

# Roe Highway Stage 4 & 5

## Welshpool Road to Nicholson Road

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The 8.5 kilometre extension of Roe Highway from Welshpool Road to Nicholson Road delivered a section of four-lane freeway style highway in Perth's south eastern metropolitan area to enhance transport efficiencies and infrastructure.

Roe Highway takes its name from former surveyor general of Western Australia, John Septimus Roe and is an important traffic link between Perth's southern, northern and eastern suburbs.

**GHD Pty Ltd** undertook all engineering design and documentation for the project.

**Main Roads Western Australia** awarded **Leighton Contractors** with a \$62 million contract to design and construct the section of highway from Welshpool Road to Nicholson Road in May 2001. This contract provided for completion of the highway to the Kenwick Link by 20 December 2002 and to Nicholson Road by late 2003.

This project included designing and constructing three grade-separated interchanges at highway access points and carrying other roads over Roe Highway.

Other project works included extending the regionally important Orrong Road as a four-lane dual carriageway to connect Roe Highway with the Welshpool and Kewdale industrial areas. As part of these works, William Street, which had been taking traffic from Roe Highway for more than seven years, was disconnected from Roe Highway and connected to Welshpool Road.

Other principal components of the project included constructing a shared use footbridge over Roe Highway and twin bridges across the Canning River.

The project encompasses an area of high conservation value including a nationally recognised wetland and a river, which were protected through strict environmental restrictions.



The design and construction of Roe Highway Stages 4/5 is a fine example of how excellence in engineering design and construction can provide measurable benefits to project stakeholders, the community and road users, while protecting and enhancing its surrounding environment.

A project of this size has many aspects of engineering excellence, however, the principle elements of this project include:

- Managing, designing and constructing a project of this scope and expenditure rate within a short timeframe, and completing it some nine months ahead of schedule;
- Delivering the project under the State Government's originally proposed budget through innovative management;
- Completing and opening the highway in two stages to minimise negative traffic impacts and provide better access and amenity to the community and road users sooner;
- Developing and implementing a pre-cast concrete design and construction method for the project's noisewalls, in lieu of the specified block work that minimised disturbance to residents, maximised security and enable the walls to be installed mostly before construction work started;
- The ability to maximise accelerated design to keep in front of the rapidly progressing construction program;
- Developing, negotiating and implementing an innovative earthworks methodology to construct a wetland system for the City of Gosnells in exchange for the use of fill;
- Introducing environmental management practices to accommodate stringent environmental controls; and
- The development and implementation of a comprehensive community relations program before, during and after design and construction that enabled the community to raise concerns and the project team to address them to resolve issues as they arose.

The Roe Highway Stages 4 & 5 project provided better than normal project results due to the unique partnering approach that developed between Main Roads, Leighton Contractors and GHD, as well as other project stakeholders. This approach included all stakeholders embracing a shared commitment to achieve excellent results measured against the project's objectives.

The project was also delivered within Main Roads budget and before schedule. The project team's 'no compromises approach' toward environmental, community and safety objectives is a testimonial in itself to the excellence of the project.

## Key Facts

- Total length of the project is 8.5 kilometres new freeway, plus 5 kilometres of associated regional road upgrades
- There were approx 63 lane-kilometres of road, plus another 10 kilometres of cycle paths.
- There were four new road-over-road bridges, two road-over-river bridges, two pedestrian underpasses and two pedestrian bridges
- The main span beams for the river bridges were 42m long x 4m wide, and weighed over 150 tonnes. They are among the largest precast beams ever made in Australia.
- Earthworks totalled about 1 million cubic metres
- We re-wrote (literally) the rules for ecologically sound treatment of road runoff and subsoil drainage water
- We constructed a complete new habitat area with extensive lakes and streams, and in the process gained a quarter million cu metres of fill for the project.
- Construction value was around \$62 million, and GHD's design fee was around \$3 million.
- The project was completely designed by my team at GHD - mainly in the Perth office, but with assistance from Melbourne for some of the bridge components
- The project was completed on budget and nearly a year ahead of schedule

## Technical complexity

The amount of civil and structural work to be undertaken over eight kilometres of road reserve, within a corridor less than 100 metres wide and wedged between mostly residential development created the primary complexity of the project. Combined with the environmental requirements and traffic management issues on local roads the project's integration between design, construction and operation was complex.

The project has won three major awards:

- The Master Builders' Association *Excellence in Construction* award for infrastructure projects over \$50 million in Western Australia.
- The Institution of Engineers' *Engineering Excellence* award for infrastructure projects.
- The Master Builders' Association *Excellence in Construction* award for infrastructure projects over \$50 million throughout Australia.