# Low-Carbon Transport – Health and Climate Benefits

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- 2500 staff members

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# Objective Background Paper

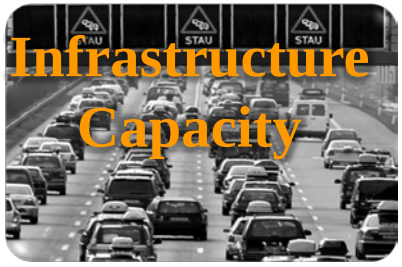
- Provide an overview of the problems due to emissions caused by road transport in Asia
- Present the various possibilities for low-carbon transport solutions
- Develop recommendations to reduce emissions in
- Discuss the link to the Sustainable Development Goals (SDG’s) and the underlying targets

# Main Drivers reshaping the future of mobility



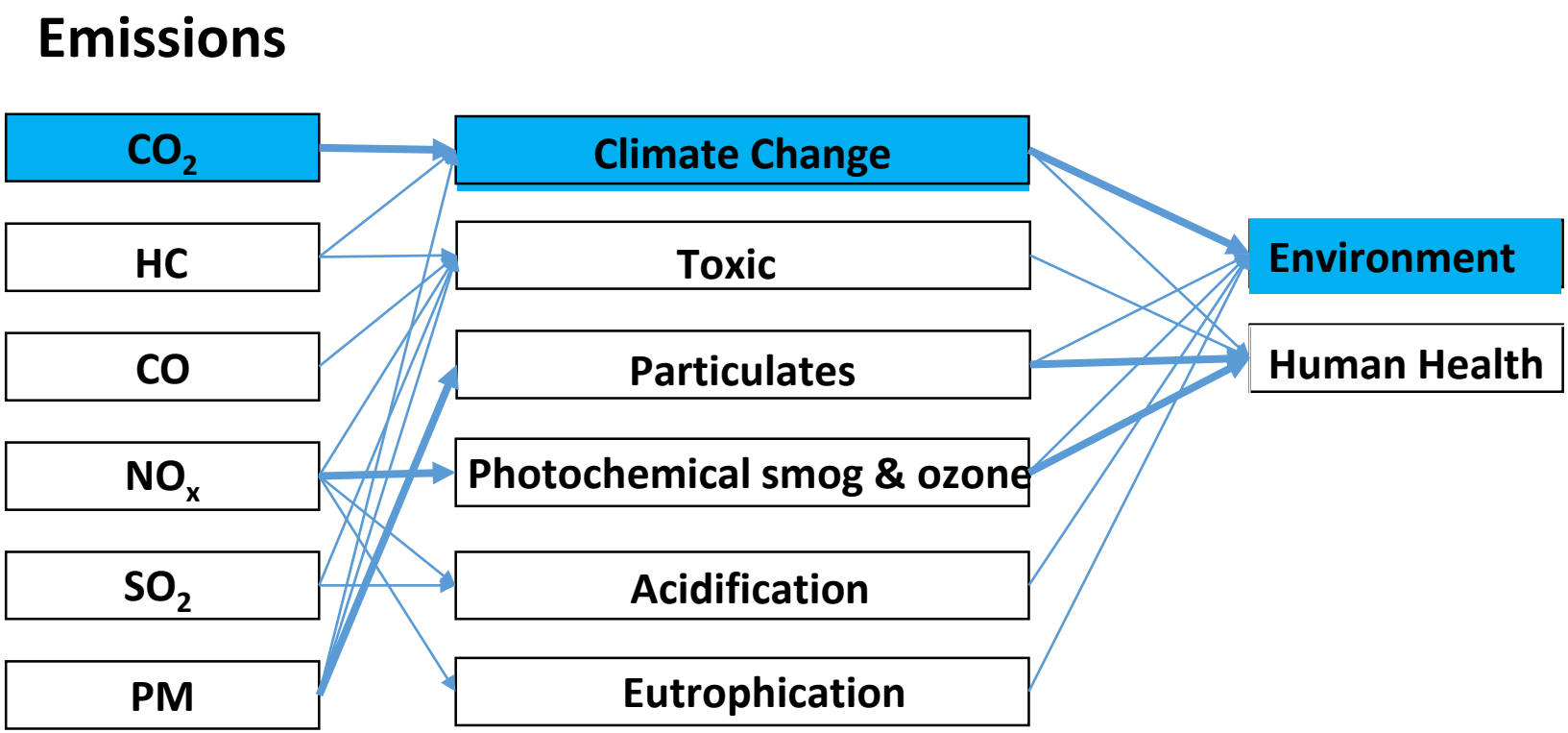








# Impact Transport Emissions



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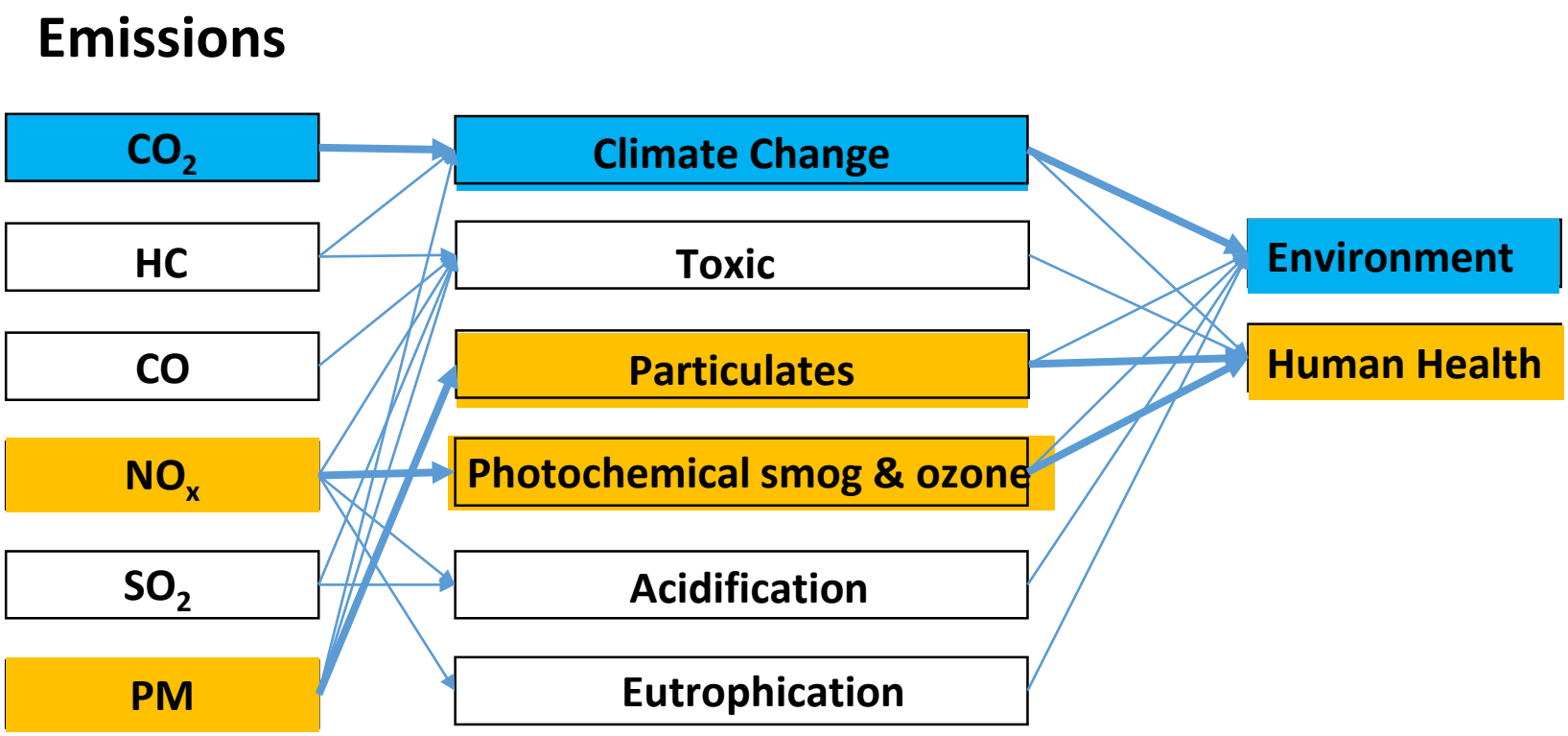


# Contribution Road Transport to Climate Change

- In the period 1991-2010, CO2 global emissions in the transport sector increased by almost 50%
- In 2012 transport was responsible for 23% of global CO2 emissions
- Road transport accounts for about 75% of these transport emissions

