

# Regional Environmentally Sustainable Transport Forum in Asia

## Plenary Session 3: Quality Road Infrastructure's Contribution to Sustainable Development

### Resilient and Sustainable Road Infrastructure

Jamie Leather  
Director Transport  
Asian Development Bank

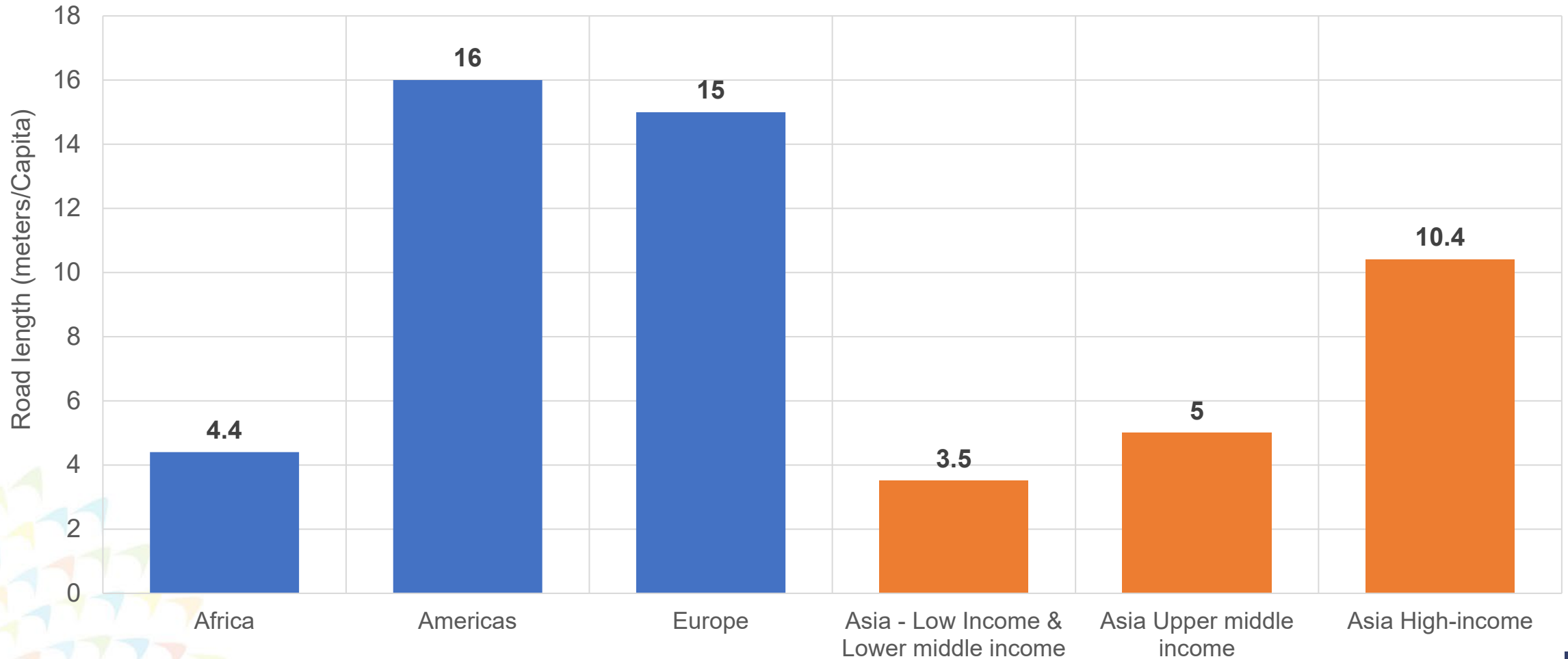


Department of  
Economic and  
Social Affairs



# Road infrastructure deficit: significant investment required

Road Length per Capita



Source: Asian Transport Outlook (ATO)

