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Armenia Telecommunications Sector Development Strategy

Concept Paper

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1. Major Goals of the Telecommunications Sector Development
2. Creation of Effective Legislative and Normative-Legal Base
2.1. Problems of the Legislative and Normative-Legal Base
2.2 Liberalization and De-monopolization of the Telecommunication Services Market
2.3. Telecommunications Services Quality
2.4. Certification and Standardization in the Branch
3. Creation of Independent Regulating Body in the Telecommunications Sector and Determination of Major Principles of Sector Regulation
4. Expansion of the communication services spectrum, improvement of telecommunication indicators
5. Provision of Armenian Population, Enterprises, and Organizations with the Universal Access to Telecommunications Services
5.1. Universal Services
5.2. Tariff Policy with Respect to Services of Moderate Price
6. Development of New Technologies
6.1. Tendencies of New Technologies Development
6.2. Creation of the National Mainline
6.3. Use of the Telecommunications in Public Health
6.4. Wi-Fi Technologies
6.5. Global mobile communications
8.1. xDSL Technologies
6.7. ETTH - EtherNet to the Home
6.8. Stimulation of Electronic Economy Development
7. Investment Policy
8. Problems of the Future Free Market
8.1. Free Market of Local Communication
8.2. Free Market of International Communication

2003

1. Major Goals of the Telecommunications Sector Development

As a result of analysis of current situation in the telecommunications sector and the drawbacks hampering its development the following goals have been formulated:

1) Creation of clear, transparent, and effective legislative and normative-legal base stimulating telecommunications development and promoting telecommunications market development as well as establishment of mechanisms of implementation and control of obligations fulfillment;
2) Creation of independent regulating body in the telecommunications sector and definition of fundamental regulation principles;
3) Expansion of communications services spectrum, essential improvement of telecommunication indicators;
4) Provision of population, enterprises, and organizations with the universal access to telecommunications services. The universal access is an opportunity for each citizen to use telecommunication networks, including global ones, at any time and in any place. The universal access provision should be a key objective of the public program of telecommunications development.
5) Stimulation and provision of free and fair competition for all telecommunications market participants;
6) Stimulation and encouragement of investments;
7) Application of universal technical and quality standards meeting international requirements;
8) Increase of the population awareness of operators' activities, market situation, and the state of telecommunication networks;

2. Creation of Effective Legislative and Normative-Legal Base

2.1. Problems of the Legislative and Normative-Legal Base

One of the key issues of the telecommunications sector is ArmenTel's monopoly on main kinds of telecommunications services along with the lack of proper legal regulation. The basis of the Armenian legislation in the telecommunications area is the ROA Law on Telecommunications adopted on 17 February 1988. Also, the important normative-legal acts regulating the legal relationships in the telecommunications area are the following:

- The ROA Government Decision No 218 on Selling the State Package of the Armentel CSC's Shares at the International Auction of 25 June 1997;
- The Minister of Post and Communications Order No 74 on Approval of the Rules of Telephony Services Provision of 12 December 1997.

As all kinds of the telecommunication services in Armenia are subject to obligatory licensing, the ROA Law on Licensing of 30 May 2001 and the ROA Government Decision No 996 on Approval of the Licensing Order and of the Form of the License of the Telegraph Services and Data Transmission of 22 June 2002 should also be mentioned. At present, the licensing body in the telecommunications area is the Ministry of Transport and Communication (actually the licenses are being given by the Ministry of Transport and Communication Chief Office on Informatization and Telecommunications). At the same time the amendments are to be made to the Law on Telecommunications in order to bring it into line with the legislation on telecommunications. In whole, the normative base of telecommunications licensing is extremely unsatisfactory:

1. The Licensing Commission Charter has not been approved yet (anyhow, it can be seen neither in the Juridical Database of Irtek nor in the Ministry Site.
2. The new order of licensing of data transmission and telegraph services has been approved by the Government Decision, but the old order of licensing has not been abolished, which may misguide the market participants.
3. With the adoption of the Law on Making Amendments and Supplements to the Law on Licensing of 11 December 2002, licensing the activities in the area of data transmission services must be carried out according to the simplified scheme. Due to the reason that amendments to the corresponding Government Decision have not been made concurrently with the adoption of the law, a contradiction between different provisions of that Decision has emerged. From one hand, it is mentioned in the Decision that the license given according to the simplified procedure should be issued by the Ministry of Post and Communications, from the other hand, the obligation of producing the licenses on data transmission services provision is under the jurisdiction of the Ministry of Transport and Communication.

