HONG KONG:
CONNECTING
THE WORLD

Digital 21 Strategy   May 2001

CONTENTS

FOREWORD

Two and a half years ago – in November 1998 - we published our first Digital 21 Information Technology (IT) Strategy. Its aim was to drive Hong Kong's development as a leading digital city in the globally connected world.

We have come a long way since then. It is now time to update and revise the strategy to keep pace with the ever-changing technological landscape. That's what this strategy document is about.

Back in 1998, the strategy focused on building Hong Kong's information infrastructure and putting in place the right environment for e-business to prosper.

We embarked on a comprehensive and visionary programme of initiatives. We liberalised the telecommunications and broadcasting regimes to enhance competition, consumers' choice and quality of service. We developed a world class telecommunications infrastructure. We have put in place a secure framework for the conduct of e-business. We have progressively put Government services online. And a vibrant IT industry and a buoyant e-culture have emerged.

We have become one of the best connected cities in the world. Our people have readily embraced new technologies just as they have always embraced new challenges of all kinds.

But we cannot stand still. E-business is rapidly developing and evolving worldwide. It has become the primary driver for the information age. The wider application of IT in future is expected to open up tremendous new business opportunities and pave the way for exciting developments in the way people communicate and share information. It also provides new and challenging prospects in the way governments, people and businesses interact. And the impending accession of China to the World Trade Organisation also presents Hong Kong with new opportunities in serving as the gateway to the Mainland of China.

Now with our revised Digital 21 Strategy we are preparing to ride the next wave of the e-revolution. *2001 Digital 21 Strategy: Connecting the World* builds on the solid foundations we have established for leveraging IT to position Hong Kong as a leading e-business community and global digital city.

We will capitalise on our inherent strengths to focus on five strategic areas –

• enhancing the e-business environment;

• building e-government;

• developing the IT workforce;

• strengthening the community capability to exploit the digital world; and

• exploiting enabling technologies.

The updated programme of initiatives under the 2001 Strategy is target oriented, focused and structured with clear directions set. We can look forward to the opening of the Cyberport as an international IT centre with world class facilities, the building of the third generation mobile platform for new e-business applications and innovative content creation, the development of digital television, an efficient and responsive e-government, and an IT-savvy community. In other words, creating one of the world's leading telecommunications, IT and broadcasting hubs.

But Government cannot do this on its own. We look forward to active co-operation and collaboration with the industry, academia, the community and our international partners to jointly drive the strategy forward. With these concerted efforts, Hong Kong will be the premier digital city, connecting the world.

Mrs Carrie Yau
Secretary for Information Technology and Broadcasting
May 2001

EXECUTIVE

SUMMARY

The history of Digital 21

Since 1997 the Chief Executive, Mr TUNG Chee Hwa, of the Hong Kong Special Administrative Region (HKSAR) has set a vision for Hong Kong to be *"a leader and not a follower in the information world of tomorrow"*, and to use information technology (IT) to retain our competitive edge and to drive overall economic expansion.

To that end the Information Technology and Broadcasting Bureau (ITBB) was set up in 1998. This puts the formulation of policies on telecommunications, IT and broadcasting all under one roof to ensure effective co-ordination and to tie in with the convergence of technologies in providing telecommunications, IT and broadcasting services. The Bureau commissioned the 1998 Digital 21 Strategy and oversaw its implementation.

The primary focus of the 1998 Digital 21 Strategy was to build capabilities and infrastructure to support a thriving information economy, and to create a strong foundation for growth in the use of IT.

The strategy included a visionary programme of initiatives that were designed to create an environment for the information economy to thrive by encouraging businesses and consumers to participate, and to exploit opportunities, in this new information economy. The objective is to develop Hong Kong into a leading digital city in the globally connected world.

Hong Kong has made great strides

In accordance with the implementation timetable of the strategy, most of the planned initiatives have now been successfully completed. Key achievements include:

- increased telecommunications sector investment, a world class telecommunications infrastructure with strong price and service competition;

- development of a legislative framework for e-business and establishment of a local public key infrastructure that lays down the necessary infrastructure for e-business to flourish;

- development of the Cyberport which is a flagship IT project to enhance our IT infrastructure and put Hong Kong firmly on the global IT map;

- improved public sector efficiency and leadership. This includes the implementation of the Electronic Service Delivery (ESD) Scheme to provide Government services online to the community 24 hours a day and seven days a week;

- significant private sector innovation and a culture that thrives on the development and usage of innovative e-business applications;

- improved public awareness and knowledge of the use of IT through promotional activities such as the "IT Hong Kong" campaign, education, and improved community access and connectivity to the Internet and IT facilities; and

- competitive standing of Hong Kong as a global leader in the information economy that has established a robust and friendly environment to support the growth of e-business.

Initiatives arising from the 1998 Digital 21 Strategy are mostly completed, resulting in significant achievements and benefits to Hong Kong.

These achievements are marked by a strong record of technology deployment and adoption as follows:

- one of the world's highest mobile penetration rates (78% in February 2001[1]);

- excellent broadband coverage (estimated to cover practically all commercial buildings and over 95% of households[2]);

- high household and business computer penetration (both at around 50% in March 2000) and Internet penetration (around 36% in March 2000)[3];

- a state-of-the-art electronic stock exchange system facilitating high volume online brokerage transactions; and

- high utilisation rate of smart card technology with more than seven million[4] in use in the market for a population of around the same number.

Hong Kong has achieved impressive gains in its objective of building an environment that supports and encourages the development of the information economy.

E-business changes everything

Since the 1998 Digital 21 Strategy was developed, e-business – electronic transactions and interactions between governments, businesses and citizens - has become the primary driver for the information economy. E-business has taken off spectacularly and is forecast to grow exponentially over the next few years. E-business will lead to significant global efficiency gains and value creation.

IT is expected to profoundly change the supply chain of many industries – transforming or eliminating intermediaries. We need to embrace e-business – to be proactively involved in setting the agenda.

Governments have a key role to play in this new era. Leading governments globally are adopting multifaceted strategies to prepare their communities and businesses for the information economy.

They are focusing on embracing e-business themselves. This enables them to improve service delivery and achieve efficiency gains. It also provides leadership and encourages others in the community to get connected and benefit from the network effects of the information economy.

Leading governments are also taking a strong role in ensuring that the appropriate infrastructure is in place to support e-business. They are also proactively encouraging the private sector to adopt e-business. At the same time, they are aggressively attracting and pursuing major international IT players to invest in their economies.

The fundamental global developments in the information economy, and the need for us to review the IT strategy to keep up with these developments, led to the promulgation of the *2001 Digital 21 Strategy: Connecting the World.*

The spectacular growth in e-business since 1998 along with competitive developments provided the impetus for reviewing the Digital 21 Strategy.

Focus of the 2001 Digital 21 Strategy

The *2001 Digital 21 Strategy: Connecting the World* aims at capitalising on Hong Kong's early success in establishing a world class environment for the information economy. Its focus is on promoting further developments in the information economy to improve overall wealth, economic and social prosperity of Hong Kong.

The 2001 Strategy builds on its predecessor's successes, and focuses on outcomes in five key areas.

The strategy covers five key result areas, with associated objectives and initiatives, that need to be achieved:

- to enhance the world class e-business environment in Hong Kong by developing our telecommunications, IT, broadcasting and multi-media content production capabilities, actively pursuing the flagship Cyberport project, etc.;

- to ensure that the Hong Kong Government leads by example by driving e-government, providing e-option for more services, and actively pursuing e-procurement and outsourcing;

- to develop Hong Kong's workforce for the information economy by improving the quality and quantity of local IT manpower, nurturing our young generation and leveraging the supply of IT professionals from the Mainland of China and overseas;

- to strengthen the Hong Kong community for digital exploitation by improving accessibility, especially for those who have less opportunities to use IT in their daily lives, and cultivating a community that takes advantage of the information economy; and

- to leverage Hong Kong's strengths in exploitation of enabling technologies in areas of next generation wireless communication, smart card technology, digital broadcasting and Internet2, etc.

The focus of the 2001 Strategy is on results and outcomes. The world of e-business is moving very quickly. We will be on constant lookout for improvement opportunities and to make suitable enhancements to our initiatives so that they offer the best potential for our cause. In doing so, we will take into account our overall positioning vis-à-vis other leading economies. We will continue to review the Digital 21 Strategy to ensure that it is visionary, forward-looking and meets the aspirations of the Hong Kong community and the challenges we face in the globally connected world.

CHAPTER 1

THE 1998 DIGITAL 21 STRATEGY -

A SUCCESS STORY

The 1998 Digital 21 Strategy

The 1998 Digital 21 Strategy aimed to "*enhance and promote Hong Kong's information infrastructure and services so as to make Hong Kong a leading digital city in the globally connected world of the 21st century*".

