

# Urban Goods Movement

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Prepared by

**PUBLIC TECHNOLOGY, INC.**  
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Secretariat  
to the

**URBAN CONSORTIUM  
FOR TECHNOLOGY INITIATIVES**



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## PREFACE

This is one of nine bulletins in the third series of Information Bulletins produced by the Transportation Task Force of the Urban Consortium for Technology Initiatives. Each bulletin in this series addresses a priority transportation need identified by member jurisdictions of the Urban Consortium. The bulletins are prepared for the Transportation Task Force by the staff of Public Technology, Inc.

Five newly-identified transportation needs are covered in the third series of Information Bulletins:

- Air Quality Regulation and Measurement
- Airport Access
- Mass Transportation Energy Conservation and Contingency Planning
- Non-Federal Street and Highway Financing.
- Pedestrian Movement

Four Information Bulletins covering needs identified in previous years, are being updated:

- Accelerated Implementation Procedures
- Coordination of Paratransit with Conventional Transit
- Neighborhood Traffic Controls
- Urban Goods Movement

The needs highlighted by Information Bulletins are selected in an annual process of needs identification used by the Urban Consortium. By focusing on the priority needs of member jurisdictions, the Consortium assures that resultant research and development efforts are responsive to local government problems.

Each bulletin provides a nontechnical overview, from the local government perspective, of issues and problems associated with each need. Current research efforts and approaches to the problem are identified. The bulletins are not an in-depth review of the state-of-the-art or the state-of-the-practice. Rather, they serve as an information base from which the Transportation Task Force selects topics that require a more substantial research effort.

The Information Bulletins are also useful to those, such as elected officials, for whom transportation is but one of many areas of concern.

The needs selection process used by the Urban Consortium is effective. Priority needs selections have been addressed by subsequent Transportation Task Force projects:

- A Manual for Planning and Implementing Priority Techniques for High Occupancy Vehicles (consisting of a Chief Executive's Report, Program Manager's Report, and Technical Guide) was developed to provide assistance to local governments in planning and implementing Preferential Treatment for buses and other high-occupancy vehicles.
- A National Conference on Transit Performance addressed the need for Transit System Productivity. The conference, held at Norfolk, Virginia, in September 1977, was attended by 200 government, industry, labor, and academic participants. As a follow-up to the Norfolk meeting, 5 Transit Actions regional meetings were held between January 1979 and May 1979. The product of these following meetings is a Transit Actions Workbook that features techniques currently being used to improve transit system performance and productivity.
- To facilitate the provision of Transportation for Elderly and Handicapped Persons, 6 documents were developed: one on local government approaches, a coordination guide, a planning checklist, an information sourcebook, a series of case studies, and a chief executive's summary.
- To help improve Center City Circulation two projects have been completed. A summary report on Center City Environment and Transportation: Local Government Solutions shows how seven cities used transportation and pedestrian improvements to help downtown revitalization. Another project, addressing the coordination of public transportation investments with real estate development, culminated in a national conference--The Joint

Development Marketplace, at Washington, D.C., in June 1978. The Marketplace was attended by over 600 persons, including exhibitors from 36 cities and counties and representatives of over 140 private development and financial organizations.

- Two documents relating to the need for Transportation Planning and Impact Forecasting Tools have been prepared: (1) A paper describing local transportation planning issues and concerns directed to the Urban Mass Transportation Administration and (2) A management-level document for local officials describing the tools available as a result of the Urban Mass Transportation research program and how these tools can be applied by local governments.
- To facilitate the dissemination of information on local experiences in Parking Management, a technical report describing the state-of-the-art is being prepared.
- A National Transit Pricing Forum was held at Virginia Beach, Virginia, in March 1979 to address the need for more information on Innovative Fares. Much of the Forum was directed to technical advances in areas of pricing research and practice. The proceedings of this conference are available.

Task Force information dissemination and technology sharing concerns are currently addressed by a series of SMD Briefs. These one-page reports provide up-to-date information about on-going UMTA Office of Service and Methods Demonstrations projects.

The support of the U.S. Department of Transportation's Technology Sharing Division in the Office of the Secretary, Federal Highway Administration, and Urban Mass Transportation Administration has been invaluable in the work of the Transportation Task Force of the Urban Consortium and the Public Technology, Inc. staff. The guidance offered by the Task Force members will continue to insure that the work of the staff will meet the urgent needs identified by members of the Urban Consortium for Technology Initiatives.

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## Chapter 1

### ISSUES AND PROBLEMS

Local officials are concerned about a wide and increasing array of problems associated with the movement of goods in urban areas. The purpose of this Information Bulletin is to point out the specific issues that most commonly concern these officials. It draws heavily upon, and replaces, an earlier Information Bulletin of the same title, dated February 1978, that provided a more general overview of the issues.

In discussions with traffic engineers, urban planners, and other local government officials, these problems are most often mentioned:

- Congestion of downtown streets and sidewalks due to on-street, over-the-sidewalk deliveries where off-street unloading facilities are not available.
- Adverse effects on residential neighborhoods when local streets are used for through-truck movements.
- Adverse effects on traffic flow generally in areas where industrial plants and truck terminals do not have adequate access to freeways and rail facilities.
- Damage to city streets because of the increasing weights of trucks.

Other problems of less common concern take on major significance in particular local situations. These include:

- Conflicts between freight and passenger movements particularly during peak hours.
- Safety hazards and traffic delays at rail-highway grade crossings.
- Economic effects of the increasing costs of drayage to and from truck terminals.
- Potential dangers in the movement of hazardous materials.

- Blighting effects on economic development of underutilized railroad and port facilities.
- Economic losses due to pilferage.<sup>1</sup>

In addition to these problems, significant environmental and energy effects are associated with urban goods movements, particularly with truck movements. For example, trucks are reported to account for more than one-half of the air and noise pollution in Manhattan.<sup>2</sup> In the Washington, D.C. area trucks account for 7.6% of the vehicle miles, while they consume 11.3% of the gasoline used.<sup>3</sup> Reductions in local truck mileage take on added importance because of these effects.

Although this Information Bulletin deals with the movement of goods, it is apparent that this is only one facet of the broader subject of urban transportation. The division of the Information Bulletin series into specific topics, reflecting priorities selected by the Urban Consortium's Transportation Task Force, should not obscure the need to treat the urban transportation system as a whole and to relate that system to other aspects of urban planning and development with which it has a reciprocal relationship.

