16TH ITU ACADEMIC CONFERENCE

From SCATS to mobility justice: An AI-driven traffic control standard for heterogeneous African cities

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Session 4.5

$4 B
Annual economic losses

70 mins
Time spent weekly in gridlock

30 hours
Average one-way journey time

In Nairobi, only 12% to 15% of households own a private car.

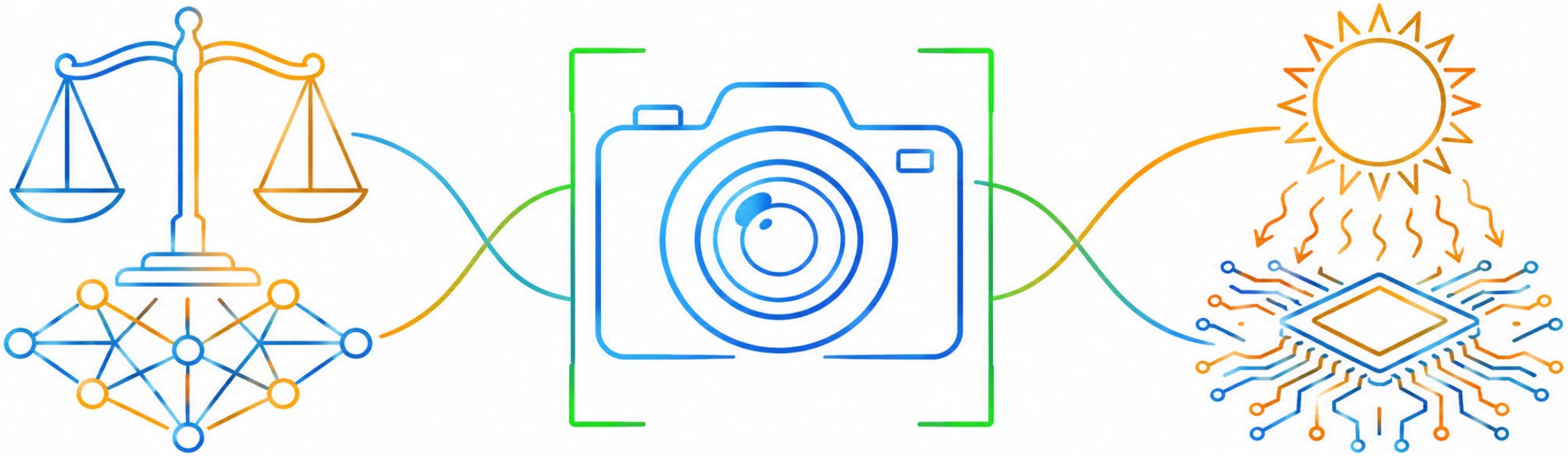
Yet, we import and design our traffic systems as if they all do.

Gridlock goes beyond just an economic loss. It is an equity and survival crisis.

A system optimized for point-to-point male commuting penalizes women. Meanwhile, out-of-hospital cardiac arrest survival rates plummet by 7-10% for every single minute an ambulance is delayed in traffic.

Existing systems are blind to the reality of African mobility.

Traditional systems like SCATS rely on rigid lane discipline, inductive loops, and a stable power grid. They demand that the street conforms to the technology.



