REPÚBLICA DE MOÇAMBIQUE
MINISTÉRIO DAS OBRAS PÚBLICAS, HABITAÇÃO E RECURSOS HÍDRICOS

9th Africa Transportation Technology Transfer Conference 2024

Theme "**Building Resilient Transportation Infrastructure for Socio-Economic Development**"

21st to 24th of May 2024

Joaquim Chissano International Conference Center

Maputo, Mozambique

Organized by

ASANRA
ASSOCIATION OF SOUTHERN AFRICAN NATIONAL ROAD AGENCIES

Hosted by

ANE
ADMINISTRAÇÃO NACIONAL DE ESTRADAS, IP

Executive Summary

The Association of Southern African National Road Agencies (ASANRA) through the Regional Technology Transfer and Capacity Building Committee organises bi-annual Technology Transfer Conferences hosted by ASANRA member states. The Ministry of Public Works, Housing and Water Resources, Mozambique through the National Roads Administration hosted the 9th Africa Transportation Technology Transfer Conference (T2) — from 21st to 24th May 2024 at the Joaquim Chissano International Conference Centre in Maputo, the capital of Mozambique.

The African Transportation Technology Transfer (T2) conferences provide excellent platforms for sharing, exchanging and debating experiences, new technology and best practice in the provision, maintenance and management of all modes of transport. It is also a forum for sharing and exchanging new approaches on technology transfer that enable countries to develop effective integrated transportation systems which are safe, efficient, reliable and affordable.

Since inception in May 2001 when the 1st Africa T2 Conference was held at the Arusha International Conference Centre, Arusha, Tanzania, the conferences have been providing a forum for government agencies and their representatives, academics, consultants, transport sector stakeholders, contractors and consultants from around the world and mainly Africa to discuss acute transportation needs and provide some of the solution to transportation needs.

In the past, various issues on road safety, capacity building and social economic and infrastructure development were addressed at the previous Africa Transportation Technology Transfer (T2) Conferences under different themes. The conferences were held as follows:

I. 1st Africa T2 Conference held in Arusha Tanzania from 23rd – 25th May 2001, hosted by Tanzania Transportation Technology Transfer Centre: “Technology Transfer in Road Transportation in Africa”

II. 2nd Africa T2 Conference held in St. Pietermaritzburg, KwaZulu Natal, South Africa from 20th – 23rd September 2005, hosted by KwaZulu Natal Department of Transport: “Transportation Technology Transfer in Africa’s Renaissance”

III. 3rd Africa T2 Conference held in Mangochi, Malawi from 23rd – 25th May 2007, hosted by Ministry of Transport and Public Works in Malawi: “Technology Transfer for Africa’s Sustainable Transportation System”

IV. 4th Africa T2 Conference held in Windhoek, Namibia from 31st August to 4th September 2009, hosted by Roads Authority of Namibia: “Capacity Building Opportunities in the Transport Sector”

V. 5th Africa T2 Conference held in Arusha Tanzania from 21st – 25th November 2011, hosted by Ministry of Work in Tanzania through TanT2 Centre: “Developing Safe,

Reliable and Sustainable Transportation Systems for Socio-Economic Development in Africa"

VI. 6th Africa T2 Conference held in Gaborone Botswana from 4th – 8th March 2013, hosted by University of Botswana through BwT2 Centre: "Effective Management of Transport Infrastructure for Economic Recovery in Africa"

VII. 7th Africa T2 Conference held in Bulawayo Zimbabwe from 11th – 15th May 2015, hosted by The Zimbabwe Ministry of Transport & Infrastructural Development through ZimT2 Centre: "Mobilising Resources for Transport Infrastructural Development and Maintenance for Poverty Alleviation in Africa"

VIII. 8Th Africa T2 Conference held in in Livingstone Zambia from 8th – 10th May 2017, hosted by The Zambia Ministry of Housing and Infrastructure Development: "Linking Africa through Sustainable Transport Infrastructure Development"

The 9th Africa Transportation Technology Transfer (T2) Conference was an event that took place from 21st – 24th of May 2024 in Maputo the capital of Mozambique. The Conference was officially opened by the Minister of Public Works, Housing and Water Resources, Honourable Carlos Mesquita, the conference was closed by the President of ASANRA and General Director of the National Roads Administration of Mozambique, Engineer Elias Paulo. Two hundred and thirteen (213) delegates from 11 countries in Africa and other countries worldwide attended the 9th Africa T2 Conference. Delegates who attended the Conference were from Angola, Botswana, India, Malawi, Mozambique, Namibia, South Africa, Tanzania, United States of America, Zambia and Zimbabwe.

The Conference programme comprised twenty-six (26) paper presentations, three (3) exhibitors, two days workshop and one site visit. The conference was proceeded by an opening cocktail held on the 21st of May, 2024 and the Gala Conference dinner held on 23rd of May 2024. The participants were drawn from various international and local organisations and individual experts. A wide range of current issues relevant to the development of the transport sector in Africa were discussed and debated at the Conference.

The purpose of this report is to ensure that the key issues arising at the Conference are recorded for wider dissemination and implementation where appropriate. It is also aimed at providing lessons learnt and additional guidance to future T2 conference hosting organisations.

Key Observations and Issues Raised

At the 9th Africa Transportation Technology Transfer (T2) Conference, participants came up with key observations, issues and recommendations through presentations and discussions and workshops.

