment, with height H=8m, placed at a distance of 35m and total number is 121. The street light pole is

placed on a concrete foundation with appropriate dimensions along with an anchor and anchor screws cast with hot bitumen. The foundation, that is, the foundation slab is at the level of the asphalt height. At the street light pole, at height of 1.7 metres from the base, there is an opening with a plate (terminal box) for the fuse and four terminal strips for the cables. The terminal plate contains connection terminal strips for direct connection of two conductors with cross-section of 35mm^2 (entrance-exit of low voltage cable). In addition, there is a part for connection of the terminal box with the light due to the fact that the supply cable is of aluminium and has a significantly bigger cross-section than the cable from the terminal box to the light. The street light poles have an earthing nut at the height of the terrain of about 20 centimeters. As installation, the street light poles have a terminal box of the M3 type with fuse holders with cylindrical fuse-link washers with nominal current of 6A. The protective conductor of the current connection between the terminal plate and the light shall be connected to the earthing nut on one side, that is to the street light poles, at the terminal plat, on the other side. In doing so, it shall be necessary to ensure the symmetrical distribution of the phase overload (alternating connection of the lights per phases).

Crossarms are to be placed on the 8-metre light poles, as follows:

- Single crossarm, with total length of L=2m,
- Double crossarm, with crossarm length of L_1=2m and L_2=2m. Crossarms are inter-rotated by 90^0 degrees and,
- Triple crossarm, with crossarm length of L_1=2m, L_2=2m, L_3=2m. Crossarms are inter-rotated by 90^0 degrees.

The fastening to the poles shall be performed through the foundations with the following technical specifications:

Pole height (m)	Pole load (kN)		Adopted foundation (cmxcmxcm)	
8	N=	1.19	a=	100
	M=	6.71	b=	100
	H=	1.24	h=	100
	Gt=	25		

Poles shall withstand wind speed of 35m/s, or 126km/h. When concreting the foundation, two PVC pipes shall be installed in it, with minimal cross-section of Ø70mm, which provides mechanical protection for the connection low-voltage cables, and also provide for introduction or replacement of the cables from the earth trench to the low-voltage cabinet. During the foundation execution, four anchor screws shall be screwed with curved ends. The anchor length is 60cm. Pipes serve as entrance and exit of cables coming from the neighboring pole/or the distribution cabinet and continue to the next pole.

Sodium light under high pressure shall be used with power of 250W, set, with pre-connection device and radius of light propagation of 75^0. The lights fittings shall be executed from aluminium of high purity level. The light projector is executed from thermally and mechanically reinforced glass with minimal level of shock resistance of IK 08, whereas the level of mechanical protection of the optical part of the light shall be IP66, and the pre-connection device shall be at least IP44. The height for mounting of the lights shall be 10 meters. Lights shall be placed at both sides in an alternating manner (zig-zag) at mutual distance of 35 meters. The light also has an option for horizontal mounting of crossarm or console at pole with diameter Φ60mm - Φ70mm, without sufficient equipment and has at

least 10 years of guarantee. The light is supplied with a system for setting of the photometric features and setting of the light position regarding the mirror and has a possibility for memorizing of the selected optic position.

For supply of the lights on the entire section of the area, first phase, two electricity cabinets for street lighting shall be mounted, type B1, DC-Str.Ligh.A andB1, DC-Str.Ligh.B. The cabinet shall be delivered and mounted by AD EVN. The housing is made of inflammable and non-hydroscopic material, resistant to mechanical damage and chemical actions from atmospheric agents. The cabinet is made of reinforced polyester, with installed elements. The mounting board is made of insulation material. The protection level of the public illumination cabinet is IP44 and IK25. The public illumination cabinet door is equipped with a lock with universal locking key. The housing is fixed on prepared concrete foundation with anchors already mounted in the foundation. Foundations are executed from MB 20 concrete, and the same provide for entrance and exit of cables in the cabinets through the foundation with use of the "entrance-exit" system, whereas the foundation is 30cm above the surface. A rubber sheet shall be placed between the concrete foundation and the cabinet through which the cables shall pass, and the same shall disable the passing of insects, rodents and reptiles. The cabinet cables, that is, the supply cable, shall be inserted in PVC pipes with Φ150mm, whereas the supply cables, on the places which envisage a passage under the road, shall be inserted in the PVC pipe Φ100mm. The cabinet consists of supply and distribution section. The supply section has terminal strips. The cabinet equipment is protected with an automatic switch AS 3P+N/63A. The current derivatives for street lighting are protected with automatic fuses with slow feature and nominal power, 25A. Switching on/off lights shall be executed through the rotary cam switch NIG, which has a possibility for manual and automatic turning off and on the lights (1-0-2). Automatic switching on and off shall be executed with a photo cell and installed timer, whereas the complete low-voltage automation is placed in the cabinet for external lighting.

The following equipment shall be included in the cabinet:

- main rotary cam switch type NIG I-0-II,
- rotary cam switches 2G,
- contactors,
- mounted clock,
- fuse with fast feature C,
- photo cell sensor,
- fan for cabinet P=45W/220VAC, 163 m^3/h set with automatic fuse type CN60-6A,
- thermostat for regulation of heater and fan in cabinet, type NCC/NOC, 100-250 VAC/2A,
- cabinet heater P=55W/220VAC set with automatic fuse type CN60-6A,

three-phase single-tariff electronic meter 10-60A 230/400 set with connected and mounting material, block testing and putting into permanent function according to the energy consent from the EVN.

