TheSecDevGroup

# NEITHER HERE NOR THERE: TURKMENISTAN'S DIGITAL DOLDRUMS

October 2012

# EXECUTIVE SUMMARY

Turkmenistan is slowly emerging from decades of darkness. President Gurbanguli Berdymukhamedov has vowed to modernize the country by encouraging the uptake of new technology for economic development and more efficient governance. Hundreds of thousands of Turkmen citizens are now online.

However, the country faces serious challenges as it prepares to go digital. Infrastructure is primitive, and public access is fully controlled by a state-owned monopoly. Slow speeds, exorbitant pricing, and technological illiteracy all constitute major hurdles.

Authorities are moving to address the capacity problem, but Turkmenistan's repressive regime is unlikely to relinquish its stranglehold on cyberspace access and content. All media – including the internet – are closely controlled. State censorship and surveillance are significant, as are intimidation tactics that encourage user self-censorship.

This study highlights the ambivalent policies and practices that have left Turkmenistan mired in the digital doldrums, torn between its desire to join the worldwide web and its compulsion to control cyberspace.

## KEY TAKEAWAYS

**The internet presents a novel challenge for Turkmen authorities.** On the one hand, the government is keen to promote internet expansion for development; on the other, officials are increasingly wary of its potential as an outlet for dissent.

**Positive steps have been taken.** Officials have pledged to improve access, infrastructure and services, establish e-government and provide internet resources in education. They have also authorized internet cafés and connections for private citizens.

**Internet uptake remains limited.** Official estimates stand at a mere 2.2%. Access is minimal outside major urban centres. Private internet connections are extremely expensive and slow. The state's 15 internet cafés are closely monitored, and offer slow connections.

**Mobile phones, used by some 63% of the population, are important points of access, but uptake has been stymied.** Unofficial estimates place mobile internet access penetration at 14% (700,000 users). Mobile access is cheaper and faster than fixed-line service, but suffered a significant setback when the government revoked the licence for MTS, a major Russian mobile provider. The licence was restored in August 2012, but overall access remains constrained.

**Demand for internet access appears to be robust.** Indications are found in the rapid rise in internet use, the striking growth in mobile subscriptions, popular unrest over a lack of new mobile subscriptions, and high demand at foreign-sponsored internet sites (which provide fast and powerful satellite connections).

**The only licensed Internet Service Provider is state-run TurkmenTelekom.** The state's *de facto* monopoly hinders progress, with slow speeds and astronomical prices for access. It also ensures that officials can control and monitor how citizens use the internet.

**Authorities control cyberspace through content-blocking, surveillance, and severe penalties.** Blocking is selective and inconsistent. Many, but not all, opposition sites are blocked, as are independent news sites that carry local news and various social media sites. At the same time, major news sites, social media and a popular commercial circumvention solution remain uncensored and available. Filtering is applied through straightforward IP and domain blacklists. Technical testing did not reveal any instances of tampering with the Domain Name System. Users are aware the government is potentially watching every online move; journalists are closely tracked. There is compelling anecdotal evidence of harsh reprisals against users who transgress government dictates.

**Netizens cope by limiting their activities and views.** Turkmen cyberspace is mostly social. Netizens use the internet primarily to keep in touch with friends and share information. International platforms are largely irrelevant, but Russian social networks are popular.

**Blogging is discouraged but legal. So far, Turkmen blog mostly for fun.** Blogging is growing in popularity, although many hosting sites are blocked. Political blogs are effectively non-existent. Most blogs share information and views on innocuous topics.

**Mild online dissent appears to be somewhat tolerated.** Evidence suggests users have expressed mild political opinions online without repercussions. However, few people risk posting serious political criticisms online.

**Censored information is sometimes shared, despite the risks.** Three common methods include: emailing attachments that contain forbidden information to trusted friends; posting translated news to Turkmen chat sites; using microblogs.

**News and information are still derived mainly from television.** Many independent news websites are blocked and slow speeds make routine access onerous.

**Most users are unaware of circumvention tools.** Most users know the state blocks some sites and monitors online posts, but few know of circumvention tools or how to use them.

**At the moment, there is no evidence that officials have targeted those citizens who do use circumvention tools.**

## TABLE 1. TURKMENISTAN: AT A GLANCE

| Indicator | Value | Source |
|---|---|---|
| Population | 5 million | 2011, Economist Intelligence Unit |
| GNI per capita | $3,967 U.S. | 2010, World Development Indicators |
| Adult literacy rate | 100%* | 2009, World Development Indicators |
| Fixed telephone landlines | 10% | 2012, Paul Budde Communication Pty. Ltd. |
| Mobile phone users | 63.4% | 2010, International Telecommunications Union |
| Internet users (likely does not include mobile users) | 2.2% | 2010, International Telecommunications Union (estimate) |
| Internet users - mobile access | 14% | Field Source (estimate) |
| EIU Democracy Index | 1.72 (165th out of 167 countries) | 2011, Economist Intelligence Unit |
| Freedom House Democracy Index | 7 (lowest possible rating for both political rights and civil liberties) | 2011, Freedom House |

*Figure based on Turkmenistan government estimate. http://data.worldbank.org/indicator

# ACKNOWLEDGEMENTS

This report was prepared by analysts from The SecDev Group, based on research conducted between October 2011 and September 2012. The SecDev Group employs a mixed methodology that includes qualitative, quantitative, technical, and ethnographic research methods. Core research for this report, which consisted of a review of public databases and statistical sources, open- and gray-source research, key informant interviews, and the management of infield sources and analysis, was carried out by Elinor Buxton, with support from Natalie Ratcliffe. Deirdre Collings and Kelly Patterson provided editorial supervision and quality control. Graphic design, layout, and desktop publishing was done by Madeline Charlton. Rafal Rohozinski provided overall guidance and management for the research and production of this report.

The SecDev Group (Analytics) is deeply grateful for the assistance of several key anonymous sources in sourcing the research and analysis presented in this report. Turkmenistan is a closed society, and obtaining accurate data on communications, surveillance, and the internet is difficult, and can put researchers at considerable risk. Where possible, we have acknowledged the significant inputs of our field-based sources, while doing our best to protect their identities and security. Tattu Mambetalieva and the team at the Civic Initiative for Internet Policy in Kyrgyzstan and Eurasia.net provided valuable support for our infield research efforts. Finally, we are also grateful to the journalists at neweurasia.net, and in particular the contributions of Annasoltan, whose work in this area is both credible and informative.

This report also benefited from research and information conducted by a number of public research organizations. These include, but are not limited to, the OpenNet Initiative, Freedom House, Reporters without Borders, and Psiphon Inc.

This report was commissioned and financially supported by the Open Society Foundations. The Open Society Foundations' activities in Eurasia and Turkmenistan provide support for groups such as SecDev that are conducting research into democratic transitions in the societies and countries of the former Soviet Union. Working with local communities in more than 100 countries, the Open Society Foundations support justice and human rights, freedom of expression, public health, and education, and help build vibrant and tolerant democracies whose governments are accountable to their citizens. Please see the OSF website at http://www.opensocietyfoundations.org/.

Any errors and omissions in this report are the sole responsibility of The SecDev Group.

# TABLE OF CONTENTS


Executive summary and key takeaways ..... i

Acknowledgements ..... iv

Overview ..... 1

1. Political context: Internet stops and starts ..... 3

2. Roadblocks on the information highway: Challenges of access ..... 7

3. Living with Big Brother: State controls and how netizens cope ..... 11

Summary ..... 16

Appendix 1. Summary of research sources ..... 17

Appendix 2. Internet and mobile rates ..... 18

Endnotes ..... 19


## LIST OF FIGURES


Figure 1. Turkmenistan's fibre-optic links to the global internet ..... 2

Figure 2. Turkmenistan's mobile Monopoly game ..... 6

Figure 3. By the numbers ..... 9

Figure 4. Ertir Chat Forum ..... 14


## LIST OF TABLES


Table 1. Turkmenistan: At a glance ..... iii


## LIST OF BOXES


Box 1. Mobile service: Explosive growth; stymied potential ..... 5

Box 2. Two steps forward, one step back: Turkemnistan's journey into cyberspace ..... 10

Box 3. Blocked URLs in Turkmenistan ..... 12

# OVERVIEW

Regarded by human-rights groups as one of the most repressive regimes in the world, Turkmenistan remains extremely insular. The right to freedom of expression and religion is close to non-existent, and human-rights defenders face severe repression, including imprisonment and forced labour.[1] Independent human rights and election monitors are regularly denied access to the country, perpetuating a lack of transparency in both the judicial and electoral processes.

