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EUROPEAN SUPPORT FOR ROMA INCLUSION

"Mapping of substandard Roma settlements in GIS" Project



General Characteristics of Substandard Roma Settlements in Serbia and a Proposal for Further Development Initiatives for the Improvement of the Living Conditions of the Roma Community

European Union

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EVROPSKA PODRŠKA ZA INKLUZIJU ROMA

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1 Introduction

In order to solve the existing system problems and bring about an overall improvement of living and working conditions of the Roma minority community in Serbia, the Serbian Government had adopted a National Strategy for the Improvement of the Status of Roma in 2008. Until present, the Strategy has been implemented by a number of different institutions and organizations through a series of projects and activities. The numerous problems of the Roma community in Serbia that have been identified include: substandard living and working conditions, low or absence of any income, legal or other form of discrimination, inability to use social and/or health insurance, and other.

The Organization for Security and Cooperation in Europe (OSCE) in Serbia provides technical support to the Government of Serbia in the implementation of the objectives of the Strategy through the "We are here together - European support for the inclusion of Roma" project. Part of this support or assistance is directed towards the creation of a national GIS database on substandard Roma settlements (SRS) in Serbia. This database should allow the line Ministry, the Ministry of Construction, Transport and Infrastructure, as well as the local self-governments in Serbia, to monitor the key indicators of the SRS development and to easily search and analyze data on the conditions of life inside the SRS in order to be able to make the right investment decisions directed at improving the life of the Roma community.

For the purpose of developing the said GIS database, the OSCE Mission to Serbia engaged the Standing Conference of Towns and Municipalities (SCTM) in September 2014 to implement the "Mapping substandard Roma settlements in GIS" project (the Project).

The **main goal** of the Project is to create conditions for the creation of a GIS database that the line Ministry needs to adopt efficient and effective investment activity decisions directed at an improvement of the position of the Roma community in Serbia. In other words, the main objective of the activities conducted by the SCTM as the implementing partner in this Project, is to create the concept of the GIS database, define the appropriate data collecting method, and, finally, to collect general data on substandard Roma settlements (SRS).

The **specific goals** of the Project include the creation of the adequate conceptual data model on SRS at the national level, and the definition of the right approaches, methods, and techniques, accompanied with an organizational model, to collect and update information about the SRS at the municipality and town level on the territory of the Republic of Serbia as a whole. In addition to storing data, the thus created conceptual model of a SRS database should also enable the connection and/or integration of the collected data with the already existing data on the Roma population and settlements in Serbia, and with other relevant databases in the country, and an integral management of the said data in the future.

The purpose of this document is to present a brief summary of the set of methods created under the Project and the general results achieved, both in terms of quality and quantity, and to also point out to the possible steps to take in order to further advance the GIS information platform and the activities directed at the improvement of the general living and working conditions of Roma in Serbia.

The introductory section is followed by the (second) chapter on the methodological framework of the Project. The next, third chapter, outlines the basic (statistical) information about the obtained data, and is followed by the fourth, fifth and sixth chapter, where the first results of the spatial-attribute analysis on SRS are presented. Before moving on to the concluding remarks, the seventh and eighth chapter offer recommendations for a further improvement of the created information basis, and proposals for possible future activities aiming to improve the living conditions in Roma settlements.

2 Methodology and a conceptual data model for the collection of data on SRS

The Project for data collection on SRS on the entire territory of the Republic of Serbia, with the aim to enable the implementation of the GIS technology, was conducted for the first time in Serbia and is intended to be the means of support for decision-makers in their efforts to improve the living conditions of the minority Roma community. The method used in the Project is based on a unique combination of different elements, including:

- The need for data and for the functionality of the future GIS database, as defined by the line Ministry and the OSCE Mission in the Project Terms of Reference;
- International and local experience, methods and standards in the domain of data collection and management (Chapters 2.2 and 2.3), and
- Experience of the SCTM team of local experts in terms of organization and implementation of the necessary activities and tasks.

Furthermore, for want of a more adequate local definition for this type of settlement, theme coverage of the Project is based on the definition of substandard settlements given by the UN, that lists the following criteria as the key criteria for their identification:

- Inadequate access to potable water;
- Inadequate access to sanitary and other infrastructure (sewers or septic tanks, public transport and traffic roads, water supply system, and other utilities);
- Poor quality of housing units (housing units built using inadequate building techniques and/or poor construction materials; housing units that are decrepit due to poor maintenance, and similar houses potentially hazardous to the security of its inhabitants);
- Overpopulation in terms of average density of population per unit area of the settlement, or in terms of a large number of persons per one household; and
- Uncertainty of the legal status of houses on plots (including unresolved property ownership rights over land and utilities in the settlement).

As concerns the Project Terms of Reference, the key requirements for the definition of the Project methodological framework is for it to achieve the desired functionality of the future GIS database on SRS, which meant that:

- the results and products of the Project had to simultaneously ensure local and national – i.e. municipal- and town- level coverage and level of detail of information on SRS and of their use;
- the data collecting methods had to ensure the collection of data about the spatial boundaries of the SRS and alphanumeric information about the settlements, essential to conduct general and individual

assessment of the status of the degree and type of substandard quality of Roma settlements on the territory of the Republic of Serbia and the individual municipalities; and

- the conceptual data model of data on SRS had to ensure their linking to the existing primary databases of self-governments on the territory of Serbia (property of Statistical Office of the Republic of Serbia, Republic of Serbia Geodetic Authority, (Spatial Units Registry, Address Registry, Real Estate Cadastre, the Central Registry of Spatial Planning Documents), and other.

2.1 Alphanumeric and spatial data collection methods

The set of methods to use in order to collect such vast a number of alphanumeric and spatial data on SRS within the relatively short time framework of the Project and in compliance with the requirements laid down by the line Ministry as the end-user of the collected data, was defined after an extensive analysis. The aim of the analysis was to learn about previous similar theme projects and their methods and practices, on the one hand, and to identify the expectations and demands of the end-user of the collected data, on the other, in order to create a set of data collecting methods with the structure and contents that are optimal for the collection of data on SRS. In this sense, the analysis included:

1. Analysis of the completed projects and studies that had obtained data on Roma settlements and communities on the territory of the Republic of Serbia as a result of their activities:
    - An overview and analysis of the data collecting methods used when collecting data on the Roma population, including their content, type, category and structure of the collected data.
2. Analysis of the needs, in terms of data, of key decision-makers in the line Ministry as the end user of the results of this Project:
    - The need for a national coverage of data on SRS that include the level of detail that would enable a synthetic overview and assessment of the current state of affairs, and the adequate communication and coordination of investment decisions and activities between local-level and national-level governments;
    - The importance of spatial location of the SRS, i.e. its geographical positions, the type and intensity of the problems the Roma population are faced with, in order to be able to properly define the activities and measures of support to be taken by the administration, and adequate territorial allocation of otherwise limited financial resources of the state budget;
    - Ensuring comparative analysis of the status of the SRS and reaching informed decisions aimed at improving living and working conditions of the Roma population in them;
    - Connecting to other data bases in the Republic of Serbia in order to ensure an integral approach to solving problems of the Roma population and a greater number of up-to-date data for future decision-making; and
    - Implementation of the GIS technology and its analytical and other advantages concerning this particular field of socio-economic and social development in Serbia.

The set of methods of collecting data on SRS included the implementation of methods and techniques relevant to collecting alphanumeric and spatial data on SRS:

The **Questionnaire Method** was used to collect alphanumeric data on SRS. It consists of 26, mostly closed-end, questions that: allow easy completion of the questionnaire and easy analysis of responses to questions; reduce the likelihood or risk of errors when completing; and, at the same time, secure preconditions for the data to be standardized as required for the implementation of the GIS technology and the analytical and visualization benefits it offers. All 26 questions were sorted into four basic categories. Data on individual SRS were collected at the level of local self-governments in a separate Excel document prepared for each of the 169[1] municipalities in Serbia (excluding Kosovo and Metohija). (Appendix 1: Example of a SRS data collecting questionnaire on the territory of the city of Novi Sad). Such methodical approach to collecting data on SRS will ensure the required general and comparative analyses at the local and/or national level and simple updating and historical analysis of the collected data in the future, when needed.

The **CAD technique**, combined with the Spatial Units Registry and orthoimagery obtained from the Republic of Serbia Geodetic Authority is intended to collect spatial data on SRS borders. - As in the case of the questionnaires, for each SRS, a separate CAD data file will be created at the local self-government unit level.

In addition to these most important methods, the set of methods to collect data on SRS proposed by the SCTM also includes the implementation of the modelling method, the method of generalization, of classification, of analysis, and other.

2.2 Conceptual model for the GIS database

In compliance with the Project's Terms of Reference related to the conceptual data model for SRS and the requirements regarding data that should be collected, and which the future GIS database will support in terms of data management, a data management model was created containing the following information (Appendix 2: Conceptual data model for SRS):

- Data on relevant administrative, statistical and cadastral spatial units, obtained from the current Spatial Units Registry, including basic information on each SRS;
- General data on individual SRS such as general demographics, data on history of the SRS, and data on the position of each individual SRS;
- General data on access to utilities and to public transport network for each individual SRS;
- General information on the legal-property relations at the level of individual SRS, and those identifying the existence and status of the current planning documents, as well as the type of land ownership.

1 The data was used in the research that there is a total of 169 towns, municipalities and city municipalities on the territory of the Republic of Serbia (excluding Kosovo and Metohija). This number corresponds with the number of spatial units provided by the Republic of Serbia Geodetic Authority.

The proposed conceptual data model was created using the UML language, it is scalable, and in line with for both local and ISO19000 and INSPIRE standards, where it was applicable.

The thus created conceptual data model will allow for the simple structuring of the GIS database in the next phase, and their entry into the same database containing graphic and alphanumeric data on SRS collected through questionnaires.

Moreover, applying the said standards at the level of data models will ensure easy connectivity, integration and exchange of data on SRS with other existing – and new - databases that contain relevant information, at the level of individual spatial units.

Using the available technology solutions, a qualitative and quantitative improvement of the thus established information platform on Roma settlements, i.e. of the information system on Roma settlements as a group of substandard settlements in Serbia will be ensured.

