International Transport Forum

Long-term CO_2 mitigation potential from urban transport:

Latin America, China, and India

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LIMA CLIMATE ACTION HIGHLIGHT

ITF urban transport model

- Simulates the evolution of variables that are relevant to transport demand in urban agglomerations (above 500 000 population):

- Population (UN urbanization prospects)
- Economic activity

1 scenario

- Land Use
- Fuel prices
- Road infrastructure
- Public transport service (Quality and quantity)

Various policy scenarios

ITF urban transport model

- The model derives levels of transport activity and modal shares that would result from each scenario

- Assumptions on load factors, fuel economy and CO_2 emission factors from the MoMo mobility model of the *International Energy Agency* (New Policy Scenario)

- Air pollution and health impacts that would result from each scenario are calculated from transport activity results by the *International Council for Clean Transportation (ICCT)*

ITF urban transport model

- Composed of individual regional modules:
  - Flexibility to use the available urban transport data of each region
  - Set relations between variables according to the specific trends found in each of them

- 3 modules for 2015 publication
  - Latin American cities
  - Chinese cities
  - Indian cities

Urban Transport Model –Scenarios

- Testing long-run impact that diverse urban transport policy packages could have if adopted as a general strategy for the region.

Baseline scenarios : Identified BAU trends assumed for the future.
China: cities with car ownership restrictions continue to have one and cities with severe congestion and > 2.5 million population adopt one.

Private transport oriented : Adoption of policy trends that intensify the shift to private mode use (high sprawl, low expansion of public transport, low fuel prices). Combined with rapid expansion of road infrastructure (high roads).
China: only cities with car ownership restrictions in 2010 have one.

Public transport oriented : Alignment of trends that increase the role of public transport in urban mobility (low sprawl, high expansion of public transport, high fuel prices). Combined with slow expansion of road infrastructure (low roads).
China: same assumptions as baseline but number of licenses is adjusted according to population increase.

Urban Transport Model- Scenarios

- Additional scenarios: Analyse particular aspects of urban transport in each region/country
- Latam: recent growth of two-wheelers (private and public transport urbanisation under different road infrastructure scenario)
- China: private or public transport oriented urbanisation in a context of car restriction ownership (private and public transport urbanisation with same car restriction scenario)
- India: possible ban of auto-rikshaws

4 relevant messages for further developments in NAMAs and INDCs

1 Results highlight the importance of mitigation actions in developing cities

Urban agglomerations above 500 000 population in Latin America, China, and India:

2010: **9%** of world surface passenger transport emissions

Baseline 2050: **20%** of world surface passenger transport emissions

38% of **total 2010-2050 growth** in world surface passenger transport emissions

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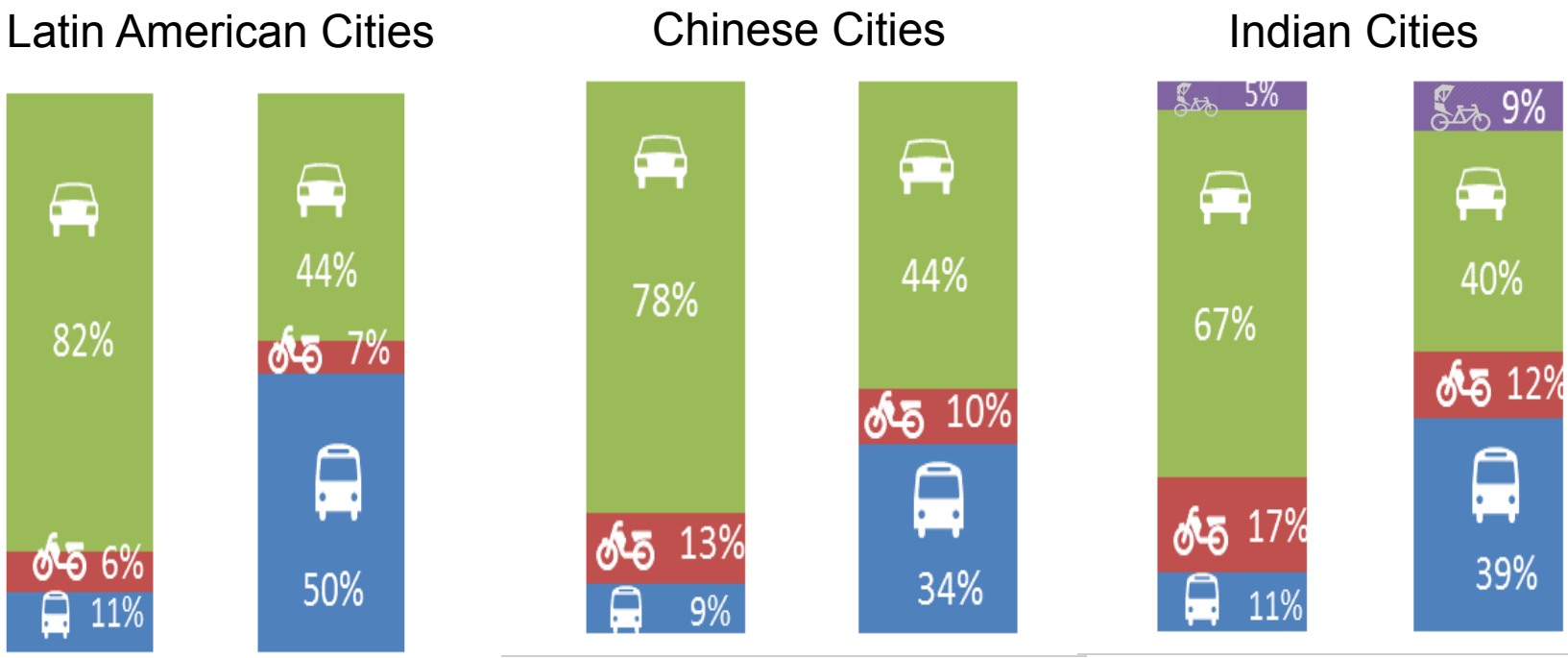
Sustained policies that promote public or private transport modes lead into very different mobility futures

