

## **VALUE OF VISUALIZATION WITHIN AN ENGINEERING CONSULTANCY FIRM**

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### **Abstract**

#### **In the Beginning**

In July 2003 PB's Cardiff office had been asked by three major clients to produce 3D Virtual Reality Model (VRM) specifically for Public Consultations. Unfortunately PB had to decline due to the lack of software/capability. One of these schemes was subsequently awarded to a major competitor. This opportunity was quickly realised and the executive board asked that a business plan be prepared. It was quite clear at the time that this gap in the market was an opportunity to provide a niche service for clients, as market research identified very few of PB's competitors providing a 3D Visualisation service.

Major clients were becoming aware of the importance of 3D Visualisation to promote highway schemes, which will predominantly be used at Public Inquiries and Consultations. Other uses could include :-

- Planning.
- Environmental Assessment.
- Assessment of Visibility Sight Lines in the Design.
- Review of Design Speeds.
- Signage and Signal positioning for ease of view and clarity.
- Visual Impact.
- Design Safety Audits.
- Design Evaluation of 'constructability'.

In March 2004 the Business plan was approved and the 3D Visualisation Programme was initiated. With the 3D Studio Max and Dynamite software in place, the Cardiff office was appointed by the HA to produce a 3D Visualisation for the A38 Dobwalls Bypass in June 2004.

The major challenges facing the project team were:-

- Team members Paul Brown and Tim Messer had no previous 3D capability.
- Two new software packages (3D Studio max and Dynamite).
- A 13 week programme deadline.
- 25k Budget. (\$50k)

The above challenges were met as follows. Firstly the team have an abundance of enthusiasm, dedication and the drive to establish the 3D Visualisation team and to see the project through. A concentrated 2 day in-house 3D Studio Max course was organised, which gave a basic understanding of the software. This was complemented by completing the tutorials for the 'Dynamite' software. On completion of this preliminary training the HA gave an instruction to commence the production of the VRM on 5<sup>th</sup> July 2004.

Other challenges were met along the way. Including the visualisation of the landscape, but with small amount of investigation, suitable software was purchased to enhance this capability, which had a significant affect on the amount of time saved on the project, allowing the cost of the project to the client to reduce by 10%. During a progress meeting in September the Client was shown preliminary runs of the VRM with excellent feedback; *'the best visualisation seen to date'*.

In addition the team have presented their VRM to numerous other major clients and PB managers with similar favorable reactions and comments. As a result PB's Cardiff office has secured work over the next 12 months without having to tender.

Special recognition has come from the following :-

Owen,

I was very impressed with 3D visualisation work on Dobwalls - money well spent I reckon and the 'video' was the best I've seen to date. Your guys have picked it up very quickly and produced an impressive package. Once public inquiry inspectors see these at inquiries they are sure to become the norm.

Martyn Leech

Wales Assembly Government

Paul

The 3D video provided to Glamorgan Engineering Consultancy for evaluation related to the A38 Dobwalls Bypass. The 1.5 minute drive through video provides a realistic drivers view of the proposed scheme.

The ability to accurately model various road features including: road texture (including different coloured surfacing), trees, traffic signs and road markings, safety fencing, street lighting and moving vehicles creates a highly professional and believable drive through.

The variety of true colouring applied to the fields from the aerial survey and the use of photo realistic sky combined with the contouring landscape provides an accurate lifelike appearance.

Overall the 3D video is probably the closest you could get to how the finished scheme will actually appear and will allow members of the public to gain an appreciation of the proposals which can be difficult to visualise from 2D drawings.

James Evans

Senior Engineer

Glamorgan Engineering Consultancy

- A38 Dobwalls Vizualisation was entered into the PB Ltd Project of the Year 2004 Competition. It was subsequently awarded a Notable Mention in the Studies Category.
- Letters of commendation from both the Highways Agency for A38 Dobwalls and A5-M1 Link Visualisations.

Future benefits to Parsons Brinckerhoff include :-

- The preferred provider of VRM services to all our clients.
- VRM will become an essential part of the design process for major clients such as the Highways Agency and The Welsh Assembly Government. PB will provide a 'one stop' design/management package to include VRM instead of going to sub consultants for this aspect.
- A niche market where PB is the leading provider in terms of capability and quality of the product.
- PB can presently provide VRM at competitive rates without compromising on the quality of the product.

## **No Time To 'Kuwait'**

This is a description of how the 3D software we are using in the UK enabled PB to have a competitive edge in preparing a tender bid for the 2<sup>nd</sup> and 3<sup>rd</sup> Ring Road, Kuwait City.

### **The Brief**

Extract from email.