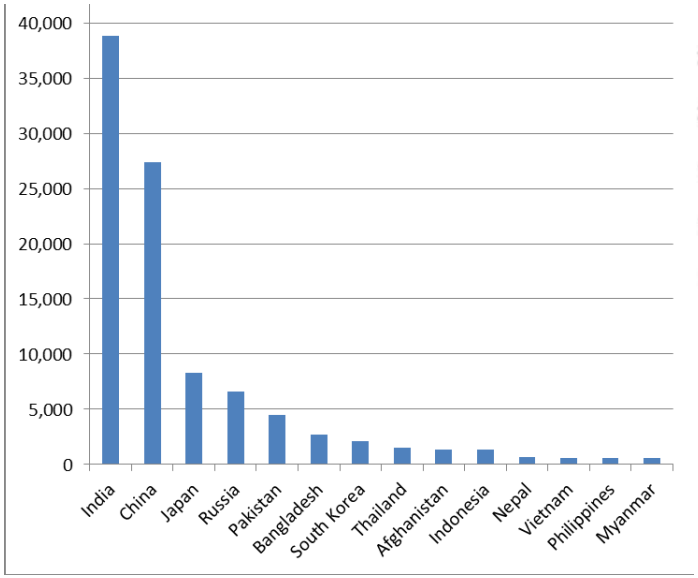

**Goal 13: Take urgent action to combat climate change and its impacts**

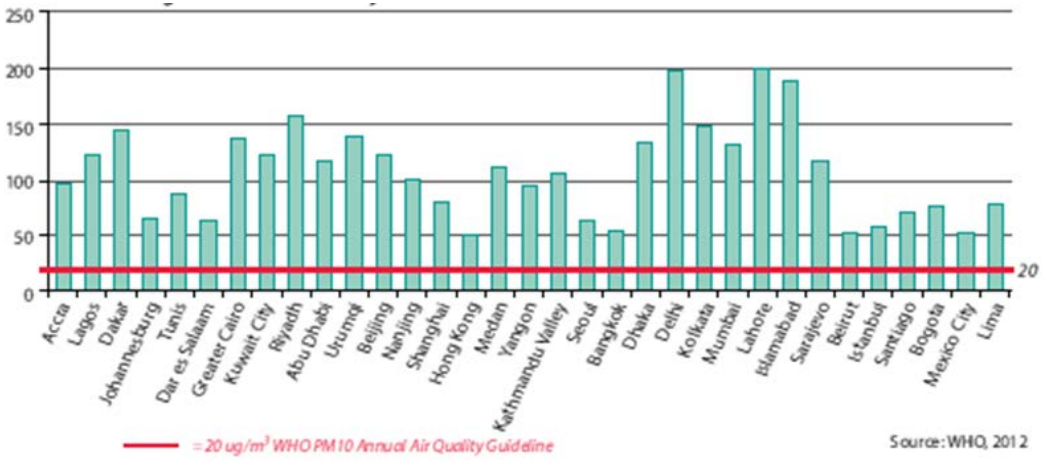
13.2 Integrate climate change measures into national policies, strategies and planning

13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

# Health Impact Emissions in Asian EST countries

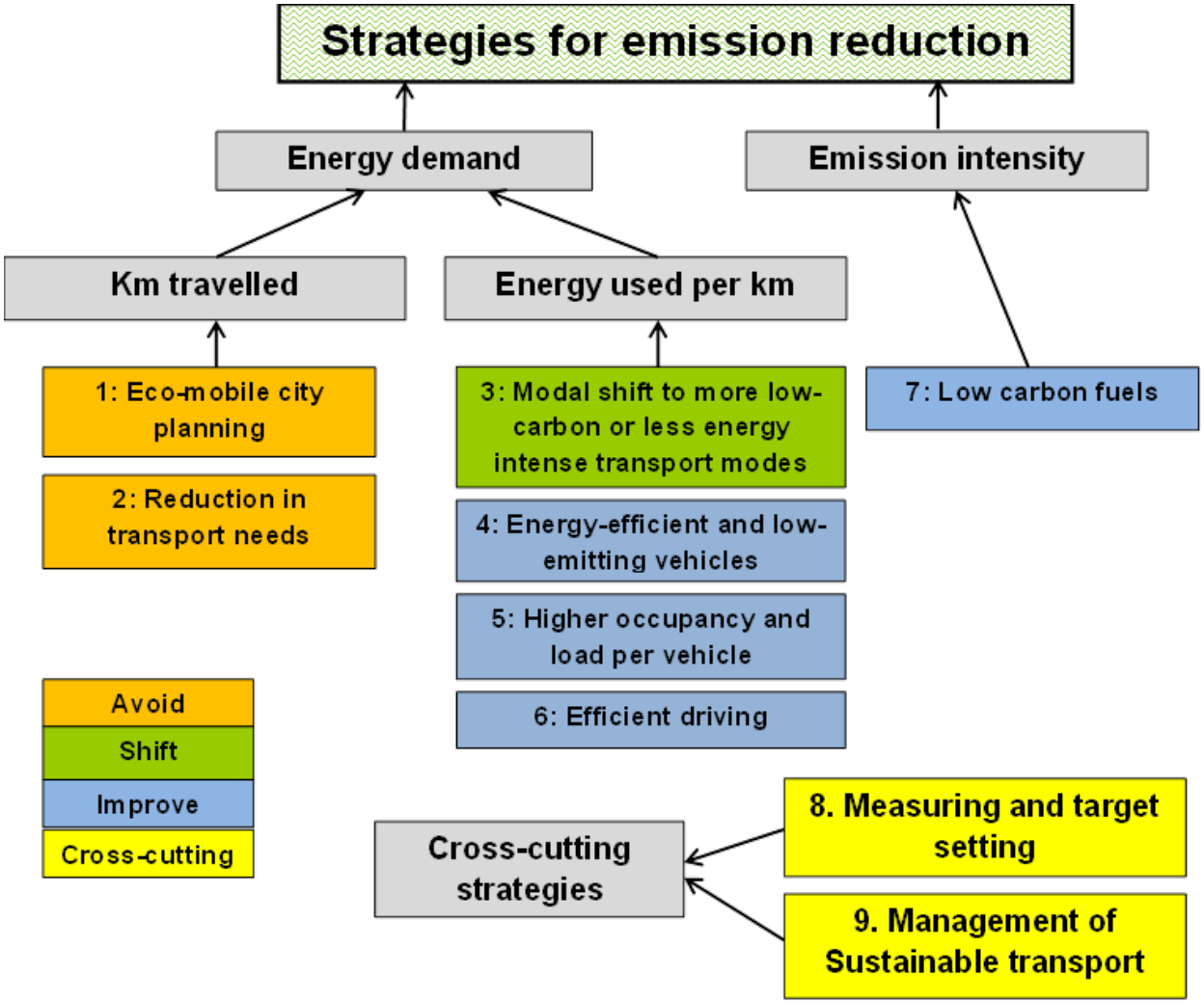
- WHO guidelines air pollution ($PM_{10}$) exceeded in many Asian cities 5-10 times, for $PM_{2.5}$ up to 20 times (Kathmandu)
- Almost 100,000 premature death yearly in the Asian EST countries (conservative estimate)
- Associated economic costs > 81 Billion US$

