Planning and Design for Sustainable Urban Mobility
Urbanization

Rapid pace, largely uncontrolled growth, taking place mainly in developing countries

Global Urbanization Trends

World’s urban population:
• Quintupled between 1950 and 2013;
• 60% will live in urban areas by 2030.

New urban dwellers:
• Every year sees the addition of 73 million;
• 67 million of these (more than 90%) in developing countries.
The Urban Mobility Challenge

- **Mobility flows** are the key dynamics of urbanization, with the associated infrastructure constituting the backbone of urban form.
- Urban planners have largely focused on facilitating urban mobility by investing in new and expanded infrastructure for private cars.
- The costs of car-dependent development include:
  - urban sprawl;
  - air and noise pollution;
  - climate change;
  - road traffic accidents;
  - community severance.

Need for Paradigm Shift

- Access is the ultimate objective of all transportation.
- Focus on the human right to equitable access to destinations and opportunities.
- Strengthen enabling and developmental role of transportation within cities.
- Review the relationship between urban form and mobility.
- Support sustainable modes of transportation, i.e. public and non-motorized transport.
- Efficient and high-capacity public-transport systems are the backbone of sustainable urban mobility.
Urban Travel Modal Shares

- The automotive industry employs 5% of total global workforce.
- There are currently 825 million passenger cars globally (70% in developed and transitional countries).
- This figure is projected to increase to 2.1 billion by 2050.
- Some 63 mill. new cars sold each year (40% in Asia).
- In many developing countries, the bulk of new car registrations are for used cars, imported from developed countries.
- Strong relationship between car ownership rates and national income in low-income countries.
- Car ownership rates in some developed countries have stagnated.
Private Motorized Transport

- Factors supporting motorization:
  - Urban sprawl;
  - Rising trade flows and incomes;
  - Expanding globalization;
  - The influence of the automotive industry;
  - Large investments in road infrastructure.
  - For many urban dwellers all around the world, the private car is the preferred means of mobility; it is a **status symbol** depicting affluence and success in life.

Non-Motorized Transport

- Globally, 37% of all urban trips are made by foot or bicycle.
- For short trips, walking is the main mode of transport (in developing and developed cities).
- Important component in poorer and smaller cities, capturing 90% of all trips.
- Developing countries: poor infrastructure for NMT.
- NMT is marginalized in urban planning and investments, which favour large (motorized) transport projects.
Public Transport

- **Modal share of formal public transport is declining** globally.
- Notable shift from publicly owned provision to a privately owned, *market-driven approach* since 1980s.
- **Informal transport** accounts for 50% of all motorized trips in developing countries.
  - Often a major source of congestion, road traffic accidents and pollution;
  - **Major source of employment**: 15% in developing countries.

---

Public Transport

- This is the **most effective** mode of urban passenger transport.
- Investments required for urban public transport services can be **prohibitive**.
- Spending on roads remains higher than on dedicated public transport infrastructure.
- **Urban planning and land use policies** – together with transport demand and fiscal measures – can encourage a shift in transport behaviour towards public transport.

---
Metro and BRT

Metro systems around the world
(cities with operational metro systems)

BRT systems around the world
(number of cities and system lengths)

Urban Goods Transport

- Goods transport accounts for:
  - 10-15% of vehicle kilometres travelled in urban areas;
  - 2-5% of the urban employment; and
  - 3-5% of urban land use.
Mobility and Urban Form

Density = key element of urban form

Enhance connectivity

The ‘5 Ds’ of built environment that influence travel:

- **Density**: People and built structures in specific land area.
- **Diversity**: Mixed spatial balance of land uses.
- **Design**: Street layout and network characteristics.
- **Destination Accessibility**: Ease of access to trip destination.
- **Distance to public transport**: Shortest street route from residence/work to nearest station/stop.
Social, Environmental, Economic and Institutional Challenges and Policy Responses

Equitable Access

- 4 parameters of urban transport:
  - Affordability
  - Availability
  - Accessibility
  - Acceptability

- Poor residents are often living on the periphery of cities → isolated, vulnerable and dependent on public transport (which is often unaffordable).
- Disabled/elderly: Often unable to access urban destinations (such as health care services) due to limited mobility.
- Children: Limited access to mobility is a major cause of school drop-outs (distances).
- Women: Sexual harassment at public transport.
- Security and safety: Vulnerable groups are more affected by insecurity and road traffic accidents.
Accessibility

Means of ensuring equitable access:
- Encourage non-motorized transport;
- Fare reduction/targeted subsidies;
- Improve service (travel-time savings);
- Better access for disabled and elderly;
- Improved security levels;
- Improve land-use accessibility;
- Linking urban mobility systems and housing policy.

