

a country



# connects

by Kelley Hunsberger | photo by Goran Deskovski

A U.S.-funded project  
brings most of Macedonia  
online in only **4** months.



**from left** Zoran Dimovski, IT intern; Olivera Zivkovska, financial manager; Aleksandar Bilbilov, director of connectivity and applications; Glenn Strachan, project director; Ljupco Tagasovski, assistant project director; Orhideja Zlatkova-Kocareva, administrative assistant; John Martone, web and database administrator; Arangel "Ufo" Angor, IT intern

# In 2001,

Macedonia was on the verge of civil war. In the five years since then, the tensions that once plagued the country have decreased, leaving Macedonia to focus on its economic development—and connecting to the world via the Internet is a major part of the plan. Through the Macedonia Connects project, the small, landlocked country in Southeastern Europe has managed to become the first all-wireless country in the world.

The project has covered the country's most populated areas with wireless access points. Now, 95 percent of its more than two million citizens have access to the Internet, up from eight percent before the project began. The project also has lowered the cost of connecting by about \$100 a month and supplied broadband access to all of the country's primary and secondary schools—some of which never even had a phone.

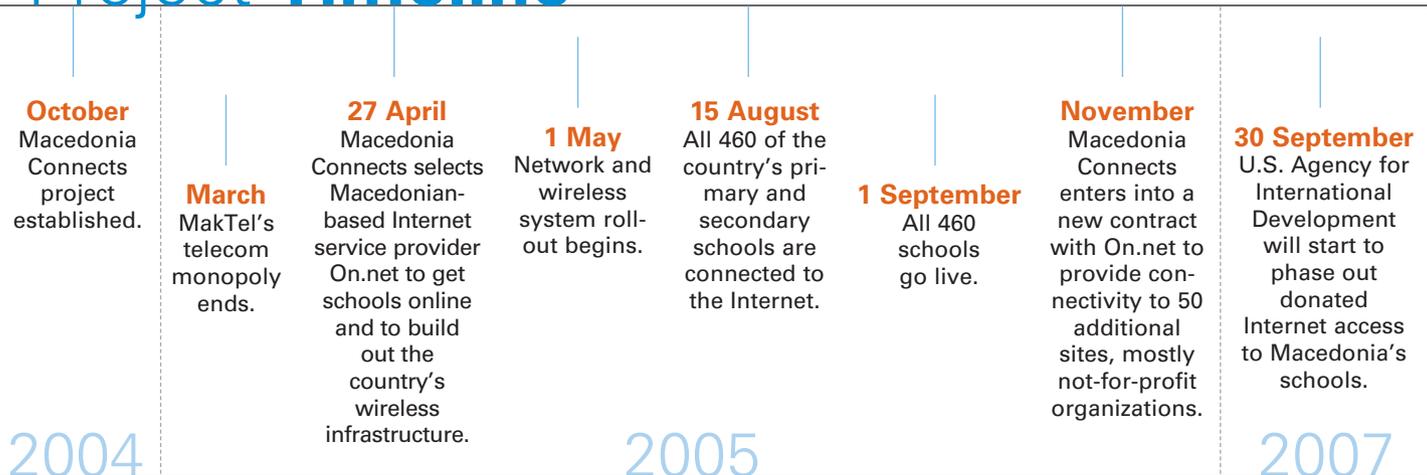
Established in October 2004, the Macedonia Connects project is primarily funded by the U.S. Agency for International Development (USAID) and managed by the Academy for Educational Development (AED), both based in Washington, D.C., USA. Scheduled to end on 1 October 2007, the project has four primary goals, according to Ljupcho Tagasovski, AED assistant project director:

1. Provide broadband Internet connectivity to all 460 urban and rural schools and several university facilities
2. Establish sustainable, commercial service to business, government and individual customers
3. Publicize and facilitate the network by assisting other Macedonian-based projects in using the broadband network to enhance their own activities
4. Introduce a competitive atmosphere for Internet services, resulting in reduced costs for connectivity.

