

# ROAD MAINTENANCE, REHABILITATION AND PAVEMENT DRAINAGE DESIGN



## 16 - 17 MAY 2024

ENGINEERING CENTRE | ROMAN RIDGE  
ACCRA | GHANA



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# OVERVIEW

Ghana, with its vast and diverse landscapes, is a nation that relies heavily on its road network for economic activities, trade, and daily commuting. However, this vital infrastructure is not without its challenges. The country grapples with a range of road-related problems that impact the safety, efficiency, and overall well-being of its citizens. One of the primary road problems in Ghana is the state of its infrastructure. Potholes mar many roads, causing discomfort to motorists and posing safety hazards. Deteriorating road surfaces, often a result of insufficient maintenance budgets, contribute to a cycle of disrepair that affects the overall quality of transportation networks. This issue is particularly acute in urban areas where heavy traffic exacerbates the wear and tear on roads.

With its diverse climate and topography, Ghana also faces significant challenges in managing stormwater drainage. The inadequacies in the existing drainage systems contribute to flooding, erosion, and environmental degradation. Addressing drainage problems is critical for the safety of communities, the preservation of infrastructure, and the sustainable development of the nation.

One of the primary stormwater drainage problems in Ghana is the inadequacy of existing infrastructure. Many urban areas lack well-designed drainage systems capable of handling the intensity of rainfall during storms. The rapid urbanization and population growth in some regions have outpaced the development of efficient stormwater management systems, leading to increased vulnerability. The lack of proper stormwater drainage exacerbates wear and tear on infrastructure. Roads, bridges, and other public works are susceptible to damage caused by flooding and erosion. The cost of repairing and maintaining this infrastructure in the aftermath of storms places a significant burden on municipal budgets.

In view of the above mentioned problems, delegates will gain insight into the latest strategies for road maintenance, covering routine repairs to long-term infrastructure planning. The conference will dissect successful case studies, offering a blueprint for effective maintenance programs tailored to diverse environments. The conference is set to unravel the complexities of stormwater drainage, showcasing best practices for efficient and sustainable systems. Delegates will understand the significance of well-designed drainage solutions in preventing flooding, erosion, and the environmental impact of stormwater runoff. A critical aspect of the conference lies in exploring performance-based contractor appointments.

Delegates will learn how to assess and select contractors based on their ability to meet specific performance criteria. The emphasis will be on fostering partnerships that ensure not only quality work but also long-term infrastructure resilience. The role of technology in modern road maintenance and stormwater drainage cannot be overstated. Delegates will be introduced to cutting-edge technologies such as smart sensors, real-time monitoring systems, and data analytics. Understanding how these technologies enhance decision-making and efficiency will be a key takeaway. Real-world experiences provide invaluable lessons. Delegates will have the opportunity to delve into case studies from various regions, learning from both successes and challenges. This practical knowledge will equip them with insights to apply in their own contexts.

## WHO SHOULD ATTEND?

- Civil engineers
- Chief Road engineers
- Road Managers
- Senior Road engineers
- Pavement Engineers
- Town Planners
- Infrastructure Planners
- Geotechnical Engineers
- Geologists
- Computer Scientists
- Software Engineers
- Public Works Professionals
- Municipal engineers
- Road Assets Managers
- Transportation Planners
- Project managers
- Stormwater Management Professionals
- Hydraulic Engineers
- Community Engagement Specialists
- Public-Private Partnership Experts
- Academics in Civil Engineering and Built Environment
- Academics in Construction
- Risk Managers.
- Quantity Surveyors
- Construction and Civil Engineering Contractors
- Construction and Civil Engineering Sub-contractors
- Legal Practitioners
- Risk Managers
- Data Analysts



# FACILITATOR



## Dr. Samuel Abejide

Principal Researcher CSIR

Past Senior Lecturer: Walter Sisulu University  
Central University of Technology

Dr. Samuel Abejide is a principal researcher with Council for Scientific and Industrial Research, Pretoria, South Africa. His role as a principal researcher delves into coordinating the pavement research group, providing leadership in research engagement while collaborating with external bodies, industry and stakeholders. Provide leading innovations in pavement research, and strategic infrastructure development in smart transport solutions. Dr. Samuel Abejide has over a decade of experience in the lecturing space. He was a Senior Lecturer in Civil Engineering at various Tertiary Educational Institutions. His research is on Sustainable Transportation (Smart Pavement Technology). He is currently the Senior Transportation specialist at the Civil Engineering Department. His Master's Degree focused in Structural Engineering "Mechanics of Materials in Engineering Structures and Highway Structures"; with keen interest in the Mechanics of Bridge failure and pavement systems. He has a few inventions in pavement technology "Portable Recycled Asphalt Plastic Pavement Machine and Mix". He has extensive engagement with Export development in collaboration with the Global Exporters Acceleration Program in partnership with the Germain Giz Mission. Samuel is actively involved in the Sustainable Roads and Transportation (SRT) Research Group. Samuel has written over 26 notable research publications locally and internationally.

