



# **Ending digital exclusion: Why the access divide persists and how to close it**

APC policy paper on access to the internet  
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## 1. The nature of the problem

Affordable and reliable internet access has become a vital means to exercise fundamental human rights and to support economic, social and human development. As observed by the former UN Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, Frank La Rue, “the internet is one of the most powerful instruments of the 21st century for increasing transparency in the conduct of the powerful, access to information, and for facilitating active citizen participation in building democratic societies.”<sup>1</sup>

However, as the internet becomes more ubiquitous, less is being heard from those who are unconnected – the less wealthy and more marginalised – who are unable to exercise their rights on the same footing as those who are connected. This includes access to basic services from governments and businesses which now use the internet as a platform for day-to-day transactions. Those who do not have access are doubly excluded: excluded from the “new” world of information and communications that the internet delivers, and also excluded from the “old” analogue world they used to have access to – even if imperfectly – because so many of those services and opportunities are increasingly only available online.

Connecting the unconnected will therefore require a major and concerted effort to address a variety of factors which are highlighted below. In this respect, APC observes that equal efforts are necessary, not only to connect more people, but also to move the billions who are “barely connected” into a fully pervasive and affordable connectivity environment.

At the outset it is important to observe that to effectively measure and analyse access inequalities, one has to look further than internet penetration rates. One cannot speak simply of those who are either connected or unconnected. There is actually a wide spectrum of connectivity levels ranging from complete disconnection up to those connected on high-bandwidth unlimited connections, with the majority of people somewhere in between – most of them being irregularly connected on high-cost, low-speed metered mobile broadband links.

Clearly there have been major improvements in access for many, particularly through reduced costs of equipment (e.g. smartphones and tablets), and greater availability of wireless broadband services (e.g. Wi-Fi and 3/4G). But high internet access costs continue to be among the biggest factors limiting connectivity in most developing regions.<sup>2</sup> Inequalities in access are more visible when disaggregated by disadvantaged groups – particularly women (who are often concentrated in low-income groups). The access gap is also much more prevalent in cultural minorities, people living in remote small islands, and in the least developed countries generally.

The digital divide is also particularly evident along the urban/rural axis. In most developing countries, and even some developed countries, internet users in rural areas are often faced with limited coverage and much slower internet speeds.

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<sup>1</sup> La Rue, F. (2011). Report of the Special Rapporteur to the Human Rights Council on key trends and challenges to the right of all individuals to seek, receive and impart information and ideas of all kinds through the Internet. United Nations document A/HRC/17/27, para 2.

<sup>2</sup> The Alliance for Affordable Internet notes in its latest report that about 60% of the world’s population – most of whom live in developing countries – are offline, and that the cost of fixed broadband remains about 40% of an average citizen’s monthly income across the 51 countries surveyed. [a4ai.org/affordability-report/report](http://a4ai.org/affordability-report/report)

In addition, those restricted to mobile services experience broadband speeds that are comparatively low, while latencies and costs are usually much higher than fixed wireless (e.g. Wi-Fi) or cable-based services. Mobile links also usually have metered access and traffic caps which constrain the amount of data that can be exchanged affordably, and restrict the user's ability to manage costs of access effectively. When costs cannot be predicted, this creates a strong chilling effect on use.

Therefore ending digital exclusion is not simply a matter of improving the coverage of mobile broadband services, but also of improving the affordability and coverage of both fixed and mobile services, along with building the technical and human capacity to ensure reliability, the ability to deploy low-cost locally owned networks, and the ability to use the applications and content effectively. The key to affordable access is giving local people the skills and tools to solve their own connectivity challenges. The internet is built and managed by people – we need fewer “satellite and balloon” projects, and more human development.

In the current context, it is also necessary to take into account the extent to which broadband and broadcast media are converging technically, and at an ownership level, are becoming more vertically and horizontally concentrated. This has serious implications for the free flow of information, the diversity and plurality of content, and the conditions of access to service provision.

But there is also an overarching point frequently ignored by efforts to address the access gap. When looking at access data in a disaggregated manner, it becomes evident that those with the least connectivity are by and large also those who are most excluded economically, socially and politically. Their lack of access is first and foremost a result of this exclusion, and while the internet may present opportunities for some social advancement, it will not alter the structural social and economic processes that causes inequality and exclusion in the first place.