Our primary focus was to build capabilities and infrastructure, and to create a strong foundation for growth in the use of IT. The strategy aimed at establishing a world class environment that could encourage both the public and private sectors to adopt IT and e-business, and to become active participants in the information economy.
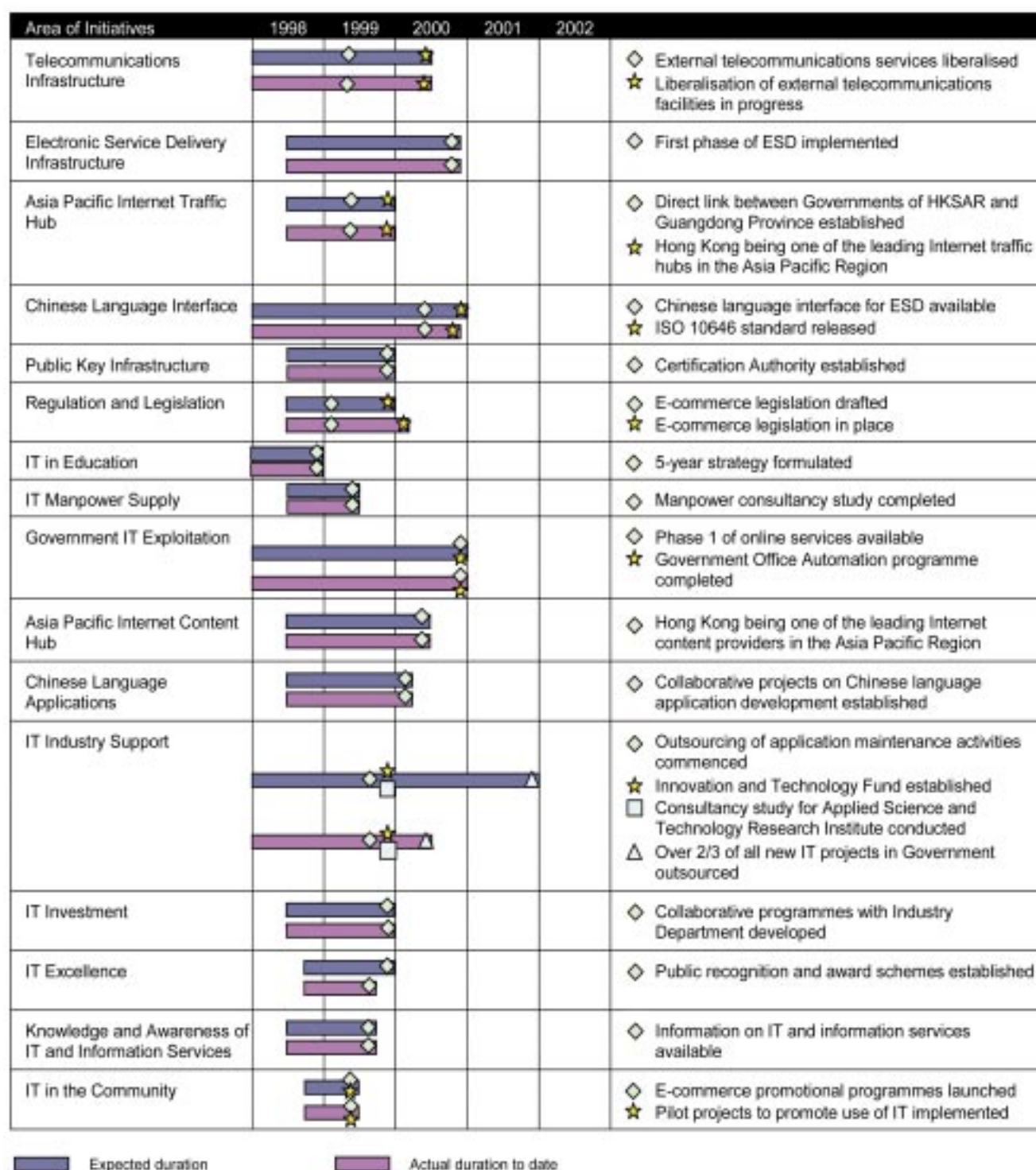
The strategy comprised four enabling factors and a visionary programme of initiatives:

Progress

The ITBB has taken a visible and firm lead in the implementation of the programme of initiatives. Through careful project planning and rigorous management disciplines, the programme has largely been successfully implemented. This has been achieved through consultation and co-operation with the private sector, the community and other bureaux and departments in Government.

A summary of the major initiatives and their progress is outlined below:

Area of Initiatives	1998	1999	2000	2001	2002	
Telecommunications Infrastructure						◇ External telecommunications services liberalised ☆ Liberalisation of external telecommunications facilities in progress
Electronic Service Delivery Infrastructure						◇ First phase of ESD implemented
Asia Pacific Internet Traffic Hub						◇ Direct link between Governments of HKSAR and Guangdong Province established ☆ Hong Kong being one of the leading Internet traffic hubs in the Asia Pacific Region
Chinese Language Interface						◇ Chinese language interface for ESD available ☆ ISO 10646 standard released
Public Key Infrastructure						◇ Certification Authority established
Regulation and Legislation						◇ E-commerce legislation drafted ☆ E-commerce legislation in place
IT in Education						◇ 5-year strategy formulated
IT Manpower Supply						◇ Manpower consultancy study completed
Government IT Exploitation						◇ Phase 1 of online services available ☆ Government Office Automation programme completed
Asia Pacific Internet Content Hub						◇ Hong Kong being one of the leading Internet content providers in the Asia Pacific Region
Chinese Language Applications						◇ Collaborative projects on Chinese language application development established
IT Industry Support						◇ Outsourcing of application maintenance activities commenced ☆ Innovation and Technology Fund established ☐ Consultancy study for Applied Science and Technology Research Institute conducted △ Over 2/3 of all new IT projects in Government outsourced
IT Investment						◇ Collaborative programmes with Industry Department developed
IT Excellence						◇ Public recognition and award schemes established
Knowledge and Awareness of IT and Information Services						◇ Information on IT and information services available
IT in the Community						◇ E-commerce promotional programmes launched ☆ Pilot projects to promote use of IT implemented

▬ Expected duration   ▬ Actual duration to date

Major achievements

Implementation of the 1998 Digital 21 Strategy initiatives has led to a series of major achievements. These include:

- **extensive liberalisation of the telecommunications sector both for fixed and wireless access.** This has encouraged significant private sector investment, the development of a world class telecommunications infrastructure with strong price and service competition, and has substantially enhanced our external telecommunications capacity. The deregulated telecommunications industry and high quality telecommunications backbone place Hong Kong amongst the top for connectivity in the Asia-Pacific Region. This is evidenced by Hong Kong having:

    - one of the highest total connectivity rating in the region based on a cumulative penetration rate of main lines, mobile subscribers, Integrated Services Digital Network (ISDN) subscribers and Community Antenna Television (CATV) and Digital Subscriber Line (DSL) accounts;

    - broadband coverage to practically all commercial buildings and over 95% of households[2];

    - external connectivity of 44.1 Gbps which is among the highest in the Asia-Pacific Region and will increase by about 10 fold in the next two to three years; and

    - the greatest level of connectivity to the international Internet backbone of all places in the South East Asia[5];

- **high mobile penetration.** Hong Kong is one of the leading economies in the world in terms of mobile penetration (78% in February 2001[1]). With the advent of mobile commerce and the increasing move towards a wireless Internet, Hong Kong's strength in mobile penetration translates into a major opportunity for e-business exploitation and adoption;

- **development of the Cyberport.** The Cyberport development announced in March 1999 provides a timely IT flagship project for Hong Kong to help focus global attention on our determination to build up Hong Kong as a leading digital city. The good progress of the Cyberport construction works has sown more seeds of

confidence in our efforts to forge ahead in the global IT race. As the Cyberport opens in phases between 2002 and 2003, there will be a new infrastructure for the clustering of quality IT and IT-related companies and professional talents. The project has successfully attracted global attention and has also heightened local awareness in the importance of IT;

- **development of secure e-business framework.** We have enacted the Electronic Transactions Ordinance (ETO) which follows the United Nations Commission on International Trade Law Model Law on E-commerce. The ETO accords digital signatures and electronic records the same legal status as that of their paper-based counterparts. We have also developed a local Public Key Infrastructure (PKI) with the establishment of certification authority to support the conduct of secure electronic transactions. These have enhanced Hong Kong's position as the place in the Asia-Pacific Region to conduct e-business with confidence and certainty;

- **high Internet and computer penetration.** Hong Kong now has over 2.6 million registered Internet accounts[6]. A survey[7] conducted in March 2000 also revealed that one in every two households in Hong Kong on average has a personal computer installed;

- **modernised and liberalised broadcasting regime.** We have enacted the Broadcasting Ordinance to put the broadcasting regulatory regime in step with the convergence of technology, and the domestic pay television market has been liberalised to enhance competition and to provide more choices to viewers;

- **increased Government exploitation of IT.** We have increasingly put Government services online. We have launched the ESD Scheme to provide public services through the Internet and public kiosks. The Scheme demonstrates Government's e-business leadership and has transformed the way the public interact with Government. This has led to improved public sector efficiency and service delivery;

- **implementation of a 5-year strategy for IT in education.** This involves capital spending of HK$3.2 billion and annual recurrent spending of over HK$550 million. It plays a significant role in preparing our future generation for the information economy;

- **promotion of innovation and technology.** We have established the HK$5 billion Innovation and Technology Fund which has encouraged private sector collaboration with universities in technological research,

benefited multiple sectors and contributed to fostering an innovative culture in Hong Kong;

- **completion of technical trials for digital terrestrial television (DTT).** This will ensure that Hong Kong continues to lead in the exploitation of new enabling technologies in broadcasting;

- **outsourcing two thirds of all new Government IT projects.** This has helped nurture the local IT market and encourage the development of a strong and viable local IT industry;

- **use of IT in business.** It is estimated that all major corporations and an increasing number of small and medium-sized enterprises (SMEs) have adopted some form of e-business;

- **use of IT in stock trading.** The Stock Exchange of Hong Kong has completed the implementation of the third generation of the Automatic Order Matching and Execution System (AMS/3) earlier this year. The system provides an infrastructure that enables investors to use the Internet and mobile phones to input orders electronically. It serves to improve transaction efficiency and allows for increased trading volume, thus enhancing Hong Kong's competitiveness in the global financial market;

- **IT in community.** We have installed computer facilities at Community Cyberpoints to provide easy access for the public to the Internet and the use of IT; and have launched a series of IT promotional activities, including the "IT Hong Kong" campaign, to drive the wider use of IT in the community. This has improved awareness and knowledge of the community in the use of IT in our daily lives; and

- **establishment of a public recognition and award scheme for IT.** The scheme has helped encourage and reward innovation and the use of IT.

Hong Kong benchmark

Hong Kong has emerged from the advent of the information age as one of the leading digital cities in Asia and globally. In particular, our key strengths include:

- world class telecommunications infrastructure. Our liberalisation policy has encouraged significant investment and competitiveness in the telecommunications industry. Hong Kong is ranked one of the

top three amongst other surveyed economies within the Asia-Pacific Region in terms of bandwidth pricing competitiveness[8].

