



## EasyStreet Plays Vital Role in Monitoring Statewide Medical Broadband Network

### Customer: Oregon Health Network

- Headquartered in Lake Oswego, Oregon
- Implementing a high-speed broadband network connecting medical facilities throughout Oregon
- Recipient of one of the largest federal subsidies for rural telehealth services

### Challenges:

- Develop one of the nation's largest broadband networks to provide state-of-the-art telehealth services to hundreds of medical facilities
- Establish a Network Operations Center (NOC) to monitor performance of network with highly sensitive data transmissions
- Coordinate, implement and enhance network connections between medical facilities and broadband vendors across Oregon to achieve a cohesive network

### Solution:

- Select EasyStreet® Online Services to develop and operate the network's crucial operations center

Oregon's vast geographical expanse is home to one of the nation's most technologically advanced healthcare projects. A powerful, state-of-the-art broadband network is being implemented to link the state's many medical facilities, from small clinics surrounded by sagebrush to advanced medical centers amidst Portland's skyscrapers.

This innovative project is being implemented through the recently formed Oregon Health Network, Inc. (OHN), supported by a large federal subsidy to assemble the far-reaching network. And EasyStreet Online Services, Inc., is a critical component of the effort.

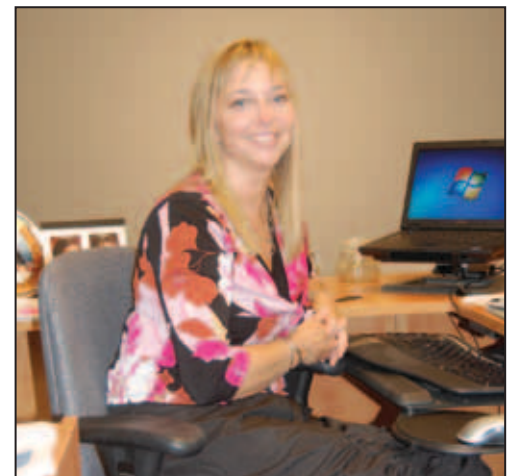
EasyStreet operates OHN's Network Operations Center (NOC) for monitoring network performance, troubleshooting glitches and tracking performance trends to head off network problems before they occur. The fact is, broken transmission during a medical-consultation videoconference would be annoying, but a network outage during an online surgical procedure could have more serious consequences.

### MAKING A VISION REAL

For several years, visionaries have sensed the potential of high-speed data communications in healthcare applications. In 2006 the Federal Communications Commission formed the Rural Healthcare Pilot Program (RHCPP) to help develop and deploy such a national network, pledging to fund — through carefully selected regional participants — 85 percent of the infrastructure costs for five years.

Meanwhile in Oregon — with its widely dispersed population often served by small medical outposts far from major hospitals — groups such as the Telehealth Alliance of Oregon and the Oregon Association of Hospitals and Health Systems in 2007 created OHN to make the medical-network vision a reality. A few months later, the FCC selected OHN as its fifth largest RHCPP awardee, providing \$20.2 million in available subsidies toward just such a broadband infrastructure. (Subsidies are paid directly to service providers.)

"I'd like to think the size of Oregon's award had to do with the quality of our application and the design of our proposed infrastructure," says Kim Lamb, executive director of OHN, headquartered in Lake Oswego. "For the design part, our model was not to build an infrastructure from the ground up, but to leverage our resources through a 'network of networks,' which is a sound and savvy approach."



*Kim Lamb, Executive Director, Oregon Health Network*

The OHN infrastructure comprises existing and new broadband networks that will be used to connect hospitals, clinics, private practices, community colleges, pharmacies, long-term health and assisted-living facilities, and governmental agencies throughout the state. OHN plans on having 200 sites on the network by June of 2011.

“The other part of our application was use of the Network Operations Center,” Lamb explains. “As long as we’re working with a whole collection of broadband providers, how are we — and how are our participants — going to be able to ensure the quality of the network connections? That’s where the Network Operations Center model becomes influential and necessary.”

From Lamb’s perspective, EasyStreet is adding considerable value to the original concept of the NOC. “They’re a true partner, very committed,” she says.

“We have situations where the medical site doesn’t have an IT department. EasyStreet has been very helpful and flexible in those instances.”

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## THE FUTURE OF MEDICINE

OHN’s achievements provide a thrilling glimpse into the future of medicine. The mission statement Lamb often quotes — “All Oregonians should have access to the best possible healthcare regardless of location” — has been the guiding inspiration since OHN’s inception.



