



Developing National Broadband/ICT Plans

The Structure and Best Practices Necessary to Ensure Success



INTRODUCTION

Most governments now recognize the substantial economic and social benefits of broadband, but questions remain about how best to achieve those benefits. Comprehensive national plans have proved to be an essential first step. These plans — which may be broadband-specific or part of broader ICT plans — provide the vision, structure and coordination necessary to ensure timely and affordable broadband diffusion.

Over the past decade, a small but growing number of countries have produced successful broadband and ICT plans. Based on those early experiences, as well as Intel's work with governments, technology companies and advocacy groups worldwide, Intel has identified a proven, three-phase structure and six best practices that can make it easier for more governments to develop effective and sustainable national plans.

"Because broadband networks have the potential to contribute so much to economic development, they should be widely available at affordable prices and should become an integral part of national development strategies."

World Bank, 2009



THE BENEFITS OF BROADBAND

There is no longer any debate as to whether broadband is beneficial. Extensive research worldwide firmly establishes the fact that broadband networks can help countries cross the digital divide by delivering extensive personal, social and economic benefits.

Recent research by the World Bank and others shows that increasing broadband penetration boosts economic growth by about 1 percent to 3 percent.¹ Greater broadband penetration also spurs job growth and expansion, as seen in Latin America, where increasing penetration from 5.5 percent to 7.7 percent would generate an estimated 378,000 new jobs.²

Although more difficult to quantify, the social benefits of broadband are equally powerful. Broadband is a social equalizer that enables all citizens — regardless of location, lifestyle or income — to communicate faster and in more ways. Broadband is particularly powerful in rural and remote areas, where it can be used to increase access to essential social services such as health care, education and emergency services. In addition, broadband enables more citizens to work from home and take advantage of new opportunities for job training and online education.

WHY ARE BROADBAND/ICT PLANS NECESSARY?

Market forces alone are not sufficient to achieve the benefits of broadband. For countries to be competitive in the global economy, broadband penetration rates need to increase quickly, and reliable broadband services must be made available to the majority of citizens at an affordable price. Such changes can only take place with an organized and sustained nationwide effort — one that begins with a comprehensive national plan.

The benefits of national plans begin early in the development process, when governments and their partners come together to consider and eventually articulate a nationwide vision for ICT and broadband. The plan development process provides valuable opportunities for public and private stakeholders — including telecommunication companies, advocacy groups, local industry, Intel and others — to share ideas and identify ways to spread broadband more quickly and efficiently.

“High-capacity networks are seen as strategic infrastructure, intended to contribute to high and sustainable economic growth and to core aspects of human development.”

The Berkman Center for Internet & Society at Harvard University, 2010

PLAN STRUCTURE

National broadband and ICT plans are — and should be — ambitious. Successful plans not only identify the best strategies to realize the benefits of broadband, but also provide specific guidelines and timelines to ensure those benefits are realized for the benefit of most or all citizens.

For more than a decade, Intel has helped countries in all regions of the world develop successful national plans. Through that work, Intel has identified an effective plan structure to guide successful planning, implementation and follow-through.

Every country's plan will include region-specific details, but the three phases and 15 steps within the following general plan structure provide a roadmap of the objectives, policies, partnerships and metrics necessary to ensure plan success (see Figure 1).

