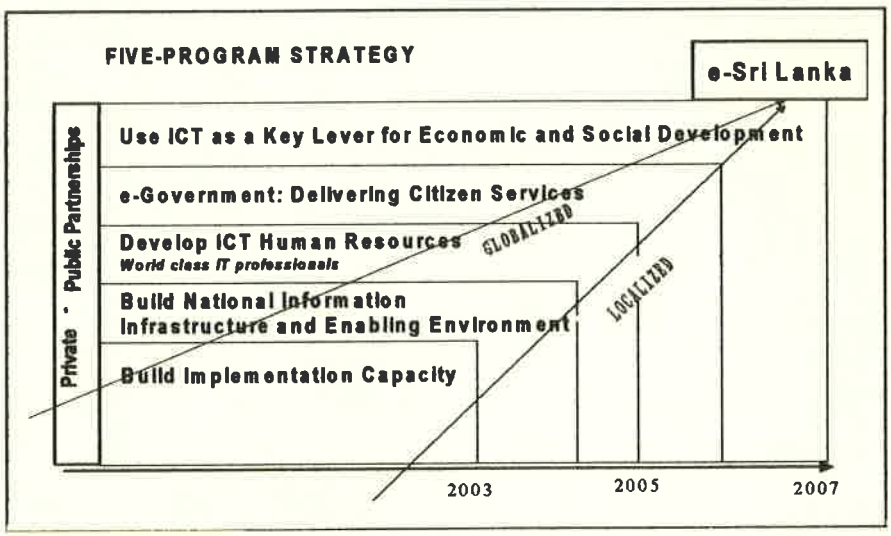
e Sri Lanka
smart people smart island

An ICT Development Roadmap



CONTENTS

Page No.

I. PREAMBLE 1

THE VISION OF AN E-SRI LANKA 2

II. HOW DO WE MAKE THE VISION A REALITY? — STRATEGY FOR IMPLEMENTATION 6

III. Program 1 - BUILD IMPLEMENTATION CAPACITY 8

IV. Program 2 - BUILD NATIONAL INFORMATION INFRASTRUCTURE AND ENABLING NVIRONMENT 9

A. Building "Hard" Infrastructure – *providing affordable telecommunications services for various users, and ensuring local and global connectivity* 9

B. Building "Soft" Infrastructure and Creating the Enabling Environment 10

C. Building Capacity for Adaptation, Learning, Monitoring, and Evaluation 13

V. Program 3 - DEVELOP ICT HUMAN RESOURCES 14

VI. Program 4 - e-GOVERNMENT : DELIVERING CITIZEN SERVICES 16

VII Program 5 - LEVERAGE ICT FOR ECONOMIC AND SOCIAL DEVELOPMENT 17

A. Societal Applications and Content Development..... 18
B. Connectivity and Telecenters..... 18
C. Mass Media 18

ATTACHMENTS:

Attachment 1: Five – Year Strategic Action Plan
Attachment 2: What can be done quickly in the telecom sector to support ICT initiatives?
Attachment 3: Developing Sri Lanka's Software Industry
Attachment 4: Sri Lanka's e- Government Strategy and Implementation
Attachment 5: Other Project Possibilities for e-Government
Attachment 6: Bridging the Digital Divide: Initiatives for Societal Applications
Attachment 7: Reforming Sri Lanka's Mass Media Sector to promote the developmental thrust of the ICT Roadmap

e-Sri Lanka

An ICT Development Roadmap

I. PREAMBLE

Sri Lanka is on the threshold of a new wave of social and economic development built on the foundations of peace, equity and social harmony. To achieve the desired levels of development, Sri Lanka must enhance national competitiveness, reduce/ irradicate poverty and realise enhancements in the quality of life of its citizens.

The Government, Private Sector and other Stakeholders in the nation's development share a belief that ICT is a foundation medium for the equitable distribution of opportunity and knowledge within societies and communities and a key determinant of the competitive advantage of Nations.

This belief has resulted in a shared vision for an **e-Sri Lanka** - a vision which will take the dividends of ICT to every village, to every citizen, to every business and also transform the way Government works. We will use ICT to develop Sri Lanka's economy, alleviate poverty, and improve the quality of life and the opportunities for all of our people.

Given the opportunity created by fast paced globalisation, Sri Lanka can, through the leverage of its inherent strengths achieve the status of a model nation in the harnessing , delivery and exploitation of ICT towards the achievement of economic and social development concurrently with its positioning as a preferred business siting destination in the region.

It is time to act. Sri Lankans are ready – we have one of the highest literacy rates in the world, impressive IT professionals in the private and government sectors, and the inherent dynamism of our youth - ever impatient to embrace ICTs and their application towards creating a new Sri Lanka.

This document charts a roadmap towards the implementation of the e-Sri Lanka vision. We will aggressively build the necessary connectivity infrastructure throughout the country to connect villages and towns to the world; create the enabling environment including the enactment of regulatory reform together with the acceleration of enabling laws for e-government and e-commerce; develop human resources at multiple levels; modernize the public sector and deliver citizen services through e-government constructs; address

the bridging of the digital divide with applications aimed at poverty reduction and social development.

This is an aggressive action plan. Given the competing demands for government resources, we will mobilize much of the financing and support for ICT through the private sector and through aid agencies such as the World Bank, the Asian Development Bank, and bilateral donors. A nimble, competent and dynamic public-private partnership is critical to the success of the strategy.

This document articulates the vision for an e-Sri Lanka, builds a strategy for implementing the vision, and details a portfolio of action plans targeted at achieving e-Sri Lanka by 2007.

By the year 2007, e- Sri Lanka will be better known as the e-Sri Lankan Miracle - a model achievement drawing global recognition, in the deployment of ICT towards the achievement of Social and Economic Development.

THE VISION of an e-Sri Lanka

If Sri Lanka takes advantage of the opportunity and acts aggressively to implement a strategy for e-Sri Lanka, what might the country look like in 5 years?

Here is a scenario that is achievable, but will require some bold actions, key enablers and sustained commitment:

Sri Lanka has captured a window of opportunity to harness the ongoing information and communication technology revolution in support of enduring peace, accelerated growth and fair equity.The e-Sri Lankan miracle has become a model of an ICT-enabled development strategy whereby information technology is exploited for broad-based growth involving all key sectors of the economy and society. Accordingly,

for good Governance

- Sri Lanka has used ICT to improve the delivery of public services, and knowledge and education to her people, empowered civil servants with information and communication tools, facilitated coordination across government agencies, made government accessible and accountable to the average citizen, improved competition and transparency in public procurement, and reduced transaction costs to businesses.
- Sri Lanka has delivered a miracle with respect to social development indicators and has outpaced regional nations in its commitment to enhance the quality of life of its citizens.

- Sri Lanka has achieved the status of a regional ICT enabled commercial hub for South Asia by harnessing top-end latent professional talent combined with a sound ICT infrastructure, to the delivery of commerce and services for businesses online, Sri Lanka was able to create an attractive business and investment environment, and to achieve a position of regional leadership.

- Sri Lanka, through the vigorous pursuit of a consensual vision on good governance has achieved model status in the formulation and practice of ICT based governance.

- An unique implementation of E-government has reinforced peace and helped integrate marginalised regions and communities within an equitable resource distribution framework. E-government has also facilitated effective decentralization and broadening of public participation in development policy formulation and program implementation. The use of ICT has transformed government services making them cost-effective and citizen-centered.

- Sri Lanka presents a modern day model for its nation-wide ICT infrastructure. The limited extent of land mass has been converted to a key strength enabling the networking of all primary and secondary cities and the extension of connectivity to even the most remote parts of the island through terrestrial as well as space-based communication technologies. The National infrastructure is well linked to global infrastructures through all the major optical fibre backbones traversing the Indian Ocean and Bay of Bengal, and through Satellite based communications.

