

**20
22**

ADDRESSING THE NEW NORMAL AND THE FUTURE OF TRANSPORT



**SOUTHERN AFRICAN
TRANSPORT CONFERENCE**
Report to Minister of Transport

40
ANNUAL

SATC 2022

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SATC 2022

REPORT TO MINISTER OF TRANSPORT

Philip Hendricks - ATC Board Chair
Jacqui Oosthuizen - SATC Secretariat

1. BACKGROUND

Established in 1982, the Southern African Transport Conference (SATC) arose from a need to transfer knowledge and build capacity within the transport sector. Originally known as the Annual Transport Conference (ATC), the SATC has always had strong support from the Department of Transport, with the Minister of Transport being the Conference's honoured patron.

It is mainly characterised by the delivery of papers that reveal the progress of transport research and its subsequent implementation in South Africa. A call to submit an expression of interest is announced at the previous SATC. The review process that follows ends up with the top papers being selected to feature at this prestigious conference. Essentially, subjects presented at the SATC are mainly based on research papers that are strictly reviewed and selected by the Technical Committee.

2. SATC 2022

The 40th annual SATC was held from 4 to 7 July 2022 at the CSIR International Convention Centre (ICC) in Pretoria, South Africa, under the theme "Addressing the new normal and the future of transport".

A total of 660 delegates attended the 40th conference, of which 590 were in-person delegates and 70 were virtual attendees.

Each year, the organising committee invites students from tertiary institutions to submit essays related to the theme of the conference. This year, five winning students and lecturers attended the conference and presented their essays. Students participating from China presented and attended virtually. Other students attended from the University of Namibia, University of Stellenbosch and the University of Venda.

One post-grad bursary student from the University of Venda was supported.

Papers are invited and are subjected to a blind review process, from which good quality papers are selected. Of these papers, 26 were from young professionals in the industry.

An exhibition was held over the four days of conference, with 20 exhibitors, of which seven were from foreign countries.

Delegates from 25 countries attended the conference.

In-person attendees earned 1 Continuous Professional Development (CPD) point per day of attendance.

The 3rd Regional seminar on Weigh-in-Motion (IS-WIM) merged with the SATC for this year and offered a two-day seminar, as well as a full day technical tour to Mantsole Traffic Control Centre.

Table 1: General programme

DATE	SESSION NO	EVENT
Monday, 4 July		Opening Session
	1A	Infrastructure
	1B	Treasury Workshop - <i>Public Transport and Spatial Transformation</i>
	1C	Traffic Engineering
	1D	Rail
	1E	Capacity Building/Transport for Rural Development
Tuesday, 5 July	2A	Infrastructure
	2B	Urban and Public Transport and Rural Development (combined session)
	2C	Freight and Logistics
	2D	Traffic Management, Safety and Security
Wednesday, 6 July	3A	3 rd Regional Seminar on Weigh-In-Motion
	3B	Urban and Public Transport
	3C	9 th China-Africa Transport Co-operation Forum and Maglev Trains Applications
	3D	Maritime
	3E	Aviation Workshop
Thursday, 7 July	4A	3 rd Regional Seminar on Weigh-In-Motion
	4B	Disruptive Women forging a new normal in the transport sector - <i>Brought to you by Tshwane Women in Transport</i>
	4C	Public Private Partnership Workshop
	4D	Second Decade of Action for Road Safety, 2021 - 2030
	4E	Integrated Public Transport Networks
Friday, 8 July	5A	3 rd Regional Seminar on Weigh-In-Motion Technical Tour

SATC ORGANISING COMMITTEE

Bean, Ms. Wilna	University of Pretoria
Behrens, A/Prof. Roger	University of Cape Town
De Beer, Mr. Gerhard	AIH Group
Dimitrov, Ms. Laverne	Development Bank of Southern Africa
Gräbe, Prof Hannes	University of Pretoria
Jennings, Ms. Gail	Research Consultant
Maina, Prof. James (Chairman)	University of Pretoria
Manana, Ms. Khibi	Department of Transport
Mashiri, Mr. Mac	Gwarajena TRD
Mhlanga-Mochadibane, Ms. Mavis	Tshwane Women in Transport
Mojafi, Mr. Tebogo	South African Maritime Safety Authority
Mokonyama, Dr. Mathetha	CSIR
Nordengen, Dr Paul	Heavy Vehicle Transport Technology Africa
Oosthuizen, Ms. Jacqui	Secretariat
Pretorius, Dr. Pieter	Innovative Transport Solutions
Ribbens, Dr. Hubrecht	Consultant
Ssamula, Dr. Bridget	AECOM
Steyn, Prof. Wynand	University of Pretoria
Visser, Prof. Alex	University of Pretoria
Wang, Mr. Yuchen	SACTCC

ATC COMPANY DIRECTORS

Hendricks, Mr. Philip (Chairman)
Kistan, Mr. Kenny (Advisor)
Mabece, Mr. Lungile
Maina, Prof James
Matete, Mr. Matete
Steyn, Prof Wynand
Udoyen, Ms. Ivandra
Van Niekerk, Mr. Pieter
Verhaeghe, Mr. Benoit

SATC TECHNICAL COMMITTEE

Adams, Prof Charles	Kwame Nkrumah University of Science & Technology, Ghana
Ölçer, Prof Dr Aykut	World Maritime University, Sweden
Prozzi, Prof Jorge	The University of Texas, USA
Wegman, Prof Fred	Delft University of Technology, The Netherlands

OPENING AND PLENARY SESSIONS

Monday 4 July 2022:

- **Prof. James Maina, Organising Committee Chairperson,** welcomed delegates.
- **Mr Philip Hendricks, ATC Board chairperson,** officially opened the conference.
- **Ms Rirhandzu Mashava, Department of Transport,** delivered the opening address on behalf of the Minister of Transport.
- **Mr Mikel Mabasa, NAAMSA,** delivered the plenary address.

Tuesday 5 July 2022:

- **Prof Dr George Giannopoulos, University of Thessaloniki – Greece,** delivered the plenary address.

Wednesday 6 July 2022:

- **Dr Joachim Vermooten, University of Johannesburg,** delivered the plenary address.

Thursday 7 July 2022:

- **Ms Sindisiwe Chikunga, Deputy Minister of Transport,** delivered the keynote address for the Women in Transport session.

3. HIGHLIGHTS FROM SESSIONS AND WORKSHOPS

INFRASTRUCTURE

Session 1A, Monday, 4 July 2022

Session Chair: Dr Emile Horak, Kubu Consultancy

Convenor: Prof James Maina, University of Pretoria

1. EXPERIMENTAL REHABILITATION OF A ROAD WITH INTRACTABLE SALT DAMAGE WITH A BITUMEN RUBBER SINGLE SEAL – Dr F Netterberg, Pavement Materials and Geotechnical Specialist.

The area of salt in roads has been covered by Dr Netterberg since the early 1980s. He now has the advantage of reviewing long term pavement performance of roads that previously had a major salt crystallisation problem. Previous experience on the old Rooikop Airforce base, with then the worst salt crystallisation problems, showed that the use of bitumen rubber effectively seals the road surface and prevents salt solution from migrating to the top where it crystallises. The road treated with a bitumen rubber seal also showed it effectively prevented any salt crystallisation from occurring as well. This topic caused a lot of discussion and input from the audience as Dr Netterberg indicated the ph test and electrical conductivity tests may need better clarification in new specifications.

2. MICROBIAL INDUCED CALCIUM CARBONATE PRECIPITATION (MICP) FOR ROAD CONSTRUCTION – MA Smit and I Akhalwaya, CSIR, FC Rust, Pavement Engineering Research Consultancy and VM Ramdas, CSIR

This innovative approach to achieve cement like stabilisation of a specific material type was discussed. It showed some benefit, but clearly this work is still at an infancy level and much more material types would need to be tested and evaluated. A lively discussion from the floor ensued.

3. A STUDY OF PAVEMENT DAMAGE CAUSED BY AXLE OVERLOADING AND ASSOCIATED COSTS IN KENYA – EA Ochola, World Bank and JB Odoki, IMES Ltd, United Kingdom

Kenya, like elsewhere in the world and specifically Africa, is suffering from the destructive effects of truck overloading and lack of policing. The presenter showed that Kenya is not getting 10% of income via fines versus the calculated loss of USD\$ 43 million per annum due to the destructive effect of overloading of trucks. HDM4 software was used with the concept of Equivalent Standard Axles Load factor (ESALF). Road user costs were quantified to show how this is increasing due to the destructive effect of truck overloading. The backlog in maintenance funding was also quantified to show the destructive effect of truck overloading.

4. INVESTIGATION INTO VARIATION IN AIRFIELD PAVEMENT STRENGTH RATING CALCULATION – Dr AM Hartman, Zutari

The International Civil Aviation Organisation (ICAO) has indicated that the international way of determining and recording strength of airports indicated the current method expressed as Pavement Classification Number (PCN) will be phased out by 2023. The PCN of an airport needs to be larger than the published Aircraft Classification Number (ACN) linked to the maximum take-off weight of aircrafts and their wheel bogey configuration. The PCN is inherently empirical in nature and prompted the move to the new Pavement Classification Rating (PCR) measured versus the Aircraft Classification Rating (ACR). Both calculations are done with mechanistic empirical software. The latest FFA software, FAARField does this calculation based on deflection measurements and back calculation of effective elastic moduli. Dr Hartman demonstrated for a limited aircraft suite how the old PCN can vary significantly if the subgrade varied while the new PCR showed more realistic uniform results with various mechanistic modelling software.

5. BITUMEN-AGGREGATE ADHESION: A PREDICTIVE STUDY BASED ON ZETA POTENTIAL ANALYSIS USING THE STREAMING POTENTIAL TECHNIQUE – B Nomlala, Z Mthembu and G Mturi, CSIR and A Hefer, Dr Arno Hefer Consulting

The bitumen-aggregate adhesion is done via several empirical tests like boiling treated aggregate and measuring the bitumen loss. Work previously done in Texas USA by Dr Arno Hefer had been used in an experimental approach to show the potential of a highly simplified laboratory procedure involving the measurement of the zeta potential of the aggregate and bitumen adhesion. The experiment showed great promise and the work clearly must proceed to a greater variety of aggregate types and sizes.

6. HIGH TEMPERATURE RHEOLOGICAL PROPERTIES OF LIGNIN MODIFIED ASPHALT BINDER – J Gao, Chongqing Jiatong University, China and X Xue, Chang'an University, China (Virtual presentation from China streamed live)

This presentation showed there may be advantages in using this “green bitumen” modification approach with bitumen modification initial strength tests showed great promise, but fatigue issues were underplayed by the presenter. It appears there may still be some way to go for this lignin modification to achieve strength and fatigue resistance though.

7. ENVIRONMENTALLY OPTIMISED DESIGN OF ROAD SURFACING ALTERNATIVES FOR STEEP SLOPE SECTIONS ON RURAL ROADS – EK Debrah, CSIR-BRRI, Ghana and JK Anochie-Boateng, CSIR

This speaker from Ghana used an example of a rural road to show how economic analysis was used to evaluate the problem of erosion and washaways on steep sections by using standard practice. This included bituminous single seal, double seal and cape seal type surfacing versus concrete and block paving. Participation from the audience was very good with proposals to use proven technology like Roller Compacted Concrete (RCC) as well as older technologies like Telford rock base packing. It appears the author may have taken some of the advice on board and appears to implement some of this back in Ghana.

8. USING MULTI-CRITERIA ANALYSIS TO SELECT ALTERNATIVES SURFACINGS FOR LOW VOLUME ROADS – CJ Pretorius and AM Hartman Zutari

This study reported on was done for Ghana, Liberia and Sierra Leone. It is part of the Research Community Access Partnership (ReCAP) funded work. Input was received from various stake holders in this study and multi criteria were developed for a variety of typical low-cost surfacing for rural roads. One of the strongest aspects for evaluation was the need for local application.

9. A LABORATORY PROCEDURE USING THE DYNAMIC CONE PENETROMETER FOR ASSESSING THE SUITABILITY OF MATERIALS FOR LOW VOLUME ROADS – MI Pinard, Infra Africa Consultants, Botswana, J Hongve, Independent Consultant, Norway and P Paige-Green, Tshwane University of Technology

The work done by ReCAP, and previous work done by the CSIR, led to the development of design procedures for low volume roads in developing areas using the Dynamic Cone Penetrometer (DCP). The use of the penetration rate (mm/blow or DN value) had been promoted by the ReCAP research and implementation work instead of using costly and problematic California Bearing Ratio (CBR). The CBR is now understood to be empirical with major problems of repeatability and can vary significantly for the same material tested. The DN approach uses moisture and density variations obtained in the laboratory to enable the designer to design for as well as monitor density and bearing capacity in the field with only the DCP. The laboratory procedure to develop the moisture and density curves for DN values with the DCP was explained. It is a refreshing look at well-known low-cost testing equipment with a clear improvement in quality and outcomes and or repeatability.

TREASURY SESSION – PUBLIC TRANSPORT AND SPATIAL TRANSFORMATION

Session 1B, Monday, 4 July 2022

Session chair: Mr Madumetja Moselakgomo, Analytrics Consulting

Convenor: Dr Mathetha Mokonyama, CSIR

The session is convened on behalf of the National Treasury Cities Support Programme and aimed at nuanced information sharing to the community of practice on approaches to the use of public transport to transform spaces. The session was well attended, with several interactive time slots.

Presentations were delivered as follows:

PROGRESS REPORTING ON THE NATIONAL TREASURY'S CITIES SUPPORT PROGRAMME SUPPORT TO CITIES AND FUTURE PROSPECTS - S Maqetuka and H Gaibe, National Treasury

1. LESSONS FROM CONVERSATIONS WITH CITIES ON PUBLIC TRANSPORT AND SPATIAL TRANSFORMATION - F Asimwe, CSIR
2. PRIORITISATION OF TRANSPORT SERVICE DELIVERY WITH NEW MUNICIPAL COUNCILORS – U MNTONINTSHI, SALGA
3. WHAT PROPERTY PRACTITIONERS WISH TRANSPORT PLANNERS KNEW ABOUT PROPERTY DYNAMICS - M Pitjeng, TseboReal Asset Management
4. SUSTAINABLE OPTIONS TO ADDRESSING ENCROACHMENT OF SETTLEMENTS IN RAIL RESERVES – S Maqetuka, National Treasury
5. MAPPING THE SPATIAL DISTRIBUTION OF HOUSEHOLD TRANSPORT ENERGY INTENSITY - D Madumo, CSIR

The following notable points were made by presenters:

- The National Treasury's Cities Support Programme is continuing to work towards inclusive growth of South African cities. Current projects by Cities Support Programme include:
- Public transport integration and mobility support; IPTN spatial support in 4 cities; integration of municipal services into the broader IPTN; and capacity building programme. However, distressed cities often do not have the requisite personnel to engage. The Cities Support Programme will be focusing on improved institutionalisation of interventions.
- Cities tend to focus more on project delivery at the expense of managing the whole transport system. The Cities Support Programme has developed tools that improve inter-disciplinary conversations across city departments and external stakeholders.
- Although 46% of responsibilities are with local government, it only receives 9% of the equitable share. About 10 400 councillors have recently been elected, 60% of which are new. Only 15% of the councillors have a qualification better than grade 12. Councillors in the transport portfolio tend to see roads and potholes, and not the strategic role of transport. Hung municipalities are presenting stability challenges. Such an environment places long term planning and associated implementation at risk. SALGA is working on a Spatial transformation barometer to measure progress in spatial transformation.
- Property thrives in an environment with a clear set of rules. Transport planners must send clear messages to the market.
- Value capture works best if the value is reinvested into the community, and not spent elsewhere.

- For every development right the municipality grants, there must be a portion of transformation attached as condition.
- Government also tends to not upset property developers. Government must enforce rights. Inclusion is not a choice; it must be deliberate. It must be included in the specifications.
- Government must be proactive with land management to protect reserves. Government must also make available large tracts of decommissioned land for development.
- Empirical data shows that public transport remains an energy intensity cushion in lower income areas. Public transport service quality must be delivered deliberately to incentivise the use of public transport.

