

Beyond Public Transport

Urban Freight
The New Urban Economy

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Energy Sector Management Assistance Program

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PUBLIC-PRIVATE INFRASTRUCTURE ADVISORY FACILITY

Cluster 5/Module 4 (C5/M4): Urban Freight. Adapted from the report on Urban Freight prepared by Laetitia Dablanc for the World Bank Transport Freight Toolkit.

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Objectives

- **Understanding that urban freight is a significant part of transport demand in cities and can generate severe environmental impacts**
- **Recognizing that logistics services in many cities are still poor**
- **Becoming familiar with simple, effective policies to address urban freight issues**



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The objectives of this module is to provide an overview of the importance of urban freight in the larger concept of urban transport.

Urban freight is ***the transport of goods by or for commercial entities taking place in an urban area and serving this area, including households.*** It is important to recognize that urban freight is a significant part of transport demand and affects the economic efficiency of cities. Urban freight also has severe environmental impacts.

It also is important to recognize that logistics services in many cities are still poor. Urban freight typically has received little planning and regulatory attention.

However, there are simple and effective policies that local decision-makers can implement to address these issues. This module will present several suggestions regarding effective policies.

Opening Exercise

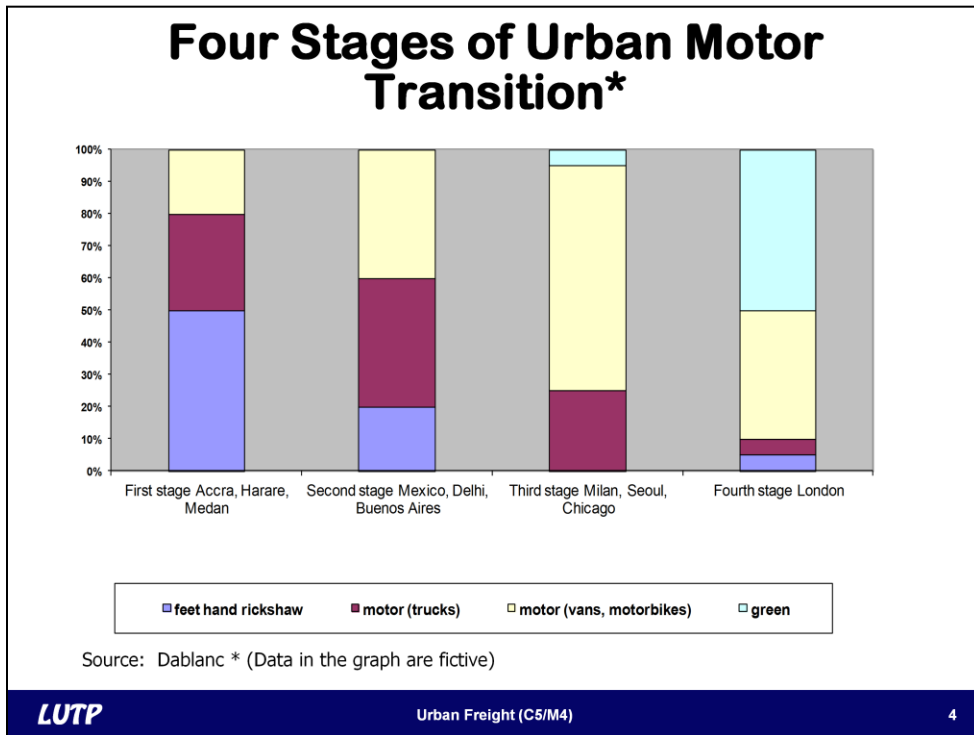
The Role of Urban Freight in Your City



- Before you start this module, please answer the following questions about your city:
 - Look at slide 8 and 9, and try to list the different supply chains in your city?
 - Try to estimate what percentage of total freight each chain represents in your city.

Our opening exercise is designed to get you to start thinking about the role of urban freight in your city. Urban freight often is a neglected component of the urban transport system in terms of planning and regulation.

Take about 5 minutes to do this exercise.



As an economy develops, urban freight evolves through a four stage transition:

- **Stage 1:** a significant share of the urban movement of goods comes from non-motorized, traditional means of circulation.
- **Stage 2:** diesel trucks and vans are dominant, with non-motorized traffic still playing an important role.
- **Stage 3:** vans and motorbikes take over the streets.
- **Stage 4:** green modes of transport stand out (electric, natural gas, or clean diesel vehicles and non-motorized means of transport. Green transport has been partially implemented in London since a 2008 ban on lorries not meeting the Euro III standard. In Mexico City, already numerous trucks run on natural gas and some electric vehicles are used in the historic city centre.

