



MONTENEGRO
MINISTRY OF FINANCE
REAL ESTATE ADMINISTRATION

A N N U A L P L A N
WORKS ON SURVEY AND REAL ESTATE
CADASTRE ESTABLISHMENT
FOR 2008

Podgorica,
December, 2007.

Pursuant to Article 4, paragraph 3 of the Law on State Survey and Real Estate Cadastre ("Official Gazette of the Republic of Montenegro", no. 29/07), the Ministry of Finance of Montenegro following the proposal of the Real Estate Agency adopts

A N N U A L P L A N

OF WORKS ON SURVEY AND REAL ESTATE CADASTRE ESTABLISHMENT FOR 2008

I BACKGROUND

Provisions of Article 4, paragraph 3 of the Law on State Survey and Real Estate Cadastre ("Official Gazette of the Republic of Montenegro", no. 29/07) (hereinafter: the Law), prescribes that the works on state survey and establishment and maintenance of real estate cadastre are to be conducted in compliance with the Mid-Term Programme and the Annual Work Programme.

The Mid-Term Work Programme for survey and real estate cadastre establishment for the period 2008 – 2013 (hereinafter: the Mid-Term Programme) is adopted by the Government of Montenegro based on its Decision 03-5982 of 26.07.2007.

The Mid-Term Programme was the basis for this Annual Plan.

II OBJECTIVE OF THE PLAN

The objective of the Plan is to provide a more detailed elaboration of the Mid-Term Programme in terms of the activities planned for 2008, and to formulate requirements and priorities related to state survey and real estate cadastre. The plan defines development of topographic plans for concept and main projects, primarily for the implementation of conclusions of the Government of Montenegro of 26.07.2007 related to construction of roads and implementation of other strategic and spatial, and planned activities of Montenegro.

III PLANS

The Plan provides elaboration of the sections of specific sub-programmes of the Mid-Term Programme, which are presented in separate chapters, which give the title, priority and the necessary funds for projects to be implemented in 2008 in line with the funds outlined in the Mid-Term Programme.

1. ESTABLISHMENT AND MODERNIZATION OF THE NATIONAL REFERENCE GEODETIC SYSTEM (BASIC GEODETIC WORKS)

The Work Plan involves establishment and modernization of components of the National Reference Geodetic System, which assumes:

- 1) Spatial reference system of Montenegro,
- 2) Horizontal reference system of Montenegro,
- 3) Vertical reference system of Montenegro,
- 4) Gravimetric reference system of Montenegro,
- 5) Setting geoids of Montenegro.

The Plan envisages that the national reference geodetic system of Montenegro and the transformation actions are implemented in the following order of designing activities:

- development of project tasks,
- development of main projects,
- implementation of projects, i.e. execution of works.

1.1. SPATIAL REFERENCE SYSTEM

It is primarily needed to harmonize the dates of all the implemented components of spatial reference plan (items EUREF GPS of the measurements, National Reference GPS network, Permanent network MONTEPOS and points of the network to be established at a higher density), and to integrate these. The coordinates of points of the EUREF GPS measurement campaign will be used as reference points. Implementation of these objectives requires additional measurements, repeated mathematic analysis of the measurements that have been completed, and certain level of modernization and maintenance.

The basic content of the planned activities and the necessary funds for implementation of the spatial reference system are given in Table 1.

Table 1: Activities and funds for implementation of spatial reference system

No.	Activity	Funds Euro
1	Network of permanent stations MONTEPOS	
1.1	Maintenance (provision of new versions of firmware and software for permanent stations and MONTEPOS Control Panel)	9.000
1.2	Upgrading for GLONASS (modernization of receivers and antenna, i.e. upgrading them to make sure that they, beside the GPS, also receive signal from the GLONASS satellite system) and switch to more convenient and more reliable communication (Internet) connections such as ADSL, subject to capabilities of T-Com Montenegro.	70.000
1.3	Setting precise spatial coordinates of the MONTEPOS station coordinates, which allows monitoring of the reference systems evolution	2.000
2	National reference GPS network	
2.1	Additional measurements for 165 reference points and linking them to the network of permanent MONTEPOS stations	15.000
2.2	Mathematic analysis of the results of the completed and stored measurements	5.000

3	GPS network that needs higher density	
3.1	Additional measurements of the existing network and linking them to the permanent network of MONTEPOS stations	3.000
3.2	Mathematic analysis	2.000
3.3	New city GPS networks (Plužine, Danilovgrad, Andrijevica, Pljevlja, Mojkovac, Podgorica (urban municipalities Golubovci and Tuzi)	30.000
		136.000,00

1.2. HORIZONTAL REFERENCE SYSTEM

Implementation of the Work Plan for establishment of the spatial reference system will allow automatic implementation of Work Plans for establishment of new horizontal reference system.

However, given that the applicable horizontal reference system is defined by both trigonometric and polygon grids and appreciating the fact that the existing and the new reference system will be used in parallel for a long time, this Plan envisages activities for its modernization and establishment of new points.

Table 2: Activities and funds for modernization of the existing and establishment of the new horizontal reference system

No.	Activity	Funds euro
1	Trigonometric, polygon and city trigonometric grids	
1.1	Renewal of signalization of trigonometric points Nikšić, Cetinje, Podgorica, Andrijevica, Berane and Bijelo Polje	5.000
1.2	Establishment and maintenance of polygon grids Plužine, Danilovgrad, Andrijevica, Pljevlja, Mojkovac, Podgorica (urban municipalities Golubovci and Tuzi)	120.000
1.3	GPS determination in implemented municipality trigonometric grids Plužine, Danilovgrad, Andrijevica, Pljevlja, Mojkovac, Podgorica (urban municipalities Golubovci and Tuzi)	15.000
	TOTAL:	140.000,00

1.3. VERTICAL REFERENCE SYSTEM

The modernization plan for the existing vertical reference system (precise levelling) assumes the most important activities towards establishment of vertical reference basis of Montenegro.

Table 3: Activities and funds needed for implementation of vertical reference system

No.	Activity	Funds euro
1	Grid of precise levelling NVT2	
1.1	Determination of benchmark status of the existing NVT2 structures, additional stabilization and measurement in the total length of 300 km	50.000
1.2	New stabilization of benchmarks in the total length of 150km and levelling measurements	40.000
1.3	Linking NVT2 grid with new locations of Bar mareograph	5.000
1.4	Mathematic processing of measurement results and estimation of definitive heights	2.000
2	City levelling networks	
2.1	Establishment, measurement and processing in city levelling networks	120.000

	in Ulcinj, Bar, Petrovac, Budva, Tivat, Kotor, Risan, Herceg Novi, Cetinje, Danilovgrad, Žabljak, Pljevlja, Plužine, Mojkovac	
	TOTAL:	217.000,00

1.4. GRAVIMETRIC REFERENCE SYSTEM

The Plan envisages partial works set out by the Mid-Term Plan for development of new basic gravimetric network and execution of new gravimetric survey of Montenegro for the purpose of determination of geoids.

The gravimetric measurement for identification of geoids will be conducted in parallel with activities related to new gravimetric network.

Table 4: Activities and funds needed for implementation of new gravimetric reference system

No.	Activity	Funds euro
1	Basic gravimetric network and gravimetric measurement	
1.1	Relative gravimetric measurement by modern gravimeter with very low motion	20.000
1.2	Gravimetric measurement (up to maximum 1000 detailed points)	20.000
	TOTAL:	40.000,00

1.5. DETERMINATION OF GEOIDS

Having in mind the fact that there is no geodic solution in Montenegro, which meets the criteria of state survey, this Plan envisages initiation of the process of geoids determination.

Table 5: Activities and funds needed for determination of geoids

No.	Activity	Fund euro
1	First phase of geoids determination	
1.1	Determination of geoids whose quality is at the level of 10 cm based on discrete values of geoid undulation, which results from the procedure of the so-called GPS levelling (GPS ellipsoid height). Average distance with geoid undulations should be from 5 to 10km. In 2008, around 75 discrete values for the territory of the Republic will be determined	20.000
2	Second phase of geoids determination	
2.1	Determination of digital model of the relief for half of the territory of Montenegro with the resolution of one spark second, i.e. around 50 m (around 2770000 points)	20.000
	TOTAL:	40.000,00

1.6. HORIZONTAL AND VERTICAL TRANSFORMATION

Compared to the Mid-Term Programme, this Plan envisages full formulation and implementation of transformation actions for horizontal and vertical linking of the current and new national reference network in 2008.