Key inputs from session participants were as follows:

- We need to find ways of bringing in the minibus taxi industry into the conversations about spatial transformation.
- There appears to be some duplication between work of the Cities Support Programme, and various interventions by the cities themselves. This must be resolved.
- The fragmentation of work in the transport sector limits progress. There is need for much more improved leadership to coordinate the sector.
- Municipalities must explore the use of municipal land transport fund, which is provided for in the National Land Transport Act, to fund spatial transformation. Municipalities must also be proactive in motivating for improved equitable share.
- Our problems are human problems not system problems. It's people who are corrupt. It's people who have no skills. We point to institutional structures instead of saying do we have the right people and are they doing the right things.
- There must be computations for optimum energy mix in South African cities. Currently, cities have not clear energy mix targets.

TRAFFIC ENGINEERING

Session 1C, Monday, 4 July 2022

Session chair: Dr Andrew Aucamp, eThekweni Municipality

Convenor: Dr Pieter Pretorius, Innovative Transport Solutions

In the traffic engineering session, several interesting papers were presented during the morning session. These were focused on the application of the latest technology in the management of transportation, especially in our smaller cities, as well as on our national freeways.

The transportation impact of COVID-19 was quantified with the use of floating car data, which was illustrated based on recent research at the University of Stellenbosch. Also, the advantages, both from an operational and congestion management point of view was analysed, based on a case study where a single carriageway road was upgraded to a dual carriageway.

During the afternoon session, a workshop was facilitated where the state of traffic signals and Intelligent Transport Systems in South African cities were discussed. Representatives from some of the major metropolitan cities presented day to day challenges, and possible solutions to address these. It was agreed that valuable lessons could be learnt from this joint discussion and knowledge sharing session. The workshop might be followed up in coming years at SATC to maximise this positive experience during the SATC of 2022.

The session concluded with a technical paper on transportation modelling and the estimation of origin / destination matrices, based on recent applications in KZN Province. An illustration of the advantages of macroscopic modelling, with reference to overseas examples also provided valuable insight to the expansion of knowledge in this highly specialised field.

The traffic engineering session stimulated some very interesting debate on the various topics, with sufficient provision being made for input by delegates.

RAIL – THE NATIONAL RAIL POLICY

Session 1D, Monday, 4 July 2022

Session chair: Prof Hannes Gräbe and Dr Willem Sprong, University of Pretoria and Ms Sethunya Matsie, RSR

Convenor: Prof Hannes Gräbe, University of Pretoria

Presentations by:

- The Department of Transport: Mr Jan-David De Villiers
- Transnet: Mr. Irwindra Naidoo
- PRASA: Mr. Hishaam Emeran
- Gautrain Management Agency (DMA): Mr William Dachs
- The Railway Safety Regulator (RSR): Mr Freddie Kgomari
- The African Rail Industry Association (ARIA): Ms Mesela Nhlapo
- Mr Jaap van der Merwe
- Prof. Jan Havenga (Stellenbosch University)

During the SATC panel discussion the following was noted:

- Rail needs to be the backbone of the South African transport system.
- This will not happen through regulations, but rail transport should be attractive to the industry.
- The establishment of the Economic Railway Regulator is crucial to the success for Third Party Access.
- Questions to be considered is about track gauge and railway electrification.
- There should be separation in Transnet between operators and asset owner. It is not on the cards at this stage.
- There needs to be an understanding of the advantages and disadvantages of security companies' vs SAPS. This needs to be discussed at national level.
- The first pilot project for standard gauge is planned for 2030.
- Transnet must become easier (and corruption free) to do business with.
- The biggest challenge for PRASA is theft and vandalism. Fare evasion is also a major problem.
- It was stated that PPP needs to be subsidised, especially for passenger services since it is impossible to get a return on investment just through passenger fares.
- Railway is not a local government responsibility.
- The establishment of local ROSCOS is a must for the successful implementation of third-party access.
- The successful implementation of the National Railway Policy is crucial for the future of South Africa.
- It was stated that society needs to embrace the railway network as a national asset.

Some important questions that were addressed:

- How will the national energy crisis influence the implementation of the rail policy?
- Would all infrastructure move to one owner (minister) or will Transnet and PRASA remain under different departments?
- Where are possible investment opportunities in the railway infrastructure environment?
- At what level will new operators be introduced? Government of existing operators to facilitate?
- What are the plans to reinstate the existing installed capacity?
- How will the RSR cost be calculated for their involvement in the new third-party access model?
- What role does the heritage/nostalgia of railways play in third party access?
- What is the integrated approach to include SADC in the National Railway Policy?
- Do we have what it takes in South Africa? Can we make this work with our own local resources?

CAPACITY BUILDING/ TRANSPORT FOR RURAL DEVELOPMENT

Session 1E, Monday, 4 July 2022

Session chair: Prof James Chakwizira, North West University

Convenor: Mr Mac Mashiri, Gwarajena TRD

1. EQUITY IN URBAN TRANSPORT - KT Sarath and B Rangan, Indian Institute of Technology Bombay, India

This presentation was done online. The authors highlighted why transport equity and transport justice are critical in modern society. Highlighted how transport costs, spatial divide and weak governance in India affect the capacity to achieve the goals of transport equity and transport justice. The authors recommended a transport equity and justice assessment and implementation framework that can help in the realization of equity in transport. Delegates noted that the issues in India are mirrored in South Africa and in developing countries in general.

2. TRANSFERRABLE CAPACITY DEVELOPMENT LESSONS IN SUPPORT OF MUNICIPAL TRANSPORT SERVICE DELIVERY: CASE STUDY OF BOJANALA PLATINUM DISTRICT - M Mphahlele, Kelelo, Knowledge Management and M Mokonyama, CSIR

In this presentation the authors demonstrated that weak structures compromise transport service delivery. A model for strengthening municipal service delivery was suggested as a way out of this problem. The delegates appreciated the model but questioned whether it was applicable beyond Bojanala District as assumptions and structure change and vary throughout the country. The authors responded that the model was a frame that can be adapted to different contexts.

3. PROPOSED APPROACH TO ADDRESS THE REGULATION OF METERED TAXI AND E-HAILING SERVICES WITHIN THE ETHEKWINI MUNICIPALITY - R Pillay, R Chetty and K Kuppusamy, Ethekwini Transport Authority

The presentation was a progress update on the works in progress in terms of seeking to create an approach to structure and regulate better the e-hailing sector. This is because currently there is a gap as no existing policy cover this group. The approach adopted involved creating a database of e-hailing operators, bringing them to a discussion and agreeing on a licensing quota as well as a queuing system for allocation of licenses as vacancies arise or demand improves. This work was hailed by the delegates as innovative and best practice that should be shared throughout all cities in South Africa.

4. CITY OF CAPE TOWN'S TRANSPORT RESPONSE TO COVID-19 REGULATIONS AND DIRECTIVES - L Van den Berg, City of Cape Town

Presentation highlighted how hotspots were identified and managed. Presentation showed how big data and analytics were vital in transport and related sectors interventions during the peak of COVID-19. During this period total crashes and accidents went down. Noted how perhaps draconian approaches can tame most of the transportation challenges of modern civilization although these fail on democratic ideals. A lot of batteries on the CCCTV and surveillance road eyes were stolen as there was limited physical movement of people. Delegates appreciated the rich presentation and suggested that COVID-19 developed protocols and platforms should be repurposed in the further development and improvement of the transport sector rather than be wasted as an innovation.

5. THE SOUTH AFRICA MINIBUS TAXI INDUSTRY AND ITS OPERATORS: WORKING CONDITIONS DURING COVID 19 - MM Muthige and JD Beneke - Vaal University of Technology

The presentation reviewed COVID-19 working conditions for taxi industry. Noted that the industry experienced losses owing to capacity restrictions despite government relief schemes. The Rank marshals were initially excluded but later benefited which was appreciated. The study recommended that the government should pay queue marshals for loss of income; minibus taxi industry should be subsidized and regulated. In the discussion delegates raised issues on the need to follow on the need for innovation in terms of mobile payment for the industry even after COVID-19.

6. RURAL TRANSPORTATION AND SOCIAL INCLUSION CHALLENGES AND OPPORTUNITIES: A CASE STUDY IN NORTHWEST PROVINCE – NGAKA MODIRI MOLEMA DISTRICT - LJ Kgori, Department of Community Safety and Transport Management, North West Provincial Government and R Jakobo, Western Cape Department of Transport and Public Works

The purpose of the presentation was to highlight the role that rural transport can contribute towards growth and development. Noted that 72% of the secondary and arterial roads are gravel and unsurfaced. 75% of the population walk short distances. There is no rail in the District Municipality. The NMT plan of 2013 has not been applied in the district hence problems of accessibility and mobility persist. While there are projects underway, the problem is lack of institutional support. In the discussion, it was noted that there is need to implement the NMT transport policy done by the DoT in almost all predominantly rural areas as a way of addressing NMT and transportation growth and development challenges in South Africa.

7. GENDER PARITY IN THE MINIBUS TAXI INDUSTRY IN SEDIBENG DISTRICT - MM MUTHIGE, Vaal University of Technology

Presentation noted the endless killings in the sector. Highlighted that people marry a person and not a permit. The study was based on interviewing 7 female operators. The sample had no youth. The findings indicated that there is a lack of an intermodal transport facility or rank for minibuses in the Vaal area. It was noted that women in transport were restricted to minibus sector and excluded from the aviation, rail and road freight sector. The Gautrain Management Agency indicated that work on the Vaal Taxi rank was going to commence soon. It was also felt by the audience that the researcher should broaden focus beyond minibus and focus on public transport as an example. The DoT indicated that a public transport plan was part of the transport plans for Vaal in the pipeline. The discussion on taxi violence noted that the government has a critical role to play, however the government was questioned in terms of its seriousness to provide leadership towards a sustainable solution.

INFRASTRUCTURE

Session 2A, Tuesday, 5 July 2022

Session chair: Prof Joseph Anochie-Boateng, University of Pretoria

Convenor: Prof James Maina, University of Pretoria

A total of nine presentations were scheduled for the session. Eight presentations were made on published papers, and one was an invited presentation. Out of the nine presentations, seven were done at the conference venue (in person) and two were pre-recorded virtual presentations that had presenters on standby to answer live questions from participants in the venue. Only one speaker was not available to present his paper due to illness. However, his co-author, who attended the conference to present another paper in this session, accepted to do the presentation. The overall attendance ranged from 20 to 35 and was higher in the morning session (before lunch) compared with the afternoon session.

1. **THE BIESIESVLEI LONG-TERM PLASTIC CALCRETE BASE EXPERIMENT: PERFORMANCE OVER 30 YEARS UNTIL FAILURE - Dr F Netterberg, Pavement Materials and Geotechnical Specialist**

The speaker used this SATC conference to highlight the long-term behaviour of Calcretes material and field performance over a period of 30 years. The performance of the Biesiesvlei plastic calcrete constructed in 1976 on the now N14-11 in the North West Province was the main point of discussion. The fact that Biesiesvlei road section, with 150 mm-thick plastic, calcrete gravel base and acceptable grading modulus under a double seal and on a 125 mm-thick assumed C4 subbase on a 150 mm Kalahari sand selected subgrade, survived without significant distress until at least 2002, after about 25 years, with reseals and no patching was an interesting discussion point. The speaker indicated that monitoring of the road section over a period of 30 years by means of periodic visual, rut depth, deflection, and roughness surveys, as well as pavement evaluations that involved DCPs, sampling and laboratory testing, enabled simple, performance-related material quality specifications to be derived for untreated calcrete base course.

2. **LATEST DEVELOPMENT OF THE MOBILE LOAD SIMULATORS (MLS) IN CHINA AND THE TECHNICAL FEATURES OF THE CHINESE NATIONAL STANDARDS ON THE ACCELERATED PAVEMENT TESTING MLS – Y Wang, SACTCC, C Hu, South China University, China, N Zheng, Chang’an University, China, C Wu and F Liu, Guangdong Huala Transport Technology, China and W Zhang, TIPTOP, China**

The speaker focused his presentation on the latest development and applications of the Mobile Load Simulators (MLS) technology in China, and mainly discussed the technical features of Chinese national standards on MLS applications. He emphasised that the MLS is an innovative advanced technology product with the original patent registered in South Africa. One of the areas that caught attention and discussion was an indication that China has the most full-scale and 1/3-scale MLS in the world with more than 100 million loading applications tested by MLSs from the east to the west, and the north to the south of China

3. **LOCALISED BRIDGE LOADING FOR SOUTH AFRICA USING WIM DATA - J van Rooyen, Stellenbosch University and P F van der Spuy, Zutari**

Mr J van Rooyen presented this paper. As part of the introduction of the presentation, he shared the history of bridge design and loading in South Africa. The presentation focused on the outcome of an investigation of bridge loading across South Africa using weigh-in-motion data from six provinces that formed one of the main discussion points. Another interesting aspect of the presentation was the fact that, in South Africa, the design of the entirety of highway bridges is done in accordance with the TMH-7 bridge design code, resulting in all the bridge stock designed for the same magnitude of traffic loads. The presenter highlighted on the economical disadvantages because of using this code, and initiated discussions on how best this could be addressed as a country.

4. THE STATE OF BRIDGE LOADING IN SOUTH AFRICA – PF van der Spuy, Zutari

As indicated in the introduction of this report, the author of this paper could not attend the conference to present this paper due to illness. However, Speaker 3 agreed to do the presentation on behalf of the author since the two co-authored the paper on *Localised bridge loading for south Africa using WIM data*. The speaker presented errors and other uncertainties that are inherent to weigh-in-motion (WIM) systems in South Africa and showed how local WIM data can be used to calculate bridge load effects. As expected, there were only a few questions to the presenter since the main author of the paper was not available.

6. STUDIES ON BONDING PROPERTIES BETWEEN POLYPROPYLENE WATERPROOF PLATE AND CONCRETE SEGMENT IN SHIELD TUNNELS - S Yin and M Zhou, Chang'an University, China

This paper was the first pre-recorded presentation of the session. The bonding properties between polypropylene bar and concrete that were tested by authors of the paper was the key presentation point. A pull-out test results was discussed in the presentation. A major lesson learned from the presentation was that stresses distributed on concrete starts to radiate from the bonding interface to the surroundings in a dumbbell shape and gradually decreases. It was discussed that the stress distribution on polypropylene bar gradually decreases from the loaded end to the free end. The speaker emphasised that a finite element model closely reflects bond-slip characteristics between polypropylene bar and concrete.

7. MODAL PUSHOVER ANALYSIS OF MULTI-LAYER OVERPASS BRIDGE - G Zhu and M Zhou, Chang'an University, China

This paper was the second pre-recorded presentation of the session. The speaker confirmed the rationality of using a modal pushover analysis to evaluate the seismic performance of multi-layer overpass bridges. The speaker compared calculated results of pushover analysis, multi-layer analysis and the nonlinear time history analysis methods and discussed that the pushover analysis can reflect the development of the structure from the elastic phase to the elastic-plastic phase in both directions. The deviations between the two analysis methods were clearly shared with participants.

8. DIGITAL TWINS FOR ROAD INFRASTRUCTURE - R Matchett, Zutari and J Wium, Stellenbosch University

This was one of the most interesting presentations of the session. Both authors of the paper shared the presentation and answered questions together, ensuring a more productive session and discussions in the afternoon. The concept of digital twins that is generally believed to be used in product design, simulation, monitoring, optimisation and servicing was clearly presented. The speakers alluded a digital twin has become a popular research topic over the past ten years and has been identified as a top potential emerging technology for infrastructure projects. They showed that digital twins are commonly associated with projects that have origins in building information modelling (BIM) and are considered to represent the ultimate state of asset information systems that are produced as part of the design and construction process in the built environment. The speakers emphasised that digital twins have a high potential to support road infrastructure asset management processes.

9. DIGITAL TWINS – Dr C Davey, University of Pretoria

A case study of an on-going digital twin project at the university of Pretoria campus was presented by the speaker. This is a project that enables integrated management and use of dynamic quantitative, geometric, spatial and documentation information, supporting better road asset management decision making for the university. As a result of the interest developed by the audience during prior presentations, a joint panel discussion was held on digital twin to further discuss the topic. Speakers answered several questions as participants were curious to know more about this new technique.

