

**PROCEEDINGS OF THE MEETING OF THE
3rd HEAVY VEHICLE SIMULATOR INTERNATIONAL ALLIANCE (HVSIA)
20 to 22 SEPTEMBER 2006
ZEVENWACHT COUNTRY INN, CAPE TOWN, SOUTH AFRICA**

PRESENT:

Title	Name	Organisation	Code
Ms	Elzbieta Sadzik	Gauteng Department of Public Transport, Roads and Works	ES
Eng	Klas Hermelin	Swedish Road Administration	KH
Mr	Don Alexander	ERDC-GSL (GM-A)	DA
Dr	Nick Coetzee	California Pavement Research Centre/Dynatest	NC
Dr	Bouzid Choubane	Florida	BC
Dr	Dave Jones	California	DJ
Civ. Eng	Leif G Wiman	Swedish National Road and Transport Research Institute	LW
Mr	Lev Khazanovich	University of Minnesota	LK
Mr	Louw du Plessis	CSIR Built Environment	LdP
Prof	Emile Horak	University of Pretoria	EH
Prof	Morris de Beer	CSIR Built Environment	MdB
Mr	Mervyn Henderson	PAWC	MH
Mr	Arthur Taute	VKE Consulting Engineers	AT
Mr	Les Sampson	Asphalt Academy/Sampson Consulting	LS
Dr	Wynand Steyn	CSIR Built Environment	WS
Mr	Bruce Morton	Ninham Shand	BM
Dr	Gerrit Jordaan	Tshepega	GJ
Dr	Simon Oloo	KwaZulu Natal Department of Transport	SO
Mr	Benoit Verhaeghe	CSIR Built Environment	BV
Mr	Piet Myburgh	Sabita	PM
Dr	Paul Olivier	Jeffares & Green	PO
Dr	Fritz Jooste	Modelling & Analysis Systems	FJ
Dr	James Maina	CSIR Built Environment	JM
Mr	Louw Kannemeyer	SANRAL	LKan
Ms	Pat Loots <i>Secretary</i>	Executive Focus/Asphalt Academy	PL

APOLOGIES:

Name	Organisation
John Harvey (JH)	University of California, Davis
Joe Mahoney (JM)	University of Washington
Bill Noakes (WN)	University of California, Davis
Edel Cortez (EC)	Corps of Engineers, CRREL

Relevant Notes and Actions from the Meeting		
Item	Action	Resp
Welcome and Introduction	<p>Ms Sadzik presented an overview of the previous meeting of August 2005 (see Appendix C) and gave the following feedback from the ExCo meeting held prior to the main meeting:</p> <ul style="list-style-type: none"> The ExCo agreed that the next lead agency to take the Chair of HVSIA will be CALTRANS headed by John Harvey. It was agreed by the ExCo that only organisations owning an HVS machine will be recognised as ExCo members of the HVSIA. A signed contract for purchase of an HVS will count as sufficient for membership. Invited attendance of relevant contributors to the main HVSIA meeting will continue. Collaboration on similar projects is encouraged to allow for direct comparison, cooperation and exchange of ideas. A letter from John Harvey was read to the meeting by Dave Jones where he extended his thanks to Gautrans and especially Elzbieta Sadzik for the hard work in establishing and sustaining the HVSIA concept and pledged his continued support to the meeting. Disappointment was expressed related to Joe Mahoney not being able to attend due to SAA and the RSA government bureaucracy. 	