2.3 Organizational model

As concerns organization, the Project's set of methods is based on the existing SCTM organizational network that encompasses cities and municipalities, and expert associates from local organizations dealing with space planning and management.

The organizational model of the Project included the creation of a smaller network of 16 associate field experts, who had received training on data collection in Belgrade, and then went on to hold local-level workshops for representatives of towns and municipalities who were assigned to them under the Project.

The key role in gathering data in the field was given to the employees of local government offices for urban planning and construction, coordinators for national minority issues, and other local-level professional services dealing with the housing issues of vulnerable social groups (such as social work centers, local housing agencies, and civil society organizations).

In this sense, good coordination and communication between members of the SCTM team and local representatives of towns and municipalities was critical to the success of the Project.

2.4 Benefits of the implemented set of methods

In line with the solutions and requirements presented in the previous chapters, a number of advantages of the implemented methods had been identified, specifically for the collection of data on SRS. Some of these advantages include:

- Implementation of the applicable European and national standards for spatial and alphanumeric data management;
- Implementation of standards and approaches needed for the implementation of the GIS database and its technological advantages;
- The possibility of linking/integration with other data bases of importance for efficient and effective decision-making;
- Creating conditions for more up-to-date information platform on SRS as a subgroup of substandard settlements in Serbia;
- The possibility of a relatively simple implementation/replication of the same method for use on other substandard settlements; and
- Creating conditions for an increased visibility of the problems existing in the SRS and the Roma community in general, through the publication of the final collected data on an Internet portal or through presentations.

3 Quality of the collected data on SRS

In line with the defined Project Terms of Reference and standard GIS technology requirements for the future management of SRS data, the Project's body of methods foresees implementing an assessment procedure to ensure the quality of alphanumeric and spatial data for each individual settlement.

In the case of this Project, quality data imply collection and creation of a database on SRS that will be able to provide reliable assessment of living conditions in the settlements. The future national database containing data on SRS should support decision-making and definition of necessary actions aimed at improving the lives of the Roma in Serbia. In the long term, this database should also support an adequate monitoring of the implementation of all adopted development measures and undertaken activities.

That is why the procedure of quality assessment of the collected data consisted of the verification of data on each of the four essential quality criteria, which are: completeness, consistency, accuracy and logical sense of the data. In the context of this Project, the criteria for the verification of the quality of the collected data on SRS included the following:

- Completeness – an assessment of the degree of completion of the questionnaire, i.e. of the completeness of each answer;
- Consistency or conformity – assessment of compliance with the set rules, i.e. the set of data collection methods for both the data obtained from the questionnaire and spatial data;
- Accuracy or precision – assessment of the accuracy of answers, and/or accuracy of spatial data about the SRS borders; and
- Logical sense - assessment of the credibility of the collected data, based on the experience of the SCTM expert team.

After an initial analysis of the collected data, a selective and rules-driven qualitative alignment of the data was conducted in view of achieving the goals and objectives of the Project. The purpose of such data reconciliation is so that they can be harmonized with the requirements -standards- of the use of GIS tools, on the one hand, and so that an elementary level of data quality on SRS is ensured, necessary for the correct implementation of the basic spatial and attribute analyses, on the other.

Despite the fact that, in the course of the data verification, in addition to the advantages, a certain number of limitations to the Project ToR were identified, and a certain number of pre-conditions for the Project activities had to be defined as necessary in order to obtain quality data, the general assessment of the quality of the collected data on the SRS is - satisfactory. This is primarily the result of the properly created and consistently applied set of methods for the implementation of the Project, both in terms of organization and in technical terms.

Smaller interventions were made in the end by members of the SCTM project team, in order to contribute to a better quality of the collected alphanumeric and spatial data on the SRS. This represents regular practice in data processing, and its purpose is to increase the use-value of the collected data and the ability to benefit from the GIS and other IT tools.

And finally, upon the formation of a GIS environment, the thus secured level of quality of such an information platform that was formed through the integration of all data for all settlements, will ensure the following: implementation of basic spatial and attribute data analyses of the SRS on the territory of the Republic of Serbia; making conclusions on the general status of these settlements and the living conditions of the Roma population in them; and adopting strategic/tactical decisions regarding further activities and course of action to be taken by the line Ministry, aimed at identifying the detailed needs of these settlements, investment priorities and the scope of the necessary funds.

4 An overview of the collected data on SRS

In compliance with the established methodological framework and plan of activities, following the training they had received in Belgrade in late October 2014, the SCTM project team in the field (i.e. associate field experts) held 10 regional workshops throughout Serbia in November and December. Subsequently, data on SRS were collected until the end of February 2015.

In addition to the associate local experts on the ground, representatives of local self-governments and local companies that had recognized the interest in solving the most pressing problems of the Roma minority in their communities have actively participated in the collection of data on SRS, and managed to secure support from the Ministry for their towns and municipalities to implement future plans concerning this issue.

Table 1. Statistical overview of collected data on SRS in Serbia

Number of municipalities/ towns with SRS settlements	Number of municipalities/ towns with no SRS settlements	Total number of SRS settlements	Average number of SRS settlements per municipality/ town	Average number of SRS settlements per district	Average number of SRS settlements per region
120 (71.01%)	49 (28.99%)	583	3.4	22.4	145.8

Based on the definition of this type of substandard settlements, established under the set of methods for collecting data on SRS (Chapter 2, p. 4) and presented at the above mentioned regional workshops, representatives of towns and municipalities have independently assessed and reported the existence or non-existence of settlements of this type on the territory under their jurisdiction. Using this method, substandard settlements of the SRS type have been identified In more than half of towns and municipalities in Serbia, as seen in Table 1.

More specifically, SRS exist in 120 out of 169 municipalities in Serbia, which accounts for over 70% of all municipalities in Serbia. The total number of SRS on which data were collected is 583, and this number corresponds to the estimates previously made by the OSCE experts. Unlike some previous research, this Project also identified the spatial distribution of the SRS throughout the entire territory of Serbia, and also collected general information about the living conditions in the settlements and the existing legal property ownership relations/statuses, in compliance with the standards and requirements of the complex spatial-attribute analyses when using GIS tools.

5 General characteristics of SRS in Serbia

The gathered information on the 583 SRA settlements in Serbia will make up a platform that will serve in the future to determine development directions and adopt general decisions on the scope and type of activity to take, and as a basis to identify the specific measures to take in order to improve the essentially different living conditions in substandard Roma settlements compared to other inhabited settlements in the country. **Nonetheless, this platform, which today contains (only) basic information on each individual registered SRS, should regularly be updated, developed and enlarged, increasing the detail and scope of data, so that critical improvement of the elementary infrastructure and superstructure in these settlements could be achieved in the near future, and Serbia's Roma population gain equal rights in terms of their living and working conditions.** Most importantly, in the course of its regular updating of this database, it would be desirable for the line Ministry to conduct once again an update/verification of the information on the (non)existence of SRS in 49 towns and municipalities.

A general statistical analysis of the data on registered SRS collected during the Project is presented in the following paragraphs, with an overview of spatial distribution of the SRS on the territory of the Republic of Serbia and their general characteristics.

5.1 Distribution of SRS on the territory of Serbia

The geographical location of SRS is determined based on the orthoimages obtained from the Republic of Serbia Geodetic Authority, and the spatial distribution of these settlements is then analyzed on the basis of data collected on their position in relation to the official statistical-cadastral division of the territory of the Republic of Serbia, as established by the Spatial Units Registry of the Republic of Serbia Geodetic Authority.

As concerns spatial distribution, in line with previous estimates, the largest number of SR settlements on the territory of the Republic of Serbia is registered around major urban centers, on the territory of the Belgrade District, Nisava District and South Backa District. In addition, over 31 SRS have been identified and registered on the territory of Mačva, Kolubara, Južni Banat and Jablanica Districts. The number of SRS on the territory of all other districts in Serbia is under 30. An important conclusion was made that there exists no district in Serbia without (at least one of) such substandard settlements.

