HANDBOOK

Sustainable Traffic Management

A guide for users

This Handbook for Sustainable Traffic Management forms part of the Dutch National Traffic Management Architecture (TMA).
TMA is a framework for the development of traffic system design, applications, technical infrastructure, organisations, and information exchange. For more information about the Traffic Management Architecture, or for support in applying the method, please contact the TMA offices by e-mail at info@avb-bureau.nl, by phone at +31 10 282 5986, or write to: AVB-bureau, P.O. Box 1031, 3000 BA Rotterdam, The Netherlands. You can also visit our web site at www.avb-bureau.nl and click the Union Jack symbol for English text.

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Foreword

This handbook, known in the Netherlands as the 'Werkboek Gebiedsgericht Benutten', was developed over the course of three years as part of the Dutch National Traffic Management Architecture (TMA). Our intention in producing this handbook has been to provide a guide which road authorities may be able to use to their advantage as they cooperate in search of structural solutions to accessibility problems in their region. It is with some pride that we point out the fact that the handbook has been endorsed by representatives of every road authority in the Netherlands.

The handbook is already being used for its intended purpose. At the local level, the method is now being applied in some forty large and medium-sized conurbations in the Netherlands. The regional directorates of the Department of Public Works have been instructed to use this handbook to safeguard consistency in the way the regional interests of the Department are formulated. And at the national level, the handbook is being used to implement national accessibility policy in a structured and unambiguous manner.

The handbook has also attracted attention at an international level. In our contacts with road authorities abroad we found that they too are often plagued by a familiar problem, the lack of a policy framework within which to carry out traffic management work, making it difficult to establish the link with stated objectives and to explain the wider importance of the work being carried out. To alleviate this problem, we have translated the 'Werkboek Gebiedsgericht Benutten' into the 'Handbook for Sustainable Traffic Management, A Guide for Users' which you are now reading. This English edition of the handbook is a straightforward translation of the Dutch version, for the simple reason that applications of the method abroad are still few and far between. However, we have added an introduction explaining the relation with the European KAREN Architecture and the US National Architecture.

We sincerely hope that you may find this English translation useful in the practical application of sustainable traffic management.

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Sustainable Traffic Management and its International Context

AN INTRODUCTION

The purpose of traffic management is to inform, induce and, if necessary, direct road users towards a safer and more efficient use of the existing infrastructure while safeguarding the quality of the environment of those living and working in the vicinity of the road network. Adjusting to current and anticipated traffic conditions requires the use of ICT systems for passing on the necessary information, stimuli, or directives to road users at certain points in place and time, or along certain routes. If traffic management aspirations regarding the quality of the traffic flow are to be successfully translated into ICT systems capable of passing on such information, stimuli and directives, an ITS (Intelligent Transportation System) architecture is essential.

Three levels

The development of the required ITS architecture should cover at least three levels: policy makers, business managers, and system engineers. The idea behind this three-layered architecture is that the right people, given the right information, will be able to make the right decisions. Such an architecture will help create the right balance between user needs and technology push, making it possible to fully meet the challenge and arrive at a specification, implementation and operation of traffic management that: a) brings about traffic management on a network level, based not only on past events, but also anticipating future traffic conditions; b) incorporates legacy systems; and c) is in line with ITS implementations in other fields of traffic and transport (e.g. public transport, emergency services, and electronic toll collection), and even other transport modes. Among road-based systems, the European KAREN system and the US National Architecture are examples of such ITS architecture standards that have found wide acceptance. The inland shipping architecture for River Information Services (RIS) is an example of a non-road transport mode.

The KAREN project starts with a long list of user needs. Like the US National Architecture, it also features a long list of services. These lists show how ITS can be used to alleviate traffic and transport problems. The USA List of Services, the Japanese HIDO Handbook, and the KAREN User Needs list are very similar. Their differences reflect, as they should, the specific needs of the three geographical areas. In all three cases, the primary target audience is the policy maker. In line with the purpose of these wide-ranging architectures, the lists of user needs and services, though extensive, are general in nature. Before they can select the relevant user needs or services, however, policy makers must first pass another stage.

At the policy level, policy objectives form the starting point. The user needs and services documents referred to above offer a complete range of traffic management services from which the ones best suited to achieve these objectives may be selected. In order to

ensure that the end result will be an ITS system that is efficient, expandable, and compatible with other ITS systems, the architecture should feature a framework to help translate policy objectives into specifications for system design. When ITS Architecture was in its infancy, the focus was on system aspects, but with the first practical implementations came the realisation that consensus about objectives and problem definitions had to come first. Both KAREN and the US National Architecture emphasise the step-by-step process of reaching consensus. After all, the hurdles to be taken are political rather than technological, so discussing technology is not a good way of avoiding political problems. The handbook for Sustainable Traffic Management, as part of the Dutch National Traffic Management Architecture, is specifically aimed at this aspect of the architecture. Moreover, the handbook provides the essential means not only towards the selection of the relevant user needs and services, but also towards their translation into geographical terms. After all, looking at user needs and services is all very well, but the thing to decide is where they should go.

The scope of this handbook

This Handbook for Sustainable Traffic Management is intended for those working at the policy level. As such it deals with the objectives (aspirations) of traffic management and the costs and benefits of the investments involved.

Public authorities such as road operators invest in traffic management in the hope that it will help to reduce problems with road safety and traffic flows, improve the quality of the environment and road safety for those living and working in the vicinity, and provide road users with a variety of information services.

Road users and road operators may not see eye to eye in all circumstances. Road users pass through a region as they drive from one point to another. Most regions, however, are made up of several different administrative areas, each with their own road operators. Even though different road operators may be struggling with similar traffic problems, even sharing the same objectives, they may have set very different priorities. Consequently, they will all have their own ideas about the traffic management services required to achieve their objectives. Add to that the vested interests and widely varying views of commercial road users, emergency service operators, and sundry other parties, and we can see why the discussion and selection of a consistent set of traffic management services can become a complex process.

The essence therefore is to come to grips with the objectives, both public and commercial, and the given range of priorities, and to harmonise them in some way. Once the objectives and priorities have been harmonised, the various operators, commercial road users, and other interested parties can set out their aspirations of improving traffic quality and informing and directing road users, in a region-wide

context. The ultimate goal is to improve traffic quality in specific situations involving excessive traffic pressure, obstructions, or adverse weather conditions. With the objectives thus defined, the traffic management services for achieving them can be selected.
To emphasize the importance of cooperation, not just with regard to harmonising policy objectives and priorities, but also regarding subsequent operations, the final step in the Handbook for Sustainable Traffic Management involves the signing of a Memorandum of Understanding by all the parties involved.
From this point onwards, the KAREN Architecture may be applied to select the user needs that match the traffic management services, and derive the specifications of the physical components and communication channels for implementing the traffic management services. Alternatively, the US National ITS Architecture or the Japanese HIDO Handbook may be used, starting with the selection of services.

The relation between this handbook and KAREN

The Dutch National Architecture focuses on road networks. KAREN covers the whole field of ITS solutions for traffic and transport in the broadest sense. In this respect, both architectures are fully in line with each other. Where the handbook for Sustainable Traffic Management concentrates on jointly defining the aspirations of traffic management, KAREN helps to put traffic management in a wider context. The RIS architecture can help to define the interaction with inland shipping at movable bridges and in case of calamities.
Karen recognises functional, information, physical, communication and organisational architectures. The Handbook for Sustainable Traffic Management is aimed at the policy level and describes a structured, step-by-step process for defining and refining the objectives of the various road authorities and other parties involved. In this sense, the Handbook for Sustainable Traffic Management paves the way for the subsequent application of KAREN. Furthermore, the process provides a link with well-established ICT systems which may be used when implementing the selected services, and which helps to shed light on the effect they have – the kind of effect a decision-maker wants to know about before agreeing on anything.
The Handbook for Sustainable Traffic Management does not deal with the physical aspects of traffic management such as architecture or (physical architecture or communications).
Our ample experience with the practical application of the Handbook for Sustainable Traffic Management, combined with our involvement in the development of the US National Architecture and KAREN, leaves us confident that this Handbook is not only fully compatible with KAREN, but also provides the right instrument to help define the aspirations and select the right traffic management services across a region. We sincerely hope that the Handbook for Sustainable Traffic Management may be of assistance to both KAREN and US National Architecture users.

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The Traffic Control Architecture

Key to effective traffic management

How can we secure mobility and accessibility? How can we restore matters to the liking of our customers – the road users? This is the challenge we will be facing over the next couple of years. And what a challenge it is! In spite of the fact that mobility and accessibility have become major economic factors, our roads appear to be gradually clogging up. The resulting state of affairs is more than just a problem for central government to solve: local and regional authorities, commercial and private road users all are directly involved. A major part of the solution can be found in traffic management, which brings us to Dutch National Traffic Management Architecture (TMA), and more in particular to one of its components, the Traffic Control Architecture (TCA). The TCA is a method that allows traffic management to be applied in such a way that problems throughout the road network can be tackled in a structured manner. The method focuses on close cooperation between all the parties involved, operates at the network level, and is aimed at sustainable solutions. In other words, the Traffic Control Architecture forms the key to efficient traffic management.

Improved Utilisation and Traffic Management
How can mobility and accessibility be safeguarded? How can we make sure that road users can count on reliable travel times? These are some of the challenges the various road authorities – local, regional, and national – find themselves facing.

An obvious – partial – solution is to make better use of what is already there: improved utilisation of available resources. After all, infrastructure bottlenecks tend to become manifest only during certain times of the day, mostly the morning and evening rush hours. If road capacity could be optimised during peak times, traffic flows would improve considerably.

For this purpose, road managers can call on a versatile instrument, (dynamic) traffic management, which provides such means and measures as route information panels, ramp-metering, and rush hour lanes, all of which may be combined with minor infrastructural and traffic planning measures. In short, traffic management is used to inform, regulate, and facilitate traffic flows, based on actual data. The effect of each measure on its own may vary, depending on its type and the location in which it is being applied, but in an integrated approach, traffic management is a powerful instrument to improve the flow of traffic in a region.

However, traffic management is not a panacea for every conceivable situation. Traffic problems tend to be complicated and impossible to separate from their context. Changes in one place have a tendency of resulting in adverse effects further down the road.
The importance of cooperation and organisation cannot be overemphasised. As a road manager engaged in traffic management you will soon meet other road managers, either because you need them to solve problems with your own road system, or because the effects of your actions extend to their roads.

So how can you achieve the constructive cooperation you need to get solutions that have the unqualified support of all the parties involved?

Traffic Management Architecture

As a guideline for the application of traffic management is essential, the Traffic Management Architecture (TMA) was developed. According to a common definition, an architecture is "a conceptual description of a complex system". The system in this case is the set of traffic management measures and everything (software, organisation, etc.) that supports it. A description of the set serves to provide insight, with connections being highlighted, structure being imposed, and essentials being separated from side issues.

In this way, the TMA lays the groundwork for the develop-ment of traffic control methods and applications, and the necessary technical infrastructure. It enables the parties involved to collectively arrive at a network-wide long-term policy that will yield optimum control over traffic problems.

The TMA consists of five subarchitectures each of which describes one aspect of traffic management:

- *Traffic Control Architecture*
  Setting up and using a collective, network-wide set of traffic management measures.
- *Application Architecture*
  The software and hardware of traffic management systems.
- *Architecture of the Technical Infrastructure*
  The general ICT services in traffic management systems.
- *Information Architecture*
  Arrangements for the exchange and use of information.
- *Organisation Architecture*
  The organisation required to facilitate traffic management.

Of the five TMA subarchitectures, the Traffic Control Architecture (TCA) clearly plays a leading role in that it forms the set of tools in support of which the other subarchitectures were devised.

Traffic Control Architecture

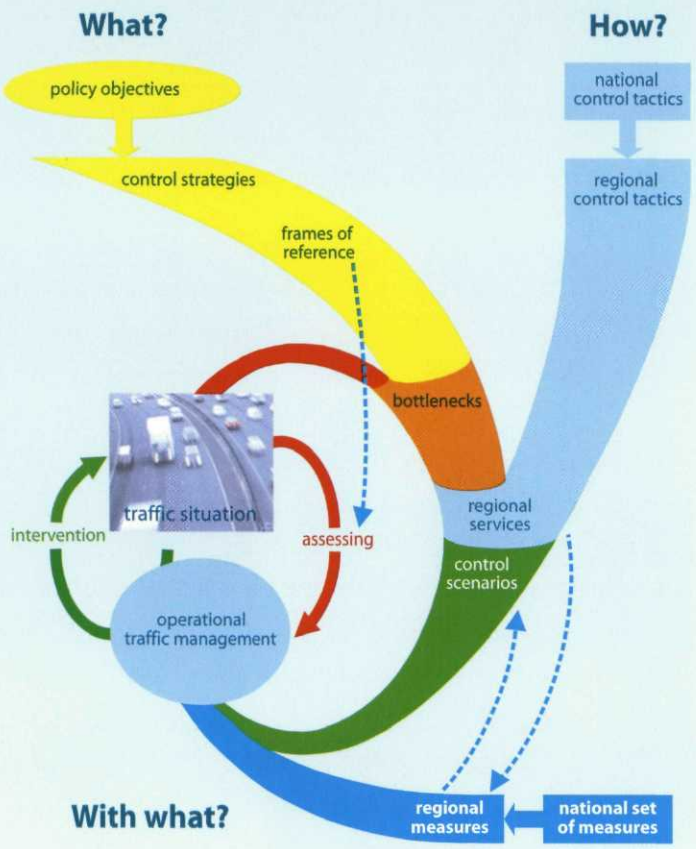
TCA is used to indicate on the one hand the targets you hope to achieve by means of traffic management within a certain area or region, and on the other hand your choice of measures for that purpose. The TCA method ensures that the process follows a structured programme and that your policy remains concrete and open. What is perhaps even more important, TCA helps you to cooperate with the various parties involved. In other words, rather than coming up with local solutions to local network problems, the use of a regional network will be optimised as if management boundaries did not exist. Of course, the credo remains "local whenever possible, at network level whenever necessary", which is why you will start by listing the general policies of all the parties involved. These are then made concrete by linking them to a specific relation or location, and translating them into such specific criteria as demand, travel time, etc. These criteria are then compared with the actual situation to find the problem areas (i.e. the places where the real world does not match the target situation). Next, you check how you can use traffic management to resolve these problem areas, and whether local or network-wide solutions are needed, progressing from

general solution directions to concrete measures. At the end of the process, the result will be an effective, widely supported, and targeted set of traffic management measures.

