Urban Freight: The Forgotten Agenda

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Although urban-goods movement has attracted little attention from policymakers, the potential gains from policy reform in this area are considerable. ***Kenneth Ogden****, Professorial Fellow in the Department of Civil Engineering, Monash University, explains.*

Transport comprises the movement of both people and goods. Much of our public infrastructure for transport caters for both, and sensible policy development would consider how to serve the needs of both.

However, transport planning and policy in most Australian cities has been preoccupied with person movements, and in particular with public transport. Although there is a political imperative for this ('goods don't vote'), a result of the neglect of freight transport has been that important opportunities to contribute to economic and social goals of the community have been missed.

This article argues that better planning for freight movements in urban areas could have a major beneficial impact on the profitability and competitiveness of Australian industry.

Freight in Transport Planning and Policy

Freight is not an end in itself. Goods do not move for their own sake, but only if they are of greater value at some location other than their current one. The freight system therefore essentially serves other productive sectors of the economy.

Increasingly, freight activities are being seen as but one (albeit important) part of a broader process of logistics management, which may be defined as 'having the right quantity of the right product in the right place at the right time'. Importantly, shippers may deliberately incur a higher price in transport (e.g. use of a reliable mode) in order to achieve savings elsewhere (e.g. reduction of inventory).

A greater degree of explicit consideration of urban freight in transport planning and policy would be valuable, for several reasons. First, urban freight is important in economic terms. Different studies have estimated that the total resource costs of urban freight are comparable to those of urban person movement (Bureau of Transport Economics, 1978). In other words, about half of total urban transport costs are associated with the movement of goods. This means that the provision of an efficient and reliable urban freight system is important to the economic development and growth of urban areas. In particular, the urban freight system is critically important to the trade-exposed manufacturing sector (i.e. those manufacturers that export their products or compete with imports). An efficient freight system is therefore an important contributor to industry's ability to compete in international and domestic markets. There are benefits from minimising, or at least reducing, operating costs such as wages, vehicle costs, terminal costs, and so on.

Of particular concern here is traffic congestion, since trucks both experience congestion and cause congestion that delays other vehicles. But because traffic congestion forms part of the operating environment for trucking activities, the costs of delay are merely passed on in the form of higher prices. Trucking firms in particular derive no benefit from reduced congestion because competition would force lower prices. The problem of congestion thus affects the industry's customers, and, since government provides and manages the road system, it is a public planning and policy issue.

Second, there is understandable concern about the adverse impacts of goods transport, in particular noise, emissions, and traffic crashes involving trucks. It is doubtful whether these concerns would be adequately addressed if left solely to the market, and a public role of some sort is probably inevitable.

Third, the movement of goods within cities is a very significant part of the total national freight task. Nationally in 1988, 26 per cent of tonne kilometres of road freight was moved within capital cities. (The corresponding figure for interstate road freight, which is what most people think of when the word 'freight' is mentioned and to which a great deal of policy development has been directed, was 20 per cent [ABS, 1990a:table 28]). Urban freight thus warrants specific attention in a policy context if only because of its magnitude.

Finally, customers are changing their demands on the freight sector. As modern industry produces high-value goods, customers are increasingly demanding a freight service that can deliver with high levels of punctuality, reliability and frequency, can accommodate overall demand, can respond flexibly to short-term demands, and minimises damage to the product (Nicolin, 1989). This requires action on the part of both the industry, to provide services of the required quality and price, and government, particularly in infrastructure provision.

Some Facts about Urban Freight

Because urban freight has been substantially overlooked as a policy or planning issue, our factual knowledge of important aspects of it (such as the patterns of origin and destination of goods movements, the patterns of daily truck movements, or the value of the goods being moved) is very limited. However, we

do know that urban freight is almost entirely carried on roads. The diverse patterns of origins and destinations, the short distances involved, and the time-sensitive nature of much of the movements mean that the technology most suited to almost all urban freight is the road vehicle — trucks and vans. Other modes, such as rail or barge transport, may have a role in niche markets, and should not be overlooked; but they will never be significant in aggregate terms for intra-urban freight.

We also know that the commodities carried are mostly bulk products and manufactured goods. In Melbourne in 1988, for example, 28 per cent of tonnes moved consisted of sand, gravel and stone, 23 per cent of metal manufactured products, 15 per cent of food and agricultural products, 8 per cent of concrete products and building materials, and 7 per cent of petroleum products and chemicals (ABS, 1990b).

Interestingly, only about one third of the freight moved within urban areas is carried by the hire-and-reward road freight industry. Two thirds is carried by firms using their own trucks (ABS, 1990a).

On the road system, articulated trucks (semi-trailers) account for less than 1 per cent of travel overall, and rigid trucks account for about 5 per cent. However, articulated trucks carry about 44 per cent of the freight tonnage (ABS, 1990a: tables 11, 27). Moreover, there is a clear trend towards the use of larger, more productive vehicles, with travel by articulated trucks growing at about twice the rate of travel by private cars.