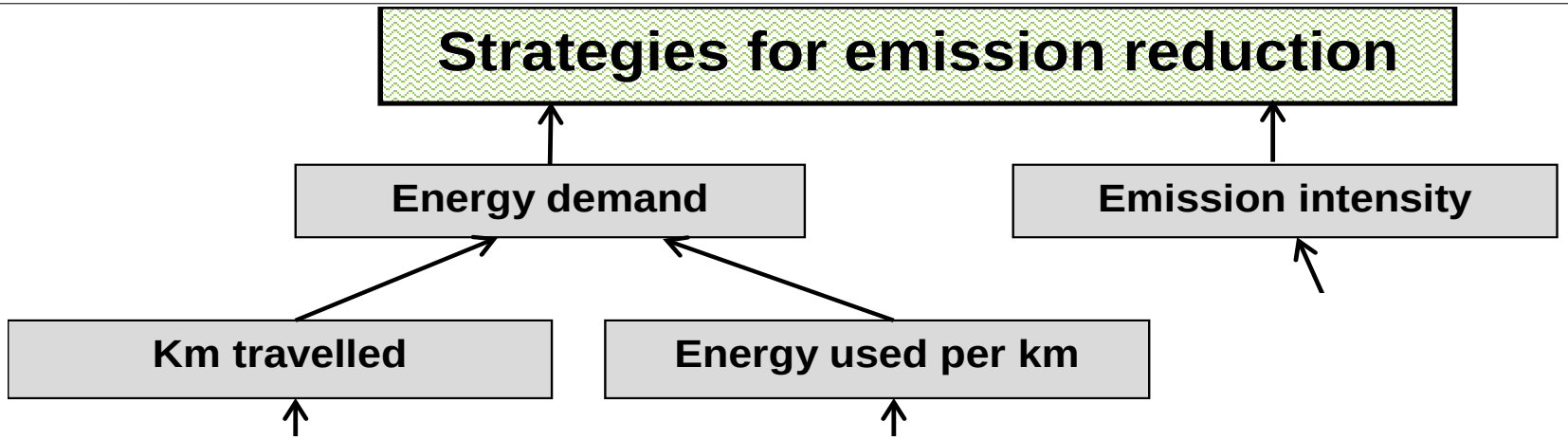


# What can be done?

## The Low Carbon Transport (LCT) strategies

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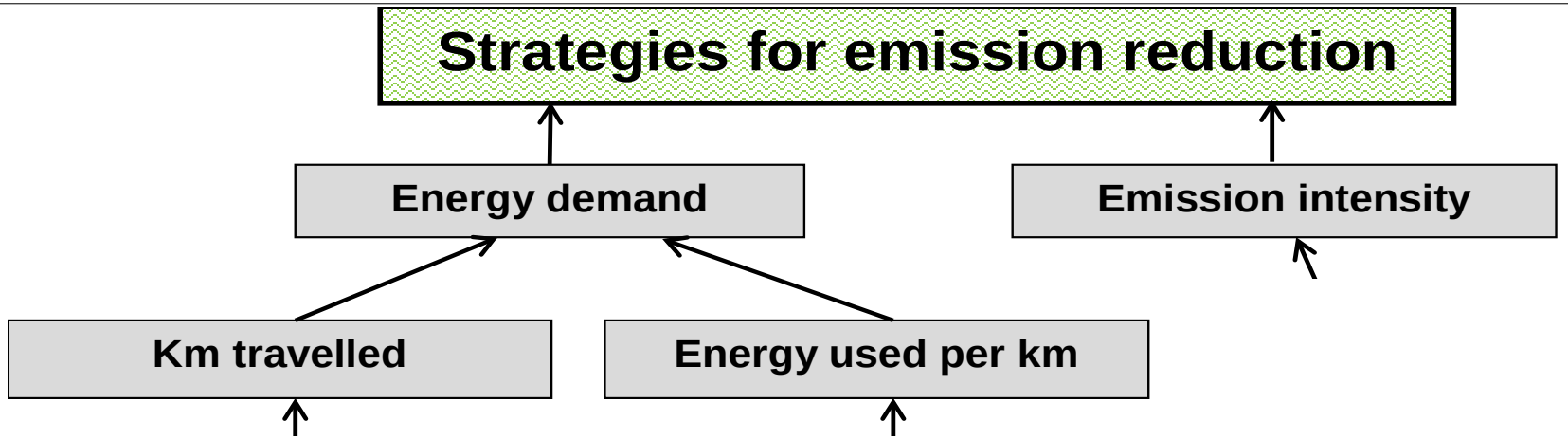
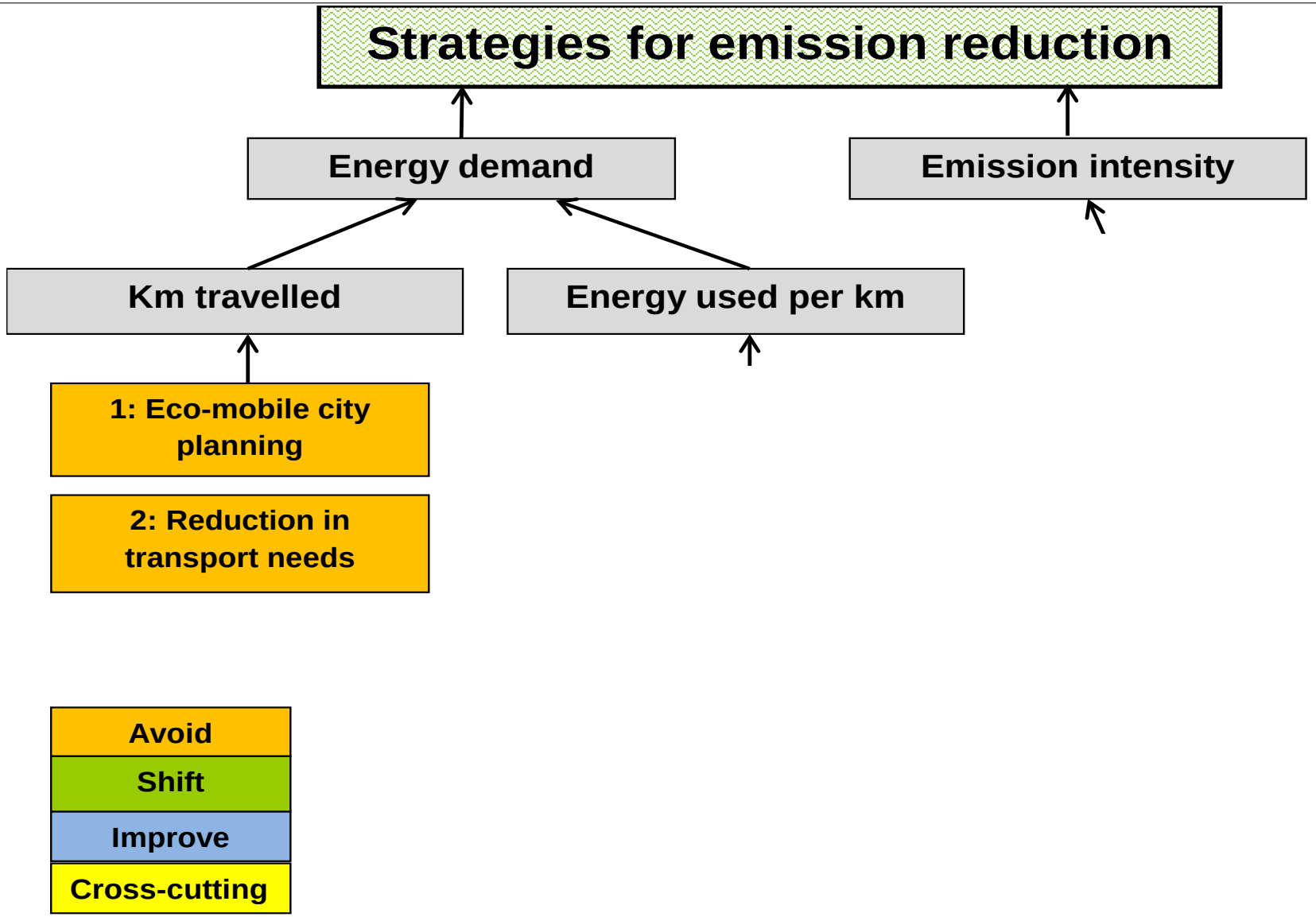
Emission intensity
Km travelled
Energy used per km




