

**INFORMATION SYSTEMS  
ASSESSMENT REPORT**

**MUNICIPALITY OF  
BLAGOEVGRAD, BULGARIA**

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Prepared by

Tassos Belessis

and

Moscow Alajem  
MTK Konsult  
Sofia, Bulgaria



**THE URBAN INSTITUTE**

2100 M Street, NW  
Washington, DC 20037  
(202) 833-7200  
[www.urban.org](http://www.urban.org)

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## EXECUTIVE SUMMARY

The assessment of information systems and data-processing capabilities in the Municipality of Blagoevgrad provided the following findings:

- The municipality has been using computer systems for several years.
- For an organization of this size and resources the level of computerization is fair.
- Many municipal functions that require data processing use computers in some fashion.
- Most of the application software is provided by other governing bodies.
- The level of functionality of the application software is very limited.
- The computer hardware is old and does not meet functional requirements.

The following sections contain a complete review of the information systems and technology capabilities in the Municipality of Blagoevgrad.



# INFORMATION SYSTEMS ASSESSMENT REPORT MUNICIPALITY OF BLAGOEVGRAD, BULGARIA

## HARDWARE, OPERATING SYSTEMS AND COMMUNICATIONS

### *Availability Review*

The Municipality of Blagoevgrad has a total of thirty-five (35) PC computers installed, including the server for the Local Area Network (LAN). Twenty-five (25) of these computers are attached to a Local Area Network, the rest are all stand-alone machines. Computers attached to the LAN have two type of configuration: with and without hard disk drive.

The municipal LAN runs on Novell NetWare version 3.12 operating system, with Ethernet protocol and thin coaxial cabling. Most workstations run DOS version 6.2 operating system, with only a few workstations run on DOS-Windows 3.1 environment.

Intranet communication is available through the internal e-mail utility Pegasus. This is a DOS based e.mail software application available to anyone attached to the network. External data communication capabilities and Internet access are available through dial-up with two modems and regular telephone lines. SPRY Mail and Mosaic have been installed at the MIS Manager workstation and allows for regular communications with other computer centers, including MTK Konsult in Sofia, American University at Blagoevgrad, and others. This facility allows for file transfer and electronic mail exchange.

In terms of functional distribution, the computer equipment in the municipality is highly concentrated in the administrative functions. Twenty-six (26) out of thirty-five (35) computers are dedicated to General Administration (18), Accounting (4) and the Mayor and his Staff (4). The Economic Affairs Division has seven (7) computers; while the Construction and Community Affairs Divisions have only one (1) computer each.

The next few pages contain a list and diagrams of all the computer hardware available in the Municipality of Blagoevgrad.

**Table 1**  
**Municipality of Blagoevgrad Computer Hardware**

Hardware	Manufacturer	Operating System	LAN	RAM (MB)	HD D (MB)	Monitor	FD D	Printer Type	Communication Cards
286	NA	DOS 6.2	No	1	40	VGA	3.5", 5.25"	No	No
286	NA	DOS 6.2	Yes	1	-	Mono	3.5"	No	TE-16XT Pegasus Mail

**Table 1**  
**Municipality of Blagoevgrad Computer Hardware (continued)**

Hardware	Manufacturer	Operating System	LAN	RAM (MB)	HD D (MB)	Monitor	FD D	Printer Type	Communication Cards
286	NA	DOS 6.2	Yes	1	-	Color	3.5"	No	TE-16XT Pegasus Mail
286	Falcon	DOS 6.2	No	1	40	Color	3.5", 5.25"	Star LC 15	No
286	Falcon	DOS 6.2	Yes	1	40	Color	3.5", 5.25"	Star LC 15	TE - 16XT Pegasus Mail UPS
286	Falcon	DOS 6.2	No	1	40	Color	3.5", 5.25"	Star LC 15	No
286	Multicom	DOS 6.2	Yes	1	40	VGA	3.5", 5.25"	No	TE-16XT Pegasus Mail
286	Pulsar 386	DOS 6.2	Yes	1	-	Color	3.5"	No	TE-16XT Pegasus Mail
286	Pulsar 386	DOS 6.2	Yes	1	-	Color	3.5"	No	TE-16XT Pegasus Mail
286	Pulsar 386	DOS 6.2	Yes	1	-	Mono	5.25"	No	TE-16XT Pegasus Mail
286	Pulsar 386	DOS 6.2	Yes	1	-	Mono	5.25"	No	TE-16XT Pegasus Mail
386DX/33	Technology	DOS 6.2	Yes	4	120	Color	5.25"	Star LC 15	TE-16XT Pegasus Mail UPS