The following key issues were discussed and debated at the Conference:

- Improvement of coordination of different modes of transport;
- Digitalization of processes and its Impact on traffic management;
- Challenges for improving the efficiency of rail transport in Africa;
- The role of the Mozambican Railway Company for national and regional transport;
- Economy driven Road Construction Materials applicable to Tropical Climates;
- Road Safety: The Safe-Systems Approach;
- A partnership to address the challenges of pedestrian safety on roads projects in Africa;
- Use of safety roller barriers as a safety innovation measure to reduce the severity of accidents and maintenance or replacement costs;
- Gender and Equity Issues in Road Transportation;
- Analysis of Characteristics of Multi-section of Mechanical Stabilized Recycled Base/CTB and New Mechanical Stabilized Base/CTB;
- Assessing Sustainability on Potential Application of Material Compactible Modified Emulsion in Road Network;
- Adequate Road Asset Management – The way to provide better road service to the users;
- Assessment of a Bridge Structure Subjected to Flood Loadings;
- Technology Transfer in Transportation

Fund Mobilisation and Conference Costs

The 9th Africa T2 Conference was promoted and financed through payment of registration fees for participation and exhibition at the conference. The registration fees for participation and exhibition were established to allow to capture a wider participation of delegates. As such the funds raised from the registration of delegates were not enough to cover the conference budget.

Therefore, to cover the financial gap, various stakeholders and sponsors were approached for support. The following institutions /firms responded positively and supported in promoting and financing the Conference:

- Ministry of Public Works, Housing and Water Resources;
- Association of Southern Africa National Road Agencies (ASANRA);
- Road Fund;
- COTOP
- CPG
- Zhongmei

The total cost for the Conference was MZN 18,738,400.00 (US$ 297,434.92). A total income of MZN 14,330,925.00 (US$ 227,475.00) was mobilised through contributions from partners,

various stakeholders and registration of delegates and exhibitors which were not sufficient to meet the total cost for the Conference. The National Roads Administration (ANE) met the budget shortfall using a budget provision in the Annual work plan and thus the conference incurred a loss of MZN 4,407,475.00 (US$ 69,959.92).

Hosting of the 10th Africa T2 Conference

The next Africa T2 Conference will be hosted by South Africa National Roads Agency (SANRAL). During the closing session of the 9th Africa T2 Conference it was announced that the Republic of South Africa, through SANRAL had been nominated by the Regional Technology Transfer and Capacity Building Committee and approved by the Board of Association of Southern African National Roads Agencies (ASANRA) to host the 10th Africa Transportation Technology Transfer Conference in 2026.

In conclusion the 9th Africa Transportation Technology Transfer (T2) Conference was a great success in terms of sharing, exchanging and debating experiences, new technology and best practice in the provision, maintenance and management of various modes of transport.

1. Introduction

The Association of Southern African National Road Agencies (ASANRA) Board at a meeting held in Livingstone on May 2017 approved the proposal of Mozambique to host the Technology Transfer (T2) conference in 2019. The role of ASANRA in the road transport sector in the region is to harmonise policies, systems and procedures through preparation of guidelines and advocating for adoption of good asset management practices among Member States in line with the SADC Protocol on Transport, Communication and Meteorology. The Association established the Regional Technology Transfer and Capacity Building Programme with the objective of developing and sustaining active technology activities through effective Technology Transfer (T2) centres and providing professional and technical capacity in the Region. The Association has hosted eight seven bi-annual conferences in Tanzania, South Africa, Malawi, Namibia, Botswana, Zimbabwe and Zambia.

The 9th Conference was initially supposed to be in 2019 but due to elections in Mozambique in 2019 the conference was postponed to 2020 and again due to COVID pandemic it had to be postponed to 2024.

The intention of holding the T2 conferences is to share, exchange and debate experiences, new technology and best practice in the provision, maintenance and management of all modes of transport. It is also a forum for sharing and exchanging new approaches on technology transfer that enables countries to develop effective integrated transportation systems which are safe efficient, reliable and affordable. The T2 conferences attract over 300 delegates from various continents which include Africa, Europe, America and Asia. During the Conferences various selected presentations and workshops pertaining to the Conference Thematic-Areas and topic are held. The Conference format includes Technical Presentations, Panel Discussions, Workshops as well as Exhibitions on Products, Technologies and Services.

The National Roads Administration of Mozambique (ANE, IP) in collaboration with the Association of Southern African National Roads Agencies (ASANRA), Transportation Technology Transfer (T2) Centres in SADC region and other local and international stakeholder institutions organized the 9th Africa Transportation Technology Transfer (T2) Conference that took place from 21st to 24th of May 2024 in Maputo the capital of Mozambique. The theme for the conference was "**Building Resilient Transportation Infrastructure for Socio-Economic Development**".

The Conference which was a major event attended by a good number of delegates from African countries and world over, targeted at transport sector policy and decision makers, development partners, practitioners, contractors, consultants, researchers, the academia, students, transport users and other interested parties.

The main objectives of organizing the Africa T2 Conference are:

- To promote Technology Transfer for Developing Sustainable Transportation Systems in Africa;
- To promote establishment and operations of Technology Transfer Centres as means for facilitating appropriate effective technology transfer in the transport sector;
- To provide a forum for discussion and exchange of views as well as learn experiences of best practices and innovative solutions in the Transportation Industry

In the past eighth Africa Transportation Technology Transfer (T2) Conferences various issues on road safety, capacity building and social economic and infrastructure development were addressed under different themes. The conferences were held as follows:

1. "**Technology Transfer in Road Transportation in Africa**" - 1st Africa T2 Conference held in Arusha Tanzania from 23rd – 25th May 2001 and hosted by Tanzania Transportation Technology Transfer Centre.

2. "**Transportation Technology Transfer in Africa's Renaissance**" - 2nd Africa T2 Conference held in St. Pietermaritzburg, KwaZulu Natal, South Africa from 20th – 23rd September 2005, hosted by KwaZulu Natal Department of Transport.

3. "**Technology Transfer for Africa's Sustainable Transportation System**" - 3rd Africa T2 Conference held in Mangochi, Malawi from 23rd – 25th May 2007, hosted by Ministry of Transport and Public Works in Malawi.

4. "**Capacity Building Opportunities in the Transport Sector**" - 4th Africa T2 Conference held in Windhoek, Namibia from 31st August to 4th September 2009, hosted by Roads Authority of Namibia.

