

EDITORIAL

Heavy Vehicle Technology and Weigh-In-Motion

Bernard Jacob

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Heavy Vehicle Technology and Weigh-In-Motion

Experiences with longer and heavier vehicles in the Netherlands

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After a test period of two years involving more than 150 Longer and Heavier Vehicles (25.25m/60t) on the Dutch road network, the Minister of Transport, Public Works and Water Management decided to extend the trial by a further three to five years. The new phase, called the Experience Phase, was launched on 1st November 2007. From that date on, every transport company is allowed to apply for a permit to drive with a Longer Vehicle. This article will discuss not only the debate on the effect of LHV on bridges, but also the various experiences with the introduction of this new type of vehicle in the Netherlands. The current regime of admittance that became effective on 1st November 2007 was shaped by the practical experience that the Netherlands has built up on LHVs since 2001.

Loes Aarts, Gerben Feddes

Vehicle infrastructure integration (VII) for heavy trucks: a new perspective of truck research

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This article outlines the U.S. Vehicle Infrastructure Integration (VII) program and considers current and future heavy truck research in the light of a future VII-enabled transportation system. It is concluded that VII offers important opportunities for relieving current pressure points being experienced by trucks operating in the highway system. Irrespective of the vicissitudes of the deployment of VII and other forms of co-operative systems, supportive research is needed. Such research should consider the systematic effects of vehicle-infrastructure interaction impacts on the ability of increasing numbers of trucks to continue to flow through the highway network.

Peter Sweatman

An initiative to introduce a performance-based standards (PBS) approach for heavy vehicle design and operations in South Africa

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The introduction of PBS for heavy vehicles in South Africa was first identified in the National Overload Control Strategy as a potential concession of a proposed self-regulation initiative. In August 2004 a PBS committee was established to investigate PBS and the following initial tasks were identified:

- develop a PBS strategy;
- review the status of PBS in other countries, and,
- initiate pilot projects to demonstrate the potential benefits of PBS.

Two concept designs (a truck/trailer and a B-double) were initially developed and considered. The truck/trailer concept vehicle was selected, and after a number of iterations a satisfactory vehicle design was achieved.

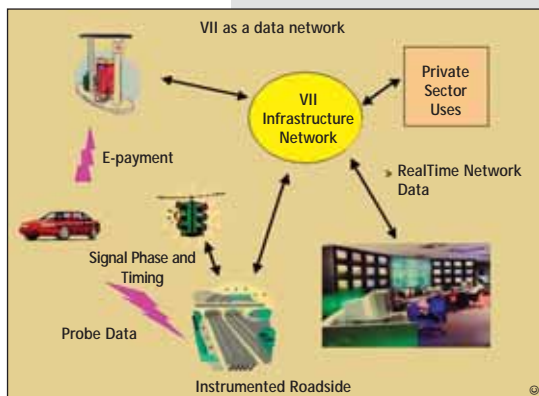
Paul Nordengen, Hans Prem, Luan Mai

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VII as a data network



Stress-In-Motion (SIM)

A new tool for road infrastructure protection ?

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Aspects of Stress-In-Motion (SIM) as a potential tool for road infrastructure protection are summarized in this article. Research in South Africa (SA) has led to the local acceptance of SIM data for Heavy Vehicle (HV) tyres. This article discusses issues towards the measurement and characterization of multi-dimensional tyre loading and contact stresses of typical HV tyres on SA roads in mechanistic structural road design.

Morris De Beer

A Statistical Spatial Repeatability (SSR) algorithm for multiple sensor weigh-in-motion (WIM)

32

The use of an array consisting of multiple WIM sensors is well established as a means of increasing the overall accuracy of in-motion axle weighing. This article proposes a new algorithm for processing the outputs from such arrays and finding an improved estimate of the static axle weights.

Eugene Obrien, Arturo Gonzalez, F. McInerney

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Improving bridge-WIM results with better road evenness and advanced compensations 38

The article illustrates how bridge-WIM accuracy can be affected by pavement evenness. Before resurfacing and without the second level calibration (per vehicle type) this bridge would not be acceptable for WIM measurements since accuracy classes E(30) in lane 1 and E(40) in lane 2 do not comply with requirements for most applications of WIM data. On the other hand, the new smooth pavement and using different calibration factors for three different types of vehicles increased the accuracy of the results on the same bridge to B(10) in both lanes, which is very good accuracy appropriate for most applications of WIM data. Two additional factors are discussed in the article: application of velocity compensation, with advantages and drawbacks, and long-term stability of the bridge WIM data using temperature compensation and auto-calibration.

