

*Improving the Policy Relevance
of Freight Transport Models*

Summary of Results

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PREFACE

This document summarizes the results of a study that was performed for the Ministry of Transport, Public Works and Water Management, Directorate-General for Freight Transport (DGG) by RAND Europe. The study, called “Improving the Policy Relevance of Freight Transport Models”, examined the information needs of the policymakers at DGG and the information provided by existing freight transport models available through the Ministry’s Transport Research Centre (AVV).

The study proceeded along two tracks. On one track, the DGG policymakers’ information needs were gathered through a series of interviews and a workshop. On the other track, information about available freight transport models was gathered by use of a questionnaire. The information about models was then compared with the information needs of the policymakers. This document presents an overview of the study and its final results and conclusions. A companion document contains detailed information from the interviews and workshops. It also provides background information about each of the models (e.g., its strengths, modes covered, and time frame). That document, which is in the form of an annotated briefing, is:

- Walker, Warren E., Mari Pöyhönen, Odette van de Riet, and Barbara van de Kerke, *Improving the Policy Relevance of Freight Transport Models: Final Briefing*, RE-98.014, RAND Europe, Leiden, 1998.

This study is the first phase of a multi-phase project to develop the tools needed to supply efficient and effective support for the current and anticipated future information needs of DGG policymakers. The primary objectives of this phase were to identify:

- the information needs of policymakers,
- the capabilities of existing freight transport models available for AVV,
- gaps between the capabilities of the models and the information needs of the policymakers.

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1. INTRODUCTION

BACKGROUND

In 1976, Greenberger, Crenson, and Crissey, in their book *Models in the Policy Process*, wrote:

Both model designers and sponsors share a general impression that the actual uses of modeling in government have fallen short of expectations. The gap between expectation and achievement is widest in the policy applications of modeling.¹

If they were writing their book today – over twenty years later – they would probably come to the same conclusion. There are many factors that contribute to this gap. These include issues relating to the models themselves, their documentation, the policy areas to which they have been applied, the types of information they provide, and the types of linkages among policymakers, policy analysts, and the policy models.

The project “Improving the Policy Relevance of Freight Transport Models,” conducted by RAND Europe for DGG and AVV, was the first phase of a multi-phase project to develop the tools needed to supply efficient and effective support for the current and anticipated future information needs of DGG policymakers. The primary objectives of this phase were to identify:

- the information needs of policymakers,
- the capabilities of existing freight transport models available to AVV,
- gaps between the capabilities of the models and the information needs of the policymakers.

It is important to understand that models are only one source (and, generally, not the largest source) of information that policymakers in DGG use in preparing policies. As shown in Fig. 1, the information sources can be divided into three categories:

- **Mental models of policymakers.** This refers to the expertise and intuition of the policymakers themselves;
- **AVV-related freight models.** This source was the focus of the project;
- **Other sources.** There are many other sources of information, including data, knowledge, and expertise at AVV, databases compiled by other organizations, and research conducted at universities and other research institutes (both inside and outside the Netherlands).

¹ Greenberger, M., M.A. Crenson, and B.L. Crissey, *Models in the Policy Process*, Russell Sage Foundation, New York, 1976, p. 26.

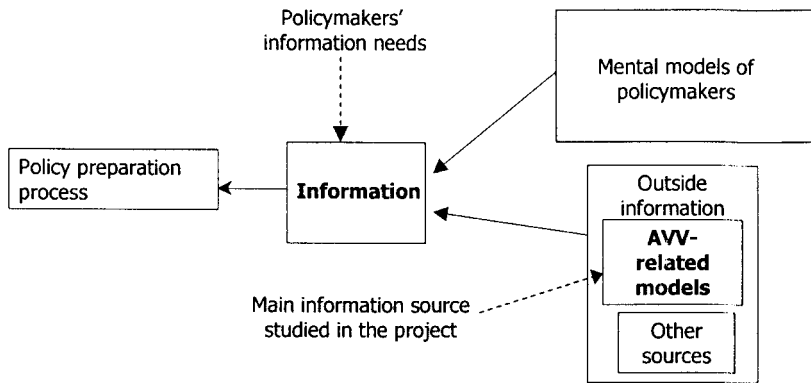


Figure 1 – Information sources for policymakers

In this project, we used the term *model* to refer to conceptual models that are implemented on a computer (see Fig. 2). A *conceptual model* is created based on perceptions (*mental models*) about the world and on measurements from that world. All of the elements on which a computer model is based -- measurements, mental models, and conceptual models -- are approximate representations of the real world. We included in the project only computer models that are currently operational and available for use by AVV.

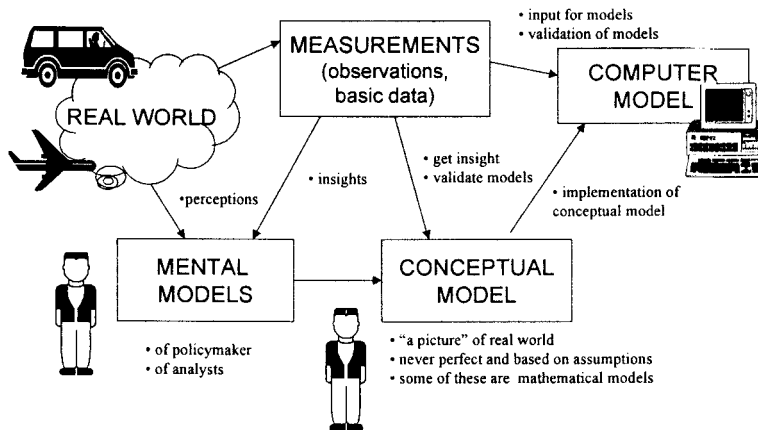


Figure 2 – What is a “model”

As originally proposed, this project was to be purely focused on assessing how well policymakers’ information needs were able to be met by existing AVV-related models. The idea, as shown in Fig. 3, was to (1) identify the models that can be used to meet the information needs of policymakers in DGG, and (2) identify gaps that may exist between the models’ capabilities and the policymakers’ needs.