URBAN AND PUBLIC TRANSPORT COMBINED WITH CAPACITY BUILDING/ TRANSPORT FOR RURAL DEVELOPMENT

Session 2B, Tuesday, 5 July 2022

Session chair and convenor– Urban and Public Transport: Prof Roger Behrens, University of Cape Town

Session chair – Rural Transport: Prof James Chakwizira, North West University

Convenor – Rural Transport: Mr Mac Mashiri, Gwarajena TRD

Urban and Public Transport: Research topics in the Tuesday (5 July) morning session included papers on evaluation and assessment methods, protecting biodiversity, cross-border minibus-taxi movement patterns, and public transport planning. These papers covered:

- Evaluating different multi-criteria decision methods for the comparison and investigation of public transport projects.
- Developing a gender and mobility policy assessment tool: South Africa as a pilot country.
- Greening the transport sector by mainstreaming biodiversity.
- An analysis of cross-border minibus taxi movement patterns using geographic information system (GIS): Case study of routes between South Africa and its neighbours.
- Public transport as a stimulus in socio-economic development and urban regeneration; case study: Detailed public transport plan for the inner city and outer ring of eThekweni Municipality.

1. **TRANSPORT RELATED AIR POLLUTION AND ITS IMPLICATIONS ON PUBLIC HEALTH ALONG SELECTED ROAD CORRIDORS IN LAGOS METROPOLIS, NIGERIA - SA Ajayi, CA Adams and G Dumedah, Regional Transport Research and Education Centre Kumasi (TRECK) Kwame University of Science and Technology Kumasi, Ghana and W Ackaah, CSIS; Building and Road Research Institute Kumasi Ghana**

The presentation sought to link the nexus between transport and health. Noted that 3 hours congestion delay is common in Lagos and children are exposure to emissions as they must trade and hawk in assisting facilities to survive on the road. Heavy good vehicles as well as high importation of second-hand cars fuel emissions. Approximately 400000 vehicles per year are imported into Nigeria. The major transport corridors have the highest density of traffic and concentrations of particulates. Carbon dioxide is severe in all transport corridors and especially highly concentrated on traffic intersections and roundabouts. 78% of vehicles on the road are used vehicles that are not efficient. Data from health institutions in the vicinity of the transport corridors was used to correlate pollution levels and health records in terms of illness reported. The long-term plan is to move to EVs rather than ICE vehicles, which is a common challenge for almost all economies in Africa and developing countries by extension. The roll out of the BRT throughout Nigeria is expected to go a long way in seeking to address these matters.

2. **ARE ALL MINIBUS TAXI OWNERS BORN OF THE SAME NON-BUDGETING MOTHER? - MM Muthige, JD Beneke, N Robbertze and S Manuel, Vaal University of Technology**

The presentation highlighted that 74 % of the taxi owners do not budget and they do not keep records of their budgets. 30 % indicated that there is no need for a budget in their industry. The research identifies a knowledge gap in terms of the non-accounting formal systems in place. It was suggested that TETA can help and has suggested simple budgeting training spreadsheet. Audiences raised question as to why a non-budgeting mother and not father. CSIR Ghana also highlighted that taxis are not bought for a profit motive but to take children and family to work as other taxis are not reliable. During the time when owners and children are at work and school the taxi can operate as a cost cutting measure rather than a full throttle business activity. The President of the South African network of Women in Transport highlighted that it is correct to talk of “non budgeting mother” as fathers are on the streets while the mothers are balancing the books. Discussions also revolved on whether the problem is with budgeting or deliberate non-disclosure as minibuses taxis have been surviving without the government. The

researcher was also quizzed with respect to the representativeness of the research as delegates felt the sample was too small. It was also noted that taxi owners talk of taxi registration for compliance rather than tax clearance as they operate in terms of tax evasion. The research can be upscaled with more municipalities, provinces and having more taxi organisations involved so that a robust and flexible policy can be charted.

3. INVESTIGATING THE RELATIONSHIP BETWEEN TRANSPORT AND LABOUR DISCOURAGEMENT IN SOUTH AFRICA - J van der Merwe (Presenter)* and Prof SC Krygsman, *Department of Logistics, Stellenbosch University

The presentation highlighted how low-income earners spent 2 hours and R310 rands weekly on commuting costs. This translated to R1200 monthly transport costs which is a quarter of the low-income average income. These are some factors that can act as discouragement for people to seek employment. It was suggested that to solve discouragement job portals and free Wi-Fi by municipalities should be implemented. Strengthening township economies can also help in solving the problem. Transport constraints have many dimensions e.g., time constraints, cost constraints and spatial divide constraints. However, it was noted that new ways of job seeking had emerged and these may not need anyone to travel physically. The researcher was requested to recheck the intercept in the model so that travel times and travel cost including minibus taxis are incorporated clearly in the model. In addition, issues of non-operational hours for subsidized buses required injection as well as the impact of train operations or unavailability. There was also discussion on reviewing fee structure from flat fees and consider differentiated peak and off-peak fares, distance-based fees etc. The regression model although good still required to be refined. The Department of Transport expressed interest in having the research reduced into a position paper.

Takeaways from the Rural Transport Sessions:

1. *Building Global Equity in Transport*

Transport equity and transport justice are now considered critical in any modern society. While the authors highlighted how transport costs, the spatial divide and weak governance in India affect the capacity to achieve the goals of transport equity and indeed transport justice, the ensuing discussion revealed that this was the case across many developing countries, including South Africa. The authors recommended a transport equity and justice assessment and implementation framework that can assist in the realization of equity in transport with impact indicators revolving around facility provision, cost-benefit, economics, accessibility and externalities.

2. *Strengthening Municipal Transport Service Delivery*

With the aid of an example, the authors demonstrated that weak structures across the board tend to compromise transport service delivery. A model for strengthening municipal transport service delivery that can be adapted to different contexts and based on the strong view that organizational administrative-political synergy and socio-economic resilience are key enablers of capacity development of service delivery structures and policies, was proposed.

3. *Finding the Middle Ground in Seeking to Fairly Regulate Taxi and e-Hailing Services*

Currently there is a gap in terms of policy and regulations that adequately cover both the taxi and e-hailing services. While this was work in progress, the approach involved creating a database of e-hailing operators, bringing them to a discussion table and ensuring agreement on licensing quotas as well as a queuing system for allocation of licenses as vacancies arose or demand improved. This work was hailed by the delegates as innovative and branded best practice that should indeed be shared throughout all cities in South Africa where these services have mushroomed.

4. **Development and Repurposing the COVID-19 Transport Service Delivery Protocols and Platforms**

The presentation demonstrated how big data and analytics were vital in transport and related sector interventions designed to slow down, and eventually stop the pandemic in its tracks, especially during its peak. Given this relative success, albeit in an emergency, delegates felt that these transport service delivery protocols and platforms should be adopted, further developed and repurposed for improved service delivery in normal times.

5. **Strengthening Social Inclusion in Transportation**

Delegates agreed that one of the most important pillars in terms of strengthening social inclusion in the transportation sector relates to the need to resource and implement the Non-Motorized Transport Policy developed by the Department of Transport.

6. **Towards Marshalling Sustainable Development Kinetic Energy on the Eastern Seaboard through the Concept of a Rural Smart City**

The presentation resonated extremely well with the audience not only because it's a rural initiative and the presidency has significant interest in it, but also because the smart city concept is currently a topical issue the world over. Two of the enduring views were that such a transformative project as the Eastern Seaboard Region certainly needs (a) communities residing in it to be super prepared to take advantage of this wonderful opportunity, and (b) municipalities that are relatively well capacitated and galvanized to be in a position to run with the various initiatives. After a spirited discussion among delegates, several issues were raised that deserve following up from not just the Department of Transport, but government as a whole:

- **Capacity Building:** Capacity building is required at 3 levels – Municipal Officials, Traditional Authorities and Communities. So, capacity here, for example, requires the funding of a Transport Planner position in local municipalities in the region – who then becomes the custodian of the various transport plans in place until such time as the municipality can budget for that position. It also means workshopping senior management on rural transportation issues facing the municipality, workshopping councillors and ward committees on the same issues. It also means workshopping traditional authorities and community members.

Such capacity building initiatives need to be replicated across the region with a view to ensuring that communities and their local authorities become aware of the opportunities that the new region (and indeed, individual projects such as the national route N2) will bring and how they can exploit that as Local authorities, as communities and as individuals for sustained socio-economic development.

- **Eastern Seaboard Regional Rural Transport Master Plan (ESRTMP)** – Given that NATMAP is silent on many transport issues in the region, concentrating as it does, on traditional urban environments, it will be important to undertake an ESRTMP that considers both community transport needs as well as regional transport infrastructure and services issues. This, would then feed into a revised NATMAP, which like the regional spatial development framework currently being developed for the region, would indeed inform the National Spatial Development Framework (NSDF), and by extension, the National Development Plan (NDP)
- **Eastern Seaboard Regional Rural Development Research Chair** – It will be important to rope in the institutions of higher learning in the region to get involved in the regional idea. One way to do this revolves around funding a research chair, for example, at Walter Sisulu University, to undertake research in the region – which is almost always cheaper than to bring in commercial firms to do it. UKZN has a research chair on rural development – and perhaps the region should canvas for some research grants to be made available to research the many development topics in the region. On the eastern side of the Eastern Cape, for example, they could do more research to ensure that the RED zones run by the Eastern Cape Rural Development Agency are even more productive – bringing in cash crops such as hemp, sprucing up the Magwa Tea Estates, etc.

- **Eastern Seaboard Maritime Spatial Development Framework** – While the regional spatial development framework currently under development will certainly confine itself to the land, it will be imperative to seek to generate a spatial framework for development for the coastline/sea spanning the region covering our internationally recognized boundaries at sea – and unravel the opportunities that are currently hidden there, including green energy – it is not called the Wild Coast for nothing.

In public transportation terms, for example, it would be important to investigate the various modes that would connect all the towns along the long coastline, including the use of a hydrofoil.

- **Eastern Seaboard Urban Development Framework** – It would be crucial to generate an organizing framework and philosophy for the smart cities on the seaboard that is uniquely African – this would be a first. All these towns need to have master plans, so land can be demarcated now and preserved before some vultures take it up
- **Eastern Seaboard Environmental Master Plan** – if we can call it that – it will be important to persuade DFFE – to fund such an environmental strategy that outlines elements that could be included in the RSDF which show indicatively where development can and should not be encouraged, facilitating the flow of investment in the region. Of course, for each development initiative – an assessment would still need to be done. This would feed into the rural regional development plan
- **Eastern Seaboard Regional Rural Development Plan (ESRRDP)** – once all the sector plans have been generated – including the Regional Spatial Development Framework – it will be important to synthesize this in the form of an ESRRDP – which would be like the NDP of the region – that captures not only the philosophical basis for the region, but also the development issues and development projects for the region (such as smart cities) – which will also be employed to market the region.

FREIGHT AND LOGISTICS

Session 2C, Tuesday, 5 July 2022

Session chair: Dr Paul Nordengen, Heavy Vehicle Transport Technology Africa

Convenors: Dr Paul Nordengen, Heavy Vehicle Transport Technology Africa and Dr Wilna Bean, University of Pretoria

Six papers were presented during the Freight and Logistics session, four of which focused on vehicle and tyre technology and the last two on logistics. Unfortunately, the presenter of the last paper, Ms Peace Tushabe from Uganda, did not arrive at the conference (without prior notification), so her paper was not presented.

1. **TYRE ANOMALY AND CLASSIFICATION TECHNOLOGY FOR IMPROVED ROAD SAFETY, REDUCED EMISSIONS, AND INFRASTRUCTURE PROTECTION – BO Ezeanowi, International Road Dynamics, Canada and TW Haichert, IRD, Canada**

The presentation described an innovative approach for detecting tyre anomalies in a non-invasive manner (vehicles travelling at speed). The method can identify tyres that are at high risk of failure as well as assist transport operators easily identify tyres that are over-inflated, resulting in increased fuel consumption, emissions and vehicle operational cost. This tyre anomaly and classification system is becoming widely accepted by North American enforcement agencies for screening commercial vehicles for unsafe tyres.

2. A RECONFIGURABLE LINEAR MODEL FOR PERFORMANCE BASED STANDARD (PBS) VEHICLE DEVELOPMENT – TMG Komana, PhD student and Prof PS Els, University of Pretoria

The presentation described multi-axle, multi-articulation heavy vehicle linear state space model that operators and designers can use in the early stages of development as part of the Smart Truck/ Performance-Based Standards (PBS) programme. The model can be used to conduct a feasibility study to determine whether a proposed PBS vehicle design will have a positive ROI (Return on Investment) for the operator. The model can also be used in concept design to identify the necessary hardware (tyres, suspension, etc.) and evaluate the proposed vehicle's performance. The model does not require a vehicle dynamics specialist (as is the case with typical PBS design software) and can be used by the designers themselves. Further, the model can be operated in common coding languages (e.g., MATLAB, Python) thus reducing the cost of PBS development.

3. USING GAUSSIAN PROCESS MACHINE LEARNING TO PREDICT DYNAMIC ROAD WEAR OF A RIGID HEAVY VEHICLE - A Steenkamp, CSIR Smart Mobility and A Steenkamp, CSIR Defence and Security

The presentation described the first iteration of a machine learning model to predict the dynamic road impact of a rigid 4x2 heavy vehicle. The machine learning model was built using Gaussian Processes and the data produced using TruckSim. Dynamic road impact is calculated using the aggregated 1st and 4th power forces. The model takes into consideration road crossfall as well as the variation of several heavy vehicle parameters to increase the usefulness of the model. The aim is to provide a comparative tool for truck suppliers and heavy vehicle operators to improve the design of their heavy vehicles from a dynamic road wear perspective (i.e., to reduce road wear per tonne of payload transported), which is one of the requirements of the Smart Truck/Performance-Based Standards Programme.

4. DEVELOPING A TRUCK ROLLOVER RISK CALCULATOR FOR SOUTH AFRICA - A Ferreira, Wits University, CC de Saxe, University of Cambridge, United Kingdom, A Steenkamp, CSIR and JA Nordengen, University of Pretoria

The presentation described the investigation of simplified Static Rollover Threshold (SRT) calculations prescribed by the New Zealand Land Transport Rule (NZLTR) and UNECE 111 as the basis for the development of a user-friendly SRT calculator. Static Rollover Threshold is one of the key safety-related performance standards that form part of the Smart Truck/PBS programme. The calculation results were validated against a multi-body dynamics model using TruckSIM for the case of a rigid truck for a range of vehicle suspension and mass properties. The UNECE 111 calculations were used as the basis for a Python-based SRT calculator user interface. The calculator demonstrates how pre-loaded technical vehicle data and logic can be used to minimise the required user expertise and knowledge to effectively use the tool in industry – for assisting with the development of a workable PBS vehicle combination in the early stages of design.

5. IMPROVEMENT OF THE ECONOMIC AND OPERATIONAL EFFICIENCY OF FREIGHT ROAD AND RAIL TRANSPORTATION IN SOUTH AFRICA - BJ Mokobori, R Gopinath and DK Das, Central University of Technology, Bloemfontein

The presentation investigated how freight road and rail transportation can be used effectively to reduce travel times, freight transport costs and generally improve the delivery efficiency of diverse commodities in South Africa. The methodology adopted involved the collection of data through survey questionnaires among various stakeholders in the freight industry. The findings of a comparative analysis revealed that road freight is significantly more competitive than rail freight as it provides lower travel times, carries smaller freight loads (therefore is more flexible), and accommodates a much greater range of commodities. The study considered aspects such as freight costs, travel factors and economic contribution and suggested that rail freight be utilised, as far as possible, on long haul corridors and road for shorter distances.

6. INDIVIDUAL ETHICAL ORIENTATION, ETHICAL SENSITIVITY AND PERFORMANCE OF THIRD-PARTY LOGISTICS FIRMS IN UGANDA - P Tushabe, African Shipping Association

This paper was not presented at the conference.

TRAFFIC MANAGEMENT, SAFETY AND SECURITY COMBINED WITH ENGINEERING FOR SAFE SYSTEM FORUM (ESSF)

Session 2D, Tuesday, 5 July 2022

Session chair – Safety and Security: Dr Karien Venter, CSIR

Session chair – ESSF: Mr Andrew van Gruting, SANRAL

Convenor: Dr Hubrecht Ribbens

1. SOUTH AFRICA'S RESPONSE TO THE SAFE SYSTEMS APPROACH - T Ndebele, RTMC Executive Manager Road Safety, Stakeholder Relations & Marketing

In September 2020, the United Nations (UN) General Assembly proclaimed 2021 to 2030 the 2nd Decade of Action for Road Safety. South Africa, as one of the 194 member countries, agreed to the adoption of the UNDoA, again pledging to achieve a target to reduce road deaths and serious injuries by half (50%) by 2030. UN Regional committees, including South Africa prepared their action plans in accordance with the global action plan.

