

Summary:

Freight transport in cities

Market segments, structure and trends in development

Background

Norwegian research has only to a small extent dealt with freight transport markets in cities. As a consequence, knowledge about logistics and freight transport operation is limited compared to passenger transport.

A major challenge for larger cities is how to organise the traffic. Capacity problems lead to conflicts between traffic categories, and this may in future lead to restrictions or priority schemes. Increased knowledge about freight transport will therefore contribute to area planning and better interaction between the city, trade and industry and the transport companies.

Oslo, Trondheim, Tromsø and Larvik were chosen for this study in order to compare cities of different sizes and characteristics. All 4 cities are important sea ports in Norway.

Trends in development

While the theoretical interest for *transport* to a large extent has been focused on the movement of people, *logistics* has been focused on freight and the movement of goods. The responsibility for implementing major transport and traffic solutions has been regarded as a *public* matter, while logistics has been left to the *private* sector. The two subject areas have different origins, and have up till now remained in two different worlds. But nowadays some overlapping of transport and logistics thinking seems to develop.

Logistics has a central position in companies influencing the freight transport solutions. A mutual influence of theoretical logistic development on one side and the current changes of practical freight development world wide caused by external conditions on the other side is taking place. In cities goods deliveries have to follow environmental requirements. Operation ideas as “just-in-time” puts new requirements to transport. An increasing number of activities along a process chain seem to be integrated in the logistic function. Logistics has become a success factor in companies. Logistics and market considerations very much put their focus on *globalisation, customer service and outsourcing*.

This report refers to an impressive number of projects going on in European cities in order to find better solution on the city freight challenge. Strong motivating

forces in these processes are environmental considerations, new trends in industrial logistics, and at last reduced street capacity due to increasing car traffic.

Experience from the project Urban Goods Transport (European Commission, 1997) confirms that cities have special characteristics which require tailor made transport solutions.

A common feature in all European research for improved solutions is a desire for efficient transport, to consolidate freight and to use low pollution vehicles.

Case studies

Case studies of 5 large Norwegian companies illustrate how different solutions for city distribution are chosen for different products, and show to a certain extent trends in development with regards to the logistics and transport solutions. The solution for one of these is an example of what globalisation may bring; where the goods is brought to the Norwegian stores directly from a European “hub”/logistic centre, and in addition European transport operators are used rather than the local Norwegian distributor.

The market segments

Sizes and market share

The freight market was in this study divided into market segment, and via various information sources the size of each segment was estimated. For Oslo the total freight transport market as defined as “city transport” is estimated to 5,9 bill. NOK of which transport hire (opposed to own transport) is in the order of 4,5- 5,0 bill. NOK. In addition there is the long distance (inland/abroad) transport and international express/air freight. In Trondheim the city freight transport market is estimated to about 705 million NOK, of which transport hire is 440-460 million NOK. In Tromsø the city freight transport market is estimated to 240 million NOK of which hire is roughly 150 million NOK, and in Larvik the city transport market is estimated to 150 mill.NOK of which hired transport is about 130 mill. NOK.

Table S.1. shows market shares of the typical “city segments” (transport within the cities), while table S.2. includes long distance transport inland/abroad with connections to these cities, plus international express goods and air freight.

From table S.1. following conclusions are drawn;

- In Oslo “Other part-load traffic” is the dominating market segment (30% of the total), while this segment has decreasing importance with reduced city sizes (Trondheim 21%, Tromsø 14% and Larvik 12%).
- The sum of all other transport not related to any specified segment in this study, “Various transports”, has the largest market share in the smallest city (Larvik 48%) and the smallest market share in Oslo (17%).
- “Gravel, sand, stone” and “Consumer goods distribution” is both about 14% of the total in Oslo. In Larvik “gravel, sand, stone” is the number two segment (15%), this is also the case in Trondheim (21%). In Tromsø this segment is the largest (29%).

- “Consumer goods distribution” in Larvik, Tromsø and Trondheim is 5%, 10% and 8% respectively, which probably reflect the fact that part of the consumer goods is not locally distributed but delivered directly to the stores, long distance from wholesalers in the Oslo region. In Oslo the “consumer goods distribution” segment is 14% of the so-called “city segments”.
- “Parcels and light goods” has large market shares in all 4 cities, largest in Tromsø (14%).

Tabell S.1. “City segments” (sum of hire and own transport). Estimated turnover in mill NOK 1999.

