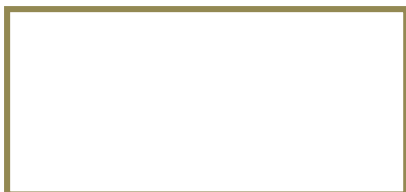




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Sustainable Municipal Services (Waste Management) - KOSOVO



SUMMARY REPORT ON THE ACTIVITIES OF URI UNDER THE CONTRACT NO. 83268846

PREPARED BY:



URBAN RESEARCH INSTITUTE – www.uri.org.al

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ABBREVIATION

WG	Working Group
URI	Urban Research Institute
MESP	Ministry of Environment and Space Planning
EIA	Environmental Impact Assessment

ACKNOWLEDGEMENT

Urban Research Institute (URI) - Tirana, prepares this document in the framework of the Contract no. 83268946 issued from BIZ Kosovo under the “Project Sustainable Municipal Services (Waste Management in Kosovo)”.

The document and the concepts on the “Reorganization of the waste collection system” in “Ulpianë”, “Kodra e Diellit” and “Velania” neighborhoods in Prishtina; “Reorganization of the waste collection system” in the city center and “Pestovë” village of Vushtrri; “Reorganization of the waste collection system” in the city center of North Mitrovica; and, “Reorganization of the waste collection system” “Dardania Street” in Fushë-Kosovë, are prepared from Eng. Edlir Vokopola and Eng. Dritan Gorica from Urban Research Institute (URI), Tirana.

URI team was supported from respective staff of Municipalities and the GIZ experts including Mrs. Drita Binaj, Mrs. Rudina Qerimi and Mrs. Merlina Beu - Muça from Green Art Centre (GAC). URI is very grateful to all, especially to GIZ and GAC representatives for the support, contact establishment and direct contribution. URI team is particularly grateful to the director of SMS – Kosovo Mr. Kai Hofmann for his continuous encouragement and support.

1. BACKGROUND

The German Government through GIZ under the Sustainable Municipal Services (Waste Management), 2014 - 2017 in Kosovo (The Project) is providing support to several Municipalities to facilitate implementation of the law “On Waste” and achieve tangible improvements of the waste collection service quality.

The amended of law “On Waste” (20121) represents the legal bases for the municipal waste management activity in Kosovo. In particular, Article 15, item 1.8 of this law constitutes the responsibilities of the municipalities to compile local plans for waste management and provide for basic infrastructure which would help with achieving reduction, reuse and recycling of waste and extension and improvement of the waste management service for the citizens at – large.

2. PROJET GOAL

GIZ Project aims at supporting the Municipalities of Prishtina, Vushtrri, North Mitrovica and Fushë-Kosovë to prepare and implement various pilot project, including:

1. Design a concept and an implementation action plan for the “Reorganization of the waste collection system” in “Ulpianë”, “Kodra e Diellit” and “Velania” neighborhoods in Prishtina;
2. Design a concept and an implementation action plan for the “Reorganization of the waste collection system” in the city center and “Pestovë” village in Vushtrri;
3. Design a concept and an implementation action plan for the “Reorganization of the waste collection system” in the city center of North Mitrovica; and,
4. Design a concept and an implementation action plan for the “Reorganization of the waste collection system” along “Dardania” street in Fushë-Kosovë;

3. REQUIRED CONSULTANCY SERVICE

Consultancy services as required in the TOR from GIZ relevant to the completion of the aforementioned deliverables have been provided by a team of Urban Research Institute led by Eng. Edlir Vokopola. The activity of URI is carried out based on the Contract NO. 83268846 of URI with GIZ – Albania.

The deliverables have been prepared and submitted based on specific requirements as defined in the TOR attached to the aforementioned contract.

4. THE PROCESS FOR PREPARATION AND SUBMISSION OF CONCEPTS

Each participating municipalities have established Working Groups and have assigned focal points from their staff to form a joint team with the Consultant and the GIZ experts.

¹ LIGJI Nr. 02/L-30 – 2008 i ndryshuar me 04/L-060 PËR MBETURINA

The Consultant and the GIZ experts have visited each municipality regularly based on the Project Implementation Schedule as it was proposed by the Consultant and approved by GIZ. GIZ experts have provided coordination and ensured availability of municipal staff for any Consultant site visit.

The Consultant has carried out all planned visits in each Municipality with the purpose of:

- Identifying and reinforcing the objectives of the project and the needs of the Municipalities;
- Identify and evaluate appropriate sites as proposed by Municipalities;
- Present and discuss draft concepts in each of the involved Municipalities;
- Present final concepts in each of the involved Municipalities;
- Follow – up with monitoring implementation of the concepts.

In each visit the Consultant has met with SWM Director Mr. Kai Hofmann with the purpose of briefing progress, discussing concerns and any particular suggestion for the Consultant to take into consideration along with the implementation of the Project.

Municipal Working Groups, GIZ experts and the SWM Director, have been informed and let known for the situation analysis, draft concepts and final concepts for each Municipality prior that these documents have been submitted for discussion and decision – making to relevant Municipalities.

5. PROPOSED CONCEPTS FOR PRISHTINA, VUSHTRRI, NORTH MITROVICA AND FUSHË-KOSOVA MUNICIPALITIES

5.1. PROPOSED CONCEPT FOR PRISHTINA

In framework of a pilot project, Prishtina Municipality has undertaken to implement the separation at source and encourage recycling, as well as to raise the awareness to the benefit of recycling and in the same time to enhance the quality of service and create best practice in waste management. The project covered “Ulpianë”, Kodra e Diellit and Velania neighborhoods. Ulpianë and Kodra e Diellit are among two main neighborhoods in Prishtina.

The pilot area is around 128.5 ha with a population estimated 58.475 inhabitants (11.885 households).

5.1.1. Current Situation of service.

The estimation of the waste amount in general and the amount of recyclable fraction in particular in the pilot zone, is based on the data as delivered by the Municipality. Data are given in reference and analogy with those, which were earlier received for Dardania neighborhood and the results of the measurements and waste analysis that were organized by GIZ between October 2009 and March 2011.

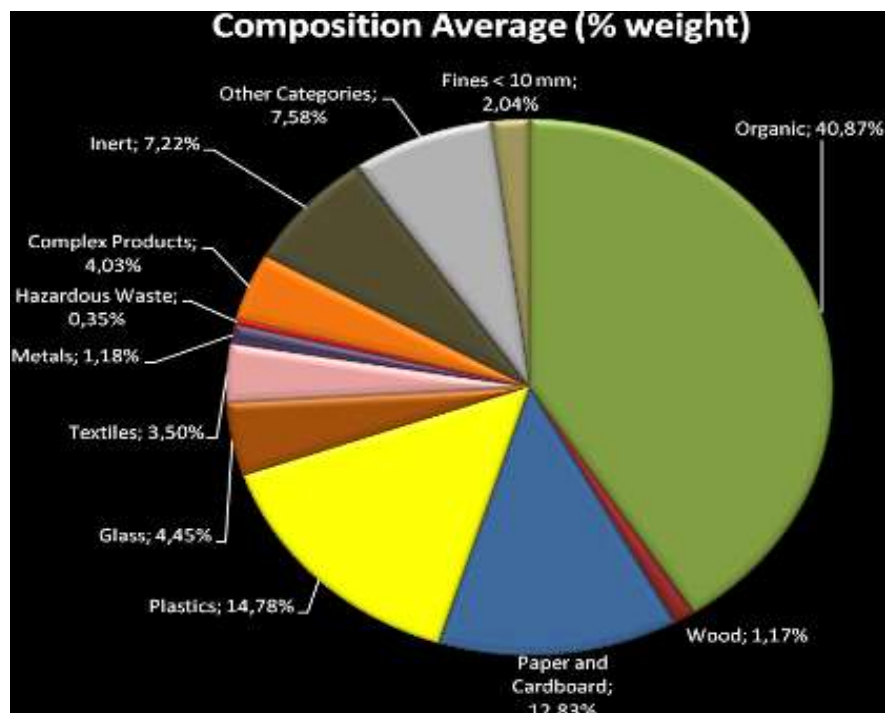


Figure 1: Waste composition in Prishtina

5.1.2. The coverage of pilot area

The consultant has identified that the collection and removal service in the pilot area, "Ulpiane-Kodra e Diellit" is carried out through a network of containers consisting of about 83 waste collection points. As it is noted from the site visit, all collection points are open (without cover) and without a platform. The number of collection points makes for a relatively good coverage of the entire area.