Hardware	Manufacturer	Operating System	LAN	RAM (MB)	HD D (MB)	Monitor	FD D	Printer Type	Communication Cards
386DX/40	NA	DOS 6.2	No	4	120	Color	3.5", 5.25"	Star LC 15	Modem
386DX/40	KAMAG	W 3.1	No	4	170	Color	3.5"	Epson NX 1001	No
386SX/40	KAMAG	DOS 6.2	Yes	2	-	Mono	3.5"	No	TE-16XTPegasus Mail
386SX/40	KAMAG	DOS 6.2	Yes	2	-	Mono	3.5"	No	TE-16XTPegasus Mail
386SX/40	KAMAG	DOS 6.2	Yes	2	-	Mono	3.5"	No	TE-16XTPegasus Mail

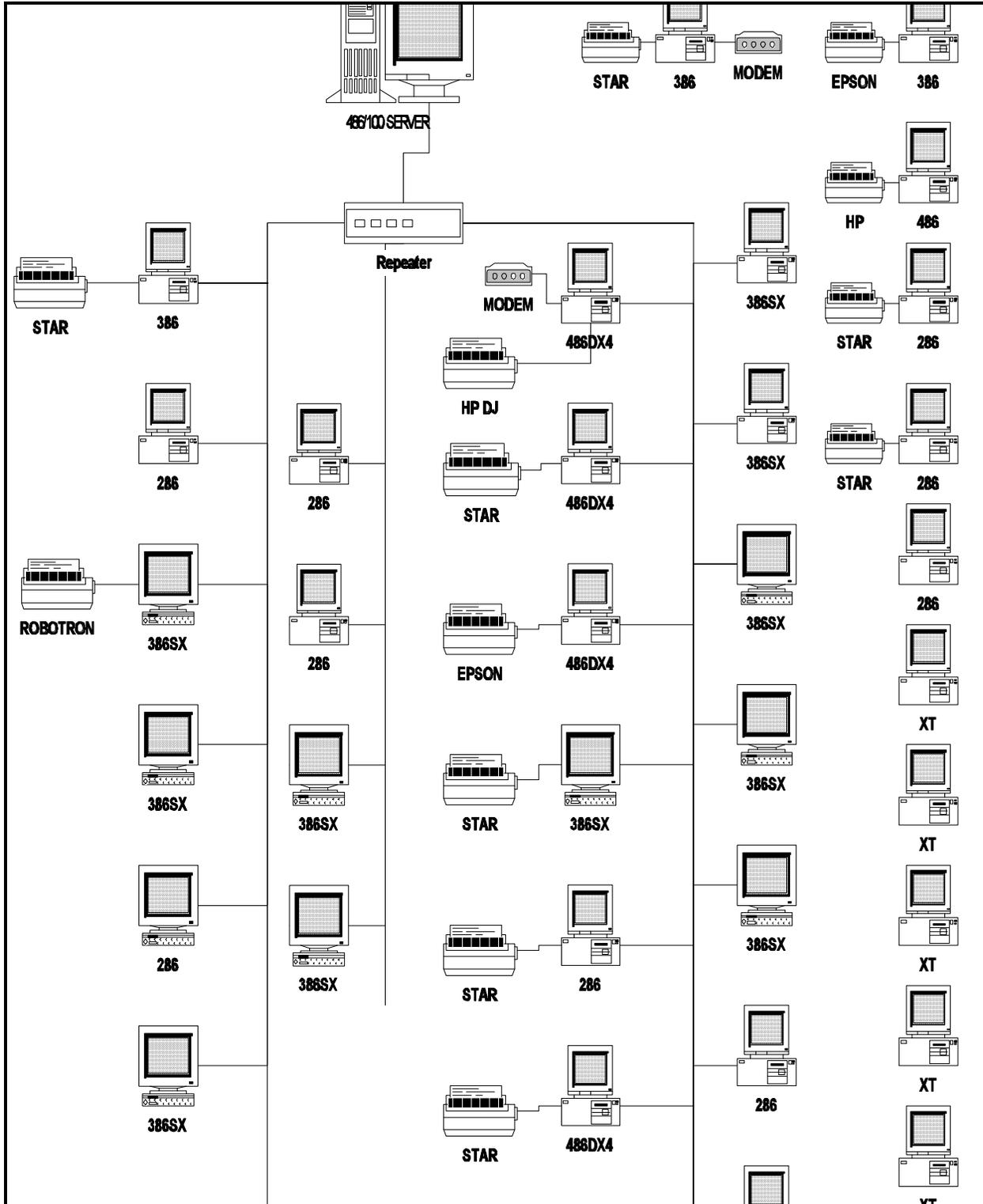
**Table 1**  
**Municipality of Blagoevgrad Computer Hardware (continued)**