#### URBAN GOODS MOVEMENT -- A DEFINITION

The U.S. Department of Transportation's 1973 Urban Goods Movement Task Force used this definition:

Urban Goods Movement is the transportation of, and terminal activities associated with, the movement of things as opposed to people in urban areas. It includes movement of things into and out of the area, through the area, as well as within the area by all modes, including transmission of electricity to the extent that it relates to transportation of fuels, pipeline movement of petroleum, water, and waste, the collection and movement of trash and mail, service truck movements not identified as person movements, and even some person trips which involve substantial goods movements such as shopping trips. Activities involving urban streets, waterways, railroads, terminals, loading docks, and internal

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1. It has been estimated that \$1 billion is lost annually in the U.S. from cargo theft.

2. Urban Goods Movement Task Force, Departmental Action Plan and Report to the Secretary, (Washington, D.C.: U.S. Department of Transportation, 1973).

3. U.S. Department of Transportation figures, 1976.

distribution systems including elevators and related facilities must all be considered in fostering greater efficiency in the movement of urban goods.

While this definition reflects considerably wider concerns than those of most local officials, it does point up the broad scope of the subject and the potential for problems to arise in particular sets of circumstances.

It is interesting, and somewhat startling, to learn that automobile shopping trips, not usually thought of under the heading of urban goods movement, actually account for more than 70% of the mileage involved in the movement of goods in urban areas.<sup>5</sup> The days when the butcher, the baker and the candlestick maker made house calls live mainly in the memories of those older persons who need them most.

#### MOVEMENT OF GOODS BY TRUCK

Leaving out those personal automobile trips, trucking is the predominant form of goods movement. In the early 1960's, a survey of freight movements in the New York Tri-State region, where water and rail facilities are used heavily, showed that trucks carried 73% of the total tonnage and accounted for 97% of the total transportation costs.<sup>6</sup>

Truck movements account for an increasing proportion of the traffic on urban streets. In the decade between 1960 and 1970, truck trips increased at a faster rate than automobile trips in urban areas. This trend continues.

The increase results principally from changes in distribution patterns:

- o Less-than-carload freight has shifted from rail to truck. At the same time truck terminals, once clustered in the central city, have been relocated to the suburban fringe, where more efficient facilities can be built on cheaper land that is more accessible to circumferential freeways. These changes, reinforcing each other, have increased substantially the length of trips required for drayage to and from long-haul terminals.

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4. Departmental Action Plan and Report to the Secretary, p. 1.

5. A.T. Kearney, Inc., A Primer on Urban Goods Movement, (Chicago, Illinois, 1976), p. 13.

6. Robert T. Wood, "Structure and Economics of Intra-Urban Goods Movement", Urban Commodity Flow, Special Report 120, (Washington, D.C.: Highway Research Board, 1971), p. 27.

- Trucks used for drayage and local deliveries are used less efficiently because of increasing demands for low-density, high-value consumer goods and for the more frequent delivery of smaller shipments. Pickup-and-delivery shipments now average less than 200 pounds.

Not surprisingly, goods movements within urban areas account for an increasing share of the national freight bill. In 1972, \$51 billion were spent for local trucking, while only \$42 billion were spent on inter-city truck shipments.<sup>7</sup>

This increase reflects both the increase in local truck mileage, to which reference has already been made, and costs occasioned by delays because of traffic congestion and inadequate loading and unloading facilities. These latter problems are particularly intense in older and large cities. For example, pickup and delivery charges for air freight in New York City are six times higher than in Norfolk, Virginia, three times higher than in Cleveland, and twice as much as in Sacramento. Two-thirds of the transportation costs of a typical small-goods movement between urban areas arise from its intracity movements.<sup>8</sup>

#### LOCAL ACTIONS AFFECTING TRUCKING

The most commonly considered technique for the relief of truck-induced congestion is the separation of trucks from other traffic.

Roughly one-half of the time used by trucks in a central business district is spent parked. Double-parked trucks making deliveries and those waiting on the street to get access to off-street facilities contribute critically to downtown congestion. The provision of adequate curb loading zones alleviates this problem to a degree, but at the cost of the curb lane for moving traffic or, alternatively, for customer parking. However, in combination with signal adjustment and a one way street system, the downtown street can conceivably handle more activity. Where sidewalk widths permit, pull-offs may be provided, but this is rarely possible in central business districts and, in any case, does nothing to eliminate conflicts between loading operations and pedestrians.

Off-street loading facilities are a partial alternative to the use of street space for this purpose. They are least effective where short-term parking is required for the delivery of mail, newspapers, small packages, and similar goods.

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7. Kearney, A Primer on Urban Goods Movement, p. 5.

8. Bob Redding, "Urban Goods Distribution: The Lifeblood of Our Cities," Handling and Shipping, February 1977, p. 55.

Legal requirements for off-street loading facilities are ordinarily placed in zoning codes. These requirements are effective when new construction is involved. They cannot be used to require loading facilities for buildings constructed before a code is adopted, except when material changes in land use are involved.

Storage-space requirements in zoning codes can serve to reduce the number of delivery trips that must be made in an urban area. However, the cost of providing such space and the desire of merchants to keep inventories at a low level must be considered, and this is not a practical solution when perishable goods are involved. Small shipments delivered to or picked up from a central parcel room serving a number of building tenants can reduce substantially the time required to perform local drayage services; trade-offs must be made between the loss of rental space, the provision of protective services, and making deliveries within the building.

A few cities are considering the construction of off-street loading facilities that serve more than one business. Dallas has built the first of a series of underground loading facilities in its central business district.<sup>9</sup> Houston has similar plans.

A more common approach to truck-induced congestion relies on the use of traffic regulations. Truck routes that restrict through trucks to specific streets and arterials and bypass areas of potential congestion are common to most large cities. Less common are streets or traffic lanes that are set aside for the exclusive use of trucks. New York City has restricted the use of automobiles on certain streets in the city's heavily congested Garment District.<sup>10</sup>

Other traffic regulations limit the times of day when trucks can use certain streets or make on-street pickups and deliveries. In Stockton, California, certain parking spaces in the CBD are designated as loading zones from 7 a.m. to 11:30 a.m. and parking zones from 11:30 a.m. to 6 p.m.<sup>11</sup>

These measures are only partially effective because some activities -- such as late mail pickups, newspaper deliveries, and emergency repairs -- cannot reasonably be restricted to off-peak periods.

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<sup>9</sup>. City of Dallas, Dallas CBD Goods Distribution Project, 1980 Update, 1980.

<sup>10</sup>. New York City Transportation Administration, Manhattan Garment Center Urban Goods Movement Study, Phase II Final Report, December 1979, DOT-05-30053.

<sup>11</sup>. Texas Transportation Institute, Urban Transportation for Goods and Services, June 1979.

