

Survey items for IT project formation survey (For sector survey)

1 Basic information

1-1 Economy related (Obtain the latest data.)

- GDP - **\$12.18 billion (2003 est.)** Real GDP growth rate - **5.5% (2003 est.)**, GDP growth per capita - **purchasing power parity - \$2,500 (2003 est.)**
- National budget – **revenues: \$603.5 million, expenditures: \$700.5 million, including capital expenditures of NA (2003 est.)**
- Average monthly salary of civil servants – **frequent changes**
- Entire population and urban population - **4,693,892 (July 2004 est.)**
- Working population – **N/A**
- Major industries and the market size - **machinery, chemicals; fuel re-exports; citrus fruits, tea, wine**
- Major exports and the export values - **\$615 million (2003 est.)**, scrap metal, **machinery, chemicals; fuel re-exports; citrus fruits, tea, wine**
- Major imports and the import values - **\$1.25 billion (2003 est.)**, fuels, machinery and parts, transport equipment, grain and other foods, pharmaceuticals

2 IT policies

2-1 National development policy, Master plan – **Reorganization of the Government sector is under the way by means of utilization of new IT tools for enhancement of monitoring and management of social procedures. There is a significant differences between the functions of Telecommunications and IT polices: 1. For telecommunications and IT, governing role belongs to the Ministry of Economic Development of Georgia as to the regulations- it is implemented through Georgian National Communication Commission.**

- Outline of country-level informatization plan (long-term and medium-term plans) and the state of implementation – **In the process of discussion with International organizations related preparation for the World Summit concerning Information Society.**
- Outline of country-level informatization plan (short-term plan) and the state of implementation - **N/A**

2-2 IT-related administrative organization - Ministry of Economic Development of Georgia

- Organization chart of major agencies that make decision on introduction of IT to central government agencies (e.g. National IT committee and the subordinate working groups, Departments of government agencies)
- Role of each organization indicated on the above organization chart

2-3 Preparation of IT-related laws - In the process of development

- **Outline of IT-related laws (e.g. E-commerce law, E-signature law, Unauthorized computer access prohibition law)**
- Outline of copyright law
- Outline of censorship

2-4 Promotion measures for IT industry - N/A

- Outline of preferential treatments given to attract overseas IT-related companies (e.g. preferential taxation)
- Outline of promotion measures for local IT industry (e.g. preferential taxation, special loans)
- Outline of IT park / IT incubator plans and the state of implementation
- State of government budgetary steps (budget related to promotion measures for IT industry) and the secular change

2-5 E-commerce – in the process of development

- Outline of E-commerce promotion measures
- State of approach by government (central government and local government) and major industries
- E-commerce transaction values
- Number of registered sites (GtoB, BtoB, BtoC)

3 IT infrastructure

3-1 Penetration of PC – 3.5% (3.5 per 100 person)

- Number of units per thousand people, secular change – **156 000 PCs**

3-2 Penetration of land phones – 648 480

- Number of fixed line companies and market share of each company - **see the PRESENTATION (attached)**

- Penetration rate (Number of units per thousand households, Number of units per thousand people) – **14.7%**
- Initial costs for introduction – **180 GEL**
- Local call rate (3 minutes) – **Time measuring will be introduced in the nearest future**
- International call rate (3-minute call to U.S.A.) – **1.5 GEL**
- Number of backlog applications (number of applicants who applied for the fixed line and are waiting for the introduction) and an average waiting period from application to introduction – **There is no waiting key for the line**
- Nationwide map showing coverage areas – **see the PRESENTATION (attached)**

3-3 Penetration of mobile phones – 11.7% or 503 619 cell subscribers

- Name of mobile phone companies and market share of each company – **MAGTI – GEOCELL 50% - 50%**
- Penetration rate (Number of units per thousand people) - **11.4**
- Initial costs for introduction – **13 – 15 GEL**
- Local call rate (3 minutes) – **0.28 GEL per minute**
- International call rate (3-minute call to U.S.A.) – **0.70 GEL per minute**
- Nationwide map showing coverage areas – **see the PRESENTATION (attached)**

3-4 Data communication service (including Internet)

- Name of ISP (Internet Service Provider) and market share of each company –
 - **Sanet**
 - **Telenet**
 - **Wanex**
 - **Geonet**
 - **Georgia On-line**
 - **Caucasus Network**
 - **CDN**
 - **Ti-service**
 - **Kheta**
 - **Grena**
 - **Ayety-TV**
 - **GWC Ltd.**

The dominators (80%) hold the following companies:

- **Georgia On-line**

- Telenet
 - Sanet
 - Geonet
 - Wanex
 - ICN
- Speed of circuit, if there is any ISP directly connected to foreign countries -
Through fiber-optic cable – 2MB/sec
Through satellite – down link 8MB/sec, uplink 2MB/sec
 - Number of users who established account with ISPs – **4 000**
 - Number of Internet users (including not only those who established an account with ISP but also those who use Internet at such places as Internet cafe, office and school) – **181 000**
 - Whether there is any Internet Exchange Point – **N/A**
 - Monthly rate of typical course that is most used (e.g. No time restriction, Dial-up connection) – **different types. Flat rate per month, Dial-up**
 - Service types, number of users and rate of narrowband (connection method for lines slower than 512Kbps) – **ISDN (BRI), Dial-up, through cooper cable, 160 000 users, 1.5 tetri per minute**
 - Service types, number of users and rate of broadband (connection method for 512Kbps and higher speed lines) – **ADSL, DSL, ISDN, through leased lines, 20 000 users, 35 USD per month**
 - Whether ISDN lines is usable for video conferencing system, and the connection fee to Japan – **It is possible through telephone lines, connection rate same for telephone connection – 70 tetri per minute**
 - Nationwide map showing Internet-unavailable areas – **N/A**
- 3-5 Remote education service - N/A**
- Name of private companies that rents a video conferencing facility, and the rental rate
- 3-6 Backbone communication lines (optical fiber, microwave, satellite connection etc.) – see the PRESENTATION**
- Map showing domestic backbone data circuit, and bandwidth of each circuit
 - Data communication backbones connected to foreign countries, and the bandwidth

3-7 Present state of electric power infrastructure

- Power supply, voltage change, frequency of blackout -**220 V, 50 Hz**
- Map showing areas where power can be supplied 24 hours a day - **Tbilisi**

4 IT utilization by government - The state register is under development. For the purposes of development of E-Government the preliminary works are under the way.

4-1 Overall plan

- Outline of E-government plan (long-term and medium-term plans) and the state of implementation
- Outline of E-government plan (short-term plan) and the state of implementation

4-2 Implementation structure

- Organization that is responsible to implement E-government plan established by central government, and the organization chart
- Role of each organization, and name and affiliation of the members

4-3 Plans by each government agency and local governments

- Outline of E-government plan established by each government agency and the state of implementation (Specify progressive government agencies if any in particular.)
- Outline of E-government plan established by each local government and the state of implementation (Specify progressive local governments if any in particular.)

4-4 Penetration of IT devices in government institution

- Number of PCs introduced into central government agencies
- Number of national public servants per PC
- Annual budget of central government for purchase of IT devices
- Number of PCs introduced into local government agencies
- Number of local public servants per PC
- Annual budget of local government for purchase of IT devices

4-5 Systems in actual operation

- Outline of major IT systems that are used by central government to improve efficiency of internal operations

- Outline of major IT systems that are used by central government to provide services to their citizens (e.g. Issuance of residency cards via network, One-stop service for various kinds of applications)
- 4-6** Governmental strategy for human resource development in IT area
- Outline of governmental strategy for human resource development in IT area (target values etc.)
 - Contents of IT education given to government agents and the number of agents who took the courses so far
- 5** IT utilization by companies – **approximately 5 000 private companies utilize LAN/WAN/MAN technologies and Internet/extranet tools. (If there is no statistical data, interview several non-IT companies and specify the summary of interview per company.)**
- 5-1** IT investment cost-Easy licensing regime and low administrative objections.
- Ratio of IT-promotion investment cost to sales
 - Whether there is any plan to raise the IT-promotion investment ratio after this year
- 5-2** Introduction state of IT devices
- Number of employees per PC- **5 employees. Per PC**
 - Ratio of employees who can access Internet -**50%**
- 5-3** Purposes of IT use - **improvement of government management, transparency of social and administrative procedures. In private sector it is for maintenance of business processes.**
- Application areas of IT systems in use (Choose from the below items.)
 - Application areas of IT systems that are expected to be introduced in future (Choose from the below items.)
- (Application areas) : Production planning, production control, purchase/outsourcing, inventory management, sales management, accounting, cost control, budget control, human resources/payroll
- Whether E-commerce is in use or not, and the ratio to sales / purchase if in use.
- 5-4** Impediments to IT promotion
- (Ask this if interviewing to companies directly. If the above item is available from statistical data etc., ignore this item.)