Environmental Challenges

- Emissions: Air and noise pollution, including CO₂ emissions, which cause climate change.
  → These emissions can be reduced by:
    - reduced travel (fewer or shorter trips),
    - by technological advances (improved fuels or emission controls), or
    - load factors (a full vehicle is more efficient than a one-person vehicle).
- Although the bulk of CO₂ emissions occur in developed countries the impacts are felt globally. Developing countries are bearing the brunt of the costs. During the next decades significant investments are required to protect transport infrastructure from impacts of climate change.
- Other human health effects of motorization are obesity (due to reduced physical activity), stress (due to traffic jams), and deaths and injuries (due to road traffic accidents).
Urban Mobility Economics

- Transport is a major factor of production, and thus an important contributor to the generation of national incomes.
- It is also a major source of employment. For example, at least 13 million people are employed world-wide by the formal public transport sector.
- However, urban transport, because it facilitates access, is fundamentally a public good.
- Consider the full costs of various modes of transport, including all externalities: traffic accidents, pollution/CO₂ emissions, economic costs of congestion.
- Disproportionate amount of infrastructure and funding supports private motorized transport.

Financing Urban Mobility

The report reviews a number of different sources of finance for Public and Non-Motorized Transport:

- General revenue model (general taxes).
- Other allocations of public funds (i.e. from parking fees, advertising, sales taxes, employer contributions, international grants, etc.).
- Value-capture models.
- Public-private partnerships.
Institutions and Governance

**Challenges for transport institutions in developing countries:**

- Lack of dialogue with relevant stakeholders;
- Fragmented policy formulation and implementation;
- Under-resourced institutions;
- Insufficient financial procedures;
- Bureaucratic procedural constraints;
- Inadequate legal and enforcement frameworks;
- Absence of comprehensive information systems.

Future Directions
Future Directions

- The ultimate objective of all travel is access.
  - Planning should focus on better accessibility instead of simply increased road investments for private cars.
- City planning should focus on bringing people, activities and places together.
  - Thus, stronger linkages are required between land-use planning and transport planning.
- Policies should encourage sustainable urban densities, characterized by mixed land-use and enhanced access.
  - This will encourage non-motorized movement (due to shorter distances), and public transport (due to higher job and population densities).

Future Directions

Urban mobility policies should focus on:
- Ensuring equitable access for all (including for the poor, women, the young, old and disabled).
- Reducing air and noise pollution, and other negative externalities.
- Enhanced understanding of, and increased attention to, the requirements and challenges of goods transport.
  (these are often in conflict with those of passenger transport).
Future Directions

- The **most efficient modes** of mobility are **non-motorized and public transport**. Urban mobility policies should thus include:
  - Incentives for non-motorized and public transport (including targeted subsidies).
  - Disincentives for private motorized transport (including paying the full cost, i.e. accidents, pollution, climate change, land use).

- **High-capacity public-transport systems** (metro, light rail and BRT) are necessary conditions for **sustainable urban mobility**
  - The type of system chosen depends on local conditions and requirements.

‘The System is the Solution’

- The efficiency of a high-capacity public-transport system is more than the sum of its individual parts. For such a system to be competitive with the private car, it should ensure:
  - **Route integration**: Between different service providers; in terms of departure locations, departure times, and fare structures.
  - **Integration with private motorized transport**: e.g. in the form of ‘park and ride schemes’.
  - **Integration with non-motorized transport**: e.g. through easy (and secure) pedestrian and cycling access to stations, safe bicycle parking, etc.

Requirements of Sustainable Urban Mobility Systems

- Planning and coordination at multiple scales (neighbourhood to regional).
- Holistic and systemic thinking and action.
- Enhancing the linkages between land use and transport.
- Good governance, including:
  - Avoiding complications related to urban administrative boundaries;
  - Streamlining urban institutions and governance frameworks; and
  - Readjusting legal and regulatory frameworks.
- Predictable and sustainable financial arrangements.

Thank you for your attention!