”City segments ”	Total market mill NOK, hire and own transport (%)							
	Oslo	%	Trondheim	%	Tromsø	%	Larvik	%
Parcels and light goods	610,0	(10,3)	57,5	(8,2)	32,5	(13,6)	9,5	(6,5)
Distr. air freight and int.express	79,0	(1,3)	7,5	(1,1)	0,3	(0,1)	0,05	(-)
Local delivery service	263,0	(4,6)	48,0	(6,8)	7,0	(2,9)	6,3	(4,3)
Consumer goods delivery	800,0	(13,6)	52,5	(7,5)	24,5	(10,3)	7,3	(5,0)
Other part load distribution	1760,0	(29,8)	145,0	(20,6)	32,5	(13,7)	17,2	(11,7)
Batch load/full load	188,0	(3,2)	37,5	(5,3)	1,5	(0,6)	5,0	(3,4)
Bulk, dry and wet	388,0	(6,6)	13,5	(1,9)	7,0	(2,9)	9,0	(6,1)
Gravel, sand, stone	833,0	(14,1)	145,0	(20,6)	68,0	(28,5)	22,5	(15,3)
Various transport	980,0	(16,6)	198,0	(28,1)	65,0	(27,3)	70,0	(47,7)
Sum “city segments”	5901,0	(100,1)	704,5	(100,1)	238,3	(99,9)	146,9	(100,0)

As a total the hired transport (as opposed to own) dominates in all cities. Largest share of the total has hired transport in Larvik (87%) and Oslo (73%). Trondheim and Tromsø have hired transport operators in the order of 63-64% of the total. As table S1 shows there are large variations between the market segments.

Table S2. Market segments for freight transport in 4 Norwegian towns. Estimated turnover in mill.NOK, 1999.

Segment		Oslo		Trondheim		Tromsø		Larvik	
		Mill.kr	Andel	Mill.kr	Andel	Mill.kr	Andel	Mill.kr	Andel
Parcels and light goods	Leie	550,0	90%	48,5	85%	32,5	100%	9,0	95%
	Egen	60,0	10%	9,0	15%	0	0%	0,5	5%
	Totalt	610,0	100%	57,5	100%	32,5	100%	9,5	100%
Distri. air fr. and int. express	Leie	75,0	95%	7,1	95%	0,3	-	0,05	-
	Egen	4,0	5%	0,4	5%	-	-	-	-
	Totalt	79,0	100%	7,5	100%	0,3	100%	0,05	100%
Local delivery service	Leie	250,0	95%	44,4	92,5%	6,5	92,5%	6,0	95%
	Egen	13,0	5%	3,6	7,5%	0,5	7,5%	0,3	5%
	Totalt	263,0	100%	48,0	100%	7,0	100%	6,3	100%
Consumer goods delivery	Leie	500,0	62,5%	9,5	18%	11,0	45%	5,0	70%
	Egen	300,0	37,5%	43,0	82%	13,5	55%	2,3	30%
	Totalt	800,0	100%	52,5	100%	24,5	100%	7,3	100%
Other part load distri.	Leie	1100,0	62,5%	127,0	87,5%	30,0	92,5%	12,0	70%
	Egen	660,0	37,5%	18,0	12,5%	2,5	7,5%	5,2	30%
	Totalt	1760,0	100%	145,0	100%	32,5	100%	17,2	100%
Batch load/full load	Leie	150,0	80%	37,5	100%	1,5	100%	5,0	100%
	Egen	38,0	20%	0	0%	0	0%	0	0%
	Totalt	188,0	100%	37,5	100%	1,5	100%	5,0	100%
Bulk; dry and wet	Leie	350,0	90%	11,7	87%	5,6	80%	9,0	100%
	Egen	38,0	10%	1,8	13%	1,4	20%	0	0%
	Totalt	388,0	100%	13,5	100%	7,0	100%	9,0	100%
Gravel, sand, stone	Leie	750,0	90%	58,0	40%	39,0	57,5%	22,0	97,5%
	Egen	83,0	10%	87,0	60%	29,0	42,5%	0,5	2,5%
	Totalt	833,0	100%	145,0	100%	68,0	100%	22,5	100%
Various transport	Leie	600,0	61%	104,0	53%	25,0	38%	60,0	86%
	Egen	380,0	39%	94,0	47%	40,0	62%	10,0	14%
	Totalt	980,0	100%	198,0	100%	65,0	100%	70,0	100%
City transport total	Leie	4325,0	73%	447,7	63,5%	151,4	63%	128,1	87%
	Egen	1576,0	27%	257,1	36,5%	86,9	37%	18,8	14%
	Sum	5901	100%	704,8	100%	238,3	100%	146,9	100%
Long dist. inland/abroad	Leie	3075,0	90%	630,0	95%	203,0	90%	120,0	100%
	Egen	345,0	10%	33,0	5%	22,0	10%	0	0%
	Totalt	3420,0	100%	663,0	100%	225,0	100%	120,0	100%
Intn.express	Totalt	1200,0	100%	30,0	100%	5,0	100%	1,0	100%

Source: Own survey

Distribution channels and freight terminals

This study has discussed the need for freight terminals in the city, considering the distribution channels for each segment. Increased globalisation and with

international companies, as the consumer goods markets, will lead to an increase in direct distribution from Europe to the Norwegian stores. To some extent this will also be the case in the parcel transport market as a result of internet trade. The conclusion is that freight terminals will remain as important elements also in the future logistic systems, since at some point consolidation or reloading of goods will be necessary in 6 of the 10 market segments that we have discussed.