- high mobile and Internet penetration rate. Hong Kong has the highest mobile penetration rate in Asia and is one of the top three globally[9]. Our Internet penetration rate (36% in March 2000) also puts us at the top in Asia and as one of the top ten globally[10].
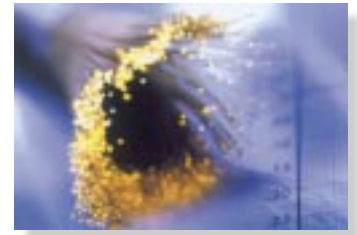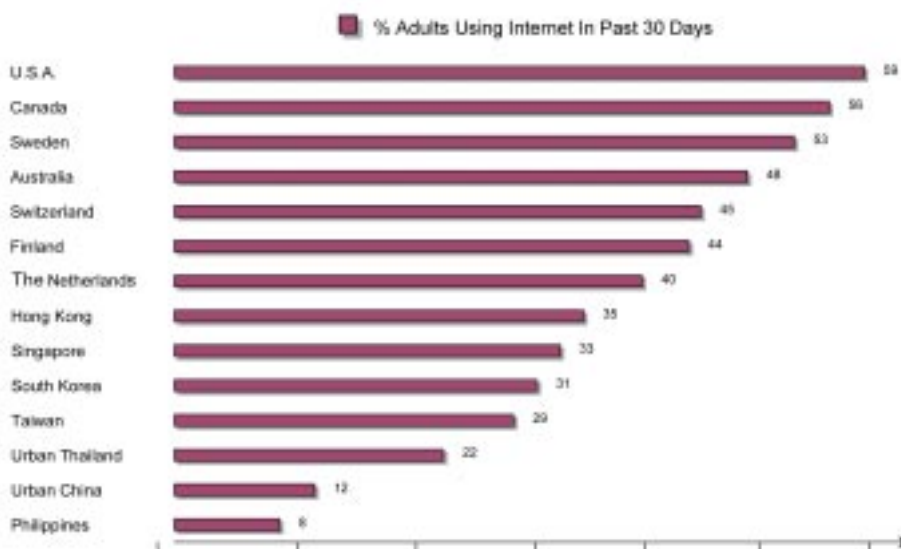
Mobile penetration - 2000
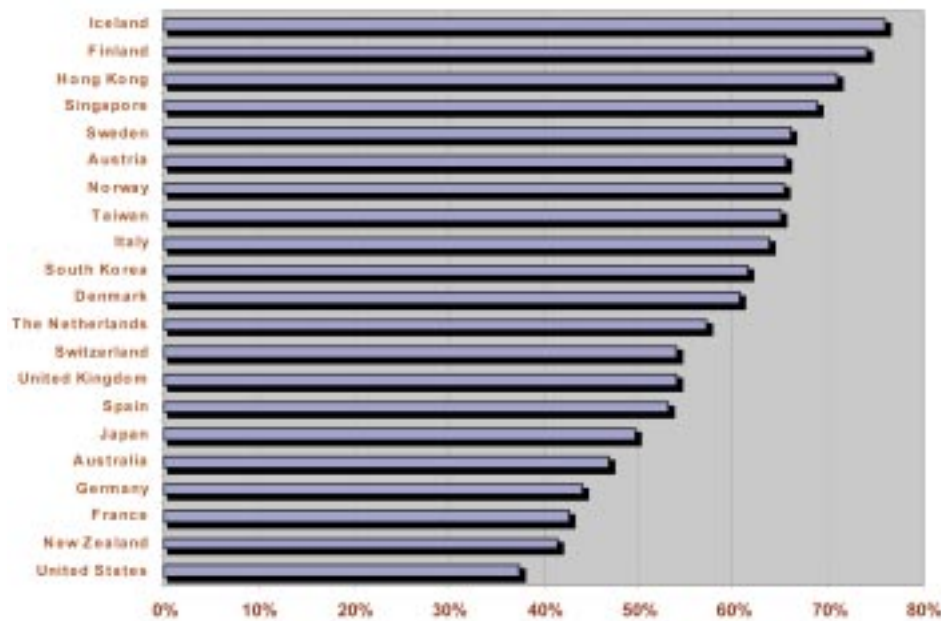
Source: PricewaterhouseCoopers, October 2000

*The mobile penetration rate of Hong Kong has increased to 78% in February 2001.*

Internet Users: Cross Country Penetration

Source: Angus Reid, The Face of the Web, March 2000

- strong foundation for e-business. Hong Kong has established a good foundation for the growth of the information economy. Our e-business developments, infrastructure, availability of IT skills and technological innovation have positioned us as one of the top three leading Asian economies with a world class e-business environment[11]. We also have the highest percentage of online shoppers within the Asian Region[12]. We also offer the best Internet banking services in the Asia-Pacific Region[13].

Percentage of Internet Users Shopping Online
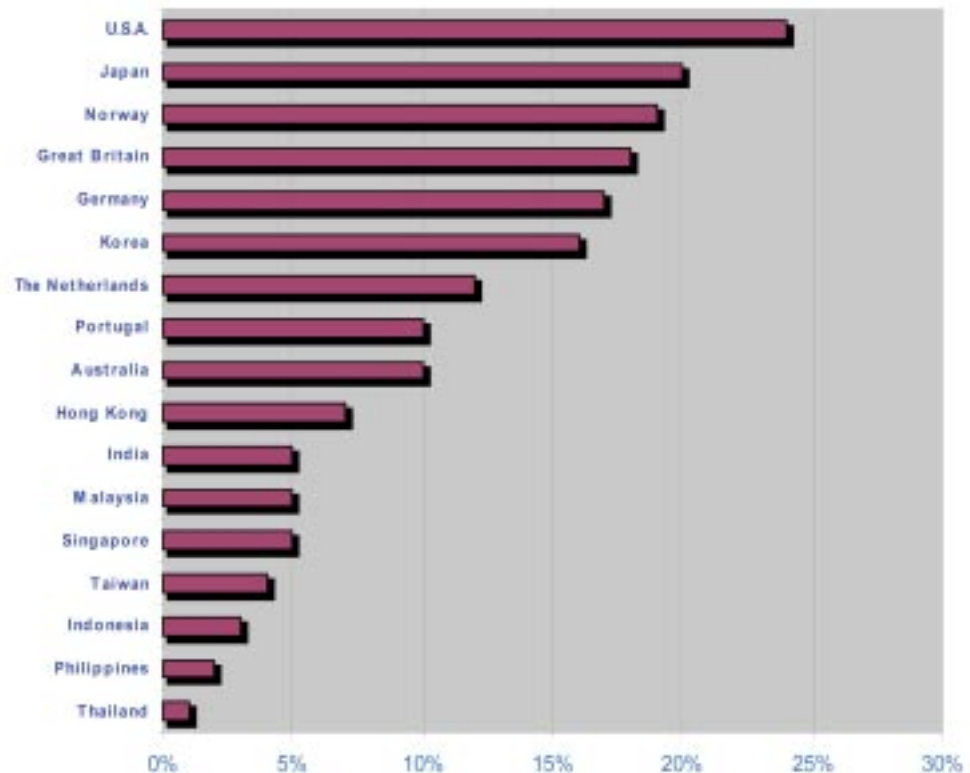
Source: Current State of Play, the Australian National Office for
the Information Technology, November 2000

- preferred international business location. Hong Kong is one of the most open, externally-oriented economies in the world. It has been rated by the Heritage Foundation of the United States as the world's freest economy for the past seven years. Our direct investment flows, economic dynamism, availability of professional services and venture capital also put us amongst the top three Asian economies[14]. We have also been ranked as the most popular city in Asia for multi-national companies to locate their regional headquarters in a study which surveyed more than 8,000 international companies[15].

- premier venue for holding major international IT and telecommunications events. With our robust development in IT and telecommunications and world class conference and exhibition facilities, Hong Kong has been chosen as the venue for holding various major international conferences, forums, exhibitions, etc. in IT, telecommunications and related activities. The International Telecommunication Union (ITU) TELECOM Asia 2000 was held in Hong Kong in December 2000 and it was described as "the ITU's largest and most successful regional event ever, and featured world and regional leaders from the telecoms and IT industries as well as key figures from governments across the region"[16]. In May 2001, we became the first city in Asia to host the International World Wide Web Conference. The FORTUNE Global Forum will also be held in Hong Kong in the same month.

A RAPIDLY AND RADICALLY CHANGING WORLD

E-business is becoming just business

Today, almost all e-business forecasts made several years ago appear conservative. E-business has become an unstoppable force set to profoundly change the world in which we live. Within ten years e-business is expected to become just normal business. Irrespective of whether it is business-to-business (B2B), business-to-consumer (B2C), or government-to-citizen (G2C), e-business will prevail because it will lead to massive efficiency gains, service improvements and value creation.

Of these developments, B2B e-business is set to take centre stage. Forecasts indicate that Internet based B2B e-business will grow to US$5,700 billion by 2004[17]. Over 50% of online trade is expected to take place through e-marketplaces[18] – web sites where multiple buyers and sellers will interact and transact. As regards Hong Kong, it is estimated that the value of e-business transactions will grow from US$2 billion in 2000 to US$70 billion in 2004[19].

These developments will profoundly affect the supply chain of many traditional industries. Some parts of the value chain, such as low value-added intermediaries, will disappear or will need to re-invent themselves to survive. Trade is an important component of the Hong Kong economy. Hong Kong traders need to anticipate, and be prepared to take advantage of, the global development of supply chain disintermediation or transformation.

Despite the current rationalisation of "dotcom" companies, B2C sales will continue to grow strongly. It is predicted that in 2005, in the United States alone, there will be US$270 billion of sales online and another US$380 billion of sales influenced by the web[20]. Sales will be increasingly dominated by traditional retailers as they master the new online distribution channel.

A significant opportunity also exists to provide goods and services to support this move online. Key inputs and requirements include telecommunications infrastructure, IT, application development, Internet service provision, consultancy and logistics. These support industries stand to gain considerably from e-business. For example, it has been estimated that Internet infrastructure and consultancy business alone would be worth in excess of US$28 billion in Asia by 2004[21]. Hong Kong has the opportunity to take advantage in those areas which we have regional strengths.

