

traffic

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Dr Brendan Hafferty reveals how advanced visualization is bringing digital ITS environments to life, making models a whole lot more realistic

Interviewed by Louise Smyth

When we in the ITS sector consider visualization solutions, we tend to think of the huge screens used in traffic control rooms. But there is an entirely different meaning of the term that has not been as widely known – until now.

Brendan Hafferty is western regional general manager of the UK office of Forum8 – a visualization software solutions company that’s experienced enormous success in Japan. Hafferty’s visualization is about bringing simulation to life via some very smart computer wizardry. “A picture speaks a thousand words,” he says, referring to the old adage. “But we’re not just talking about a single picture. It’s about building a 3D digital model of the real world – whether a streetscape or a whole city – and then playing ‘what-if’ scenarios with it. What would be the effect of building a bridge in a particular location, or a pedestrianized area in another?”

From virtual to reality

Forum8’s UC-win/Road software is a virtual reality package that can be used for an array of purposes. Having taken the Japanese market by storm, the archaic modeling

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methods being used in the UK are a constant source of amusement for Hafferty: “Architects here still use balsa wood models!” he scoffs. “And to plan events – traffic management at a big sporting event, for instance – desktop planning is still widely used; 2D maps on a desk using toy cars to simulate real traffic! But if you can get the real world into a digital format, there is just so much more that you can do and so many more questions you can answer.”

Popular in a variety of sectors from driving simulation to emergency response planning, Hafferty has also observed a growing interest from the ITS market for UC-win/Road, particularly in the bridges and tunnels sectors. This is far from its only deployment, however: “It’s an interactive simulation system and can be used to visualize anything to do with the real world, whether that’s mass transit,

pedestrians walking down the street, or vehicular traffic,” he points out.

Forum8 began life as a civil engineering consultancy, designing roads using software suites that were available at the time. Ten years ago a client requested a 3D image of an intersection, which led to the initial version of the software being created and the past decade has seen its evolution. As we speak, Hafferty is busy with the launch of Version 5, which, as he explains, has two new developments: “One side relates to developing the software itself,” he says. “We’ve really improved environmental conditions, for example, so as a wheel spins on a car on a wet road, you can see water splashing up the back; as rain falls, puddles form on the road and we can even visualize a mirage effect on the road surface.

“We’ve also been developing more third-party plug-ins, covering software products

such as InRoads, Vissim and S-Paramics. It means that users can conduct their data development within those products but use UC-win/Road for all of their visualization. It enables them to have the best of both worlds – excellent simulation coupled with superb visualization.”

Copy and paste visualization

Another intriguing advance on the plug-in side relates to the product’s ability to accept laser scanning data, a function known as ‘Point Cloud’. Imagine you want to visualize an existing bridge, you just point a laser scanner at the bridge, send that data to UC-win/Road and then you can visualize the bridge exactly as it is in the real world. There’s no need for drawings or CAD work or inaccurate measurements; it’s like having the capability to copy and paste from real life – and the resultant time-savings it could bring are immense.

A key point to emphasize is that this is not just about pretty pictures for designers or architects – the product has a plethora of applications of huge value to those involved with operating roads. “Tunnel operators, for instance, can now very quickly build a model of their tunnel and then mimic the real-world conditions,” Hafferty says, citing a highly popular use of the tool. “Their software links in to UC-win/Road for training purposes. They can take live feeds from all of the ITS equipment in the tunnel – incident detection, fire detection, etc – and then run real-time simulations, to instantly find out what would happen if they close a lane or respond in any other way to the data the ITS is providing.”

This is where the true strength of Forum8’s software lies. Ignoring the staggeringly detailed imagery for a second, it is these links to other products that enable users to achieve so much value from the initial investment. “We’re a software house – we’re not in the game of dealing directly with road operators,” Hafferty agrees. “Instead, we are looking for partners – whether consultants or other software vendors already in the market – who will use their own software to link to ours and develop it for wider use.”

An obvious benefit of enhanced visualization is the greater understanding that it brings to projects. The beauty of UC-win/Road is that you don’t need a degree in engineering or a black belt in CAD. Those planning new transport projects can simply incorporate all of the technical elements – engineering drawings, CAD work and so on – into what is effectively a mirror image of the real world. If you want to construct a new road through a town, for instance, you could call a town meeting and demonstrate to local residents,



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politicians and anyone else you need to get on side exactly what it will look like and how it will work. Perhaps this is why the software is gaining so much interest from consultants in the USA who are tasked with implementing roundabouts, aka traffic circles. The software allows those who will ultimately be using the roundabout to explore interactively how they look and how to drive on them.

The cost factor

Hafferty is also keen to note that this level of detail before a project even begins to be implemented helps save costly mistakes later on in the process. “I was recently talking to a guy in Las Vegas who was involved with building a new bridge,” he recalls. “Construction was well under way when one of the nearby hotels realized that it was going to be blocked off from the highway. They objected, work stopped and it’s going to cost several millions of dollars to put right. ‘If only we’d been able to visualize it!’ he told me. If they would have had our software – which they will do shortly when they become one of our partners – they could very easily have built the model of that streetscape and made the whole thing available on the internet so anyone could look at it interactively and pinpoint any likely problems.”

Asked to list the three most important selling points of UC-win/Road, Hafferty is quick to answer. “Ease of use, competitive price and comprehensive functionality,” he says. The starting price for a regular user with a license is US\$5,400 (“Compare that to any other software in this marketplace”, Hafferty suggests), which links to his point about functionality. At such a price, the software is available to not only consultants with deep pockets, but is affordable for academics, too. On this note, Hafferty refers to a current project being tackled by the University of Sunderland as part of the UK’s One North East scheme. “They’re embarking on a project using UC-win/Road along with one of our drive simulators to investigate electric vehicles,” he reveals.

Hafferty predicts a busy time ahead for Forum8 and its global partners in the coming years. The software developers are already working on Version 6 and he feels that by the time it’s ready, the wider market will have realized the true benefits brought about by such a product. “Coupled with improving the ability to put those models interactively on the internet, as the requirement for 3D visualization increases, word will spread quickly. Many people around the world can all be working on the same project. To be able to offer that ability is a step forward.” ○