Plans for more extensive time separations of street uses, including allocations of time for various kinds of deliveries are sometimes successful, for example in auto restricted zones and for major grocery and department stores. A high degree of private sector participation appears to be a prerequisite.<sup>12,13</sup> Evening goods deliveries were tried experimentally in London, but the test failed because many merchants could not afford to keep their stores open and staffed after shopping hours.<sup>14</sup> Similar difficulties, as well as the objections of truck operators and drivers, can be anticipated in U.S. cities in the absence of strong incentives, for example, reduced rates.

A consideration on streets carrying a significant amount of truck traffic is the timing of traffic signals. Signals are usually timed on the basis of automobile performance characteristics, which may not be appropriate for the smooth flow of truck traffic. This conflict is not susceptible to an easy solution, since trucks vary greatly in performance among themselves, and a solution which favors either automobiles or trucks may not provide effectively for the movement of local transit vehicles or pedestrians.

Some Transportation System Management techniques that can affect the movement of trucks are widening of streets, intersections, and medians to give trucks a greater area in which to turn; setback of street furniture (lights, signs, etc); adequate routing messages; and an increase in overpass clearances and maximum load limits.

#### TRUCKS IN RESIDENTIAL NEIGHBORHOODS<sup>15</sup>

Through trucks in residential areas are usually the result of inadequate alternative arterial routes. Truck traffic in residential neighborhoods is a safety hazard, damages streets designed for lighter vehicle loads, creates noise and fume nuisances, and is generally perceived as being incompatible with the residential character of a neighborhood.

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12. Robert J. Bonadonna, "Urban Distribution: Problems and Alternatives," and Robert Drake "Metropolitan Goods Movement As Seen By the Long-Haul Carrier," Metropolitan Goods Movement Symposium, p. 35-36, 38-40.

13. William J. Markham, "Urban Goods Movement Implications In the Design of Auto-Restricted Zones," Goods Transportation in Urban Areas, pp. 327-336.

14. J.D.C. Churchill, "Operation Moondrop: An Experiment in Out of Hours Goods Delivery," The Urban Movement of Goods, Proceedings of the Third Technology Assessment Review, (Organization for Economic Cooperation and Development, 1970), pp. 135-140.

15. Neighborhood traffic controls are considered in detail in another Information Bulletin in this series.



Restrictions on through truck movements may be difficult to enforce, particularly with respect to the types of vehicles (such as moving vans and package delivery trucks) that may have legitimate local destinations. The best answer to the problem is the provision of satisfactory truck routes.

#### TRUCKS CARRYING HAZARDOUS MATERIALS

Increasing public attention has been directed through news accounts and the reports of the National Transportation Safety Board, to the potential danger to human life and property involved in the transportation of hazardous materials. It is an emotional subject, and there have been discussions on banning such movement. Since there is an inherent risk in moving hazardous substances, in the interest of public safety some constraints are necessary. These constraints need to be realistic in economic as well as social terms. A study now underway at the University of Southern California is looking at risk analysis as a way to formulate regulations for the transportation of hazardous materials.<sup>16</sup>

More than 50% of all goods transported throughout the world are to some degree hazardous. The danger or hazard depends on the degree of toxicity, corrosiveness, explosive potential or flammability of the substance. The movement of such substances is not itself hazardous if (1) the vehicle is suitable, properly maintained and sensibly used, (2) the packaging arrangements are secure, and (3) the substance carried is not incompatible with its packaging and with other substances on the vehicle.<sup>17</sup> The hazard occurs when a spill of the substance is caused by a road accident or vehicle malfunction.

The local concern is primarily with local routing and training of fire, police and other city and county departments in the handling of situations which may arise accidentally from these shipments. A similar concern relates to rail transportation of these shipments. A major problem is that many cities do not even know when and what kind of hazardous materials are going through their city unless an accident occurs.

#### TRUCKS BATTER STREETS

Local street and highway budgets are strained by many factors. One factor of increasing significance in all cities, as truck weights increase nationally, is the damage done to local streets, arterials, and structures that were designed for substantially lighter loadings. This is in part a

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16. U.S. Department of Transportation. Research and Special Projects Administration - Materials Transportation Bureau.

17. Ashton, W.G., "Routing of Hazardous Substances by Road", Transport of Hazardous Materials, (The Institute of Civil Engineers, proceedings of the symposium held in London, December 15, 1977, p. 88).

regulatory issue involving the establishment of practical weight limits on local streets. In large measure, however, the solution lies in demonstrating to those who appropriate public funds the urgency of making funds available to upgrade existing street facilities which must be used by trucks that meet the legal limits applicable to intercity and interstate movements and which do not meet Interstate Commerce Commission Commercial Zone construction standards.

#### CONSOLIDATION OF LOCAL GOODS SHIPMENTS

A major objective in rationalizing urban goods movement is a reduction in the vehicle miles involved in the pickup and delivery of less-than-truckload shipments.

The consolidation of such shipments--the grouping of separate shipments to a single consignee or area--could reduce the number of vehicles and vehicle miles required to provide essential delivery services. This would aid in the solution of many of the problems discussed in this Information Bulletin and contribute directly to objectives of reducing fuel consumption and air pollution. Consolidation would also facilitate technological and managerial improvements, such as containerization, automated material handling, and centralized rating and billing.

A major study of freight consolidation was completed for the U.S. Department of Transportation in 1974.<sup>18</sup> The study explored the feasibility of a network of transportation centers that would provide facilities for pooling shipments, container interchange, transportation equipment pooling, and inland consolidation and break bulk of international air and marine containerization freight. Chicago was the focus of the study, and city officials have expressed interest in implementing the concept. Additional research is needed on new techniques for consolidating shipments.

The effectiveness of a consolidation plan depends upon local conditions and the attitudes of suppliers, carriers, consignees, and organized labor. The institutional barriers to such plans are substantial. Carriers view each other as competitors. They hesitate to surrender direct control of shipments for which they are legally responsible. Shippers and consignees do not want to give up control over the frequency and timing of pickups and deliveries. Much local service is now provided privately by the producer of the goods; the delivery truck serves as a mobile billboard, and the driver may perform sales functions.<sup>19</sup>

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18. The Ralph M. Parsons Co., A Study of the Transportation Center Facilitation Concept, prepared for the U.S. Department of Transportation (Washington, D.C.: 1974).

19. Proceedings of the Workshop on Urban Freight Consolidation sponsored by the U.S. Department of Transportation, Federal Energy Administration and University of Tennessee, CONF-760165, January 13-17, 1976.

That these barriers can be breached has been demonstrated in a few cases. In Richmond, Virginia, for example, local florists bring their shipments to a central point where they are redistributed among themselves for delivery in preassigned areas.

#### RAIL AND PORT FACILITIES

Many cities have extensive rail yard and terminal areas -- the heritage of the days of the dominance of rail transportation of both passengers and freight -- that are now underutilized or abandoned.