Relevant Notes and Actions from the Meeting (<i>continued</i>)		
Item	Action	Resp
Feedback from HVS Owners on current and future initiatives	<p>California (Appendix D)</p> <ul style="list-style-type: none"> • Bitumen rubber asphalt has proved very effective in reducing reflection cracking. • The use of rubber in asphalt is a mandatory environmental requirement in California to dispose of old tyres. • The use of 210mm thick reinforced pre-cast concrete slabs to replace damaged slabs in existing concrete pavements has proved a viable rehabilitation option. HVS tests show the slabs to perform adequately without grouting under a few days of traffic. When fully grouted, they can carry in excess of 140MESA. • The use of warm mix asphalt to enable construction of thin layers at night is also being investigated. • The California MB Road specifications are expected to be available in about 6 months and could provide inputs into the revision of the SA Modified Binders Guideline (TG1). It was agreed that Dave Jones would keep Les Sampson informed of developments and provide information as available. Information can also be obtained from the ERC website. 	DJ/LS
	<p>Sweden (Appendix E)</p> <ul style="list-style-type: none"> • Sweden bought out the Finish share of the HVS and is now full owner of their HVS. • Regression models for rut depth prediction have been prepared for their pavement. • The machine has been relatively inactive over the past 12 months. 	
	<p>Corps of Engineer: CRREL (Appendix F)</p> <ul style="list-style-type: none"> • Two projects are scheduled for completion in 2007, one on subgrade performance (national pooled fund study – SPR2-(208)) and the other on Geogrid basecourse reinforcement. • Future projects being considered are: <ul style="list-style-type: none"> ○ Basecourse Performance ○ Validation of the AASHTO Mechanistic-Empirical Design Method ○ Reinstatement of Utility Cuts 	
	<p>Corps of Engineer: ERDC-WES (Appendix G)</p> <ul style="list-style-type: none"> • A major investigation is looking at airfield damage and quick setting rehabilitation materials for use in remote areas. • The SBRO C17 test programme is looking at semi-prepared runway operations. • CBR thickness design procedures have been investigated to provide a better understanding of the design criteria and providing revised design models. However, the new procedures do not take environmental effects such as moisture into account. The revised design criteria will be published in the near future. • Rubblization related to rubblized PCC pavements are being investigated. • Extensive experience has been gained using the Portable Seismic Pavement Analyzer (PSPA). 	
	<p>Florida (Appendix H)</p> <ul style="list-style-type: none"> • Florida has developed a Condition Based Maintenance (CBM) for monitoring and logging critical components of the HVS machine. • An accelerated pavement ageing system has been developed to model cracking. • A portable environmental chamber has been developed. South Africa requested further information on the chamber and the incorporation of portable panels for attachment to the HVS. • Work is being carried out to investigate fine and coarse mixes (in terms of the Superpave grading) using limestone and granite with and without polymers (binder PG67-22 and PG76-22). After 17 MESA in the NCAT test, the coarse rutted 5.8mm and the fine 3.2mm and the HVS tests showed the same trends. It was agreed that coarse and fine is not a suitable classification to discriminate between mixes that rut and those that don't. More work is required on the packing of the sand fraction. • SBS modifiers significantly improve rutting behaviour. Modifier only placed in the top 50mm of a 100mm overlay. • Stripping being investigated with composite pavements. • Payment to contractors based achieving certain parameters within limits. Factors used to determine bonus/penalty are density, lab air voids, AC content, passing #8 sieve and passing #200 sieve. Up to 10% bonus paid on density and smoothness. • Introducing a 3-year performance guarantee system and if not provided the contractor will lose the right to bid for Florida DoT projects. 	LdP/BC

Relevant Notes and Actions from the Meeting (<i>continued</i>)		
Item	Action	Resp
Feedback from HVS Owners on current and future initiatives	<p>Gauteng Department of Public Transport Roads and Works – Gautrans (Appendix I)</p> <ul style="list-style-type: none"> The South African (Gautrans) HVS research programme is investigating the following in line with its revised strategy for 2006 – 2009: <ul style="list-style-type: none"> Continuously reinforced thin layer concrete (in association with SANRAL) Bitumen stabilisation manual for foam and emulsion treated materials (in association with Sabita and SANRAL) Validation of the SA HMA design method Investigation of contact stresses using the HVS and MMLS on the SIM Labour intensive pavements 	
International collaboration (Appendix J)	<ul style="list-style-type: none"> COST347: Draft final report available from Nick Coetzee or on the COST347 website. The TRB Planning Committee (AFD40) has created the following two sub-committees: <ul style="list-style-type: none"> APT Coordination Committee; International APT Conference Organising Committee for Spain in October 2008. The minutes of the last forum meeting were taken by Dave Jones and are available if required. The CAPT meeting of May 2006 identified similar emphasis areas to those of HVSIA. The goals and objectives of CAPT are similar to HVSIA except that membership is more open than that of HVSIA. The CAPT Chair is Buzz Bowell of the National Centre of Technology; Co-Chair is Bouzid Choubane. CAPT have been using the HVSIA matrix as a template for their information gathering. Stefan Romanovski is working on the matrix with some changes. It was requested that any changes to the database structure and their inputs are coordinated. Elzbieta Sadzik will contact Stefan Romanovski in this regard. The initial development of the matrix by HVSIA should also be acknowledged by CAPT. 	NC DJ BC/ES BC
	<p>HVS v Real Life Protocol Task Group</p> <ul style="list-style-type: none"> The protocols developed by Dave Jones will be available in the next two months and will be circulated to the new Task Group for comment. The new Task Group consists of Dave Jones, Nick Coetzee, Don Alexander, Mervyn Henderson and Bouzid Choubane. Once the Task Group comments have been incorporated, the protocol will be presented to the next HVSIA meeting. The Federal Highway Administration database containing LTPP/APT data can be obtained through Dave Jones. South Africa was requested to identify 5 LTPP sites with known performance related to HVS tests for submission to Bouzid Choubane. Dave Jones will also obtain information from 12 sites in California and 14 sections linked to LTPP in Australia. 	DJ Task Group DJ ES DJ
Feedback from Task Groups (Appendix K)	<p>Activity Coordination Task Group (<i>including HVSIA website as well as Instrumentation and Results Task Group</i>)</p> <ul style="list-style-type: none"> Don Alexander was requested to check on the WES and CRREL information required for the matrix and forward to Wynand Steyn/Rianie Castelyn for inclusion. It was agreed by the meeting that the ownership/management of the HVSIA website and associated activity coordination database will remain with South Africa. Florida and Sweden were requested to provide links or electronic copy of the reports shown in the matrix. Wynand Steyn will send e-mails to members identifying where information is outstanding to populate the matrix. A list of acronyms and their meanings will be added to the website. 	DA ES/WS/ All LW/BC WS/All WS
	<p>Instrumentation and Results Task Group</p> <ul style="list-style-type: none"> The Instrumentation Matrix is not on the website as yet. The South African table is available and CALTRANS, Florida and Sweden still need to submit information to RSA to populate the matrix. Wynand Steyn will send an e-mail with the information required. It was agreed that Wynand Steyn will chair the Instrumentation and Results Task Group. 	WS/All WS
	<p>Practice Specification and Terminology Task Group</p> <ul style="list-style-type: none"> It was agreed that Joe Mahoney would remain the Task Group leader and Nick Coetzee will liaise with him in this regard. It was requested that there be consistency with the CAPT initiative in this area. 	NC/JM

Relevant Notes and Actions from the Meeting (<i>continued</i>)		
Item	Action	Responsibility
Feedback from Task Groups	<p>Information Dissemination & Marketing Task Group</p> <ul style="list-style-type: none"> It was agreed that Bill Noakes will continue as Task Group leader. Dave Jones to liaise in this regard. Available on request: Caltrans Partnered Pavement Research Program (PPRC) Summary Report Four Year Period: 2000–2004 Authors: J.T. Harvey, C.L. Monismith, W.A. Nokes, and N.F. Coetzee. This work was completed as part of Partnered Pavement Research Program Strategic Plan Item 2.3. 	DJ/WN NC/PL
Thin Layer Concrete	<p>Heidelberg Sections (Appendix L)</p> <ul style="list-style-type: none"> It is expected that the 50mm thick slab will work well with proper steel fibres, and providing the 5.6mm diameter steel reinforcing mesh is properly placed and covered. SANRAL intend to use this soon on a comparative pricing basis on two roads out for rehabilitation. Concerns were expressed about thermal pop-ups and kicking on curves as the slabs will not be bonded to the underlying base except at tie beams placed at 100m to 300m spacing. 	
Mechanistic Empirical Design	<p>Stiffness measurements under the HVS – the issues</p> <ul style="list-style-type: none"> The early stiffness reduction phenomenon observed from HVS tests in RSA for pavement layers is considered to be a concern. All HVS owners will investigate the initial changes in stiffness measurements observed during their tests and report back to the next meeting. Equipment issues, sensitivity to rate of loading/rest periods and water suction should be considered during the investigation and contributors to the phenomenon. 	All owners
	<p>SA Initiatives</p> <ul style="list-style-type: none"> SANRAL have instigated two projects to improve structural design procedures. 	
Future Areas of Cooperation	<p>Issues for the Next meeting</p> <ul style="list-style-type: none"> Task Group feedbacks M-E Design Interpretation of HVS results <ul style="list-style-type: none"> Stiffness Deflection Rutting Others as identified Preparation and condition of test sites Machine issues (captured under instrumentation matrix) Upcoming conferences 	
Date of the Next Meeting	<ul style="list-style-type: none"> The Chair has passed on to California headed by John Harvey of UC Davis. Dave Jones will brief him on developments during the meeting, and the date and venue for the next meeting will be made known accordingly. 	

APPENDICES TO PROCEEDINGS:

- Appendix A: List of Attendees
- Appendix B: Programme
- Appendix C: Summary of previous meeting – E Sadzik: *presentation*
- Appendix D: California Pavement Research Centre – D Jones: *presentation*
- Appendix E: VTT/VTI – Leif Wiman: *presentation + 2 supporting PDF files*
- Appendix F: CRREL – D Alexander: *presentation + 2 movie files*
- Appendix G: WES – D Alexander: *presentation*
- Appendix H: Florida DOT – C Choubane: *presentation*
- Appendix I: Gautrans/CSIR – Elzbieta Sadzik: *presentation*
- Appendix J-1: International Collaboration: CAPT – N Coetzee: *presentation*
- Appendix J-2: International Collaboration: LTPP activities related to HVS programmes – D Jones: *presentation*
- Appendix K-1: Feedback from Task Groups: Activity Coordination Task Group –W Steyn: *presentation (including HVSIA website)*
- Appendix K-2: Feedback from Task Groups: Instrumentation and Results Task Group – W Steyn: *presentation*
- Appendix K-3: Feedback from Task Groups: HVS v Real Life Protocol Task Group – D Jones: *presentation*
- Appendix L: Thin Layer Concrete: Heidelberg Sections – L Kannemeyer: *presentation*
- Appendix M-1: Mechanistic Empirical Design: Stiffness measurements under the HVS: the issues – F Jooste: *presentation*
- Appendix M-2: Mechanistic Empirical Design: Multi-layer elastic analysis formulation for surface moment loading – J Maina: *presentation*
- Appendix M-3: Mechanistic Empirical Design: AASHTO Design Method – Lev Khazanovich: *presentation*
- Appendix M-4: Mechanistic Empirical Design: SA Initiatives – M de Beer: *presentation*
- Appendix N: Future areas of cooperation – E Sadzik/L Sampson: *presentation*
- Appendix N: Photos of Delegates