The report discusses 4 types of distribution channels for part load distribution in cities;

- *Type 1: Direct transport between producer and end user.* Typical examples are found within the local delivery service and express markets.
- *Type 2: Use of central warehouse / hub as an intermediate link on the way from producer to end user.* Typical examples could be parcels and capital goods.
- *Type 3: Use of both central warehouse /hub and retail shop between producer and end user.* Consumer goods are often distributed in this way.
- *Type 4: Distribution to retail shops directly from producer.* Examples of this type of distribution are found within the fresh food (fish, meat, green grocery) market, plus within the batch load /full load markets such as distribution of heavy goods (beer, soft drinks, etc).

Part load vehicle use and part load transport characteristics

The number of freight vehicles operating within the city would be interesting information, as well from a town and traffic planner's point of view as from trade /industry and transport operators. Calculations show that there is in the order of 4500 goods vehicles operating in Oslo for various part-load traffic, including 5 of the listed market segments. In *addition* there are a number of vehicles in the other segments, plus all the smaller vehicles represented goods movement by craftsmen, plumbers, TV-repairs , etc.

Table S.3. Key figures for part load transport in cities.

Part load sizes:	Parcels: 7-10 kg, Light goods 70-75 kg, Various part load 120-400 kg.
Number of packages per consignment:	Parcels: 1-1,5 , Light goods 2,5-3 , Various part load 3.
Consignments per vehicle:	Depends on weight, in the area 30-60, normally ca.40.
Load per vehicle:	Parcels/light goods <3, 5 tons, Various part load 3,5-7,5 tons, Heavy load 7,5 –16 tons.

Source: Own survey

Challenges and suggested further studies

This report summarises first the challenges stated through interviews by leading transport operators, narrated to the following points.

Authorities and public framework for transport operation

A general view among transport operators is that public authorities are not well enough updated on the current transport developments. Somebody puts it strongly; “our authorities has little understanding of real life”, where one reason being a lacking co-operation between the transport business and the authorities.

The market

The driving force behind the development in the market segments is complex. In some segments the development is decided by the chain stores. The transport operators realise that they have to communicate better with these to be able to strengthen their position.

The transport operators see possible new markets within the public sector, where there are “own “ transport today. Other markets of main interest are the growing post order and internet trade markets.

Operations and organising

Operation round the clock will depend much on the customer. In some businesses timing of the good operation is the most important factor, since industrial production will halt if transport operation fails. The ongoing centralising in Europe increases the pressure on time. Long distance transport will often take place over night, while distribution of parcel and part-load during day-time. Time limits on delivery will increase in the cities, particularly in the inner city centre.

Improved economy for the operators will depend much on vehicle utilisation. Outsourcing and the use of freight hotels will increase.

Operators believe that in the near future improved freight consolidation will be enforced by the authorities. Some operators believe there is less need for freight terminals in the city centre; while others regard the establishing of terminal close to the airport as vital.

One leading operator believes that a “company neutral” freight terminal near the city will lead to more environmental friendly transport.

Internet trade

In general operators have more questions than answers about internet trade. Will private deliveries mean evening deliveries, will operators be forced into different delivery pattern etc? Regardless answers to these questions, most operators believe that they will benefit on the internet trade and that internet trade will create new transport markets.

Environment

Environmental challenges will put new requirements on the transport operators, and some of the operators fear added cost as a result. For some operators public

environmental certification is one important step to improve themselves in this area.

Improved statistics on freight transport

This project has demonstrated the shortcomings of Norwegian statistics on freight transport. The need for strong improvements on the freight transport statistics is expressed by all participants of the reference group, transport business organisations, trade and industry and city transport planning departments.

Areas for further research

Along the project several new questions were raised, but not answered in this connection. These are listed below as *hypothesis*, as suggested areas for further research;

I. Locating goods terminals and “truck-stops”

“Close connection to infrastructure (main roads, ports, railways and airports) and other transport operators is a more important issue for the transport operator than location close to certain customers”.

II. Local or national/international transport operator

“The local transport operators within some freight market segments are losing the grip of the local transport market to national/international operators”.

III. Supermarkets and the small shops outside

“Small shops and small businesses in the city cause inefficient goods distribution systems. From a traffic environmental point of view the city would benefit by a concentration of consumer sales and small industries into activity centres”.

IV. Impact on the city of high frequent freight transport;

“High frequent daily goods deliveries to shops have a large environmental and economic impact on the city, but this high frequent transport activity is not necessary from a customer service point of view”.

V. Load consolidation and capacity utilisation

“Improved load consolidation and capacity utilisation of goods vehicles in the city is possible”.

VI. Co-ordinating long distance freight traffic

“Arrival and departure times for long distance freight traffic connecting freight ferries, ships, freight trains and freight terminals have great influence on both road capacity and the environment in the city”.

VII. Estimation of freight transport based on city size

“The city size gives a good indication of the volumes of the various freight transport market segments in the city”.