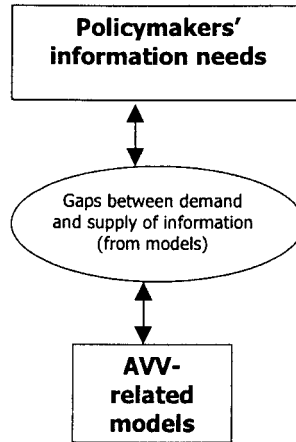


Figure 3 – The original project design

Early in the project – as we began to compile a list of the policymakers’ information needs – we realized that the assessment effort should be expanded to include non-model sources of information for satisfying the information needs. The revised idea, as shown in Fig.4, was to (1) identify the models and information available from other sources that can be used to meet the information needs of policymakers in DGG, and (2) identify gaps that may exist between the models’ capabilities and the policymakers’ needs.

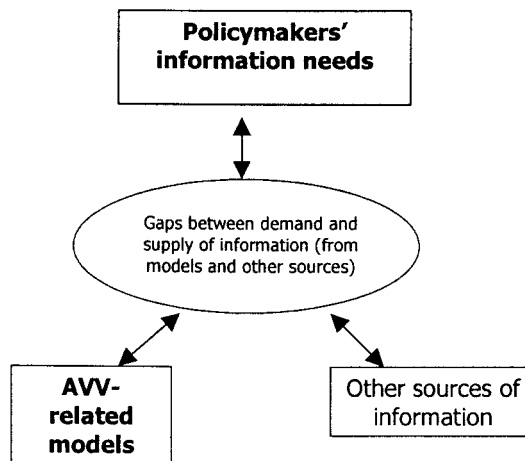


Figure 4 – Addition of other sources of information

As we began doing interviews with policymakers in DGG and research managers in AVV, it became clear that there was another crucial element required for the successful linking of information supply with information demand. This element is “communication”. The communication gap between analysts supplying information and policymakers needing the information was mentioned by both sides as a major roadblock in the effective and efficient use of information for policymaking. As a result, we further expanded the scope of the project to

collect information about communication problems (as illustrated in Fig. 5), and made recommendations about further work that might be done to examine the problems raised.

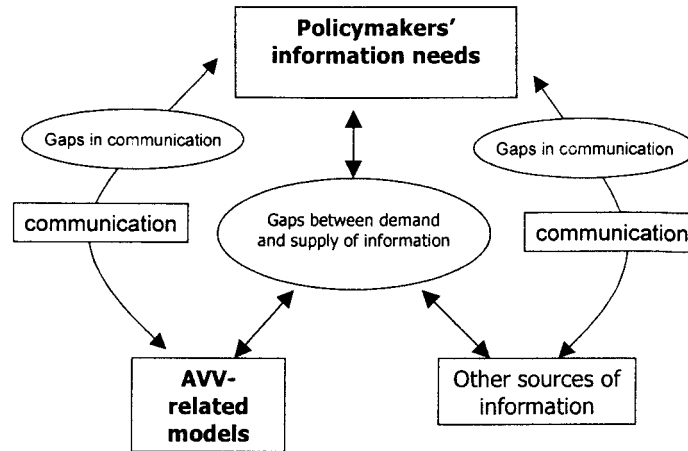


Figure 5 – Addition of communication issues

Thus, although this phase of the project remained primarily focused on identifying gaps between the capabilities of models and the information needs of policymakers, it also considered the entire “decision support system” (“DSS”) for supporting the policymaking process in DGG.

The remainder of this document is divided into three sections. The following section explains the approach that was used in carrying out the project. Then, the results of the project are summarized. Finally, some suggestions are given for future work that might be performed in order to achieve the expanded objective of developing an efficient and effective “DSS”, including appropriate models, other information sources, organization structures, and communication processes. Appendix A contains a table showing the information needs of policymakers and the corresponding information sources that are available to help satisfy those needs.

APPROACH

The original objective and the primary purpose of this project was to begin to build a bridge between the information needed by policymakers (expressed in their own language) and the information that is, or can be, produced by models to fill these needs. We proceeded along two tracks. On one track, the DGG policymakers’ information needs were gathered through a series of interviews and a workshop. On the other track, information about 11 freight transport models was gathered by use of a questionnaire and a workshop. The 11 models, which are listed below, covered all of the AVV-related models that focus on freight transport and that are currently operational:

- ATTACK
- GSM-7²

² GSM-7 is the only model that is not available through AVV. It is owned by GHR, Gemeentelijk Havenbedrijf Rotterdam. However, GSM-7 was included in the project because it is an important source of information for DGG policymaking.

- LMS
- NEAC
- MOBILEC
- PACE-FORWARD
- PAWN
- POINT
- SMILE
- TEM II
- VP-WEG

A flowchart depicting the overall approach is given in Fig. 6. A complete description of the process and its intermediate products is given in Warren E. Walker, Mari Pöyhönen, Odette van de Riet, and Barbara van de Kerke, *Improving the Policy Relevance of Freight Transport Models: Final Briefing*, RE-98.014, RAND Europe, December 1998.