This will facilitate execution of the initiated work on the establishment of real estate cadastre and introduction of the new national reference system into official use.

Table 6: Activities and funds needed for implementation of horizontal and vertical linking of the current and the new reference system

No.	Activity	Fund euro
1	Horizontal and vertical transformation	
1.1	GPS measurements in around 200 locations, i.e. trigonometric and polygon points rather evenly distributed throughout Montenegro	50.000
1.2	Levelling measurements in around 200 locations of benchmark of NVT1 and NVT2 networks rather evenly distributed throughout Montenegro	80.000
1.3	Formulation and implementation of transformation procedures	5.000
	TOTAL:	135.000,00

1.7. FINANCIAL SUMMARY

It is necessary to provide **708.000,00 euros** for implementation of the Plan for establishment of national reference system of Montenegro, determination of geoids and implementation of transformation procedures.

1.8. ESTABLISHMENT OF A DEPARTMENT IN THE REAL ESTATE ADMINISTRATION FOR MAIN GEODETIC WORK

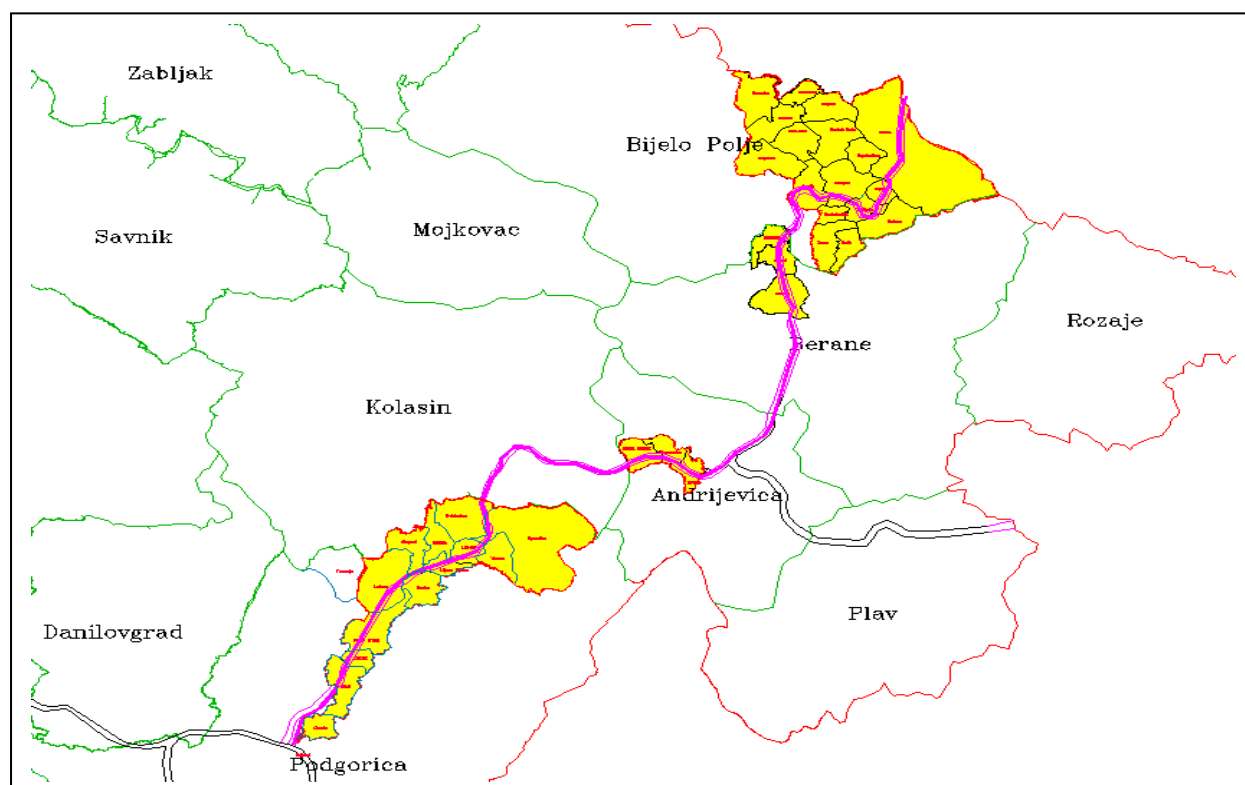
A Department for main geodetic works will be established in the Real Estate Administration in the first half of 2008 with the following general responsibilities: maintenance of the network of permanent GPS stations – *MontePos*; determination of geoids, definition of a digital model of relief for the purpose of main geodetic works; collection, processing and export of data on main geodetic works for the uniform geodetic and cadastre information system; designing, implementation and maintenance of the main reference geodetic networks (spatial, vertical and gravimetric reference system); metrological security measures for geodetic works; connecting national reference networks with networks of neighbouring countries and participation in international projects.

2. ESTABLISHMENT OF REAL ESTATE CADASTRE IN THE REGIONS OF MONTENEGRO THAT HAVE NOT BEEN SURVEYED

2.1. ACTIVITIES TOWARDS ESTABLISHMENT OF REAL ESTATE CADASTRE IN PODGORICA, ANDRIJEVICA, BERANE AND BIJELO POLJE MUNICIPALITIES

The Plan envisages continuation of the work started in 2007 towards establishment of the real estate cadastre in the municipality of Podgorica (**14** cadastre municipalities in the region covering **20.372ha**), Bijelo Polje (**17** cadastre municipalities in the region covering **26.397ha**), Andrijevica (**3** cadastre municipalities in the region covering **2.195ha**) and Berane (**3** cadastre municipalities in the region covering **3.177ha**), i.e. with the total size of **52.141ha**.

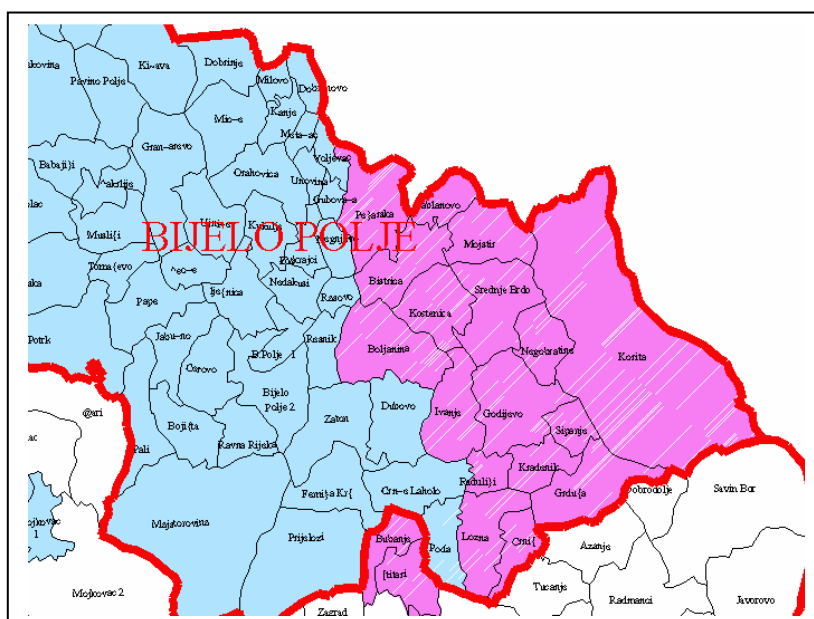
The work on the developed and adopted Main Project is executed in compliance with the priorities defined based on requirements, which resulted from the Strategy of Transport Development of Montenegro, which relate to construction of Podgorica – Andrijevica - Berane – Bijelo Polje (Boljari) highway. Establishment of real estate cadastre will provide data, which will create the foundation for implementing expropriation for construction of the highway, and at the same time digital cadastre plans will be developed with height presentation of the terrain as the main geometry foundation for the preparation of technical documentation for construction of the highway (concept and main project).