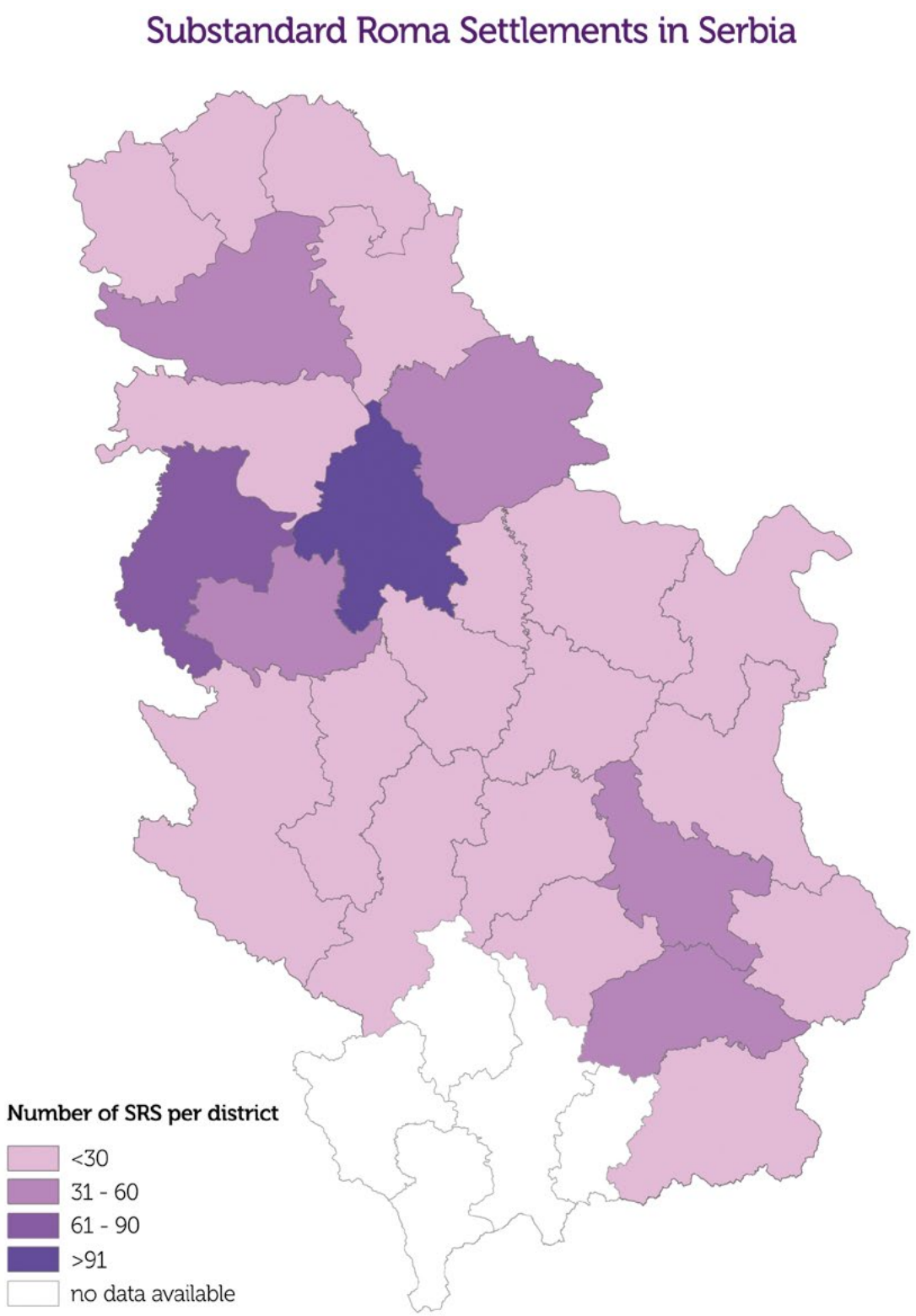


Figure 1 Distribution of SRS in Serbia per districts

5.2 Living conditions in SRS

The collected data on the living conditions in the SRS across Serbia can be divided into three basic categories:

- Information on the general characteristics of the SRS in terms of location, duration, years of existence, and size (5.2.1);
- mmm Information on the status of infrastructure networks and other utilities (5.2.2);
- Information on the status of legalization of the housing units in the SRS and if there are possibilities to improve the existing legal ownership rights, and relations (5.2.3).

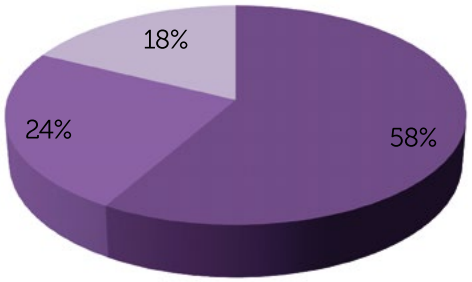
5.2.1 An overview of the general characteristics of the SRS in Serbia

The collected data on the general characteristics of the SRS provide insight into the general living conditions in this type of substandard settlements in Serbia. Also, together with data on the position of the SRS in relation to the statistical and cadastral districts from the Spatial Units Registry (region, district, city/town, municipality, settlement, cadastral municipality, statistical district, census-gathering district), data on the general characteristics of the SRS provide criteria for aggregation and analysis of other collected data, such as data on the status of infrastructure networks and legalization of objects in the SRS.

5.2.1.1 Position in relation to a formal settlement

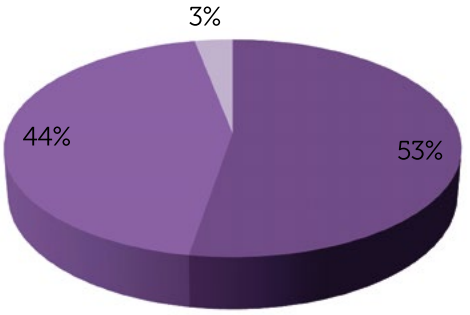
The analysis of the collected data on the position SRS revealed that most of these settlements (52.75%) are integrated into formal settlements, mainly in the area of Belgrade Region (58%). The lowest number of SRS is positioned outside of formal settlements, an average of 10.25% at the regional level in Serbia. The majority of these settlements that are outside of formal settlements are (again) found on the territory of Belgrade Region. The number of SRS located around the perimeter of formal settlements in Serbia amounts to an average of 37% per region, and the majority of these settlements - 44% - are found on the territory of Vojvodina Region. Other statistics of the position of SRS in relation to formal settlements in Serbia are shown in the diagrams in Figure 2 below.

BELGRADE REGION



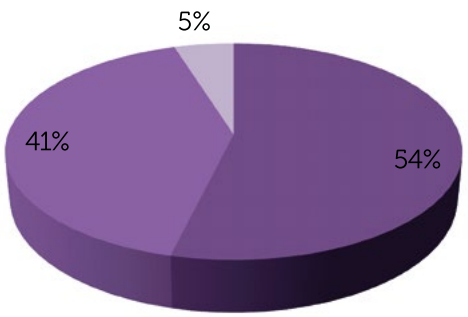
- Integrated into a formal settlement
- On the outskirts of a formal settlement
- Outside a formal settlement (> 1 km distance)

VOJVODINA REGION



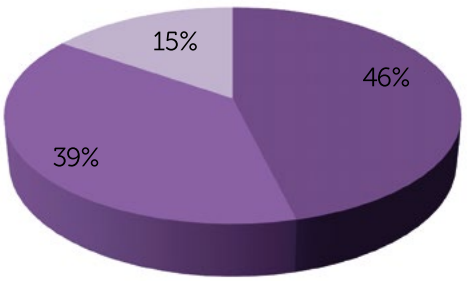
- Integrated into a formal settlement
- On the outskirts of a formal settlement
- Outside a formal settlement (> 1 km distance)

SOUTH AND EAST SERBIA REGION



- Integrated into a formal settlement
- On the outskirts of a formal settlement
- Outside a formal settlement (> 1 km distance)

ŠUMADIJA AND WEST SERBIA REGION



- Integrated into a formal settlement
- On the outskirts of a formal settlement
- Outside a formal settlement (> 1 km distance)

Figure 2 Position of the SRS in relation to formal settlements

5.2.1.2 Number of years of existence of the SRS

The majority of the most recently formed SRS, with an estimated number of years of existence of under 15, are found on the territory of Belgrade Region (10%), followed by Šumadija and West Serbia Region, South and East Serbia Region, and finally Vojvodina Region with 1%. The greatest number of the SRS with an estimated number of years of existence of over 45 years has been registered in the region of Vojvodina, followed by the South and East Serbia Region, Šumadija and West Serbia Region, and, finally, the Belgrade region with 35% of substandard settlements this old.

The largest number of SRS with an estimated number of between 15 and 45 years of existence are located in the Belgrade region, followed by the region of Šumadija and West Serbia with 41%, while the regions of Vojvodina and South and East Serbia have equal percentage of such settlements, 34%.

Regardless of the low percentage of certain groups of SRS in terms of number of years of their existence, all regions in Serbia have SRS in all categories. Belgrade Region has the largest percentage of both youngest and oldest SRS on its territory, compared to other regions.

An overview of all statistics regarding the number of years of existence of SRS across regions in Serbia is shown in Figure 3 (below)

5.2.1.3 Construction materials used to build housing units in SRS

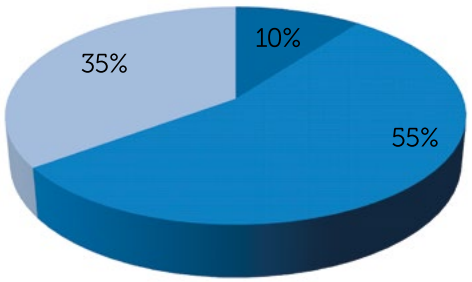
Housing units in the SRS settlements registered on the territory of the Republic of Serbia were built for the most part using construction materials that do ensure the safety of their residents, as well as the durability of the structure itself. On average, in 59.25% of SRS on regional level, housing units were built of materials that ensure durability and safety. The largest number of such SRS are found in the Šumadija and West Serbia region (80%) and the smallest percentage of such SRS are found in the region of Vojvodina (37 %).

The highest percentage of SRS where residential buildings were built using poor materials are located on the territory of Vojvodina region (63%) and the lowest percentage in the region of Šumadija and West Serbia (20%).

Such a structure of house categories according to the type of building materials, where the majority of houses are durable, opens up possibilities of building new and safer housing, or improving the safety of the existing ones, in accordance with other characteristics of the SRS and the existing living conditions in settlements.

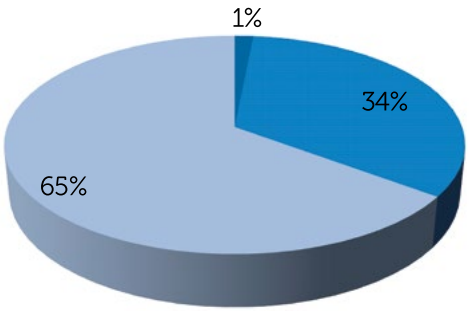
A general overview of the statistics of housing units by type of construction materials at the regional level is given in Figure 4 (below).