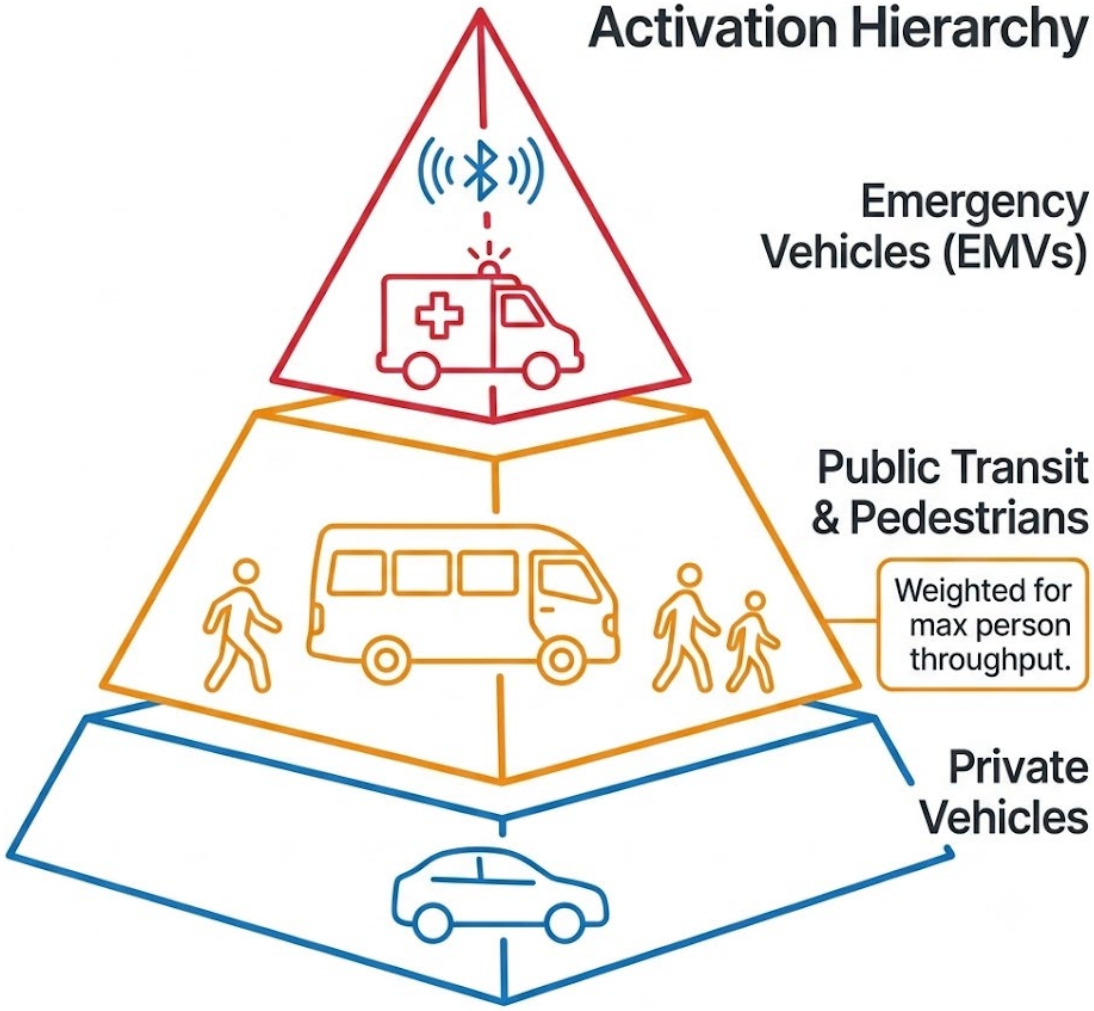
1. The Mobility Justice Algorithm

2. YOLO Computer Vision

3. Solar Edge Computing

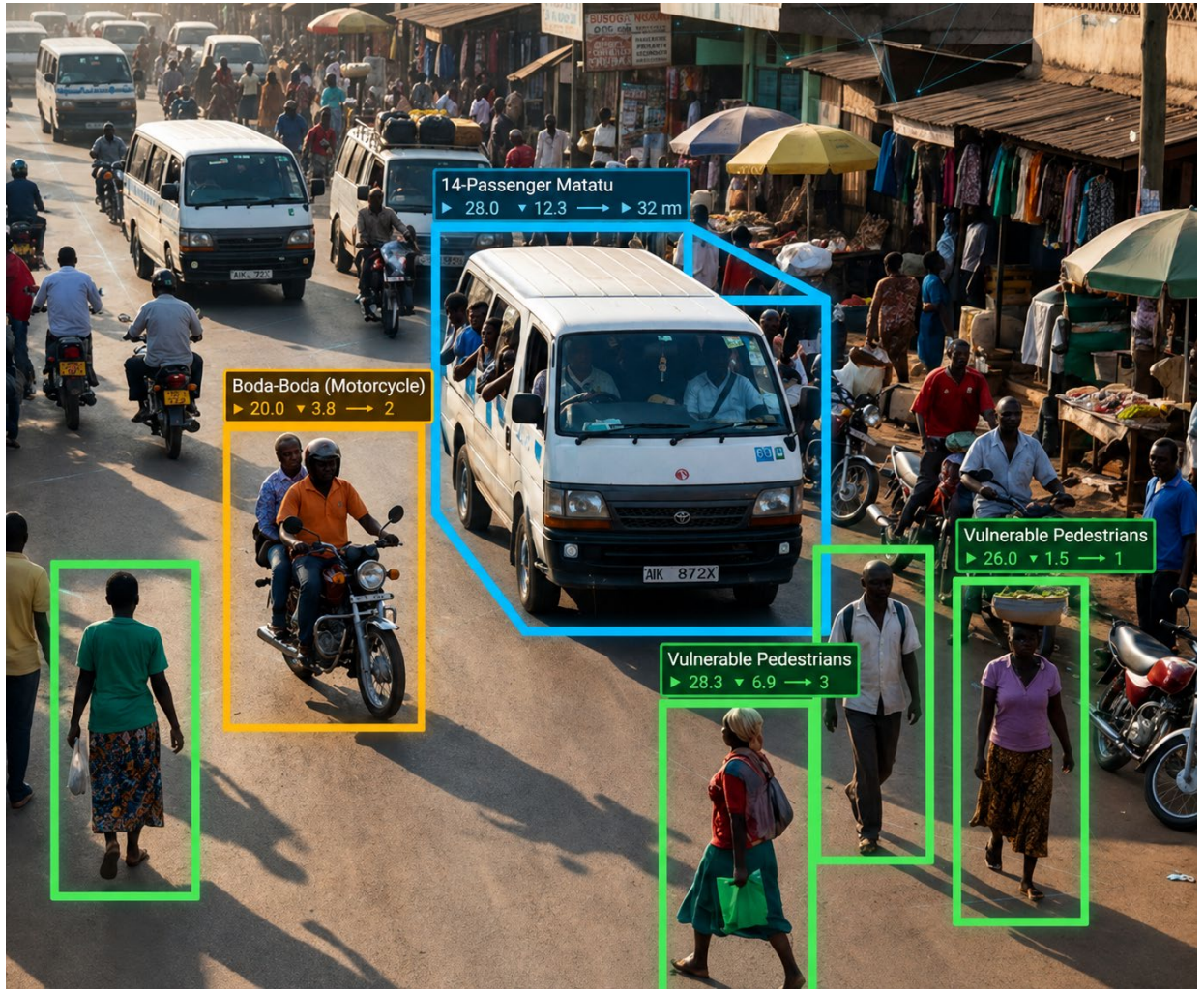
Pillar 1: Re-weighting the algorithm for human life.

Multi-objective reinforcement learning enforces a strict hierarchy, prioritizing emergency access and mass transit over private luxury.