Paul: I want to develop a high standard presentation for a proposal we are submitting to a client. Are you available to come to Kuwait and develop a highway interchange in MX and create a 3D image for presentation purposes. If possible create a fly-around.

Please respond ASAP.

Date 4<sup>th</sup> May 2005

### **The Reality**

- Work to be completed by 4<sup>th</sup> June 2005.
- 4 Major Interchanges to be designed.
- No Mx Ground Survey.
- No Mx Design.
- No Time.
- Nothing .....Start from scratch.
- Arrived in Kuwait 11<sup>th</sup> May 2005.

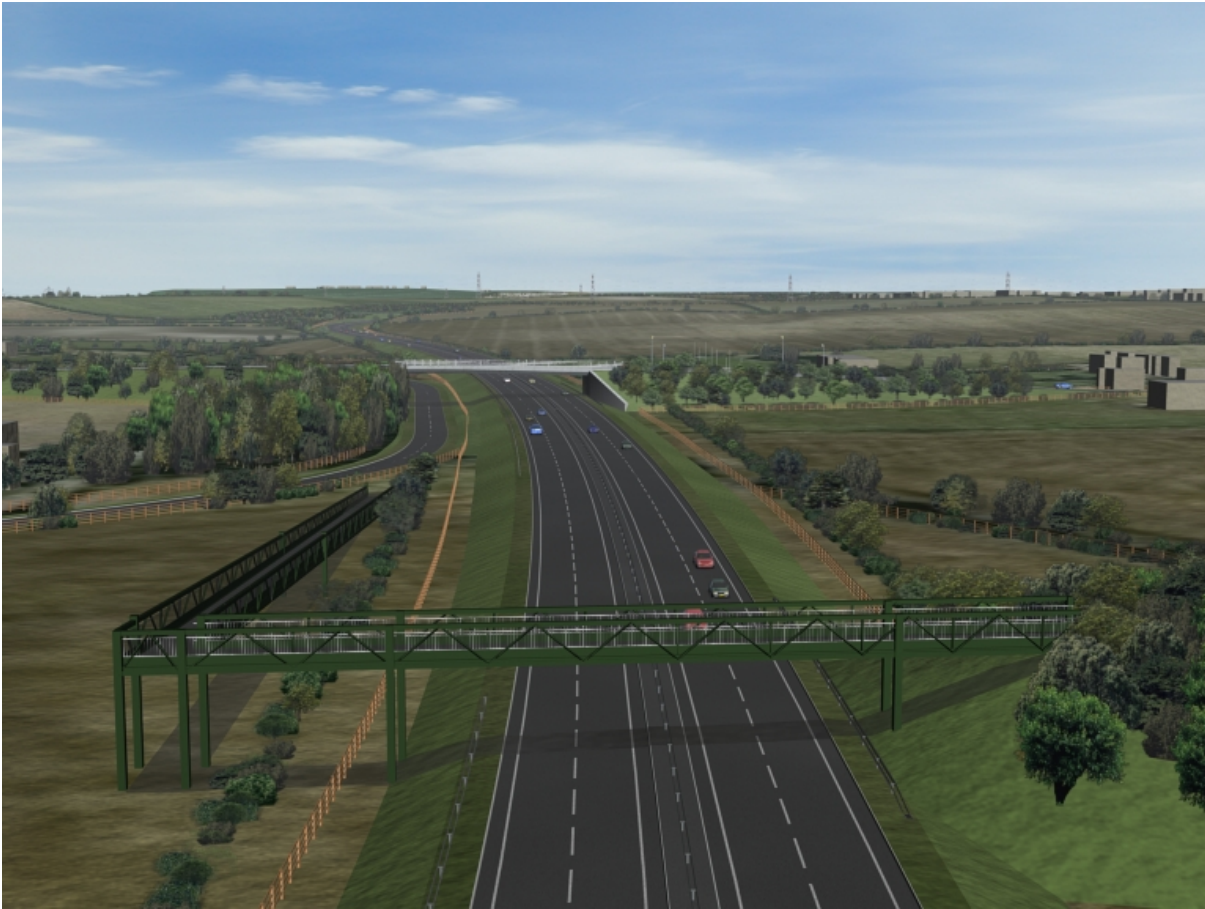
### **The Work**

- Created a ground model using spot heights from existing mapping.
- Proceeded to create designs in Mx for import into 3D Studio Max and Dynamite VSP.
- Dynamite VSP's Genio facility was used to import the ground models.
- Created buildings, trees street furniture and applied textures and surfaces using aerial photography, 3D Studio Max and Dynamite VSP.
- Dynamite VSP was particularly important in creating the road markings, street lighting and structures.
- Dynamite VSP's vehicle library and object placement styles were invaluable in creating the traffic effect.
- The scene created and both Drive through and Fly around rendered animations produced.

