

Chapter 5 Connecting to the Future

Trinidad & Tobago – A Knowledge Based Society



5. CONNECTING TO THE FUTURE



Working Group Action Plans

Over the course of several weeks, each of the five Working Groups discussed, developed and refined a number of connectivity programmes and projects specific to their area of focus. Each Action Plan identifies a series of broad and far-reaching initiatives that will accelerate Trinidad and Tobago into a knowledge-based economy and provide ongoing benefits for all elements of society. The Plans also take into account the current level of e-Readiness to ensure they remain practical and achievable.

The Working Groups met at regular intervals during the planning process to share their ideas and to identify the numerous dependencies and important points of integration across the emerging programme areas. Individually, the Plans are comprehensive, creative and connected – all are integrated with, and dependent upon, one another to achieve their goals. Collectively, they provide a blueprint for an exciting future and a realistic roadmap for getting there. Although the Plans incorporate elements of international best practice in ICT and connectivity, the result is very much a "made in Trinidad and Tobago" solution.

Action Plans for each of the individual Working Groups can be found at Appendix E.

Integrated National Strategy

From Vision to Reality

The Action Plans identify the various strategies, programmes and projects that are necessary to achieve all aspects of Trinidad and Tobago's National ICT Vision.

As a reminder, the National ICT Vision is: "Trinidad and Tobago is in a prominent position in the global information society through real and lasting



improvements in social, economic and cultural development caused by deployment and usage of information and communication technology."

The National Connectivity Agenda will:

- Provide all citizens with affordable Internet access;
- Focus on the development of children, and adult skills to ensure a sustainable solution and a vibrant future;
- Promote citizen trust, access, and interaction through good governance; and
- Maximise the potential within all citizens, and accelerate innovation, to develop a knowledge-based society.

The following pages examine various elements of the National ICT Vision and explain how these goals will be achieved through the ICT Strategy.

Providing Affordable Internet Access to all Citizens

The *Community Connection Programme* (*CCP*) will establish hundreds of *Community Access Centres* (*CACs*) in every part of the country. These Centres will provide everyone in the community with an on-ramp to the Internet and access to a broad range of information and services. *CACs* will be particularly important for those members of society who cannot afford a computer at home.

Situated wherever possible in schools and libraries to reduce cost and leverage investment, *CACs* will help everyone, wherever they live, take advantage of emerging opportunities in the new global knowledge-based economy. Each Centre will be designed around the specific needs of the community and provide up-to-date computers, each with high-speed Internet connectivity. The Centres will be designed to provide "universal access" – catering for all members of society, including those with physical, mobility and learning disabilities.

All *CAC* users will be provided with access to a wide variety of on-line information sources including:

- Local and community information and services
- Information regarding jobs, health, taxes and education etc.
- Government information and services such as school registration, unemployment benefits, birth certificates, passport applications, regulatory requirements, etc.
- On-line learning

The Community Connection Programme (CCP) will establish hundreds of Community Access Centres (CACs) in every part of the country.

- - Business information and services especially for start-up and small businesses
 - Information specifically tailored to the needs of children, senior citizens and young mothers
 - Simplified links to communicate with family and friends abroad

The NICT Strategy will seek to find mechanisms to encourage community ownership of *CACs* wherever possible.

A *Youth Computer Corps Programme* will also be established to select and train young adults to work alongside volunteers in each of the *CACs*. Young adults placed in these positions will be paid for their service. They will need to successfully complete a formal certification programme allowing them to provide high quality services and advice in a number of areas such as computer training, Internet training, e-Commerce training, technical assistance for small businesses, website design, troubleshooting, etc. The *Youth Computer Corps* will not only help build new skills in the local population and workforce, but it will also create entry-level employment opportunities that can translate into sustaining employment in the ICT sector – a key element of the National ICT Strategy.

The *Community Connection Programme* will be funded and sustained through a variety of sources including government funding, modest user fees, small charges for training and technical assistance, and through corporate sponsorship and other private sector involvement strategies.

