



## Report on their June 2017 visit to China

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To: PEECE Directors

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# 1. Purpose and structure of the report

This report provides an overview of the trip that Peter Rufford and Geoff Webb made to China between 2-16 June 2017. The two PEECE directors attended the World Transport Conference in Beijing and met with the Jilin Transport Research Institute in Changchun, Zoyan in Wuhan and SinoRoad in Nanjing.

The report is divided into eight sections and an overview is provided as follows:

- Section 1 outlines the structure of the report.
- Section 2 provides an overview of PEECE and its interests in China.
- Section 3 provides an overview of the HeDa Expressway construction in north-east Jilin Province. PEECE has an interest in the expressway due to its design and research features.
- Section 4 features the World Transport Conference and the associated stalls.
- Section 5 illustrates the visit to Changchun in Jilin Province. The directors had a meeting with officers of the Jilin Transport Research Institute to discuss their progress with their research program on the instrumented pavements on the HeDa Expressway.
- Section 6 shows the meeting with Zoyan in Wuhan, Hubei Province. Zoyan is a company that makes truck mounted laser instruments that measures surface deformation under load as well as road and tunnel condition whilst travelling at traffic speed. Zoyan also provides asset management consulting services.
- Section 7 deals with the meeting with SinoRoad in Nanjing. SinoRoad is a company that undertakes pavement technology research including for the Jilin Provincial Communications Department.
- Section 8 summarises where the company would like to take its Chinese connections to promote goodwill between the two countries by sharing road pavement technology through collaborative research

Both Zoyan and SinoRoad companies are central to PEECE's interests in China. Whilst in Nanjing, the two directors were invited to attend the first morning session of a conference on expressway maintenance.

## 2. Introduction to PEECE

PEECE is a small multi-disciplinary Australian consulting company, who offer pavement technology solutions and undertake road feasibility studies for clients seeking funding for road infrastructure projects. Their web site is found at [www.peece.com.au](http://www.peece.com.au).

The Directors of the Company and their expertise include:

- Steve O'Rourke – civil engineering construction
- Geoff Webb – pavement technology and design
- Peter Rufford – highway planning engineering
- Jeff Roorda – asset management and IT solutions

PEECE has been active in China for 13 years through their links with the Jilin Provincial Communications (JPCD) in north-east China. Its directors have made regular visits to Jilin to discuss and exchange information on technology and construction issues.

PEECE has hosted four Chinese delegations to Australia as part of a Memorandum of Understanding with JPCD, initially signed in Changchun in September 2007 and subsequently endorsed as a Co-operation Agreement in April 2010, when the first delegation came to Australia.

They have delivered technical papers at conferences in Changchun and have witnessed at first hand the construction of the HeDa Expressway which contains innovative design and construction features.

## 3. HeDa Expressway

The PEECE Directors were initially briefed on the design features of the HeDa Expressway during their visit to Changchun in 2011. They subsequently inspected progress with its construction in each of the three construction seasons (2014-16). They witnessed the project from the design phase to the completion of construction and observed many innovative and high-quality technologies.

The HeDa Expressway included five 500m trial pavement sections, namely:

- Type 1 – Traditional semi-rigid pavement with additional 2cm strain-stress absorber
- Type 2 – Perpetual pavement with an additional asphalt layer on top of traditional semi-rigid pavement
- Type 3 – Flexible pavement configured in accordance with advanced technologies of other countries

- Type 4 – Flexible pavement configured with additional unbound granular layers
- Type 5 – Traditional semi-rigid pavement

The development of the high-performance asphalt binder made with crumb rubber and SBS polymer used in the asphalt mixes was also of great interest. The built-in instrumentation of the trial pavements included:

- Temperature and moisture of pavement layers
- Stress, strain and soil pressure measurements throughout the pavement

These measurements will be very valuable in understanding the performance of the pavement.

The innovative use of resource conservation and recycled materials were very impressive and included the use of volcanic ash, aggregate processing from tunnel excavations and crumb rubber in the asphalt.

Other special areas of interest included:

- The extensive production and use of the ecological block used for many applications throughout the project
- The Oil to Gas conversion asphalt plant
- The use of Flolic Foam tunnel freeze-thaw resistance technology
- Vehicle activation of lighting in tunnels

Also of great interest were the special techniques used for crossing wetland subgrades including the use of CFG (cement, fly ash and gravel), to minimise the impact of the road on aquatic wildlife.

