

## Summary

Retail goods distribution in towns and cities shows a development whereby a growing volume of parcels of diminishing size must be supplied within ever-shorter delivery times. At the same time increasingly stringent restrictions are imposed on the city transport and distribution systems by the municipal boards in order to safeguard the quality of life of the inner cities.

In the growing tension created by this situation the time is now ripe for the introduction of a new concept of inner city distribution. In doing so, the efforts and costs needed to improve the quality of the city distribution system can be amply compensated by the clustering and, consequently, improved utilisation of the transport activities between distribution centres and town borders.

In response to this pressing question, representatives from the Netherlands Ministry of Transport and Water Management, the Holland International Distribution Council (HIDC), the Delft University of Technology and Albert Heijn took the initiative to set up the research project 'Stedelijke distributie in de retailketen' (Inner city distribution in the retail chain).

The project is carried out by the following project partners with support from Connekt, Knowledge Center for Traffic and Transport:

- TRAIL Research School/Delft University of Technology (also responsible for project management);
- HIDC;
- TNO Road Transport Means;
- DAF Trucks NV;
- Van Eck Beesd BV;
- Van Riemsdijk Rotterdam;
- BT Nederland BV;
- Buiscar Constructie en Transportwagenfabriek.

This chapter summarises the report of the first stage of the project: the choice of the new logistic concept and the preparation of its functional design.

The success of the new distribution concept depends on the introduction of a new standard load unit, which can carry different cargo types, including roll containers.

During engineering of this standard load unit - the 'town box' - a universal design was achieved enabling the use by many trade branches. With such a town box everybody can gain the advantages of a standardised manner of transfer, storage, moving, fixing and information exchange. In trade and industry there are numerous examples of the big social revenues obtained by standardisation and this will certainly apply to inner city distribution under the slogan:

**Standardization: For nobody best, for everybody better.**

By splitting up the logistic chain between distribution centers and the branches in two parts – a supply part on the main road and a distribution part in the city – better conditions are created for each part. Supply can be carried out with greater efficiency by large road lorry combinations (shuttles) while the inner city distribution can make use of special vehicles which are adapted to the city environment. The starting points applied for the design of last mentioned function were based on the recommendations for road vehicles and city admission policies as formulated by the 'Platform Stedelijke Distributie' (Platform for Inner City Distribution).

A number of possible designs for the links and nodes of the logistic chain were investigated, as independent unit operations as well as in the interaction with each other.

For the investigation of the new logistic concepts two Albert Heijn reference distribution cases were selected. The first case relates to the inner city of Amsterdam. This case is characterised by a relatively short distance to the distribution center at Zaandam and by extensive traffic congestion at the shop locations.

The second case includes the Province of Groningen (including Groningen City). This case is characterised by a relatively large distance from the Zwolle distribution center and little traffic congestion around the shops.

A large number of possible transportation concepts were subsequently investigated by means of a multi-criteria analysis applying three different points of view, i.e.:

- Environment and Society;
- Economy;
- Client and Logistics.

The investigation showed that the application of the new transportation concepts can lead to significant improvements of various aspects of transportation and distribution of retail goods. For one, the implementation of the inner city distribution link with specially adapted vehicles and transport units, more aptly answers the demand for improvement of the quality of live and safety in the city.

From a first economic reconnaissance appears that the new transportation and distribution concepts can result in financial savings compared to the present concepts. Savings can even increase when distribution activities of various trades and branches are combined.

Furthermore, there is the possibility to improve the level of service for the customer. Also, important improvements appear to be possible for the whole logistic chain with regard to emissions, traffic hinder and safety.

The town box can best be implemented as the standard carrier for inner city distribution in combination with a limited family of vehicles with characteristics which are adapted to the demands of the relevant logistic chain. The transportation configurations which seem to have the best potential and possibilities for migration for the investigated cases consist of a supply link to the city with large truck combinations and transfer of the town boxes to special city distribution vehicles.

Two concepts of the city distribution vehicle emerge from the investigation as most promising. The first one is an adapted van for two town boxes with an integrated transfer mechanism. The second one is a multi-trailer vehicle with disconnectable combined tractor/lift truck.

The first one of these two concepts offers the best implementation and usage profile with a greater operational flexibility and a reduced technical complexity. The multi-trailer can be attractive for pedestrian areas and/or free road lanes.

For the implementation stage the proposed vehicle concepts have some important inherent advantages. The 6-box trailer for the supply route to the city can be an optimally designed vehicle because the concept falls in with the present developments of road transport (large loading length of over 13 m end reduction of the floor height to allow volume transport). The 2-box city distribution vehicle can be realised on the basis of standard components from the automotive world and links in with developments of the light van industry (sound, safety provisions, width, energy consumption, emissions, driver comfort).

The new transportation concepts can be further enhanced by municipalities when the special city distribution vehicles can use the (now underused) bus, tram and taxi lanes. This will create the possibility of further savings for the transport companies as compensation for the additional investments in city friendly vehicles (less emissions, less noise, safer, durable).

At the same time it is necessary that the municipalities will conduct identical policies with regard to vehicle specifications, admission regimes and use of special provisions. For, the municipalities will also reap the benefits of the new transportation concepts in the shape of reduction of the damage to street furniture and pavement, the improved quality of live and the continuation of the distribution function which is of the utmost importance for the vitality of the city.

The investigation also shows that it is necessary to adapt some of the recommendations of the Platform Stedelijke Distributie with regard to vehicle specifications, for which no legal or practical objections appear to exist.

In view of the positive results of the first stage of the project 'Stedelijke distributie in de retailketen' (Inner city distribution in the retail chain), as summarised in this chapter, it is proposed to continue the project with a second project stage. In addition to continued research, the first stage results also indicate the need for a pilot.

The ultimate objective of the second stage will therefore be the detailed preparation of a pilot to be commissioned immediately at the end of the second project stage. Besides research the preparations will also consist of approaching and enthusing prospective future users of the concepts.

Next to the project partners of the first project stage also other users, shipping and transport companies and knowledge institutions will be involved in the second stage. The Delft University of Technology will continue to be the lead partner in view of the know-how gained in the first stage. On the user side it is the intention to involve not only the retail branch in the second project stage but also branches for domestic appliances, clothing, and parcel post.

On the basis of a kick-off of the second project stage in early 2003 it is expected that the pilot can start in the second half of 2003.