



Clearing a path to the outside world.

Using grit, planning, and time to bring the Internet to Tusheti.

Sheep on the slopes below their shepherds' campsite
along the road to the Tusheti in the Greater Caucasus mountains.

It is 6 a.m. when the small villages scattered across the mountain tops of northeastern Georgia begin waking up. Without heat or an electricity grid, the villagers start the oven fires to warm their homes; the teapot always atop the flames for hot water.

The snow is new in Tusheti this day, so the villagers left in the highlands clear a path to their farms and barns to milk their cows and feed the animals. After their own breakfast, the men head to the springs for the day's water which they transport by foot or horse as the villages are built near the springs. The women cook, clean and make cheese. It is 2017, and unless they travel to the lower, more populated, regions—where they live in the winter months—the sparse population of these villages have little contact with the outside world.

The What

Fast wireless Internet service is now available in this remote area of the world, thanks to a partnership between the Internet Society (ISOC) and its Georgia Chapter, The Small and Medium Telecom Operators Association of Georgia, The part of the association LTD Freenet, technical head of the project – Mr. K. Stalinski, and the Tusheti Development Fund (TDF). It is helping to encourage the tourism the region depends on, as well as to keep the residents connected to each other, and to the rest of the globe.

The project's aim was to provide affordable, high-speed fixed-wireless Internet by constructing a local connecting network in three directions from Diklo mountain and Abano pass, with mast sites from 2,500 to 3,500 meters above sea level.

With help and permission from the government of Georgia, Executive Director of the Small and Medium Telecom Operator's Association of Georgia, Ucha Seturi, coordinated sites for the masts, hardware fabrication, resale and solutions, and equipment and money transfer to get the project off the ground. In a matter of months, from October 2016 to May of 2017, these groups conducted radio planning and site survey for the network. From May to July, local technicians implemented the design.

With a grant from ISOC and other in-kind contributions from local and regional partners, Seturi coordinated the efforts between TDF, ISOC and various other groups. In fall of 2016, the masts,



The loadmaster of a Border Police helicopter making a detour to deliver building supplies to a nunnery in the remote village of Abano in the Truso Gorge, near the Chechen border in the Mtskheta-Mtianeti region of Georgia.

mounts and other equipment were manufactured, then stored for the winter after being tested locally. Starting in June of 2017, the equipment was transported to Tusheti, via helicopter, 4-wheel-drive, and even by pack horse.

Several of those horses ran away or wandered off with the packs on their backs. Sometimes, the mounts and other equipment fell off the animals when they couldn't keep their balance, smashing on the rocks of the mountainside.

This equipment and solar panels had to be able to withstand intense thunder, wind, and snow. Sometimes the areas were so remote, high, and treacherous that

it was impossible to set some of the masts in their original locations. In another instance, the sites did not have the clear line of sight to the villages necessary. In these cases, the teams chose other regions and installed extra solar power and repeaters to connect.

Still, by early August, five masts had been installed around Abano pass and Diklo, Chiglaurta, Makratela and Koklata mountains, connecting 85 percent of the villages which had at least one continuous inhabitant. Access points have been installed in more than a dozen hotels and guesthouses in the region, as well as in businesses, and even private residences. This means 26 out of 36 villages now have Internet access.

“There were many delays because of the weather and terrain. We had to take pack horses up to the peaks with equipment on their backs.”

Nyani Quarmyne, photographer for the project

The Where

Tusheti is located on the northern slopes of the Greater Caucasus Mountains, bordered by the Russian republics of Chechnya and Dagestan. It covers 969 square kilometers as one of the most isolated areas of Georgia, with a population of only a few dozen during the winter months when the road becomes impassable.

"It sounds strange but from the beginning of November until the end of the May there is just one way to reach the destination - a helicopter," Seturi said.

As such, villages are traditionally split in two; winters are spent on more sheltered lower slopes, while summers are spent on more defensible higher ground, where ancient fortified defensive towers still stand from eras past. Those summers are rife with tourists; the population surges to more than ten thousand during the few warmer months of the year.

When we think of the Internet and connectivity, we usually think in terms of large, connecting populations. The Internet is global. In many cases, its importance lies in the number of people able to connect to any one network. In Tusheti, the opposite also holds true. The villages with the fewest people also desperately needed a network. If, during the seven months of winter, you are the only person living in a village, you need to be able to cry out for help should you be injured. If you are the region's only doctor, people in surrounding areas need to be able to reach you quickly.

In Upper and Lower Alvani, people live in conventional homes with running water, electricity, and Internet access. There are schools and small shops but very little employment.

"Even though most Tushetians spend part of the year in Alvani, there is a palpable sense that Tusheti is their real home, and they flood up into the mountains as soon as the road opens," Quarmyne said. "We are literally hooking those locations up to the world for the first time."

In Tusheti, the Internet is not just about globalization, economic forces and enhancing connections. Here, the Internet can mean the difference between life and death.

Irakli Khvedaguridze is Tusheti's 76-year-old doctor. He is the sole inhabitant of Bochorna in the winters, paid to stay and tend to the few others who stay in their respective villages. When local technicians arrived to install the antenna and get the network connection running, he was overjoyed, even though he does not yet have a smart phone, or even a computer. He recounted one winter when a tree fell on a villager, hurting his back. The man had to walk with his injury for three days through waist-deep snow to find someone who could contact Khvedaguridze. Even then, helicopters couldn't reach him and a team of seven men had to walk from another village and carry him out on a stretcher. The doctor's first thought was how much of this could be avoided with an Internet connection.

The road through the Abano Pass in the Greater Caucasus mountains in Georgia. The road through the pass, the highest in the Caucasus at an elevation of 2850m, is impassable for seven months of the year, during which time infrequent helicopter flights provide Tusheti's only physical link to the outside world.

The How





Konstantin Stalinsky pausing for a breather on his way up Diklo Mountain. Together with a group of colleagues, he was on his way to begin construction of a solar-powered wireless network to bring broadband Internet access to Tusheti.

Establishing the network involved mounting transmission equipment on an existing mast the in Abano Pass, which is the highest road in Georgia, at more than 2,800 meters. Then they beamed a signal from point to point across Tusheti. This meant masts had to be constructed at high points across the region. Volunteers traveled to each location to erect a mast and install the network gear. From those masts, wireless signals are beamed out to the villages where receivers are now installed.

The work, of course, does not end with the hardware. The project is sustainable both in its ability to power itself through solar energy and in the local population now trained to use it.



The LEPL of the Ministry of Economy of Georgia - The Georgian Innovation and Technology Agency (GITA) runs an ecommerce training program aimed at reducing the tech literacy gap between urban and rural areas, together with a voucher program for equipment needed to connect to the Internet for residents funded by The World Bank. Training focused on basic Internet literacy and the use of travel and commerce sites like booking.com and expedia.

com, with a view to supporting tourism businesses. Meanwhile, Freenet, an ISP in Kakheti, donated free transit, free co-location and offered bandwidth at cost.

Only half of Georgia's population is hooked up to the Internet, according to the International Telecommunication Union. ISOC's Senior Manager of Regional Affairs Europe Maarit Palovirta said the access percentage fell along economic lines with remote and rural areas suffering the most.

"We want to demonstrate that the Internet can act as a horizontal enabler to improve people's lives across the board," Palovirta said. "In the end, ISOC's

Sometimes things just do not go as planned, and those undertaking a project like this should be prepared for various pitfalls. In Tusheti, while the group had been promised horses at no cost, weather delays meant they did not get off the ground until the Tusheti tourist season, when no horses were available. Mast locations that looked good on a map often did not pan out in real life. Masts had to be installed lower than expected, and extra equipment had to be made and bought to make up the coverage between villages.

"No matter how well you plan, the real situation will differ from the one given by software in the planning stage," Seturi said.

That real situation is very much still a part of Tushetian society, which is considered semi-nomadic in that shepherds still roam with their flocks, moving them seasonally between lowland pastures and the mountainous highlands. Quarmyne spent just a few days with the shepherds and describes scenes from centuries past still existing.

"There was still snow on the pass when we went. It was super cold, and it rained. I had waterproof everything—good gear for the mountain—but I was soaked within minutes from the horizontal hail," Quarmyne recalled. "These guys were just in tracksuit pants and a couple of pullovers. They are just used to being cold and wet, and plugging on. It's incredible how hard a life they live."

While historically their families remained snowed in at the villages, these days most citizens spend their winters in Alvani. Aside from winter emergencies, the Internet will be of much use during the summer months for tourism and sales, both a large part of modern Tushetian life.

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Maarit Palovirta, Internet Society, Senior Manager of Regional Affairs Europe

Giorgi Kitidze (left), Tedo Shabalaidze, Konstantin Stalinsky, Giorgi Kirvalidze, Murmani Tcharelidze and Amirani Giorganashvili erecting a tower on Diklo Mountain.



The Why



Kaxa Tatrulaidze holding his young daughter, Sophia, as he and his wife, Tamo Khucishvili speak with Sophia's grandparents on speaker phone at their home in Omalo.





The Old Omalo Guest House in Omalo, the central village in the remote mountain region of Tusheti. The guesthouse belongs to Kaxa Tatrulaidze and his wife Tamo Khucishvili, and together with their baby daughter, Sophia, they are one of only a handful of Tushetians who spend the winter months in the mountains.

Tusheti's short summer season boasts more than 17,000 visitors a year, which is the mainstay of the region's economy. Lodges and guesthouses abound in the region's villages, and hotels are starting to pop up, too.

booking] services. Good quality WiFi connection in hotels is also important to attract customers."

In this way, Internet connectivity is helping support the economic sustainability of Tusheti while also creating opportunities for

the moment, those wanting to get ahead, they go to university, and then the cities are where jobs are."

In essence, Internet in Tusheti serves as an additional service for tourists a connection for locals to obtain information and to contact to their

family members and friends, both near and far. Those in the tourism industry can now focus their services without any intermediary.

The Internet is the most important form of communication. Tourism is a beacon of hope for us, and the Internet is very important for that."

Ia Buchaidze, bakery owner, Omalo, Tusheti

While many tourists come to get away from the world's technology, a lot of them are now dependent on that technology to get them there.

"Due to wilderness, beauty and the unique local culture, Tusheti has become popular touristic destination," said Sandro Karumidze, the chair of the ISOC Georgian Chapter. "Today almost every family is trying to start small hospitality business, and good Internet connection is essential for communication with partners and access to popular [ticket

communities to sell their local products and services. Tusheti is famous for its particular type of Ghuda cheese, and the locals hope to peddle that delicacy to a wider audience, as well.

Most importantly for many fulltime residents, though, is the hope that the young people will have more reason to stay in the area.

The hope is that if tourism becomes more viable then there will be careers for young people, and they'll stick around," Quarmyne said. "At

Ia Buchaidze, who owns a bakery in Omalo, Tusheti's main village, already has a Facebook page for her business. Her 17-year-old daughter uses the connection to talk with friends and do research for schoolwork. Her 15-year-old son plays video games. The family owns one computer, and Buchaidze said it is often not enough, but she is thankful for what they have.


In addition to the bakery, Buchaidze volunteers at the library in the village, teaching German to those interested. Community-minded, she is currently writing a grant application

Luka Aftarauli (15) with his elderly grandmother after bringing one of his brother's horses into the front yard for the night in Kvemo Alvani, Georgia.



to for support set up a social enterprise that will make sustainable bags; proceeds from the sale of which will help disabled members of the community.

For all these projects, the Internet is key.



The Tusheti network project was the result of the partnership between the Internet Society and its Georgia Chapter, The Small and Medium Telecom Operators Association of Georgia, The part of the association LTD Freenet, technical head of the project – Mr. K. Stalinski, and the Tusheti Development Fund (TDF).

The project aims to provide a way for the people who live in Tusheti to build opportunities while preserving their local heritage, traditions, and ways of life.

Photographer Nyani Quarmyne spent several weeks in Tusheti between March and July 2017 to capture the different phases of the project.

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1775 Wiehle Avenue
Reston, VA 20190 USA

Galerie Jean-Malbisson 15
CH-1204 Geneva, Switzerland