Topic Area:
"B5" Urban Goods Movement

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Title:
A Comparative Study on the Major Problems of Urban Goods Movement and its Countermeasures Between Developed and Developing Cities in Asia

Abstract:

Goods movement in any country is indispensable to the growth of its economy. Today, Southeast Asia is one of the most dynamic regions experiencing accelerated economic development. As a consequence, government infrastructure development programs has been struggling to keep up with the present and future demands of this extraordinary growth, especially in the major urban areas.

In this paper, urban goods movement characteristics of seven selected Asian cities were examined. A cluster analysis was done to determine the grouping of the cities based on the choice of countermeasures against problems of urban goods movement, and the transport and socio-economic characteristics of each city. An investigation between the representative members of the clustered groups was done by comparing goods movement characteristics of Tokyo and Manila. A general discussion on how the two cities manage its goods movement problems was also presented.

A Comparative Study on the Major Problems of Urban Goods Movement and its Countermeasures Between Developed and Developing Cities in Asia

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1 INTRODUCTION

Goods movement is absolutely essential to modern urban civilization. No urban area could exist without an efficient and reliable flow of goods to, from, and within it. However, this vital sector of transportation is, in a large part, overlooked. Urban transportation planners mainly focus on solving traffic problems brought about by trips generated by people alone. As a result, low or minimal investments are given for goods movement and government policies and regulations are usually unfavorable to the industry. In fact, in the Philippines, there has been no comprehensive studies on freight, and that, notwithstanding the importance of the freight system, freight traffic has always fared badly in almost all transport decisions involving a trade-off (MMUTSTRAP, 1984).

2 OBJECTIVE AND METHODOLOGY

This paper takes a look at the characteristics of urban goods movement and identifies the common problems besetting some Asian cities in order to understand how each country comes up with countermeasures to tackle its goods movement problems. Countermeasures which have been tested and proven to be effective in these cities are presented in the light of possible applications to other Asian cities. An analysis to understand the pattern of choice of countermeasures against problems of urban goods movement is done by reviewing current countermeasure practices in major Asian cities through a questionnaire survey.

A detailed examination of some of the critical differences found in two countries that represent a diverse set of urban freight environments in Asia is also done. These are: Tokyo, which is already one of the highly developed cities in the world, and Manila, which is one of the developing cities in Asia. Specifically, the study aims to examine the current condition of truck transport and identify and compare the differences of the countermeasures undertaken by Tokyo and Manila in managing its goods movement problems.

3 GENERAL PROBLEMS AND COUNTERMEASURES OF URBAN GOODS MOVEMENT

3.1 Problems and Countermeasures of Goods Movement

Table 1. Typical Problems of Goods Movement

Problem	Description
Congestion	Road congestion is caused by increased number of transport activities which includes both passenger and freight movements.
Damage to Infrastructure	Inferior design and rampant practice of overloading wherein the maximum permitted vehicle axle loads and gross weight are ignored causes accelerated deterioration of roads.
Safety	Problems in the geometric design, poor road conditions, over-utilization of old vehicles, and extended working hours of drivers results to safety problems.
Environmental Pollution	Vehicle emissions from road transport and the transport industry in general is increasing every year with the growth of the number of motor vehicles which causes negative influence on the ecological system and people's health in metropolitan areas. .

Table 2. Typical Countermeasures of Goods Movement

Countermeasure	Description
Information Dissemination and Research	***Agency Coordination*** Since urban goods movement is a concern of both the private and the public sector, a better and more efficient coordination between agencies concerned with freight movement and the business sector is needed.
	Database of Freight Transport Accurate data should be gathered regularly and the correct analysis should be conducted before any strategies for improvement and implementation of policies can be carried out.
Transportation Planning	***Infrastructure Improvement*** This involves the construction and expansion of roads, railway system, etc. in order to accelerate goods transport
	Inter-modal Transport Measures to increase the efficiency of transport by combining and improving the links with rail, air and sea transport are needed to cope with the emerging congestion and environmental problems.
	Terminal Development A central facility connected directly with the expressway network is needed to concentrate the usage of heavy vehicles on expressways and prevent them from circulating in urban residential areas.
	Parking Facility Provision of parking space for the loading and unloading of cargo, and the promotion of parking area improvements and more effective use of street parking lots can be done to decrease on-street parking for the loading and unloading of cargo in urban areas.
	Use of Advanced Information Systems Real-time positioning of vehicles, information on cargo, information on road conditions, Electronic Data Interchange, etc. can be utilized to improve the urban freight network.
Travel Demand Management	***Truck Lane*** This measure involves the allocation of a traffic lane, either for the exclusive use of trucks, or for the exclusive use by trucks and buses and other high-occupancy vehicles.
	Truck Ban This measure involves a prohibition on trucks using a particular route on certain hours of the day in order to move trucks to uncongested roads or shift truck movements to a different time of day.
	Cooperative Delivery This measure involves the promotion of change in the form of urban delivery from independent transport using vehicles owned by each shipper, to consolidated transport using public haulage. Consolidation of different consignments into concentrated goods flow will also increase truck load factors and decrease the frequency of truck trips.
	Quality Truck Licensing and Taxation This measure includes restrictions on operator or vehicle standards, safety measures, pollution, imposition of tax, etc. in order to improve the quality of trucking services.
	Parking Fees This measure involves the payment of fees for the use of parking facilities in order to discourage long periods of truck parking and low levels of productivity.
Land Use	***Land Use*** This measure includes ordinances such as administrative approval for location of traffic generators and location of bus and freight terminals in order to effectively control development in urban areas.
	Building Code This measure involves the issuance of building permits with consideration of parking and loading and unloading provisions for trucks.
Environmental Policies	***Environmental Regulations*** This involves the setting-up of policies which aims to reduce vehicle emissions through the development of environment friendly vehicles, the discouragement of the usage of diesel engines mainly used by trucks, and the proper enforcement of vehicle emission standards.