Igor Lavric, Aleš Znidaric, Jan Kalin

Sustainable mobility and transport

Mobility and Transport for our tomorrow roads 44

During the years of my youth, near the fateful '68, there is no doubt roads were considered one of the essential factors for the economic, social and cultural development of the human society. Only benefits were expected from a new road. In the two decades between 1970 and 1990 this assumption has been gradually called into question up to 2000, when some thinkers and environmental associations started contest about any new road construction. Pasquale Colonna

PPPs for road infrastructure development

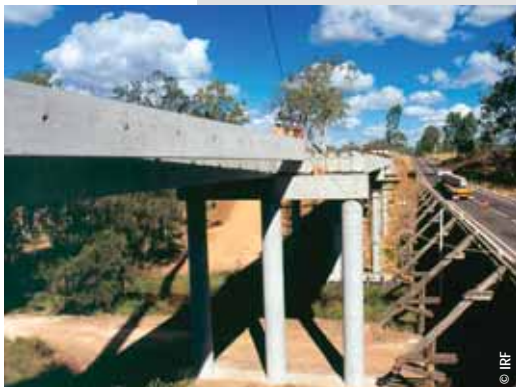
Public/Private Partnerships beyond the financing aspects 54

This publication aims to highlight the economical advantages of public/private partnership contracts over traditional forms of contracting. Long terms performance based contracts can help road authorities of all levels to reach their objectives of a safe, well maintained road network in an efficient way. With the publication, the IRF wishes to contribute to the development of knowledge about public/private partnerships and to increase awareness amongst road authorities of their potential benefits. With as the ultimate objective to improve the road sector's performance.

Michel Démarre, Sibylle Rupprecht, Caroline Visser, Tim Goodyear

Burnett River Bridge upgrade

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Electronic Tolling Services

Electronic Fee Collection (EFC) Interoperability and the promotion of independent Toll Service Providers 65

The development of multiple road pricing schemes within individual countries coupled with the rise of electronic fee collection (EFC) has led to the creation, in some countries, of an interoperability platform to enable the timely exchange of road usage information. In that respect, the Republic of Ireland established both an interoperability platform and open market conditions which has enabled independent toll service providers to enter the electronic fee collection market. Taking advantage of the market conditions, Easytrip Services Ireland was launched as an independent toll service provider. This article provides a brief overview of the current market conditions and key trends in electronic tolling in Europe including a summary of the situation in Ireland followed by an in-depth review of the innovative marketing strategy developed in 2008 by Easytrip Services Ireland. Steve Morello, Eric Wurmser, Emmanuel Michaux

Pavement design - Fundamental Characteristic Modulus and fatigue

Analysis of the Measured Performance of High Modulus Asphalt (HMA) and Road Base Asphalt (RBA) and a Proposal for a Compensation Principle 72

It is becoming increasingly frequent to perform full mix design studies which include the determination of fundamental characteristics such as the modulus and fatigue strength as defined in the standard EN 13108-1 [1]. Historically, these have been known as level 4 studies. The Colas Group possesses a large database which provides the basis for a preliminary detailed analysis dealing essentially the importance of the nature of the binder and design possibilities. We shall begin by describing recent changes in standards, and the concept of critical distance, which is essential when the results from different laboratories are compared. We shall then present our results for two major families of products, namely class 2 high modulus asphalt (HMA) and class 4 road base asphalt (RBA). Last, the article will discuss the concept of compensation which now seems to be essential in the light of our knowledge about measured performance and also the feedback we have had about our mixes. Michel Chappat, Xavier Carbonneau, Yann Lefeuvre

New Emulsifier Range

Controlling performances of microsurfacing by the choice of emulsifiers and cohesion improver additives for parafinic asphalt 86

Microsurfacing practices around the world could be significantly different due to local supply constraints especially asphalt and aggregates. In a microsurfacing formula design, chemicals represent the easiest part to change (and be provided with) to make the asphalt and aggregates available fit together. As a matter of fact, it is the role of chemical suppliers to adapt the chemicals to meet the customers' needs. Microsurfacing is the emulsion technique with the best cohesion evolution under ageing, making possible the reopening to traffic after 15 to 30min, that is quicker than the hot mixes. Nowadays microsurfacing gains market share over surface dressing. Gilles Barreto, Eric Jorda