Efforts to end the digital divide that are not linked to efforts to address broader social divides are not likely to produce the circumstances in which people are truly able to enjoy the benefits of the internet. Activities to increase access to infrastructure should therefore be coupled with efforts to address political, economic, social and cultural barriers that prevent people from fully accessing the internet. And for access to the internet to fully enable human rights, it should be free of censorship, surveillance, harassment, and any other form of violation of human rights.

## **2. The underlying causes of limited connectivity**

The main reason the internet is still poorly dispersed and unaffordable for many, especially in rural and remote areas, is the poor distribution of basic telecommunications infrastructure. There are insufficient affordable international and national backbones and last-mile/local networks. In addition, the level of demand is low, due to limited digital literacy and lack of relevant local applications and content.

There are a large variety of factors that cause this, and local conditions vary considerably from country to country, which underlines the fact that there is no universal “silver bullet” that will end digital exclusion.

### **2.1. Market access and network provisioning models**

Among the most common factors for poor levels of access are the lack of competitive open markets and the burdens on market entry for basic infrastructure providers, along with limited access to sufficient radio spectrum. Legacy incumbent fixed-line national operators and a few mobile operators continue to

dominate markets for broadband in many countries. This affects availability, cost and quality of access services. National governments often continue to protect legacy fixed-line operators and existing mobile operators from players wishing to use innovative new technologies and business models. Moreover, these “new incumbents” are usually subsidiaries of large international companies and are able to use their superior resources to influence the regulatory environment so that it favours their investments in older technologies over potential new entrants. For example, in many cases licensing requirements and fees can be too onerous for smaller private operators and community-driven initiatives such as “village fibre” or municipal Wi-Fi.

## **2.2. Spectrum use**

Conservative spectrum allocation policies also continue to restrict the potential for new providers looking to make use of the latest technologies. For example, fixed broadband operators can use new wireless systems such as TV white space (TVWS) and other dynamic spectrum-sharing approaches, but so far only the Philippines has had the vision to make it a national priority to use these systems to help address connectivity issues. In many countries the regulators are not aware that most of the frequencies in these wavebands are unoccupied, and traditional occupants of the frequencies – the broadcasters – often do not understand the technology that makes it possible to share the frequencies without interference. In addition, incumbent operators can use their high spectrum licence fees as a way of obtaining commitment from regulators to maintain their exclusivity over wireless markets.

## **2.3. Content controls**

Content controls can be a major burden in some countries with restrictive policies on open access to the internet, which also limit freedom of expression. There are efforts by some governments to restrict access to content from outside their territories and to suppress content originating in their territories, in contravention of international human rights norms.

These include laws and regulations that restrict free discussion on internet forums and social media, as well as requirements to limit access to some websites, or for news sites to apply for licences. There is often a lack of protections from liability for intermediaries. Surveillance can also lead to a chilling effect on freedom of expression and loss of trust in the internet as a means for secure and private communications.

## **2.4. Public access**

For people who cannot afford their own equipment and connectivity, or who only have access in their place of work, public access facilities could offer an effective alternative. However, there is limited investment in libraries, telecentres and multi-purpose community centres amenable to provision of public internet access. Support for provision of public access has unfortunately fallen off the agenda in most countries as a result of the rapid growth of internet-connected mobile phones, which has reinforced the widely held view that public access is just a stepping stone to private access.

However, there is now growing recognition<sup>3</sup> that there will continue to be a need for public access for the foreseeable future. Large-format screens and high-definition multimedia provide a more immersive learning, professional or entertainment experience, but may be too slow or costly via a mobile connection. In addition, it may take many years for some countries to reach high levels of household connectivity, and therefore public information and communications technology (ICT) access will remain a critically important service.

A variety of indirect factors may also serve to limit internet accessibility. Grid power is often unavailable or costly, basic ICT literacy may be lacking, and high import duties may be levied on ICT equipment, which, along with luxury taxes on internet and voice services, further reduces their affordability. In addition, lack of relevant local content and applications limits demand for the internet.