- What is the biggest problem in promoting IT in the company ? (e.g. shortage of IT engineers, introduction of IT devices, maintenance costs, communication costs, education of employees)

6 Software industry

6-1 Present states of software industry and affiliated organizations - **Distributors and representatives of foreign companies leaders in the soft ware industry.**

- Whether there is any industry group, and its profile
- Whether there is any foreign company, and its business contents
- Number of companies developing software
- Number of people engaged in software industry
- Market size (annual sales, export values and import values) and the secular change
- Major export counterparts and export products & services (e.g. software development orders, data input, CAD drawings)
- Average monthly salary of people engaged in software industry
- Annual number of engineers moving out to foreign countries and the major countries they move out to.

6-2 Software development capacity (Obtain data through interview with a few major software companies and specify the names of the companies interviewed.) – **the first successful results in the development accounting /billing procedures with harmonization of applicable legislation.**

- Classification of software that is mainly developed (package software or custom software, applicable business area)
- Program language usable in development
- Man-month of largest-scale system that has been development so far
- Experience of software development based on an order by government
- Skills of internal technical staffs that are perceived as insufficient (e.g. Project management, requirement definition, documentation). Whether trainings to acquire the skills is locally available or not.
- (For countries with IT industry promotion measures) Whether any national support is given, and whether it is giving good effects on corporate management.

6-3 Software penetration rate

- Penetration rate of pirated copy of software – **Mostly the users of the licensed production is the government (after reorganization) and the big private companies, all others use the pirated software**
- Penetration rate of open-source software – **5%-6%**

7 Hardware industry

7-1 Present states of hardware industry and affiliated organizations

- Whether there is any industry group, and its profile – **Orient Logic, Alta and etc.**
- Articles that are produced (e.g. IC chip design, IC chip production, PC assembly) – **PC assembly**
- Average monthly salary of people engaged in hardware industry – **N/A**
- Market size (annual sales, export values and **import values**) and the secular change -

8 Education of IT engineers

8-1 Supply and demand of IT engineers

- IT-industry employed workforce
- Number of IT-related researchers/engineers
- Outflow of IT-industry employees to foreign countries (statistical data etc.) – **approximately 50%**
- Inflow state of IT-industry employees from abroad – **mostly for international projects, drafts – 40%**

8-2 Training organizations

- Number of universities with IT-related faculty / Number of IT-related vocational schools, and their enrollment - **5; 3 NGO; about 100 private, 5 int. projects**
- Outline of curriculums in representative training organization and outline of the facilities

8-3 IT engineer examinations

- Outline of national qualification examination – **Tbilisi state university, Georgian Technical University, also about 5 other privates who have national licenses**
- Kinds of private qualification examination (e.g. Oracle, CISCO, Microsoft) that can

be taken.- CISCO, Prom tic, VUE

9 IT literacy education

9-1 Compulsory education system and IT education

- Outline of compulsory education system – **LINUX, Microsoft**
- Outline of IT education in compulsory education curriculum – **The ministry of Education makes up the plan**
- Number of schools giving compulsory education - **100**
- IT budget for schools giving compulsory education – **average is 2000 GEL, 100 000 USD per year - grants**

9-2 Penetration state of IT education (Compulsory education)

- Number of schools giving compulsory education, number of schools having PCs, number of schools with Internet connection – **10-15**
- Total number of PCs owned by schools giving compulsory education, and the number of students per PC – **1/1 – 1/10**
- Average number of PCs owned by urban schools giving compulsory education, and average number of PCs owned by suburban schools giving compulsory education
- Outline of IT curriculum – **It depends on the profile and specialty**
- Major software (OS, application) in use - **Windows, Linux, MS office, Oracle, Adobe, Corel and etc.**
- IT utilization state in other subjects such as mathematics and science
- Factors hindering expansion of IT education (e.g. shortage of IT teachers, shortage of devices, nonexistence of software that can handle local language) – **Low budget, not good attention to the modern technologies by the high management**

9-3 Private educational institutions

- Number of private PC schools – **about 50 (internet café 252)**
- Contents of popular lectures and the lecture fees – **MS Office, Internet**

9-4 Remote education

- Usage state of remote education in higher educational institutions – **Distance learning**
- Usage state of remote education in compulsory educational institutions – **video**

conference

10 Locally available equipments

10-1 Hardware: Whether the following articles are available, their typical brands and referential price

- Notebook PC – **Dell, HP, Compaq, Toshiba, and other assemblies**
- Desktop PC - **Dell, HP, Compaq, Toshiba, IBM and other assemblies**
- Rack-mount server – **IBM, Dell, HP, Compaq, Toshiba, and other assemblies**
- Blade server – **N/A**
- Router – **CISCO, D LINK, Cinet, 3com**
- Switching hub – **HP, CISCO, 3com**
- Wi-Fi LAN access point – **Proxim net, HP, CISCO, Aeronet**
- Video conferencing system (Polycom etc.) – **Polycom, Vicon, Huawei**

All facilities cost – international costs + customs

10-2 Software: Whether official products of the following manufacturers are available, and whether maintenance contract can be closed with the local traders.

- Microsoft – **Regional or local Distributor**
- Macromedia – **Download (light version)**
- Autodesk – **low level of usage**
- Oracle - **Regional or local Distributor**

11 Trends of other donors

11-1 World Bank, ADB, UNDP and donor in each country

- Support state of each donor, future trends, strategic paper - **World Bank, UNDP**
- Whether there is any IT-related survey material – **Yes, there are.**

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The Institute was founded in 1977. At first, it was a branch of the All-Union Institute of Organization and Management Problems. Since 1990 it has begun to function as an independent institute under the present name. Until 1990 the institute was affiliated to the State Committee of Science and Technology, then it was attached to the State Department of Statistics.

From the date of its founding until now, the institute has functioned as an organization that coordinates development of automatized control systems for national economy of Georgia and the Souths Caucasus Countries. The institute has elaborated a conception of the Republican automatized control system, and projected automatized control system for informational service of governmental bodies and regional management.

The Institute was the first organization in the Republic which began to develop computer network for data transfer. In 1992 computer data transfer network of general use was projected and put into operation: functions under the name "IBERIAPAC".

The Institute was the first organization which successfully put into operation automatized control systems for agrarian sector of the Republican economy. The National prize was awarded to the Institute for one of these systems: "RTVELI"-Automatized system of harvesting.

The Institute was the pioneer organization which created an automatized information exchange center that paved the way for the electronic mail installation in Georgia and providing Georgian users with an access to foreign computer network-information resources. A great number of specialists of high qualification have been trained on the basis of the Institute, now they successfully work in various institutions of Georgia, develop INTERNET technologies.

Since its founding, the Institute has been a leading organization in Georgia which has elaborated, developed and put into practice national and international classifiers for technological, economic and social information. The Institute pro-

vided the elections of the first legislative bodies with computerization. Besides that, in 1993 the Institute projected and put into operation the automatized informational system for voting in Georgian Parliament.

Computer system for voucher recipient registration elaborated by the Institute has ensured full identification in the country population, promoted successful privatization in Georgia,

It is important to mention few projects implemented through financing of international funds:

-INTAS (International Association for the Promotion of Cooperation from the New Independent States of the former Soviet Union): "Exploration of the existing investment climate in Georgia and in other countries of South Caucasus region" - 2000-2003.

-World Bank : Creation of network of information- consulting centers for farmers' economies in Georgia 2000-2003.

-Fund Eurasia: concept of creation of informational-analytic centers for local organs of self-governance.

The main directions of the Institute activities are as follows:

- Development and put into practice new informational technologies in the branch of accounting and statistics.
- Projecting and installation of corporate computer networks.
- Elaboration of informational resources of general use and support to their functioning in computer networks.
- Elaboration of information resources of general use and support to their functioning in computer networks.
- Elaboration and putting into effect national classifiers harmonized with international standards.
- Providing small and medium-scale business with new technologies. Information-telecommunication service for users.

