Case studies in low-carbon transport
Which modes generate the highest emissions?

Mode share for a typical emerging city (5-10m pop)

- Cars: 23%
- Tuk tuk: 19%
- Train: 16%
- Bus: 9%
- Cycle: 5%
- 2W: 3%
- Walk: 25%

CO₂ emission share

- Cars: 43%
- Bus: 27%
- 2W: 9%
- Train: 8%
- Auto: 5%
- Tuk tuk: 3%

ITDP calculations
Status quo:
- High-carbon infrastructure
- Rising congestion & time wasted in traffic
- Increasing road safety challenges
Induced and Latent Demand

Congestion

Source: Jeffrey Tumlin, Nelson\Wygaard
# Greenhouse gas reduction strategies

<table>
<thead>
<tr>
<th>Activity</th>
<th>Emissions reduction potential</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-motorised transport improvements</td>
<td>High</td>
<td>$</td>
</tr>
<tr>
<td>Bus fleet expansion</td>
<td>High</td>
<td>$</td>
</tr>
<tr>
<td>Trip reduction from land use policy change</td>
<td>High</td>
<td>$</td>
</tr>
<tr>
<td>Rapid transit</td>
<td>Low-High*</td>
<td>$ - $$$*</td>
</tr>
<tr>
<td>Vehicle technology</td>
<td>Moderate</td>
<td>$$</td>
</tr>
<tr>
<td>Road expansion, elevated corridors</td>
<td>Only temporary</td>
<td>$$$$</td>
</tr>
</tbody>
</table>

* Depending on mode, fuel/electricity source
CO₂ emissions per passenger km

Emergent Ventures India (2013)
Construction emissions (CO₂ t/km)

- MRTS: 15,600
- Four Lane Road: 2,100
- Ring Road: 2,100
- Road Widening: 1,100
- Single Lane: 660
- BRTS: 1,900
- Walkable Footpath: 20
- Cycle Track: 20

Emergent Ventures India (2013)
Nairobi: Status quo

At the current growth rate, trips by cars and 2Ws will more than double by 2030.
Nairobi: A low-carbon scenario

The diagram shows the number of trips per day from 2013 to 2031. In 2013, the number of trips was approximately 2000000. In 2031, the status quo scenario predicts a significant increase to about 4000000 trips per day, while the sustainable scenario indicates a significant reduction to about 2000000 trips per day.
A sustainable Nairobi: How do we get there?

100 km of rapid transit

250 km of complete streets

Plus: New city buses, parking management, etc.
Cycle track on Outer Ring Road
Ngong Rd cycle lane
Addis Ababa NMT Strategy

10-year goals

Walking and cycling
- 600 km of footpaths
- 300 km of cycle tracks
- All MRT stations have safe access

Bicycle sharing:
- 10,000 cycles provide last-mile connectivity throughout the city center

Travel demand management:
- 30,000 managed parking spaces generate revenue for sustainable transport

Communications
- Changed culture that accepts walking & cycling as integral modes of transport

Governance:
- New street design standards
- All engineers & planners skilled at designing, implementing, and managing complete streets

Current mode shares

- Walking: 5%
- Public transport: 30%
- Car: 55%
Walking & cycling networks
Addis Ababa bicycle sharing system

- 500 cycles
- 69 stations
- 7.8 sq km phase 1 coverage area
  - Churchill
  - Mexico
  - Meskel Square
  - Bole
  - Urael/Atlas

- Funding support from TUMI Challenge
Rapid transit across the continent

In order to stabilise growth in personal vehicle use, Africa’s major cities need **3,700 km of mass rapid transit** over the next 15 years.
BRT around the continent

- Operational BRT systems
- BRT under planning or implementation
Dar es Salaam

- Population: 5 million, growing at 5% per year, one of the fastest rates in Africa
- 70% of residents in unplanned settlements
- 85% of residents walk, cycle, or use public transport
Before: Public transport service provided by 5,000 daladalas
After: Cleaner, newer buses; efficient and reliable service carrying 200,000 passengers a day; trip time from 2 hours to 45 minutes
Before: A typical bus stop
Today: A typical DART station, designed for comfort & efficiency
Before: Waterfront access & bus stop
Today: Waterfront recovered, good pedestrian access to stations
Phases 2 and 3 under implementation

- Phase 1: 20.9 km
- Phase 2: 19.3 km
- Phase 3: 23.6 km
- Phase 4: 16.1 km
- Phase 5: 22.8 km
- Phase 6: 27.6 km

- 130.3 km of DART corridors
- 18 terminals
- 228 stations
Thank you

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