Urban goods movement and its countermeasures vary accordingly to the political, and socio-economic characteristics of a country. In general, typical urban goods movement problems and its countermeasures can be classified according to Tables 1 and 2.

Table 3. Problems and Countermeasures Matrix

Countermeasure	Problems			
	Congestion	Safety	Damage to Infrastructure	Environmental Pollution
Agency Coordination	O	O	O	O
Freight Transport Database	O	O	O	O
Infrastructure Improvement	O	O	O	O
Inter-Modal Network	O	×	O	O
Terminal Development	O	×	O	O
Parking Facility	O	×	×	×
Information Systems	O	×	×	O
Truck Lane	O	×	O	×
Truck Ban	O	×	O	×
Cooperative Delivery	O	×	O	O
Quality Truck Licensing	O	O	×	O
Parking Fees	O	×	×	×
Land-Use Planning	O	×	×	×
Building Code	O	×	×	×
Environmental Regulations	×	O	×	O

Note: O : Applicable , × : Not applicable

Table 3 shows a matrix of the common urban freight transport problems and the countermeasures that can be applied to each.

3.2 Travel Demand Management (TDM)

With very rapid growth in the demand for freight transportation, Travel Demand Management (TDM) measures for physical distribution has emerged as an important tool for urban transportation planning. The importance of TDM has significantly increased over the past years as it has been recognized that many transport problems can be resolved without large-scale investment in transport infrastructure. The approach to planning transport improvements which has evolved is management-intensive rather than capital-intensive, with one of the principal objectives being to reduce inefficiencies in the transport system. TDM achieves this through the planning, design, implementation, maintenance and monitoring of physical and policy measures which promote the efficient and safe flow of people, goods and vehicles. Since efficiency in the transport sense is concerned with moving people and goods rather than vehicles, public and freight transport schemes are important features of most comprehensive TDM improvement programs. In many cases, the success of a scheme depends on good inter-agency coordination and strong enforcement by the police of the accompanying traffic regulations.

This switch in emphasis from "capital" solutions to "management" solutions is gaining momentum throughout the world as the harsh realities of the current economic crisis are being felt.

4 EXISTING COUNTERMEASURES APPLIED BY SELECTED ASIAN CITIES BASED ON A QUESTIONNAIRE SURVEY

4.1 Questionnaire Survey

A questionnaire was developed and used to explore urban goods movement of some Asian cities (Fig. 1). The main objective of the survey was to understand how each city cope with the problems of urban goods movement and identify the countermeasures for efficient freight transport presently enforced in each city.

The design of the questionnaire was made simple so that a respondent would not encounter any difficulty in answering it. A list of goods movement countermeasures, and description, normally adapted around the world was itemized and the respondents were made to indicate whether a particular countermeasure is currently adapted by the city or not by simply putting a cross (x) or a check (o) mark.

Personnel from the transport planning divisions, and university professors engaged in the field of transportation in each country were selected as respondents of the survey.

The items (or countermeasures) in the questionnaire survey were grouped into two main types: *"hard"* and *"soft"* type countermeasures. Hard type countermeasures are those measures which involve transportation facility and infrastructure development usually characterized by huge amount of capital investments. Soft type countermeasures, on the other hand, include regulatory and policy measures which do not require too much capital disbursement.

The percentage of "hard" countermeasures was determined by computing the ratio of the total number of hard countermeasures and the total number of countermeasures used by each country.

Figure 1. Location of the Selected Cities

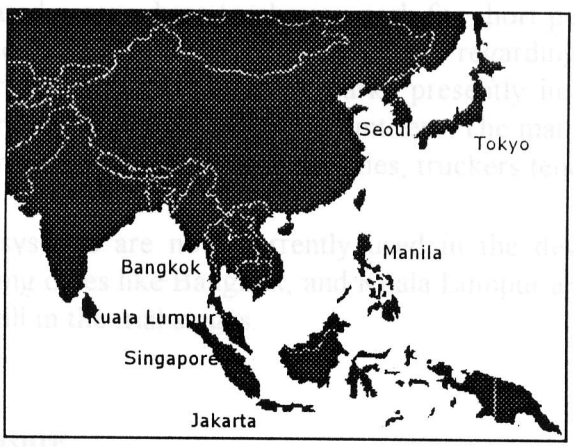


Table 4. Countermeasures of Selected Asian Cities

Countermeasure		City						
		Tokyo	Manila	Seoul	Bangkok	Jakarta	Kuala Lumpur	Singa-pore
HARD	Agency Coordination	×	×	O	O	O	×	O
	Data Collection	O	×	O	×	×	O	O
	Infrastructure Improvement	O	O	O	O	O	O	O
	Inter-Modal Network	O	×	O	×	×	O	O
	Public Terminals	O	×	O	×	×	O	O
	Parking Facility	O	×	O	×	×	×	O
	Information Systems	O	×	O	×	×	×	O
SOFT	Truck Ban	×	O	×	O	O	O	×
	Cooperative Delivery	O	×	×	×	O	×	×
	Quality Truck Licensing	O	×	O	×	O	O	O
	Parking Fees	O	×	×	×	O	×	O
	Land-Use Planning	O	O	O	O	O	O	O
	Building Code	O	×	O	×	×	×	O
	Environmental Regulations	O	O	O	O	O	O	O
Ratio of Hard Countermeasure (%)		50	40	55	33	25	50	54

Source: Interview Survey Note: O : Applied , × : Not applied

4.2 Existing Hard and Soft Countermeasures

4.2.1 Hard Countermeasure

Japan has been at the forefront of developing public distribution centers and truck terminals. However, most truck operators in Asia have no clear comprehension of the benefits of using these terminals. In most developing countries, since the majority of truck operators are small family-owned businesses, they try hard to minimize out-of-pocket cash expenditures and, as long as the use of truck terminals incurs what are perceived as "extra" costs, they will not use them (Midgley, 1992).