The institute carries out a number of projects aimed at introduction of ICT in different fields such as: healthcare, education, agriculture etc.

Presently, the Institute represents a Joint stock company and is mainly occupied with provision of the public registers with ICT, with elaboration of elements of the E-Government and with training of public servants in the field of ICT.



STATE DEPARTMENT OF
STATISTICS OF GEORGIA



UNITED NATIONS
DEVELOPMENT PROGRAMME
IN GEORGIA

Tbilisi, 16 March 2004

**Key findings of the General Population Census of Georgia and
of the Study on the Improvement of Targeting the Poor presented**

Hundreds of enumerators, statisticians and scientists worked on obtaining, processing and analysing vast amount of information from the Census. As a result of this work, today there is a wealth of updated information available for the Government of Georgia, donors and academia comprising the basic demographic information about Georgia, as well as basic socio-economic information.

On Tuesday 16 March 2004 Mr. Lance Clark, UN Resident Coordinator/UNDP Resident Representative and Mr. Teimuraz Beridze, Chairman of the State Department of Statistics hosted the presentation of the findings of the General Population Census of Georgia and of the Study on the Improvement of Targeting the Poor.

The Population Census, conducted by the State Department of Statistics was funded by the Government of Georgia as well as the Governments of Germany, the Netherlands and the UK, UNDP and UNFPA through the UNDP project – "Support to General Population Census of Georgia". The objective of the project was to provide technical and financial inputs for the timely conducting of the Census and dissemination of its results.

"We all know, how important this Census is for the country. UNDP provided the framework for a coordinated response of the donors' assistance for the Census and monitored the timely conducting of the Census and dissemination of results through the institutional partnership with the State Department of Statistics", said Lance Clark, UN Resident Coordinator/UNDP Resident Representative.

The Study on the Improvement of Targeting the Poor funded by UNDP and based on the Census data aimed at providing recommendations and tools for better targeting the assistance for the poorest population of Georgia.

The Study on Improvement of Targeting applied a method combining household and Census data to estimate poverty for disaggregated

geographical units. It is the first attempt to produce maps of different welfare indicators (poverty headcount; poverty gap, severity of poverty and income inequality) disaggregated at the district level. These findings were juxtaposed with a selected set of geographical and demographic factors. Finally, the project explored the potential use of poverty maps in assisting the targeting of the poor and extremely poor households in Georgia.

The results of these two endeavours will contribute significantly to the process of reforms initiated by the new Government of Georgia and will enable the donor community shape their assistance programmes in line with the revised needs and requirements of the country. Information about the Census findings will be available at the Population Census webpage, created within the UNDP project and hosted by the State Department of Statistics homepage at: www.statistics.ge

Given that this information has not been updated since 1989, publication and wide dissemination of this data is essential for policy planning and formulation, planning and allocation of central and local budgetary transfers, development of demographic policies, aid coordination, etc.

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3. 文献資料

3-1 GEORGIA R-READINESS ASSESMENT REPORT



Georgia Development Gateway

GEORGIA E-READINESS ASSESSMENT REPORT

(Prepared within the framework of InfoDev Grant # CG 005 from 18.01.01)

Tbilisi - October 2001
First Updated: December 2002
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1. Introduction

The “Georgia E-readiness assessment Report” is presented by the “Georgia Development Gateway” Union within the framework of infoDev (WBG) grant # CG 015 from 18.01.01. The following report addresses ability and readiness of the Georgian Society to benefit from Information Communication Technologies in their development, as well as the evaluation of the existing problems in the area of ICT and the ways of overcoming those obstacles.

Basic Methodology used for this Assessment is the one recommended in the “Readiness for the Networked World: A Guide for Developing Countries” developed by Center for International Development at Harvard University and IBM (www.readinessguide.org). As for applied methodology, the research team considered it necessary to use this methodology since it is more accepted worldwide.

Data sources used for E-Readiness Assessment include the Ministry of Statistics, Ministry of Transport and Communications, Ministry of Education, Ministry of Economy, Georgian State Department of Information Technology, other governmental agencies, Georgian Telecommunications Company, private telecom operators, ISPs, NGOs. The E-Readiness assessment also comprises information provided by independent experts and GeDG stakeholders, summaries of workshops and meetings held, personal interviews, as well as Internet resources, etc.

In order to give comprehensive vision of ICT of the country the GeDG team also undertook questioning of different communities of the society. Over 80 respondents from different areas took part in public opinion poll. Questionnaire packages contained 22 questions (see the Annex 1) on the issue of existence and scope of information and communication technologies application.

2. Executive Summary

It is very important to mention, that the development of Communication Technologies after the collapse of Soviet Union was very rapid and reached its pick in 1999. Since 1999 to 2003 the development of Telecommunication Technologies is under implementation but with comparatively low speed. It should be assumed that during those years telecommunication sphere had been liberalized in whole. As a result of the liberalization more that 10 licenses for operators and more than 42 licenses for Internet Service Providers had been issued, 3 companies of mobile communication had been established and what is the most important the Independent Regulatory Body of Communications, Independent State Department of Information Technology and several committees and councils in ICT (Information Society Technology Development Committee, Information and Communication Technology State Council under President of Georgia) had been set up.

According to the Harvard research methodology, the level of Georgia’s e-readiness to the digitally driven world community has been assessed by stages from 1 (the least advanced) to 4 (the most advanced). The assessment has been accomplished by five leading categories (Network Access, Networked Learning, Networked Society, Networked Economy and Network Policy), fractionating into 19 subcategories, each of them been assessed in detail.

The following table demonstrates the results of the research.

Table 1. ICT sector development.

CATEGORIES	STAGE OF DEVELOPMENT	
	Tbilisi	Regions
Network Access		
Information Infrastructure	3	3
Internet Availability	4	2
Internet Affordability	2	2
Network Speed and Quality	3	2
Hardware and Software	2	2
Service and Support	3-in general / 4-in some cases	2
Networked Learning		
Schools Access to ICTs	4-in general / 3-in some cases	2
Enhancing Education with ICTs	3-in general / 4-in some cases	2
Developing the ICT Workforce	4	2
Networked Society		
People and Organizations Online	4	2
Locally Relevant Content	4	3
ICTs in Everyday Life	3-in general / 4-in some cases	3
ICTs in the Workplace	4	2
Networked Economy		
ICT Employment Opportunities	4	2
B2C Electronic Commerce	2	2
B2B Electronic Commerce	1	1
E-Government	2/ 3 in some cases	1
Network Policy		
Telecommunications Regulation	4	2
ICT Trade Policy	2	2

3. Country Overview

Georgia is a presidential republic with a population of 5.4 million people in a geographical area of about 69,700 square kilometers bounded by the Black Sea, the Russian Federation, Azerbaijan, Armenia, and Turkey, and is strategically located as a trade and transit corridor in the Caucasus, between Europe and Asia (see Appendix 1). Density of the population is 77.14 people per km². Tbilisi, the capital and main cultural and economic center of the country, has two thirds of urban residents (or 37% of population). Other principal towns are Kutaisi (241 000 population), Rustavi (158.000), Batumi (137.100), Zugdidi (105.000 including IDP from Abkhazia), Chiatura (70.000), Gori (70.000), Poti (50.900). Approximately 56% of the total population is urban in Georgia. The national language is Georgian (Abkhazian in Abkhazeti), though majority of population is multilingual. Russian predominates yet as the second language; however, as a result of the country's recent integration into the world economy, a significant portion of the population speaks English, German or French. Administratively, Georgia is divided into 9 districts, 65 regions, 5 towns of Republic Dependence, 2 autonomic republics – Abkhazeti and Adjara, 1 autonomic region - South Ossetia. Georgia's GNP per capita was estimated at US\$6201 for 1999. Main religion is Greek Orthodoxy, other confessional groups include Shiite and Sunni Muslims, Armenian Gregorians, Catholics, Baptists, Judaists.

Once one of the most prosperous former Soviet republics (after Baltic Republics), Georgia experienced period of political instability and civil unrest after the break-up of the Soviet Union in 1991. It was among the first republics of the Soviet Union to declare independence in 1991. The breakup of the Soviet Union disrupted traditional trade and payments links and led to a large terms-of-trade shock for energy imports. These difficulties were compounded by civil conflicts in Abkhazia and South Ossetia, resulting in large movements of refugees. This adversely affected Georgia's economy and in 1994 the country's GDP reached only one-third of the 1991 level, between 1990 and 1995, output fell by more than 70%, capacity utilization in the industrial sector dropped to about 20% of pre-1989 levels, heavy disruptions in agriculture occurred, and tourism revenues collapsed. Significant external debt and payment arrears were accumulated, while lax fiscal and monetary policies led to large budget deficits. By end-1993, annual inflation had reached 8,400 percent.