Source: Asian Transport Outlook



# Roads Need a Balance of Development and Maintenance

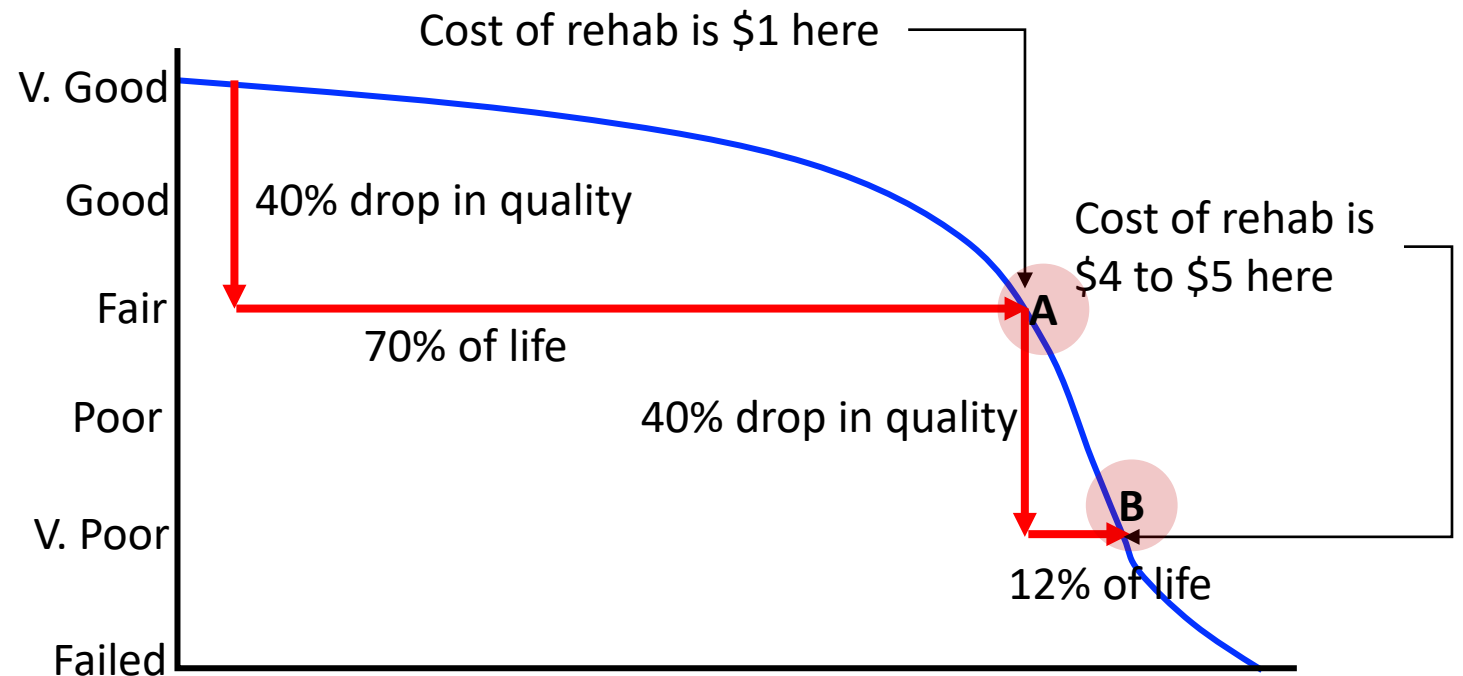
- In many emerging/developing economies, actual expenditure on road preservation and maintenance is between 25 ~ 60% of need