Avoid
Shift
Improve
Cross-cutting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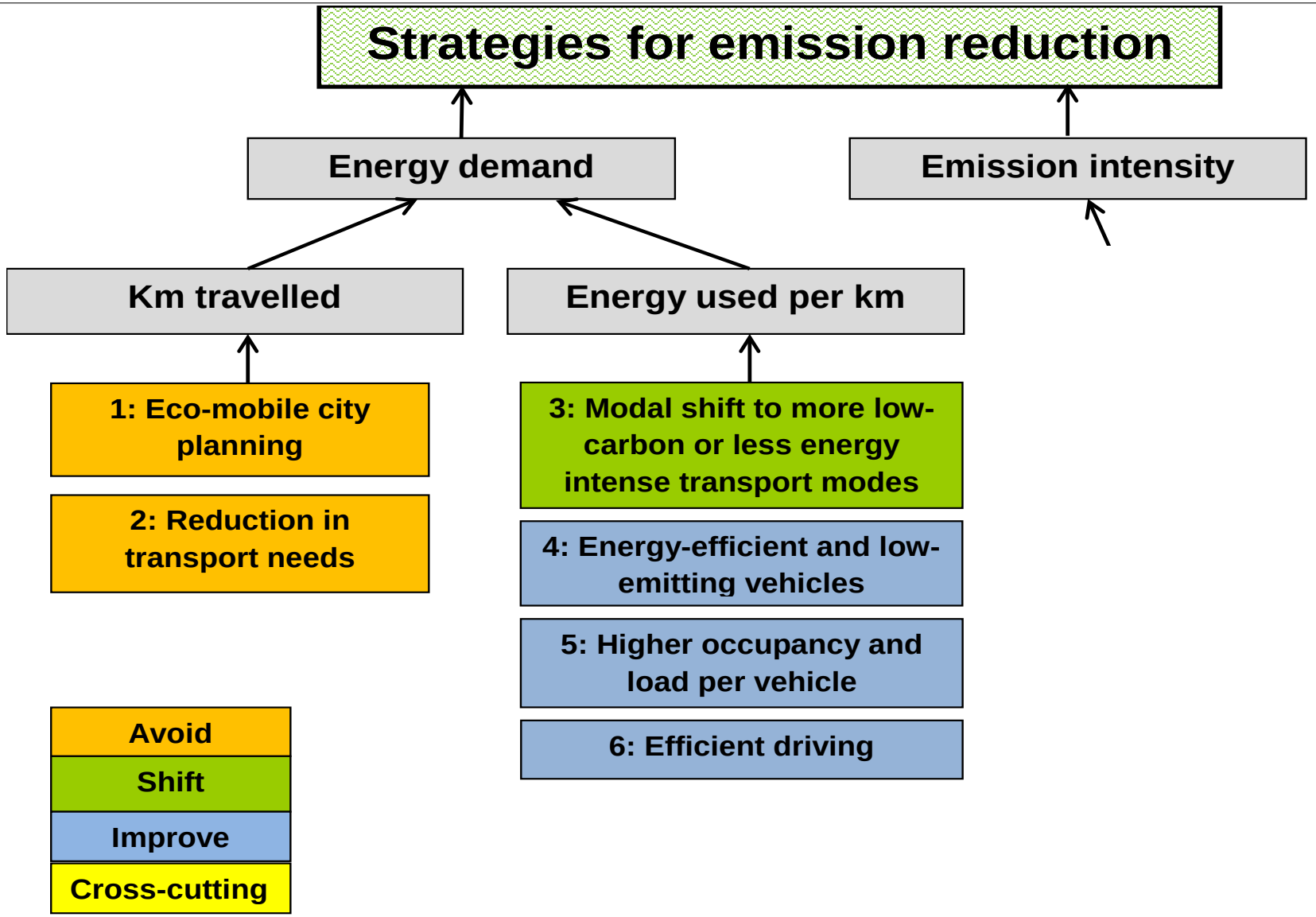
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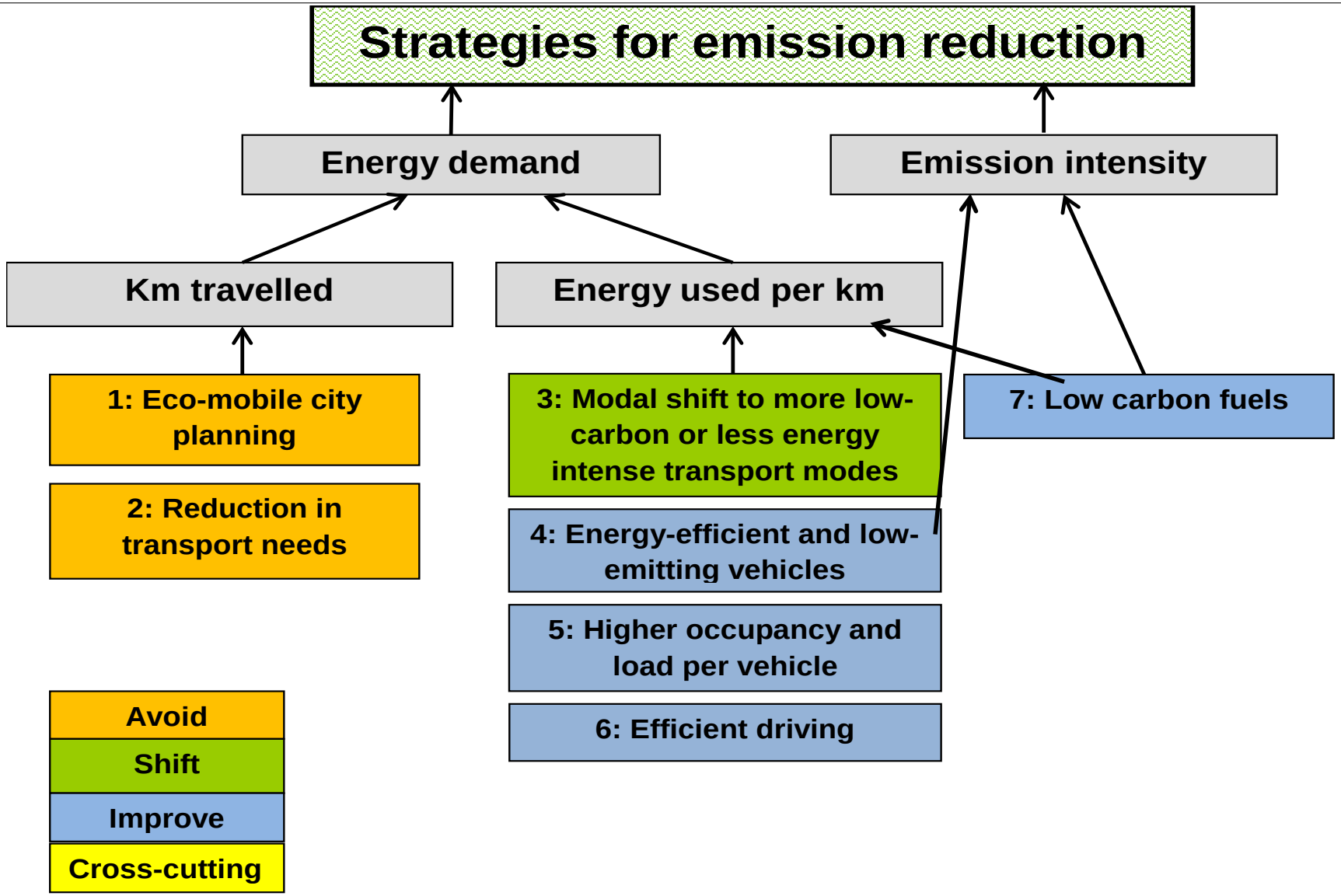
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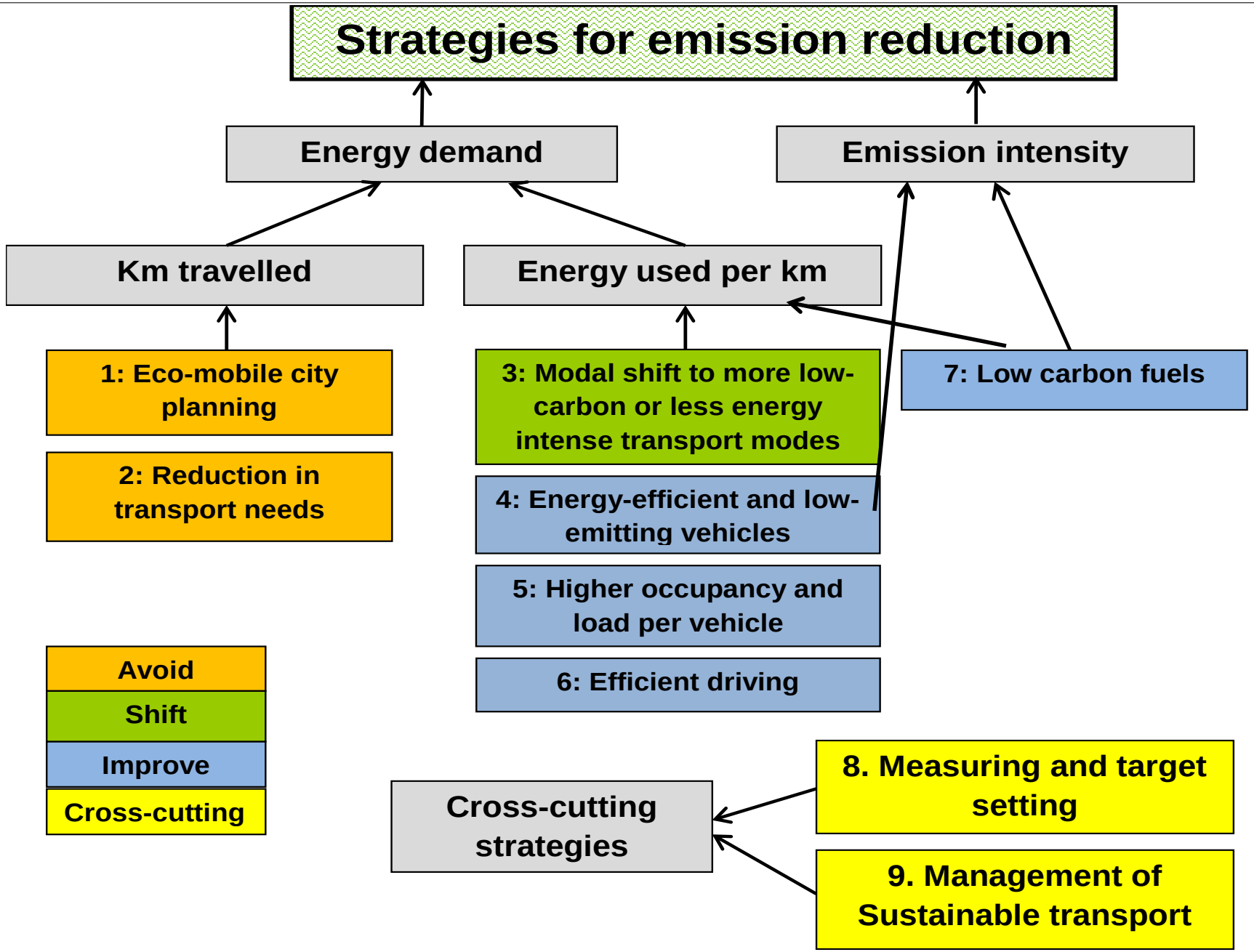