- Best in Class Soft Infrastructures, complement the country's hard infrastructure featuring Internet based infrastructures and efficient and nimble constructs encompassing e-commerce gateways, shared service platforms, storage and archiving facilities, ICT enabled service provisioning infrastructures and Business Process outsourcing platforms.

- The innovative application of ICT for Social Development has been achieved through the leverage of Sri Lanka's long tradition of grassroot development initiatives , large and active NGO community and widely-shared literacy. Noteably a majority of the innovative applications have been developed by local software companies, in collaboration with local and international NGOs, and are now used throughout world by the donor community and individual local governments keen to emulate the e-Sri Lankan example. One such application is that developed for credit cooperative societies to facilitate the use of ICT to further mobilize its members, extend micro-credit and generate employment in rural Sri Lanka, and then exported its low-cost ICT applications to credit unions throughout the world.

for her industries

- Sri Lanka's main and traditional industries have been revitalized. Agriculture, tourism, and apparel, among others, have increased their share of value-addition to the end product in an increasingly competitive and globalized market. These industries have also penetrated new markets via Internet-based sales channels. Small firms and rural cooperatives have also commenced participating in international e-commerce transactions via international e-market sites. Remote areas generate millions in annual revenues from eco-tourism promoted and retailed globally through electronic means. This process of modernization of enterprises, large and small, has generated growth rates close to those of East Asia, and also contributed largely towards the elimination of unemployment.

- In tandem with the convergence trends within the ICT industry (bringing together IT, Telecommunications and Electronics industries) Sri Lanka has established a visible presence in the Hi-Tech electronics industry through the leverage of its skilled work force IT skills, and its superior global reputation in the ICT industry as a whole. Several multinationals have established manufacturing as well as R&D facilities in Sri Lanka focussed on the emerging markets for multi-media technologies and 3rd generation mobile devices. Several leading telecommunications and multi-media multinationals have sited their knowledge based device production centres in Sri Lanka providing a ready employment market for high tech graduates from Sri Lanka's leading edge technology universities.

for her global positioning

- Sri Lanka has also won recognition as an ICT destination featuring high quality R&D facilities supported by centers of excellence as well as world class academic input and local as well as expatriate diaspora. The country also boasts of the region's best industry support services in the form of R&D as well as testing, measurement and advanced calibration services.

- Information and communication technology has been used to transform education institutions and learning processes, to extend quality education at all levels and to all parts of the country. Students and teachers throughout the country now have access to world-class educational curriculum via the Internet. Sri Lanka has embraced online education and lifelong learning, utilizing abundant and rich learning material and networking local learning institutions with collaborating academic and training institutions regionally and internationally.

- Spurred by burgeoning local demand, the local content development and e-learning material production industry has achieved international standards. Accordingly, Sri Lanka has leveraged its experience and expertise to become a regional learning service provider. Sri Lanka has leveraged the substantial learning resources available globally and participated in the

Asia-Pacific Advanced Network and Internet2 consortium, among others, to become a smart Island.

- Sri Lanka has reinforced and extended its global positioning as a major transportation hub for air and sea cargo, for South Asia and beyond. The ports have been modernized, and a modern trade net has dramatically reduced the transaction costs for importers and exporters. Strategic ICT applications in this area have followed the models of Singapore, Hong Kong, and Malaysia, where similar trade nets have contributed more than 1% of GNP and helped spur the adoption of ICT by small and medium enterprises throughout these economies. The ports and customs have enabled local industries and services to become increasingly competitive and added to the country's attractiveness to foreign investors.

- Similarly, Sri Lanka has become a financial services hub. Building on its long tradition of progressive fiscal policies backed by top-end professional services, and combined with successive initiatives to modernize the stock market and other financial institutions, the country has, using ICT, captured a window of opportunity to be positioned as a leader in the global financial services industry.

- Sri Lanka is recognized as a preferred business location for multinational corporations who, based on the country's human resources, infrastructure and government efficiency, have invested in commencing a large number of off-shore operations.

- Sri Lanka is also a well recognised location for Hi-Tech industries - available technology parks are filled to capacity and new parks in five other cities have commenced. These parks now constitute a vibrant cluster of knowledge and innovation-driven industries and professional services that rival the best in the region.

- Sri Lanka has positioned itself to participate in higher value-added software segments of a fast growing global marketplace for such products and services. It has become known in certain market niches as a preferred source for advanced software technology and services, including for example, business software in the Middle East, computerization of stock markets, and financial software for district governments in developing countries. Annual revenues from software exports are $ 500M US and growing at 30% APR. Sri Lankan technology firms have listed on the NASDAQ, and more have engaged in joint ventures or been acquired by leading international firms.

- Sri Lanka has become a global hub for ICT-enabled services and business process outsourcing. Sri Lanka has moved quickly to capitalize on a new and fast growing global market in ICT-enabled business services. The country rapidly and strategically built on its 91% literacy rate, English language skills, and links to the Sri Lankan diaspora to enter into the

market, attracting knowledge work ranging from clerical to creative. This work has become a major source of employment for the youth throughout the Island.

for her people

- Sri Lanka has created a communication environment that allowed optimal opportunities for all Sri Lankan citizens to participate fully in the global information economy, for businesses to engage in all forms of e-commerce, and for all citizens to support their economic, learning and personal needs.

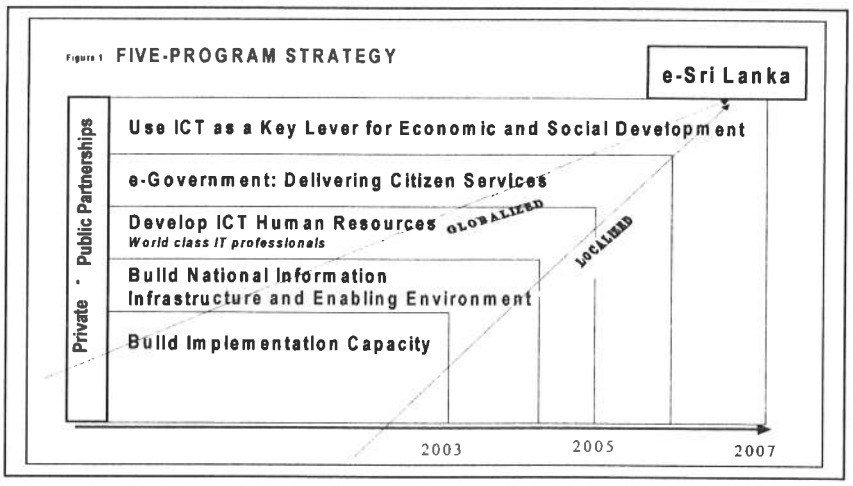
- Inexpensive contact with family abroad via email and voice over Internet is available at Cyber Cafes in all towns. Educated Sri Lankans have re-patriated and dense networks have been built up with overseas Sri Lankans to provide venture capital financing, market entry, international business experience and partnerships with educational institutions and NGOs. Links with overseas Sri Lankans are also strengthened by broadcasting and webcasting by a vibrant cultural content development industry.

for the World

- Sri Lanka has used its leadership and experience in multilateral and regional institutions to position Sri Lanka as a base for developing a model International laboratory for Information Technology-enabled Development (ITeD). Delegations from emerging economies come to learn from the "e-Sri Lankan miracle" and to partner with local institutions on ICT applications for sustainable development.

II. HOW DO WE MAKE THE VISION A REALITY? — STRATEGY FOR IMPLEMENTATION

We can achieve the vision of e-Sri Lanka through a five-program strategy (see figure 1).