## Springboard Into Action

The Macedonia Connects project initially focused on schools. Almost immediately, though, it became clear that the project instead should expand to

## Project Timeline



offer nationwide connectivity. “Since the schools were distributed throughout the entirety of the country, why not view this as a national connectivity project instead of a school-based initiative?” says Glenn Strachan, AED project director of Macedonia Connects.

Macedonia’s telecom infrastructure covered little more than half of the country, however, and there was no market for an Internet service provider (ISP) to build out the rest. The situation called for an innovative solution.

“I suggested we leverage the schools as an anchor tenant for a nationwide network and provide a selected ISP with the capital financing to build out a network, which not only concentrated on the schools, but also on all other constituent markets,” Mr. Strachan says.

Once the schools were connected, USAID would subsidize their fees until 1 October 2007. The move would create a market for the ISP to use as a springboard to build a sustainable customer base. “The model used in this project activity is fairly unique and differs from other technology projects,” Mr. Tagasovski says. The ISP had two years to adopt and create the rural market so it is sustainable past September 2007.

### Calling All Macedonians

On.net, a Skopje, Macedonia-based ISP, won the project bid. The company had four months—from 1 May 2005 to 1 September 2005—to connect all the schools. “The deadline was set primarily because the school year starts on 1 September, and we wanted the students to have the opportunity to use the Internet from the beginning,” says Aleksandar

Bibilov, director of connectivity and applications for the project.

During that time, On.net worked to:

- Plan the network and order the backbone equipment
- Install the equipment in the schools
- Resolve power issues for communication towers on mountain tops.

To meet its tight deadline, On.net hired several subcontractors and partnered with Macedonia’s Ministry of Education and Science (MoES). “MoES assisted them with the installation at the schools and the testing of the equipment,” Mr. Bilbilov says.

Macedonia Connects leaders also set guidelines to ensure that all rural schools were connected as efficiently as the country’s urban schools. The ISP had to establish connectivity in a ratio of three rural schools for every one urban one until all rural schools were con-

nected. AED paid incentive bonuses as each rural district was brought online. These incentives varied according to three levels of difficulty:

- **Rural 1:** Dense population, mid-developed infrastructure
- **Rural 2:** Small town, mid-developed infrastructure, remote location
- **Rural 3:** Village, low infrastructure.

The network was completed on 15 August 2005—with 15 days to spare for testing.

On.net also had to sign an agreement that guaranteed schools would receive high-quality access, security and data storage. Per the ISP request for proposals, Macedonia Connects received a credit on its monthly charge if the service agreement was not met.

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—Glenn Strachan,  
Academy for Educational Development,  
Washington, D.C., USA

## A Stake in the Project



### Connecting a country is a group effort.

Macedonia Connects project stakeholders include:

**Academy for Educational Development (AED):** Works to solve social problems and help communities and institutions become more self-sufficient. AED is responsible for the project's administration and management.

**U.S. Agency for International Development (USAID):** Provides assistance to countries recovering from disasters, trying to escape poverty and engaging in democratic reforms. USAID is the project's source of funding and will subsidize access for the schools until 1 October 2007.

**On.net:** Macedonian Internet service provider selected to connect all 460 of

the country's schools and build out the nationwide wireless infrastructure.

**Ministry of Education and Science:** Assisted On.net with the system rollout. Worked with USAID to distribute more than 5,300 computers donated by China and perform technical assessments of schools to gauge basic infrastructure requirements.

The majority of project team members were resident Macedonians, ensuring that the country's citizens had a say. "Macedonians were involved from the very beginning of the project, from planning to establishing and managing," Mr. Tagasovski says. "The planning and designing phases involved Macedonian employees at USAID's Macedonian mission, as well as [employees] from MoES and local experts." School principals, teachers and even students were encouraged to make suggestions.

### Defeating the Incumbent

For decades, Hungarian-owned ISP MakTel benefited from a state-sponsored monopoly of Macedonia's telecom industry. Without competition from other providers, MakTel set its prices high—charging a whopping \$150 a month for Internet service at one point. In March 2005, the industry was deregulated, opening the door for low-cost, broadband alternatives to stake their claim in Macedonia's network.

