

Bordering on genius

Paul Hutton talks to Greg and Margaret Yova, the brains behind an industry-changing traffic video distribution system

The quality of traffic information has increased immeasurably over the past decade or so. More sensors on the roads and in cars mean we can detect unusual traffic patterns far quicker, and lower communications and hardware costs mean that there are more traffic cameras around these days than ever before.

Both are important for proper traffic monitoring because while the sensors will tell you something's going on, the cameras will allow you to see what the cause is.

However, sharing the camera images remains a challenge. Although hardware and communications costs are falling, they're still there so getting the images beyond a traffic control room to the public or other organisations (for example emergency services or major venues) remains a challenge.

Despite the growth in the Internet,

online streaming remains extremely costly and inherently unstable, with a host of technological issues that severely reduce the uptime and usability of the images, eg hops, packet loss, latency, etc.

Streaming is a very difficult solution for supplying images to the general public. Not only would you need a room full of expensive encoders to cope with all your cameras simultaneously, but fluctuating demand would mean the amount of bandwidth required could be low one day and very high the next. Authorities could end up paying for a vast amount of bandwidth they never use, yet still run the risk of their system falling over on a bad weather day when everyone rushes to their site to see live streamed images.

Therefore, until now the main solution has been to provide jpegs of camera images online for the public to look at. These are regularly updated (usually every five or 10 minutes, although some

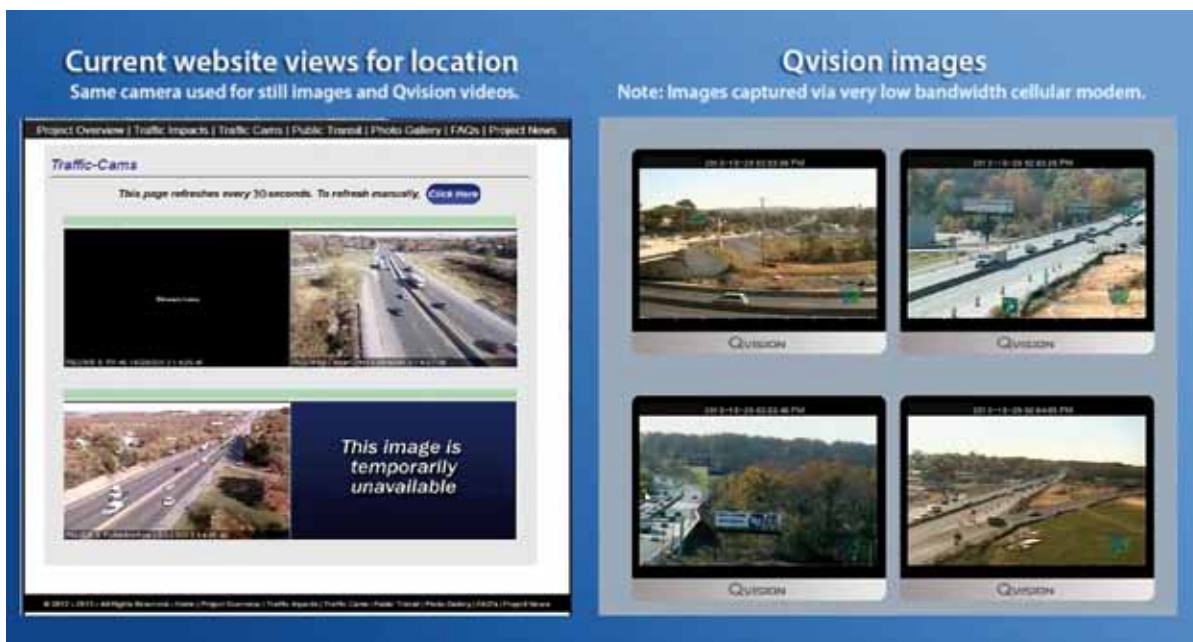
try to update every three) and give a snapshot of the situation.

However, they can only show you the volume at that second and don't show you the speed. There have been times when I've looked at a jpeg to see a clear road only to discover when I've driven towards it that the reason it was clear on that camera was because of the accident blocking the road just out of shot. Alternatively I do wonder how often I've avoided a road that looks busy on a jpeg, yet may well have still been moving at a reasonable speed as the sensors had suggested.

SPEED TOO

So if jpegs don't do the job, and streaming is too expensive and complicated, is there no half-way house? Well the good news is, thanks to a husband and wife team in California, there is now.

Qvision Technology is a reliable,



Live streaming suffers from buffering and packet loss, whereas Qvision's solution provides robust, always-there solutions

“Unlike jpegs they give an accurate, high quality, moving view of the traffic, thus giving a good idea of speed as well as volume”

advanced video distribution service that takes advantage of the capabilities of today's computing and advanced video distribution technologies. It provides near real-time looped moving images from traffic cameras that are updated at regular intervals. All the hassles of streaming are gone because the images are slightly delayed, but they are still real-time enough for effective monitoring of a road. And unlike jpegs they give an accurate, high quality, moving view of the traffic, thus giving a good idea of speed as well as volume.