The procedure of license obtaining is rather complicated especially for data transmission operators (Internet service providers). The serious drawback of the acting licensing order consists in the absence of any gradation among operators. Actually, operators must present equal volumes of documentation to get a license, regardless the scale of activities. Besides, the annual licensing dues (state duty on activities to be licensed) also do not depend on the scale of activities of a data transmission operator. In addition to that, the licensing dues for the monopoly operator of telephony services is only 10 times as much as the dues for data transmission operators, while the revenues of the telephone company exceed those of providers in far larger amount.

Despite the fact that other operators' rights to use the services provided on the basis of an exclusive right are guaranteed by Law, in practice, there arises a great many of difficulties connected with the technical standards of networks coordination and interconnection. The main challenge that operators encounter in case of interconnection necessity is the absence of rules of interconnections as well as of the system of payments between interconnected operators. The only normative act more or less regulating the rules of interconnections to the common network belonging to ArmenTel is the Section Γ.1 of License No 60 that had been given to the monopoly operator.

In spite of that in accordance with the provisions of License No 60 (which actually is an agreement between the Government and OTE Company), application of sanctions against the monopoly operator is only possible after the latter is notified in written and given an opportunity "to express its opinion at an open meeting"; such measures should be foreseen by the legislation, as any monopoly requires a strong public control by the government. Speaking about the control over the monopoly activities, not only the adoption of adequate legal norms should be adopted, but also the inclusion in the Government Plan as well as in the plans of other state bodies (independent state commissions) of certain measures for assessment of the monopoly activities. This is exactly in the context of the activities of regulating bodies that planning the undertakings purposed to guarantee the telecommunications users' rights should be understood.

The responsibility for the violation of the legislation in the telecommunications area is rather limited. Of all the existing administrative measures, the least effective measures are foreseen for operators, exactly, a warning and, as an extreme measure, a deprivation of a license. These measures are of the least effectiveness with respect to the monopoly operator, ArmenTel. The question is about the absence of the administrative fines for the refusal of service provision, the late service provision (delays), and for exceeding the time limit for the broken connection recovery. The absence of the

institution of moral damage does not allow the telephone communication subscribers to effectively defend their rights (in the best case, consumers may get a proportional decrease of a payment for the improper / incomplete service). And the absence of direct financial responsibility for the failure in the obligations restrains the subscribers from the use of court defense measures and makes them seek compromises in relationships with operators that does not in the slightest promote the improvement of service quality and market development.

The telecommunication infrastructure planning should be started with identification of those kinds of services and those regions, where ArmenTel does not intend to provide services in the nearest time (1-2 years). If ArmenTel does not include the provision of some services throughout the country or within a certain region in its nearest plans, it shall announce that, or otherwise shall provide the information about its plans that might be estimated as additional obligations (apart from those mentioned in the license).

As a whole the state policy in telecommunications is vague and unfortunately the government represented by the Ministry of Transport and Communications did not clearly define the goals and priorities of state regulation in the sector.

There is a necessity of radical reform of the legislation, in the first turn, the Law on Telecommunications, which should reflect in full volume the frame of problems subject to regulations, as well as the principles of state regulations themselves.

2.2. Liberalization and De-monopolization of the Telecommunication Services Market

The free competition and de-monopolization of the telecommunications services market should become one of the most essential factors of the establishment of the developed and effective system of telecommunication services in Armenia.

At present the competition development is hampered by the following factors:

- The ArmenTel's monopoly in the market of inter-city and international communications for general use networks;
- High tariffs on the local and especially rural telephone communication that do not justify the cost;
- Low payable demand and its uneven distribution caused by poor socio-economic situation in the country. There is a high percent of an unsatisfied demand on the conventional and mobile telephone communications.

The transition to the free market of telecommunications services must be realized through overcoming the monopoly in the areas where the monopoly operator is unable to provide the quality and volumes of the services required by the society. The decision on that should be made by an independent regulating body.

Tasks:

1. ***Radical review of the legislation in the telecommunications area, in the first turn, of the Law on Communications which must fully reflect the entire spectrum of questions subject to regulations as well as the public regulation principles themselves;***
2. ***To adopt amendments to the Law on Telecommunications in order to bring it into line with the legislation on licensing;***
3. ***To hasten the adoption of Licensing Commission Charter;***
4. ***To hasten the transfer of the authority to give licenses by a simplified scheme to the new licensing body, which is the Ministry of Finance and Economy;***
5. ***Identification of the kinds and regions where the ArmenTel does not intend to provide services in the nearest time (1-2 years). If provision of this or that services countrywide or within some***

certain region is not included in the ArmenTel's nearest plans, the company shall announce about that or otherwise shall provide the information about its plans, which might be understood as additional obligations (apart from those mentioned in the license);

