URBAN TRANSPORT AND CLIMATE CHANGE

Not just that...
CONGESTION

2-5% cost of GDP through traffic congestion

ROAD SAFETY

Traffic fatalities lead to 1.2 million deaths every year and many more injuries

PUBLIC HEALTH

Transport accounts for one-quarter of global CO₂ emissions

Physical inactivity causes 1 in 10 deaths worldwide, on par with smoking

CLIMATE CHANGE
CONGESTION

2-5% cost of GDP through traffic congestion

ROAD SAFETY

Traffic fatalities lead to 1.2 million deaths every year and even more injuries.

CLIMATE CHANGE

Transport accounts for one-quarter of global CO₂ emissions

PUBLIC HEALTH

Physical inactivity causes 1 in 10 deaths worldwide, or with obesity.

~10% of GDP LOST

Physical inactivity causes 1 in 10 deaths worldwide, or with obesity.
The Calculator is funded by the UK Government’s International Climate Fund and the EU’s Climate-KIC, and has been built by an international team from the following organisations:
Can we improve the quality of life globally and reduce GHG emissions?
YES!

“The world has enough for everyone's need, but not enough for everyone's greed.”

— Mahatma Gandhi
Compact, Connected, Coordinated Cities

Atlanta and Barcelona have similar populations but very different carbon productivity

<table>
<thead>
<tr>
<th>Population</th>
<th>Urban area</th>
<th>Transport carbon emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 million</td>
<td>4,280 km²</td>
<td>7.5 tonnes CO₂/person (public + private transport)</td>
</tr>
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<thead>
<tr>
<th>Population</th>
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<th>Transport carbon emissions</th>
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<tbody>
<tr>
<td>2.8 million</td>
<td>162 km²</td>
<td>0.7 tonnes CO₂/person (public + private transport)</td>
</tr>
</tbody>
</table>

Better Growth Better Climate
New Climate Economy Report
http://newclimateeconomy.report/cities/
THREE PRONGED APPROACH

AVOID
- Urban development and transport integration

SHIFT
- Non-motorized Transport
- Public Transport

IMPROVE
- Technology Improvements

Improved Access, Specially for the Poor
Reduced Fatalities, Injuries, Illness
Achieving the CO2 reduction targets
## Compact, Connected, Coordinated Cities

### Different Cities, Different Choices

<table>
<thead>
<tr>
<th>Compact urban growth</th>
<th>Global Megacities</th>
<th>Mature Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design in compact city features from the start, including integration of industrial and residential areas, and efficient public transport routes.</td>
<td>Re-densification through regeneration of existing city cores and multiple hubs, brownfield re-development, urban retrofitting, and well-managed growth of urban periphery.</td>
<td>Re-densification through regeneration of existing city cores and supporting hubs, brownfield re-development, and urban retrofitting.</td>
</tr>
<tr>
<td>e.g Chenggong (China)</td>
<td>e.g Beijing (China)</td>
<td>e.g. Hamburg (Germany)</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Connected infrastructure</th>
<th>Global Megacities</th>
<th>Mature Cities</th>
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<tbody>
<tr>
<td>Introduce surface-based public transport based on bus and BRT systems and rapid rail where appropriate.</td>
<td>Expand existing public transport systems and increase share of public and non-motorised travel.</td>
<td>Major opportunities for introducing cycling and non-motorised travel (in mature sprawling cities, re-densification is also required to make public transport more cost-effective).</td>
</tr>
<tr>
<td>e.g. Bogota (Colombia)</td>
<td>e.g Mumbai (India)</td>
<td>e.g. Amsterdam (Netherlands)</td>
</tr>
</tbody>
</table>

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<th>Coordinated governance</th>
<th>Global Megacities</th>
<th>Mature Cities</th>
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<tbody>
<tr>
<td>Build capacity for integrated land use and transport planning.</td>
<td>Integrated land use and transport planning, including accessing international finance for smarter infrastructure, road pricing and land value capture mechanisms.</td>
<td>Integrated land use and transport planning, including use of regulations.</td>
</tr>
<tr>
<td>e.g Curitiba (Brazil)</td>
<td>e.g London (United Kingdom)</td>
<td>e.g Barcelona (Spain)</td>
</tr>
</tbody>
</table>

http://newclimateeconomy.report/cities/
The Global Calculator v23

Primary energy supply vs. Final energy demand

Global GHG emissions per year

Cumulative CO2 emissions to 2100

Global mean temperature change in 2100 (°C)

Warning: Keep emissions below the line to maintain a 50% chance of meeting the UNFCCC 2°C target.