Hardware	Manufacturer	Operating System	LAN	RAM (MB)	HD D (MB)	Monitor	FD D	Printer Type	Communication Cards
386SX/40	KAMAG	DOS 6.2	Yes	2	-	Mono	3.5"	No	TE-16XTPegasus Mail
386SX/40	KAMAG	DOS 6.2	Yes	2	-	Mono	3.5"	Robotron K6314	TE-16XTPegasus Mail
386SX/40	KAMAG	DOS 6.2	Yes	2	-	Mono	3.5"	No	TE-16XTPegasus Mail
386SX/40	KAMAG	DOS 6.2	Yes	2	-	Mono	3.5"	No	TE-16XTPegasus Mail
386SX/40	KAMAG	DOS 6.2	Yes	2	-	Mono	3.5"	Star LC 20	TE-16XTPegasus Mail
386SX/40	KAMAG	DOS 6.2	Yes	2	-	Mono	3.5"	No	TE-16XTPegasus Mail
386SX/40	KAMAG	DOS 6.2	Yes	2	-	Mono	3.5"	HP DeskJet 690C	TE-16XTPegasus Mail

Hardware	Manufacturer	Operating System	LAN	RAM (MB)	HD D (MB)	Monitor	FD D	Printer Type	Communication Cards
486DX4/100	KAMAG	W 3.1	Yes	4	850	VGA	3.5"	Epson LQ 1010	TE-16XT Pegasus Mail
486DX4/100	KAMAG (*)	DOS 6.2	Yes	16	1000	Mono	3.5"	No	No
486DX4/100	KAMAG	W 3.1	Yes	8	590	Color	3.5", 5.25"	Star LC 15	TE-16XTUPS
486DX4/100	KAMAG	W 3.1	Yes	4	590	Color	3.5"	Robotron K6314	TE-16XT Pegasus Mail Modem
486DX4/100	KAMAG	W 3.1	No	4	640	Color	3.5"	HP DeskJet 660C	No
486DX4/33	KAMAG	W 3.1	Yes	4	110	VGA	3.5", 5.25"	Star LC 15	TE-16XT Pegasus Mail
XT	NA	DOS 3.2	No	640 kB	20	Color	5.25"	No	No
XT	NA	DOS 3.3	No	640 kB	40	Color	5.25"	No	No
XT	NA	DOS 6.2	No	640 kB	20	Color	5.25"	No	No
XT	Pravetz	DOS 3.2	No	640 kB	20	Mono	5.25"	No	No
XT	Pravetz	DOS 3.2	No	640 kB	20	Mono	5.25"	No	No

Note  
(\*) LAN Server

### Municipality of Blagoevgrad Computer Infrastructure Diagram



## **Evaluation**

Overall, the computer power is very low. In terms of processors, sixteen (or 45%) of the computers are either XT or 286 based processor, and thirteen (or 35 percent) are 386s. All of these computers are very slow and obsolete for today software applications. These processors are too slow to run applications other than the currently available DOS-based systems. There are only five (5) 486 computers running at 100 MHZ and one (1) 486 running at 33 MHZ that are considered appropriate to run new Windows-based applications. Pentium processors are not available at this time.

The typical RAM available is 1MB for XTs and 286s; 2MB for 386s; and 4MB for 486s; and only the LAN server with 16MB. The RAM available in XTs, 286s and 386s based computers is limited to run only DOS-based applications. The RAM available in the 486s is also very limited and requires appropriate upgrade in order to run modern, Windows-based applications.