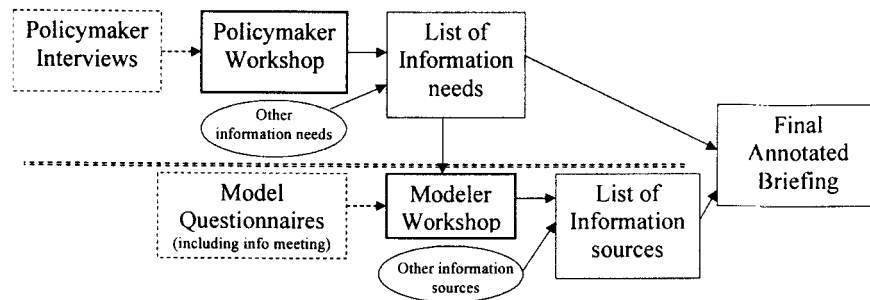


Figure 6 – Project Flowchart

The bridge between the information needs and the information provided by models was facilitated by using a single framework to capture both. The framework can be viewed as a large matrix whose rows refer to parts of the freight transport system and whose columns represent types of information.

We identified the parts of the freight transport system (the rows) using the system diagram that was developed by RAND Europe and TNO Inro for the Questa project.³ This diagram, shown in Fig. 7, divides the system into three markets: (1) the travel market, (2) the transport market, and (3) the traffic market. We used the elements of the markets as the basis for classifying the information needs:

Travel market:

- Activities to be performed
- Spatial and temporal structure of society
- Interactions in the travel market

³ Riet, O.A.W.T. van de and B. Egeter, *Conceptueel model van het vervoer- en verkeer-systeem; Drie markten in het verkeer en vervoer*, Project Questa, Ministerie van Verkeer en Waterstaat, Den Haag, Juni 1998.

Transport market:

- Travel patterns
- Transport means and services
- Interactions in the transport market

Traffic market:

- Transport patterns
- Infrastructure
- Interactions in the traffic market
- Traffic patterns

One should note that many external factors affect the freight transport system. Also, each of the three markets has effects outside of the transport system.

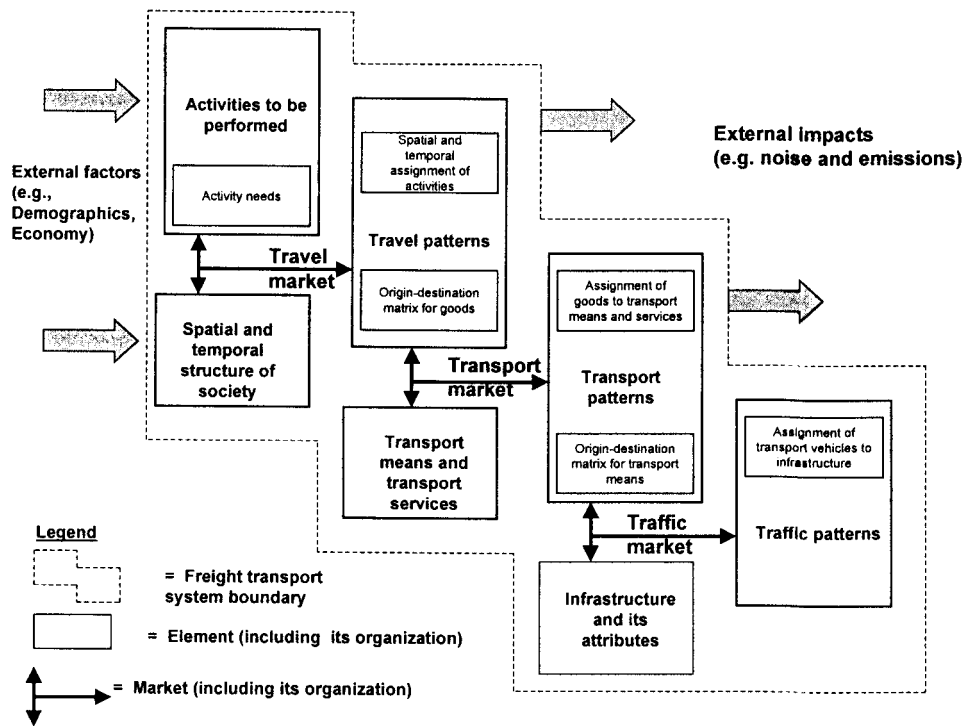


Figure 7 – Diagram of the Freight Transport System

Based on interviews with policymakers, we identified three different types of information needs. Policymakers want to get information related to the current situation, the effects of policies, and possible future situations. We divided the information needs related to the current situation into two categories based on whether the information is needed to understand the factors affecting the system and their interactions, or to provide a description of the system. So, the resulting four categories of information needs were:

1. Information to understand the current situation:
 - 1A. Information to understand the factors affecting the system, and their interactions
 - 1B. Information providing a quantitative or qualitative description of the system
2. Information to define and understand the effects of policy changes
3. Information that would facilitate understanding and responding to future situations

The division of the freight transport system into ten elements, and the separation of policymakers' information needs into four categories, lead to the matrix of information needs shown in Fig. 8.

		Current system		2 Effects of policies	3 Future System
		1A	1B		
Over the whole system					
Travel market	Activity needs				
	Spatial and temporal structure of society				
	Interactions in travel market				
Transport market	Travel patterns				
	Transport means and services				
	Interactions in transport market				
Traffic market	Transport patterns				
	Infrastructure				
	Interactions in traffic market				
	Traffic patterns				

Figure 8– Framework for categorizing the policymakers' information needs

The output from Track 1 (the interviews with policymakers, a workshop, and “other sources of information needs”) was a list of policy questions by market element and type of information, which represents the policymakers' information needs (their “wish list”). The output from Track 2 (the model questionnaires and modelers' workshop) was a similar list showing which of the information needs was able to be supplied by which of the existing models. (Note: A single model can produce information on the current system, the effects of policies, and the future system.)