Truck parks are designated areas where trucks can park for short periods of time, awaiting prearranged time for collection or delivery, instructions regarding next assignments, or permitted time to enter the city. Public truck parks presently in use are located in the developed cities only, and not in the developing countries. The main reason for this is that, as long as there is a charge for the use of these facilities, truckers tend not to use them.

Advanced information systems are now currently used in the developed cities of Asia. Although other developing cities like Bangkok, and Kuala Lumpur are now developing their own systems, they are still in the trial stages.

4.2.2 Soft Countermeasure

A number of large cities in developing countries have imposed truck bans of various forms.

They fall into two types: route limitations and area-wide bans. Manila uses the first type of restriction, while Bangkok and Jakarta use the second.

In Manila, the ban prohibits movement of cargo trucks along, but not across, 11 specific routes during the period 6 to 9 AM and 5 to 9 PM, Monday to Friday. Cargo trucks refers to motor vehicles, whether loaded or empty, having a gross vehicle weight of 4 tons or more, principally intended for carrying cargo. Four and six-wheeled trucks are restricted in the Greater Bangkok Area during peak hours (6-9 AM and 4-8 PM) while ten wheelers and larger trucks are restricted in the morning between 6-10 AM and in the afternoon between 3-9 PM everyday except official holidays. In Jakarta, trucks whose gross vehicle weight is heavier than 3.5 tons are not allowed to enter the downtown area between 7-9 AM and between 3-5 PM on weekdays and between 7-9 AM and between 1-3 PM on Saturdays. Articulated trucks are not allowed into the city between 6 AM to 6 PM, tractors with 20 foot container are banned from the city between 6 AM to 10 PM; and tractors with 40 foot containers are banned from the city at all times.

4.2.3 Reasons for the Differences in the Adaptation of Countermeasures

Financial resource greatly affects the approach of adapting countermeasures for efficient goods movement. Developing cities focus more on the development of transportation systems brought about by person-trips rather than trips due to goods movement. Presently, the construction of mass rapid transit systems to improve public transport are on-going in Kuala Lumpur, Jakarta, Bangkok and Manila. However, there are no development projects which pertains to goods movement alone. This is compounded by the fact that freight transport is considered a private sector activity only. Hence, this neglect by the government has resulted to unavailability of accurate data which results to freight transport not properly incorporated into the final master transportation plan of the city. This is particularly true for developing countries with minimal financial reserves. As a result, developing countries resort to various low-cost methods through the use of Travel Demand Management.

4.3 Socio-economic and Transport Characteristics of Selected Asian Cities

The socio-economic and transport characteristics of the seven selected Asian cities is presented in Table 5.

An examination of the relationship between per capita GNP and car ownership (data from Table 5) shows that the two are directly proportional. However, developing economies which recently experience high growth rates like Bangkok and Kuala Lumpur show higher vehicle ownership than some of the already developed economies (Fig. 2). This is by virtue of the absence of car restraining policies in these areas.

Figure 2. Relationship Between
Per capita GNP and Car Ownership

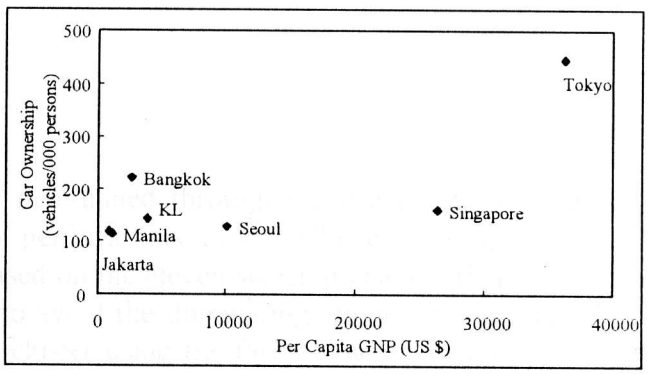


Figure 3 shows a scatterplot of the per capita GNP and the percentage of "hard" countermeasure used by each city (data from Table 5). It can be seen that developing cities usually employ "soft" countermeasures in managing its goods movement problems, whereas developed cities adapt the "hard" countermeasures. However, with the increase of income, the percentage of "hard" countermeasure decreases as shown by the experiences of Singapore and Tokyo. Since the transportation systems of these cities are already well developed, stricter TDM measures are now employed resulting to a shift towards "soft" countermeasures.