Highlights:

- South Africa is aligning with the NRSS2030. However, implementation of road safety actions is more difficult than preparing the strategy.
- South Africa is a hybrid nation, that needs to acknowledge and address socio-economic issues from a first and third world perspective. Understanding the social context is a key factor in solving road safety problems on a community level as needs differ from area to area. Road safety efforts are complicated by long travel distances, crime, and other social factors. Initiatives such as the Department of Transport Shova Kalula programme which aims to promote safe travel and reduce distances and long travel times. Some salient issues related to South Africa's progress towards achieving the UNDoA targets are:
- While South Africa is aligning with the NRSS2030, implementation of actions is proving to be far more challenging than merely preparing the strategy.
- Road safety efforts need to be cognisant of South African context - being a hybrid nation, we need to acknowledge and address socio-economic issues from both a first and a third world perspective.
- Understanding the social context is a key factor in solving road safety problems on a community level, as needs differ from area to area.
- Road safety efforts are complicated by long travel distances, crime, and other social challenges. Initiatives such as the Department of Transport's Shova Kalula bicycle programme aim to promote safe, efficient travel

Progress Indicators to date include:

- Fatalities for 2021/22 were 14% greater than in 2020/21. However, they were 5% lower when compared to the latest non-COVID-19 influenced festive season figures.
- Pedestrian fatalities declined by 14% (84 lives) compared to the previous festive season.
- Medium-term engagements need to include town planning initiatives to ameliorate the dangers of a mix of pedestrians and cars.

2. DEFENSIVE ADVANCED DRIVING, LAW ENFORCEMENT AND WORKING CONDITIONS: A MINIBUS TAXI DRIVER PERSPECTIVE - M Muthige, Vaal University of Technology

This paper considers driving behaviours of minibus taxi drivers, law enforcement attitude toward minibus taxi drivers and the impact that working conditions in the taxi industry have on minibus taxi driver behaviour.

The key findings from the study were:

- Minibus taxi drivers are concerned about the level of corruption they encounter with law enforcement officials daily.
- Minibus taxi drivers felt abused and disrespected by fellow motorists.
- The data showed that the minibus taxi drivers drove at an average speed of 114 km per hour in an 80 km per hour zone.
- Minibus taxi drivers reported an average of 15 working hours per day. They are paid per trip and to earn more income, the drivers drive longer hours.
- This labour practice causes drivers to drive while fatigued, contributing to reckless and violent driving behaviour that results in accidents.

Recommendations included:

- The Department of Labour and the Department of Transport should investigate the issue of working conditions at minibus taxi ranks and implement fair labour practices as well as a minimum wage within the minibus taxi industry.
- South African traffic officers should have body cameras to monitor them when they are on duty. This will prevent them from taking bribes.
- The demerit system should be implemented to punish reckless and speeding drivers. Government should mount more speed cameras alongside roads.
- All minibus taxi drivers should only be allowed to drive the minibus taxi with advanced driving skills. To train drivers, the minibus taxi industry association and leadership should appoint advanced driving training agencies.
- All minibus taxis on the road should carry insurance so that law enforcement officers can quickly identify minibus taxis operating without a valid operating licence.
- Road safety campaigns should be done all year round.

3. HARNESSING LEISURE CYCLISTS TO PROMOTE COMMUTER CYCLING - E Da Silva and P Onderwater, Hatch Africa

This paper explores if and how the sub-culture of leisure cyclists can be harnessed to create further cycling use for commuter trips within South Africa. Cycling in South Africa is a scarce mode of transport for commuter purposes but is seen as a leisure activity undertaken by specific groups. Whilst the leisure cyclist sub-culture has gained popularity amongst their communities, often this is where their bicycle use ends. In South Africa, limited cycle lane facilities are available, which increases traffic unsafety amongst cyclists. Sandton, Soweto, and Tshwane contain a few dedicated routes - and promotion of cycling as a sustainable mode of transport within South Africa is often downplayed owing to a lack of infrastructure. However, studies within communities have shown that leisure cycling sub-cultures exist, even where no cycling infrastructure is available. Therefore, there is an innate attraction to cycling within these groups that has the potential to achieve a modal shift for other trip purposes. By understanding the drivers related to these subcultures it could be possible to formulate the desired conditions required

to create South African cycling common use. In this paper, we have surveyed several leisure cyclists, to identify the attractive components for leisure cycling as well as the hinderances to commuting cycling use. We used the findings to develop a set of requirements that would assist in promoting more commuter-type cycling activity in the country as well as attracting more cyclists.

4. THE EFFECTIVENESS OF SIDEWALKS ON PEDESTRIAN SAFETY IN A TOWNSHIP ENVIRONMENT - D Naicker and M Sinclair, University of Stellenbosch

South Africa needs to provide safe roads for all road users. In its urban environments, pedestrians are often neglected when the design and construction of road networks take place. Yet, many South Africans are most dependent on walking as a form of mobility often most evident in poor income areas. Poor income areas include older 'Township' establishments as well as the more recent RDP housing developments that have been built since the end of apartheid. International studies show that the physical separation of pedestrians and vehicles will typically reduce road crashes and fatal injuries to pedestrians. In a township environment, where walking may be the predominant mode of transport, the potential of sidewalks to improve road safety seems straight forward. However, operational elements such as the lack of traffic enforcement and poor driver behaviour; poor road safety education; lack of infrastructure and undisciplined pedestrian and public transport movement, may well influence the effectiveness of sidewalks, and this has yet to be investigated. This study assessed the effectiveness of new sidewalks on pedestrian safety along four roads in three townships in eThekweni. Comparisons were made of crash data before and after installing a sidewalk on already constructed roads, and observations were carried out along each route to begin to understand the behaviour of the pedestrians and the overall effectiveness of the sidewalks at the sites. Observations included a breakdown of the number of people walking until (and using) a crossing point; the number of people not crossing at a crossing point; and the number of people choosing to walk in the carriageway (i.e., not on the sidewalk).

5. IMPROVING ROAD SAFETY THROUGH UNIVERSAL ACCESS DESIGN AND ACCESSIBILITY WITHIN THE BUILT ENVIRONMENT AND INFRASTRUCTURE - F Combrink, City of Johannesburg

The provision of accessibly transport facilities and services is a constitutional right. There is a need to provide infrastructure that enables all transport users to have equal access to safe transport and travel opportunities. Numerous pieces of legislation and regulations refer to the need for accessible and safe transport and transport facilities. In addition, the National Transport policy 2021 contains strategic objectives and policy statements for transport and emphasises a national commitment to universally accessible transport. A universal design approach to ensure safer infrastructure for all includes the realisation that there is a need to remove or neutralise obstacles that can hinder the progress, safety of people, regardless of their age, capability, or status in life; people pushing a trolley or a pram, people with a temporary disability or injury, and people with any disability, be it visual, mobility or hearing or other. This applies to any trip hazard on footway surfaces, level difference between two surfaces, a flight of stairs, or even a single stair or step. A significant amount of research and development has been completed over the last decade and it is the onus of the designers and planners of the system to make the system safe and accessible for all users. However, planners, designers, and constructors of the transport system, still fail to provide equal access to transport for all transport users.

ENGINEERING FOR SAFE SYSTEM FORUM 2022

The South African Road Federation (SARF) started the Engineering for a Safe System Forum (ESSF) in 2020. The ESSF presents the opportunity to elevate the discussion about road safety engineering and the forum endeavours to promote the adoption of the Safe System Approach (SSA) to address and improve road safety going forward. The research presented at the ESSF 2022 was commissioned by the Road Traffic Management Corporation (RTMC) and is firmly based on the Safe System Approach. These guidelines provide guidance in terms of Road Restraint Systems, Road Network Screening, Network Level Assessments and Road Safety Investigation, and Road Safety Audits. The guidelines (TMH 24 and TRH 29) discussed at the ESSF 2022 were published in March 2022 and are currently under review in accordance with the Committee of Transport Officials (COTO) process.

The following presenters were involved in the ESSF 2022:

INTRODUCTION AND CONTEXT - D Roux, Road Traffic Management Corporation (RTMC)

Designing within the Safe System approach, requires a design that considers *functionality, homogeneity, predictability, forgivingness of roads, as well as status of awareness of road users*. The Safe System Approach advocates the need to adopt the viewpoint that roads and roadsides should be *forgiving*, and that fatal and serious accidents should not occur as result of driver error. Countermeasures (such as a reduction in speed limits) need to reduce crash severity to survivable limits and/or eliminate or compensates for the human error.

TMH 24 SOUTH AFRICAN ROAD RESTRAINT SYSTEMS MANUAL (SARRSM) - Dr L Roodt

The RTMC initiated the Road Restraint Systems (RRS) research project to provide a uniform approach to the assessment, evaluation, prioritisation, and design of road restraint systems across all road networks. The SARRSM 2022 is part of the South African Road Safety Manual (SARSM) series of documents that have been developed to assess or audit road safety conditions, identify areas that require improvement and provide guidance to improve road safety on the South African road network, including the installation of RRS. It is accepted in road design that no road is entirely safe because, inherent to the driving task, there is the constant risk of damage to property or injury to persons. The aim of RRS is to contain and redirect errant vehicles to avoid injury to occupants and reduce the damage to vehicles and infrastructure (SARRSM, 2022). RRS (both vehicle and pedestrian restraint systems) forms a vital part of the road planning and design process and requires detailed knowledge of civil, transportation and traffic engineering, and road safety principles. Technical Methods for Highways (TMH 24) consists of two volumes compiled under the auspices of the Committee of Transport Officials (COTO):

- Volume I offer an overview of assessing and addressing roadside hazards and the protection of road users.
- Volume II provides guidance on standards that any RRS must comply with and the requirements that they need to fulfil. Volume II provides detailed design parameters for different RRSs that will fall under the proposed South African National Standards (SANS) 51317 which is based on the EN1317:1998 and the current SANS 1350: Guardrails for roads (W-section) standards. The COTO Draft Standard Specifications for Road and Bridge Works for South African Road Authorities (DSS 2020), Chapter 11: Ancillary Road Works, Section 11.4 *Road Restraint Systems* provides some guidance as to performance-based design. Although South Africa adopted the European standard (EN 1317:1998), there is a need to take note of United States of America's Manual for Assessing Safety Hardware (MASH), which allows for testing of road restraint systems against heavier vehicle impacts.

TRH 29 SOUTH AFRICAN ROAD SAFETY ASSESSMENT METHODS (SARSAM 2022) FJJ Labuschagne, SARF

The revision of SARSAM 2012 recognises the extensive development of methodologies and guidelines aligned with the Safe System Approach and facilitates the improvement of road infrastructure safety performance. The revision resulted in the South African Road Safety Assessment Methods – SARSAM 2022. SARSAM 2022 considers road safety research and practices that has come to the fore since publication of SARSAM 2012 and acknowledges international trends to develop road safety engineering manuals as multi-part documents focusing on specific aspects. These aspects include screening of the road network to identify sites which hold potential to be improved by subjecting them to formal road safety assessment and inspection processes. Experience gained in Network Screening and Road Safety Assessment processes has also been incorporated to address deficiencies and/or to repackage the document to provide a more pragmatic approach for network level assessments in South Africa. Extensive guidance is naturally also provided for road safety audits on upgraded or proposed/newly opened roads.

SARSAM2022 consists of three volumes, namely:

- **Volume 1: Network screening**
- **Volume 2: Road Safety Assessment**
Network Level Assessment
Road Safety Inspection
- **Volume 3: Road Safety Audit**

Part A - RSA Management: Policy and Procedures

Part B - Conducting Road Safety Audits

ESSF CLOSURE - B Johnson, SARF

SARF supports the Safe System Approach and the technical documents that have been prepared in support of making South African roads safer from an infrastructure perspective. Both TRH 29 and TMH 24 are currently COTO Draft Standards that will follow well-regulated COTO review processes for TRH and TMH-type publications. SARF will support the development and training of practitioners to implement the guidelines.

3RD REGIONAL SEMINAR ON WEIGH-IN-MOTION (DAY 1)

Session 3A, Wednesday, 6 July 2022

Session chairs: Mr Hans van Loo, Corner Stone, Mr Andy Less, Q-Free and Dr Paul Nordengen, Heavy Vehicle Transport Technology Africa

Convenor: Mr Hans van Loo, Corner Stone International

1. OPTIMIZING ROAD FREIGHT TRANSPORT USING WIM DATA

The session was chaired by Mr. Hans van Loo, ISWIM & Corner Stone Int., Switzerland.

- Mr. Chris Koniditsiotis, the president of the International Society for Weigh-In-Motion (ISWIM) welcomed all delegates to the 3rd Regional Seminar on Weigh-In-Motion (RSWIM3). He gave a short introduction of ISWIM, its objective, activities and membership base. He explained the objective of the RSWIM3 is to bring together end users, researchers and manufacturers of WIM systems and data to exchange experiences, ideas, latest developments and needs for the future for the use of WIM in Southern Africa.
- Mr. Nazir Alli, the founding CEO of South African National Roads Agency Limited (SANRAL) and current president of the World Road Association (PIARC) gave an introduction of the PIARC organisation, its history, members and activities. He stressed the importance of the cooperation and exchange of experiences between road authorities, technical experts and systems providers in all topics relevant to the usage, operation and maintenance of the road infrastructure including WIM.
- Mr. Louw Kannemeyer, the Engineering Services Executive of the South African National Roads Agency (SANRAL) presented an overview of the current implementation of WIM systems and use of WIM data in South Africa. He explained SANRAL's plans use WIM for direct weight enforcement in South Africa.
- Mr. Hans van Loo, coordinator of promotional activities of ISWIM and international expert on WIM from Corner Stone Int. provided an overview of the recent global developments in WIM. This included the improved accuracy and reliability of WIM systems and new sensors capable of detecting tire pressure that may be used for traffic safety applications. Next, he showed the implementation of WIM for direct weight enforcement in several countries around the world and the need for a practical international standard for this. Finally, the combination of different technologies was described, e.g., Road-and Bridge-WIM, In-Road and On-Board WIM.

2. OVERLOAD DETECTION AND MITIGATION IN THE WORLD

The session was chaired by Mr. Hans van Loo, ISWIM & Corner Stone Int., Switzerland.

- Mr. Bernard Jacob from the University Gustave Eiffel in France presented an overview of the current practices in overload detection, direct enforcement, and mitigation around the world. He presented the different applications of WIM systems that are currently for weight enforcement and their main disadvantages. Finally, he explained the challenges, pre-conditions, and requirements for the use of WIM for direct enforcement and examples of implementations in a number of European countries.
- Mrs. Alta Swanepoel, the owner of Alta Swanepoel and Associates CC (ASA) in South Africa. Her presentation addressed the current legal position on the requirements for mass measuring. She assessed the scope and requirements of the relevant legislation, the Trade Metrology Act, 77 of 1973, the Legal Metrology Act, 9 of 2014 and National Road Traffic Act, 93 of 1996 for the controlling overloading of vehicles. She concluded with the challenges to use WIM measurements to prosecute operators and drivers criminally or administratively.
- Mr. Gustavo Otto from Labtrans/UFSC presented on behalf of Mr. Fernando Bráulio from the National Department for Transport Infrastructure (DNIT) in Brazil. Gustavo presented an overview of the current implementation of WIM systems as pre-selection tool for remote operated weigh stations in Brazil and DNIT's plans for the implementation of WIM for direct enforcement in Brazil in the coming years.
- Mr. David Bétaille from the University Gustave Eiffel showed the approval method for direct enforcement of overloading in France. He started with an overview of the more than 60 years of history of the use of WIM systems in France. In 2013, the General Directorate for Infrastructure, Transport and the Sea (DGITM) of the French Ministry of Transport launched a new WIM project, led by IFSTTAR and involving Cerema, to investigate the feasibility of using HS-WIM systems for direct enforcement in a legal metrology frame. Finally, he described the working method used to approve High Speed WIM systems for direct enforcement purposes.