PLAN DEVELOPMENT PROCESS

Phase 1. Assess	Phase 2. Develop	Phase 3. Implement
<p>1. Evaluate ICT infrastructure and economic status Baseline information about a country's current ICT infrastructure and economic status creates a foundation for setting goals and measuring progress. ITU core indicators provide a good starting point.³ Key statistics include GDP, current and forecasted ICT spending, number of school PC labs, health clinic ICT usage, small and medium business ICT usage, and basic demographics.</p> <p>2. Examine the regulatory environment Every country has unique and complex policies and regulations that will greatly affect broadband rollout. Phase I should include examination of all these issues, including spectrum ownership and usage, tariffs and costs, licensing, universal service obligations, etc.</p> <p>3. Assess the country infrastructure The suitability of the country's broadband infrastructure needs to be understood in order to identify "choke points" that will impede broadband diffusion. Infrastructure concerns include issues such as international connectivity, last-mile connectivity and the in-country backbone.</p> <p>4. Complete customer/user segmentation Identifying the needs of various user segments helps pinpoint agendas and stakeholders. User segmentation may be based on factors such as geography, population demographics, occupation (student, family, business, etc.), frequency of use and user skill set.</p> <p>5. Conduct a user vs. needs analysis The user segments identified in the previous step make it possible to identify the level of service necessary to meet the needs of each segment. This "needs roadmap" can then be used to help determine necessary broadband investments.</p>	<p>6. Develop plan objectives Once the plan's goal, or vision, has been defined, the objectives necessary to achieve that goal need to be identified. The objectives should be specific, measurable, attainable, relevant and time-bound (SMART). Objectives should also be reviewed and updated every 36 to 48 months.</p> <p>7. Define broadband It is important to establish a clear definition of broadband that includes desired broadband performance levels. For instance, in emerging markets, download speeds of 1.5 to 3 Mbps are generally deemed acceptable, although rates should become faster over time.</p> <p>8. Develop service provider strategies The plan should include an exhaustive analysis of important operators in broadband-related areas of the infrastructure. Strategies can then be developed, in conjunction with regulatory bodies and service providers, that will be of the most benefit to consumers. Consider plan elements such as networks, access arrangements, services, devices, subsidies, training, and promotional/marketing programs.</p> <p>9. Collaborate with other business stakeholders Along with service providers, broadband-related businesses such as network resellers, equipment manufacturers, and local and international software developers should be brought into discussions. These stakeholders may offer new ideas and funding strategies to support plan implementation.</p> <p>10. Consider regulatory and policy changes The regulatory environment is an important part of plan success. Planners should consider updating existing regulations, and implementing new ones, to create a favorable environment for broadband growth and adoption. Policies should be technologically and competitively neutral to encourage fair competition.</p> <p>11. Identify funding resources To accelerate broadband adoption, all sources of funding should be considered, including private investment, government funding and support from non-governmental organizations. Dedicated Universal Service Funds and government subsidies should be strongly considered.</p>	<p>12. Develop an implementation strategy Phase 3 moves from planning and discussions to the design and implementation of specific programs that will help countries achieve the goals and vision set forth in Phase 2. An overall strategy should be developed that carefully considers the most effective ways to generate support for the national plan. A critical element of this strategy is the public statement of the government's intent and process, including a commitment to report progress frequently and regularly.</p> <p>13. Implement policy and funding strategies The best policy and funding strategies identified in Phase 2 should be aggressively pursued. Along with government subsidies, the reallocation of spectrum and Universal Service Funds ought to be strongly considered — and because spectrum reallocation typically takes years to accomplish, it should be pursued immediately.</p> <p>14. Implement demand-side programs Demand-side programs such as reduced-cost broadband and ICT skills training build consumer interest in broadband services. These programs can be led by the government, implemented in cooperation with stakeholders identified in Phase 2, or delegated by the government to entities such as universities or service providers.</p> <p>15. Measure progress It is essential that mechanisms be in place to track, report and evaluate progress toward overall plan goals. Progress should be measured against regional and international standards, and individual programs should be continually evaluated to ensure steady progress is made toward each objective identified in Phase 2. Based on the results of these frequent and specific measurements, adjustments can be made to improve results and efficiency over time.⁴</p>

Figure 1. Three Phases of Plan Development

BEST PRACTICES

To ensure best results, Intel's experiences indicate that the overall plan structure (as described above) should incorporate the following six best practices:

1. Form public/private partnerships

Governments must lead the way in developing national plans, but governments cannot succeed alone. Plan success depends on the active support of a broad ecosystem of public and private entities. The long list of potential partners includes:

- Banks and venture capital organizations
- Business organizations (small and medium businesses, chambers of commerce)
- Development agencies and non-governmental organizations (NGOs)
- Educators/teachers
- Health care organizations
- ICT suppliers
- Intel and other ecosystem partners

Identifying a few key partners early in the planning process can speed the entire plan process. For instance, Intel is frequently brought in early in the planning process to lend experience, support strategy development and help bring additional partners into the ecosystem. Public policy and corporate affairs groups can also provide early assistance in the development of regulating positions and strategies.