One of the primary e-business inputs – skilled IT professionals – is expected to remain in short supply globally. The current global IT skills deficit is estimated to be approaching 500,000. In five years' time global demand for appropriate IT skills may outstrip supply by as much as 20%. Some economies are already taking measures to increase the number of IT immigrants, looking to places such as India to fill the gap. Other economies are encouraging IT professionals to immigrate. In order to sustain our economic development, Hong Kong has to take active steps to attract the required IT skills in an internationally competitive environment.

The current global IT skills deficit is estimated to be approaching 500,000. In five years' time global demand for appropriate IT skills may outstrip supply by as much as 20%.

Government transformation

There are three major elements to e-government:

- establishing the correct environment within the government for e-business to flourish by putting in place appropriate leadership, governance, policy, targets, infrastructure and culture;

- developing e-business applications to fulfil government objectives. Governments around the world are looking to the development of e-business applications to improve service delivery and efficiency. Innovative service delivery models will emerge. This will increasingly involve back-end process re-engineering. There will also be front-end integration with private sector services; and

- stimulating and providing leadership to the public and businesses to encourage the adoption of e-business. Through the development of flagship online initiatives and e-procurement, governments will lead by example in the adoption of e-business, and encourage the use of electronic means in government transactions with the public and businesses. Hence, government leadership is a key enabler to the broader adoption of e-business in the whole community.

E-government, as measured by revenue collection and e-procurement, will grow significantly in this decade. Forecasts indicate that by 2006, in the United States alone, federal, state, and local governments will collect over US$600 billion[22] (including government fees and tax) via the Internet.

Governments as change agents

Various governments are actively developing and formulating comprehensive strategies to transform their economies to information-based.

At basic level these strategies aim to provide a suitable infrastructure and environment for the development of the information economy. At a higher level the strategies seek to encourage societal changes through leadership, education and training, and the manner in which government interacts with its stakeholders.

Comprehensive strategies typically include a combination of the following:

- encouraging competition in the telecommunications market;

- transforming government through IT and e-business;

- using e-procurement as a lever to encourage the e-enablement of businesses that provide supplies to government;

- conducting aggressive inward investment strategies to attract global participants in the information economy to establish high value-added facilities;

- funding e-business development initiatives and encouraging e-business;

- aggressively deploying IT in schools, exposing students to the use of IT and e-enabling them; and

- encouraging and assisting the industry to become e-business-enabled, particularly in SME-dominated sectors.

> E-government is an on-going process of transformation of government towards the conduct of internal operations and provision of government services to the public (including the access to government information and the completion of government transactions) via electronic means on an 'anywhere and anytime' basis.

The impetus for the 2001 Digital 21 Strategy

The rapidly changing e-business landscape, and the active and comprehensive response made by other leading governments, has led to the revision of the 1998 Digital 21 Strategy. Government recognises that the 1998 Strategy, the associated initiatives and the way in which the strategy was implemented, needed to be reviewed and updated in the light of these developments in order to drive Hong Kong as a leading digital city in the globally connected world.

The 2001 Digital 21 Strategy has been developed in response to the rapidly and radically changing world of e-business.

THE 2001 DIGITAL 21 STRATEGY:

CONNECTING THE WORLD

The 2001 Digital 21 Strategy

The Chief Executive's vision to establish Hong Kong "as a leader not a follower in the information world " continues to steer the course of the 2001 Digital 21 Strategy. The main theme is "Hong Kong: Connecting the World". The policy objective that captures the strategic intent for the way forward in the 2001 Strategy is:

Building on Hong Kong's early success in establishing a solid foundation for the use of IT, Digital 21 will now strive to position Hong Kong as a leading e-business community and digital city in the globally connected world

The 2001 Strategy places major emphasis on the following elements:

• Government's success to date in establishing a solid foundation for the use of IT;

• the importance of engaging the whole community – Government, the business community, the industry and the general public;

- the significance of focusing on e-business, in particular within the information economy;

- the global nature of the information economy; and

- the aim to position Hong Kong at the forefront of the global information economy as a leading digital city connecting the world by focusing on:

  - applications and services; and

  - specific areas which we can leverage our relative strengths and competitive advantage such as high mobile penetration, our position as a major trading hub in the Asia-Pacific Region, and close proximity to the Mainland of China.

The 2001 Strategy is a strategy for the whole community of Hong Kong. Its successful implementation will bring economic and social benefits to the whole community, and spearhead the development of Hong Kong as an information-based society and a leading digital city in the globally connected world.

The 2001 Strategy is a strategy for the whole community of Hong Kong.

Key Result Areas

The 2001 Digital 21 Strategy has five Key Result Areas (KRAs) which we need to focus on:

KRA 1:
To enhance the world class e-business environment in Hong Kong

KRA 2:
To ensure that the Hong Kong Government leads by example

KRA 3:
To develop Hong Kong's workforce for the information economy

KRA 4:
To strengthen the Hong Kong community for digital exploitation

KRA 5:
To leverage Hong Kong's strengths in exploitation of enabling technologies

Each KRA has its own associated objectives and initiatives.

We recognise that the globally connected world of e-business is moving so rapidly that today's initiatives may not be appropriate or relevant tomorrow. Therefore there is a need to constantly review the initiatives to see whether they are still appropriate for achieving the key results. This will require ongoing monitoring, flexibility and readiness during implementation to modify or seek new initiatives.

KRA 1:
To enhance the world class e-business environment in Hong Kong

E-business will be a strong driver for future ways of conducting businesses and a key enabler for transforming existing traditional businesses. Hong Kong has made considerable progress in establishing a conducive environment for e-business to develop. Achieving this KRA will place Hong Kong firmly on the e-business global map and secure international recognition and investment.

Objectives:

• ensure that the private sector is supported by world class e-business infrastructure and environment;

• attract international investors and companies to Hong Kong as their preferred choice for conducting e-business; and

• facilitate local e-business companies to explore overseas markets and cooperate with their potential partners overseas.

KRA 2:
To ensure that the Hong Kong Government leads by example

As the primary sponsor and champion of the 2001 Digital 21 Strategy, Government is committed to achieving a change at all levels in its own administration. This will inspire other stakeholders interacting with Government to adopt e-business. As a major customer in its own right, Government can help nurture a viable e-business support industry. Achieving this KRA will lead to significant improvements in customer service quality and efficiency.

Objectives:

• introduce IT-enabled business change that innovatively alters the face of Government for all users of public services; and

• transform Government's service delivery mechanisms, processes and structures through the use of IT.

KRA 3:
To develop Hong Kong's workforce for the information economy

The rapidly growing world-wide competition for skilled IT manpower and the corresponding shortage of these skills locally is a critical issue for Hong Kong. This KRA will help meet the digital city's demand for skilled IT professionals and practitioners in order to sustain the economic development of Hong Kong.

Objectives:

• implement effective short and medium term measures to address immediate IT skills requirement in the market;

• cultivate an environment to create an IT-savvy workforce; and

• adopt long term and sustainable solutions to secure a skilled IT workforce for the future.

KRA 4:
To strengthen the Hong Kong community for digital exploitation

Digital divide is often described as the gap between people who are able to participate in and benefit from the information economy and those who cannot. As technology gives rise to new products and applications, greater convenience and better services, the need for the community at large to have the knowledge of and access to the use of IT increases. We will foster the community to embrace, develop and use IT and will specifically target people who have less opportunities to access IT facilities in their daily lives, e.g. senior citizens, housewives, people with disabilities, etc. Achieving this KRA will ensure that the entire community will benefit from the developments of IT in enhancing our quality of life.

Objectives:

• facilitate a change in the cultural environment to ensure that the community embraces the adoption of innovative IT applications; and

• ensure access to the Internet, computers, telecommunications and other IT facilities for all sectors of the community.

KRA 5:
To leverage Hong Kong's strengths in exploitation of enabling technologies

Hong Kong should aim to take a leadership position in the exploitation of advanced and key enabling technologies where it has a competitive advantage. We should continue to leverage our strength as an early adopter and a mature user of technologies. We have long been recognised internationally for our achievements in commercialising new technology applications. Achieving this KRA will further enhance our position as a leading digital city.

Objectives:

• gain a leadership position globally in the awareness and adoption of emerging technologies for e-business; and

• be a leading global centre for the development of applications, content and services that utilise these new technologies.

How the 2001 Digital 21 Strategy positions Hong Kong for the future

The 1998 Digital 21 Strategy focused on building a foundation of capabilities and infrastructure. The 2001 Digital 21 Strategy aims for developing leadership in the rapidly changing and very competitive world of e-business.

The 2001 Strategy is essentially non-interventionist, following our free enterprise philosophy which guided us to our success in the past. It aims to put in place the right environment, infrastructure, skills and culture to encourage the development, adoption and use of IT and e-business by the whole community.

Government will adopt a proactive approach. The information economy is complex and sophisticated and no single economy can claim a lead in everything. Other economies are focusing their efforts and resources on leveraging their unique strengths and competitive advantages to attain leadership in their chosen fields. Hong Kong will also identify and target key areas to leverage our strengths in the drive to position ourselves as a leading digital city in the globally connected world.

With the liberalisation of the external telecommunications facilities market, Hong Kong's external connectivity is expected to increase by about 10 fold in the next two to three years.

FINLAND

UROPE

Via U.S.A.

CHINA

KOREA

JAPAN

ISRAEL

HONG KONG

TAIWAN

To U.S.A.

INDIA

MALAYSIA

PHILIPPINES

SINGAPORE

SOUTH AFRICA

AUSTRALIA

Internet Bandwith (Mbps)

▬▬▬▬	1,455
▬▬▬▬	452
▬▬▬▬	404
▬▬▬▬	118
▬▬▬▬	103
▬▬▬▬	97
▬▬▬▬	Other major Internet traffic

CHAPTER 4

PROGRAMME FOR

THE 2001 DIGITAL 21 STRATEGY

The initiatives

In order to achieve the objectives of the KRAs in the 2001 Digital 21 Strategy, Government will develop and implement the following initiatives, monitor their implementation and review their effectiveness. We will also revise the initiatives where necessary to meet changing market needs and development.

