



# Heavy Vehicle Simulator International Alliance (HVSIA) 19 & 20 August 2010 Pretoria, South Africa



## Proceedings



**7<sup>th</sup> HEAVY VEHICLE SIMULATOR INTERNATIONAL ALLIANCE (HVSIA)  
19 & 20 AUGUST 2010  
PRETORIA, SOUTH AFRICA**

**PROCEEDINGS**

**PRESENT:**

<b>Name</b>	<b>Organisation</b>	<b>Code</b>
Kent Newman <i>Chair</i>		KN
Eddy Sikaala	Gauteng Department of Roads & Transport	ES
George Rugodho	Gauteng Department of Roads & Transport	GR
Larry Lynch	USACE-ERDC	LL
Bob Briggs	Florida DoT	BB
Nick Coetzee	Dynatest/UCPRC	NC
James Signore	UCPRC	JS
Gabriel Bazi	Dynatest	GB
Sigurdur Erlingsson	Sweden	SE
Lev Khazanovich	University of Minnesota	LK
Wynand Steyn	University of Pretoria	WS
Stefan Budricks		SB
Morris de Beer	CSIR Built Environment	MdB
Louw du Plessis	CSIR Built Environment	LdP
Les Sampson	Sampson Consulting	LS
Pat Loots <i>Secretary</i>	Executive Focus	PL

<b>Relevant Notes and Actions from the Meeting</b>		
<b>Item</b>	<b>Note/Action</b>	<b>Responsibility</b>
<b>Day 1: CSIR Conference Centre</b>		
<b>Welcome and Introduction</b>	<p>The Chairman, Kent Newman of the US Army Corps of Engineers, Engineer Research and Development Center, welcomed HVSIA members to the meeting as well as interested SATC delegates. He gave a summary of the history of the HVSIA and said that the Alliance is a group of dedicated people collaborating on HVS issues. His presentation is shown in Appendix C.</p> <p>From the discussion, Mr Eddy Sikaala of the Gauteng Department of Roads and Transport said that the South African government HVS owner is no longer known as Gautrans, but is now known as Department of Roads and Transport. The Department funds the HVS and partners with the CSIR who carry out the testing. The information received from the testing is shared between all relevant government departments. It is becoming increasingly difficult to obtain a funding budget for the HVS each year due to perceptions that the Department should be building roads and not funding research.</p>	

Relevant Notes and Actions from the Meeting - <i>Continued</i>		
Item	Note/Action	Responsibility
<b>Day 1: CSIR Conference Centre</b>		
Feedback on current status of HVS Owners	<p><b>Florida DoT, USA</b> Bob Briggs gave feedback on current and future Caltrans initiatives. The presentation is shown in Appendix D.</p>	
	<p><b>California PRC HVS Programme</b> On behalf of the ECPRC and Caltrans teams, James Signore presented the current and future testing of their HVS. The presentation is shown in Appendix E.</p>	
	<p><b>US Corps of Engineers</b> Kent Newman gave an overview of the different ways the US Corps of Engineers use the HVS which covered items such as flexible and concrete pavements, marginal basis for asphalt, revision of CBR equations, tensor geosynthetics, concrete rapid repair with PUR foams, stabilised surfaces and dust control studies. The presentation is contained in Appendix F.</p> <p>In response to the question regarding what the factor would be from the test results to practice, and would there be a "fuzz factor", Mr Coetzee said that the correlation between APT and the field performance is not an issue.</p>	
	<p><b>India and Chinese HVS Programmes</b> (Presentation shown in Appendix G) Gabrielle Bazi informed the meeting that China had taken delivery of their HVS (Chang'an HVS Mk VI) in August 2008 with the SAT (Site Acceptance Test) being completed in June 2010 and are currently in the process of upgrading their Mk VI HVS. They constructed an HVS building in 2009. It is expected that Dynatest, in conjunction with the CSIR, will present an APT startup workshop for the Chinese owners.</p> <p>With regard to the Indian HVS Mk IV++, the Central Road Research Institute (CRRI) took delivery in late 2009, with the FAT (First Acceptance Test) being completed in May 2009 and due to an accident during transportation undertaken by the Indians, a SAT was then completed in May 2010. They are currently familiarizing themselves with the HVS. An operations contract is in place with Dynatest and CSIR. It is also expected that collaboration between CSIR and CRRI, and a bilateral agreement between South Africa and India will be signed.</p>	
	<p><b>MNRoad Update – University of Minnesota</b> Lev Khazanovich said that even though the University of Minnesota did not own an HVS, they were undertaking testing. The presentation is contained in Appendix H.</p>	
	<p><b>VTT/VTI</b> Sigurdur Erlingsson, VTI Sweden gave a presentation which is attached as Appendix I. It should be noted that the HVS belongs only to Sweden, and is no longer shared with Finland.</p>	
	<p><b>South Africa – Gautrans</b> Louw du Plessis gave feedback on behalf of George Rugodho of Gautrans. The presentation is shown in Appendix Ja.</p> <p>Wynand Steyn presented the Hot Mix Asphalt component of the testing done on behalf of Gautrans. The presentation is attached as Appendix Jb.</p>	
Feedback on current status of HVS Owners	<p><b>South Africa – Gautrans</b> Louw du Plessis gave a presentation on behalf of Gautrans. The presentation is included in Appendix K.</p>	
	<p><b>Discussion: Future HVS Research and Collaboration</b> The presentations given from the HVS owners on future HVS research and collaboration are contained in Appendices L, M, N, O and P. The presentations are summarised in the following Table:</p>	