Figure 3. Relationship Between Per Capita GNP and Hard Countermeasure

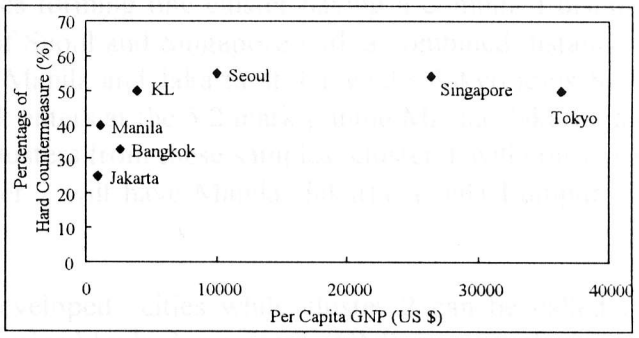


Table 5. Basic Data of Selected Asian Cities

Item	C	I	T	Y			
	Tokyo	Manila	Seoul	Bangkok	Jakarta	Kuala Lumpur	Singapore
Area (sq. km)	618	636	605	1,712	661	243	646
Per Capita GNP (US $)	36,315 (1996)	1,130 (1996)	10,076 (1996)	2,680 (1996)	940 (1996)	3,930 (1996)	26,400 (1996)
Population Density (persons/sq. km)	19094	13207	18016	5315	12405	5350	4799
Population Rate (%)	0.30	2.4	1.0	1.3	1.6	2.4	1.0
Vehicle/Person (veh/ 1,000 persons)	446	113	128	221	119	142	161
Ave. Travel Speed (km/hr)	15	10	18	9	15	9	30
Accidents (accid/1,000 veh)	12	15	20	22	18	49	14
Vehicles/Kilometer of Road	202	104	202	819	434	105	45
Private Car Users (%)	33	25	15	33	35	33	16
Public Mode Users (%)	67	73	67	39	53	34	80
Hard Counter measure (%)	50	40	55	33	25	50	54

Source: Various data reports

4.4 Cluster Analysis

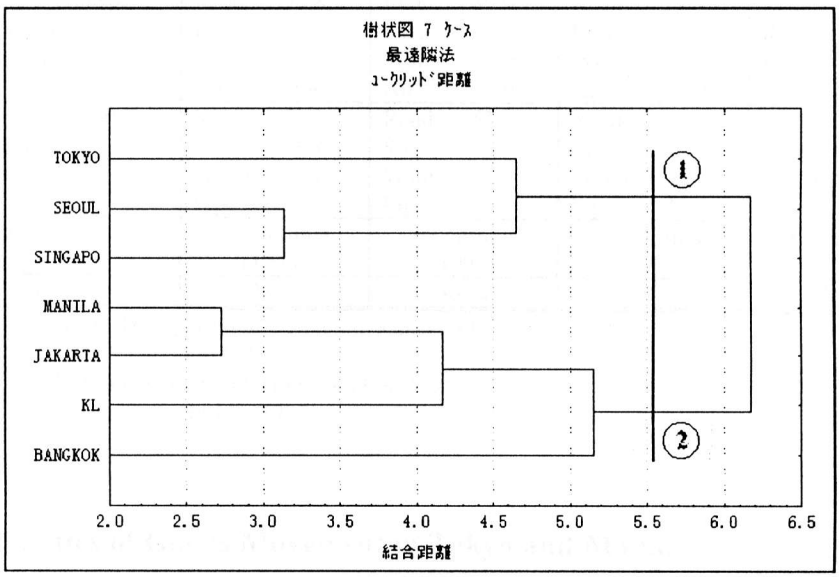
The grouping of the selected cities was determined through the use of cluster analysis. Statistica by Statsoft™ was utilized to perform this task. Cluster analysis identified relatively homogenous groups of cities based on the eleven selected characteristics in Table 5. These values were first standardized to avoid the dominating effects of some variables having very large values. A hierarchical cluster using the farthest neighbor approach and

Euclidean distance interval was used for the analysis.

The resulting dendogram in Figure 4 shows that Manila and Jakarta share the same demographic and transport characteristics forming one cluster having a combined distance of 2.7. This is followed by the cluster of Seoul and Singapore with a combined distance of 3.1. Kuala Lumpur joins the cluster of Manila and Jakarta at 4.1 while Tokyo joins Seoul and Singapore at the 4.6 mark. Bangkok enters at the 5.2 mark joining Manila, Jakarta, and Kuala Lumpur. If we are to form two clusters from these samples, cluster 1 will consists of Tokyo, Seoul and Singapore, and cluster 2 will have Manila, Jakarta, Kuala Lumpur and Bangkok as members.

Cluster 1 can be called the "already developed" cities while cluster 2 can be called the "developing" cities. Cluster 1 is characterized by high per capita GNP, low accident rates, high public transport usage, low population rates and high percentage of "hard" countermeasures used for goods movement. Cluster 2 is characterized by low per capita GNP, high accident rates, low public transport usage (except Manila), high population rates and low percentage of "hard" countermeasures adapted for goods movement.

Figure 4. Cluster Analysis



5 COMPARATIVE URBAN GOODS MOVEMENT (UGM) STUDY BETWEEN TOKYO AND MANILA

5.1 Demographic and Transport Characteristics of Japan, Philippines, USA and Europe

A comparison of the geographic, demographic and passenger and freight transport characteristics between Japan, the Philippines, USA and Europe is shown in Table 1. A discussion of the transport characteristics of each country is essential in providing a

background for understanding Japan and the Philippines relative to the world.

Passenger movement in all countries is mainly through the use of road transportation. However, in Japan, a major amount of passenger transport is also carried by rail because of its extensive urban mass rail transport system. Road transportation accounts for more than half of freight domestic traffic in all the countries except the USA, wherein the majority of freight is carried by rail. In Europe, rail and inland waterway together account for less than a quarter of all ton-kilometers performed. Yet, only a matter of a few decades ago, rail was the largest carrier of goods and inland waterways were considerably more important than they are now. USA and Europe gets considerable freight movement through pipelines because of their geographical nature, whereas Japan and the Philippines, two countries made up of a chain of islands, freight movement through pipelines is considered negligible. As a result, it is not surprising that freight carried by waterway is also a major contributor of freight domestic traffic in Japan and the Philippines.