BELGRADE REGION



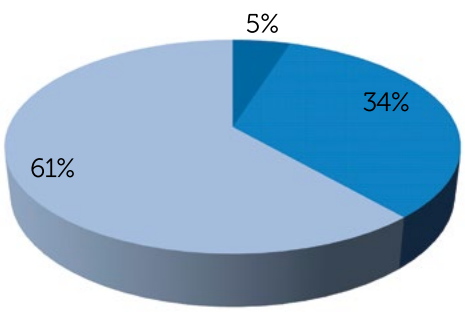
< 15 years
15 - 45 years
> 45 years

VOJVODINA REGION



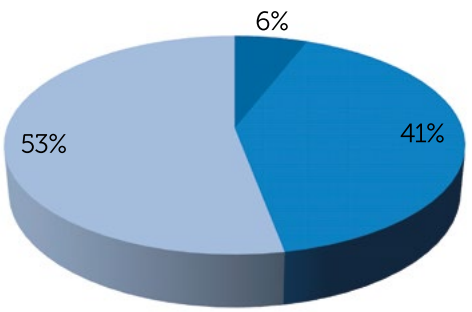
< 15 years
15 - 45 years
> 45 years

SOUTH AND EAST SERBIA REGION



< 15 years
15 - 45 years
> 45 years

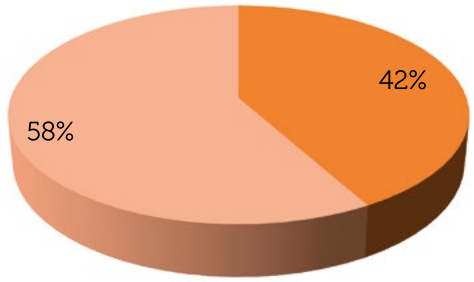
ŠUMADIJA AND WEST SERBIA REGION



< 15 years
15 - 45 years
> 45 years

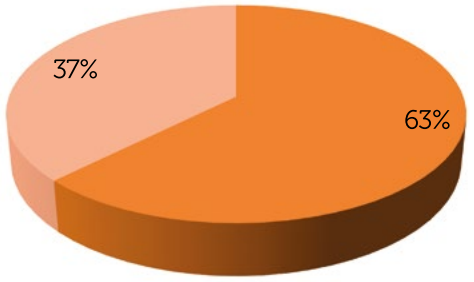
Figure 3. Years of existence of SRS in Serbia

BELGRADE REGION



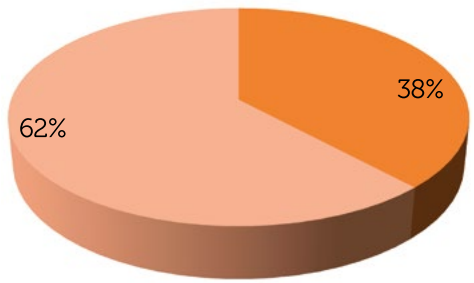
- Poor quality materials, unsuitable for construction purposes
- Materials that guarantee durability and safety

VOJVODINA REGION



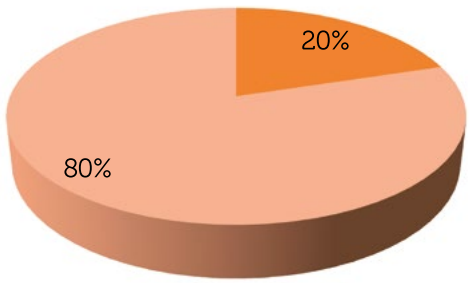
- Poor quality materials, unsuitable for construction purposes
- Materials that guarantee durability and safety

SOUTH AND EAST SERBIA REGION



- Poor quality materials, unsuitable for construction purposes
- Materials that guarantee durability and safety

ŠUMADIJA AND WEST SERBIA REGION



- Poor quality materials, unsuitable for construction purposes
- Materials that guarantee durability and safety

Figure 4 Durability of housing units in SRS in Serbia

5.2.1.4 Size

The size of the SRS settlements registered on the territory of the Republic of Serbia, as established in the definition of this particular type of settlement, was estimated on the basis of the number of houses or housing units built in them.

The majority of the smallest-size SRS with up to 15 houses/housing units are located on the territory of Šumadija and West Serbia (40%), while the majority of SRS with over 200 houses/residential units is registered on the territory of the South and East Serbia region (6 %).

Generally, in the territory of the Republic of Serbia, SRS settlements of size between 15 and 50 housing units (44.25%) are predominant, while the SRS with more than 200 housing units are the least present (3.25% on average).

A detailed overview of the collected data on the size of SRS in Serbia is given in the diagrams in Figure 5 (below).

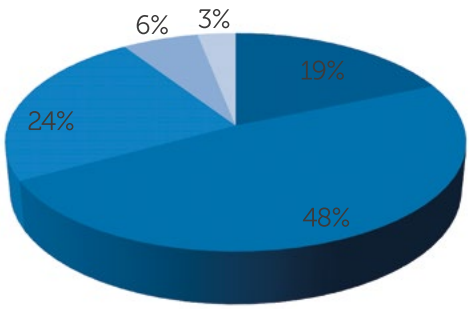
5.2.1.5 Number of inhabitants

In accordance with the above presented statistics on the SRS size expressed by the number of housing units, the majority of the largest SRS settlements in terms of population are also found in the region of South and East Serbia (5%). Vojvodina region follows with 2% SRS with more than 1000 inhabitants. Sumadija and West Serbia region and Belgrade region have 1% of such settlements each.

The percentage of the least populated SRS, i.e. with under 100 inhabitants, is the highest in the region of Sumadija and West Serbia (55%) and lowest in the Belgrade region (28%). SRS settlements with fewer than 100 residents represent at the same time the largest group of SRS settlements on the territory of Serbia, and their average percentage share at the regional level is 46%.

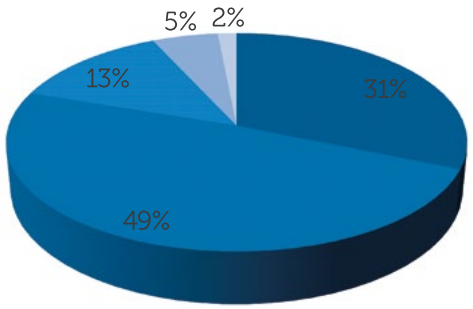
Further statistics on the estimated number of inhabitants in SRS per categories and regions is shown in Figure 6 (below).

BELGRADE REGION



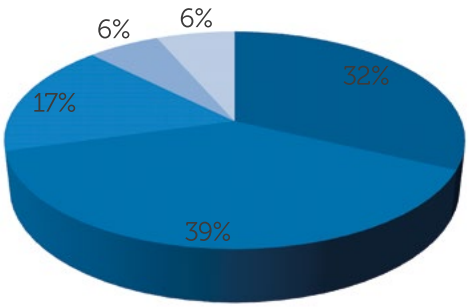
- < 15 units
- 15 - 50 units
- 51 - 100 units
- 101 - 200 units
- > 200 units

VOJVODINA REGION



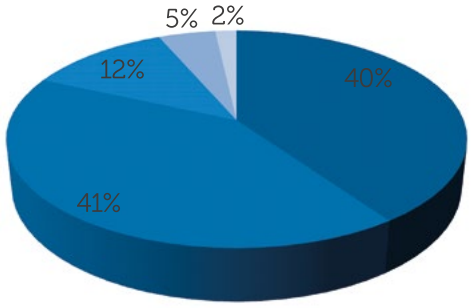
- < 15 units
- 15 - 50 units
- 51 - 100 units
- 101 - 200 units
- > 200 units

SOUTH AND EAST SERBIA REGION



- < 15 units
- 15 - 50 units
- 51 - 100 units
- 101 - 200 units
- > 200 units

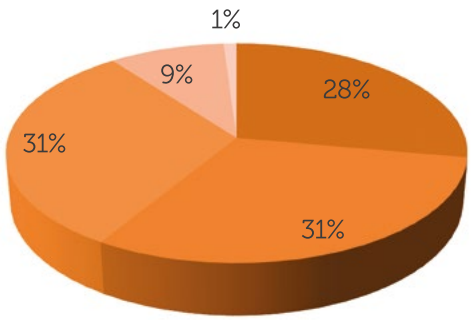
ŠUMADIJA AND WEST SERBIA REGION



- < 15 units
- 15 - 50 units
- 51 - 100 units
- 101 - 200 units
- > 200 units

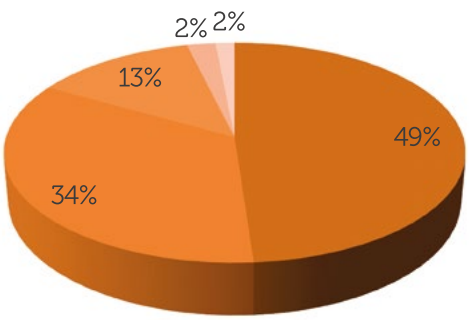
Figure 5 Number of houses/ residential units in SRS settlements in Serbia

BELGRADE REGION



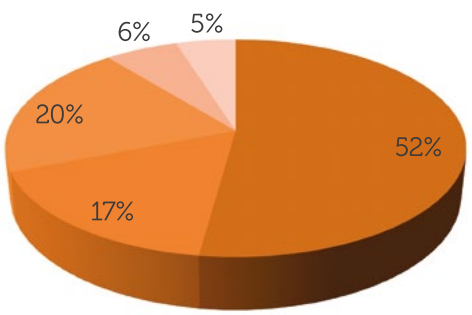
- < 100 inhabitants
- 100 - 200 inhabitants
- 201 - 500 inhabitants
- 501 - 1000 inhabitants
- > 1000 inhabitants

VOJVODINA REGION



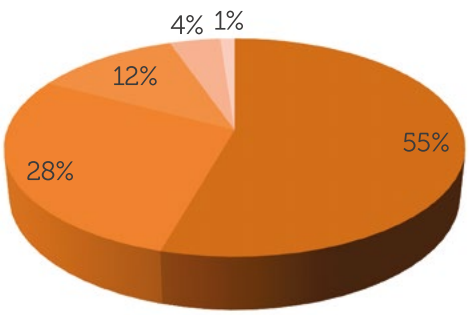
- < 100 inhabitants
- 100 - 200 inhabitants
- 201 - 500 inhabitants
- 501 - 1000 inhabitants
- > 1000 inhabitants

SOUTH AND EAST SERBIA REGION



- < 100 inhabitants
- 100 - 200 inhabitants
- 201 - 500 inhabitants
- 501 - 1000 inhabitants
- > 1000 inhabitants

ŠUMADIJA AND WEST SERBIA REGION



- < 100 inhabitants
- 100 - 200 inhabitants
- 201 - 500 inhabitants
- 501 - 1000 inhabitants
- > 1000 inhabitants

Figure 6 Number of inhabitants in SRS settlements in Serbia

5.2.2 An overview of the status of infrastructure networks in SRS in Serbia

The collected data on the status of infrastructure networks and other utilities in SRS directly indicate the quality of life in them, and as such are an important part of the information on the general characteristics of the existing substandard settlements in Serbia.

Data were collected during the Project on water supply, sewerage, public transport, electricity, and public lighting networks, as well as information on the type of heating and solid waste disposal. These data (only) allow for a basic analysis and general assessment of possible development activities in the future. However, even at this general level, by using different models to conduct an integrated analysis together with other relevant data, the data collected during the Project are able to support the competent Ministry in the definition of future steps to take towards improving the living and working conditions of the Roma minority in Serbia.