3. PRACTICAL APPLICATIONS OF WIM

The session was chaired by Mr. Andy Lees, ISWIM & Q-free, UK.

- Mr. Rob Sik from MIKROS in South Africa gave an overview of the role of Mikros Systems in the more than 40 years of history of the implementation of WIM systems in South Africa. He explained the Technical Methods for Highways (TMH) that ensure uniform methods for highway engineering in South Africa in general and specifically the TMH3 that covers WIM monitoring services.
- Mr. Leonardo Guerson from INTERCOMP in the USA presented the experience of Intercomp and Fiscal Tech in Brazil on three different strategies of WIM for direct enforcement. He explained the main differences and advantages of the three modes of WIM for weight enforcement currently used in Brazil: automated fixed weigh stations, mobile weigh stations and High-Speed WIM for direct enforcement.
- Mr. Jan Fučík from CAMEA in the Czech Republic shared Camea's long-term experience to develop a novel weighing digital sensor for further evolution of WIM technology. The new sensor can measure the tyre position, single or double tire configuration and the tyre footprints. This can be used to detect over- or underinflated tyres and missing tyres; this information can be used to improve traffic safety.

4. IMPLEMENTATION OF A WIM NETWORK

The session was chaired by Mr. Paul Nordengen, Heavy Vehicle Transport Technology Africa (Pty) Ltd, South Africa.

- Mr. Brendan Ezeanowi from International Road Dynamics (IRD) in Canada presented a recent WIM installation as part of the 'Source of the Nile' Bridge (New Jinja Bridge) Project in Uganda. WIM systems were installed at both approaches to the bridge to have a more efficient weight enforcement, to reduce overloading and to achieve the expected lifespan of 120 years. The Virtual Weigh Station (VWS) consisted of three rows of piezo quartz sensors capable of achieving ASTM Type III / COST 323 A[5] accuracy classes.

- Mr. Lucas Franceschi from Labtrans/UFSC in Brazil answered the question: Where should WIM stations be placed? Using the Brazilian approach including a novel data-driven spatial decision support system selection of WIM locations. It includes a multi-criteria method developed to facilitate decision-making in this process by summarizing a set of important information. The method is currently being used by the Brazilian National Land Infrastructure Department (DNIT).
- Mr. Hans van Loo from Corner Stone Int. in Switzerland presented a new hybrid method for the implementation of a WIM network using a combination of different WIM technologies. Short term Bridge-WIM measurements will be used to identify actual overloading hot-spots on the road network prior to investing in the installation of more costly, permanent In-Road WIM systems. This hybrid approach is especially suited for countries where no reliable information is available on the actual distribution of traffic overloading and has been used in the Serbia and Georgia in Europe.

URBAN AND PUBLIC TRANSPORT

Session 3B, Wednesday, 6 July 2022

Session chair and convenor: Prof Roger Behrens, University of Cape Town

Research topics in the Wednesday (6 July) session included papers on public transport data, minibus-taxi regulation, data collection methods, parking management, Covid-19 impacts, and non-motorised transportation.

- Analysing NHTS on public transport aspects
- Using topic modelling to analyse bus route data.
- Moving from a reactive to proactive public transport regulatory environment in the City of Cape Town; phase 1: Minibus taxi special regulatory project.
- An innovative method to collect route choice preference data using a smartphone application.
- Experiments in understanding passenger needs on the first and last mile of the public transport trip.
- Assessing the effectiveness of reduced parking requirements in facilitating transit-oriented development: a case study of 'PT areas' in Cape Town.
- The state of transport opinion poll: Gauteng 2021.
- A self-perception theory meta-analysis of the habit-breaking impacts of Covid-19 travel restrictions in South African cities.
- Public transport as a driver of economic and social revitalisation in central business districts: The case of Pinetown, eThekweni.
- 'Pedestrians don't build the economy': Why walking policies don't match policy outcomes in African-cities.
- Over a decade of developing accessible infrastructure in South Africa.

The contexts of papers covered Cape Town, eThekweni, and Gauteng. Most papers (seven out of 16) focused on various aspects of public transport planning, followed by (four out of 15) on changes in travel behaviour and attitudes (particularly in a declining Covid-19 context). Amongst other things, these papers highlighted important recent shifts in travel behaviour that have been accelerated by Covid-19 movement restrictions and raise questions on what a 'new normal' will look like (the overall conference theme in 2022).

9TH CHINA AFRICA TRANSPORT CO-OPERATION FORUM AND MAGLEV TRAINS APPLICATIONS

Session 3C, Wednesday, 6 July 2022

Session chair – China Africa: Dr Emile Horak, Kubu Consultancy

Convenor – China Africa: Mr Yuchen Wang, SACTCC

Session chair – Maglev: Mr Tshepo Kgobe, Gautrain

Convenor – Maglev: Mr Gerhard de Beer, AIH Group

1. THE NEW DEVELOPMENT WITH THE INNOVATIVE FRAMEWORK OF THE CHINA-AFRICA TRANSPORT STRATEGY RESEARCH INSTITUTE (CATSRI) UNDER UNIVERSITY OF PRETORIA (UP), CHANG'AN UNIVERSITY (CAU) AND SOUTH AFRICA-CHINA TRANSPORT CO-OPERATION CENTER (SACTCC)

South African Department of Science and Innovation, Mozambique's Embassy and CASTRI interacted this dialogue. More information from the governments was released. It is a good platform to report the progress of the SACTCC.

This forum invited both Hon. Deputy Minister Sindisiwe Chikunga of DoT and Minister Counselor Long Shen of the Chinese Embassy. Fortunately, both high-rank officers met at the session hosted by Tshwane Women in Transport on 7 July. It was successful. Thanks to the SATC.

2. PROGRESS REPORT ON TWO RESARCH PROJECTS APPROVED BY CHINA-AFRICA INSTITUTE WITH CHINA AND AFRICAN UNION

Chinese research team from China-Africa Institute reported the co-operative projects. Mr. Wang and the local South African team interacted with the Chinese counterparts. This is a formal opportunity to exchange the common progress between South Africa and China.

3. NOVA PAVEMENT MATERIALS AND APPLICATIONS AT GUANGDONG AND PEARL DELTA REGION OF CHINA

Prof. Chichun Hu reported his technology and applications on road materials. He wishes to get the proper partners to work together for the new technology and products applied within the Southern African transport industry.

4. INNOVATIVE CO-OPERATIVE PROGRAMME AND TECHNOLOGY TRAINING ADVANCEMENT DEVELOPMENT AMONG SOUTH AFRICA, SADC, AFRICA AND CHINA

Deputy Principal Prof. Xiaochun Song of the Chinese Hubei University of Technology, China presented his university for China-Africa Innovative Actions and intent with South African and African universities online. Deputy Vice Chancellor Prof. Noisse Feza of University of Venda responded to Prof. Song and interviewed with media in person. This dialogue supplied a bridge from two universities between China and South Africa.

5. CASE STUDIES FOR COLLECTING DYNAMIC DATA WITH FATIGUE ANALYSES ON ACCELERATING PAVEMENT TESTING (APT) BY THE 1/3 SCALED LOADING SIMULATORS IN CHINA AND SOUTH AFRICA

Prof. Chuanyi Zhuang presented his research on APT. He is currently deputy secretary general of the International Society of the Mobile Load Simulators. He promoted deep co-operations on-road technologies. It is a good platform to exchange the research progress on APT.

6. INTERNATIONAL PROFESSIONAL TRAINING PROGRAMME AT YUNNAN JIAOTONG (TRANSPORT) COLLEGE AND INTENT CO-OPERATIONS WITH SOUTH AFRICA AND AFRICA

Deputy Dean Prof. Yousong Zhao of Yunan Jiaotong College presented his higher vocational educational institution and showed the intent to work with Africa. Mr. Jingpeng Jia, Director of Road Research of Yunnan Provincial Transport Institute reported four cases of the APT projects on the 1/3 mobile load simulator in his province. More applications in his province are coming.

Recommendations:

1. To make efforts to link with the South African, African and Chinese authorities and further promote the exchange and co-operation on transport sector with capacity building.
2. To link with the Chinese SATC: World Transport Convention (WTC) for deeper development.
3. To continue for the 10th China-Africa Transport Co-operation Forum at the SATC 2023.

Maglev Trains

The purpose of the session was to start an engagement platform in South Africa for high-speed trains and in particular maglev trains.

Presentations by:

- Mr Tshepo Kgobe – High-speed rail
- Mr Gerhard de Beer – Role of smart cities and maglev in the future
- Dr Paul Lombard – An economic analysis of high-speed rail
- The 4th presenter (Mr. Mu a Maglev specialist) could not present due to the status of the bilateral discussion between China and South Africa and the possible involvement of Mr. Mu's company who are specialists in maglev design and operations. Mr. Yuchen Wang presented some videos of maglev trains in operation in China.

The session was well accepted with between 30 and 40 delegates in attendance. The presentations have covered the following in more detail

- Mr. Tshepo Kgobe – High-speed rail: He has provided an overview of Gautrain and high speed in South Africa. More important is the shortage of skills to design and build such a train network in the future.
- Mr. Gerhard de Beer- Role of smart cities and maglev in the future. He used the Maslow theory to explain where South Africa is in terms of the technology required in South Africa, the rail network and how commuters perceive our rail transport. Further, he has led the theme of maglev as a technology by using the new 600km/h train in Japan as an example.
- Dr Paul Lombard – An economic analysis of high-speed rail. He has presented a high-level economic overview of the impact and cost of high-speed rail networks.
- Mr. Yuchen Wang has presented videos of where maglev trains are in operation in China and the latest maglev pilot train in China.

The focus of the questions at the workshop was:

- Question 1: Can South Africa afford a maglev train network?

Response: We don't need to look at maglev only but rather look at high-speed trains in the future. With the latest technologies maglev has become much more affordable, where a low-speed maglev train could cover the cost with 8000 commuters a day. Is the Moloto corridor a possible pilot site?

- Question 2: We don't have the skills to build such infrastructure. How can we deal with it?

Response: The purpose of this session at the SATC is to establish a platform to discuss high-speed transport and the training required to build skills in South Africa with the training institutions and in the industry. (The target group is Civil, Mechanical and electric/electronic engineering). Therefore, the COO of Gautrain, Mr. Tshepo Kgobe, has offered a sponsorship for two papers to be presented at the next SATC (Future high-speed trains in Africa). The sponsorship is aimed at students and young professionals

MARITIME

Session 3D, Wednesday, 6 July 2022

Session chair and convenor: Mr. Tebogo Mojafi, SAMSA

The maritime session featured speakers from government departments like SAMSA, Department of Forestry Fisheries and the Environment (DFFE) and Moses Kotane Institute (MKI), as well as International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), universities, independent experts, and international companies from countries like Kenya, the United Kingdom, Madagascar, and Europe.

The maritime session was streamed live, with online presentations as well as face-to-face. Representing academia, government and industry, females constituted 60 % of the presenters. As such, the maritime section presentations were interesting, diverse, and highlighted the current issues in the maritime industry.

1. MARINE SPATIAL PLANNING DEVELOPMENT IN SOUTH AFRICA: OPERATION PHAKISA OCEANS ECONOMY - M Ramakulukusha, Department of Environment, Forestry and Fisheries (DFFE)

Mr. Ramakulukusha gave a very informative presentation on the Marine Spatial Planning development in South Africa. South Africa has a coastline of around 3000 km, which makes it an extremely important resource. The Operation Phakisa: Oceans Economy document has highlighted the growth of coastal marine tourism, small harbor development, marine transport and manufacturing, fisheries and aquaculture development, oil and gas exploration and marine heritage and governance. For the implementation of the Operation Phakisa Oceans Economy goals, the DFFE has developed the strategy of marine spatial planning. The aim of marine spatial planning is to unlock the ocean economy, enable society to engage with the ocean, ensure a healthy marine ecosystem, as well as good ocean governance.

The Marine Spatial Planning system works on the understanding that, despite the ocean's economy being vast and the Operation Phakisa agenda covering many aspects, not all aspects can be applied to all maritime sector zones. A plan has been adopted, in collaboration with other government agencies, to divide the South African Maritime landscape into zones, with the most prevalent maritime activities being supported because marine resources are not distributed evenly. As such, it would be wasteful to seek to develop maritime businesses in areas where there are insufficient resources. The South African marine spatial plan was developed by the DFFE with the different maritime development zones mapped out. The next step is to receive commentary from the industry and all stakeholders.

An important takeaway from this presentation was that, with any development plan, there should be proper planning. Without an understanding of the marine environment, and a proper feasibility plan, it is extremely difficult to successfully move forward.

2. FREIGHT FORWARDER'S ROLE IN EFFICIENT PORTS - SP Mokoena and C Maya, University of Johannesburg

The focus of Ms. Mokoena's presentation was the role of freight forwarders in efficient ports. In order to present her argument, Ms. Mokoena provided the background of port development and the role of ports in modern global trade. Unlike in the past, modern ports are those that provide more than goods and services acceptance and exit. The most efficient ports in 2022 were chosen because of their positioning, infrastructure, capacity, management and overall terminal performance. The choice of terminal usage is often made by freight forwarders, who seek the most effective and efficient ports, for the transportation of their goods.

The presenter spoke of the factors contributing to port efficiencies, pointing out that there needs to be alignment between landside operations, terminal operations and marine operations. As these are interdependent, the ease with which these factors flow together impacts on the overall efficiency of a port. For this reason, ports should seek to improve this alignment. Port efficiency enablers should be both technologically adaptive and effective as well as properly trained human resources. The proper mix of these enablers contributes towards the efficiency of modern ports.

Challenges facing freight forwarders include lack of advanced port equipment and infrastructure which results in port inefficiencies, the efficiency and transparency of customs clearance, capacity issues, and lackluster multimodal transportation. Presenter concluded with the fact that freight forwarders do have power, they can choose between ports and have knowledge about available ports and their performance. As such, their role in choice of port is not to be underestimated, making freight forwarders key players.

3. SUCCESSFUL LEADERSHIP STYLES FOR GLOBAL COMPETITIVENESS - C Mara and T Mushayi, University of Johannesburg

Dr Maya presented on behalf of her student Mr. Mushayi on his dissertation topic. They looked at leadership from a port management perspective, with the port of Walvis Bay being the subject of the discussion. Prior to her discussion on the different leadership styles, the presenter discussed Namport, the role of ports within the current trading climate and the changing role of port management.

A point that was raised was that of the current leadership vacuum within Namport, which has given rise to government interference in the administration of Namport. Dr Maya then discussed two main leadership styles, these being transactional leadership and transformative leadership style. Transactional leaders focus on a system of rewards and penalties. Their style of rewards and penalties does not really inspire, as employees do the bare minimum to avoid sanctions. These leaders focus on the exchange, not development. Without power, however, their ability to influence is hampered.

Transformational leaders, on the other hand, build a connection, show trust and respect, and collectively pursue shared objectives. Transformative leadership is also ethical leadership.

Ethical leaders inspire ethical conduct among followers who tend to refrain from, even report wrongdoing. This is the standard of leadership we aspire to, especially in the culture of corruption that is prevalent within Africa. An important aspect of transformative leadership is emotional intelligence. Aspects of emotional intelligence include self-awareness, self-regulation, empathy, motivation and social skills. Transformative leaders, with emotional intelligence are empathetic, team players, transparent, balanced and self-managed. By encouraging this type of leader, there is greater hope for the development of Namport, as the leadership vacuum can be dealt with through adopting a progressive leadership style.

4. SMART PORTS: IS THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY (SADC) READY FOR TRANSITION? Dr L Grimett, Moses Kotane Institute

The increase in global trade has resulted in many innovations and changes to data systems, supply chains and global port systems. Dr Grimett, using the port generations model, explained the history of ports, from the first generation to the current fifth generation ports, as per the United Nations criteria. Having defined ports and discussed the United Nations (UN) toolkit criteria for port reform, the presenter then explained the criteria for the establishment of logistics hubs, which are an important aspect of port development.

The seven criteria mentioned are the strategic location, government commitment and stability, human resources, infrastructure, administrative processes, regulation and anchor businesses and foreign direct investment attraction. The presenter then discussed the status of the main SADC ports, these being Durban, Walvis Bay, Luanda, Lobito, Maputo, Beira and Dar Es Salaam. According to the UN rating system, these ports are only second and third generation ports, with some having aspects of fourth generation ports. None of the SADC ports have single window technology, with some having basic electronic data interchange (EDI) technology capability.