KRA 1: TO ENHANCE THE WORLD CLASS E-BUSINESS ENVIRONMENT IN HONG KONG
- International promotion of Digital 21
- Promote the on-going development of e-business infrastructure and multi-media content
- A new information infrastructure in operation at Cyberport
- Encourage adoption of e-business
- Facilitate an open and competitive telecommunications environment
- Enhance Hong Kong's position as a regional broadcasting hub
- Position Hong Kong for China's accession to the World Trade Organisation

KRA 2: TO ENSURE THAT THE HONG KONG GOVERNMENT LEADS BY EXAMPLE
- Promulgate a comprehensive e-government policy
- Further implementation of the Electronic Service Delivery Scheme
- Adopt e-procurement for Government purchases
- Develop the necessary infrastructure, tools, and skills for e-government
- Continue to outsource Government IT projects

KRA 3: TO DEVELOP HONG KONG'S WORKFORCE FOR THE INFORMATION ECONOMY
- Task force on IT manpower
- Increase IT manpower supply through training and education
- Leverage supply of IT professionals from other places
- Ensure young people are equipped for the information economy

KRA 4: TO STRENGTHEN THE HONG KONG COMMUNITY FOR DIGITAL EXPLOITATION
- Improve IT awareness and knowledge of the community
- Promote the use of IT
- Develop and publish Hong Kong best practice guidelines for access to online services

KRA 5: TO LEVERAGE HONG KONG'S STRENGTHS IN EXPLOITATION OF ENABLING TECHNOLOGIES
- Develop next generation wireless technologies
- Exploit smart card technology
- Development and deployment of digital terrestrial television
- Ensure Hong Kong's active participation in the development of next generation of Internet technologies

KRA 1:
TO ENHANCE THE WORLD CLASS E-BUSINESS ENVIRONMENT IN HONG KONG

International promotion of Digital 21

Digital 21 represents Hong Kong's overall strategy for leadership in the information economy of the 21st century. We will develop a marketing strategy for enhancing public and international awareness of Hong Kong's image as a leading digital city, an e-business-friendly economy, and a hub for exploiting technologies.

The marketing programme to promote Digital 21 will include activities such as road shows, press conferences, exhibitions, trade fairs, advertising via global media channels like business publications and web sites, and active participation in various international forums. We will also actively compete for holding prestigious international IT and telecommunications events in Hong Kong.

As part of this initiative, we will use the Digital 21 brand for all e-business and IT related marketing material, so as to strengthen the brand both locally and internationally.

We have entered into collaborative arrangements in the form of Memorandum of Understanding (MOU) or bilateral agreement with six partner economies which are advanced in the use of IT – Canada, Australia, the United Kingdom, Finland, India and Israel – to enhance co-operation and exchange in the field of IT and telecommunications. This has enhanced our status as a leading digital city. We will aim to leverage these arrangements to strengthen Hong Kong's digital credentials. We will also explore to conclude more such arrangements with other places which are advanced in the use of IT. This will help attract investors and companies from these places to conduct e-business in Hong Kong and facilitate local e-business companies to explore overseas market and co-operation with their potential partners overseas.

Promote the on-going development of e-business infrastructure and multi-media content

We have successfully developed the necessary infrastructure for conducting e-business. This includes telecommunications infrastructure, regulations and legislation, public key infrastructure and certification

Initiatives for KRA 1

- *International promotion of Digital 21*
- *Promote the on-going development of e-business infrastructure and multi-media content*
- *A new information infrastructure in operation at Cyberport*
- *Encourage adoption of e-business*
- *Facilitate an open and competitive telecommunications environment*
- *Enhance Hong Kong's position as a regional broadcasting hub*
- *Position Hong Kong for China's accession to the World Trade Organisation*

authorities, Chinese language interface, and the development of the Cyberport and Science Park. We will continue to enhance our world class e-business infrastructure by extending these initiatives and by encouraging the development of applications that demonstrate and promote the use of the infrastructure. In addition, we will continue to actively manage data privacy and transaction security issues which are crucial for e-business to flourish. We will also review within 2001 the Electronic Transactions Ordinance enacted to take account of technological advancement and social changes, and to ensure that our legal framework for e-business is up-to-date.

We will enhance the awareness of information security in the community and strengthen our ability to cope with computer emergency response situations. We have provided funding to support the establishment of a local Computer Emergency Response Team Coordination Centre to enhance the ability of the industry and community to tackle information security and respond to computer security incidents. We will also set up within 2001 a non-profit making and non-statutory organisation to administer Internet domain name registration in Hong Kong to ensure that our institutional framework will tie in with international development and the rapid increase in the use of the Internet in the community.

Hong Kong is one of the major broadcasting and film production centres in the world. We are also one of the world's largest film exporters and a major film producer. In terms of per capita production, Hong Kong ranks first globally. Our films have captured a considerable share of the film markets in the South East Asia. They have also become increasingly popular in the United States and Europe. Hong Kong films are screened in major international film festivals. Our film industry personnel have also won a wide variety of awards in these events including the prestigious Oscar Awards in 2001[23]. This stimulates our further development as a major content provider, including multi-media and digital content. To maintain our competitive advantage in this area, we will strive to develop an environment which is more conducive to investment and innovation in multi-media content production.

A new information infrastructure in operation at Cyberport

The Cyberport captures global and local attention as its construction works progress quickly to phased completion between early 2002 and end 2003. The state-of-the-art information infrastructure at the Cyberport will connect the different areas of the integrated Cyberport

campus and will link the campus with the rest of the world. The initial scalable bandwidth capacity will see Cyberport tenants comfortably through their first quarter century of rapid digital development. This will be complemented by a wide range of high-tech facilities such as multi-media laboratory, content centres, studios, and media conference theatres. In the centre of the Cyberport will be a Cybercentre where the professionals will enjoy a wide range of cyber-related retail and entertainment facilities and where the public will experiment innovative IT applications through the technology-themed retail and entertainment facilities. The Cyberport infrastructure will support and facilitate e-business in all directions.

Many companies have already expressed interest to become Cyberport tenants. Multi-national corporations such as Cisco, Hewlett-Packard, IBM, Microsoft, Oracle, Sybase and Yahoo!, etc. have signed letters of intent to become anchor tenants. The selection of tenants will be based on the applications of the interested companies, acting on the advice of a committee comprising international, local and industry experts. A strategic cluster of IT and IT-related companies will be built up at the Cyberport, starting from early 2002. This cluster will comprise 150 – 200 companies of varying sizes and at different stages of development, ranging from famous multi-national corporations to medium and small sized overseas and local companies. Not only e-business will be practised by these companies 24 hours a day and seven days a week at the Cyberport but these companies will also develop new technologies, applications, services and content in many different fields. Some of their productions may take e-business development to a new height.

The Cyberport will be an icon on the world IT map. The project, when it starts to take in tenants in early 2002, will transform itself from a symbol of Hong Kong's determination to build up a leading digital city into a working example of a world class environment to apply and nurture e-business and other IT-related activities.

Encourage adoption of e-business

We will continue to encourage the adoption of e-business in the business community and the industry to enhance our competitiveness in the information economy. We will organise awareness seminars and exhibitions targeting businesses on a sector specific basis. We will also actively promote the use of IT applications in SMEs, which make up more than 95% of the enterprises in Hong Kong and are the backbone of our economy. In addition, we will proactively assist key sectors to

leverage Hong Kong's strengths or address areas which need enhancement.

It remains a common perception in industry that IT investments are inherently risky and costly. We will continue to work closely with industry support organisations to explore readily affordable solution packages for e-business. In addition, we will encourage and facilitate participation in e-marketplaces.

Facilitate an open and competitive telecommunications environment

Our advanced telecommunications infrastructure is an important part of our vision to be a leading digital city. Government is committed to continuing with the liberalisation in the telecommunications sector. Our telecommunications services and facilities are not subject to any form of foreign ownership restrictions and we are committed to providing a level playing field. This will bring more effective competition which in turn will lead to improvement in service quality, as well as better value to customers. A pro-competition and open regulatory regime will continue to underpin our liberalisation policy for the telecommunications industry.

Following the liberalisation of our external telecommunications facilities market with effect from 1 January 2000, all sectors of our telecommunications market, local and external, service-based and facilities-based, are open to competition. Consumers and businesses now enjoy more choices of service providers, a wider range of innovative services as well as competitive prices. Competition has resulted in a substantial reduction in International Direct Dialing (IDD) call rates and improved service quality. With reduced IDD call rates, we estimate that consumer savings in 2000 alone amounted to HK$5.2 billion.

With the progressive liberalisation of the local fixed telecommunications market, we are now able to enjoy enhanced broadband networks and services provided by a total of ten operators. To press on with our commitment to further liberalise the local wireline-based fixed telecommunication network services market, we will invite new licence applications within 2001 for operation from 1 January 2003.

We have granted licences for operating wireless fixed telecommunications network services, and licences and letters of intent

for providing external telecommunications facilities. To encourage take up of broadband, we will ensure that the regulatory framework facilitates the development of an open infrastructure. This will encourage broadband services to be made widely available at reasonable price to the consumers. This is essential to our overall competitiveness, promotion of e-business and improvement of our quality of life. Investment from the private sector will amount to HK$13 billion in the next three years.

After wide consultation, we have finalised the third generation (3G) mobile communications licensing regime. We have adopted a hybrid approach. There will be a prequalification process, to be followed by spectrum auctioning. This commits the applicants to providing a quality 3G network within a reasonable period of time. The spectrum auction, unlike the more traditional auction based on dollar amount, will be based on a royalty percentage of turnover. To minimise Government's risks, successful bidders need to pay a minimum guaranteed payment. Auction by royalty will have the following results:

- operators face less financial burden, particularly upfront cost, in getting a 3G licence; and

- more investors may get interested in the Hong Kong 3G market.