Figure 2: Distribution of waste collection point in pilot area (Ulpian, Kodra e Diellit)

5.1.3. Separation at source and recycling

The Municipality of Prishtina has requested to apply for the separation of waste at source and differentiated collection for encouraging recycling, to replicate and extend in this area the plan, which was already being implemented in the Dardania neighborhood.

An active network of informal collectors operates both in Dardania neighborhood and in the pilot area Ulpianë-Kodra e Diellit. This fact was noticed during the site visits, as well as information provided by the GAC organization.

Otherwise, in the neighborhood of Velania no evidence of the informal collectors because was noticed in this area; waste is collected through a door to door system without separation at source.



Figure 3: Presence of informal collectors in pilot area

5.1.4. Presentation of the Concept on the Reorganization of the service in pilot area

The concept of separate collection and promotion of recycling in the neighborhoods of Ulpianë, Kodra e Diellit and Velania of Prishtina Municipality, aims to install a functional system for separation at source and differentiated waste collection by replicating and improving the system and the experience established in the Dardania neighborhood. The concept includes establishment of a new collection system door-to-door collection of recyclable wastes in Velania neighborhood. The proposed system will ensure optimal separation, comfort and hygienic and environmental conditions for the citizens, economic activities and institutions operating in the area.

The concept of waste collection for recycling and reorganization of the service in the area covered by the Pilot Project will be developed, taking into consideration:

1. Implementation of laws in the Republic of Kosovo.
2. Defining the service area.
3. Determination of technical conditions and service standards (split agenda program, including:

- a) Waste separation currents;
- b) Type and number of containers;
- c) Frequency of waste collection;
- d) Collection schedule;
- e) Container ownership;
4. The role of stakeholders.
5. Facilitating awareness and education.
6. Monitoring and evaluation of results.

The concept will be consistent with the urban typology of the area, considering that neighborhoods included in the project are typical residential areas, with the main roads offering mainly small and medium commercial services (for the Ulpianë and Kodra e Diellit area), while typology of Velania area is typically residential.

5.1.5. Development of the Concept of Reorganization of service in the selected neighborhood in Prishtina

The consultant has estimated that for a better coverage, especially for the separate collection of recyclable waste, it is necessary to make some changes with the removal – reallocation of existing collection points and some additions to the existing points. For this reason, the idea of designing a new map by placing all waste collection points was necessary to ensure full coverage of the area subject of the study.

The map below shows the redistribution of waste collection points in the Ulpianë and Kodra e Diellit pilot area.

For that reason number of containers and composition for each collection point was considered:

- Collection points would consist of a combination of:
 - Containers for non-recyclable waste;
 - Containers for recyclable waste (dry - paper / cardboard, plastics, metals, glass);
 - Use of containers made of iron net will be used for big commercially activities to collect paper / cardboard and plastic. This type of containers shall also be used in the university dormitory area as they have a visual and educational effect.
- Collection points for institutions will be unique and in line with their number in the area;

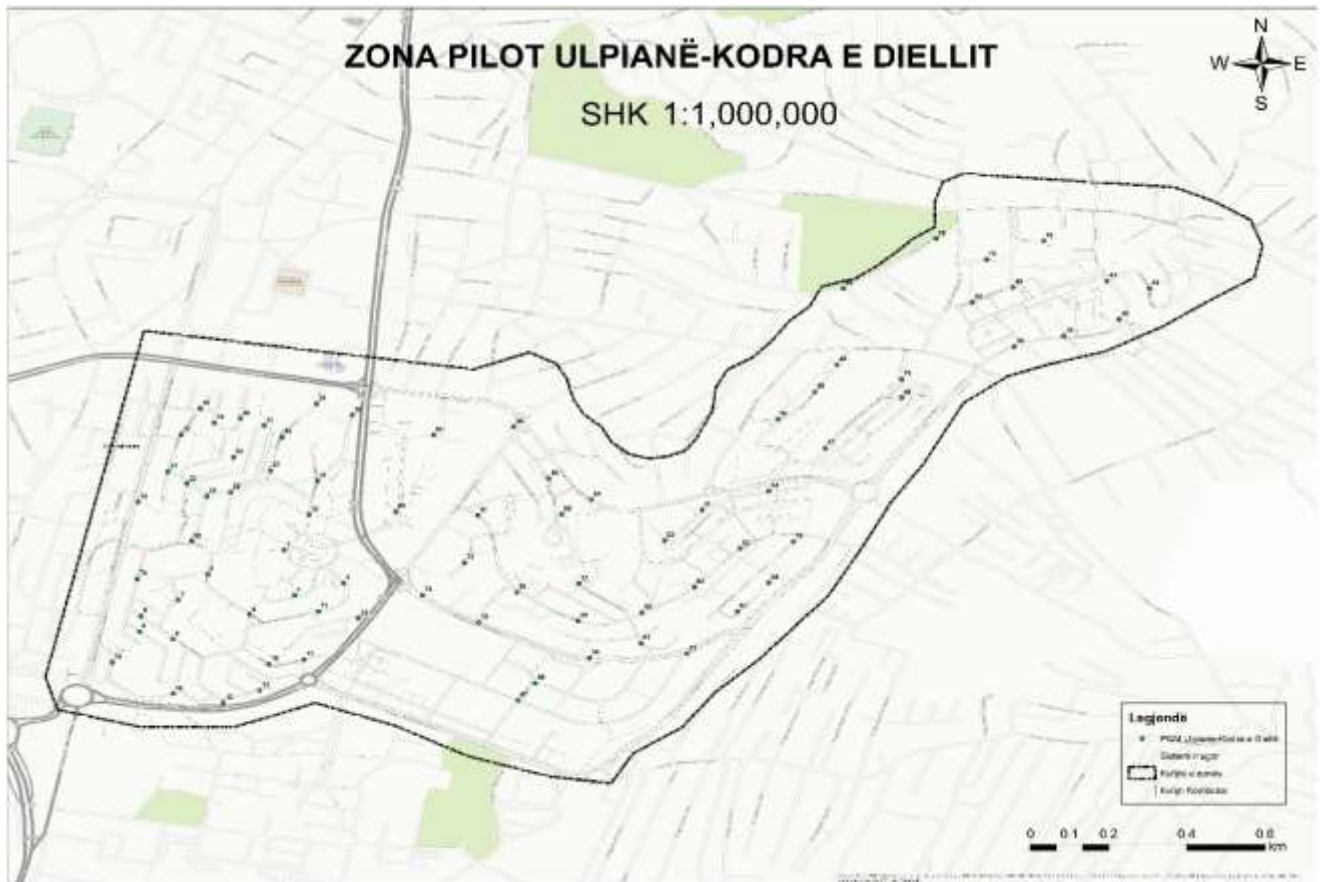


Figure 4: Redistribution of waste collection point for Ulpianë and Kodra e Diellit pilot area

Number of shared containers:

- The number of shared containers for recycled wastes are calculated on the basis of the following criteria:
 - Density of mix waste in container which is filled at 70% full is equal 165 kg / m³;
 - filling of the container with mix waste at 70% full;
 - Collection frequency 1 times a day.
- The number of containers for recyclable waste are calculated on the basis of the following criteria:
 - Density of recyclable waste in a container which is filled at 50% full is equal 75 kg / m³,
 - filling of the container with mix waste at 50% full;
 - Collection frequency 1 times a day

Based on the above criteria the system will be comprised of:

- 80 collection points,
- 339 containers, of which:
 - 118 containers designated for the collection of recyclable waste (paper, cardboard, plastics, metals, glass and other);
 - 221 containers destined for collection of non-recyclable waste

All containers will be equipped with adhesive labels on at least one side. Adhesive labels will help remind residents to separate the recyclable waste from the non-recyclable waste and throw waste into respective containers.

On the basis of the above definitions, allocation and container composition for each collection point for a full coverage of the designated area with differentiated waste collection system is provided as in the map below.

