Proceedings of ASNEngr 18th Annual Conference, August 9, 2025

Theme:
"Advancing the Future Through Equitable Engineering, Entrepreneurship, and Emerging Technologies"

Date: Saturday, August 9, 2025
Venue: DoubleTree by Hilton New York LaGuardia Airport, Elmhurst, NY

Technical Proceedings:

General Chair: Ranjan Pokharel, MS
Technical Chair: Surya Lamsal, PE
President: Mangal Maharjan, ME
Local Chair: Narayan Baral, PE, CPC

Keynote and Guest Speeches:

The conference featured a fireside chat with the keynote guest and several guest speeches. Below are brief summaries of the key points discussed, based on available reports and participant accounts from the event.

Fireside Chat with Keynote Guest Er. Kulman Ghising (Former Managing Director, Nepal Electricity Authority), Moderated by Mr. Raju Joshee, MBA: The fireside chat explored Er. Ghising's journey from growing up in a remote village to leading Nepal's largest power institution. He reflected on early influences that shaped his discipline, accountability, and service-oriented leadership philosophy. He discussed how Nepal's chronic load-shedding crisis was not merely an infrastructure deficiency but a leadership and management failure. Upon assuming leadership of NEA during a period of up to 18-hour daily blackouts, he implemented bold reforms focused on data-driven load management,equitable power distribution, operational discipline, and elimination of political favoritism in supply allocation. He emphasized restructuring grid operations, improving accountability within a bureaucratic system, and leveraging engineering principles and real-time data analytics to optimize transmission and distribution. The discussion also covered resistance to reform, difficult leadership decisions, and navigating political challenges. Looking forward, Er. Ghising shared his vision of Nepal as a clean energy exporter in South Asia, highlighting hydropower potential, regional energy trade, private sector partnerships, automation, and AI-enabled grid

management. He encouraged young engineers to remain ethical, persistent, and hopeful despite bureaucratic challenges, and concluded with reflections on leadership, legacy, and the future of Nepal's energy landscape toward 2040.

Guest Speech by Hari Darlami, PhD (Associate Professor, Institute of Engineering; Former NEA President): Darlami highlighted advancements in engineering education and research in Nepal, drawing from his experience at IOE and NEA. He addressed integrating modern technologies into curriculum development, the importance of collaborative projects between academia and industry, and how Nepali engineers can contribute to global challenges like climate resilience and energy security.

Guest Speech by Er. Subodh Timilsina (Director, PMPS; President, SONE UK): Timilsina spoke on project management in engineering sectors, sharing experiences from UK-based initiatives and PMPS. He emphasized best practices for overseas Nepali engineers, including risk mitigation in international projects, fostering professional networks, and leveraging diaspora expertise to support development back in Nepal.

Guest Speech by Mr. Subash Tuladhar (Associate Commissioner, New York City Department of Design and Construction): Mr. Tuladhar provided an in-depth overview of New York City's Department of Design and Construction (DDC), which manages an estimated $30B capital portfolio serving 8.5 million residents. Drawing from his experience in both public and private sectors across multiple countries,he highlighted the scale, complexity, and coordination required to deliver infrastructure in one of the world's densest cities. He discussed strategic blueprint initiatives focused on delivering projects "better, faster, and cheaper," emphasizing front-end planning, risk identification tools, digitization, data quality improvement, cloud infrastructure, AI analytics, and smarter equipment and materials. He also presented examples of emerging technologies such as drone inspections, sentiment analysis, crack detection, augmented reality, and progress tracking tools that are transforming urban infrastructure management. He encouraged engineers to stay engaged with industry trends, research, collaborative problem-solving, and continuous learning to drive innovation in public infrastructure systems globally.

Guest Speech by Mr. Rudra Pandey (Founder, Deerhold & DWIT; Chairman, Hamro Patro): Mr. Pandey shared his personal journey into entrepreneurship, highlighting the challenges of building technology ventures from Nepal to the global market. He discussed founding Deerhold, developing Hamro Patro into a globally recognized digital platform, and

fostering Nepal's startup ecosystem. He emphasized innovation, AI adoption, global networking, and diaspora collaboration.
Importantly, he discussed his ongoing initiatives supporting academic growth in rural Nepal, including investments in technology-enabled education, institutional development, and youth entrepreneurship programs aimed at creating sustainable impact beyond urban centers.