Another possible way of filling the gaps between demand and supply is by using non-model sources of information. As part of the project, we added a task to initiate the process of identifying possible non-model sources to address information needs. These other sources include other types of models, expertise and data residing at AVV, databases generated by other organizations (e.g., the Central Bureau of Statistics), and ongoing university research. Persons at AVV assisted us in identifying the non-model sources of information.

RESULTS

Information Needs

The final table of information needs and information sources can be found in Appendix A. There are a total of 96 needs. Figure 9 shows how these needs are spread over the cells of the matrix (the numbers within cells refer to the number of items in that category in Appendix A). Overall,

the largest number of information needs relate to basic information and data on the existing system (i.e., information needs in Category 1B). Within this category, the focus is on information about the transport and traffic markets – not the travel market. Participants in the policymaker workshop felt that they already have a good “gut feeling” about how the system works (i.e., Category 1A needs). Relatively few needs expressed during the interviews or the workshop dealt with understanding future situations (Category 3 needs).

		Current system		2 Effects of policies	3 Future System
		1A	1B		
Over the whole system		5	3	7	1
Travel market	Activity needs		1		1
	Spatial and temporal structure of society	2		1	1
	Interactions in travel market	3	1	1	
Transport market	Travel patterns			1	
	Transport means and services		9	1	2
	Interactions in transport market	6	5	4	
Traffic market	Transport patterns		10		4
	Infrastructure	1	4	3	1
	Interactions in traffic market	2		2	
	Traffic patterns		9		4

Figure 9– Policymakers’ Information Needs

Twenty of 96 information needs were highlighted as “high priority needs” based on a prioritization exercise conducted at the policymaker workshop. In this case, the highest priorities were given to information about the travel and transport markets. These 20 high priority needs are listed below (the numbers correspond to the identification numbers used in the third column of Appendix A – “ID used in workshop”):

5. Who are the players in each of the three markets?
9. What are the relationships between economic development and freight transport?
10. What factors influence mode choice?
15. How do changes in the infrastructure affect freight transport?
16. Providers of indicators should use the same definitions for indicators.
17. Who are the customers of the service providers?
26. What is the added value of transport for each mode?
29. What is modal split for different business sectors and types of goods?
34. What are transfers in tonnes by region and by mode?
43. Lack of detailed information about freight flows (not only origin and destination).
51. How can the Dutch economy grow without the same growth in environmental and safety problems?
52. Which market should DGG focus on? How can reachable policy goals be defined and in what terms should they be defined?
53. What are the effects of policies applied to the different markets? How can the effects of policies in the different markets be measured? How can the effects in the different markets be compared?
56. How to stimulate companies and municipalities to locate their companies at locations that are accessible by multiple modes?

66. What are the factors (and their development) outside the freight transport system affecting the future demand for freight transport?
67. Forecasts of freight transport demand are needed for years 2010, 2020, 2030.
68. Forecasts should take into account trendbreaks in vehicle development.
77. What is the competitive position of each of the modes (compared with the competitive position of neighboring countries)?
78. What is the lifetime of vehicles (for all modes)?
79. What is the importance of transport for different business sectors (in terms of money, employment, etc.)?
92. Transport prevention: what are the tools for this?

Model Capabilities and Information from Other Sources

The models were found to have broad capabilities and to provide information related to all of the categories of information needs. Figure 10 shows which elements of the three markets of the freight transport system are covered by each of the models. The models taken together relate to all of the markets. Also, all models include a description of the current situation through their base cases, and include variables and assumptions that can be used to study the effects of changes in policies. Furthermore, all of the models we studied include mechanisms for providing forecasts for the future. So, comparing the matrix presented in Fig. 9 with the coverage of the models presented in Fig. 10, reveals that there are no major areas for which the models would not be able provide at least some information. However, this does not give a full picture of how the models supply information for information needs, it only suggests that the gaps need to be looked at in more detail.

		SMILE	TEM II	NEAC	MOBILEC	ATTACK	VP-WEG	POINT	GSM-7	PACE-FORWARD	PAWN	LMS
Travel market	Activity needs	●	●	●	●	●			●			
	Spatial and temporal structure of society	●	●	●	●							
	Interactions in travel market	●	●	●	●							
Transport market	Travel patterns (e.g., O/D matrix of goods)	●	●	●	●	●	●	●	●	●	●	
	Transport means and services	●	●	●	●	●	●	●	●	●	●	
	Interactions in transport market	●	●	●	●	●	●	●	●	●		
Traffic market	Transport patterns (e.g., O/D matrix for transport means)	●	●	●	●	●	●	●	●	●	●	●
	Infrastructure	●	○	●	●					●	●	●
	Interactions in traffic market	○		○						○		●
	Traffic patterns	●		●		●	●	●		●		●

Figure 10 – The coverage of three markets by the models.

To identify gaps at a more detailed level, we compared each information need presented in Appendix A with the information provided by models. When drawing conclusions from this table, however, the reader should note two important caveats:

1. In many cases an information need applies to all modes. But, most models cover only a subset of the modes. To simplify the table, we linked a model to a need even if it provides information for only a single mode.
2. Although most of the policymakers' information needs are addressed by the models,

most needs are such that a model alone would not provide a complete answer. We linked a model with an information need if we felt that the model might contribute at least in part to satisfying the need. We assumed that there would be an analyst providing a bridge between the policymaker and the model(s) who would supplement the model results with information from other sources to address the information need.