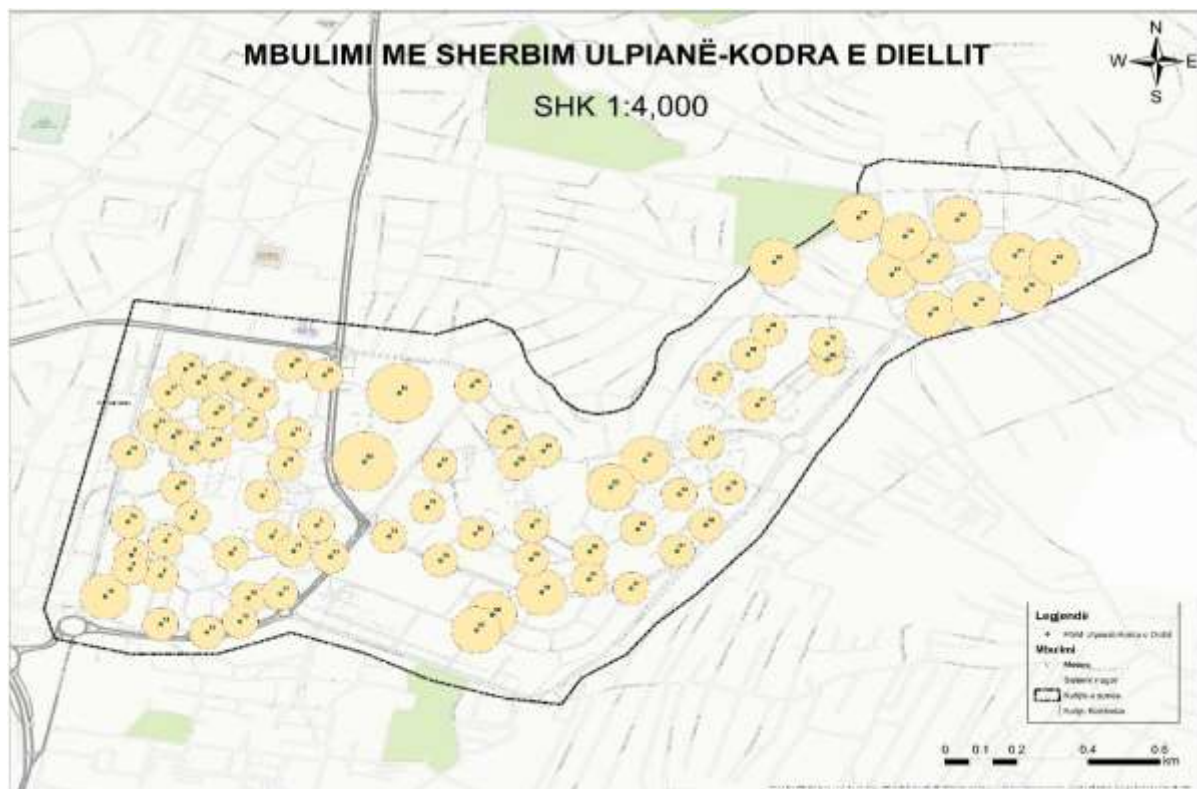


Figure 5: Service coverage for the collection of recyclable waste

5.1.6. Costs for implementation of pilot project

Costs for implementing the pilot project is associated with the cost items as follows. Cost allocation includes the costs that will be covered by the Municipality and the costs to be covered by the donor(s).

1. Capital Costs			
Cost Items	Pcs	Cost/Pcs	Total (Euro)
Procurement of new 1.1 m3 containers	339	350 ²	118.650
Installment of new platforms for WCP	50	100	5.000
Installment of structures of WCP	30	170	5.100
Total			128.750
2. Awareness Raising			

² Cmimi do të ndryshohet sipas cmimit të blerjes nga GIZ

1. Capital Costs			
Cost Items	Pcs	Cost/Pcs	Total (Euro)
Informing leaflets	5,000	1	4,250
Production of a TV Spot	1		
Broadcasting of TV Spot	90		-
Billboard/city lights (4mx3m)	10	40	400
Adhesives for containers	1000	2	2000
Total			6.650
Total costs of the project			135.400

Table 1: Summary of cost for implementation of the concept for Prishtina

Referring to cost elements as listed above, the total cost for establishing a differentiated waste collection system in Ulpiana and Kodra e Diellit pilot area is estimated at approximately 135,400 Euros

The operational cost for collection and transport of recyclable waste is estimated as part of the cost that are covered by the informal sector as part of the sales price of these products to the private sector. Operational costs for collection and disposal of mix waste are the same with those that are currently carried out at the daily bases from “Pastrimi” company.

5.1.7. Action Plan for Implementation of the Concept

By adding resources and tools to delivering waste collection services to achieve a higher standard and reach and satisfaction of citizens for the cleaning service, the Municipality of Prishtina will aim to achieve the objectives and results as presented in the following paragraph.

The implementation of the Action Plan will be extended to 1 to 2 years, within the interval of January 1st 2018 to December 31st 2018, while monitoring will continue throughout 2018.

The Task Force based on the measurement of the performance will review the plan every three to six months and will make the necessary adjustments for necessary changes that may appear mandatory during implementation.

To conclude, the Municipality of Prishtina will aim during 2018 and throughout 2019 the following:

- i. Carry out separate collection of waste for recycling in the pilot area (Ulpianë, Kodra e Diellit and Velania neighborhood) according to the methodology presented in this concept;
- ii. Ensure the integration of informal collectors and clarify the role for all other actors, including the role of the regional waste collecting company named “Pastrimi”, private sector and civil society;
- iii. Ensure and support full participation and awareness raising of residents and businesses in the pilot zone to separate recyclable waste at source in accordance with the Municipality's rules and standards in order to ensure sustainable of action;
- iv. Ensure waste separation from businesses and provide a clean environment that protects the health of citizens and encourages the development of the economy in this specific area of the city;
- v. Strengthen the inspection and enforcement of law and regulations on waste management.
- vi. Investigate the possibility of establishing a legal / regulatory framework for relations with the private sector / informal sector that operates in the collection of recyclable waste.

5.2. PROPOSED CONCEPT FOR MUNICIPALITY OF VUSHTRRI

The Working Group of the Municipality, the Consultant and the GIZ expert have agreed to propose to options for the improvement of the waste collection service in the city center of Vushtrri and Pestovë Village.

The first and most probable option is based on the collection of waste through an organized and consolidated system through using small plastic containers mostly with a capacity of 240 L and when needed of 120 L to 100 L for door to door collection of waste.

The alternative option would be based on establishing a curbside system unified for all clients of the area made of 1.1 m3 metallic or plastic containers.



Figure 6: Illustrative pictures of type of containers (100 L, 120 L, 240 L and 1,100 L)

Based on an inventory carried out by the Municipality with the assistance of a group of students and according to the plan as envisaged from the Consultant, number and allocation of containers for the delivery of the services in the city center of Vushtrri is proposed as in the following table:

Client category	Nr.	Habitants	Kg/day
Apartment units	670	3299	2382
Houses	171	842	608
Total	843	4041	2990

Table 2: Estimation of no. of container necessary to render and regulate the service in the city center and Pestovë village in Vushtrri.

In order to accommodate the service for both project areas, the municipality and the Company would need a total of about 53 containers of 1.1 m3 and about 460 container of 240 l for collection of waste in city center and an addition amount of 200 containers of 240 l for the collection of waste in Pestovë village.

Cost estimation for the purchasing of new containers and related awareness activities are estimate as in the following table.

Cost items	Unit	Amount
------------	------	--------

Total Capital investment cost	Euro	50.700
Total awareness and education cost	Euro	6.800
TOTAL PROJECT COST	Euro	57.500

Table 3: Summary of cost for implementation of the concept for cite centre and Pestovë village in Vushtrri.



Figure 7: Illustrative pictures to indicate a consolidated door to door collection system

5.2.1. Some issues to consider while implementing the concept for city center and Pestovë village in Vushtrri.

Implementation of the concept would require enforcement of some basic rule and regulations, including, but not limited, as in the following:

- The principle “polluter pays” should apply;
- Scheduled washing of containers should apply;
- Small 240 L containers shall be property of the Municipality while maintenance shall be ensured from users; containers will be replaced by users if damaged from them;
- A system for collection of bulk and C & D waste is a must for a higher standard of the service, therefore the municipality and the company should look for developing an amenity center for bulk and C&D waste;
- Collection frequency of 1.1 m3 containers in the surrounding curbside system should be once per day and at last 6 days / week;
- An efficient use of the collection truck and control of transportation costs would require a unified daily itinerary of collection for all clients, including households, businesses and institutions;
- The Inspectorate of the Municipality shall coordinate with the Company and shall establish and enforce a systematic monitoring and reporting system.