*(Source: World Bank)*

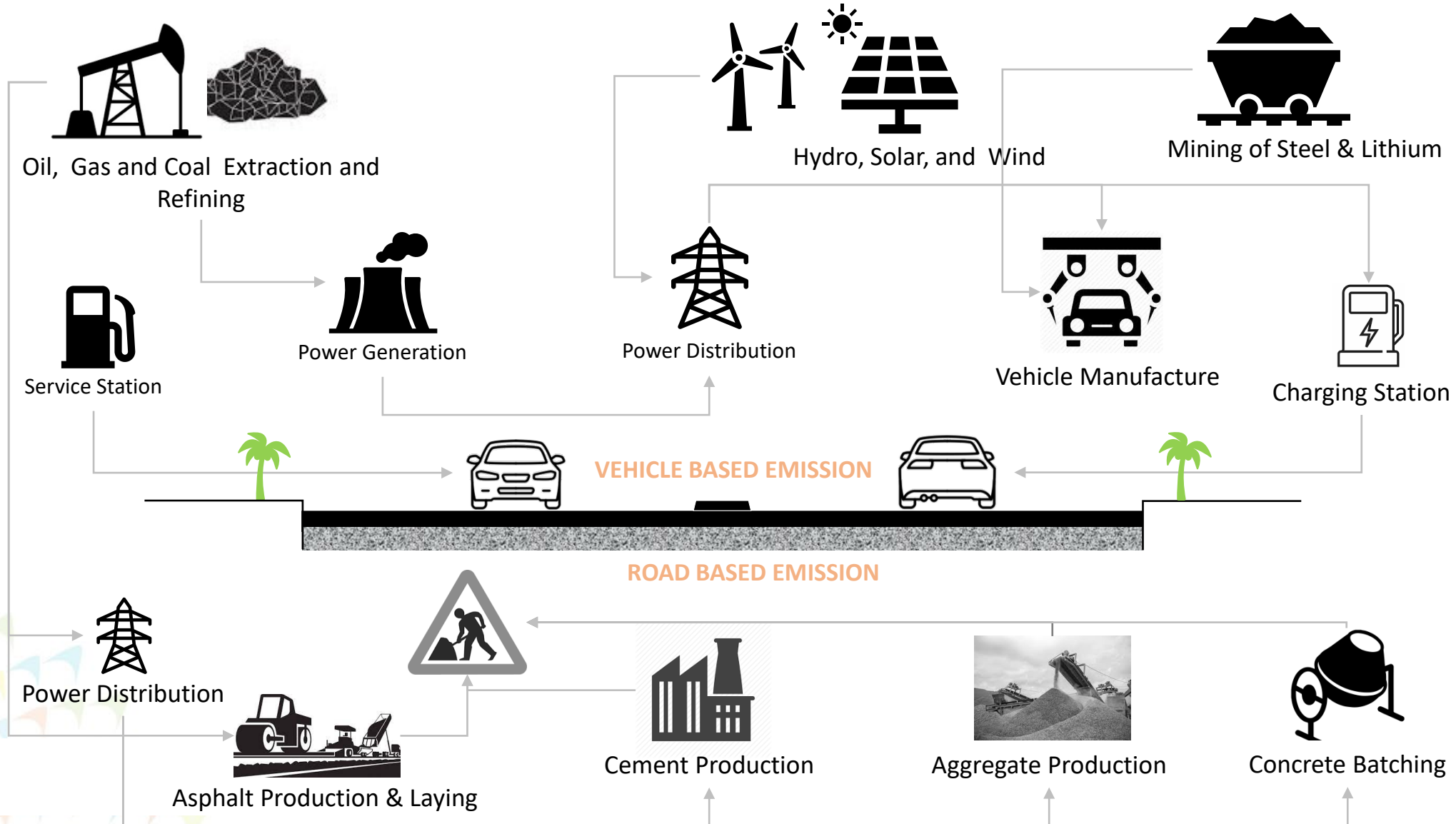
- Countries with low income economies typically spend 50% more on the network, per km than higher income economies