Since its independence and end of the conflict with Abkhazia, Georgia has steadily improved its economic position and established a stable political environment. During this period, it has accomplished the following major steps in an effort to ensure the long-term growth of its economy and attract foreign investment:

Establishment of stable democratic institutional framework. The new constitution based on democratic principles adopted in 1995.

Implementation of economic stability program since 1994 involving improvement of the taxation and bank surveillance systems, abolition of state orders, liberalization of trade and currency exchange and a privatization policy. Currently Georgia enjoys a market environment that is one of the most liberal amongst the newly independent states (NIS) and relies on a free-market legislation base, independent regulatory and anti-monopoly institutions in place.

Implementation of a comprehensive structural reform program to rebuild the economy, with support from the World Bank and the International Monetary Fund and accompanying fiscal and monetary policies that was successful in restoring growth and drastically improving internal and external imbalances. Real GDP growth resumed in 1995 and exceeded 10 percent in 1996 and 1997. Inflation was reduced to single-digit levels by 1997. From 1994 to 1997, the fiscal deficit was reduced from 20 percent to 4.6 percent of GDP, and the current account deficit from 35 percent to 11 percent of GDP.

Tight monetary policy. In 1995, a new national currency, the Lari, was introduced, which has been one of the most stable currencies in the CIS since 1996.

Economic performance declined again in mid-1998 with the onset of the Russian crisis. The fiscal deficit (excluding grants) reached 4.9 percent of GDP against a target of 2.7 percent, and the current account deficit rose to 12 percent of GDP. Inflation, which reached a record low of 1 percent over the first 9 months, reached 11 percent in December, for an end-year average of 3.6 percent (up from 7 percent in 1997).

Economic developments during 1999 were somewhat encouraging, though fiscal performance remained weak. GDP grew by a moderate 3 percent, but revenue shortfalls, accumulation of expenditure arrears, and unrealistic budgeting continued throughout the year. The government has launched an ambitious privatization program for key infrastructure (ports, telecommunications, and the power sector) that is expected to enhance overall economic efficiency. In addition, various ongoing initiatives aimed at reducing administrative interference (public procurement and de-licensing reforms), establishing a sound legal and regulatory framework, and strengthening the judiciary are expected to positively impact the investment climate. As a result, the activity of small and medium enterprises in the manufacturing and service sectors is expected to increase and contribute to growth.

Exports, which grew by over 20 percent on average (in volume terms) in 1996-97, declined in 1998 and 1999 (-3.4 percent). Nowadays, the export increase is rated 129% compared to 1995. Among the main products that hold the largest share in total volume of export, 32% of total export: mineral waters (7.2%), ferrous metals pipes (7%), ferroalloys (6.2%), and tea (5.5%).

The sharp volume increase in imports registered in 1997 (40 percent) and 1998 (12.5 percent) was largely driven by investments for the construction and refurbishment of the "early oil" pipeline connecting Azerbaijan to the Black Sea. From the largest share products in total volume of import, 48% of total import: oil and oil products (16%), cigars and cigarettes (11.5%), natural gas (9%), wheat and rye-wheat mix (6%), cars (4,7%).

Nowadays Georgian economy is one of the most rapidly developing (by 1997 the rate of increase was 14%). The growth of economy is mainly related to those global projects currently implemented in Georgia. Despite this, there are a number of problems: the share of industry is still small in the gross domestic product, the share of imported production is large (80-85%) in consumer market, unemployment rate is high (according to preliminary estimates 20-25% of capable population), standard of living and gross domestic product per one person are very low, chronic lack of power resources remains a painful issue, credits and grants received from donors still form the main part of income to the country's budget. In view of the heavy debt burden (external debt to GDP is estimated at around 60 percent) and difficult external environment, Georgia will continue to need substantial external assistance and capital inflows to finance its transition to a market economy and its poverty alleviation efforts.

Macroeconomic Outlook. Overall the macroeconomic prospects for Georgia are positive and Mr. Shevardnadze will continue to proceed with his reform-oriented pro-Western course over the next five years. The 2000 federal budget has been agreed with the IMF, with priority given to debt servicing. The Government is expected to continue its large-scale privatization effort and a tight monetary policy should maintain a stable exchange rate with the USD. These development are expected to be accompanied by a sharp fall of inflation over the next years (see table 2).

Table 2. Basic Macroeconomic Parameters

	1999	2000	2001	2002
GDP (USD bn)	2.7	3.0	3.2	N.A.
Real GDP Growth (%)	1.5	1.9	4.5	N.A.
Consumer Price Inflation (%), ave.	19.10	5.40	5.10	N.A.
GDP per capita (USD)	540.00	600.00	640.00	N.A.
Exchange Rate (GEL/USD), ave.	2.00	2.2	2.00	1.8
Money market interest rates (%), ave.	34.62	N.A.	N.A.	N.A.

Integration into the World Economy/ Investment Successes. After becoming an independent country in 1991, Georgia quickly expanded its foreign economic and political orientation. While maintaining close economic ties with other CIS countries, Georgia has developed trade relations with over 100 countries and has recently completed its acceptance into the World Trade Organization (WTO). It has also achieved active membership status in the European Council and co-operates closely with a number of international institutions such as OSCE, World Bank, IMF, EBRD, and USAID.

The process of privatization in Georgia began in 1992. At the initial stage, priority was given to the privatization of small and medium-sized enterprises. Consequently, approximately 16,000 such enterprises had been privatized to date.

Source: Parliament of Georgia (www.parliament.ge)

World Bank (www.worldbank.org)

Ministry of Statistics

The following table shows main indicators of social and economic development of Georgia.

Table 3. Indicators of social and economic development of Georgia

	Measure unit	1997 actual	1998	1999	2000 forecast	2001 forecast	Pace of Growth In Comparison to Previous Year					
							1998	1999	2000	2001	2002	
Gross Inner Product	Million GEL	4504.7	4794.6	5500.0	6170-6510	6737-7433	110.8	102.9	103.3	104.2	105-108	107.4
the Joint Budget Income Compared to the GIP	%	-	18	16	18-17	13						
Budget Deficit Compared to the GIP	%	5.1	5.2	5.0	8.0-7.6	6.3						
State Indebtedness (end of the year) Total	Million GEL	3067	3692	4853	5163		112.6	120.4	131.4	706.4		
Foreign	Million	2122	2520	3600	3860		111.7	118.8	142.9	107.2		

Indebtedness from the Total	GEL											
Industrial Production (including shadow economy)	Million GEL	1498.1	1564.7	1753	2219-2416	2426-2774	108.1	97.3	104.8	105.6-113.5	112.8-118.4	
Agriculture. Forestry. Fishery	Million GEL	2280	2266	2650	2970-3185	3157-3481	107.1	92.0	108.0	104.2-110.4	100.2-1022	
Investments to the main capital (all financing sources)		204.3	434.8	313	378-406	490.0	2.2 times	2.1 times	49.1	115.2-117	119.6	
Consignment (all types of transport)	Million Tons per KM.	5973.5	10472.2	9057	11694-13027	12278-13075	86.4	173.7	86.5	114.9-128	105-105.2	
Passenger Traffic (all types of Transports)	Million passengers per KM	4102	4772	5005	5370-5495	5590-5720	124.9	116.3	104.9	104.9-107.3	104.1	
Trade from the total volume of service	Million GEL	1000	1195	1550	1800-1940	2080-2300	1.4 times	111.7	108.5	108.7-111.1	107.9-109.1	
Production Export (including unorganized trade)	Million USD	385.7	299.7	334.8	398-405	491-515	120.4	80.9	116	119-121	123.2-127	
Production Import (including unorganized trade)		946.7	985	1044.3	1128-1149	1126-1185	134.7	104.0	106	108-110	113-116.1	
Index of Customers' Prices		107.3	110.7	110.9	106-109	106.0-109						
Exchange Rate of GEL Compared to USD (annual average)	USD-per GEL	1.3268	1.3842	2.0192	2.1-2.2	2.0-2.1						
Average Monthly Salary of the Employed in the national Economy	GEL	42.5	55.4	63.4	72.5-87.5	83-105	146.6	130.4	114.4	114.3-138.1	114.5-120.0	

Source: Ministry of Statistics

<http://georgia-gateway.org/index.php3?mw=ENG/Business~Economy/Economy in General/Analytical Write-ups/indicatorsfinal.php3>

The number of computers in Georgia (2002) is not large (150,000 - 200,000), but a tendency of rapid growth is quite evident. Considerable (sufficient) number of computers is concentrated in governmental agencies and universities. Unfortunately, Georgian schools fall far behind them. Although, schools are required to deliver special courses in Information Science, very few of them own adequate equipment. However, there are plans to improve computer situation in secondary schools (multi-million project funded by the World Bank).

