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HKIE

IRSC 2025

Advancing Railway Safety through Innovations and Collaborations

Hong Kong, China 25th - 30th November 2025

Contributions of Engineers in Safeguarding the Railway Safety in Hong Kong

Ir Alice CHOW
President, The Hong Kong Institution of Engineers

HK Railway Routines

Nearly

5 Million

Daily Passengers

Incident Rate

<0.1

per **1M** Passenger Journeys (2024)

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RAILWAY SYSTEMS IN HONG KONG

271km

46%

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KCR TO MTR: ENGINEERING SAFETY FROM 1910 TO 1975

- Taming **rugged mountains**, reclaiming **sea beds**
- Battling **typhoons** and **wars**
- Prioritizing resilience: **earthquake-proof** viaducts, **flood-resistant** tracks

HKIE THE HONG KONG INSTITUTION OF ENGINEERS 香港工程師學會

The only statutory professional engineering body in our city

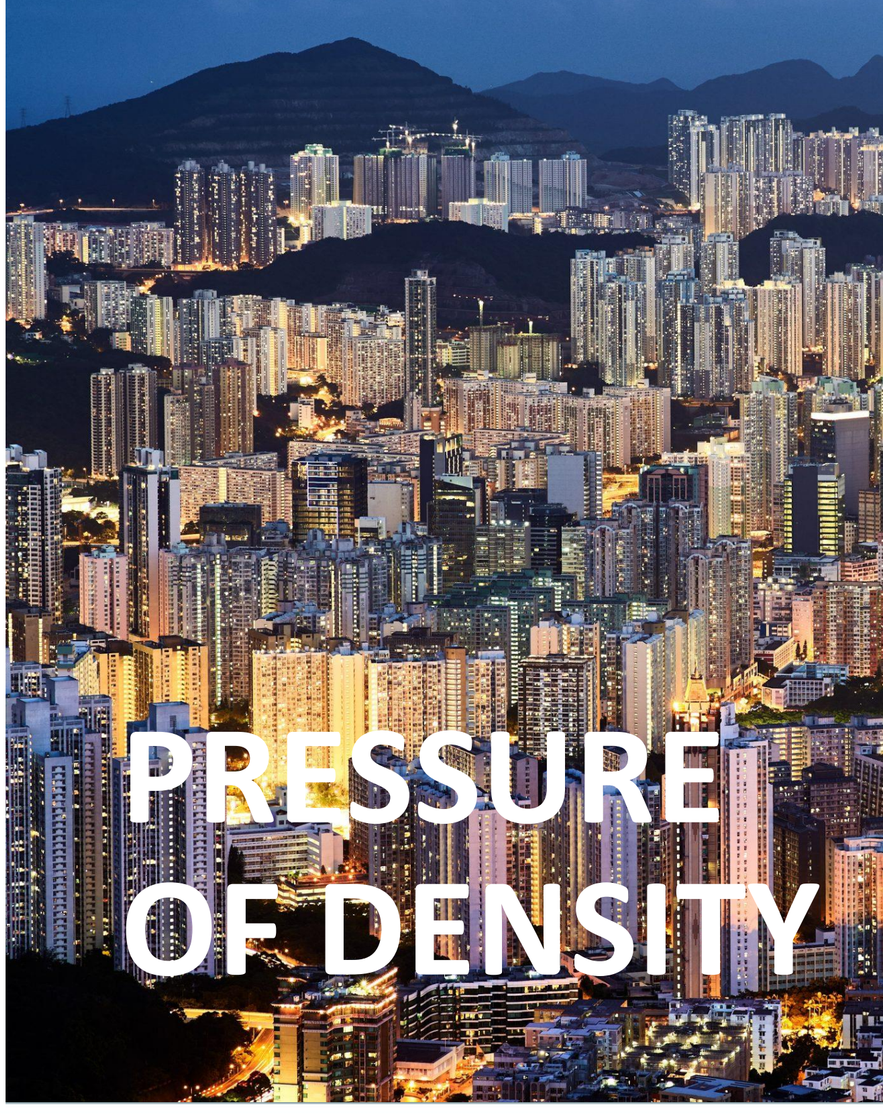
33,000

MEMBERS

22

DISCIPLINES

1. Aircraft
2. Biomedical
3. Building
4. Building Services
5. Chemical
6. Civil
7. Control, Automation & Instrumentation
8. Electrical
9. Electronics
10. Energy
11. Environmental
12. Fire
13. Gas
14. Geotechnical
15. Information
16. Logistics & Transportation
17. Manufacturing, Industrial & Systems
18. Marine & Naval Architecture
19. Materials
20. Mechanical
21. Nuclear
22. Structural