Expert Panel Discussion, Moderated by Shubha Adhikari, AICP & Tribal Naharki, PE; Panelists: *Nabin Baskota (Niural – AI & Fintech), Dinesh Khatiwada (United Aero Solutions), Madan Upreti (Infra Investment USA, NACC), Binod Tiwari, PhD (CSU Fullerton)*: Moderated by Shubha Adhikari, AICP and Tribal Naharki, PE, the expert panel brought together leaders from AI, aviation, infrastructure investment, academia, and entrepreneurship. The discussion was structured around four major themes: Entrepreneurial Spark, Global Growth and Risk, Innovation and Leadership, and Community and Legacy. Panelists shared pivotal turning points in their careers, high-risk decisions taken during scaling ventures, regulatory and operational challenges, and strategies for sustaining innovation in highly competitive and regulated industries. The panel highlighted venture capital fundraising, global regulatory compliance in aviation and fintech, large-scale infrastructure investments, academic research commercialization, and the role of diaspora networks in accelerating Nepal's development. A key takeaway was balancing profitability with purpose—aligning business growth with mentorship, community building, and long-term legacy. The session concluded with advice to young engineers: cultivate resilience, embrace calculated risks, stay technically grounded, commit to continuous learning, and build ventures that create both economic and social value.

Overview of Presentations

Before presenting the abstracts, here is a brief description of what each speaker discussed during their session, summarized in a few lines based on the program details and presentation content.

Dr. Sukh Gurung, PE, D.Engr (Life member - ASNEngr): In his talk on the Flood Protection System for the Eastside Coastal Resiliency Project in Manhattan, NY, Dr. Gurung explained the challenges of building resilient infrastructure in coastal areas with poor soil conditions. He highlighted engineering solutions like deep foundations and cutoff walls to combat flooding from storms and sea level rise, protecting utilities, schools, and communities serving over 110,000 people.

Thakur Dhakal, PE (Engineer IV, Fairfax County Government, Fairfax, VA) & Rabin Bhattarai, PhD (Assistant Professor, University of Illinois Urbana Champaign, Champaign, IL): Their presentation on Urbanization and Watershed Dynamics addressed how urban expansion disrupts natural water systems, leading to flooding, pollution, and heat islands. They discussed real-world impacts and advocated for integrated solutions like green infrastructure to promote sustainable urban planning and ecosystem resilience.

Nirajan Mani (Fitchburg State University, Fitchburg, MA, USA) & Kishor Shrestha (Washington State University, Pullman, WA, USA): Focusing on Leveraging Large Language Models to Enhance Safety Awareness and Accessibility of Nepali Building Codes, they explored using AI to simplify Nepal's seismic building regulations. The talk covered tools for better code interpretation and compliance, aiming to reduce earthquake risks through improved stakeholder understanding.

Siddha Joshi, PE: Joshi's session on From Reactive to Proactive: How New York City's Facade Inspection Laws Are Shaping Smart Infrastructure detailed the evolution of NYC's facade safety program. He described inspection techniques, common issues like cracking, and emerging tech like drones and AI for efficient, proactive building maintenance to safeguard public spaces.

Chet Pokharel (VP, MTA C&D, New York, with 32+ years in global project management): In his presentation titled Using Project Management Best Practices to Prevent Disasters in the EPC Industry (adapted for Nepal's infrastructure context), Pokharel emphasized governance, oversight, and compliance in large-scale projects. He used examples from transportation to show how planning, risk management, and Lean Six Sigma can avoid overruns, accidents, and failures.

Abinash K. Chaudhary (Principal Engineer, K&A Engineering Consulting, P.C.) & Aniruddha Narkhede (Quality Supervisor, K&A Engineering Consulting, P.C.): Their talk on Unlocking Grid Potential: K&A's Framework for Effective DLR Integration discussed enhancing power grids with Dynamic Line Ratings to handle renewables and data centers. They presented a novel tool integration for real-time analysis, improving capacity, reliability, and efficiency amid energy demands.

Ram C. Poudel (Appalachian State University, Boone, North Carolina, United States): Poudel's presentation on A Science of Migration: Why did I come to America? applied thermodynamic principles to human migration patterns. He modeled flows using energy

concepts from social field theory, exploring personal and societal implications of migration as a natural evolutionary process.