*(Source: PIARC)*

- Roads require a balance of maintenance and development



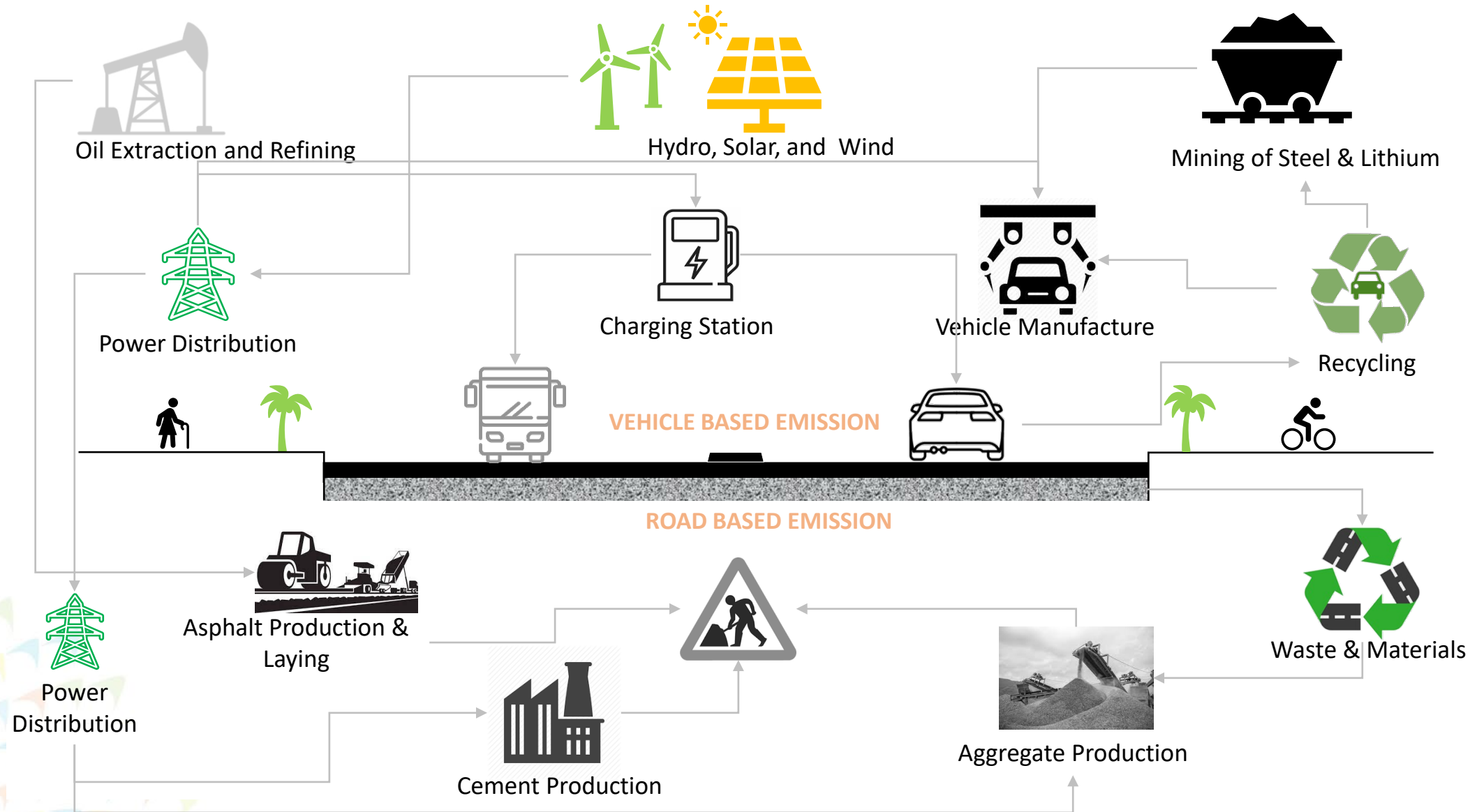
# Current Carbon Intensive Approach



Source: ADB



# Low Carbon Future Alternative for Roads

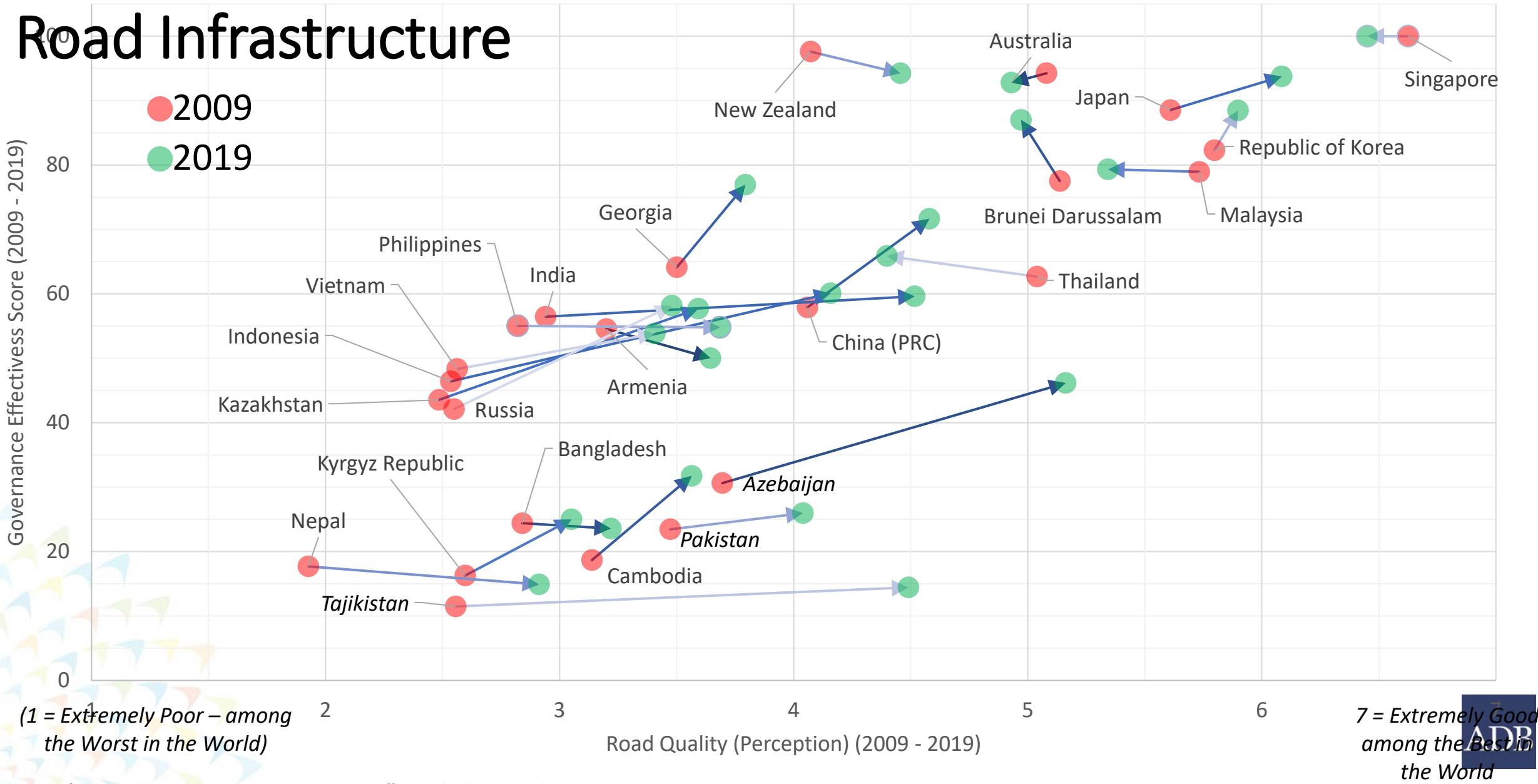


Source: ADB



# Good Governance is Essential for Delivering Quality

## Road Infrastructure



(1 = Extremely Poor – among the Worst in the World)

7 = Extremely Good among the Best in the World





# The impacts of climate change are already very real in Asia and the Pacific

Impacts from disasters in Asia and the Pacific\* (2015-2022)

**814.8 million**  
People affected

**40,415**  
Fatalities

**418.5 billion**  
Total losses

**Total losses for DM Cs only**

	2015	2016	2017	2018	2019	2020	2021	2022
<b>PHILIPPINES</b> Typhoon Chan-hom (Jul) <b>\$1.7 billion</b> (5 deaths)	<b>PRC</b> Flood (Jun-Jul) <b>\$24.8 billion</b> (289 deaths; 60 million affected)	<b>PRC</b> Flood (Jun-Jul) <b>\$6.6 billion</b> (78 deaths)	<b>INDIA</b> Flood (Aug) <b>\$3.1 billion</b> (504 deaths)	<b>INDIA</b> Flood (Jul-Sep) <b>\$10.6 billion</b> (1,900 deaths)	<b>PRC</b> Flood (May-Jul) <b>\$17.8 billion</b> (280 deaths)	<b>PRC</b> Flood (Cyclone Cempaka) (Jun-Aug) <b>\$16.5 billion</b> (352 deaths)	<b>PRC</b> Drought (Jul-Aug) <b>\$5 billion</b> (6.1 million affected)	<b>PRC</b> Drought (Jul-Aug) <b>\$5 billion</b> (6.1 million affected)
<b>VIET NAM</b> Drought (Dec-Feb 2017) <b>\$7.7 billion</b> (1.8 million affected)	<b>SRI LANKA</b> Flood (May) <b>\$1.4 billion</b> (203 deaths)	<b>PRC</b> Typhoon Hato (Aug) <b>\$3.9 billion</b> (8 deaths)	<b>PRC</b> Tropical storm Rumbia (Aug) <b>\$5.8 billion</b> (53 deaths)	<b>PRC</b> Cyclone Hanna (Jul-Sep) <b>\$10.6 billion</b> (72 deaths)	