Urban Distribution Channels (1)

- Independent retailing, including informal sector, and local convenience stores
- Chain retailing and commercial centres
- Food market



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- **Small shops.** It represents 30 to 40% of all daily deliveries in a city. Local stores are supplied between three and 10 times per week. Suppliers are diverse, with a predominant use of small distributors using vans, bikes and three wheelers in poorer countries.
- **Large retailers.** In European cities, large retailing brands with subsidiary or franchises are increasing their share of the urban space at the expense of independent local stores. Goods are supplied to these stores, with less frequent deliveries, a larger share of consolidated shipments, and larger and better loaded vehicles.
- **Food markets,** particularly important in developing countries, have extremely diverse modes of supply, including bicycles, hand pushed carts, or animal driven carts. A survey carried out on 300 market vendors in Phnom Penh, Cambodia showed that 87% of markets' deliveries were made by the vendors themselves, and 13% by transport providers. Deliveries are quite frequent: 24% of the vendors deliver everyday.



Urban Distribution Channels (2)

- **Building sites**
- **Parcel transport (less than truck load) and express transport services**
- **Home deliveries**



- **Building sites** represent a key urban freight segment because of the important tonnage they generate. Building materials can make up to 30% of tons carried in cities, and vehicles to carry them are generally heavy lorries, generating much damage to the roads. Building sites' supply is notoriously inefficient. Multiple suppliers and poorly planned delivery schedules generate a high number of deliveries, queuing, and are generally disorganized.
- **Parcel transport (less than truck load) and express transport services** are one of the fastest growing transport businesses in cities. This industry uses large vans or small or medium size trucks, and is based on consolidated delivery tours departing from cross dock terminals located in close suburban areas. Vehicles from the leading express transport companies (UPS, DHL, TNT, FedEx) now circulate through the streets of most cities in the world.
- **Home deliveries.** In Europe, the home shopping market represents €80 billion (5% of all retailing). These markets are dominated by large postal operators but new players emerge. Japanese *takkyubins* are parcel transport companies specialising in home deliveries; these represent an extremely original service and a specific feature of Japanese urban logistics.

A City Generates

- 0.1 delivery or pick-up per person per day
- 1 delivery or pick-up per job per week
- 300 to 400 truck trips per 1000 people per day
- 30 to 50 tons of goods per person per year



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A city not only **receives goods**, but also **ships goods**: 20 to 25% of all truck-km in urban areas are for outgoing freight, while 40 to 50% is incoming freight. The rest originates from and is delivered within the city.

Urban freight represents 10 to 15% of vehicle equivalent miles travelled in city streets and two to five percent of the employed urban workforce. Three to five percent of urban land is devoted to freight transport and logistics. A city generates :

Transport companies providing urban freight services are generally **very small**. In Europe, 85% of short distance truck companies have less than five employees.

in Mexico City, 80% of private carriers with a fleet of 100 vehicles or less have less than five vehicles. 70% of these companies' vehicles are **light commercial vehicles** (less than 3.5 tons).

Environmental and Safety Impacts

- **Urban freight generates up to 25% of CO₂ emissions due to:**
 - Old urban freight vehicles
 - High number of short trips and stops
- **Safety issues: 14% of all urban collisions involving freight vehicles result in fatal injuries (London 2007)**
- **Conflict of trucks traffic with bicycles**

Urban freight is more polluting than long distance freight transport, because of the **old** average age of the vehicles and the high number of **short trips and stops**. Freight transport generates between 20% and 60% (according to the pollutants considered) of local transport-based pollution. In the metropolitan area of Mexico, 71% of the 3,500 tons of PM_{2.5} generated in 2002 by mobile sources were from freight vehicles*. Greenhouse gas emissions and noise pollution are also among the most severe environmental impacts of freight in cities. Freight represents about one fourth of **CO₂ emissions** coming from transport activities in European cities.

Another important issue is **road safety**. Lorries have a low share of accidents in cities but the accidents involving them are serious. In European cities, about 5 to 10% of fatal accidents involve light commercial trucks and 10 to 15% involve heavy commercial trucks.