In this closed, tightly controlled environment, the internet presents a novel problem for Turkmen authorities. On the one hand, the government is keen to promote internet uptake in order to modernize the nation; on the other, officials are increasingly wary of its potential as an outlet for dissent.

In keeping with this ambivalence, the government has taken a two-steps-forward, one-step-back approach. It has promised ambitious infrastructure improvements and boldly broadened access over the past five years. At the same time, state controls continue to deter users and stymy development.

This report presents an overview of the political, technological, and social facets of Turkmenistan's current internet environment. Due to the lack of publicly available data in Turkmenistan, finding credible documented information is difficult. Much of this report is based on information obtained by field sources with solid, first-hand knowledge of the country: journalists, bloggers, and computer experts who are either Turkmen or have worked extensively in Turkmenistan. In order to protect these sources from reprisals, this report does not reveal their identifying details. The report also draws on data from secondary sources, including technical articles, corporate reports and NGO studies (see Appendix 1).

This study is written in three parts:

- **Political Context: Internet Starts and Stops** provides an overview of the country's official steps towards going online;
- **Roadblocks on the information highway** considers the challenges of internet access in the country;
- **Living with Big Brother** outlines state control tactics (censorship and surveillance) and how Turkmen netizens cope.

FIGURE 1. TURKMENISTAN'S FIBRE-OPTIC LINKS TO THE GLOBAL INTERNET

Source: The Central Asian Research and Education Network

# 1. POLITICAL CONTEXT: INTERNET STARTS AND STOPS

Turkmenistan's authoritarian political system is deeply entrenched. In 2012, President Gurbanguli Berdymukhamedov was re-elected in a landslide victory that is widely regarded as rigged, reportedly receiving 97 per cent of the popular vote.[2]

Democratic reforms are unlikely. Turkmenistan ranks 165th of 167 countries on the Democracy Index, narrowly beating Chad and North Korea.[3]

The country's human-rights record is dismal. Political dissidents risk imprisonment, torture, and enforced disappearance, and are subject to arbitrary travel bans. There are "draconian restrictions" on the rights to freedom of expression and association, and external human-rights monitors are not allowed into the country.[4] Freedom of the media is utterly non-existent.

Not surprisingly, Turkmenistan has been slow to open its doors to the global internet.

## NIYAZOV'S INTERNET: SLOW AND RESTRICTED

The government took the first step toward going online in the 1990s under former President Saparmurat Niyazov, when Siemens and Alcatel were invited to develop the country's internet. Throughout Niyazov's reign, the internet existed mostly for the use of government, academia, foreign diplomats, and foreign-owned businesses. There was little public internet access except at centres sponsored by foreign aid programs.

In 2000, Niyazov banned the country's four private Internet Service Providers (ISPs), solidifying the monopoly of state-controlled TurkmenTelekom. In 2002, he banned internet cafés, after an alleged presidential-assassination attempt.[5]

In 2003, however, the government launched a long-term plan for social and economic development that identified telecommunications infrastructure as a top priority. Among other goals, the plan called for the addition of 1.8 million phone lines by 2020 – the number needed for every household to have a phone.[6] Progress has been slow. As of 2010, only some 10% of Turkmenistan's 5 million citizens had basic fixed-line phone service, a mere 2% increase since the plan's launch.[7]

Also in 2003, Turkmenistan's higher-education and research sectors (members of TuRENA[8]) were connected to the NATO-funded Virtual Silk Highway via a 708-km stretch of fibre-optic cable and a satellite set up in Ashgabat and linked to Hamburg, Germany.[9] A year later, the cable was extended to the country's eastern and western regions, providing service to major cities such as Turkmenbashi and Balkanabat.[10]

Despite these targeted efforts, connections remained slow and unreliable. Key beneficiaries – such as university staff – routinely resorted to using the faster, satellite-based services provided by foreign agencies such as the U.S. Embassy, United Nations, and the Organization for Security and Cooperation in Europe, among others.[11]

By 2007, Turkmenistan had four international fibre-optic lines[12] (see Figure 1) These connect to:

- Uzbek Telecom in the north, near Dashoguz;
- Iran (and farther to Frankfurt via the Trans-Asia-Europe line) near Ashgabat;
- Uzbek Telecom in the east, near Turkmanbat;
- Turkmenbashi in the west, which is to be connected to Azerbaijan's AzTerraNet via a cable under the Caspian Sea.[13]

Niyazov also initiated mobile service in the country, by granting an exclusive licence to a private provider, U.S.-based Barash Communications Technologies (BCT), in 1996. He issued a second licence to state-owned TM Cell (also called Altyn Asyr) in 2004. The following year, BCT was taken over by a Russian company, Mobile Telesystems (MTS), which began an ambitious expansion of services in Turkmenistan.[14] Over the next six years, the mobile penetration rate skyrocketed, almost all of it driven by MTS.

In 2011, MTS was forced to shut down when its licence was revoked by Niyazov's successor. (see Box 1, p. 5). In August 2012, the government reversed course and MTS resumed services. By September, the number of subscribers had exceeded 500,000.[15] The majority appear to be former subscribers of MTS.

## BERDYMUKHAMEDOV'S PROMISE: INTERNET FOR ALL (…SORT OF)

Upon his election in 2007, President Berdymukhamedov vowed to bring Turkmenistan's internet into the 21st century. He has also stated that internet access is the right of every Turkmen citizen.[16] In fact, many of his policy pronouncements on telecommunications development give a glimmer of hope to Turkmenistan, at least in terms of potential internet access.[17] And he has taken some bold steps.

In 2009, he launched a new initiative to increase infrastructure capacity: the Central Asian Research and Education Network[18] (CAREN) project. Funded mostly by the European Commission's Europe Aid Cooperation Office (AIDCO),[19] the project replaces the Virtual Silk Highway, establishing broadband connections for universities and research institutes via fibre-optic cables linked to GÉANT, the European data network.[20]

The government reports that researchers now have much faster internet access than before. The website of the Academy of Sciences of Turkmenistan claims there are some 12,000 users on the TuRENA network, which has a download speed of 13 Mbps – significantly faster than the top speed for ADSL access in Turkmenistan.[21]

For the general public, however, it is another story. Sources report woefully low download speeds for all forms of internet access, and the country's total bandwidth remains extremely limited. Engineers report that the total bandwidth for Turkmenistan is 650 Mbps. While this is a huge increase from the country's 0.26 Mbps in 2000, it is still relatively small compared to that of neighbouring states. Uzbekistan, for instance, had 1,250 Mbps as of October 2009.[22]

Berdymukhamedov's other internet-related policy movements – both forward and back – include:

- lifting the ban on internet cafés (2007);[23]
- permitting home internet connections for private citizens (2008);[24]
- hindering the growth of mobile phone service and 3G internet access by suspending Russian-owned MTS's licence (2010). At the time, MTS had about 2.5 million subscribers (about half the population), its services covered 83% of the country, and it was planning to offer 3G service. By contrast, state-owned TM Cell had less than half a million customers, and its coverage was centred on Ashgabat and its surroundings.[25] In 2011, MTS was shut down altogether, leaving TM Cell as the sole mobile provider, despite its low capacity (see Box 1, p. 5, and Figure 2, p. 6). MTS has since regained its licence and as of September 2012, it had reactivated 500,000 subscribers;[26]
- introducing e-government, with plans for some 80 ministries and government agencies to have their own websites.[27] A new IT-focused government department was also created (2011);
- signing a resolution to improve TM Cell's poor service (2012).[28] He also threatened to sack the Minister of Information and Communications if the service did not improve.[29]
- vowing to integrate computers into the education system (2011). Lenovo notebooks worth $26 million U.S. have been reportedly distributed to 100,000 first graders.[30] (While this move suggests a commitment to creating Turkmenistan's first "wired" generation, a lack of connectivity means that very few classrooms will actually be online);
- supporting the *Mejlis'* (parliament's) efforts to use ICTs to strengthen institutional capacity, legislative processes, control functions and public outreach;[31] and encouraging the introduction of an electronic voter registration system by the Central Election Commission;[32] and,
- reiterating support for the 2020 strategic plan, which would increase the fibre-optic network by 2,500 km and connect core urban centres.[33]

The government has made some decidedly internet-friendly gestures in recent years. Yet Turkmenistan remains a highly restrictive environment for both internet access and internet content, as the state continues to maintain tight control on both fronts.