5.2.2.1 Water supply system

Of the total number of reported SRS settlements on the territory of the Republic of Serbia, in the majority (38%), houses are not connected to the water supply system. However, in 30% of these settlements more than 70% of housing units are connected to the water supply system. In addition to these 30%, in another 32% SRS (10% + 22%), a certain percentage of residents are able to use water directly from the tap in their houses.

Given the position of the majority of SRS settlements in Serbia, and their integration into formal settlements in most cases, an increase in the degree of connection of houses in the settlements onto the water supply network can be expected in the future, via investments in small-scale construction works (smaller than if the SRS is situated outside the formal settlements, where land is not equipped with infrastructure).

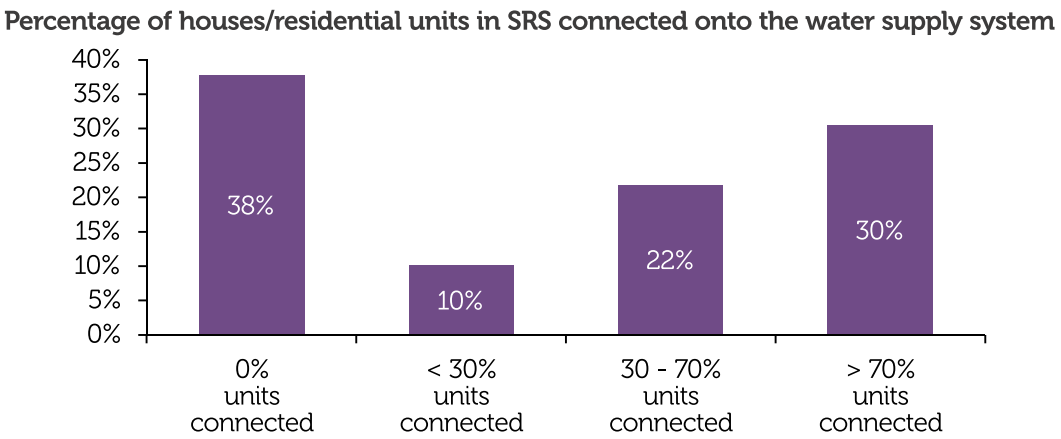


Figure 7 Status of the water supply system in SRS in Serbia

5.2.2.2 Sewerage system

The condition of the development of sewerage system in SRS is the poorest in comparison with all other infrastructure networks covered by the Project.

The data analysis showed that only 10% of SRS in the territory of Serbia had more than 70% of houses connected to the sewerage network; while in as much as 74% of these settlements, the inhabitants do not have or cannot

use the sewerage system directly in their homes, whether because it does not exist, or because it is being planned, in the design stage, or in the stage of construction.

As is the case with the water supply system, the fact that the majority of SR settlements in Serbian are integrated in the formal settlements, creates the possibility of a relatively simple connection of housing units to the existing sewerage system. This would significantly improve the basic living conditions of the Roma population in Serbian in the future.

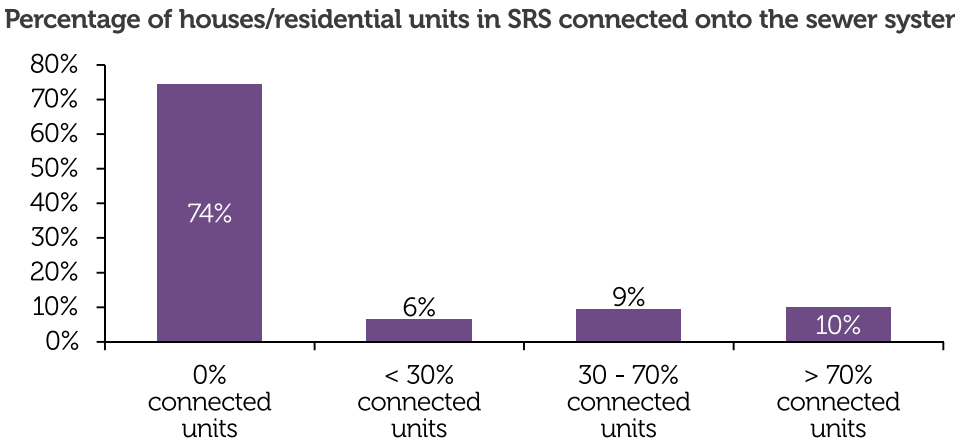


Figure 8 Status of the sewerage system in SRS in Serbia

5.2.2.3 Electrical power system

The percentage of housing units in SRS settlements that are connected onto the electrical power system is the highest in relation to all network infrastructure covered by the Project, and represents 68% of the total number of the SRS settlements in Serbia. In addition, another 24% SRS (16% + 8%) have a certain number of residential units where electricity can be used directly, while in only 8% of SRS the inhabitants do not have or can not use electricity in their homes for various reasons.

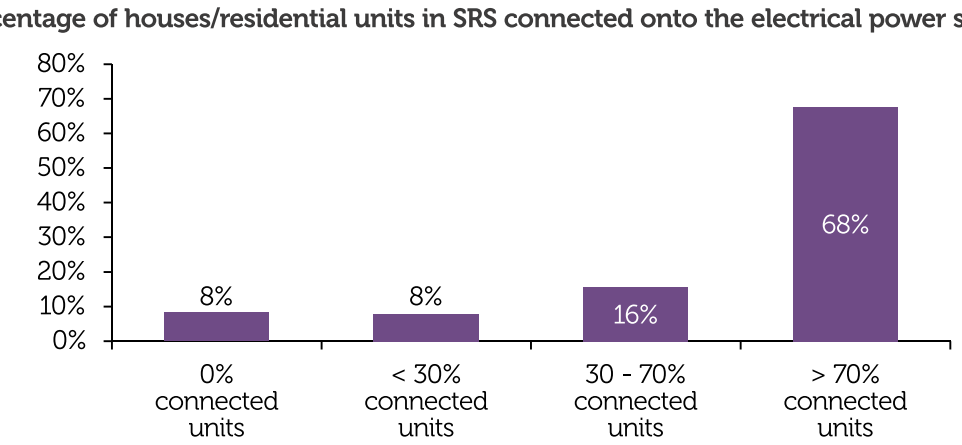


Figure 9 Status of the electrical power system in SRS in Serbia

5.2.2.4 Road network

Given that most SRS settlements in Serbia are integrated into formal settlements (in terms of their position), the found percentage of 30% of SRS where more than 70% of roads are asphalt-paved, was as expected. In addition, in another 44% of SRS (26% + 18%), a certain number of asphalt-covered roads exist. Finally, in only 26% SRS roads are paved with a different type of material, or the standard network of roads does not yet exist as such (it is being planned, projected, or under construction).

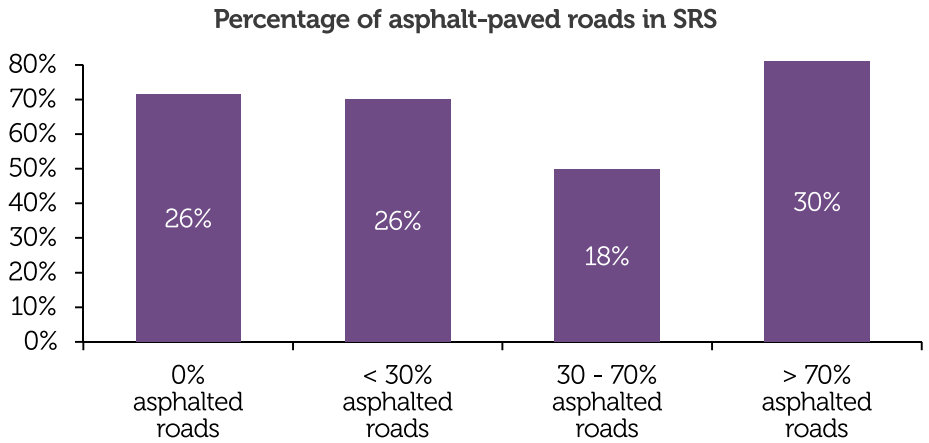


Figure 10 Asphalt-paved roads in SRS in Serbia

5.2.2.5 Public Lighting

A high percentage of SRS settlements with asphalt-paved roads that are integrated into formal settlements, go hand-in-hand with an expected relatively high percentage of SRS (31%) with over 70% of roads with public street lighting. In another 36% SRS, the public street lighting exists to some degree, while in 33% of settlements public lighting does not exist. As with the previously analyzed network infrastructure (water supply, sewerage, electricity and traffic roads), the reasons for the lack of public lighting can be multiple, from the fact that public lighting, as such, simply does not exist, to the fact that it is being planned, in the design phase, or construction phase.

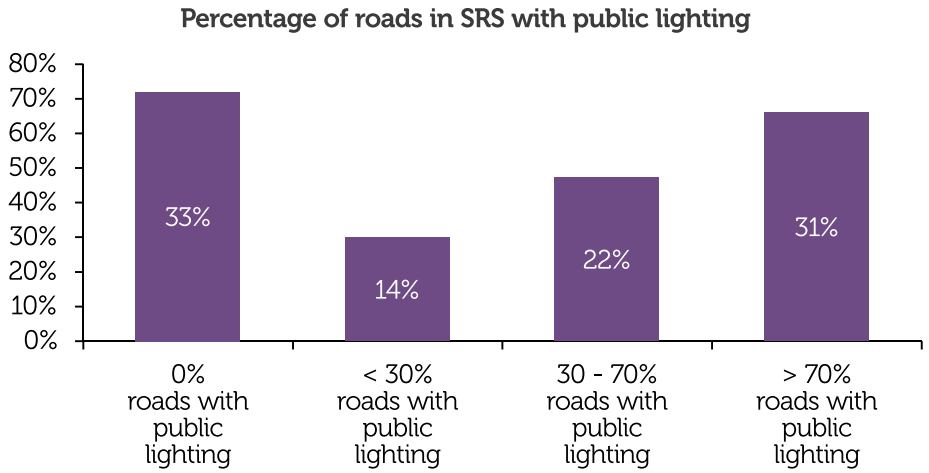


Figure 11 Public lighting in SRS in Serbia

5.2.2.6 Heating

The population in 97% SRS settlements on the territory of the Republic of Serbia uses solid fuels as the source of heat (wood, coal), while the minimal percentages use other sources or types of thermal energy, such as electricity (2% SRS). According to the data collected, natural gas is not used at all for heating in this type of substandard settlements in Serbia, while in as much as 1% of SRS no heating exists.