5. "**Developing Safe, Reliable and Sustainable Transportation Systems for Socio-Economic Development in Africa**" - 5th Africa T2 Conference held in Arusha Tanzania from 21st – 25th November 2011, hosted by Ministry of Work in Tanzania through TanT2 Centre.

6. "**Effective Management of Transport Infrastructure for Economic Recovery in Africa**" - 6th Africa T2 Conference held in Gaborone Botswana from 4th – 8th March 2013, hosted by University of Botswana through BwT2 Centre.

7. "**Mobilising Resources for Transport Infrastructural Development and Maintenance for Poverty Alleviation in Africa**" - 7th Africa T2 Conference held in Bulawayo Zimbabwe from 11th – 15th May 2015, hosted by The Zimbabwe Ministry of Transport & Infrastructural Development through ZimT2 Centre.

8. "**Linking Africa through Sustainable Transport Infrastructure Development**" - 8Th Africa T2 Conference held in in Livingstone Zambia from 8th – 10th May 2017, hosted by The Zambia Ministry of Housing and Infrastructure Development:

During the past Africa Transportation T2 Conferences, various presentations were made to address those themes. The Events have facilitated bringing together Member States, Ministries responsible for transport infrastructure, Roads Agencies and Authorities, Academia, transport infrastructure users, Consultants, Contractors and Technology Transfer Centres. In addition, among other things, the events have facilitated the following:

- Exchange and sharing of technological information for transport infrastructure development;

- Conducting of Technical Site Visits that enables professionals to learn from each other regarding application of appropriate materials in road construction, technologies, operations of various transportation modes such as roads and ports.

- Carried out Capacity Building Programmes such as training courses and workshops that were conducted concurrently with the Conference;

- Exhibitions on various products, technologies, and services applied by companies, organizations and institutions from within and outside Africa;
- Formulation of collaborations and partnerships between institutions from Africa and those outside Africa;

- Gathering of professionals from various countries inside and outside Africa and sharing experiences and innovative solutions;

- Visiting natural resources and sightseeing in host countries

The Africa Transportation T2 Conference as highlighted above has been an event that has put Africa as a continent on the global map. Mozambique through the National Roads administration hosted the 9th Africa Transportation Technology Transfer Conference that included technical presentations, workshops as well as exhibitions on products and services.

The 9th Africa Transportation Technology Transfer (T2) Conference took place from 21st – 24th of May 2024 in Maputo the capital of Mozambique. The Conference was officially opened by the Minister of Public Works, Housing and Water Resources Honourable Carlos Mesquita, the conference was closed by the President of ASANRA and General Director of the National Roads Administration of Mozambique, Engineer Elias Paulo. Two hundred and thirteen (213) delegates from 11 countries in Africa and other countries worldwide attended the 9th Africa T2 Conference. Delegates who attended the Conference were from Angola,

Botswana, India, Malawi, Mozambique, Namibia, South Africa, Tanzania, United States of America, Zambia and Zimbabwe.

To meet its objective the Conference featured various paper presentations and workshops pertaining to the Conference thematic-areas and topics. Being fully aware of the current trends, the Conference agenda addressed the following: issues ranging from rural accessibility and transport services, innovative maintenance and application of technologies in overcoming transport challenges, road safety, Asset management and preservation, policy and financing, transport infrastructure resilience to climate change, gender in the transport industry and cross cutting issues in the transport sector, all of which were expected to be beneficial to the delegates in attendance. The Conference offered a great opportunity to network with decision makers and key players in the African Transportation and Infrastructure sector, and also provided a platform to enhance professional networking and interaction between key industry players.

Exhibition of activities and services by some sponsors and stakeholders was held in conjunction with the Conference.

1.1 The Conference Theme

The Conference theme was "**Building Resilient Transportation Infrastructure for Socio-Economic Development**"

1.2 Conference sub-themes

The Conference dealt with the below mentioned topics. There were no restrictions on attending any one topic.

- Integrated Transportation Systems
- Sustainable Climate Adapted Infrastructures and Innovative Technology
- Efficient Rural Access Transportation
- Asset Preservation and Financing Mechanisms

2. Organisation of the Conference

Mozambique through the Ministry of Public Works, Housing and Water Resources was the host and main organiser of the 9th Africa Transportation Technology Transfer (T2) Conference. Ministry of Public Works, Housing and Water Resources through the National roads Administration formed an Organising Committee of five (5) officials being responsible for overall preparations and organisation of the 9th Africa Transportation Technology Transfer Conference in year 2024. Various Subcommittees that carried out specific duties were also set up.

The Conference organisation committee and the secretariat were responsible for organising the successful hosting of the Conference. The preparatory activities included the following activities:

i. Preparation of the conference budget;
ii. Sending invitation to participants;
iii. Follow -up, correspondence and custody of all conference records and information;
iv. Arranging Conference Organising Committee meetings;
v. Arrangement for venue, accommodation, tours and other services related to the Conference;
vi. Preparation of advertisements and ensuring their timely release in the various media;
vii. Design of brochures, posters and banners;
viii. Arrangement for transport, Conference bags and stationery;
ix. Support the participants to get visa to come to the conference;
x. Arrangement for social events;
xi. Follow-up of production of Conference proceedings;
xii. Design for a set-up of exhibition area and stands;
xiii. Provision of Standard Conference Team during the event days i.e. Secretaries, Logistics Officers, Facilitators and Rapporteurs;
xiv. Supervising the production of the Conference materials;
xv. Preparation of the Conference Report.

The lists of the members of the Conference Organising Committee is presented in table 1 below:

Table 1: Conference Organizing Committee

No.	Name	Title	Institution
1	Miguel Coanai	Chair of the Committee	National Roads Administration
2	Calado Ouana	Chair – Logistic & Transport sub-committee	National Roads Administration
3	Carla Mangane	Chair – Finance and Fund rising sub-committee	National Roads Administration
4	Rubina Normahomed	Chair – Marketing and Public relation sub-committee	National Roads Administration
5	Adérito Guilamba	Chair – Technical sub-committee	National Roads Administration

2.1. Time Table for Organization of the Conference

The following timetable for organisation of the Conference was agreed upon by the Organising committee:

1st September, 2023: Call for Papers

3rd January, 2024: Closing date for submission of papers
3rd February, 2024: Notification of acceptance of abstracts
18th March, 2024: Deadline for submission of full papers
29th March, 2024: Reviewed papers returned to authors for possible amendment
6th April, 2024: Deadline for Submission of finalised papers
22nd April, 2024: Notification of acceptance
21st – 24th May, 2024: Conference in Maputo, Mozambique.