Another possible way to fill the gaps between demand and supply is by using non-model sources. During the project we began to identify possible non-model sources to address information needs. The other sources of information are shown in Column 6 of the table in Appendix A (“Other”).

Comparing the supply of information to the policymakers’ demands for information, the first question to be asked is whether the current set of models is adequate to fill the policymakers’ needs. If the information from other sources is combined with the information that can be produced by the AVV-related models, there is a very good match between the supply and the demand. There are, of course, some remaining gaps. Focusing on gaps that we think could be filled by additional model development, we found that the most important of these gaps are:

- Safety issues: e.g., what are the major factors affecting safety, and what are their interrelationships?
- Fragmentation: how to avoid *versnippering*?
- Issues related to details about the transport infrastructure outside the Netherlands: e.g., what happens if there are big changes in the road or rail links?
- A lack of behavioral models for the choices being made within each of the three markets.
- A lack of help in creating future scenarios: e.g., who will be the important players in each of the markets in the future?

As pointed out previously, there are no major areas in our matrix of markets and types of information for which the models would not be able provide at least some information. However, only few models focus on the travel market -- e.g., to model relationships between transport and the economy. In this area, there are a lot of information needs that have high priority. The on-going development of models such as SMILE and MOBILEC shows movement towards satisfying these needs. The development of these types of models to address information needs of policymakers should have high priority.

One of the questions posed at the beginning of the project was whether some of the models are superfluous. There are two reasons a model may become superfluous: (1) the model supplies information not requested by policymakers, and (2) the information supplied by the model can be obtained from another model. All of the models we studied address some of the policymakers’ information needs. Thus, no model is superfluous based on the first criterion. In practically all of the cases where there is an apparent overlap in the information supplied by two models, there are important differences that make them both relevant. For example, the geographic coverage of the models may be different, or they cover different modes. However, one model was found to be superfluous according to the second criterion. VP-WEG produces the same information as can be obtained from either ATTACK, POINT (VEV), or LMS. This fact is already recognized by the modeling community: VP-WEG is no longer being updated.

Communication

It is impossible to discuss the information supplied by the models without touching on the topic of communication between policymakers and analysts. Information needs to flow in both directions; policymakers need to specify their information needs and analysts need to produce information in a form that is understandable to policymakers. Although this project did not focus on communication, communication issues came up regularly during the interviews and workshops. We found that communication roadblocks seriously restrict the flow of information between policymakers and analysts. If models are to achieve their potential in filling the information needs of policymakers, further attention needs to be paid to communication issues. Three examples of communications issues that arose in our interviews are:

- Generally, policymakers feel that they do not need computer models. They rely largely on their mental models and their own expertise.
- Policymakers and analysts use different languages. Analysts have difficulty understanding what policymakers want, and policymakers do not get the information in a form that is clear to them.
- The process by which a policymaker can have an information need filled is not clear to some policymakers.

There is no simple way to solve these communication problems. Both DGG and AVV are aware of them and are working on them. To improve communication, the issues related to organization and structure (who should be involved?), process (how to communicate?), and tools that can help (e.g., the use of the Internet) need to be considered.

FUTURE OPPORTUNITIES

As a result of carrying out the work described above, we identified a variety of issues that could be addressed and actions that could be taken that would help meet the expanded objectives of the project: to develop the tools needed to supply efficient and effective support for the current and anticipated future information needs of DGG policymakers.

First, we identified information that can be produced by the models and is of possible use to policymakers, but is not explicitly requested by the policymakers. (I.e., we identified some information needs that could be added to the table in Appendix A and satisfied by existing models.) Two specific information needs of this type are:

- What would be the effects in the Netherlands if Switzerland (or some other region outside the Netherlands) were to close its borders to freight traffic coming from or going to the Netherlands?
- What would be the effects of implementing various types of underground freight transport systems?

Second, based on our understanding of the field of freight transport policy, we identified some policy issues that may need to be addressed in the future, but were not explicitly identified by the policymakers and are not covered by any of the existing AVV-related models. These policy issues could be addressed by extending existing models or building new ones. (I.e., we identified some rows that could be added to the table in Appendix A and filled by extending existing models or building new ones). Three specific issues of this type are:

- Modeling air transport (either as a separate mode or as part of an intermodal chain)
- Models to support the analysis of corridor policies
- Models to estimate the direct and indirect effects of new and improved transport infrastructure

In general, the work we carried out revealed a range of possibilities for improving the system providing support for the current and anticipated future information needs of DGG policymakers. As shown in Fig. 11, models are only one element in this system. First, unless the policymaker also runs the models, he must communicate his needs to the persons who run the models. This may require passing requests back and forth through several links in a communication chain (both within the organization, and between organizations). Second, the policymaker is likely to call on a wide variety of other sources of information (e.g., research reports, statistics, maps). Again, this may require passing requests back and forth through several links in a communication chain (both within the organization, and between organizations).

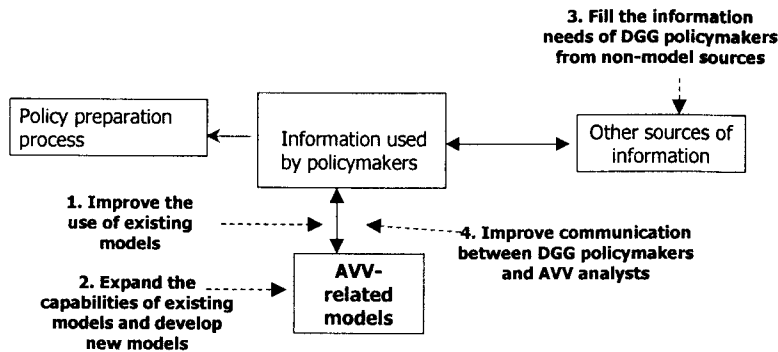


Figure 11 – Information flows in the policy preparation process.