The measuring of the consumer electricity shall be in the mounted cabinet by AD EVN.

A cable of the type NAYY 4x35mm^2 shall be mounted for power supply of the street lights. The supply cable is generally in the cable trench. The cable is mounted in a pipe or cable channel. The cable channel in which the cable is placed is with depth of 80cm below the terrain level, in surrounding area of sand or fine grain earth. Parallel to the cable, there shall be an earthing strip connected to all metal parts, that is, poles. The distance between cables is equal along the entire alignment with the permitted bending radius. The cable shall be

covered in layers of 20cm which are compacted in each layer individually. Cables shall be appropriately connected from one pole to another with screws from the terminal plate of each pole. The ends of the wires shall be executed with cable terminals by applying pressure.

In addition, rings shall be made, that is, cable connection of two adjacent lights (from one to another terminal plate) of different supply source. In that manner, in case of unwanted interruption of supply of one derivative (light), the same shall manually be transferred to the other from the neighboring RO (DC distribution cabinet). Rings are open in regular operations, that is, they are not connected to the NN (LV-low voltage) street lighting network.

Standard earthing with FeZn 30x4mm strip is executed for all pole positions and illumination objects, placed in the earth trench in parallel to the power cable and appropriate third protection conductor of the terminal box of the pole to the light fittings. As an earthing protection system, in accordance with the distribution system, TN-C-S was selected.

4. Traffic signalization phase

Traffic signalization (procurement, transport and mounting) will be realized according to adopted and approved traffic project with technical number 134/14. The horizontal signalization will consist of: white color 2370m^2, yellow color 152m^2 and red color 190m^2. The vertical signalization, traffic signs with columns are placed in concrete. The following activities are assumed: procurement, transport and assembly of hot galvanized coated column with sign-holders, according to Rulebook (Official Gazette of the Republic of Macedonia No. 47/10) standard size of traffic signs Type 2 and Category of reflection I with the following dimensions:

- Length of side of equilateral triangle 90cm,
- Circle diameter 60cm,
- Square side 60cm,
- Rectangle side 60x90cm.

The following traffic signs will be positioned: 201 Give way, 202 Mandatory stopping, 205 No traffic in one direction, 230 No left turns, 231 No right turns, 232 No U-turn 1, 236 No stopping and parking, 245.2 Turn right, 252 Segregated pedal cycle and pedestrian route, 302.1 Marked pedestrian crossing, 305 One-way street, 306 Priority road, 314.4 End of pedal cycle and pedestrian route, 321 Permitted bypass, 328 Gas station, 330 Bus station, 366 Realignment of vehicles (according to situation), 381.2 (90m) Sign for closure of right traffic lane (at distance of 90 meters), 502 Additional board (right arrow), 9.07 Board marking a traffic island, Semi-portal for signpost boards.

Light signalization will include the following activities: excavation, backfilling, procurement, transport, mounting of equipment, putting into operation and delivery of attestations. The BoQ consists the following positions: Concrete shaft for traffic lights with base and cover for heavy traffic, for connection and cable crossings, Traffic lights device (URS), Semi-portal traffic light pole, hot-galvanized coated, Regular traffic light pole, hot-zink coated, Anchor base for semi-portal traffic light pole with included excavation, concreting with MB (concrete class) according to project, Anchor base for regular traffic light pole with included excavation, concreting with MB (concrete class) according to project, Anchor base for traffic light device (URS) and URS device, Driver's led lantern F300, with lens, Driver's led lantern F210, with lens, Bicycle pedestrian led lantern F210, with lens, Signaling cable 16x1.5mm^2 (m1), Signaling cable 24x1.5mm^2 (m1), Earthing cable 1x16mm^2 (m1), Energy cable 4x10mm^2 (m1), Lantern cable 5x1.5mm^2 (m1), Lantern cable 3x1.5mm^2 (m1), Earthing tape,

Procurement, transport and mounting of PVC pipes internal cross-section 110mm in excavated trench and filled with gravel, Execution of "combs" with connection terminals (per traffic light pole), Programming and putting into operation of traffic lights (URS).

5. Replacement of installations

The work contains all things to complete dislocation of some existing installations, such as: electricity cables, high and low voltage cables and phone lines. Full dislocation means dismantling of existing installations and their move with all the things that are necessary to restore the full functionality of the related installation.

The work includes the collection of all necessary documents and approvals from the relevant institutions or users of installations.

Dislocation of existing installations is done carefully and observing all necessary technical measures for the installation and for the people who perform the dislocation. Control and security especially in power lines must be fully secured. Dismantled materials stored carefully for possible re-using. After dismantling of existing installations it approaches into performance for dislocation. This work contains all the necessary things and materials to perform the dislocation and to re-establish the functioning of the corresponding installation. The way the works contractor determines, in accordance with the project for dislocation and instructions of the supervisory authority. The overall damage that might occur due to improper operation falls at the expense of the contractor

The tenders for displacing of installations in ownership of EVN and TELEKOM are in accordance with technical decisions prepared by the installation holders, with included items with quantities and unit prices defined by EVN and TELEKOM. The quantity column shall include the value of tenders for EVN and TELEKOM, respectively. Bidders shall be obliged to include the percentage tender increase, or to accept the tender value and enter the calculated amount in the column "total”.

Displacement of installations owned by EVN Macedonia AD Skopje according to tender 23-7628/2 dated 25.12.2014 according to technical specification by the installation holder.

Displacement of installations owned by Telekom according to tender 24748/1 dated 01.02.2015 according to technical specification by the installation holder.