Local officials view these areas as potential sites for large-scale redevelopment, meeting an urgent need for vacant and easily-prepared land in or close to the central city and for an increase in the local economic and tax base.

Some proposals envision also the consolidation and modernization of the remaining rail facilities so as to increase the attractiveness and reduce the costs of rail freight transportation. Despite seeming advantages to the rail carriers, few have been willing to work together to achieve this goal. Labor agreements also interpose barriers to the effective consolidation of facilities.

In St. Louis, the Federal Railroad Administration, the Illinois Department of Transportation, and the 17 involved railroads are working to develop a project for restructuring the St. Louis Railroad Gateway Terminal with the objective of improving railroad efficiency and operation and enhancing the environment by freeing 800 acres of railroad riverfront property for alternative land use. The problem involves obtaining the support of all 17 railroads which are concerned about the financial impacts and maintaining their competitive position, and also obtaining the support of the public which is concerned about the sociological and environmental impacts. The cost for the total project is estimated at 1/2 billion dollars.

Rail-highway grade crossings that constitute safety hazards and are a source of major traffic delays have for many years been a problem to local officials. The difficulty is usually one of limited financial resources. The best solution--grade separation--is costly and, except for the most urgent situations, beyond local financial capabilities.

Buffalo has a rail problem that may be unique--major industrial tracts to which truck access is limited because of inadequate clearances under existing grade separations.

Active port facilities present major, but essentially localized, problems in providing adequate truck access and truck routes to replace now largely unused rail connections. Some port cities are concerned with the reuse for economic and recreational activities of waterfront facilities that are no longer required for the handling of marine cargoes.

The increase in intermodal container shipments has resulted in requirements at major ports for the modernization and expansion of related handling and storage facilities. Although this problem is more commonly faced by port authorities than by local government officials, its solution will affect local traffic patterns and land use.

#### ECONOMIC LOSSES DUE TO PILFERAGE

It is impossible to determine the total monetary loss resulting from pilferage and cargo theft. In addition to the direct financial loss of the goods, there are other hidden financial consequences involved such as higher prices, increased insurance premiums, delayed and/or lost sales, and lost business by the carriers, all of which are eventually paid for by the consumer.

Twenty-five percent of all thefts are pilferage of one case or less, 60% consist of a theft of more than one case but less than a full load, 10% consist of a major theft of full loads including hijacking. The remaining 5% is attributed to the burglar or shed/warehouse breaker.<sup>20</sup>

According to these figures, it can be conjectured that 85% of all goods stolen are taken by people who have authority to be present in the terminal area. This can range from petty thefts by terminal workers to truck drivers withholding part of the load to collusion between dockman and truck driver to sell part of the load.

#### INSTITUTIONAL ISSUES

Institutional issues have seriously hampered efforts to solve urban goods movement problems. Fragmentation pervades the goods transportation industry, and governmental responsibilities are distributed among many agencies and levels of government.

Most freight is moved by private industry, operating as common, contract, or private carriers. A multiplicity of firms engage in a wide range of operations, in which many different kinds of commodities are transported. Industrial, wholesale, and retail shippers and consignees have differing requirements that must be met. In many cases, delivery is but one of the functions of an integrated operation, such as the production and marketing of bakery goods. Such conditions limit the potential for the coordination and consolidation of operations that would improve the efficiency of urban goods movement.

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<sup>20</sup> U.S. Department of Transportation, Guidelines for the Physical Security of Cargo, (Washington, D.C.: U.S. DOT, Office of the Secretary, 1972), Preface pg. iii.

While firms with large truck fleets can use modern management techniques to improve efficiency and service, 98% of all urban fleets consist of less than 20 vehicles.<sup>21</sup> These small firms cannot afford sophisticated studies which might improve their performance, but which do not offset their costs.

Regulatory authority over urban goods movement is exercised by a number of Federal and State agencies. At the Federal level, these include the Interstate Commerce Commission, Federal Railroad Administration, Civil Aeronautics Board, and Federal Maritime Commission.<sup>22</sup> The structure of State regulatory agencies in many ways parallels that of the Federal government. States also have control over such aspects of truck movements as vehicle and driver licensing, size and weight restrictions, and operating speeds. In a number of States, legislatures responsive to labor demands have enacted full-crew and caboose laws.

Most regulatory agencies have functioned to maintain competition among carriers within their specific area or responsibility, but tend to protect their industry against outside competition. The effect of this, and of the lack of an integrated regulatory policy at Federal and State levels, has been to prevent the full realization of efficiencies made possible by improved technology.

Local governments may also have regulatory functions with respect to local carriers, and, through the police power, they control traffic and parking, issue licenses, and enact zoning codes which affect the location of freight facilities and the provision of off-street loading facilities. One problem, noted earlier, is that these functions and powers may be exercised without regard to the need to treat the urban transportation system as a whole and to relate that system to other aspects of community planning and development.

Finally, independent public and quasi-public agencies may be responsible for the development and operation of airport and seaport facilities without adequate provision having been made in authorizing legislation for coordination with other urban needs and activities.

Technological, organizational, and regulatory approaches to improving urban goods movement must take into consideration the complexities of the institutional setting if they are to be successful. Further study is needed to develop the appropriate roles of, and relationships among, the various private and public participants in urban goods movement.

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21. Kearney, A Primer on Urban Goods Movement, p. 9.

22. The effects of deregulation remain to be examined.

## DATA AND PLANNING NEEDS

Because of the critical situation which arose in connection with the provision of urban mass transportation services after World War II, and the need for direct governmental intervention to preserve and continue essential local transit services, considerable effort has been devoted at all levels of government to the development of planning techniques for the movement of persons. There has not been a comparable incentive to study and plan for the movement of goods within urban areas.

The lack of incentive and the fragmentation of governmental responsibility for goods movement are reflected in the absence of an integrated approach to a study of that subject. Studies have addressed goods movement broadly on a national scale, and considerable data are available on interregional and intercity movements. Little, however, is available on intracity goods movement. Particularly, there has been little attention given to, or even recognition of, the varying requirements of the many different kinds of goods movements that occur within urban areas and of the specific needs of shippers, consignees, and carriers.

The paucity of data regarding local urban goods movement affects long-range regional planning to improve goods movement efficiency. More importantly, at least from the standpoint of the local government official, it precludes the development of local solutions to specific problems in the context of the functioning of the whole urban transportation system.

For example, traffic volumes for planning purposes are usually determined by converting truck trips to numbers of automobile trips. While this approach may be adequate for determining levels of traffic flow, it may lead planners and others to disregard the specific operating characteristics of trucks on the street and delivery requirements of particular goods.