In addition to the method described in this Handbook for Sustainable Traffic Management the TCA includes the preparation of control scenarios to handle contingencies such as road works, incidents, and other events, as well as the operational deployment of your measures. In a nutshell, the TCA is a step-by-step guide towards operational traffic management.

Of course, implementing traffic management is not a static project, but a dynamic process. Modern traffic is as variable and unpredictable as the weather. However, since the TCA starts with the development of a collective network vision, you will gain a working frame covering the next five to ten years that will help you to develop, test, and implement adaptations in a structured manner.

The entire Traffic Control Architecture process of the Traffic Management Architecture has been visualised in the corkscrew model shown below. The model illustrates how forces and input arrive practically simultaneously from different directions. In a converging and cyclic process, they even-tually result in operational traffic management with a balanced set of traffic control measures.



Sustainable Traffic Management

An Outline

The method for Sustainable Traffic Management forms the main ingredient of the Traffic Control Architecture. The process helps you to develop a network vision based on the policy objectives. Together you will decide how to make use of the available capacity offered by the road network. In addition, it will provide you with a first indication of the measures required to achieve effective traffic management in line with that vision. In this way, the method for Sustainable Traffic Management lays the foundation for all your other activities within the framework of 'improved utilisation of the available road infrastructure'.

It goes without saying that the subject is complex and driven by many different factors. Add to this the fact that a number of different parties, often with a diversity of interests, are involved, and it will become clear that the method for Sustainable Traffic Management requires attention to detail if it is to succeed.

This handbook offers a helping hand in the form of a step-by-step guide to lead you past the cliffs and crags of the process. It helps all those involved to cooperate in a constructive manner towards the creation of a win-win situation. The result will be effective traf-fic management to provide improved accessibility, taking into account requirements of safety and quality of life.

Nine Steps

The Traffic Control Architecture provides you with a structure, a framework for setting up and using traffic management. Most of the details of this process can be found in this Handbook for Sustainable Traffic Management. It covers the entire process, from your initial intent to improve your local traffic situation right up to an integrated traffic management concept.

The Handbook for Sustainable Traffic Management is subdivided into nine steps. Each of these steps comprises a number of self-contained actions. These actions result in 'intermediate products' (reports, analyses). At certain points – coinciding with executive meetings - you will be presenting 'products', in the form of memorandums laying down the agreed arrangements and the results of the discussions that were held during the step(s) under review.

Your project starts with an initial memorandum, in which you state your intention to work in accordance with the TCA, and it concludes with a memorandum of understanding between all the parties involved, describing a network vision and a detailed set of traffic management measures.

For an overview of the Sustainable Traffic Management steps and their products, see pages 20 and 21.

In Brief

Generally speaking, the process as described in this workbook is as follows. You will start by organising the project, bringing together the parties that will be needed to work collectively on Sustainable Traffic Management. Together you will define the 'traffic management targets', indicating the problems you intend to tackle using traffic management (and perhaps other means). You will also set up a proper project organisation structure. Once the assignment, its content, and the organisational framework have been ratified, you are off!
Together, you will now follow three steps to formulate your common goals more precisely. First you will elaborate the traffic management targets into a network vision. You will formulate policy objectives to clearly and unambiguously state the target situation. In a control strategy, you will set the contingency priorities to be used in case the target cannot be met fully. The frames of reference constitute the third element of the network vision and includes measurable criteria (travel time, noise levels, etc.) as well as thresholds to indicate what is acceptable and what not.
You can now compare the target situation with the actual or projected situation to determine the locations and severity of bottlenecks. You indicate your proposed manner of dealing with these bottlenecks by defining services, i.e. a general description of actions intended to achieve the desired effect for certain traffic flows, locations, or roads (e.g. limit the flow of incoming traffic, increase the capacity at the bottleneck). In doing so, you will take into account the priorities you defined for the control strategy. This is the step where you create logic, consistency, and coherence.
Next, you link each service to one or more measures – the means you intend to use to implement the services (e.g. ramp metering, traffic lights, rush hour lane). You will then calculate the cost, effectiveness, and completion date of this set of measures. This will result in a proposal for an action scheme. Once the scheme has been ratified at the political level, you can start to implement the measures, designing control scenarios and, finally, the operational traffic management.
All this lies outside the scope of this handbook, however.

Participants

In all of the nine steps and actions outlined above, three groups of participants will be involved and active; sometimes alternately, in other cases simultaneously: a Steering Group, a Working Group, and an Expert Group. The Steering Group consists of executives from central and local authorities as well as interested private parties. The Working Group consists of executive representatives of these organisations. Initially, this group will be made up mostly of policy makers, later on it will consist of representatives of the relevant parties who are better versed in traffic control systems. The Expert Group consists of (traffic) experts.

So what are the tasks of these groups? First of all, the Steering Group makes decisions regarding general policy and starting points. In fact they will meet only a few times to discuss and sign major policy documents. After that, they will remain informed through their representatives in the Working Group. The latter will actively participate in work meetings to contribute their knowledge, experience, and to air their party's point of view. They must be given the necessary authority, within certain limits, to make decisions – for example, on

intermediate reports, and when preparing documents for ratification. Finally, the primary task of the Expert Group is to provide the Working Group with facts and figures and recommendations. In view of the concrete nature of their task (as either policy makers or traffic experts), it is essential that the members of the Expert Group be selected with due care to ascertain their suitability. The success of the entire process is determined for a large part by the actions of the Expert Group, which prepares the decisions of the Working Group, works out proposals, analyses the effects of decisions, etc. They are also responsible for providing the working materials (e.g. maps) and for the proper presentation of the (interim) decisions (maps, tables, reports, etc.).

Work Meetings

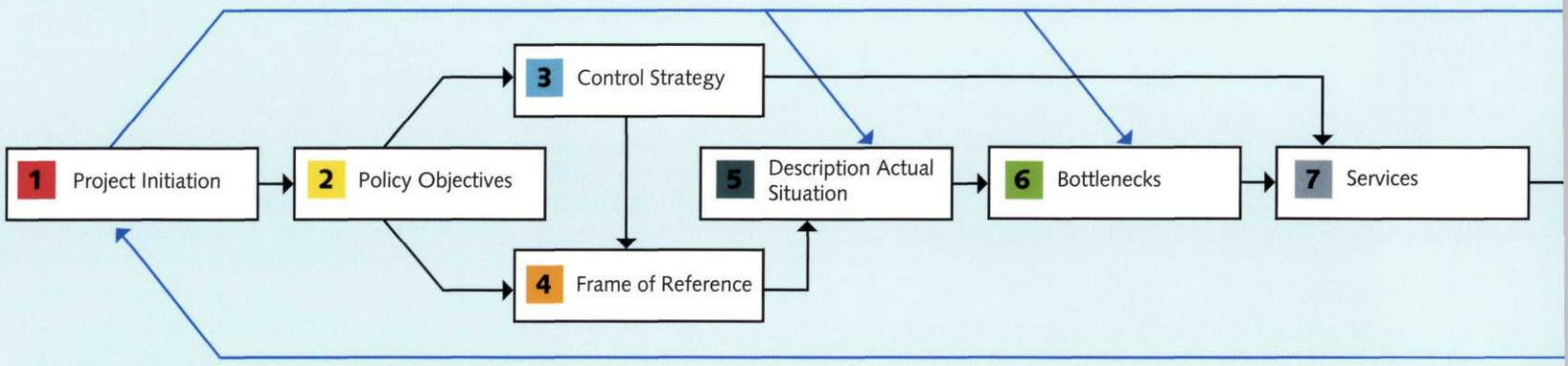
The Working Group in particular will be meeting on a regular basis to attend work meetings (workshops) – how else can a collective approach be realised? During these meetings, the members of the Working Group will look at all the intermediate products and the options involved. It is advisable to elect an outside facilitator to set up and preside over these meetings, so none of the Working Group members need be forced into the awkward twin role of 'impartial' chairperson and representative of one of the parties.

Handbook Structure

This workbook has been specially designed to help you detail your traffic management in a structured way. Each of the nine steps comprising the method for Sustainable Traffic Management is discussed in detail, with added comments. Even so, this does not mean that you will be following the instructions to the letter. They leave enough room for improvisation and changes to suit specific circumstances.
However, if you follow the main thread of this handbook, you will be progressing through a thoroughly thoughtout and above all, fieldtested method for setting up and detailing traffic management. It is a process which focuses on proper cooperation between all the parties involved in order to ensure that the resulting measures will be widely supported. It is also a process that does not stop at helping you resolve bottlenecks, but goes on to find the kind of structured, networkwide solutions that are so desperately needed. Solutions that do not just provide a remedy to the symptoms, but delve deeper to tackle the problem at its root – and in such a way that everyone involved will agree that the chosen solutions are the best available.
The prospect may be daunting, but at least you can rest assured that both the Traffic Control Architecture method and the path marked out in this Handbook for Sustainable Traffic Management have been put to the test in numerous actual cases. You should also regard it as an investment in the future: you will be laying the foundations that will help you develop, test, and implement all the traffic control measures you need for the next couple of years.

If you would like to tell us about your experiences with the method, or if you have any suggestions or remarks, please let us know!

Sustainable Traffic Management Process Diagram

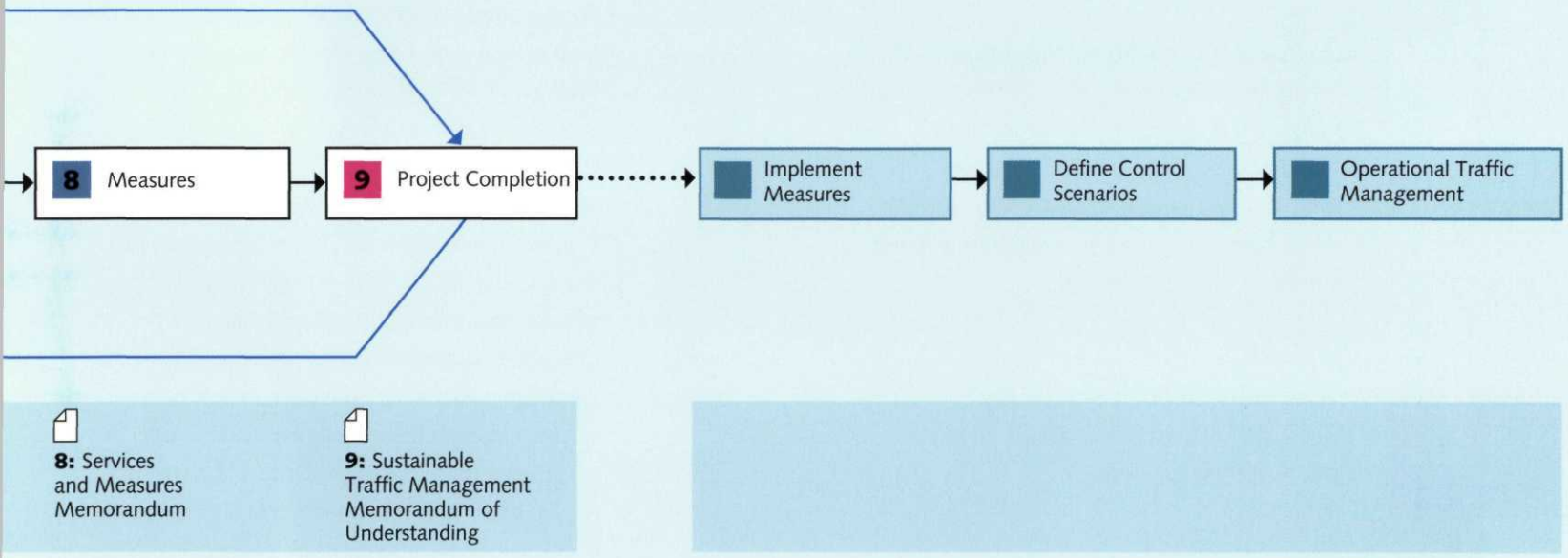


1: Initial Memorandum

4: Policy Memorandum (Policy Objectives, Control Strategy, Frame of Reference)

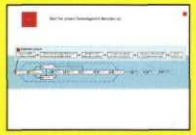
6: Actual Situation and Problem Definition Memorandum

LEGEND 10 step number | product | → primary relationship | → secondary relationship


8 Measures
9 Project Completion
Implement Measures
Define Control Scenarios
Operational Traffic Management
8: Services and Measures Memorandum
9: Sustainable Traffic Management Memorandum of Understanding

How to Use this Handbook

The nine steps in this Handbook for Sustainable Traffic Management all follow a common pattern.



Each step starts with a **flow diagram** providing an overview of the entire Sustainable Traffic Management process, with the current step indicated and expanded into its component actions. To make it easier to tell the steps apart, each has been given its own colour which you will find marking the relevant pages.

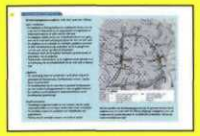
Next is a **summary** of the current step. To get a quick impression of how the method works, read these summaries.