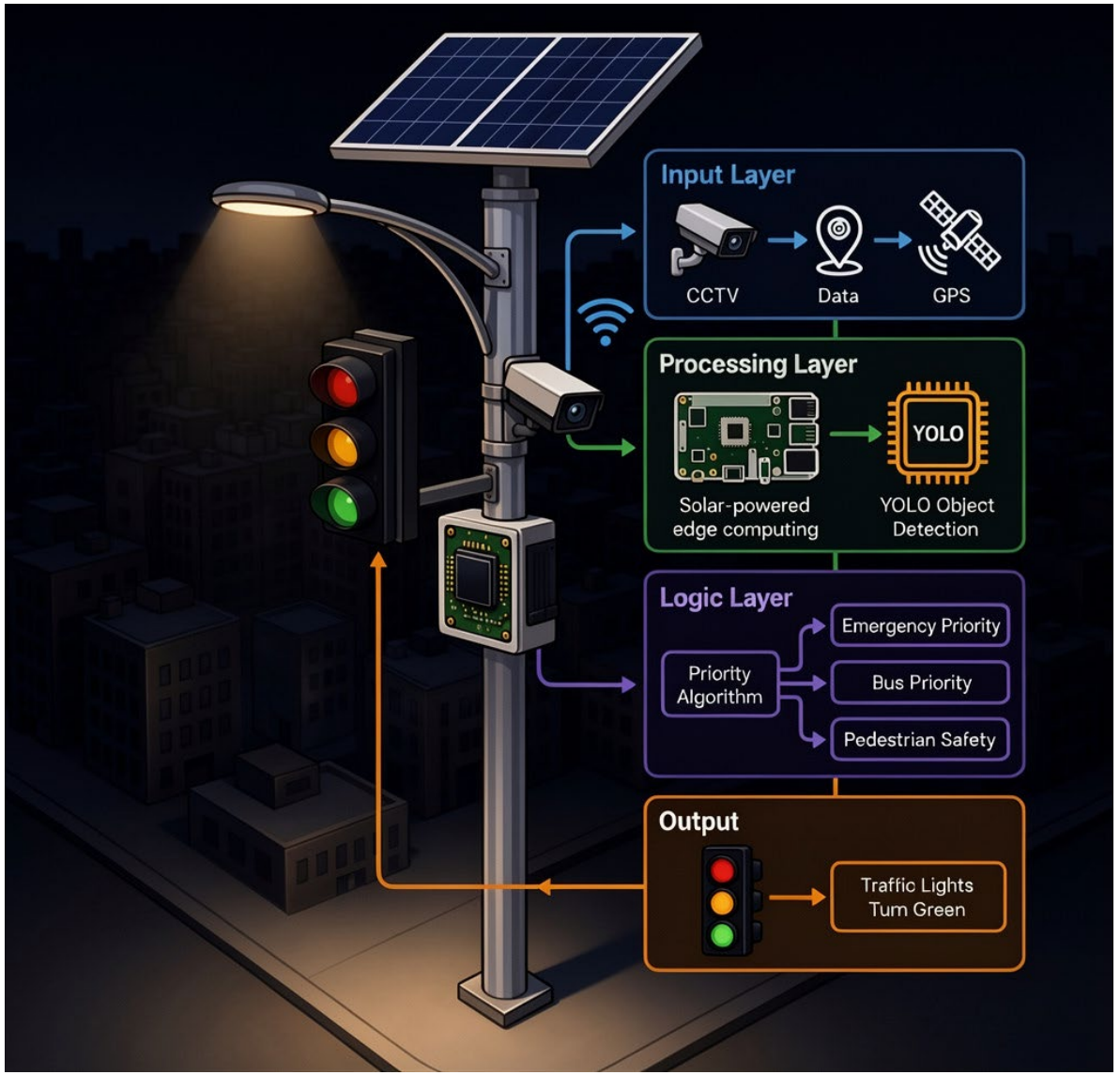
Pillar 2: Computer vision that sees the street as it actually is.

Replacing expensive, fragile pavement loops with "You Only Look Once (YOLO)" edge-processed AI. It detects informal transit and weaving motorcycles, bridging the sim-to-real gap.



Pillar 3: Decentralized solar-edge resilience.

Surviving the blackout. Solar-powered edge computing ensures 24/7 operation, drops capital expenditure from $283,000 to just $10,000 per intersection, and utilizes peer-to-peer mesh networking to bypass central server failures.



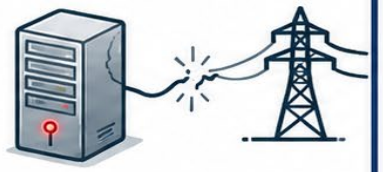
SHIFTING THE GLOBAL STANDARD

Legacy/ SCATS Standard

Goal:
Minimize Vehicle Delay

Design:
Top-Down Import

Infrastructure:
Centralized & Grid Dependent



Privacy:
Surveillance State (Video Storage)

