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Resource-efficient Cities and Transport in Urban Areas

Challenges

- The global level of urbanisation is expected to rise from 54% in 2014 to 66% by 2050. Cities are responsible for around 80% of global GDP, and for the consumption of around 70- 75% of global energy and materials.
- Nearly 90% of the projected global urban population increase is set to occur in Africa and Asia, which are currently the two most rural continents in the world, with current urbanisation levels of 40% and 48% respectively. Such rapidly expanding urban areas need to be designed and planned in a way that maximises urban resource efficiency potential.
- There is also a need to ‘retrofit’ existing urban areas to improve their resource efficiency.
- Transport is a major global resource-consuming sector, with high environmental impacts. Globally, energy consumed directly by the transportation sector, which includes road, rail, air, water, and pipeline transportation, accounts for 19% of total primary energy supply, and 64% of total oil consumption. Global demand for transport services is expected to continue to rise, as the currently relatively low per capita transport demand of developing and emerging economies catches up with that of industrialised economies.



Responses

- There are three main strategies for mitigating rising transport demand and associated environmental impacts: reducing transport demand; shifting demand onto more resource- efficient modes; and upgrading transportation technologies to be more efficient or less polluting.
- In the latter case, major improvements towards resource-efficient and low-carbon transport technologies are required. Life-cycle analyses of the emissions and environmental impacts of technologies and fuel-chains are crucial to support transport technology policies.
- Municipal governments should work with a variety of urban actors, including residents, developers, finance providers and research institutes, in order to identify creative and innovative resource-efficient solutions that match the needs of the particular location.
- Holistic approaches to planning are required, which coordinate transport infrastructure and the built environment in a way that increases access to amenities and services (thereby avoiding transport demands) and access to public transport systems (thereby shifting demand from private transport onto shared transit).
- Five “Ds” are important in shaping energy use and transportation. These are:
 - Density: Population density (people/km²) and activity density (people + jobs/km²)
 - Diversity of uses, e.g. mixed residential – commercial
 - Distance to public transit (the closer the better)
 - Design to support multiple modes of travel (pedestrian, bicycle, automobile, public transit)
 - Access to Destinations, with focus on job locations
- In rapidly expanding urban areas, especially in the Global South, the role of city planners in coordinating expansion to deliver high density, mixed-use settlements, well connected by multi-mode transport systems, will be crucial. In rapidly growing cities and peri-urban areas in the developing countries, the principles of “transit-oriented development” represent a major opportunity, if they can be implemented prior to the building of new infrastructure that could create a lock-in to resource-inefficient transport practices.

Examples

Green Mortgages Mexico

What?

- More than 900,000 “green mortgages” (for houses built with energy-saving materials and using eco-efficient technologies for improved service quality of water, electricity and gas) benefiting more than 3 million people have been granted between 2007 and 2012.

Success factors

- Credits targeted mostly on low-income households have low interest rates, which are cross-subsidized by higher-income households.

Results

- Households save about US\$17 on their monthly bills, while spending US\$6 more compared to conventional mortgages.
- Water use decreased on average by 60%, gas by 50% and electricity by 40%, which brought about reductions of 0.75 tonnes of carbon emissions per household per year.

Innovative collaborations with a variety of actors

What?

- In Curitiba, Brazil, residents were incentivised to sort their organic and non-organic recyclable wastes and deliver them to waste stations, in exchange for bus tickets, food and school books.
- In Vietnam’s cities, syndicates of individual workers have self-organised to collect household waste, liaising with local authorities to identify areas that require additional services, and gaining permission to collect in those areas. In Ho Chi Minh city there are around 3,000 such independent collectors, who are often better able than large collection trucks to navigate the narrow streets.

Success factors

- Involvement of variety of actors.

Results

- Reduced waste.
- Created more jobs compared to a truck- and machine-based collection and sorting system.

Resource-Efficient City Development Planning

What?

- City Development Planning in Ahmedabad in India.

Success factors

- Variety of strategies including mixed use development (diversity), design (multi-modal transport), access to destinations, short distance to public transit, and compact higher density development.
- Decision of the municipality to undertake its transportation planning alongside its broader Development Plan, and to give the resulting Integrated Mobility Plan a time horizon of 20 years.
- Complementary use of all forms of transportation, with local public transit systems connecting to mass transit systems at hub points, and inclusion of dedicated walking and cycling lanes.

What?

- Vauban, eco-city development in Germany near the city of Freiburg.

Success factors

- All housing designed to a high efficiency standard, with 100 buildings reaching Passivhaus standard, and many with solar cells installed, including 59 that are net exporters of electricity.
- The area is designed to enable sustainable transport, with a tram line connecting to the centre of Freiburg, and all homes within easy walking distance of a tram stop.
- The district layout has been designed to actively encourage walking and cycling and discourage car use. This is achieved by making most local streets crescents and cul-de-sacs, which create dead-ends for cars. However these car dead-ends connect to a network of pedestrian and cycle paths which do permeate the neighbourhood with continuity.

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