6. ***Development of the detailed system of tariffs calculation to provide the "stable profits adequate to the average rate of return in the similar telecommunications markets". Such system should be based on the computation of the services profitability along with provision the population with the access to universal services, i.e. the cross-financing should be excluded;***
7. ***Working out the effective measures of responsibility for violation of legislation in the telecommunications area;***
8. ***Introduction of the annual differentiated licensing dues (state duty for the licensing activities) depending on the scale of activities of an operator;***
9. ***Introduction of normative acts to regulate the rules of interconnections of operators;***
10. ***Insertion of changes in the ROA Law "on Licensing" and the ROA Government Decision "on Approval of the Order of Licensing and of the Form of License on Telegraph Communication and Data Transmission Services";***
11. ***Adoption of the Law on Electronic Signature. Adoption of normative acts subject to law, in particular, on the order of the use of electronic signature by state structures, banking and financial-loaning organizations, on the creation of an accreditation body (Certification Center), and on the order of accreditation;***
12. ***Introduction of the normative acts to increase the responsibility for the violation of legislation in the telecommunications area. Introduction of administrative fines for the refusal to provide services, for late provision of services (delays), as well as for exceeding the time limit for the broken communication recovery;***
13. ***Inclusion of the certain measures aimed to assess the monopoly activities into the Government Plan and the plans of other state bodies (independent state commissions);***
14. ***Establishment of the institution of compensation for moral damage in the Armenian Civil Code;***
15. ***Introduction of the direct financial responsibility for the failure in the fulfillment of the rules of services provision.***

2.3. Telecommunications Services Quality

The problem of users rights guarantee is tightly connected with the problems of telecommunication services quality. And the quality of telecommunications services is not limited to the mere quality of the signals transmission, but includes also providing clients with a proper level of services (interconnection, payments, reservation of a number, should the address be changed). The observance of the established standards of services quality is the most important condition for consumers rights guarantee. Unfortunately, the standards of communication quality have not been adopted yet in Armenia that allows the monopoly not to care about the services quality. Therefore, telecommunications planning is impossible without the development of telecommunication quality standards adopted in many European countries.

In the conditions of absence of market competition the problem of services quality provision and users rights guarantee is one of the key issues of public regulation. The Armenian Civil Code foresees a number of legal norms with respect to the issue of telecommunication services users' rights guarantee but there is no legal regulation regarding service quality. Though the issues of the quality provision and consumers' rights protection are not direct tasks of planning in the area of telecommunications, they do concern directly the public policy in this area. In other words, the

process of the public policy planning should include the development and adoption of telecommunication services quality standards as well as measures directed to the consumers' rights guarantee.

Tasks:

1. ***Development and adoption of telecommunications services quality standards as well as measures directed to the consumers' rights guarantee.***

2.4. Certification and Standardization in the Branch

Activities in the area of standardization and certification are regulated by the corresponding legislation of the Republic. Certification is a tool to establish barriers to the use of communication equipment that does not meet established technical norms and communication service quality requirements. The compliance of the monopoly operator, which is actually the national operator to the international standards of management, is also a key issue. In this regard the national operator apparently does not meet the international criteria and the Government has a right to require its certification.

Tasks:

1. To assist the ArmenTel in the improvement of the company's management and bringing it into line with ISO standards

3. Creation of Independent Regulating Body in the Telecommunications Sector and Determination of Major Principles of Sector Regulation

As the decision on the creation of the independent Regulator has already been made and these obligations are imposed on the Energy Commission, it is necessary to foresee the gradual transformation of the existing bodies regulating the telecommunications sector with the transfer of the regulating functions to the new body (Regulator).

As the world practice proves, the like Regulators are the best to provide the development of the effective regulating mechanisms and can guarantee their fair and transparent use for the further progress of the sector.

It is necessary to work out mechanisms of fulfilling the administrative functions by the Regulator and its financial support, work out a corresponding draft of the legislative act to foresee also a clear differentiation of obligations of various competent bodies, in particular, between the Ministry of Transport and Communication and the Independent Regulator.

The key components of the Regulator's independence should be:

- Financial independence (though some forms of the budget approval and the audit are mandatory);
- Independence from operators and from the Government when fulfilling its functions;
- Transparent criteria of the appointment and dismissal of the Regulator's employees;
- Ability to involve and to keep a competent and professional staff along with salaries adequate to qualification.

The independence of the Regulator does not imply its being beyond a control. As a rule, independent regulators present annual reports to the Parliament or corresponding Parliament Commission; its budget should be approved and examined, and a corresponding ministry or committee should assess its policy.

The Regulator's independence allows:
- The State to determine the policy in the telecommunications area to the nation's benefit without conflicting interests due to its role of a co-owner of a monopoly operator;
- The independent regulator to objectively and impartially pursue the public policy in the telecommunications area;
- To attract more investments from the monopoly operator and other market participants due to the market's confidence towards the impartiality of the independent regulator,
- Operators to take reasonable economic decisions without fear that pressure may be exerted upon the Regulator to make a decision to the benefit of one of the market participants.