IRSC 2025 INTERNATIONAL RAILWAY SAFETY COUNCIL

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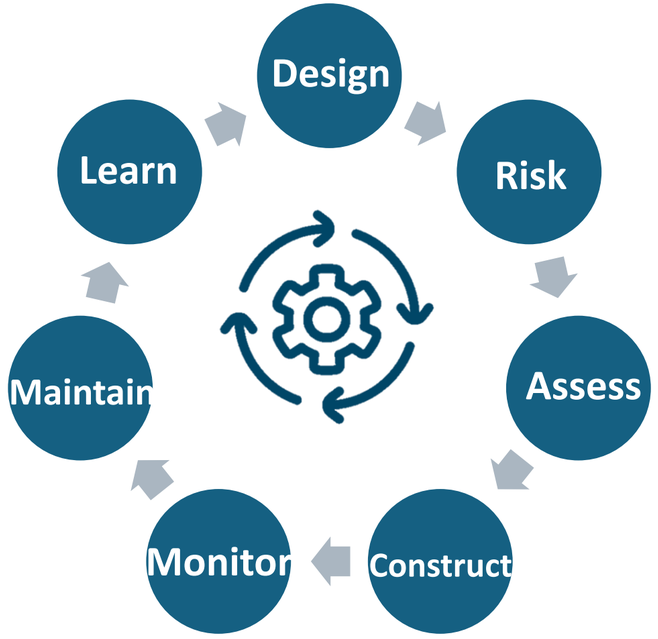
THE HONG KONG BLUEPRINT: A SYNERGY OF SYSTEMS

1. A CULTURE OF LIFE-CYCLE RESILIENCE



RAMS

Reliability

Availability

Maintainability

Safety

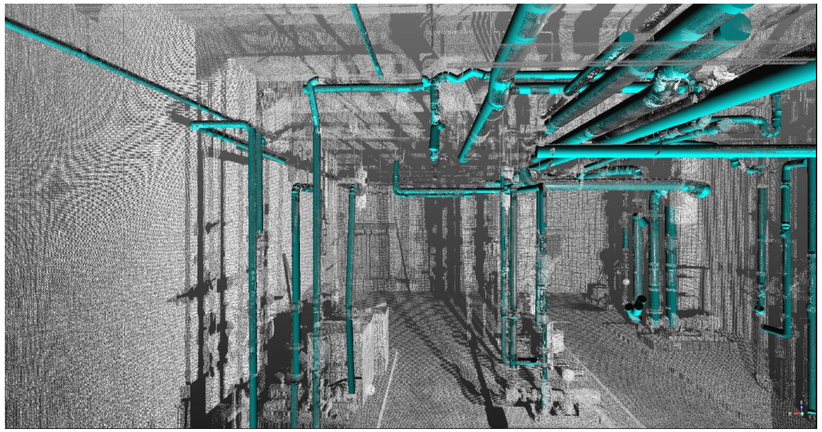
THE HONG KONG BLUEPRINT: A SYNERGY OF SYSTEMS

2. INTEGRATED TECHNOLOGICAL INTELLIGENCE

Widespread adoption of **Building Information Modeling (BIM)**

To identify and resolve conflicts virtually

To prevent errors at their source



THE HONG KONG BLUEPRINT: A SYNERGY OF SYSTEMS

3. PUBLIC TRUST

Maintain this trust through relentless transparency

Openly reporting performance data

Engage in public dialogue about risk

Leading educational initiatives

FUTURE OPPORTUNITIES:

TECHNOLOGY AND SUSTAINABILITY

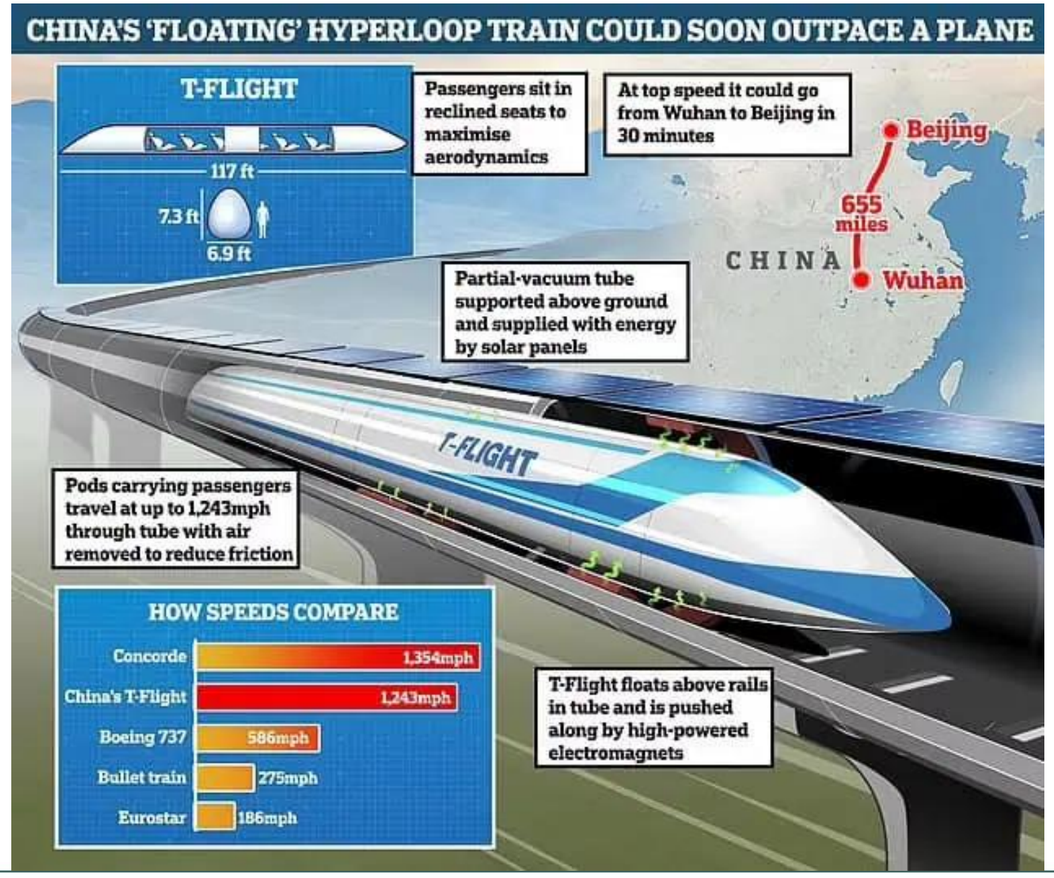
The same Chinese train driver photographed 26 years apart in 1996 and 2022

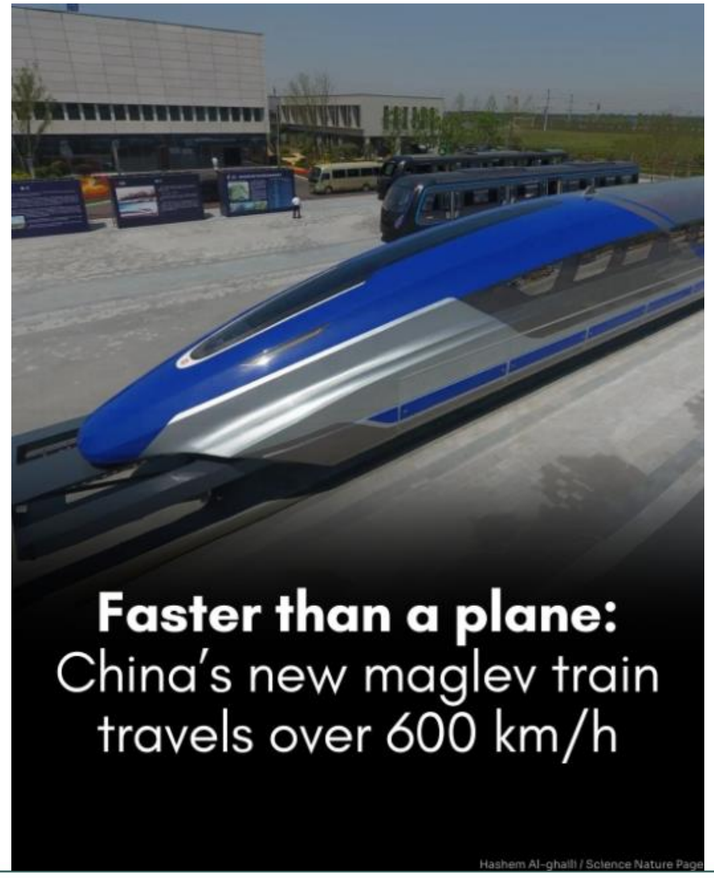
HIGH-SPEED RAIL MOMENTUM IN THE MAINLAND

