

# The Vordingborg project - Co-ordination of Public Transport Service

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## Abstract

This paper describes how the Municipality of Vordingborg reorganised and co-ordinated the Public Transport Service of Vordingborg. The Vordingborg Project achieved some outstanding results. Increasing the overall level of service and at the same time saving a substantial amount of money. The Vordingborg Project builds on the knowledge and development work performed by the consultancy NOVA PRO and on the EU THERMIE Project ERANTIS, and its work on a more energy and environmental efficient Public Transport. One of the main tools is a special set-up and use of standard email system and the Microsoft Excel software.

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## Preface

The Municipality of Vordingborg is situated on Zealand in the Southern part of Denmark. The Municipality is dominated by the town of Vordingborg with about 10.000 inhabitants. The rest of the about 20.000 inhabitant is situated in rural town communities and/or vast farmland or along the long coastal line of the Municipality. The basic concepts used build on the experience gathered by the research and development carried out by NOVA PRO (a Danish consultancy) and though the ERANTIS project supported by the EU Commission (The EU – THERMIE Programme).

The ERANTIS project is disseminating results from work with the issues of energy efficiency in rural areas. The project has based on the experience of selected European projects developed the concept of a step-by-step method to aid the decision making and set up of energy efficient and more economical public transport in rural areas.

The project has demonstrated how the principles of the ERANTIS Project applied to a small community can:

- Improve mobility
- Simplify public administration

- Reduce energy consumption

## **Background**

Denmark has established (as a number of other EU countries) a system of county-based public transport companies whereas ordinary public transport is supplied. Often primarily using standard 12-meter busses in a mode of operation based on a line and route structure with fixed timetables. The bus services of these public transport companies are in principle open to all citizens.

Apart from the ordinary public transport system a number of more or less “closed” other public paid operated transport schemes are in operation. Either set-up by municipalities or the county as a consequence of law. In Denmark special transport services are mandatory to the mobility impaired. Mandatory schemes are also operated to the benefit of others. Often by decision of the local municipality, groups of individuals are offered a public transport scheme of some kind for special purposes. The expenses for these “special transport services”, which is not open to the general public and administrated by different parts of a local municipality, can often be of a quite substantial nature both in money terms and measured on for example vehicle kilometres or other similar measures of transport production.

For the local authorities administration of the above mentioned “special transport services” is an administrative burden, and as a basically individual service it is often administrated by different individual public officers with little or no possibilities to co-ordinate the transports. The result is for example, that a family of 3 can be picked up in the morning by 3 different vehicles approximately at the same time. Ordered by 3 different public officers from 3 different organisational units in the same municipality, and even the vehicles will often come from the same taxi or bus operator.

A significant problem for a public transport system in rural areas is that the level of service for economic reasons often is very limited, and thereby seriously affecting the mobility of those with no or limited access to a car. This is primarily elderly people, children and teenagers, families with only one car.

A second significant problem for public transport in rural areas is that the traditional route and line structure of service leads to unnecessary long routes in order to cover a given area and give access to public transport. This increases the expenses and in turn makes the public transport even more expensive and less attractive. A vicious circle of events has thereby been established.

There are examples of public expenses to “special transport services” being a factor 3-5 times the expenses paid by the local municipality to traditional public transport open for all. In this way the public service to the few has become the barrier for the reasonable mobility to the majority.

In total the economic resources of the “open for all public transport” and the “special transport service” provided in rural areas form the sound basis for a reasonable public transport system. However this is only true if the system is planned, operated and administrated efficient and using the experience and know how available of how to design a user oriented transport system focusing on the needs for transport and not the need for operating traditional busses in rural areas.

## **The Purpose of the Vordingborg project**

The Municipality of Vordingborg had in the late 1990'ties wanted to modify the public paid transport in the municipality in order to:

- Offer a better service;
- Achieve a more economically and energy efficient public transport;
- Improve mobility;

- Combine all kind public paid transport into one integrated dial-a-ride system.

A number of methodical and practical problems hampered the project. By mid 2000 Vordingborg municipality became aware of the ERANTIS project and the work of the NOVA PRO in the field of rural public transportation. Following a presentation by the Director of NOVA PRO Preben Thisgaard for key players in the Municipality it was decided to move forward a.s.a.p. following the methodology of the ERANTIS step by step method. Less than 2 months later the project became operational. The step by step approach and the solid empirical foundation of NOVA PRO and the ERANTIS project proved to be a very valuable tool for the Municipality.

## Results of the project

By the evaluation of the project in 2001 the municipality could note a drop in average net cost per passenger of about from 91 DKK in 1999 to 51,70 DKK in 2001. Even including the vast service improvements and the additional passengers in the public transport system the yearly savings of the municipality were about 34% from 1999 figures to 2001 figures. The total number of passengers per year in 2001 was 29.798.

The development of the projects economy has been influenced by different changes in the price charged by the Municipality to the passengers. Also a quite substantial rise in the price of the taxi-fares and a larger number of older and less mobile clients have affected the total economy.

For an overview please see the following table.

**Table 1 Passenger and economy overview**

Source: Municipality of Vordingborg

	2000 *)	2001	2002	2003 **)
Passengers	7.627	29.798	36.457	24.565
Gross Expences ***)	425.581	1.710.943	2.307.592	1.733.272
Net Expences ***)	401.175	1.539.869	2.140.892	1.623.072
G.E. per passenger ***)	55,8	57,4	63,3	70,6
N.E. per passenger ***)	52,6	51,7	58,7	66,1

Notes:

\*) From 4 September – end of year

\*\*\*) From 1 January to 5 September 2003

\*\*\*) DKK – yearly price basis

The project succeed in establishing a de facto new public transport system for all citizens with a special need for public transport service. The new system was integrated in the traditional public transport system and based on a dial-a-ride and a door-to-door concept.

The passenger transport system also embracing transport co-ordination of public service in relation to goods such as tools and utilities to disabled and elderly persons etc. There is an unused potential of increased benefits by incorporating transport of e.g. library books, material to nurseries and kindergartens, and certain items in the Municipality's waste and recycling system. The

vehicles driving in the system has an unused additional capacity of 2 to 2,5 times the present number of passengers outside peak hours in the morning and afternoon.

Low cost ordinary standard PC software was used (Microsoft Office for Windows) to manage dispatching, administrating and all other practical and economic aspects of the transport system. Microsoft Excel in standard version and an email standard programme (unmodified, but only with certain conventions and procedures to be strictly observed) is used by all individuals and institutions involved in the project. The Municipality was in advance using these software tools as a part of their standard software package.

The system based on Excel and email has on a yearly basis handled more than 35.000 passengers per year. The peak load on a single day has been about 300 passengers, which on a year basis would be about 100.000 passengers per year. This makes the Excel/email based system competitive to even some of the more expensive dedicated software tools for dispatching and administration of door-to-door public transport.

The traditional publicly administrated service has been outsourced to the local tourist information bureau, thus working as a local Mobility Management Centre. During evenings and week-ends the service is handled by the local taxi company. The same identical telephone no. is applied.

### **The “before” the project situation**

Up to the start of the project transport matters were handled the traditional way in the Municipality of Vordingborg.

The county-based public transport company supplied supplemented by local authority sponsored busses ordinary public transport. Primarily using standard 12-meter busses in a mode of operation based on a line and route structure with fixed timetables.

Apart from the ordinary public transport system a number of more or less “closed” other public operated transport schemes were in operation set-up by the municipality as a consequence of law or by decision.

There were no transport problems as such. But locally it was often discussed how things could be made better. Public transport was operated separately and individual public officers operated the “special transport service” system as a basically individual service administrated with little or no possibilities to co-ordinate transports.

Small schoolchildren from the farm areas had to wait for a bus along the roadside some distance from their home and had often quite long travel time. This was a cause for concern of the parents and the municipality.

### **The “after-the-project” situation**

The Municipality maintained as per agreement with the county public transport company the regional bus transport in a fixed line and route structure. In addition this principle of service has been maintained where this kind of service was necessary due to significant numbers of passengers on the route, or when special economic considerations made this alternative reasonable. All “special transport service” and substantial part of the local public transport is integrated in a flexible and cost effective dial-a-ride door-to-door system that can be easily adjusted to the present need for transportation - and where the marginal fare price to a certain extent reflects the level of service provided. The project has also managed to embrace goods between public institutions and citizens for example being wheel chairs or walkers. The project incorporated in its later part a taxi-bus system for the Vordingborg city area and extended the service to all households of the municipality.

The system is during daytime hours on workdays made up of a dial-a-ride service open only for persons who are entitled to receive free transport from the Municipality and to all elderly persons over 65 of age. During evenings and in weekends local public transportation were integrated into the system and the dial-a-ride, door-to-door system was open to all inhabitants in the municipality (From June 2001 to the end of 2002). The service open to all inhabitants were cut by the Municipality in an endeavour to reduce the expenditure of the Municipality.

The dial-a-ride system is based on five levels of service. Each with its own fare price. Service level one consists of normal bus on pre-defined route. Service levels two; three and four consist of varying degrees of dial-a-ride service. At the highest level of service - level four - passengers can get assistance from the driver to get in and out their homes.

A key aspect of the concept developed by the project is a kind of Mobility Management Centre set up at the town of Vordingborg's Tourist Information Bureau. Its functions is to:

- receive both goods and passenger transport requests from citizens and the Municipality;
- carry out a systematic registration of all transports;
- co-ordinate transports;
- inform citizens of the existence of the dial-a-ride service;
- produce overviews on the magnitude of transports;
- administer the entire system on behalf of the Municipality.

The vehicles used were more differentiated and flexible than in the "before" situation. The vehicles embraced a number of ordinary taxis (max 4 passengers), vans (max 9-12 passengers) and special equipped minibuses for transport of individuals confined to a wheelchair.

The traditional line and route part of the public transport system was operated by standard 12 meter and smaller busses.

**Table 2: Overview of the Project's Main Trajectory Elements**

Activity	Time
Operational planning	August and September 2000
Step-by-step start-up	September to December 2000
Fully operational	By December 2000
Evaluation	By end 2001
Made permanent	From January 2002
Increased possibilities for the elderly	From April 2002 (lower fare and lower age limit (65))
Open to all citizens (evenings/week-ends)	From June 2001 to end 2002

## **Better service and lower costs**

The dial-a-ride service has given especially the elderly the opportunity to be transported door-to-door and to be aided by the driver to and from the vehicle. There have been considerable improvements in the service offered to the users of the dial-a-ride system. For example more frequent trips and the introduction of an evening service. For the first time ever and quite unique in a rural area it is possible to be transported door-to-door to and from all households in the municipality (within the different bussiness hours set-up and regulated by the Municipality. However, it is a condition that a transport is ordered at least 2 hours before the departure. During the period of June 2001 to end of 2002 it was also possible to use the hourly departure from the Vordingborg train station from were it was not needed to order transport in advance.

The overwhelming majority of schoolchildren from the rural and farm areas have experienced a substantial improvement in travel conditions to and from school. Before, up to (or above) one hour of transport time was not unusual. Now 1/2 an hour is close to the maximum transport time to or from school. With a few exemptions all transport for schoolchildren is door-to-door operated with a limited detouring to pick up other schoolchildren or passengers. This has been perceived as a substantial improvement by the parents and their children.

## **Energy savings**

Energy savings have been accomplished as a result of a more efficient use of the single vehicles and a higher occupancy rate per trip. The average energy efficiency is difficult to calculate. Some trips are very efficient with a high average utilisation factor. Other trips in the system has to be carried out with only one passenger in the vehicle (about 50%). A preliminary estimate indicates an energy efficiency of about 1.7 MJ per passenger kilometre and 1.2 MJ per person kilometre.

The mini-buses and other vehicles used in the project (Mercedes Vito, VW Van, Mercedes 300, ordinary cars etc) run almost exclusively on conventional diesel fuel.

There is no doubt about that this is a severely more efficient situation than before.

## **The contractual and legal set up**

Is very simple and straight forward as the already excising taxi regulations are maintained and only supplemented with certain provisions to ensure the smooth operation of the Excel and email based administration system.

## **The use of PC and standard software as planning and dispatch tool**

Handling the day to day planning of a total dial-a-ride system with only flexible non-fixed-routes gives rise to a variety of problems. Occasionally very expensive computer based tools are used. This is prohibitive for a small community. Therefore the Vordingborg project took advantage of the work of the NOVA PRO company and their work for the ERANTIS project. In accordance with the ERANTIS projects results a system was set-up to use email (any normal mail program) with the Microsoft Excel as the primary tool. A standard PC with a standard Intel Pentium III processor and a 17 inch monitor was used. This set-up has with marginal changes been the tool for the Vordingborg Tourist Information Bureau in their handling of all aspects of the dial-a-ride service and the administrative information needed by the local authorities of Vordingborg. The software is also the information tool enabling the distribution of costs to more than 20 institutions and administrative units of the Municipality of Vordingborg. Each unit or institution carry their share of the expenses to the transport system proportional to the service level ordered and the number of transports provided. The inexpensive standard software is also forming the basis for the comprehensive database of transports performed by the municipality enabling the municipality to describe and make precise calculations of different level and price of services. An immense advantage when for example making new contracts with operators and/or performing competitive tenders.

## **The human aspects of the project**

Public transport and public supplied "special transport service" is often provided as a kind of social service or welfare resulting in a certain "clientification" of people. It is often emphasised, that a system where transport is provided to the general public via an ordering with a third party (in this case the Tourist Information Bureau) seem to change in a fundamental way the relation between the citizens and the municipality. It is perceived more as a regular situation to be a part of a public transport scheme, and the project has lead to:

- a decrease in time spend by public officers in discussion issues related to transportation with citizens;
- dramatically reduced time spend on administration and control, and
- significant improvements in general service level and transparency of public services provided by the public.

The more user-friendly service offered at a lower cost has in consequence lead to a higher usage of transport services. This has without any doubt improved the social climate for the inhabitants of Vordingborg municipality and has meant that especially elderly and mobility-impaired citizens have experienced an increased quality of life.

## **Conclusion**

The project has proven that it is possible to gain significant positive results on economy, mobility and energy efficiency by applying the principles of Mobility Management and in particular the results of the ERANTIS project. It is furthermore obvious that many small and medium size European local authorities situated in rural communities fruitfully can draw on the experience of Vordingborg.

## **More Information**

If you need further information you are welcome to make contact to either:

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