The most important spheres to be regulated must be:
- Licensing the operators,
- Tariffs on services,
- Control over the monopoly operator's observance of license,
- Regulation of interconnections.

Tasks:

1. ***Transfer of regulating functions to the new independent body,***
2. ***Working out necessary normative legal acts, providing the independent Regulator's functioning,***
3. ***Identification of spheres to be regulated,***
4. ***Working out the regulation procedure f or telecommunications services tariffs.***

4. Expansion of the communication services spectrum, improvement of telecommunication indicators

The efforts of telecommunications operators should be directed to the improvement of the telecommunications indicators, such as:
- Phone density (number of main telephones per 100 inhabitants),
- Density of the users of all telecommunication networks (number of users of all telecommunication networks including mobile per 100 inhabitants),
- Density of public phones (number of automatic telephones per 1000 inhabitants),
- Number of Internet users per 1000 inhabitants,
- Share of digital station numbers in the overall capacity,
- Share of digital channels in the overall number of main line channels.

Table 1. Desirable parameters of telecommunication indicators for the nearest years:

Indicator	2003	2004	2005
Density of fixed phones	14	15	20

Density of mobile phones	0.7	1	8
Density of public phones	1.53	2	8
Density of Internet users	10	15	20
Share of digital station numbers in the overall capacity	28	35	80
Share of digital channels in the overall number of main line channels	~ 80%	~ 90%	~ 99%

Tasks:

1. ***To require the monopoly operator to satisfy the population demand and to make up with neighboring countries, to increase sharply the mobile phones density up to the full satisfaction of the demand,***
2. ***To require the monopoly operator to minimize the population's unsatisfied demand for fixed phones.***

5. Provision of Armenian Population, Enterprises, and Organizations with the Universal Access to Telecommunications Services

5.1. Universal Services

The universal services imply the minimum set of telecommunications services available (also with respect to prices) for each inhabitant, regardless of his/her social status and place of residence.

Though there is no such a concept as universal services in Armenia, the provisions of the license of the monopoly operator ArmenTel contain conditions that as a matter of fact are legislative guarantees for the provision of access to the minimum set of services that, from the public point of view, should be available for all citizens of Armenia. The public regulation of tariffs in the main telecommunications services (local and distant telephony and telegraph services) also is an element of this right protection. In the meantime, the conditions of Section Б. of License No 60 are also the requirements of universal services provision. Those requirements include:

1. The Licensee is obliged to fulfill the following requirements within 5 years from the day of admission of the new edition of the license
   a) to create four junction joints outside Yerevan,
   b) to link up to 180 villages to the digital automatic telephone stations
   c) to create 20000 digital channels/km in addition to the transarmenian fiber optic digital communication channel.

2. The Licensee is obliged to provide the phone density of 20:100 of within 7 years from the day of admission of the new edition of the license.

Presently it equals to 17%, which is 72% counting for a household (considering that the country population is 3.2 mln, the number of people in household – 4 and the number of abonents is 540000).

Thus, one of the main conditions of endowing ArmenTel with exclusive rights on provision of the basic telecommunications services is the development of telecommunications infrastructure in Armenia and providing the population with the minimum package of telecommunications services.

The following criteria of universal services may be offered in the intermediary term prospect:

Table 2. Criteria of the Universal Services for the Period till 2006

Year	Element of Service	Contents
Before 2005	Access	Voice telephony in the telecommunications network of general use
Before 2005	Mandatory Package	Free calls to the emergency aid Operator's services Information services
2006		Internet E-mail

At present most of rural regions do not meet criteria of the universal access. To establish such an access it is necessary to organize points of general use providing the voice telephony, E-mail, transmission of facsimile messages, access to Internet in each inhabited locality.

Tasks:

1. ***Legislative determination of the universal services concept and securing citizens' right to use them,***
2. ***To allow the community and school Internet centers (TeleCenters) in the districts of Armenia to use of Web-site satellite system (32KB-up, 1MB-down). This would allow starting solving the problem of universal access in the part of Internet access. As TeleCenters' activities in the data transmission are not of commercial nature, they do not need a license (Section 2.5. of Article 43 of ROA Law on Licensing).***

5.2**.** Tariff Policy with Respect to Services of Moderate Price

In Armenia, as in the most countries, the tariffs on services recognized by the Government as available to population do not justify their costs and, moreover, do not allow making capital investments into those services infrastructure. The world practice offers two major ways of financing the expected losses:

8. Financing at the expense of the operators. The latter in its turn may be implemented through:
9. Creation of special Fund to accumulate the allotments of the market participants and to assign funds for the compensation for the losses of operators providing socially significant services,
10. Cross-subsidies within one operator charged with obligations on providing the universal access countrywide (national operator) and in the same time endowed with certain privileges,
11. Cross-subsidies within one branch of telecommunications with the use of the machinery of direct calculations between operators of the main line and local telecommunication networks.

b) State subsidy

The development and adoption of clear and effective donation mechanism for the establishment of widely available communications services provision should be one of the Regulator's tasks.
The following steps should be taken for that machinery mechanism:
- To validate by the normative act of a competent body in the telecommunications area the minimum list of telecommunications services of moderate price, with fixed quality parameters,
- To validate by the Government Decree the obligations of the monopoly communication operator of the telecommunication networks of general use on provision of national security and countrywide universal access,
- To work out the appropriate rules and methods.

The equality of tariffs on equal services of equal quality for subscribers of all categories should be the underlying principle of tariff policy in the national market of universally available services.

The plan of re-balancing the tariffs and changing their structure should be developed, in the course of implementation of which the structure of tariffs would be changed and they would be leveled. The tariffs on the local telephony services would increase, as they would reflect the costs of their production and provision, but, concurrently, the tariffs on the international communication services would be considerably lowered, as the need for the unprofitable services cross-subsidizing would no longer arise.

Tasks:

1. ***To validate by the Regulator's normative act in the communications area the minimum list of telecommunications services of moderate price with fixed quality parameters;***
2. ***To validate by the Government Decree the Statute of the National Communication Operator of the telecommunications networks of general use, its obligations on provision of national security and countrywide universal access as well as its privileges with respect to other operators for the short term;***
3. ***To work out the appropriate rules and methods.***

6. Development of New Technologies

6.1. Tendencies of New Technologies Development

One of the key intermediary term goals of the strategy is building the internal high-speed optic-fiber communications network (national information super-mainline) to provide high quality internal exchange (also to the benefit of government, defense, security, and law- protecting bodies) and access to the international network.

The national information super-mainline will allow the general public, enterprises, and organizations of the country to use modern communications services and will lead to the following results:
- Establishment of the universal information space, development of data transmission network technologies, introduction of broadband services, and creation of intellectual networks of mass services;
- Provision of interaction between the national telecommunication networks and global communication networks on the basis of the standards and technical recommendations of the international regulating bodies;

- Coordination of the information processing networks and services in purpose to provide access to the widening information resources in user-friendly way, available price, and guaranteed quality,
- Increase of the economy effectiveness due to introduction of electronic commerce and payment systems, as well as electronic office work,
- Optimization of the transportation services control,
- Introduction of remote education, informatization of educational institutions, including schools, scientific cooperation;
- Improvement of information services quality, teleworking, joining in the world information resources, new technology achievements, education, and culture,
- Creation of interconnected network of TeleCenters (community centers) in districts;
- Optimization of administrative, supervisory activities of state bodies;
- Improvement of mechanisms of the reference, office and bookkeeping activity.

6.2. Creation of the National Mainline

The Government of Armenia should not consider ArmenTel's plans to be the national plan of the sector development. Creation of the national super-mainline is not in the least connected with the ArmenTel's plans; moreover, the latter may not be interested in that. However as, in accordance with License No 60, ArmenTel is obligated to promote the introduction of new technologies, the key element of the public policy is the determination of that obligation's meaning - how and on what terms it is possible to require the company to introduce them. Actually, the Government, being an owner of 10% of ArmenTel's shares, may require a few threads of ArmenTel's optic-fiber cable to be assigned for the national mainline creation. In the conditions of scare budget the Government is hardly able to invest in the creation of a mainline. However the international organizations and funds are ready to provide funds in this purpose. The Government needs only to promote this. It is necessary to create the national mainline on the basis of DWDM, i.e. optic infrastructure based on technology of dense spectral multiplexing. This technology will allow increasing the network capacity. Creation of such a network with the use of DWDM technology and transmission system will make Armenia a technologically advanced country. It provides the possibility of transmitting signals at a speed of 1.6 Terabit/sec via one fiber. The Gigabit Internet with a capacity of 1.2 Gigabit/sec may be an alternative.

Such national mainline will allow the transmission of streaming video and audio, remote education, E-commerce, interactive television, access to Internet and will provide a customer with maximum of services. Besides the broadcasting channels, the consumers will also need interactive communication for the video-report exchange, carrying out TeleBridges and TeleConferences. The integration of the broadcasting services with Internet services will progress on. Today it is already possible to hear various stations' broadcasts and to watch clips via Internet. In the course of time, new interactive services will be created to remove borders between visiting the web sites and watching the television channels.