**Box 1. Mobile service: Explosive growth; stymied potential**

In 2010, Turkmenistan could have revolutionized internet access with a move to fast, affordable 3G mobile service. But just as this opportunity was announced by the Russian provider MTS, Turkmen authorities shut it down.

Between 2006 and 2010, Turkmenistan's mobile service penetration rate skyrocketed from 4% to some 63%. Mobile's explosive growth was mostly driven by the Russian provider MTS. By August 2010, its services covered 83% of the country, with an estimated 2.5 million subscribers. By contrast, state-owned TM Cell was available only in major cities, with about 400,000 customers.

In late 2009, TM Cell customers began receiving a very basic 3G service. But service was poor and unreliable, and uptake was reportedly low.

In 2010, MTS announced plans to offer 3G services. Given MTS's extensive capacity, wide coverage and massive customer base, this move would have created a cheap, fast and nearly nationwide option for internet-capable mobile service.

However, within weeks of MTS's announcement, the government suspended its licence. In January 2011, MTS operations were shut down altogether, with authorities stating its five-year contract had expired.

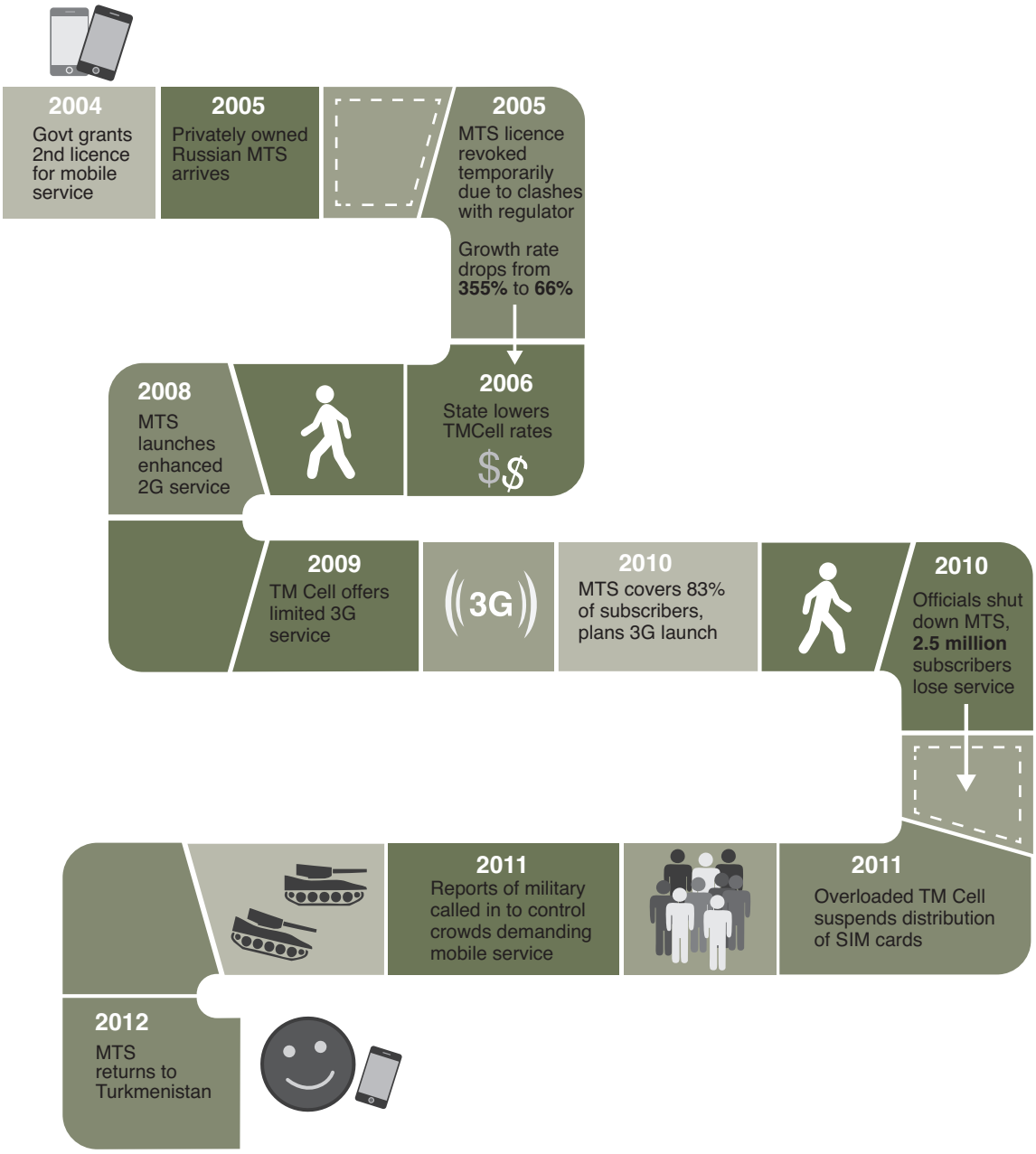
TM Cell was left as the sole mobile service provider in the country, despite its extremely limited range and low capacity. The company struggled to absorb MTS's customer base. In fact, demand was so high that officials reportedly suspended the distribution of SIM cards temporarily in April 2011, with the exception of cards for public officials and foreigners.

In a move designed to address the lack of wireless capacity, the Ministry of Communications signed contracts with Huawei and Nokia Siemens in April 2011 to upgrade and expand TM Cell's mobile network. By August 2012 the government had once more changed course. MTS's licence was restored, and within a month it had reactivated over 500,000 user accounts.

No data are available publicly on how many mobile customers have internet access. Estimates for this report suggest a rate of about 14% of the population, with 6% having 3G service.

Sources: Freedom House. 2011. *Nations in Transit 2011*; Paul Budde Communication Pty Ltd. 2012. *Turkmenistan: Telecoms, Mobile and Internet*; Turkmenistan.ru. 2011. "Huawei and Nokia Siemens networks to increase capacity of national cellular operator Altyn Asyr." 7 April 2012; Annasoltan. 2012. "The Turkmenet's not over until the fat lady sings!" in *NewEurasia*. 27 February 2012; ITU. 2010

FIGURE 2. TURKMENISTAN'S MOBILE MONOPOLY GAME




Source for data: Paul Budde Communication Pty. Ltd.

# 2. ROADBLOCKS ON THE INFORMATION HIGHWAY: CHALLENGES OF ACCESS

## TURKMEN NETIZENS: NOT SO MANY, BUT DEMAND IS THERE

Official statistics find only 2.2% of the Turkmen population online.[34] But this number probably does not include mobile internet access. A field source with knowledge of the area estimates mobile internet users to number some 700,000, with 300,000 of those using 3G services.[35] By these numbers, some 14% of the population has mobile access.

While Turkmenistan's internet penetration rate remains much lower than that of its neighbours,[36] it has risen considerably since the Niyazov era, when few Turkmen citizens other than government employees had access to the internet.

There are also clear signs that demand for internet access is robust. By 2010, there were more than 20 times as many internet users as in 2000[37] (based on the low official statistic), and the rapid increase in the number of mobile subscribers is particularly striking, with growth rates exceeding 200% in some years. In fact, officials reportedly had to call in the military to quell popular unrest in larger cities over a lack of new mobile subscriptions after MTS shut down.[38]

Public internet centres sponsored by foreign governments and organizations report strong demand. These centres offer fast and powerful satellite connections, a service for which users – researchers, government employees, state journalists, and the regular public – are willing to wait in line.[39] By way of example, the Information Resource Center (IRC) at the U.S. Embassy in Ashgabat reported users queuing for 30 minutes or more to use their terminals.[40] Their monthly usage rose 50% between 2007 and 2008.[41]

Overall, indications suggest there is a burgeoning potential market of users who are poised to go online as soon as access and service improve in Turkmenistan. But those improvements will likely be a long time coming.

The major stumbling block is the TurkmenTelekom monopoly, which sits at the strangled heart of Turkmenistan's slow, expensive, censored, and surveilled internet.[42]

## TURKMENISTAN'S STATE MONOPOLY: NOT READY FOR PRIME TIME

TurkmenTelekom, parent company of TM Cell, has long been the only authorized Internet Service Provider in the country, even though the price of internet access skyrocketed when the monopoly took over in 2000 from the four independent providers that had been operating in Turkmenistan.[43]

The government maintains direct control over the company. The director of TurkmenTelekom reports directly to the Cabinet, bypassing the Ministry of Communications, which is nominally in charge of the ISP, as well as all other related industries, such as radio and television broadcasting.[44]

Thus, despite President Berdymukhamedov's various initiatives to improve internet access, it is TurkmenTelekom that has set the pace for internet development, and that pace has been agonizingly slow, as the cash-strapped company makes do with primitive infrastructure, slow connectivity speeds, and limited geographical range.