5.2.2. Alternative option for the concept of waste collection in city center and Pestovë village in Vushtrri.

This option considers an alternative curbside collection system by installing a network ad regular system of 1.1 m3 public containers to cover the whole area of city center.

Based on the distance between two collection points that could vary from 100 to 200 m and to the mixed waste density of about 120-125 kg per one 1.1 m3 container, which is considered 70% full, the system for the city center of Vushtrri would look like as in the following sketches:

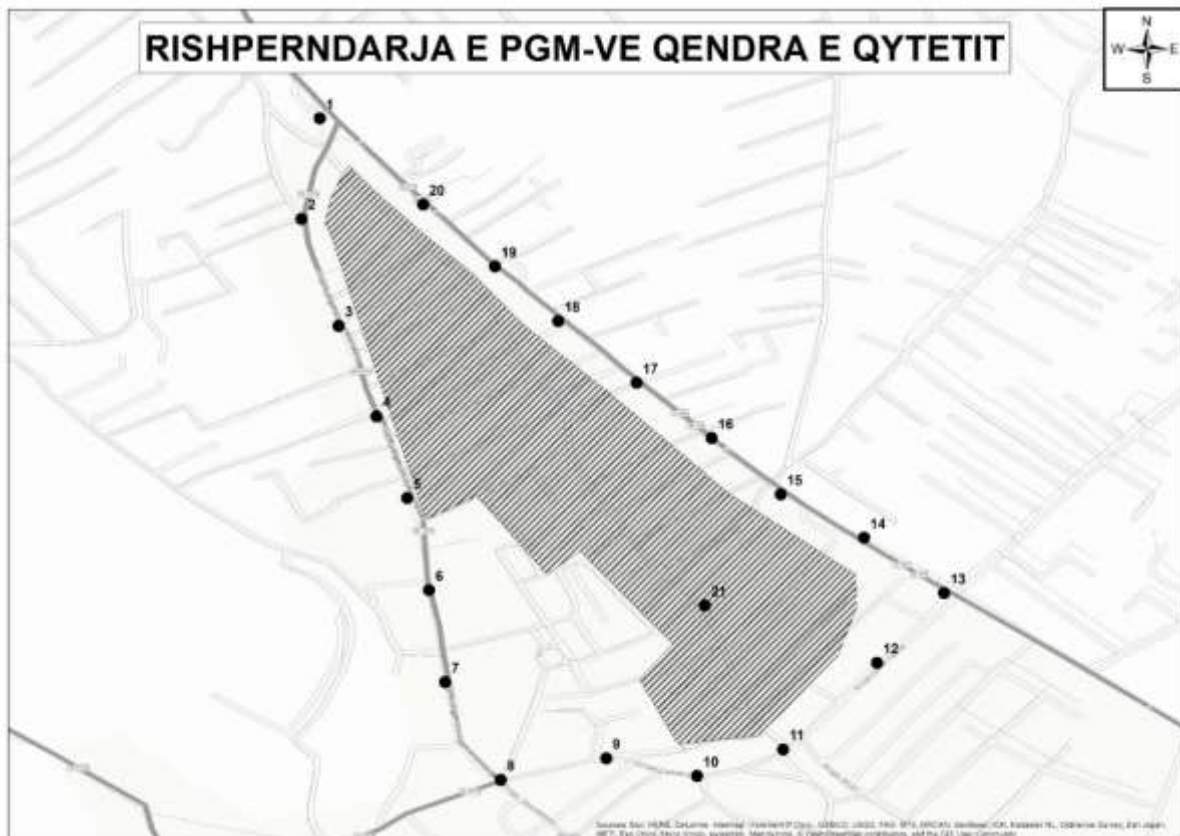


Figure 8: Distribution of curbside Waste Collection Points in city center of Vushtrri

Based on the proposed scheme, the area would require about 21 Waste Collection Points and about a number of 53 containers.

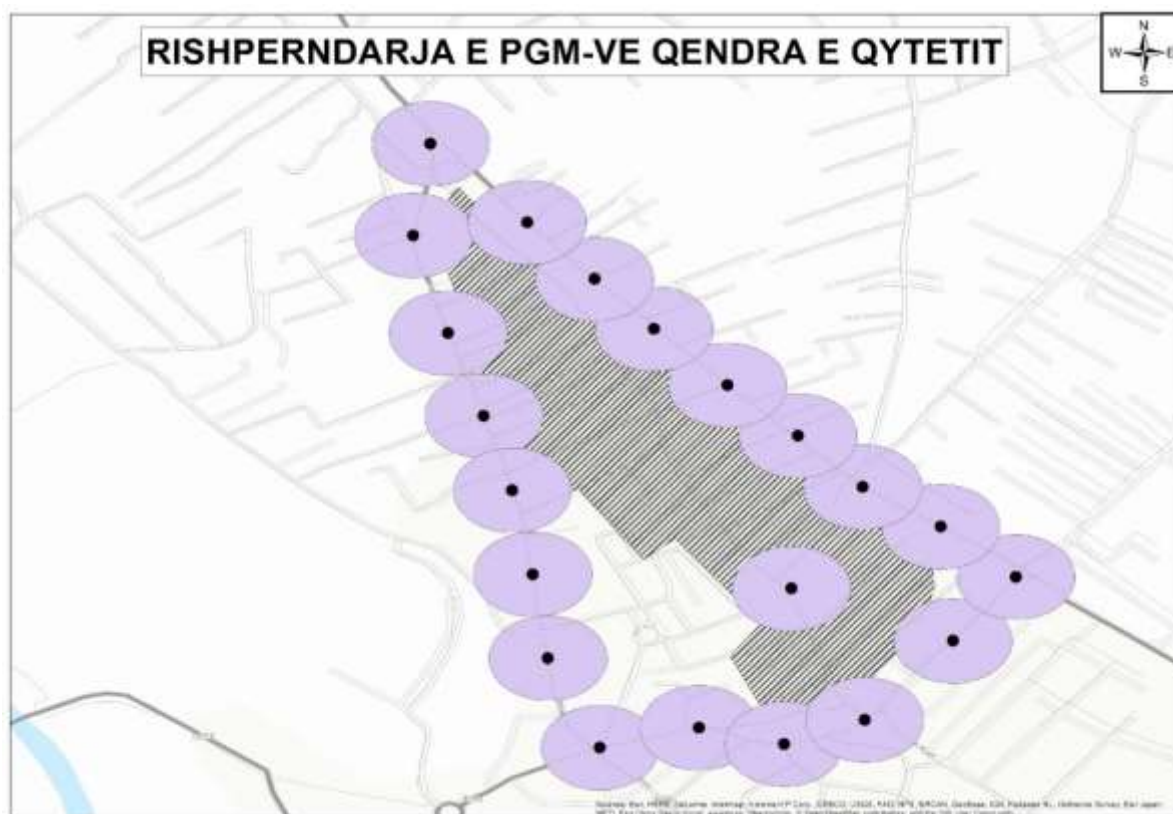


Figure 9: Coverage of city center of Vushtrri with the curbside collection system

Application of this option would cost to the Municipality the total amount of 108,000 Euro, including 78,000 Euro for capital investments in containers, adjustment of collection points, including a new compactor truck, and about 29,000 Euro to carry out an intensive awareness and education campaign.

5.2.3. Action Plan for implementation of the concept

Implementation of the concept would develop going through various actions, among which most important would include:

1. Preliminary actions:
 - a. Approval of the concept;
 - b. Ensure funding for necessary capital investments;
 - c. Purchase of equipment;
 - d. Establishment of the system; and
 - e. Implementation of the awareness and education campaign

Major indicators for monitoring performance and achievement of the objectives would include:

- Purchasing of at least 390 containers ;
- Purchasing of a new compactor truck;
- Ensure a consolidated collection system for the whole area of the city center;
- Collect and dispose at least 3.8 ton/day of municipal solid waste;

The project is implementable within one year and a half time span, starting from the beginning of the second half of 2017 or the beginning of 2018.

5.3. PROPOSED CONCEPT FOR FUSHE KOSOVE

The selected area of the project covers an area of about 25 ha. The area is characterized by high population density, typical typology of mix residential and commercial activities. In the absence of accurate data from the Municipality, it is estimated that the population in the pilot area is about 12.500 inhabitants. Considering that the average number of members of a family is about 4.92, it is estimated that the area could have about 2540 households.