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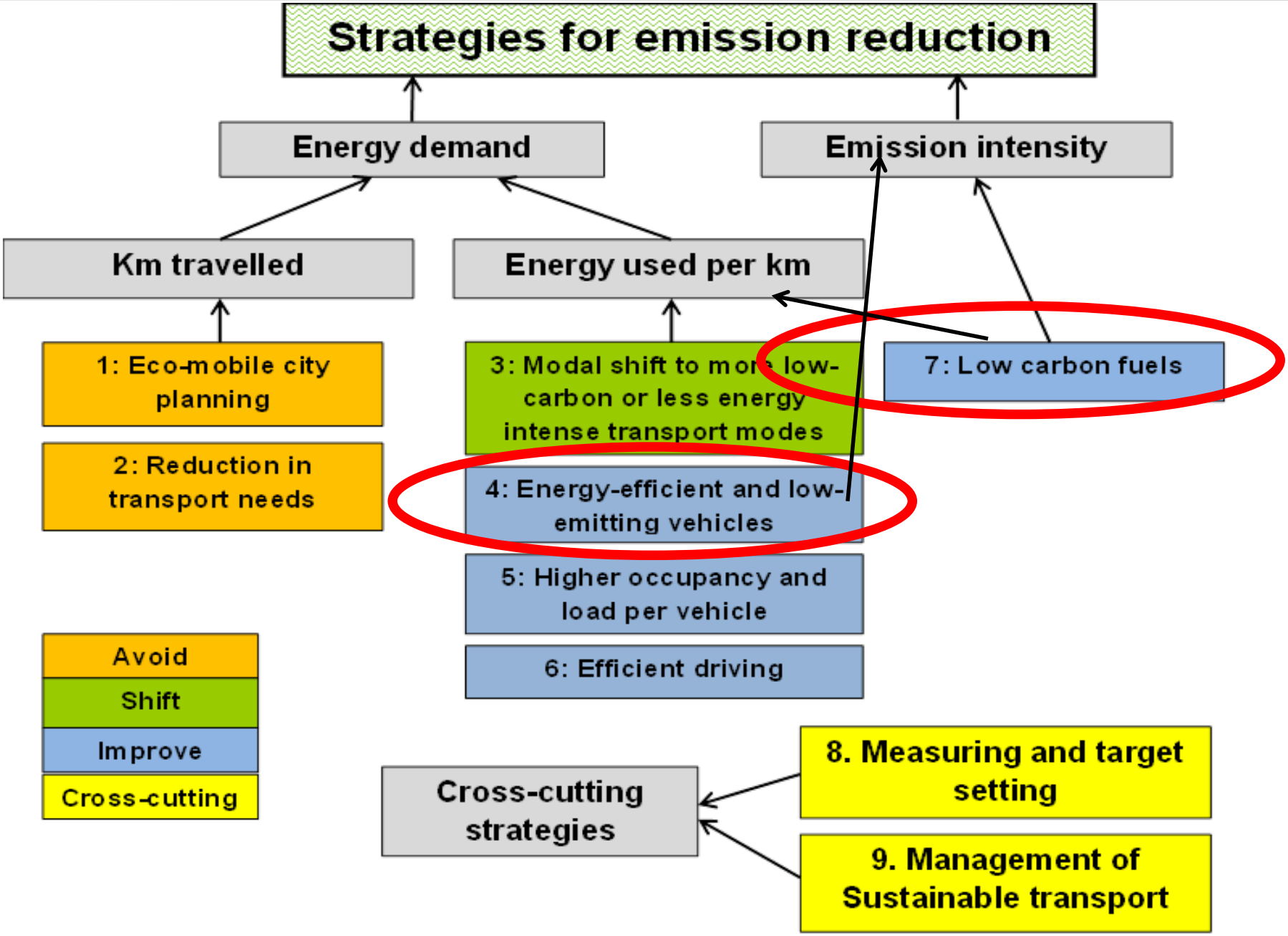
9. Management of Sustainable transport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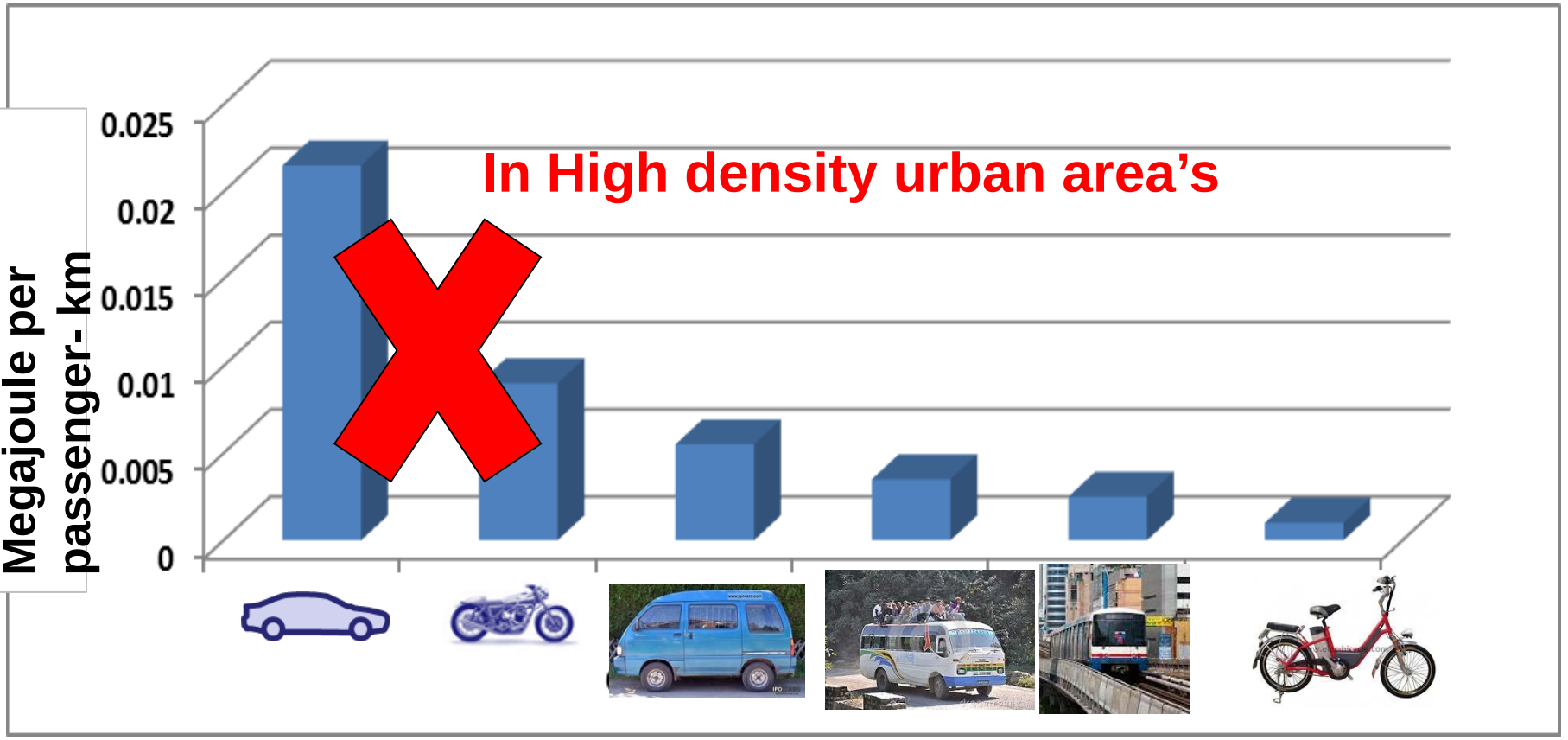
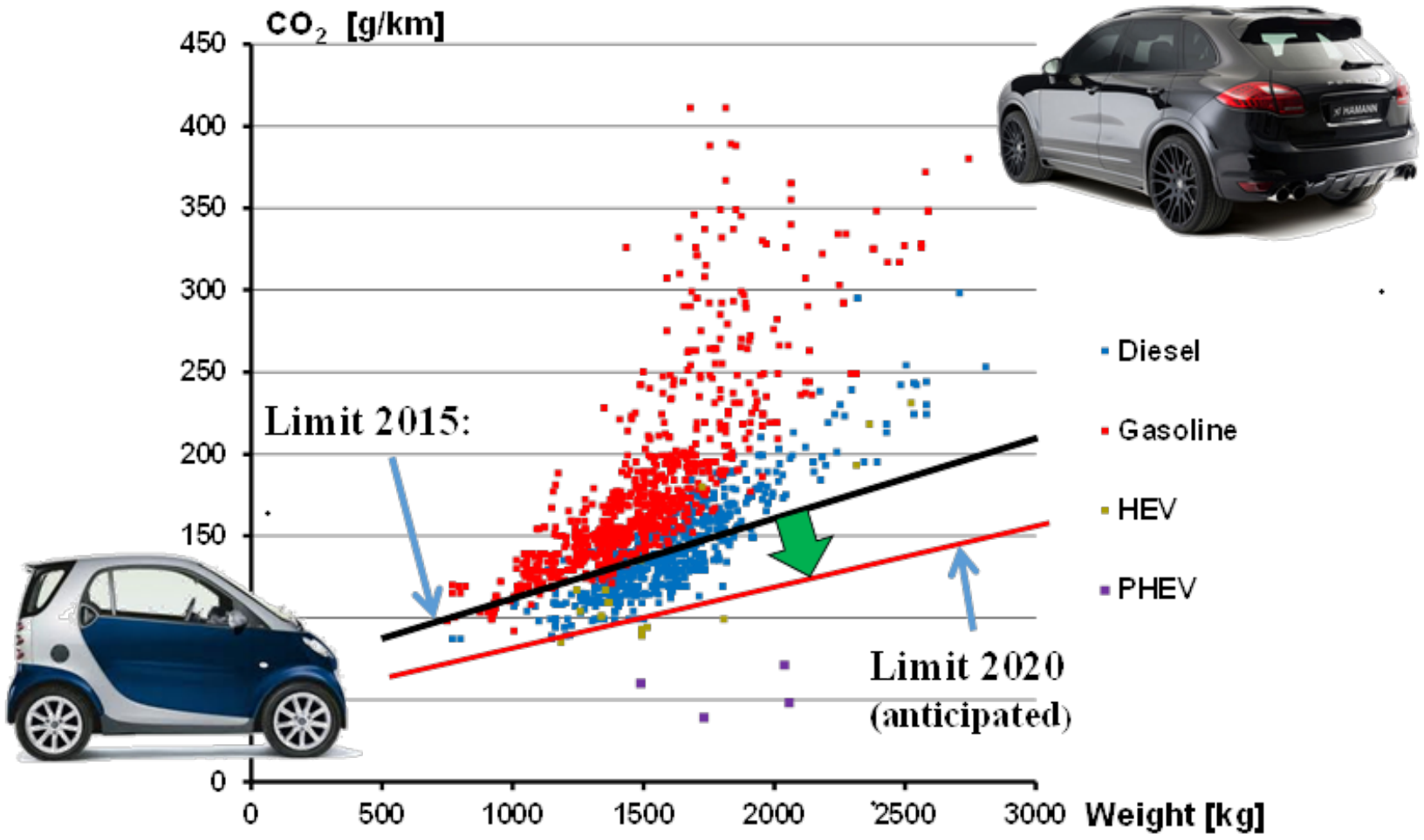
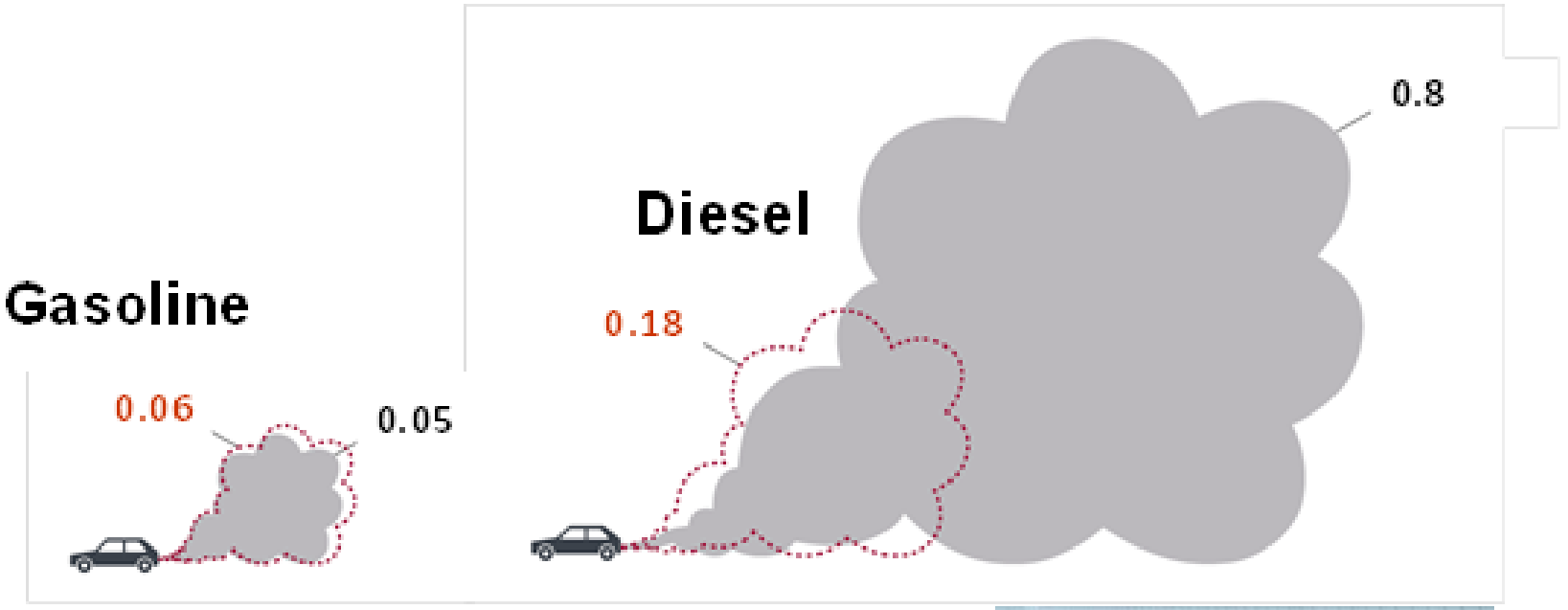
# Energy efficiency different motorized transport modes