The changing global trade climate has resulted in automation of ships, with the increasing pressure on ship owners to comply with IMO and domestic environmental protective measures. Within the context of SADC countries, except for Dar Es Salaam, most of these ports have insufficient railroad capacity to support their transshipment goals.

Even though SADC is a cooperative community, each coastal state is competing against the others for transshipment traffic. The ability of these ports to meet the needs of global shipping companies is incredibly important for their future development.

For funding purposes, the ability to work with the private sector, as can be seen with the ports of Namibia, Mozambique and Angola, will be essential, as governments within SADC often lack the financial clout required for port development. Development is also linked to sufficient energy and wireless connectivity, as well as strong domestic buying power and export ability, together with a skilled labour force.

The presenter emphasised that all issues that are lacking within the SADC ports will need to be addressed before SADC ports can hope to make the changes required for the development of globally competitive ports. Regardless of the challenges facing SADC governments, the requirements of global trade demand that governments create enabling trading smart port environments or they run the risk of being replaced with more accommodating global port operators.

5. INCIDENT MANAGEMENT SYSTEMS (IMS) FOR AN EFFECTIVE MARITIME RESPONSE; A CASE FOR SOUTH AFRICA – R Naicker, SAMSA

The movement of oil across the globe comes with the risk of oil spills. Every year, there are global incidents where tanker accidents cause a great deal of damage to sea life, shore life and coastal waters. In addition, the cleaning operations take time, causing additional damage to marine life, especially where there are seals, sea lions and penguins. Because of the environmental and economic damage done by oil spills, it is imperative that countries act immediately as delays increase both costs and damage. Countries need to be proactive, taking all the necessary steps beforehand, with a functional response plan. Captain Naicker, through his presentation, unveiled the South African plan for dealing with oil spills.

The Department of Transport and SAMSA incident management system is the plan which is followed in South Africa when there is oil spill, detailing the response plan and committees that are responsible to manage the oil spill. The presenter took the maritime session through the planning and process of creating the incident response plan as well as the testing phase and the procedure to be followed. Should there be another oil spill within South African waters, this is the plan which is in place and ready to be deployed. An important takeaway from this presentation was the importance of preplanning and stakeholder engagement to ensure that important matters are dealt with timeously.

6. SHIPPING'S ENERGY TRANSITION: STRATEGIC OPPORTUNITIES IN SOUTH AFRICA – K Abhold, Global Maritime Forum

Ms. Abhold presented the results of the study done by the Global Maritime Forum on the potential for South Africa to transition to the production and sale of renewable energies. Currently, domestic GHG emissions in South Africa are underestimated by 87 percent. The emissions in South Africa from shipping account for 4.4 percent of the GHG emissions produced by South Africa, and 2.1 percent of the overall emissions from the global fleet.

These emissions have a negative impact on coastal communities within South Africa. When looking at alternative energy sources, they found that South Africa was well positioned to be able to produce solar, hydro, wind, and nuclear energies. In addition, should efforts be made from the present, to harness these energies, South Africa would be able to supply the demands of the entire global fleet, if the entire global fleet was decarbonised by 2030.

The Global Maritime Forum identified three areas which could be used to produce green energies in South Africa, which is green hydrogen and nitrogen. The Saldanha Bay Industrial Development Zone is one such area. Other areas include the proposed Boegebaai Harbour, near Mossel Bay and the Hydrogen Valley. The Durban-Richards Bay Hub has been identified as having much potential, although the density of industry and population hinders the harnessing of wind energy, in some areas.

With the movement of shipping industry from coal, it will assist Richards Bay to make the transition away from coal, as it provides alternative industries. When discussing the means of handling the South African ports transition to the usage of renewable energy, the presenter recommended that South Africa prioritise the electrification of its ports with renewable energies. There should, in addition, be increased coordination and guidance with global partners, to support port development towards decarbonisation and a just economy as well as the creation of green ports.

International collaboration is critical as there needs to be alignment between countries on the types of fuel that will ultimately be used to ensure that vessels are able to refuel along their journeys. This is even more important now, as the usage of renewable fuels requires vessels to refuel more often. The ability to service the global fleet will impact countries' economies. With regards to policy initiatives, the presenter recommended that South Africa align maritime policies with domestic climate change ambitions. There should, in addition, be export synergies between shipping decarbonisation and coal phasing-out. At an international level, it is important that South Africa sign the Declaration for Zero-emissions by 2050 as well as the Clydebank Declaration to create Africa's First Green Corridor. While financing is still problematic, innovators will be assisted by the creation of conditions that enable first mover projects, boost private renewable energy generation, and enable fair transition.

7. ADDRESSING GHG EMISSIONS IN MARITIME SECTORS IN LEAST-DEVELOPING ISLAND STATES: CASE OF MADAGASCAR - MV Rabemiafara, Agence Portuaire Maritime et Fluviale, Madagascar (Online Session)

The presentation focused on the challenges facing developing countries, like Madagascar, in fulfilling their undertakings to reduce greenhouse gas (GHG) emissions as per the requirements of the International Maritime Organisation (IMO) and the Paris Convention. According to Ms. Rabemiafara, although developing economies are not active or major polluters and emitters of GHGs through large industries within their economies, they are very dependent upon international trade for most of their goods which is mostly by sea. This means that they are responsible for high shipping volumes, as they receive most of their imports through their ports.

As such, despite their economic status, they contribute to maritime GHG emission growth. Despite being signatories to the IMO shipping regulations for decreased GHG emissions, these countries tend to fall behind with regards to their undertakings, citing issues such as lack of finances. There is additional burden of increased energy usage to fuel their economic growth, and the cost of transition to renewable energy usage. Within the short term, meeting International Labour Organisation (ILO) and the Paris Agreement GHG reduction targets, may be extremely difficult to achieve. In addition, the situation at the national level has not improved much. High national barriers hinder the adoption of measures to reduce GHG emissions in the maritime transport sector.

The most important stage, which is developing relevant policy and legal basis with inclusive approaches for all stakeholders, has not been reached yet. This paper recommended that short term steps and measures should be initiated in parallel. These initiatives should consist of raising the awareness of all actors (decision makers, port operators, ship owners), small actions achievable (adoption of renewable energies in ports) and starting to advocate for climate finance for shipping as Madagascar is eligible for climate change mitigation funding. Ultimately, regardless of compliance difficulties, developing countries should not utilise their lack of development to renege on their GHG undertakings.

8. FACILITATING TRANSITION TO DECARBONISING AFRICAN WATERS; THE ROLE OF MARITIME TECHNOLOGY COOPERATION CENTRES – L Ngugi, Jomo Kenyatta University of Agriculture and Technology, Kenya

Advocate Ngugi presented on the works of the Maritime Technology Cooperation Centres within Africa. She indicated that there are opportunities and challenges faced by MTCC Africa in fulfilling their work. MTCC Africa is an IMO initiative, whose focus is to build capacity and mitigate climate change effects on Africa. Although they are situated in Kenya, their mandate is the entire continent. They work closely with maritime departments, maritime entities and port authorities throughout Africa.

Within South Africa, they work closely with SAMSA. As a global entity, they are funded externally, and fulfil their mandate by undertaking pilot projects on selected topics. They seek to ensure that long-term bankable projects are undertaken within Africa. In addition, as less than 20 African countries have ratified the MARPOL Annexure VI, the presenter encouraged the remaining African countries to ratify and domesticate the MARPOL Annexure VI provisions.

One of the MTCC pilot projects undertaken is the provision of power banks to the Mombasa Ports Authority, which is aimed at assisting it with the transition to solar power within the port. Another MTCC project undertaken has been to quantify the impact of GHG on ports. They sought to understand the emission factors and determine what could be done to reduce emissions within these ports.

South Africa participated in this study and the impact of these studies have resulted in a 60 percent energy saving in the Port of Mombasa. They have also been able to establish a baseline in the Port of Mombasa which is used as a benchmark in other ports. In addition, MTCC has been able to train port administrators in Africa to assist in the work which they are currently undertaking. Challenges faced in undertaking their mandate have been linked to technical cooperation, financing models, capacity building and funding gaps.

MTCC Africa is mindful, in its mission, that no country must be left behind. Unfortunately, their work is both capital and labour intensive, on a limited budget. Needs determined so far, in the pursuit of the decarbonisation goals, are increased technical capacity, policy and regulations to align with global standards and finances for the decarbonisation mandate.

They have, however, obtained funding to establish satellite offices within the region. From this presentation, it was clear that there is still a lot of work to be done within a limited timeframe. The overarching message was that Africa cannot hold back on the climate change and decarbonisation agenda, as it will unfortunately be left behind.

9. SYSTEMS APPROACH TO COASTAL AND MARINE TOURISM – CHALLENGES AND OPPORTUNITIES: UGU DISTRICT, KWAZULU NATAL - VB Zulu, S84 Learnovate (Online)

Mr. Zulu's presentation was on one of the South African Operation Phakisa: Ocean Economy subsectors, the Coastal and Marine Tourism (CMT). The presentation highlighted the general divisions in the CMT before looking at the governance structures for the development of CMT, focusing specifically on the development of CMT within the Ugu District Municipality in KwaZulu Natal. Using the Systems Thinking Approach, the presenter referred to the fact that the CMT industry is a complex system with many Actors such as tourism operators, local government, grading agencies, transport providers, food and beverages companies, law enforcement agencies, among other actors, all having an effect and interconnectedness.

As a complex system, problems and opportunities that arise may not be solved using Straightforward Approaches or Reductionist Approaches. Conventional solutions are incapable of addressing the structural deficiencies that allow problems to continuously exist. An example provided was that of the water crisis within the Ugu District. The current water crisis often results in coastal inhabitants not having access to water for weeks – impacting all actors of the CMT system.

The lack of water affects all residents and businesses, as water must be purchased by individuals during this time. With tourism on the South Coast taking many forms, including holiday houses, hotels, waterfront caravan parks and self-catering apartments, the lack of access to running water has impacted negatively on CMT businesses during the tourism season, with many tourists choosing to leave after 2 or three days.

The current approach to CMT is extremely fragmented, with departments working in silos, without an understanding of all the business variables that impact the entire ecosystem. There is a need for holistic planning, through the adoption of a Systems Thinking Approach, in which all role players and stakeholders work together, considering the overall picture. In this way, the government's development goals can be properly achieved.

10. MARINE AIDS TO NAVIGATION AND THE WORKS OF IALA AIDS TO NAVIGATION IN THE 21ST CENTURY - K Gregory, IALA

The presenter began by introducing International Organisation for Maritime Aids to Navigation (IALA) and the work of IALA. The conference learned about the role that the International Organisation for Maritime Aids played in setting up navigation aids such as lighthouses, and buoys, etc. He explained how these maritime aids devices, systems, or services, which are external to vessels are designed and operated to enhance safe and efficient navigation of individual vessels and/or vessel traffic. The presenter spoke of the role of Vessel Traffic Services (VTS) and the expectations of Masters, Pilots and Navigators of the vessel traffic services. These include the provision of essential and timeous information (traffic, weather, tidal, berthing, allied services etc.).

They also have their movements within the VTS area which are managed and organised to avoid congestion or conflict. In addition, their navigational safety will be monitored, and advice provided appropriately if they are in danger of running aground or otherwise proceeding into a difficult position.

In addition to providing these aids, IALA is also responsible for the training of operators of these aids, providing education and employment to those who attend its school. The priorities for assisting coastal states were also discussed, with IALA assisting states based on the assessment of their need. Those with the greatest need are prioritised.

The challenges facing IALA were also raised. With the adoption of automated ships, the role of navigational aids will need to change. The question of what changes will be required is now facing IALA. From this presentation, we were able to see the interdependency of the maritime sector, and the importance of each stakeholder when it comes to vessel traffic services.

Recommendations

There is a need for the National Ports Authority and Port Regulator to participate in the maritime session either as speakers and or participants and sharing data / information aimed at building the South African port systems.

The National Department of Transport should also be visible to learn and share their inputs on how to best shape the maritime policy. After all, the Minister of Transport is the patron of SATC.

The women constituted about 60% of the Maritime Session presenters. Such an achievement should be sustained to ensure that this participation is maintained or improved.

AVIATION WORKSHOP

Session 3E, Wednesday, 6 July 2022

Session chair and Convenor: Dr Bridget Ssamula, Aecom

1. THE CHILDREN'S FLIGHT PRESENTATION- F Goshier

Felix virtually presented an initiative called the Children's Flight where they take underprivileged children on their first flight. They have in the last two years only been able to take 50 Children for their first flights per event (due to Covid-19 restrictions) but this year they will be taking 500 Children for their first flight experience on the day and these children will span across 41 Charities who provide names for these flights giving children an opportunity to fly.

Outcome: There was a call for awareness for partnerships and funding from companies involved in aviation.

2. ASSESSING THE THRIVING AFRICAN AIRLINE NETWORK STRUCTURES: DOCTORAL THESIS REVIEW 15 YRS ON - Dr B Ssamula, AECOM

Reviewing some of the outcomes of her doctoral thesis on the airlines that are growing their networks 15 years later. Looking at the multiple hubs and spoke method and analyzing how Ethiopian airlines has designed strategic hubs in the four regions growing its hub network through acquisition. On analysing the One-hub network, the presenter showed how Rwanda air has built its strategic hub in the center of the continent positioning itself with Central Africa and widening its network through strategic partnerships with Qatar Airways.

Outcome: The airlines that have grown their networks have done so with strategic partnerships to increase passenger reach and through access to financial capital.

3. THE USE OF DRONE TECHNOLOGY TO EVALUATE AND REPORT PAVEMENT CONDITIONS IN SOUTH AFRICAN AIRPORTS - TK Maloka, WA Elsaigh and JE Honiball, Tshwane University of Technology

This research paper explores the possibility of introducing drones to the airport environment and the impact thereof. A survey questionnaire was administered to technical managers that are based in 20 major airports in South Africa. The results showed that there is an appetite in the airport environment to use drone technology to identify defects on runways, to replace the manual and cumbersome checklist process to develop work orders. Questions were asked about incorporating GPS technology and images confirming the defect and whether that process is also automated, and the presenter responded in the affirmative.

Outcome: Technology innovation can be incorporated in the airport environment to improve maintenance processes and procedures.

4. SUSTAINABLE AVIATION FUEL PRODUCTION IN SOUTH AFRICA: POTENTIAL AND OPPORTUNITIES - F Chireshe, J Reeler and T Bole-Rentel, WWF

Presented on the steps taken in exploring and researching the sourcing and production of sustainable aviation Fuels in South Africa. The paper and presentation showed how the source of the sustainable aviation fuel (SAF) from invasive alien plants (IAPs), reducing CO2 emissions in the aviation environment. The market for the fuel was identified to be in Europe and partnerships with Sasol were crucial in ensuring that South Africa becomes a player in this market.

Outcome: Positioning South Africa as a producer of biofuels is possible and should be considered for the country to remain a relevant player in emissions reduction.

5. PANEL SESSION: REVITALISING THE INDUSTRY POST PANDEMIC – D Samuels, Wesgro and J Vermooten, Independent Consultant

The panel covered the biggest sectors (tourism and cargo) which rely on aviation as a major supply chain and how they were impacted by the pandemic. Some of the setbacks in the industry with respect to airlines closing and loss of jobs were identified. The potential that was uncovered was the untold story of cargo as the one component that grew during the pandemic. Some of the aspects needed to revitalize the industry discussed include ramping up supply to meet demand as we see the industry grow and expected to bounce back in December 2022. Outcome: Airlines and airports to be supported in growing their network in a fair way allowing international carriers and FDI investment to kickstart and grow the air transport sector.

6. STRATEGIC AEROTROPOLIS PROJECTS UPDATE- CAPE TOWN INTERNATIONAL AIRPORT- PROVINCIAL PERSPECTIVE- D King, Wesgro

The history of the Cape Town Air Access project was presented to try and grow the demand and supply of airline services serving the Western Cape with Cape Town as the major focus. The importance of air transport and the airport as an economic driver for the region was identified by the province hence the initiative that brings together relevant stakeholders to drive air access into the region. The progress that has been made in attracting airlines to the region and revitalizing the industry post pandemic was presented. The success of the initiative was identified as being an independent organisation focusing on supporting the industry from a private and public sector space. Outcome: Government to support policies, platforms that drive the growth and sustainability in the air transport sector as its crucial for economic development.