About 200 small and medium-sized businesses carry out their daily activity in the area; some large commercial businesses, categorized as important waste producers, especially waste from packaging, exert their activity in this area as well.



Figure 10: The project area in "Ruga Dardania" - Fushë-Kosovë

The consultant has identified that the collection and removal waste service is carried out through a network consisting of about 24 collection points. It is noted that all collection points are open (without cover), missing a proper platform; the majority of containers are old and in very bad physical shape; and in most of the cases, collection points are located in the entrances of the residential buildings.



Figure 11: Actual distribution of waste collection points

5.3.1. Development of concept for the reorganization of service in Fushë-Kosovë

The concept for establishing a differentiated waste collection system and improvement of the service in the pilot area (Dardania street and surrounding as bordered in the image above indicated), aims to review the current waste collection scheme and reestablish it in a differentiated way. A new system is configured and proposed, taking into account quantities, demographic distribution and the way of disposing of waste collection points.

The proposed version will provide for the establishment of an effective system for waste collection, resource allocation and differentiated collection, creation of comfortable, hygienic and environmentally optimal conditions for citizens, economic activities and institutions operating in the area.

Piloting of differentiated waste collection for encouraging recycling and therefore improving the quality of the service in the area, will develop taking into consideration:

1. Implementation of laws in the Republic of Kosovo.
2. Defining the service area.
3. Determination of technical conditions and service standards:
 - a. Waste separation streams;
 - b. Type and number of containers;
 - c. Frequency of waste collection;
 - d. Collection schedule;

- e. Container ownership;
- 4. The role of stakeholders.
- 5. Facilitating awareness and education.
- 6. Monitoring and evaluation of results.

The concept will be consistent with the urban typology of the area, considering that the neighborhood involved in the project is typical mixed residential and commercial areas, with the main roads providing access to commercial services.

5.3.2. Technical options and standards for service delivery

Differentiated waste collection in the pilot area will be based on the establishment of a system and the technical criteria as follows:

1. The use of 1.1 m³ containers for differentiated collection of waste for recycling, which shall be organized in a two-stream system according to the divisions:
 - a. Green containers dedicated to mixed waste;
 - b. Yellow containers dedicated to separate collection recyclable waste;
2. Unified use of 1.1 m³ containers only for institutions;
3. Use of containers made of metallic wire for differentiated collection from supermarkets on Daradania Street and Mother Teresa Boulevard.
4. Use of plastic bags (with logo) for collecting recyclable waste as part of a combined door-to-door collection system.
5. The frequency of waste collection service for all categories of customers will be at the daily bases (1 time/day);

5.3.3. Determining criteria for calculating the number and type of containers

The separate waste collection system in the pilot area will be composed of:

Containers:

- Combination of 1.1 m³ public containers designated for separate collection of waste from households and businesses; and
- Combination of special containers of 1.1 m³ designated for separate collection of waste from institutions;
- 2 m³ containers made of metallic wire for commercial units with large generation of recyclable waste from packaging;



Figure 12: Plastic (1.1 m³) and wire-made containers 9up to 2 m³) that can be used in the pilot area

Number of collection points:

- The waste collection system in "Dardania Street" (and surrounding areas) will consist of about 42 waste collection points that provide a total and uniform coverage for differentiated waste collection, into two streams:
 - Wet biodegradable and other wastes (mixed waste);
 - Recyclable (dried waste - mainly plastics, paper / paperboard and metals)
- Collection points will be denser in the area where big commercial activities are located;
- The frequency for recyclable waste from the curbside collection system shall be 1 time per day;

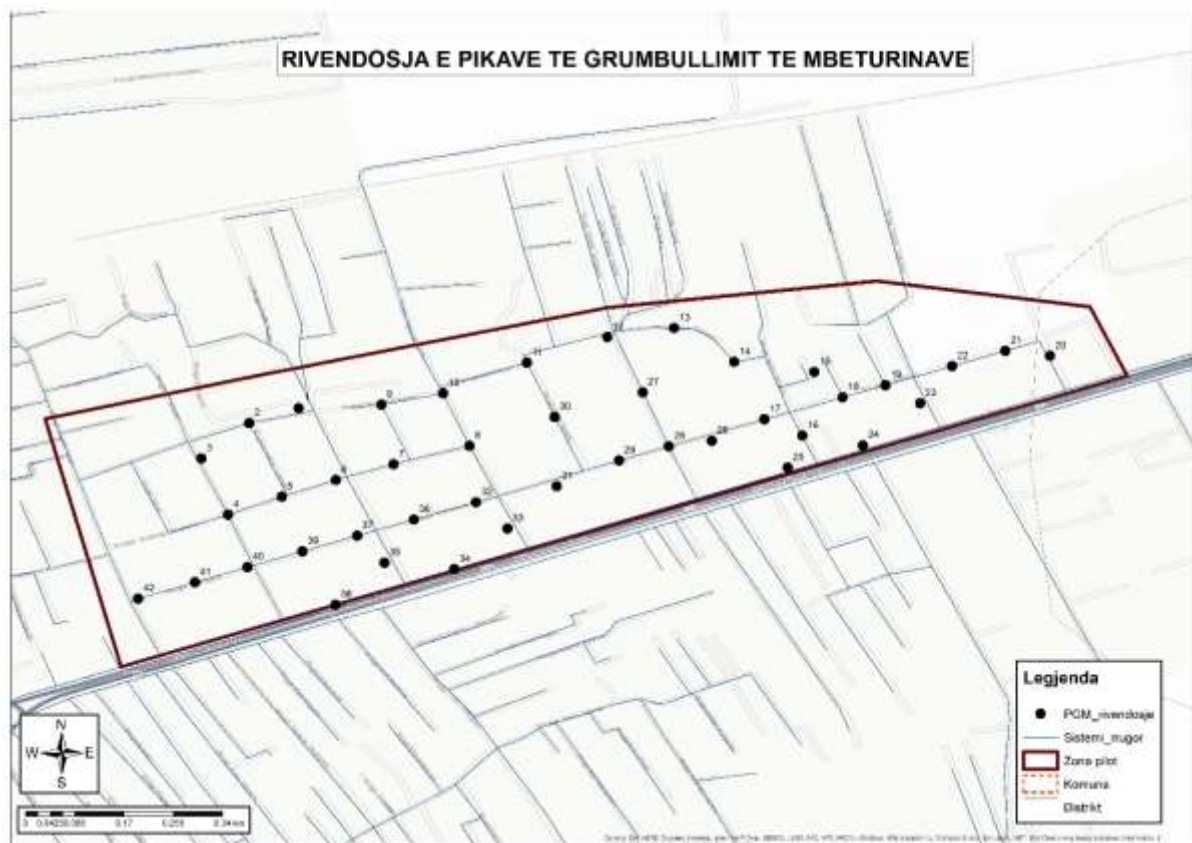


Figure 13: Redistribution of waste collection points in the pilot area (Dardania Street)

Based on the above criteria the system will consist of:

- 42 collection points,
 - 128 containers, of which:
 - 49 containers designated for the collection of paper, cardboard, plastics, metals, glass and other;
 - 79 containers designated for collection of mixed and biodegradable waste