Meanwhile, the lack of competition has led to astronomically high prices for some services.

### PRIVATE ACCESS: PRICEY, SLOW, AND RARE

The government began allowing private internet access in 2008, but uptake has been slow. Satisfactory connections are rare outside the country's capital, astronomically expensive as well as slow, and require a daunting registration process.

Connectivity is essentially non-existent beyond Ashgabat and some major towns. This is a major obstacle, given that some 50% of the population lives in rural areas.[45]

ADSL internet access costs a staggering $7,000 U.S. per month for the highest speed. Even at the slowest speed, an ADSL connection with no limits on traffic costs more than half of the average monthly income of $330 U.S.[46] In this respect, the pricing policies set by the state-owned operator appear to run counter to the official goal of forging ahead with plans for e-government.[47] (For the monthly subscription rates in both U.S. dollars and the Turkmen currency, manats, see Appendix 2.)

Hardware is also expensive. A basic desktop computer, for example, costs the equivalent of almost two months' salary for the average Turkmen citizen.[48]

Download speeds are extremely slow, estimated at some 72 kbps.[49] By comparison, neighbouring Afghanistan's average speed is 150 kbps – more than twice as fast.[50] Ironically, many websites created as part of the regime's e-government efforts are effectively inaccessible. Using the most affordable private-connection plan, it would take about seven minutes to download the website for the country's Chamber of Commerce (see Figure 3, p. 9).

Acquiring access is also an administrative nightmare that can take several months.[51] Users must register their passports with TurkmenTelekom, agree to refrain from a wide range of online activities, such as accessing websites containing untrue or defamatory information (a definition understood to include opposition websites), and even promise not to use foul language. A signature from the local police station is also required.[52]

## STATE-RUN INTERNET CAFÉS: UNDER SURVEILLANCE

Re-opened in 2007, state-run internet cafés offer higher speeds than most people can afford through home access. The difference is relative, of course. In 2008, there were reports of webmail taking an hour to open. This situation may have improved, as the connections at internet cafés were recently upgraded. Hourly rates are also less expensive than monthly home-access plans, estimated at some $1 U.S. to $3 U.S an hour, although this is still a significant sum for the average citizen.[53]

There are only 15 state-run internet cafés in the whole country, all of them in major cities.[54] State surveillance makes many people wary of using the cafés. Customers must show their passport or other identification and fill out a questionnaire giving personal data and explaining why they want to use the internet. Observers have noted, however, that controls are inconsistently applied. At some cafés, staff appear indifferent to state directives, while others demonstrate considerable zeal. Users of the U.S. Embassy's public internet outlet have also stated that they avoid internet cafés because they believe they are being monitored.[55]

In 2008, observers concurred that most cafés had very few users.[56] An exception seemed to be in two particular locations – one in Ashgabat and another in Mary City. The reasons for the higher traffic in these locales remain unexplained.[57]

## MOBILE ACCESS: CHEAP BUT SLOW, WITH LIMITED RANGE

Mobile access is a key avenue for internet use in Turkmenistan, including access via mobile devices connected to laptops. Engineers report that TM Cell leases a 300 Mb/s channel from TurkmenTelekom to provide internet access via smartphones.

Dramatically cheaper than fixed lines, mobile phones are used by some 63% of the population,[58] and the addition of internet access is relatively inexpensive. As already noted, our field source estimates some 14% of the Turkmen population accesses the internet via mobile service, with about 6% accessing 3G services (which should provide full internet access in theory, but falls far short of this in reality – see below).

According to our sources, a SIM card from TM Cell costs about $6 U.S. in addition to the credit required for making calls or texting. The company offers a variety of relatively affordable plans for online access, ranging from a minimum daily fee of $0.10 U.S. plus $0.02 per MB, to a daily fee of $0.04 U.S. and $0.02 U.S. per MB for 3G service (see Appendix 2).[59]

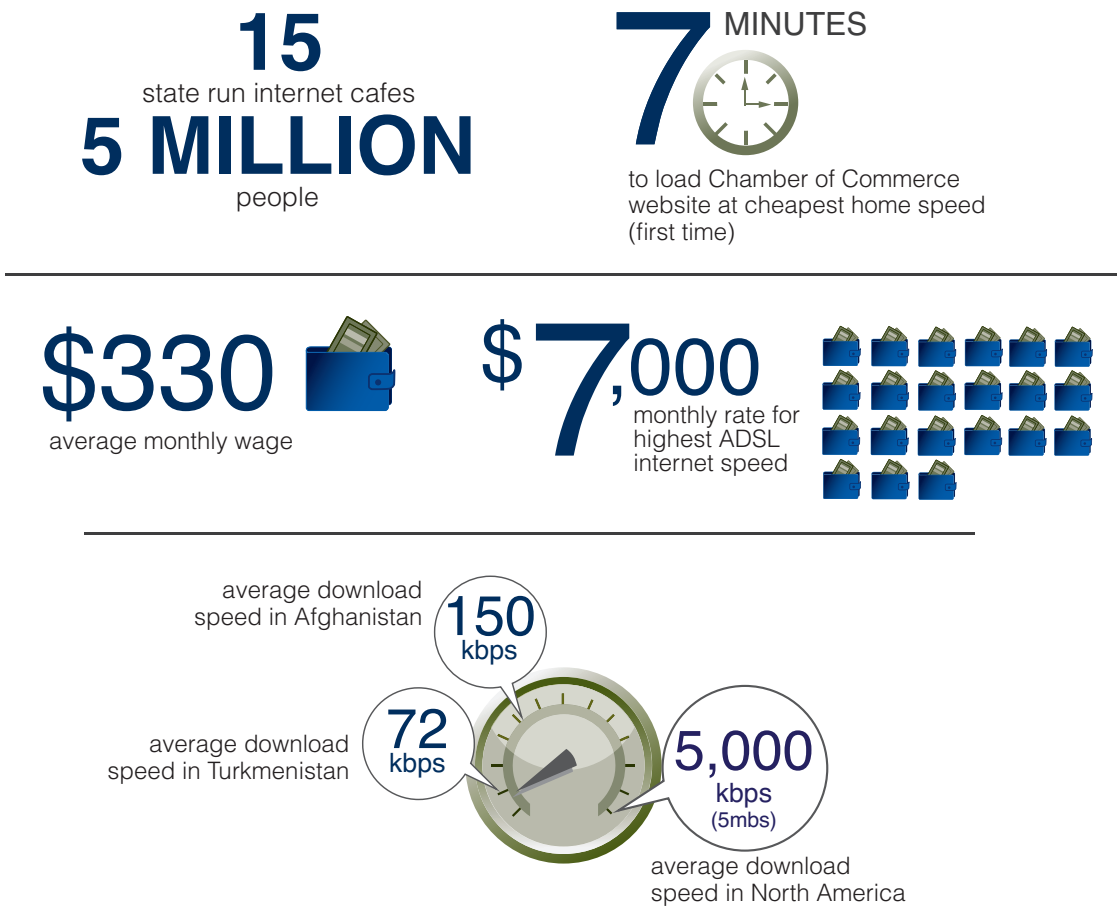
Smartphones themselves are expensive, but most remain more affordable than personal computers. Nokia models that cost from $180 to $240 U.S. are the most common. Mobiles running the Android platform are also increasingly popular. Sought-after models include the Samsung Galaxy, Sony Ericsson Xperia, and various HTC phones. These are, however, more pricey. The most desirable HTC phones cost $650 U.S., while older models are available for $550 U.S.

Most mobile subscribers make full use of 2G services such as messaging: people often exchange their mail.ru agent username rather than phone numbers, according to a prominent Turkmen blogger.

TM Cell's coverage is extremely limited when it comes to 3G service (see Box 1 above). Even large towns such as Abadan reportedly do not have full internet access via mobile devices. And connections remain notoriously slow. When 3G service first became available at the end of 2009, the connectivity rate was only 56k/second, which ruled out standard services like internet television, YouTube video content, and other video content. In essence, TM Cell's 3G service worked at about the same speed as dialup connections from home.[60] Field sources[61] state that the speed for 3G service can now reach up to 1 Mbps, but does so only at low-volume times of the day, and only in well-serviced locations.