Two display boards along the road side at the opening of the expressway are shown as follows:



## 4. World Transport Conference

The two directors attended the Word Transport Conference in Beijing between 4-6 June 2017 and visited each of the stalls at the conference.

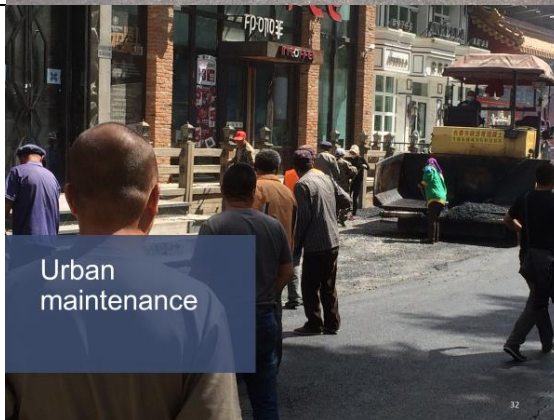
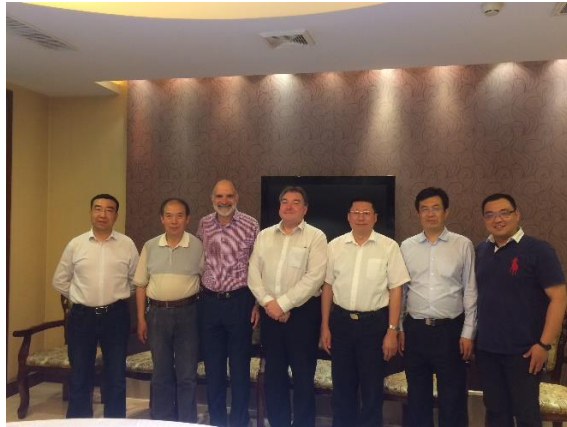


## 5. Visit to Changchun

They then flew to Changchun in Jilin Province and met with colleagues at the Jilin Transport Research Institute (JTRI). They discussed progress with the data capture and analysis of the data from the HeDa Expressway instrumentation. The JTRI colleagues indicated that it was early days in the research but they were purchasing additional data processing equipment to assist in the analysis.

They then took the PEECE directors on an inspection of Changchun and surrounding area to show recent developments including weigh-in-motion equipment and rest area facilities.