From the disk storage point of view, the level of capacity is also very low. Sixteen (16) PCS do not have hard disk drive and are used only as terminals. The total disk storage capacity is 4.5GB, most of it (3.7GB or 81 percent) concentrated in four the 486s computer, including the LAN server. The lack of disk space in many machines represents a serious limitation to the flexibility of the LAN. The lack of disk space requires the users to depend completely of the network and does not allow them to take full advantage of the computer processing capabilities.

The distribution of computer power among the different functional divisions is very uneven, being most of the computers used for administrative functions. The situation is particularly critical in the Division of Construction where there is only one computer available, and the potential for using computer technology is very high.

## **General Applications**

A number of PC general software applications (personal productivity tools) are available for most users. These applications include word-processing, spreadsheet, electronic mail, graphics, etc. The following table is a list of all the general applications used in the municipality.



**Table 2**  
**System and Package Software**

Type of Software	Manufacturer	Operating System	NW	Manuals
Word 5.0	Microsoft	DOS 6.2	Yes	Yes
WinWord 2.0	Microsoft	Windows 3.1	No	Yes
Win Excel 4.0	Microsoft	Windows 3.1	No	Yes
Microsoft Office 4.2	Microsoft	Windows 3.1	No	Yes
CorelDraw 5.0	CorelDraw	Windows 3.1	No	Yes
PE 3	NA	DOS 3.30	No	Yes
PE 2	NA	DOS 3.30	No	No
Diction	NA	DOS 6.2	Yes	No
Prosoft Text	Prosoft Ltd.	DOS 6.2	Yes	No
Spray Mail	NA	Windows 3.1	No	Yes
Pegasus Mail	NA	DOS 6.2	Yes	No

## APPLICATION SOFTWARE

### Overview

The application software available covers a wide variety of the municipal functions, from Payroll (TRZ) to Civil Registration (ESGRAON) to Legal Database (APIS). Many of these existing software applications have been provided by external central government organizations, such as the Ministry of Finance (SOMB for budget execution) and the Ministry of Regional Development and Construction (for example ESGRAON for Civil Registration). Other applications have been acquired by the municipality from local vendors, such as Soft Informatika (DELOVODSTVO for Documentation Tracking System). All available software applications are character-based and run on DOS operating system. These applications have been developed using a variety of languages and tools, including DBase, Clipper, Btrieve. The following table is a list of all the application software available in the municipality.


**Table 3**  
**Application Software**

Name	Main Functionality	Operating System	Network Ready	Developer	Source Code
<i>Accounting and Finance</i>					
BDJ	Budget preparation system	DOS 6.2	No	IT Center MOF	No
SOMB	Budget consolidation system	DOS 6.2	No	IT Center MOF	No
FSD	Accounting system	DOS 6.2	No	IT Center MOF	No
<i>Administration</i>					
ESGRAON	Civil registration system	DOS 6.2	Yes	Central Institute for Programming Products and Systems	No
KADRI	Human resources system	DOS 6.2	Yes	IT Center MOF	No
TRZ	Payroll system	DOS 6.2	No	IT Center MOF	No
Delovodstvo	Documentation tracking system	DOS 6.2	Yes	Soft Informatika	No
Storage	Storage management system	DOS 6.2	Yes	DPlus	Yes
<i>Construction</i>					
ACT 19	Construction cost system	DOS 3.30	No	NA	No
ACTI	Construction evaluation system	DOS 3.30	No	NA	No
ACSTER - M	Graphical Information System (GIS) and Cadaster	DOS 6.2	No	Technical University - Computer Laboratory - Acstrer	No
<i>Economic Affairs</i>					
BTO	Temporary trade contracts	DOS 6.2	No	ITM - Rouse	No
OI	Municipal properties rental contracts	DOS 6.2	No	ITM - Rouse	No
DIMOT	Creating acts for municipal estates	DOS 6.2	No	Central Institute for Programming Products and Systems	No
NAEMI	Municipal housing rental collection	DOS 6.2	No	Local developer	No



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GIL	Control of lodging ownership for single families	DOS 6.2	No	self developed	Yes
JVSS	Housing savings bank information system	DOS 6.2	No	SoftInformatika	No
APIS	Legal information repository	DOS 6.2	Yes	"Apis" Ltd.	Yes

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## **Analysis**

### **Accounting and Finance**

# **Budget Preparation System (BDJ).** The purpose of this application is preparation of the Budget of the Municipality organizations. This software application does not support multi-users and runs on DOS. The software application was developed using Clipper and acquired from IT Center of Ministry of Finance.