HVS Owner	Future Research Topic	Possible Areas of Collaboration
South Africa: Gautrans & CSIR	<ul style="list-style-type: none"> <li>• HVS strategic plan has been submitted for approval</li> <li>• Planned HVS steering committee meeting, Involving all role players</li> <li>• National (SANRAL &amp; DOT)</li> <li>• Provincial</li> <li>• Metro</li> <li>• Private: <ul style="list-style-type: none"> <li>◆ Consultants, suppliers, contractors</li> </ul> </li> <li>• Academia (CSIR, Universities)</li> <li>• Roller Compacted Concrete <ul style="list-style-type: none"> <li>◆ Starting Aug 2010</li> <li>◆ Joint project between a private contractor, The Provincial Government Gauteng Department of Roads &amp; Transport And the CSIR</li> </ul> </li> </ul>	
US Corps of Engineers	<ul style="list-style-type: none"> <li>• AM-2 Mat Test Sections <ul style="list-style-type: none"> <li>◆ F-15 traffic on subgrade soil strengths above 15 CBR (recommended max for mats) <ul style="list-style-type: none"> <li>▪ 80CBR</li> <li>▪ 15 CBR</li> </ul> </li> <li>◆ High traffic volume mat torture test</li> </ul> </li> <li>• Validate Thin Concrete Designs <ul style="list-style-type: none"> <li>◆ F-15 and B-52 (62,000lbs) single wheel</li> <li>◆ Three test items, two traffic lanes</li> <li>◆ Goal is to add 6 more data points to existing design curves</li> </ul> </li> <li>• Tensar Geosynthetic Road Sections <ul style="list-style-type: none"> <li>◆ Low volume</li> <li>◆ Thin asphalt layers</li> <li>◆ Develop designs, layer thickness for reducing asphalt thickness over selected geosynthetics</li> </ul> </li> </ul>	