*Some remote clinics use specialized devices, such as the Intouch Health® Remote Presence Robotic System, which enables physicians to be remotely present. Devices such as electronic stethoscopes, otoscopes and ultrasound can be connected to the Expansion Bay of the Robot, to transmit medical data to the remote physician over the OHN network.*

“An important part of our vision is that we don’t use the terms ‘urban’ and ‘rural,’” she says. “If we’re really successful in meeting our vision, the concepts of urban and rural become obsolete.” In other words, the opportunity for sophisticated medical treatment exists for people anywhere in the state, regardless of location.

“It’s thinking holistically, seeing healthcare in our communities and statewide as an ecosystem,” Lamb continues. “With OHN, a clinic can have access to any hospital in the region that’s on the network. It can have a specialty relationship with a pediatrics unit at OHSU (Oregon Health Sciences University) or with the burn unit there. It means patients can remain in their communities and still have videoconferencing with experts on the other side of the state. And this is just the beginning.”

OHN’s broadband network provides tiers of increasingly sophisticated services. A basic application is transferring electronic medical records from site to site. Higher up the scale, transmitting high-resolution x-rays, radiology images and CT scans require a more powerful broadband connection. “Most often, if you don’t have the broadband network, it means putting the x-rays or CT scans in a taxi to be driven somewhere,” Lamb says. “If it’s a life-and-death situation, that’s not really helping.”

For example, Wallowa Memorial Hospital in Enterprise, Oregon, had been experiencing connection time of an hour or more to transmit CT scans on its previous network. Since its network upgrade through OHN, transmission time is down to less than 15 minutes, according to Lamb.

Video-based consultations can occur physician-to-physician or physician-to-patient, depending on the situation. “Mental health consultations are a real need,” Lamb adds. “Having that very personalized, high-resolution experience with the patient is really important.”

In La Grande, situated in a mountainous region of northeastern Oregon, the local hospital uses a remote-presence, mobile-interface robot from InTouch Health. “If you’re a mother who’s had a baby and there’s not a pediatrics specialists on hand, the robot enables specialists in another location to see in high-res the dilation of your eyes, the monitors around the room and other medical information, and then the specialists can give instructions on what to do,” Lamb says. “With the network, you may not need to transport your patient at upwards of \$20,000 for an airlift and all the stress and costs for that family. Keeping the patient in the community has a positive economic effect, and it helps for people to know they can receive the highest

levels of care without having to leave their community.”

## AN EASYSTREET STRENGTH

OHN’s statewide healthcare network application highlights one of EasyStreet’s core competencies — an advanced and proven Network Operations Center

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for monitoring network performance. EasyStreet’s 24/7 NOC has been vital to EasyStreet achieving the longest-standing record of customer satisfaction of any Managed Services Provider (MSP) or Internet Service Provider (ISP) in the Pacific Northwest.

From the time EasyStreet went online in the mid 1990s, its own NOC has put emphasis on spotting early warning signals to prevent outages and other degraded performance. This was the type of experience and orientation OHN was seeking in a NOC partner for its proposed health network.

“The FCC program requires an open competitive bidding process, so we went out for bid on the NOC and EasyStreet won,” Lamb recalls. But behind that simple statement is the strenuous work on the part of EasyStreet’s technical staff to scope the size and complexity of the OHN challenge, determine the most effective way to provide network-monitoring services and to assemble an implementation process.

At OHN, Lamb is adamant about the critical nature of the NOC and keeping

the broadband network running at peak performance.

“Our network-of-networks model depends on providing a high-speed, high-quality, managed connection for all of our (broadband) providers to connect them to each other and ensure a certain level of performance,” she says. “Jitter latency and packet loss, as examples, are significant in the world of videoconferencing, where a little bit of packet loss means you’re not delivering quality healthcare. And if you’re conducting robotic surgery over the network, you certainly don’t want glitches in the system. Performance is at the heart of everything.”

Assembling an experienced team of technical and customer-support specialists from across the company, EasyStreet defined its strategy and processes for the OHN project, then worked hand-in-hand with the OHN staff and directors, as well as the Universal Service Administrative Company (USAC) —the nation’s non-profit administrator for telecom and Internet services for rural healthcare — to arrive at the NOC solution.

“The value of the NOC is huge,” Lamb explains. “For a rural clinic or other site that doesn’t have a large staff of IT folks, if they have a connection problem and go to their provider, the finger-pointing can start, they

have nobody to solve the problem, lives are on the line and they can do nothing about it. This is where the NOC can be empowering to these sites.”

## STATE-OF-THE-ART NOC

To be effective as OHN’s NOC, EasyStreet functions as a neutral entity, an unbiased observer of network performance without affiliation with any specific broadband provider. That way, the NOC can identify problems and see that they are solved without unnecessary territorial issues.