Mobility Justice Standard

Goal:
Maximize Person Throughput

Design:
Participatory Co-Creation

Infrastructure:
Decentralized Solar-Edge

Privacy:
Data Democracy

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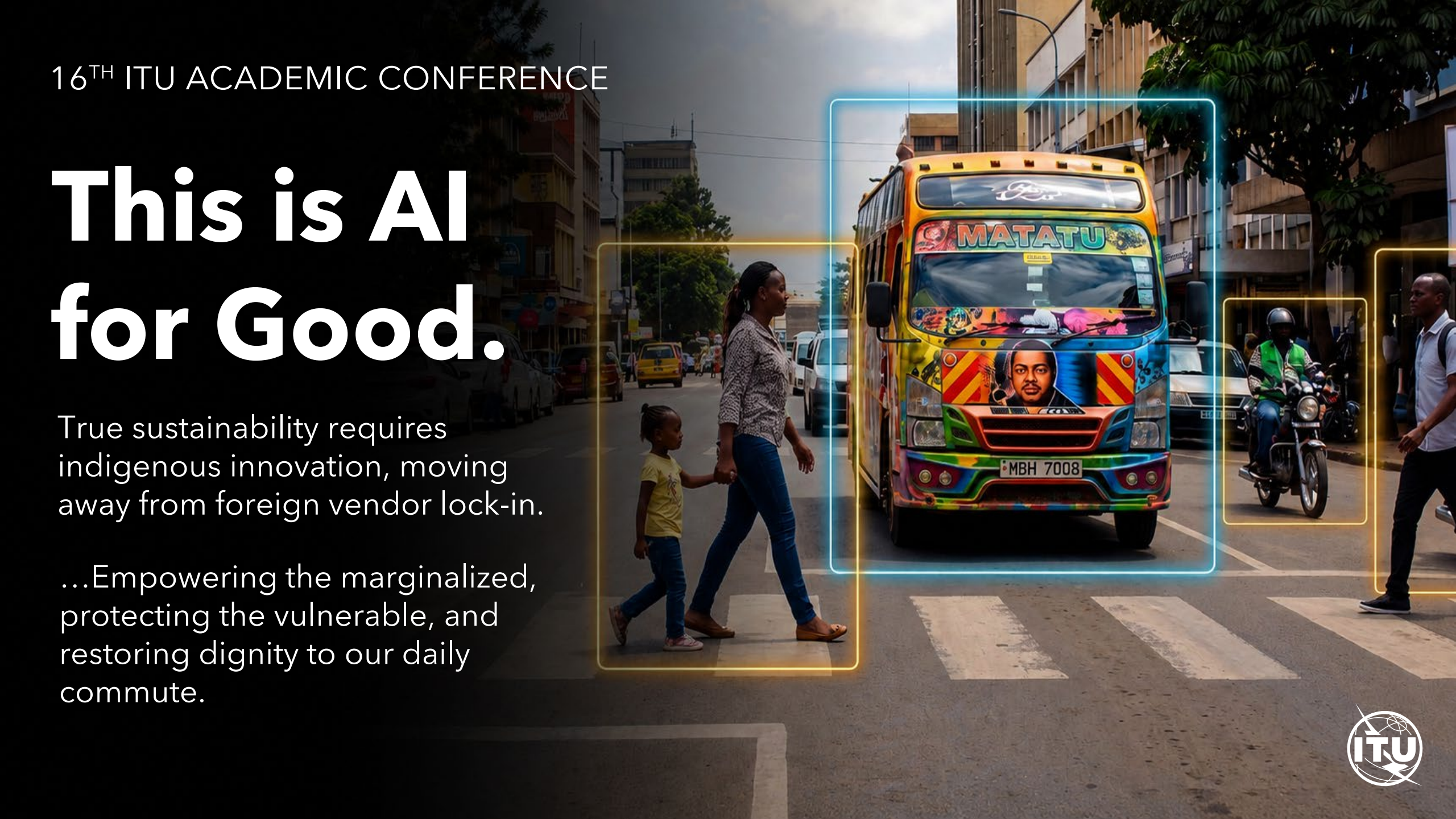
This is AI for Good.

True sustainability requires indigenous innovation, moving away from foreign vendor lock-in.

…Empowering the marginalized, protecting the vulnerable, and restoring dignity to our daily commute.



Thank you!

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