<b>INDIA</b> Cyclone Amphan (May) <b>\$14.1 billion</b> (90 deaths)	<b>INDIA</b> Floods, Landslides (June) <b>\$7.9 billion</b> (1,922 deaths)	<b>INDIA</b> Flood (May-Oct) <b>\$4.2 billion</b> (2,035 deaths; 1.3 million affected)	<b>INDIA</b> Flood (May-Oct) <b>\$4.2 billion</b> (2,035 deaths; 1.3 million affected)
<b>PRC</b> Typhoon Mujigae (Oct) <b>\$4.8 billion</b> (20 deaths; 78,300 affected)	<b>INDIA</b> Cyclone Vardah (Dec) <b>\$1.1 billion</b> (24 deaths)	<b>THAILAND</b> Flood (Jan) <b>\$1.1 billion</b> (96 deaths)	<b>PRC</b> Flood (May-Jul) <b>\$1.9 billion</b> (112 deaths)	<b>INDONESIA</b> Flood (Dec) <b>\$1.3 billion</b> (66 deaths)	<b>PAKISTAN</b> Flood (Aug-Sep) <b>\$1.6 billion</b> (410 deaths)	<b>PRC</b> Drought (Jan-Dec) <b>\$3.1 billion</b>	<b>PAKISTAN</b> Flood (Jun-Sep) <b>\$15 billion</b> (1,739 deaths; 33 million affected)	<b>PAKISTAN</b> Flood (Jun-Sep) <b>\$15 billion</b> (1,739 deaths; 33 million affected)
<b>VANUATU</b> Cyclone Pam (Mar) <b>\$0.52 billion</b> (188,000 affected)	<b>FIJI</b> Cyclone Winston (Feb) <b>\$0.68 billion</b> (540,558 affected)	<b>INDONESIA</b> Flood (Dec) <b>\$1.3 billion</b> (66 deaths)	<b>INDONESIA</b> Flood (Dec) <b>\$1.3 billion</b> (66 deaths)	<b>TONGA</b> Cyclone Harold (Apr) <b>\$0.12 billion</b> (25,000 affected)	<b>INDIA</b> Cyclone Yaas (May) <b>\$3 billion</b> (19 deaths)	<b>INDIA</b> Cyclone Yaas (May) <b>\$3 billion</b> (19 deaths)	<b>INDIA</b> Cyclone Yaas (May) <b>\$3 billion</b> (19 deaths)	<b>INDIA</b> Cyclone Yaas (May) <b>\$3 billion</b> (19 deaths)
<b>\$45.3 billion</b>	<b>\$58.3 billion</b>	<b>\$28.3 billion</b>	<b>\$24.3 billion</b>	<b>\$33.8 billion</b>	<b>\$60.3 billion</b>	<b>\$36.4 billion</b>	<b>\$29.4 billion</b>	<b>\$29.4 billion</b>