In concert with *CCP*, a plan to dramatically increase the number of homebased Internet users will be put in place. This plan will be stimulated by opening up the telecommunications market to full competition starting in 2004. Open and effective competition in the telecommunications sector will increase service quality and variety while reducing cost. The result will be faster, cheaper and easier access to the Internet and a marked increase in computer and Internet take-up amongst the general public and small businesses. As more users get connected there will be a corresponding demand for local hardware, software and technical support. This in turn will develop additional employment and skills in the ICT sector. As the domestic market flourishes, the local population will benefit from cheaper, higher quality ICT products that will stimulate even further domestic growth and achieve the positive supply and demand cycle that is critical in ensuring long-term sustainability for the ICT sector.



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By 2007, over 50% of companies will use the Internet as a business tool

The KID Programme will provide up-todate computers and connect all 636 of Trinidad and Tobago's schools to high-speed Internet service by 2008. By 2008 it is envisioned that over 50% of homes will have personal computers and Internet access, and over 50% of the population will consider themselves "regular Internet users". By 2008, over 50% of companies will use the Internet as a business tool and will be realizing increased revenues as a result. To assist in this matter, Government will examine a series of tax and other fiscal incentives that could be employed to stimulate increased ownership of computers and encourage ICT take-up by citizens and the business community.

A comprehensive promotion campaign will be mounted to increase awareness of the country's connectivity agenda and to inform citizens and business owners of the benefits of increased on-line interaction. This will be a multi-media campaign using television, radio, print, outdoor, and new media (web) strategies. As well as a general awareness campaign, targeted messaging will be used to address specific benefits for groups such as children, young mothers, senior citizens and small businesses. A national theme and logo will be developed to emphasise the integration of the various ICT programmes and as a tool for promoting Trinidad and Tobago's drive for connectivity on the international stage.

Focusing on the Development of Children and Adult Skills

The Knowledge, Innovation and Development (KID) Programme is key to establishing a knowledge-based society and a cornerstone of the country's ICT Strategy. Working closely with the *Secondary Education Modernization Programme (SEMP)*, which is already underway, the *KID Programme* will provide up-to-date computers and connect all 636 of Tinidad and Tobago's schools to high-speed Internet service by 2008. The Programme will look beyond networked education on a school-by-school basis and attempt, over time, to develop an interactive network of innovative schools at a national and international level.

A student-to-computer ratio of approximately 7 to 1 is thought to be the minimum requirement for effective ICT-based teaching methods. Research has shown that more sophisticated on-line and collaborative learning may well require transmission speeds at broadband (>1.5Mbps) level. Studies to determine the exact student-to-computer ratio, bandwidth requirements and appropriate transition plans are to be carried out over the next eighteen months. Of course, providing computers and connecting schools to the Internet is only one element in developing a knowledge-based society – and one that should be relatively transparent to those delivering and receiving education. The true benefits of ICT-driven innovation lie in areas such as curriculum reform, change management, teacher training and content development. To realise these benefits, Government will ensure that computers and ICT-related skills be introduced to children at the earliest possible age and formalised into the general curriculum so that children have to acquire a certain level of proficiency at various stages of their academic development. The *KID Programme*, in conjunction with *SEMP*, will establish educational content and well-defined programmes at each level of the academic system whereby children's achievements and capabilities in ICT can be formally measured and continuously improved. ICT will be introduced as an aid to in-class learning, assist with distance learning and be taught as a subject in its own right.

Another critical component of the *KID Programme* will be the training of educators so that they have a greater understanding of ICT and can use it both as a classroom tool and as educational content. Over the next eighteen months a major study will be conducted to identify the training needs of educators and to establish a customised training programme to equip teachers with the necessary skills for a more ICT-intensive approach to education.

As the *KID* and *Community Connection Programmes* mature, they will require many thousands of computers to be placed in schools and community centres. The cost of acquiring, upgrading, repairing and replacing these computers and supporting infrastructure could become prohibitive if not managed effectively. The feasibility of government and private sector organisations "donating" surplus computers in support of these programmes, and receiving some form of financial benefit in return, will be closely examined. There are a number of similar initiatives in place in various parts of the world that will provide useful background in this area.