Table 6. Table of Comparison between Japan, Philippines, USA and Europe

Characteristic	A S I A		USA	Europe
	Japan	Philippines		
Geography	Archipelago	Archipelago	Continent	Continent
Passenger Transport (percentage of passenger-kms)	Road: 59.8 Rail: 34.3 Water: 0.5 Air: 5.4	Road: 89.0 Rail: - Water: 9.0 Air: 2.0	Road: 90.3 Rail: 0.6 Water: - Air: 9.1	Road: 93.2 Rail: 6.8 Water: - Air: -
Freight Transport (percentage of ton-kms)	Road: 51.3 Rail: 4.5 Water: 44.0 Pipe: -	Road: 53.0 Rail: - Water: 47.0 Pipe: -	Road: 25.3 Rail: 35.8 Water: 22.2 Pipe: 16.4	Road: 70.7 Rail: 15.7 Water: 7.5 Pipe: 6.1
Population	126 million (1996)	69 million (1996)	266 million (1996)	494 million (1993)
Urban Population	78 %	46 %	76 %	70 %

Sources: Japan: Transportation Outlook in Japan 1996
Philippines: DOTC 1990
USA: Department of Transportation 1995
Europe: Rick Gruber, 1996

5.2 Characteristics of Goods Movement in Tokyo and Manila

5.2.1 Goods Movement in Tokyo

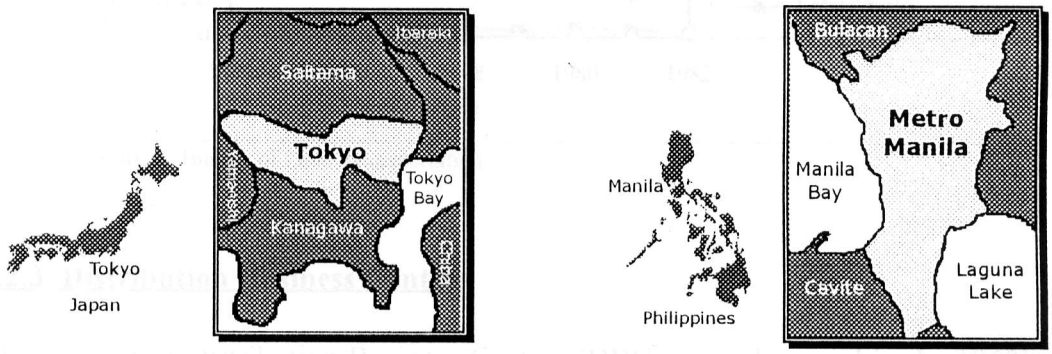
Tokyo is one of the most crowded cities in the world with a population of 11.8 million in 1996. An enormous concentration of economic activity is focused within this relatively small area. Goods flow in Metropolitan Tokyo[1] in 1982 was 3,270 thousand tons/day in 1972 and declined slightly to 3,000 thousand tons/day in 1982. However, the volume of freights increased from 1,580 thousand freights/day to 2,630 thousand freights/day. According to 1982 data, the share of truck in terms of freight was 84.5% and that of rail was only 0.2%, ship was 0.1% and air was 0.2% (TGTC, 1984).

Goods flow in Tokyo mainly depended on rail and water transportation until trucks became popular after the second world war. Thus, many physical distribution facilities are

concentrated in the waterfront areas along Tokyo Bay close to the Central Business District (CBD). This area is important not only for delivery services to the CBD but also as sites for inter-city truck terminals and warehouses (Kuse et al, 1992).

After the first oil shock in 1973, goods movement evolved with the changes of industrial structure, the diversification of consumer demands, and advances in the field of technology. Just-in-Time (JIT) type of physical distribution resulted to decreased loading rates and more frequent delivery of trucks.

Figure 5. Map of Tokyo and Manila



Note: Maps are not the same in scale

5.2.2 Goods Movement in Manila

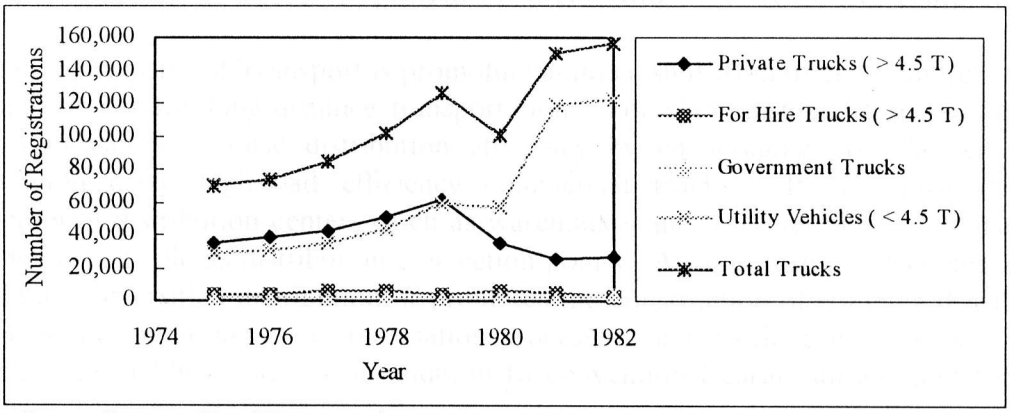
Metro Manila is the center of economic activity in the Philippines. It comprises 7 cities and 10 municipalities having approximately 8.4 million inhabitants. Freight transport in Manila is heavily dependent on trucks, and rail and air freight are at present insignificant in importance and volumes.