As the planning process continues, additional partners can be targeted depending upon specific program needs. For instance, school administrators and banks could be recruited to support a program offering low-interest loans to teachers, and health care organizations and NGOs could be recruited to facilitate a program providing mobile health workers in rural areas.

2. Encourage competition

Competition is an essential contributing factor to the success of national broadband and ICT plans. By incorporating strategies that actively facilitate competition, countries can expand the broadband market, make broadband more affordable and speed private-sector investments.

One way to encourage competition is to create a supportive regulatory environment. Regulations should support private investment and promote competition wherever potential barriers exist. Especially in the early stages of broadband expansion, a light regulatory approach can lower barriers to the broadband market while also ensuring non-discriminatory access for service, application and content providers.

National plans can support competition through a variety of specific strategies. For instance, plans can:

- Categorize broadband as a value-added service and permit all types of broadband access technology
- Support low-cost access to incumbent carrier facilities
- Deregulate price and tariff regulations
- Support open public-bidding processes
- Introduce service-level agreements for broadband services
- Establish dispute resolution procedures
- Unbundle facilities at rates favorable to market entrants

3. Release spectrum

The global demand for mobile broadband is growing at a phenomenal rate, but many countries lack sufficient new spectrum to support wireless broadband services. To accommodate the escalating demand for wireless technologies, spectrum reallocation strategies are an essential part of any national broadband or ICT plan.

The potential economic impact of wireless communications is demonstrated in the United States, where the contribution of wireless services to the overall GDP grew more than 16 percent annually between 1992 and 2007, compared to less than 3 percent growth for the rest of the U.S. economy.⁵ Many developing economies rely even more heavily on wireless broadband services to provide affordable broadband access, especially in rural and remote areas.

Given the increasing demands for wireless broadband and the rapid pace of technology advancements, it is important to expedite processes that streamline spectrum allocation and assignment processes. National broadband and ICT plans should support technology-neutral and service-flexible spectrum policies that promote broadband investment and facilities-based competition. Market-based techniques can clear underutilized spectrum for higher-value uses such as wireless broadband, and new policies can be enacted that allow carriers and manufacturers to make market-driven agreements to deploy new and innovative wireless technologies.

Spectrum auction proceeds can be utilized to further support broadband and ICT programs. In Korea, for instance, spectrum auctions accounted for 15 percent of the \$7.8 billion raised between 1993 and 2002 to support ICT and broadband improvements.⁶

In recent years, spectrum in 2.3 and 2.5 GHz bands has been made available in all regions of the globe. For instance, spectrum has recently been assigned to or is in process to support broadband wireless access in Chile, Germany, Ghana, India, Libya, Malaysia, the Netherlands, Norway, Peru, the Philippines, Poland, Saudi Arabia, Singapore and South Africa — and many more countries are expected to benefit from spectrum releases in the months and years ahead.

4. Apply Universal Service Funds

Universal Service Funds (USF) can be an important tool to promote telecommunications connectivity for underserved people. Many countries have established USF, but most of the funds are underutilized, especially in developing economies.

Through national broadband and ICT plans, governments can take several critical steps to utilize USF more effectively. One is to establish or expand the pool for USF distributions beyond traditional telecommunications to include broadband/ICT adoption, training and deployment. Countries can also correct USF inefficiencies and establish a USF specifically to support broadband service and equipment.