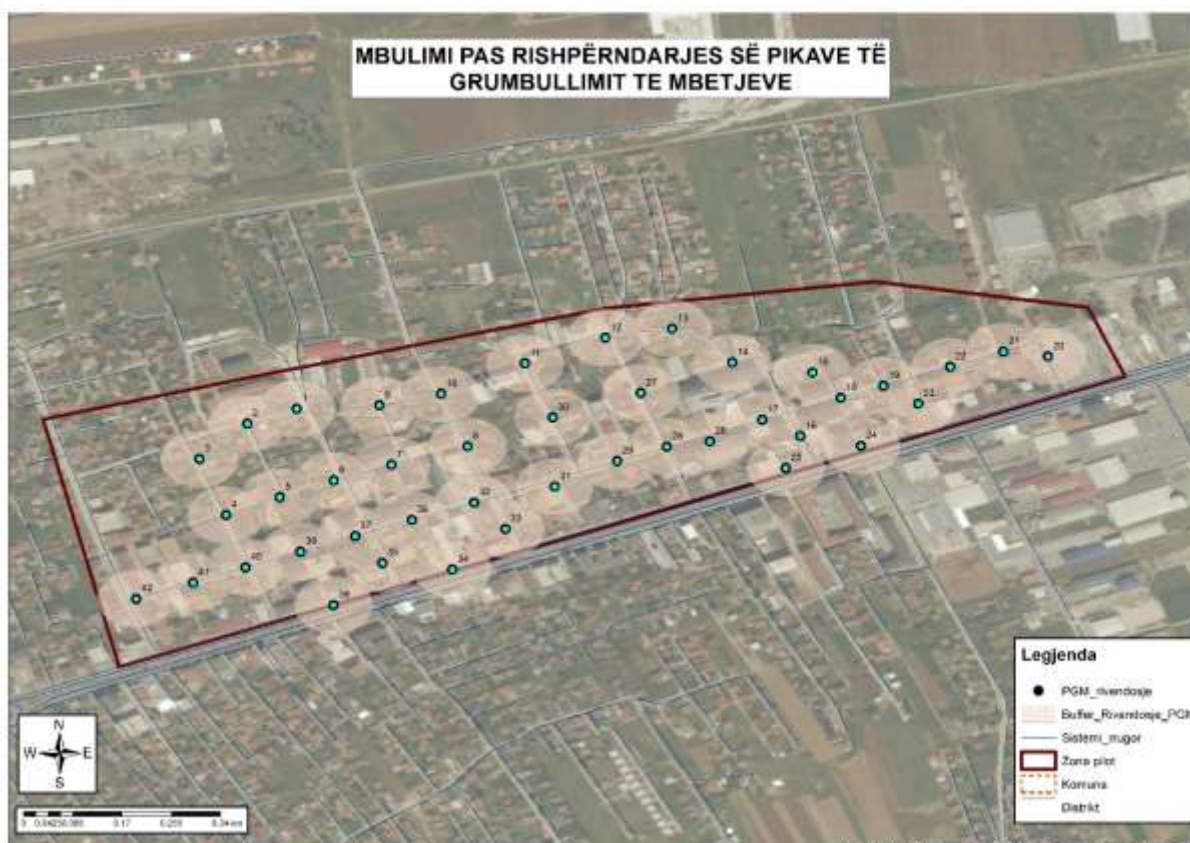


Figure 14: The service coverage of pilot area by proposed redistribution of waste collection points.

5.3.4. Costs for implementation of concept

Costs for implementing the pilot project will be associated with the cost items as follows. Cost allocation includes the costs that will be covered by the Municipality/Company and the costs to be covered by donor financing.

1. Capital costs			
Cost items	Unit	Cost/unit	Amount (€)
Containers 1.1 m3	128	350 ³	44.800
Installment of platforms/basements for WCP	42	100	4.200
Decorative fencing of WCP	42	170	7.140
Wire net containers for packaging waste	10	300	3000
Purchasing of plastic bags	2.540 ⁴	7 ⁵	17.780
Total Investments			76.920
2. Awareness and education costs			

³ The price will be changed to the GIZ procurement price

⁴ Number of families in pilot area

⁵ Pirce of plastic bags necessary for 1 year for a family.Cmimi i qeseve te nevojshme per 1 vit per nje familje.

Information leaflets	5.000	1	5.000
Production of TV Spot			
Broadcast of TV Spot			
Billboard (4mx3m)/city lights 1mx1.2m)	10	40	400
Adhesive for containers no.	600	2	1200
Total awareness			6.600
Total Project Cost			83.520 Euro

Table 4: Summary of cost for implementation of the concept for Fushë-Kosovë.

Referring to cost elements as listed above, the total cost for implementation of the project in the pilot area is estimated at approximately 83,520 Euro.

The operational cost of collecting and transporting of recyclable waste from collection points to the selection and storage center are going to be part of the cost that will be covered by the informal sector as part of the sales price of these products to the private sector.

5.3.5. Action plan for implementation of concept

By employing resources and tools to delivering waste collection services to achieve a higher standard and reach and satisfaction of citizens, the Municipality of Fushe Kosova will aim to achieve the objectives and results as presented in the following.

The implementation of the Action Plan will be extended for 1 to 2 years, starting from January 1st 2018 and will end on 31 December 2018, while monitoring will continue throughout 2019.

The plan will be reviewed every three to six months by the Working Group to measure performance and to make the necessary adjustments in the context of changes that may appear mandatory during implementation.

To conclude, the Municipality of Fushe Kosova will aim during the year 2018 and in the continuation, the following:

- i. Carry out separate collection of recyclable waste in the pilot area (Dardania Street) according to the methodology presented in this concept;
- ii. Ensure the integration of informal collectors and clarify a clear role for all other actors, including the Company, private sector and civil society;
- iii. Ensure full participation and awareness of residents and businesses exercising their activity in the pilot area to separate recyclable waste at source in accordance with the Municipality's rules and standards;
- iv. Implement waste separation from businesses and provide a clean environment that protects the health of citizens and encourages the development of the economy in this specific area of the city;
- v. Strengthen the inspection and enforcement of law and regulations on waste management.

The municipality will investigate the possibility of establishing a regulatory framework to creating relations with the private sector, Company that operates the collection system and the informal sector.

5.4. PROPOSED CONCEPT FOR MUNICIPALITY OF NORTH MITROVICA

The Pilot Project covers the city center and the surrounding areas of the Mitrovica North Municipality. This area is limited from Iber River in East and South part, Philip Vishnjiq Street in the North and the Hospital neighborhood in the West. The area is characterized by a typical mixed urban typology of high density, including low and high residential buildings, institutions, businesses and educational facilities.



Figure 15: Map and image of the Pilot Project area

According to data as received from the authorities of the Municipality, the pilot area has a total surface of 5.6 km², of which 3.36 km² is an urban area and 2.3 km² classified as rural area.

The total population is estimated at about 18,000 inhabitants, out of which 15,000 habitants living in the urban area and about 3,000 in the rural area. Several universities are located in the urban territory of the municipality, therefore increasing the number of inhabitants during the time-period of September-June with about 12,000 students and academic staff; during this time-period of the year, the total population of North Mitrovica reaches at about 30,000 inhabitants.

Taking into consideration these data, the average density of the population for the urban area in North Mitrovica is estimated at about 8,035 inhabitant / km². Based on this number, we calculate that the population living within the borders of the pilot project area is estimated at about 4,100 habitants, plus 12,000 students and academic staff during the period from September to June of each year, reaching a total of about 16,000 habitants for most part of the year.

5.4.1. Development of concept for the reorganization of service in North Mitrovica

The concept for the reorganization for waste collection service in the municipality of North Mitrovica presents the deployment of a functional system, which will ensure optimum environmental hygienic conditions for households, business and institution activities operating in the area.

The reorganization of the service in the Pilot Project area will follow through the steps below:

1. Definition of the service area;
2. Develop and enforce a municipal waste management regulation;
3. Definition of stakeholders and the relationship between them;
4. Resolve technical conditions and service standard including:

- a. Number and type of waste collection points;
 - b. Type and number of containers;
 - c. Frequency of waste collection;
 - d. Collection schedule;
 - e. Container Ownership;
 - f. Collection itinerary and frequency
5. Facilitation of awareness raising and education campaigns;
 6. Monitoring and evaluation of results;

5.4.2. Technical conditions and standards for the concept of service reorganization

Waste collection in the pilot area will be based on the following system and technical criteria:

1. A unified system based on containers of 1.1m³ capacity (plastic or metallic) should be utilized for mixed waste collection from households, business and institutions;
2. A unified system of containers of 240 L capacity should be utilized for mixed waste collection from households on a door to door collection system in the areas with difficult access for the waste collection vehicles;
3. The frequency of waste collection for 1.1m³ containers should be at a daily bases;
4. The frequency of waste collection for 240L containers should be at least once a week or twice a week, depending on the observed waste quantity as carried out by the operator ;
5. Waste collection points should be located mainly on main road axes in order to facilitate access of vehicles and easy approach of habitants. When possible, waste collection points should be placed in appropriate open spaces in the sidewalk, and, in all cases, the site should be flat (paved with concrete/tiles or asphalt), in order to facilitate access and movement of containers. Possible increase of the number of containers in the future should be taken into account when the placement site of containers in a waste collection points is designed.
6. Considering the aesthetic and hygienic aspects, waste collection point should have a three-side fencing around them. Fencing is recommended to be made of friendly light environmental material that could also be easily removed when needed. In special cases fencing of the WCP could be all around four sides. No coverage of WCP is necessary applicable.