“We identify problems, where they’re located, who’s responsible for them, and we let the appropriate parties know about the problem,” explains Lizette Luke, head of EasyStreet’s project-management office, who has kept the EasyStreet aspect of the OHN project on track. “It’s important that we’re entirely neutral. We monitor and we advise, but have no actual participation in the network itself.”

In fact, the data the NOC monitors is actually simulation data that speedily travels up and down every link of the data highway and reports back on road conditions. “We simulate high-sensitivity traffic and look at its quality,” Luke explains. “If the quality drops below what’s required for that type of traffic, we contact the people responsible.”



The EasyStreet Network Operations Center (NOC) monitors leaf nodes on the Oregon Health Network around-the-clock.

EasyStreet software technicians evaluated a dozen products before identifying the complex monitoring software and device-management tools capable of compiling data for the size and sensitivity of the OHN network. Selecting the Orion® Network Performance suite of products from SolarWinds® enables EasyStreet to add more modules as required for additional functionality as well as network growth.

EasyStreet's monitoring system for OHN relies on an intricate system of "leaf nodes" — mostly specially configured Cisco 1700 Series routers — and leaf-node "responders" for generating and testing the simulation data. A leaf node is installed at every medical site on the network so performance can be monitored and analyzed between any two sites at any time. Normal operations call for every link of the network to be monitored and analyzed every five minutes.

"OHN has established criteria — a fixed set of specifications — for all aspects of network performance," Luke says. "By graphing the levels of performance for all parts of the network every five minutes, we can quickly see if anything is getting out of spec and then respond accordingly."

## PROACTIVE ANALYSIS

Through the frequent graphing of performance specs from all across the network, EasyStreet has developed valuable trend data enabling the NOC to spot potential performance weaknesses before they occur.

"A major advantage to generating our own (simulation) traffic rather than just being reactive to customer complaints is that we can actually trend performance

and detect a problem before it becomes noticeable to the client," Luke continues. "This is where the NOC is truly proactive — and not just reactive — to network performance."

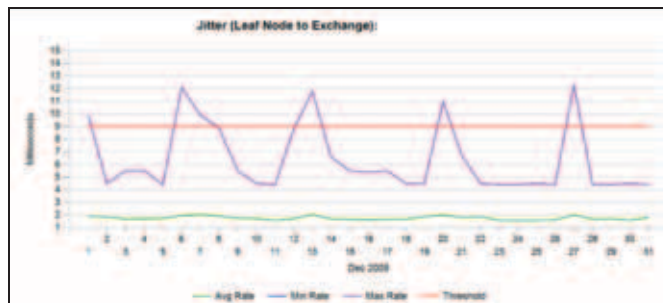
All performance data is shared with OHN's participating broadband providers and medical facilities. Custom specifications can be developed and tested between any two or more connections on the network to ensure proper future performance, and the system can generate historical data for enhanced analysis.

Another common feature between OHN and EasyStreet is the emphasis on continuous improvement. OHN included the drive for improvement as part of its RFP for the NOC, and EasyStreet has made continuous improvement a long-standing component of its corporate culture.

"We're always on the lookout for ways to make improvements," Luke says. "We look at the performance specs and ask, 'Are these appropriate?' We want to find adjustments for making the network and the monitoring even more effective, even though this is a cutting-edge type of network and there's not much historical experience to draw upon."

## AN ACTIVE PARTNER

As a neutral player in the OHN infrastructure—plus having considerable IT skill of its own—EasyStreet also functions as a support partner for many of OHN's medical participants and broadband vendors alike.



Critical leaf node performance criteria, such as jitter, packet loss, availability and Mean Opinion Score (MOS) are graphed every five minutes to ensure networks are performing within specifications.

"EasyStreet's interaction starts after the vendor is awarded the contract, and then the vendor and EasyStreet and the (medical) site all work together to deploy the leaf node on the site," OHN's Lamb explains. "They're working with both the site and the vendor because it's a new relationship and we get a lot of questions: Who do I talk to? What do I do? That's where EasyStreet can step in and help them."

"We have situations where the medical site doesn't have an IT department," she continues. "EasyStreet has been very helpful and flexible in those instances."

She says that even when working with the more IT-fluent broadband providers, EasyStreet has functioned successfully as mediator, thanks to the neutrality factor.

"Our vendors like it," she says of EasyStreet's role. "If the problem is not on their line, now they have an objective third-party in EasyStreet helping them say, 'No, it's really that other provider whose connection is the problem, and let's help them troubleshoot and work with them to resolve it.' It stops a lot of finger-pointing."

"EasyStreet has been a joy to work with," Lamb says.



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