Urban Freight Policy Objectives

To develop coherent and useful policies for urban freight, it is necessary to be clear about the goals of such policy. As an overall goal, it may be helpful to propose that we should attempt to minimise the total social cost of moving goods, consistent with meeting the freight needs of the community (Ogden, 1991a). Within that overall goal, six sets of specific policy objectives may be proposed:

- **public-sector macroeconomic performance**: to contribute towards local, regional, State and national economic performance;
- **cost and quality of freight services**: to improve freight efficiency and productivity by reducing transport operation costs, especially those associated with traffic congestion;
- **road safety**: to minimise the number and severity of truck crashes;
- **the environment**: to minimise the adverse environmental effects of freight activities (terminals and transport), especially noise, emissions, vibration, and intrusion into residential areas;
- **infrastructure and management**: to provide and manage an adequate public infrastructure, especially related to the provision and maintenance of the road system and terminals, and appropriate regulation of trucking operations; and
- **urban structure**: to contribute towards 'desired' urban structure, especially through the location of freight generators and terminals.

This is not the place to attempt to develop these in any detail. However, as with any area of policy development, the challenge is to determine an acceptable balance between these objectives, since in some cases they conflict or are mutually inconsistent.

Policy Initiatives

The urban-freight sector is characterised by a large number of individual firms of different size, free entry and exit, and an ability to serve its market. This makes the industry very competitive in both cost and quality, and it generally serves its customers well (May, Mills & Scully, 1984).

Planning and financial objectives within the private sector are necessarily limited to those factors over which the firm has some control. Thus, if we accept the above argument that policy should aim at 'total social cost', various components (in particular, contribution to regional and national economic performance, safety, environment, infrastructure and management, and urban structure) will not be directly taken into account in private firms' decision making. Government therefore has a role in ensuring that these wider costs are taken into account in some way. Preferably, costs should be internalised (e.g. requirements on truck braking), with regulation as a last resort. It is particularly important that such intervention (whatever form it takes) should minimise outside interference in the day-to-day activities of private firms, since operating decisions should be left to the market, with competition between firms ensuring that an efficient outcome is achieved.

Infrastructure. A key aspect of public policy on urban freight is the provision and maintenance of infrastructure. Governments have a virtual monopoly on the provision of roadspace, and for this reason alone there is a public-policy role in urban freight.

Freight-related infrastructure improvements include the provision and operation of urban arterial roads and freeways, provision of access roads to freight-generating areas, constructing or upgrading roads in congested corridors or to serve ports, airports and rail terminals, increasing capacity and operating speeds by installation of traffic-control devices, and road maintenance.

As noted above, it is increasingly being recognised that the economic development of a metropolis is related to the quality of its freight-transport system. In Melbourne, for example, a very significant study carried out by the Road Construction Authority (RCA) showed the key importance of urban-road investment in encouraging development of the region's manufacturing industry. It concluded that reduced urban-freight costs resulting from either travel-time savings or more reliable delivery times directly affected the profitability and competitiveness of Melbourne manufacturers. On this basis, it showed that the economic benefits from urban

road investment, when the flow-on benefits were included, were much greater than had hitherto been calculated. It concluded that 'estimates of ultimate benefits to the national economy from major urban road improvements should involve increasing the benefits conventionally calculated to the freight sector (for time and cost savings) by *about 50%*' (RCA, 1987:6; emphasis in original).

This conclusion has been supported in a number of overseas studies. For example, a British study by Quarmby (1989) concluded that the benefits to commercial vehicles of road improvements could exceed the benefits of straight time savings by 30–50 per cent.

The policy direction here is clear: an efficient urban-road system can contribute towards national economic development, especially to the extent that it assists trade-exposed firms or sectors to become more competitive. Melbourne's Outer Ring Road, currently under construction, and the proposed southern and western bypasses of the central city, are purportedly directed towards achieving these benefits.

Road investment is the key infrastructure requirement for intra-urban freight. Rail, airport and seaport investment are important for inter-regional and international freight links.

Traffic operations. Delays experienced by trucks in traffic affect truck operating costs, either directly through wear and tear and lower truck utilisation, or indirectly through truck operators having to program their work to avoid periods of peak congestion. Congestion also leads to hidden costs, such as stress-related health problems for truck drivers (Plant Location International, 1983).

Many things can be done by traffic engineers to take better account of the needs of heavy vehicles in the traffic stream. Examples include traffic-signal settings, linked traffic signals, intersection design, access and egress provisions at freight generators, overhead and lateral clearances, and so on (Ogden, 1991b).

Although these tasks may seem prosaic and almost trivial, the fact is that at present trucks are often neglected in these design and operational decisions. Indeed, the greatest single area of payoff from a higher level of concern for urban freight activities is arguably in the traffic-management area. Often all that is required is to take explicit account of the needs of heavy vehicles in traffic design and operation.

Terminals and loading areas. The provision and use of truck terminals and loading areas, and access to such sites, are in many cases inadequate, leading to lengthy delays, double parking of trucks, potential for theft, and so on.

