

West Gate Freeway Project

Summary of 3D real-time interactive model status – IAC Panel Hearings

Background

CPBJH JV are required to produce an interactive 3D model that accurately reflects the tender design for the West Gate Tunnel Project to be available for use at the IAC Panel Hearings commencing on 14 August 2017.

Features and capabilities of the model

The model has undergone extensive technical reviews and represents an accurate reflection of the tender design, including key urban design features, as well as a limited context model that represents surrounding buildings, roads and other features. The model also supports a fully interactive user interface that provides a visual representation of the project design and allows the user to:

- View all aspects of the project design from a 360 degree perspective; pan, zoom and tilt the viewing angle as required
- Focus on specific pre-selected locations
- Undertake pre-programmed drive-through journeys along dedicated routes
- Adjust the time of day and weather conditions
- Search for addresses of properties along the project corridor
- Undertake simple measurements of dimensions of project features
- Capture screen shots from selected perspectives

Limitations

There are inherent limitations to the real-time model, many of which are consequences of the level of detail in the design that is currently available – while the model accurately reflects tender design, many elements remain to be resolved through further design development. These limitations include:

- Lack of detail about how certain elements of the design integrate; for example how urban design concepts might integrate with structures or other project assets
- Lack of detail about final treatments for some design elements; for example, final lighting design, final landscaping design including locations of specific trees or plants
- Limitations on the modelling of surrounding context; some buildings, roads and landmarks have been modelled to a high degree of accuracy, however this does not accurately capture every detail of the areas surrounding the project boundary
- Complexities in the size and scale of the interactive model, meaning some elements are represented in a more basic form; for example, traffic appears on the freeway but is not programmed to behave in an 'intelligent' manner (eg changing lanes)

It is anticipated that these issues will be progressively addressed throughout the duration of the project.

Technical process:

- Design information is submitted in appropriate technical file formats
- These data sets are imported into a 3D modelling application (3ds Max 2016, usually) and used to create a 3D design model of the alignment and its surrounds
- The design model is combined with an existing 3D model of survey elements from data inputs e.g (contours, aerial photography, feature survey, photos)
- The 3D model is exported to the real-time interactive platform using the Unity 5.6.2 game engine technology to turn an accurate and complex design into a visualisation tool
- Once inside the platforms editor, materials and textures are applied to the 3D meshes
- The platform has programmed features enabling users to navigate and view the design, calculating intense lighting and shadow processes in real-time
- Each time an iteration is required the process restarts: Design data -> 3D Modelling -> Exporting and editor setup -> Platform program buildings (a process which takes between 6 and 12 hours)
- The interactive features a patching system that will automatically update the program when the user launches the app.
 - Each interactive screen or surface has to update individually – and be initiated by the user at the device, or via a remote internet connection.