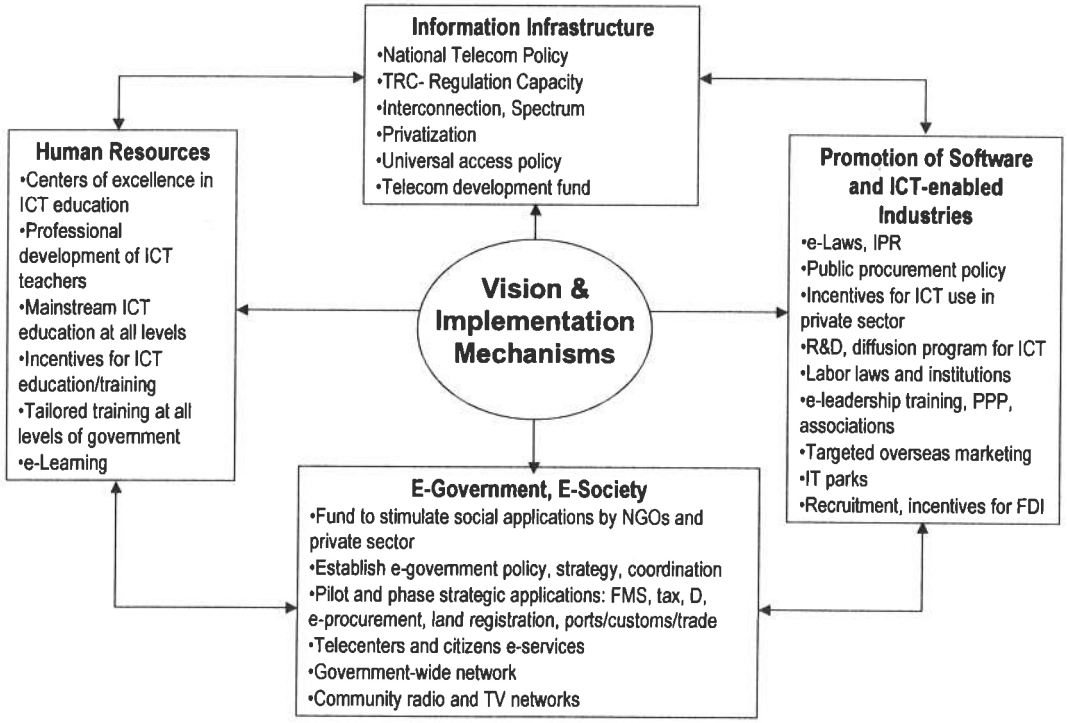


These programs run concurrently and are integrated. The objective also is to bring local integration and external/global linkage to bear. Public-private partnerships are key to success of each of the programs and to the integrated vision.

The foundation of the strategy is to get our own house in order, by building implementation capacity; this includes creating an ICT agency and appointing a CEO and a super team. We also need to build the national information infrastructure, create a framework for the promotion of software and ICT-enabled industries (enabling environment and market creation); and to develop ICT human resources. We will develop a wide spectrum e-government system to achieve the highest standards of good governance as well as deliver citizen services; and use ICT as a key lever for economic and social development - bridging the digital divide, through a variety of innovative and on-going societal applications.

The interactions among the five programs are highlighted in figure 2:

Figure 2: **Sri Lanka's ICT Strategy: e-Lanka**



This Roadmap outlines how we will implement the five-program strategy to achieve the vision of e-Sri Lanka by 2007.

Action items are detailed in Attachment 1 (Five Year Strategic Action Plan).

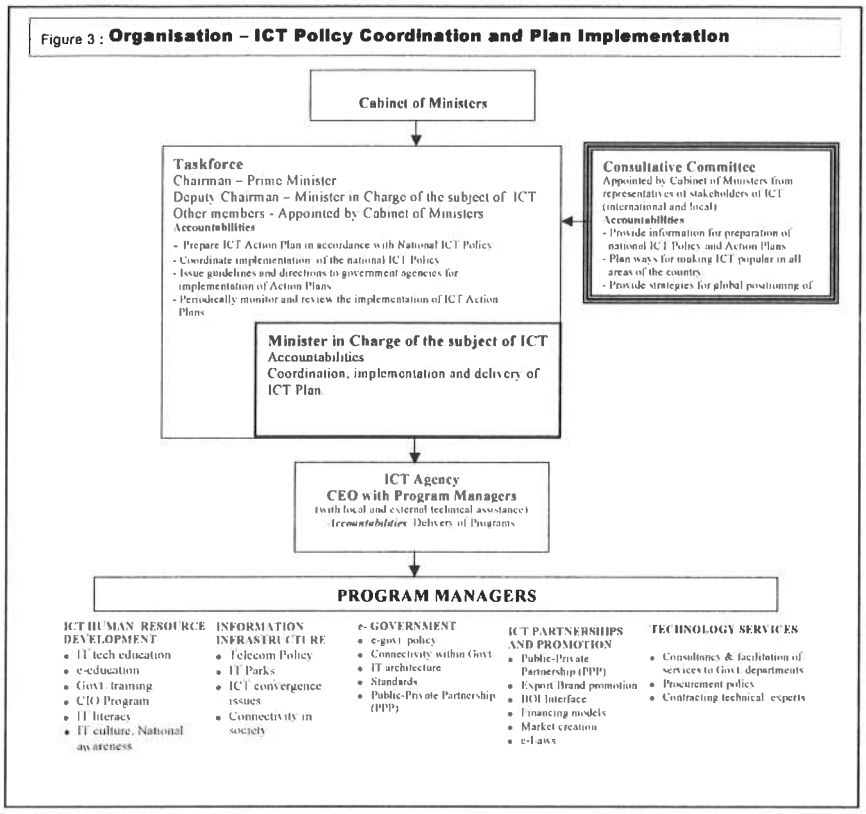
The five **Programs 1 - 5** are in the following sections.

III. Program 1 - BUILD IMPLEMENTATION CAPACITY

Having the right implementation framework and implementation capacity in place are critical to produce results and to ensure quick learning from pilots and early phases of program implementation, and to secure continuous adaptation in the light of fast changing ICT and global markets.

To build implementation capacity, we will take the following steps:

- The Prime Minister takes the lead in setting the overall ICT strategy and communicating this vision to all stakeholders.
- The Cabinet of Ministers will appoint a National Task Force to give ICT Policy directions. Establish an ICT Consultative Committee to provide advisory input to the PM and Task Force on policies. Membership of the Consultative Council will be drawn from the Secretaries of Key Ministries, Industry Leaders (both ICT suppliers and users), Professional Associations, Think Tanks and International Experts.
- Establish an ICT Agency headed by a CEO, reporting to the Minister in Charge of the subject of ICT. The CEO of the agency will be supported by five program managers to cover: ICT human resource development, information infrastructure, e-government and e-society, ICT promotion and partnerships, and technology services. The Technology Services arm of the agency will recruit the necessary skills, contract with experts both local and overseas, and provide in-house consultancy to government-wide initiatives. The *Modus Operandi* adopted by the agency will be one of results-orientation, speedy decision making, and openness and partnership with all stakeholders.
- The ICT Agency will provide leadership in the establishment of Public–private partnerships/constructs in the field of ICT. The agency will also be the apex coordinating body with respect to donor assistance programmes focussed on ICT.
- All key ministries will establish ICT implementation units to carry out their components of the ICT program. Each minister may consider creating a CIO position, or assign this accountability to a high-level champion within the ministry. Alternatively the Agency could include Ministry specific programme champions/ coordinators who are placed in a matrix reporting structure involving the key ministries. All key ministries will have their own in-house champions and have clear ownership in the modernization and citizen centered orientation of government services.
- Substantial time and resources will be devoted to change management efforts, skill upgrading, and the redesign of business processes. The Minister of ICT and the CEO of the ICT agency would work closely with the CIOs and ministerial champions in achieving the desired levels of transformation.