Universal Service programs can be funded and distributed in a variety of ways. Ideally, funding should come from general tax revenues, but if that is not possible, funds can be raised from a comprehensive, fixed charge on end users, which is preferable to usage-based charges. Funds should be awarded on a technology-neutral and competitively neutral basis using

market-based mechanisms such as reverse auctions. As shown in Figure 2, the funds can then be used to advance demand-side goals such as increasing broadband adoption rates.

In developing economies, initial USF objectives in national plans may focus on expanding basic services and supporting interim measures such as providing broadband service to community centers, Internet kiosks or other public places. Ideally, however, USF should eventually be used to support the broader goal of providing affordable, accessible and reliable broadband services to classrooms, hospitals and clinics, small and medium businesses, and households nationwide.

EXAMPLES OF BROADBAND/ICT PROGRAMS

Country	Program Description	Investment (Millions USD)	People Impacted (Millions)
Argentina	Goal is to connect 150,000 rural areas with Internet and telephone access	\$20	0.8
Brazil	18% VAT exception for broadband services; monthly fee under \$20 in some states	\$20	0.4
India	Broadband wireless access to secondary schools and healthcare centers in Gram Panchayats province	\$200	100
Malaysia	One million PCs with one year of free broadband connectivity, supported by USF	In process	To be determined
Morocco	Subsidized broadband connections to schools and teachers	\$4	0.1
Nigeria	Broadband/ICT programs for schools are accelerating broadband deployment in state capitals, and are also providing PC labs, teacher training, Intel-powered classmate PCs and skool.com	\$21	0.1
Pakistan	Goal is to increase broadband subscriptions from 0.1m to 1.5m, and add 10,000 rural PC centers	\$90	1.4
Poland	Internet service fees can be deducted from taxes, up to \$250 (USD) a year	\$1,400	2.0
Portugal	400M Euros in funding from government 3G spectrum action subsidizing laptop and broadband contracts	\$560	2.0
Turkey	School access program brings broadband and Intel-powered PCs to schools	\$11	0.1

Figure 2. Examples of countries with Broadband/ICT Programs



5. Implement demand-side programs

Broadband connectivity alone — without sufficient consumer and business demand — is not enough. Successful broadband and ICT plans must include a variety of demand-side programs, especially in the initial stages of deployment, to generate public interest and spur investment.

A wide array of demand-side programs should be considered for inclusion in national plans, with the final choices dependent on local and regional needs. Plans could, for instance, include demand-side programs that encourage and facilitate:

- Low-interest financing and/or subsidies to support ICT and broadband purchases
- Tax reductions
- Loans to build broadband networks in rural and remote areas
- ICT skill development and digital literacy programs
- E-commerce to increase broadband adoption by businesses
- E-learning programs targeting underserved groups (elderly, disabled, etc.)
- ICT infrastructure and broadband access in all schools

A combination of these and other demand-side programs can be used to raise awareness of broadband, make broadband services more affordable, and expand networks and services to the widest population in the shortest time possible.

6. Develop metrics to measure plan success

To ensure countries make steady progress toward broadband goals, governments need to develop and implement metrics that are specific, measurable, attainable, relevant and time-bound (SMART). Broadband and ICT plans should include SMART metrics as part of a regular reporting program to track performance.

The International Telecommunication Union (ITU) provides a starting point to identify the best ways to measure ICT and Internet access, including a core list of ICT indicators and methods to collect the indicators.⁷

Intel suggests that additional metrics be included for specific target markets, if reaching those market segments is a program goal. For instance, if improving education or health care is a program goal, additional metrics might include:

- Broadband penetration rates in hospitals and health centers
- Percent of hospitals and health centers with digitalized patient records
- Number of teachers using PCs in the classroom
- Number of hours students have Internet access

As a country's broadband market tracking matures, the government can establish a baseline of acceptable broadband performance metrics⁸ and facilitate disclosure of material terms (such as actual upload/download speeds, price, packet loss and latency). Broadband providers should then provide consumers with meaningful data about service plans so users can make informed service choices.