The **detailing stage** looks at the various ingredients of the step in more detail. The numbers in the margins show you immediately which action of the step you're dealing with. In case you plan to follow the line of the handbook bold print indicates essential text. Explanatory details are shown in normal print. Examples and tips are printed in italics on a blue background. Each section clearly describes the (intermediate) products you will be creating. This text is for Working Group members .

How you detail the essential elements is up to you, but in most cases you will be offered a tried and tested method, which is easily recognised by the text on a yellow background headed **'Suggested Method'**. The 'professionals' – principals, consultants, Expert Group members – can read through these suggestions. The challenge lies in using the information to deliver customised results, distilling the optimum solution from the opportunities and restrictions of the specific project you are working on.

At the start of the method, a **sample case** is introduced which reappears at regular intervals to help visualise the actions and suggested method

of each step. The case usually deals with (intermediate) products in order to let you grasp exactly what you are working towards.



In addition to the sample case, the handbook contains a number of further **examples taken from real life**.

Meaning of the icons used in the text:

- Important tip or remark
- An (intermediate) product
- Definition of a term

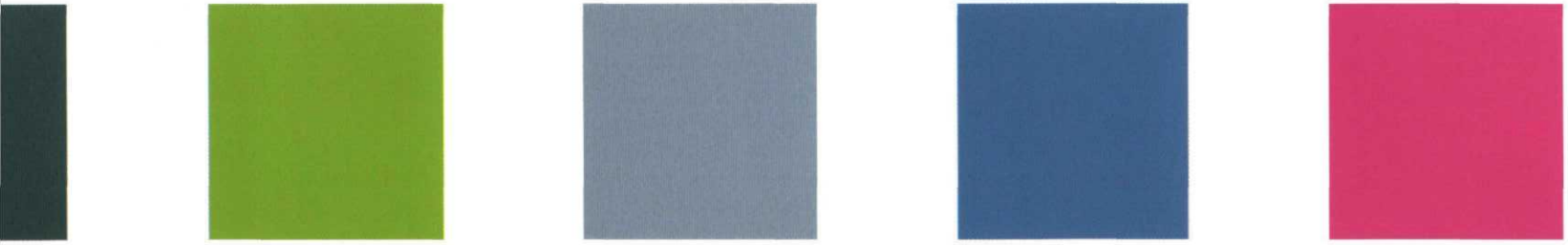
Please note that terms are defined only once, the first time they appear in the text.
The appendix includes a full alphabetical list of terms and definitions.

Doing it your way

To tackle traffic management in a structured manner, you should at least follow the nine steps and the actions within each step (shown in bold print). You are free to interpret the actions as you see fit, in which case you can replace the **'Suggested Method'** section with your own way of working.
Whatever you do, please observe the following essential elements of the Traffic Control Architecture:

- **Cooperation between parties is paramount;**
- **Local solutions whenever possible, networkwide when required;**
- **All decisions must be traceable (What were they based on? What were the considerations? etc.);**
- **The network vision must comply with the set of measures you intend to implement.**

The Nine Steps to Sustainable Traffic Management



step 1

Initiate the Sustainable Traffic Management Project

You have a number of traffic problems in your area that you know you can resolve by means of traffic management – especially if you handle things in a 'networkwide' manner. The question is, how do you go about setting up and managing the collaboration between the various authorities and road managers involved? You decide to use the Traffic Control Architecture (TCA) of the Traffic Management Architecture as a guideline, and to set up a Sustainable Traffic Management project. The first step discusses how to initiate the project. You will contact the relevant parties, and together you will draw up a list of the problems involved and define your idea of the role traffic management will play in resolving these problems. You will then look at the way the project is to be organised, formalising your intention to collaborate in an Initial Memorandum. Put in a nut-shell, step number one is where you lay the foundations for the remainder of the project.

Step 1, Summary

In this first step, the initiator defines to both himself and his managers the rationale for using traffic management and what it aims to accomplish: 'what do we intend to achieve by means of traffic management, for which area, for which periods of time (rush hour, off-peak hours, recreational) and what is the intended time scale (e.g. five years)'. Based on this, he decides which parties to invite to participate in the Sustainable Traffic Management project.

The interested parties then discuss the initial rationale and intent, amending it as required. In addition, they look up the problem locations and problem relations in the area. Can these traffic and transport problems be resolved (either partly or completely) by means of traffic management? If so, they are included in the traffic management assignment.

Armed with this knowledge, the parties can now determine the final prerequisites of the project (scope of study area, periods of time to be considered, time scale, etc.). This is also the point at which the project organisation can be set up, with the initiating group determining who will participate in the Steering Group (decision process), the Working Group (detailing the steps, creating a common ground, deciding about results, etc.), and the Expert Group (setting up meetings, checking the results of the Working Group, etc.).

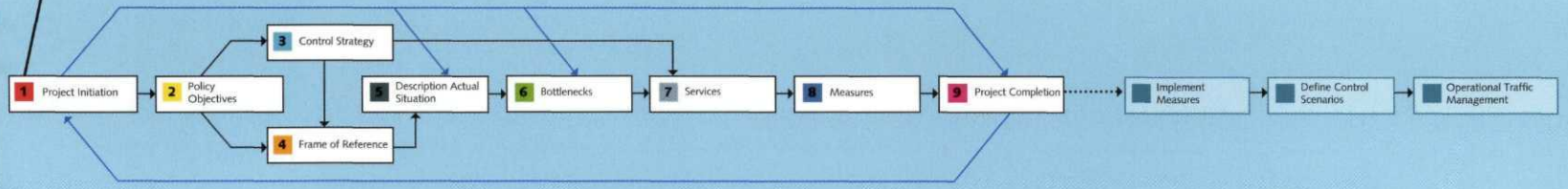
Finally, the parties draw up the Initial Memorandum, in which they state their willingness to collaborate on networkwide traffic management, and their intention to use the Traffic Control Architecture as a guideline.

step 1

Initiate the Sustainable Traffic Management Project

1 Project Initiation

1.1 Define the initial rationale and intent → 1.2 Involve the relevant parties in the project and define the joint intent → 1.3 Identify the policy problems → 1.4 Define the traffic management assignment → 1.5 Determine the prerequisites and organisation of the project → 1.6 Draw up the Initial Memorandum



step 1

Initiate the Sustainable Traffic Management Project

1.1 The initiator defines, in general terms, the initial rationale and intent for starting up the Sustainable Traffic Management project.

The rationale consists of the wish to collaborate to order to resolve existing problems by means of networkwide, regional traffic management (improved utilisation of the road network).

By defining this rationale, you are creating a broad general basis for traffic management in your area. This basis can be amended where necessary to handle contingencies such as incidents, large-scale roadworks, calamities, or special events).

Without the broad basis, parties run the risk of using the Traffic Control Architecture solely to resolve contingencies – e.g. when roadworks make it necessary for the parties to collaborate.

In the long run however, it is advisable to go for the more general approach and not to focus purely on specific situations.

The intent is used to give a general indication of the result you hope to achieve by means of the project.

It can also be used to list what you think are the prerequisites of the project. This can include such aspects as:

- Resolution level – Is it about installing a few isolated route information panels, or are you looking for an integrated traffic management implementation?
- Time scale – Are you hoping to achieve your targets for the project in one, five, or ten years' time?

This should also take into account (major) changes in the field of infrastructure and planning. If for example you know that a new housing estate is to be completed near your focus area in four years' time, you can choose your time scale so as to include measures to accommodate the new situation. In this case you could look at your current situation, and plan ahead for the situation in, say, five years' time.

- Periods of time to be taken into account – Is your problem to do with the rush hours only, are you including the offpeak hours, or are we talking about weekend traffic? Remember, additional periods involve more work.
- Modes of transport to be taken into account – Will you be considering the traffic as a single, constant flow, or will you be making special arrangements for, say, public transport and commercial vehicles?
- Scope of the study area – It goes without saying that this is determined for a large part by the problems you wish to resolve and by the space each solution requires. A larger area may be more ambitious and more complex, but at the same time it could be more effective.

Intermediate Product: Initial Rationale and Intent

1.2 The initiator involves the relevant parties in the project. They then define the common intent of the project.

It depends on the gravity of the rationale, the scope of the area under consideration, and your intent (i.e. what do you hope to achieve) which parties you will invite to participate.

The general rule is that it is better to ask a few too many than to leave anyone out. If in due course a party decides your scheme is not for them, they can always pull out. On the other hand, parties joining the project at a later date tend to slow matters down while they catch up on current knowledge and thinking.
Possibly relevant parties include local, regional, and national authorities, councils, and road managers, as well as chambers of commerce, road users associations, the police, regional transport companies, major employers in the area, property developers of new housing or industrial estates, theme parks attracting large numbers of visitors, etc.

You will preferably approach the parties at the executive level in order to ensure sufficient support for the process right from the beginning.

The normal procedure is to start by inviting the parties (executives) to a meeting or presentation.

Your initial invitation should include a concise version of your own rationale and intent, as well as your intention to follow the Traffic Management Architecture principles. In most cases, you will need to provide a lucid, well-prepared presentation on the facts underlying your rationale and the principles of the Traffic Management Architecture if you are to persuade the parties to join the project.

Study area:
the geographical area forming the subject of the Sustainable Traffic Management project, usually determined by the locations at which solutions to the supposed problems may still be found.

Be sure to try and approach the parties at the executive level.

The representatives of the interested parties – mostly executives at this stage of the proceedings – will form the initiating group. They will apply themselves to defining the Initial Rationale and Intent[1.1], amending the rationale (and if necessary, the relevant prerequisites) to arrive at a shared point of view.

By defining a joint intent at this very general level ('what do we hope to achieve with this project?') you will be creating a solid basis for agreement right from the start.

Intermediate Product: Joint Intent

1.3 The initiating group identifies policy problems

At this stage, you will identify the major problem locations (areas, zones) and problem relations within the study area. In other words, you will find the points where the traffic and transport situation fails to meet your requirements.

You should also look at any problems you will be expecting to crop up in the future (depending on your chosen time scale).

For example, say a large new housing estate is planned for completion within a few years (which is within your time scale). This will considerably increase the volume of commuter traffic on the relations under review, and may lead to congestion, extra traffic on back roads, etc.

Work up the policy problems into a map, and provide explanatory text if necessary.

Intermediate Product: Overview of Policy Problems

→ Suggested Method:

- Prepare an overview of the target traffic and transport situation as envisaged by the different parties.

  In doing so, you will be providing more detail than you did with the Joint Intent[1.2], even though you will still be sketching outlines only.

  You will be creating a detailed overview of the target (in the form of policy objectives) in the next step.

  You should restrict yourself to the matters for which a joint, networkwide traffic management approach is required.

For example: one of the road management authorities wishes to redesign a number of public spaces to make them 'sustainably safe'. This turns out to be perfectly feasible on a local scale, without the direct cooperation of other parties. In this case, the Sustainable Traffic Management project constitutes the general framework within which the local work will fit, but the Expert Group will not include the relevant 'wish' in the project. Nevertheless, such a local project would lend itself equally well to an approach using the method proposed in this handbook.

- Map out the target situation.

  On a map, indicate the locations (areas, zones) or relations to which the target situation pertains.

  For example, you will be identifying important target areas (area of origin or destination) and relations, and the locations/zones that affect safety and the quality of the living environment. It is useful at this point to indicate which roads you could use for traffic management, and which roads can definitely not be included (e.g. private access roads).

- Compare the target situation with the actual situation now and in the future (irrespective of the time scale you have set yourself).

  If at any location or relation the target situation does not match the actual current or future situation, this means that the target situation is not being fully realised in those instances. Therefore, a policy problem exists at the location or relation in question.

1.4 The initiating group determines which policy problems may be resolved by means of traffic management (traffic management assignment).

In the previous action, you identified the policy problems. For each of these problems you should now consider whether you will be able to resolve it using traffic management? If so, what will it achieve? Can be problem be resolved in full, or only partially?

The result of this check is a list of problems you intend to resolve at least partially by means of traffic management. In your list, add riders specifying what you expect traffic management to do for each problem.

If you expect the problem will be partially resolved, indicate to what extent this will be the case.

For example, access to a major centre is being severely restricted as a result of daily congestion. You expect traffic management to reduce delays to a target level, and you expect to be able to give reliable advance information about delays to the road users.

You can also arrive at several different traffic management assignments, each of which focuses on a number of previously defined, interrelated policy problems.

For example, you decide to start separate Sustainable Traffic Management projects for the ring road of town A, for a major relation between towns B and C, and for the problems in the vicinity of town D — all of which are locations within your region.

Intermediate Product: Traffic Management Assignment

It is best to include any policy problems you will not be attempting to resolve through traffic management in a separate overview. Other measures will have to be taken to safeguard the accessibility, safety, and quality of the environment in your region.

1.5 The initiating group determines the prerequisites for the Sustainable Traffic Management project and defines the project organisation.

The prerequisites defined in this step replace those of the Joint Intent[1.2] and will be included in the formal Initial Memorandum[1.4].

This is really a tighter definition of the same subject matter, made possible by the fact that you now have a clearer picture of the problems you will be tackling in the project. With the prerequisites of this action you are creating a clearly defined framework for the next steps in the Sustainable Traffic Management project.

Reconsider your earlier choices regarding solution level, time scale, transport modes, and study area scope in the light of your findings from the Traffic Management Assignment[1.4], adapting them where necessary.

At this point, you should make your choices regarding:

- Road network

Which roads are to be included in the project? These are the roads on which you expressly intend to deploy traffic management, as

well as any roads (including potential shortcuts) that you expressly wish to exclude. You may already have answered this question when you mapped out the target situation (see action 1.3). At this point you should also establish the relation with Sustainable Safety.