The *Computers for Schools (CFS)* initiative has been identified as an innovative mechanism for maintaining computers in schools and *Community Access Centres.* The initiative will create a number of computer repair labs that will refurbish computers prior to them being used in schools and then maintain, upgrade and repair computers that have been used in the school system for some time. These labs could be situated in

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various parts of the country, in schools as part of the ICT curriculum, or even in prisons to assist with rehabilitation of offenders.

The labs will provide additional employment opportunities for scores of people and assist in developing new skills that will help grow the country's ICT sector.

Generating new, and additional ICT skills in the adult population will be addressed in the *Skills & Knowledge for the Information Era (SKIE) Programme. SKIE* will incorporate a range of initiatives aimed at training and job creation for those outside of the formal educational system – with a focus on the development of skills in adults. For example, *SkillNet* is a project that will coordinate with existing programmes to create a network of on-line services and tools aimed at helping employers and job seekers use the Internet for recruitment, career, labour information and learning. In addition to the adult training and education offered at *Community Access Centres*, local businesses and private sector training organisations will be encouraged to offer greater levels of ICT training. Major employers and providers of distance learning will work with government to examine the financial and ICT architecture needed for the development of a national life-long learning model for Trinidad and Tobago.

Libraries play an important role in generating the transition to a knowledge-based society. By 2008, the *LibraryNet* Programme will provide all libraries with computers and high speed Internet access, and all librarians will receive ICT related training. Libraries will be furnished with the same degree of technology, training and support as the *SchoolNet* Project and may be used as *Community Access Centres* in some locations. A number of mobile libraries, equipped with wireless Internet connectivity and computers, will also be introduced.

The *Electronic Heritage Project* will work closely with libraries, curriculum development offices in the Ministry of Education, and local children to capture valuable cultural information in digital form – thereby making it available to everyone regardless of location. A similar project, the *Historical Connections Initiative* will see children and senior citizens working together to develop an on-line cultural record of stories, folklore and genealogy that can be accessed by all. In addition to being fun and capturing valuable historical and cultural information, the *Electronic Heritage Project* and *Historical Connections Initiative* will also help children attain valuable ICT skills for use in the future.

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A Sustainable Solution and a Vibrant Future

Increased levels of connectivity offer substantial educational, social, community and cultural benefits for everyone in Trinidad and Tobago. However the country's national connectivity agenda will only be successful, and sustainable, if it results in increased productivity, more jobs and greater levels of investment.

Trinidad and Tobago is well positioned to capitalise on the opportunities offered by the global information society. It is ideally situated to service the needs of the North American market; the general population is well educated; investment sources appear to be available; Government is committed; and the current technical architecture is adequate to meet near-term requirements. If the country moves aggressively, the Internet economy can provide tremendous opportunities for start-up and small companies to flourish, new businesses to be built from the ground up and entire industries to transform themselves for success in the global economy. In many respects, ICT has all of the necessary ingredients to provide T&T with a potential heir to the energy sector which has been so successful in past decades.

Working in partnership, Government and the private sector will explore a number of strategies aimed at accelerating the e-Economy, stimulating economic growth and assisting with poverty alleviation.

The country's drive for increased levels of connectivity in schools, communities and government will result in growth opportunities for local suppliers of computers, software, Internet, installation and repair services and training. These small businesses will feed larger domestic companies, collectively creating many hundreds of new employment positions in the local marketplace. Clear conditions for participation into the liberalised telecommunications sector will provide new entrants with both the confidence and tools to compete and prosper in this expanding market, also providing new business and employment potential.

Government will work closely with those in the technology sector, including Internet Service Providers (ISPs), to examine breakthrough business opportunities that could be seized as Trinidad and Tobago takes a prominent place in the digital marketplace. A joint working group will analyse the feasibility and resulting strategies for the introduction of new business areas such as call centres, software development, data processing, computer assembly and technology parks that will arise from increased electronic interaction. Government will also develop strategies for attracting a large ICT "anchor company" Increased levels of connectivity in schools, communities and government will result in growth opportunities for local suppliers.



to the country, such as a major software, computer or technology component manufacturer. If the right conditions can be put in place, and a major technology company can be introduced, it will create many more "feeder companies", producing substantial employment opportunities, fast-tracking the evolution of a world-class ICT sector, and significantly expanding exports of ICT related products and services.

Traditional industries can also be strengthened through increased levels of ICT.