### **3. Needed policy responses to the access gap**

Significant resources will be needed, along with the political will to support national policy and regulatory changes which improve affordability and coverage of broadband networks. Aside from lack of political will, needed changes are often not being implemented due to lack of transparency, corruption, lobbying from vested interests in older technologies, and the adoption of policy and regulatory models that are more appropriate in developed country contexts.

The most important policy initiatives required are listed below, and could be encapsulated in the formulation or updating of comprehensive national broadband strategies. Again it should be emphasised that there is no “one-size-fits-all” solution and that national broadband strategies need to be developed through extensive public consultation that includes all stakeholder groups – national and regional government structures, the private sector and civil society.

Broadband strategies also need to be efficiently and rapidly implemented, and not just “sit on the shelf” – a phenomenon which happens to many good policies. International initiatives and conferences may be able to contribute, by providing inspiration, but ultimately these are processes that have to be owned, driven and monitored locally rather than globally.

Key policy strategies to address the access gap:

- Eliminating market protections for incumbent operators and levelling the playing field where markets are encumbered by dominant operators.
- Increased government investment in public access facilities and awareness raising of their value to disenfranchised groups in particular.
- Allowing innovative uses of spectrum and new dynamic spectrum-sharing techniques such as TV white space (TVWS).
- Promoting community and municipal ownership of small-scale communications infrastructure.
- Using public funds and utility infrastructure to ensure national fibre networks are extended into remote and sparsely populated areas.
- Adopting effective infrastructure-sharing guidelines and regulations.

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<sup>3</sup> In-depth research carried out by the University of Washington found at least one-third of the users had no other means of access to the internet than public access, most users (55%) would use computers less if public access were not available, and public access venues are the first point of contact with the internet for most users. For further details see: APC, IFLA and TASCHA. (2014). *Public access: Supporting digital inclusion for all*. <https://www.apc.org/en/pubs/public-access-supporting-digital-inclusion-all>

- Reducing taxes on ICT goods and services.
- Adopting regulations that promote the net neutrality principle, and provide a mechanism to monitor and limit abuse of the principle, particularly in relation to the provision of internet access services targeted to the poor.
- Adopting regulations that limit potential market abuses from corporate concentration, cross-ownership and business relationships between infrastructure providers and content producers.

The benefits of these strategies in ending the digital divide are largely self-evident, with the possible exception of infrastructure sharing, the impact of which is often underestimated. To support improved awareness of the benefits of infrastructure sharing policies to national broadband plans, APC recently commissioned a study on infrastructure sharing in emerging markets. The report *Unlocking Broadband for All*<sup>4</sup> found in its global review of infrastructure-sharing experiences that developing countries can save billions and speed universal broadband access by sharing infrastructure.

These savings can be obtained both through sharing telecom infrastructure (such as ducts, fibres and masts) as well as sharing with other utility infrastructure such as roads, power grids, fuel pipelines and rail lines. In urban environments water supply and sewage systems can also provide sharing opportunities. If governments ensure that ducts or fibre are incorporated in all new road building and power line projects, this can make the difference between a sustainable and a loss-making investment in backbone infrastructure for a private operator. The benefits of this for encouraging private investment in broadband for remote and rural areas are clear.

There are a wide variety of other policy strategies for “connecting the unconnected” that could also be mentioned, but this document has focused on the above for the sake of clarity on the key priorities. Overall, however, activities that address connectivity challenges must be rooted in addressing the broader development challenges while taking into consideration the need for an integrated ecosystem approach to ensure that the various components of the connectivity chain work seamlessly together.

In an effort to provide a framework for helping to ensure that all the policy needs are addressed for a digitally inclusive enabling environment, a Broadband Infrastructure Development Readiness Checklist is included as an appendix.

## 4. Targets

Policies to promote connectivity require measurable targets by which to judge their effectiveness. Measures also need to be pragmatic, rather than exhaustively accurate – they need to be easily obtained, objective, comparable and up to date. In this respect the following few simple measures are proposed, aiming to provide not only an indication of the numbers connected but also the level of internet utilisation.