For efficient and effective policymaking, this entire “decision support system” comprising models, other information sources, organizational structures, and communication processes must function efficiently and effectively. We identified four tasks that together can contribute to satisfying this objective. Although closely connected, the tasks are mutually exclusive, and any or all of them would be sensible to carry out. The four tasks are described briefly below. The order in which the categories are presented is based on a modeling logic: the first category is most closely related to models, and the last one is the least closely related.

1. **Improve the use of existing models.** One of the major conclusions of our project is that the existing AVV–related freight transport models can satisfy many of the policymakers’ information needs. However, the existing models are not being used to their full potential. Few models have a user’s manual or guidebook to explain all of the possibilities. There is work that could be done to produce a compendium of guidelines for the use of the existing models, including which models can be used to find answers to which questions.
2. **Expand the capabilities of existing models and/or to build new models** to provide a better match with the (current and anticipated future) needs of policymakers.

3. **Improve the capabilities for filling information needs from non-model sources.** Policymakers have many information needs that are unrelated to models. There is work that could be done to think about ways of filling the high priority needs.
4. **Improve communication processes and improve the ways in which information is presented.** Our interviews with persons in AVV and in DGG revealed that in many cases a failure to fill an information need was due more to a communications gap than to a gap between the need and the capabilities of models to fill it. There is work that could be done to improve the communication processes and improve the ways in which information is asked for and presented.

APPENDIX A

bold = Policymakers assigned a high priority for this information need in the workshop.

Part of the freight transport system	ID used in workshop (new means added later)	Information need	Source of information:	
			Freight transport models studied in the project	Other (sources provided by AVV)
1A Over the whole system:	1	What are the major factors affecting safety and their relationship.		
	2	What is relationship between freight transport and "leefbaarheid"?		AVV (literature), EEB, CBS, BER
	3	How should external costs be calculated?		IOO (1995), NEI (1997), CE Delft (1996), AVV-VMG
	4	To what extent do laws affect traffic safety?		
	5	Who are the players in each of the three markets? (by taking into account all the modes, also short-sea and air)	SMILE	AVV-VMG
1A Spatial and Temporal Structure of Society	6	How do changes in spatial planning affect freight transport?	SMILE, NEAC, MOBILEC, TEM II	AVV (literature), other sources
	new	How do companies select their production and distribution locations?	SMILE	AVV (literature), K.v.K., University of Groningen, University of Utrecht, TU Eindhoven, other sources
1A Interactions in Travel Market	7	What are the external factors affecting freight transport demand.	SMILE, NEAC, MOBILEC, TEM II	AVV-VMG, other sources
	8	How does the travel market work?	SMILE, NEAC, TEM II, MOBILEC	NEA
	9	Relationships between economic development and freight transport.	SMILE, NEAC, TEM II, MOBILEC	AVV/NEI/NEA, ("Waar zit de groei?")
1A Interactions in Transport Market	10	What factors influence mode choice?	SMILE, NEAC, TEM II, MOBILEC	AVV (literature), other sources
	11	Why transporters use the Netherlands as a transit country?	SMILE, TEM II (Port Competition model)	AVV-VMG
	12	How do the different modes interact? (How does intermodal transport work?)	SMILE, NEAC, TEM II	AVV-VMG (literature), IVS90 (RAV), NWB
	13	For the various business sectors, what are the potential benefits (and costs) from changing the modal split?	SMILE	
	75A	How does the transport market work?	SMILE, NEAC, TEM II, MOBILEC	
1A Supply of Traffic Market	14	What factors in global development affect the mainports (Port of Rotterdam and Schiphol)?	GSM-7 (R'dam), SMILE, NEAC, TEM II	
1A Interactions in Traffic Market	15	How do changes in the infrastructure affect freight transport demand?	SMILE, NEAC, TEM II, MOBILEC	OEEI
	75B	How does the traffic market work?	LMS (person transport), MOBILEC (road)	
1B Over the whole system	16	Providers of basic data should use the same definitions for indicators (especially for vehicles and safety issues).	SMILE, TEM II, NEAC (all modes within one model, no safety)	Procedures are developed, TIB indicators, BRIDGE, TLN
	83, 84	Information is needed from foreign countries with respect to problems ("bottlenecks") that Dutch encounter in foreign countries. With respect to policies, information about the neighborhood countries is sufficient.		other sources
	90	What are the internal costs of infrastructure by mode and who should be charged?		IOO
1B Demand of Travel Market	17	Who are the customers of the service providers?		other sources (verladers enquête)
1B Interactions in Travel Market	79	What is the importance of transport for different business sectors (in terms of money, employment, etc.)?	SMILE, MOBILEC	CBS
1B Supply of Transport Market, transport means	18, extended	What are the proportions of different types of vehicles in use? (by age, by the country of registration, by size, by type, etc., for all the modes)	ATTACK (road), NEAC, POINT, VP-WEG	CBS, RAI, NIWO, IVR, other sources