- Objective traffic data for the current and future situations

Which data sources will you be using? Who will supply the data, and who is responsible for their quality?

- Analyses, use of models

What kind of detail are you looking for in the analyses for this project? Will you be using traffic system models, and if so, will they be dynamic or static?

At this stage, you should be taking into consideration – or at least be aware of – the financial consequences of the prerequisites you define. Where necessary you can adjust the prerequisites as required.

In this respect you need not necessarily concern yourself with the cost of the final measures, and instead look at the expenses involved in the use of personnel and the need for support within the Sustainable Traffic Management project. For example, as you increase the number of time periods within your project scope, you will be requiring more analyses, maps, etc.

Intermediate Product: Prerequisites

You will now set up the organisation for the subsequent parts of the Sustainable Traffic Management project. At this stage you should have a clear picture of the size of the project.

This handbook assumes a fairly "heavy" project organisation, with a Steering Group, Working Group, and an Expert Group. Practical experience shows that each of these three groups fulfils an important function. Nevertheless, the parties involved are at liberty to adapt the organisation to their liking, as the specific circumstances of the project dictate.

You could consider establishing a response group in which representatives of interested, but not primarily responsible parties can participate (e.g. road user organisations, chambers of commerce).

Of course, the composition of the groups may change as the Sustainable Traffic Management project progresses. Even so, you should try to restrict personnel changes to a minimum.

1

Initiator:
Make sure the parties realise what is expected of the various groups.

Keep the size of the Working Group within practical limits.

Demand clear statements of mandate from the Working Group members.

For this reason you should make sure that all parties have the right idea about what is expected of the different groups and how much time will be involved with participating in the process. The initiator can play both an informative and a guiding role in this.

Intermediate Product: Project Organisation

About the Steering Group
A large part of the initiating group will probably consist of executives. Due to their involvement, these executives are practically always automatically elected to the Steering Group.

About the Working Group
This will generally be the largest group, since you will want to see as many interests represented as possible. However, you should keep the size of the Working Group within practical limits. Remember that this group will be the one meeting most often, and in this case, large generally means uncontrollable, slow, etc.

If the group threatens to become too big, you could opt for a system in which parties with a common interest are represented by a single person. For example, you could have a single representative of the local chamber of commerce instead of several representatives of local businesses. It could be useful if parties, insofar as possible, were to delegate two different types of members to the Working Group, a policy staff member and a traffic systems expert. There is no need for them both to be present at every meeting or workshop; they can decide who will attend at each stage of the Sustainable Traffic Management project. Of course, both "types" could be represented by one and the same person. Initially, the focus will be on the policy staff members, and as the project progresses, the input of the traffic systems experts will become increasingly important.

The main idea is to have a clear picture of what each of the group members is expected to do, and what their mandates are.

This determines to a large extent the freedom of action of the Working Group as a whole. Should the Working Group work out decisions in fine detail before submitting them to the Steering Group for approval, or is constant feedback to the executive of one or more parties required? It goes without saying that it is more practical to work with Working Group members of equal stature who have all been given sufficiently strong mandates.

About the Expert Group:
In view of the important role played by the Expert Group – they take on the lion's share of the work in between meetings and workshops – the initiating group should carefully vet each of the Expert Group members for the required qualities (know-how, insight, experience, etc.).

The vetting process should look at knowledge of and insight into the traffic situation under review as well as insight into (the possibilities offered by) traffic management, but also a feeling for the (administrative) relationships between the relevant parties in the region.

Other organisational aspects

In addition to appointing the steering, working, and Expert Groups, a number of other organisational aspects require your attention:

- *What will be the lead time of the project?* In real terms, you will set a lead time before executing step 2. At that stage, you will also set tentative target dates for the remaining steps, which you can adjust during the completion of step 2.
- *How often will the Working Group convene for plenary meetings? What about the Expert Group?*
- *How often will formal administrative feedback take place during Steering Group meetings? At which moments will administrative feedback be required?*
- *Will you be using external support, e.g. an independent facilitator?* During (Working Group) meetings, a facilitator will assume the role of chairperson in order to avoid forcing any of the group members into an uneasy double role of independent chairperson as well as representative of one of the parties.
- *What are the responsibilities of the parties?* This varies from providing input at meetings to the actual setting up, deployment, exploitation, and management of solutions. Generally speaking, the responsibility will be taken by the party under whose authority a solution (measure) comes.
- *To what extent will the participating parties contribute resources to cover the cost of the project?* This could be the expense involved in e.g. the use of staff and external support, but also the costs to be incurred for implementing your choice of traffic management measures. Insofar as possible, you will make arrangements to cover the entire cost of the Sustainable Traffic Management project in order to avoid financial problems that might hinder the project's progress later on.

1.6 The initiating group draws up the Initial Memorandum

This action involves combining the results of the previous actions into the Initial Memorandum – the document in which the parties state their desire to participate in the Sustainable Traffic Management project, the intended goals, and the proposed method.

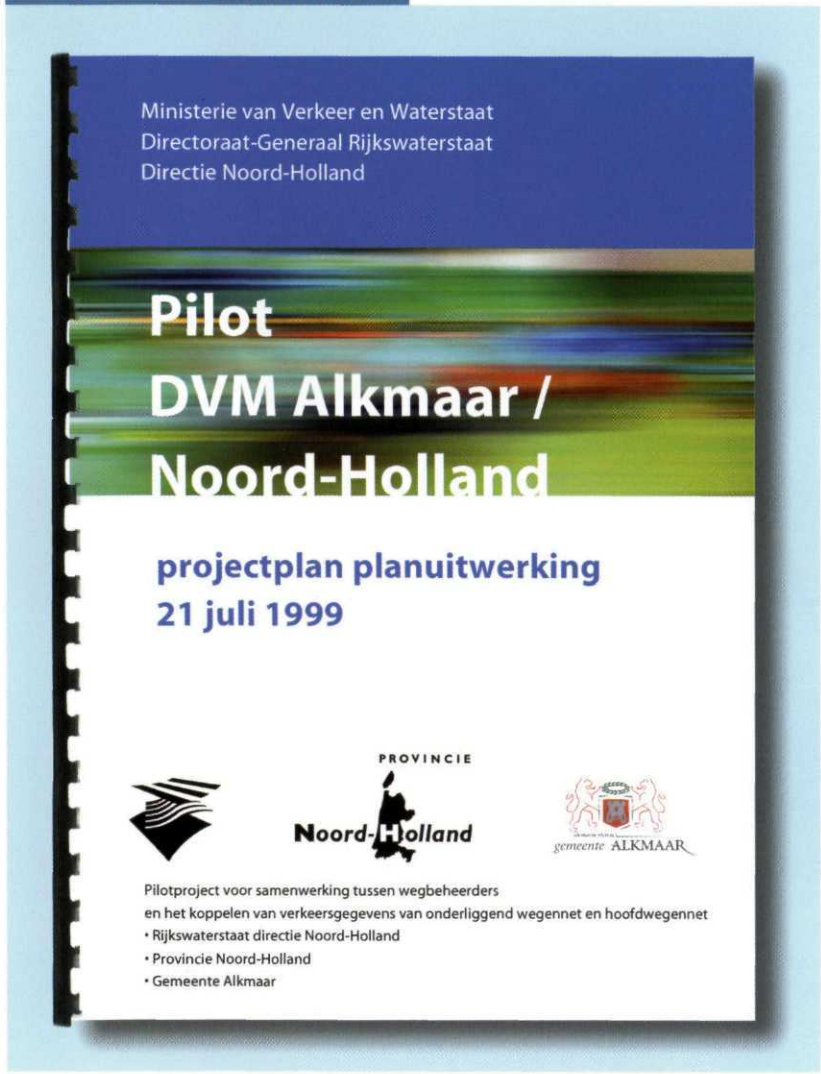
Intermediate Product: Initial Memorandum

→ At the very least, the Initial Memorandum shall contain

- The Rationale from the Initial Rationale and Intent [1.1];
- A statement indicating the willingness to jointly work in a network-wide manner on traffic management using the TMA method;
- The Traffic Management Assignment [1.4];
- The Prerequisites [1.5] – solution level, time scale, periods of time to be considered, etc.;
- The Project Organisation [1.5] – the composition of the steering, working, and Expert Groups. See also the list of items under "Other organisational aspects".

In order to keep track of events and progress, you could draw a diagram showing meeting dates, products, and administrative feedback dates.

The Steering Group discusses the Initial Memorandum, proposes amendments as deemed necessary, and once the final version has been agreed upon, signs the document.


Ministerie van Verkeer en Waterstaat
Directoraat-Generaal Rijkswaterstaat
Directie Noord-Holland

Pilot
DVM Alkmaar /
Noord-Holland

projectplan planuitwerking
21 juli 1999

PROVINCIE
Noord-Holland

gemeente ALKMAAR

Pilotproject voor samenwerking tussen wegbeheerders
en het koppelen van verkeersgegevens van onderliggend wegennet en hoofdwegennet
• Rijkswaterstaat directie Noord-Holland
• Provincie Noord-Holland
• Gemeente Alkmaar

The purpose of the Initial Memorandum

By signing the Initial Memorandum, the parties indicate their intent to participate in the Sustainable Traffic Management project in accordance with the Traffic Control Architecture method (TMA-TCA).

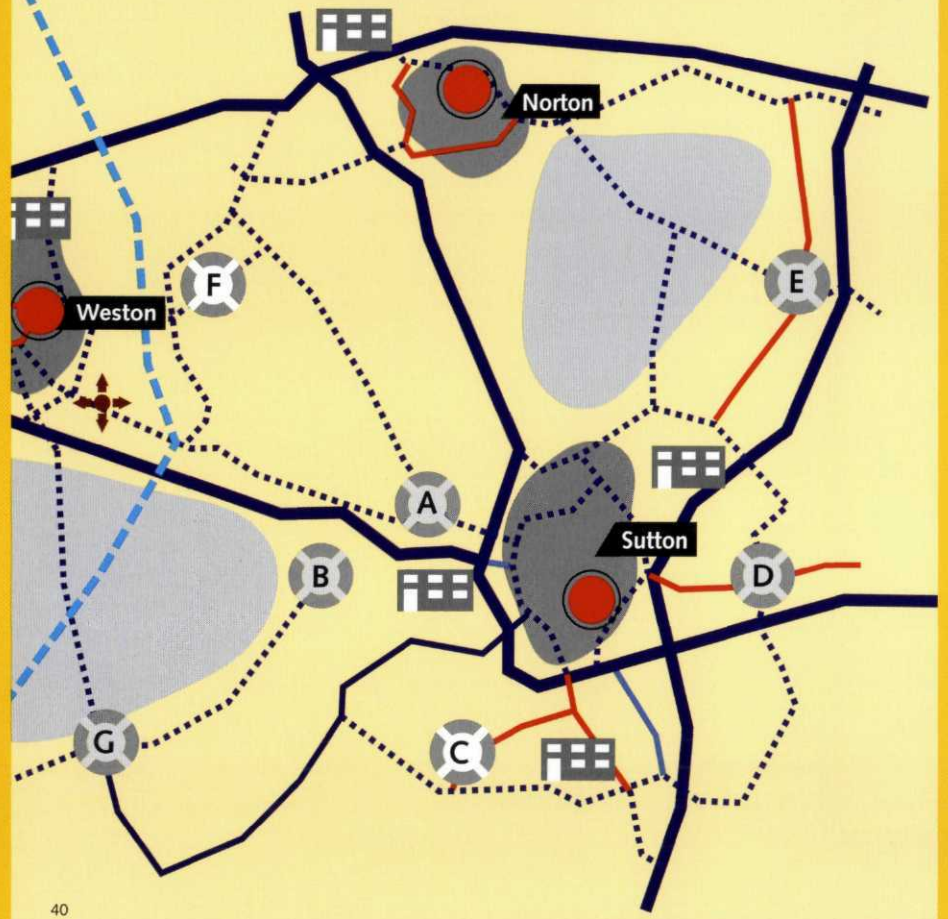
The memorandum outlines the results the parties propose to achieve by means of traffic management in their region, how they intend to go about doing so, who does what, and who pays for what.

In a nutshell, the memorandum serves to commit the parties to the Sustainable Traffic Management project.

Initial
Memorandum

Theoretical Case Study:

Improved access to South Lakedale



In order to enable you to see what the various actions and steps of the project should lead to, throughout the handbook you will find (intermediate) products from the fictitious project, **"Improved access to South Lakedale"**. South Lakedale covers an area with three major towns, Norton, Weston, and Sutton, as well as a number of villages. The region suffers increasingly from congestion, so the various parties involved have decided to implement a Sustainable Traffic Management strategy based on the Traffic Control Architecture.

CASE STUDY

Improved access to South Lakedale

step 1

1.1 Initial Rationale and Intent

Initial Rationale and Intent

The South Lakedale region has seen considerable economic growth over the past few years. As a result, traffic flow, and consequently, congestion, has rapidly increased.