2050 modal shares (passenger-kilometres)



Private oriented, high roads

Public oriented, low roads

Private oriented, high roads, No expansion in car ownership restrictions

Public oriented, low roads, Stringent expansion in car ownership restrictions

Private oriented, high roads

Public oriented, low roads

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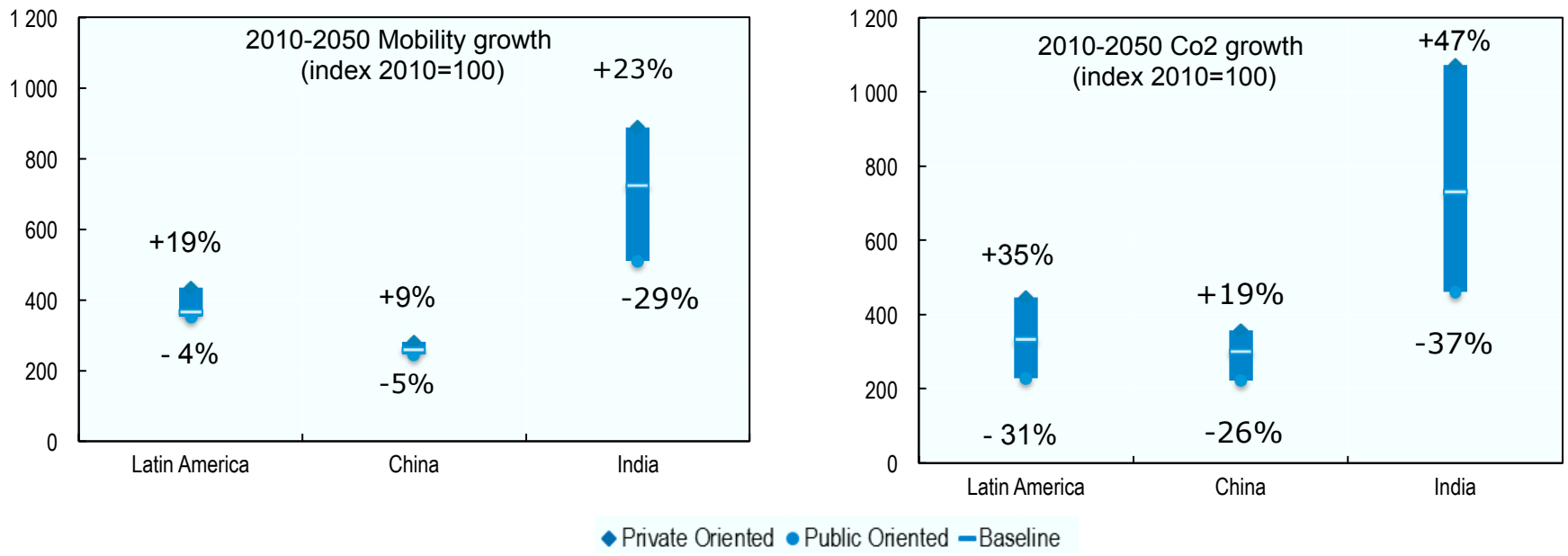
Carbon intensity of urban transport is highly dependent of the type of policies in place



2 Avoid-shift is a powerful element of the way-forward for low carbon urban mobility

Mitigation strategies and policy questions are different between regions, countries and cities (logic of NAMAs and INDCs)

Regions chosen provide excellent examples:

India: ban of three wheelers?