- Number of broadband subscriptions per capita (%), “broadband” being defined as a connection of at least 512 Kbps today but growing to the higher rates available in developed countries. Data should be disaggregated according to gender, age, geographic area and minority groups. Full data disaggregation may only be feasible on an annual basis.
- Data traffic per capita (bps), defined as the total of domestic network data traffic generated by broadband users divided by the total population.

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<sup>4</sup> APC. (2015). *Unlocking Broadband for All*. South Africa: APC. <https://www.apc.org/en/node/20382>

These two measures when taken together are all that is necessary to provide a general indication of the status of the local connectivity environment. A number of additional indicators can be useful in helping to determine the cause of problems. These are:

- Network coverage (% of geographic territory in which connectivity is available).
- Cost of 10 Gb/month of broadband data traffic, relative to average income levels (% of GNI/capita). 10 Gb is a common tariff package and on a monthly basis is a desired minimal level of utilisation, corresponding to 10-20 hours per month of video.
- Average download and upload speed per subscriber (Mbps).
- Autonomous System Numbers (ASNs) per capita. AS numbers are used by IP networks that are reliable – they are needed if the network has more than one connection to the rest of the internet. As such they provide a reliable indication of the extent of independent network development in the country.

Comparison between countries can be useful in identifying effective strategies, but the key aim with the use of indicators is to be able to measure progress over time within a country. Therefore the data points should ideally be updatable on a quarterly basis and authorities may need regulations to ensure that network operators provide the necessary data in a timely fashion.

## 5. Summary

In summary the key points are:

1. Access inequalities are more visible when disaggregated by disadvantaged groups – particularly women, the poor, rural populations and the less abled.
2. Expansion of mobile broadband by itself will not meet the connectivity needs of the rest.
3. High internet access costs continue to be the biggest factor stopping the rest from getting connected.
4. Implementing policies for connecting the rest will also vastly improve the connectivity of those who are already connected but are constrained in their use of the internet by slow speeds, high costs or other barriers.
5. The main reason the internet is still poorly dispersed and unaffordable for many is the poor distribution of basic telecommunications infrastructure.
6. There is no universal “silver bullet” that will address these issues and connect the rest.
7. The two most common factors are the lack of competitive open markets for basic infrastructure, and limited access to sufficient radio spectrum.
8. Content controls can also be a major burden in some countries with restrictive policies on open access to the internet.
9. Public access facilities are also an important means of addressing the connectivity needs of the rest, but there is limited investment in libraries, telecentres and multi-purpose community centres.

10. Indirect factors also limit access to the internet, including limited energy supply, lack of basic ICT literacy, few applications and content of local relevance, and high import duties or other taxes on ICT services.
11. Comprehensive and up-to-date national broadband strategies which address the policy barriers are needed, which should include effective infrastructure sharing policies.
12. Clear targets and monitoring are needed to ensure that the effectiveness of policies can be measured.

## **Appendix. Broadband Infrastructure Development Readiness Policy Checklist**

In helping to meet the connectivity infrastructure needs of developing countries, governments, the private sector, civil society and the international community need to take into account a wide variety of different and often interrelated factors to determine where and when it would be most effective to apply resources. This integrated approach to maximising connectivity is a response to the fact that a bottleneck in one of the components of the broadband ecosystem will act to limit overall use.

To aid in the process of identifying areas that need attention from stakeholders, the following Broadband Infrastructure Development Readiness Policy Checklist has been developed, which aims to provide a systematic way of ensuring that all the relevant factors affecting the connectivity environment are identified and assessed. The assumption is that if all the components of the checklist are at their optimal levels, then the country in question has a “perfect” enabling environment and an unobstructed potential to achieve maximal levels of connectivity.

The elements of the assessment as outlined below have been broken down into three categories:

- Openness of markets
- Strength of policy and regulatory institutions
- Enabling strategies and incentives.

Under each of these categories the significance of the factor is described and each can then be given a rating. A scale range of 1 to 10 is suggested, with the following characteristics for the two extremes and mid-point:

1 – undesirable/poor/absent

5 – average, in process or proposed

10 – desirable/good/all features present.

Considering that each factor has a different level of significance depending on the point of view of the scorer or the purpose of the scoring, provision for a “rating weighting” is given in the second column to indicate the level of importance to the party concerned, with a suggested range of 1 to 5, which would then be multiplied by the score in the previous column. In a country with an “ideal” enabling environment, with all weights set to 5, the total possible score would be 1000.