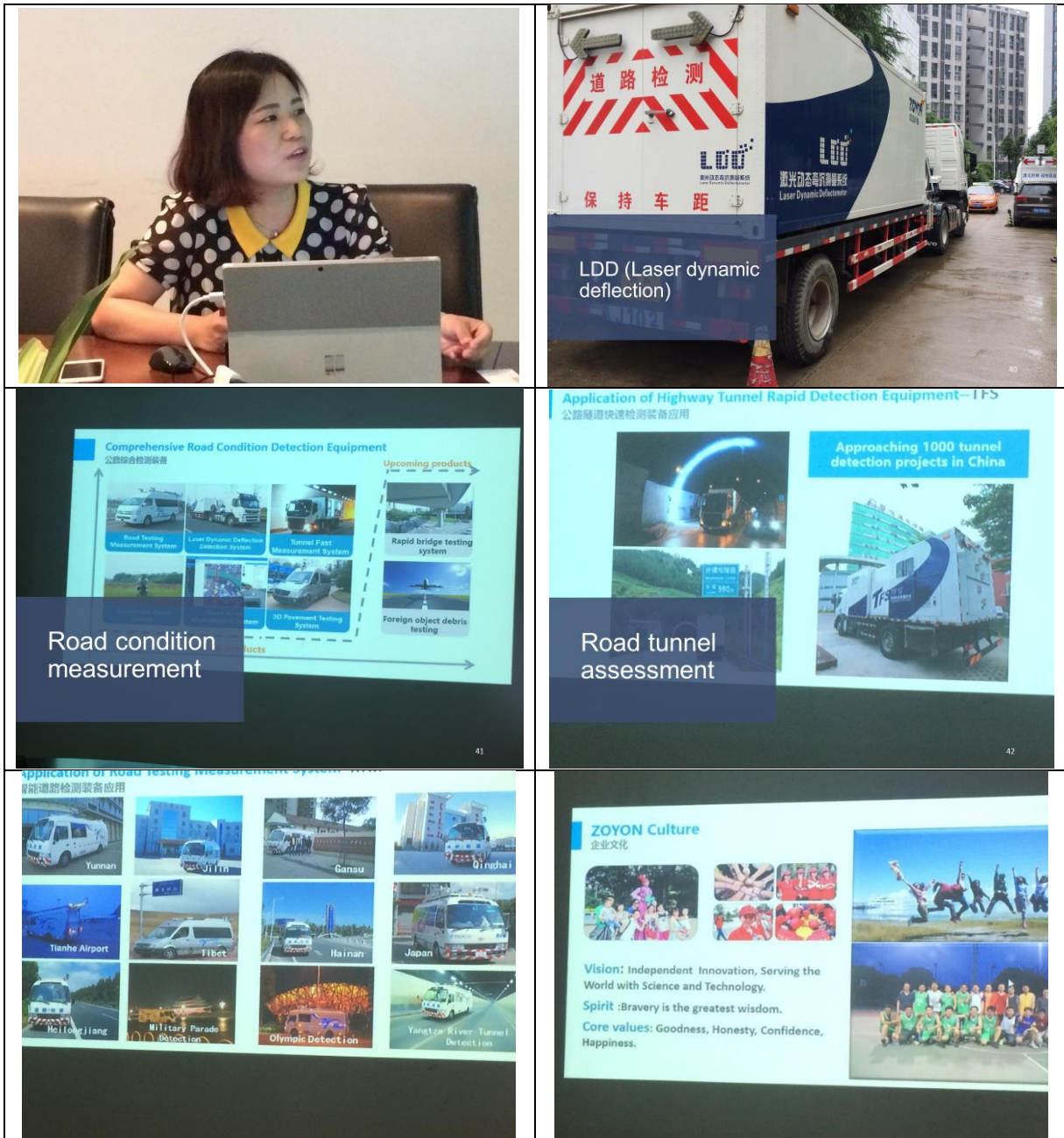






## 6. Visit to Zoyan in Wuhan

The PEECE directors then flew to Wuhan in Hubei Province and met with Zoyan officials. Zoyan makes truck mounted laser instruments and provide asset management consulting services. The directors inspected the LDD (Laser Dynamic Deflection) truck which was parked outside their offices. This equipment measures surface deformation under load whilst travelling at traffic speed.





## 7. Visit to SinoRoad in Nanjing

The PEECE directors then caught the high-speed train to Nanjing in Jiangsu Province to meet with the Jiangsu SinoRoad Engineering Institute (SinoRoad). The directors had met with Dr Zhang, the CEO of SinoRoad both in Changchun and in Nanjing on previous occasions and were keen to discuss the opportunity for a joint proposal for research on the HeDa Expressway using Zoyan's LDD equipment. These discussions went well and the directors agreed to send Dr Zhang their initial thoughts on the nature of the research.

This was subsequently sent and Dr Zhang is now incorporating his ideas into the proposal. Once the proposal has been agreed by both parties, it will be submitted to JPCD for funding. If not successful in Jilin Province, there may be scope for the Jiangsu Transport Agency to fund the work. Once a funding source has been found, PEECE will send one of its directors to Nanjing to develop the research plan defining the roles of individuals from each company and the revenue stream.

Whilst in Nanjing they were invited to attend the first morning session of a conference on expressway maintenance in Jiangsu Province. On the sidelines of the conference, they were interviewed on a range of transport issues in Australia and a transcript of the interview is available on PEECE's web site.





## 8. PEECE's future interests

PEECE has several objectives in its Chinese strategy, including:

- Strengthening ties with Jilin Transport Research Institute and the Jiangsu Expressway Management Company. This will focus on hosting delegation visits to Australia and facilitating the exchange of technology between organisations in both countries.
- Collaborative research with SinoRoad. Initially this will focus on preparing a joint proposal to forecast future maintenance requirements on the HeDa Expressway using the LDD equipment and analysing the data captured at the five field trials. It is hoped that if the research proves to be reliable, it can be applied to expressway management in Jiangsu Province.