Developers typically see loading facilities as 'dead space', and aim to provide as little as possible. The attention given to layout and access is often minimal. For these reasons, it is probably inevitable that some form of public intervention, in the form of building or planning guidelines, is necessary to ensure that these facilities are provided. These should, however, be sensibly and consistently applied, and aim at ensuring that there is a sufficient number of loading spaces, that their design and layout permits efficient loading and unloading of goods, and that access to them is possible by the sorts of vehicle likely to service the building or site in question.

Safety. The size of trucks ensures that the consequences of collisions in which they are involved are serious. About 13 per cent of all urban fatal crashes involve trucks, and 95 per cent of these involve collisions with other vehicles or pedestrians.

Safety is a fundamental humanitarian concern, as well as an economic one. Improved safety performance of the road-freight sector involves action on the part of all participants: the industry, drivers, government agencies, etc.

Actions in the public sector include research (establishing the nature and characteristics of the problem), driver licensing, truck-design requirements (e.g. braking), road and traffic design, publicity and education (including that directed at car drivers), and enforcement.

There is evidence that trucks and other heavy vehicles have different crash patterns from cars, and that truck-related crashes should be treated differently. These factors need to be taken into account in road-safety programs.

Noise. A significant environmental effect of urban freight is truck noise. Although truck drivers may be exposed to some risk of loss of hearing ability, the more pressing issue is the annoyance caused to residents and pedestrians, especially at night and on routes that have a high proportion of trucks.

The noise emissions of light trucks, which comprise the majority of trucks on urban roads and streets, may not differ appreciably from that of automobiles. But medium and heavy trucks produce much greater noise levels and can cause a high, even excessive, level of overall traffic noise. These effects are greater in stop-start traffic, due to acceleration and braking, than in smoothly flowing traffic.

Noise problems can be tackled in several ways, each of which implies a particular policy response. For example, noise can be tackled at source (quieter trucks can be produced); this requires an engineering input, perhaps stimulated by regulation. Noise is lower in freely flowing traffic conditions, implying a need for better roads or upgraded traffic-control systems.

Emissions. Road vehicles emit several distinct types of pollutant. Each has its own set of deleterious effects, and each is produced under different conditions. However, the contribution of trucks to overall vehicle emissions is significant. For example, trucks in total have been estimated to contribute 16.8 per cent of

domestic greenhouse gases emitted by the transport sector in Australia (Bureau of Transport and Communication Economics, 1991). However, it also showed that, per tonne-kilometre of freight, articulated trucks produced only a fraction of the emissions of smaller trucks, and supported actions that would lead to the wider use of these more productive units.

Once again, emission production can be tackled in several ways, each with a concomitant policy position. A primary focus is upon the source (the vehicle and its fuel), which may be the result of design rules. Since emissions are reduced in freely flowing traffic conditions, traffic management (to keep vehicles moving freely) and road investment have important roles to play. Land-use planning, which influences the location of truck movements, is another influential factor. Selection of vehicle type is essentially an operator's task, but there may be a public-policy role through, for example, differential registration fees for different truck types.

Urban structure. Poor integration of land use and freight transport facilities imposes costs. Moreover, once installed, new urban development and related transport facilities usually remain in place for many years. Many of today's freight problems and inefficiencies stem directly from poor location and design decisions made in the past.

In a dynamic urban area, physical changes continually take place as the structure of the region responds to social, economic and technological change. Some of these changes that have a direct bearing on freight include the suburbanisation of residential, commercial and industrial activities; the development of regional shopping centres; the rapid rise in the economic importance of service industries; the relative use of road transport for line-haul freight (with typically suburban terminals) and sea or rail (located near the historical centre); and the tendency towards development of integrated 'parks' for industry, offices, and so on.

Conversely, industrial-location decisions affect freight flows. Land-use planning policy in Australian cities has been to separate different types of activity: residential, retailing, light industry, heavy industry, extractive industry, warehousing, etc. Whatever the environmental reasons for doing this, it is important to realise that the consequent separation of complementary industrial activities has the effect of building into cities the need for massive and sustained freight flows. Planning that aims to integrate rather than separate complementary activities may therefore have economic and environmental benefits.

Conclusion

Urban freight is important, and transport planning and policy should take serious account of urban-goods movement. This article has postulated the sorts of objectives that may be pursued, and very briefly suggested some ways in these may be achieved.

Progress in this area requires the active involvement of the private sector and public-sector agencies at all levels of government. A private freight firm is concerned with those factors over which it has some control; it does not have control over factors like traffic congestion and is not able itself to provide better public infrastructure. The firm either accepts congestion and the like as part of its operating environment, or it moves elsewhere. Provision of adequate infrastructure is thus a public-sector activity, and it is important that public officials accept the need to consider trucks and freight in their decisions. Some public officials display the unfortunate attitude that their role is to restrict what they see as a rapacious private sector, rather than to assist the private sector to provide jobs, goods and services to the community.

Moreover, the private sector does not and cannot take account of some of the broader components of what has been described as 'total social cost', such as regional structure, aspects of environmental impact, and so on. For these reasons, public-sector policy and planning are necessary both to contribute towards stated economic, transport and regional goals, and to ameliorate some of the undesirable consequences of urban goods movement.

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