# Vehicle mass and $CO_2$ emissions



# Real world driving emissions for $NO_x$ compared to Euro 5 limits




Euro 5 standard

Real World emissions

# Recommendations

1. Importance of the Bangkok declarations goals
2. Adequate fuel standards
3. Introduction alternative fuels
4. Promotion electric vehicles
5. Stringent emission regulations and GreenNCAP
6. Reduce pollution by motorcycles and shift to e-bikes
7. Promote energy-efficient and low-emitting vehicles
8. Importance or reliable air quality and health data
9. Take actions now
10. Resilient cities: health and disaster resiliency

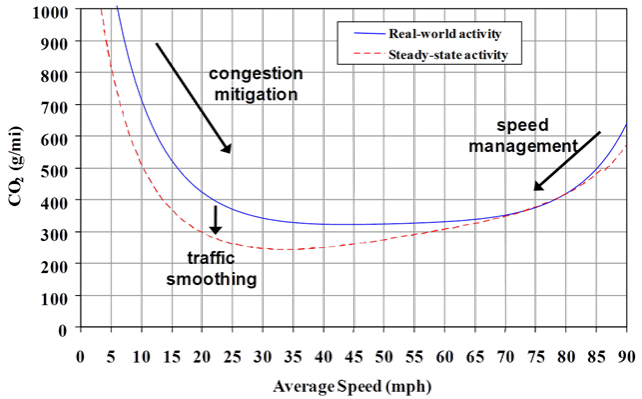
# 1 Importance of the 20 Bangkok declarations goals

- ***All are important in view of the LCT strategies***
- ***Consider to expand with the following strategies:***