Smaller sectors, particularly areas such as tourism, medical training, culture (arts, music, crafts etc.) and exports in flowers, fruits and vegetables seem particularly suited for growth through ICT. Traditional industries can also be strengthened through increased levels of ICT. An *e-Business Roundtable*, comprising leaders from Government, industry and the technology sector will be assembled to provide vision and guidance in this area. The Roundtable will work with various Industry Associations to explore the potential for ICT being used as a catalyst for the further enhancement of foundation industries such as the financial, energy, ship building and repair, port and fisheries management sectors.

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Government interacts with all elements of society and has a key role to play in accelerating the electronic marketplace and acting as a modeluser in Trinidad and Tobago's ICT agenda. Government is the country's largest consumer of local goods and services. As part of its e-Government agenda, the public service will introduce an *e-Procurement* system and start to tender and select more of its products and services across the electronic channel. In addition to realising internal efficiencies for government, *e-Procurement* will encourage the many hundreds of companies who sell to government to move to the Internet and introduce increased levels of office automation.

Promoting Citizen Trust, Access and Interaction through Good Governance

Government is transforming itself for the digital age and is introducing a sweeping reform agenda aimed at improving service quality, reducing red-tape and realising greater efficiencies in the public service. A major *e-Government Initiative* has been established, which will serve as a catalyst to the transformation. Also, a contract has recently been signed to develop the *Government Backbone Project*, which will work towards technically interconnecting all ministries and agencies.

Government will simplify access and service delivery by developing a world-class *e-Government Portal*. The Portal will be designed around the needs of client groups, making the organisational structure of government more transparent to citizens and business. It is envisioned that this one-stop-shop for government services will have three gateways – one for citizens, one for business and one for visitors. Government is striving to make its services available at anytime from anywhere. As well as enabling users to access services from their homes or offices via the Internet, government services will also be available on-line from *Community Access Centres*; kiosks placed in shopping centres and strategically placed terminals located in government offices.

By 2006, all government information will be available on-line – placing particular prominence on topics such as jobs, education, health, advice for small business, and services that relate to e-business facilitation.

By 2008, all government services that are appropriate for on-line delivery, will be available over the Internet. For citizens, early on-line services will include license applications, on-line payments, school registration and passport applications. Early candidates for electronic service delivery to businesses are company registration, tax submissions, micro-credit applications and export advice. Visitors will use their gateway to access information and services on matters such as tourism and investment opportunities.

As government moves more of its service offerings on-line, it will also look towards improving service quality and internal efficiencies by reengineering and standardising its business processes and introducing enterprise-wide technologies such as finance, document and customer relationship management solutions.

A major initiative to train government employees for increased levels of electronic service will be introduced. In addition to teaching technical skills in support of *e-Government*, this initiative will also look at enhancing customer service qualities in staff. This will be particularly important as more transactions become automated and government staff move towards consultative and decision-making roles rather than transactional and administrative duties.

Over the next eighteen months, government will also examine the feasibility of introducing ICT-driven innovation in three key areas. One initiative will examine opportunities for integration between the National ICT Strategy and ongoing Justice and National Security IT By 2006, all government information will be available on-line.

By 2008, all government services that are appropriate for on-line delivery, will be available over the Internet.



projects. It is felt that increased ICT usage and a common information network connecting the police, courts and correctional systems could provide additional public safety and operational benefits. An *e-Revenue Initiative* will assess the advantages of ICT-led automation and transformation in the area of customs and excise. And an *e-Health Initiative* will study the potential for enhancements in health care service to citizens and lowering the cost for health care providers through increased deployment of ICT.

As well as using ICT for improving public sector service delivery, government also has an important role to play in ensuring there is a clear and stable regulatory and legal infrastructure in place that supports a smooth transition and constant evolution of the country's Connectivity Agenda. As a matter of urgency, a *Legislative Review* will be carried out to examine the suitability of current legislation in supporting new levels of electronic transaction – making recommendations for areas that need to be addressed. The Review will focus on all aspects of legislation, including the current Telecommunications Act; security privacy and data protection; electronic documents and signatures; intellectual property and protection from inappropriate content on the Internet. A *Code of Practice for Consumer Protection in Electronic Commerce* will also be developed.