Construction site: parts of municipalities Podgorica, Bijelo Polje, Andrijevica and Berane

Table 1: Bijelo Polje Municipality

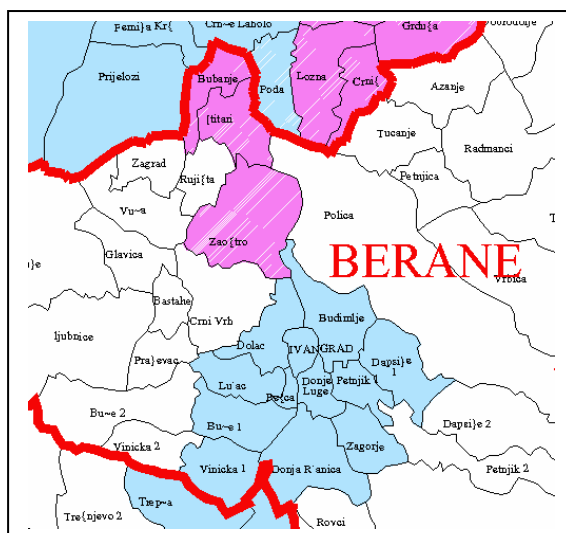
No.	Cadastr municipality	Size CM (ha)	Number of cadastre lots	Number of cadastre cultures	Number of structures	Number of property deeds
1.	Bistrica	1.087	1.484	2.172	190	409
2.	Boljanina	1.732	1.446	2.288	169	402
3.	Goduša	1.554	1.254	1.823	134	332
4.	Godijevo	1.570	1.402	2.215	166	368
5.	Jablanovo	577	841	1.046	57	119
6.	Ivanje	1.355	1.354	2.075	141	287
7.	Korita	8.603	3.040	6.457	267	619
8.	Kostenica	1.124	1.067	1.631	121	252
9.	Kradenik	655	718	1.148	99	239
10.	Lozna	1.303	1.532	2.253	164	341
11.	Mojstir	1.173	1.125	1.435	86	158
12.	Negobratina	782	350	621	24	95
13.	Pečarska	1.653	1.891	2.949	212	410
14.	Radulići	436	471	727	50	116
15.	Sipanje	513	374	574	36	133
16.	Srednje Brdo	1.635	723	1.636	72	182
17.	Crniš	645	545	836	57	137
TOTAL:		26.397	19.617	31.886	2.045	4.599



Construction site: Bijelo Polje Municipality

Table 2: Berane Municipality

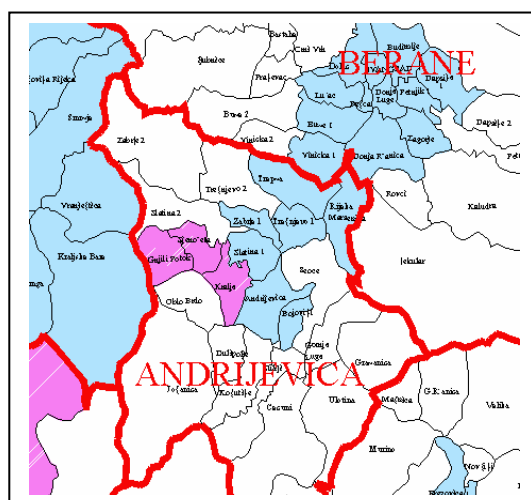
No.	Cadastr municipality	Size CM (ha)	Number of cadastre lots	Number of cadastre cultures	Number of structures	Number of property deeds
1.	Bubanje	727	1.217	1.088	92	93
2.	Zaostro	1.670	3.483	4.608	186	452
3.	Štitari	780	1.940	1.543	124	111
TOTAL:		3.177	6.640	7.239	402	656



Construction site: Bijelo Polje Municipality

Table 3: Andrijevisa Municipality

No.	Cadastre municipality	Size CM (ha)	Number of cadastre lots	Number of cadastre cultures	Number of structures	Number of property deeds
1.	Gnjili Potok	883	547	1.187	62	146
2.	Kralje	680	728	1.360	108	232
3.	Sjenožeta	632	462	879	47	108
TOTAL:		2.195	1.737	3.426	217	486

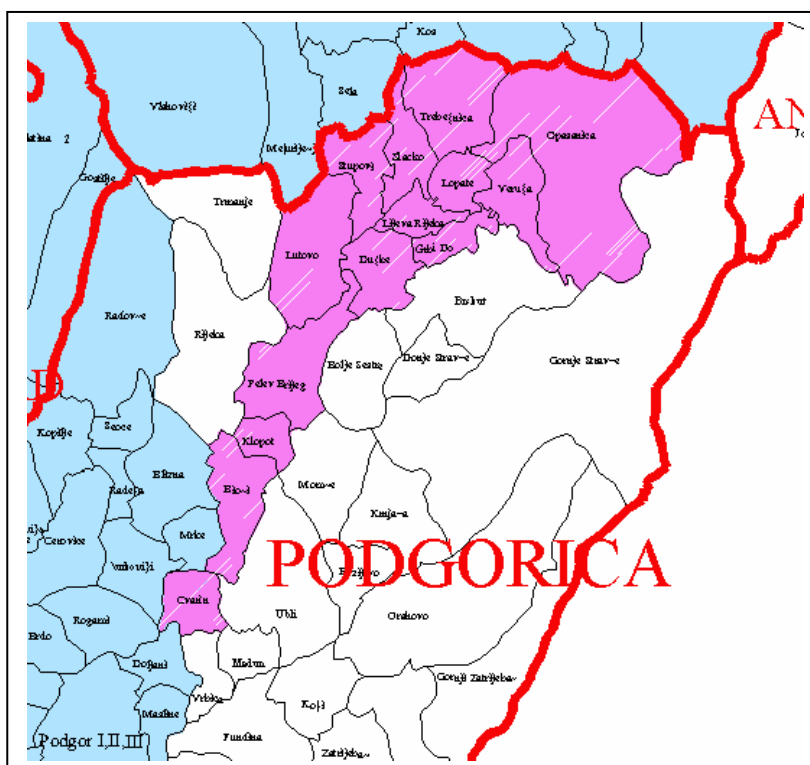


Construction site: Andrijevisa Municipality

Table 4: Podgorica Municipality

No.	Cadastre municipality	Size CM (ha)	Number of cadastre lots	Number of cadastre cultures	Number of structures	Number of property deeds
1.	Bioče	1.417	1.052	2.451	110	211
2.	Lutovo	2.305	776	1.901	28	62
3.	Klopot	482	159	357	38	47
4.	Pelev Brijeg	1.807	700	1.488	101	159
5.	Duške	1.064	783	1.295	87	158
6.	Lopate	655	573	962	43	98
7.	Veruša	1.030	698	1.366	121	326
8.	Opasanica	6.000	503	1.457	79	151
9.	Lijeva Rijeka	533	492	845	60	91

10.	Cvarin	755	470	1.197	53	131
11.	Grbi Do	555	383	765	36	65
12.	Slacko	949	215	602	53	81
13.	Stupovi	1.054	407	1.513	56	91
14.	Trebešnica	1.766	641	1.514	44	112
TOTAL:		20.372	7852	16199	909	1783