The purpose of the checklist is not to produce a composite index for comparing countries, as these are often misleading when attempts are made to rank countries on the basis of so many wide-ranging factors, especially when the weighting of each factor will vary from one scorer to another. However, the checklist can be used in a specific setting (by the same scorer) to determine how far a country is from

the ideal enabling environment, or how different one country is from another. This could be set up as a web-based form or a spreadsheet to simplify the scoring process.

The weighting value is essentially a way of “personalising” the scores when countries are being compared or when a country is being assessed for its relative distance from the optimal value. Setting the weighting value to 0 can also be used to filter out factors that are not deemed to be relevant for the particular scoring situation. Alternatively, a provision can be made to give the factor “showstopper” importance by assigning 0 to the weighting when the score in the prior column is only 1. If particular factors end up being set to 0, or more than a predetermined number of 0s appear in the weight scale, then this can be used to identify and highlight special problems.

Table 1: The Broadband Infrastructure Development Readiness Policy Checklist

<b>Infrastructure development readiness component</b>	<b>Significance</b>	<b>Rating</b>	<b>Weight</b>	<b>Overall rating</b>
<b>Openness and competitiveness of ICT markets</b>				
Open technology neutral license structure, with streamlined licensing process and no legal barriers to market entry at all levels, except minority local ownership requirement	Allows competition that is not restricted by limiting market access to types of technology or services.			
Limited or no government ownership of retail service providers	Government ownership can cause a conflict of interest with other private operators and with the government wishing to maximise profitability of its shareholding vs the public needing more affordable services.			
Dominance of existing operators addressed	Operators with a large proportion of the market may need special regulation to ensure their market dominance does not disadvantage smaller market entrants. Allows for increased customer choice and therefore improved competition and downward pressure on costs and improved service quality.			
Wholesale international capacity available at competitive prices or regulated capacity pricing	Countries with only one or two international fibre links can find prices charged for capacity are not competitively priced and may require price caps.			
Multiple international fibre connections	Redundancy is vital to maintaining reliable connectivity and also to aid in competitively priced wholesale services to local operators.			
Mandatory, transparent cost-based interconnection	Reduces potential for market dominance, improves			

<b>Infrastructure development readiness component</b>	<b>Significance</b>	<b>Rating</b>	<b>Weight</b>	<b>Overall rating</b>
agreements, including availability of direct inward dialling (DID) numbers	opportunities for using low-cost VoIP services, allows for increased customer choice and therefore improved competition and downward pressure on costs and improved service quality.			
Local internet exchange point(s) & carrier neutral data centre(s)	Keeps traffic local and therefore reduces costs to operators and improves network performance as well as improving local control/management of local content services.			
Cost-based, transparent, efficient radio spectrum licensing, including access to unlicensed spectrum bands, the digital dividend, and spectrum sharing/dynamic spectrum management	Improves availability of a vital resource for delivery of broadband services. Allows for the use of the latest, most efficient technologies, limits ability of incumbents to maintain franchises through technology.			
Availability of number portability is mandatory and process is efficient	Allows for increased customer choice and therefore improved competition and downward pressure on costs and improved service quality.			
Limitations on concentration of public and private media channels and content services	Provides greater diversity in access to information and improved consumer choice.			
<b>Strength of policy and regulatory institutions</b>				
Independence from other governmental entities, broadcasters and telecom providers – strong advocacy for consumer/public interests	Decision making is more objective and is not influenced by politics or vested interests.			
Sufficient and predictable funding streams	Helps ensure independence and that regulator has human and financial capacity to go up against large private or public vested interests.			
Track record of regulatory certainty with clear, transparent regulations and evidence-based policy making and regulatory procedures that include public participation	Helps ensure the most appropriate policies and regulations are adopted and minimises investor sense of risk and improves ability of private sector to make long-term investments.			
Authority, jurisdiction, accountability to enforce regulations, including effective regulation of anti-competitive	Improves independence and effectiveness but may also need supportive competition/anti-trust			