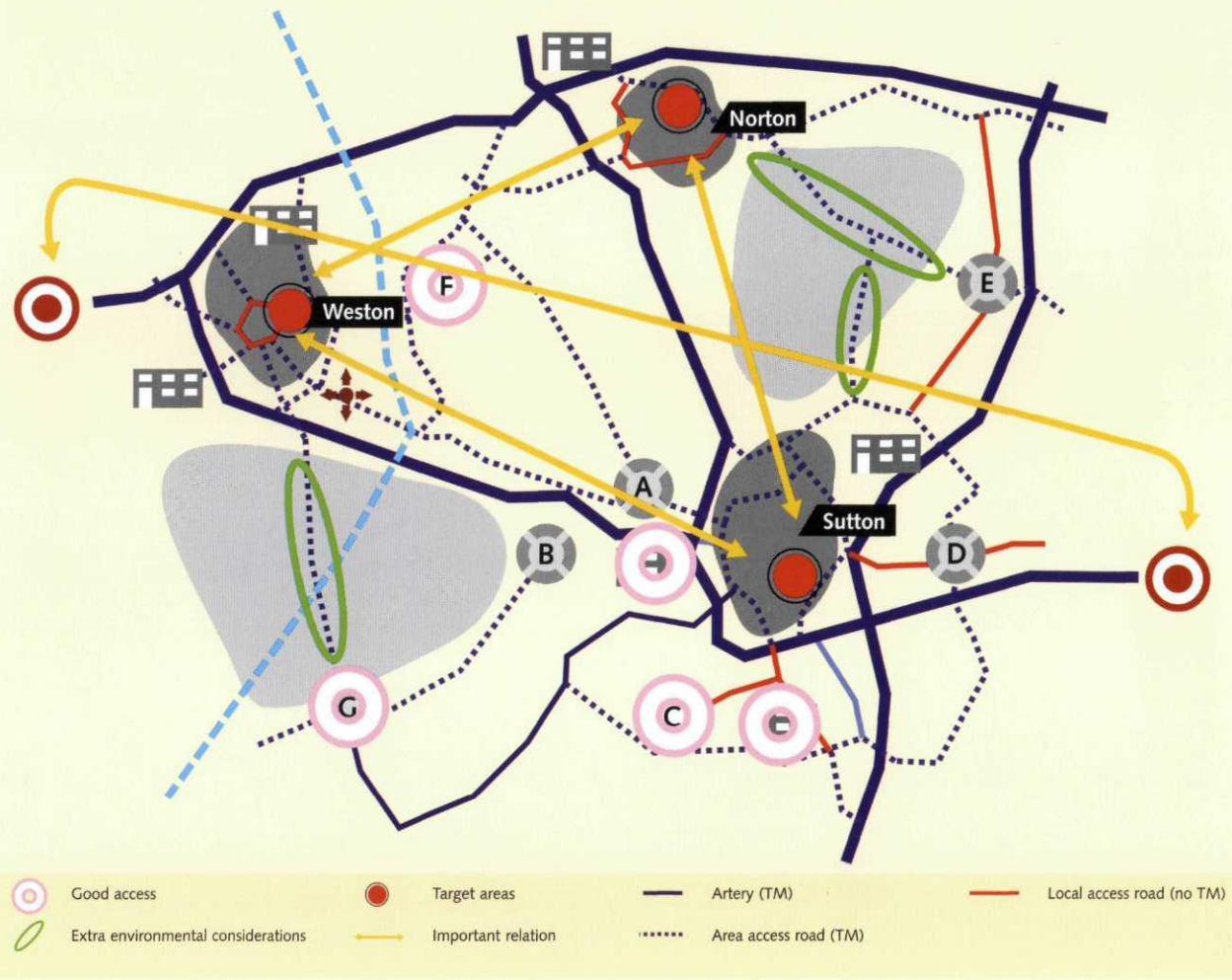
Since expanding the capacity of the road network in the short term is practically impossible, accessibility and safety in the area are under pressure. Accordingly, Sutton and Weston have taken the initiative to launch a project, "Improved access to South Lakedale", with the following aim:

> *To improve, through joint traffic management, peak hour accessibility for the next five years. This is to be achieved within the framework of Sustainable Safety and the legal restrictions regarding emission and noise levels.*

The method proposed by the initiators for the joint development and deployment of traffic management measures is the so-called Traffic Control Architecture, part of the Traffic Management Architecture.

In order to determine where policy problems occur, the initiating group of the "Improved access to South Lakedale" project has started by literally mapping out the wishes regarding traffic and transport. Note that the map also shows which roads can be included in traffic management (TM), and which ones are expressly excluded.

1.3 Identifying the Policy Problems



1.4 Traffic Management Assignment

By comparing the desired situation with the actual situation (now and in the future), the (general) policy problems become self-evident. The question remains which of these problems can be resolved by means of traffic management (TM). Traffic management is not a panacea, so additional measures will be required for a number of policy problems. The remaining policy problems can be resolved using TM.

The map shows the policy problems and the estimated effectiveness of TM.

1.6 Initial Memorandum

South Lakedale

Traffic Management Initial Memorandum

Contents

1. Rationale
2. The Traffic Management Assignment: The policy problems to be resolved by means of traffic management
3. The working method: TCA
4. Prerequisites
   Solution level, time scale, periods, transport modes, study area, road network, data, analyses, and models.
5. Project Organisation
   Composition, mandate, method, and products of the Steering, Working, and Expert Groups, schedule, budget.

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step 2

Define the Common Policy Objectives

In the previous step you defined the Traffic Management Assignment. To fill in the details of the assignment, you start by defining a set of uniform, unambiguous policy objectives. You will focus on harmonising the objectives, i.e. resolving any possible inconsistencies. Finally, you will work towards a concise overview in which you set explicit priorities. After step 2 you will be ready to start the actual development of a shared network vision.

Step 2, Summary

In the Traffic Management Assignment part of the Initial Memorandum (Step 1) you listed the general policy problems you wish to resolve by means of the Sustainable Traffic Management project. However, these problems are still far from concrete. What you need to do is to define highly specific, widely supported traffic and transport goals. This is what you will be doing in this step.

To begin with, each of the parties involved will define their own goals they intend to achieve through the project. This results in a set of policy objectives that are more specific than the general intent and the desired situation you defined in the previous step. You will then make these policy objectives uniform, i.e. you will describe them all in the same, concrete way, and with the proposed target in mind (as opposed to a possible solution).

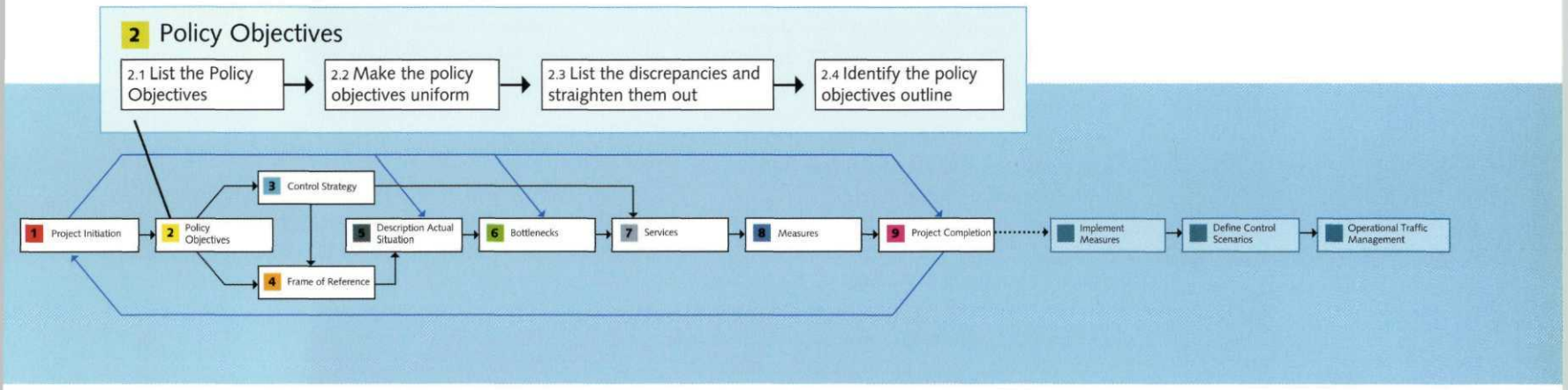
As a result of this process, any ostensible discrepancies due to a confusion of ideas will be automatically resolved, whereas any real discrepancies will become easy to spot.

In a plenary meeting of the Working Group you will then try to harmonise the discrepancies in your policy objectives. For example, you could start by defining the underlying policy items on which you agree, or you could list the prerequisites that would make the use of traffic management acceptable to all the parties involved.

Finally, you will make the (long) list of harmonised policy objectives more accessible by reducing it to a short and concise list, the Outline.

step 2

Define the Common Policy Objectives



step 2

Define the Common Policy Objectives

2.1 The Working Group lists the policy objectives.

The policy objectives are used by the parties involved in the project to indicate the targets they hope to achieve as they elaborate the Traffic Management Assignment included in the Initial Memorandum[1.6]. The result will be much more concrete than the (general) intent or the desired situation from Step 1.

By way of "homework", to prepare for the first Working Group meeting you will list the policy objectives your organisation wishes to put forward. In a joint session, all the Working Group members will then collect all these policy objectives. This usually results in a long list that, at least at this stage, contains both discrepancies and partially overlapping policy objectives.

The policy objectives form the basis for the entire subsequent process. Therefore, to ensure the success of the total process, it is essential that all parties be absolutely straightforward, exhaustive, and clear in formulating their own policy objectives. If any of the parties wishes to go back on one or more of their original objectives once these have been fixed, you will have to go back to this step in the process and rework your work through all the subsequent stages.

Many of these objectives will have been specified before in plans and memoranda. These items form a good starting point for listing the relevant policy objectives.

Such texts can include:

- *National, provincial, regional, and municipal traffic and transport plans, public transport plans, etc.*
- *Traffic safety plans (including the "Sustainable Safety" programmes).*
- *Plans on the subjects of living environment and public planning, provincial planning schemes, town planning schemes, etc.*

- *National economy planning policy, similar plans at the provincial and municipal levels, relevant chamber of commerce memoranda, etc.*

At this stage, the long list of policy objectives requires no further analysis.

This means that for the time being, you will accept the policy objectives as they stand. In Step 3, as you develop the control strategy, you will consider objectives in the light of the opportunities offered by the network.

What is important though, is that each of the listed objectives can be traced back to the party or parties who put it forward, and to the policy document(s) in which it originally appeared. Objectives may be shared by parties.

Intermediate Product: Policy Objectives

2.2 The Expert Group makes the policy objectives uniform.

This action involves the rewriting of the policy objectives to make them more concrete and uniform. The uniform version should focus on the targets rather than the problems and possible solutions.

This will facilitate the harmonisation of the policy objectives later on: any ostensible discrepancies due to a confusion of ideas will be automatically resolved, whereas any real discrepancies will become easy to spot.

Intermediate product: Uniformly Formulated Policy Objectives

→ Suggested Method:

- Define each of the basic policy objectives in terms focused on your target: what do you intend to achieve?

  In many cases, objectives will be worded in such a manner that the intended result does not become apparent.

- Rewrite each of the policy objectives that simply points out (either explicitly or implicitly)

Make sure the origins of the policy objectives can be traced!

Make uniform: To describe (the policy objectives) in a consistent manner.

a problem and the need for a solution. Focus on why the problem should be tackled, i.e. what the purpose of doing so is.

Example: Rather than "The increasing congestion on the roads to the economic centres A and B should be alleviated soon" you should write "The economic centres A and B must be readily accessible".

- Rewrite each of the policy objectives that instead of itself serving a purpose, is aimed at supporting underlying goals. Emphasise why you pursue the underlying goals.

Example: Rather than "The speed on the secondary road C must be considerably lowered" you should write "The secondary road C must be made safe".

- Rewrite each of the policy objectives that is in fact a concrete solution. Work out what you are actually trying to bring about by means of the solution you offer.

Example: Rather than "A bus lane should be constructed along the road from A to B" you should write "For reasons of accessibility and quality of the living environment we want good public transport facilities in our region, in particular in the relation from A to B".

Of course, you can keep the solutions under your hat for future reference during Steps 7 and 8, when you will be using services and measures to build solutions.

The Working Group discusses the Uniform Formulated Policy Objectives, amending them as necessary, and ratifies them.

2.3 The Expert Group identifies the inconsistencies in the policy objectives.

In the previous action, by redefining the policy objectives so as to make them uniform, the Expert Group automatically brought to light any possible discrepancies in the set of policy objectives. These discrepancies are now listed to see which items are at odds with each other.

In most cases, the number of remaining discrepancies will be limited. Experience shows that once the policy objectives have been reformulated to be exhaustive, clear, and straightforward, there will be few grounds left for discussion.

You should be aware that discrepancies can occur within certain themes (accessibility, quality of the living environment, safety) as well as between these themes.

Example: One party considers a certain target group important, whereas another party does not (within the theme). One party considers the quality of the living environment in a certain area very important, while another party emphasises the importance of freight transport relations through the same area (between themes).

Since the policy objectives in action 2.1 have all been formulated in terms of goals (as opposed to solutions), everything else being correct the discrepancies should relate to the goals themselves or their target values.

Be aware that differences in possible solutions are less relevant; the important thing is to achieve the goals you have set together.

Insofar as possible, the Working Group harmonises the discrepancies in the policy objectives.

Basically, the Working Group will attempt to achieve agreement on the complete set of policy objectives. In practice however, a number of conflicts can be foreseen as at first glance obvious solutions clash with one or more of the objectives. You should explicitly indicate such possible conflicts – which are probably caused by policy requirements of a sensitive nature – taking care not to mask the prerequisites about which the parties agree.

For example, let us assume that two towns, A and B, in order to safeguard accessibility, intend to increase the traffic on the route through village C. Village C though, has a strict set of objectives concerning the quality of the living environment. Even lengthy discussions and "negotiations" cannot completely resolve the differences, but the parties do agree that village C will accept a maximum flow of X vehicles on the route through the village, and that the towns, A and B will be content to accept a maximum travel time Y. In this case, X and Y form the prerequisites for any subsequent decisions. The differences have been stated and as such remain permanently available for future reference.

For each of the harmonised policy objectives, you should now determine whether they are location-focused or relation-focused. See the "Location-focused or relation-focused?" text frame for more information.