Construction site: Podgorica Municipality

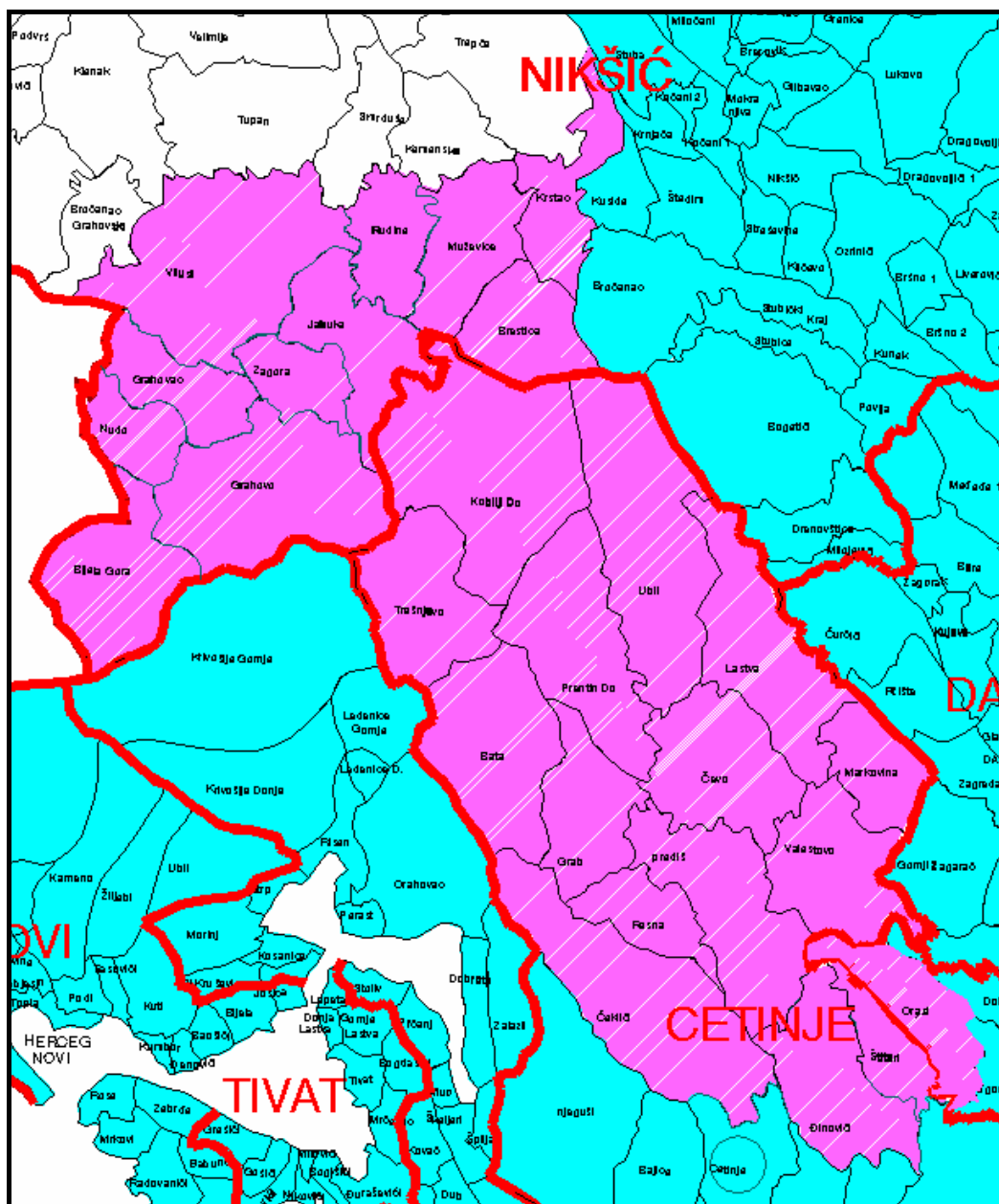
It is necessary to ensure **2.214.505,00 euros** for further implementation of the Plan for establishment of real estate cadastre in the regions of Montenegro that have not been surveyed, such as municipalities Bijelo Polje, Berane, Andrijevica and Podgorica.

2.2. WORK ON ESTABLISHMENT OF THE REAL ESTATE CADASTRE IN MUNICIPALITIES OF NIKŠIĆ, CETINJE AND PODGORICA

The Plan envisages execution of works in 2008 towards establishment of the real estate cadastre in municipalities of Nikšić (**11** cadastre municipalities covering the region of **31.627 ha**), Cetinje (**15** cadastre municipalities covering the region of **54.670 ha**), Podgorica (1 cadastre municipality covering the region of **1.911 ha**), i.e. the total size of **88.208 ha**.

Development of the TOR and the Main Project is under way, which will also implement the conclusion of the Government of Montenegro of 26.07.2007 towards construction of Adriatic – Ionian highway. The Main Project will be completed in January.

Implementation of the Main Project will ensure establishment of the real estate cadastre in the abovementioned cadastre municipalities and the technical documents needed for the formulation of concept project, the Main Project and the Expropriation Elaborate.



Construction site: Nikšić, Cetinje and Podgorica

Legend:

- Administrative municipality borders
- Cadastre municipality borders
- Survey planned for 2008

Table 5: Overview of planned work on establishment of real estate cadastre in Nikšić Municipality where cadastre list is used

No.	Cadastre municipality	Size CM (ha)	Number of cadastre lots	Number of cadastre cultures	Number of structures	Number of property deeds	Scale of plans	Value of works (euro)
1. Nikšić Municipality								
1.	Bijela Gora	3.413	280	614	7	134	1:2500	
2.	Grahovac	1.930	609	2.199	100	137	1:2500	
3.	Grahovo	5.391	2.156	5.287	246	558	1:2500	
4.	Jabuka	2.861	385	2.087	70	142	1:2500	
5.	Nudo	1.455	774	2.245	115	211	1:2500	
6.	Vllusi	6.406	1.590	6.849	210	385	1:2500	
7.	Zagora	1.350	201	1.056	34	70	1:2500	
8.	Krstac	2.052	635	1.885	83	178	1:2500	
9.	Brestica	2.301	354	1.240	55	85	1:2500	

10.	Rudine	1.837	291	1.050	71	81	1:2500	
11.	Muževice	2.631	400	1.397	62	108	1:2500	
TOTAL:		29.827	7.675	25.909	1053	2.089		2.530.160,00

Table 6: Overview of works planned for establishment of the real estate cadastre in Cetinje Municipality, where cadastre list is used

No.	Cadastre municipality	Size CM (ha)	Number of cadastre lots	Number of cadastre cultures	Number of structures	Number of property deeds	Scale of plans	Value of works (euro)
1. Cetinje Municipality								
1.	Trešnjevo	3.293	828	2.324	108	164	1:2500	
2.	Kobilji Do	6.407	1.035	4.367	134	223	1:2500	
3.	Ubli	5.963	685	2.418	151	226	1:2500	
4.	Lastva	4.018	529	2.129	94	139	1:2500	
5.	Prentin Do	4.081	924	2.889	124	201	1:2500	
6.	Bata	4.134	1.565	3.080	191	228	1:2500	
7.	Čevo	3.409	1.184	3.307	161	245	1:2500	
8.	Markovina	1.690	410	1.379	54	85	1:2500	
9.	Velestovo	3.225	586	2.129	105	174	1:2500	
10.	Prediš	3.876	1.147	3.026	148	191	1:2500	
11.	Grab	2.477	2.053	3.993	158	224	1:2500	
12.	Resna	1.500	859	1.834	91	113	1:2500	
13.	Čeklići	5.814	5.715	11.928	280	552	1:2500	
14.	Štitari	1.384	935	2.826	110	170	1:2500	
15.	Đinovići	3.399	1.696	4.549	179	355	1:2500	
TOTAL:		54.670	20.151	52.178	2.088	3.290		4.373.600,00

Table 7: Overview of works planned for establishment of the real estate cadastre in Podgorica Municipality, where cadastre list is used

No.	Cadastre municipality	Size CM (ha)	Number of cadastre lots	Number of cadastre cultures	Number of structures	Number of property deeds	Scale of plans	Value of works (euro)
1. Podgorica Municipality								
1.	Orasi	1.911	955	3364	106	151	1:2500	
TOTAL:		1.911	955	3364	106	151		152.880,00

It is necessary to ensure **7.056.640,00 euros** for implementation of the Plan for establishment of the real estate cadastre in the regions of Montenegro that have not been surveyed.