3RD REGIONAL SEMINAR ON WEIGH-IN-MOTION (DAY 2)

Session 4A, Thursday, 7 July 2022

Session chairs: Ms Michelle van der Walt, SANRAL, Mr Hans van Loo, Corner Stone and Mr Andrew Houliston, Syntell

Convenor: Mr Hans van Loo, Corner Stone International

1. QUALITY IMPROVEMENT OF WIM DATA

The session was chaired by Mrs. Michelle van der Walt, SANRAL, South Africa.

- Mr. Gerhard de Wet from Static Motion in South Africa talked from the Kruger Park about requirements for updating the Truck Tractor (TT) WIM calibration method. He explained the history of the TT Method, how it works and what accuracy can be achieved. He concluded with areas of improvement using variable target, accuracy markers accounting for vehicle composition updated TT Method.
- Mr. Bernard Jacob, University G. Eiffel, France, presented the status of the ongoing revision of the OIML R134 standard on WIM systems. He started with an explanation of the COST-323 recommendations. He gave an overview of the history of the OIML R134 and the main topics discussed during the current revision: new accuracy classes, use for high-speed condition, the use of axle loads as references and acceptance for overload enforcement only.
- Mr. Gustavo Otto, from Labtrans/UFSC in Brazil, showed a new correction model for HS-WIM systems based on pavement temperature and vehicle speed. The method was tested at the Labtrans WIM test site near Ararangua using three reference vehicles with known axle loads. The results show that the method reduces the spread of the errors, as observed by the standard deviation before and after the correction.
- Mr. Olivier Quoy, from Atlandes in France, spoke about truck silhouettes analysis with WIM data from the two WIM systems on the A63 between Castets and Lesperon. The study focused on the detection of vehicles with one or more lifted axle/s in order to improve the accuracy of the vehicle classification using a non-hierarchical classification method for mobile centres (k-means).

2. DISCUSSION: WIM FOR DIRECT WEIGHT ENFORCEMENT

The session was chaired by Hans van Loo (Corner Stone Int., Switzerland).

- Panelists were Michelle van der Walt (SANRAL, South Africa), Mike Hellens (MIKROS Systems Ltd., South Africa), Gerhard de Wet (Static Motion Ltd., South Africa), Bernard Jacob (University G. Eiffel, France), Carla Davis (Trans African Concessions, (TRAC), South Africa) and Tom Kearney (Federal Highway Administration, USA).
- During the 2-hour panel discussion several aspects of the use of High Speed (HS) WIM for direct weight enforcement were discussed. This included topics/questions like: What are the main advantages of the use of HS- WIM for direct weight enforcement? What are the crucial steps/elements and challenges in the implementation? What is the status quo with the implementation around the world, what are the experiences and which recommendations could be given for other (potential) future end-user of High-Speed WIM for direct weight enforcement?

3. PRACTICAL APPLICATIONS OF WIM

The session was chaired by Mr. Andrew Houliston, Mikros/Syntell, South Africa.

- Mr. Thomas Greene from Q-FREE in the UK showed their showcase project on targeted enforcement using WIM for the Driver and Vehicle Safety Agency (DVSA) in the UK. DVSA uses ANPR and the high-speed WIM for pre-selection of probably overloaded vehicles for roadside controls. The quality of the WIM measurements is constantly being monitored by weekly analysis of the average front axle weight. This will be used to identify any potential issues with the data.

- Mr. Brendan Ezeanowi from IRD in Canada showed the results of using continuous calibration to improve WIM accuracy in commercial vehicle operations. The CCWIM automatic calibration algorithm minimizes the GVW error by considering multiple factors. It maintains WIM accuracy without any manual calibration over a long period of time (several years). He showed that it can be used to improve data collection accuracy for: traffic research, roadway design, maintenance planning and to improve confidence for mobile enforcement and direct enforcement.
- Mr. Matjaž Sokol from CESTEL in Slovenia presented their portable SIWIM Bridge-WIM system where the sensors are installed under a bridge and measure the bending of the bridge when trucks are passing over. He explained the working principle of the system and the main applications and advantages. He also showed a current installation near Dar es Salaam in Tanzania.

4. SELF-REGULATION IN OVERLOAD CONTROL

The session was chaired by Mr. Hans van Loo, ISWIM & Corner Stone Int., Switzerland.

- Mr. Chris Koniditsiotis, president of ISWIM and former Chief Executive Officer of Transport Certification Australia (TCA), Australia presented the Intelligent Access Program (IAP) that is being used in Australia. He explained how a combination of on-board WIM and vehicle location systems is used to optimise road usage without investing in the road infrastructure. High performance freight vehicles using these on-board systems are allowed to carry more load and/or allowed access to additional parts of the road network because their mass and position are exactly known. Finally, he explained how the IAP is organised and what are the roles of the different partners.
- Dr. Paul Nordengen, director of his own consulting firm, Heavy Vehicle Transport Technology Africa, chairman of the South African national Smart Truck (PBS) committee for heavy vehicles in South Africa and Chairman of the RTMS national steering committee in South Africa. He presented the experiences with the Road Transport Management System (RTMS), a self-regulation accreditation scheme for heavy vehicles used in South Africa. The RTMS is a system that voluntarily regulates the heavy vehicle industry and has achieved significant results including a reduction in overloading, speeding, number of breakdowns and accidents.
- Mrs. Loes Aarts, senior policy advisor at Rijkswaterstaat in the Netherlands, presented an overview of the current initiatives on Intelligent Access programmes in four European countries, Italy, Estonia, Sweden and The Netherlands. She showed the similarities and differences between these initiatives and the River Information Services used on transport ships. She shared her views on the current and future role of WIM systems and data in IAP in the Netherlands.

5. OVERVIEW AND CLOSURE

The session was chaired by Mr. Hans van Loo, ISWIM & Corner Stone Int., Switzerland.

- Mrs. Michelle van der Walt / Layton Leseane, SANRAL, South Africa, presented the future of WIM in South Africa. Operations at Traffic Control Centers (TCCs) in South Africa are not optimal. Issues are experienced with geometric design (queuing times and space in particular), effectiveness and accuracy of WIM screening equipment, availability and cooperation from traffic police, slow weighing procedures, errors caused by the human element, potential for bribery and corruption, ageing technology and lack of integration of interrelated processes and systems. Time wastage of law-abiding, compliant freight companies due to congestion at weighbridges, inaccurate WIM screening, repeated weighing at several weighbridges on the same route during a single journey etc. are detrimental to freight logistics, the economy at large and create negative sentiment within the freight industry.
- It is evident that the current overload control methods in South Africa need to be scientifically assessed to determine how they can be optimised and better integrated and to quantify what improvements could be realistically achieved. Furthermore, the use of technology has lagged over the years and innovative ways need to be explored using the latest technology and automation to not only improve weighbridge operations but also cover a much wider area of the road network and find alternative and more efficient and effective approaches to law enforcement.

- Mr. Hans van Loo, ISWIM and international expert on WIM from Corner Stone Int. provided a summary of the seminar. This included the current implementations and future plans for use of WIM data in South Africa. And the developments from around the world: new sensors measuring tire pressure allowing for new safety applications, the improved performance of WIM systems by integrated quality checks and the combination of different WIM technologies e.g., Road & Bridge-WIM and In-Road & On-Board WIM. ISWIM providers (Camera, Cestel, Intercomp, IRD, Mikros and Q-Free) showed examples of practical applications of WIM from around the world.
- The use of WIM for direct weight enforcement is implemented in a couple of countries and preparations are ongoing in many more (incl. South Africa). For this application the quality of WIM data is crucial, which can be guaranteed through a combination of quality checks in the WIM system and post calibration in the database. Both end users and manufacturers expressed an urgent need for a practical international standard for High-Speed WIM systems for direct enforcement! Special attention was given to the self-regulation in overload control with practical examples from Australia, Europe, South Africa.
- After thanking the supporters, our sponsors, and the members of the organizing committee the seminar were closed with an invitation to join ISWIM again at the 9th International Conference on WIM from 6-10 November next year in Brisbane Australia.

DISRUPTIVE WOMEN FORGING A NEW NORMAL IN THE TRANSPORT SECTOR – BROUGHT TO YOU BY TSHWANE WOMEN IN TRANSPORT

Session 4B, Thursday, 7 July 2022

Session chair: Ms Lesedi Mokoma, CSIR

Convenor: Ms Mavis Mhlanga-Mochadibane, TWIT

This session was the third annual SATC-Tshwane Women In Transport workshop dedicated to women who are involved in the transport sector. The aim was to create a platform for sharing the experiences of women, specifically those who are leaders in transport operations, management, and research in the public and private sectors. The purpose of the discussions was to highlight gender-specific issues in the sector and celebrate women who are emerging as disruptors, those who dare to break the mould and serve as beacons of inspiration in the transport sector.

KEYNOTE SPEAKER - Deputy Minister of Transport Ms Sindisiwe Chikunga

The session commenced with an inspirational address that spoke to the government's acknowledgement of the challenges that women in all quarters of the transport sector experience. The address focused on the economic empowerment of women: touching on access to opportunities for female entrepreneurs and the various programs created by the government to uplift women. The deputy minister conceded that it was clear that these initiatives were not filtering down to the women who need them. She encouraged more communication between Tshwane Women In Transport and the government so that more can be done to support women.

10 presentations were delivered at the workshop. A summary of each presentation is provided in the following sections.

1. PIONEERING REGIONAL CHANGE - N Moloto, Tsa Africa

The presentation focused on risk management for SMEs and the different mechanisms required to assist entrepreneurs with their day-to-day functions. Questions from the workshop were related to the risks that the government faced in providing public transport and assisting women. Multi-level governance, the inability to plan across all tiers of government and limited budgets were mentioned as risks for women empowerment and service delivery improvements.

2. THE IMPACT AND EFFECT OF COVID-19 ON WOMEN IN THE TAXI BUSINESS - Makhasane, SANWIT

The presentation gave an account of the challenges that female taxi operators experience in the business with emphasis on the Covid-19 lockdown period. Due to discriminatory practices in the minibus taxi industry female operators were reported to have not received any assistance from the government during the lockdown forcing many to forfeit their businesses. The workshop enquired about how female operators can be better represented in the executive leadership of minibus taxi structures so that their concerns are addressed. The presenter stated that policies for equal participation were required. She agreed with the audience that female-only minibus taxi services will be beneficial for vulnerable members of society. The government was requested to assist female operators to participate in the entire public transport value chain. Manufacturing of buses and bus subcontracting were identified as avenues that female operators were interested in pursuing.

3. CHALLENGES FACED BY WOMEN AMID THE COVID-19 PANDEMIC IN THE TRANSPORT INDUSTRY - M Matshwane, National Department of Transport

The presentation spoke of the challenges in the transport sector and how they were exasperated by the lockdown period. These were more acute amongst women. Transportation projects were seen by the government as an opportunity to remedy the situation and uplift women. The workshop enquired about the data collected by the presenter's Gender, Disability, Youth and Children unit at the National Department of Transport and the trends they have analysed over the years. There were also questions about gender-responsive transport research however, the available information in government was not sector specific and the performance of the transport sector could not be assessed.

4. WOMEN INSPIRING WOMEN TO LEAD IN TRANSPORT: THE OPPORTUNITIES AND CHALLENGES - N Scott

The presentation was an overview of the development of the Commercial Transport Academy and the funding secured for upskilling women through training in the freight logistics sector. The company provides fully funded training for women. The presentation showed successful trainees and the employment they have gained since completing the programme.

5. HOW THE CITY OF JOHANNESBURG IS COMPLETING ITS STREETS - N Ciko, City of Johannesburg

Complete streets projects in Johannesburg were presented. The presenter spoke of the importance of this infrastructure in making streets more equitable and accommodating vulnerable users. The challenges of renegotiating space with stakeholders, particularly property owners were also discussed. NMT infrastructure was also presented. Surveys indicate that pedestrians avoid pedestrian bridges, and the city was investigating the causes. The workshop recommended that incidents of crime should be tracked along pedestrian bridges as safety is a concern in such community structures.

6. WOMEN, MOBILITY AND MODE CHOICE IN SOUTH AFRICA - N Cheure, University of Pretoria

Travel surveys conducted in Gauteng to measure changes in travel patterns during the pandemic were used to analyse the gender influence on travel patterns. The results show that more women were negatively influenced by Covid-19 than men, with a 7% decrease in the number of women employed compared to a 2% decrease for men. Before Covid-19 more men worked from home as compared to women but during Covid-19 both men and women working from home increased by 8% and 10% respectively. Although public transport use declined during Covid-19, more women still made use of the modes and women (59.3%) were more concerned about hygiene on public transport than men (49.8%). More women mentioned that they reduced the number of trips during Covid-19 and were planning to increase them when the regulations eased. The research shows that women have less flexibility to adapt their travel patterns when restrictions are applied during natural disasters.

7. REVOLUTION AND TECHNOLOGY IN TRANSPORT AND WHAT IT MEANS FOR WOMEN AS CONSUMERS AND PRODUCERS - N Mhlanga, Standard Bank SA

Opportunities to improve transport for vulnerable users by making use of technology were presented. The technology included the Starling Crossing (Stigmergic Adaptive Responsive Learning Crossing) which is a smart, interactive pedestrian crossing system developed by London-based software company Umbrellium. The crossing prioritises pedestrian safety by dynamically reacting in real-time to different conditions and can modify the patterns, layout, configuration, size, and orientation of pedestrian crossings while utilising common traffic signs and pavement markings. A prototype of the crossing was installed temporarily in South London to test the system's capabilities. The 72-foot-long installation demonstrated the durability of its infrastructure, carrying the weight of vehicles, as well as being able to differentiate between cars, cyclists, and pedestrians.

8. CHALLENGES EXPERIENCED BY FEMALE PROFESSIONALS IN THE TRANSPORT SECTOR - I Tshenye, City of Tshwane

The challenges experienced by municipal officials in transport service delivery divisions were discussed. The slow delivery of transport projects was attributed to the unethical behaviour of both municipal officials and external consultants. The presenter called for government intervention to remedy the work environment.

9. INVESTING IN WOMEN-CENTRIC TRANSPORT: HOW THE TRANSPORT SECTOR CAN HELP WOMEN ACHIEVE THEIR DREAMS - N Matebese-Maponya, DBSA

The need for women to work together and be more ambitious and tenacious was the focus of the presentation. Professionals were urged to speak up and break the pattern of gender-neutral planning so that transport solutions can cater for the needs of vulnerable members of society. Entrepreneurs were also urged to be bold when developing business plans. The presentation highlighted the need for women to not only have a seat at the table but to also have a voice to speak up for access to knowledge, funding and markets.

10. ENABLING SMART MOBILITY FOR SMART AFRICAN CITIES: OPPORTUNITIES FOR WOMEN - V Majola, Ubunye Capital

The speaker presented the challenges of being a female leader in the minibus taxi industry. This included discrimination, insubordination and attempts on her life. However, she encouraged females not to be discouraged from participating whole-heartedly. Smart cities offer many opportunities, however, before these can be realised, women must gain the courage to lead as well as to support one another.

PUBLIC PRIVATE PARTNERSHIPS WORKSHOP

Session 4C, Thursday, 7 July 2022

Session chair and Convenor: Ms Laverne Dimitrov, DBSA

The focus for the day was contracting of commuter rail services:

1. WHERE TO START: A DEBATE ON PPPS IN SOUTH AFRICA' COMMUTER RAIL SERVICES – X Li, Curtin University, Perth, Australia

A discussion led by X Li, Curtin University, Perth Australia. Mr. Li expanded on his procuring urban rail transit infrastructure by integrating land value capture and public-private partnerships: learning from the cities of Delhi and Hong Kong.

- Having policies in place so that SPV can manage the risk of PPP as there is no security for the Private partner.

- Hong railways minimised their risk by purchasing the land at a very low cost. This guarantees high values in the future and grows the LVC approach.
- A discussion was on the current contract for Gautrain and the model that's being used in other countries.