Given that most of the SRS in Serbia are integrated into formal settlements, as in the case of water supply and sewerage system, an improvement of the existing heating system in these settlements can be expected in the future.

Type of heating in houses/residential units in SRS

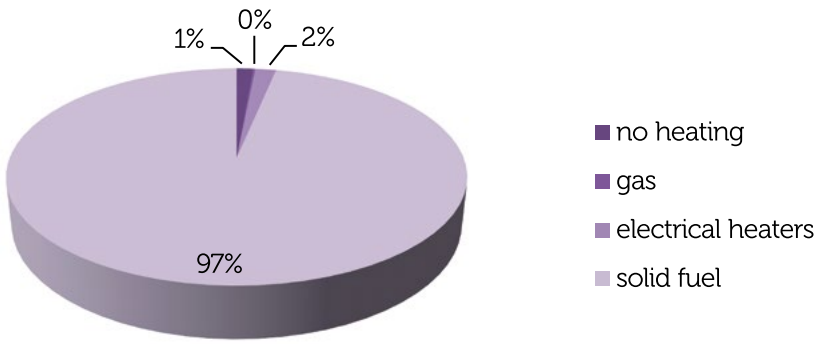


Figure 12 Types of heating in SRS in Serbia

5.2.2.7 Collection and removal of the municipal solid waste

In 60% of SRS settlements on the territory of the Republic of Serbia an organized collection and disposal of solid waste exists, while in the remaining 40% of the settlements this is not the case. By organizing waste collection from these latter settlements in the future, more problems would be solved related to the quality of life in them. A certain progress can be expected as regards this utility with an increase in the degree of development and number of asphalt-paved roads in the SRS in Serbia.

Public collection and removal of solid waste from SRS

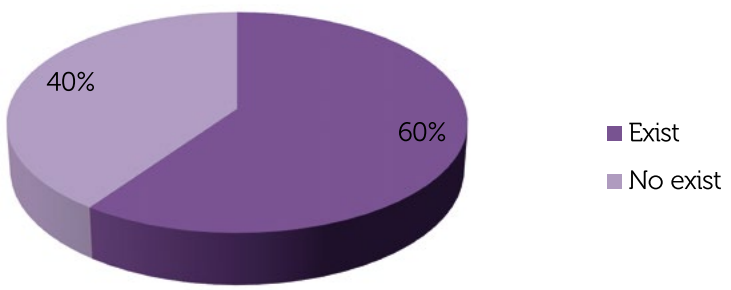


Figure 13. Organized collection and removal of municipal solid waste from the SRS in Serbia

5.2.3 An overview of the inclusion of the territory of SRS in urban/spatial planning documents in Serbia and the degree of legalization of the houses/housing units

The existence of adequate planning documents in force is a prerequisite for development and improvement of living conditions in SRS settlements registered on the territory of Serbia. In addition to meeting the necessary technical-urban planning conditions and obtaining permits for the construction/improvement and utilization of infrastructure networks in the SRS, the spatial/urban planning documentation is critical for the successful implementation of the process of legalization of residential buildings in SRS and a creation of a legal ownership security for its inhabitants. Also, the process of legalization and resolved legal-property relations are important in order to secure future development investments in these settlements.

By checking the completeness of the data collected in the course of the Project, it was found that only a small number of the SRS settlements have no information available about their coverage under the current planning documents (which does not exclude the existence of such documents for some of the SRS and their land). On the other hand, by analyzing information obtained about these documents, existence of a large number of precisely those kinds of planning documents that are needed for the implementation of various development activities has been uncovered.

Of the total number of planning documents in force that cover the territory of 583 registered SRS settlements in Serbia, 50% are Municipal spatial plans, 21% are General regulation plans, 19% are General urban plans and 10% are Detail regulation plans. Moreover, in most cases the said documents or adopted planning solutions can be implemented directly, and the process of developing planning solutions for direct implementation thereof is already underway in most cases, where plans of higher order foresee it (i.e. the development).

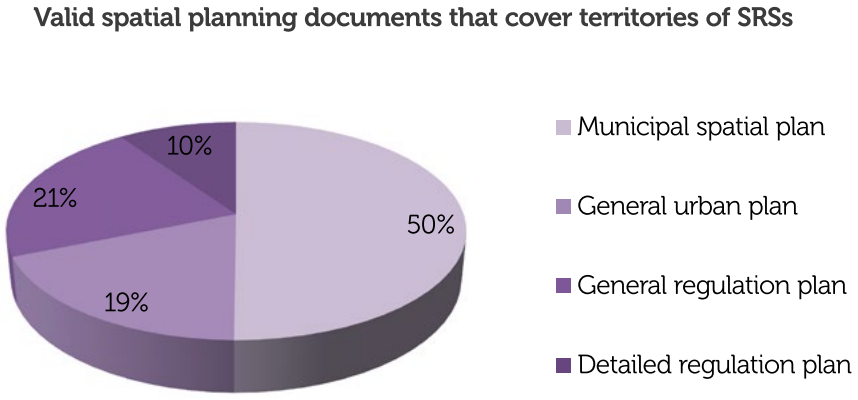


Figure 14 Types of urban/spatial planning documents that cover the territories of the SRS in Serbia

Based on the collected data on the assessed number of houses in SRS that are currently in the process of legalization, it can be concluded that the largest number of housing units in SRS is currently illegal.

In other words, in 80% of SRS registered on the territory of the Republic of Serbia, the percentage of housing units in the process of legalization is lower than 30%. In the remaining 20% SRS (8% + 12%), the legalization process has started or has already been completed to a certain degree. All this should be double checked and verified in the future, by conducting detailed and precise analysis and comparison with the Real Estate Cadastre.

One should keep in mind that the legalization of housing units in the SRS is a prerequisite of a future ownership security for its inhabitants, as well as a necessary condition to secure investments in development activities at the level of substandard Roma settlements in Serbia in the future, whether in terms of local or international funds, and other sources of financial assistance and support (EU, World Bank, and other).

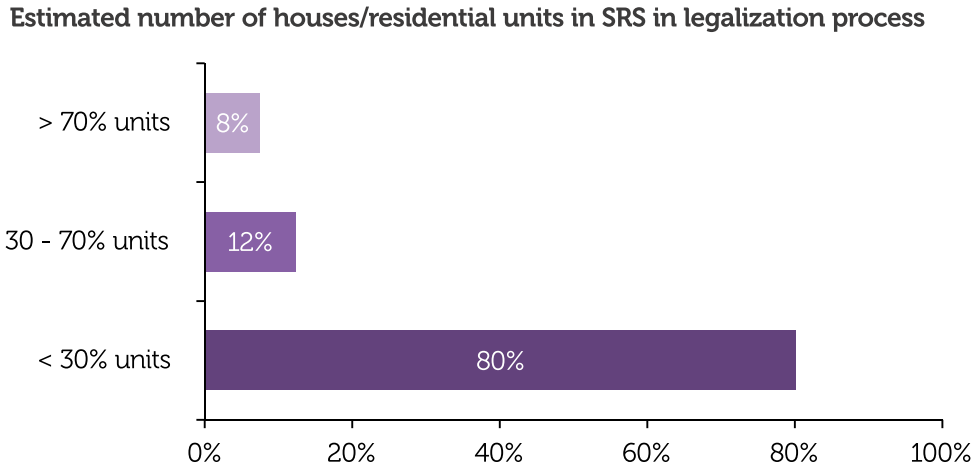


Figure 15 Legalization of housing units in SRS in Serbia

6 Proposed activities to maintain and improve the information platform on SRS in Serbia

In order to create a reliable information platform, i.e. a GIS database that will support informed and timely adoption of relevant decisions, decisions of importance for the development of the SRS registered in Serbia and contribute to the improvement of living conditions in them, it is necessary to continuously maintain and update data collected during this Project.

Maintenance of collected data implies the establishment of an adequate and continuous process of monitoring and evaluation of all categories of data that had been subject of collection activities under this Project.

Maintaining and updating the data, and/or introducing changes into the collected numeric data represent an integral part of this process, with the goal to align each individual piece of information, and databases in general, with the real situation on the ground. The proper maintenance of the collected data will help preserve the use value of the created information platform on SRS settlements throughout Serbia, which will in turn help decision-makers make the right development decisions and contribute to the relevance of the activities that will be undertaken in the future.

The improvement of the collected data implies initiating activities aimed at the improvement of both quality and quantity of the created information platform, in terms of constantly expanding the GIS database with new data. These data can be obtained through new measurements directly on the ground or by downloading data from other relevant databases that exist or are being developed in the country.

Furthermore, upgrading the database on SRS settlements also means increasing the level of precision in terms of numbers related to the collected data. An increased accuracy or detail of data on SRS can be achieved by direct addition of new predefined numerical values in the already created code list at the level of a conceptual data model for SRS, or by downloading the existing code lists (the so-called 'code books') from other databases considered relevant for the SRS settlement development management in Serbia.

7 A discussion on potential initiatives to take to improve the living conditions of the Roma population in Serbia

The data on SRS settlements collected during this Project represent a solid basis for the creation and use of general advantages of the GIS environment. This implies that the thus created GIS database on SRS in Serbia will enable the implementation of the basic spatial-attribute analyses, and will also enable asking relatively simple questions and obtaining general responses that will be of importance for future decisions and actions to take towards the development of registered SRS.

Setting up more complex questionnaires and implementing more complex analyses related to the SRS settlements in Serbia, which would yield a greater level of detail in responses, and subsequently higher precision in the development decisions and actions, would require additional efforts and activities on behalf of the line Ministry and other stakeholders in the future.

With the goal to improve the concrete living conditions in the SRS in Serbia registered during the Project in mind, we therefore propose defining fundamental criteria (e.g., the justification of investments) to define those SRS settlement categories in the near future that will have priority treatment when choosing development activities for a future period, whether short or long term.

