REDUCTION OF THE ENERGY CONSUMPTION FROM GOODS TRANSPORT IN CITIES

SUMMARY OF THE PROJECT

July 13, 1995

INTRODUCTION

This summary contains the most important results of a research project about goods transport in cities. In the project the consequences of establishing a city distribution terminal have been analysed on the basis of the Danish city Odense with 140,000 inhabitants.

The project has recieved support from the SAVE Programme, which is a programme supporting research in saving energy within several fields, among these transportation planning. The SAVE Programme is financed by the European Commission. The support has amounted to 92,250 ECU.

The project has furthermore recieved support from the Danish Transport Council. This support has amounted to 430,000 Danish kroner, or approximately 56,000 ECU.

The project has been followed by a steering committee, with representants from the organizations:

- The Municipality of Odense
- The Danish Railways Freight, Odense
- The Association of Freight Lorries Fyen
- The Postoffice of Odense
- The City Centre Association of Odense

The project has been carried out by Anders Nyvig A/S, which firm has been responsible for the project, with support from the following subconsultants:

- The Danish Packaging and Transportation Institute, Copenhagen, Denmark
- M + I Consultants, Amsterdam, The Nederlands
- Consultant Sjoerd Stienstra, Heiloo, The Nederlands.

The documentation of the project is divided into the following 3 parts:

- Summary and Conclusions
- Results of the project

- Annex 1-3.

These 3 reports are only available in Danish.

THE PURPOSE OF THE PROJECT

The project has aimed to demonstrate, that by establishing a city distribution terminal, it will be possible to make reductions in:

- The energy consumption from goods distribution
- The environmental pollution
- The transportation expences

In the city distribution terminal the goods shal be reloaded from vans and lorries to small distribution vehicles, that will provide for an efficient goods distribution in the city centre.

The Project

The project has consisted of the 6 phases:

1. Description of the problems of city distribution
2. Datacollection
3. Elaboration of a concept for a city distribution terminal
4. Estimation of the consequences of a city distribution terminal
5. Feasibility study
6. Evaluation of the project.

The decriptions of the problems of city distribution has been based on contributions from the Municipality of Odense, the distributors represented in the steering committee and the City Centre Association. This phase is decribed in detail in annex 1.

The datacollection was carried out on a day in May 1994, where all vans and lorries (3,300) were stopped in a ring around the city centre and interviewed about their errands in the centre that day. This phase is described in detail in annex 2.

The elaboration of a concept of the future city distribution terminal has been based on 2 trips to the Nederlands, visiting Maastricht, Utrecht and Amsterdam, and on contri-butions from the Danish Packaging Institute and the local distributors in Odense. In this phase the following matters have been determined:

- The best location of the terminal
- The size of the terminal vehicles
- The restrictions on the size of vans and lorries in the city centre

- The restrictions on the periods, when goods distribution in the pedestrian areas are allowed
- The opening times of the terminal
- The goods potential for the terminal.

The following consequences of establishing a city distribution terminal has been estimated on the basis of the data, collected at the intervew-analysis:

- The Energy Consumption
- The CO_2-emission
- The air pollution, described by the emission of NO_x, HC, CO and particles
- Traffic noise in 2 primary streets in the city centre of Odense

The feasibility study has been based on comparisons between the expences to run a city distribution terminal and the existing costs to distribute goods from the location of the future terminal to the city centre.

Altogether the energy consumption, the environmental impact and the economic consequences have been estimated for 36 different models for a city distribution terminal. These estimations are described in detail in annex 3.

CONCLUSIONS

The project has demonstrated, that there will be basis for operating a city distribution terminal, that may handle about 450 tons of goods per day, corresponding to 32 % of the total goods distribution to the city centre. The terminal shall have a floor area of between 1,900 and 3,000 m^2 and operate with a fleet of between 40 and 100 terminal vehicles. The exact values will depend on the level of restrictions, the municipality will enforce in the city centre.

Such a city distribution terminal will contribute to free the city centre for about 450 larger vans and lorries daily (totalweight over 6 tons).

A city distribution terminal will furthermore cause a reduction of 31 % in the energy consumption of the vans and lorries in the city centre. In relation to the total cartraffic in the city centre, the terminal will result in a reduction of 7 % in the energy consumption. The reductions in the CO_2-emission will be the same as the energy consumption.

A city distribution terminal will cause both a reduction and an increase in the air pollution. There will occur a considerable reduction in the emission of NO_x and particles, but an increase in the emission of HC and CO.

A terminal will result in a little decrease in the traffic noise in the 2 analysed streets in the city centre.

The project has demonstrated, that it will be nesessary to invest about 4 to 6 millions ECU in a new city distribution terminal, and that the working expences for the terminal will be of the order of 1.9 to 2.2 millions ECU per year. This means, that there will be a slight increase in the expences of the order of 0.4 to 0.6 millions ECU per year for the city distribution on the last distance to the city centre, that is the distance from the future location of the terminal to the city centre.

In short, the city distribution terminal will have a positive effect on the energy consumption and the environment. The working expences for the terminal will be of the same order of the existing expences for distributing goods to the city centre, even if the project has demonstrated, that there will be a little increase in the expences.

To solve the problems of city distribution it will be nesessary to find an investor, who will see a profit in establishing a city distribution terminal. Furthermore, the munici-pality will have to carry out the nesessary restrictions on the size of the vehicles and the access for the terminal vehicles to distribute goods in the city centre.