2.3. WORKS ON UPDATING THE REAL ESTATE CADASTRE IN AND OUT OF THE ZONE OF MARITIME DEMESNE AND THE NATIONAL PARK SKADAR LAKE

The works on updating the real estate cadastre in and out of the zone of maritime demesne for attractive locations:

- Ada Bojana,
- Velika plaža,
- Valdanos,
- Buljarica,
- Jaz Beach,
- Ostrvo Cvijeća,
- Sveti Marko Island,
- Luštica Peninsula.

The works on updating the real estate cadastre in the zone of the National Park Skadar Lake:

- Virpazar,
- Vranjina,
- Karuč,
- Dodoši,
- Žabljak Crnojevića,
- Donji Murići,
- Krnjice,
- Raduš,
- Pristan,
- Seoca,
- Godinje.

It is necessary to ensure **70.000,00 euros** for implementation of the Plan for updating the real estate cadastre in and out of the zone of maritime demesne and the National Park Skadar Lake in 2008.

2.4. FINANCIAL SUMMARY

It is necessary to ensure **7.126.640,00 euros** for implementation of the Plan for establishing real estate cadastre in the regions of Montenegro that have not been surveyed, and for implementation of the Plan for updating the real estate cadastre in and out of the zone of maritime demesne and the National Park Skadar Lake in 2008.

3. ESTABLISHMENT OF UTILITIES CADASTRE

Establishment of utilities cadastre in Bar and Pljevlja assumes development of the TOR and the Main Project, and their implementation will depend on the willingness of all municipalities to financially support the Project implementation in cooperation with the Administration.

Main Projects will be completed in January.

Table 1: Overview of works planned towards establishment of utilities cadastre

No.	MUNICIPALITY	Total underground structures (km)	Value of works (euro)
1.	Bar	855	855.000
2.	Pljevlja	700	700.000
	TOTAL:	1.555	1.555.000,00

It is necessary to ensure **1.555.000,00 euros** in municipalities for implementation of the Plan for establishment of utilities cadastre.

The Real Estate Administration will bear the costs of: formulation of the TOR, Main Project and costs of supervision of the execution of works and establishment of the database of utilities cadastre.

4. BASIC NATIONAL MAP, TOPOGRAPHIC AND DETAILED TOPOGRAPHIC MAPS

4.1. DEVELOPMENT OF BASIC NATIONAL MAP SCALE 1:5000

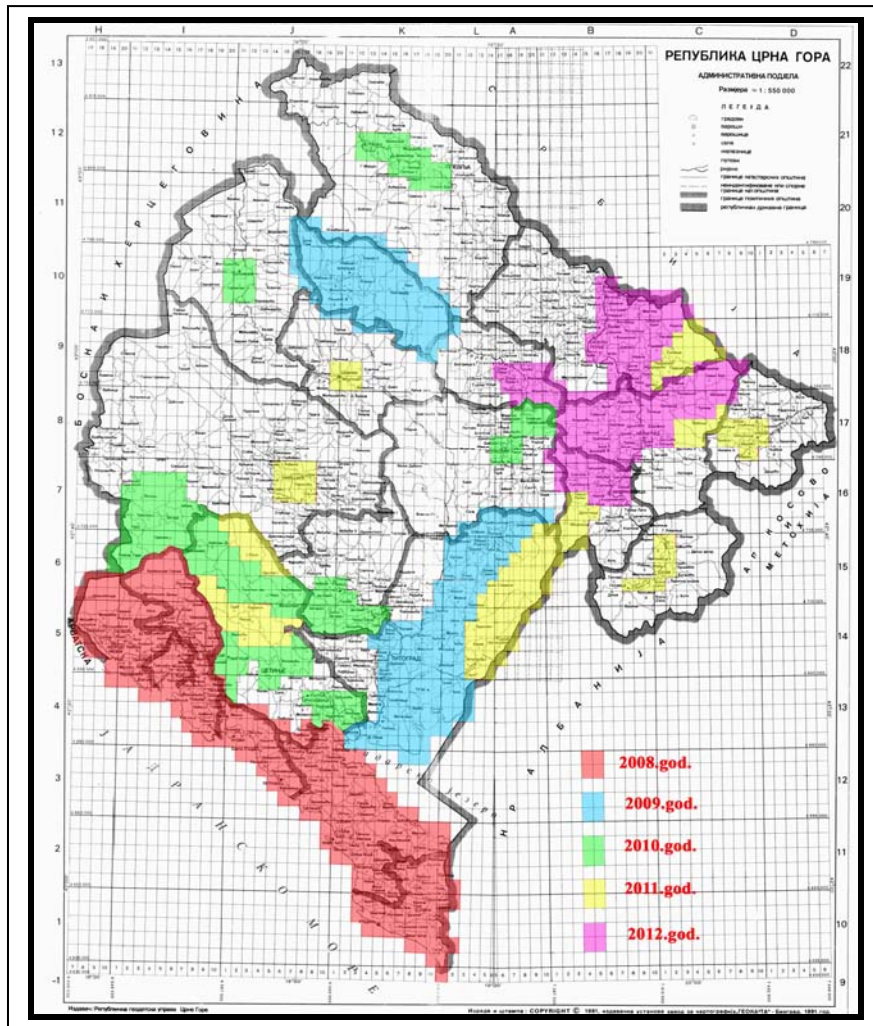
The basic national map (BNM) 1:5000 will be developed by developing a new digital map based on aerial photography, and by using available data from the existing cadastre register.

The procedure of developing new BNM involves the following activities:

- drafting technical documents (Main Project);
- aerial photography and scanning of aerial images (Real Estates Administration);
- execution of works (preparation of terrain for aerial photography, determination of guide points, identification and decoding, development of BNM), and supervision of execution of works.

Table 1: Development of 1:5000 BNM

No.	Location	Scale 1:5000	Number of sheets	Size of sheets (ha)	Value of works (euro)
1.	Bar Municipality	X	75	50.519	505.190
2.	Budva Municipality	X	18	12.224	122.240
3.	Herceg Novi Municipality	X	35	23.359	233.590
4.	Kotor Municipality	X	49	32.990	329.900
5.	Tivat Municipality	X	7	4.627	46.270
6.	Ulcinj Municipality	X	38	25.886	258.860
TOTAL:			222	149.605	1.496.050,00



Overview of development of planned sheets of the basic national map 1:5000

4.2. DEVELOPMENT OF DIGITAL ORTOPHOTO MAP 1:5000 (DOF5)

The digital ortophoto 1:5000 map (DOF5) will be produced based on the new direct aerial photography or available photo material from previous aerial photography conducted in 2006 and 2007, in compliance with the prescribed technical documents.

Table 2: Production of ortophoto 1:5000 map (DOF5)

No.	Location	Planned number of sheets	Size of sheets (ha)	Value of works (euro)
1.	Andrijevica	49	32.995	16.498
2.	Berane	101	68.407	34.204
3.	Bijelo Polje	98	66.135	33.068
4.	Cetinje	133	89.962	44.981
5.	Mojkovac	56	37.464	18.732
6.	Nikšić	322	217.611	108.806
7.	Plav	72	48.663	24.332
8.	Plužine	126	85.232	42.616
9.	Pljevlja	200	134.770	67.385
10.	Rožaje	64	42.951	21.476
TOTAL:		1.221	824.190	412.095,00

4.3. PRODUCTION AND PROCUREMENT OF TOPOGRAPHIC AND DETAILED TOPOGRAPHIC MAPS

The first phase of establishment of cartographic database for Montenegro will involve procurement of topographic and detailed topographic maps, which are contained in documents of other countries.

Table 3: Overview of procurement of the necessary source documents

No.	Activity	Permanent task	Value of works (euro)
1.	Procurement of cartographic material: <ul style="list-style-type: none"> • sheets of map 1:5000 • sheets of map 1:7500 • sheets of map 1:10000 • sheets of map 1:25000 • sheets of map 1:50000 • sheets of map 1:75000 • sheets of map 1:100000 • sheets of map 1:200000 • sheets of map 1:300000 • sheets of map 1:500000 • sheets of map 1:1000000 • other cartographic material, technical documents, land books, deeds and plans 		100.000
TOTAL:			100.000,00

4.4. DIGITAL TOPOGRAPHIC MAP 1:25000

In 2007, the production of digital topographic 1:25000 maps for the territory of Montenegro, 128 sheets in total, started from the donation of the Government of Japan.