3. Networked Access

3.1. Information infrastructure

At the break of the USSR, Georgia has inherited relatively extensive, but low quality and inefficient fixed telephony networks. Tele-density was 9 per 100 inhabitants in Georgia, which is relatively high when comparing with countries with similar development level. The USSR Ministry of Communications exclusively executed international telephone communication by means of Moscow operators. By the collapse of the USSR, there were 9 outgoing and 27 incoming channels between Tbilisi inter-city and Moscow international networks. Nowadays, there are thousands of channels in Georgia serving outgoing and incoming signals.

Together with market economy, Georgian telecommunication area institution has undergone significant changes. Existing infrastructure could not meet the increasing demand on modern telecommunications that was aggravated by lack of corresponding investments and retarded rapid modernization of telecommunication system. Since then Georgia has launched sector reforms: opened the sector to competition before privatization of its fixed network. In the last five years, the fixed line park grew at half rate of that in Georgia. At the same time, Georgia cut waiting lists by 13. Despite the efforts to modernize networks, digitalization rates are still very low, at less than 20%.

The worse situation is observed in regions. Apparently, Georgian villages have suffered bad influence of the damaged networks: by 1990, there were 137,822 subscribers connected to 935 village exchanges, while currently there are only about 53,000 subscribers provided with a working telephone line. Service can be partly restored by rehabilitating some damaged rural crossbar exchanges and replacing stolen subscriber and junction cables.

To date, existing market of telephone service can offer modern telecommunication services provided by both national operators and private companies. Their networks are equipped with up-to-date hardware that ensures higher quality of services offered. Their profit is mainly received from inter-city and international calls and offering up-to-date services.

Competitiveness between the companies encourages development of national telecommunication infrastructure.

Table 4. Telephone communications statistics

	Georgia	Low income countries	Europe	World
Fixed line telephony				
Main telephone lines (k), 2000	860			
Main telephone lines per 100 inhabitants, 2000	16.80	1.64	37,25	14,29

Mobile telephony/ Paging	3.8			
Mobile subscribers (k), 2000	130			
Mobile subscribers per 100 inhabitants, 2000	2.3	0,11	13,15	5,38
CAGR of mobile subscribers 1995-2000	410	116,6	63,4	52,1

Currently the country is beginning to actively adopt new technologies. According to the local statistical data, there are approximately 2000 new computers sold monthly in Georgia.

In Georgia, two vertically separated state-owned companies dominate the fixed telecommunications market: GEC (Georgia Electrical Communications - also known as Elektrokavshiri), provider of traditional local fixed-line telecommunications services to customers, and Georgia Telecom (GT - also known as Sakartvelos Telecomi), majority (51%) state-owned provider of domestic and international long distance services.

Georgia Electrical Communications (GEC) is 100% state-owned company and currently has a subscriber base of 361,668 with half living in the relatively more affluent capital City of Tbilisi. "Georgian Electrical Communications" network comprises the whole territory of Georgia except for Abkhazia, Tskhinvali region and Adjara. It consists from Tbilisi city network and three branch offices, which in their turn are subdivided into 12 territorial subsidiaries and 57 units of the country. Total length of main cables map - 1254 km, total length of cables - 137708 km. Total length of digital radio relay lines is 267 km, while total number of telephone channels - 746 km. Total length of similar radio relay lines - 536 km. First and second channels of state television are the users of "GEC" radio relay channels. Temporarily, Telecom Georgia provides "GEC" subscribers from 34 towns and regional centers of East Georgia with inter-city and international telephone connection. "GEC" infrastructure was assembled in 1930-s and the greater part of it is out of date and damped. From 349 stations 44 are ten-step type, 11 quasi-electronic type, and only 2 stations are equipped with modern digital technologies.

The company is currently not able to offer full International Long Distance ("ILD") and Domestic Long Distance ("DLD") services and depends almost exclusively upon Telecom Georgia for providing these services to its customers. However, GEC has the necessary licenses to provide these services in the future and can directly provide them to its customers with relative modest investments in a gateway antenna and modern switching equipment. The company is also in need of substantial investment for installing new switches and upgrading its trunk network. GEC has been issued a countrywide GSM 1800 license and could realistically become a major factor in Georgia's booming Internet market. GEC has the exclusive rights to country's entire fixed-line numbering capacity of approximately 510 thousand numbers. "GEC" has a leading hand in the Georgian market and currently accounts for 89% of local fixed telephone service market. The company's capacity can serve 510 subscribers, half of which the capital inhabitants. "GEC" possesses 361 668 subscriber serving base. The company renders services to 22 000 corporate subscribers, 13 900 of which are civil (state) bodies.

Telecom Georgia (TG), a National Operator of Georgia, was established as a limited liability company with participation of foreign partners, where major shares belong to the Georgian State to provide domestic and international long distance services in Georgia. It was founded to develop a modern international satellite gateway in Georgia and began operations in 1994. Until that time, international outgoing traffic from Georgia was routed through Moscow. For

over five years, TG has been a leader in providing international and long-distance telecommunication.

The company has proved to be an excellent investment for its founders and has retained a market share of more than 50% in traditional DLD and ILD services despite the recent opening of the market to competition. The company's core assets include an international satellite gateway, two digital EWSD exchanges and a SDH digital radio relay line between Georgia's two largest cities, Tbilisi and Kutaisi. The company's international access code 8-10, widely recognized in the countries of the former Soviet Union, and its established brand name give it a major competitive advantage in the Georgian telecom market. The company's total international and CIS traffic amounted in 1999 to 220.3 million minutes (a 17% increase from 1998).

Currently, TG is planning several new investment projects, including the entry into Internet and data business. It is also planning the introduction of new value added services for its customers, principally ISDN, IP-telephony, pre-paid card system, and premium business service. In addition, the company has the potential to exploit Georgia's strategic geographic location and become a partner in international transit projects to link Europe and Asia through Georgia, bypassing both Russia and Iran. The company is currently a partner in a project to build a Tbilisi-Baku digital radio-relay link, and lay a fiber-optic submarine cable connecting Georgia's Black Sea Port of Poti with Turkey's port city of Rize.

Until recently, TG has been a very profitable company. The reasons for the recent decline in profitability can easily be eliminated by proper management. First, partly due to the current regulatory regime, TG has not adapted to the liberalizing of the ILD (International Long Distance) and DLD (Domestic Long Distance) markets in Georgia and has not been aggressively competing with the emerging competition. Second, because of government regulations, TG has been required to continue to provide service to certain non-paying customers, such as Georgian Government ministries and agencies, several state controlled enterprises and, to its largest delinquent customer, the Autonomous Republic of Adjara. The market for communication services in Georgia has been growing substantially within the last 4 years. During 1994-1997 Telecom Georgia actually was the only international and long-distance operator in Georgia that rendered its service to the entire telecommunications market in the country.

During past years the telecommunications field has been significantly changed. New, basically private companies have appeared. Liberalization of the market started early and a number of new competitors have established themselves in the market. The majority of them have been created on the basis of foreign investments that promoted the creation of a specific environment. Though there are many telephone providers on Georgian market, Telecom Georgia preserves the leading position covering 60% of the market and annually contributing 5-7mil GEL to the Budget of Georgia. The largest and most successful among several new entrants in the LD market is Egrisi, which has increased its market share to roughly 25-28%. The competitive LD providers have their own satellite antennas, but route their traffic through Telecom Georgia's international exchange. However, Egrisi has reportedly built its own international exchange recently, enabling it to completely by-pass Telecom Georgia. (see Annex 2)

Traffic. Telecom Georgia is the International Operator, which has Agreements with 14 International Operators in 12 countries of the world (Annex 3). It has connections with 225 countries of the world (Annex 4) and direct digital-satellite channels with large international carriers. It already uses Signaling 7 instead of Signaling 5 with BRITISH TELECOM, MCI, AT&T, TURK TELECOM and ROSTELECOM. The question of using Signaling 7 with

SPRINT is on agenda and will be realized in the near future. It is important that Signaling 7 gives the possibility to observe connections organized by Telecom Georgia, to plan and manage channels and traffics optimally.