The following pictures and sketches indicate various types of fencing and decoration of Waste Collection Points

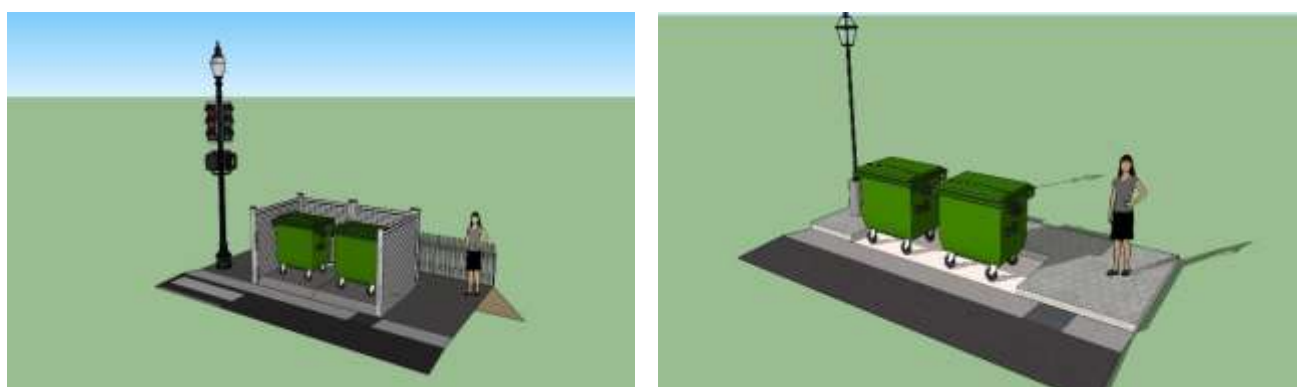


Figure 16: WCP by type of containers and typology of fence

Waste collection service in the pilot project should be designed based on the urban functions that are carried out in the area. The proposed system is based on the usage of a network of 1.1 m³ containers. For the calculation of the necessary collection points and number of containers of 1.1m³ the following criteria of functionality are considered:

1. The optimal distance of an inhabitant from the waste collection point should be around 70 m; depending on the urban infrastructure in different areas, distance between two collection points could extend to approximately 100 m;
2. The capacity of a 1.1m³ container filled with mixed waste is estimated at about 250 kg, considering a coefficient of about 227 kg/m³.
3. The filling factor of containers for mixed waste is estimated at about 70% of full load, thus, a full container contains about 175 kg of mixed waste;
4. Calculation of the number of plastic containers 240 l for door to door collection will be based on the number of households.

Based on the above functionality criteria, the waste management system and distribution of WCPs in the pilot area should consist of 53 points, and a total number of about 157 containers of 1.1 m³, which are located as shown in the following map:

Monitoring of the implementation of concepts

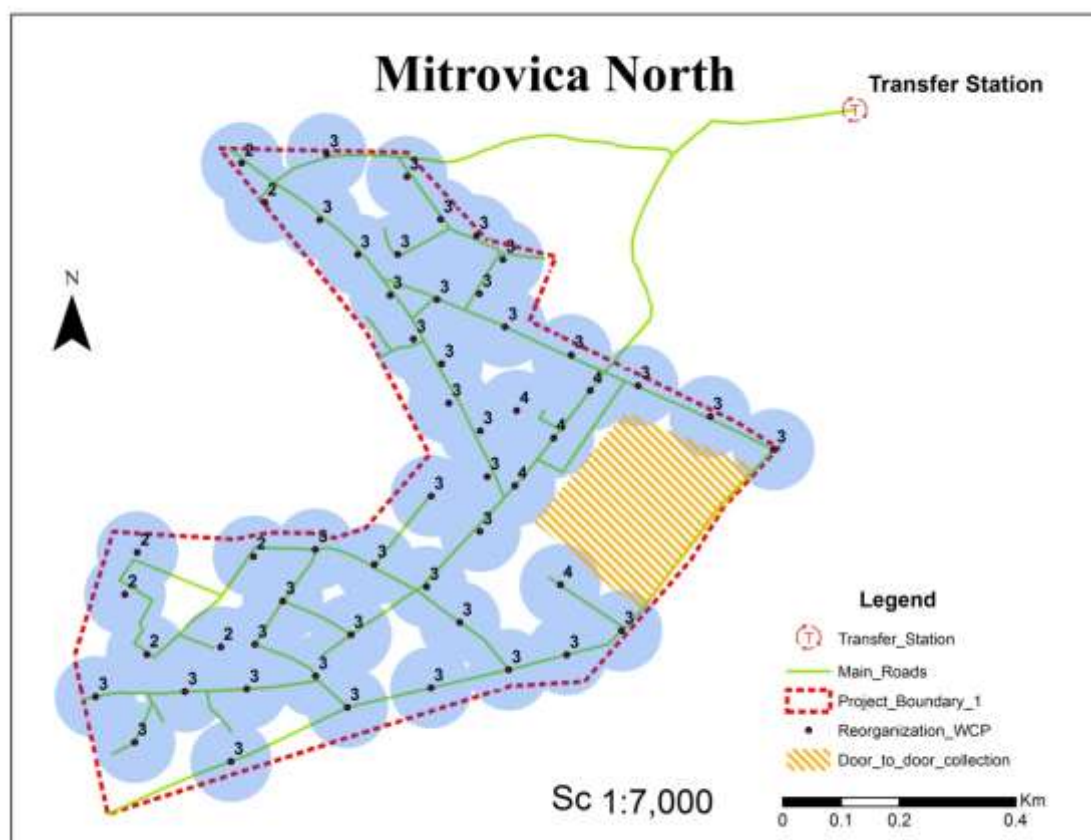


Figure 17: Map of the reorganized scheme in the pilot area.

5.4.3. Criteria for the collection of hospital waste

By the request of the municipality, in addition of the concept for the city center of North Mitrovica, the consultant has provided for a concept collection and treatment of hospital waste as well. The collection

and disposal of hospital waste is a sensible issue in the municipality, which also need to be addressed, considering that these waste constitute a category of hazardous waste, which are already collected together with household waste. Although this issue is not subject of this concept and addressing it would require a deeper analysis of the situation, the following recommendations are provided on how to improve the current situation:

1. Two 7 m³ containers dedicated currently to hospital waste have to be removed from the system;
2. The hospital, but also other health care centres in the municipality should immediately start with separate collection of medical hazardous waste form other type of waste similar to household waste;
3. Along with the improvement of the service in the project area, 4 WCPs for municipal waste may be installed in the territory of the hospital, in order to cover disposal and collection of municipal waste that are currently generated and collected together with hospital waste;
4. An additional point is defined within the territory of the hospital to deploy a top – closed container. The size and capacity of this container should be defined based on the daily amount of medical waste; it could differ from 3 m³ to 7 m³.
5. It is recommended that hospital waste collection be approached in two phases:
 - a. **In the first phase** hospital waste should be collected in 240l yellow or red containers and specific bags with a hazardous waste logo in order to simplify their identification. A 3-7m³ top- covered container should be installed in the territory of the hospital for disposing hospital waste generated from the hospital and also from other health clinics of the town. This container will be picked up by another truck with a frequency of not less than 2 time per week (or more often, if needed).
 - b. **In a second phase** the installation of an Hydroclave in the hospital premises is recommended for the sterilization of hazardous waste, allowing that, after treatment, waste be either (i) burnt in an incinerator or (ii) disposed together with other municipal waste, having no radiation in spreading diseases, infections etc.

The pictures below illustrate the equipment and tools recommended for waste collection and treatment of hospital waste:



Figure 18: Containers 240l and 3-7m³ top - covered container and plastic bags for hospital waste collection

5.4.4. Related costs to implementation of the pilot project

The following cost items will compose the costs for the implementation of the pilot project for the collection of waste in the pilot area of Mitrovica North. The distribution of the costs will be covered by GIZ and Municipality.