MakTel was not invited to bid on the Macedonia Connects project—and then attempted to derail it. "There has been no more monopoly, but still MakTel uses all its power—political and other

connections—to undermine, slow down and harden the process of liberalization and competitiveness," Mr. Tagasovski says.

"[The company] went public and said it was providing free access to all the schools on our list," Mr. Strachan says. However, MakTel's plan would not result in lower Internet access prices in the country, so Macedonia Connects project leaders decided to move ahead as planned. They had to receive assistance from USAID and the embassy, though, to stop MakTel from signing up schools for access while posing as Macedonia Connects staff.

### In the Clouds

On.net selected Motorola Canopy™ to distribute connectivity throughout the country. Canopy is designed to provide high-speed Internet access to residential and business customers who are underserved or live in locations with no infrastructure. When it came time to build that infrastructure in Macedonia, On.net used the country's rural terrain to its advantage—mountain tops were used as distribution points for wireless connectivity.

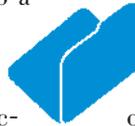


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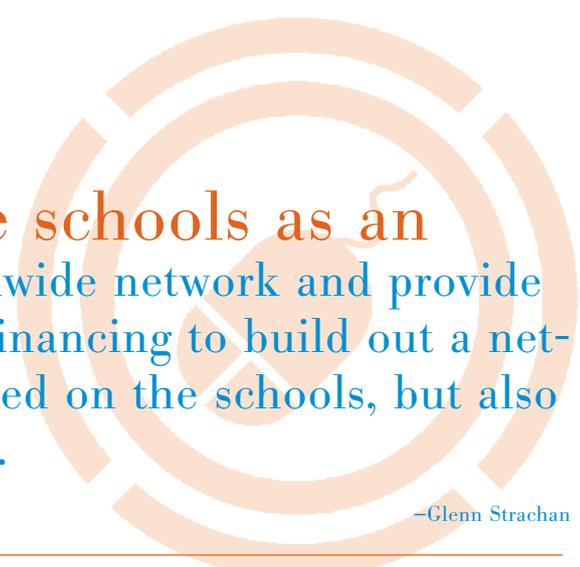
“The Macedonia Connects project is a good example of scalability,” says Dennis Stipati, director of sales for Motorola Canopy in Europe, Middle East, Africa and Asia. “Working with On.net and using the schools as a platform for the country-wide network, we have been able to build to a scale large enough so that the resulting market has the economic critical mass to help ensure uninterrupted Internet connectivity, especially in rural areas. In turn, this larger scale has enabled On.net to lower the prices of connectivity dramatically.” For example, the company offered teacher and student packages at \$9 to \$15 per month.



On.net also employed Calabasas, Calif., USA-based Strix Systems’ radio-mesh technology to create Wi-Fi “clouds”—wireless hot zones that stretch 9.3 miles—in Macedonia’s six largest cities. The system allows anyone with a laptop to go online. “You can sit out on a bench on the river and you can get onto the free wireless network or you can take out an account for \$9 and get four gigabytes of download,” Mr. Strachan says.

### Signing On

Building out the infrastructure, however, is not the sum of the Macedonia Connects story. Once all the schools were online, a project team member was at



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On.net's disposal to help develop marketing plans aimed at increasing the number of subscribers. "That will allow the ISP to continue to maintain the connectivity in rural and remote locations even after the project's free-of-charge period ends," Mr. Tagasovski says.

The marketing push included a national eLiteracy campaign to build interest and increase the citizen's computer skill level. "You have to have a program that encourages them to use the connectivity and the computers," Mr. Strachan says.

Being wired is already proving to be a boom for the economy: Slovenian Telecom recently bought 72 percent of On.net shares. "It's not very often that a foreign direct investment happens here," Mr. Tagasovski says. "In fact, Macedonia is at the bottom of the regional list."

That's starting to change as Macedonia taps into its newfound connections. "[The Internet] has made a big difference for the country," Mr. Strachan says. "We built this little snowball and it rolls down the hill and just gets bigger." **PM**

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