By means of digital satellite links, the company has direct connections with large International operators (Annex 5), such as:

- AT&T - 59 circuits (USA) (both-way)
- SPRINT - 86 circuits (USA) (both-way)
- MCI - 43 circuits (USA) (both-way)
- BT - 29 circuits (USA) (both-way)
- DT - 41 circuits (Germany) (both-way)
- TI - 30 circuits (Italy) (10 outgoing, 20 incoming)
- Turk Telecom - 59 circuits (Turkey) (both-way)
- OTE - 59 circuits (Greece) (both-way)
- SCOTCO - 239 circuits (Russia) (both-way, 29 incoming)

By means of Analogue and digital links, TG has connections with the following CIS countries (see Annex 4):

- Russia (RosTelecom) - 71 outgoing, 158 incoming
- Ukraine 40 outgoing, 40 incoming
- Belarus - 12 outgoing, 12 incoming
- Armenia - 18 outgoing, 15 incoming
- Azerbaijan - 57 both-way
- Turkmenistan - 6 outgoing, 6 incoming

According to the concluded agreement, TG performs account settlement with the above-mentioned countries through the Department of International Traffic, Tariffs and Settlements, and relations with other countries are implemented under ITU Recommendations.

Total international Traffic of Telecom Georgia for 1999 amounted to 104 million minutes: 57 million - incoming and 47 million - outgoing traffic.

Table 5. Telecom Georgia International Traffic

	1998	1999	2000	2001
International Outgoing Traffic	29	38	45	47
Increase/Decrease of International Outgoing Traffic (%annual)		29%	19%	3%
International Incoming Traffic	49	65	69	57
Increase/Decrease of Incoming International Traffic (%annual)		33%	9%	-17
Total International Traffic	78	103	114	104

Currently Telecom Georgia renders its service to all potential customers, namely, GEC, Akhali Kselebi, Magticom, Geocel, Megacom, CGS etc. Statistics shows that among 5 mil 603500 customers have the telephone, out of which 210-250 000 are active customers, and Telecom Georgia daily serves 250-380000 calls.

Tariffs for international calls are quite competitive and affordable for the population that ensures wide range of Telecom Georgia users. (See Annex 6).

The privatization process of Georgia Telecom and GEC was recently launched with the exact details still being worked out by the financial advisors, Commerzbank, from Germany, which

were appointed through international competitive bidding process. The Government claims its intention is to privatize them separately, as evidenced by the President's decree on competition, which establishes the right of GT to a license to serve the local market and of GEC to provide long distance and international services, thus effectively, establishing two national full-services providers. A consortium headed by Commerzbank has been selected by the government of Georgia to sell majority stakes in its leading telecommunications companies. The sale is a major part of the government's economic reform program.

The country's leading long-distance operator, Telecom Georgia (TG), as well as the leading national local loop operator, Georgian Local Lines Company (GLLC), are to be privatized via a public tender scheme. The due diligence procedure for both companies starts today, Feb. 1, and will continue through April 30, 2001.

There is a growing interest from regional players to enter these markets, which, although currently small, have tremendous potential for growth. The major Turkish cellular operator, Turkcell, as well as the US's Metromedia have their investments in Georgia. Greek national operator OTE undertakes of large equipment contracts in the region, including Georgia.

Liberalization process in Georgia in 1995 resulted in emergence of new competitive companies: "Newnet", "Akhtel", "Iberiatel" and "SSG"'s total share is 4% of telecommunication market. "Akhali Kselebi" ("New Net") and other companies offer higher quality service, while "GEC's" network infrastructure has become obsolete as a result of investment reduction during the last years.

Despite the market dominance of the state companies, some private companies have managed to make large inroads into the Georgian communications market. Two such pre-eminent private operators in the local and long distance markets, respectively are New Net, serving some 120 000 subscribers in Tbilisi alone, with presence on other markets, and Egrisi, considered Georgia's second long distance carrier. NewNet with market share of some 7% with its 120 000 subscribers and its subsidiary Akhteli are the largest competitive local exchange carriers. They are able to offer higher quality services to their customers, as most Georgian Local Lines network infrastructure is obsolete as a result of gradual under-investment over decades. In addition, FOPNet, who is operating the country's largest fiber optic network with about 150 000 subscribers, is becoming Georgia's third distance carrier. The Georgian Company "Iberiatel" using technologies of "Ericsson" installs telephones in regions of Georgia. Based on the principles of radio communication realizes with the help of cell terminal. The terminal gives the signal by the net of NMT-450 system shaped on the territory of Georgia by the Iberiatel. This terminal may be installed at any place of NMT-450 system's spreading (natural) area.

Except the telephone, fax and modem also may be linked to the terminal. With that, it will be possible in the global information space integration, necessary information allocation and reception in the Internet and fax.

Numbering: Georgia is divided to about 70 geographical numbering areas, each of them identified with a tree-digit area code except a two-digit code '32' in Tbilisi and some longer codes for cities in Abkhazia and Adjara. Length of the subscriber number is six digits in Tbilisi and five digits elsewhere. In Tbilisi all subscriber numbers starting with digits 2 or 9 have been allocated to GES's digital exchanges while NewNet has part of the numbers starting with digits 3,5 and 7.

Local calls within each numbering area are placed by dialing a subscriber number of varying length up to 6 digits. Long distance calls via Telecom Georgia are placed by dialing trunk prefix 8, the area code and the subscriber number. International calls are placed by dialing 8-10 followed by the country code and relevant area codes and subscriber numbers e.g. 8-10-1 XXX-XXXX for a subscriber in Washington D.C., USA. Already subscribers have an equal access to other long distance providers by dialing 8-11, 8-12, etc. for international calls.

Network Structure and Operators

Table 6. A list of current fourteen telecommunications operators is provided below.

NAME	Established	Ownership Structure	License	Switching Systems
Telecom Georgia	1994	Govt. 51%, Metromedia 30%, Bulcom (CY) 19%	International & Long Distance	Siemens 2xEWSD
GEC, Georgian Electrical Comm.	1995	Georgian Government	Local services all over Georgia	Step-by-step, crossbar, dig. AXE
NewNet (Akhali Kselebi)	1996	100% by 5 Georgian private companies	Local services in Tbilisi & Kutaisi	Digital switches Daewoo, Alcatel
FOPNET		Egrisi, Akhteli, NewNet	TAE cable in Georgia	
EGRISI	1997	413 Georgian Shareholders	Int. & Long dist. DAMA satellite	Teldar DMS300 12K trunks instl.
IBERIATEL	1998	NewNet 51%, CGC & Greek Comp. 49%	Local telephone	Teldar DMS10
CGC (Central Georgian Comm)	1995	Egrisi 49%, Gener 25.5, Monevmasia25.5	Local services in Kvemo Kartli reg	Alcatel S-12
Ayety TV		Metromedia (USA)& Georgian companies	Cable TV	
GATCO/SakTel Com Plus	1998	Georgian-American Telecom. Saktelcom	International telephone	
GoodWillCom	1998			
8-66	2001	Georgian Company/100%	International telephone	EWSD
8-16	2001	Georgian Company/100%	International telephone	EWSD

Mobile communications. However, where the impact of different policies is most striking is in the area of mobile communications. Georgia has experienced exponential growth over the past three years resulting in approximately 1.9 % mobile penetration (January 2000), 5% (July 2001) and there appears to be considerable opportunity for further expansion. The Georgian cellular market is one of the most dynamic in the region, with three established operator and

two new ones soon to enter the market in the 1800 MHz band. Price reductions have been possible due to the competitive pressures, which have made cellular service relatively affordable. There are three major cellular operators in Georgia: Magticom with 150,000 or 55.9% of the mobile customers, Geocell (both GSM 900) with more than 100,000 or 37.3% of the mobile customers and Megacom (AMPS) with 18 000 or 6.8% of the mobile customers. Regardless the quality of services provided, such market share is also conditioned by the prices (see Annex 7). Mobile companies implement their international and long-distance communication, as well as communication to fixed telephones through Telecom Georgia. Magticom, a joint venture between local investors and U.S. companies Metromedia and Western Wireless, is currently the largest GSM cellular network in Georgia. The second GSM operator and Magticom's most important competitor is Geocell, a joint venture between local investor and Turkish cellular operator Turkcell. However, the first cellular services provider to start operating in Georgia had been MegaCom, fully owned by U.S. company Shomann International. MegaCom utilizes the analogue AMPS cellular standard and has not been able to attract more than 2,000 subscribers, due to the unavailability of roaming and other services possible with digital technologies. Regarding paging services, two paging companies have been established in Georgia, Paging-1 and Paging-2, both with the strategic participation of U.S. Metromedia.