The distinction will come in useful when you define the control strategies and the reference framework (Steps 3 and 4).

Intermediate Product: Harmonised Policy Objectives.

Harmonise:
To come to an agreement (about the set of policy objectives).

Location-focused or relation-focused?
Policy objectives can be divided in location-focused items and relation-focused ones. The distinction will be used in Steps 3 and 4.

Relation-focused policy objectives are items written from the road user's point of view – they look at the quality of relations (traffic flows, among other things) between areas. Therefore, these items focus primarily on accessibility, travel time, speed, reliability, etc.

Location-focused policy objectives on the other hand, are concerned with specific parts of the infrastructure (locations rather than relations). These items have been written mainly from the point of view of the environment and of the road authority. These policy objectives cater for the needs of e.g. the road authority as the operator of the road network and people living in the neighbourhood. As such, they are primarily concerned with such issues as the quality of living, environment, safety, and the handling of traffic at certain locations of the road network, in terms of safety, noise, and emissions (and consequently, though indirectly, with acceptable volumes and speeds).

A location-focused general objective can be related to pinpoint locations (e.g. a set of crossroads or a section of motorway), but also to whole zones (e.g. a residential area or a nature reserve).

2.4 The Expert Group identifies the outlines of the policy objectives.

The purpose of this action is to make the long list of Harmonised Policy Objectives[2.3] more accessible by reducing it to a short and concise list – an outline.

This is not to say that you will be pruning out the "less relevant" policy objectives for good. The idea is that, since the complete list of Harmonised Policy Objectives will tend to be unwieldy, with a fair number of items being concerned with details, picking out the major objectives will in the long run prevent you from getting sidetracked and losing sight of the primary targets.

Identifying the essential objectives usually is not very hard. In most cases, right from the start of the Focused Use of Space project there will be a general consensus about the points that certainly need improvement. Isolate the objectives that relate directly to these points. These are now your primary objectives.

The result of this action will be a shortlist in which all the parties will be able to see the jointly agreed policy basis at a glance. This shortlist will serve as the primary point of orientation for all the subsequently developed control strategies,

services, and measures. The remaining objectives will act as a sort of checklist that you can use to see if the details of control strategies etc. still fit in with the policy of the parties involved.

Intermediate Product: Policy Objectives Outline

The Working Group discusses the Policy Objectives Outline and where necessary suggests amendments.

Policy Objectives for the Old Town Ring Road, Tilburg

Cars / Lorries

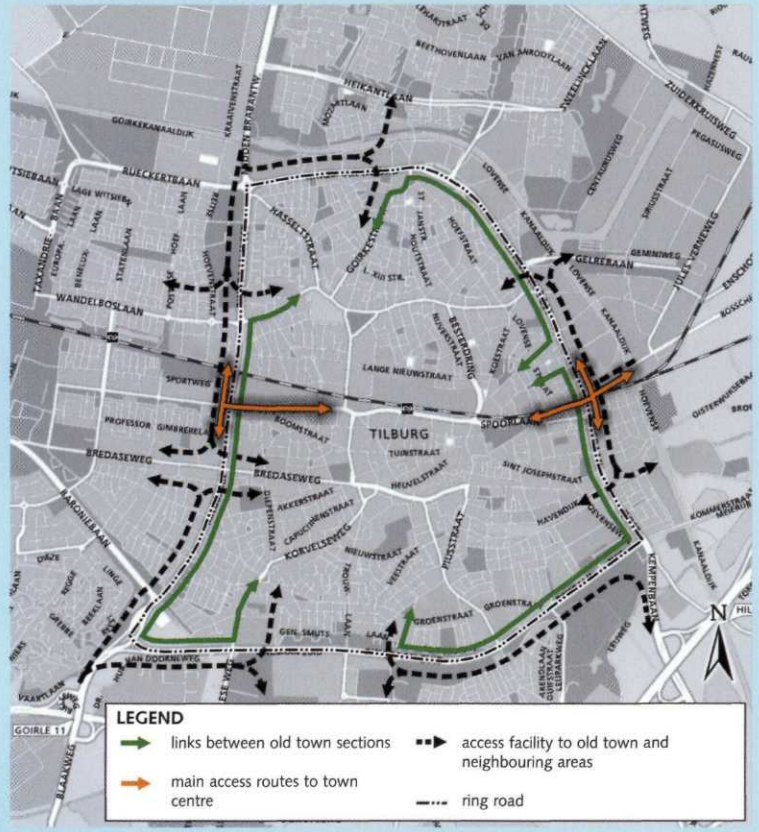
- The Tilburg ring road serves as an access road to the old town, to the town centre, and to the neighbouring residential areas and industrial estates
- The ring road also serves as a link between different areas of the old town (to keep traffic from passing through the old town itself).
- The ring road with the eastern and western access roads, the "Spoorlaan" and the "Hart van Brabantlaan" stand out as the primary access routes into the old town and its centre in particular.
- Through traffic is to be banned from using the ring roads.
- Any capacity improvement on the ring road is to be used to improve the accessibility of the old town and the town centre.

General

- The prioritisation of the traffic modes must be in line with the stated objectives (car network quality requirements, express routes, and bicycle hub and spoke network).
- The accessibility of the old town, and in particular the town centre, by bus and bicycle should remain as is, and be improved whenever possible.

Prerequisites

- Solutions may not lead to an increase in traffic casualties nor to more rat-running through the residential areas.
- The statutory standards and guidelines for emergency services must be followed.
- The same holds for the statutory noise and emission limits.



Listing the policy objectives laid down the proposed functions of the old town ring road of Tilburg . The items indicate how the prioritisation of the various different traffic modes is to be handled. In addition a set of prerequisites has been defined.

2.2 Uniformly Defined Policy Objectives

► Accessibility

Relation

Car traffic

- Solve congestion between the three main towns and the region → **Fast and reliable traffic flow on the network between the three main towns and in the region**
- Fast and reliable traffic flow between Weston and village G

Business traffic

- Fast and reliable travel times for business traffic between South Lakedale and the region

Commercial traffic

- Fast and reliable flow of commercial traffic passing through on the Foreland/Hinterland relation

Public Transport

- Build bus lanes → **Unhindered traffic flow on all high-quality public transport connections**

Location

Car traffic

- Fast and reliable traffic flow on motorways around the three main towns, in particular around Sutton
- Housing estates at F and C with fast and reliable access to motorways
- Prevent congestion caused by open bridges → **Fast and reliable traffic flow across Lake Canal bridges**
- Transport modes (car/public transport/shipping) will be prioritised in line with stated objectives.

Business and commercial traffic

- Fast and reliable access to industrial estates, in particular near Sutton

Car traffic and public transport

- Stimulate transport mode change from car to public transport by improving access to transfer site near Weston

► Quality of living environment

Location

Car traffic (including business traffic) and commercial traffic

- Reduce rat-running traffic in nature reserves
- Reduce volume on north ring road → **Improve the current low quality of the living environment at Sutton caused by high traffic volumes on north ring road**
- No congestion on private and local access roads

► Safety

Location

All traffic

- Solutions must not result in an increased number of traffic casualties or increased rat-running traffic in residential areas or nature reserves

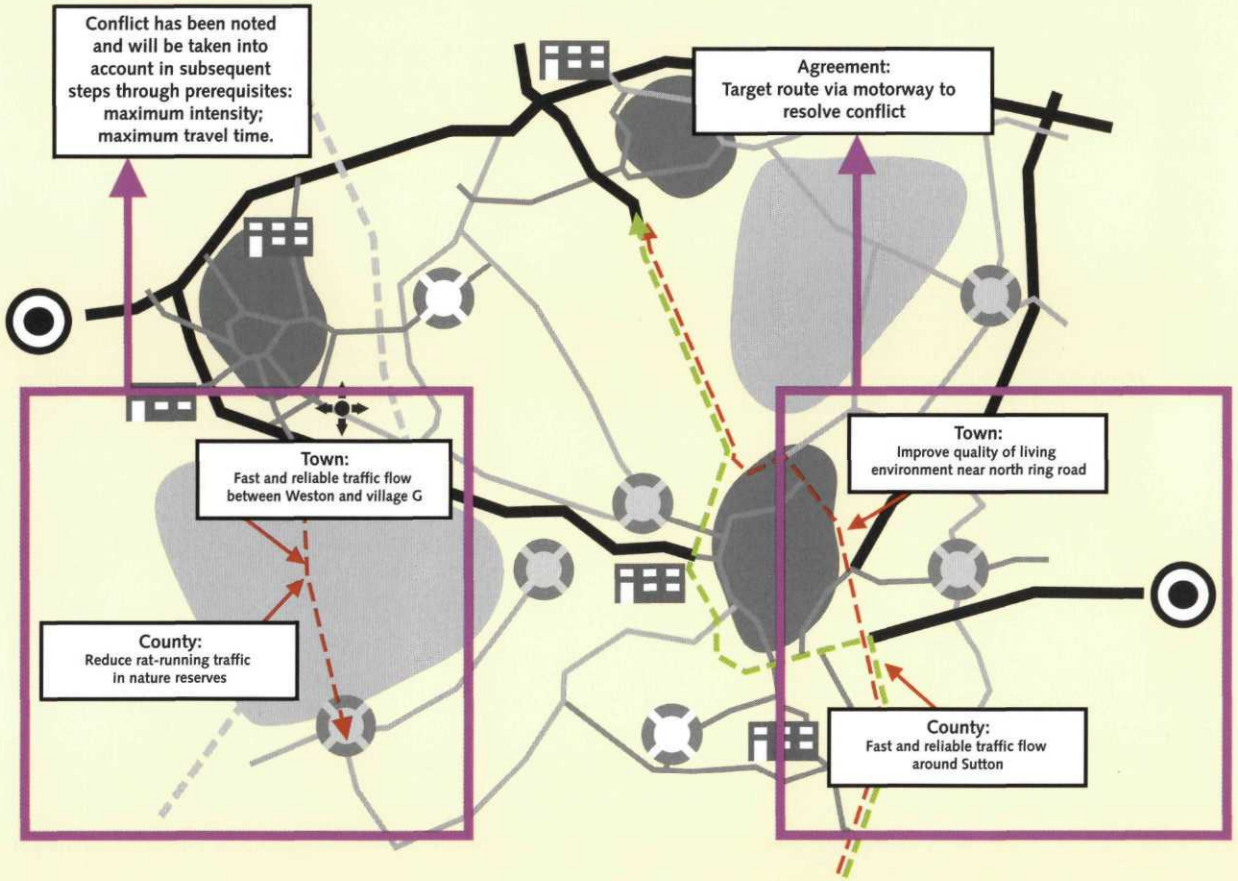
Rewritten Policy Objectives
Red: incorrectly formulated Green: correctly formulated

CASE STUDY
Improved access to South Lakedale
step 2

The parties of the "Improved Access to South Lakedale" project have put forward all their policy objectives. The Expert Group then went to work to produce a uniform list of objectives. The complete list has now been rewritten with the target in mind and reshuffled according to theme (accessibility, living environment, safety) and type of objective (relation-focused or location-focused).

The Working Group has identified discrepancies in the policy objectives and has harmonised the resulting list.

2.3 Harmonised Policy Objectives



2.4 Policy Objectives Outline

"Improved Access to South Lakedale" - Outline

- Fast and reliable traffic flow on the connections between the three main towns and the region
- Smooth flow of traffic on motorways around the three main towns, and around Sutton in particular
- Prioritise traffic modes according to stated objectives
- Good access to housing estates from motorways
- Stimulate public transport and use of transfer site
- Unhindered flow of high-quality public transport
- Fast and reliable flow of commercial through traffic
- Good access to industrial estates from motorways

To make the policy objectives more easily accessible, the Expert Group of the "Improved Access to South Lakedale" project has identified the outline of the objectives – and thus the main targets of the project.

▶▶ Continued on page 73

step 3

Develop the Control Strategy

In this step you will be working towards the first milestone of the Sustainable Traffic Management project, the Control Strategy. In this strategy you will define how you intend to handle the traffic in your region in the event of a problem. As you formulate the control strategy, you will be looking for answers to such questions as: what are the most important traffic flows in your region? In what way do you intend to facilitate these traffic flows? On which (essential) parts of the network would you like to keep the traffic moving for as long as possible in the event of an (imminent) overload situation? You should be looking for ways to control the traffic situation with a certain purpose in mind, since you will not always be able to avoid problems. This will enable you to lay the foundations for proactive traffic management.

Step 3, Summary

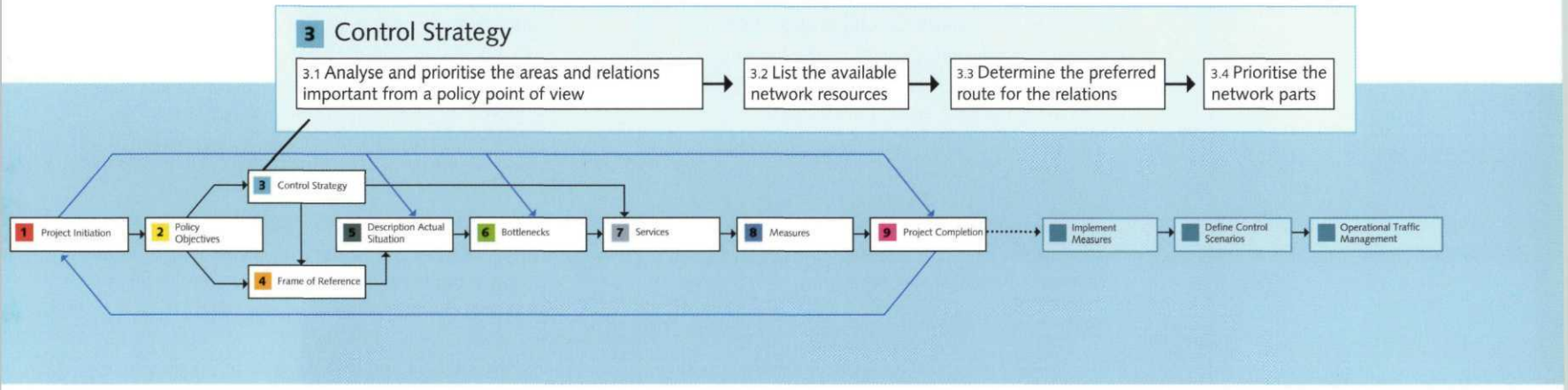
With the completion of Step 2 you will have gained full insight into the policy objectives, i.e. the targets you intend to achieve by means of traffic management, and the objectives outline. Keeping this knowledge in mind, you will now analyse the target areas and relations that are important from a policy point of view. You will also prioritise the areas and relations.

