Republic of Macedonia

Municipality Gjorce Petrov

Project Appraisal Document

"Reconstruction of various streets in the urban districts of the Municipality Gjorce Petrov – 2nd phase"

World Bank

Municipal Services Improvement Project

Skopje, 2014

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EXECUTIVE SUMMARY

The project assumes reconstruction and/or rehabilitation of various streets in the urban districts of the Municipality Gjorce Petrov, in addition to storm-water network on two, and street lighting on one of the street. The total length of the streets that are subject to this Appraisal is 2,858.2m, varying in length from 100m to 350m, while the width of the street varies from 5m to 6m.

The main purpose of the proposed technical solution is to provide a long range improvement of the streets by maximizing the technical life of the surface, thus meeting the needs of the community in the Municipality Gjorce Petrov. Moreover, the proposed technical solution is in line with the existing standards and positive regulation for this kind of projects, which implies that the implementation of the project is technically feasible. No adverse social or environmental impacts were identified for this project.

The project is in line with the Strategy for Local Economic Development (2011-2018) where the highest strategic priority is improvement of the infrastructure of the municipality to make it easier for businesses to operate (i.e. houses, transport, roads, water and electricity etc) and thus, creating an environment that promotes economic growth and better living conditions for the citizens. Municipality Gjorce Petrov has implemented various similar projects in the past, some of which in collaboration with IFIs, which implies that the municipality is able to implement large construction projects such as this one.

The project is relevant to the development objective of the Municipal Services Improvement Project (MSIP) because it is considered both as cost - efficient and cost – effective, over a long run and also useful for the environmental protection.

The cost-benefit analysis (CBA) showed the project is acceptable and desirable for implementation according to the methods used. In addition, the Project will cause significant unquantifiable benefits such as increasing the traffic safety and comfort, increasing the traffic capacity and communications, ensuring a feeling of security by pedestrians, enhancing the commercial activities, as well as extending the outdoor social and recreational activities for the residents living on the streets. Additionally, the implementation of the project is expected to lead towards reduction of the municipal costs for constant repairs of the streets. Once the project is implemented, the municipality will spend less money for repairs and reallocate them to other municipal services. The implementation of the project is also expected to increase the property value for houses and other residential or commercial objects on the streets, thus increasing the growth of revenues from property taxes.

The project will further build up the economic capacity of the municipality to improve its economic future and the quality of life for all citizens.

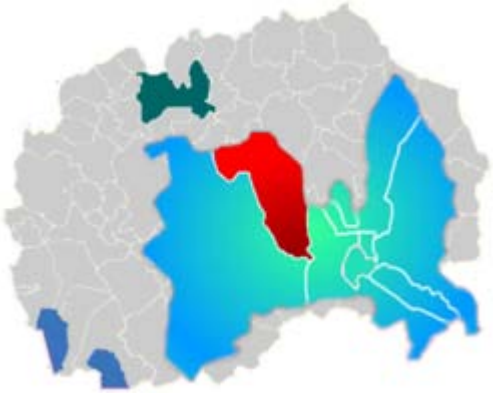
Furthermore, it is very difficult to relate the benefits of projects of this kind with the economic development and poverty levels in a certain municipality in a short-term. However, taking into account that good local infrastructure, contributes to providing better living conditions it also creates an environment that promotes economic growth. Therefore, given the fact that increasing the quality of the transport infrastructure is considered as crux for increased local economic development, this project will have a wide positive impact on the economic growth, local development and poverty alleviation in the Municipality Gjorce Petrov, not only in a short term but also in the longer-term perspective.

1 PROJECT DESCRIPTION

1.1 General Information on the Municipality Gjorce Petrov

Municipality Gjorce Petrov is one of ten constituent municipalities of the city of Skopje, the capital of the Republic of Macedonia. The Municipality is situated on the north-west part of the Skopje region (see picture 1) between the rivers Vardar and Lepenec along the border line with the Republic of Kosovo, spreading on an area of 67km^2 on an altitude of minimum

Picture 1. Municipality Gjorce Petrov within the city of Skopje



**Note: the municipal territory is marked in red*
Source: Ministry of local self – government of the Republic of Macedonia

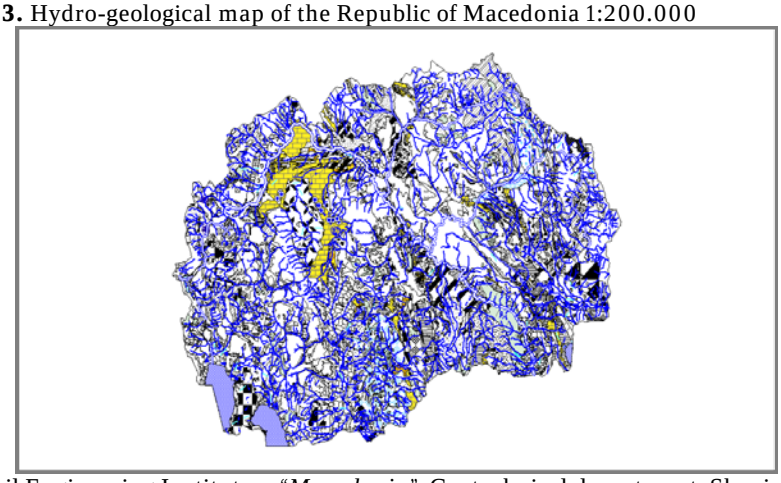
Picture 2. City of Skopje with its ten constituent municipalities

Note:* 1. Municipality Centar; 2. Municipality Gazi baba; 3. Municipality Aerodrom; 4. Municipality Cair; 5. Municipality Kisela Voda; 6. Municipality Butel; 7. Municipality Suto Orizari; 8. Municipality Karpos; **9. Municipality Gjorce Petrov; 10. Municipality Saray
Source: Ministry of local self – government of the Republic of Macedonia

260m to maximum 720m.

The border line with the Municipality Karpos is on the south-eastern part of the Municipality Gjorce Petrov, the borderline with the Municipality Saray is on the south-western part, while the borderline with the Municipality Cucer-Sandevo is on the eastern part. The Municipality has 41,634 inhabitants (revised Census data from 2005) and 12 local communities of which, the local communities (districts) of Gjorce Petrov, Dame Gruev, Deksion, Mirce Acev and Hrom are located in the urban area, while the other 7 local communities, Volkovo – Przino, Nikistani, Orman, Kisela Jabuka, Novo Selo, Kuckovo and Volkovo are located in the rural area of the municipality. This project is intended to be implemented in the urban area of the municipality, i.e. in the districts of Gjorce Petrov, Dame Gruev, Mirce Acev and Hrom (see picture 4 below).

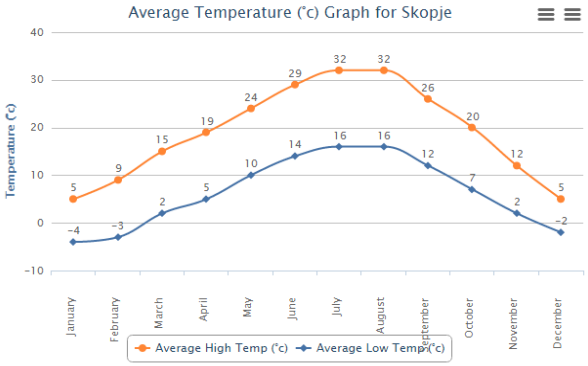
Picture 3. Hydro-geological map of the Republic of Macedonia 1:200.000



Source: Civil Engineering Institute – "*Macedonia*", Geotechnical department, Skopje 2010

The average annual minimum temperature is 6°C, while the average maximum temperature is 38°C, which classifies the area as hot and dry. Skopje area is part of the Mediterranean basin and thus, characterized by hot summers, and even at times very hot and dry, while winters are relatively mild to cool, wet winters. Therefore, the climate of Skopje is usually classified as continental sub-Mediterranean, while according to the Köppen climate classification, it has a humid subtropical climate (Cfa), with a mean annual temperature of 13.5°C. The summers are long, hot and humid, while the winters are short, relatively cold, and wet. Snowfalls are common in the winter period, but heavy snow accumulation is rare and the snowcover lasts only for a few days. In summer, temperatures are usually above 31°C and sometimes above 40 °C. In spring and autumn, the temperatures range from 15 to 24°C. In winter, the day temperatures are roughly 6°C, but at nights, they often fall below 0°C and sometimes below −10 °C. Skopje area is characterized by a largest cloudiness in the Republic of Macedonia after the Valley of Polog, with an average of 105.5 cloudy days per year. The average quantity of rainfalls is 500.7mm and occurrences of precipitation are evenly distributed throughout the year, being heaviest from October to December and from April to June.

Chart 1. Average temperature in the city of Skopje in 2013



Source: Hydrometheorological Centre of the Republic of Macedonia

1.2 Demographic and economic profile of the Municipality Gjorce Petrov

According to the revised 2005 Census, the total number of inhabitants is 41,634 with a natural growth rate of 4.1. The total number of households is 11,884, while the average number of households' members is 3.49. Additionally, the total number of dwellings is 13,886. There are 90km of local roads, 3 post offices and 88 primary health protection centres. Additionally, there is one high school and 7 primary schools where 3,276 children at the age of 7-14 attend. As regards economy, there are 1,649 active enterprises according to the State Statistical Office data. The rate of employment is 40%, while the unemployment rate 26.8%. The women activity rate is 47.7%. The main macroeconomic indicators of the Municipality Gjorce Petrov are provided in Table 1.