IV. PROGRAM 2 - BUILD NATIONAL INFORMATION INFRASTRUCTURE AND ENABLING ENVIRONMENT

A. Building "Hard" Infrastructure — *providing affordable telecommunications services for various users, and ensuring local and global connectivity*

Without solid connectivity, we cannot succeed. A major investment in infrastructure is necessary for enabling e-government, e-learning, and e-commerce, and for allowing the country to be part of the "networked" and interdependent global knowledge economy. In order to implement this, the private sector will have to play a lead role to mobilize the necessary resources. Lessons learned in other countries will be taken into account in order to select the most appropriate ways of financing and sequencing this substantial investment. An aggressive infrastructure development roadmap will be anchored by a study covering the communication needs of all segments of business and society and the most appropriate ways of mobilizing and complementing private sector investment. The precursor to this is building upon the present competition-centered communication policies and the establishment of the independence, effective governance and enforcement authority of the Telecommunications Regulatory Commission.

- Our target is 15% for fixed line penetration by 2007, and a similar target for mobile lines
- National backbone development and networking as well as the linkage of the internal infrastructure so established, to global backbones will be addressed as a top priority
- We will address rural connectivity, national backbone development and fiber wiring a few hot spots, commercial centers in the capital and surrounding business cluster and key industrial parks in Sri Lanka.

To accomplish this, we will:

- Eliminate current uncertainty and regulatory risk by adopting the final recommendations of the new National Telecommunications Policy.
- Follow the policy with the immediate articulation of a National Telecom Action Plan or Road map designed in line with the policies espoused in the NTP. Attachment 2 outlines what can be done quickly in telecommunications to support ICT initiatives.
- Take practical and incremental approaches to minimize risks for the government, and reinforce market forces. Work closely with the private sector and attract potential investors to extend the information infrastructure under various scenarios of incentives and regulatory regimes.
- Establish an explicit universal access policy and create a Telecommunications Development Fund (TDF).
- Proceed with further privatization of the incumbent PSTN after eliminating current uncertainty and regulatory risk. A high priority will be given to the restructuring of SLT with a view to maximizing the benefit derivable from the legacy infrastructure towards the future development of ICT infrastructure.

B. Building "Soft" Infrastructure and Creating the Enabling Environment

It is recognised that Sri Lankan software companies are at a significant disadvantage relative to overseas competition because of their lack of critical mass, supportive habitat and/or large local customers. While many Sri Lankan software companies have the competence to undertake large, complex projects for government and local companies, they often encounter significant difficulties in winning these types of business.

Therefore, we will:

- Create a business-friendly policy environment. Conduct high-level training and development for government leaders to ensure they can lead the

change management process involved in making effective use of ICT in government, and to help them create the necessary enabling environment for a competitive ICT industry.

- Bring software industry leaders into the policy making process.

- Using market lead business models, supplement the national (hard) ICT infrastructure with a multi-layered soft infrastructure possessing the capacity to meet the challenge of transforming Sri Lanka into a regional leader and hub for ICT enabled services. The spectrum of soft infrastructures will range from Internet based infrastructures such as e-commerce gateways/platforms, trading platforms, shared (ASP) model infrastructures, automated financial services platforms, etc., through to the heart of the nation's ICT infrastructure which is the capacity, critical mass and capability of the software development and e-service provider industry.

- Provide an immediate impetus to the local industry by encouraging capacity building through the combining of capabilities and capacity. These parties may compete either individually or in the form of a consortium for the development of first tier e-government applications, service provider platforms (e.g. shared database and infrastructure model for e-government applications).

- Fast track the enabling laws for e-government and e-commerce.

- Inculcate an industry wide ethic of quality control and assurance along with sound cost based contracting methodologies in order to ensure that the output of the industry for both local and overseas markets would be of a high standard.

- Reform venture capital laws and exchange controls that inhibit the availability of high-risk capital. Work with the financial and Venture capital (VC) community to modernize the regulatory framework, to examine options for establishing public-private VC funds, and to provide lines of credits for making offshore tenders.

- Examine labor laws pertaining to retention, retirement, and others areas to facilitate workforce mobility in line with the needs of the software and ICT-enabled services.

- Stimulate domestic demand for software applications. Review and improve public procurement policies and practices to ensure they do not discourage or arbitrarily exclude local bidders from participating in government procurement of ICT services and computerization projects, including those funded by donors. Use government automation and e-government programs to further create the local demand and project management

experience needed for promising local software companies. Create incentives that are tailored for large companies to integrate into the global supply chains and for small and medium enterprises to adopt basic ICT tools and train their employees.

- Help software exporters establish awareness of Sri Lanka as a preferred source of ICT products and services. This will include promoting the software industry through foreign missions, hiring marketing firms for building Sri Lanka brand awareness in targeted markets, mobilizing the Diaspora to create market opportunities for Sri Lankan ICT products, and sponsoring a study for a national ICT export strategy drawing on the experiences and successes of India.

- Develop Sri Lanka as an Open Source Software Development Centre.

- Commission an International study on new-wave ICT market opportunities in order to identify and subsequently build on a defensible niche(s) on the Global ICT landscape in which Sri Lanka will achieve recognized international status.

- Recognise "Testing, Certification and Quality Assurance" as an emerging sector in the global ICT market space and sponsor a study to identify priority areas and build capacity in the local industry to exploit an evident window of opportunity with a view to positioning Sri Lanka as a global leader in a high return global sector.

- Review pending laws of special importance to multinational enterprises in the ICT industries, and create a one-stop-shop to recruit and locate leading ICT multinationals.

- Work in partnership with the private sector (including possible overseas investors or ICT park operators) to develop one ICT park as a show case to promote a dynamic ICT cluster, and build on this experience to encourage the development of other parks.

- Establishment of an ICT Development Zone/Cyber Corridor - named as the Sitawaka Corridor- A focused ICT Development Area onthe Eastern boundary belt of the Mega-polis coveringparts of Attanagalla (Nittambuwa-Urapola), Dompe(Kirindiwela) amd Homagama electoral divisions.

  The corridor will be supported by state of the art highway and telecommunications infrastructure. The Sitawaka corridor will be promoted as the desired location for the siting of ICT related manufacture and application development covering a broad range of application areas such as education, health and entertainment, in addition to core technology based industries.

- Recognise the importance of establishing an excellent support infrastructure for the ICT sector. In particular the promotion and elevation of National R&D facilities across a range of sectors to international standards will be facilitated at selected centres of excellence. The combination of R&D facilities with incumbent human resources in the form of world class diaspora across a wide spectrum of expertise will serve to provide a "hot bed" of ICT industrial activity in the country.

C. Building Capacity for Adaptation, Learning, Monitoring, and Evaluation

The Integraton of ICT into development processes and delivery mechanisms for public and private services require as pre-requisites, social learning, agile planning, local initiation and the sharing of local and international experience and best practice. Effective monitoring and evaluation is a must. It is recognised that no blueprint plan will remain relevant for long, given the frequent and rapid changes in ICTs and the degree of local adaptation and innovation needed to exploit these technologies.

Therefore, we will emphasize on building capacity for adaptation, learning, monitoring and evaluation. Visionary High level leadership and strategic direction are no doubt critical to success. However, equally important will be the capacity to learn quickly from local actions, and the existence of enabling mechanisms to support local initiatives and participation.

To build this learning capacity, the government will:

- Focus on creating the enabling environment and inducing private sector lead bottom up community initiatives.
- Play a catalytic role by supporting pilot and fast-track initiatives to demonstrate the benefits and cost-effectiveness of ICT solutions prior to their scaling up for widespread application.
- Mobilize political and private sector support for the establishment of large scale investments (typically having longer gestation) and for fundamental changes required in institutional constructs.
- Apply overriding emphasis on the mobilisation of the resources and capabilities of the private sector, NGOs and community groups. Only in cases where there are clear market failures and/or substantial externalities and public good rational, will the government intervene to lead or create market forces, once again in a fashion which will complement and catalyse the initiatives of the private sector.
- Become an effective and exemplary user of ICT to meet government's own information and communication requirements. The use of ICT in this context will be shown to reduce transaction costs between government and business in addition to providing cost-effective, citizen-centered public services.