Technical Session I – Disaster Mgmt, Natural Resource Mgmt, Risk Mgmt
Aug 9, 2025 1:00 PM – 2:00 PM EST
Session Chairs: Dev Jaisi, PhD , Ananda Paudel, PhD

Author(s): Sukh Gurung, PhD.Engr (Life member - ASNEngr)

Presentation 1: Flood Protection System: Eastside Coastal Resiliency Project, Manhattan, NY

Abstract:
The soil composition in New York City's coastal zones typically features deep layers of soft, unstable deposits covered by haphazard urban fill. These areas face heightened flood risks from intense tropical storms driven by shifting climate patterns and rising sea levels due to global warming. Developing flood-resistant structures requires foundations anchored in stable soil or enhanced ground conditions, incorporating deep supports and barriers to prevent erosive water flow. This discussion outlines a flood defense installation along Manhattan's east side, designed to shield vital utilities including water, sewage, gas, and power lines, as well as educational facilities and more. The system aims to ensure fair access to safe living and commerce for roughly 110,000 residents in the Eastside Coastal Resiliency zone.

Author(s): Rabin Bhattarai, PhD (Assistant Professor, University of Illinois Urbana Champaign, Champaign, IL); Thakur Dhakal, P.E. (Engineer IV, Fairfax County Government, Fairfax, VA)

Presentation 2: Urbanization and Watershed Dynamics: A Problem That Needs an Integrated Approach

Abstract:
With worldwide population expansion, urban growth has become an unavoidable aspect of contemporary progress, transforming terrains and disturbing ecological balances. This talk examines the extensive effects of city expansion on watershed functions, focusing on changes to hydrological cycles, water purity decline, and amplified strain on urban drainage areas. The replacement of natural landscapes with hard surfaces like pavement and buildings dramatically boosts runoff amounts and speeds, impairing soil absorption and aquifer replenishment while modifying river flows. Urban zones see elevated flood peaks, shifted baseline stream levels, and increased erosion hazards from shorter runoff times and unstable channels. Stormwater

from cities acts as a key pollution carrier, transporting toxins like metals, oils, fertilizers, bacteria, and silt from various origins such as streets, roofs, parks, factories, and building sites, harming water life, species variety, and community well-being. Additionally, the session covers the Urban Heat Island phenomenon, where metropolitan areas run hotter than nearby countryside due to less greenery, darker surfaces, heat from human activities, and compact layouts, raising power use, pollution, and stress on water habitats. Consequences involve steeper energy bills, more emissions, and heightened risks during extreme heat. Case examples illustrate urban expansion's combined toll on watersheds and the success of countermeasures. Proposed fixes encompass eco-friendly designs, absorbent paving, advanced drainage, and cooling methods like vegetative covers and tree planting. In summary, the talk stresses the critical call for unified city design and watershed oversight, pushing for equilibrated growth that upholds environmental soundness and bolsters city durability.

Technical Session II – AI, Smart Infrastructure & Org. Mgmt
Aug 9, 2025 2:15 PM – 3:15 PM EST

Session Chairs:
Prathiba Phuyal, MBA, Sajana Suwal, PhD

Author(s): Nirajan Mani (Fitchburg State University, Fitchburg, MA, USA); Kishor Shrestha (Washington State University, Pullman, WA, USA)

Presentation 3: Leveraging Large Language Models to Enhance Safety Awareness and Accessibility of Nepali Building Codes

Abstract:

Due to Nepal's exposure to earthquakes, rigorous compliance with the Nepal National Building Code (NBC) is essential for building durability and protection. Yet, despite legal mandates, implementation struggles persist because of constrained local resources and low knowledge levels among involved parties. Research indicates just two engineers per local government unit, handling about 400 permits yearly, underscoring the demand for stronger enforcement systems. A 2017 analysis found 94% of Kathmandu Valley residences fail NBC criteria, making them prone to seismic harm. This gap stems mainly from insufficient code familiarity and its intricate wording, complicating real-world use. To tackle this, the research suggests employing Large Language Models (LLMs) to boost NBC's usability, clarity, and adoption. The suggested setup includes three core parts: (i) a module for code explanation, (ii) a dynamic question-answering system, and (iii) a tool for adherence support. These features aid local officials, builders, and property owners in grasping and implementing NBC rules. Adopting

LLM-based approaches brings benefits like better reach, higher adherence rates, and streamlined reviews. This effort supports Nepal's aims for NBC rollout, focusing on education and skill enhancement to improve construction safeguards. Through LLMs, the research foresees a major change in code handling and usage, promoting a robust emphasis on protection and durability in Nepal's building sector.