One additional feature of our licensing regime is the "open network requirement". To encourage competition at the service and application level, 3G network operators will need to lease at least 30% of their capacity to non-affiliated mobile virtual network operators and content providers. We believe that an open network is what the consumers want and that content or application providers are encouraged to bring new innovation to an accessible 3G market. We will issue four 3G licences adopting this approach within 2001, with a view to rolling out services along the same time as other advanced economies.

Enhance Hong Kong's position as a regional broadcasting hub

With our world class telecommunications infrastructure and a critical mass of talents in programme production, Hong Kong is well positioned to be a regional broadcasting hub. We will strive to provide an environment that is conducive to investment and innovation in broadcasting and multi-media content production.

Technological advance has to be supported by a flexible and facilitating environment. We have reviewed our broadcasting regulatory regime to ensure that it is in step with technological development and market demands. Under the Broadcasting Ordinance enacted in mid-2000, broadcasters are allowed to choose any technically feasible means of transmission for delivering their services to consumers.

The four categories of television services under the Broadcasting Ordinance, i.e. domestic free, domestic pay, non-domestic and other-licensable television services, are now regulated in accordance with their nature and pervasiveness rather than their transmission mode. This technology-neutral piece of legislation provides a fair, open and business-friendly regulatory environment that is conducive to investment, technology application and innovation in the television industry.

An open and competitive television market will attract investment, encourage innovation and, most importantly, bring wider programming choice to viewers. We have taken the policy decision that, subject only to physical constraints like spectrum limitation, there should not be a ceiling on the number of licences to be issued. This liberalisation policy has led to an increase in the number of domestic pay television licences from two in 1998 to five in 2001, and non-domestic television licences from two in 1998 to six in 2001. New domestic pay television services are expected to be launched in the second half of 2001 or early 2002. Apart from ensuring that consumers get the best services at competitive prices, an opened-up television market will create new business opportunities for the local television production industry. We expect that the market demand for good local productions will increase under the emerging multi-channel, multi-media environment, thus further stimulating the growth of Hong Kong as a broadcasting and production hub in the Asia-Pacific Region.

Position Hong Kong for China's accession to the World Trade Organisation

With the imminence of China's accession to the World Trade Organisation, Hong Kong, capitalising on our special relationship with the Mainland of China and our knowledge and expertise in the operation of the Mainland market, stands ready to take advantage of the new opportunities which will arise with the opening up of the Mainland market, especially in the IT and telecommunications field. Apart from reinforcing our traditional gateway role, we can also become

the leading regional and international hub for the Mainland, as well as providing crucial financial, management and logistics support.

The Mainland has the high tech expertise and human resources for research and development. Hong Kong companies can help bring Mainland technology development to the local and international market. We can also provide the capital to nurture this development, with the abundance of venture capital in Hong Kong and our vibrant securities market. Many Hong Kong telecommunications companies are beginning to invest in Mainland telecommunications infrastructure, such as fibre-optics networks, and keen to take part in the provision of value-added telecommunications services in the Mainland.

We will promote investment in infrastructure to increase telecommunications capacity between the Mainland and Hong Kong. This has already increased by more than eight times in the past year. We will also bring together the telecommunications and IT industry of the Mainland and Hong Kong, encouraging them to explore further scope for co-operation.

Targets for implementing the specific initiatives under this KRA are:

KRA 1
To enhance the world class e-business environment in Hong Kong

INITIATIVE	TARGET
To enhance the legal infrastructure for e-business	Review the Electronic Transactions Ordinance in 2001
To develop institutional arrangements for administering Internet domain name registration	Establish a non-statutory and non-profit making organisation to administer Internet domain name registration by end 2001
To implement the Cyberport project	Open Cyberport in phases from early 2002 to end 2003
Introduce further competition in the local wireline-based fixed telecommunications network services (FTNS) market	Invite licence applications for local wireline-based FTNS in 2001, for operation from 1 January 2003
Develop third generation (3G) mobile communications services	Issue four 3G licences in 2001
Provide more competition in domestic pay television services	New domestic pay television services are expected to be launched in the second half of 2001 or early 2002

KRA 2:
TO ENSURE THAT THE HONG KONG GOVERNMENT LEADS BY EXAMPLE

Promulgate a comprehensive e-government policy

Government is committed to leading by example in the use of e-business, both in conducting internal business operations and in delivering public services to the businesses and community on an "anywhere and anytime" basis. We can use e-business solutions to modernise Government operations, improve efficiency and optimise the use of limited resources. We can also improve the quality of providing services to the community. We can move away from the conventional approach of service delivery and break down bureaucracy between departments to facilitate the provision of more customer-oriented, valued-added and user-friendly one-stop Government services.

We will implement a comprehensive policy to build e-government. We will:

• set up a dedicated E-government Co-ordination Office to drive and co-ordinate e-government initiatives;

• set a target for providing e-option (the option to obtain the service online) for public services amenable to the electronic mode of service delivery. At present, 65% of such services already have an e-option. We will increase this to 90% by end 2003. We will also actively promote and encourage the utilisation of the e-options available;

• proceed with flagship e-government projects which will bring significant benefits to Government and the community. These flagship projects fall in the following four categories:

Government-to-Citizen (G2C): providing convenient and user-friendly public services online to individual citizens can significantly improve our service level and enable us to better serve the community. It will also enhance public confidence in conducting electronic transactions and promote the wider adoption of IT in the community. We will continue to introduce more G2C services online. The development of the ESD Scheme sets out the way forward.

Government-to-Business (G2B): transacting with our business partners online can improve efficiency and reduce the compliance costs of the

business sector, thus enhancing competitiveness. It will also facilitate innovation and investment and help promote Hong Kong as the world's premier business city. We will actively implement and drive e-procurement initiatives.

Government-to-Employee (G2E): Government as an employer using electronic means in communication and transactions with its employees, namely, civil servants, will enhance internal management efficiency, reduce administrative costs, and foster an e-government culture within the civil service. We will roll out G2E projects such as electronic leave application and processing shortly.

www.esd.gov.hk

Government to Government (G2G): G2G transactions refer to inter-departmental and intra-departmental operations. We are implementing a phased programme for adopting inter-departmental and intra-departmental electronic transactions to promote the use of IT within Government. These include putting the process to prepare the annual estimates online, developing systems to allow departments to place orders online for common store items and for printing Government publications:

• ensure that the backend processes of our online services are engineered to optimise efficiency and effectiveness;

• strengthen Government internal information infrastructure to sustain the various e-government initiatives; and

• enhance the skills of the management and staff in the civil service and provide the necessary tools for exploitation of e-government opportunities.

Successful development of e-government involves initiating cultural changes within Government for championing the e-agenda, coordinating with different departments, addressing inter-departmental issues arising from the implementation of cross-departmental projects based on a customer-centric approach and exploring innovative implementation models like establishing partnership with the private sector. We have secured top level support to develop e-government. We will also ensure that all Government departments share the vision and develop their e-business strategies to support the implementation of the e-government policy.

Further implementation of the Electronic Service Delivery Scheme

Government will continue to take the lead in creating demand for services that make effective use of the open and common information infrastructure developed through the further implementation of the ESD Scheme (www.esd.gov.hk). Under the current scheme, the community can obtain a wide range of services from various departments and agencies, e.g. submission of tax return, registration as a voter, renewal of driving and vehicle licences, payment of Government fees, etc. and to transact with Government online efficiently and securely through Internet-connected computer facilities or conveniently located public kiosks. With the development of ESD, Hong Kong is branded as "a platform for a glimpse of the possibilities of e-government in Asia"[24].

We will continue to roll out additional ESD applications, e.g. booking of leisure and sports facilities, registration for sitting public examinations, booking of marriage appointment, etc. The priorities for implementation of ESD applications will continue to be determined by transaction volumes, Government and user readiness, potential efficiency gains, and the extent to which the public demand particular online services. To widen accessibility, we will explore the potential of other delivery channels such as mobile phone, wireless hand-held device and interactive television, etc.

ESD is also the pioneer in the integration of the delivery of public and private sector services. The ESD information infrastructure can also be used to carry private sector services thus making the scheme more attractive and convenient to users.

Adopt e-procurement for Government purchases

Procurement activities between Government and its suppliers are significant. Huge savings can be achieved for both through adopting e-procurement — particularly for high volume, low value items. It also encourages the suppliers to adopt e-business.

www.ets.com.hk

E-procurement provides electronic support for the entire procurement process, from integrated supplier database, invitation to tender, receipt and negotiation of tenders, to contract signing and payment. We have developed one of the world's first ever web-based electronic tendering system. This enables us to issue tenders and receive bids securely via the Internet. We have adopted the system for non-works projects not

exceeding HK$ 10 million each. We will soon extend electronic tendering to cover works projects, as well as non-works projects exceeding HK$ 10 million each. Our target is to carry out at least 80% of Government procurement tenders through electronic means by end 2003. We will also develop an electronic marketplace for lower value procurement which is currently conducted through quotations or direct purchases.

Develop the necessary infrastructure, tools, and skills for e-government

To develop an efficient and effective e-government, we need to enhance our internal IT infrastructure. This includes hardware, software, network and standards enhancement such as:

- higher bandwidth networks within and across departments;

- secure electronic mail networks;

- asset management software; and

- wider access to office automation facilities, electronic mail and the Internet.

We will also continue to explore new technologies to support e-government. For example, we are working on a programme for the use of hand-held devices for field officers to facilitate their work on site.

In addition to infrastructure, both the management and staff at all level need to be equipped with the necessary skills to fully exploit the e-government tools available. Awareness and training programmes targeting all levels of Government officers will be implemented.

Continue to outsource Government IT projects

Since 1998, we have adopted an active outsourcing strategy for the provision of IT services within Government. This has helped enlarge the delivery capacity, accelerate the delivery of IT solutions, and create a market of sufficient size to encourage the development of the local IT industry. We have also enhanced our communications with the local IT industry through various forums to enhance their understanding

Central Cyber Government Offices

of our outsourcing plans. To date, we have achieved our target of outsourcing two-thirds of new Government IT projects each year.