- Take the lead in ICT related higher education and in augmenting the pool of human resource for ICT industry development, effective use and wide diffusion. At all times the government will facilitate the leverage of private sector resources through dismantling bureaucratic constraints and disincentives to private sector participation in ICT human resources development.
- Recruit multinational companies with core competencies in ICT education and training, and encourage them to invest and partner with the local counterparts.
- Encourage local initiatives, local experimentation and learning through competitive access to national resource pools, and through complementary and coordinated funding by government agencies and international donors.

V. PROGRAM 3 - DEVELOP ICT HUMAN RESOURCES

Strategies for human resource development and for stimulating the ICT industry are based on emerging opportunities in three key segments:

- To develop software products for new applications and markets
- To capture a significant share in the Global Software Services market.
- To secure a dominant position in the global market for ICT-enabled services and business process outsourcing.

These segments present different opportunities and challenges, and have different training requirements and employment related impacts. The development of ICT HR would be clearly multi-layered and multi-skill based. ICT HR would range from ICT experts and professionals through ICT service/production sectors down to blue collar ICT trained workers. It is critical to aim for a globally competitive ICT workforce. In addition, the human resource strategy aims to prepare the rest of society for the knowledge economy and to enhance the productivity of working professionals.

To develop ICT human resources, we will:

- Increase the number of qualified software professionals by: initially establishing at least three centers of excellence, assessing and addressing the needs of tertiary ICT education to upgrade quality and expand capacity, providing incentives for the pursuit of software education, granting autonomy for public university ICT programs, and providing incentives for R&D activities in universities and across the private sector.

- Focus on preparing for future markets, including training for IT-enabled services such as financial services, global logistics, professional services

(legal, banking, medical, accountancy), ICT-enabled services (call centers, data processing etc).

- Mainstream ICT education at multiple levels of learning. ICT education will thus cover a wide spectrum covering training programs in the use of ICT tools in those disciplines with the greatest impact on the economy ranging to ICT literacy in primary and secondary schools. e-learning will be supported in priority disciplines and under-served areas.

- Ensure that teachers undergoing training learn computer-based pedagogy for primary and secondary education. Prerequisites are a robust training program for teachers and students and universities, as well as a basic and affordable connectivity. A fast track approach will be taken with respect to Connectivity and ICT usage in schools.

- Make ICT awareness programs through the electronic media a regular feature, and expand mobile awareness programs to cover all parts of the country. At least 15% of all primary schools will be equipped with ICT labs in the next 3 years.

- Increase intake of undergraduates for ICT based University courses to at least 1,000 per year. 100 University staff would be provided training at MSc level to be increased subsequently.

- Use ICT as a fundamental enabler for the broadbasing of multi-layered as well as tertiary education across the country. This will be made possible through the use of e-learning infrastructures with maximised reach with respect to the number of educational institutions offering virtual education, as well as the breadth of curricula offered and the volume of students benefited from the initiative.

- Augment ICT training for working professionals by providing incentives for corporate ICT and English Language training, and by piloting training programs that are tailored to public sector leaders and to all levels of civil service.

- Increase opportunities and incentives for English and ICT literacy through tax incentives, tuition loans, certification, use of TV and radio programs and the broad-basing of tertiary and University education through virtual learning.

- Increase the supply of ICT professionals by a prudent policy on issuing of visas for foreign ICT professionals with required skill sets and by actively recruiting and providing incentives for leading ICT multinationals and training institutions to invest in Sri Lanka.

Details are provided in attachment 3.

VI. PROGRAM 4 - e-GOVERNMENT: DELIVERING CITIZEN SERVICES

To build e-government and deliver citizen services, we will:

- Establish an ongoing high level forum on e-government to facilitate a national dialogue and consensus on an e-government vision and to support the establishment of institutional frameworks for planning and implementing e-government initiatives. The forum will also facilitate continuous input and feedback from those who make use of government services.

- Commission a study by world class experts working alongside Government Sector ICT professionals to help detail priority e-government needs, applications and milestones leading up to the establishment of an e-government roadmap and action plan.

- Address communication and connectivity needs of government and work towards the establishment of a government wide area network, the implementation of which will be carried out by the private sector on competitive basis. The Government's information infrastructure will also support a secure and robust email system linking every government institution and employee.

- Focus on the development of fundamental data registries/databases that will serve many e-government applications: a master database of citizen data.

- A GIS encompassing land registration, survey, census and statistics data will also be implemented.

- Identify, prioritize, and contract out the development of e-government applications, and automation of major transaction systems, including, among others, government financial systems, customs, e-procurement, inland revenue/tax, company registration, land registration, vehicle registration, birth and death registration, Immigration/emigration, Police/Law enforcement, Import/Export documentation, National Credit Reporting Agency, ID/smart card, and unified project (fiscal and physical progress monitoring) management system. Applications will be prioritised based on the criteria that weigh the need for quick dividends to both citizen and government, the envisaged strategic impact on government costs/revenues, and other "network" effects complementing parallel initiatives.

- Establishment of a National Operations Room (NOR) as a focal point for the monitoring of policy implementation on a nationwide basis. The NOR will

provide multi-tiered drill down capability ranging from Policy implementation through to individual project management in terms of fiscal and quantitative performance. The NOR will reach out to all parts of the country through the Government WAN and provide multiple views of GIS data in addition to performance measurement data.

- Establish multiple levels of Government to Citizen (G2C) Service Delivery infrastructure ranging from the dispensing of government information through telecenters through to multi-functional ICT enabled citizen centers which would provide a one-stop service point for government - citizen interactions. Several pilot initiatives will provide proof of concept for the related infrastructures, e-government applications, and the viability of business models pertaining to G2C service delivery. Following proof of concept the delivery of citizen services will be packaged in to viable business propositions for subscription by the private sector.

- A government call center will be established to provide voice based interactive support to citizens in carrying out their interactions with the government.

- Establish a Sri Lanka Portal which will serve as a global front end to the nation's ICT enabled administration and service delivery channel.

- Establish an ICT enabled Government to Business (G2B) Interface which will facilitate the seamless interaction between the private sector and the government in the transaction of business, procurement and day to day commercial activities including but not limited to customs, taxation registration and funds transfer.

- Ease regulations concerning procurement practices enabling the participation of a wider spectrum of local software developers. The contracting of e-government applications is seen as an ideal opportunity to mobilize a consortium of Sri Lankan IT firms for the execution of a national level initiative - the experience and expertise so gained would in turn assist the e local IT industry In establishing international competitiveness.

Details are provided in attachments 4 and 5.

VII. PROGRAM 5 - USE ICT AS A KEY LEVER FOR ECONOMIC AND SOCIAL DEVELOPMENT

We will address several broad aspects pertaining to the bridging of the digital divide: among these, priority will be given to societal applications and content development targeted at poverty reduction and social development, connectivity and telecenters to promote access to the Internet and computer

literacy, and the use of mass media for broadbased dissemination of information and knowledge.

A. Societal Applications and Content Development

We will:

- Establish a national fund to support innovative applications of ICT for social and rural development. NGOs and private sector entities would be invited to submit proposals through a competitive process for this "social venture capital fund." (Details are in Attachment 6).

- Study alternative channels and mechanisms to manage the Social Venture Capital Fund, to ensure participation of key stakeholders, simple and quick approval processes, and selection of applications and local initiatives that address national priorities for social development and poverty reduction. Donors and foundations committed to social development may contribute to this fund.

B. Connectivity and Telecenters

We will:

- Establish explicit Universal Access Policy obligations for licensed operators to contribute towards an (telecom) Infrastructure development fund.
- Partner with the private sector, local government and community organizations to develop telecenters and other forms of public access to information and communication services.
- Establish a working group to examine on an ongoing basis, the experiences both nationally and overseas with respect to connectivity enhancement to rural communities. The group will propose a pilot program to systematically examine options to enhance telecenters' financial sustainability and their reach to the rural areas.