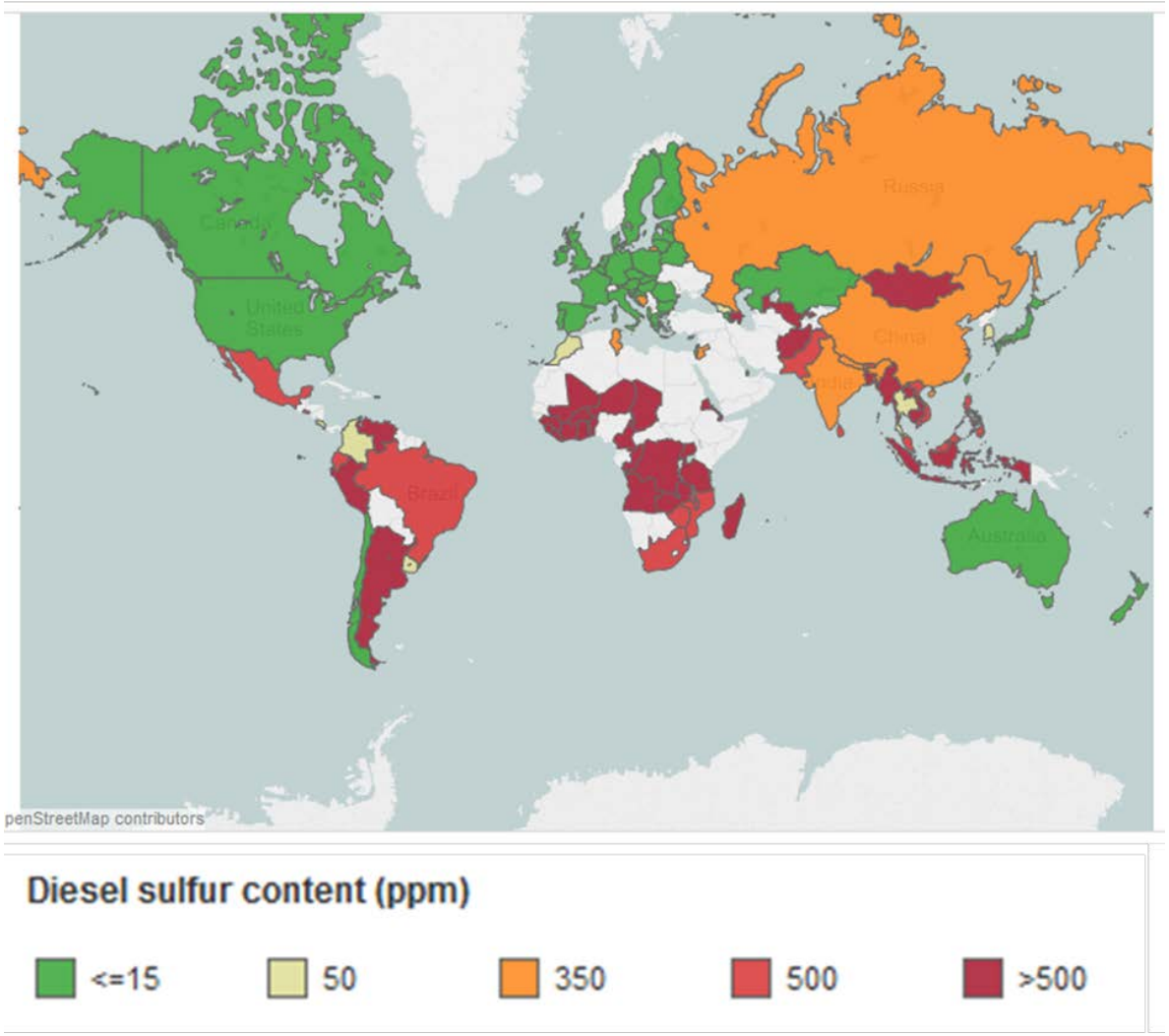
**4: Energy-efficient and low-emitting vehicles**

**5: Higher occupancy per vehicle**

**6: Efficient driving**

# 2. Introduce adequate fuel standards

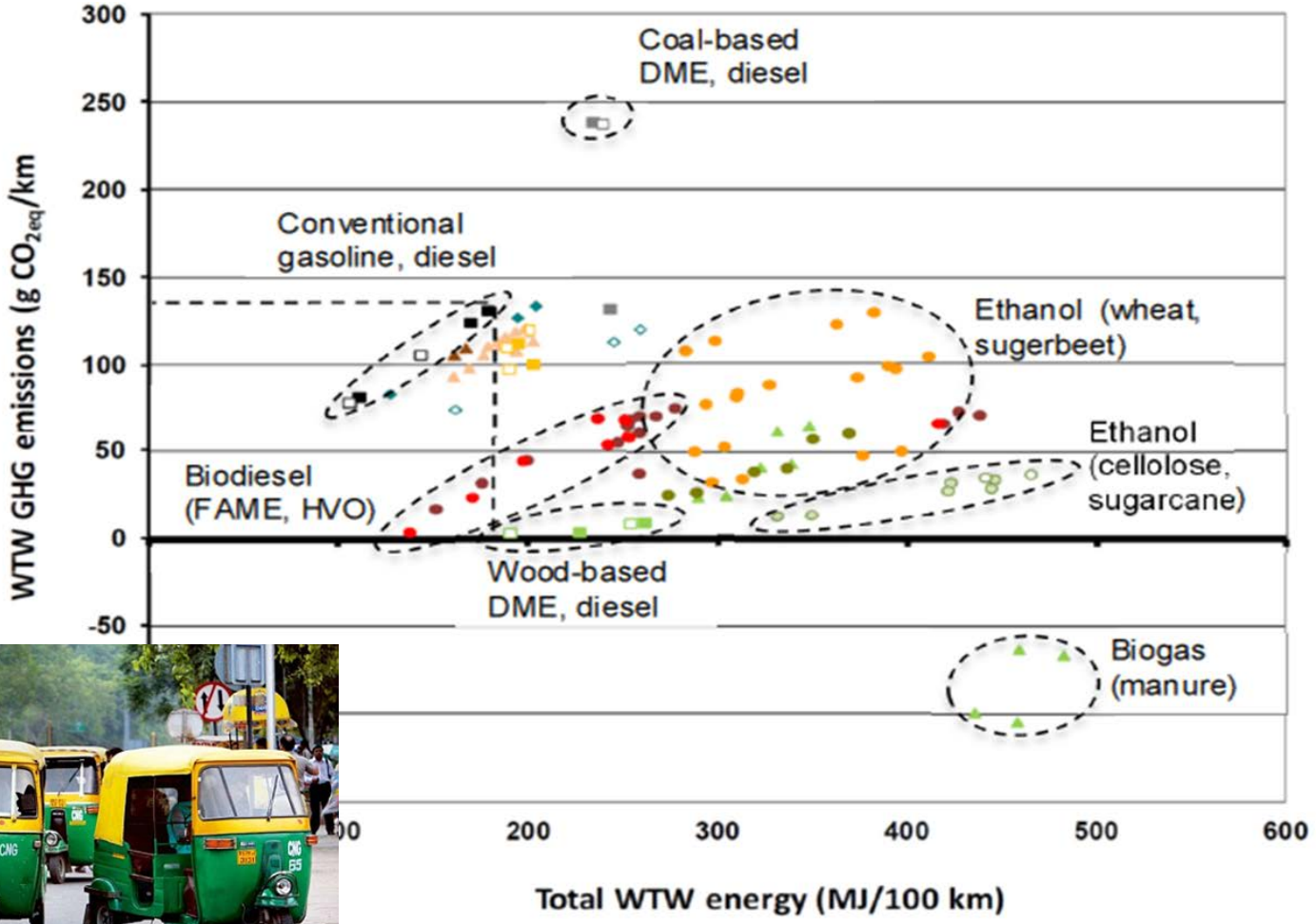



***Example: national sulphur limits for Diesel***

*(TransportPolicy.net, 2015)*

# 3. Introduction alternative fuels

## *Well-to-wheel energy and greenhouse gas emissions*




# 4. Promotion electric vehicles (EV's)

- EV's benefit both GHG and local pollution
- Becomes rapidly more affordable among others due to battery developments
- Start with demonstration projects in particularly for public transport in trucks and for distribution of goods in dense urban areas