Short-range planning efforts require more knowledge about, and consideration of, urban goods movement. Requirement of shippers, consignees, and carriers must be taken into account in dealing with existing street problems and in the design of new shopping areas, redevelopment projects, airport and seaport facilities, and industrial areas. Loading and unloading needs and practices are as important considerations in street and project design as the size and turning radii of trucks.

More specific attention should be given to urban goods movement issues in Federal planning guides and the formulation of local Unified Transportation Work Programs. Much work needs to be done in developing and testing techniques which local officials can use in determining the magnitude and nature of their urban goods movement problems and devising specific solutions to them. In this regard, both the University of Tennessee and the Texas Transportation Institute have developed guides on transportation planning for urban goods movement.

## CHAPTER 2

### CURRENT PROGRAMS AND CONTACTS

#### CURRENT PROGRAMS

The U.S. Department of Transportation has taken a number of steps to incorporate urban goods movements in Transportation System Management (TSM). In addition to addressing freight issues in TSM workshops and training sessions, a number of publications dealing with TSM have addressed the freight component. In the Fall of 1979, the Federal Highway Administration (FHWA) and the Urban Mass Transportation Administration (UMTA) distributed to their field offices copies of Urban Transportation Planning for Goods and Services--A Reference Guide. This publication described the nature of urban trucking, suggested how to forecast truck trips, and proposed a number of short-range, low-cost alternatives to improve the efficiency of urban goods movements.

In November of 1979, the Secretary of Transportation directed that regional transportation planning include a component which addresses goods movement, particularly the link between rail and highways in port communities. Subsequently, FHWA and UMTA have requested that their regions and divisions work with the States and metropolitan areas to identify urban freight issues and existing or potential problems, both short-range and long-range.

UMTA, FHWA and the Research and Special Programs Administration (Transportation Systems Center) have undertaken work to incorporate goods movement into urban transportation systems planning.

#### CONTACTS

The following offices and individuals in the Department of Transportation are actively engaged in urban goods movements activities.

##### Federal Highway Administration

- Office of Highway Planning.  
Development of a manual on local planning for urban goods movement, emphasizing Transportation Systems Management strategies.

Contact: Gary Maring  
Chief, Transportation System  
Management Branch (HPP-32)  
400 7th Street, S.W.  
Washington, D.C. 20590  
202/426-0210

- Office of Policy and Programs.  
FHWA policy and resource material on urban goods movement.  
Contact: Bruce Barkley  
Chief, Policy Planning Division (HPP-20)  
400 7th Street, S.W.  
Washington, D.C. 20590  
202/426-0226
- Office of Research and Development.  
Projects dealing with curbside loading and unloading requirements  
and effects of curbside operations on traffic flows and evening  
deliveries.  
Contact: Paul Ross  
Highway Research Engineer  
Traffic Systems Division (HRS-31)  
400 7th Street, S.W.  
Washington, D.C. 20590  
703/557-5224

#### Office of the Secretary

- Office of Intermodal Transportation.  
Analysis of intermodal height transportation issues, freight demand  
forecasting methodologies.  
Contact: Carl Swerdloff  
Chief, Intermodal Studies  
Division (P-14)  
400 7th Street, S.W.  
Washington, D.C. 20590  
202/426-4163

#### Urban Mass Transportation Administration

- Office of the Associate Administrator for Planning, Management and  
Demonstrations.  
Coordination of urban goods movement activities within UMTA.  
Contact: Charles Hedges  
Special Assistant (UPM-2)  
400 7th Street, S.W.  
Washington, D.C. 20590  
202/426-2053



## Urban Mass Transportation Administration (cont'd)

- Office of Service and Methods Demonstration.  
Projects dealing with goods movement requirements of auto-restricted zones.  
Contact: Joseph Goodman  
Program Manager  
Conventional Transit  
Service Innovations (UMD-20)  
400 7th Street, S.W.  
Washington, D.C. 20590  
202/426-4984

## Federal Railroad Administration

- Office of State Assistance Programs.  
Information on urban rail relocation planning and demonstration projects.  
Contact: Garold Thomas  
Chief, State Planning Assistance  
Division (RFA-31)  
400 7th Street, S.W.  
Washington, D.C. 20590  
202/426-1567

## Research and Special Programs Administration

- Office of Facilitation.  
Research facilitation of urban freight movement, through use of consolidation and intermodal facilities (emphasis on intercity freight).  
Contact: William R. Myers  
Acting Director (DPB-40)  
400 7th Street, S.W.  
Washington, D.C. 20590  
202/426-4308
- Transportation Programs Bureau.  
Research and special programs in the areas of urban and regional freight terminals, pick-up and delivery systems, and freight transportation standardization.  
Contact: Jack Norris  
Chief, Transport Systems Division (DPB-43)  
400 7th Street, S.W.  
Washington, D.C. 20590  
202/426-4341

## Research and Special Programs Administration (cont'd)

- Transportation Systems Center.  
Research concerned with improving urban goods planning process.  
Contact: Howard Slavin  
Office of System Research and  
Analysis (DTS-24)  
Transportation Systems Center  
Kendall Square  
Cambridge, MA 02142  
617/494-2794

## National Highway Traffic Safety Administration

- Office of Automobile Fuel Economy Standards.  
Rules for fuel economy in motor vehicles, impacts of proposed  
changes in fuel economy standards and of alternative technologies.  
Contact: David Goette  
Light Truck Standards  
Division, (NRM-21)  
400 7th Street, S.W.  
Washington, D.C. 20590  
202/472-6902

## LOCAL AGENCIES

- City of Dallas  
Planning to facilitate CBD goods movement through local regulations  
and construction of underground freight loading and unloading  
facilities.  
Contact: Rodney Kelley  
Director, Office of Transportation  
City of Dallas  
1500 Marilla Street  
Dallas, TX 75201  
214/670-4025
- Dallas-Fort Worth Region  
Regional goods movement planning.  
Contact: William Barker  
Director of Transportation  
North Central Texas Council of Governments  
P.O. Drawer COG  
Arlington, TX  
817/640-3300

LOCAL AGENCIES (cont'd)

- New York City  
Projects to improve freight movement in the congested Manhattan  
Garment District.  
Contact: Eleanor Lippman  
Project Director  
New York City Department of Transportation  
51 Chambers Street, Room 1420  
New York, NY 10007
- San Francisco Bay Area  
Survey of goods movement issues in the San Francisco Bay Area and  
consideration of alternatives to improve freight distribution  
efficiency.  
Contact: Christopher Brittle  
Freight Program Manager  
Metropolitan Transportation Commission  
Hotel Claremont  
Berkeley, CA 94705  
415/849-3223



## CHAPTER 3

### ANNOTATED BIBLIOGRAPHY

Works included in this bibliography were selected to provide an overview of the various aspects of urban goods movement. A number of sources included in the Transportation Research Information Service (TRIS) network of the U.S. Department of Transportation are utilized, edited and supplemented by the staff of Public Technology, Inc. The A.T. Kearney study, listed below, contains an extensive bibliography with literature abstracts.