In addition to the donation of the Government of Japan, the Real Estate Agency must allocate **186.750,00 euros** for implementation of this Project in 2008.

4.5. ESTABLISHMENT OF THE CARTOGRAPHY DEPARTMENT WITHIN THE REAL ESTATE ADMINISTRATION

The Cartography Department will be established within the Real Estates Administration in the first half of 2008 with the following general tasks: preparation, coordination and monitoring of implementation of the Mid-Term Programme and the Annual Plan in cartography; definition of cartography standards and collection of geographic names; making decisions on geographic names (toponyms, hydronyms, oronyms and horonyms), and their changes, in compliance with the previously received feedback from local government; development and updating of national topographic and detailed topographic maps and thematic maps in all forms; collecting and updating of cadastre and topographic database within the uniform geodetic and cadastre information system; giving approval for use and circulation of thematic maps; establishing international cooperation in cartography and exchange of cartography publications and information.

4.6. FINANCIAL SUMMARY

It is necessary to ensure **2.194.895,00 euros** for implementation of the Plan for development of the main national map and procurement of topographic and detailed topographic maps for the territory of Montenegro.

5. MEASUREMENT, MARKATION AND RENEWAL OF BORDER SIGNS ON THE STATE BORDER AND ESTABLISHMENT OF REGISTER OF DATA ON THE STATE BORDER

5.1. MEASUREMENT, MARKATION AND ESTABLISHMENT OF REGISTER OF DATA ON THE STATE BORDER

The measurement, marcation and establishment of the register of data on the state border in 2008 will be executed in relation to the border with the Republic of Albania in the length of 207km (Table 5.1.):

- development of digital graphic display of the position and the stabilization method for the existing border points of border line and establishment of the register of XYZ coordinates in the national coordinate system,
- development of markers, stabilization and renewal of stabilization, clearing from trees and other overgrowth and marcation of border line points,
- identification of the existing points of geodetic basis and establishment of new points for the purpose of geodetic survey,
- the geodetic survey and mapping of residential and economy facilities in immediate surrounding of the border line, and the facilities in the immediate surrounding of the border line which are used for state border protection and for control of the state border crossing based on the existing cadastre plans, and the data contained in the digital national ortohoto map scale 1:5000,
- establishment of digital cartographic layers (basic national maps, topographic and detailed topographic maps, and maritime navigation maps) in the borderland,
- selection of data from the database of the real estate cadastre on cadastre lots and property owners in the borderland.

Table 1: Measurement and markation of state border and establishment of the register

No.	Border line towards	Length (km)	Year	Value of works
1.	Albania	207	2008	450.000
TOTAL:		207		450.000,00

5.2. ESTABLISHMENT OF THE SECTOR WITHIN THE REAL ESTATE AGENCY FOR STATE BORDER AND BASIC GEODETIC WORKS

The Sector for state border and the basic geodetic works will be established within the Real Estate Administration in the first half of 2008 with two departments: Department for State Border and the Department for Basic Geodetic Works.

The Department for State Border has the following general tasks: keeping records, markation, numeration and measurement of state border, coordination of renewal and maintenance of the marked state border, monitoring activities that relate to preparation of international contracts on the state border signed between Montenegro and neighbouring countries, cooperation with authorities responsible for demarcation and regulation of state border, professional and technical activities related to the state border, drafting reports on the works executed on the state border.

The Department for Basic Geodetic Works has the following general tasks: maintenance of the network of permanent GPS stations – *MontePos*; determination of geoids, definition of digital relief model needed for basic geodetic works; collection, processing and export of data on basic geodetic works for the uniform geodetic and cadastre information system; designing, implementation and maintenance of the basic reference geodetic networks (spatial, vertical and gravimetric reference system); metrological security measures for geodetic activities; linking national reference networks with the networks of neighbouring countries and involvement in international projects.

5.3. FINANCIAL SUMMARY

It is necessary to ensure to ensure **450.000,00 euros** for implementation of the Plan for surveying, markation and renewal of border signs on the state border towards Albania and establishment of register of data about the state border.

6. REGISTER OF HOUSE NUMBERS, STREETS AND SQUARES AND THE REGISTER OF SPATIAL UNITS

6.1. REGISTAR OF HOUSE NUMBERS, STREETS AND SQUARES

The development of the Register of house numbers, streets and squares is planned for 2008 for the region of 37 cadastre municipalities (17 CM - Bijelo Polje, 14 CM - Podgorica, 3 CM - Andrijevica and 3 CM - Berane), and it involves: drafting technical documents, collection of data on house numbers, streets and squares from municipalities public utilities authorities, issuing decisions on house numbers and organizing production and placement of house number plates, names of streets and squares.

The development and implementation of specific software for establishing the Register of house numbers, streets and squares will be initiated in parallel to the abovementioned activities.

The initiative for preparation of the new Law on Settlements, and the relevant by-laws will be put forward in order to regulate marcation of house numbers, streets and squares in a uniform manner throughout Montenegro.

It is necessary to ensure **360.000,00 euros** for implementation of the Plan for establishment of the Register of house numbers, streets and squares in 2008.

6.2. REGISTER OF SPATIAL UNITS

For the development of the Register of spatial units, it is planned to work on collecting data on spatial units (in accordance with Article 152 of the Law) from the state authority competent for statistics and determination of digital coordinates of border lines for spatial units in Montenegro, towns, municipalities and cadastre cantons, with appropriate precision.

It is necessary to ensure **30.000,00 euros** for implementation of the Plan for registering spatial units in 2008.

6.3. FINANCIAL SUMMARY

It is necessary to ensure **390.000,00 euros** for implementation of the Plan for establishment of the Register of house numbers, streets, squares and the Register of spatial units.

7. MODERNIZATION OF GEODETIC AND CADASTRE INFORMATION SYSTEM

7.1. WORK PLAN

The Work Plan involves modernization, upgrading and provision of new hardware and software infrastructure aimed at improving the quality of products and services provided by the Real Estate Administration.

Table 1: Activities and funds for procurement and maintenance of hardware infrastructure

No.	Activity	Description of activities	Fund euro
1	Maintenance and upgrading of hardware infrastructure		
1.1	Hardware		
	New equipment	Replacement of outdated servers, work stations and UPSs	80.000
	System maintenance	Regular maintenance and servicing of equipment	20.000
1.2	Communication infrastructure		
	New equipment and services	Upgrading communication infrastructure – LAN networks	30.000
	System maintenance	Costs of communication service providers	100.000
1.3	Specialized equipment		
	Equipment for 3D images and GIS processing	Procurement of 3D equipment and specialized work stations	20.000
	TOTAL:		250.000,00

Table 2: Activities and funds needed for procurement and maintenance of software infrastructure

No.	Activity	Description of activities	Fund euro
1	Maintenance and upgrading system software		
1.1	Operating systems		
	Software maintenance	Licensing and upgrading to new version	40.000
1.2	Database management system		
	Software maintenance	Regular maintenance and upgrading of DBMS	25.000
1.3	System software for business correspondence		
	Software maintenance	Regular maintenance and software upgrading	8.000
1.4	Protection and anti-virus programmes		
	Software maintenance	Regular maintenance and software upgrading	5.000
2	Maintenance and upgrading application software		
2.1	GPS network - software		
	Software maintenance	Regular maintenance and software upgrading	12.000
2.2	Photogrammetry and remote detection		
	New modules	Procurement of new software modules for photogrammetry, restitution and remote	150.000

	Software maintenance	Regular maintenance and software upgrading	50.000
2.3	GIS and cartography		
	New modules	Procurement of new software modules for GIS and cartography	50.000
	Software maintenance	Regular maintenance and software upgrading	40.000
2.4	Real estate cadastre		
	Upgrading of TerraSoft system	Upgrading of existing and development of new software functions	35.000
	Implementation of modules of the Register of house numbers, streets and squares	Analysis of available data, testing and implementation of new software modules	15.000
	Implementation of modules of the Register of spatial units	Analysis of available data, testing and implementation of new software modules	15.000
	Implementation of utilities cadastre modules	Analysis of available data, testing and implementation of new software modules	30.000
	Software maintenance	Regular maintenance and software upgrading	40.000
2.5	Application software for business correspondence		
	Software maintenance	Regular maintenance and software upgrading	12.000
2.6	Archive		
	Implementation of modules	Analysis of available data, testing and implementation of archive databases and the relevant software solutions	65.000
3	Upgrading operations of INFORMATION SYSTEM		
3.1	Development of DATA MODEL for cadastre and other GIS data		130.000
	UML scheme	Analysis of the structure of cadastre data and identification of packages and classes	
	Catalogue of objects	Establishing catalogue in line with ISO and OGC standards	
	Catalogue of topographic markers and signatures	Establishing catalogue in line with ISO and OGC standards	
	Catalogue of meta data	Establishing catalogue in line with ISO and OGC standards	
	Specification of data exchange format	Specification of formats according to ISO and OGC standards	
	Work processes	Definition of work processes according to ISO and OGC standards	
	Testing of models	Analysis, upgrading and testing of data model	
3.2	Geoportal		30.000
	Definition of architecture	Adoption of standards and definition of services	
	Hardware and software infrastructure		
	Implementation of spatial data infrastructure		
	Implementation of Geoportal		
	Software maintenance		
	TOTAL:		752.000,00

7.2. ESTABLISHMENT OF THE SECTOR FOR GEODETIC AND CADASTRE INFORMATION SYSTEM

The Sector for geodetic and cadastre information system will be established in the first half of 2008 in the Real Estate Administration with the following general tasks: use and maintenance of technical basis of information system; survey and development of methodology and definition of standards for data management, design of the system, programming, preparation, control and extraction of data on computer systems, maintenance of the system and application software, development of databases for

information and communication needs; ensuring data integrity; procurement of information equipment (hardware and software); hardware and software servicing; copyrights protection for programme solutions; introduction of new operating systems, system software, telecommunication software, computer network, local networks, Internet and Intranet; establishment and maintenance of WEB and MAIL servers, reception and organizing material for development of WEB and other presentation of the Real Estate Administration in Montenegrin and English; dissemination of data by media, computer networks, Intranet and Internet; laying professional foundation for by-laws under this Sector's responsibility; development of Mid-Term Programme and annual Work Plans; testing and implementation of Geoportal and spatial data infrastructure.

7.3. FINANCIAL SUMMARY

It is necessary to ensure **1.002.000,00 euros** for implementation of the Plan for modernization of geodetic and cadastre information system in 2008.

8. REORGANIZATION OF THE REAL ESTATE ADMINISTRATION AND ITS BRANCH OFFICES

8.1. REORGANIZATION AND CONSTRUCTION OF FACILITIES FOR THE REAL ESTATE ADMINISTRATION

Reorganization of the Real Estate Administration will be implemented in line with the basic functions set out by the Law and the Administrative Reform Strategy of Montenegro - 2002-2009, by adoption of new systematization.

From the Law's viewpoint, the main functions to be implemented by the Real Estate Administration are:

- develop and maintain national reference geodetic systems;
- establish and maintain real estate cadastre;
- establish and maintain utilities cadastre;
- produce and maintain the main national map, topographic and detailed topographic maps, and establishment of a uniform cartography database of the Republic;
- survey, mark, maintain, and renew border markers on the state border and keep records on the state border;
- manage the Register of house numbers, streets and squares and records of spatial units;
- manage geodetic and cadastre information system;
- manage archive of documents on national measurement and real estate.

8.2. MODERNIZATION AND CONSTRUCTION OF BUSINESS PREMISES

In order to improve work conditions for the employees, by this Plan we envisage preparation of implementation projects for construction of business premises for the Real Estate Administration in Podgorica, with provision of facilities for the branch office Podgorica, and preparation of projects for adaptation, modernization and construction of business premises in branch offices.

Branch offices require additional equipping by office furniture and appropriate office equipment.

8.3. FINANCIAL SUMMARY

It is necessary to ensure **560.000,00 euros** for implementation of these activities that relate to modernization and construction of business premises.

9. DOCUMENTS ARCHIVE OF THE REAL ESTATE ADMINISTRATION

9.1. WORK PLAN

Establishment and the work of the Archive of documents on state survey and real estate in the Head Office of the Real Estate Administration in Podgorica and in head offices of branch offices involve:

- scanning of available documents of cadastre plan, geodetic and photogrammetric elaborates, descriptive plans, elaborates of cadastre land classification and evaluation, collection of documents, etc.,
- procurement of appropriate office equipment for archiving and physical protection of stored and other documents,
- procurement of technical system for storing and physical protection of digital data,
- collection of historical documents on geodetic works in Montenegro and establishment of database,
- establishment and operation of multi-purpose data distribution system,
- establishment of a library of the Real Estate Administration.

9.2. ESTABLISHMENT OF DEPARTMENT FOR ARCHIVING DOCUMENTS ON STATE SURVEY

The Department for archiving documentation on state survey will be established in the first half of 2008 with the following general tasks: establishment and operation of multi-purpose data distribution system; coordination of activities in geo-information infrastructure; preparation and managing analogue and digital data in the format appropriate for dissemination; preparation and making data available to users in analogue and digital format (physical preparation, ensuring access to data, ensuring insight into data); informing users about types of information, meta data, layers, catalogues of data in other publications, demo presentation and detailed description of the structure of distributed data; managing of central Register of spatial data including meta data; providing technical and personal assistance to users, settling complaints, preparation of information on using the data; calculation of fees for using data, managing various statistics on utilization and sales of data, preparation of various reports, participation at professional gatherings; managing library of the Real Estate Administration and cartography collection; submission of archive material to the Archive of Montenegro and preparation of information of common interest.

9.3. FINANCIAL SUMMARY

It is necessary to ensure **70.000,00 euros** for implementation of the Plan for modernization of the National Archive of documentation about state survey and real estates.

10. PREPARATION OF NEW AND INOVATION OF APPLICABLE BY-LAWS IN THE FIELD OF STATE SURVEY AND REAL ESTATE CADASTRE

Pursuant to Article 174 of the Government Law and Article 175 of the Law of the Ministry of Finance, following the proposal of the Real Estate Administration, the following by-laws should be drafted within two years (Article 190 of the Law):

No.	By-laws	Preparation year	Funds euro
1.	Method of acquiring work licenses and keeping records on work licences, content and form of identity papers for execution of geodetic works	2008.	3.000
2.	Technical norms, methods and method of work for drafting and control of technical documents for execution of geodetic works, professional supervision and acquiring permits for designing and execution of geodetic works, professional supervision for cadastre land classification and evaluation	2008.	3.000
3.	Content and method of keeping diary of works and inspection book	2008.	1.000
4.	Technical norms, methods and a way of work towards drafting utilities cadastre and its maintenance	2008.	4.000
5.	Method and procedure of control, overview and acceptance of works in the procedure of maintaining real estate cadastre	2008.	2.000
6.	Method of establishing, the content and managing the Register of house numbers, names of streets and squares and the Register of spatial units	2008.	2.500
7.	Registration of real estate rights and the procedure of the registration	2008.	10.000
8.	Method of acquiring authorization for designing and execution of geodetic works in engineering and technical fields	2008.	2.000
9.	Technical norms, method of work for drafting technical documents and control of technical documents for works in engineering and technical fields	2008.	2.000
10.	Method of supervision and control of geodetic works in engineering and technical fields	2008.	1.000
11.	Method of storing, reviewing, using, i.e. dissemination of data on state survey and real estate cadastre	2008.	5.500
12.	Regulation on fees to be paid for using the data on survey, real estate cadastre and services of the Real Estate Administration	2008.	2.500
13.	Comments on the Law on State Survey and Real Estate Cadastre with the printout of 500 copies	2008.	25.000
14.	Method of establishment, the content and managing registers of data on the state border	2008.	5.000
	TOTAL:		68.500,00

10.1. FINANCIAL SUMMARY

It is necessary to ensure **68.500,00 euros** for implementation of the Plan for drafting new and innovation of applicable by-laws in the field of state survey and real estate cadastre.

11. EDUCATION OF STAFF TO WORK IN THE FIELD OF STATE SURVEY AND REAL ESTATE CADASTRE

Implementation of the Plan is possible only with capable staff of geodetic, legal and information-related background, and for this reason, we will propose by the new Systematization of positions the necessary increase of the number of agents in order to properly respond to new jobs set out by the Law on State Survey and Real Estate Cadastre, and to respond to a huge increase of the number of cases in branch offices.

At the same time, an initiative will be put forward in 2008 for modernization of, primarily, secondary education system for geodesy staff (the Law introduced a number of new functions in the field of state survey and real estate cadastre, which also requires appropriate adjustments and modernization of secondary education in Montenegro). The practice proved that the staff educated in the past cannot be substantially involved in implementation of many activities in this field due to the lack of IT, geodetic and other types of knowledge and skills. The reason for this is insufficient number of modern education teachers, insufficient equipment for educational process in terms of modern geodesy instruments, computers and software).

The analysis of the needs of University geodetic education of engineers (geodesy engineers and geo-informatics (Bsc)), and graduated geodesy and geo-informatics engineers (Msc) under the current Geodesy Study Programme will be conducted in parallel to this initiative.

IV TOTAL FUNDS NEEDED FOR IMPLEMENTATION OF THE PLAN

The total of **16.339.540,00 euros** needed for implementation of the Annual Plan in 2008 are presented according to Mid-Term Work Programme for survey and preparation of the real estate cadastre ("Official Gazette of the Republic of Montenegro", no. 55/07).

Annual Plan for 2008 will be implemented in relation to available funds.

As for funding the works outlined in the Mid-Term Work Programme and the Annual Work Plan for 2008, we think it is useful to refer to Article 176 of the Law on State Survey and Real Estate Cadastre, which defines the following sources of funds:

- 1) general revenues of the Republic budget;
- 2) revenues generated by fees paid for use of the data on survey, real estate cadastre and utilities cadastre and fees paid for provision of services;
- 3) proportion of taxes paid for real estates sale in the amount of 5% which belongs to the Republic budget;
- 4) other sources (donations, credits, etc.).

We also think it is necessary to refer to conclusions of the Government drawn in the process of adoption of Mid-Term Programme, which say: "The Real Estate Administration is responsible for making sure that in the process of drafting Mid-Term Programme for the survey and real estate cadastre, the priority is given to determining highway routes."

V FINAL PROVISIONS

Implementation of this Plan shall start on the day of its adoption.

Number

Podgorica, December 25, 2007.

MINISTRY OF FINANCE OF MONTENEGRO

Minister

Dr Igor Lukšić

REAL ESTATE ADMINISTRATION

Director

Mičo Orlandić

TABLE OF CONTENTS

I BACKGROUND.....	2
II OBJECTIVE OF THE PLAN.....	2
III PLANS	2
1. ESTABLISHMENT AND MODERNIZATION OF THE NATIONAL REFERENCE GEODETTIC SYSTEM (BASIC GEODETTIC WORKS).....	3
1.1. SPATIAL REFERENCE SYSTEM.....	3
1.2. HORIZONTAL REFERENCE SYSTEM	4
1.3. VERTICAL REFERENCE SYSTEM.....	4
1.4. GRAVIMETRIC REFERENCE SYSTEM	5
1.5. DETERMINATION OF GEOIDS.....	5
1.6. HORIZONTAL AND VERTICAL TRANSFORMATION	6
1.7. FINANCIAL SUMMARY	6
1.8. ESTABLISHMENT OF A DEPARTMENT IN THE REAL ESTATE ADMINISTRATION FOR MAIN GEODETTIC WORK.....	6
2. ESTABLISHMENT OF REAL ESTATE CADASTRE IN THE REGIONS OF MONTENEGRO THAT HAVE NOT BEEN SURVEYED.....	7
2.1. ACTIVITIES TOWARDS ESTABLISHMENT OF REAL ESTATE CADASTRE IN PODGORICA, ANDRIJEVICA, BERANE AND BIJELO POLJE MUNICIPALITIES.....	7
2.2. WORK ON ESTABLISHMENT OF THE REAL ESTATE CADASTRE IN MUNICIPALITIES OF NIKŠIĆ, CETINJE AND PODGORICA.....	10
2.3. WORKS ON UPDATING THE REAL ESTATE CADASTRE IN AND OUT OF THE ZONE OF MARITIME DEMESNE AND THE NATIONAL PARK SKADAR LAKE.....	12
2.4. FINANCIAL SUMMARY	13
3. ESTABLISHMENT OF UTILITIES CADASTRE.....	13
4. BASIC NATIONAL MAP, TOPOGRAPHIC AND DETAILED TOPOGRAPHIC MAPS	14
4.1. DEVELOPMENT OF BASIC NATIONAL MAP SCALE 1:5000	14
4.2. DEVELOPMENT OF DIGITAL ORTOPHOTO MAP 1:5000 (DOF5).....	15
4.3. PRODUCTION AND PROCUREMENT OF TOPOGRAPHIC AND DETAILED TOPOGRAPHIC MAPS	16
4.4. DIGITAL TOPOGRAPHIC MAP 1:25000	16
4.5. ESTABLISHMENT OF THE CARTOGRAPHY DEPARTMENT WITHIN THE REAL ESTATE ADMINISTRATION	16
4.6. FINANCIAL SUMMARY	16
5. MEASUREMENT, MARKATION AND RENEWAL OF BORDER SIGNS ON THE STATE BORDER AND ESTABLISHMENT OF REGISTER OF DATA ON THE STATE BORDER.....	17
5.1. MEASUREMENT, MARKATION AND ESTABLISHMENT OF REGISTER OF DATA ON THE STATE BORDER	17
5.2. ESTABLISHMENT OF THE SECTOR WITHIN THE REAL ESTATE AGENCY FOR STATE BORDER AND BASIC GEODETTIC WORKS	17
5.3. FINANCIAL SUMMARY	18
6. REGISTER OF HOUSE NUMBERS, STREETS AND SQUARES AND THE REGISTER OF SPATIAL UNITS.....	18
6.1. REGISTRAR OF HOUSE NUMBERS, STREETS AND SQUARES.....	18
6.2. REGISTER OF SPATIAL UNITS	18
6.3. FINANCIAL SUMMARY	18
7. MODERNIZATION OF GEODETTIC AND CADASTRE INFORMATION SYSTEM	19
7.1. WORK PLAN.....	19

7.2. ESTABLISHMENT OF THE SECTOR FOR GEODETIC AND CADASTRE INFORMATION SYSTEM	20
7.3. FINANCIAL SUMMARY	21
8. REORGANIZATION OF THE REAL ESTATE ADMINISTRATION ADMINISTRATION AND ITS BRANCH OFFICES.....	21
8.1. REORGANIZATION <i>AND CONSTRUCTION OF FACILITIES FOR THE REAL ESTATE ADMINISTRATION</i>	21
8.2. MODERNIZATION AND CONSTRUCTION OF BUSINESS PREMISES	21
8.3. FINANCIAL SUMMARY	22
9. DOCUMENTS ARCHIVE OF THE REAL ESTATE ADMINISTRATION.....	22
9.1. WORK PLAN.....	22
9.2. ESTABLISHMENT OF DEPARTMENT FOR ARCHIVING DOCUMENTS ON STATE SURVEY.....	22
9.3. FINANCIAL SUMMARY	23
10. PREPARATION OF NEW AND INOVATION OF APPLICABLE BY-LAWS IN THE FIELD OF STATE SURVEY AND REAL ESTATE CADASTRE.....	23
10.1. FINANCIAL SUMMARY	23
11. EDUCATION OF STAFF TO WORK IN THE FIELD OF STATE SURVEY AND REAL ESTATE CADASTRE.....	24
IV TOTAL FUNDS NEEDED FOR IMPLEMENTATION OF THE PLAN	24
V FINAL PROVISIONS	25