China: car ownership restriction in a growing number of cities

Latin America: leadership in BRT implementation and expansion

Understanding context, drivers, and effects of policies chosen is crucial to attain desired results.

Example 1: 3-wheeler ban in **Indian** cities

- Reduction of 80% of three wheelers by 2050
- 18% more two wheelers
- Only 4% reduction in CO2 emissions with very likely mobility costs

Example 2: car ownership restrictions under private or public oriented urbanisation in China

- Baseline car ownership restriction policy setting would bring 19% higher growth in CO2 emissions (relative to baseline) if set under a private oriented urbanisation context
- The same policy design could bring 12% less growth in CO2 emissions (relative to baseline) if implemented under policies

3 One of the biggest challenges for a global mitigation framework is to encompass a wide range of transport interventions while moving towards better methodologies for measuring, reporting and verification

Latin American cities

Policy effects on CO2, pollution, and health are quite different in magnitude and sign

Policy effects on CO2 emissions, pollution and health are quite similar in magnitude and sign

Result in higher than baseline NOX emissions

Have limited effects in premature mortality (less reductions than in CO_2)

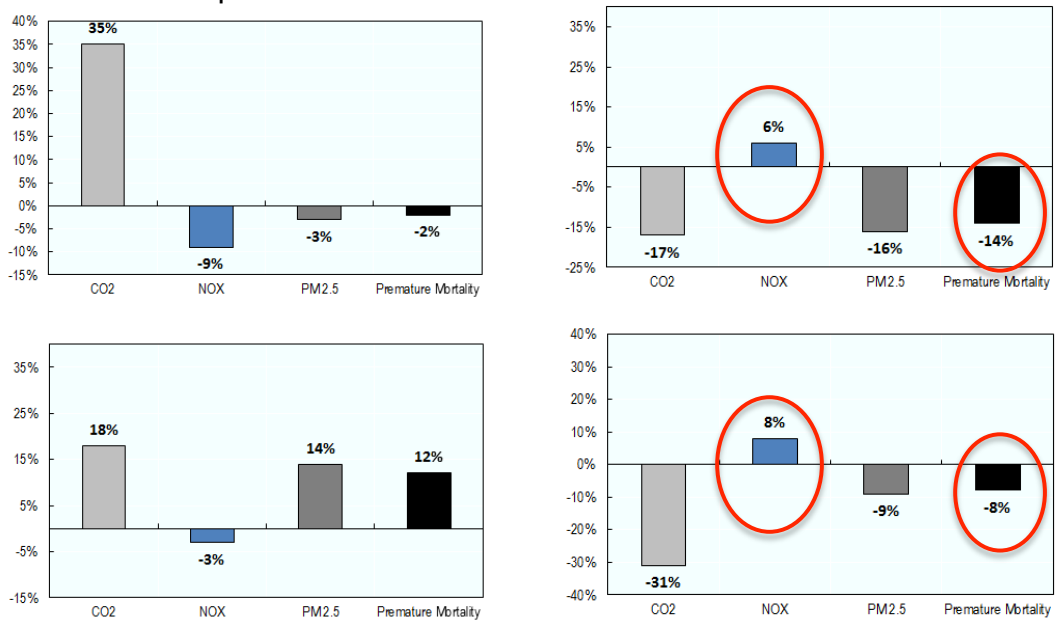
Growth relative to Baseline scenario

Private transport oriented

Public transport oriented

High Roads

Low Roads



Scenarios with higher two-wheeler fleet penetration have better results in CO2 emissions but worse results in terms of pollution and health impacts (lax emission standards and low penetration of electric two-wheelers)

4

It is desirable that countries develop NAMAs as part of a wider urban sustainable policy strategy instead of expecting all other externalities to be automatically reduced as a co-benefit of CO2 mitigation

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Thank you

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