2.2. Publicity of the Conference

The Director General of ANE made the first announcement of the conference at a press briefing held at the Ministry of Public Works, Housing and Water Resources board room in 1st July 2023.

The call for abstracts and exhibitors was issued on 1st September, 2023 and posted on the Conference website https://t2moz2024.com. The announcement contained most details about the Conference including Conference theme, thematic areas, topics, guidelines to authors of papers and conducting of courses and workshops, exhibitions, venue, registration information, sponsorship, accommodation, transport and other practical information.
Invitation letters in both hard copies and electronic forms were sent to institutions and individuals who are stakeholders in the transportation sector. Locally, awareness about the Conference were raised through print media, electronic media and press briefings.

All information about the 9th Africa T2 Conference including the "Announcement and call for Papers and Exhibitors" were made available at the Conference website https://t2moz2024.com. Delegates to attend the Conference were required to fill the registration form and submit through the website.

Over 800 local and international potential participants were informed and invited to participate in the Conference by all possible means. In order to make effective sharing of the Conference information, regular reminders at various intervals were sent to stakeholders on the mailing list.

2.3. Abstracts and paper review process

The first call for abstracts and exhibitors was issued on 1st September, 2023 and posted on the Conference website https://t2moz2024.com. Guidelines for authors and deadlines were also included in the announcement. A total of sixteen (16) papers were received and the call for papers ended on 3rd January 2024. The Technical Sub Committee appointed three (3) experts to the T2 Technical Review Panel (TRP) and the deadline for review of

papers was 3rd February 2024. Based on recommendations of the reviewers, the Organising Committee accepted and approved fourteen (14) full papers for presentation during the Conference. Authors were advised to adhere to the given guidelines during their submission

3. Conference Proceedings

3.1. Paper Presentations

3.1.1. Integrated Transportation Systems

a) Key issues

i. An intelligent vision of the ports in terms of digitalization of the processes can contribute positively for better management of the cargo traffic that in most cases contribute negatively for congestions of the roads during the pick hours.
ii. This approach improves the expected arrival of Rail and Road cargo at the ports as well as the loading and offloading of from the vessels and improve the efficiency of the ports.
iii. Road and rail transport are the key for developments of the countries and shall be well structured to benefit the economy of the countries.

b) **Conclusions**

i. Road and rail transport are the key for development of the countries and shall be well structured to benefit the economy of the countries.
ii. An integrated transport system shall be always promoted in the region as it can contribute for the reduction of the costs of goods and services.

3.1.2. Sustainable Climate Adapted Infrastructures and Innovative Technology

a) Key issues

i. The overloading is becoming a serious problem for the life of the roads and there is a need to address this issue seriously in the region.
ii. The transport infrastructures are being negatively impacted by the climate change and there is a need to adapt cost effective measures to improve their resilience.
iii. The resilience of the transport infrastructures shall be included in all phases of the infrastructure management system.

b) **Conclusions**

i. Measures on permission of new trucks types must be aligned among the member countries and the implication must be recognized if it is the case.
ii. Countries must explore different existing type, low cost and easy adaptation measures that can be implemented for improvement of the resilience of the transport infrastructures.
iii. The cost benefit analysis of the resilience of the transport infrastructures shall be part of the management systems to support the informed decisions of the management.

3.1.3. Efficient Rural Access Transportation

a) Key issues

i. Rural accessibility is one of the most important aspects in most of African countries as where more population live.
ii. The improvement of rural access transportation is a key factor for economic development of the countries.

b) **Conclusions**

i. African countries shall build and maintain resilient rural transport infrastructures to provide safe and reliable accessibility to rural areas.

3.1.4. Asset Preservation and Financing Mechanisms

a) Key issues

i. Asset preservation mast include the entire cycle of asset management from planning, designing, construction and maintenance.
ii. Informed decisions are the key factor for an adequate asset preservation.
iii. Asset Management systems are very important to provide all information of the performance of the asset that is used to support the decisions.

b) **Conclusions**

i. A good combination of management, finance, engineering aspects and other practices applied to a specific asset will always help to improve the efficiency of the asset and provide the desired service level for the users.

3.2. Workshop

During the Conference, two days Road Safety workshop has been conducted and it was supported by the Federal Highway Administration (FHWA).

a) Key issues

iv. Road Safety is acknowledged worldwide as a sustainable development challenge
v. Every year Road Traffic Crashes (RTC) claim about 1.19 million lives and injure over 50 million people worldwide, with 90 percent of these RTCs being in Low-and-Middle-Income countries (LMIC).
vi. The World Health Organization (WHO) reported in 2023 that road traffic injuries are now the leading killer of children and young adults aged 5-29 years and is the 8th leading cause of death for all age groups, with the burden being disproportionately borne by pedestrians, cyclists, and motorcyclists, particularly those living in LMICs.
vii. It is being predicted that without action, road traffic crashes will be the leading cause of death in the world by 2030.

b) **Conclusions**

i. To invert the actual situation, it is recommended to adopt sustainable road safety interventions and action through adoption and implementation of five (5) pillars of road safety namely: Road Safety Management, Safer Roads and Mobility, Safer Vehicles, Safer Road Users and Post-Crash care.
ii. Countries must implement the above-mentioned pillars taking into account their local environment and conditions.

3.3. Site Visit

3.3.1. Port of Maputo

The port of Maputo has been concessioned to Maputo Port Development Company (MPDC).
MPDC is a national private company, which results from the partnership between the Mozambican Railway Company (Caminhos de Ferro de Moçambique) and Portus Indico, comprised by Grindrod, DP World and local company Mozambique Gestores. On the 15th of April 2003 MPDC was given the concession of Maputo's Port for a period of 15 years, with an extension option of another 15. In June 2010, the concession period was extended for another 15 years, and in February 2024 the Government awarded an extension until 2058 based on a plan to expand the port capacity.

a) Services offered

The port offers most services required by ocean going ships namely:

i. Dry Dock and Repairs (Small drydock with maximum dimensions 80m X 12m; The dock entrance sill is 3.6m below chart zero; Mobile welding and repair services at all wharves; Diver services)
ii. Ship Chandlers (Available, should be contacted via Ship Agents)
iii. Bunkering (Heavy Fuel Oil, Marine Diesel Oil, Gas Oil and Lub Oils available)
iv. Fresh Water (Available at most wharves and terminals)
v. Ship Telephone (Not available)
vi. Electricity supply
vii. Removal of waste
viii. Sludge removal
ix. Boat launch

b) Future projects

i. Expansion of container terminal, volumes ramp up above 1
ii. Million TEU
iii. New berth 15 - 17 (1.2 km quay) for mixed bulk
iv. New rail connection and siding to berths 15-17
v. Space reservation for power barge tying into national grid

c) **Conclusions**

i. Maputo Port has shown a strong annual growth of throughput volumes of about 10% since the start of the concession in 2003. The main growth has been in dry bulk export, but the Port has also diversified its portfolio and is continuing to work on this.
ii. 2The ability of MPDC and the sub-concessionaires to implement the Future projects is dependent, apart from internal factors, but upon a number of external factors to the Port, such as:
    - the progression of market growth driven by trade flows,
    - the increase of local exports through Port of Maputo
    - the reduction of logistics chain costs along the corridor
iii. Ensure sustainable and efficient 24/7 operations at the Komatipoort /Ressano Garcia border
iv. The creation of a platform between CFM, Transnet and MPDC to further develop the Ressano Garcia rail corridor.

3.3.2. N1 Maputo – Ponta D'Ouro including Maputo – Katembe bridge

The participants, guided by ANE staff, visited the 115 km road from Maputo and Ponta D'Ouro and Maputo – Katembe bridge with the total length of 3,003 m which were officially opened in November 2018.

a) Key issues

i. With a main span of 680 m and a total length of 3,003 m, the Maputo-Katembe Bridge together with its approach bridges is the longest Suspension Bridge in Africa, representing a national milestone in terms of large scale projects and the largest construction work since the country's independence in the 70s.
ii. The structure of the approach bridges consists of reinforced concrete, with the suspended bridge deck comprising 57 steel prefabricated segments.
iii. The bridge is designed to carry two lanes for each direction. The Southern Approach Bridge was constructed using beams and cover-slabs composed of prefabricated post-tensioned 30 m and 45 m T-beams. The Northern Approach was built through the cantilever method using box girders and 30 m beams for the first spans between bridge piers.
iv. The approach bridges have a total length of 1,234 m on the Katembe side and 1,093 m on the Maputo side.
v. The two towers, one located on the Maputo side and the other on the Katembe side, are the highest elements of the bridge, respectively 135 m and 136 m high, and are supported with piles with a depth of 105 m on the South side and 95 m on the North side.

3.4. Exhibitions

At the Conference venue, there was an exhibition of technologies, products and services.

3.4.1. Cimentos de Mozambique

Is the oldest company in Mozambique that is producing cement for all construction purposes.

3.4.2. TRAC

Is the Concessioner of the N4 road from Maputo in Mozambique to Witbank in South Africa.

3.5. Social Events

A Welcome Cocktail, Gala Dinner and closing lunch were hosted at the Conference.

3.5.1. Welcome Cocktail

The Welcome Cocktail took place on the first day of the Conference Tuesday, 21st May 2024 from 18:00 to 19:30 hours at conference venue.

3.5.2. Gala Dinner

The Gala Dinner took place on the final day of the Conference on Thursday, 23rd of May 2024 from 18:00 to 20:00 hours at the conference venue. The programme for the event
included entertainment by Kakana Band which is the famous band in Maputo. The event was graced by ANE Director General Engineer Elias Paulo.

4. Financial Management

4.1. Funds Mobilization

The 9th Africa T2 Conference was promoted and financed through payment of registration fees for participation and exhibition at the conference. The registration fees for participation and exhibition were established to allow to capture a wider participation of delegates. As such the funds realised from the registration of delegates were not enough to cover the conference budget.

Therefore, to cover the financial gap, various stakeholders and sponsors were approached for support. The following institutions /firms responded positively and supported in promoting and financing the Conference:

- Ministry of Public Works, Housing and Water Resources;
- Association of Southern Africa National Road Agencies (ASANRA);
- Road Fund;
- COTOP
- CPG
- Zhongmei

Details of the income from sponsors are as indicated in Table 2 below:

Table 2. Income from Sponsors

No.	Sponsor	Amount
1	Ministry of Public Works, Housing and Water Resources	US$ 10,000.00
2	Association of Southern Africa National Road Agencies (ASANRA);	US$ 20,000.00
3	Road Fund	US$ 80,000.00
4	COTOP	US$ 30,000.00
5	CPG	US$ 50,000.00
6	Zhongmei	US$ 20,000.00
Total		**US$ 210,000.00**

The total cost for the Conference was MZN 18,738,400.00 (US$ 297,434.92). A total income of MZN 14,330,925.00 (US$ 227,475.00) was mobilised through contributions from partners, various stakeholders and registration of delegates and exhibitors which were not sufficient to meet the total cost for the Conference. The National Roads Administration (ANE) met the budget shortfall using a budget provision in the Annual work plan and thus the conference incurred a loss of MZN 4,407,475.00 (US$ 69,959.92).

4.2. Income and Expenditure

Details of the budget, income and expenditure are as indicated in the Financial Statements in Tables 3, 4, 5 and 6 below

Table 3: Conference Budget

No.	Description	Unit price (US$)	Quantity	Total (US$)
1	Conference venue	10,000.00	3	30,000.00
2	Website and management	40,000.00	1	40,000.00
3	Conference badges, bags, and stationary	30	350	10,500.00
4	Meals	30	1200	36,000.00
5	Service Provider (Event management)	60,000.00	1	60,000.00
6	Conference preparation	60,000.00	1	60,000.00
7	Professional organizers	1,500.00	12	18,000.00
8	Review of abstracts and papers	15,000.00	1	15,000.00
9	Transportation and bus services	10,000.00	1	10,000.00
10	Conference advertisements	10,000.00	1	10,000.00
11	Simultaneous translation services	2,000.00	3	6,000.00
12	Printing of Conference material	10,000.00	1	10,000.00
13	Audio-visual and simultaneous translation equipment hire	15,000.00	1	15,000.00
14	Promotional materials and advertisement	20,000.00	1	20,000.00
15	Entretainment	12,000.00	1	12,000.00
16	Sundry expenses	20,000.00	1	20,000.00
17	Contigency	20,000.00	1	20,000.00
Total				**392,500.00**

Table 4: Income and Expenditure Summary

Revenue	Amount (US$)
Delegate fees	17,475.00
Sponsorship	210,000.00
Total Revenue	**227,475.00**
Expenses	
Conference rooms and facilities	54,379.40
Event Management and Logistics	19,047.62
Conference Equipment and related services	37,976.19
Services	118,531,74
Transportation	21,119.02
Promotional Materials	46,380.95
Total Expenses	**297,434.92**
Deficit	(69,959.92)
ANE funding	69,959.92
NET Surplus/Deficit	0.00

Table 5: Revenue

Description	Amount (US$)	Amount (MZN)	Equivalent (US$)	Total (US$)
Delegate fees	11,100.00	401,608.00	6,375.00	
Total Delegate fees				**17,475.00**
Sponsorship:				
• ASANRA	20,000.00			20,000.00
• MPWHWR		630,000.00	10,000.00	10,000.00
• Road Fund		5,040,000.00	80,000.00	80,000.00
• COTOP		1,890,000.00	30,000.00	30,000.00
• CPG		3,150,000.00	50,000.00	50,000.00
• Zhongmei		1,260,000.00	20,000.00	20,000.00
Total Sponsorship				**210,000.00**
Total Revenue				**227,475.00**

Note: All sponsors paid their contribution directly to the conference service provider.

Table 6: Expenditure

Description	Amount (MZN)	Equivalent (US$)
Conference rooms and facilities • Conference rooms • Secretariate services • Health services • Registration services	**3,425,900.00** 1,775,900.00 195,000.00 255,000.00 1,200,000.00	**54,379.40**
Event Management and Logistics • Website and management • Conference Advertisements	**1,200,00.00** 750,000.00 450,000.00	**19,047.62**
Conference Equipment and related services • Sound and projection equipment • Interpretation equipment and services • Dedicated internet	**2,392,500.00** 1,065,000.00 1,185,000.00 142,500.00	**37,976.19**
Services • Airport support services • Catering services during the conference • Gala Dinner • Entertainment • Ornamentation	**7,467,500.00** 525,000.00 4,402,500.00 1,890,000.00 425,000.00 225,000.00	**118,531,74**
Transportation • Transportation services	**1,330,500.00** 1,330,500.00	**21,119.02**
Promotional Materials • Backdrops and roll ups • T-shirts • Other promotion materials	**2,922,000.00** 445,000.00 525,000.00 339,000.00	**46,380.95**
TOTAL	**18,738,400.00**	**297,434.92**

5. Conclusion

The 9th Africa Transportation Technology Transfer (T2) Conference was successfully organized and the attendance was good and the level of participation by delegates was high. It is worth noting that the relevance of the subjects that were selected for discussion and the preparedness of the presenters, facilitators and speakers made the whole conference a success. It is expected that various issues discussed during the conference and highlighted in this report will provide impetus to stakeholders in the transportation sector to address some of the challenges affecting the sector. Further, various key issues

highlighted by the delegates which continue to affect the transport sector will also provide a basis for discussion at the next T2 conferences.

6. Recommendations

Delegates attending the 9th Africa T2 Conference which included paper presentations, workshops and exhibitions on technologies, products and services in the transport sector are recommending ASANRA to continue with this kind of conferences as they give a unique opportunity of all stakeholders in the transport sector in Africa and around the world to be together and discuss the issues and challenges for the development of the transport sector.

It is also very important to highlight that this a forum where officials and interested stakeholders involved in a different mode of transport are seating together to discuss and seen how better the transport systems can be integrated.

7. Acknowledgements

The Ministry of Public Works, Housing and Water Resources and the National Roads Administration of Mozambique would like to thank all stakeholders who contributed towards the hosting of the 9th Africa Technology Transportation Technology Transfer Conference, we offer our sincere gratitude.

We cannot express enough gratitude to the organising committee and all members involved in the organizing process for their contribution towards the conference.

To our sponsors, thank you very much for your contribution which was both financial and also in kind.

Lastly, we thank ASANRA for the guidance and support provided, as the conference would not have been as success without your contribution.

8. Appendices

Appendix 1: CONFERENCE PROGRAM

Monday 20 May, 2024	Registration and Final Build up / Organization	
Time	**Detailed Description of Activities**	**Responsibility**
9:00 a.m to 17:00 p.m	Onsite Registration of Conference Participants	Registration Team /Secretariat
9:00 a.m to 17:00 p.m	Stand exhibition build up	Exibitors

Tuesday 21 May, 2024	Summary of Tuesday Program	
Time	**Detailed Description of Activities**	**Responsibility**
8:00 a.m to 9:00 a.m	Onsite Registration of Conference Participants	Registration Team /Secretariat
9:00 a.m to 17:00 p.m	Conference Proceedings-Opening & Key Note Speeches, Paper Presentations	Director of Ceremony / Presenters / Exhibitors
17:00 p.m. to 19:00 p.m.	Welcome Cocktail Party	Secretariate

Tuesday 21 May, 2024	Tuesday detailed Program	Venue: Main Conference Room
Time	**Detailed Description of Activities**	**Responsibility**
8:00 a.m to 9:00 a.m	Onsite Registration of Conference Participants	Eng. E Soares - Registration Team /Secretariat
9:00 a.m to 9:10 a.m	Introductory Remarks and Announcements	Director of Ceremony
9:10 a.m to 9:15 a.m	Mozambique Nacional Anthem	Director of Ceremony
9:15 a.m to 9:20 a.m	Opening remarks	Eng. Miguel Coanai-Chairperson T2 Conference, Deputy Director of National Roads Administration (ANE), Mozambique

9:20 a.m to 9:25 a.m	Speech by ASANRA President	Eng. Elias Paulo, President of ASANRA
9:25 a.m to 9:40 a.m	Enterteinment	Cultural dance
9:40 a.m to 9:45 a.m	Welcome Remarks	Mayor of Maputo City
9:45 a.m to 9:50 a.m	Welcome Remarks	Governor of Maputo City
9:45 a.m to 10:00 a.m	Official Opening Speech	Minister of Public Works, Housing and Water Resources
10:00 a.m to 10:30 a.m	Tea Break - Designated Area	Secretariate
10:30 a.m to 10:50 a.m	Presentation 1 – The digitalization of processes in the Port of Maputo and its Inpact on traffic management along the corridor (A Digitalização de processos no Porto de Maputo e seu Impacto na melhoria de Gestão de Trafego ao longo do corredor)	Mr. Princidónio David (Maputo Port Development Company), Mozambique
10:50 a.m to 11:10 a.m	Presentation 2 – Desafios actuais dos CFM para Impulsionar o transporte ferroviário com mais resiliência	Mozambique Railways Company
11:10 a.m to 11:30 a.m	Presentation 3 - O papel do CFM no transporte nacional e Regional	Mozambique Railways Company
11:30 a.m to 11:50 a.m	Presentation 4 - An overview of Railway Transport System in Malawi	Witness Kuotcha Ignasio Ngoma
11:50 a.m to 12:10 a.m	Discussions, Q&A	All
12:10 a.m to 12:30 p.m	Presentation 5 – Economy driven Road Construction Materials applicable to Tropical Climates	Mr. Adérito Guilamba: National Roads Administration, Mozambique
12:30 p.m to 13:00 p.m	Discussions, Q&A	All
13:00 p.m to 14:00 p.m	Lunch Break - Designated Area	Secretariate
14:00 p.m to 14:20 p.m	Presentation 6 - Road Safety: The Safe-Systems Approach	Mr. Patrick Hasson: Federal Highway Administration, Resource Center, USA
14:20 p.m to 14:40 p.m	Presentation 7 - A partnership to address the challenges of pedestrian safety on donor-financed roads projects in Africa	Mrs. Texel Cossa: Country Manager, Amend, Mozambique
14:40 p.m to 15:00 p.m	Presentation 8 - Pilot project for the use of safety roller barriers in the Kwazulu-Natal road network as a safety innovation measure to reduce the severity of accidents and maintenance or replacement costs	Mr. Simphiwe Nene: Civil Engineer, KwaZulu-Natal Department of Transports, South Africa
15:00 p.m to 15:30 p.m	Discussions, Q&A	All

15:30 a.m to 16:00 a.m	Tea Break - Designated Area	Secretariate
16:00 p.m to 16:30 p.m	Presentation 9 - Gender and Equity Issues in Road Transportation	Mrs. Lateefah Burgess: Federal Highway Administration, USA
16:30 p.m to 16:45 p.m	Discussions, Q&A	All
16:45 p.m to 17:00 p.m	Closing remarks of the first day and announcements	Director of Ceremony
17:00 p.m to 18:30 p.m	Welcome Cocktail Party	Secretariate

Wednesday 22 May, 2024	Summary of Wednesday	
Time	**Detailed Description of Activities**	**Responsibility**
8:00 a.m to 8:30 a.m	Onsite Registration of Conference Participants	Registration Team /Secretariat
8:30 a.m to 13:00 p.m	Parallel Workshop Session on Road Safety; Technical Sessions-paper presentations	FHWA
14:00 p.m to 17:00 p.m	Technical Sessions-paper presentations	Director of Ceremony / Presenters / Exhibitors
17:00 p.m. to 18:30 p.m.	Welcome Cocktail Party	Secretariate

Wednesday 22 May, 2024	Wednesday detailed Program	Venue: Main Conference room
Moderator:		
Time	**Detailed Description of Activities**	**Responsibility**
8:30 a.m to 8:40 a.m	Daily announcements	Director of Ceremony
8:40 a.m to 9:00 a.m	Presentation 10 - Analysis of Characteristics of Multi-section of Mechanical Stabilized Recycled Base/CTB and New Mechanical Stabilized Base/CTB at N7 in Mozambique	Mr. Moisés Dzimba: National Roads Administration, Mozambique
~~9:00 a.m to 9:20 a.m~~	~~Presentation 11 - Influence of nanomaterials on the performance properties of reclaimed asphalt mixtures and bitumen binders~~	~~Mr. Actor Zonde: Department of Roads, Zimbabwe~~
9:20 a.m to 9:40 a.m	Presentation 12 - Assessing Sustainability on Potential Application of Material Compactible Modified Emulsion in the Mozambique Road Network	Mr. Adérito Guilamba: National Roads Administration, Mozambique
9:40 a.m to 10:30 a.m	Discussions, Q&A	All
10:30 a.m to 11:00 a.m	Tea Break - Designated Area	Secretariate
11:00 a.m to 11:20 a.m	Presentation 13 - Adequate Road Asset Management – The	Mr. Calado Ouana: National Roads