For example, the priority category when developing the water supply system could be the category of SRS settlements that are integrated into formal settlements, have existed for over 15 years, have more than 500 inhabitants, over 200 houses/housing units on their territory, and for which valid planning documentation exists that includes direct implementation.

Defining the said criteria and priority for the development of certain SRS categories in Serbia may be subject to a new project in the future, so that the international best practices and lessons learned in this domain could be transferred and applied in Serbia. The results of such a project could involve the creation of an informal Book of Regulations on the categorization of SRS and development priorities, and the creation of a long-term development program to improve the lives in the SRS settlements throughout Serbia.

Finally, as part of new project activities towards the development of SRS in Serbia, the line Ministry could consider launching an initiative to define, design and build an integrated information system for the domain of substandard settlements in Serbia. More precisely, this means applying the experience in collecting data gained during this Project onto other substandard settlements in Serbia, and, ultimately, creating a single GIS information system to serve to improve the living conditions and reduce the poverty of the most vulnerable social groups in Serbia in the future.

8 Final conclusions

As part of its technical assistance to the Serbian Government in solving the problem of substandard living conditions of the Roma minority population in Serbia, the OSCE Mission in has engaged the SCTM under the 'We Are Here Together-European Support for Roma Inclusion' project to collect data on Substandard Roma Settlements (SRS) and create conditions for the creation of a national GIS database on the SRS.

Thus, in the period September 2014 - February 2015, the SCTM team created and implemented an appropriate data collection method, and collected general data for 583 SRS settlements in the Republic of Serbia to be included in an initial GIS database which will be used for reaching relevant development decisions in the future. Conditions of life in them (status of infrastructure networks and utilities), and the possibilities for their further development (the current planning documents and the degree of legalization of housing units). The above described data on SRS include data about surface and borders of the SRS, alphanumeric data on their general characteristics (when the settlement was founded, its location, size, etc), the living conditions (status of infrastructure networks and utilities), and the possibility for further development (current urban planning documents and the stage of the legalization of houses).

The data collected under this Project will help install a number of relatively simple spatial-attribute data analysis and questionnaires into a GIS environment, needed to make informed decisions on future development activities in the field of improving living conditions in the SRS settlements in Serbia. On the other hand, the use of these simple initial analytical advantages of GIS is expected to create a need in the end user, the line Ministry, to keep upgrading the created data base on SRS settlements in Serbia, both in terms of quality and in terms of quantity. With this in mind, the SCTM has suggested possible steps and activities in this direction, expecting further support from local and international organizations and funds for the development efforts on behalf of the local self-governments in the Republic of Serbia.

Appendix 1:

An example of the questionnaire used in the collection of data on SRS on the territory of the city of Novi Sad

"Data collection on substandard Roma settlements for GIS" Project

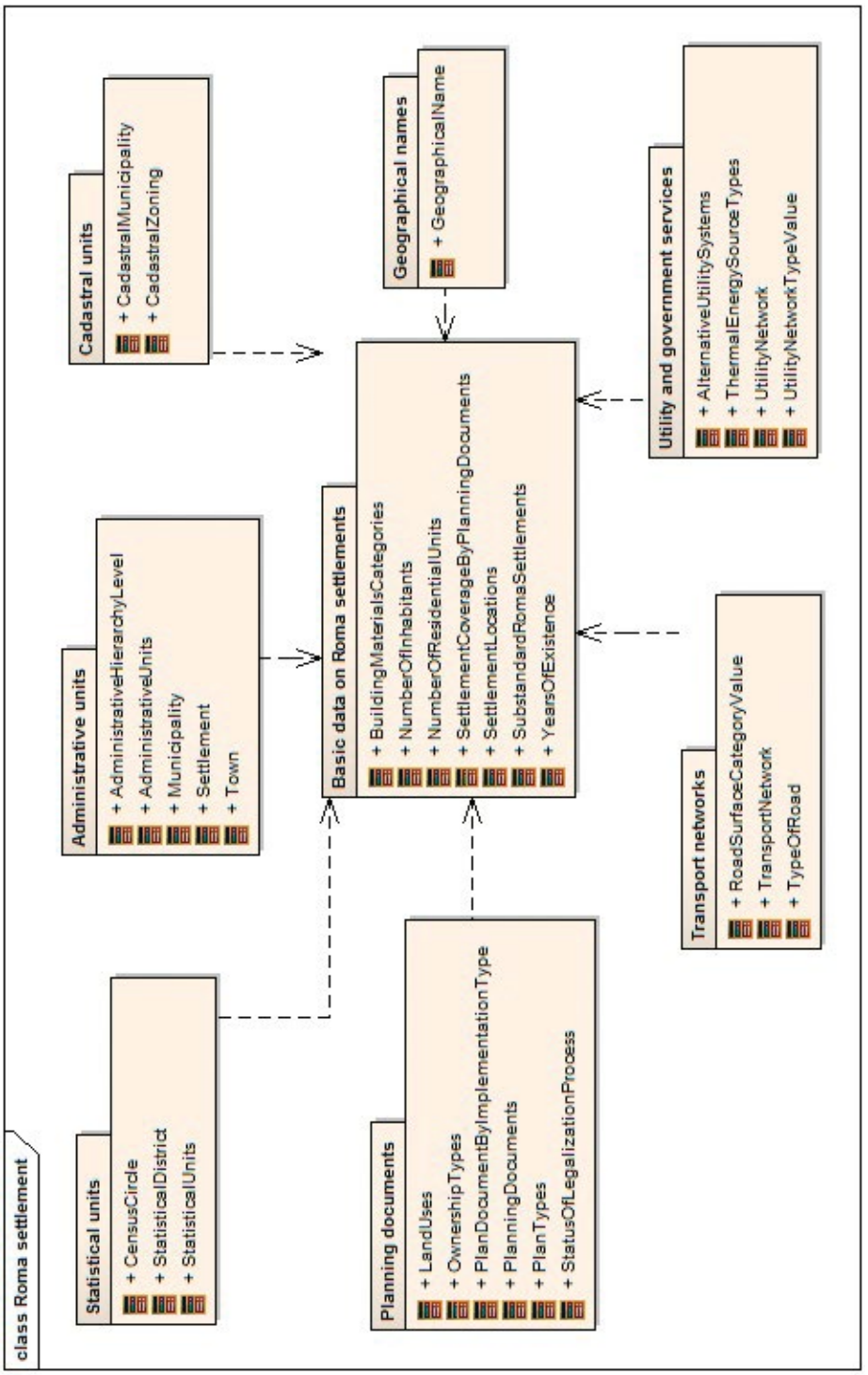
A.	GENERAL INFORMATION/DATA ON THE SUBSTANDARD ROMA SETTLEMENT (* Mandatory fields)	
1	Town/Municipality	
1.1	Name of town	NOVI SAD
1.2	National code of the town	89010
1.3	Name of municipality	NOVI SAD
1.4	National code of the municipality	80284
2	Settlement	
2.1	Name*	Please select the name of settlement
2.2	National code of the settlement	Please select a settlement number
3	Cadastral Municipality	
3.1	Name	Please select a name of CM
3.2	National cadastral zoning reference	Please select a CM number
4	Statistical district	
4.1	National code	Please select an SD number
5	Census circle	
5.1	Number	Please select a CD number
6	Substandard Roma settlement	
6.1	Name*	Please enter the name of settlement
6.2	Description of the border of the settlement	Please enter description of the settlement border
B.	GENERAL INFORMATION ON THE SUBSTANDARD ROMA SETTLEMENT (All fields are mandatory)	
7	Position of the SRS	
		Please select a settlement location
8	Estimated years of existence of the SRS	
		Please select a category
9	Construction materials used in construction of the majority of the houses/residential units in the SRS	
		Please select type of construction material
10	Estimated number of houses/residential units in the SRS	
		Please select number of houses/residential units
11	Estimated number of inhabitants in the SRS	
		Please select number of inhabitants