Author(s): Siddha Joshi, PE

Presentation 4: From Reactive to Proactive: How New York City's Facade Inspection Laws Are Shaping Smart Infrastructure

Abstract:

New York City boasts some of the globe's loftiest towers and oldest brick edifices. With crowds traversing nearby daily, ensuring secure exterior walls is vital. Historically, responses came post-accident, after fragments like clay tiles or stones plummeted onto paths. Such events underscored the necessity for forward-thinking measures to guard civilians. This prompted Local Law 10 in 1980, advancing to Local Law 11 in 1998, now called the Facade Inspection and Safety Program (FISP). FISP mandates that proprietors of structures over six floors engage certified engineers or architects for tactile examinations every five years. A comprehensive assessment is submitted to the city's Buildings Department, outlining status and required fixes. This work explores NYC's transition from after-the-fact upkeep to anticipatory exterior care. It covers key FISP stipulations, approaches like detailed sight

checks and material sampling, and frequent problems such as flaking, fissures, and moisture entry. It also details tech innovations boosting assessments, including UAVs with sharp imaging, suspended rigging, heat scanning, and machine-learning for flaw spotting, allowing quicker, safer, and earlier issue detection without extensive rigging for spot checks. Lastly, it envisions upcoming exterior protection via ongoing sensor tracking and forecast-based servicing. Merging solid technical methods with advanced tools, NYC models how contemporary metropolises can defend their architecture, prolong key asset longevity, and secure countless inhabitants and tourists.

Author(s): Chet Pokharel (VP in MTA C&D in New York with over 32 years of global experience in engineering and management; PMP, Prince2 Practitioner, PE from Ontario, Lean Six Sigma Black Belt)

Presentation 5: Using Project Management Best Practices to Prevent Disasters in the EPC Industry: Why Governance, Oversight and Process Compliance Matter

Abstract:

Projects in Engineering, Procurement, and Construction (EPC) are often vast and intricate, featuring strict deadlines, substantial funding, and elevated dangers. Lacking adequate preparation, setup, implementation, and supervision, they risk major setbacks like timeline slips, budget excesses, hazards, or total collapse. This discussion outlines how robust project oversight methods, authority structures, and consistent monitoring can lessen or avert these crises. Effective oversight involves thorough preparation, solid groundwork, smooth rollout, and vigilant tracking. This enables groups to address shifts and problems promptly, spot threats ahead, devise countermeasures, alert leaders swiftly for choices, adhere to rules, meet legal and project standards, and maintain progress. Monitoring and adherence focus not merely on post-issue corrections but on avoidance upfront. By sticking to norms like readiness evaluations, activity and threat mapping, efficiency principles from Lean Six Sigma, quality verifications, and transparent updates with early alerts, teams gear up for diverse obstacles. For instance, in big transit endeavors like new rail routes or stops, flawed strategy, threat handling, updates, quality checks, choices, or overlooked protections can cause holdups, mishaps, or expense explosions. However, with strong oversight, tracking, efficiency tactics, routine checks, and clear reports, such concerns can be identified soon and handled well, preserving resources, funds, and safety. The work stresses the value of solid oversight processes and adherence guarantees, efficiency methods, collaborative atmospheres, appropriate tech adoption, and firm guidance to confirm projects align with top standards. Integrating these into risk strategies makes EPC efforts more secure, productive, and effective.

Technical Session III – Renewable Energy & Resource Mgmt
Aug 9, 2025 5:00 PM – 6:00 PM EST

Session Chairs:
Manoj Khadka, MBA , Utsab Pokharel, MS

Author(s): Abinash K. Chaudhary (Principal Engineer, K&A Engineering Consulting, P.C.); Aniruddha Narkhede (Quality Supervisor, K&A Engineering Consulting, P.C.)