Selected pathway: IEA 2DS (approx.)

TRAVEL
- Passenger distance
- Freight distance
- Mode
- Occupancy & load
- Car own or hire

LIFESTYLE
- Energy intensity
- Transport efficiency
- Electric & hydrogen

TECHNOLOGY AND FUELS
- BUILDINGS
- MANUFACTURING
- CARBON CAPTURE AND STORAGE (CCS)

By using the Global Calculator, you are agreeing to be bound to its conditions of use. Based on spreadsheet v.3.99.0 v.3.99.0.
Some findings from http://globalcalculator.org/

- We could even travel further (on average), but 20-30% less than business as usual projection (consistent with ETP-IEA)
- Industrialized countries need reductions in VKT
- Emerging countries need to curb current VKT pathway

![Figure 1: In our four plausible 2°C pathways, global average domestic travel increases between 2011 and 2050 from 7,500 to 11,000 km per person per year](http://globalcalculator.org/figure1.png)
Avoid, Shift, Improve combined measures

Cooper, Lefevre, Pestiaux, GHG Emissions from the Transport Sector Using Multi-Sectoral Tool, TRB Annual Meeting, 2015
Myths busted:

Switching coal to gas does not work: we need to decarbonise global electricity generation to near zero gCO2e/kWh by 2050 – Electrify 10% Car fleet by 2050

We cannot rely on running out of fossil fuel. The world has enough fossil fuel resources to put the world at risk of a global mean temperature of over 6°C by 2100

We also cannot rely on futuristic technologies to suck carbon out of the atmosphere. At best 10% savings

Curbing population to the UN’s lower projected estimate (8 billion) would only save around 10%

Some findings from http://globalcalculator.org/
Figure 3 | A Global 10% Transportation Biofuel Target in 2020 Would Consume 20% of 2010’s Food Crop Calories. By 2050, This Target Would Consume 29%.

2010 FOOD CROP PRODUCTION = 71 EXAJOULES

NEEDED TO MEET 10% TARGET IN 2020

NEEDED TO MEET 10% TARGET IN 2050
WE HAVE SOME HOPE: SUSTAINABLE MOBILITY IS ON THE RISE

CYCLING ON THE RISE - USA

http://www.bikeleague.org/content/acs-bike-commuting-continues-rise
REALLY SHY COMPARED WITH WESTERN EUROPE

http://www.fietsberaad.nl/library/repository/bestanden/Fietsberaad_publicatie7_Engels.pdf
Congestion pricing – emerging

- Singapore: 1975
- London: 2003
Low emission zones - tipping in European Union

- Received wide implementation due to EU’s health-based air quality standard;
- Additional 100 EU cities will implement LEZs
Vehicle quota system – on the rise in China

- Caps the number of new vehicle registrations
- Formats
  - Beijing, Guiyang – Lottery
  - Singapore, Shanghai – Auction
  - Guangzhou and Tianjin – Auction and Lottery
TransMilenio, Bogotá, 104 km 2 million pax/day
Metro rail tipping in China

189 Cities
10,500 km
112 MM pax/day

181 Cities
4,500 km
31 MM pax/day
Global growth of bike-sharing 2000-2013

Graphic by EMBARQ and Peter Midgely. Data via Peter Midgely.
Global Growth of Car Sharing 2000-2012

Zipcar launched

Zipcar Initial Public offer; Car2go launched

Number of Members

EMBARQ
The future is not what it used to be; we see some indications of change, but not enough is happening!
Count it, measure, scale it
MÉXICO

- 20 km BRT (2005) -> 105 km BRT (2014)
- 1 city -> 9 cities (265 km)
1 bus system (2009) -> 18 cities (2014)
Pedestrianization Historic Penninsula
Most used BRT Line in the World
Metrobüs Intercontinental Connection
Urban Mobility Plans

PlanMob
CONSTRUINDO A CIDADE SUSTENTÁVEL

PlanMob
2014

5570 cities reached

168 mi people impacted
Low-carbon and sustainable transport in Qingdao
Scaling Strategy

3-Tiered Approach Towards Change

- **Global**
  - Agenda Sustainable Development Goals & Climate Change Agreement

- **National**
  - Policy and Funding Programs for Sustainable Mobility and Urban Development

- **Local/National**
  - Avoid, Shift, Improve
Sustainable Development Goals (Draft) still missing quality in public transport and infrastructure for walking and biking

11.2 by 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding quality public transport and infrastructure for walking and biking, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.
Teşekkür ederim

dhidalgo@embarq.org