

CAD User

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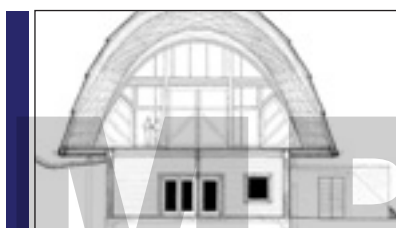
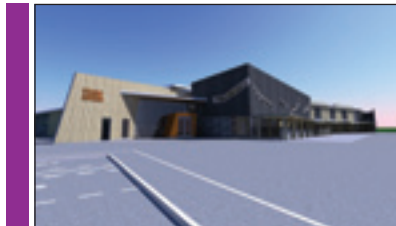
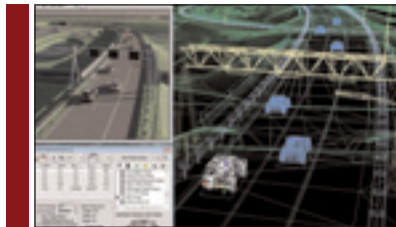
Your roadmap to wide format printing

**TURBOCAD
PROFESSIONAL
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Cover image courtesy of Parsons Brinckerhoff, Cardiff, created using 3am Solutions' Dynamite VSP



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Dynamite!

David Chadwick is blown away by Dynamite VSP, which brings real-time visualisation to road and rail projects, allowing civil design engineers to set the scene

Want to run a by-pass through a local beauty spot? Need a couple of roundabouts to sort out some pressing traffic flow problems? Whatever you want to do, someone, somewhere, will object to it.

Civil engineering projects invariably come nowadays with high political and environmental issues. It is not enough to come up with the most efficient and cost-effective designs - project developers have to persuade all of those who are affected by their proposals that the impact on their neighbourhood, lives and pockets will be appropriate to their needs.

You need all the ammunition in your armoury to present the most compelling case for any civil engineering project, and one of the most persuasive tools that you have is visual simulation - from eye-catching and highly realistic posters, to full scale animations that show the proposed development in fine detail. You can even add simulated traffic flows!

Until recently, the only sensible way in which such simulation AVIs could be produced would be to hand the civil design data over to visualisation specialists, so that they could use their skills with 3ds Max and Viz to come up with your presentation material.

They would do a great job, but they have to wait until you have completed the design element of the project before they can start, and any subsequent modifications to the design sends them back to their workstations, and, of course, you would pay through the nose for any such modifications.

A far better scenario is to provide the civil design engineer with the ability to build the visualisation themselves, using software that simplifies the interface between their civil design application of choice, and 3ds Max or Viz, whilst still taking advantage of their superior rendering and animation creation tools, and maintaining dynamic -links between the civil model and the visualisation, so that any design change immediately updates the visualisation as well.

DYNAMIC INTEGRATION

Dynamite VSP from 3am Solutions does just that. It doesn't exactly turn designers into visualisation specialists, although they will improve their skills vastly as they use the software, but it does take over and automate many of the more complex visualisation tasks. It makes Autodesk 3ds Max accessible, at last, to non-3D designers.

Dynamite VSP is essentially a suite of plug-ins and is compatible with both Autodesk 3ds Max and Viz. Users have to have one or the other, plus, of course, the originating software for the civil model; AutoCAD Civil 3D, Bentley MX, Inroads or Geopak, or I2D Model. The software reads 3D geometry from any of the above, and you don't necessarily need the originating software for this - just 3ds Max or Viz!

Dynamite VSP strips out extraneous data from each civil design application, and intelligently applies materials to the model for the visualisation - concrete for kerbs, etc., which are automatically applied during the data transfer process. Automatic material assignment helps

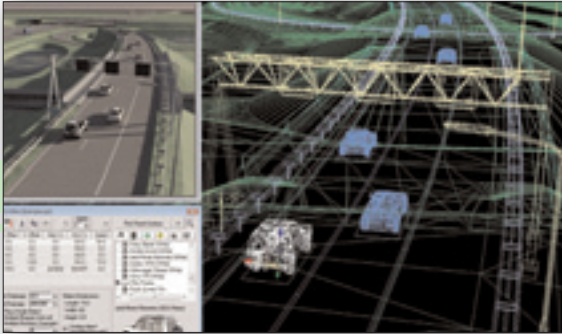
designers set up models rapidly without having to master 3ds Max's complex Materials Editor. Similarly, Dynamite VSP applies default environment settings, including standard sky, or optional fog, by selecting environment settings in the intuitive Dynamite VSP Explorer Panel.