2. SUBURBAN RAIL DECENTRALISATION IN SOUTH AFRICA - A discussion led by E Beukes, World Bank

The view is that when local government takes over national railways, they will be taking over all the problems that currently exist.

- Will local governments be more efficient in terms of costs than their international counterparts?
- Should they outsource concession services to the private sector?
- Will a joint venture between local and national government authorities be better?
- What will be the user impact?
- Will the users be better off with decentralisation? Why?
- Will tariffs increase?
- Will the stations, buildings and land in the right of way be transferred to the local authorities for their use and redevelopment? What are the implications if the lines are also to be used by intercity passengers and flight services?

3. CONTRACTING OF COMMUTER RAIL SERVICES AND THE IMPORTANCE FOR SOUTH AFRICA - A Rutter, Texas A&M Transportation Institute

He advised on:

- How to incorporate the costs into a bid and the marrying of costs when services are extended.
- An explanation should be given to the concessionaire on how his performance will be monitored.
- Agency level capacity building.
- When concession agreements come to an end, how staff transitioning will play out.
- A labour agreement between the concessionaire and the sponsor should stipulate the exit strategy and protect staff overall.

When handing over the asset, it should be according to industry standard and not just based on quick discussion.

DECADE OF ACTION FOR ROAD SAFETY 2021 – 2030 WORKSHOP (ROLE OF ACADEMIA, RESEARCH ORGANISATIONS, NGO'S AND PRIVATE SECTOR)

Session 4D, Thursday, 7 July 2022

Session chair: Prof Marianne Vanderschuren, University of Cape Town/ SAICE

Convenor: Dr Hubrecht Ribbens

PURPOSE OF WORKSHOP

- To share the goals, objectives, and action focus areas of the Global Plan with all South African role players.
- To clarify the role that civil society, academia, NGO's and the private sector in South Africa could play in support of the Decade of Action for Road Safety during the current campaign until 2030.
- Unpacking the recommended actions in the Global Plan in the South African context with specific focus on non-governmental participation. Presenters sharing their views are all experts in the respective focus areas from the non-governmental sector.

- Sharing road safety good practice involvement applied by the non-government sector to stimulate other role players to take road safety action.
- Exploring synergies among stakeholders to strengthen future road safety actions. A panel discussion will initiate the discussion with subsequent inputs from all delegates.

PROPOSED WORKSHOP OUTCOMES

- Clarity on the role that civil society, academia, the private sector and the community could play to reduce road fatalities and injury;
- By identifying what recommended actions they could apply in their organizations to support the action focus areas.
- implementing safe road practices in their respective organisations in line with the Safe Systems Approach.
- Supporting and supplementing government's road safety interventions during the campaign.
- Better understanding and consensus among role players about how to foster co-operation and integrate road safety actions between themselves and with government.

PRESENTATIONS:

- Global road safety plan – review - T Ndebele
- Building on the Safe System approach - J Rammutla, WSP Africa
- Multimodal transport and land use planning - J Coetzee, Innovative Transport Solutions)
- Safe road infrastructure – Dr M Vanderschuren, UCT SAICE Chairperson
- Vehicle safety - L Beard, AA of SA]
- Safe road users - Dr A Sukkai, UNISA
- Post-crash response – P van der Sandt, ER24
- Road Transport Management System (RTMS) - Dr P Nordengen, Heavy Vehicle Transport Technology Africa
- Botnar child safe project - Delivering Safer School Zones in Mogale City, Gauteng - B Jonsson, SARF
- South Africans against drunk driving - C Smit, SADD

Panel discussion highlights:

The panel discussion highlights the Safe System's Approach as best practice and provides an opportunity to address road safety:

Shared Responsibility:

- SSA needs to urgently be expanded from an idea to practice.
- Multi-stakeholder approach which pulls together all partners to make meaningful contribution.
- Need to capacitate government officials and to install political will for road safety in South Africa.
- Integration of efforts across and between all pillars.
- Need a blanket protocol for NCAP in South Africa (e.g., why does South Africa accept vehicles that are not as safe as in the developed world?)

Data driven and evidence-based practices and interventions

- Meaningful participatory methods (e.g., Photovoice) is used to obtain information on road safety issues in communities.
- Projects are data driven with strong emphasis on monitoring and evaluation of efforts.
- Opportunity to create a Safe Schools Zone Model for upscaling at the Provincial and National level.

Good practices that need to be promoted:

- Road safety education needs to be taught from an early age. This needs to be sustained throughout school phases. Teachers are already overloaded, get universal teams to promote road safety through education.
- Make transport and travel space safe for NMT and VRUs.
- Emphasis on speed reduction to 30Km/hr in school zones ties in with Global Plan of Decade of Action.
- Universal emergency numbers and coordination between private and public EMS response.

INPUTS FROM PARTICIPANTS

- Law enforcement discipline was not represented at this session – need to get input and commitment from them as well.

SUMMARY

The more important points and priorities raised by the participants under the different DoA Focus Areas are summarised in this section.

SAFE SYSTEMS APPROACH

The Safe System approach must form the basis for all road safety implementation in South Africa:

- a) It anticipates and accommodates human errors.
- b) Incorporates road and vehicle designs that limit crash forces to levels that are within human tolerance to prevent death or serious injury.
- c) Those who design and maintain the roads, manufacture vehicles, and administer safety programmes to share responsibility for safety with road users, so that when a crash occurs, remedies are sought throughout the system, rather than solely blaming the driver or other road users.
- d) Pursues a commitment to proactive and continuous improvement of roads and vehicles so that the entire system is made safe rather than just locations or situations where crashes last occurred.
- e) Adheres to the underlying premise that the transport system should produce zero deaths or serious injuries and that safety should not be compromised for the sake of other factors such as cost or the desire for faster transport times.

MULTIMODAL TRANSPORT AND LAND-USE PLANNING

Key Road Safety Issues in South Africa are:

- a) Reducing crashes complex problem due to a complex system.
- b) No halving of fatalities in 10 years realistic targets of 5% to 10% reduction per year.
- c) Minibus taxis carry high percentage of traffic and contribute a high percentage to fatalities.
- d) We need to create a generation of responsible citizens next 15 to 25 years.
- e) Road safety education at schools, for R50 million per year we can make a significant difference.
- f) Driver training change K53 to test more complex driving conditions.
- g) Implement special training for Bus and Taxi drivers (PRDP permits process is flawed as it does not consider fitness to drive from a road safety perspective but from a health perspective).
- h) Improve vehicle road worthiness.
- i) Law Enforcement. We need to remove corruption, improve training, implement honest broker observers.

SAFE ROAD INFRASTRUCTURE

Key points related to safer infrastructure are:

- a) There is a need to understand the infrastructure that is provided to ensure safe travel.
- b) There is a need to understand transport demand and supply vs. risk.
- c) Proposed solutions/tools to do this include:
 - The SAICE Report card is a tool to assess the quality of the infrastructure provided (e.g., how many sidewalks are provided to learners in support of travelling safe to work, school, etc.)
 - Improved georeferencing for crash locations
 - Centralising the reporting and response to crash locations
 - Need for evidence base interventions to plan and provide safe infrastructure

The main challenges to be addressed regarding safe road infrastructure are:

- a) The road safety burden still needs significant attention in South Africa.
- b) Road infrastructure is an important focus area for the reduction of road fatalities and injuries.
- c) Appropriate data is needed to guide infrastructure improvements.
- d) This includes the need for geo coding.
- e) More extensive mining of data is needed.
- f) Also, for the developing of additional road safety indicators and assessment methods.
- g) There is a significant amount of potential infrastructure measure that are cost effective.

VEHICLE SAFETY

Vehicle safety challenges in South Africa must be addressed as a priority. There is a fixation on pedestrians in South Africa and, although warranted, there is also a need to look at the protection of passengers. Report cards for how safe vehicles are that are assembled in South Africa is needed – indications are that the same stringent principles applied to vehicle safety in the developed world is not applied in Africa.

Unroadworthy vehicles:

In South Africa there is a high number of vehicles that are not roadworthy. A study by Verster and Fourie 2017 estimates that as many as 1 million vehicles operating on South African roads may be unroadworthy. The RTMC suggests that the figure is around 550 000 but if unlicensed vehicles are included, the figure rises to over 1 million. Any of these figures indicate the problem is serious, as vehicles that are unroadworthy are a hazard and a death trap.

Key takeaways:

- a) If European standards were to be applied on vehicles sold in South Africa many would receive zero-star ratings (Alejandro Furas, Technical Director, GNCAP).
- b) Poor welding, lower quality steel, hastier production lines, or a lack of proper quality control to cut costs leads to poorer quality vehicles.
- c) Hyundai i20 for Europe fared a lot better in 2015 crash testing than the same model available in South Africa in 2018 (and EuroNCAP has more stringent crash criteria than GNCAP).
- d) Costs of including ESC, airbags and ABS can be reduced through economies of scale
- e) The question really is can costs be equated to saving lives?

SAFE ROAD USE

Safe Road Use Priorities are:

- a) Enact and enforce road safety legislation (max. speed, BAC and drug thresholds; protective devices; distracted driving): appropriate penalties, prevent corruption.
- b) Establish traffic rules and licensing requirements (including minimum age and vision): ongoing review, updating & education, professional drivers (driving time, rest), mandatory third-party insurance, competency-based testing for driver licensing and graduated driver licensing for novice drivers, insurance premiums linked with driver performance.
- c) Safe road infrastructure focused on all road users: intuitive road signage and markings, traffic calming, physical separation of VRUs from motorised traffic.
- d) Vehicle safety features and technologies to support safe behaviours: seat belt alerts, intelligent speed assistance and speed limiting devices, technologies to prevent distracted driving incl. use of mobile phones whilst driving.

POST-CRASH RESPONSE

The priorities to improve post-crash response in South Africa are:

- a) Increase the liaison and interactions with all relevant role players.
- b) Maximise on response time with accurate Incident information.
- c) Maximise safety with effective communication and information.
- d) Aim to minimise delayed treatments and transports to hospital.
- e) Understanding National, Regional, Local State and Private Resource allocation and availability.
- f) Basic training and skills for communities directly impacted with incidents that are in remote areas.
- g) First Aid – Traffic Calming – C.E.R.T training. “Learn to Act” in other words, let’s do something.
- h) Make use of technology with meaningful outcomes and service delivery.
- i) Have a user-friendly interactive information platform.
- j) Together we can all make a difference.

ROLE OF ACADEMIA, RESEARCH ORGANISATIONS, NGOS AND PRIVATE SECTOR TO PROMOTE ROAD SAFETY IN SOUTH AFRICA

The main observations about the role of the non-government sector in respect of road safety promotion are:

- a) The workshop presenters identified various challenges that need to be addressed in the respective focus areas during the current campaign.
- b) The good practice case studies presented by several invited organisations, illustrated that there are various non-government bodies that are actively involved in road safety promotion in South Africa. This demonstrated that civil society, academia, NGO’s, the private sector, and other bodies in South Africa can play an important role in support of government’s actions during the Decade of Action for Road Safety in the current campaign until 2030.
- c) The need exists to explore synergies among the various non-government stakeholders; as well as with government to strengthen future road safety actions.

INTEGRATED PUBLIC TRANSPORT NETWORKS

Session 4E, Thursday, 7 July 2022

Session chair: Mr Anele Siwa, Ekurhuleni

Convenor: Dr Mathetha Mokonyama, CSIR

The session is convened on behalf of the national Department of Transport and cities implementing integrated public transport networks (IPTNs). The primary purpose of the session is to provide a knowledge sharing platform on the implementation of IPTNs. The session was well attended, by local and international delegates. The session had a number of interactive time slots.

Key messages delivered:

1. ANALYSIS OF THE INFLUENCING FACTORS OF SHARED BIKE TRANSFER TO RAIL TRANSIT - W Chen, Nanjing Tech University

The paper uses empirically collected data of public transport users to analyse problems related to the transfer between shared bicycles and passenger rail service at Andemen subway station in China. The paper further ranks factors influencing factors affecting the use shared bicycles to transfer to rail services. The paper concludes that convenience has the greatest impact, followed by comfort, safety and cost. The paper reminds planners in South Africa that empirical measurements of traveler behaviour are necessary for improved prioritisation of interventions.

2. CYCLING TO PUBLIC TRANSPORT STATIONS – THE MOST SUSTAINABLE TRANSPORT MODE COMBINATION - P Onderwater and E Da Silva, Hatch Africa

The paper investigates how cycling in South Africa can be made a viable option as a feeder mode for passenger rail services. The paper does so by comparing conditions in the Netherlands and those in South Africa. The paper concludes that while it would be difficult to have a large proportion of rail passengers making use of cycling as a feeder mode in South Africa, deliberate effort must be made to encourage such a shift because the benefits are worthwhile.

3. OPTIONS FOR MERGING A MUNICIPAL OWNED BUS SERVICE INTO THE BROADER PUBLIC TRANSPORT NETWORK: THE CASE OF TSHWANE - D Madumo, CSIR

Integrating municipal bus services into the broader IPTN is proven necessary to minimise duplication and improve efficiencies. However, practical implementation requires far reaching institutional reforms in cities, including concessions by organised labour.

4. CRITICAL ISSUES WITH BUS OPERATING COMPANY AGREEMENTS FOR BRT OPERATIONS IN SOUTH AFRICA - R Moosajee, Barefoot Facilitator and D Skrbinek, Future of Transport

Focus in cities tends to be on the technical aspects, for example clauses in contracts and technical indicators at the expense of critical things such as political will to transform public transport, and proper management practices within operating companies. An incremental approach, emphasising consistency, and not stop-start is necessary.

A one-size fits all approach has been detrimental to progress.

5. KEY SUCCESS FACTORS FOR EFFECTIVE BRT IMPLEMENTATION IN AFRICAN CITIES - G Fortune, Gershwin Transportation Consultants

Outcomes-based approach should be adopted for BRT projects. Often emphasis is on the technology. Across the continent, more emphasis tends to be placed on road construction technologies at the expense of service improvements. Cities must attract the requisite in-house technical skills for traction. Implement direct routes as much as possible because people dislike transfers.

6. BRT INTEGRATION ACROSS MUNICIPALITIES IN GAUTENG PROVINCE – EKURHULENI AND JOHANNESBURG - G Akinnusi, Gauteng Department of Roads and Transport

Gauteng Province has initiated a conversation on the integration of BRTs across municipalities in the province. A study by the province has shown that a corridor between Ekurhuleni and Johannesburg is viable for piloting. The recently launched Transport Authority Gauteng will be overseeing the conversation between the cities on the subject.

7. UNPACKING THE NEW NATIONAL GUIDELINE ON IPTN AS A SUITE OF SERVICE OFFERINGS – B Malila, Department of Transport

The new national guide for the implementation of IPTNs is necessitated by poor judgement in cities when choosing technology. Implementation cities will soon have to prove that their interventions are fit for purpose.

8. USING SYSTEMS DYNAMICS MODELLING TO FACILITATE IMPROVED PLANNING AND IMPLEMENTATION OF INTEGRATED PUBLIC TRANSPORT NETWORKS AS EFFECTIVE SPATIAL TRANSFORMATION INSTRUMENTS IN SOUTH AFRICAN CITIES - M Rathogwa

Systems dynamics modelling can significantly improve the communication of IPTN as a strategic tool for spatial transformation. Courses are being organised for cities to train officials on the use of systems dynamics in transport planning.

9. ROBUST TRANSPORT PLANNING – CONCEPTUALIZING THE CITP AND IPTN PLAN UNDER DEEP UNCERTAINTY - Dr. S Cooke, University of Cape Town and C Holderness, City of Cape Town

The presentation outlined the use of a method to develop the Comprehensive Integrated Transport Plan (CITP) and Integrated Public Transport Network (IPTN) which attempt to incorporate future uncertainties. The approach fuses techniques climate adaptation, Decision-Making under Deep Uncertainty (DMDU) framework, and sustainability transitions research fields. The method is still work in progress but promises to improve approaches to planning for resilience.

4. SATC 2023

The 41st annual SATC will take place at the CSIR ICC in Pretoria from 10 to 13 July 2023. The theme of the conference will be: “Rethinking Transportation: planning and building resilient systems to meet global externalities”.

The Minister of Transport is the patron of the annual SATC. As patron, the Minister is invited to open the conference on Monday, 10 July 2023.