A study made by Japan International Cooperation Agency (JICA) in 1993 indicated a goods inflow of 42,000 tons/day and an outflow of 22,000 tons/day in Manila. Generated truck trips amounted to 6,400 trips/day (LISR, 1993).

Licensed for hire (TH) trucks in Manila are only making up for 15 per cent of the truck fleet. However, if compared with the total number of TH trucks in the Philippines, this comprises almost half. Thirty-one (31) percent of the total truck fleet is in Manila alone.

The controversial issue of the truck ban is still largely unresolved. Kirby, Tagell and Ogden (1986) in a study in Manila concluded that the introduction of the ban has led to the increase in the number of small trucks not covered by the ban. They also said that any action that causes a single truck to be replaced by more than two light-vehicle trips will surely worsen traffic congestion. An examination of the truck registrations in Manila showed a rapid increase in the Utility Vehicle (UV) category after the imposition of the truck ban in 1978 (Fig. 6). UV vehicles are vehicles with four wheels of less than 4.5 tons, with a truck type body and are not subject to the ban. A decline in the number of private trucks in the over 4.5 ton category was also noted.

Figure 6. Truck Registrations in Manila



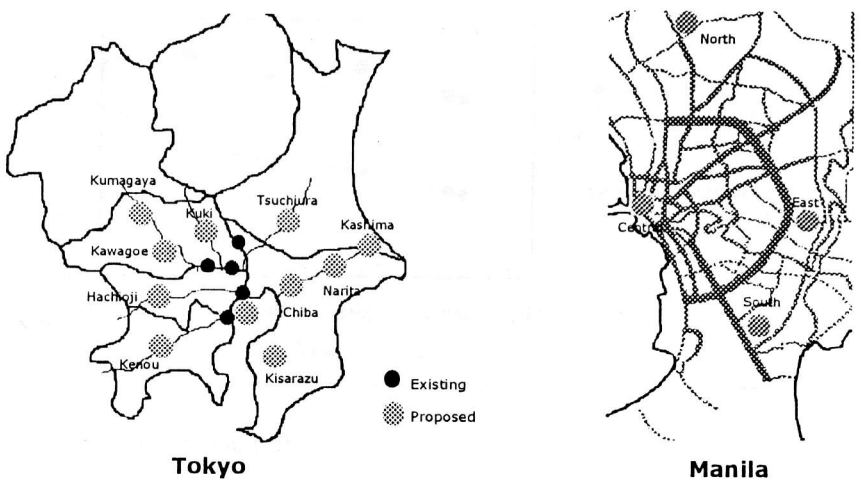
Source: Bureau of Land Transportation

5.2.3 Distribution Business Centers

The concept of Distribution Business Centers (DBC) was advocated in the 1960's to solve physical distribution problems in urban areas of Japan (Kuse et al, 1992). Presently, five DBC's have been constructed on five regions located at the periphery of Tokyo (Fig. 7). Each DBC has 100 hectares of land area and has enough capacity to meet distribution and storage activities.

In Manila, freight terminals are mostly small commercial stalls operated by private enterprises. A study made by the Southeast Asian Agency for Regional Transport and Communications Development (SEATAC) proposed the development of modern common user facilities for Manila (Fig. 7). However, the study could not document any evidence that these projects were economically feasible. According to another study (RTIS, 1987), the common carriers are opposed to common carrier terminals facilities because they want to keep full control over all aspects of their operations. The study concludes that the government leaves terminal development to the private sector.

Fig. 7. Location of Existing and Proposed Distribution Centers



5.3 Discussion of Existing Urban Goods Movement Problems and Countermeasures

5.3.1 Tokyo's Existing Goods Movement Problems and Proposed Countermeasures

The Japanese Ministry of Transport is promoting a modal shift from trucks to more efficient trains and vessels for long-distance transportation. For short distance transportation, it promotes measures to raise distribution efficiency by encouraging consolidated cargo transportation using high-load efficiency commercial trucks. It also promotes the construction of distribution centers, such as warehouses and truck terminals, because they play an important role as distribution connection points. Also, in response to demands for advanced and diversified distribution, it promotes the construction of complex distribution centers equipped with advanced information processors and distribution systems, such as labeling and assembling features, in addition to conventional cargo storage and handling functions.

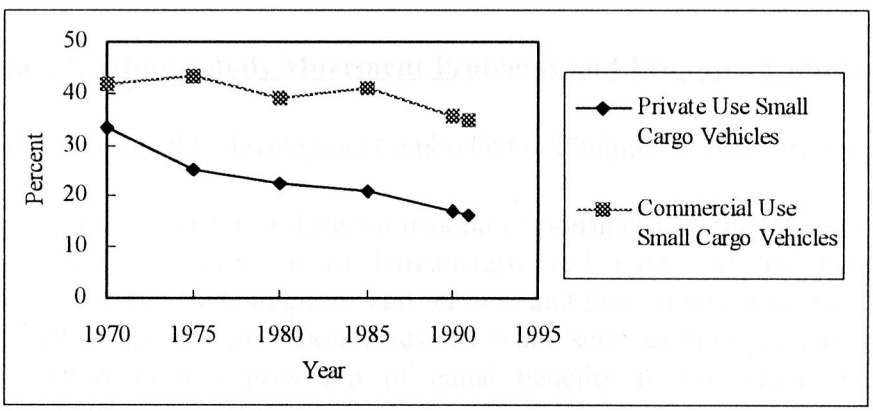
The Comprehensive Program of Logistics Policies by the Japanese Cabinet states that by the beginning of the 21st century, the total loading efficiency of trucks will be increased 50% by undertaking the following measures: increase sharing rate of commercial trucks, computerization improvement, cooperative delivery, and effective commercial practice.

Traffic Congestion

Road congestion levels in Tokyo during peak hours has been increasing steadily over the past years. Data from the Ministry of Construction showed that there has been a decline on traveling speeds during peak hours from 22.5 km/hr in 1980 to 18.5 km/hr in 1990.

Loading efficiencies for small cargo vehicles has also decreased over the years as shown by a 33.2 percent loading in 1970 to a 16.1 percent loading in 1991 for private use, and a 42 percent loading in 1970 to a 35 percent loading in 1991 for commercial use cargo vehicles (Fig. 8). This constitutes an average of 2.4 tons shipment per vehicle. As a result, more frequent trips were needed as shown in the increase of frequency of shipments per establishment from 3 deliveries per day in 1980 to 5 deliveries per day in 1990.

Figure 8. Loading Efficiencies of Trucks in Tokyo



Source: Ministry of Transport

Safety

The trucking industry fails to attract young workers because of its harsh and difficult labor conditions. As a result, truck drivers are forced to work overtime which in turn leads to safety problems. The shortage of drivers in Japan has kept the use of trucks below capacity. A study revealed that the estimated required number of truck drivers per truck is 1.2 persons, but the actual number of truck drivers is only 0.8 persons in urban cities (Ozawa, et al, 1992).

Promotion of cooperative delivery, and inter-modal transport will significantly decrease the rate of unused trucks. Promotion of better working conditions and increased wages will improve the image of the industry.

Deterioration of the Environment

CO_2 emission from the transport industry amounted to 20 percent of the total CO_2 emission in 1989 which also includes emissions from business, manufacturing and households. Trucks accounted for 9 percent of the total CO_2 emissions.

The Ministry of Transport is presently promoting the widespread use of low-pollution vehicles and acquisition of environment-friendly physical distribution equipment by offering special tax incentives to those who will use them. Cooperative and consolidated transport and delivery using public haulage has also been practiced to increase truck load factors and decrease frequency of truck trips.

Table 7. Tokyo's Problems on Goods Movement

Problem	Cause	Countermeasure
Traffic Congestion	Frequency of trips Increase in traffic volume Insufficient parking spaces	Terminal Development Inter-Modal Network Parking Facility
Safety	Labor Shortage due to difficult labor conditions	Cooperative Delivery
Environmental Deterioration	Small lot goods are frequently delivered due to JIT	Cooperative Delivery Environmental Regulations

5.3.2 Manila's Existing Goods Movement Problems and Proposed Countermeasures

The principles of sustainable development embodied in Philippines 2000 are the following:

- *Devolution* - transfer of decision-making responsibility to the lowest units possible
- *Deregulation* - removal of bureaucratic red tape and liberalization in the production and trade in goods and services and flow of investments
- *Decentralization* - provision of resources and services in the countryside
- *Democratization* - provision of equal benefits to the citizenry and people participation in governance
- *Privatization* - reduction in government's stake in business and promotion of private sector-financing government project

These aims of the Philippine government is in line with the needs of the transportation industry, particularly with goods movement. The question remains on how effective these redirection of policies will be. A large portion of it will depend on the government's will to study, implement and enforce policies that will change the present trend of the transportation sector.

Traffic Congestion

Insufficient Road Network

Given the volume of traffic experienced in Manila everyday, the existing network is dismally insufficient. The 1994 Road Handbook in the Philippines show that addition of road networks and maintenance of existing road networks in the Philippines currently gets the greatest attention of the Department of Public Works and Highways (DPWH) in terms of amount of government investments with 77 percent of the total infrastructure budget. The government clearly recognizes the improvement of road network as its top priority.

Lack of Coordination and Data

In the Philippines, although a transportation planning hierarchy is distinctively defined and the agencies at the different levels are properly mandated by the national government to perform their specific duties, it is quite obvious that the big number of agencies involved in the transportation planning process will lead to inter-agency conflicts (Felias, 1997).

Therefore, in order to achieve the intended purpose of a transport plan, the planning process must be a coordinated effort among the different planning agencies involved.

Mixed land use

Central areas of Manila are poorly utilized for high-class residential subdivisions called "exclusive villages" wherein ordinary traffic is prohibited to pass through. This problem is mainly due to the historical growth of Manila and its solution is still quite unexplored as this is a highly political area of contention. Most residents within these subdivisions are highly influential people who would not easily give up their prime land ownership in the heart of the city.

Studies on successful urban land renewal and relocation for Manila should be studied as efforts in this direction has led to many problems because of the resistance of land users with even the milder solutions like zoning.

Damage to Infrastructure

In order to compensate for the many disadvantages encountered by the trucking industry, like the truck ban, poor road conditions and chronic traffic congestion, the practice of overloading has become prevalent. Maximum permitted vehicle axle loads and gross weight are ignored. This has resulted to accelerated deterioration of roads that are initially not designed for passage of heavy trucks.

Review of the existing truck ban and strict enforcement of permitted vehicle weights should be done.

Safety

Lax policies and illegal practices in the issuance of driver's licenses and operator's permit for urban goods distributors have resulted in a number of truck drivers who do not even know the meaning of basic road signs like "No Entry" and "Give Way.". This lack of knowledge about their occupation results in low levels of productivity and safety problems.

Lax implementation and enforcement of rules especially in vehicle registration should be thoroughly reviewed. There is a need for more testing centers for vehicles like in the Land Transportation Office (LTO) Motor Vehicle Inspection System (MVIS) that strictly complies with the government approved standards.

Environmental Pollution

Manila has been known to surpass safe levels of pollutants in the air. According to a study of the Department of Environment and Natural Resources (DENR) in 1994, average Total Suspended Particulate (TSP) at the most traveled street in Manila, EDSA, is 200 μ g/m^3. This is well above the standard limit set by the World Health Organization (WHO) of 60-90 μ g/m^3. Trucks and buses account for nearly 40% of the TSP. This is primarily caused by the proliferation of diesel powered second-hand trucks and public buses. A survey on the trucking industry specified that truck fleets in Manila are usually 6 and 10 wheeler trucks mostly imported secondhand from Japan (MMUTSTRAP, 1984).

Uncontrolled increase of motor vehicles, lax regulations regarding importation and registration of old vehicles, general lack of enforcement of policies and prohibitive costs of new vehicles have all contributed to the problem.

Table 8. Manila's Problems on Goods Movement

Problem	Cause	Countermeasure
Traffic Congestion	Increase in Truck Movement	Truck Ban
	Insufficient Road Network	Infrastructure Improvement
	Loading and Unloading Problems	Terminal Development
	Parking Problems	Parking Facility
	Lack of Coordination	Agency Coordination
	Lack of Freight Transport Data	Database of Freight Transport
	Mixed Land Use	Land-use Planning
Damage to Infrastructure	Increase in Volume of Trucks	Quality Truck Licensing
	Overloading of Trucks	Enforcement of Loading Regulations
Safety	Lax practices in the issuance of driver's license	Quality Truck Licensing
	Problems in the Design of Roads	Infrastructure Improvement
Environmental Pollution	Emissions from old vehicles	Quality Truck Licensing

5.3.3 Comparative Discussion

A comparison between Tokyo and Manila shows that both cities encounters similar problems brought about by goods movement. These are traffic congestion, damage to infrastructure, safety problems and the deterioration of the environment. However, the approach of each to mitigate these problems are quite different.

First, in developed cities like Tokyo, the availability of technology and ample budget ensures that transportation planners always get the proper data they need. In most developing cities like Manila however, this ideal situation is uncommonly seen. Because of budget constraints, primary surveys are often skipped and transportation planning is usually based on secondary data which are in most occasions outdated or are remnants of previous studies usually funded by foreign consulting groups. This has resulted in incoherent transportation plans that usually do not account planning for goods movement.

Second, the government of Japan has prepared definite steps to improved urban goods movement by providing public freight facilities such as distribution centers, truck terminals, parking facilities, improved inter-modal transport, sufficient network for public and private transport, and advanced information systems. Furthermore, the government has been showing interest on the feasibility of creating underground networks for freight transport that will ultimately separate people and goods to combat freight transport problems. On the other hand, the Philippine government apparently gives minimal support to help the freight industry as manifested by its inability to provide public trucking facilities and unbiased enforcement of transportation policies and regulations. The issue of the truck ban which inhibits the trucking industry is one policy that definitely needs to be reviewed. Government attention and action should be done even at least to simple land-use and zoning policies where adequate and suitable land may be reserved for truck terminals, parking, and loading and unloading near traffic generating sources.

Third, the effective implementation of low-cost measures such as Travel Demand Management (TDM) will certainly help improve urban goods movement. Despite infrastructure investments by the Tokyo Metropolitan Government and its private and public companies, goods movement still suffers and much has to be desired, i.e. traffic congestion, labor shortage, and environmental pollution. Thus, the implementation of TDM measures, i.e. quality licensing, parking fees and taxation, and land-use policies such as the building code and the land readjustment plan, has become popular even in areas where good transportation systems exist. In Manila however, the absence or the lax implementation of these government policies causes more and more chaos and deterioration of the transportation and physical environment.

6 CONCLUSION

An analysis of countermeasures to enhance efficiency in urban goods distribution in some Asian cities showed differing approach in the application of prescription methods. Most developing cities usually adopt the "soft" method of countermeasures such as management of transport systems and travel demand management to alleviate urban goods movement problems. On the other hand, developed cities focus more on the "hard" solutions to the problem wherein it tries to improve on the conventional methods of countering urban goods

movement problems by adopting pioneering approaches such as development of distribution business centers, and utilization of advanced information systems.

It also examined the existing freight transport characteristics of two representative cities in Asia - one which is highly developed, that is Tokyo, and a developing city which is Manila. Differences in the setting-up of measures to manage goods movement between the two cities were discussed. Tokyo, despite its huge investment in infrastructure improvement, still has its share of goods movement problems. Manila, on the other hand, is still laying the foundation of developing its transportation system mainly directed towards public transport through infrastructure building. However, the experience of Tokyo clearly shows that effective Transportation Demand Management is one of the best measures to alleviate goods movement problems.

An extensive number of measures exists that can be applied by both the public and the private sectors to address the problems created by goods movement. However, there is not one "recommended" approach to manage urban goods movement problems that large cities face. There are many options and varieties of measures that can be taken to address the problems. If applied in coordination with other measures and with strong governmental support, these measures have the capability of being effective, regardless of their level of sophistication or technological development.

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Note:

1. Metropolitan Tokyo comprises Tokyo's 23 wards and the surrounding prefectures of Saitama, Chiba, and Kanagawa having a population of approximately 32 million and area of 14,000 km^2.