Notes: 1. The amounts for total losses refer to the monetary amount of damage to property, crops and livestock at the year of the event. (Center for Research on the Epidemiology of Disasters)

\* All ADB regional members.

Photos: CTTO



# Climate resilience is a development need

- Reliable transport infrastructure is one of the backbone of a prosperous economy;
- Due to wide spatial distribution, many transport assets are exposed and vulnerable to natural hazards

## PAKISTAN FLOODS

- Out of the 25 poorest districts in the country before the floods, 19 were calamity-affected, pushing people who were already poor into acute poverty.
- A total of 1,739 people died, 12,867 injured, and over 2 million houses were destroyed or damaged, affecting the lives of 33 million people across the country (or 14.5% of the population).
- The national poverty rate will increase by 3.7 to 4.0 percentage points,
- 8.4 and 9.1 million people will be pushed into poverty.

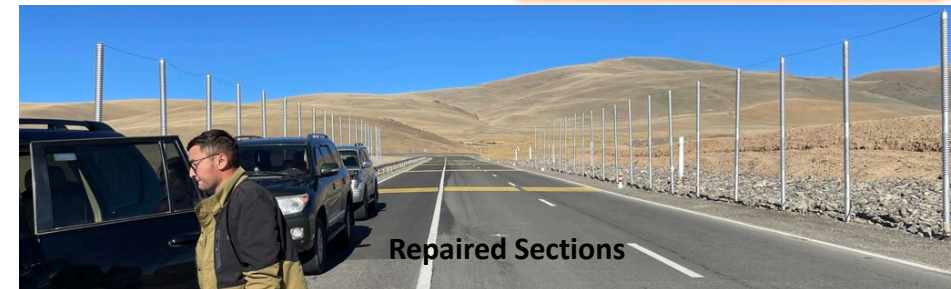
Pakistan Floods (Source: Ecologist)



Mongolia Permafrost Failure Treatments (Source: ADB & MRTD)



Investigating Failed Sections



Repaired Sections





Climate change manifests in various ways, and the transport sector is called upon to lead integrated multi-sector climate solutions.

# Thank you

Jamie Leather, Asian Development Bank

[jleather@adb.org](mailto:jleather@adb.org)