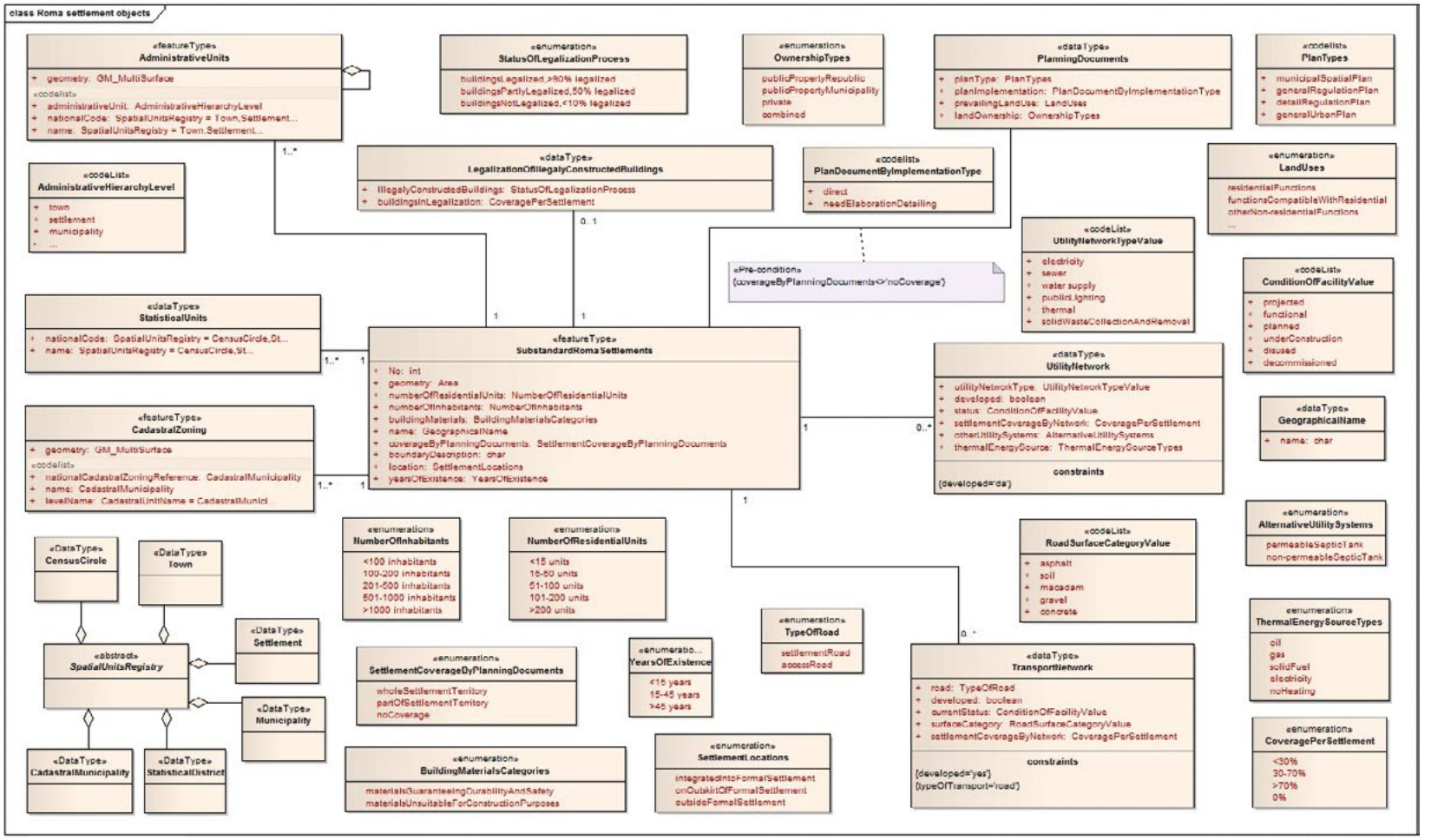
V.	INFORMATION ON THE STATUS OF INFRASTRUCTURE IN THE SUBSTANDARD ROMA SETTLEMENT (All fields are mandatory)
12	Water supply system with the utilities
12.1	Is there a water supply system in the settlement with the utilities?
	Yes/No
12.2	What is the status of the water supply system utlities in the settlement?
	Please select status
12.3	Percentage of houses/residential units in the settlement that are connected onto the water supply system
	Please select percentage of houses/residential units connected onto the utility
13	Sewerage system with the utilities
13.1	Is there a sewerage system in the settlement?
	Yes/No
13.2	What is the status of the sewerage system utilities in the settlement?
	Please select status
13.3	Percentage of houses/residential units in the settlement that are connected onto the sewerage system
	Please select percentage of houses/residential units connected onto the utility
13.4	There is another type of household waste water draining system in the settlement
	Please select type of septic tank
14	Electrical power system with the utilities
14.1	Is there an electrical power system in the settlement?
	Yes/No
14.2	What is the status of the power utilities in the settlement?
	Please select status
14.3	Percentage of houses/residential units in the settlement that are connected onto the electrical power system
	Please select percentage of houses/residential units connected onto the utility
15	Traffic road network
15.1	Is there access to the settlement via a traffic road?
	Yes/No
15.2	Are there traffic roads in the settlement?
	Yes/No
15.3	What is the status of the traffic road network in the settlement?
	Please select status
15.4	What is the roadway surface paved with in the settlement?
	Please select traffic road category
15.5	Percentage of asphalt-paved traffic roads in the settlement?
	Please select percentage
16	Public lighting network
16.1	Is there public lighting, i.e. street lighting, in the settlement?
	Yes/No
16.2	What is the status of the public street lighting in the settlement?
	Please select status of utility
16.3	Percentage of traffic roads in the settlement with street lighting
	Please select percentage
17	What is the type of heating predominantly used in the households in the settlement?
	Please select type of heating
18	Is there an organized collection and disposal of municipal solid waste in the settlement? (e.g. are there garbage containers/cans, do public utility vehicles come to the settlement, etc.)?
	Yes/No

G.	INFORMATION ON THE SPATIAL PLANNING DOCUMENTS FOR THE TERRITORY OF THE SRS, AND THE LEGAL OWNERSHIP STATUS OF THE LAND AND HOUSING UNITS (All fields are mandatory)	
19	Is the territory of the settlement covered by the current urban/spatial planning documents?	
		Please select type of coverage
20	What type of current urban/spatial planning documents exist for the territory of the settlement? (Except if the answer to #18 is "the settlement is not included in the current urban/spatial planning documents")	
		Please select type of plan
		Please select type of plan
		Please select type of plan
		Please select type of plan
21	What form of implementation of the urban/spatial planning document is foreseen for the settlement?	
		Please select form of implementation of the plan
22	If the current urban/spatial planning document foresees further detailed development of solutions, could you please confirm if a document is currently being developed that will enable direct implementation of the plan?	
		Yes/No
23	Have the houses/residential units been legalized in the settlement, and/or registered in the real estate cadastre?	
		Please select degree of legalization of the housing units in the settlement
24	Estimated number of houses/residential units currently in the process of legalization in the settlement (number of submitted requests for legalization)	
		Please select percentage of submitted requests for the legalization of houses/residential units in the settlement
25	Under the current urban/spatial planning documents, what type of purpose is the land where the settlement is located predominantly intended for?	
		Please select category of purpose intended for the land
26	Form of land ownership on the territory of the settlement	
		Please select type of ownership
	Data collected and edited by (first and last name, job title):	
	Signature	

Appendix 2:

Conceptual data model of data on SRS




class Roma settlement objects
«featureType» AdministrativeUnits
+ geometry: GM_MultiSurface
«codelist»
+ administrativeUnit: AdministrativeHierarchyLevel
+ nationalCode: SpatialUnitsRegistry = Town,Settlement...
+ name: SpatialUnitsRegistry = Town,Settlement...
«enumeration» StatusOfLegalizationProcess
buildingsLegalized,>80% legalized
buildingsPartlyLegalized,50% legalized
buildingsNotLegalized,<10% legalized
«enumeration» OwnershipTypes
publicPropertyRepublic
publicPropertyMunicipality
private
combined
«dataType» PlanningDocuments
+ planType: PlanTypes
+ planImplementation: PlanDocumentDyImplementationType
+ prevailingLandUse: LandUses
+ landOwnership: OwnershipTypes
«codelist» PlanTypes
+ municipalSpatialPlan
+ generalRegulationPlan
+ detailRegulationPlan
+ generalUrbanPlan
«codeList» AdministrativeHierarchyLevel
+ town
+ settlement
+ municipality
- ...
«dataType» LegalizationOfIllegalyConstructedBuildings
+ IllegalyConstructedBuildings: StatusOfLegalizationProcess
+ buildingsInLegalization: CoveragePerSettlement
«codelist» PlanDocumentByImplementationType
+ direct
+ needElaborationDetailing
«enumeration» LandUses
residentialFunctions
functionsCompatibleWithResidential
otherNon-residentialFunctions
...
«Pre-condition» {coverageByPlanningDocuments<>'noCoverage'}
«codeList» UtilityNetworkTypeValue
+ electricity
+ sewer
+ water supply
+ publicLighting
+ thermal
+ solidWasteCollectionAndRemoval
«codeList» ConditionOfFacilityValue
+ projected
+ functional
+ planned
+ underConstruction
+ disused
+ decommissioned
«dataType» StatistiealUnits
+ nationalCode: SpatialUnitsRegistry = CensusCircle,St...
+ name: SpatialUnitsRegistry = CensusCircle,St...
«featureType» SubstandardRomaSettlements
+ No: int
+ geometry: Area
+ numberOfResidentialUnits: NumberOfResidentialUnits
+ numberOfInhabitants: NumberOfInhabitants
+ buildingMaterials: BuildingMaterialsCategories
+ name: GeographicalName
+ coverageByPlanningDocuments: SettlementCoverageByPlanningDocuments
+ boundaryDescription: char
+ location: SettlementLocations
+ yearsOfExistence: YearsOfExistence
«dataType» UtilityNetwork
+ utilityNetworkType: UtilityNetworkTypeValue
+ developed: boolean
+ status: ConditionOfFacilityValue
+ settlementCoverageByNetwork: CoveragePerSettlement
+ otherUtilitySystems: AlternativeUtilitySystems
+ thermalEnergySource: ThermalEnergySourceTypes
constraints
{developed='da'}
«dataType» GeographicalName
+ name: char
«featureType» CadastralZoning
+ geometry: GM_MultiSurface
«codelist»
+ nationalCadastralZoningReference: CadastralMunicipality
+ name: CadastralMunicipality
+ levelName: CadastralUnitName = CadastralMunici
«DataType» CensusCirole
«DataType» Town
«abstract» SpatialUnitsRegistry
«DataType» Settlement
«DataType» Municipality
«DataType» CadastralMunicipality
«DataType» StatisticalDistrict
«enumeration» NumberOfInhabitants
<100 inhabitants
100-200 inhabitants
201-500 inhabitants
501-1000 inhabitants
>1000 inhabitants
«enumeration» NumberOfResidentialUnits
<15 units
15-50 units
51-100 units
101-200 units
>200 units
«enumeration» SettlementCoverageByPlanningDocuments
wholeSettlementTerritory
partOfSettlementTerritory
noCoverage
«enumeration» YearsOfExistence
<15 years
15-45 years
>45 years
«enumeration» BuildingMaterialsCategories
materialsGuaranteeingDurabilityAndSafety
materialsUnsuitableForConstructionPurposes
«enumeration» SettlementLocations
integratedIntoFormalSettlement
onOutskirtOfFormalSettlement
outsideFormalSettlement
«enumeration» TypeOfRoad
settlementRoad
accessRoad
«codeList» RoadSurfaceCategoryValue
+ asphalt
+ soil
+ macadam
+ gravel
+ concrete
«dataType» TransportNetwork
+ road: TypeOfRoad
+ developed: boolean
+ currentStatus: ConditionOfFacilityValue
+ surfaceCategory: RoadSurfaceCategoryValue
+ settlementCoverageByNetwork: CoveragePerSettlement
constraints
{developed='yes'}
{typeOfTransport='road'}
«enumeration» AlternativeUtilitySystems
permeableSepticTank
non-permeableSepticTank
«enumeration» ThermalEnergySourceTypes
oil
gas
solidFuel
electricity
noHeating
«enumeration» CoveragePerSettlement
<30%
30-70%
>70%
0%