1. Capital costs			
Cost items	Unit	Cost/unit	Amount (€)
Containers 1.1 m3	155	350	54.250
Containers of 240 L	100	38	3.800
Top – Closed 3-7 m3 container	1	700	700
Installment of platforms for WCP	53	100	5.300
Fencing of WCP	53	170	9.010
Total Capital			73.060
Hospital waste treatment Hydroclave	1	120.000	120.000
2. Awareness and education costs			
Information leaflets	3,000	1	3.000
Billboard (4mx3m)/city lights 1mx1.2m)	10	40	400
Information for containers	500	2	1.000
Total awareness			4.400
Total Project Cost			77.460
Hospital waste treatment Hydroclave ⁶	1	120.000	120.000
Grand Total			197.460

Table 5: Predicted costs for the implementation of the Project

Referring to cost items above, the total costs for the improvement of the waste management service in North Mitrovica is estimated to be 197.460 Euro of which 77.460 Euro are the costs for the rehabilitation of the service and the awareness and education and around 120.000 Euro are for the procurement of new Hydroclave for treatment of hospital waste.

5.4.5. Targets of the proposed concept for the first year

Taking into account this concept and the resources and tools that the municipality and GIZ may deploy, the project will aim to deliver waste collection services with a higher standard and reach the satisfaction of citizens for the cleaning service, the Municipality will increase of this concept indicators at the following levels:

1. Setting 53 waste collection points, 11 more than existing ones,
2. Adjustment, maintenance and decoration of all collection points;
3. Purchase and install 157 new containers to replace all existing containers.
4. Purchase and distribution of 100 container of 240 L for service coverage in the door-to-door waste collection area.

⁶ Indicative price

Through these additional inputs, by 2019, the Municipality will increase its product level to:

1. Provide a quality service for approximately 20.000 inhabitants, all businesses, as well as all institutions in the pilot project area,
2. Provide special service for business in the center area.
3. Ensure the removal of about 11.8 tons / day of waste from the city's pilot.
4. Ensure safe and environmentally sound collection and treatment of hospital waste.

6. MONITORING OF IMPLEMENTATION OF CONCEPT IN MUNICIPALITY OF FUSHË-KOSOVË

Implementation of concepts have already started in the municipalities of Fushe Kosove, Vushtrri and Mitrovica North, while is in preparation phase in the municipality of Prishtina.

6.1. Monitoring of concept implementation in the Municipality of Fushe Kosova

The Municipality of Fushë-Kosovë is implementing the concept for the differentiated collection of recyclable waste. This process is the result of the persistence and consistence work of the Working Group GIZ and Green Art Center Prishtina, which implements the project in seven municipalities, including the one of Fushë-Kosovë. The process has started with the implementation of collection system, placement of waste collection points at the number and location as designed in the conceptual phase.

Starting from 19.04.2018, the differentiated collection of recyclable waste in the pilot area (Dardania Street) of in Fushë-Kosovë has already started. These investments are made available from GIZ.



Figure 19: Coverage of "Rruga Dardania" in Fushë-Kosovë

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The following photos illustrate the location and the placement of waste collection points; containers with yellow cover are dedicated for recyclable waste whereas green containers are dedicated for mix waste.



Figure 20: The rehabilitated waste collection points in Fushë-Kosovë

6.2. Monitoring of implementation of concept in Municipality of North Mitrovica

Municipality of North Mitrovica is the second municipality that has started the implementation of the concept for the reorganization of waste management service in the city center. The municipality has placed the new waste collection point as were foreseen in the concept aforementioned in the above sections of this report.



Figure 21: Placement of Waste Collection Points in various areas of the city center of North Mitrovica



Figure 22: Placement of waste collection points in the hospital area of Mitrovica North

6.3. Monitoring of implementation of concept in Municipality of Vushtrri

Municipality of Vushtrri is one of the first municipalities that have started with the implementation of the concept for the reorganization of the waste management service. The concept for the reorganization for Vushtrri Municipality consisted in the reorganization of waste management service

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in the city center and the village of Pestovë. The municipality has started the process on April 2018; it consist in the establishment of the differentiated collection system for recyclables waste in the center of the city.

In the course of the ongoing processes the Municipality of Vushtrri has placed the new containers and the installment of basements and fences for the waste collection points. This investments are made available from GIZ. New waste collection points and containers are located as in the following map. The municipality will continue to extend the service by complementing the system with the placement of other Waste Collection Points.



Figure 23: Map of distribution of waste collection points in Vushtrri (city center)

Figure 24: The rehabilitated waste collection points in Vushtrri (city center)



6.4. Monitoring of implementation of concept in Municipality of Prishtina

The Municipality of Prishtina has not started yet the implementation of concepts for the reorganization of the service in the two selected neighborhoods (Kodra e Diellit and Ulpianë). Although the municipality has replaced some of the old containers in Ulpianë neighborhood with new ones but still not as they were foreseen in the concepts.

6.5. Ongoing Monitoring of implementation of concept in four selected municipalities

Ongoing monitoring of concept's implementation in the four selected municipalities shall be subject of the activity that GAC is carrying out as GIZ project partner. GAC in supporting GIZ and municipalities shall ensure that the systems are put into place and become functional based on the concepts are designed from the consultant and as approved by the municipalities.

A communication and reporting system shall be installed to ensure that the systems are working effectively and the required results are achieved.

An information and monitoring flow chart is given in the following scheme.

Implementation of the proposed scheme aims at ensuring the systems are in place, differentiated collection is effective and information is provided to decision makers.

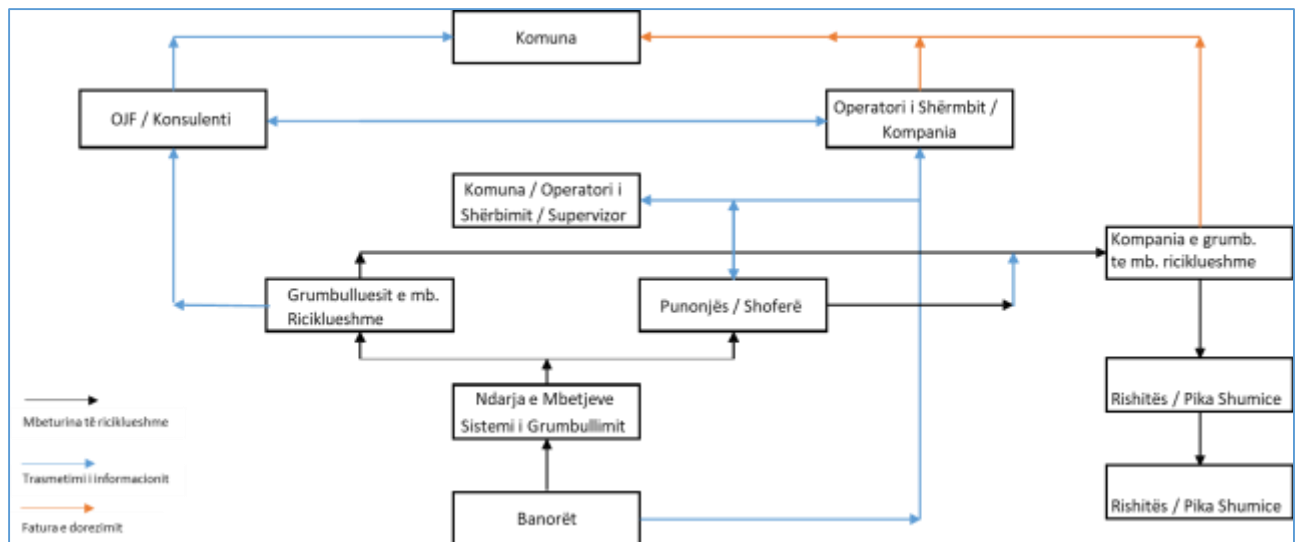


Figure 25: Monitoring and reporting systems for the implementation of the concept

The following scheme shall be implemented to follow with the monitoring of the plan, achieving outcomes and monitor the results that will come from the newly established waste collection system.

The scheme involves three main activities/ directions and defines the responsibilities of each party involved, aiming at the integration of informal collector's activity.

- The system defines the flow of recyclable waste (black line), which are collected by informal collectors, taken to the intermediary retailers of recyclable waste and from them to the either recyclable wholesalers or recycling industry.
- The system defines the flow of information (blue line) for recyclable waste as collected from informal collectors. The information is collected and elaborated from a specialized NGO and then is taken to the municipality and / or the company in charge of waste management.
- The system provided for the monitoring of results (orange line), retailer companies shall provide to the commune either directly or through the NGO, the information about the quantity, composition and origin of recyclable streams that are collected in the area of the municipality.