The Armenian Government should undertake the creation of the city optic-fiber network (COFN) as a part of national super-mainline, laying the channels in the underground tunnels. The territorial networks of city- and district administration bodies, the joint networks of Ministry of Finance and Economy, Tax-Police, Internal Affairs Office, courts, Prosecutor Office, Ministry of Emergent Situations, fire-service, medical care bodies (polyclinics, emergency aid, drugstores) must

be created on the base of COFN. Also recommendations on further development of mainline telecommunication city networks should be formulated.

Creation of COFN will stimulate the development of transport telecommunication infrastructure. The high-speed academic network embracing universities, libraries, institutes, schools should become a part of COFN. OSI AF-Armenia has allocated funds for the creation of such network; NATO has provided the satellite antenna and ground equipment for the 2Mbps data transmission channel. However the Ministry of Post and Communications and ArmenTel do not allow to link up this network to Internet.

The city authorities should actively participate in projects related to the creation of transport telecommunication infrastructure, as it is as much important for the city as the automobile transport infrastructure (high-speed highways), underground, in-town high-voltage electricity transmission lines, mainline sewer systems and collectors are.

The city should have a justified long-term program of mainline telecommunication infrastructure development in that part of it that is necessary for the city administration bodies, public security bodies, and social organizations (schools, hospitals, polyclinics, libraries, etc.). The development of the city transport telecommunication networks should be coordinated with various programs, including those of education and public health development.

The city authorities should assist in the organization of points of public access to IT in order to familiarize with IT those population layers that drop out of information society. Joint efforts of the city administration, NGOs, scientists, and private sector are necessary to finance that idea. The purpose is the development information services available for the general public and points of public access to them (at libraries, railway stations, polyclinics, trade centers, etc.), regional Internet-cafes, and public centers of access to modern technologies.

The Government of Armenia should provide social aid in an electronic form to socially unprotected population layers in the following way:

- Further informatization of the social services (services of social security, assistance, insurance, pension funds, etc.);
- Assistance in organization of networks of mutual helps and support with the use of IT for the elderly,
- Organization of centers of access to IT for young and capable handicaps who might - due to modern technologies - live a fuller life and contribute to the city socio-economic development.

The city authorities should stimulate citizens' interest in the use of IT by means of carrying out demonstration-educational campaigns designed to explain the advantages of the life in the "information city".

Tasks:

8. ***To create the national information super-mainline and, in the first turn, of the city optic-fiber network;***
9. ***To get a few threads of the ArmenTel's optic-fiber cable to be assigned for the creation of the national mainline;***
10. ***To get a permission for the linking up the high-speed academic network embracing universities, libraries, institutes, and schools to Internet via 2MB-satellite data transmission channel;***

11. ***To work out a long-term program of the city mainline telecommunication infrastructure development;***
12. ***To work out a program of the development of available for the general public information services and points of public access to them (at libraries, railway stations, polyclinics, trade centers, etc.), regional Internet-cafes and public centers of access to modern technologies.***

6.3. Use of the Telecommunications in Public Health

The Government of Armenia in behalf of Ministry of Health should provide the introduction of IT in the public health area, in particular:

- Creation of the computer database with detailed information about medicines and other medical wares for population and specialists as well as the database of medical and diagnostic centers of Yerevan;
- Provision of access to medical information for professionals and ordinary consumers of the corresponding goods and services;
- Training the personnel of each Yerevan health institution in the basics of work with E-mail and Internet resources,
- Creation of the points of "Consultations-Via-Internet" for all health institutions, including polyclinics and systems of making an appointment to a specialist via E-mail on the base of leading institutes, clinics, and diagnostic centers,
- Introduction of Telemedicine,

Telemedicine implies a complex of procedures providing an adequate remote exchange of medical data via information technology and high-speed mainline communication channels. The Telemedicine allows solving simultaneously a number of urgent social and medical problems:

- The patients may be available regardless their place of residence and within short time period may be consulted by qualified specialists; even arrangement of a consultation of physicians of different clinics and towns is possible;
- Mutual use of expensive high-tech equipment by different medical institutions; training in work with that equipment.

The Government of Armenia should start developing the strategy of the Telemedicine development in the country and Yerevan. The implementation of the strategy should consist of several stages and directions:

- Analysis and summarizing of rapidly growing international experience in use of Telemedicine;
- Scientific and educational activity, including carrying out distributed symposiums and videoconferences, joint research, various forms of distant education and certification,
- On-line and deferred consultations and diagnostics, before- and after-hospital care, monitoring of operations and the patents' health state,
- Attracting of professional medical associations to creation of standards and medical examination algorithms as well as to the definition of unambiguity in understanding of symptoms, terms, and concepts,
- Legal guarantee of Telemedicine.