The Explorer Panel? This is one of the key elements in the software's simplicity. A hierarchical tree in the panel gives direct access to every part of the visualisation, with, underneath it, full context sensitive editing capabilities of any part of the visualisation in the viewport. The intermediate file also enables bi-directional connectivity between the civil design model and the visualisation.

SETTING THE STYLES

With materials and environment mostly taken care of - and you can set your own if you wish - what remains is to set up and apply the objects that will convert the string based road and rail design, and the surrounding terrain, into a realistically rendered scene, and to populate it with the sort of objects you would find in such a scene. And, if it is a stretch of road you are setting up, introducing a number of cars and lorries that you will animate at a later stage to add realism.

Dynamite VSP facilitates this process, by enabling the designer to set Styles for a number of different processes. Swept Object Styles are used to define road and rail surfaces, bridges and tunnels. Object Placement Styles and Road Marking Styles do just that. Rail Object Styles allow rail specific objects to be added to the scene, and, to add further



realism, the software provides a library of building facades, to create extruded 3D structures out of 2D building plans.

Swept Object Styles use lofting techniques to sweep along the line of a road or tunnel, using the parent profile of a section of road, imported from the Civil model, maintaining data related to the swept section - material data for road surfaces and kerbs, which can be saved for re-use. This allows complex road surfaces to be created, including road markings, traffic barriers, embankments, ditches and variable offsets.

Object Placement Styles allow trees, street furniture, signs and drive through cameras to populate a scene, linked to a nominated parent shape, and managed through subsequent modification. Cars and trucks, for example, can be configured to represent any of a number of predefined models, and can be 'driven' along a section of road, retaining relationships with the swept section as it turns, rises and falls with the underlying terrain.

Objects are managed through the Placed Object Manager panel, allowing users to select individual or groups of objects, with fine control over animation placement parameters (to set up traffic flows, and incorporate acceleration, deceleration and lane changing of vehicles) and to set up opacity mapping for things like road chevrons. The perceived realism of a visualisation depends on detail as well as visual styles, such as accurate road markings. Familiar objects to all of us, they also provide an element of scale. Road markings are applied as ribbons along a

road surface - slightly raised above it (less shadows) to ensure that they are not obscured by the road surface itself. Modifying the opacity of the ribbon at regular intervals allows dashed lines to be created.

Rail Object Styles allow safety fences, walls and even rail tracks to be created along swept paths associated with parent shapes. This can be automated in conjunction with Feature Interpretation.

Feature Interpretation applies to all Object Styles, and associates imported civil design strings with object placement instructions during the data import process. It does this using simple string label masks, and facilitates the automation process by eliminating things like space contention issues.

RENDERING THE SCENE

With all object styles created, and textures and environment automatically defined, scenes can be rendered within minutes of loading the model data! Actually there is rather more to it than that. The end result, though, can be a realistic scene of a traffic roundabout with identifiable cars - individually created and rendered - that can negotiate the roundabout at their own speed, retaining full associativity with the road and other traffic.

To render each vehicle and calculate its exact position in relation to the road surface at each stage of the progress takes a fair bit of time, but, if you remember, this is now a real-time task for the civil design engineer, and much time is saved by developing the animated simulation in conjunction with the

building of the model.

DYNAMITE VSP 3.5

Version 3.5 of Dynamite VSP has just been released by 3am Solutions, replacing 3.1 which was launched earlier this year. The new release vastly improves integration with AutoCAD Civil 3D, with a free dedicated exporter for Civil 3D, developed in the Civil 3D API, and released as Dynamite EXPORT for AutoCAD Civil 3D 2008.

This exporter uses a proprietary binary file format (*.vsp3d) to transfer models to Dynamite VSP very intelligently and efficiently. Material assignment is handled automatically by converting corridor 'sub-assembly' names to Dynamite VSP material assignments. Every time the intermediate file from Dynamite EXPORT is updated from Civil 3D, Dynamite VSP will notice this and update the 3ds Max visualisation accordingly - along with all other objects of course!

DYNAMITE SIMM

3am Solutions has also released an optional add-on for Dynamite VSP which introduces integration with VISSIM. This new product, known as Dynamite SIM, enables the import of complex real-time traffic simulation data from VISSIM into Dynamite VSP, taking the realism of a civil based visualisation to the next level. Now, the ability to simulate real traffic conditions in conjunction with detailed 3D civil design data, all combined into a single visualisation model, is possible without the need to employ specialists in this field.

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