The conflict of **truck traffic with bicycle use** has been a recent target of policy concerns in Paris and London following much publicised fatal collisions.

* (Lozano, 2006).

Managing Urban Freight

- **Truck and van access restrictions**
- **Parking policies, provision of delivery spaces**
- **Land use policies, zoning and building regulations for delivery activities**
- **Consultation policies**
- **Most recent trends: environmental zones, mixed use buildings, multi-story urban logistic buildings**



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Restricting large trucks in cities, due to road limitations, is one of the most popular measure in developing countries. Since 1978, in Manila, trucks over 4.5 tons cannot travel along eleven primary arterial roads between the hours of 6AM and 9PM. Ten other roads are prohibited during peak hours. Alternate routes are available to reach the port of Manila. It is common in large Chinese cities to ban trucks weighing greater than five tons from the city centre during peak hours-as a consequence light small owner trucks are used more and more. This kind of regulation requires enforcement and control which need criteria easy to control, sufficient and well trained staff, and good communication between services.

Insufficient **delivery spaces** will transfer delivery operations to traffic lanes, which leads to congestion. In Buenos Aires, Argentina, a policy on loading/unloading areas was implemented in February 2009, but only 750 on-street delivery areas have been laid out in downtown Buenos Aires- so far, much less than in Paris (10,000) or Barcelona (8,000).

Land use regulations can serve a local freight policy. Many cities impose the building of off-street delivery areas in new commercial or industrial developments. In Barcelona, Spain, since 1998, all new bars and restaurants were asked to build a storage area with a minimal size of five square metres within their premises as restaurants do not need a daily supply of bottles and beverages if they store sufficient volumes.

Consultation processes with private stakeholders provide a better understanding of the constraints and obligations of each party, and allow the development of concerted action programs. Consultation processes in urban freight can provide very interesting and valuable collaborations between private companies that otherwise are not willing to work together.

Recent trends: Environmental concerns have led some cities into developing logistic facilities. Twenty-two freight facilities in Tokyo have been implemented with the help of the national state in order to solve urban difficulties for truck companies. The Korean government is creating a network of forty logistic hubs located in the major metropolitan areas of the country.



Inefficiency of Urban Freight Transport

- Numerous and competing small operators
- Small operators in Medan, Indonesia*

Firm Size	Frequency of Trucks Use (time per week)	Average Load Factor
Less than 5 employees	2.11	29%
5 or more employees	2.43	76%

* From data displayed in Sato & Kato (2006)

Inefficiencies of urban freight challenge sustainable development of cities and their urban economies. Public and private stakeholders need to define strategies to address them.

In most cities urban freight transport is quite **inefficient**, i.e. the same amount of goods, with a better quality of service, could be distributed with a smaller amount of vehicle-kilometres travelled. The inefficiency of urban freight can be especially important **with small operators**. Small operators are dominant in Africa, as both local small companies and large ones operate with their own in house fleet, and explain part of the high cost of transport and logistics. In South Africa, the inefficient use of commercial vehicles explains the high logistics costs of the country*. In European cities, the load factor, expressed in volume, is increasing. Today, it has reached about 70% to 80%*.

Urban freight is operated by **numerous and competing small operators**, ready to accept low prices. Clients request customized or just in time deliveries, generating costs that do not necessarily translate into higher prices. Public policies also add costs by being unpredictable. This is a major source of problems for truck manufacturers who hesitate in developing fuel efficient and ergonomically designed urban vehicles, because they do not know what the next regulation will be.

- * (Joubert & Axhausen, 2009)
- * (Bestufs, 2006)

New Services

- Consolidation schemes for urban deliveries
- Growing demand for new services
- Services provided in Shanghai



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New urban logistics services are emerging and/or consolidating to accommodate the needs of new consumers and businesses.

Consumer behaviour has changed rapidly and the way people travel for shopping has been transformed accordingly. People shop in a growing number of places, including local shops, local supermarkets, large supermarkets, malls, and the internet. This generates a **demand for new logistics** and transport services, among them home deliveries or deliveries at the office or at pick up points. Businesses also have growing demands for new logistics services. Surveys have shown that many inner city retailers are interested in (and willing to pay for) new services such as the rental of storage space, dedicated areas for the reception of their deliveries, specialized services for the pick up of pallets, etc.