# **Budget Consolidation System (SOMB).** The purpose of this application is to consolidate the budget of all Municipal organizations. The data for running this system is obtained from BDJ. This software application does not support multi-users, and it is running on DOS. The software application was developed using Clipper and acquired from IT Center of Ministry of Finance.

# **Accounting System (FSD).** The purpose of this application is to manage the accounting information for the Municipality. This software application does not support multi-users, and it is and running on DOS. The software application was developed using dBase and acquired from the IT Center of the Ministry of Finance.

### **Administration**

# **Civil Registration System (ESGRAON).** The purpose of this application is to support and maintain a database with information of all citizens (living and past). This software application supports multi-users, and it runs on DOS. The software application was developed using Btrieve and acquired from the Central Institute for Program Products and Systems.

# **Human Resources System (KADRI).** The purpose of this application is to support and maintain the database for the municipal employees. This software application supports multi-users, and it is running on DOS. The software application was developed using dBase and acquired from IT Center of Ministry of Finance.

# **Payroll System (TRZ).** The purpose of this application is to prepare the Payroll for the employees of the Municipality. This system works with input from the KADRI system. This software application supports multi-users, and it is running on DOS. The software application was developed using dBase and it was acquired from the IT Center of the Ministry of Finance.

**# Documentation Tracking System (Delovodstvo).** The purpose of this application is to keep track of the documentation turnover of the Municipality. This software application supports multi-users, and it is running on DOS. The software application was developed using dBase and acquired from Sofinformatika.

**# Storage Management System.** The purpose of this application is to keep track of available inventory of the Municipality. This software application does not support multi-users, and it is running on DOS. The software application was developed using Clipper and acquired from dPlus.

### **Construction**

**# Construction Cost System.** This application main function is the preparation of costs estimates for all construction and rehabilitation projects. This software application does not support multi-users, it is written in Assembler and running on DOS.

**# Construction Evaluation System.** The purpose of this application is to support in the evaluation of construction projects (grouping data). This software application does not support multi-users, it is written in Assembler and running on DOS.

**# Graphical Information System (GIS).** This is a new application that the municipality is trying to implement with support of the LGI program. The primary objective of this system in the short term is to implement the Cadaster and Regulations in a graphical format. In the future, the system will include more than 20 layers of information, including water and sewage, telecommunications, etc. The system runs on DOS and it was developed using mostly C language. The application provides an excellent user interface (AutoCAD type) and a great deal of functionality to implement a full geographical database with access to regular text and data databases. The current version of the application is single user, but the vendor (Bulgarian, Technical University Computer Laboratory) is preparing the release of a multi-user version. According to the technical personnel interviewed during this mission, more than 200 copies of the software have been implemented across the country, for which they provide regular support.

### **Economic Affairs**

**# Temporary Trade Contracts (BTO).** The purpose of this application is to keep track of temporary trade contracts (objects). This software

application supports multi-users, it is running on DOS. The software application was developed using dBase and acquired from ITM Rouse.

# **Municipal Properties Rental Contracts (OI)**. The purpose of this application is to maintain contracts and information of Municipal estate properties. This software application supports multi-users, it is running on DOS. The software application was developed using dBase and acquired from ITM Rouse.

# **Creating acts for municipal estates (DIMOT)**. This product automates the activity of changing the legal status of estates in the region of the Municipality. This software application does not support multi-users, it is running on DOS. The software application was developed using dBase and acquired from Central Institute for Program Products and Systems.

# **Municipal Housing Rentals (NAEMI)**. The purpose of this system is to support and maintain a database with contracts for rentals of municipal houses. This software application does not support multi-users, and it is running on DOS. The software was developed using dBase and acquired from a local developer.

# **Single-Family Housing (GIL)**. The purpose of this application is to check housing ownership. This is a single query application that uses the ESGRAON database. This application runs on DOS and does not support multi-users. The application was developed using dBase by the municipal IS manager.