Tasks:

1. ***To work out a strategy of development of the Telemedicine in the country and Yerevan;***
2. ***Creation of points of "Consultations-Via-Internet" for all health institutions, including polyclinics and systems of making an appointment to a specialist via E-mail on the base of leading institutes, clinics, and diagnostic centers;***
3. ***Creation of a computer database with detailed information about medicines and other medical wares for population and specialists as well as a database of medical and diagnostic centers of Yerevan;***
4. ***Training the personnel of each Yerevan health institution in the basics of work with E-mail and Internet resources.***

6.4. Wi-Fi Technologies

Wi-Fi (Wireless Fidelity or officially 802.11b) wireless communication technologies in the non-licensed part of the spectrum started to spread rapidly throughout the world due to the cheapness and simplicity of installation. For linking up to Internet according to this technology, one only needs a Wi-Fi card in a computer and a point of access (base station) in the distance not more than 100-200 m, i.e. the need for laying the cables, digging the trenches, in short, of any participation of local telephone or cable companies would no longer arise. It is necessary to start active use of this technology in Armenia in order to provide access to Internet without use of telephone network and consequently without payment per minute.

6.5. Global Mobile Communications

Over the past years intensive works are being conducted worldwide on creation of systems of global personal mobile satellite communication (GPMSC) with the use of low and medium orbits, which may be used for the establishment of a communication in those regions where the creation of ground telecommunication nets is not expedient from the economic point of view. It is necessary to develop the legal base for those systems work in the territory of Armenia (in the part of appropriation of and payment for the radio frequencies, obtaining permissions, transborder move of terminals).

6.6. xDSL Technologies

The main way users operate with private networks and networks of general use is application of conventional telephone lines and modems - devices designed to transmit digital information by analogue signals. The speed does not exceed 56 KB/sec. However the saturation of web sites with graphics and video as well as big volumes of documents slows down the operation.

Application of xDSL technologies allows considerably increase the speed of data transmission via conventional telephone line, i.e. the need for laying new lines or modernizing old ones would no longer arise (laying the communication lines is the most expensive part of works on channels or networks building). The xDSL technologies turn a telephone line into a high-speed channel, being at the same time extremely economical. Any subscriber who utilizes a conventional telephone line has an opportunity to significantly increase the speed of his/her linking up to Internet by means of the DSL technologies. Due to variety of DSL technologies the user may choose the suitable speed of data transmission from 32KB/sec to more than 50MB/sec.

These technologies allow also using the conventional telephone line for such broadband systems as video-by-request or remote education. The xDSL technologies make possible the arrangement of the high-speed access to Internet at each home or at any small or medium business

enterprise, turning the conventional telephone cables into high-speed digital channels, connecting a user and a provider.

6.7. ETTH - EtherNet to the Home

During the last years the networks of this kind spread widely as it became possible to set up 10/100?bps EtherNet network with 200-500? UTP cable and hubs/routers for distances up to 10 km. In densely populated areas, living blocks and big buildings, city living and business blocks such kind of networks represent the most convenient, quick and cheap solution. There are mass production of devices and accessories for the establishment of client ETTH networks already.

It should be noted that subsystems built on xDSL and Ethernet technologies in future can be without any changes incorporated into the structures of newly created high speed networks.

6.8. Stimulation of Electronic Economy Development

Tasks:

1. ***To stimulate creation and development of electronic payment systems and e-commerce within the frame of electronic economy development;***
2. ***To work out the mechanisms of realization of standards of documents identification, electronic signatures, and information protecting systems;***
3. ***To assist in the preparation of population to the conditions and opportunities of the information society;***
4. ***To take measures on leveling the opportunities of the access to information for population groups of various age and social status, wider involvement of young people and socially-vulnerable groups in the process of production and propagation of information.***

7. Investment Policy

The investment policy in the telecommunications area must stimulate the development of fair competition, based on increase of a number of communication operators and broadening of the services spectrum, in the first turn, via creation of the infrastructure for the competition appearance. Here it is necessary to clearly differentiate the operators creating the infrastructure from the providers. Creation of infrastructures and networks must become a priority for the public investment policy in the telecommunications area.

When developing projects and building communication lines it is necessary:

- To use at a maximum the opportunities of other owners of transport networks, railway networks, energy complex nets, etc. (in particular, the transport optic-fiber network TRACECA),
- To modernize the departmental networks of state bodies, which- with telecommunication networks of general use- compose the universal, coordinated network of the country,
- To broaden the access of rural population to the information exchange, including telephony communication, data transmission, distant education, and television access to medical diagnostic centers (Telemedicine)

The investment activities in the mentioned spheres should be stimulated by the state through the encouragement of operators themselves to invest.