Through national plans, governments can also encourage industry to create a voluntary system to gather quality and performance metrics and disclose this information to consumers. Even countries with minimal broadband competition should encourage a disclosure program to help promote acceptable quality of service and set a disclosure precedent for future market entrants.

PLAN EXAMPLES

Many countries have completed comprehensive national plans. Although each plan is unique, they share a broad acknowledgement of the benefits of increased broadband penetration, and of the need to build partnerships to make broadband and ICT more affordable and accessible. The following plans can be accessed online:

Colombia

Plan Nacional de TIC

www.colombiaplantico.org.co/index.php

Costa Rica

Plan Nacional de Desarrollo de las Telecomunicaciones 2009-2014

www.mideplan.go.cr/content/view/69/371

Ecuador

Plan Nacional de Conectividad (PNC) 2008-2010

www.conatel.gov.ec/site_conatel/index.php?option=com_content&view=article&id=347%3Afodotel-pilar-del-plan-nacional-de-conectividad&Itemid=184

Malaysia

The National Broadband Plan — Enabling High-Speed Broadband

Malaysian Communications and Multimedia Division

www.nitc.my/index.cfm?&menuid=31

Mexico

Agenda Digital Sistema Nacional e-Mexico 2.0

www.e-mexico.gob.mx (click on “Know e-Mexico”)

Singapore

IT2000: Singapore’s Vision of an Intelligent Island

<http://choo.fis.utoronto.ca/fis/respub/IT2000.html>

United States

National Broadband Plan — Connecting America

www.broadband.gov





CONCLUSION

Broadband connectivity is vital to the economic and cultural growth of countries around the world. For governments to be competitive in the 21st-century global economy, they need to increase broadband penetration quickly, and make it affordable and accessible to most or all citizens — goals that can only be achieved by developing comprehensive national broadband/ICT plans.

National plan development must take place soon, and it should be undertaken with an awareness of the basic structure and best practices outlined in this paper. Applying the lessons learned from previous planning efforts can streamline the development process, and ultimately give more countries the opportunity to develop successful national plans that help bridge the digital divide.

Achieve Your Vision

Intel can help you achieve your vision of a growing national economy supported by widespread broadband deployments. To learn more, contact your local Intel representative, or visit us online at www.intel.com/intel/worldahead.

INTEL® WORLD AHEAD PROGRAM

For years, the Intel World Ahead program has worked with governments, development organizations, community groups and other technology leaders to develop sustainable, comprehensive approaches to ICT and broadband deployment in emerging markets.

Through hands-on expertise and extensive resources, the Intel World Ahead program helps countries develop comprehensive plans and targeted programs that make broadband and ICT more affordable, reliable and accessible.

¹ See, for instance, Qiang, Christine Z., 2009. "Telecommunications and Economic Growth." Unpublished paper. World Bank, Washington, D.C., and Booz & Company, 2009, Digital Highways: The Role of Government In 21st-Century Infrastructure.

² Dr. Raul L. Katz. "Estimating broadband demand and its economic impact in Latin America," Sept. 4, 2009.

³ www.itu.int/ITU-D/ict/partnership/index.html

⁴ The ITU provides a helpful list of core ITU indicators for 2010, available here: www.itu.int/ITU-D/ict/partnership/material/Core%20ICT%20Indicators%202010.pdf

⁵ Harold Furchtgott-Roth, The Wireless Services Sector: A Key to Economic Growth in America 1 (Jan. 2009) (unpublished manuscript) (Furchtgott-Roth Wireless Services Sector Report).

⁶ Yongsoo Kim, Tim Kelly, and Siddhartha Raja, "Building broadband: Strategies and policies for the developing world," Global Information and Communication Technologies (GICT) Department World Bank, January 2010.

⁷ www.itu.int/ITU-D/ict/partnership/index.html

⁸ Depending on local circumstances, it may be appropriate for the government to determine separate baseline performance metrics for wireline, fixed wireless and mobile wireless. Intel strongly encourages this approach in order to avoid discrimination against wireless as the market matures.