In Shanghai, logistics providers are evolving*. Since 2005, following China's entry into the World Trade Organization, two new groups of logistics providers have appeared: Sino-foreign or foreign capital logistics providers (11% of current companies) and companies affiliated to large manufacturers (47% of logistics companies). These large, consolidated firms have replaced many private logistics firms which were efficient but did not have the capital. Now these firms make Shanghai one the most active places for global logistics services in Asia.

* (Chin et al., 2007)

Sprawl

- Overtime, spatial relocation of warehouses and terminals from the centers of the city to the suburbs
- Today, terminals and distribution centers close to highways and airports are key to urban freight system
- But sprawls generates additional vehicle-km and CO₂ emissions



Historically, freight transport terminals tended to be close to the city centres, favouring a proximity to railway networks. Confronted with the severe land pressure in large cities, as well as with the large urban renewal projects that took place in cities during the 1960s and 1970s, logistics and transport companies began to move away from **urban centers**. Today, terminals are located close to **highway** networks and suburban **airport** areas. The constraint of land availability remains as these new freight terminals are larger than they were in the past.

The first consequence of sprawl is it increases distances travelled by trucks and vans to deliver goods in urban areas where jobs and households remain concentrated. This is further reinforced by the tendency to locate logistic facilities close to arterial road networks while reducing the total number of facilities. Terminals today are bigger than they were in the past, and each one serves more businesses and households than they did previously.

This leads to more vehicle-miles travelled by trucks and vans in the metropolitan area. In Paris, it is estimated that in the past 34 years, the impacts of sprawl has added 15,000 tons of **CO₂ emissions** per year in the region*.

*(Dablanc & Rakotonarivo, 2009)

Labor Issues

- **Subcontracting is a key pattern of urban freight**
- **Illegal hiring practices, often absence of contract**
- **Poor working conditions and safety issues**
- **Use of old vehicles**
- **Governments role**

Urban freight faces many labor issues:

Subcontracting means that the last set of miles and the actual delivery of a shipment are made by a different operator from the one formally hired by the shipper. The rate of subcontracting is proportionate to the size of a city. In French cities, up to 90 to 100% of urban freight operations in express parcel transport are subcontracted to small operators.

Illegal practices, including the hiring of undeclared workers, are often associated with the use of **old (and thus more polluting and noisy) vehicles**, and with drivers who exceed the authorized driving time (which leads to tiredness and a greater frequency of accidents).

Wages are low, while the work is stressful. Lack of staff and difficulties in recruiting skilled employees have been a recent feature of urban transport markets. The turnover of staff can be high, leading to difficulties in providing a good service, as well as a high level of traffic penalties for these companies. The development of couriers on motor bikes has also led to an increase in difficult **working conditions**.

Governments must help improve working conditions and skills in the urban freight sector, which is often the least considered in the trucking industry. They also need to inform operators of the different regulations.

Policies Recommendations

- **To promote more efficient and environmental friendly urban freight systems**
 1. **Setting up a governance structure**
 2. **Serving urban growth and providing value added logistics services**
 3. **Making cities safer and more livable**
 4. **Facilitating deliveries and providing better labor conditions for delivery personnel**



Faced with these challenges as well as an inefficient and unsustainable freight system, cities must take remedial action. Serving the local economy and accompanying economic transformation is a priority. There are tools for policy-makers to better organize urban freight, although the task is not easy. Even in countries with strong local political entities, policy leverage regarding urban freight tends to be weak.

We will examine possible suggestions for improving this situation in the next few slides.

Setting up a Governance Structure

- **Assessing the needs of the economy**
- **Possible policies and programs**
 - **Finance**
 - Subsidies
 - Investment
 - **Regulate**
 - Restrictions
 - Land use master plan
 - **Coordinate**
 - **Set up consultation processes with private stakeholders**

A key issue in the governance of urban freight is that the urban planning department, the transport department, and the economic development department need to work in **coordination** on all issues related to freight and logistics.

No urban freight policy can succeed without prior **consultation** with freight companies and their organisations, local business groups, and residents. A permanent **Urban Freight Forum** should be set up with all target groups and meet on a regular basis. It is very important that all stakeholders be included in such a forum.

Cities need to make informed decisions on urban freight by collecting data at regular intervals.