8. Problems of the Future Free Market

8.1.Free Market of Local Communication

Creation of the competitive environment means the creation of a balanced telecommunications market, based on the transparent and impartial regulation. In its turn, the balanced market presumes balanced tariffs, introduction of universal services and their financing, as well as financing the state needs (governmental communication services connected with mobilization reserves, maintenance of networks that are used for the National Security) at the expense of budget.

At present the sphere of services using local networks is determined by the legislation as a natural monopoly, and here the tariffs are subject to public regulation. Further steps to full market relations in the telecommunications area presume:

- Creation of attractive for the operator's economic conditions to provide services of moderate price, in particular, creation of a mechanism of compensation for the losses caused by these kinds of activities,
- As the competition develops in this telecommunications sector, preparation of proposals with regard to making changes in ROA Law on Natural Monopolies in the part of the clarification of the kind of activities in the telecommunications area related to the natural monopoly sphere and of methods of regulation of communication operators' activities in purpose to prevent unfair competition.

As the competition in local markets is possible and has economic sense, provided the mechanism of financing the universal access is introduced, it is necessary to establish a procedure of regulation of tariffs on the telecommunications services, while the bodies of anti-monopoly regulation should control the availability of prices for the universal services, as well as the observance of fair competition by the operators on the basis of other legislative acts.

8.2. Free Market of International Communication

It is believed that the ArmenTel's exclusive right for as incoming as outgoing international, inter-town communication provides the financial opportunity for producing the services of moderate price countrywide. If this is the case, the liberalization of the market should be preceded by the appearance of an alternative mechanism of the universal access establishment and financing. Another important problem of the international communication liberalization is the regulation of operators' rates of discount on the incoming international communication.

The adopted worldwide practice of calculations between operators of different countries while establishment of international communication is based on the concept of rate of discount per traffic unit, which is the fee that an operator collects for the termination of a call initiated by an oversees operator in the territory of its country. The amount of the rate of discount depends on the length of the national prolongation and volume of resources spent by an operator for the arrangement of the call termination. During the reciprocal calculations of the operators of two countries the operator, whose volume of incoming traffic exceeds the volume of outgoing traffic, receives the network monetary inflow. ArmenTel obtains a significant network inflow of currency from oversees operators as a part of the fee for the traffic termination. Besides that, in purpose to safeguard the mentioned situation, the society keeps a high level of rates of calculation and, consequently, of payments made by international operators. The de-monopolization of the incoming international communication implies, first and foremost, the appearance of operators freely establishing the size of rates for the

calculations with oversees partners. As, from one hand, these operators will not possess such a large net of subscribers as ArmenTel does, and, from the other hand, having no social obligations and aspiring to lower the tariffs in the competitive struggle, they will promote radical reduction of the rates. Consequently, the reduction of rates of discount will reduce the amount to be received in Armenia as well as the share to be allotted to the budget. According to the data, the situation may change in a number of directions, and Armenian operators themselves will have to pay other countries. As, a difference between the incoming and outgoing traffics, favorable for Armenia, will continue objectively in the intermediary term prospect, the Regulator will have to regulate the minimum level of rates, preventing their sharp fall.

The partial liberalization of the telecommunications market is possible due to the currently unprofitable city telephony communication market. If ArmenTel agrees with the elimination of the exclusive rights on services of unprofitable local telephony communication and brings the tariffs on international communications services into line with world ones, as the cross-subsidy will no longer exist, it might bring to the creation of a competitive environment in the local communication market. Perhaps, this market can become attractive due to high-tech approaches that do not require big investments.

While preparing for the full liberalization of the communications market, it will be necessary to solve the following problems:

- Re-balancing tariffs in order to provide profitability of all market sectors,
- Working out and realization of mechanism of the universal access to communications services financing;
- Working out and introduction of new licensing rules;
- Working out and introduction of new rules of operators' communication networks interconnection;
- Working out and implementation of a mechanism for distribution of inflows from incoming traffic.

While liberalizing the communications area the following problems must be solved:

- Refusal of internal cross-subsidy of unprofitable services at the expense of profitable ones, which is presently being exercised by the monopoly operator of telecommunication network of general use and which is incompatible with the conscientious competitive environment and WTO criteria;
- Involvement of new operators in the provision of currently unprofitable services at the local telecommunication networks and in rural regions;
- Appearance of two and more operators of mainline telecommunication networks,
- Creation of real competition at the local communication networks;
- Endowment the consumers with the right to choose a communication operator;
- Broadening the taxable base in the overall telecommunications area,
- A significant increase of the area's attractiveness for the investors.

The necessity of the introduction of the new business model to create conditions for the co-existence of various international communication operators without any damage with respect to the national operator is also apparent.