We will continue to actively pursue the outsourcing strategy by outsourcing not only new Government IT projects but also the application maintenance activities currently performed in-house.

Targets for implementing the specific initiatives under this KRA are:

KRA 2
To ensure that the Hong Kong Government leads by example

INITIATIVE	TARGET
To establish the institutional framework for driving e-government	To set up a dedicated E-government Co-ordination Office within 2001
To provide e-option for public services amenable to the electronic mode of service delivery	To provide e-option for 90% of such services by end 2003
To continue to develop the Electronic Service Delivery (ESD) Scheme	To roll out new ESD applications in 2001 and in subsequent years
To drive e-procurement	To carry out 80% of Government procurement tenders through electronic means by end 2003
To actively pursue outsourcing	To outsource 2/3 of new Government IT projects each year and to outsource application maintenance work starting from 2001
To implement a phased programme for adopting intra-departmental and inter-departmental electronic transactions	To initiate in 2001 to put the process to prepare the annual estimates online and develop systems to allow departments to place orders online for common store items and printing Government publications

KRA 3:
TO DEVELOP HONG KONG's WORKFORCE FOR THE INFORMATION ECONOMY

Task force on IT manpower

The IT manpower gap is a crucial issue to address in positioning Hong Kong as a leader in the information economy. To this regard, a task force on IT manpower has been set up under the Information Infrastructure Advisory Committee to act as a focal point to address the question of IT manpower supply in Hong Kong.

The task force comprises representatives of the IT industry, employers, professional bodies, industry associations and providers of training and education. It provides a forum to channel information from the demand side of the manpower equation to the supply side, and advises Government on how to strengthen our IT manpower supply. The key role is to identify and drive new initiatives that bridge the IT manpower gap in Hong Kong.

Increase IT manpower supply through training and education

To address the immediate shortage of IT manpower in Hong Kong, we will aim to maximise output by increasing availability of training opportunities at all levels, particularly through self-financing programmes. At present, we have over 9,000 graduates at degree and sub-degree level from IT and related disciplines each year, representing more than 25% of the annual output. We will explore to increase the supply in the medium to longer term.

As Hong Kong moves into an information economy, our workforce needs to be versatile and adaptable so as to be able to seize emerging opportunities. Life-long learning is necessary to continually enhance the knowledge and skills of the workforce. In order to develop more flexible system and training curricula that match market demand, private sector participation is necessary as private training institutions are able to rapidly modify their programmes according to market needs.

We will explore introducing more IT training programmes and accrediting qualified courses. We will encourage:

Initiatives for KRA 3

- *Task force on IT manpower*
- *Increase IT manpower supply through training and education*
- *Leverage supply of IT professionals from other places*
- *Ensure young people are equipped for the information economy*

- the provision of IT training by local private institutions;

- more overseas tertiary bodies and renowned institutions to provide IT training in Hong Kong; and

- the provision and use of other channels such as interactive television or the Internet for online training.

We will also explore collaborating with renowned overseas training institutions and prestigious IT companies to provide internships for our students and IT practitioners so as to widen their perspective and international outlook.

Leverage supply of IT professionals from other places

Hong Kong should leverage supply of IT professionals from the Mainland of China and other places.

To ensure that Hong Kong's economy is not hampered by any bottleneck in IT manpower supply, importation of high quality IT professionals will be explored as a solution to fill the gap. Admission of outside professionals is a common practice around the world. We have reviewed the policy and channels for importation of qualified people with a view to improving the processing procedure for recruitment of IT professionals from other places. This will increase the number of professionals with IT related skills for both short term and long term assignments in Hong Kong.

With the special relationship between Hong Kong and the Mainland of China and the abundance of good quality IT professionals in the Mainland, we have recently proposed to launch a special scheme for the admission of Mainland IT professionals. Those who possess IT skills and knowledge not readily available locally, and who are offered a remuneration package broadly comparable to the market level for IT professionals in Hong Kong, can apply under the scheme.

On the other hand, we also encourage the use of overseas IT professionals in their domicile where assignments could be facilitated by the Internet environment.

We will introduce promotion programmes to market Hong Kong as a preferred destination for prominent IT professionals to work and live. We will also actively encourage IT professionals working overseas and students who have completed studying IT overseas to return and work in Hong Kong. We will leverage our international promotion effort, and will distribute promotional brochures through our overseas offices around the world.

Quality IT and IT-related companies will start moving into the Cyberport from early 2002. These companies will bring with them professionals from all parts of the world. Apart from attracting and retaining IT professionals, the infrastructure at the Cyberport will also make it a place to nurture talents. We are already in discussions with the prospective tenants, universities and other interested bodies in developing suitable and useful activities to help groom talents at the Cyberport.

Ensure young people are equipped for the information economy

We have launched the 5-year strategy (1998-99 to 2002-03) to develop IT in education in schools. We will continue to improve the IT curricula and learning environment in schools. We will provide adequate IT facilities including network facilities for teachers and students to access and share information. We will continue to provide recurrent grants to all public sector primary, secondary and special schools for Internet access. In addition, we will equip the schools with more multi-media facilities to enhance teaching and learning through the use of IT. We will also continue to give technical and training support for schools and teachers.

We will also collaborate with the IT industry to provide professional IT training to students at secondary level so that students can gain early exposure to the use of IT. These training programmes will lead to professional qualifications which are recognised internationally and will help the students acquire state-of-the-art IT skills. This will give them a competitive edge in establishing a career in the IT field or pursuing future study in IT. We will also explore the provision of IT training to those secondary school leavers who may wish to pursue an early career in the IT field. The training will also equip them with qualification which can be accepted academically if they wish to pursue higher study at a later stage.

We will continue to run an IT assistant training course to provide more supply at junior IT assistant level to sustain the development of IT in Hong Kong. We will also establish an IT Skills Assessment Centre and work together with the IT profession to provide for accreditation of IT skills.

It is important that our students receive quality education that equips them for the information economy. We will continue to review curricula

to ensure alignment to market demand. English is regarded as the primary language of the global information economy and the language for the Internet. While maintaining our bilingual capabilities in the development and localisation of software products, we are conscious of the need to further enhance our students' competency in English in order to strengthen Hong Kong's competitive edge in the globally connected world.

Targets for implementing the specific initiatives under this KRA are:

KRA 3
To develop Hong Kong's workforce for the information economy

INITIATIVE	TARGET
Provision of IT training by private institutions	Explore in 2001 to attract world-renowned overseas training institutions to provide accredited IT training courses in Hong Kong
Admission of IT professionals from other places	Roll out an admission scheme for IT professionals from the Mainland of China
Develop IT in education in schools	Continue to implement the 5-year strategy of IT in education (1998-99 to 2002-03) in schools
Provide IT training for secondary students in co-operation with multi-national IT companies	Roll out pilot schemes in 2001
Provide training courses for IT assistants to increase the supply of trained IT manpower at junior level	Provide 1,000 training places in 2001-02 and to monitor implementation and review the way forward in the light of market demand
Establish institutional framework to accredit IT skills	Establish an IT Skills Assessment Centre in 2001

KRA 4:
TO STRENGTHEN THE HONG KONG COMMUNITY FOR DIGITAL EXPLOITATION

Improve IT awareness and knowledge of the community

Digital divide is defined as the gap between individuals, households, businesses and geographical areas at different social-economic levels in respect of their opportunities to access IT and the use of the Internet for a wide variety of activities. With the rapid development of the information economy, the problem of digital divide has emerged and has become a subject of international concern.

Hong Kong is one of the most advanced economies in the Asia-Pacific Region. Our IT development is at the forefront of the region. We have excellent telecommunications infrastructure and our personal computer and Internet penetration rates are comparable to any advanced economies in the world. A substantial proportion of our population readily has the opportunities to access IT and the use of the Internet. Digital divide is less an issue to Hong Kong as compared with other places. However, we need to focus on how to avoid its emergence and to strengthen the Hong Kong community to exploit opportunities in the information economy. We will consult relevant bodies in drawing up our initiatives.

Government has implemented a series of activities ranging from the establishment of Community Cyberpoints to the launching of IT appreciation programme to raise the awareness, confidence, and familiarity of the community in the use of IT in all spheres of their lives, especially towards life-long learning and knowledge renewal. We have significantly improved the accessibility to the Internet and IT facilities by providing public computer facilities in community centres/halls, public libraries, district offices, post offices, etc. and funding computer purchases in schools. All schools are now linked to the Internet. We will continue to expand the Community Cyberpoint programme. We will also focus on educating the community in the use of IT.

We launched the "IT Hong Kong" campaign in September 2000 to promote the wider adoption of IT in the community. It comprises a series of promotional activities, including a territory-wide IT awareness programme. We have also launched an "IT Hong Kong" web site (www.ithk.gov.hk) which serves as a forum for disseminating information to the public on IT and related activities. We will continue with these

Initiatives for KRA 4

- *Improve IT awareness and knowledge of the community*
- *Promote the use of IT*
- *Develop and publish Hong Kong best practice guidelines for access to online services*

promotional efforts. We will also conduct survey annually to assess the level of the use of IT in the community.

Promote the use of IT

Government is committed to encouraging the participation of the whole community in the information economy. We believe that as IT continues to become more pervasive, the general public would have more opportunities to use IT facilities in their everyday life. However, some sectors of the community, e.g. senior citizens, housewives, people with disabilities, etc. may have less opportunities to fully appreciate the benefits brought about by the development of the information economy.

We will conduct survey to identify the specific groups of people who have less opportunities to use IT in their daily lives. This can be achieved by analysing indicators like computer and Internet penetration, usage of IT, etc. by groups of different education levels, income levels, occupation, age, gender, geographic location, etc. Once the target groups are identified, we will develop specific programmes for them.

We have been providing IT training and awareness programmes for the senior citizens, housewives and people with disabilities through the territory-wide IT awareness programme in co-operation with other non-Government organisations and the response has been very encouraging. We will provide more such programmes.