Next, you will determine which parts of the network you can make use of to process the relations, and which parts should explicitly be excluded. On the available road network you will then designate certain preferred routes for those relations while attempting to honour as many of the policy objectives as possible by taking into account the wishes regarding noise limits, maximum intensity, etc.

Finally, you will be answering the question how to deploy the limited road resources in the event that parts of the road network are, or are in danger of, becoming overloaded. To find the answer to this question, you will first prioritise the network parts, indicating on which sections you would like to keep the traffic moving for as long as possible, at the expense of traffic on other parts of the network. By defining different levels of priority you will be creating the means for "graceful degradation" in the event the network becomes overloaded.

step 3

Develop the Control Strategy



step 3

Develop the Control Strategy

3.1 The Expert Group analyses and prioritises the areas and relations that are important from a policy point of view.

You should now determine which areas and relations to analyse, by means of the list of Harmonised Policy Objectives[2.3]. Restrict yourself to the really relevant areas and relations.

You can start with the relation-focused policy objectives, using them to define the target areas (areas of origin and destination) and the relevant relations between them.

You may have started a tentative general analysis of the areas and relations when you mapped the target situation during action 1.3. If so, feel free to use this analysis to work from.

Working out the details for prioritising the areas and relations is something you should do separately for each time period (peak hours, off-peak hours, recreational traffic). You have defined the time periods to be considered in the Initial Memorandum[1.6].

Separate prioritisation is necessary since the importance of a relation or area may differ according to the time period under consideration.
For example, you may choose to give priority to residential and office areas during the rush hours. Outside the rush hours you could give priority to economic centres, whereas during the weekends a shopping precinct or theme park might be given priority.

During analysis and prioritisation you should allow for major planning or infrastructure changes that fall within the time scale of the project.

Use the analysis and prioritisation to produce maps with explanatory notes.

Intermediate Product: Prioritisation of Areas and Relations.

→ Suggested Method:

- Based on the relation-focused items from the list of Harmonised Policy Objectives[2.3], determine which of the relations and relevant target areas are the most important from a policy point of view.

  In addition to the areas within the study area, include the most relevant -(from a traffic point of view) areas (just) outside it.

  Identify the relations/areas that will gain importance in the future.

- Indicate all the relevant target areas on a map and provide explanatory details.

  Describe the target area properties in terms of:

  - Physical properties, e.g. type of area (area of origin or destination), size and composition of the policy objectives with regard to accessibility.

    Example: "Good access from area X". The explanatory notes should include the source of the relevant general objective (in order to enable the control strategy to be traced back to it later on).

- Prioritise the areas separately for each time period (peak, off-peak, recreational).

  Use the Policy Objectives Outline[2.4] and the analysis you have just completed as a basis. You should state explicitly whether the prioritisation will change in the course of the time scale, e.g. due to new building projects (office construction etc.), and if so, when.

  For each separate time period (peak, off-peak, recreational), indicate every relevant relation on a map with explanatory notes.

- You are the one to decide which of the relations are relevant. However, to prevent getting bogged down by details, it is recommended that you start with the major relations covering longer distances (at a regional scale, which in many cases will be longer than 5 to 10 kilometres). In other words, whenever possible you should combine the relations of adjoining areas.

  Map out the relations as the crow flies, indicating any directional preference (from, to, or both). The result will be a map with straight arrows linking the relevant areas (sources and sinks).

  Note that at this point, you will be disregarding any existing infrastructure

(this will be taken into account in the next action).

Describe the relations in terms of:

- Physical properties such as size (scope), peaking, and composition (target group; means of transport; paying/non-paying) – policy objectives.

  Example: "high average speed" or "high reliability". In the explanatory notes, include those of the policy objectives that underlie the requirements/wishes (in order to be able to retrace the control strategy later on).

- Prioritise the relations separately for each of the time periods (peak, off-peak, recreational).

Using the Policy Objectives Outline[2.4], the analysis of properties you have just completed, and the prioritisation of the areas as a basis, you will now determine the priorities of the relations.

Example: the relations between areas with high priorities will also be given high priorities.

The Working Group discusses the Prioritisation of Areas and Relations, amending them as deemed necessary.

3.2 The Expert Group lists the network resources available for the (relevant) relations.

On a map, the Expert Group indicates which parts of the road net will be available to facilitate the required relations. The map should also show which roads have been explicitly excluded – e.g. to safeguard the quality of the local living environment.

You may already have prepared a preliminary list of the roads that are available and those that are to be excluded as part of action 1.3. Whatever the case, you should check the location-focused policy objectives from the list of Harmonised Policy Objectives Items[2.3], since these often set explicit prerequisites for the use of certain roads (e.g. a maximum acceptable intensity as dictated by anti-noise legislation).

Do not forget to keep future developments in mind when listing the available network resources.

In the Initial Memorandum[1.6] you recorded to what extent you intend to take future developments into account. For example, you may have decided to consider the development over the next five years, in which case it would be relevant to include new trunk roads scheduled for completion in five years' time in the available network resources for the

situation five years onwards. Conversely, as part of Sustainable Safety program, a certain route may explicitly be scheduled for reconfiguration as a local access road, which means that it will cease to be a part of the available road network.

Intermediate Product: Available Network

The Working Group discusses the map of the available network as supplied by the Expert Group, amending it where necessary.

Once the map has been ratified by the Working Group, it will serve as the basis for plotting preferred routes.

3.3 The Expert Group determines the preferred routes for the listed relations.

Should the traffic situation in your case prove to be relatively simple, the Working Group could prepare a proposal to be submitted to the Expert Group for further detailing.

A number of different factors play a role in determining the preferred routes:

- The relation-focused policy objectives – what is the quality we intend to offer to the road user?
- The location-focused policy objectives – what are the acceptable effects at these trouble spots?
- The available road network – which roads will be available for the preferred routes?

You should bear in mind any future developments insofar as they fall within the set time scale. Your Initial Memorandum [1.6] states which time period and time scale you are to consider.
You should also look at any possible differences between the time periods (peak, off-peak, recreational).

Generally speaking, preferences for certain routes tend to be independent of the time of day, but in some cases the preferred route for the morning rush hour can be different from the evening rush hour route.

Make sure you clearly mark the direction of each preferred route.

You will translate the results of this action to a set of maps with explanatory notes.

There will often be a large number of relations, and consequently a large number of preferred routes. To keep things simple, the best thing to do is to present the preferred routes in groups on different maps.

Preferred route:
A continuous series of network parts that should preferably be used to establish a certain relation.

Be sure to discuss your reasons for choosing the preferred routes in your explanatory notes.

Intermediate Product: Preferred Routes

→ Suggested Method:

- Prepare an initial proposal for the preferred routes.

  Check whether any of the relation-focused policy objectives contain direct statements regarding any preferred routes.

  For example: "long-distance traffic is to routed via the city ring", "commuter traffic is to be routed via road X", "football fans coming from the station are to be routed via road Y".

  Next, define the preferred routes for the remaining relations (i.e. those that have not been explicitly defined) that are important from a policy point of view, bearing in mind the accessibility aspect in particular.
  If necessary, indicate alternative routes for the preferred routes.

  High-priority (or heavily stressed) relations in particular may require the definition of one or more alternative routes. In doing so, you will be creating a "policy-based search space" that you will be able to use during Step 7 (services) to resolve bottlenecks.

- Check for places where your initial proposal comes in conflict with location-focused policy objectives.

  You are not looking for conflicts resulting from physical restrictions (you will not have a clear view of these until Step 7), but for conflicts on a policy level regarding noise limits, emission controls, etc.

- Move the preferred routes to avoid these conflicts.

  You can base your actions in this respect on the Prioritisation of Areas and Relations[3.1]. As the priorities of the relations come lower on the scale, discrepancies will be more acceptable.

  If the preferred route cannot be moved (or if there is little to be gained from doing so), see whether the relevant conflict offers the possibility of a clear choice. The Policy Objectives Outline[2.4] is important in this respect.

If in a conflict between a relation-focused general objective (e.g. access to a residential area) and a location-focused general objective (e.g. noise limits) one is clearly "the most important" (i.e. part of the outline), that item could be given priority.

The Working Group discusses the preferred routes proposed by the Expert Group.

In many cases, it will be impossible to map out all the preferred routes together in one go to the assent of all the parties involved. This is an iterative and creative process.

3.4 The Expert Group submits an initial proposal for prioritising the network parts.

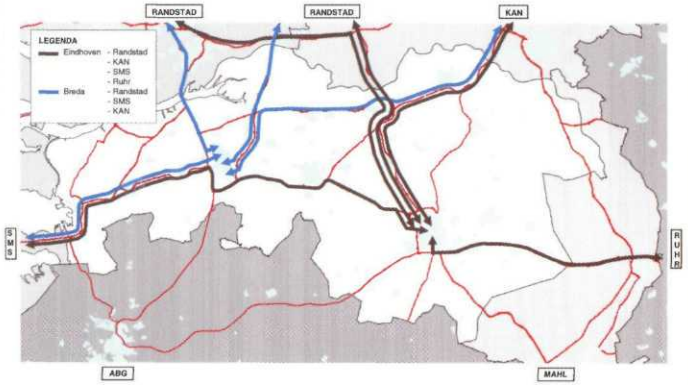
Should the traffic situation in your case prove to be relatively simple, the Working Group could prepare a proposal to be submitted to the Expert Group for further detailing.

PRACTICAL EXAMPLE

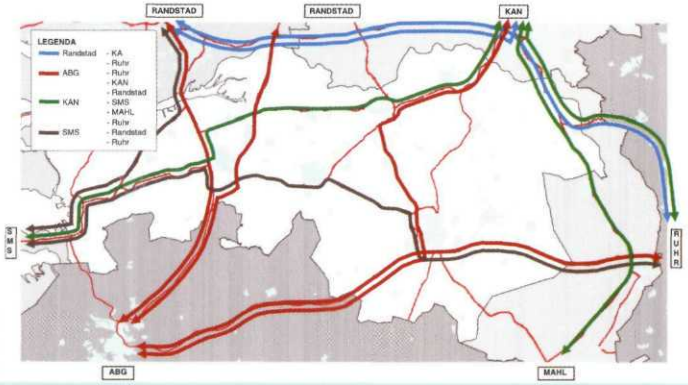
3

Preferred routes for the relations between "Greater Brabant" and the other urban networks (top), and for the long-distance relations through the province of Noord-Brabant (bottom).

Examples of preferred routes, "Greater Brabant" <> other urban networks



Examples of preferred routes, long-distance relations through the province of Noord-Brabant



You will now determine for each separate time period (peak, off-peak, recreational) which of the network parts will receive priority in the event that capacity becomes reduced, grading the resources on a scale ranging from 1 to 5, with 1 indicating the most important.

The consistent use of the same number of priority levels for prioritising network parts makes it easier to align different utilization projects.

Follow a logical and consistent method.

For example, there is little to be gained by giving a long-distance route a very high priority if it gives on to a section of road that is given a very low priority ("taking the fast lane to the next traffic-jam").

Note that you can give priorities according to certain network parts or subdivided according to direction of travel.

The latter option can be useful if the network part is used for a large number of high-priority relations in one direction while the other direction is used for a large number of low-priority relations.

The result of this action will be a single map for each period of time, showing the priorities of the network parts, and accompanied by explanatory notes.

Make sure that the explanatory notes discuss the reasons for setting the priorities the way you do, as well as the links with the policy objectives.