C. Mass Media

The converging broadcasting and multi media sectors can make an inestimable contribution towards the social, political and economic development of Sri Lanka; together these sectors will provide for the most extensive and broadly-based dissemination of information and knowledge, enhancing the reach and quality of education, health care, promoting empowerment and equitable growth and strengthening democracy and nation building.

Therefore, we will:

- Deregulate the mass media sector, instilling it with such universal principles as freedom of expression, equality, multi-culturalism, multi-ethnicity, choice, and diversity within a framework of national unity.

- Reformulate Sri Lanka's mass media and multi media policy and objectives to be based on internationally established principles. Policymaking is a shared responsibility of public authorities and institutions, and principally so by Parliament, Government and the Regulatory Authorities. Clear and detailed processes will be established for interaction among these entities, which will also define mechanisms to resolve policy disputes (attachment 7).

- Specific practical steps to be taken include:

  - Planning and implementing a massive and sustained e-education campaign, making the most extensive use of the airwaves
  - Conducting a systematic English proficiency campaign for primary, secondary and tertiary pupils and students via radio and television
  - Converting all present - and future - community radio and television stations into fully-fledged Internet relay stations, transforming them into "Gateways to the new ICT world"
  - Equipping all cinemas and telecenters with multi media facilities
  - Digitizing all archived educational video and audio material, presently housed in the country's television and radio stations and its many non-governmental organizations, with the objective of enriching them with interactive multi media components

See attachment 7 for details.

Finally, this vision becomes a reality only with the support and engagement of all - the Legislature, the Executive, the Public Sector, the Private Sector, the Academia, the Donor Community, the NGO's and above all the People of Sri Lanka as willing partners to achieve the critical milestones given in the Strategic Action Plan, during the five years ahead.

Acknowledgment : We are thankful to the industry, the consultative groups, the World Bank, SIDA, USAID and the other multilateral agencies for the input provided in the preparation of the Roadmap.

Attachment 1

Five-Year Strategic Action Plan

Goals	Recommended Action	Responsible Parties	Time Line	Est. Gov. Cost in US$ MM
Implementation Mechanism				
Create Leadership and Focus for ICT	The Prime Minister to be the sponsor of the ICT Policy. Led by the PM, initiate massive communication campaign to raise awareness and appreciation of ICT role in national development strategy	PM, Minister of ICT	Nov 2002	
	ICT to be given the highest level of priority on the national agenda through a Cabinet appointed Task Force, chaired by the Prime Minister, assisted by the Minister responsible for ICT	PM, Minister of ICT	January 2003	
	Ensure stakeholders participation and the leverage of international and local expertise through the appointment of a national consultative committee on ICT	Minister of ICT	January 2003	
	Create an Apex agency to spearhead the nations ICT development road map.	Minister of ICT	January-March 2003	1-3
	Appoint a CEO for overall implementation of the ICT Strategy.	PM, Minister of ICT	January-March 2003	
	Establish the Sri Lanka Technology Services agency, reporting to the CEO which will recruit the necessary skills to provide in house expertise on overall government information infrastructure and standards and to carry out procurement, contract with experts and provide overall MIS support and consultancy across government departments, as needed and requested by departments.	Minister of ICT	June 2003	1 - 3

Goals	Recommended Action	Responsible Parties	Time Line	Est. Gov. Cost in US$ MM
	Appoint five Program Managers to lead countrywide coordination of ICT Policy and Industry Promotion, Human Resources, e Government, Telecommunications and Technology Services.	CEO ICT	January-March 2003	3 – 5 m for CEO, 5 program managers for 3 years, and other support/TA to ICT Agency
	Establish ICT implementation units in relevant Ministries to lead implementation of their components of the ICT program.	Relevant Ministers	January-March 2003	1 – 3 m total
Dynamic Telecommunication Infrastructure				
Eliminate current uncertainty and regulatory risks	Adopt the final recommendations of the new National Telecommunications Policy. Follow this immediately with the National Telecommunications Action Plan/ Road Map designed in the line with the Policies espoused in the NTP.	PM	March 2003	1 – 3 m for TA
	Ensure greater independence and authority for the TRC to regulate all the ICT sectors. Restructure the organization, appoint empowered Chair and full time Commission members, train the TRC staff, and ensure transparent regulatory proceedings. Strengthen the Commission's spectrum management functions and capabilities.	Min. Mass Communication	March 2003	3 – 5 m for TA and training
Increase Competition	Transform the telecom market structure towards a more liberalized technology-neutral model. Develop a comprehensive interconnection framework that will be in compliance with Sri Lanka's WTO commitments.	Min. Mass Communication and Min. Economic Reform	March 2003	

Goals	Recommended Action	Responsible Parties	Time Line	Est. Gov. Cost in US$ MM
	Proceed with further privatization of SLT, following the elimination of current uncertainty and regulatory risks. Give high priority to maximizing the benefit derivable from the legacy infrastructure towards future development of ICT infrastructure.	Mass Communication Min. Economic Reform	Nov 2002	Revenue depending on 100% share sold. 1 m TA for restructuring privatisation
Human Resource to Support ICT Strategy				
Increase number of qualified software professionals	Establish three centers of excellence in ICT (as proposed by TCI). Encourage them to immediately prepare plan for increasing quality and quantity of graduates and to prepare for future markets. Encourage development of distance learning curriculum from these institutions to broaden education in IT.	ICT, Tertiary Education	June 2003	5 – 10 m
	Encourage students to undertake software education at public and private institutions, e.g., with tax deferments, tuition grants/ loans etc.	Education, Tertiary Education	Sept. 2003	3 – 5 m
	Conduct an outside audit of the relevant departments (Computer Science, Software Engineering, Management Information Systems) of Sri Lankan Universities and their graduates to identify shortfalls in curriculum, faculty training, and graduation requirements. Improvements based on auditor's recommendations should be funded immediately. Include private sector input from large and small software companies.	ICT, Tertiary Education	June 2003	1 m
	Expand software education capacity at the Universities. Address Teacher's salaries issues and continuous professional development.	Tertiary Education	Sept. 2003	10 - 20
	Develop fast-track plan to grant autonomy to public University ICT programs.	Tertiary Education	June 2003	1 m
	Create incentives for broad support of R&D at all Universities, Technology Parks, ACCIMT, Private educational institutions, and corporate R&D groups. Encourage corporate sponsorship of University R&D as well as joint industry-academia research projects.	ICT, Tertiary Education, Science and Technology	Sept. 2003	10 - 20

Goals	Recommended Action	Responsible Parties	Time Line	Est. Gov. Cost in US$ MM
Mainstream ICT Education at all Levels	Pilot program to train non-ICT students in effective use of ICT tools in their disciplines (such as science, engineering, medicine, management).	Tertiary Education	June 2003 - June 2005	3 – 5 m
	Pilot program in computer literacy and in the use of ICT to enhance quality and reach of primary and secondary education. Pilot e Learning programs for teacher training. Build on / scale up World Bank / IDB assistance in this area. These programs must be coordinated with measures to improve connectivity and affordable access.	Education, Schools Education	June 2003 - June 2005	5 – 10 m for pilot only
ICT training for working professionals	Consider tax credit scheme for companies who invest in software training (and foreign language training) for their employees.	Finance	Sept. 2003	
	Pilot program to train all levels of management in government in the strategic uses of IT, IT procurement, and project management, as well as in fundamental ICT skills.	ICT, Public Administration	June 2003- June 2005	1 – 3 m
	Pilot program in computer literacy for all civil servants.	ICT, Public Administration	June 2003- June 2005	1 – 3 m
English	Increase the amount of English language training at all levels critical for both software and IT related services industries.	Education	Sept. 2003	5 – 10 m
	Initiate TV/ Radio programs to raise English proficiency through the country.	Mass Comm., HRD	Sept. 2003	3 – 5 m
ICT literacy/ culture	Create national campaign to raise awareness of ICT. Create and offer computer literacy course via TV.	Mass Comm., HRD, ICT	Sept. 2003	3 – 5 m
Other HR related actions	Implement visa program for foreign ICT professionals (similar to US H1B Visas).	Interior, Labour and ICT	March 2003	
	Create an ICT education advisory council to inform policy and guide government programs. Include software industry leaders as well as government and private stakeholders.	Education	March 2003	