# **Housing Savings Bank (JVSS)**. The purpose of the software is to provide information for people with housing-savings in Housing Savings Bank in order to be classified by their real needs. This software application does not support multi-users, and it is running on DOS. The software application was developed using dBase and acquired from Sofinformatika.

# **Legal Information Repository (APIS)**. This application is repository of the country's laws and regulations. This software application supports multi-users, and it is running on DOS. The software application was developed using dBase and acquired from APIS Ltd.

### **Evaluation**

As it is the case with the functional variety, there are also important differences in the quality and functionality of the software applications currently available. However, a common denominator is that all of these

applications are DOS-character based. Also, most of the applications are single users, which make them unsuitable for use in a network environment.

A detail and complete (one-by-one) analysis and evaluation would be required to determine the specific features of each application and make specific recommendations for improvement. This type of analysis is out of the scope of this general assessment. In addition, due to the fact that many of the applications are required and provided by central government institutions with higher authority level,<sup>1</sup> it is difficult to determine the flexibility of the municipality to change or replace particular applications.

Yet, a quick overview of many of the applications currently available showed systems that was poorly designed and provides very limited functionality. Some of these applications are no more than simple databases able to perform basic data-entry, reporting and querying functions. Another obvious overall feature is the lack of integration of the applications and the corresponding databases, creating a high degree of data duplication. Another critical issue is that the environments and the tools (databases, languages, etc.) being used to develop these applications are the most basic currently available, with very limited capabilities for future improvements. The development tool of choice seems<sup>2</sup> to be dBase and its compiler version Clipper. The fact that source code is not available for most of the existing applications is also a limiting factor, which prevent the municipality from maintaining and improving these applications. However for most of the applications available in the Municipality there are existing upgrade versions provided by developers, with new functions, multi-user access, etc. The Municipality plans to obtain these versions in near future.

A general recommendation is that in those areas where the municipality has the flexibility to change or replace software applications do so. The upgrade of these applications will require, however, considerable external resources since the municipality does not have the technical personnel required to develop and/or implement these type of applications. One alternative would be to determine application software packages develop by external vendors (local or non-local), that are suitable to perform the municipal business functions, such as the case of the GIS system.

## **SYSTEM ADMINISTRATION PROCEDURES**

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<sup>1</sup> This is the case of ESGRAON, BDJ, etc.

<sup>2</sup> In most cases, the municipality does have knowledge of the tools used to develop the applications.

The results of our analysis indicate that there are very few and poorly defined system administration procedures in place. This is an important area to consider, if growth and expansion is expected in terms of computer and information systems support. The following are our observations and evaluation of some of the most critical systems administration procedures.

### ***Backup and Restore***

The hardware infrastructure does not include any backup/restore devices, and there are no special backup/restore procedures in place. Backups are performed using floppy disks (3.5" diskettes) and occur at two levels. The first level of backup responsibility is on the hands of the users. They are supposed to backup files that have experienced changes during the day. This procedure is not enforced by the IS Manager. The second level of backups is the responsibility of the IS Manager and is performed for the entire 500 MB of data residing on the network server. These backups are also performed using 3.5" diskettes and should occur weekly. The backup diskettes are maintained in the same room where the server is located with no special controls or protection.

### ***Security and Controls***

Security and control devices and procedures are limited. The network server is located in small room that is also used as the IS Manager office, hardware repair shop and eventually for perform data-entry tasks. The room has no especial environment controls and no fire control equipment is available. Controls access are implemented at the software level. Users logon into the network by user IDs and personal passwords.

### ***Installations***

The Municipality has a computer room where the network server is located. The room is also used as the offices of the Network and Information System manager. The room is very small (approximately 12 square-meters) and houses also computer equipment that is under repairs, maintenance and configuration. A printer and an external telephone line are also available in this room. When necessary, the room is made available for to a data-entry operator.

### ***Other Issues***

Hardware and software maintenance and support are provided mostly by the IS Manager. When necessary, the IS manager acts as the contact person for maintenance and support provided by external entities, mostly the



government agencies that provide the application software used in the Municipality. The network server is protected against power outage by an Uninterrupted Power Supply (UPS) unit. But the rest of the equipment is not protected by this type of equipment. Despite the fact that smoking is allowed in most offices, except at the offices of the Civil Registration Department, fire control equipment is not available