China’s High-Speed Railway Network, 2012

China’s High-Speed Railway Network, 2024

MAGLEV AND ULTRA-HIGH SPEEDS





CLIMATE-EFFICIENT

~41 g CO_2
per passenger-km

~171 g CO_2
per passenger-km

~251 g CO_2
per passenger-km

SUSTAINABILITY: RAIL AS A LOW-CARBON BACKBONE

CUT OVERALL EMISSIONS

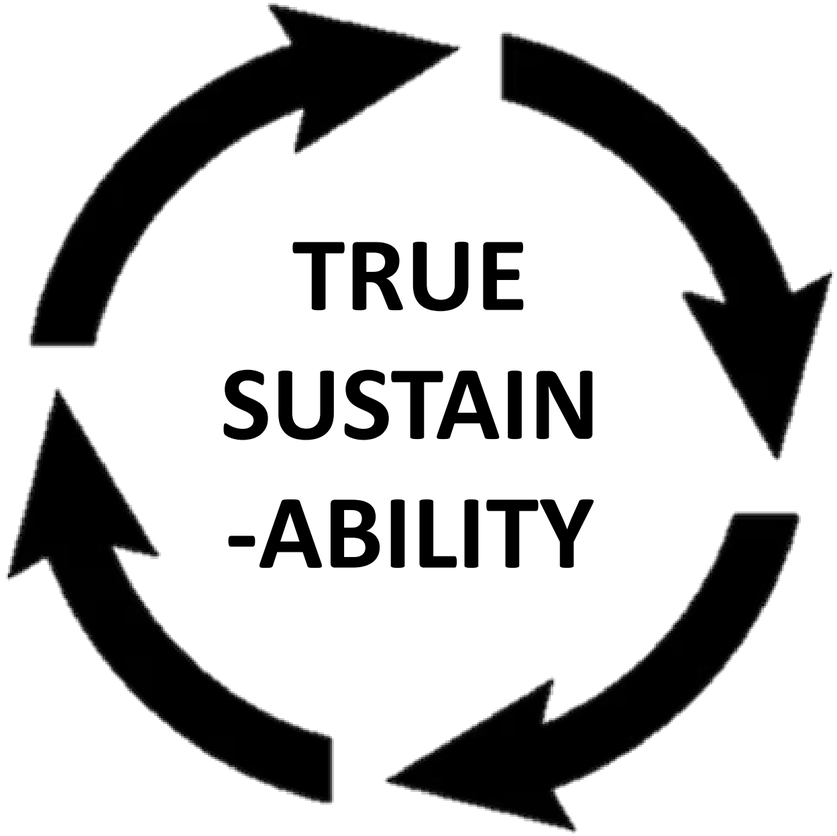
BUILD MORE COMPACT, WALKABLE CITIES

USE LESS LAND

EASE TRAFFIC JAMS

WE MAKE IT POSSIBLE…

- Full electrification
- Regenerative braking that recaptures energy
- Lightweight materials
- Sleeker aerodynamics
- Smart operations



THE MISSION

Intelligent and **Wise Systems**

Strong yet **Resilient Infrastructure**

Human-Centered Protection

HONG KONG, CHINA 2025
IRSC
INTERNATIONAL RAILWAY SAFETY COUNCIL

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