Goals	Recommended Action	Responsible Parties	Time Line	Est. Gov. Cost in US$ MM
Promotion of Software and ICT enabled industries				
Stimulate domestic demand for software product and services (to create a supportive habitat for local software exporters)	Reform government procurement practices so that local software companies can compete on a level playing field.	Finance	June 2003	
	Use government automation and e-government projects to stimulate the domestic software industry.	ICT	July 2003	
	Create incentives for private sector investment in new information systems. These measures will also improve the competitiveness of Sri Lanka's other industries.	ICT, Finance	June 2003	3 – 5 m
	Create innovative pilot programs for national resources sharing, such as country-wide PC hot line to help all citizens with basic computing and internet questions.	ICT, Public Admin.	July 2003	3 – 5 m
Create a friendly policy environment for all software companies, especially small start ups	Conduct high level workshop for top government officials to enable them to be leaders in introducing ICT in their organizations and creating an enabling environment for growth of ICT related industries.	ICT, Public Admin.	March 2003	1 m
	Bring software industry leaders into the government policy-making and planning process at the highest level, e.g., through Consultative Committee.	ICT	January – March 2003	
	Implement mechanisms for fast-tracking enabling laws and programs for the ICT industry. Consider making English the legal language for ICT related laws.	ICT, Commerce, Labour, Justice	March 2003	
	Reform venture capital financing laws, import/export controls and other policies that inhibit the availability of high-risk capital. Work with VC community to devise plan for joint public- private fund for investment in promising ICT companies.	ICT, Commerce, Finance	Sept. 2003	1 m (TA)
	Study the impact of labour laws on the ICT industry and revise appropriately to support industry workforce flexibility needs.	Labour, ICT	Dec. 2003	1 m
	Create Policies and Programs to assist software services companies in obtaining Lines of credit, guarantees and other help for making off shore tenders.	Finance, ICT	Sept. 2003	

Goals	Recommended Action	Responsible Parties	Time Line	Est. Gov. Cost in US$ MM
Help Software exporters establish awareness of Sri Lanka as a Technology producer	Partner with industry associations, EDB, BOI, and foreign missions in targeted marketing efforts overseas.	ICT, Enterprise Dev., Foreign Affairs	June 2003	5 – 10 m
	Sponsor a study to estimate current market and future trends for targeting software segments and ICT-enabled services for which Sri Lanka would have a competitive advantage in 2-3 years	ICT, Enterprise Dev.	June 2003	1 m
	In key foreign markets, engage Sri Lanka expatriates in seminars, online discussion groups, distance learning projects, and other activities to stimulate business development assistance and knowledge exchange.	ICT	March 2003	1 –3 m
	Encourage and prepare top government officials to personally promote the Sri Lanka software industry in their dealings abroad.	ICT, Foreign Affairs, Commerce	March 2003	
Create a competitive environment for attracting and supporting IT related services companies	Ensure that high-quality bandwidth will be available at regionally competitive prices. Expedite processing of licenses and private proposals for Colombo area infrastructure improvements.	ICT, Mass Comm.	March 2003	
	Sponsor a study to identify priority areas of soft infrastructure (such as internet data centers, electronic trading hubs, payment gateways, etc) for investment and targeted incentives.	ICT	March 2003	1 m
	Accelerate pending and new legislation of key importance to MNE's, such as IP protection, computer crime, etc. in order to attract more outsourced software and ICT-enabled services to Sri Lanka.	Enterprise Dev., ICT, Justice	March – Dec. 2003	
	Improve the BOI's efforts to provide comprehensive services for MNE's who are considering locating operations in Sri Lanka. Aggressively target leading ICT multinationals to locate in Sri Lanka.	Enterprise Dev., ICT	June 2003	5 – 10 m
	In a public-private partnership, develop one showcase technology park as a means of expediting the creation of an ICT cluster of both local companies and MNE's.	Policy Dev., ICT	Dec. 2003	20 – 50 m

Goals	Recommended Action	Responsible Parties	Time Line	Est. Gov. Cost in US$ MM
e-Government				
Put in place Key Enablers	Announce National IT and e-government policy and Roadmap. Appoint Key players with the highest levels of authority & Allocate Budgets	Prime Minister	Nov 2002 - March 2003	
Design a detailed e-government strategy and roadmap	Engage a reputed Global Management Consultant to study individual departments & services To be dovetailed with overall National Development Strategy Establish a High-Powered Sub-Committee to decide on the broad IT Architecture for SL	CEO ICT, Key Private Sector Actors	March 2003	1 - 3 m
Deliver Remote Citizens e-Services	Identify 4-6 key pilots : Potential areas can be land registration, utility payments, taxation, government information service, employment, e-learning, passports etc. Identify 3 key Geographical locations Design and issue RFPs for inviting private partnerships for implementation	CEO ICT, Egov, Heads of Concerned Depts. / Agencies	January 2003 – June 2003	1 – 3 (pilot project at 3 locations)

Goals	Recommended Action	Responsible Parties	Time Line	Est. Gov. Cost in US$ MM
Create Enable information Infrastructure	Create the National People's Hub Create the National Land Hub including GIS Database Establish a Wide Area Network to connect the major cities Design a Private-Public Partnership to implement it Budgetary Support for Capital Expenditure and Financing Models. Telecom Liberalization	CEO ICT, DG-Surveys, Census, Commissioner RPD, TRC, District and Divisional offices	January 2003 Dec. 2004 Initial dialogue design RFP; March – Oct. 2003 Pilot rollout. Dec. 2004 Full rollout	5 m (land and people's hub, Pilot and complete database) 5 m (for WAN, over a period of 5 years- cost may be transferred to the private on a BOO/ BOOT basis)
Internal Government Automation	Identify Key Departments and strategic application: e-procurement, integrated financial and budget systems, ports and customs, trade net. Introduce a nation-wide project management system to improve project and financial management and accountability. Select Vendors for automating them Train Govt. Employees to use new applications and systems Launch Sri Lanka Portal	CEO ICT, Dept. Heads, outside vendors/ Agencies	June 2003-Dec. 2006	50 – 100 m (Will vary with project scope and structuring)
Bridging the Digital Divide				
Stimulate ICT-enabled social development	Establish a national fund to support innovative applications of ICT for social and rural development. NGOs and private sector would submit proposals through a competitive process.	Minister ICT	June 2003 - June 2006	10 m
Increase connectivity in rural areas	Establish explicit Universal Access Policy obligations for licensed operators to contribute to US, create a telecom development fund.	Minister ICT, TRC	June 2003	10 – 20 m

Goals	Recommended Action	Responsible Parties	Time Line	Est. Gov. Cost in US$ MM
	Encourage the construction of multipurpose community centers, first through a pilot program.	Minister ICT	June 2003 - June 2004	3 – 5 m for pilot program
Support the development of the film and content industry	Provide incentive for startups and independent content providers.	Culture, Mass Comm.	Sept. 2003	10 m
	Transfer educational video material into digital format for interactive training and infotainment.	Mass Comm., NGOs	Dec. 2003	3 – 5 m
Establish community radio and TV networks to act as gateways to the Internet	Open up the community radio and TV sectors; integrate ICT structure to bring wealth of Internet to villages; provide frequencies for community radio and TV stations.	Mass Comm., Finance, NGOs	Dec. 2003	5 m
Enhance TV/radio staff's competence in the use of multimedia applications	Design curriculum for multimedia training for all TV/radio staff in cooperation with private sector and NGOs	Mass Comm., NGOs	Dec. 2003	1 m

Attachment 2

What can be done quickly in the telecom sector to support ICT initiatives?