Part of the freight transport system	ID used in workshop (new means added later)	Information need	Source of information:	
			Freight transport models studied in the project	Other (sources provided by AVV)
	19	To what extent are new vehicle technologies and telematics used by companies?	Not a model issue	AVV (literature), RIVM, TNO, other sources
	20	What are costs and benefits of using bigger trucks, Combi road, special vehicles?	SMILE, NEAC, PACE-FORWARD	AVV (literature), other sources
	21	What are the latest technological developments with respect to vehicles?	Not a model issue	TNO
	22	Environmental and safety impacts of different kinds of vehicles (for all modes)	ATTACK, SMILE, NEAC, PACE-FORWARD, POINT	EEB
	23	Transport prices for each mode.	SMILE, NEAC, TEM II, MOBILEC	AVV, NEA
	77	What is the competitive position of all Dutch transport sectors (by mode) compared with neighboring countries?	SMILE, NEAC	
	78	What is the lifetime of transport vehicles? (for all modes)	ATTACK (road)	CBS, other sources
	new	How does the Dutch vehicle fleet look like compared to the fleet in other European countries?	NEAC	"Jaarbericht vervoerend Nederland", other sources
1B Interactions in Transport Market	24	What is the share of transport alone from GDP?	SMILE	CBS, J.V.N., AVV-VMG, RolGoed
	25	The share of different modes of the international transport in the Netherlands?	GSM-7 (R'dam), NEAC, TEM II, SMILE	AVV-VMG, CBS
	26	What is the added value of transport by each mode (both money and employment)?	SMILE, MOBILEC	CBS, BER
	27	Lack of good estimates for price-elasticities.	SMILE, NEAC, TEM II	"Waar zit de groei?"
	28	What are the latest technological developments with respect to logistics?	Not a model issue	AVV-VMG
1B Demand of Traffic Market, transport patterns	29, 31, 32	More information on modal split (by different business sectors, by types of goods, by tonne-kilometers for distance categories, and by vehicle kilometers)	SMILE, NEAC, TEM II, MOBILEC	NEA, CBS
	30	Modal shift in terms of transported tonnes.	NEAC, TEM II, SMILE, MOBILEC	
	33	Transported tonnes in inland shipping and in selected short-sea routes divided between containers and other freight.	GSM-7 (R'dam), TEM II, SMILE, NEAC	
	34	Transfers in tonnes by region and by mode (the use of terminals).	SMILE, NEAC, TEM II	
	35	International freight transport around the Netherlands.	GSM-7 (R'dam), NEAC, TEM II, SMILE	
	36	Intermodal flow of goods (inside and outside the Netherlands).	SMILE, NEAC, TEM II	
	37	What are the destinations of (hazardous) goods on specific routes (rail and road)?	NEAC, TEM II (based on approximations)	other sources
	38	What kinds of hazardous goods are transported in trucks and vessels?	NEAC, TEM II (based on approximations)	other sources
	39, extended	How are different goods packaged (percentages of different goods packaged in containers, pallets, bulk, etc., for all modes)?	GSM-7 (R'dam), TEM II (containers), NEAC (containers), SMILE	IVS90/AVV-BG
	40	What are capacity utilizations (benuttingsgraad) by mode?	NEAC, SMILE, ATTACK, POINT	
	new	What are the possibilities for modal shift in terms of transported tonnes? (E.g., how much of air-freight could be transported by rail instead of by road?)	SMILE, NEAC, TEM II	
1B Supply of Traffic Market	41	What is the capacity of the various segments of infrastructure (for all modes)?	LMS (road), SMILE (all modes), NEAC, MOBILEC	
	42	Where are the specific versnippering locations?		

Part of the freight transport system	ID used in workshop ('new' means added later)	Information need	Source of information:	
			Freight transport models studied in the project	Other (sources provided by AVV)
	85	Up-to-date maps about the infrastructure for all modes.	Not a model issue	AVV-BG, NWB (road)
	86	Maps of planned projects.	Not a model issue	VROM
1B Output of Traffic Market	43	Detailed information about freight flows (i.e., actual number of kilometers by vehicles by time of the day).	LMS (road), VP-WEG, NEAC	AVV-VMM
	44	What is actual use of infrastructure (for all modes)?	LMS (road), MOBILEC (road), NEAC (including passengers)	AVV-BG, TIC (road), VOIR, Radarschapenteller
	45, 50, 65	Integral comparison of modes based on environmental and safety impacts (lack of good indicators for environmental and safety impacts)	SMILE (no safety)	
	46	Freight transport's share of environmental impacts compared to other sectors.	ATTACK (road), POINT	CBS, RIVM Milieubalans
	47	Areas with noise emissions from road vehicles	PACE-FORWARD	RIVM, Silence, VMK
	48	Congestion in the hinterland.	LMS, PACE-FORWARD, NEAC, MOBILEC	NWB, AVV-VMM
	49	Lack of graphical information on accidents for road, rail, and inland shipping.		AVV-BG
	82	Proportion of freight transport of total traffic flows, and its contribution to congestion.	LMS (road), PACE-FORWARD, NEAC	AVV-VMM
	98	What are the vehicle loss hours caused by congestion (for freight)?	LMS (road), NEAC	AVV-BG, AVV-VMM, NEA
2 Over the whole system	51	How can the Dutch economy grow without the same growth in environmental and safety problems?		RIVM
	52	Policy questions: Which market should DGG focus on? How can reachable policy goals be defined and in what terms should they be defined ?	Not a model issue	
	53	Information needs: What are the effects of policies applied to the different markets? How can the effects of policies in different markets be measured? How can the effects in the different markets be compared?	All models (too generic information need)	
	54	What can DGG do to respond to various external developments?	Not a model issue	
	55	How can we maintain or even strengthen the social acceptance (draagvlak) for freight transport?	Not a model issue	
	89	What are the factors that define the success of a public-private partnership?		
	93	When do the effects of policies take place? (What is the time perspective of policies?)	MOBILEC, SMILE (all models can be used, depends on the market)	
2 Spatial and Temporal Structure of	56	How can companies and municipalities be stimulated to locate at locations that are accessible by multiple modes?	SMILE	
2 Interactions in Travel Market	57	How to affect the amount of freight that needs to be transported?	SMILE, NEAC, TEM II, MOBILEC	
2 Demand of Transport Market	92	What are the possibilities to reduce the demand for transport? E.g., by stimulating the use of telematics or by supplying information to reduce the number of empty vehicle kilometers.	SMILE, POINT, NEAC	"Waar zit de groei?"
2 Supply of Transport Market	58	How to stimulate the use of new vehicle technologies?	Not a model issue	other sources
2 Interactions in Transport Market	59	Lack of insight into the demand side of the transport market (spatial and temporal assignment of activities).	SMILE	
	60	What would be the effect of various tactics on modal split?	SMILE, TEM II, PACE-FORWARD, NEAC	
	61	How can logistics be made more efficient by government actions?	SMILE	