	way to provide better road service to the users	Administration, Mozambique
11:20 a.m to 11:40 a.m	Presentation 14 - Proposal (Proposta de Um Sistema Simplificado de Gestão de Pavimentos Rodoviários)	Mr. Asken de Fortuoso Pambe: Engenheiro Civil e de Transporte
11:40 a.m to 12:00 a.m	Presentation 15 - Current Challenges on Mozambique Road Asset Preservation: Overloading on Maputo Ring Road	Mr. Victor Rangel: COTOP, Mozambique
12:00 a.m to 12:20 a.m	Presentation 16 - Road management System of Namibia	Mrs. Sophia Take & Mr. Paulse Fergusson: Roads Authority, Namibia
12:20 p.m to 13:00 p.m	Discussions, Q&A	All
13:00 p.m to 14:00 p.m	Lunch Break - Designated Area	Secretariate
14:00 p.m to 14:20 p.m	Presentation 17 - Possibilidade do Uso do Melaço na Estabilização da Camada de Desgaste em Estradas	Mr. W. Palate
14:20 p.m to 14:40 p.m	Presentation 18 - Assessment of a Bridge Structure Subjected to Flood Loadings - Case Study of Licungo Bridge in Mozambique	Mr. C. Mafuiane
14:40 p.m to 15:00 p.m	Presentation 19 - GOA - Reshaping Bridge Inspection with AI, 3D Tools and BIM: Outcomes from an R&D initiative	Mr. Tiago Mendonça at all, BETAR
15:00 p.m to 15:30 p.m	Discussions, Q&A	All
15:30 a.m to 16:00 a.m	Tea Break - Designated Area	Secretariate
16:00 p.m to 16:20 p.m	Presentation 20 - Technology Transfer in Transportation	Mrs. Lateefah Burgess: Federal Highway Administration, USA
16:20 p.m to 16:40 p.m	Presentation 21 - Training needs analysis system for ASANRA Member States	Mwanaisha Mvungi Rajabu: ASANRA Technology Transfer Committee
16:40 p.m to 17:00 p.m	Discussions, Q&A	ASANRA Secretariate
17:00 p.m to 17:10 p.m	Closing remarks of the second day and announcements	

Wednesday 22 May, 2024		Venue: Room A
Time	**Detailed Description of Activities**	**Responsibility**
8:30 a.m to 11:30 a.m	Parallel Workshop Session on Road Safety	Registration Team /Secretariat
11:00 a.m to 11:30 a.m	Tea Break - Designated Area	Secretariate
11:30 a.m to 13:00 p.m	Parallel Workshop Session on Road Safety	FHWA

13:00 p.m. to 14:00 p.m.	Lunch Break - Designated Area	Secretariate

Thursday 23 May, 2024	Summary of Thursday Program	
Time	**Detailed Description of Activities**	**Responsibility**
8:00 a.m to 8:30 a.m	Onsite Registration of Conference Participants	Registration Team /Secretariat
8:30 a.m to 13:00 p.m	Parallel Workshop Session on Road Safety; Technical Sessions-paper presentations	FHWA
14:00 p.m to 17:00 p.m	Technical Sessions-paper presentations	Director of Ceremony / Presenters / Exhibitors
18:00 p.m to 20:00 p.m	Gala Dinner	

Thursday 23 May, 2024	Thursday detailed Program	Venue: Main Conference room
Moderator:		
Time	**Detailed Description of Activities**	**Responsibility**
8:30 a.m to 9:00 a.m	Presentation 22 - Adaptation Measures for Climate Resilience of Bridge Infrastructures	Mr. Calado Ouana: National Roads Administration, Mozambique
9:00 a.m to 10:00 a.m	Presentation 23 - Preparation of Road Network Master Plans for Provinces. Indian Case studies	Mr. Sety, LEA International
10:00 a.m to 10:30 a.m	Discussions, Q&A	All
10:30 a.m to 11:00 a.m	Tea Break - Designated Area	Secretariate
~~11:00 p.m to 11:30 p.m~~	~~Presentation 24 – Nanomaterials application in road binders modification for production of low cost and clean high modulus coal tar for road surfacing and rehabilitation~~	~~Mr. Actor Zonde: Department of Roads, Zimbabwe~~
11:30 p.m to 12:00 p.m	Presentation 25 - Acidentes de viação por colisão frontal: Estudo de caso Maluana	Mr. Venildo Armando Feliciano Mazoio: Mozambique
12:00 a.m to 13:00 a.m	Presentation 26 - Sistema de transporte e infraestruturas de transporte integrados	Mr. Henrique Victorino: INEA, Angola and Mr. Etelvino Almeida: ANTT, Angola
13:00 p.m to 14:00 p.m	Lunch Break - Designated Area	Secretariate
14:00 p.m to 16:00 p.m	Closing Session	
18:00 p.m to 20:00 p.m	Gala Dinner	Secretariate

Thursday 23 May, 2024		Venue: Room A
Time	Detailed Description of Activities	Responsibility
8:30 a.m to 11:30 a.m	Parallel Workshop Session on Road Safety	FHWA
11:00 a.m to 11:30 a.m	Tea Break - Designated Area	Secretariate
11:30 a.m to 13:00 p.m	Parallel Workshop Session on Road Safety	FHWA
13:00 p.m. to 14:00 p.m.	Lunch Break - Designated Area	Secretariate

Friday 24 May, 2024	Site Visit	
Time	**Detailed Description of Activities**	**Responsibility**
8:30 a.m to 9:00 a.m	Arrival of participants	Registration Team /Secretariat
9:00 a.m to 10:00 a.m	Tour to Maputo City	Secretariate
10:00 a.m to 12:30 p.m	Tour from Maputo to Ponta D'Ouro	Secretariate
12:30 a.m to 15:00 a.m	Lunch Break - Designated Area	Secretariate
15:00 a.m to 17:00 p.m	Travel Back to Maputo City	

Appendix 2: CALL FOR ABSTRACTS