<b>Infrastructure development readiness component</b>	<b>Significance</b>	<b>Rating</b>	<b>Weight</b>	<b>Overall rating</b>
behaviour	authority.			
Regular (quarterly) data collection and publication of key market indicators disaggregated according to vulnerable groups (including gender) and including pricing, speed, adoption rates to identify gaps and opportunities	Provides the basis for informed decision making and evidence-based policy development to identify gaps and opportunities.			
<b>Enabling strategies and incentives</b>				
Presence of a national utility infrastructure database/geographical information system (GIS) containing routes and features of telecom/transport/energy grids/water/waste pipelines augmented by data on location of populations and public service outlets (schools, clinics, municipal authorities)	Improves planning process, reduces cost of network deployment and improves reliability of networks by helping to minimise accidental fibre cuts.			
Efficient permitting process for infrastructure deployment and regulations which encourage sharing of passive infrastructure – one-stop-shop for access to rights of way/way leaves, ducts, poles, masts, government land/buildings. Includes rapid cross-border permitting, tariff caps for lease fees and submarine landing station fees, and transparent dispute resolution procedure.	Helps to minimise network deployment time and provides major cost savings.			
Mandatory “dig once” utility works requirement – first to dig/lay must share conduit, coordinated infrastructure deployment (all new roads/electricity grids/pipelines/rail lines must have ducts and fibre included). Optical ground wire (OPGW) to be installed on all new overhead high-tension pylons. Local authorities have effective mechanisms to promote transparency and share best practices.	Minimises disruption and creates huge savings in costs of telecom network deployment.			
Long-term soft finance/other incentives for rural infrastructure investment, such as an efficient Universal Service Fund (USF) which subsidises infrastructure in non-market attractive areas and	Improves opportunities for private sector to invest in network deployment in areas with marginal profit potential.			

<b>Infrastructure development readiness component</b>	<b>Significance</b>	<b>Rating</b>	<b>Weight</b>	<b>Overall rating</b>
available to all players on a non-discriminatory basis. The operation of the USF is based on: 1) Non-discrimination (fair collection and distribution of funds, including non-carriers) 2) Using transparent and consultative processes, incorporating stakeholder inputs and priorities 3) Setting clear target goals and monitoring of effectiveness and impact of USF programmes and projects 4) Prioritising one-time infrastructure and other expenditures to enable access				
Low taxation and import tariffs on broadband goods and services	Reduces network deployment and maintenance costs as well as minimising customer equipment acquisition and service costs.			
Investment in e-govt applications and connectivity for government service outlets – municipalities, libraries, schools, clinics, community centres, including support for academic and research networks and those with disabilities.	Improves potential for universal access and thus improves overall demand for broadband services and therefore attractiveness of further e-govt and private applications and services investment.			
Content Distribution Networks (CDNs) present, local web services hosting and simple, fast and low-cost Domain Name registration	Improves ability for international and local web services to gain traction.			
Content blocking/disabling not permitted, except due to human rights violations (no websites blocked or broadcast licence applications refused due to content without public legal process)	Underlies adherence to democratic freedom of expression and access to information values.			
Network neutrality adherence and protection against intermediary liability legislation	Improves ability for international and local web services to gain traction.			
Legal framework for cyber security and data protection, use of e-health records	Ensures abuses of the internet and associated risks for the public are minimised.			
Presence of tech hubs, incubators, science parks and other shared workspace	Supports innovation, skills development and business development.			

<b>Infrastructure development readiness component</b>	<b>Significance</b>	<b>Rating</b>	<b>Weight</b>	<b>Overall rating</b>
environments				
Presence of open mobile and electronic payments platforms	Basis for broad-based adoption of e-commerce.			
Clear and transparent IPR legal framework and Open Data Strategy for government and private information	Creates incentives for business investment and allows re-use and value addition from existing information.			
Integration of the development of the above in a coherent and broad-based national broadband plan, which includes a government online strategy, time-based targets and a multistakeholder guidance process	Improves coordination, economies of scale, accountability and cross-sectoral synergies while reducing duplication.			
Favourable context for foreign investment (through tax incentives and/or no constraints on foreign ownership and employment)	Attracts capital and expertise to build local infrastructure.			
	<b>Total</b>			