Additional legal advice and assistance will be required in support of telecommunications liberalisation. In this context, the role of the Trinidad and Tobago Telecommunications Authority (TTTEL) will become increasingly important as the telecom marketplace becomes more competitive and the country assumes more of a prominent position in the global information society. Further investment and support will be provided to TTTEL so that it becomes a fully mature institution and a highly effective regulator.

Maximising the Potential within All Citizens

Trinidad and Tobago's ICT Strategy is truly a national undertaking with roles and benefits for everyone. Initiatives such as the *Community Connection Programme, KID Programme, LibraryNet* and *SKIE* will help citizens of all ages establish new skills, which will be of enormous value to them, and our country, as the world advances further into the digital age.

Trinidad and Tobago's young people will play a pivotal role in the ICT campaign. Not only will they be at the centre of our major ICT training and development programmes, but their ability to quickly

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The *Student Connections Programme* is just one example of how skilled young adults can be used to benefit others. *Student Connections* will place specially trained students from university or community colleges in small businesses or non-profit organisations to assist with the adoption of ICT. The companies will benefit from increased understanding and better use of ICT and the students, who will be paid for their services, will gain valuable job experience. In conjunction with *Student Connections*, a programme of specialised training for company CIOs and senior managers will also be prepared. This programme will help senior business people better understand how ICT and the Internet can be effectively applied as business tools to increase productivity, profitability and organisational effectiveness.

Helping small businesses become e-businesses is a key component of the National ICT Strategy. In addition to the training and support that will be offered by initiatives such as the *Community Connection Programme* and *Student Connections*, the *e-Government Portal* will also provide a special area specifically tailored to the needs of small business including practical advice and tools for business start-up, company registration, developing an effective website, using the Internet as a business tool and a service to connect potential buyers and suppliers.

Many small businesses will not have the skills or finances to effectively move their products and services on-line. To address this, Government will assist in developing a highly flexible e-Business application specifically designed for small business. The application will contain storefront, shopping cart, payment and accounting modules and will be accompanied by training software and content. The application may be based on Open Source technologies.

Small Business Centres will also be established in government offices around the country to provide a wide range of advice and assistance to small business owners with special emphasis on e-Commerce.

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Accelerating Innovation

If Trinidad and Tobago's ICT Agenda is to maximise its potential, it will need to be accompanied by a sister programme that looks to foster increased levels of innovation and entrepreneurship over the long-term. To aid in this transformation, a *National Innovation Council*, consisting of business leaders, academics, entrepreneurs and top government officials will be assembled and tasked with developing a strategy to increase innovation at all levels of society, to encourage investment and improve quality of life. The Council will also be tasked with identifying tactics to reverse the "Brain Drain" of the country's most talented people to other areas of the world.

Two other specialist bodies will also be formed. An *e-Business Roundtable* of top business people, technology experts and academics will serve as a "think-tank" to guide and challenge the Ministry of Public Administration and Information as it begins the implementation of the ICT agenda. And a *National Infrastructure Taskforce* will be established to ensure there is always a "future-oriented" infrastructure platform under development. This Taskforce will comprise technical experts whose mandate will be to identify and advise on new telecommunication technologies such as Broadband and Satellite. These technologies will become increasingly important over the next few years, as the ICT agenda matures and enhanced infrastructure will be required to support more sophisticated and data-rich ICT applications such as health, education and entertainment. The Taskforce will also advise on topics such as on-line security, Public Key Infrastructure, Open Source Software and standards development.

Other countries have already made significant advances in ICT-led innovation. The Government is exploring the potential of *Twinning Programmes* to learn and benefit from the achievements of world leaders in ICT development and usage. The *Twinning Programme* could include collaborative initiatives such as *Smart Cities*, *Smart Hospitals* and *Innovative Schools*.

