

# Westlink M7

CASE STUDY

**Abigroup, Leighton, SMEC,  
AECOM**

COMPLETION: 2005

12d DIMENSIONS:  
Roads and Highways



## Project Summary

12d Model was used for visualisation, design interrogation and the “pegging out” of Australia’s largest urban road project, the Westlink M7 (previously known as the Western Sydney Orbital).

## For more information

To find out more about how you can create better designs faster with the 12d Model solution for civil engineering design, visit [www.12d.com](http://www.12d.com).



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The Westlink M7 filled the longest remaining gap in the orbital road network of motorways around Sydney. The Westlink M7 is a 40km motorway with dual carriageways and lies between the M5/Hume Highway at Prestons and the M2 at West Baulkham Hills.

The construction of Westlink M7 offered significant social, environmental and economic benefits, including:

- safer and more efficient road transport for passenger vehicles and freight in western Sydney
- good access to employment opportunities for the people of western Sydney by linking existing/future industrial and residential areas
- improved access to other growing cities and regions, including the Central Coast, Newcastle, Canberra and the Illawarra
- faster travel times between key western Sydney suburbs.

The Abigroup Leighton Joint Venture (ALJV) undertook the design and construction of the Motorway, which opened at the end of 2005.

SMEC/AECOM were the designers for ALJV and set up a dedicated design team on site. 12d Model was used extensively for stormwater drainage design on the project. Philip Campbell (SMEC), leader of the drainage design team, said, *“12d Model was used for all aspects of the drainage design, including layout of pit and pipe networks, measuring catchment areas and calculating time of concentration, design of onsite detention and water quality basins, and transverse drainage.”*

12d Solutions worked closely with the design team at the start of the project to develop tools for the design/sizing of basins and for locating headwalls for transverse drainage. These routines greatly assisted in the design of the stormwater elements. Mr Campbell added, *“12d Model’s ability to produce quality output directly to the printer enabled me to plot a drawing just*

*minutes before a meeting, and table the latest design at the meeting."*

*"Abigroup has used 12d Model for nearly seven years," said Brett Lehmann, Survey Manager, ALJV. "Because its developers are a local company, 12d Solutions, we have been able to work closely with them and have input into the software's development."*

12d Model was also used on this project to download and analyse the design, and then convert that information to TP Stakeout files for use with the Leica Total Station and to guide the surveyors in pegging out the motorway.

*"We are also using 12d Model to help us visualise the designs and so interrogate them to ensure they are viable as well as present the designs to third parties such as other contractors, the Government, community groups, etc.," said Mr Lehmann at the time. "We are able to create a virtual drive through of the motorway on the computer and test it with the engineer in a 'live' environment, so to speak."*

To create the virtual images of the planned road, ALJV took the design information and then used 12d Model software to combine it with huge raster files, drape it over tins and then output the information as a 3D image or drive-through.

*"12Model is fast, intuitive, easy to use and good value for money," said Mr Lehmann. "And the 12d Solutions people provide a prompt and reliable service – a fundamental requirement when you need support on a project of this size."*

12d Model has been used on many of the other major road projects around Sydney, including the M2 and Eastern Distributor.

*"As 12d Model has matured we have added many features which meet the needs of engineers and surveyors such as raster modules, visualisation capabilities and drainage modules," said Dr Lee Gregory, Managing Director of 12d Solutions Pty Ltd. "These features, plus our ability to handle images of all sizes and our integration with TP SetOut and then TP StakeOut, has seen 12d Model become the software of choice for large road projects."*





### Roads and Highways

12d Model's design option is the smarter solution for the design, modification and maintenance of Road and Highway projects.

Enjoy advanced 3D tools to design local and major roads, intersections, roundabouts, highways, interchanges and much more.



### Ports and Dredging

12d Model is the solution for port infrastructure and dredging, easily managing the very large datasets and complex volume calculations often required by these projects.

A complete range of flexible and customisable volume calculation tools allow teams to extract and present the information quickly and easily.



### Land Development

12d Model is the most versatile solution for the creation of sustainable land development projects, including residential, commercial and industrial developments, recreational areas, landfills, and agriculture projects.

Easily manage all aspects of your land development project from earthwork quantities, road design utilities and drainage design.



### Airport Infrastructure

12d Model provides a solution for the design, construction and analysis of new airports, as well as the upgrade and maintenance of existing runways and airport infrastructure.

Easily manage large airport infrastructure projects and share data across multi-disciplinary teams.



### Rail

12d Track has been specifically designed for the survey, design and construction of light, heavy and high speed rail projects.

Extensive railway tools in 12d Track allow the rail designer to quickly and easily design their projects. These options are built on the existing 3D modelling and design tools available in 12d Model.



### Mining Infrastructure

12d Model's powerful set of exploration, site investigation, survey and analysis tools are crucial for the initial design, construction and ongoing operation of mining projects.

Comprehensive tools for the survey, design and construction of access roads, railways, earthworks and services allow for the coordinated design and management of mining infrastructure from within 12d Model.



### Drainage, Sewer and Utilities

12d Model provides comprehensive tools for the design, analysis and optimisation of stormwater and sewer projects using rational, dynamic (hydrograph) and 2d drainage methods.

Powerful clash detection management allows for efficient 3D modelling of service networks such as gas, electricity, telecommunications and water prior to construction.



### Surveying

12d Model is a complete surveying package providing the tools to manage all facets of surveyed data including LIDAR, topographical, as-built, conformance, traversing, geodetics, data mapping, labelling and much more.

The 12d Field option runs on a ruggedized tablet and gives the user access to full 12d Model functionality, allowing you to take the entire project into the field with the most comprehensive pick-up and set-out tools.



### Oil and Gas

12d Model assists with the design, construction and mapping of oil and gas pipelines, original site exploration and the wide range of infrastructure required for oil and gas projects.

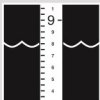
Accurate 3D modelling and the ability to share data between users allow teams to quickly and easily coordinate designs.



### Construction

12d Model is the ultimate software for construction with powerful set-out options, direct interfaces to machine control and detailed conformance reporting and auditing.

Manage 3D data and control volumes, quantities and progress claims with 12d Model. Set-out your project and undertake conformance and as-built surveys live on-site using 12d Field.



### Rivers, Dams and Hydrology

12d Model handles very large datasets and interfaces with a wide range of analysis packages, making it perfect for flood studies and the management of rivers and dams.

12d has partnered with industry leading analysis software, allowing users to apply 2D drainage analysis from within 12d Model.



### Environmental

12d Model's ability to handle very large datasets combined with flexible and comprehensive 3D analysis and modeling tools make it perfect for a wide variety of environmental projects.

Existing workflows can adopt 12d Model easily as it allows users to directly interface with GIS systems and most software packages and file formats.

## Why Choose 12d?

- Powerful data processing & intelligent functionality.
- Modular, easy to update & completely customisable.
- Seamless integration with major industry software and hardware.
- Used in over 55 countries worldwide.
- Friendly support & training from industry experts.

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