Possible policies and programs to consider include:

- Subsidies to small operators to enable them to buy cleaner vans or trucks
- Investment in road or rail infrastructure to support freight flows
- Restrictions imposed on truck and van access
- Inclusion of logistics infrastructure in the land use master plan

Serving Urban Growth

- Provide planning and funding for logistics parks
- Create training for logistics and freight transport jobs
- Develop urban logistics spaces



Logistics parks include common facilities and services for all companies located on the site, such as surveillance, catering, fuelling, cleaning station for trucks, overnight truck parking, and night accommodation for drivers. These parks must be accessible by public transport at extended hours, as logistics jobs require non-traditional working hours.

Bodies such as chambers of commerce should promote campaigns and **training programs** for logistics jobs, from warehouse workers to managers' positions.

Urban logistics spaces are terminals of about 500 to 2,000 square metres located in dense urban areas where logistics services can be provided to neighbourhood businesses and residents. These logistics spaces can be directly provided by public authorities in the facilities they control, such as underground parking

Ports Access

- **Managing more efficient access to ports**



Efficient and simple measures can be taken to alleviate congestion to and **from port areas**. Results depend on the co-operation of economic interests.

Los Angeles and Long Beach* are good examples of state and local regulations applied to the ports. In Los Angeles, congestion and air pollution associated with increased ports' activity has led to a state regulation requiring appointments or extended hours at terminal gates and the implementation of the "Offpeak extended gate hours program" (2005) which established night and Saturday shifts at both ports. The program far exceeded expectations as more than an average of 60,000 truck moves per week have been diverted to the off-peak shifts. The program has had a notable impact on truck traffic congestion at the terminal gates.

*(Giuliano & O'Brien, 2008)

Public procurement procedures can be efficient tools to achieve a more environmentally-friendly freight supply. Organizing them likewise can set an example to private contractual relationships between shippers, clients and transport providers.

Suggestion 3: Making Cities Safer and More Livable

- Plan to prevent sprawl
- Re-introduce non-motorized and cleaner modes of transportation
- Adopt environmental criteria for freight vehicles



Planning to prevent logistics sprawl: Metropolitan planning of logistics facilities is one of the key policies used to reduce truck vehicle-kilometres. The final choice for the location of logistics terminals results from a bilateral relationship between a developer (logistic real estate companies, logistic providers) and a local community.

Non-motorized vehicles like bicycles, animal powered carts need to be considered. But it is essential to provide privileged access to the street space, such as reserved lanes on urban boulevards, in order to avoid conflict between the different modes.

Cities should adopt a delivery access regulation based on a simple combination of the size and the age of delivery vehicles.

FORS (Freight Operator Recognition Scheme) in London provides a quality and performance benchmark for the trucking industry. A key project within the London Freight Plan (Transport for London, 2007), FORS gives a label (at bronze, silver or gold levels) to operators complying with a list of criteria such as efficiency, safety and environmental impact.

Promotion of Innovations in Clean Delivery Vehicles

- **Cleaner and quieter modes of transport must be (re) introduced on city streets like “La Petite Reine” tricycle in Paris**
- **Use of CNG**
- **But some vehicles are still too costly or difficult to maintain**



Keeping/Reintroducing Non Motorized And Cleaner Modes Of Transportation

Existing non-motorized vehicles (bicycles, animal powered carts) must be considered and promoted, by providing privileged access to the street space, such as reserved lanes on urban boulevards. Generally, policies promoting bicycles target passenger transport, but they can have an important impact for freight transport as well.

Cities should also facilitate the use of CNG (**compressed natural gas**) or electric vans and trucks for urban deliveries when operators are willing to try them.

Summary



- **Urban freight constitutes:**
 - **A significant part of the transport demand in cities**
 - **A significant employment opportunity for city residents**
 - **An important factor in the economic efficiency of a city**
 - **A significant contributor to adverse environmental impacts**
- **But**
 - **Logistics services in cities are poor**
 - **Dealing with urban freight has not received the kind of attention it deserves**
- **Local decision-makers can implement simple and effective policies to address the issues**

The purpose of this module was to present an overview of the importance of urban freight. It is a significant part of transport demand and affects the economic efficiency of cities. At the same, it can generate severe environmental impacts.

It also is important to recognize that logistics services in many cities needs to be improved. Urban freight usually receives little planning and regulatory attention. It is important to create awareness and train the different stakeholders.

Local decision-makers can implement simple and effective policies that to address these issues. But many freight and logistics issues depend on long-term national policies that cannot be properly addressed at the local level.