With the closure of MTS in 2011, the total number of mobile subscribers declined.[62] Sources for this study reported that overloading became a chronic problem with TM Cell's service as it struggled to absorb MTS's large subscriber base. These capacity problems may have prompted the government's decision to reinstate MTS's licence in 2012.

FIGURE 3. BY THE NUMBERS




Sources for data: Paul Budde Communication Pty. Ltd., in-country sources, Pando Networks. All prices in U.S. dollars. Data as of March 2012

### Box 2. Two steps forward, one step back: Turkmenistan's journey into cyberspace

In 2010, the OpenNet Initiative published a baseline study of Turkmenistan's online environment. Since then, the country has taken a number of steps – both progressive and regressive – that have affected its digital development. Research carried out for this report provides a checklist of the country's progress.

**Legend:** ✓ step forward — no change ✗ step backward

| Snapshot: ONI report, 2008-2010 | Update 2012 | Comments |
|---|---|---|
| State control of all media | — | |
| Government control of fixed-line internet; all data pass through central hub | — | |
| State control of mobile internet | ✗ | MTS forced to cease operations in 2010. Licence restored in August 2012. State retains tight control over all Internet access. |
| Telecom monopoly reports directly to cabinet | — | |
| Penalty for insulting government representatives: Fines, forced labour and/or prison | — | |
| Penalty for insulting president: 5 years in prison | — | |
| Penalty for expressing critical political opinion | ✓ | Mild political opinions tolerated, but self-censorship still the rule |
| Internet users must register passports, pledge to respect restrictions, including ban on "defamatory" (i.e. opposition) websites | — | |
| Pervasive filtering of political websites, including foreign news and Russian-language websites | — | |
| Selective filtering of social, conflict/security websites | ✓ | Filtering slightly less systematic than before, according to anecdotal reports |
| Private connections slow, expensive | — | |
| Mobile internet range limited, speeds slow | — (slight improvement) | Mobile service affordable, used by 63% of Turkmen. An estimated 14% have mobile internet access, including 6% with 3G service |
| Internet cafés: 15 outlets, generally unpopular, slow speeds, with overt state surveillance | ✓ | Two cafés very crowded, according to U.S. diplomatic cable, indicating increased interest |
| Foreign outlets (e.g. embassies, hotels) offer fast internet access via satellite, but filter it to comply with government | — | |
| Internet penetration rate (excluding mobile) 1.6%, very slow growth over time | ✓ | Official rate for fixed-line access now 2.2%, excluding mobile |

(Sources: ONI report, Buddecomm, US embassy cables, ITU, SecDev source interviews)

# 3. LIVING WITH BIG BROTHER: STATE CONTROLS AND HOW NETIZENS COPE

Turkmenistan's authoritarian regime exerts aggressive controls over the digital content available to its citizens.

It deploys a range of basic tactics, from the blocking of opposition and foreign-language websites, to the imposition of harsh penalties for online dissent in order to intimidate users.

For their part, Turkmen netizens are relatively unsophisticated in evading government censure. Few know how to use circumvention tools, and self-censorship is common.

## CENSORSHIP AND SURVEILLANCE OF TURKMEN CYBERSPACE

"The government has sought to establish complete control of the internet to avoid any potential threat that unmonitored access may pose to the regime."[63] So concludes the most systematic technical assessment of Turkmenistan's internet filtering and surveillance practices to date, released by the OpenNet Initiative (ONI) in 2010 (see Box 2, p. 10).

The regime uses a range of control tactics: centralized media control, content-blocking, surveillance, and severe penalties.

### CENTRALIZED MEDIA CONTROL

State-owned TurkmenTelekom holds a monopoly on all forms of internet access, from mobile phones to fixed-line connections. All internet channels pass through a central hub under government control, which enables both censorship and surveillance.

As noted earlier, the general director of TurkmenTelekom reports directly to the Cabinet. The regime also controls all media outlets, including nominally independent outfits. Foreign stations are accessible only to the handful of people with satellite dishes or shortwave radios.

### CONTENT-BLOCKING

Little is known about the exact mechanisms by which the Turkmen government implements internet censorship. There are no public records or official documents that describe who is tasked with deciding what content to filter, nor is there a record of the process according to which sites are blocked. Available information is patchy at best, pieced together from accounts of former employees of TurkmenTelekom and organizations such as TuRENA, the Turkmen academic and research network.

Censorship is centralized – a logical conclusion given TurkmenTelekom's monopoly and the high degree of control exercised by the presidency. There is no publicly disclosed list of blocked sites in Turkmenistan.

Some accounts claim that a key advisor to President Berdymukhamedow decides the exact content to be censored. These claims are unverified, but they are consistent with the selective and highly centralized pattern of censorship that is evident at the technical level.

It also suggests that censorship practices may be difficult to scale as they require specific approvals from a very limited number of officials.

The available evidence suggests the system is simple and relies on predefined block lists. TurkmenTelekom possesses deep packet inspection technology that could be used to filter at the keyword level.

However, testing carried out for this report suggested that blocking is straightforward and dependent on blocking IP addresses and domain names.

Technical testing carried out in July and August 2012 revealed a highly selective and inconsistent pattern of censorship.

Blocked sites included popular blogs and news sites in Russian and Turkmen, as well as YouTube and CNN. The list of blocked sites included those of several prominent NGOs, such as the Soros Foundation and Human Rights Watch.

At the same time, numerous other sites remained accessible. These included BBC, Amnesty International, Global Voices, blogger.com, Facebook, and Twitter. (see Box 3, p. 12)

**Box 3. Blocked URLs in Turkmenistan**

- http://ca-c.org/
- http://echo-az.com/
- http://en.ria.ru/news/
- http://tmhelsinki.org/
- http://turkmeny .h1.ru/
- http://www.azathabar.com/
- http://www.azathabar.org/
- http://www.centrasia.ru/
- http://www.chrono-tm.org/en/
- http://www.cnn.com/
- http://www.easttime.ru/
- http://www.erkin.net/
- http://www.ferghananews.com/
- http://www.gundogar.org/
- http://www.inosmi.ru/
- http://www.livejournal.com/
- http://www.neweurasia.net/
- http://www.rferl.org/
- http://www.soros.org/
- http://www.tm-iskra.org/
- http://www.turkmenmedia.cjes.ru/
- http://www.vtunnel.com/
- http://www.youtube.com/
- http://hrw.org/
- http://www.bayram-jm.blogspot.com/
- http://www.dogryyol.com/
- http://www.fergana.ru/
- http://www.iwpr.net/
- http://www.mobimeet.ru/
- http://www.pankelle.blogspot.com/
- http://www.rutube.ru/
- http://www.sandancepe.blogspot.com/
- http://www.watan.ru/
- http://www.wordpress.com/

Despite allegations ofampering with the domain name system, technical testing did not yield evidence of sites being deliberately redirected.

Some Turkmen confirm that they are able to access blocked sites via smartphones or the Opera Mini browser, which is popular in Turkmenistan because it compresses websites for faster downloads on slow networks.

The ability to access blocked sites indicates that the Turkmen filtering system is not highly sophisticated. However, an article published by neweurasia on 27 February 2012 said that Opera Mini had been blacked out.[64] At the time of this report, the original version of Opera Mini was still blacked out, but new versions (Opera Mobila12 and Opera Mini7) with built-in proxies were in circulation among Turkmen netizens, according to Turkmen blogger Annasoltan.

Censorship of circumvention technologies appears to be highly selective. The website of hidemyass.com, a major commercial provider of secure tunneling technologies, is accessible, and provides free access to a number of open proxies.

The extent to which these proxies are used in Turkmenistan remains unknown.[65]

## SURVEILLANCE

The message is loud and clear to internet users in Turkmenistan: The government is potentially watching every online move. As noted, users accessing the internet from home or internet cafés must register their passports with TurkmenTelekom and agree to refrain from a wide range of online activities.

Some sources for this report suggest monitoring in general is being applied less consistently than in the past.

It is clear that journalists are still being closely followed. All correspondents working for international media are monitored by the government, which has limited their internet access in some cases.[66]

Sources say that the government monitors the internet connections of correspondents who work for services such as Radio Free Europe/Radio Liberty, and Annasoltan reports that when some journalists unintentionally tried to access blocked sites, the National Security Ministry (DHM) called them in for questioning.[67]

Popular sites may also be monitored to some extent. Our sources report that a user on the www.teswirler.com chat forum who made several posts related to Islam had his membership cancelled, and when the site was re-launched, his registration was denied.

### SEVERE PENALITES

Under Articles 132 and 133 of the country's Criminal Code, Turkmen who libel or insult government representatives may face fines, forced labour, or up to one year in prison. Insulting the president can result in a five-year prison term.

While the Turkmen constitution guarantees its citizens "the right to freedom of conviction, the free expression of those convictions and the right to receive information,"[68] this is clearly far from reality.

Online news reports that contravene official statements may trigger harsh reprisals.

In July 2011, an arms depot exploded in Abadan, destroying a large swath of the town. The government announced 15 people had been killed. At the same time, internet access and mobile phone services were blocked locally, seemingly to restrict the flow of unofficial information.

A website called Chronicles of Turkmenistan (managed by the Turkmen Initiative for Human Rights) cited a substantially larger death toll of 1,382. It was subsequently hacked and its subscriber list exposed, presumably as a warning to others that government was tracking followers of the site.[69]

Similarly, when a freelance journalist, Dovletmyrat Yazkuliyev, published information that contradicted official reports on the disaster, he was sentenced to five years in prison. (International pressure led to his release three months later.)[70]

In its March 2011 report, *Internet Enemies,* Reporters Without Borders noted that human rights activist Umida Dzhumabaeva was forbidden to leave the country in July 2010 for having given information to opposition websites.

In October that same year, the website of the Turkmen Initiative for Human Rights was hacked after the satellite station K+ aired a television interview with the agency's director, Farid Tukhbatullin.[71]

While an atmosphere of fear continues to prevail, anecdotal reports suggest Turkmen authorities now tolerate some very moderate dissent online.

Many users have in recent years reportedly been able to express mild political opinions without facing repercussions, although pseudonyms are widely used.[72]

## HOW NETIZENS COPE: LIMITING ACTIVITY

Many socially active citizens want to use the internet to participate in discussions and obtain independent information about events in Turkmenistan. However, the average Turkmen internet user is aware of the potential for censorship and surveillance, as well as the harsh penalities for producing or accessing banned content. This awareness affects online behaviour and expectations.

Overall, cyberspace is used primarily as a medium for social interaction. The internet is also used to share information and access news. Self-censorship is the norm, and most citizens express only mild political opinions in cyberspace, avoiding social and political participation altogether. Circumvention tool use remains quite limited.

### CYBERSPACE IS MOSTLY SOCIAL

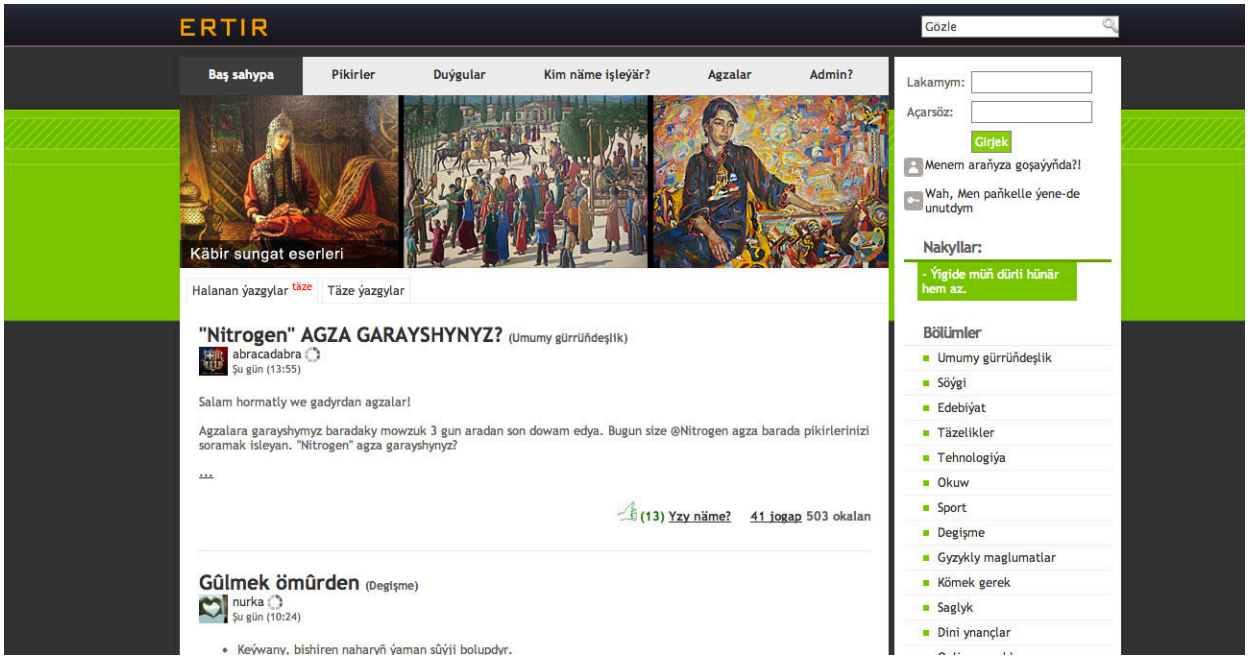
With most citizens using the internet primarily as a recreational tool, social networks, forums, and chat sites such as odnoklassniki.ru, vkontakte.ru, and rambler.ru, are overwhelmingly popular, a Turkmen computer expert reports (although it is worth noting that these are all actively monitored by Russian security services).

Data compiled by Google Insights on the most popular searches originating from Turkmenistan also reflect a primarily social orientation, as well as a keen interest in mobile services.

Between April 2011 and April 2012, the most common search terms included several variations on "mobimeet.ru" (an online dating service) and the Russian social network, Odnoklassniki, as well as "Android," "mail.ru," "iPhone 5," and "Nokia." "Opera Mini," a browser for mobile phones that is especially effective for slow networks, was also a popular choice.

Chat forums are particularly popular. Teswirler.com was reportedly one of the most popular Turkmen-language websites, but was shut down permanently in July 2011. It has been replaced by ertir.com (see Figure 4, next page). Many citizens also use talyplar.com, a popular discussion forum hosted in the U.S. that was originally designed for students. These chat forums are also routinely accessed from mobile phones.

FIGURE 4: ERTIR CHAT FORUM




Popular search engines include Google, Bing, Yandex poisk, mail.ru poisk, and Brothersoft (a software and freeware download website).

## BLOGGING IS MOSTLY FOR FUN

Blogging is discouraged, but not illegal. Nearly all hosting sites (such as WordPress) are blocked. For fear of intimidation from the authorities, political blogs are effectively non-existent. Instead, blogs function as a format for sharing information and knowledge about relatively innocuous topics, including technology, new companies, and saving money.

Examples of personal blogs include:

- www.sapar.mammedow.com
- www.vadimtorin.com
- www.bayramtm.com
- www.maxathanja.com
- www.pankelle.blogspot.com
- www.bayram-jm.blogspot.com
- www.sandancepe.blogspot.com

## SHARING INFORMATION

Despite the atmosphere of fear, some Turkmen do find ways to share censored information through the internet. According to our sources, three common avenues for information-sharing are:

- emailing attachments that contain forbidden literature or translated foreign literature to trusted friends;
- posting translated news to Turkmen language chat websites; and,
- using microblogs such as the mail.ru agent.

## NEWS AND INFORMATION

Given state controls, it is not surprising that the internet has not become an important source of information and news for citizens. Many news websites are blocked and slow internet speeds make routine access onerous. There is one official online news site (the Turkmen State News Service) and two that have government links; however, they lack multimedia, sharing tools, links, and comment options.

Popular news sites among Turkmen citizens (both blocked and accessible) include:

- www.bbc.co.uk/mobile
- www.haberler.com
- www.ria.ru
- www.cnn.com

- www.turkmenistan.gov.tm/_tm
- www.turkmenistan.ru/ru
- www.zamantm.com/tm
- www.trtturkmen.com
- www.azathabar.com
- www.ehabar.com (link aggregator for Turkmen news)

Our Turkmen sources say the most important source of information is not the internet but television, through local, Russian or Turkish channels. Print media, while cheap, only contain information from state agencies; subscriptions are compulsory for government employees.[73]

Despite the importance of television – or perhaps because of it – Berdymukhamedov ordered that satellite dishes be removed from Ashgabat homes in August 2011 because they are "unsightly." The Economist Intelligence Unit suggests that a more likely reason is that satellite television allows access to Russian and Turkish channels, thus offering an alternative to state-controlled cable television. While Turkmen television currently depends on Russian satellites, President Berdymukhamedov has said that the country plans to launch its own communications satellite.[74]

## CIRCUMVENTION: LACK OF AWARENESS MAKES FOR LIMITED USE

Low levels of computer literacy mean that most users are unfamiliar with the circumvention tools they could use to gain access to blocked information. According to Turkmen sources, the most popular circumvention tools include Ultrasurf, Hotspot Shield, or vTunnel, but most users use private proxy servers to access blocked sites.

Psiphon, which uses a popular Turkmen news service as its landing page, is also used. In April 2012, there were over 80,000 page views of that news service using Psiphon.[75]

While there is little evidence of people being persecuted for circumventing internet controls (as opposed to posting dissenting content), a culture of fear persists. This is exacerbated by slow internet speeds: even elite proxy servers can take an excessively long time to download data and they do not provide access to protected mail servers via SSL or HTTPS, according to a Turkmen computer expert.

# SUMMARY

Keenly aware that the internet is critical to its future development, Turkmenistan stands poised at the threshold of the wired world. Officially, it has already stepped through the door, moving to improve connectivity and to broaden access by allowing home service, lifting the ban on internet cafés, and creating government websites.

In reality, though, it's a different story. Maintaining tight control over the internet remains a key priority. The regime is extremely wary of the potential of the internet as a vector for dissent, and for potentially exposing its secretive practices to unwelcome international scrutiny.

The regime's efforts to pursue these contradictory goals have bogged down efforts to improve the country's internet infrastructure and capacity, which remain extremely limited, and indeed are virtually non-existent outside of a handful of major urban centres, despite the fact that roughly half the population of Turkmenistan lives in rural communities.

The state has a stranglehold on all forms of internet service, from home access to mobile networks. Prices set by the state monopoly are staggeringly high for private connections; internet cafés are more affordable, but remain scarce and surveilled. Mobile service is comparatively inexpensive, but the state-owned service is chronically overloaded. Only research facilities enjoy improved internet access, through infrastructure provided by foreign aid.

Internet content is also restricted. Media are controlled, activity monitored, reports sanitized, websites blocked. The state ensures that only approved news reaches its citizens. Those who challenge the government online risk interrogation, imprisonment and even forced labour.

The state's methods of monitoring and surveillance are basic; however, citizens' knowledge of alternatives such as circumvention tools is likewise minimal. For the most part, netizens censor themselves, and avoid looking for trouble.

In short, Turkmenistan remains in a kind of online limbo, torn between the benefits of joining the wired world and the risks of losing control over information and communication within its closed borders. One thing the government does seem to know, however, is that the internet is the gateway to modernity, and developing it is an important step towards escaping the fate of a forgotten country.

# APPENDIX 1. SUMMARY OF RESEARCH SOURCES

Research for this report was conducted from October 2011 to July 2012.

This report was prepared using multi-source, evidence-based methodology developed by The SecDev Group for research in challenging or difficult contexts. The research methods used include quantitative as well as qualitative measures, and were derived from a number of sources, including:

- **public research**, such as that carried out by university and nongovernmental organizations (NGO) groups, including Freedom House, the OpenNet initiative, and other organizations active in the field of freedom of expression, censorship, and surveillance monitoring. Statistical information was obtained from the World Bank, United Nations, ITU, and national statistical agencies.

- **commercial research** obtained for this for report from sources including BBC Monitoring, IDC, Paul Budde Communication, and Psiphon Inc.

- **open-source research**, including blogs, alternative news sites, and forums and sources specializing in telecommunications, Turkmenistan, and political events in Turkmenistan and the CIS.

- **gray-source research** that included access to confidential reports prepared by NGOs, the European Union, NATO, UNDP, World Bank, diplomatic reporting, and other third-party sources shared in confidence. These included technical reports and project documents pertaining to the development of the Turkmen internet infrastructure, and assessment reports of major infrastructure projects funded by NATO and the European Union.

- **interviews with key informants**, carried out with knowledgeable individuals contacted and screened by SecDev researchers for this report. These included Turkmen journalists, computer experts, and an engineer retained by TurkmenTelekom. Informant research was carried out over several sessions, and information obtained by interviews was verified by additional sources and followup research.

- **technical testing,** which was carried out in July 2012 in several locations in Turkmenistan. The testing used the Black Watch™ platform and measured results on fixed line, Wi-Fi, and mobile Internet services. The Black Watch testing protocol is consistent with ONI testing practices and methods.

Wherever possible and practical, original sources have been cited. To protect the identity of individuals contributing to this report, some names and sources have been excluded, or attributed to the best available public source for this information.

Any errors and omissions are the responsibility of The SecDev Group (Analytics).

# APPENDIX 2. INTERNET AND MOBILE RATES

Rates as of March 2012

## MONTHLY COST OF ADSL INTERNET ACCESS

| | Speed | USD (including VAT) | Manats (including VAT) |
|---|---|---|---|
| Initial ADSL connection | n/a | 96.14 | 274.00 |
| ADSL connection using subscriber's equipment | n/a | 58.19 | 165.84 |
| Unlimited traffic | 64 kbps | 213.16 | 607.50 |
| | 128 kbps | 426.32 | 1215.00 |
| | 256 kbps | 852.63 | 2430.00 |
| | 512 kbps | 1705.26 | 4860.00 |
| | 1024 kbps | 3410.53 | 9720.00 |
| | 2048 kbps | 6821.05 | 19440.00 |
| Prepaid incoming traffic | 64 kbps (up to 2 GB) | 43.12 | 122.88 |
| | 128 kbps (up to 5 GB) | 125.75 | 358.40 |
| | 256 kbps (up to 10 GB) | 323.37 | 921.60 |
| | 512 kbps (up to 20 GB) | 862.32 | 2457.60 |
| | ADSL connection | 96.14 | 274.00 |
| | ADSL connection using subscriber's equipment | 58.14 | 50.60 |

Source: http://online.tm

## COST OF MOBILE SERVICES

| Tariff | Cost per MB | Cost per day | Video call per minute | Additional notes |
|---|---|---|---|---|
| "Save" tariff | 7 tennesi* (USD 0.02) | 30 tennesi (USD 0.10) | 20 tennesi (USD 0.07) | Connection fee is 5 manats Incoming foreign calls cost 20 tennesi per minute. Incoming calls from landlines cost 10 tennesi per minute. |
| 3G | 7 tennesi (USD 0.02) | 10 tennesi (USD 0.04) | | Limited geographical availability |

*100 tennesi = 1 manat

Source: Annasoltan

# ENDNOTES

1. Human Rights Watch. 2012. *World Report 2012: Turkmenistan.* New York: Human Rights Watch. http://www.hrw.org/world-report-2012/ world-report-2012-turkmenistan.

2. BBC News. 2012. "Berdymukhamedov wins Turkmenistan election in landslide," in *BBC News*. 12 February 2012. http://www.bbc. co.uk/news/world-asia-17009053.

3. Economist Intelligence Unit. 2010. Democracy Index 2010. New York: *The Economist*. http:// graphics. eiu.com/PDF/Democracy_Index_2010_ web.pdf, p8.

4. Human Rights Watch. 2011. *Turkmenistan: Briefing Note for the European Parliament Foreign Affairs Committee and Central Asia Delegation on Turkmenistan*. New York: Human Rights Watch. http:// www.hrw.org/ news/2011/04/26/turkmenistan-briefing-note-european-parliament-foreign-affairs-committee-and-central. IREX and USAID. 2011. *Media Sustainability Index 2011*. Washington, DC: IREX and USAID. http://www.irex.org/sites/default/files/ MSI_2011_EE_Full.pdf, p279.

5. See Paul Budde Communication Pty. Ltd. (Buddecomm). 2012. *Turkmenistan: Telecoms, Mobile and Internet*. 16 January 2012, p8.

6. Ibid., p6.

7. See Index Mundi, available on http://www.indexmundi.com/turkmenistan/telephone-lines.html. Japan provided some $90 million U.S. to help upgrade this infrastructure. By 2004, 80% of all phone subscribers had digital lines and in 2006, phone exchanges were upgraded in Balkanabat and Turkmenbashi. See BuddeComm, p7

8. For listing of members of the Turkmen Research and Education Network Association (TuRENA), see http://science.gov.tm/en/turena/.

9. Science for Peace and Security. 2006. *Final Step on the Virtual Silk Highway*. Brussels: North American Treaty Organization. http://www. nato.int/science/virtual_silk/2003/a030826a. htm.

10. Buddecomm. 2012, p7.

11. See U.S. Embassy cable leaked in 2011. U.S. Embassy Ashgabat. 2008. *Turkmenistan: Limited bandwidth and price hinder progress on internet access a year into reform*. 17 March 2008. http://leaks.hohesc.us/?view=08ASHGABAT348

12. Central Asian Research and Education Network (CAREN). 2010. *The CAREN Project*. http:// caren.dante.net/server/show/nav.2295.

13. Trans-Eurasia Information Networks-Central Asia. 2007. *TEIN-CA Final Report,* section 3.4.2, p55.

14. Buddecom. 2012. p11.

15. Telegeography.com. 2012. *MTS Turkmenistan reactivates more than 500,000 subscribers on first day back in service*. 3 September 2012. http://www.telegeography.com/products/commsupdate/articles/2012/09/03/mts-turkmenistan-reactivates-more-than-500000-subscribers-on-first-day-back-in-service/

16. U.S. Embassy Ashgabat. 2009. *Turkmen State-Owned Company announces 3G Services, but not so fast…* 15 December 2009. http://leaks.hohesc.us/?view=09ASHGABAT1615

17. Access to unfettered content, however, remains a separate issue. See Part 3 of this report.

18. Known in planning stages as Trans-Eurasia Information Networks-Central Asia (TEIN-CA).

19. CAREN. 2010.

20. The first phase of the CAREN project was due to finish at the end of 2011.

21. Academy of Sciences of Turkmenistan. Turkmen Research Educational Network Association (TuRENA). 2012. http://science.gov.tm/en/turena/

22. Sherzodkhoja Khabibullakhoja. 2009. *Communications and IT development in the Republic of Uzbekistan*. Communications and information agency of Uzbekistan. http://www.unescap.org/ESID/Meetings/ICT09/Uz_P.pdf

23. IREX and USAID. 2011. p279.

24. Annasoltan. 2010. "State of ambivalence: Turkmenistan in the digital age," in *Digital Icons*. http://www.digitalicons.org/wpcontent/uploads/2010/07/Annasoltan-3.1.pdf, p3.

25. Freedom House. 2011. *Nations in Transit 2011*. New York: Freedom House. http://www.freedomhouse.org/report/nations-transit/nations-transit-2011.

26. Telegeography.com. 2012.

27. Dzhumaguly Annayev. 2011. "Turkmenistan to implement e-government," in *Central Asia Online*.

7 July 2011. http://www.centralasiaonline.com/ en_GB/articles/caii/features/main/2011/07/07/ feature-01.

28. Ashgabat Turkmen TV Altyn Asyr. 2012. "The quality of communications services will be significantly improved," in *Turkmenistan Online*. 26 January 2012. http://www.online.tm

29. Buddecomm. 2012. p15.

30. Turkmenistan.ru. 2011. "Every Turkmen first grader received notebook on September 1," in *Turkmenistan.ru*. 1 September 2011. http:// www.turkmenistan.ru/en/articles/15312.html.

31. In cooperation with the United Nations Development Programme (UNDP). See http://www.undptkm.org/index.php?option=com_content&task=view&id=1288&Itemid=43

32. See: United Nations Development Programme. 2012. *From Paper to Electronic Register of Voters*. 4 May 2012. http://www.undptkm.org/files/news/2012/040512_Electronic_register_of_voters_en.pdf

33. Buddecomm. 2012. At present, however, lack of infrastructure means connectivity is essentially nonexistent outside Ashgabat and some major towns. See Part 2 below.

34. International Telecommunication Union (ITU). 2010.

35. The source – an engineer who worked for Turkmen Telecom – is well-placed to make such an estimate.

36. By way of comparison, 2010 ITU estimates for internet uptake in the region are as follows: Georgia -- 27%; Azerbaijan -- 46%; Uzbekistan – 20%; Kyrgyzstan -- 20%.

37. Buddecomm. 2012. p9.

38. Ibid., p15.

39. There are only a small number of two-way satellite dish ISPs in Turkmenistan, operated mostly by foreign missions and companies. The service is extremely expensive, with immense bureaucratic hurdles to obtain permission.

40. U.S. Embassy Ashgabat. 2008.

41. At that time, the IRC reportedly had a greater bandwidth through its two-way satellite dish than the entire TurkmenTelekom network, according to the 2008 U.S. Embassy cable cited above.

42. Part 3 returns to the issues of censorship and surveillance.

43. Buddecomm. 2012. p1.

44. OpenNet Initiative. 2010. *Country Report: Turkmenistan*. Toronto, ON: MIT Press. http:// opennet.net/sites/opennet.net/files/ONI_Turkmenistan_2010.pdf, p242.

45. Asian Development Bank. 2010. *Turkmenistan Fact Sheet*. http://www.adb.org/documents/fact_sheets/TKM.pdf. Since the breakup of the USSR, development has been minimal outside of the capital, Ashgabat, and Akhal, the central province of Turkmenistan, according to Turkmen online journalist Annasoltan.

46. World Bank Group. 2010. *World Development Indicators 2010*. http://data.worldbank.org/ data-catalog/world-development-indicators/ wdi-2010. Gross domestic product per capita for Turkmenistan is $3,967 U.S. , according to the World Bank.

47. Turkmenistan Online. 2012. "Rates," in *Turkmenistan Online*. http://www.online.tm/content/

48. The cost is around $500-600 U.S., on par with that in most developed countries. Annasoltan. 2010. p6.

49. Ferghana Information Agency. 2011. "Turkmenistan has got the slowest internet in Central Asia," in *Central Asia News*. 18 November 2011. http://enews.fergananews.com/news.php?id=2149

50. Pando Networks. 2011. *Global Download Study.* http://chartsbin.com/view/2484

51. Annasoltan. 2010. p6; Freedom House. 2011.

52. See ONI (2010); and Freedom House. 2011.

53. $1 figure from *Ferghana News*. February 2011. http://enews.fergananews.com/news.php?id=2011&mode=snews. $3 figure from Turkmen sources.

54. 2010 estimate. Ibid. (*Ferghana News*).

55. U.S.Embassy Ashgabat. 2008.

56. ONI (2010), and U.S Embassy Ashgabat (2008).

57. Ibid. ( U.S. Embassy Ashgabat).

58. ITU. 2010.

59. Data as of March 2012. The cheaper price for 3G service may be due to its limited availability and the need for a more advanced handset. It is hard to estimate the average monthly cost to users due to the Turkmen strategy of charging by volume, rather than time.

60. U.S. Embassy Ashgabat. 2009.

61. In this case, an engineer who has worked with TurkmenTelekom.

62. A Turkmen computer expert.

63. ONI. 2010.

64. Annasoltan. 2012. "The Turkmenet's not over until the fat lady sings!" *NewEurasia*. 27 February 2012. http://www.neweurasia.net/media-and-internet/the-turkmenets-not-over-until-the-fat-lady-sings/.

65. http://www.hidemyass.com/proxy-list/

66. Annasoltan. 2012. p8.

67. Ibid., p8.

68. Ibid., p2.

69. Economist Intelligence Unit 2011. *Country Report October 2011: Turkmenistan.* pp14-15.

70. Economist Intelligence Unit. 2012. *Country Report January 2012: Turkmenistan.* p15

71. Reporters without Borders. 2011. *Internet Enemies*. Paris, France: Reporters Without Borders. http://12mars.rsf.org/i/Internet_Enemies. pdf, p44.

72. Freedom House. 2011. p561.

73. IREX and USAID. 2011. p278.

74. Economist Intelligence Unit. 2012. p16.

75. Internal data from Psiphon Inc., a Canadian corporation that develops content-delivery mechanisms for organizations working in restrictive environments. See www.psiphon.ca

Copyright © 2012 by SecDev Analytics,
a division of The SecDev Group.

World Exchange Plaza,
45 O'Connor Street, Suite 1150,
Ottawa, ON
K1P 1A4
Canada

All rights reserved.
No part of this publication may be reproduced,
stored in or introduced into a retrieval system,
or transmitted, in any form or by any means,
electronic, mechanical, photocopying,
recording, or otherwise, without the prior
written permission of the copyright owner.