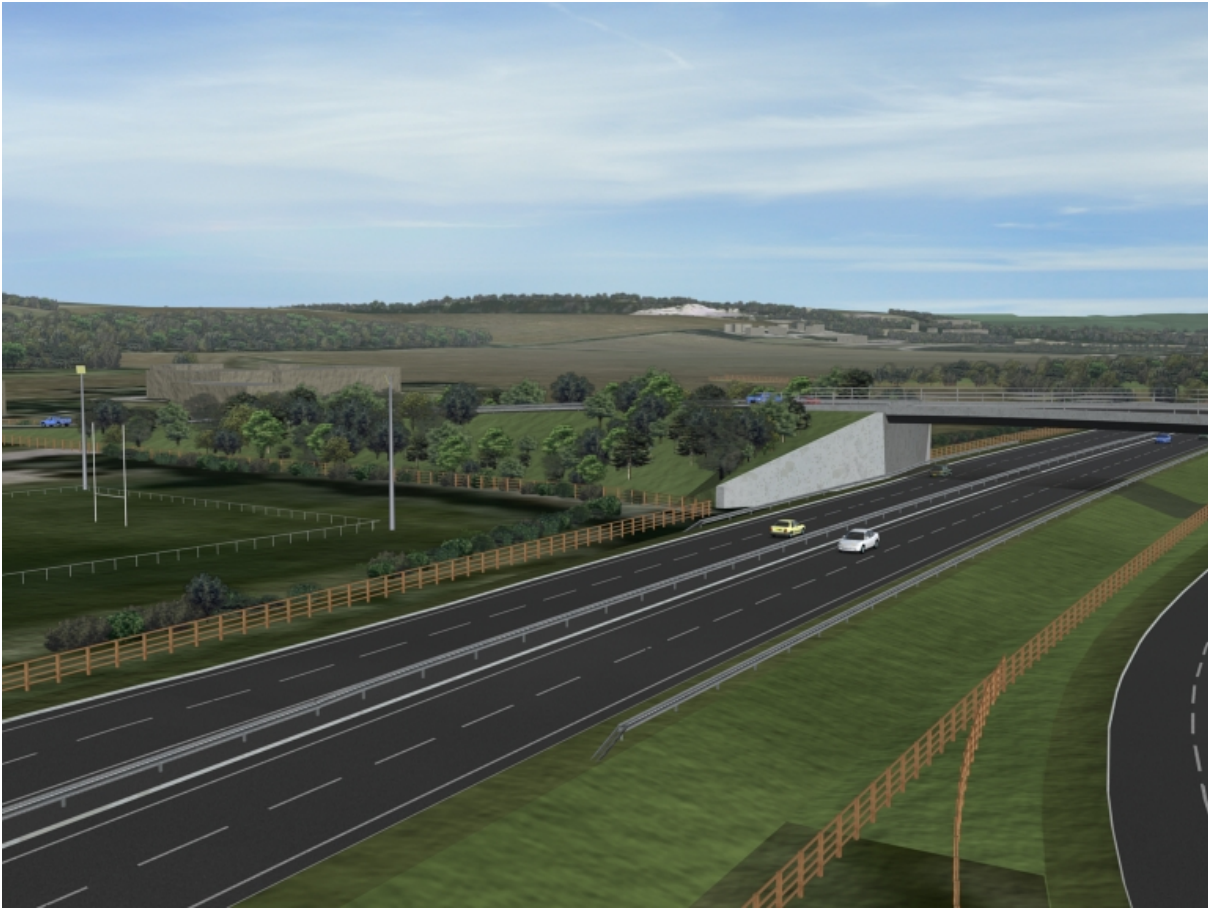
### **Conclusions**

- 4 Major Interchanges designed and Vizualised in 3 weeks to a high standard.
- Proposal Delivered to client on time.
- PB management pleased with the Quality of the final product and the timescale in which the work was produced.
- The efforts of the 3D Vizualisation team could not have been achieved without the Dynamite VSP software and it's ease of use.
- It has now given PB a competitive edge in 3D Vizualisation within the EAME market.
- During our time in Kuwait we were also asked to produce a visualisation for the First Ring Road Project at Jarha Gate.
- Construction start September 2006, Drive and Fly throughs were produced to be included on a public information website. The public are able to view the movies to gain an understanding of the proposed improvements.
- Also the movies were used on Kuwait National TV to promote the start of the scheme.
- To date we have completed 12 schemes.
- Currently working on 2 schemes.
- 2 schemes being pursued.

**EXAMPLES OF WORK**



**M1 – A5 Link, London UK**



**M1 – A5 Link, London UK**