Presentation 6: Unlocking Grid Potential: K&A's Framework for Effective DLR Integration

Abstract:
The growing use of variable clean energy and expanding high-power users like server farms are straining conventional electrical networks. This frequently results in denying new power or load links due to overloads, especially in rare extreme cases, demanding costly

expansions that often make initiatives uneconomical. Numerous brief overloads can be resolved via better setup and forecasting, enabling more integrations. Technologies to boost grids, like Dynamic Line Ratings (DLR), are key here. DLR differs from fixed seasonal ratings by assessing live capacity using local climate and conditions, optimizing transmission, increasing precision, and lengthening old asset lifespans. Global and select U.S. uses demonstrate up to 30% short-term capacity gains, crucial for overload relief, outage support, and bottleneck easing. Though beneficial since the 1990s, DLR's full study inclusion lags, as major software (e.g., PSSE, PSLF, PowerWorld) lacks full dynamic support, hindering planning and rollout. To fill this void, K&A created a fresh method to blend DLR into standard tools, surmounting hurdles and allowing utilities to model and refine operations instantly. Linking DLR to flow analyses yields precise system views, better awareness, and smarter choices. This session covers DLR basics, integration obstacles, and K&A's fix strategy, with a demo showing analysis effects, uses, advantages, and modernization prospects. This bridges DLR and studies to maximize reliability, performance, and durability against rising needs and shifting supplies.

Author(s): Ram C. Poudel (Appalachian State University, Boone, North Carolina, United States)

Presentation 7: A Science of Migration: Why did I come to America?

Abstract:

Individuals relocate across borders and regions for diverse motives. This examination looks at time-based and location-specific movements in human shifts. Predicting these patterns (entries, exits, spreads) aids in economic strategies (transit, homes, education), disease simulations, and crisis handling. Migration is analyzed through frameworks inspired by physics, including gravity-style [1] and radiation-style [2, 3] approaches. These are calibrated with census info (demographics) and spatial data (facilities) to forecast movements for guidance in development and modeling. Science unifies sensory and tech-gathered observations into natural principles. Humans are integral to the environment, yet literature lacks a cohesive framework tying these to theories of behavior, relocation, and communities overall. Thermodynamics offers a broad lens via energy, disorder, and force. This introduces a fresh migration model via personal energy states in social contexts [4]. Under Social Field Theory [5, 6], it probes personal migration to the U.S. and wider societal and cultural impacts. Surface reasons explain human moves, but fundamentally, it's a mindful shift between energy states in societal fields—a process since early humans in Africa.

Author: Suman Timsina (CEO, Everest Federal Credit Union)

Presentation 8: Advancing Sustainable Development Through Equitable Trail Tourism The International Development Institute's Role in Nepal and the Buddhist Circuit

Abstract:
This presentation delves into the profound impact of trail tourism on sustainable development, with a focus on creating employment opportunities and revitalizing rural economies in regions like Nepal and the Buddhist Circuit. As the Executive Director of the International Development Institute (IDI)—a Washington DC-based capacity-building and business consulting firm—Suman Raj Timsina highlights how strategic trail initiatives empower local communities, institutions, and systems through innovation, governance solutions, and inclusive partnerships. IDI, with over 15 years of international experience and operations in Nepal, Nigeria, Kenya, and Bangladesh, serves as a trusted collaborator for governments, development partners, and private sector entities. The "Trail Effect" refers to the multiplier benefits of well-designed trail systems, which attract eco-tourists, hikers, and cultural explorers while generating jobs in hospitality, guiding, handicrafts, and conservation. In Nepal's diverse landscapes—from Himalayan treks to sacred Buddhist sites—IDI's projects emphasize equitable access, ensuring marginalized groups, including women and indigenous populations, share in economic gains. By integrating environmental stewardship with community-led development, these initiatives mitigate challenges like rural depopulation, poverty, and environmental degradation, fostering resilient economies. Case studies from the Buddhist Circuit demonstrate how trails preserve cultural heritage, promote biodiversity, and stimulate local entrepreneurship, potentially increasing household incomes by 20-50% in participating areas.

The talk advocates for diaspora involvement, policy advocacy, and scalable models to expand trail tourism's reach. Ultimately, IDI's approach underscores that sustainable trails are not just paths but catalysts for long-term prosperity, aligning with global goals like the UN Sustainable Development Goals (SDGs) for poverty reduction, gender equality, and climate action. This session offers actionable insights for engineers, policymakers, and diaspora professionals to contribute to Nepal's rural transformation.