Bolger, Frances T. and H.W. Bruck. An Overview of Urban Goods Movement Projects and Data Sources. Prepared by the U.S. Department of Transportation. Cambridge, MA: Massachusetts Institute of Technology, 1973.

Documents problems in the study of urban goods movement. Section one reviews studies in the cities of Chicago, St. Louis, New York, San Francisco, and Baltimore; and section two presents information on national and state data sources. This report notes the lack of adequate methodology and data on which to base empirical studies of goods movement.

Button, Kenneth J. and Alan D. Pearman. The Economics of Urban Freight Transport. London: McMillan, 1980.

The authors have prepared a comprehensive study of the economics of urban freight transport. Separate chapters examine: the underlying theory of freight transport; the cost of urban freight movement; the demand for urban freight movement; optimizing urban freight movement-the operator; optimizing urban freight movement-society; and urban freight transport in the 1980s. The book is directed primarily at economists, planners, and managers, but should be of interest to all concerned with urban affairs.

Chatterjee, Arun et. al. "Goods Movement Planning for Small and Medium Size Urban Areas." Transportation Engineering. (November 1977).

Case studies of goods movement performed by the University of Tennessee in six small and medium size urban areas reveal a variety of possibilities for UGM improvements that can be made in short time for relatively little money.

Chatterjee, Arun et. al. "Short Range Planning for Urban Goods Movement." Traffic Quarterly, Volume 33, No. 3, July 1979, pp. 381-96.

An overview of urban goods movement problems and opportunities, with emphasis on selecting and implementing short-range, low-cost strategies for cities of less than 750,000 population, and incorporating such strategies into the Transportation System Management plan.

Coleman, William T. National Transportation Trends and Choices. Washington, D.C.: U.S. Department of Transportation, 1977.

This report includes sections which discuss urban freight costs, energy and environmental considerations from a national perspective, and provides a taxonomy to relate the causes and effects of specific urban goods movement problems. Local freight activity is forecasted to grow at approximately twice the rate of passenger activity during the period 1975-1990.

Crowley, Kenneth W. et al. State of the Art Review of Urban Freight Movement. Study performed for UMTA by Pennsylvania State University, 1980.

This report is a synthesis of published literature concerned with urban goods movement including a comprehensive bibliography and annotations of significant items.

Fisher, Gordon P. (Ed). Goods Transportation in Urban Areas, Proceedings of the Engineering Foundation Conference, 1973. Washington, D.C.: Federal Highway Administration, 1974.

Fisher, Gordon P. (Ed). Goods Transportation in Urban Areas, Proceedings of the Engineering Foundation Conference, 1975. Washington, D.C.: Federal Highway Administration, 1976.

Fisher, Gordon P. (Ed). Goods Transportation in Urban Areas, Proceedings of the Engineering Foundation Conference, 1977. Washington, D.C.: Federal Highway Administration, 1978.

These proceedings include resource papers dealing with all aspects of urban goods movement, case studies, and reports prepared by conference participants on specific goods movement issues. Included among the issues covered are urban goods movement planning; local, state, and Federal regulations; freight consolidation, terminal relocation; rail facilities; service vehicles, Transportation System Management, and the private sector.

Goette, David and Ernest R. Codotte. "Freight Movement: A Crucial Component of Transportation System Management." Transportation System Management. (Special Report 172). Washington, D.C.: Transportation Research Board, 1977, pp. 37-43.

Reviews the importance of efficient freight movement to the health of the urban economy and the need for incorporating urban goods movement considerations in the local planning process. Low capital, traffic engineering-oriented actions are recommended as a means of achieving significant short-term goods movement improvements.

Habib, Philip A. Curbside Pickup and Delivery Operations and Arterial Traffic Impacts. Washington, D.C.: U.S. DOT, 1980.

An analysis of curbside pickup and delivery operations based on studies of six cities with emphasis on characteristics of trips, parking, type of vehicle, the trip generator, and impacts of truck double-parking on traffic flow. Includes methodology to predict demand for truck trips on curb space, and analyzes traffic engineering strategies to improve levels of service on streets where curbside operations occur.

Hassell, B.B. "Control of Goods Vehicle Movements in Urban Areas - The London Experience." ITE Journal Vol. 48 No. 12, December, 1978, pp. 31-36.

Describes a variety of different controls on the activity of road freight vehicles which have been implemented or proposed over the past 10 years. Also describes the problems for which the controls were developed.

Hedges, Charles A. "Urban Goods Movement: An Overview." Proceedings of the Twelfth Annual Meeting of the Transportation Research Forum, 1971. pp. 69-98.

Overview and summary of state of the art of urban goods movement, including synopsis of Conference on Urban Commodity Flow (Highway Research Board Special Report 120). Uses economics frameworks to define the service and the problem and to recommend changes in transportation and in government programs.

Hedges, Charles A. "Transportation System Management: The Freight Component." Goods Transportation in Urban Areas, Proceedings of the Engineering Foundation Conference, 1977. Gordon P. Fisher, Editor, 1978, pp. 227-249.

This paper argues that if Transportation System Management (TSM) is to be effective, it must consider the interactions between the movement of people and freight, and that TSM should include a freight component. Summarizes the goal of TSM, the similarities and differences between goods and people movements and recommends law to incorporate urban goods movement into TSM.

Highway Research Board, Highway Research Board Special Report 120. "Urban Commodity Flow," Washington, D.C.: Highway Research Board, 1971.

This is a collection of papers defining the problems, trends, policy issues and research needs in areas of urban goods movement.

- A.T. Kearney, Inc. A Primer on Urban Goods Movement - Summary Report. Prepared for the Urban Mass Transportation Administration, U.S. Department of Transportation, Washington, D.C.: A.T. Kearney, Inc., 1976.

This report provides a quick, basic understanding of the characteristics and impacts on the community of urban goods movement. In reference to a demonstration project design developed by the same company, it defines opportunities for the improvement of urban goods movement as well as recommendations for action.

- A.T. Kearney, Inc. Urban Goods Movement Demonstration Project Design, Final Report, Phase I and II. Prepared for the Urban Mass Transportation Administration, Washington, D.C.: U.S. Department of Transportation, 1975. (NTIS PB 249 319).

Although the title is misleading, this report documents a comprehensive study of urban goods movement problems, and potential short and long range solutions. Many statistics are provided regarding the relative magnitude of urban goods movement in terms of cost, traffic congestion, energy consumption, air and noise pollution, and land use. Appendix B includes an extensive annotated bibliography.