HVS Owner	Future Research Topic	Possible Areas of Collaboration
California PPRP	<ul style="list-style-type: none"> <li>• Planned HVS Testing (2010-15) <ul style="list-style-type: none"> <li>◆ Rubberized warm mix asphalt - completion</li> <li>◆ Validation of new warm mix asphalt technologies that will be proposed to Caltrans over next five years</li> <li>◆ SHRP-R21 cracking</li> <li>◆ Rutting performance of new designs for preservation and rehabilitation overlays of asphalt and concrete pavements for using current, rubber, and modified binder asphalt mixes</li> <li>◆ Evaluation of extended life benefits of pavement preservation treatments</li> </ul> </li> <li>• Proposed HVS Testing (2010-15) <ul style="list-style-type: none"> <li>◆ New approach to prediction of fatigue damage in PCC</li> <li>◆ Temperature Variation Effects on Pavement Fatigue on Asphalt Pavements</li> <li>◆ Interlayer Performances for CalME Modeling</li> <li>◆ ME Rutting Parameters - HMA, base, SG</li> <li>◆ Inverted HMA Pavements</li> <li>◆ Fully Permeable pavements</li> <li>◆ Terminal Blend Binders in HMA overlays</li> </ul> </li> </ul>	
Florida	<ul style="list-style-type: none"> <li>• Alternative pavement materials, to increase recycling and reduce green-house gas emissions</li> <li>• Pavement materials made with bio-binders as alternatives to asphalt and cement</li> <li>• Cracking performance of new concrete mixes with recycled concrete materials</li> <li>• Rutting and cracking performance of asphalt mixes with increased recycled asphalt pavement content</li> <li>• Alternative in-place recycling methodologies: depth of recycling, use of light cementation, alternative mix designs</li> </ul>	
Sweden	<ul style="list-style-type: none"> <li>• Current /Planned Experiments <ul style="list-style-type: none"> <li>◆ Dominant Aggregate Size Range (DASR)</li> <li>◆ MEPDG fatigue equations</li> <li>◆ Top-down cracking</li> </ul> </li> <li>• ME pavement design and performance predictions <ul style="list-style-type: none"> <li>◆ HVS and LTPP data will be used to calibrate a new ME approach for Sweden.</li> </ul> </li> <li>• Tests under consideration <ul style="list-style-type: none"> <li>◆ Peab – soil stabilization using local low quality material.</li> <li>◆ Rehabilitation methods - Testing diff. rehab. methods (combined activity with the other Nordic Countries NO, SE, FI, IS)</li> </ul> </li> <li>• EU projects <ul style="list-style-type: none"> <li>◆ Greece and Portugal !! (Testing typical local structures)</li> </ul> </li> </ul>	



Relevant Notes and Actions from the Meeting <i>continued ...</i>		
Item	Note/Action	Responsibility
<b>Day 2: Knowledge Commons, CSIR</b>		
Final Session	<ul style="list-style-type: none"> <li>• Potential Workshops/sessions: <ul style="list-style-type: none"> <li>♦ Optimising the use of APT</li> <li>♦ Calibration of mechanistic empirical models using APT</li> <li>♦ Identification of programmes/projects for pool fund studies</li> </ul> </li> <li>• Contact for the APT Conference is Dave Jones (<a href="mailto:dijones@ucdavis.edu">dijones@ucdavis.edu</a>).</li> </ul>	

## APPENDICES TO PROCEEDINGS:

3. Appendix A – List of Delegates
4. Appendix B – Programme
5. Appendix C – HVSIA Introduction – Kent Newman
6. Appendix D – Florida DoT, USA – Bob Briggs
7. Appendix E – California PRC HVS Programme – James Signore
8. Appendix F – US Corps of Engineers – Kent Newman
9. Appendix G – India and Chinese HVS Programmes – Gabrielle Bazi
10. Appendix H – MNRoad Update – University of Minnesota – Lev Khazanovich
11. Appendix I – Sweden HVS Programme – Sigurdur Erlingsson
12. Appendix Ja – South Africa – Gautrans – Louw du Plessis
13. Appendix Jb – South Africa – Gautrans – Wynand Steyn
14. Appendix K – South Africa – CSIR – Louw du Plessis
15. Appendix L – Current & Future, South Africa – Louw du Plessis
16. Appendix M – Current & Future, US Corps of Eng – Kent Newman
17. Appendix N – Current & Future, California & CALTRANS – James Signore
18. Appendix O – Current & Future, Florida – Bob Briggs
19. Appendix P – Current & Future, Florida – Sigurdur Erlingsson
20. Appendix Q – Machine Control – Stefan Budricks
21. Appendix R – Interface – HVS and Pavement Instrumentation – Morris de Beer
22. Appendix S – Pavement Instrumentation Software – Louw du Plessis
23. Appendix T – Activity Matrix and Instrumentation – Wynand Steyn
24. Appendix U – Design Catalogue – Wynand Steyn
25. Appendix V –
26. Appendix W –
27. Appendix X –
28. Appendix Y –
29. Appendix Z –