# 5. Introduction stringent emission regulations and GreenNCAP

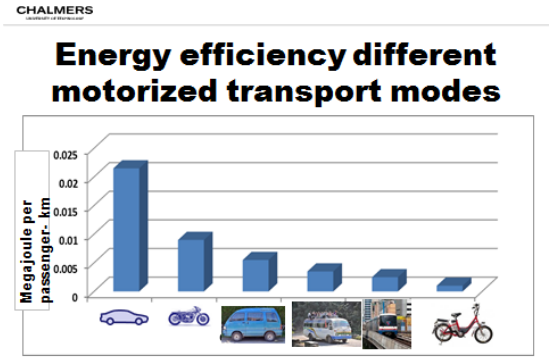
- Implement the most stringent emission regulations for fuel economy and reduction of pollution.
- Apply realistic tests like the 2015 UNECE Worldwide harmonized Light vehicles Test Procedures (WLTP) + real driving tests for certification by an independent authority.
- Consider also a consumer testing program like GreenNCAP to be introduced 2016/2017


# Note : Non-emission particulates (PM)

- PM is also caused by wear of brakes, tires and asphalt
- If most stringent emissions standards (Euro 6 or equivalent) are met, wear of brakes, tires and asphalt is causing bigger problems than PM from emissions

# 6. Reduce pollution by motorcycles and shift to e-bikes (and NMT)

- Promote measures that reduce the pollution by 2-wheelers with a combustion engine.
- Phasing-out  2-stroke engines and/or access restriction in dense urban area's
- On the mid- and longer term a strategy where all motorized 2-wheelers are replaced by electric 2-wheelers – in particular e-bikes- will be much more effective.



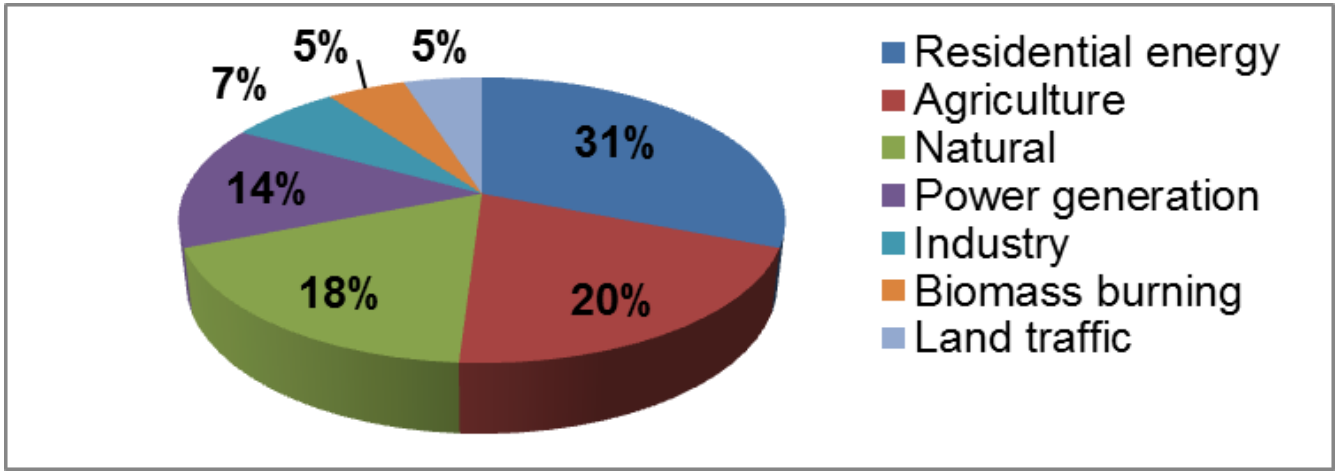

# 7. Measures promoting energy-efficient and low-emitting vehicles

***Examples:***

- Green zones for NMT and vehicles with low emissions and low pollution. E.g. Diesels could be banned in these area's
- Taxes based on fuel economy and the amount of pollution emitted in particular also for heavy-duty trucks, weight of the vehicle and the type of propulsion etc..
- Facilities for low-emitting vehicles
- Low resistance tires
- Etc..


# 8. Importance or reliable air quality and health data

- Required to take proper evidence based decisions on mitigation actions and to measure the progress of actions
- Methodologies to measure air quality and health impact assessment from transport pollution need to be improved




*Source: Lelieveld et al, 2015*

# 9. Integrated approach vs isolated measures

- An integrated system approach will be often much more effective than taking isolated measures
- This requires a lead agency for sustainable transport responsible for cooperation between various actors on city and national level etc..
- But on the other hand a number of the measures can and should be introduced already shortly in spite of that the effect may be not always be optimal.

# 10. Resilient cities: health and disaster resiliency

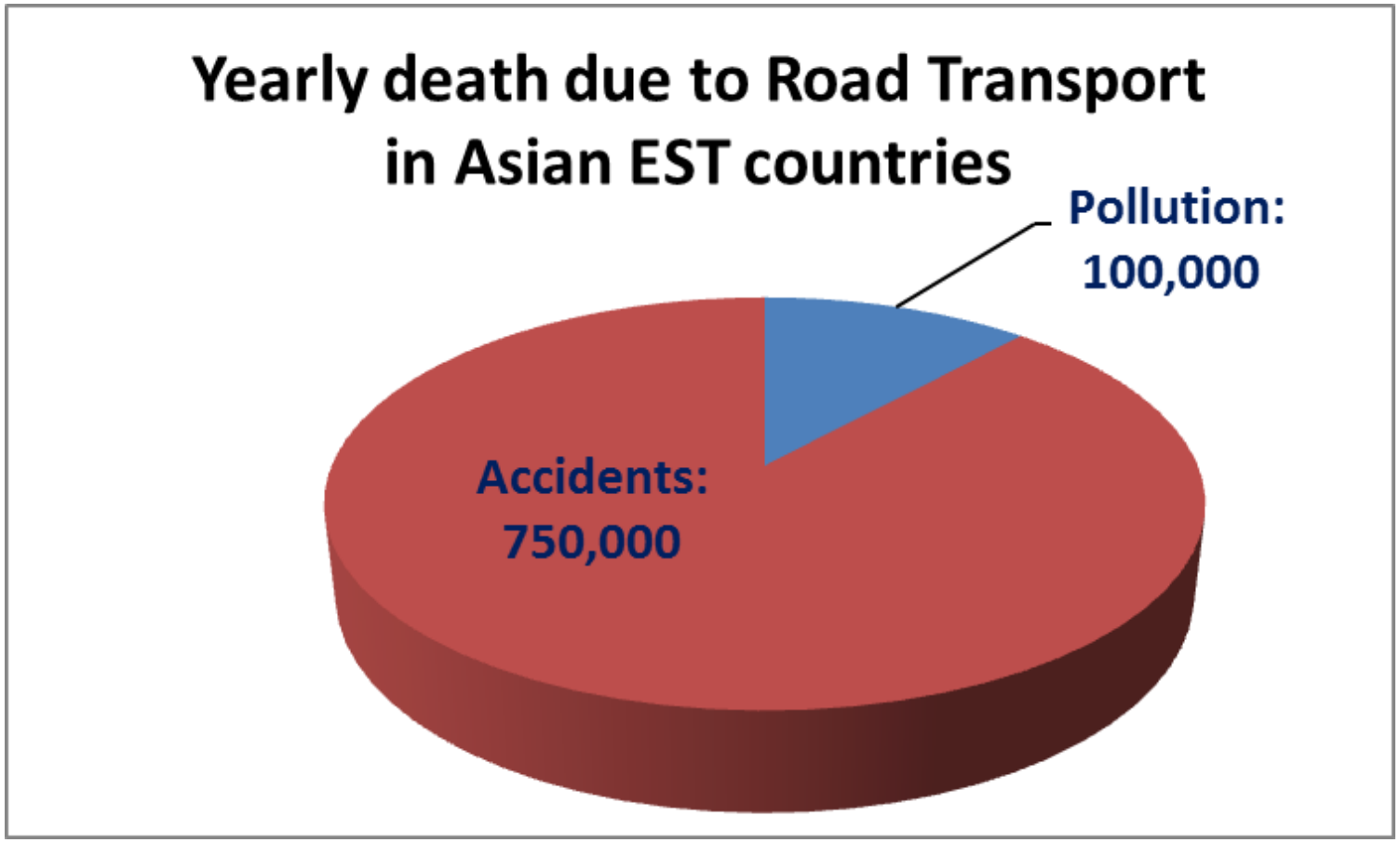




The Bangkok declaration goals and the recommendations given in this paper all need full attention due to:

1. the positive contribution to achieving healthy cities - health resiliency - and the SDG's related to this
2. the contribution to the SDG concerning climate change, in other words meeting the 2 degrees Celsius global warming target and in this way reducing the risk on extreme climate events - disaster resiliency

# Measures reducing emissions should not lead to less safety on the road



# Thank you for your attention

**Acknowledgements**

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