## BENEFITS OF ATTENDING

- Explore innovative solutions and best practices for building sustainable and resilient road infrastructure to meet the challenges we are facing today.
- Gain insight on components of effective road-maintenance programs and contrast of Africa's Road Maintenance programs to best road maintenance programs across the globe.
- Explore road quality indexes and case studies of road maintenance programs.
- Gain a better understanding about the grading and testing the quality of components/elements (Aggregates, Asphalt, Bitumen, Concrete, Bituminous mix) of a road for maintenance to prevent the use of sub-standard components for road maintenance.
- Develop skills on how to use smart sensors for real time monitoring of road conditions.
- Explore advancements in pavement materials, construction techniques and maintenance equipment.
- Acquire first hand knowledge on road maintenance emergency response planning and anticipating road disasters.
- Gain insight on automated pothole detection systems using sensors & cameras mounted on vehicles for efficient identification and repair.
- Gain insight on comprehensive assessment of causes of blocked drainage systems in a city and the cost estimations of developing solutions for drainage systems.
- Engage on the future planning of water drainage systems: Maximizing natural drainage & expanding water drainage system (financial and practical feasibility assessment).
- Become proficient in the integration of data analytics and predictive maintenance algorithms to identify potential issues and optimize.
- Engage on the adoption of autonomous vehicles and drones for road inspections and maintenance operations in hard-to-reach areas.
- Incorporation of green infrastructure elements into road maintenance practices (e.g. bioswales, permeable pavements, vegetated roadside slopes).
- Explore the internal dynamics and implementations processes within municipalities regarding road infrastructure maintenance, highlighting challenges and opportunities for effective management.
- Learn about barriers to municipal road construction project success in local municipalities.
- Gain insight into properties of soils and their impact on the design and construction of municipal roads, offering insights into soil mechanics and engineering solutions.
- Acquaint yourself on the best practices for lifecycle planning, performance modelling, and risk assessment in road infrastructure management.
- Gain a better understanding on advancements in pavement materials, construction techniques and maintenance equipment.



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**08:00 WELCOME & REGISTRATION.****08:30 INTRODUCTION TO THE CONFERENCE AGENDA:**

- Welcome.
- Introduction to the Conference Agenda.
- Overview of Municipal Roads in Ghana.

**09:00 SCIENTIFIC REVIEW OF ASSESSMENT FRAMEWORKS ON THE STATE OF MUNICIPAL ROADS IN GHANA:**

- Emerging Scientific methodologies and frameworks used to assess the current state of roads in Ghana (Intelligent Pavement Analysis using Machine Learning Algorithms for Visual Condition Assessment).
- Highlighting key findings and recommendations for improvement of road networks.
- State of roads network remaining useful life based on the parameters and methodologies of various scorecards (FWD, VCI and Pavement Condition Index).

**10:00 TEA & REFRESHMENTS****10:15 URBAN AND RURAL ROAD NETWORK PLANNING, DESIGN AND OPTIMIZATION:**

- Explore the intricacies of municipal road networking planning, design principles and optimization strategies to ensure efficient transportation systems for sustainable Smart City.

**11:00 MECHANICS OF SOILS & THEIR IMPLICATIONS IN THE DESIGN OF MUNICIPAL ROADS:**

- Properties of soils and their impact on the design and construction of municipal roads.
- Insights into soil mechanics material quality and engineering solutions.

**12:00 LUNCH BREAK****13:00 FRAMING THE BARRIERS TO MUNICIPAL ROAD CONSTRUCTION PROJECT SUCCESS IN LOCAL MUNICIPALITIES:**

- Framing the barriers to road construction project success in urban and rural design.
- Demonstrate how original techniques and new technology can be harnessed to better manage road construction projects and programs.

**13:45 INNER SETTING & IMPLEMENTATION PROCESS DOMAIN IN MUNICIPAL ROAD INFRASTRUCTURE MAINTENANCE:**

- Explore the internal dynamics and implementation processes within municipalities regarding road infrastructure maintenance, highlighting challenges and opportunities for effective management.

**14:45 TEA & REFRESHMENTS****15:00 INTERACTIVE DISCUSSIONS: THE CONTRADICTIONS BETWEEN POLICY OBJECTIVES AND LEGISLATIVE PROVISIONS IN THE MANAGEMENT OF MUNICIPAL ROADS FACILITATOR.****16:00 END OF DAY 1****08:00 WELCOME & REGISTRATION.****08:45 RESPONSIVE PAVEMENT ENGINEERING SYSTEMS DESIGN:**

- Future planning of transport pavement infrastructure systems: Maximizing climate adaptation measures to develop climate resilient asphalt mix design.

**09:30 ROAD MAINTENANCE:**

- Sustainable maintenance program and product.
- Guarantee.
- Drainage.

**09:45 TEA & REFRESHMENTS****10:00 POTHOLE REPAIRS & SOLUTIONS:**

- Introduction to developing guidelines in Pothole repair.
- Comparison between various Pothole repair and fixing technologies.
- Methodology.
- Success Story.
- Cost Effectiveness.
- Quality Assurance.

**11:00 SMART ROAD SOLUTION:**

- Smart Transport Infrastructure system: Smart Infrastructure solutions and design methodology for inroad sensors for pavement prediction.

**12:00 LUNCH BREAK****13:00 SMART ROAD SOLUTION:**

- Embedded sensors and pavement failure prediction using damage models.

**14:00 EMERGING PAVEMENT & DRAINAGE DESIGN:**

- Comprehensive assessment and causes of poor pavement design in a city.
- Comprehensive design and developing solutions for pavement drainage systems. (Perpetual Pavement Design, Review of Porous Pavement Design, Nano Technology in Asphalt Design).

**15:00 TEA & REFRESHMENTS****15:15 INTERACTIVE DISCUSSIONS****16:00 END OF CONFERENCE**