- A.T. Kearney, Inc. Measuring Productivity in Physical Distribution - A \$40 Billion Gold Mine. Prepared for the National Council of Physical Distribution Management.

This study focuses on improving the physical distribution of goods. It details techniques for measuring physical distribution productivity and includes a textbook outlining productivity measurement programs and ideas for improving productivity in physical distribution.

- A.T. Kearney, Inc. Card Perspective. Chicago, Illinois.

This is a quarterly publication from Kearney Management Consultants devoted to local goods transportation.

- N.D. Lea and Associates, Ltd. Urban Goods Movement Report Series in 10 volumes. Prepared for the Urban Transportation Research Branch of Canadian Surface Transportation Administration Transport Canada. Montreal, Quebec: 1972 Reprinted 1978.

These ten volumes constitute an exhaustive study of urban goods flow within Canadian cities. The titles of the individual works are: Urban Goods Movement Reserch - A Framework and Results vol. 1, Urban Goods Movement in Canadian Cities vol. 2, A Profile of Urban Goods Flow in Calgary vol. 3, Myths and Realities of Urban Pick Up and Delivery Operations vol. 4, Evaluation of Urban Trucking Rationalization in Vancouver vol. 5, Potential Energy Conservation in Urban Commodity Flow vol. 6, Study of Off Street Urban Trucking Endjoint Facilities vol. 7, Consolidated Building Receiver Demonstration vol. 8, and A Framework of UGM Information in Canada vol. 9 and the Economics of Urban Goods Movement, vol. 10.



Markham, William J. "Urban Goods Movement Implications in the Design of Auto-Restricted Zones." Goods Transportation in Urban Areas, Proceedings of the Engineering Foundation Conference, 1977. Gordon P. Fisher, Editor, 1978 pp. 327-336.

Design of an auto-restricted zone (ARZ) in a downtown area with emphasis on goods movement coordination is illustrated by a case study focused on downtown Boston.

Metropolitan Washington Council of Governments. Goods Movement in the Washington Area. (Information Report No. 61). Washington, D.C.: 1976.

Reviews projections for truck operations in the region from 1978 to 1992 and the impact of increased truck movements on air quality. The feasibility of various approaches to facilitating goods movement or improving goods movement efficiency--including Transportation System Management measures and the consolidation of freight operations--are explored.

National Transportation Policy Study Commission (Bud Shuster Chairman). National Transportation Policies through the Year 2000: Final Report, 1979.

Identifies urban freight as one of the least studied transportation activities. Distinguishes between different components of truck operations in urban areas. Forecasts increases in urban truck miles to 1990 according to high, medium and low growth scenarios, and predicts impacts on traffic and environment are understated by growth estimates because of decreasing urban densities and the nature of urban trucking operations.

NATO Committee on the Challenge of Modern Society. Urban Goods Movement, CCMS Report No. 86. Brussels: NATO, June 1978.

This report examines problems created by the movement of freight in urban areas with emphasis on less-than-truckload shipments. The following topics were examined: traffic problems; technical problems; freight terminals; planning, regulation, and commercial use; and demonstration of new projects. This report was prepared by representatives from the U.S.A., the United Kingdom, and France.

New York City Department of Transportation. Manhattan Garment Center Urban Goods Movement Study--Phase I, Final Report. New York: 1976.

The New York City Garment District experiences the most severe truck-induced street congestion found anywhere in the U.S. This report presents and analyzes data on goods movement in the garment district and discusses the development and implementation of elements in a short-range improvement program. Actions discussed include passenger vehicle bans, creation of turning lanes, restrictions on pedestrian crossings, reduction in truck parking duration, and curb cuts.

New York City Department of Transportation. Manhattan Garment Center Urban Goods Movement Study--Phase II. New York: 1979.

The Phase II report assesses the results of the short-range strategies implemented as a result of Phase I; assesses the long-term market for the Garment Center; develops a number of long-range proposals (including both Transportation System Management and technological changes); estimates environmental impacts; and considers applicability to other urban areas.

Organization for Economic Cooperation and Development. The Urban Movement of Goods: Proceedings of the Third Technology Assessment Review. Paris: 1970.

The problem of urban goods movement is reviewed in relation to generation of traffic by retail, wholesale and industrial establishments; truck movement in urban areas; and the long-term evolution of short-distance goods transport. Possible courses of action in the field of traffic management, such as operation moondrop, (an experiment in out-of-hours goods delivery) are suggested. The feasibility of a number of technological innovations in goods distribution is also discussed. The objectives in planning the transport of urban goods in future years are considered in relation to urban planning.

Organization for Economic Cooperation and Development, Management of Urban Freight Distribution. Paris: OECD, 1980.

This report is a survey of urban goods movement problems, planning techniques, regulations, traffic engineering and other strategies in OECD countries. The particular priorities of each of the countries (i.e., traffic congestion versus environmental) is emphasized.

Pignataro, Louis J., editor. Proceedings of the Metropolitan Goods Movement Symposium. March 27-28, 1972, sponsored by UMTA, Polytechnic Institute of New York, 1972.

Proceedings of a conference of members of the trucking industry, shippers and receivers from a number of industries, government, labor institutions, and members of the academic and planning professions. It includes clear statements of different perceptions of the problem and assessments of alternative policies.

The Ralph M. Parsons Company. A Study of the Transportation Facilitation Center Concept. Prepared for the U.S. Department of Transportation. Washington, D.C.: U.S. Department of Transportation, 1974. (NTIS PB 236 593).

This study evaluates a concept for the pickup and delivery of small shipments in the urban area, utilizing centralized consolidation terminal facilities. Potential advantages include better pickup and delivery services, lowered costs, and reduced vehicle requirements. Questions of legal, institutional, and economic feasibility are explored.

Roberts, Paul O. Seeking Policies for the Improvement of Goods Movement in the Dallas-Fort Worth Area. Cambridge Systematics, Inc., 1976.

This report discusses urban goods movement in the Dallas-Fort Worth area. It defines the parties involved, problems, opportunities and the role of local government and its importance in initiating reform. Upon this framework a strategy was developed for addressing the issues and a plan of action was laid out. The appendices include a plan for data collection and a structure for an urban and interregional goods movement model.

Robeson, J.F. and E.R. Cadotte. An Analysis of the Economic Costs of Constructing and Operating an Urban Goods Consolidation Terminal -- Part 2. Columbus, Ohio: Ohio State University, 1974. (NTIS PB 239 354).

The primary purpose of this study was to estimate the cost of an urban goods small shipment consolidation terminal for Columbus, Ohio. These costs are compared against the potential economic and social benefits which would be realized by the adoption of the consolidation terminal concept for the pickup and delivery of small shipments in the Columbus CBD. More specifically, the study deals with (1) the investment requirements for the initial structure of the terminal and its materials handling systems; (2) the timing and size of future investments in the terminal structure and/or materials handling system; and (3) the terminal operating expenses throughout the terminal planning horizon.

Shuster, Allen D. "The Urban Freight Consolidation Terminal Concept: An Appraisal." Traffic Quarterly (July 1978).

Double-parking trucks, engaged in pickup and delivery of freight shipments, impede traffic flow in the business districts of many cities. This article examines the concept of the urban freight consolidation terminal, a proposal to reduce vehicular congestion and the costs of providing freight transportation services in densely populated areas. It looks at the economic feasibility of implementing the concept in various size metropolitan areas, and cites prior studies by Dennis McDermott and Ralph Parsons Company. It finds that the consolidation terminal is economically and socially beneficial, and recommends that public policymakers should encourage the formation of these terminals in major metropolitan areas. Future research on the consolidation terminal concept is recommended.

Wilbur Smith and Associates. Motor Truck in Metropolis. New Haven: Automobile Manufacturers Association, 1969.

Reports the results of an in-depth study of the operation of the motor truck in the urban society. The report focuses on the use of the truck--its movements, relation to land use, and other pertinent facts about trucks and their operations as a part of the total urban transport system.

Stanford Research Institute. Urban Railroad Relocation: Nature and Magnitude of the Problem and Planning for Remedial Action. Prepared for the U.S. Department of Transportation. Washington, D.C.: U.S. Department of Transportation, 1975. (NTIS PB 248 164).

Reports significant findings and recommendations of a project to analyze the nationwide magnitude and nature of urban railroad relocation. Problems identified include travel delays at grade crossings, safety hazards, community barriers, environmental degradation, incompatible land use, and reduced railroad efficiency. Recommends Federal financial assistance and incentives to help meet the high cost of individual projects where substantial benefits are possible. Volume 3 of the study is a guide for local planning officials.

Talmers, Lydia, and Michael Meyer. "Urban Freight Movement in a Changing Policy and Planning Environment". Proceedings, Eighteenth Annual Meeting Transportation Research Forum, 1977, pp. 604-610.

This paper identifies different concepts of efficiency found in recent Federal transportation programs, and stresses the importance of making explicit the concept which is emphasized in different types of investigations, i.e., vehicle flows versus economic activity and traffic networks versus the economic sector (including private as well as public goods). It suggests that a performance index is necessary in order to make the different types and levels of analyses consistent.

Texas Transportation Institute. Dallas CBD Goods Distribution Project, Final Report. Prepared for the City of Dallas and Dallas Central Business District Association. Dallas: Texas A & M University, 1974.

Documents a study of the problems associated with delivery of goods and services in the central business district of a major city. Emphasizes the identification and evaluation of alternative solutions with the goal of better services, lowered costs, reduced congestion, and reduction of conflict between trucking and mass transit operations and pedestrian traffic.

Texas Transportation Institute. Urban Transportation Planning for Goods and Services. Prepared for the Federal Highway Administration. Washington, D.C.: U.S. Department of Transportation, June 1979.

Documents data, techniques, and methodologies that can be used by traffic engineers and planners to identify the nature of urban trucking problems and to evaluate alternative problem solutions.

Transport and Road Research Laboratory. Lorries and the World We Live In. London: Her Majesty's Stationery Office, 1973.

The publication reports on the work of a group representing industry, commerce and local government which was set up to examine how the road haulage industry can help solve environmental problems associated with the distribution of goods by road. The group considers that road haulage must continue to be the major element in freight distribution in the U.K. Environmental improvement is expected through provision of adequate roads and traffic management schemes; a comprehensive road program is seen to be the critical factor, especially in relation to ports, terminals and urban congestion. Experiments to study the role of transshipment centers are planned; other suggested experiments include night delivery schemes, composite warehousing and nominated day deliveries.

Transportation Research Board. Urban Goods Movement. Transportation Research Record 496. Washington, D.C.: Transportation Research Board, 1974.

Contains twelve research papers prepared for the fifty-second and fifty-third annual meetings of the Transportation Research Board. Subjects covered include estimation of urban goods movement demand, data needs for urban goods movement analysis, the role of regional planning, warehouse location, and terminal consolidation.

U.S. Department of Transportation. Urban Transportation Planning for Goods and Services: A Reference Guide. Washington, D.C.: U.S. DOT, 1979.

This report describes the nature of urban trucking and problems associated with goods movement in cities. It suggests how to forecast truck trips and how to involve the private sector in goods movement planning; outlines a number of Transportation System Management strategies; suggests long-range capital intensive improvements; and contains a number of specific examples and data collection forms.

United States Urban Goods Movement Task Force. Departmental Action Plan and Report to the Secretary. Washington, D.C.: U.S. Department of Transportation, 1973.

An Urban Goods Movement Task Force was established within the U.S. Department of Transportation by former Secretary Volpe in 1972. Particularly useful in this document prepared by the Task Force is the "Report to the Secretary," which provides an overview of urban goods movement from a Federal perspective, and describes associated problems and related Department of Transportation activities.

Alan M. Voorhees and Associates. Auto Restricted Zone/Multi-Use Vehicle Systems Study. Prepared for UMTA, Washington, D.C.: U.S. DOT, 1977.

The study examined the ARZ from the perspective of the pedestrian, the automobile, transit, business environment, and goods movement. Demonstrations were proposed for five cities: Boston, Burlington, Memphis, Providence, and Tucson. The goods movement component of the ARZ was examined in Volume III and in a separate technical appendix prepared for each city.

Watson, Peter L. comp. An Annotated Bibliography on Urban Goods Movement. Evanston, IL, Northwestern University, Transportation Center, 1972.

This annotated bibliography of monographs, government reports and journal articles covers the period from 1955-1972. The abstracts are highly evaluative and of moderate length. A detailed subject index is included.

Watson, Peter L. Urban Goods Movement: A Disaggregate Approach. Lexington, MA: Lexington Books, 1975.

This book surveys the difficult and complex problems urban goods movement presents and develops modeling techniques that allow for better planning in this area. The conclusion is that UGM data can be collected, models built, and predictions made. The disaggregate analysis technique is recommended. Although specific modeling techniques are described, the author says they are not yet ready for direct application.

Wood, Robert T. "Structure and Economics of Intra-Urban Goods Movement." Urban Commodity Flow. (Special Report 120). Washington, D.C.: Highway Research Board, 1971. pp. 22-37.

This presentation, based on urban freight studies in the New York City Tri-State region, provides an excellent introduction to the economics of urban goods movement and to the complexity of goods movement operations. The paper emphasizes those factors that have contributed to a loss in efficiency in intra-regional goods distribution at the same time efficiency has improved somewhat for intercity goods transportation.




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