I. Telecom Infrastructure for ICT Service Industries

For e–commerce

E-commerce is defined broadly to include b-b, b-g, and b-c. E-commerce relationship may be seen as intra-country as well as inter-country. Obviously, soft infrastructure such as Public Key Infrastructures and mechanisms for assuring trust and confidentiality are needed for e-commerce. But the focus here will be on the fundamental network infrastructure, ranging from narrowband lines to broadband access and extending up to Payment gateways, Backend Services and secure servers.

- **Network rollout**. Sri Lanka has experienced rapid acceleration in network rollout in the past few years (CAGR of 30%+ in fixed lines which is the most relevant to ICT service provision). It is imperative that we maintain, , if not increase, the momentum. It is essential that we respect the commitment made to investors and provide certainty to future investors. This massage is reflected in the overall recommendations of the recent telecom consultation (Attachment 1: see also draft National Telecom Policy (NTP). Implementation of recommendations regarding technology-neutral licensing and non-discriminatory interconnection will increase incentives for rollout by all operators/stakeholders in the industry.

- **ISPs and Competition in Internet Service Provision**. Sri Lanka has 44 licensed operators, a majority of them licensed to provide Internet services. Of this group, some are licensed to build physical infrastructure while others are required to obtain facilities from the former group. The recent telecom consultation process identified the possibility of anti-competitive practices affecting the non-facilities based Internet providers in particular and recommended that the Telecom Regulatory Commission (TRC) conduct and investigation and implement remedies.

- **Leased lines**, Leased lines, domestic and international, are vital elements for ICT service provision. They are currently over-priced and difficult to obtain.. Access to satellite capacity was liberalized in 1999, but undersea cable capacity is constrained by the incumbent's claims of exclusivity. The recent telecom consultation process recommends action to further liberalise this sector. In addition, the introduction of a liberal licensing regime for international gateways combined with a proper domestic interconnection regime will contribute to the lowering of price and greater availability and

choice. With a an adequate number of players licensed to build network capacity domestically, there is no obvious reason for complaints re domestic leased lines, other than anti-competitive practices deriving from vertical integration. This problem is likely to be resolved by implementation of the telecom consultation recommendations.

- **Retail pricing,** Flat-rate pricing encourages users to stay online and facilitates engagement in e-commerce. Flat-rate pricing is not possible in Sri Lanka in the near term because congestion is an ever-present danger in a fast growing network.

  Measured service and peak/off-peak price differentiation allows the use of economic incentives to redistribute demand and manage congestion (in at least one exchange area the daily peak was shifted to the evening by this means in 1998.) Flat-rate or drastically reduced per-minute rates are possible during the off-peak periods (this has been done to an extent since 1999). One way of achieving this would be by allowing intra-region data usage at flat rates. This would also improve the network congestion a great deal and would help accelerate internet usage.

- **Termination rates and ISP Pricing**. Interconnection based on sender-keeps-all (SKA) creates disincentives for Internet services. A proper interconnection regime can create incentives not only for the provision of incoming-only lines, but even for "free-surf" type arrangements wherein ISPs can officer "free" or minimal-price services, based on termination payments received from network operators. Such an interconnection regime is proposed in the recommendations of the telecom consultation process.

- **Payment Infrastructure and Secure Servers**. Adequate demand for the provision of e-commerce services by Sri Lanka vendors is likely to ensure provision of payment infrastructures (gateways and exchanges) and secure server facilities by local operators. The Government also needs to enact a Data Security Act to ensure legal confidentiality of sensitive corporate data lying in off-shore data farms. This would also send a good signal to the global corporate community about the certainity of law enforcement in the event of any data tampering and would incentivize investment in the area of IT enabled services and the new global industry of business process outsourcing (BPO).

- **Backbone capacity**.. In addition to the incumbent and major fixed operators as well as a potentially profitable "carrier's carrier" capable of supplying backbone capacity, it is likely that additional capacity will be brought on stream by the facilities-based "data" operators if properly incentivised by interconnection arrangements and a recognition that the voice-data boundary is no longer meaningful.

For e-government

E-Government is a key national priority and suitable telecom reforms must be undertaken to provide voice and data access at globally competitive rates, both for domestic backbone and for the last mile connectivity. The latter conditions would go a long way in successfully rolling out e-government applications across the country.

- For this purpose we will obtain telecom services on a competitive basis from licensed operators without favoring the incumbent, although it is still majority owned by government.
- The measures described above to enable e-commerce in terms of telecom infrastructure will also enable e-government applications.

For call centers

- The end of the executive and regulatory efforts to enforce the ambiguous exclusivity with respect to international telephony services granted to SLTL will remove the largest existing barrier to call center operations, enabling low-cost and flexible international termination.
- There is divided opinion among telecom operators and potential call center operators on the suitability of satellite channels for call center. The conduct of public demonstrations and tests on the relative merits of satellite and undersea fiber/cable may eliminate ambiguity on this issue.. In the event satellite is inferior or significantly more expensive, we will need to actively liberalise existing cables and provide incentives for the landing of new cables. Safeguards to ensure non-discriminatory access to these and other bottleneck resources are necessary.
- IT parks. Current satellite technology is such that it is possible for each call center to be directly connected abroad. Ideally a mix of satellite and cable bandwidth is critical for the development of IT in Sri Lanka. Satellite bandwidth can be used for batch-processing and non-real time back office operations while cable can be used for high grade of service voice operatiors.

For intranets

- There is tremendous demand to interlink different locations of business, enterprises both at home and over seas using broadband. The current Telecom Act constrains this.

  The draft NTP proposes a significant relaxation that will be forthwith translated into a legislative amendment.

II. Telecom infrastructure for rural areas and the poor

It is essential that Sri Lanka continue to use the market mechanisms that have been proven in practice to improve connectivity. We will use market mechanisms as far as possible and supplement them with competitively neutral subsidies at the margins.. Particularly with the removal of technology specifications from licenses and cost-reflective interconnection, it is possible that the existing operators will roll out the networks to rural areas and connect more of the poor. But the government will actively seek options to make this happen, in partnership with the private sector.

Demand in rural areas

- **Surveys**. In 1999, the TRC commissioned a national survey of telecom use and an additional study of the ECT needs of persons living in areas that did not even have post offices (Sri Lanka has one of the highest densities of post offices among developing countries, equal to that of Italy). The study indicated a very high demand for telecom, including payphone services. The low demand for multi-purpose community telecenters may be explained by the skepticism of people lacking access to the basic forms of telecom.

- **Expressed demand under unfavorable price regime**. Despite continuing increases in domestic rates (driven by rate rebalancing) and the continuation of very high installation charges (app. SLR 16,000, which can however be paid in installments since 1999), there has been tremendous demand for telecom services. Unlike in South Africa and Jamaica, the churn rate has been low in Sri Lanka. While the waiting lists in greater Colombo have been more or less cleared, there are 270,000 waiters for SLTL service (other suppliers do not maintain waiting lists), mostly outside urban areas.

- **Participation in pilot projects**. The Kotmale Telecenter project attracted tremendous interest and participation. However the fact that it was totally subsidized reduces the value of the indicator. Better indicators may be found from the Sarvodaya sponsored projects in the Ratnapura area.

High capital costs

- **Technology issues**. It is generally recognized that wire line is expensive in low-density areas. Fixed-wireless, especially DECT (Digital Enhanced Cordless Telecommunications), was considered the silver bullet in the mid 1990s. However, low take-up for voice, inadequacy for data, and non-realization of economies of scale in manufacturing have dimmed the earlier envisaged prospects.. Fixed wireless in not necessarily the cheapest way of connecting rural users. While there is still some hope in new standards such