

# OPermit for the NZ Transport Agency

## NZ Transport Agency reduces costs and streamlines services with OPermit.

### The background

NZ Transport Agency (NZTA) is responsible for providing a safe and efficient state highway system throughout New Zealand. With nearly 11,000 kilometres of state highways in its care, NZTA is constantly building, upgrading and maintaining a complex roading infrastructure, ensuring that all road users are kept well informed about the status of the roading network. As part of this responsibility, NZTA needs to manage the risks associated with commercial vehicles crossing roading structures (such as bridges and culverts) with overweight loads.

Every journey involving transporting an overweight load on the state highway system requires a permit. NZTA's legacy process was comprised of an historic database linking with a relatively simple analysis tool, leading to a less than adequate business outcome for both NZTA and the transportation industry as a whole. Also, new construction styles have been introduced over time, meaning some pieces of construction were not adequately represented in either system. A more sophisticated, efficient and accurate system for issuing overweight permits was needed.

### What is OPermit?

OPermit collects vehicle and route information entered by NZTA's Permit Issuing Officers (PIOs). This information is subjected to a number of high level checks (such as checking that the vehicle does not exceed general weight limitations). After passing the high-level checks, the vehicle configuration is submitted to the engineering analysis engine which evaluates the vehicle load across every bridge on the selected route.

OPermit models both the vehicle and the selected route, including structures such as bridges and off-ramps for example, so decisions can be made as to whether the journey is safe and a permit can be issued. Ultimately, this makes it easier for NZTA to generate permits electronically, with fewer exceptions requiring manual input. The extent of the modeling in this type of application is unique in New Zealand and probably unique world-wide.

The final output of the application is a permit document which specifies which bridges on the route must not be crossed, or may only be crossed under certain conditions (such as speed or supervision restrictions).

Integrated system provides one-stop shop for accurate analysis and issuance of overweight permits.

**"The new system is simpler to operate, extensible, and more ably supports NZTA's business strategy and future plans."** Para Ganesan, Deputy CIO, NZTA

## Benefits

For NZTA	For Permit Issuing Officers	For the Clients
<ul style="list-style-type: none"> <li>+ Improved safety and protection of assets</li> <li>+ Improved compliance</li> <li>+ Reduced operational costs</li> <li>+ State-of-the art system - future-proofed for extensibility</li> </ul>	<ul style="list-style-type: none"> <li>+ Easier, more reliable service</li> <li>+ Improved accuracy of bridge and pavement analysis</li> <li>+ Reduced time to issue permits</li> </ul>	<ul style="list-style-type: none"> <li>+ Reduced operational costs</li> <li>+ Reduced time to issue permits</li> </ul>

## The solution

OPermit needed to integrate a web-based user interface with a complex and specialised engineering model. The system had to model the effect of the vehicle traveling over bridges, off ramps, etc to determine whether it is safe, and whether any restrictions are required (such as only travel on the centre lane). This made the solution complex and required specialist engineering skills on Fronde's part.

Fronde elected to divide the project into two workstreams: the user interface stream, and the engineering analysis stream.

- + In the user interface stream, Fronde's business analyst and developers worked with the NZTA business analyst and user representative to clarify and elaborate the requirements of the system. Fronde chose to develop the web interface utilising the Spring framework to improve flexibility and extensibility. The result was a wizard-based Java web application for entering all the information required to enable the provisioning of permits.
- + In the engineering analysis stream, Fronde's developers and testers engaged directly with NZTA's bridge engineers. During initial stages of the project, both parties identified complex technical challenges associated with the delivery of the application. Collaboration at a senior level between NZTA and Fronde allowed the project to continue as planned, isolating some of the challenges without affecting the success of the project overall. With Fronde's extensive expertise in both engineering and IT our consultants were able to create the engineering algorithm design document to solve these complex problems.

The overall result stemming from the two work streams was a system combining both human and computer intelligence; a complex and specialised engineering model applied through a relatively simple user interface.

## Features of the OPermit solution include:

- + Web-based system provides users with secure, timely access.
- + Accurate real-time bridge/pavement analysis using reliable data.
- + Includes capabilities for structural analysis and asset protection.
- + Reduces costs and time of permit administration.
- + Provision of appropriate level of service to the industry through provision of ability to:
  - Apply different permit fees
  - Apply different route conditions
  - Supervision of movements
- + Meets requirements for extending to other services in the future such as multiple permits, online fees processing.

## Success

In July 2009, NZTA's OPermit system went live. NZTA was able to replace two disparate IT systems with a solid technical solution that will future proof NZTA's systems and provide a platform that can accommodate new bridge design algorithms and building techniques.

OPermit makes the whole analysis and permitting process easier, more accurate, and more reliable. In addition, the new system has led to a reduction in operational costs.

In the future there is the potential for OPermit to be enhanced with further development such as self provision of permits and mobility solutions.

The OPermit project demonstrates Fronde's ability to work with clients to analyse, design and deliver systems with high computational complexity. NZTA was impressed with Fronde's commitment, openness and expertise in delivery. "The project was a collaborative effort with very good working relationships", says Grant Robinson, Fronde's NZ Operations Manager. "It was this partnership approach that contributed to the overall success of what has been technically, a complex project."

## Fronde

Fronde is a Kiwi IT services company that is best known for delivering great software solutions to major blue-chip organisations in the government, utilities and finance sectors.

Fronde teams are committed. The dedication, experience and sector knowledge of our people sets us apart. Our longest serving team has been with their client for over 10 years.

We are trusted to build complex, high quality software systems that get the job done for some of New Zealand's most mission critical services. We built and continue to support - the largest non-bank lending system in the country. One of the security systems we have built processes over 1 billion requests per day (or 10,000 per second). We integrated the New Zealand wholesale electricity market system. And New Zealand's most successful mobile commerce service was created by us.