Table 7. Mobile and Paging Services

NAME	Established	Ownership Structure	License	Number of Subscribers
GEOCELL	1996	Gurtel (Turkcell) 40% Cellcom (Geo) 46% others – 14%	Cellular GSM	150 000
MAGTI GSM	1996	Metomedia (USA) & Georgian companies	Cellular GSM	201 000
MEGACOM	1993	American & Georgian private companies	Cellular AMPS	16 000
PAGING 1&2	1996	Metomedia (USA) & Georgian companies	Paging service in Georgia	200

Local and International Network: There are plans to create a common telecommunications system in 'Silk Road' countries called SILKSAT, with the participation of U.S. satellite corporation Orbital, which has already attracted (lie interest of Ukraine, Georgia, Azerbaijan and Russia. At the same time, Georgia is consolidating itself as a regional hub for the interconnection of telecommunications networks. A number of fiber optic lines, both projected and in existence, converge in Georgia: the Sochi-Poti fiber-optic line laid by Rostelecom to interconnect the two Black Sea ports; FOPNet's nation-wide trunk telephone network, which will connect Poti with Tbilisi and branch off to Azerbaijan and Armenia; (he Trans-Asia-Europe Line (TAE), an 18,000 km fiber-optic network that runs from Frankfurt to Shanghai, via Tuikcy, Iran and the Central Asian states of the former Soviet Union; the Black Sea underwater fiber optic cable, which connects the networks of Bulgaria, Russia, Ukraine and Georgia. In addition, the European Commission is financing via the TACIS Traceca project an optical cable for communication between 133 stations and for the signaling of railway tracks for the Caucasian railways. It is estimated that up to 80% of the network capacity could be leased to public and private telecom operators for general telecommunications purposes.

Backbone transmission network consists of four major analogue underground cable routes operated by GES. For each of the cable routes, diversity is provided by a radio relay system providing also TV and radio program transmission. These transmission routes serve also international traffic to neighboring countries, see table below.

Table 8. Transmission Route

COUNTRY	TYPE OF TRANSMISSION ROUTE
Russia	Symmetrical cable 4x4x1.2 with 480 channels K-60 radio relay link TV + 1,920 channels for telephone
Armenia	Coaxial cable with 1,920 channels for telephone Radio relay link TV + 1,920 channels for telephone
Azerbaijan	Coaxial cable with 1,920 channels Radio relay link TV + 1,920 channels for telephone

The new Trans-Asian-Europe (TAE) fiber optic cable will follow the route of the fourth major analogue route Poti-Samtredia-Kutaisi-Zestaphoni-Gori-Tbilisi, where Telecom Georgia already operates a digital Siemens STM-1 (1,920 channels) radio relay system between Tbilisi-Kutaisi-Poti. From Poti TAE cable will be extended across the Black Sea to Rize in Turkey and from Poti to Sochi in Russia. In Eastern Georgia there will be a branch from Tbilisi-Rustavi-Gardabani to Azerbaijan. TAE cable will be owned and operated by FOPNET and capacity will be available for international hard patched transit as well as for various domestic services and operators e.g. fixed and cellular telephony, data and Internet, TV and radio program transmission.

At the end of 1997 telephone density was 47 lines per 100 households as an average for all cities, i.e. 62 in Tbilisi and 43 in other cities. As an average for the whole country there were 37 lines per 100 households and 12 lines per 100 inhabitants. Nowadays, there are 25 lines per 100 inhabitants in urban areas and approximately 10 lines per 100 in rural areas.

Local networks are composed of rather large areas: in one main distribution frame (MDF) can be over 10,000 subscribers. Cables are mostly 0.32 and 0.4 mm diameter polyethylene insulated cables and the maximum length of subscriber lines is 4 to 5 km. Cable network is divided to primary and secondary network. Primary cables are 300 to 1,000 pairs and secondary cables of 10 to 100 pairs.

In rural areas GEC is the sole provider of local access. The service level in the villages is much lower than in cities, i.e. 18 vs. 47 lines per 100 households. Many villages are without any telephone service and villages with more than 100 households may have only one telephone. In the future, when subscriber density will be higher the subscriber cable network in rural villages can be provided quite cost-effectively because the houses are located in dense groups. However, to connect the villages together can be very difficult in mountain areas.

Several foreign companies have made investments in Georgian telecom companies. The two most noticeable among operating companies are Metromedia Communications Group (holding stakes in Paging One (45%), Paging Ajara (35%), Magticom,(35%), Radio Georgia (51%), Ayety TV (49%), and Telecom Georgia (30%) and - Turkcell, a Turkish mobile operator (41% owned by Sonera), holds an equity stake in excess of 80% in Geocell, the country's second largest mobile operator. Through its subsidiary Iberiatel, Ericsson is building a rural cellular

network in NMT 450 standard, which has already partly started operations. OTE subsidiary Hellascom has recently completed a fibre optic cable across the country from Poti on the Black Sea to the Armenian and Azerbaijani borders through Tbilisi. The cable is part of the Trans Asia-Europe (TAE) project to connect Germany with Shanghai via more than twenty countries. Finally, suppliers such as Siemens (Germany), Alcatel (Turkey), Daewoo (Korea) and Telrad (Israel) have delivered substantial infrastructure components for various Georgian operators.

Source: World Bank site

Telecom Georgia (<http://www.telecom.ge>)

Ministry of Post and Communications of Georgia (<http://www.iberiapac.ge/mincom/>)

Georgian National Communications Commission (<http://www.gncc.ge/>)

CONCLUSION: Information Infrastructure is generally considered to be at stage 3.

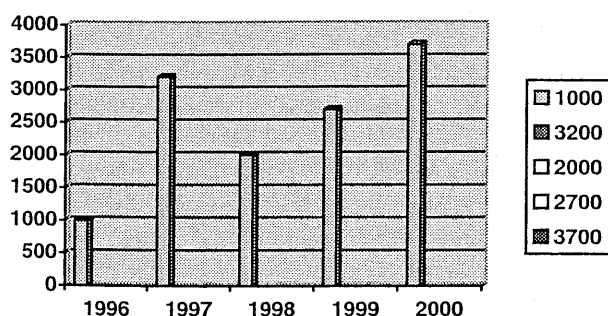
Internet availability:

Computer and Internet penetration is quite low in Georgia, but the local populace, together with the government and private sector understand that the country is competing with the rest of the world to create jobs and gain inward investment. Georgia needs to consider developing policies to encourage knowledge workers to its cities and regions. Organizations and communities, which recognize and value their information resources, should be able to create employment. Those, which make their information available electronically, will create these opportunities.

The market for online services and data communications in Georgia is still in its infancy: in 1999, approximately 6,000 subscribers accessed Internet in dial-up mode. A relatively small percentage of the public in Georgia has an access to Internet. Today the number of regular users having access to Internet is approximately 100,000 people in Georgia, i.e. about 2% of population. Only 0,2% of them (or about 10 000 people) are home-users of Internet.

Currently in Georgia there are approximately 20 000 individual dial-up accounts and over 300 ADSL (dedicated lines). The number of dial up accounts has reached its growth peak in 1997, but due to an economic hardships the number of Internet subscribers has been gradually decreasing until 2000 year's upraise. The following chart demonstrates an individual dial-up account subscription pattern.