Developing a Knowledge-Based Society

Trinidad and Tobago's National ICT Strategy sets out a compelling roadmap for the development of an innovative, creative and entrepreneurial community that will adapt, flourish and prosper in the new global information society. The Strategy is far-reaching and aggressive. It is also thought to be very attainable. The National ICT Strategy has been designed to benefit everyone in the country. It will provide children from the earliest age with new skills, learning and development opportunities. Education will become more interactive, dynamic and group-oriented. Information will be accessed, shared, refined and turned into knowledge for the benefit of all. Teachers will learn new skills and will apply these skills along with the innovation and imagination of children, and the community at large, to achieve new levels of academic excellence. The ICT Strategy will provide the children of today with the tools for tomorrow.

The ICT Programme will also bring communities closer together. All citizens will be able to use ICT in their everyday lives and will have easy and rapid access to information that is important for their social and economic well being. Families will be able to communicate with loved ones in distant parts of the world, and cultural and historic information will be captured in digital form and made available to everyone, forever.

Young adults will play a prominent role. They will acquire new skills, share these skills with others in the community and prepare themselves for an exciting and prosperous future in the information era.

The Strategy will close the in-country digital divide by providing universal access and offering new opportunities to everyone, particularly those who may otherwise have been marginalised in an "unconnected society".

Businesses will be encouraged to embrace the Internet as a competitive and productivity tool. Small businesses will soon become e-businesses and will be able to compete in arenas that were traditionally only open to larger players. Trinidad and Tobago's ICT sector will grow significantly as a result of the country's connectivity program. Larger companies will be able to expand their global reach and new companies, and perhaps entire industries, will be built from the ground up. Investor confidence will continue to grow and thousands of new employment opportunities will be created in a wide variety of disciplines – not only technology but also in education, manufacturing, sales, marketing and administration.

Government will become more responsive, more transparent and more service-oriented. Citizens and businesses will benefit as a result.

However the most rewarding aspect of the ICT Strategy is that it is selfperpetuating. It has been designed to produce a supply and demand cycle that will be created and satisfied by the people of Trinidad and Tobago. The Strategy will kick-start the e-Economy. New skills, ideas and access The ICT Strategy will provide the children of today with the tools for tomorrow.

The Strategy will close the in-country digital divide by providing universal access and offering new opportunities to everyone.



to new sources of information and global markets will be generated. This will provide additional enterprise and innovation. Additional enterprise and innovation will result in local employment opportunities that will require new skills and ideas. The cycle will have been completed – a knowledge-based society created.

A Special Role for Tobago

Everyone will have a role to play in the implementation of the National ICT Strategy. Government may need to serve as a catalyst initially, however it is essential that citizens, communities, non-profit organisations and the private sector embrace and adopt the various initiatives if they are to be implemented effectively, and sustained over the long-term.

Tobago has a very important function to play in rolling out the National ICT agenda.

Tobago has a very important function to play in rolling out the National ICT agenda. It is well suited to be used as a pilot site for many of the programmes and projects that will be launched. It is recommended that Tobago be included in some of the early pathfinder projects in programmes such as *SchoolNet*, *LibraryNet* and *Community Connections*. Tobago will be considered as a potential site for a future *Smart Community* and perhaps have its own gateway on the e-Government Portal.

It is felt that the tourism industry in Tobago could benefit significantly from improved levels of ICT. This area will receive specific attention over the next twelve months.

Alignment with Vision 2020

Trinidad and Tobago's National ICT Strategy is a comprehensive, forward-looking plan that will steer the country towards a prosperous future in the new millennium. Although the Strategy has been constructed to focus primarily on maximising the benefits of ICT and national connectivity, it has been designed in a way that complements and works towards achieving Vision 2020 and developed country status.

The National ICT Strategy will contribute directly to the underlying philosophies of Vision 2020 in a number of ways, including:

- Improving social equity by providing universal access to an online world of information and services;
- Helping people become "information-sensitive" through easy access to the information superhighway;

It has been designed in a way that complements and works towards achieving Vision 2020 and developed country status.



- Improving education at all levels and increasing science and technological literacy through the application of cutting-edge information and knowledge;
- Creating a competent, productive and sophisticated workforce for the 21st century;
- Sustaining strong economic growth by targeting key economic sectors towards higher value-added activities;
- Providing easy access to quality healthcare;
- Improving accessibility to social services;
- Enhancing consumer education;
- Improving efficiencies and service quality in public sector agencies, and;
- Improving transparency and responsiveness of government.