The system was invented by Greg and Margaret Yova during their frequent trips between Mexico and San Diego. The border at Tijuana is the busiest land crossing in the world and it can take many hours to get through. Greg, an electrical engineer who'd quit his job in order to set up an orphanage in Tijuana, hated the long waits he had to put up with between the orphanage and his home and he knew there had to be a



The bordertraffic.com website. This image shows the volume of traffic but not the speed and gives no indication of whether the traffic on the bottom right hand corner is moving or at the back of a queue. Viewing the moving Qvision images answers these questions

way to see the queue length and work out the best line to wait in, or when to travel. He wanted to see the queue speed but knew streaming wouldn't work.

“What I needed was a way of seeing how fast the traffic was moving”, he explains. “I found there was nothing

available, so wondered if I could put up some cameras and stream the images live. I realised the cost and hassle of streaming wasn't worth it, but it dawned on me that something which is almost live would be just as good – what difference would a couple of minutes make when I had a 20 minute journey to get to the back of the line?”

So Greg went away and designed the solution and wife Margaret did the marketing. They began bordertraffic.com as a way of sharing the traffic situation at the border with the other near-million people who cross the border each week, and also as a project for the children at their orphanage to understand how to run a business.

For the first time, simply by logging onto their computer or mobile phone 24/7, border crossers could make informed crossing decisions based on real-time video queue information, thus saving time, money, and aggravation. And it worked! The border authorities

Live Loop Video

Map with Colors

Then...

Presenting the Future!

Still Image

Now...

The Qvision story, from lines on a map to jpegs to moving video images

“Remote, yet important roads, or temporary roadworks sites, can be visually monitored in near-real time far more easily and cost-effectively than before”

reported a reduction in waiting times, better distribution of traffic across the various lines and a smoothing of the volume of traffic across the day, as people used the site to plan their routes and time of travel.

Marketing Qvision more widely was almost an accident. Greg admits he wasn't really concentrating on the technology, more the solution, “then someone said to me one day that this could be used all over the world, and suddenly my working life changed. The orphanage was established and well run by a great team, I now had a new challenge”.

A PROBLEM VIDEOED IS A PROBLEM SHARED

Qvision doesn't only deliver for the general public, though. It offers several services to meet the needs of traffic and incident management. The system provides real-time video with pan-tilt-zoom control to Traffic and Emergency Management Centres via a secure streaming service or from an agency's private server system. Videos can be securely and easily shared with emergency responders and the media.

It gives agencies the ability to distribute video received from any location and can replace any existing legacy network. It is capable of managing and displaying

CCTV sites linked via fiber optic, DSL, Ethernet-over-Copper, and cellular communication links. The ability of the systems to communicate via cell modem or elaborate, long-range wireless systems opens up a market to areas that currently are not being served due to inability to connect to the Internet.

This means things like remote, yet important roads, or temporary roadworks sites, can be visually monitored in near-real time far more easily and cost-effectively than before, when organisations couldn't really justify the cost of kit and comms for the occasions they're needed. Compared to previous systems, this new technology is fast, light on network and computing resources, flexible, easy to implement, and can save agencies between 50 and 80 per cent over current costs.

STEPS IN THE RIGHT DIRECTION

Some traffic control rooms have a 13-step process to go through before an operator can see a desired image from a CCTV camera. It is an automatic process but requires four servers and six application processes. To do the same job Qvision does it in four steps with just two servers and a single application. Because it has fewer moving parts, it can cope with legacy systems far easier.

I ask Margaret how it works and she smiles and tells me “I'm not going to answer that, how it works is our secret sauce! But what I can tell you is how it'll work for you – if you're an agency wanting to get your traffic conditions out to the driver, or partner organisations, with much more detail than a jpeg at much lower costs than streaming, you need to talk to us.”

Furthermore, she says, users don't care that the image isn't to-the-second live, “Research has shown that when people look at traffic cameras, they only view them for a few seconds so most users wouldn't even know that the image they're watching is looped”.

Qvision is currently being used by a partner organisation to monitor a major construction zone in Massachusetts. They're also talking to a number of DOTs in North America, plus some high-profile agencies in Europe and is also attracting interest from organisations such as zoos, surfers' websites and construction companies who want moving pictures but know streaming doesn't work for them.

The back-end solution is a lot more complicated than this article has the space to cover appropriately but the user simplicity of the product is what makes it a very real option. It's the slow process of government procurement that is the reason why it's not public-facing just yet.

“We'll get there”, says Greg. “It'll take time but we could speed that up with a bit more investment, but when we show people the product they love it.” Qvision, like the images it provides, is clearly a company that's moving.



Qvision founder Greg Yova, left, with ITS America's Scott Belcher at the company's test camera in San Diego

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