We have developed dedicated Community Cyberpoints which have installed special computer facilities such as screen with enlarging device, Braille machine, software for conversion of text into voice, etc. to enhance access for the blind and visually impaired. We will review the scheme to see how it should be further developed. We will also upgrade the public kiosks provided under the ESD Scheme by installing screen enlarging devices to facilitate the visually impaired to make use of the kiosks to access Government online services.

Develop and publish Hong Kong best practice guidelines for access to online services

Web sites and electronically available content should be made accessible to all groups of people in the community including those with disabilities. Accessibility needs to be 'designed in' and may cover issues such as:

- availability of the web site in both English and Chinese;

- ability to resize text;

- use of captions for graphic content and video presentations; and

- ability for access via a variety of media, e.g. Internet, mobile communications, digital television.

Having regard to international standards, we have developed in collaboration with the industry and disabled groups a set of accessibility guidelines for best practice in web development and electronic transactions. These accessibility standards will be enforced in all Government web sites. We will also encourage Government-related organisations and the private sector to adopt such guidelines. These guidelines will also be published and made accessible to the general public and web developers. We will also explore the establishment of a web site accreditation scheme so that web sites that meet the accessibility guidelines may be readily recognised.

Targets for implementing the specific initiatives under this KRA are:

KRA 4 **To strengthen the Hong Kong community for digital exploitation**	
INITIATIVE	**TARGET**
Conduct surveys to monitor digital divide	Conduct survey on the use of IT on an annual basis
Provide free computer facilities for use by the community	Continue to develop the Community Cyberpoint scheme
Promote the use of IT in the community	Continue to implement the "IT Hong Kong" campaign
Actively encourage the use of IT in sectors of the community that may have less opportunities to access IT	Organise IT awareness programme to provide basic training of computer operation and the use of the Internet to senior citizens, housewives, people with disabilities, etc.
Enforce the accessibility standards for all Government web sites	All Government websites will adopt the accessibility guidelines by early 2002 to facilitate universal access, including people with disabilities

KRA 5
TO LEVERAGE HONG KONG'S STRENGTHS IN EXPLOITATION OF ENABLING TECHNOLOGIES

Develop next generation wireless technologies

Our high mobile penetration creates the potential for Hong Kong to be a leader in exploitation of mobile commerce technologies. We have drawn up the licensing regime for 3G mobile services. We will ensure that Hong Kong makes steady and uninhibited progress towards the early issuance of 3G licences. We will develop a consistent and interoperable framework for the wireless broadband platform, and encourage the development of leading edge wireless applications on this platform. We will also drive the issue of mobile digital certificates to support the conduct of secure mobile commerce. We will be amongst the first in the world to issue such certificates.

Exploit smart card technology

Smart card technology has been around for over 10 years. The advent of the Internet and the greater adoption of e-business by both the public and private sectors have substantially increased the potential for smart card usage. The use of this technology in payment transactions is becoming increasingly common in Hong Kong. We are familiar with the use of e-money smart cards for payment in transport and retail services in our everyday life.

We will replace the existing Hong Kong citizens' identity cards with a new generation of 'smart' identity cards from 2003 onwards. This will cover a population of around seven million people. The identity card replacement exercise presents us with a unique opportunity to capitalise on the use of smart card technology for developing a user-friendly platform to provide more efficient, better quality and value-added services to the community. We have proposed that the new identity card should take the form of a multi-application smart card with capacity to support different types of applications. This will be a significant step forward in enhancing our overall information infrastructure and achieving our aim to position Hong Kong as a leading digital city. It will also facilitate the adoption of e-business in the community.

We are conducting feasibility studies to examine how smart card technology can be used to provide additional value-added functions through the new identity cards. We will carry out public consultation on whether these functions should be adopted. We will also adopt comprehensive measures to ensure that the smart identity cards are secure and to address privacy and personal data protection. We target to roll out the new smart identity cards with multi-application capacity starting from 2003.

Development and deployment of digital terrestrial television

Economies all over the world are at various stages of testing or launching digital broadcast services. Hong Kong is no exception. It is our policy objective to encourage and facilitate the use of state-of-the-art technology in broadcasting services.

Digital terrestrial television (DTT) will offer a new transmission platform in addition to the existing ones such as satellite, cable and analogue radio spectrum. In addition to providing opportunities for introducing more television services, DTT offers other advantages to viewers like high-definition pictures and CD sound quality. With the right equipment, DTT can also offer interactive services such as home-banking, e-shopping, Internet access and electronic mail. E-business on television will be one of the many business opportunities that the industry can explore.

In the past year, Government and the television industry had jointly completed technical trials of DTT. In the light of these results, Government has formulated policy proposals on digital terrestrial broadcast for consultation with the industry and the community. The consultation period ended in February 2001 and we are studying the comments in detail. We will take full account of the submissions in formulating the policy framework and implementation timetable for broadcasting services under a digital environment. The objective is to ensure that our policy framework will widen programming choice for the community, encourage investment and innovation in the industry, promote fair and effective competition in the market and enhance Hong Kong's position as a regional broadcasting hub.

Ensure Hong Kong's active participation in the development of next generation of Internet technologies

The next generation of Internet technologies will better support advanced applications such as multimedia-based applications and multicasting in different areas, for example, tele-medicine, digital library, video conferencing and distance learning, etc. To maintain Hong Kong's leadership in deploying and leveraging these new technologies, we will ensure that we can actively participate in the relevant research and development activities. Our aim is to be a leader in the deployment of such technologies within the region.

The Joint Universities Computer Centre, formed by the computer centres of the eight tertiary institutions in Hong Kong, has signed an MOU with the University Corporation for Advanced Internet Development (UCAID) – a non-profit consortium of American research universities working in partnership to provide leadership and direction for advanced networking development within the university community. The UCAID is currently engaged in Internet2 – a programme to jointly collaborate on the development of next generation of Internet technologies and applications over a high speed network. The primary goals include:

- creating the leading edge Internet network, and to develop and test advanced applications over that network; and

- ensuring rapid transfer of new network services and applications to the broader Internet community.

A high speed link will be established between the Hong Kong tertiary institutions and the Internet2 network. Government will promote and facilitate research and development work on advanced and multi-media applications through the link. We will also set up a working group comprising industry experts and academia to drive Internet2 development.

Apart from improving Hong Kong's leadership position in Internet research, we will gain early access to, and knowledge of, advanced applications that can utilise the next generation of Internet technologies. This will facilitate Hong Kong's early deployment and commercialisation of these applications.

Targets for implementing the specific initiatives under this KRA are:

KRA 5 To leverage Hong Kong's strengths in exploitation of enabling technologies	
INITIATIVE	**TARGET**
Develop leading edge mobile applications	Issue third generation (3G) mobile communications licences in 2001, with service rollout along the same time as that for other advanced economies
Facilitate the conduct of mobile commerce	Drive the issue of mobile digital certificates in 2001 to support the conduct of secure mobile commerce
Exploit smart card technology	Issue smart card identity cards with multi-application capacity in 2003
Encourage and support the establishment of a link between Hong Kong and the Internet2 network to promote research and development work in the next generation of Internet technologies	Establish the Internet2 link by end 2001 and set up a working group to promote the development of Internet2

CHAPTER 5

CONCLUSION

Hong Kong has made significant progress in developing as a digital city. But responding to new challenges and adapting to more change, more often and more quickly are the norm in the information age and the key to future success. Since the promulgation of the first Digital 21 Strategy in 1998, the world has experienced unparalleled social, economic and technological changes which have been significantly influenced by the growth of the Internet and e-business. IT as a tool has substantially changed the way we live, learn, do business or interact with each other. We in Hong Kong must move forward with a visionary, focused and target oriented strategy which can meet the ever-changing challenges in the information economy. The 2001 Digital 21 Strategy: Connecting the World sets out our way forward.

Government, private sector and the community must work together in driving the strategy and turning our vision into reality. The challenge is great, but the benefits to Hong Kong are enormous. We will be able to take the opportunities, move with times, and make positive progress and real achievements.

The e-revolution gives us the opportunity and the tool to improve governance. We will build on our strengths of entrepreneurship, versatility and determination to succeed in implementing the Digital 21 Strategy. But not all ingredients of good governance can be downloaded from the Internet or substituted by the e-revolution. We must continue to uphold our pillars of success including the free and open market policy, the rule of law, independent Judiciary, protection of contractual and intellectual property rights by law, free flow of information, low and business-friendly tax regime, level playing field for business operation, and a clean and efficient civil service, These are the core values which we will embrace whatever changes may be. But IT can be our key tool to drive all these virtues. And Hong Kong will excel as the leading digital city, connecting the world.

Our Digital 21 Strategy will continue to develop and evolve in response to the rapid pace of technology innovation, adoption and application and the changing environment where advances considered innovative today may become obsolete tomorrow. We, in the Information Technology and Broadcasting Bureau of the Government of the Hong Kong Special Administrative Region, will therefore welcome suggestions and comments on the Digital 21 Strategy. We can be reached –

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By fax – 2511 1458

By electronic mail – itbbenq@itbb.gov.hk

FURTHER INFORMATION AND UPDATES

For further information and updates relating to the 2001 Digital 21 Strategy, please visit the following web sites:

Digital 21 Strategy	http://www.info.gov.hk/digital21/
Information Technology and Broadcasting Bureau	http://www.info.gov.hk/itbb/
Information Technology Services Department	http://www.info.gov.hk/itsd/
Office of the Telecommunications Authority	http://www.ofta.gov.hk/
Commerce and Industry Bureau	http://www.info.gov.hk/cib/
Education and Manpower Bureau	http://www.info.gov.hk/emb/
Innovation and Technology Commission	http://www.info.gov.hk/itc/
Invest Hong Kong	http://www.investhk.gov.hk/
Government Information Centre	http://www.info.gov.hk/
Interactive Government Services Directory	http://www.igsd.gov.hk/
Electronic Service Delivery	http://www.esd.gov.hk/
IT Hong Kong	http://www.ithk.gov.hk/

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