Part of the freight transport system	ID used in workshop ('new' means added later)	Information need	Source of information:	
			Freight transport models studied in the project	Other (sources provided by AVV)
	95	How to transform the railway sector into a privatized, competitive market?		
2 Supply of Traffic Market	62	How to use land more efficiently? (to avoid "versnippering")	NEAC (European scale)	other sources
	91	How can the flow of information be improved to influence the perceptions of actors so that the infrastructure is used in a more efficient way?		INDRIS
	new	Where should new multi-modal terminals be located?	SMILE, NEAC, TEM II	
2 Interactions in Traffic Market	63,64	How can the existing infrastructure be used more efficiently (higher utilization) (all modes)?	LMS (road), SMILE, NEAC, MOBILEC	AVV-IB
	88	How should pricing policies be implemented? (What rules should be used in charging for the use of infrastructure?)	SMILE, MOBILEC (all models can be used in some way)	AVV-VMO
3 Over the whole system	96	Who will be the most important actors in the future, and how can they be influenced (over all three markets)?		
3 Demand of Travel Market	66	What are the factors (and their development) outside the freight transport system affecting the future demand for freight transport?	SMILE, NEAC, TEM II, MOBILEC	
3 Spatial and Temporal Structure of	67	Forecasts of freight transport demand are needed for years 2010, 2020, 2030	SMILE, NEAC, TEM II, MOBILEC, ATTACK (road)	other sources
3 Supply of Transport Market	68	Forecasts (emissions, vehiclekilometers) should take into account trendbreaks in vehicle development.	ATTACK (road), SMILE, POINT, NEAC	
	69	What are the relevant new developments in vehicle technology?		TNO
3 Demand of Traffic Market, transport	70	What will be the modal split in the future?	NEAC, TEM II, SMILE, MOBILEC	other sources
	71	Forecasts of transport means needed for years 2010, 2020, 2030.	ATTACK, NEAC, MOBILEC (road)	
	new	What are the future possibilities for the modal shift in terms of transported tonnes? (E.g., how much air-freight in 2010 might be transported by rail instead of by road?)	SMILE, NEAC, TEM II	
	new	What are the future situations in packaging different goods (percentages of different goods packaged in containers, pallets, bulk, etc., for all modes)?	GSM-7, TEM II, SMILE, NEAC	
3 Supply of Traffic Market	72	The forecasts should pay more attention to the possible changes in infrastructure (both the Netherlands and abroad).	LMS (road), NEAC, TEM II, SMILE, MOBILEC	
3 Output of Traffic Market	73	There is a big difference in the forecasts for emissions produced by different organizations.		RIVM
	74	What are the trends in the number of accidents?		other sources
	97	What will be the traffic patterns of passenger transport in the future? (This is important, since less person traffic leaves more space for freight transport on the roads)	LMS (road), MOBILEC (road), NEAC	
	99	New indicators for describing traffic and transport.	Not a model issue	

ABBREVIATIONS

ATTACK	Analysis of Truck Traffic: Air Pollution, Cargo, Kilometrage
AVV - IB	A department of AVV
AVV - VMO	A department of AVV
AVV-BG	A department of AVV
AVV-VMG	A department of AVV
AVV-VMM	A department of AVV
BER	Beleidseffectrapportage
BRIDGE	Beleidsrelevante Regionale Integrale set van Data en instrumenten op het gebied van Goederenvervoer en Economie
CBS	Centraal Bureau voor de Statistiek
CE Delft	Centrum voor Energiebesparing en Milieuvriendelijke Technologie Delft
GSM-7	Goederenstromen Module Nummer 7
INDRIS	Inland Navigation Demonstrator for River Information Services
IOO	Instituut voor Onderzoek van Overheidsuitgaven
IVR	Internationale Vereniging van Rijnschepenregister
IVS	Informatie en Volgstelsel Scheepvaart
K.v.K	Kamer van Koophandel
LMS	Landelijk Model Systeem
NEAC	NEA transport simulation system for the European Community
NEI	Nederlands Economisch Instituut
NIWO	Stichting Nationale en Internationale Wegvervoer Organisatie
NWB	Nationaal Wegen Bestand
OEEI	Onderzoek Economische Effecten Infrastructuur
PACE-FORWARD	Policy Analytic and Computational Environment for Dutch Freight Transport
PAWN	Policy Analysis for the Watermanagement of the Netherlands
POINT	Pollution Indicators of Transport
RAI	Dutch division of the road transport industry
RIVM	Rijksinstituut voor Volksgezondheid en Milieuhygiëne
SMILE	Strategisch Model Integrale Logistiek en Evaluatie
TEM	Transport Economic Model
TiB	Transport in Balans
TIC	Traffic Information Centre
TLN	Transport en Logistiek Nederland
TNO	Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek
VOIR	IVS routing
VP-WEG	Verkeers Productiemodel Wegvervoer
VROM	Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer

