

Summary:

Basis data requirements for developing the freight model system in Norway

Introduction

This report was produced for the National Transport Plan (NTP) working group for transport analyses. The objective of the report is to describe the current national freight model system and pinpoint its methodological insufficiencies and the lack of data. The objective of the report is also to describe the desired data collection and model development to improve the national model system and to suggest principles for development of freight models and the implied data requirements at the regional and local scale.

We conclude that in general PINGO (the forecast model) and NEMO (the network model) are methodologically sound, and that a logistic module will fit well into the model system as a whole. There are methodological insufficiencies though that are grounded in lack of data, and it is concluded that insufficiencies can to a large extent be corrected for if data from a commodity flow survey (CFS) becomes available. However, it is realized that model improvements can also be obtained by better utilization of existing data sources to increase the number of commodity groups.

Logistics

We discuss briefly the intermediate logistic project report by de Jong et al. (2004). We agree about the most of the plans but we question the level of detail and disaggregation since this can be cumbersome both with regard to the fact that new data is required and because the complexity will lead to increased development and maintenance costs of the model system. We are critical about the plans to move from Production-Wholesalers-Consumers (PWC) matrices to Production-Consumers (PC) matrices since this will be in conflict with economic models in general and PINGO in particular. It is explained that TOIs ongoing terminal survey can improve the data availability for development of the logistic module, but information

about internal inventories and consignment size are missing data.

Levels of aggregation

An important issue with regard to the National versus regional modelling levels is the possibility of obtaining consistency of the freight flows in different modelling levels. It is important that all the different trip purposes are represented and that there is no overlap (e.g., we need to decide whether service trips should be part of the regional freight or passenger models). The degree of disaggregation should be considered with regard to the need for coherency between freight and passenger models, analysis requirements and with regard to data availability. The municipality level is considered sufficient for freight analysis, but expansion to the NTM5¹ level (with the aid of specific indicators) is mandatory in order to carry out joint passenger and freight analyses, and also introduce congestion in the model system.

The DISTRA model is briefly described to illustrate the scope of a relevant regional model. More in depth considerations about the possible use of the existing PANDA model are then outlined. The PANDA model consists of two main modules, an input-output module for prediction of production/employment and a demographic module for population growth. A region is defined as a number of municipalities aggregated together (the number of municipalities in a region can, in principle, range between 1 and 435). It is considered viable to use the Input-output tables and the Regional Purchasing Coefficients (RPC) in PANDA at the municipality level to subtract zonal internal flows from the NEMO marginals before running the gravity model to establish the delivery pattern. Information about production values is available from PANDA at municipality level and could thereby be used to

¹ NTM5 – The Norwegian National Transport Model, i. e. the national model for Passenger transport in Norway.

develop PINGO to be a forecast model for regional models as well.

Available data sources and needs for further data

Development of regional models requires identification of data requirements, which should be followed by exploitation of existing data sources and collection of new data. This report includes a general overview of data about freight transport at the regional level. It explains how to possibly apply the available trade statistics at the postal code zoning level. The manufacturing statistics and the external trade statistics could in principle be disaggregated in the same pattern. For other kinds of production, where information is not available at the zonal level of postal codes, techniques are available for this purpose including use of indicators to spread data to the desired zoning level.

Changing in existing data sources

Some existing statistical sources that are regularly updated have gone through some changes that lead to less quality in the continuation of the statistics. The lorry survey is one example where the vehicles between 1 and 3,5 tons have been removed. Moreover the survey among coastal vessels has not been carried out since 1993, and the external trade statistics suffer from the fact that the number of custom offices will be halved during 2004 with the effect of a more coarse external trade statistic.

Recommendations for new data

It is a challenge to follow up the intentions about improving and developing the national freight model as well as the new regional freight models in a situation where the need for new data emerges and the quality of some existing data sources are reduced. It is concluded that a commodity flow survey (CFS) will fill many needs. Other means of collecting data is also of interest and can give both supplementary information and overlapping but more detailed information that can give us in-depth insight. Until now there have not been any CFS for Norway², and they are expensive to conduct. Despite the cost, we think that this could be the way to proceed. New data in terms of a commodity flow survey would also become useful, in that this

would make it possible to apply the CFS data in the matrix balancing instead of the mode specific counts and then save the mode specific counts for evaluation purpose.

Main conclusion

Improved information of freight flows can be achieved from use of more detailed statistic than already used in the development of the freight model system for Norway. Register data from SSB are available at more detailed level than recommended used even in regional models in this report.

The main missing data is information about delivery pattern (both with respect to geography but also with respect to which business link the delivery goes through). Information about delivery pattern between detailed zonal sizes can be obtained for truck transports for use in regional models from data extraction from transport operators data systems. The main problem is however how to get a covering picture, because the transport market consists of many small enterprises (some with only one employer) where the small transport operators are not expected to have any electronic system for their transports at all. Another problem is how to catch transports on own account.

With respect to the logistic module, there is a lack of information about consignment size and volumes through internal warehouses (inventories). Both this information and the information about delivery pattern and transport costs can be obtained from a commodity flow survey (CFS). There are experiences from such surveys from both USA and Sweden. The main drawback with a CFS is however the high level of costs related to such a survey, but a survey can be limited to either a geographic area or a limited number of industries.

² Except for an old study by Statistics Norway for some traded commodities (Strøm K F: Varestrømmer i engros- og detaljhandel. Rapport 83/31. SSB (1983) This study was carried out in order to split the trade sector in the National Accounts in retail- and wholesale trade.