Chart 1. Dial-up account subscription pattern



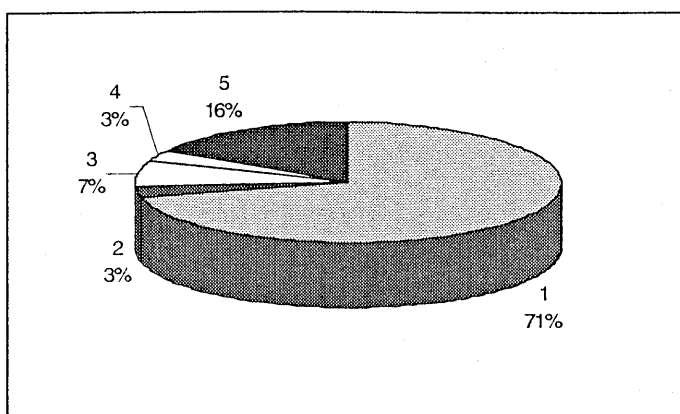
The Internet is gradually becoming an important instrument of choice for the Government of Georgia as the country moves from a rigid centrally planned economy to a free market

economy. Between 1995 when the first 64 Kpbs leased line was opened and the end of 1996, only some 900 computers were connected to the Internet and web sites numbered 7. Some of the very first web sites were designed by the 1st Internet Service Provider (ISP) in Georgia – Sanet and by the Parliament of Georgia. Total bandwidth of the leased international connections has been increased to 2 Mbps.

Distribution of Internet access, however, remains unsatisfactory with the 10 regions with 60 percent of the nation’s population accounting for only 29 percent of users, whereas the capital – Tbilisi (40 percent of the population) - accounts for 71 percent of overall use of Internet. The following graph illustrates the modem pool distribution in Georgia.

Chart 2. Internet access

- Tbilisi
- Imereti
- Ajara
- Kakhet
- The rest



Source: polling results conducted by the GeDG team

Nowadays, the following Internet service providers operate on the Georgian data exchange market:

Table 9. IP in Georgia

ISP	Market Share	Web-site
Sanet	32%	www.sanet.ge
Georgia-Online	31%	www.rustavi2.com.ge
Caucasus Network (ICN)	7%	www.caucasus.net
Global-1	7%	www.global-erty.net
Iberiapac	4%	www.iberiapac.ge
GeoNet	4%	www.geo.net.ge
TI-Service	4%	www.ti.net.ge
WaneX	4%	www.wanex.net
Kheta IT-Group	3%	www.kheta.ge
Multimedia-MMC	4% for all	www.mmc.net.ge
Orioni		www.orioni.com.ge
Basri-Net Ltd		www.basri.net

CONCLUSION: In general, Internet availability in Georgia is considered to at the stage 3, and stage 4 in some cases (the capital).

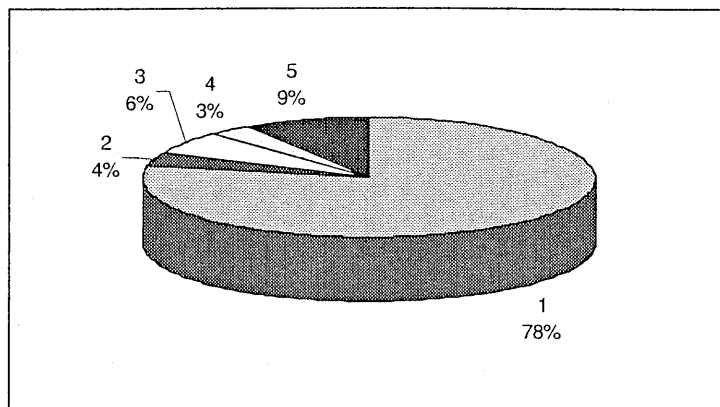
Internet affordability.

Tight competition has also affected pricing structure for Internet connection in Georgia. The prices of Internet access varies between \$0.30 per hour (0.20 per hour at night) and \$1.30 per hour for dial-up access. Price for the leased lines (unlimited access), ranges from \$99/month for

asynchronous lines to \$1,400/month for synchronous lines. Phone calls are charged as a local call except when an ISP has no node in a particular city where customer wants to connect to the Internet. Currently, the nodes are in 22 cities and towns of Georgia (but not all of them provide Internet access, some provide access to public data network only), though the highest payment capacity is still observed in the capital and large cities:

Chart 3. Payment Capacity

Tbilisi
Imereti
Ajara
Kakheti
The rest



Source: polling results conducted by the GeDG

team

While the prices are quite competitive for different organizations, businesses and enterprises, most of the population cannot afford have a regular access to Internet with the average salary \$50 per month. Since 1999, as more ISPs established their operations, market share distribution has shifted somewhat. Some of the newly established ISPs have boasted prime 2MB direct connection to the US Internet backbone grid, thus offering their customer faster, more reliable and comprehensive Internet services. They have started to operate an extensive optical network with links to various regional centers throughout Georgia. Most of the ISP's offer the asymmetric service, i.e. delivery of high incoming traffic up to 2Mbps, while the normal terrestrial phone circuit or leased line is used for all outgoing traffic. This arrangement uses a standard digital KU-Band or C-Band satellite television antenna costing \$175-\$500 (depending on size required) and a decoder card for the PC, the leasing costing about US\$450. This policy allow ISPs to limit traffic on their expensive existing links to outgoing data only, and to use a low-cost TV satellite dish for receiving the higher volumes of incoming traffic. This approach substantially reduces the operating costs for the ISPs and increases the speed of access to the web for their users. Georgia Online is already offering prepaid Internet cards allowing customers to make payments on-line.

Table 10. Prices of Georgian Internet Service providers

ISP	Per minute		Per hour		Unlimited (Monthly Charge)
	Working days	Weekend	Working days	Weekend	
Kheta IT group	0.003-0.01	0.001-0.006	0.22-0.78	0.11-0.39	
Iberiapac	0.01	0.009	0.60	0.55	150
Sanet	0.007-0.01	0.005-0.01	0.45-0.60	0.35-0.60	
Global 1	0.006-0.012	0.006-0.012	0.36-0.72	0.36-0.72	
TI Service	0.005-0.01	0.005-0.01	0.35-0.60	0.35-0.60	
Wanex	0.005-0.01	0.008	0.35-0.60	0.52	
Geonet	0.007-0.0125	0.0058-0.0108	0.45-0.75	0.35-0.65	
Multimedia MMC	0.0033-0.01	0.0033-0.01	0.20-0.60	0.20-0.60	Deposit-20 / 30

ICN	0.0066-0.015	0.005-0.01	0.40-0.90	0.35-60	Deposit-18 / 36
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CONCLUSION: Internet affordability can be considered to be at the stage 2.

Network Speed and Quality

Fixed-line network switching stations in Georgia are already outdated and hard for maintenance. Due to high international tariffs and lack of circuit capacity, obtaining sufficient international bandwidth for delivering web pages over the Internet is still a major problem in Georgia. Until recently few of the country ISPs had international Internet links larger than 64Kbps, but today most of them provide 512Kps or more. Most of the ISP's offer the asymmetric service, i.e. delivery of high incoming traffic up to 2Mbps, while the normal terrestrial phone circuit or leased line is used for all outgoing traffic. This arrangement uses a standard digital KU-Band or C-Band satellite television antenna costing \$175-\$500 (depending on size required) and a decoder card for the PC, the leasing costing about US\$450. This policy allow ISPs to limit traffic on their expensive existing links to outgoing data only, and to use a low-cost TV satellite dish for receiving the higher volumes of incoming traffic. This approach substantially reduces the operating costs for the ISPs and increases the speed of access to the web for their users. The high international tariffs charged by telecom operators discourage Internet Service Providers from establishing multiple international links. As a result, ISPs are forced to consolidate all of their traffic over a single high cost international circuit. Voice over Internet (VOIP) services are officially available and some of the telecom operators have implemented voice over IP technology for their traffic. Demand for most of these services is expected to increase with a broader penetration of computers and data processing equipment on the sub-continent. Commercial services have local delivery facilities. A most critical issue for Internet access in Georgia is the poor infrastructure with low bandwidths. There was a move from the initial 64kbts to 128kbts and beyond. Most of ISP's now have bandwidths that go beyond 2Mb.

CONCLUSION: Although network speed and quality can be estimated by the stage 3 in the capital, the overall situation can be considered to be at the stage 2.

Hardware & Software

No local production of computer peripherals exists in Georgia. PC equipment is most often imported from Asia, but brands - Compaq, Dell, IBM and ICL also have significant shares of the market (especially due to banks and international companies operating in region). The annual value of imported hardware & software sold in Georgia is \$ 3 500 000, wherefrom \$1 500 000 accounts for the computers themselves. The approximate number of computers sold annually amounts 2 000.

Chart 5. Level of computerization in Georgia regions:

- Tbilisi
- Imereti
- Ajara
- Kakheti
- The rest