Table 1. Main macroeconomic indicators of the Municipality Gjorce Petrov*

Demography	Municipality Gjorce Petrov	City of Skopje	Republic of Macedonia
Total Population	41,634	506,926	2,022,547
Natural growth rate	4.1%	2.9%	2.5%
Total number of households	11,884	146,546	506,203
Average number of households members	3.49	3.45	3.58
Total number of dwellings	13,886	163,561	697,529
% of dwellings connected to the water supply system	94.1	96.5	85.5
% of dwellings connected to the sewerage system	72.2	84.9	59.8
% of dwellings connected to the public heating network	1.5	33.8	8
Infrastructure			
Local roads	90km	587km	9,471km
Primary health protection centres	88	1,075	3,793
Number of Post offices	3	66	n.a
Education			
Regular primary Schools in school year 2013/2014	7	94	1,046
Children at age 7-14 that attend school	3,276	53,586	195,311
Population literacy at age 10 and more	36,186	433,139	1,693,044
Economy			
Number of business subjects – active (as of 31.12.2009)	1,649	25,585	71,290
GDP per capita (US$)**	n.a	6,764	4,698
Employment			
Employment rate	40.0	39.1	40.6
Activity rate	54.7	55.3	57.2
Activity rate of women	47.7	41.0	36.1
Unemployment rate	26.8	29.3	29.0

Source: State Statistical Office, Revised Census Data 2005, other SSO reports, Municipality Gjorce Petrov
** Note: the data is for the Skopje planning region which constitute of the 10 constituent municipalities of the city of Skopje, as well as few gravitating municipalities around the city, i.e. Ilinden, Arachinovo, Cucer Sandevo, Studenichani, Zelenikovo, Petrovec and Sopiste.

Table 2. Age repartition

	Municipality Gjorce Petrov		City of Skopje		Republic of Macedonia	
Repartition	Number	Percent	Number	Percent	Number	Percent
0 - 4	2,248	5.4	30,097	5.9	122,757	6.1
5 – 9	2,484	6.0	32,788	6.5	143,184	7.1
10 – 14	2,869	6.9	35,942	7.1	160,339	7.9
15 – 19	3,189	7.7	38,117	7.5	165,422	8.2
20 – 24	3,109	7.5	40,111	7.9	161,945	8.0
25 – 29	3,213	7.7	39,973	7.9	153,461	7.6
30 - 34	3,075	7.4	38,700	7.6	148,281	7.3
35 - 39	2,956	7.1	36,900	7.3	149,837	7.4
40 - 44	3,192	7.7	35,361	7.0	146,902	7.3
45 - 49	3,410	8.2	37,152	7.3	142,688	7.1
50 - 54	3,207	7.7	37,044	7.3	127,760	6.3
55 - 59	2,389	5.7	27,497	5.4	95,234	4.7
60 - 64	2,096	5.0	24,283	4.8	89,822	4.4
65 - 69	1,724	4.1	21,500	4.2	84,443	4.2
70 – 74	1,194	2.9	14,906	2.9	61,969	3.1
75 – 79	738	1.8	9,906	2.0	40,384	2.0
80 – 84	357	0.9	4,484	0.9	18,975	0.9
Above 85	165	0.4	1,916	0.4	7,941	0.4
unknown	19	0.0	249	0.0	1,203	0.1
Total:	**41,634**	**100**	**506,926**	**100**	**2,022,547**	**100**

Source: State Statistical Office, Revised Census Data 2005

Table 2 represents the age distribution in the total population. The analysis of data shows that the age groups are mainly distributed in the age groups of 15 - 55. As it can be seen in table 3, 49.7% of the total population in the municipality are male, while 50.3% are female, which means that there is nearly an equal representation of male and female in the total population.

Table 3. Gender repartition

	Municipality Gjorce Petrov		City of Skopje		Republic of Macedonia	
	Male	Female	Male	Female	Male	Female
Number	20,677	20,957	249,689	257,237	1,015,377	1,007,170
%	49.7	50.3	49.3	50.7	50.2	49.8

Source: State Statistical Office, Revised Census Data 2005

The prevailing population is the urban one, it means that around 72.1% of the total population is settled in the urban area of Gjorce Petrov (table 4).

Table 4. Urban repartition

	Municipality Gjorce Petrov		Republic of Macedonia	
Repartition	Number	Percent	Number	Percent
Urban	30,000	72.1	1,169,032	57.8
Rural	11,634	28.9	853,515	42.2
Total	41,634	100	2,022,547	100

Source: State Statistical Office and Municipality Gjorce Petrov

In relation to the ethnic affiliation of the citizens, the prevailing population in the Municipality Gjorce Petrov are Macedonians, representing 85% of the total population (table 5). It is important to note that each of the above ethnicities speaks its own languages in the informal communication. The officially used language in this municipality however, is the Macedonian with its Cyrillic alphabet.

Table 5. Population repartition

	Municipality Gjorce Petrov		City of Skopje		Republic of Macedonia	
Repartition	Number	Percent	Number	Percent	Number	Percent
Macedonians	35,455	85	338,538	67	1,297,981	64
Serbs	1,730	4	14,298	3	35,939	2
Roma	1,249	3	23,475	5	53,879	3
Vlachs	109	0	2,557	1	9,695	0
Turks	368	1	8,595	2	77,959	4
Bosniacs	489	1	7,585	1	17,018	1
Albanians	1,597	4	103,891	20	509,083	25
Others	637	2	8,167	2	20,993	1
Total	**41,634**	**100**	**506,926**	**100**	**2,022,547**	**100**

Source: State Statistical Office, Revised Census Data 2005

Table 6. Live births

		2010	2011	2012	2013
Municipality of Gjorce Petrov	Male	230	224	200	224
	Female	215	216	222	207
	Total	445	440	422	431
City of Skopje	Male	3,502	3,370	3,428	3,435
	Female	3,201	3,145	3,156	3,280
	Total	6,703	6,515	6,584	6,715
Republic of Macedonia	Male	12,631	11,752	12,243	12,093
	Female	11,665	11,018	11,325	11,045
	Total	24,296	22,270	23,568	23,138

Source: State Statistical Office

According to the data available, the number of live births in the Municipality Gjorce Petrov varies during the last 4 years (table 6).

Economic profile of the Municipality Gjorce Petrov

Additionally, according to the SSO data, private enterprises are operating mainly in wholesale and retail trade; repair of vehicles, motorcycles and personal and household goods (579), followed by manufacturing (197), transport storage and communication (185), construction (151), professional, scientific and technical activities (139), other services (110), and health and social work (82).

Table 7. Active business subjects by sectors (as of 31.12.2013)*

Active business subjects by sectors	number	in %
Wholesale and retail trade; repair of vehicles, motorcycles and personal and household goods	579	35.1%
Manufacturing	197	12.0%
Transport, storage and communication	185	11.2%
Construction	151	9.2%
Professional, scientific and technical activities	139	8.4%
Other services	110	6.7%
Health and social work	82	5.0%
Hotels and restaurants	61	3.7%
Information and Communications	39	2.4%
Administrative and supporting services	25	1.5%
Arts, entertainment and recreation	24	1.5%
Education	14	0.9%
Agriculture, hunting and forestry	10	0.6%
Real estate, renting and business activities	10	0.6%
Water supply; disposing of sewage, waste management; rehabilitation of the environment	9	0.6%
Financial services and insurance	8	0.5%
Mining and quarrying	4	0.2%
Electricity, gas, steam and air conditioning	1	0.1%
Public administration and defence; compulsory social protection	1	0.1%
Total	**1,649**	**100%**

Source: State Statistical Office *Note: last available data

When analysing the labour market, the available data show that 18,584 of the municipal population is considered economically active, of which 13,586 are employed (57% male, 43% female), while 4,998 are unemployed. From the total number of the unemployed persons, 53% are male, while 47% are female.

Table 8. Activity rates

		Economically active			Economically inactive	Total
		All	Employed	Unemployed		
Municipality Gjorce Petrov	Number	18,584	13,586	4,998	15,352	**33,936**
	Percent	55	40	15	45	**100**
City of Skopje	Number	200,937	143,745	57,192	205,455	**406,392**
	Percent	49	72	28	51	**100**
Republic of Macedonia	Number	743,676	460,544	283,132	833,325	**1,577,001**
	Percent	47	62	38	53	**100**

Source: State Statistical Office, Revised Census Data 2005

Finally, 15,352 persons are considered economically inactive, where 41% are male, while 58% are female.

1.3 General description of the project

In general, the project assumes reconstruction of various streets in the urban districts of the Municipality Gjorce Petrov..

Subject to this PAD are 14 streets ("Avstraliska", "Anton Cehov", "Anton Keckarov 1", "Jadranska", "Isaija Madzovski", "Brakja Galevi", "Via Egnatia", "Aleksa Demnievski 3", "Aleksa Demnievski 4", "Aleksa Demnievski 5", "Zlate Mihajlovski", "Crnogorska 2", "Ibe Palikukja" and "Krsto Rakovski" street) located in the urban districts of Gjorce Petrov, Hrom, Mirce Acev and Dame Gruev (picture 4 below). The technical design (Chapter 3) assumes reconstruction on the surface of all of the 14 streets in addition to street lighting, stormwater and water supply network installation on some of the 14 streets subject to the PAD. Namely, the basic project design presents division of works into the following categories: road works, street lighting installation works, construction of stormwater drains and water supply works. The division of works by categories and by street is presented in Table 9 below. The total length of the streets that are subject to this Appraisal is 2,858.2m, varying in length from 100m to 350m, while the width of the street varies from 5m to 6m.

According to the data available, 1,921 inhabitants live on these streets, which is 4.6% of the total population in the Municipality Gjorce Petrov. The streets are primarily residential, but with frequent traffic. In addition, it is worth mentioning that there are also some important public objects located on these streets, such as one kindergarten – "Rosica" (on "Isaija Madzovski" street), municipal library of "Brakja Miladinovci", Specialized Hospital for Nephrology and Dialysis – Diamed and municipal registry office (on "Via Egnatia" street). In addition, "Crnogorska 2" street is the main municipal street that leads to one of the two city's public cemetery located in the Municipality Gjorce Petrov.

According to the information provided by the municipality, the above mentioned streets are constructed mainly after the vast earthquake that hit the city of Skopje in 1963 and they are all in a very poor condition. The infrastructure on the streets has fallen into such disrepair that an expansive reconstruction is required, so as to extend their useful life. Additionally, 9 out of total 14 streets subject to the PAD are streets where there is no existing upper layer and adequate installations (storm water drains, street lighting) which would classify the streets as modern and thus, satisfactory for the needs of the citizens in the local community.

The above implies that the implementation of this project will have a wider positive impact, not only for the local community living and quality of life in the Municipality Gjorce Petrov, but the City of Skopje as well.

The streets are part of the Detailed Local Urban Plans (DLUPs hereinafter) for the urban districts which are adopted by the municipal council and as such, are a part of the General Spatial Plan (GSP) of the City of Skopje which is adopted by the city's council. The DLUPs of the urban districts were used as a base for elaboration of the technical documentation of the project.

Table 9. Division of works by categories and streets

Division of works by categories	Street
Road works (14 streets)	"Avstraliska", "Anton Cehov", "Anton Keckarov 1", "Jadranska", "Isaija Madzovski", "Brakja Galevi", "Via Egnatia", "Aleksa Demnievski 3", "Aleksa Demnievski 4", "Aleksa Demnievski 5", "Zlate Mihajlovski", "Crnogorska 2", "Ibe Palikukja", "Krsto Rakovski" street
Street lighting installation works (10 streets)	"Avstraliska", "Anton Cehov", "Anton Keckarov 1", "Jadranska", "Via Egnatia", "Aleksa Demnievski 3", "Aleksa Demnievski 4", "Aleksa Demnievski 5", "Crnogorska 2" and "Ibe Palikukja"
Construction of storm water drains (5 streets)	"Avstraliska", "Anton Cehov", "Jadranska" "Aleksa Demnievski 5", and "Zlate Mihajlovski"
Water supply works (2 streets)	"Anton Keckarov 1" and "Jadranska"

Source: project's technical design

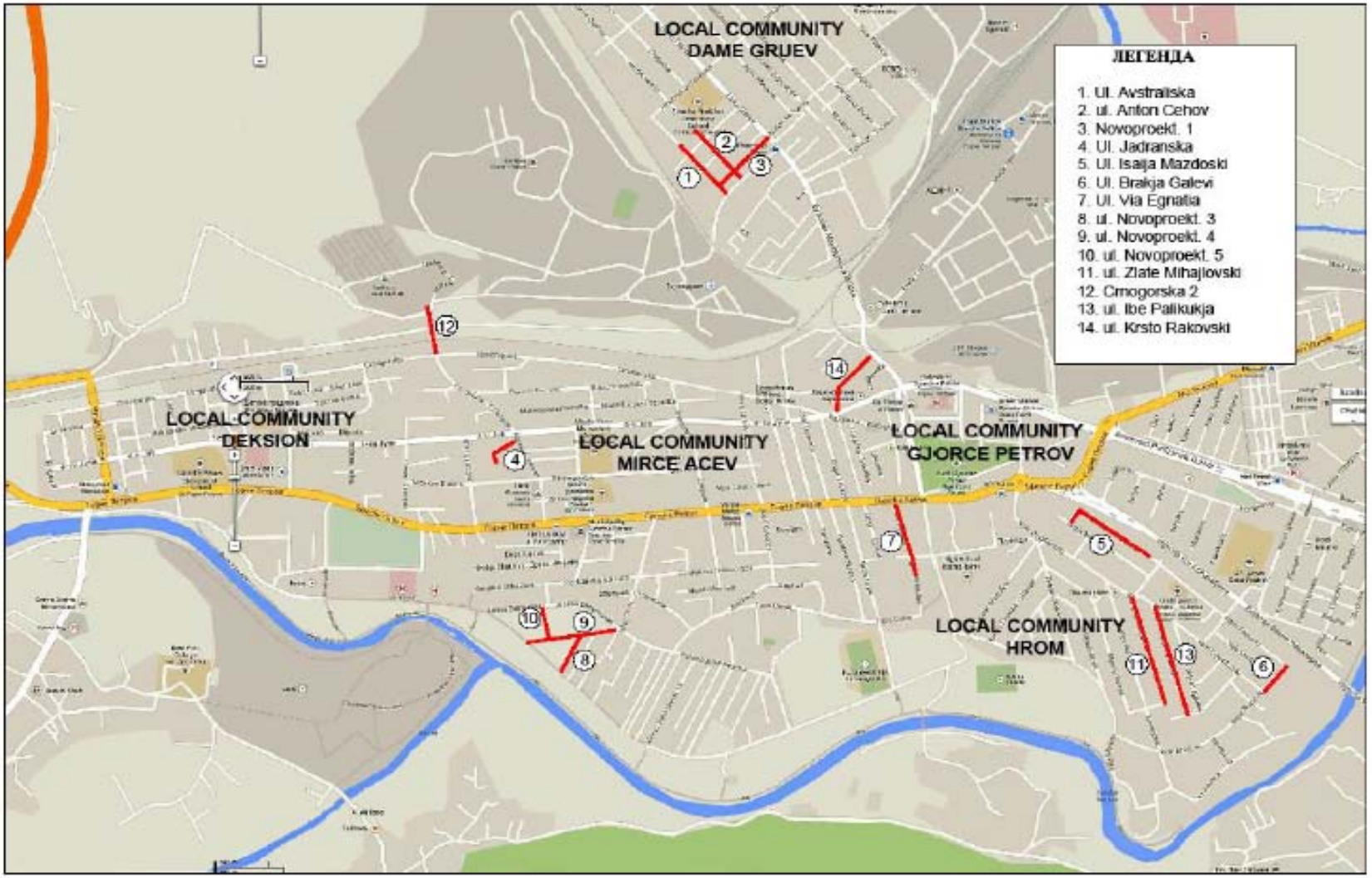
The main purpose of the proposed technical solution is to provide a long range improvement of the streets by maximizing the technical life of the surface, thus meeting the needs of the community in the Municipality Gjorce Petrov. The objectives of the technical solution of the project are as follows:

- to provide traffic comfort, convenience and safety for the pedestrians and traffic by improving the surface on the streets and sidewalks, as well as their carrying characteristics;
- to ensure that stormwater inundation of residential and commercial areas located on the flood–prone “Avstraliska”, “Anton Cehov”, “Jadranska” , “Aleksa Demnievski 5”, and “Zlate Mihajlovski” street occurs only on very rare occasions and that the velocity/depth conditions during these events are below prescribed limits;
- to provide adequate street lighting to satisfy various social, recreational and residential needs of the citizens who reside on the streets of “Avstraliska”, “Anton Cehov”, “Anton Keckarov 1”, “Jadranska”, “Via Egnatia”, “Aleksa Demnievski 3”, “Aleksa Demnievski 4”, “Aleksa Demnievski 5”, “Crnogorska 2” and “Ibe Palikukja”;
- to replace the current water pipes on the streets of “Anton Keckarov 1” and “Jadranska” in order to improve the water supply services for the citizens living on these streets.

The benefits expected from the implementation of this project are related to increasing the traffic safety and comfort, increasing the traffic capacity and communications, ensuring a feeling of security by pedestrians, enhancing the commercial activities, as well as extending the outdoor social and recreational activities for the residents living on the streets.

The present condition of the streets causes frequent interruption of transport services and forces the citizens to search for alternative routes, which ultimately results in fall of productivity. Additionally, the implementation of the project is expected to lead towards reduction of the municipal costs for constant repairs of the streets. Once the project is implemented, the municipality will spend less money for repairs and reallocate them to other municipal services. The implementation of the project is also expected to increase the property value for houses and other residential or commercial objects on the streets, thus increasing the growth of revenues from property taxes.

Picture 4. The municipal area concerned with the project



Source: Municipality Gjorce Petrov

**Note:* The streets that are subject of this appraisal are marked in red.

Strategic interest of the Municipality Gjorce Petrov to implement the project

If implemented, the project will contribute towards accomplishment of the strategic goals in the area of infrastructure of the Municipality Gjorce Petrov. The Mayor and the municipal administration strive to achieve full coverage of a transport, communal (utility) and electricity infrastructure throughout the municipal territory.

During 2011, Municipality Gjorce Petrov with its own resources developed a Strategy on Local Economic Development covering the period of 2011–2018[1]. According to the document, among the highest strategic priorities in the area of improvement of the municipal infrastructure are the following:

- Improvement of the infrastructure of the municipality to make it easier for businesses to operate (i.e. houses, transport, roads, water and electricity etc) and thus, creating an environment that promotes economic growth and better living conditions for the citizens.
- Full coverage of stormwater network throughout the municipal territory;
- Improvement of existing water supply network and construction of new one where it is deemed necessary; and
- Full coverage of street lighting throughout the municipal territory.

Moreover, the streets subject to this PAD are identified as priority tasks and therefore technical documentation was prepared. It can be inferred that the achievement of the above elaborated goal will undoubtedly contribute towards improvement of the quality of life and well – being of all of the citizens of the Municipality Gjorce Petrov. Therefore, one might claim that the project meets long run development municipal objectives. Based on the strategic document the municipal council made decision on project financing with MSIP loan.

Knowledge and experience of the Municipality Gjorce Petrov to implement the project

The knowledge and experience needed for successful implementation of the project are related to project management, technical knowledge and execution of procurement practices. The Municipality Gjorce Petrov, the competent authority in this project, has participated in a wide variety of large construction or other type of projects with different investors, whereby the Municipality allocated the land and provided the investors with technical services, and gained in return new businesses on its territory or improved housing facilities, schooling facilities, wastewater networks and treatment.

The Municipality has implemented several other projects for improving municipal services supported from bilateral and multilateral development assistance. Some of the most notable capital investments (construction of waste water treatment plant, reconstruction of various streets, construction of faecal infrastructure, construction of local roads in the rural parts of the municipality, reconstruction of primary schools, recycling of waste etc.) were financed by the European Bank for Reconstruction and Development, European Investment Bank, UNDP, USAID, Swiss Agency for Development and Cooperation, Slovenian Government and others.

Moreover, during the period of 2012-2014, Municipality Gjorce Petrov has successfully implemented a project involving reconstruction and rehabilitation of various streets in the urban districts of Mirce Acev, Gjorce Petrov, Hrom, Deksion and Dame Gruev which was financed from the World Bank MSIP funds to the Government of the Republic of Macedonia.

[1] Strategy for Local Economic Development (2011 – 2018), Municipality of Gjorce Petrov, 2011.

Based on experience with other projects and the overall existing local road and streets network in the Municipality Gjorce Petrov, the municipal administration has the capacity to maintain the streets after the implementation of the project. In addition, the municipality has an administration which has experience to monitor the progress of the project.

It can be inferred that the Municipality is able to contribute with the necessary experience to large construction projects such as the one subject to this PAD, i.e. reconstruction of various streets in the urban districts of the Municipality Gjorce Petrov envisaged to be financed from the World Bank MSIP funds to the Government of the Republic of Macedonia.

1.4 Concluding remarks

The project is in-line with the Strategy for Local Economic Development (2011 – 2018) and it will contribute towards achieving the vision of the municipal administration for providing full coverage of a transport, communal and electricity network throughout the municipal territory.

The relevance of the project results from the fact that 4.6% of the total population is directly influenced by negative implications of the inadequate surface of streets and sidewalks, in addition to stormwater due to lack of stormwater network, inadequate street lighting and inadequate water supply service.

In addition, the relevance of the project stems from the fact that there some very important public objects (kindergarten, municipal library, specialized hospital for nephrology and dialysis, municipal registry office) are located on some of the streets subject to the PAD, the implementation of the project is expected to have a wider positive impact on the local community living and quality of life in Municipality Gjorce Petrov, as well as the city Skopje in general.

The proposed technical solution is in-line with the existing standards and regulations for this kind of projects. The knowledge and experience needed for successful implementation of the project are related to project management, technical knowledge and execution of procurement practices. Municipality Gjorce Petrov has implemented various similar projects in the past, some of which in collaboration with IFIs, which implies that the Municipality is able to implement large construction projects such as the reconstruction of various streets in the urban districts of the Municipality Gjorce Petrov.

2 SOCIAL IMPACT

The sociological study refers to five areas: social diversity and gender, institutions, rules and behavior, stakeholders, participation, social risk. The Assessment anticipated field research to get available information on interests and attitudes of stakeholders. The time constraint, did not admit field application of all instruments for data collection such as survey, meetings with focus groups, thus the research is reduced to relevant secondary data from the Municipality Gjorce Petrov and face-to-face interviews with three officials (Mayor, Head of the Department for Urban and Communal Utilities and Head of Department for financial issues in the Municipality Gjorce Petrov). The interviewees gave their opinions about the role and influence of various stakeholders in the process of decision making relevant to the project, as well as the level of information, capacities and readiness of the citizens to support the project. Hence, the project idea was discussed with the citizens in public consultations. Second, the project was presented to the Council and got its approval.

2.1 Social diversity and gender

Demographic analysis presented in Chapter 1 allows formulating the following conclusions:

- The age groups are mainly distributed in the age of 20–55. The data show that this is the case both on a city of Skopje's level and on a country level as well;
- There is nearly equal representation of male and female in the total population in the municipality. The data for the municipality reflect the situation in the city of Skopje's level and on a country level too;
- The prevailing population is the urban one (72.1% of the total population in the municipality is located in the urban area);
- The prevailing nationality in the Municipality Gjorce Petrov is the Macedonian, representing 85% of the total population;
- Each of the ethnicities in the municipality speaks its own languages in the informal communication. The officially used language in the municipality is Macedonian with its Cyrillic alphabet;
- 94.1% of the households are connected to the public water supply system, opposite to 96.5% on the city of Skopje's level and 85.5% on a country's level;
- 72.2% of the households live in dwellings connected to the public sewerage system, opposite to 84.9% of the city's level and 59.8% on a country's level;
- 1.5% of the households live in dwellings connected to the public heating system, opposite to 33.8% on the city's level and 8% on a country's level;
- There are 1,649 active business subjects in the municipality, opposite to 25,585 active enterprises in the city of Skopje and 71,290 in the country;
- The unemployment rate in the municipality is 26.8%, opposite to 29.3% in the city of Skopje and 29% in the country.

Asked about the number of beneficiaries of the projects, the interviewees expressed their opinion that given the fact that some very important public objects (kindergarten, dialysis centre, municipal registry, public cemetery) are located on the some of the streets subject to the PAD, all of the citizens in the municipality can be considered beneficiaries of the project. They also stressed that the impact would be even wider since not only the citizens in the Municipality Gjorce Petrov, but also the citizens from other municipalities comprising the city of Skopje use the services of these public objects. However, 1,921 inhabitants who live on these streets (which is 4.6% of the total population in the Municipality Gjorce Petrov) can be considered direct beneficiaries of the project.

2.2 Stakeholders

There are several important stakeholders of the project. The interviewees fully agree that the most influential participants in the process of decision making at the municipal level are the Mayor and the Municipal Council. In addition, potentially influential stakeholder in Gjorce Petrov is the business sector. The NGOs have some influence, but since this project will promote improvement of the quality of life in the Municipality Gjorce Petrov, the NGOs are expected to be in favour of the project.

According to the interviewees, the citizens are obviously the most important stakeholders. They have frequently submitted their complaints about the current situation in the streets that are subject to this Appraisal.

With regards to citizens' support of the project, it is worth mentioning that during 2011 under the initiative of the Municipality Gjorce Petrov, an analysis of the business environment and the overall quality of life and communal living in the Municipality Gjorce Petrov has been made. This analysis was later used for creation of measures and projects for improving the local economic development in the Municipality Gjorce Petrov. A relevant part of the methodology for this analysis comprised of a survey that was undertaken on the municipal territory during the period of May/June of 2011, where various business entities and citizens were interviewed. According to the results of the questionnaire, the citizens and the business entities have chosen the transport infrastructure (road and street network) and communal infrastructure to be features of a highest importance for improvement of the overall community living in the Municipality Gjorce Petrov (table 10 below). This adds to the level of relevance of the project.

Table 10. Features which will contribute towards improvement of the community living according to their level of importance

Feature	of high importance	of little importance	Not very important	Not important
Transport infrastructure (road and street network)	60	7	2	1
Communal infrastructure	59	8	3	2
Public services	49	14	6	1
Parks and green areas	45	16	6	3
Recreational utilities	28	20	8	4

Source: "Strategy for Local Economic Development of the Municipality Gjorce Petrov 2011-2018"

Moreover, it is worth mentioning that during the last week of September, 2014 (from 24.09.2014 to 29.09.2014), several meetings were held in the premises of all urban and rural local communities in the municipality with representatives and citizens from the communities. Municipality Gjorce Petrov has established a practice of organizing yearly public debates about priorities and problems of the citizens which will later be addressed with relevant measures and activities incorporated in different municipal programmes (communal, education, local economic development, environment etc.). Thereafter, these programmes are then used as base documents for formulation of the municipal budget. This practice can be considered sort of a '*voice of the citizens*' of the Municipality Gjorce Petrov since it enables them to directly influence the measures and activities undertaken by the municipal administration for solving community problems.

The entrance on these meetings was free to anyone interested, but invitations were sent via the local communities. Mayor and Heads of relevant departments (urban and communal utility department, education, environment, financial issues, legal issues, local economic development issues etc) represented the municipal administration. Presidents of the local communities were also present as well as many citizens depending in which local community premises the meeting was held.

Municipality Gjorce Petrov has prepared minutes of each meeting and summarized the measures proposed by the citizens in accompanying annex tables. The citizens were raising questions about when the streets subjects of this PAD will be reconstructed as the streets are either highly damaged or without upper layer which makes it difficult to access their homes, causes traffic discomfort and inconvenience for the pedestrians and traffic. The questions referred to the planned technical solution and activities. According to the minutes, the reconstruction of the 14 streets subject of this PAD is recognized as highest priorities for the citizens of the local urban communities of Mirce Acev, Gjorce Petrov, Hrom and Dame Gruev. The perception of the project. i.e. intended reconstruction of the streets was positive and other representatives agreed with selection of priorities.

Mayor Mr. Sokol Mitrovski and municipal representatives Mr. Cele Ristevski and Ms. Dragica Todorovska elaborated that the municipality has already prepared the technical documentation for reconstruction of these streets. They presented the technical solution and financial conditions of the intended sub-loan and informed about the proposed timeframe of project implementation. Citizens are fully informed of the project, its goals, costs and consequences.

Based on these discussions, on November 25th, 2014 the municipal council approved the project and its financing with borrowing. The municipal council comprises 23 councillors representing different political parties. The interviewees stated that the councillors support the project, which means that a political consensus is achieved on this issue and that the councillors are considering this project one of the top priorities of the Municipality Gjorce Petrov.

It is decided that the loan will be repaid from the municipal budget in the following years. The answers of the interviewees were unanimous that there is no need for any kind of voluntary participation or financial contribution of the citizens.

The streets subject to this PAD are part of the adopted DLUPs for the Districts of Gjorce Petrov, Hrom, Mirce Acev and Dame Gruev. The DLUPs have been prepared over a long period and they were also a subject of a public debate.

Based on the support expressed by citizens during the public consultations and Council decision, one may conclude that there is no resistance to the project and it has support of all citizens and their representatives.

2.3 Social risks

High social risks for carrying out the project cannot be perceived.

One very important question that was discussed during the interviews is related to potential *feeling of inequality among the citizens and possibility they could endanger the realization of the project in order to get some personal or group benefits?*" The interviewees stated that it might happen that the realization of this project causes a slight discontent among the population in the rural areas, simply because they will not be direct beneficiaries of the project. However, taking into consideration that the citizens highlighted the improvement of the transportation network to contribute mostly to the improvement of the quality of life in the Municipality in general (as shown in the table 10 above), they should be in favour of the project.

It is also important to state that the municipality has the intention to improve the transportation network in all of the settlements. It solves the problems that were persistent for many years. Those, who will be not covered by this project, can expect that will be provided with such public good subsequently. With the implementation of this strategically important project, the municipality is sending a strong signal that plans to solve this issue on the overall municipal area. The interviewees unanimously expressed their opinion that any special technical or economic obstacles and difficulties in the maintenance of the project could not be expected. They referred to both the implementation phase and the operation's and maintenance phase.

The project is considered cost-effective over a long run and will contribute to improvement in community standards of living in Municipality Gjorce Petrov in general, and specifically in Districts of Gjorce Petrov, Hrom, Mirce Acev and Dame Gruev. The project is priority for the public administration and citizens. The population is not expected to contribute financially. The project is not subject to resettlement issues. No expropriation is expected to be raised during the implementation of the project.

2.4 Other considerations

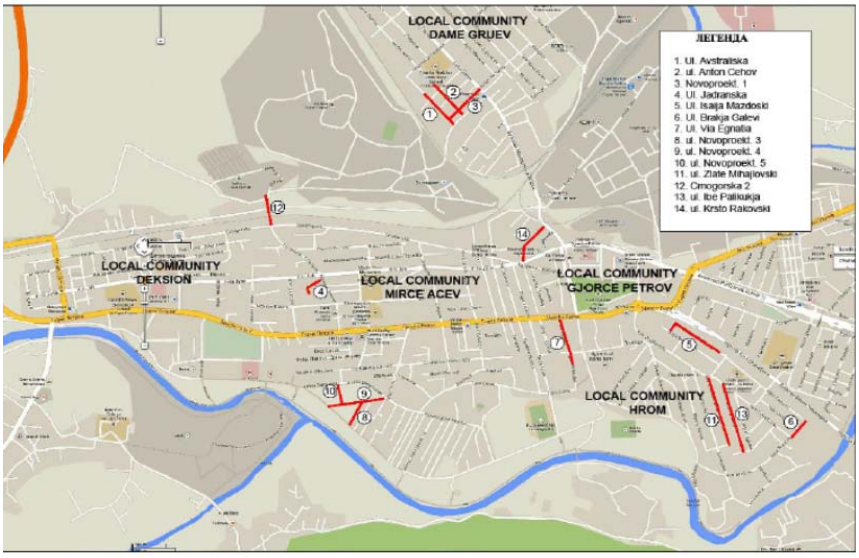
The reconstruction of the streets in the urban districts of the Municipality Gjorce Petrov that are subject to this Appraisal is expected to improve the overall community living in the Municipality Gjorce Petrov. The implementation of this project is expected to create savings in the item of the municipal budget for the streets and road maintenance on the long-term basis. The implementation of the project is also expected to improve local public finances in a sense that once the streets are being reconstructed, the Municipality will spend less money for repairs and reallocate them to other municipal services. Moreover, increased property value as a result of the improved infrastructure will result in growth of revenues from property taxes.

2.5 Concluding remarks

The relevance of the project stems from cost-efficiency and cost-effectiveness over a long run and also its goal for the improvement of the community living in the Municipality Gjorce Petrov. Its implementation is considered the highest municipal priority for the public administration and what is more important, for the citizens. As presented in the analysis above all of the stakeholders feel very motivated by the realization of the project. The project does not bear very high financial burden in comparison to the Budget and the population is not placed into a position to contribute financially, so there is no cause for conflict on this point. The project is not subject to resettlement issues and no expropriation is expected to be raised during the implementation of the project.

3 ENVIRONMENTAL IMPACT

The main objective of the project is to reconstruct the following streets in the Municipality Gjorce Petrov: “Avstraliska”, “Anton Cehov”, “Anton Keckarov 1”, “Jadranska”, “Isaija Madzovski”, “Brakja Galevi”, “Via Egnatia”, “Aleksa Demnievski 3”, “Aleksa Demnievski 4”, “Aleksa Demnievski 5”, “Zlate Mihajlovski”, “Crnogorska 2”, “Ibe Palikukja” and “Krsto Rakovski”. All streets are located in 4 urban districts (Hrom, Mirce Acev, Gjorce Petrov and Dame Gruev) in the Municipality Gjorce Petrov presented on the following picture.



Map of Municipality of Gjorce Petrov with marked streets relevant for the project

The project assumes reconstruction and/or rehabilitation of various streets in the urban districts of the Municipality Gjorce Petrov, in addition to work on water supply network on two streets, construction of storm water drains on 5 streets and street lighting installation works on 10 streets. The relevant project activities per each street are presented on Table below. The total length of the streets that are subject to this appraisal is 2,858.2m, varying in length from 100m to 350m, while the width of the street varies from 5m to 6m.

Table 11: Type of project activities per street

Street	Type of project activities			
	Reconstruction or Rehabilitation works	Street lighting installation works	Construction of storm water drains	Water supply works
“Avstraliska”	X	X	X	
“Anton Cehov”	X	X	X	
“Anton Keckarov 1”	X	X		X
“Jadranska”	X	X	X	X
“Isaija Madzovski”	X			
“Brakja Galevi”	X			
“Via Egnatia”	X	X		

Street	Type of project activities			
	Reconstruction or Rehabilitation works	Street lighting installation works	Construction of storm water drains	Water supply works
“Aleksa Demnievski 3”	X	X		
“Aleksa Demnievski 4”,	X	X		
“Aleksa Demnievski 5”	X	X	X	
“Zlate Mihajlovski”	X		X	
“Crnogorska 2”,	X	X		
“Ibe Palikukja”	X	X		
“Krsto Rakovski”	X			

The main project activities will include: a) removing of the existing asphalt; b) setting of a new two-layer (or one-layer) asphalt and road base coarse layer; c) setting the kerbstones and sidewalks on both sides of the streets with variable width; d) replacement of existing water supply network with new pipes; e) construction of new storm water network where it is not exists; f) placement of the street lighting on one side of the streets on galvanized steel with a high pressure sodium bulbs SAP-150W.

All streets are located in the very urban districts in the municipality. These are residential areas, so, along the streets the family houses are found with direct entrance from the related streets. The population living along and near the streets will be the most vulnerable groups. There are also some important public building located along these streets, such as one kindergarten – “Rosica” (on “Isaija Madzovski” street), municipal library of “Brakja Miladinovci”, Specialized Hospital for Nephrology and Dialysis – Diamed and municipal registry office (on “Via Egnatia” street). In addition, “Crnogorska 2” street is the main municipal street that leads to one of the two city’s public cemetery located in the Municipality Gjorce Petrov.

In or near the project location there are no registered endemic, protected and endangered animal or plant species or protected areas and habitats that could be negatively affected by the construction activities. No cultural heritage site is in the vicinity.

Improper waste management with different waste streams and noise disturbance from the outdoor equipment and pollution of ambient air (mainly dust in the spring/summer period when the works will start) will cause the major environmental and health impacts. The improper waste disposal near the river Vardar bank could cause water pollution. During the reconstruction of streets in the urban community Mirce Acev, any dumping or waste disposal near river Vardar is strictly prohibited.

The impacts are minor and with very locally significance.

In the operational phase of the streets, a possible occurrence of crashes and accidents associated with: traffic accidents, accidents at traffic participants carrying dangerous substances. Moreover, spills of hazardous substances, fires, etc. may occur.

Some of the different sub-projects (local streets reconstruction or rehabilitation works, street lighting installation works, construction of storm water drains and water supply works) could be implemented in parallel by specialized team of workers on the same location, so the close communication and good coordination among the teams is essential for in time and quality accomplishment of works. The overall Plan for implementation of reconstruction activities need to be developed based on the all sub-project Dynamic Plans. The Plan will synchronize the planned start and finish of each sub-projects as well as the human resources and vehicles, mechanization and equipment on the each site position. The overall Plan for implementation of reconstruction activities need to be agreed between the Contractor and eventually engaged Sub-contractors, Supervisor and municipal staff and all stakeholders need to respect the agreed

conditions for work. The regular meetings should be organized (initiated by the PM from the Municipality of Gjorce Petrov) between all involved in sub-projects implementation discussing the progress of each phase of sub-projects and the planning of next phase need to be done. The frequency of regular meetings will be agreed at the beginning (the recommendation is to be on weekly or two week period).

The proper waste management and keeping noise level below the max. level (40dB during the night and 50dB during the day and evening) will be crucial to deal with during the construction works. Different waste streams (municipal, hazardous and non-hazardous waste) could be found on the reconstruction sites, so the compliance with the waste hierarchy principles is essential. The Contractor needs to communicate with the municipal staff at the very beginning of the project start in order to receive the instructions where to dispose the inert waste. The Contract with authorized company/ies for hazardous waste need to be signed (if any hazardous waste occurs). The evidence - keeping records of temporary and final disposal of all waste streams is also very important.

Because the project activities will be implemented in urban part of the municipality, the adoption of developed Traffic Management Plan (including the horizontal and vertical signalisation for drivers and pedestrian safety) is essential prior the start of the activities and it need to be communicate among municipal staff, Contractor and Supervisor. The Plan should include the re-routing directions and works time schedule. The public announcement needs to be launched (it could be done via local newspaper, municipality notice board, municipality web page and/or city radio stations) about start-up of works on related street. This is very important especially prior the asphalting of the streets.

The entrance and exit from the family houses and parking of the households vehicles need to be solved as well prior works start.

Air emissions that may occur during the implementation of sub-projects are from the phase of reconstruction of the streets and other activities and emissions from vehicles in the phase of streets use. In the reconstruction phase of the streets and water supply and storm water networks, sources of air pollution are construction machinery (trucks and excavators), which will be used for supply of raw material and pipes, excavation of soil, scrape the asphalt, etc. The dust management measures should be implemented as well in order to reduce the PM (particulate matters – dust) emissions.

In order to minimize the negative impacts on the safety of workers, drivers and the population living near the construction site and pedestrians passing along the streets, the Contractor should compulsory provide fencing, marking and putting signs on the construction site. The prohibition of entry into the reconstruction sites in order to prevent the possibility of injury and causing accidents is essential and should be done with alert signs placed on the construction site

The good construction practice could cover almost all mitigation measures proposed mainly to overcome the OH&S risks and community risks that could appear because of urban area and surrounding of the project sites. The usage of personal protective equipment for workers is obligatory as well.

The Environmental Impact Assessment Report for the Project “Reconstruction of various streets in the urban districts of the Municipality Gjorce Petrov – 2nd phase” was prepared by the consultancy company “CeProSard” Skopje according the national legislation and the Major of the City of Skopje issued the Decision for adoption in December 2014.

All mitigation measures and monitoring parameters listed in the Environmental Mitigation Plan and Monitoring Plan (EMPs) as a part of Project Appraisal Document for the Project “Rehabilitation and reconstruction of various streets in the urban districts of the Municipality of Gjorce Petrov” should be followed as well as the measures proposed in the adopted EIA Report.

The measures that should be apply in order to protect, avoid, mitigate the adverse impacts of the all planed sub-projects are provided within the following Environmental Mitigation Plan. The main responsibility for implementation of the mitigation measures lay to the Sub-contractor and Supervisor (nominated by the Municipality of Gjorce Petrov) on daily basis. Some of the measures should be applied by the municipality staff (announcement of the traffic regime – very important as it is an urban area, recording the waste quantities), CSE ”Komunalna higiena” dealing with waste management CSE ”Vodovod i kanalizacija” dealing with drinking water supply and sewage water and storm water networks.

The Monitoring Plan presents the frequency of monitoring and main responsibilities among all involved during the Project implementation and operational phase.

The relevant Environmental Mitigation Plan and Monitoring Plan are provided in following Tables.

Table 12. MITIGATION PLAN

Potential impact	Impact scale	Proposed mitigation measures	Responsibility
Project activity: Set the protective signalization for achieving safe transport of the route and the connecting streets - under reconstruction			
Possible negative social and health impact on the population, drivers and workers because: • Lack of signs placed on security measures at the beginning of reconstruction work • Injuries occur because of passage near the construction site along the route • No established standards and procedures that comply with health and safety at work	Local / within the municipality / short time during the reconstruction	• Development of synchronized (according the Dynamic plan of each sub-project timetable) overall Plan for implementation of reconstruction activities; • The overall Plan for implementation of reconstruction activities need to be agreed between the Contractor and Sub-contractors, Supervisor and municipal staff and reviewed on regular base (e.g. weekly/two week period); • Preparation and implementation of Traffic management Plan together with the municipality staff; • Information through local media/local newsletter for activities related to construction activities – beginning and finishing with work every day and certain location of the activities, working time frame and traffic access to other streets • Providing adequate marking of the construction site • Ensuring warning tapes and signs; • Not allowed entrance for unemployment in the site where the construction activities are provided; • Measures to protect the safety and health of workers (first aid, protective clothing for workers, appropriate machinery and tools)	Contractor, Supervision Municipality staff (Communal inspector / Environmental inspector / Traffic engineer)
Project activity: Reconstruction of streets, construction of water and storm water networks and street lighting			
Air emissions Rehabilitation activities will initiate creation of gases and dust particles suspended: • fugitive dust emission during cutting of existing asphalt on both sides of the channel through which the pipeline will be laid; • fugitive emission of dust for load and transport of dig material and disposal of asphalt; • fugitive emissions of volatile organic compounds in the application of bitumen and asphalt emulsion,	Local / within the municipality / short time frame during the reconstruction	• Use of standardized fuels for the mechanization and switching off engines of the mechanization when it is not in work, for reducing gas emissions; • Use of sprayers that do not contain chemicals and are on a water base – for reduction of the dust; • Planning the transport and the factor of loading and unloading are of great importance to reducing fuel consumption and emissions and fugitive dust emissions; • Stopping work or reducing the amount of construction work if register intense dust emission in order to determine the cause of the issue and to take measures for its elimination; • The speed of movement of the vehicles for transporting dig soil to a particular location should be low 30(40)km/h; • Vehicles that perform transport of gravel, grit, soil and ephemera should be covered or closed. • Construction materials should be keep on appropriate places so to eliminate dust; • Use of protection masks for workers if there is dust; • Information for population of the urban communities for the construction	Contractor, Supervision Municipality staff (Communal inspector / Environmental inspector / Traffic engineer)

hydrocarbons, NOx, SO2, smoke and dust emissions associated with construction activities; • Traffic congestion will be caused as well as changes in existing traffic circulation		activities should be delivered through local radio/ TV so to use other streets in the period while providing construction activities at the projected locations.	
Emissions in water and soil • Disposal of construction waste and filling with construction material surface water flow • Contamination of surface and underground waters due to inappropriate ensuring portable toilets and rubbish bins where it is possible uncontrolled spill / disposal of the liquid and solid waste • Contamination of surface and underground waters due to traffic accidents and crashes	Local / within the municipality / short time frame during the reconstruction	• The mobile toilet need to be posted and they need to be cleaned and maintenance on time; • Repair and maintenance of vehicles should be made in mechanical services; • Putting fuel should be made on gas stations and certain locations for that purpose with concrete platform; • If there is need for putting fuel at the location that should be made without possibility for spilling derivatives; • In case of holing additional quantities of fuel on the construction to be ensured quality correct containers under conditions stated with standards for storage and keeping this kind of materials; • For leakage of oil derivates it is necessary fast intervention with digging the soil and transport it to the city dump; • Construction waste and filling the surface water flows with construction materials including stones, concrete waste, threes plastic packages that can be spread is not allowed.	Contractor, Supervision Municipality staff (Communal inspector / Environmental inspector)
Waste management Possible adverse environmental impact and health effects could be occurred as a result of generation of the different waste streams and its inappropriate management	Local / within the municipality / short time frame during the reconstruction	• To ensure collection and disposal of waste by an authorized company for waste collection and transportation; • Identification of the different waste types at the construction site; • Transportation and final disposal of the inert and communal waste by the Communal Services Enterprise (CSE) “Komunalna Higiena”; • The materials should be covered during the transportation to avoid waste dispersion; • Fulfilment of the Annual Report for non-hazardous waste management by the Mayor of Municipality and reporting to the Ministry of Environment and Physical Planning; • Possible hazardous waste (motor oils, vehicle fuels, asbestos cement pipes) should be collected separately and authorized collector and transporter should be sub-contracted to transport and finally dispose the hazardous waste ; • The temporary or final disposal of waste streams near the river Vardar is forbidden; • If the waste has one or more hazardous characteristics, producer or/and owner are obligated to classified in category hazardous waste and to manage it as hazardous waste;	Contractor, Supervision Municipality staff (Communal inspector / Environmental inspector)
Possible **noise disturbance** as a result of outdoor equipment	Local / within the municipality / short	• Use of appropriate and technically functional equipment and mechanization;	Contractor, Supervision

usage and transportation vehicles driving around the construction site.	time frame during the reconstruction	• Construction activities have to be made during the day and with certain time frame; • Switching off vehicle and construction mechanization engines when there is no need for their working	Municipality staff (Communal inspector / Environmental inspector)

Table 13. Monitoring plan

What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?	When is the parameter to be monitored (frequency of measurement)?	Why is the parameter to be monitored?	Cost		Responsibility	
					Constr.	Oper.	Reconstruction of streets in Municipality of Gjorce Petrov	Operation phase
Project stage: Start-up of the Project activity "Reconstruction of water supply network and construction of water reservoir in Municipality of Negotino" (marking construction site)								
Activities for protection of the construction place	On the roads for reconstruction	Visual monitoring	Regularly during the project activities, determining the state of visits during the implementation of the activities	To ensure OH&S and community safety along the all reconstructed streets			Contractor and Supervisor Communal /Environmental Inspector at the Municipality of Gjorce Petrov	
Air emissions due to dust or cutting the existing asphalt, load and transport of the dig soil and removal of the asphalt	On the roads for reconstruction	Visual monitoring	Regularly during the project activities, determining the state of visits during the implementation of the activities	To minimize and prevent air pollution and negative impact on human health				
Separated hazardous and non-hazardous waste	On the construction site	Visual monitoring and reporting	During the project activities	To avoid disposal of hazardous waste on municipal landfill			Contractor / Municipal staff (Communal inspector and Environmental Inspector) Director of the CSE " Komunalna Higiena"	

What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?	When is the parameter to be monitored (frequency of measurement)?	Why is the parameter to be monitored?	Cost		Responsibility	
					Constr.	Oper.	Reconstruction of streets in Municipality of Gjorce Petrov	Operation phase
Fulfilled Annual Report for transportation and disposal of waste	Local self-government administration	Review of documentation – Identification waste List	After the accomplishment the task of collection, transportation of waste on daily/monthly basis	To improve the waste management and hazardous waste management on local and national level			Mayor of Municipality of Gjorce Petrov/ Director of the CSE " Komunalna Higiena"	
Exposure the citizens to noise disturbance from vehicle machine and electric tools	On the site	Review the noise level technical specifications of the used vehicle mechanization and equipment for their use outside	Before the beginning of the work (first day)	To protect the citizens against exposure to loud noise taking into account the technical specifications of the equipment and time duration of the work outside				
Regular maintenance of the water supply network , storm water network and street lighting	Along the water supply and storm water network	Review of the Preventive Plan and proposed measures for prevention of spills, water losses and cracks	On annual basis /6 months after the diagnostic of the “hot spots” along the water supply network	To prevent or minimize the risks to human health				Mayor /Director of CSE "Vodovod i kanalzacija"

4 TECHNICAL SOLUTION

4.1 Description

The technical design assumes reconstruction of 14 streets ("Avstraliska", "Anton Cehov", "Anton Keckarov 1", branch of the street of "Jadranska", "Isaija Madzovski", "Brakja Galevi", "Via Egnatia", "Aleksa Demnievski 3", "Aleksa Demnievski 4", "Aleksa Demnievski 5", "Zlate Mihajlovski", "Crnogorska 2", "Ibe Palikukja" and "Krsto Rakovski") in the urban districts of the Municipality Gjorce Petrov. It should be noted that "Avstraliska" and "Anton Cehov" streets have already been reconstructed with a length of around 100m within MSIP project at the end of 2013 and the remaining parts of these streets will be completed with the additional MSIP financing.

The technical design assumes road works on all of the 14 streets, street lighting installation works on 10 streets ("Avstraliska", "Anton Cehov", "Anton Keckarov 1", "Jadranska", "Via Egnatia", "Aleksa Demnievski 3", "Aleksa Demnievski 4", "Aleksa Demnievski 5", "Crnogorska 2" and "Ibe Palikukja"), construction of storm-water drains on 5 streets ("Avstraliska", "Anton Cehov", "Jadranska" "Aleksa Demnievski 5" and "Zlate Mihajlovski"), as well as replacement of water supply pipes on 2 streets ("Anton Keckarov 1" and "Jadranska").

According to the positive regulation in the country, the streets are classified as local residential streets albeit with significant amount of traffic. The basic technical design of the streets is based on extracts from the DLUPs for the urban Districts of Gjorce Petrov, Dame Gruev, Mirce Acev and Hrom, survey situation in R=1:500, spatial limitation of the terrain, terrain-oriented reconnaissance, as well as available data on the existing and planned infrastructure. The technical design is in line with the positive regulation, i.e. all applicable laws, secondary legislation and civil engineering and urban-planning standards in the area of streets and local roads, stormwater networks, water supply networks and street lighting.

4.2 Analysis and calculation

4.2.1 Road works

Subject of the technical design for the road works are all of the 14 streets subject to the PAD. The total length of the streets that are subject to this Appraisal is 2,858.2, varying in length from 100m to 350m, while the width of the street varies from 5m to 6m (table 14 below). According to the conditions on the terrain, the width of the sidewalks varies from 1m to 2m. The structure, sizes and layers of the proposed technical design for the streets is based on the positive regulation and standards applicable for this kind of traffic on these streets.

Table 14. Length and width of the streets subject to the PAD

Street	Length (m)	Width (m)
"Avstraliska" street	245.0	5.5
"Anton Cehov" street	214.0	5-5.5
"Anton Keckarov 1" street	208.8	5.5
"Jadranska" street	100.0	5.5
"Isaija Madzovski" street	210.0	6
"Brakja Galevi" street	100.0	6
"Via Egnatia" street	236.0	6
"Aleksa Demnievski 3" street	252.2	6
"Aleksa Demnievski 4" street	106.9	6
"Aleksa Demnievski 5" street	105.7	6
"Zlate Mihajlovski" street	392.0	6
"Crnogorska 2" street	187.0	6
"Ibe Palikukja" street	350.0	5.5
"Krsto Rakovski" street	150.6	6
Total	**2,858.2**	

Source: project's technical documentation

The analyses, which were made, show that depending on the damage degree of the street, different types of reconstruction have been proposed. According to a European standard and world adopted definition, the street reconstruction project is a project whereby many or all meaningful elements of an existing street are being removed and replaced. This would include sidewalks, bituminous or concrete pavement, granular base and items appurtenant to these elements. In relation to the project and depending on their damage degree, we have divided the streets **into two sub-categories that is: streets with significant degree of damage and streets where there is no existing upper-layer**, which would classify the streets as good, modern and convenient for the residents, other pedestrians and the traffic.

a) Streets with significant degree of damage

This subgroup includes 5 streets i.e. "Zlate Mihajlovski", "Ibe Palikukja", "Brakja Galevi", "Via Egnatia" and "Isaija Madzovski". These are streets with significant frequency of traffic.

The technical solution for the streets of "Zlate Mihajlovski", "Brakja Galevi" and "Via Egnatia" involves the following:

- removing of the existing asphalt;
- setting of a new two-layer asphalt with the following characteristics:
  - AB 11 (asphalt concrete layer) with a thickness of 4cm,
  - BNS 22 (bituminous asphalt bearing layer) with a thickness of 6/7cm,
  - road base coarse layer with a thickness of 30cm.
- kerbstones and sidewalks on both sides of the streets with variable width, with the following characteristics of the layers:
  - 6cm thick paver elements,
  - 3-5cm thick fine sand layer.
  - 20cm thick base coarse layer,

The technical solution for the "Ibe Palikukja" street involves the following:

- removing of the existing asphalt;
- setting of a new one-layer asphalt with the following characteristics:
  - BNHS 16 (bituminous asphalt bearing layer) with a thickness of 7cm,
  - road base coarse layer with a thickness of 30cm.
- kerbstones and sidewalks on both sides of the street, with the following characteristics of the layers:
  - 6cm thick paver elements,
  - addition of road base coarse.
  - 3-5cm thick fine sand layer.

The technical solution for the "Isaija Madzovski" street involves both rehabilitation and reconstruction of the street depending on the degree of damage. Half of the street (100m) involves rehabilitation, while the other half where the existing asphalt layer is completely ruined involves reconstruction whereby the existing asphalt layer will be removed and a new asphalt layer will be set. Therefore, the technical solution for the rehabilitation part involves setting of new one-layer asphalt BNHS 16 (bituminous asphalt bearing layer) with a thickness of 7cm. The technical solution for the reconstruction part involves:

- removing of the existing asphalt layer;
- setting of a new one-layer asphalt with the following characteristics:
  - BNHS 16 (bituminous asphalt bearing layer) with a thickness of 7cm,
  - addition of road base coarse.
- Kerbstones and sidewalks are envisaged on both sides of the street with a width of 1.5m, with the following characteristics of the layers:
  - 6cm thick paver elements,
  - 3-5cm thick fine sand layer.
  - 20cm thick base coarse layer.

b) Streets where there is no existing upper-layer

Most of the streets subject to the PAD are streets where there is no existing upper-layer and adequate installations (storm water drains, street lighting) which would classify the streets as modern and thus, satisfactory for the needs of the citizens in the local community. Namely, this subgroup includes 9 streets of the total 14 i.e. the streets of "Jadranska", "Crnogorska 2", "Avstraliska", "Aleksa Demnievski 3", "Aleksa Demnievski 4", "Aleksa Demnievski 5", "Anton Cehov", "Anton Keckarov 1" and "Krsto Rakovski" street.

The technical solution for the "Crnogorska 2", "Anton Keckarov 1" and "Jadranska" envisages the following:

- setting of a new one-layer asphalt BNHS 16 (bituminous asphalt bearing layer) with a thickness of 7/8cm,
- road base coarse layer with a thickness of 30cm,
- road base coarse layer with a thickness of 20cm and 6cm thick paver elements for the sidewalks.

The technical solution for the street of "Avstraliska" envisages the following:

- setting of two-layer asphalt with the following characteristics:
  - AB 11 (asphalt concrete layer) with a thickness of 5cm,
  - BNS 22 (bituminous asphalt bearing layer) with a thickness of 7cm,
  - addition of road base coarse.
- road base coarse layer with a thickness of 30cm,
- kerbstones and sidewalks on both sides of the street with the following characteristics of the layers:
  - 6cm thick paver elements,
  - 3-5cm thick fine sand layer,
  - 20cm thick base coarse layer.

The technical solution for the streets of "Aleksa Demnievski 3", "Aleksa Demnievski 4" and "Aleksa Demnievski 5" envisages the following:

- setting of two-layer asphalt with the following characteristics:
  - AB 11 (asphalt concrete layer) with a thickness of 4cm,
  - BNS 22 (bituminous asphalt bearing layer) with a thickness of 6cm,
- road base coarse layer with a thickness of 30cm,
- kerbstones and sidewalks on both sides of the streets with a variable width of the layer, with the following characteristics of the layer:
  - 6cm thick paver elements,
  - 3-5cm thick fine sand layer.
  - 20cm thick base coarse layer.

The technical solution for the street of "Anton Cehov" envisages the following:

- setting of two-layer asphalt with the following characteristics:
  - AB 11 (asphalt concrete layer) with a thickness of 5cm,
  - BNS 22 (bituminous asphalt bearing layer) with a thickness of 7cm,
- road base coarse layer with a thickness of 30cm,
- sidewalks on both sides of the street with a variable width of the layer, with the following characteristics of the layers:
  - 6cm thick paver elements,
  - 3-5cm thick fine sand layer.
  - 20cm thick base coarse layer.

The street of "Krsto Rakovski" is considered a frontage street with a width of 6m and the technical solution envisages its construction with the following characteristics of the layers:

- 8cm thick paver elements,

- 3-5cm thick fine sand layer,
- 10-15cm thick base coarse layer,
- kerbstones 8/15.

4.2.2 Construction of storm water drains on the streets of "Avstraliska", "Anton Cehov", "Jadranska" "Aleksa Demnievski 5" and "Zlate Mihajlovski"

Subject of the technical design for the stormwater collection are 5 streets (out of the total 14 subject to the PAD) where there is no existing stormwater drains. Namely, the streets where storm water drains are envisaged to be constructed are the streets of "Avstraliska", "Anton Cehov", "Jadranska" "Aleksa Demnievski 5" and "Zlate Mihajlovski". The goal of the technical solution is to provide convenience and safety for pedestrians and traffic by controlling stormwater flows within prescribed limits and to retain within each catchment as much stormwater and run–off as possible given the planned use of the terrain and its civil engineering characteristics. It is important to state that the technical documentation is complete and there is no need for elaboration of additional documents. The technical documentation has been designed according to the existing standards, norms and regulations. In addition it is important to state that the existing stormwater network in the city of Skopje and in the Municipality Gjorce Petrov in particular, follow the same standards provided by the PE "Water Supply Network and Sewage System – Skopje" for implementation of stormwater networks.

Table 15. Summary of the technical solution for stormwater drains

Street	Length of pipe (m)	Slope (J)	Diameter of the pipe	Type of pipe	Connection with existing network
"Avstraliska"	311	0.40%	OD 300mm - 400mm	reinforced concrete vibro pressed	"Luka Gerov" street
"Anton Cehov"	278	0.40%	OD 300mm - 400mm	reinforced concrete vibro pressed	"Luka Gerov" street
"Jadranska"	107	6%	OD 300mm	reinforced concrete vibro pressed	"4ti Juli" street
"Aleksa Demnievski 5"	80	0.40%	OD 300mm	reinforced concrete vibro pressed	"Sremski front" street
"Zlate Mihajlovski"	79	0.37%	OD 300mm	reinforced concrete vibro pressed	"Kicevska" street

Source: project's technical documentation

Table 14 provides summary of the technical solution for construction of stormwater drains on the streets subject to this category of construction works. Table 15 also provides information about where the foreseen network is envisaged to be connected with the existing stormwater network.

4.2.3 Street lighting for the "Avstraliska", "Anton Cehov", "Anton Keckarov 1", "Jadranska", "Via Egnatia", "Aleksa Demnievski 3", "Aleksa Demnievski 4", "Aleksa Demnievski 5", "Crnogorska 2" and "Ibe Palikukja" street

Subject of the technical design for the stormwater collection are 10 streets (out of the total 14 subject to the PAD) where there is no existing street lighting. Namely, the project envisages street lighting for the streets of "Avstraliska", "Anton Cehov", "Anton Keckarov 1", "Jadranska", "Via Egnatia", "Aleksa Demnievski 3", "Aleksa Demnievski 4", "Aleksa Demnievski 5", "Crnogorska 2" and "Ibe Palikukja".

The street lighting is planned to be one sided i.e. placed on one side of the streets and the same, should be powered from the nearest power substations (10/0.4kW) according to the certificate issued by the energy services company, EVN - Macedonia.

The street lighting fittings - arc lamps are planned to be placed on galvanized steel poles (H=8m) with a high pressure natrium bulbs SAP-150W. The poles are projected to be placed 0.7 to 1m away from the edge of the street, on either the sidewalk or the green area, depending in the terrains' conditions.

Table 16. Distribution of poles by street

Street	Number of poles	Distance between poles (m)
"Avstraliska" street	11	30
"Anton Cehov" street	8	30
"Anton Keckarov 1" street	6	25
"Jadranska" street	4	25
"Via Egnatia" street	9	30
"Aleksa Demnievski 3" street	9	30
"Aleksa Demnievski 4" street	4	30
"Aleksa Demnievski 5" street	3	30
"Crnogorska 2" street	7	28
"Ibe Palikukja" street	12	30

Source: project's technical documentation

The distribution of lighting poles by streets is provided in Table 16. The projected distance between poles varies between streets from 25-30m according to the photometric calculation and characteristics of the street, which are in line with the European standard EE89/336EEC and EC73/23/EEC and other standards, norms and regulations.

Except for "Aleksa Demnievski 5" street where two typical distribution boxes DB for street lighting are planned, on all other street one DB for street lighting is planned. The power cables from the DB to the street light poles are planned to be PP00-A-4x25mm + FeZn 30x4mm, for the streets of "Ibe Palikukja" and "Via Egnatia", NAY2Y-J-4x25mm^2 + FeZn 30x4mm for the "Aleksa Demnievski 3", "Aleksa Demnievski 4", "Jadranska" and "Crnogorska 2", as well as NAYY-4x25mm^2 + FeZn 30x4mm on "Anton Cehov", "Avstraliska" and "Aleksa Demnievski 5". The power cables will be placed in a trench with sizes 0.4x0.8m.

The technical design provides detailed calculation of the required installed power, the photometric characteristics of the lights, the voltage drop and for the light intensity. Additionally, the technical design provides detailed elaboration of the electrical grounding of the projected poles, electro-installation material, testing of the functionality of the performed activities and detailed attest documentation for the necessary equipment, installations and other material.

4.2.4 Water supply works for the “Anton Keckarov 1” and “Jadranska” street

The goal of the technical solution for the water supply works on the streets of “Anton Keckarov 1” and “Jadranska” is to replace the current water pipes in order to improve the water supply services.

The water supply network works on the street of “Anton Keckarov 1” envisage replacement of the existing pipe and placement of new ductile iron pipes with a diameter of OD 100mm. The total length of the pipeline is L=124m. Four fire hydrants are envisaged to be placed on the street in line with positive regulation in the country. The foreseen network is envisaged to be connected to the existing water supply network on the “Avstraliska” and “Anton Cehov” streets.

Water supply network on “Jadranska” street envisages placement of ductile iron pipes with a diameter of OD 80mm. The total length of the pipeline is L=120m. Two fire hydrants are envisaged to be placed on the street in line with positive regulation in the country. The foreseen network is envisaged to be connected to the existing water supply network on the streets of “4ti Juli” and “Meckin Kamen”.

4.3 Concluding remarks

The technical design is in line with the positive regulation, i.e. all applicable laws, secondary legislation and civil engineering and urban-planning standards in the area of streets and local roads, stormwater networks and street lighting.

The Project is part of the DLUPs for the urban Districts of Gjorce Petrov, Dame Gruev, Mirce Acev and Hrom, which were used as a base for elaboration of the technical documentation of the Project.

It is worth mentioning that the Municipality Gjorce Petrov has proposed this project as of its utmost priority based on public hearings and various complaints with the citizens as well as the strategic goals set in the Strategy for local economic development for the period 2011-2018. The various benefits of the implementation of the Project are elaborated in the subsequent chapters of the PAD.

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