You will make the general overview easier to read by colour-coding the different priority levels, preferably using the following standard colour codes:

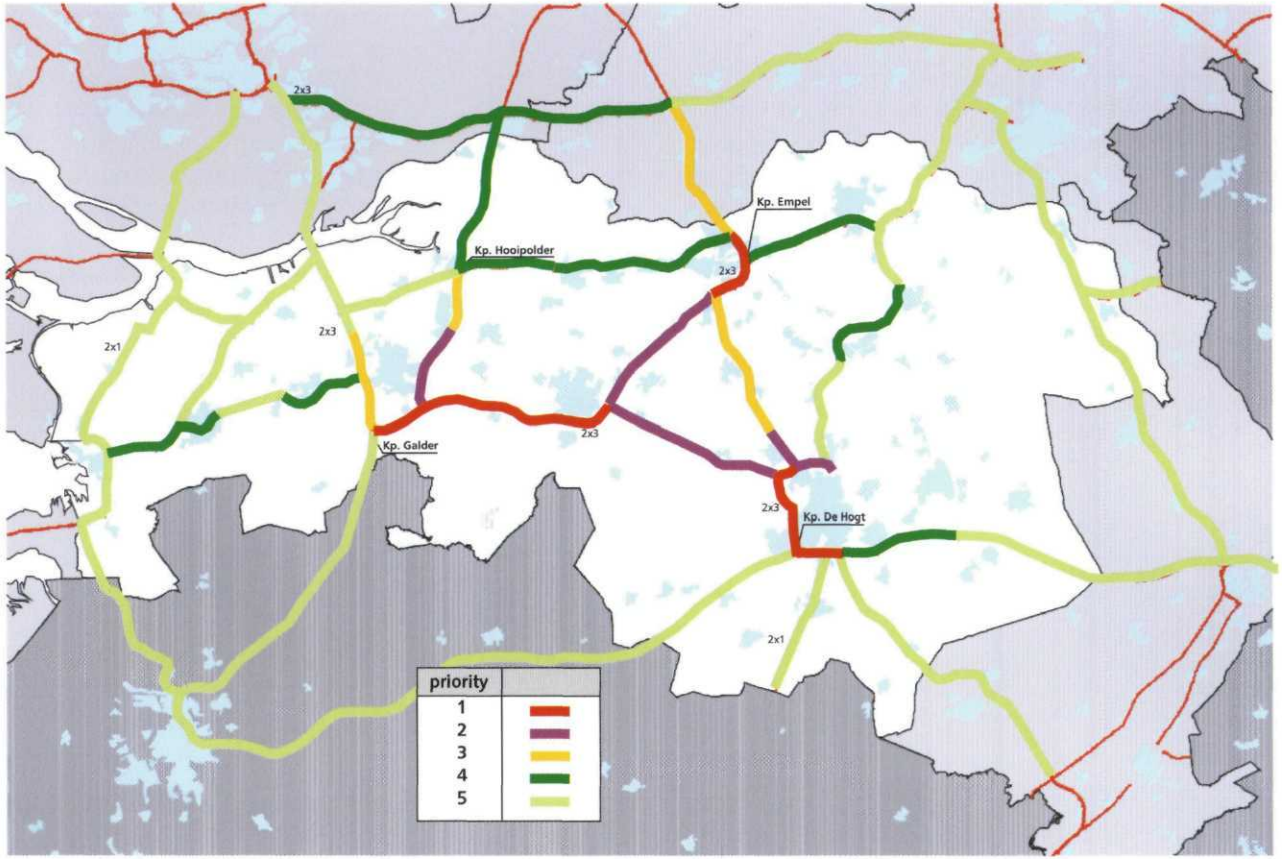
The consistent use of the same colour coding for prioritising network parts makes it easier to align different utilization projects.

Priority	Colour
1	
2	
3	
4	
5	

Intermediate Product: Prioritisation of Network Parts

The prioritisation of the network parts in the province of Noord-Brabant.

2006 peak period control strategy, Directorate of Noord-Brabant



Control Strategy and Graceful Degradation

In this step you have indicated your preferred routes for processing traffic in your region. You have also awarded levels of priority to each of the network parts to show which roads or intersections will be given priority in the event that the flow of traffic is threatened by congestion. These two elements together form the control strategy ▤.

The purpose of plotting the preferred routes is to highlight the policy objectives, with regard to accessibility and traffic processing as well as to safety and the quality of the living environment. The central idea of prioritising the network parts is to control or redirect an imminent overload on (part of) the road network. Its purpose is to indicate which of the network parts will be the first to be allowed to drop in quality (congestion may be acceptable) and which will be the last (congestion highly undesirable). Network parts with lower priorities will give way to those with higher priorities in order to keep traffic on the latter moving for as long as possible. Remember that the priorities you are setting at this stage are entirely relative, and give no indication whatsoever as to the actual quality level to be aimed for. The latter will be discussed in the next step, in which you will be compiling the reference framework.

▤ Control Strategy:
A network-wide target for redistributing (by means of dynamic traffic management) the available capacity in the event of imminent congestion of the road network. It comprises preferred routes and network part prioritisation.

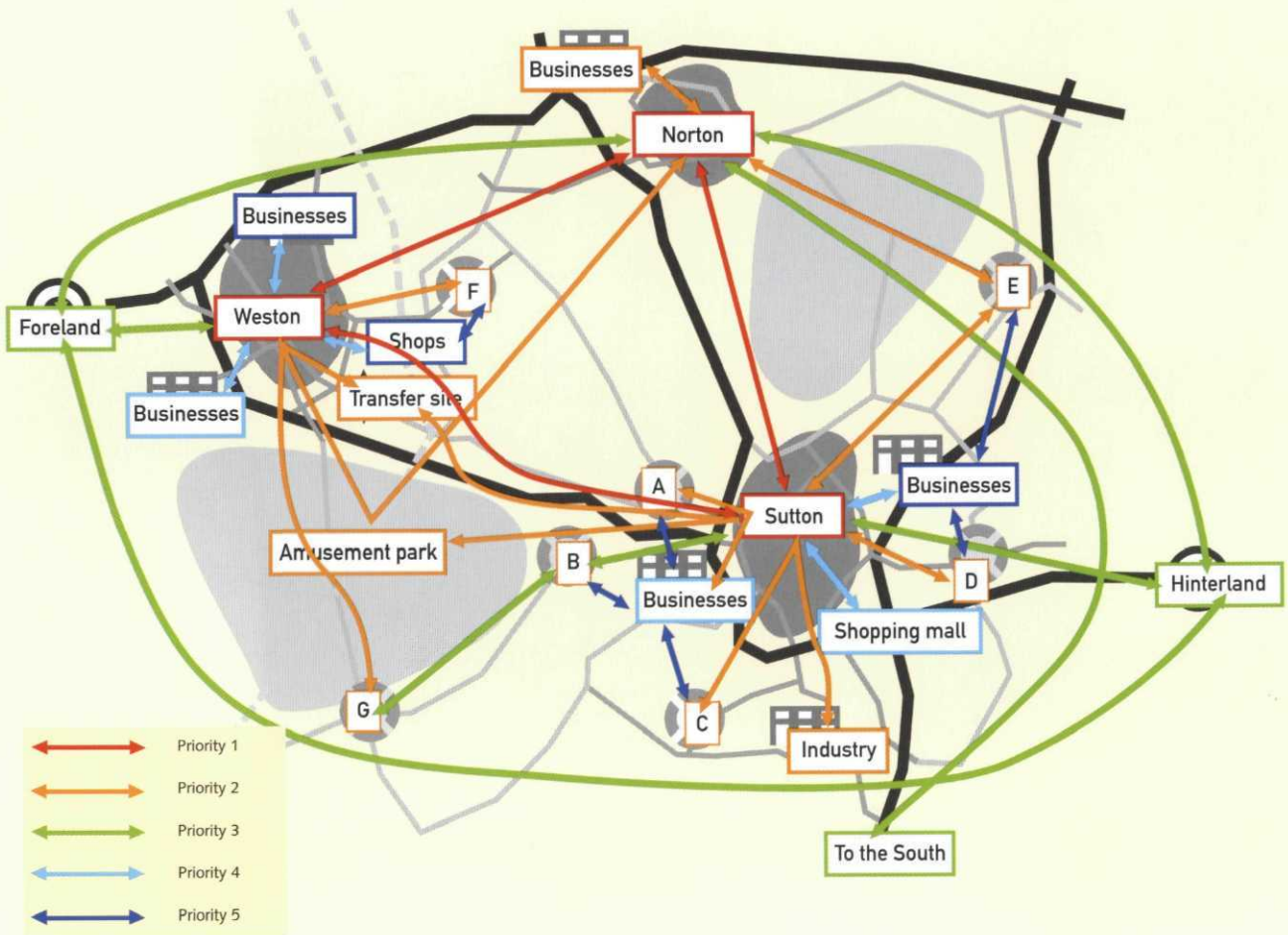
The Working Group discusses the Network Parts Prioritisation prepared by the Expert Group, amending it as necessary.

You should bear in mind that the prioritisation of the network parts is the result of the previous prioritisation in the relations and the preferred routes! Changing the priority of a network part involves having to reconsider the priority of the relation(s) that use the network part in question, and/or the preferred routes of those relations.

The (approved) Preferred Routes [3.3] and the Network Parts Prioritisation [3.4] together form the Control strategy.

Product: Control strategy

3.1 Prioritisation of Areas and Relations



CASE STUDY

Improved access to South Lakedale

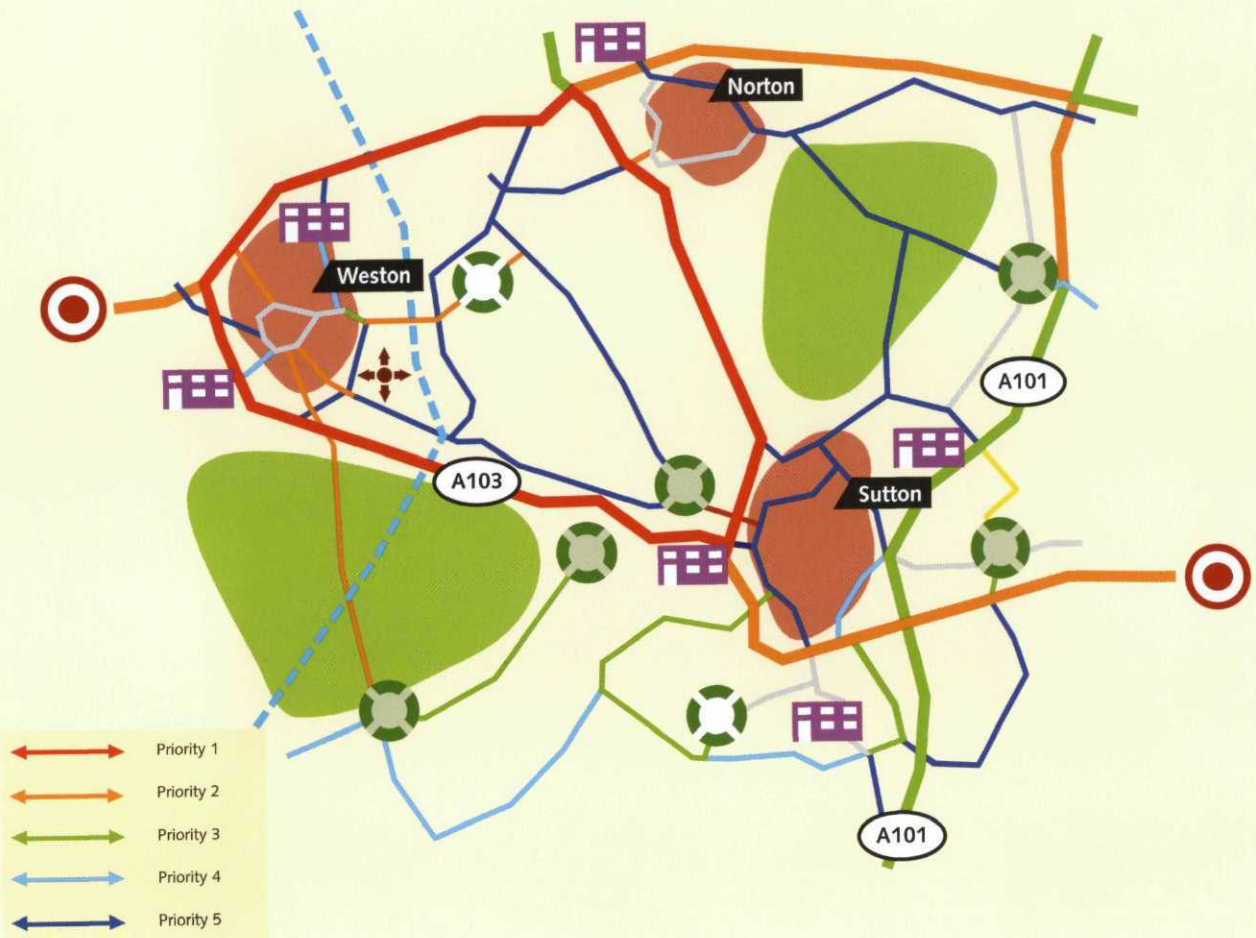
step 3

The main areas of origin and destination, and the relations between them, have been prioritised. Since the Improved Access to South Lakedale project is concerned with rush-hour traffic only, a single map suffices.

For most relations, the shortest route has been plotted, based on the available network – which is why there are no preferred routes through the area between village C and Sutton. It has also been agreed that the north ring road at Sutton is to be relieved by not planning any routes along it. An alternative route has been plotted for the Hinterland-Norton relation.

3.3 Preferred Routes

3.4 Network Parts Prioritisation



The general map clearly shows that the network parts facilitating the highest-priority relations between the three main towns have been given the highest priority.
To the southwest and east of Sutton, the A103 has been given second priority, since this network part carries mainly third and fourth priority relations. The A101 carries relations with priority level 3 or lower, so this road has been given level 3 priority. Since no relations are being processed via the north ring at Sutton, this stretch has been given the lowest priority.

▶▶ Continued on page 88

step 4

Set the Frame of Reference

In step 2 you defined all the traffic management-related policy objectives. In step 3 you translated these "paper objectives" into real-world terms by designating preferred routes and prioritising network parts (control strategy). You will now proceed to further detail the practical implementation by setting up a Frame of Reference. This will be used as a calibration tool after you have filled it with a quantitative specification of the target situation, expressing your wishes in terms of criteria and thresholds.

The result will be a versatile tool that you will be able to use to quantify the significance of each bottleneck (step 6). It also provides the basis for estimating the required services and measures (steps 7 and 8). In addition, the frame of reference forms the starting point for before-and-after evaluations as well as on-line traffic control methods.

Step 4, Summary

In this step you will be working on a frame of reference, i.e. a quantitative specification of the target situation. You will be expressing your wishes in criteria (units) and thresholds (the transitions points between desirable and undesirable results). Using these as a basis, you will use step 6 to assess the significance of the bottlenecks in the study area.

The first action of this step is to select the criteria that are relevant to your study area. You will do so using a set of standard criteria such as average travel time, volumes, noise, etc.

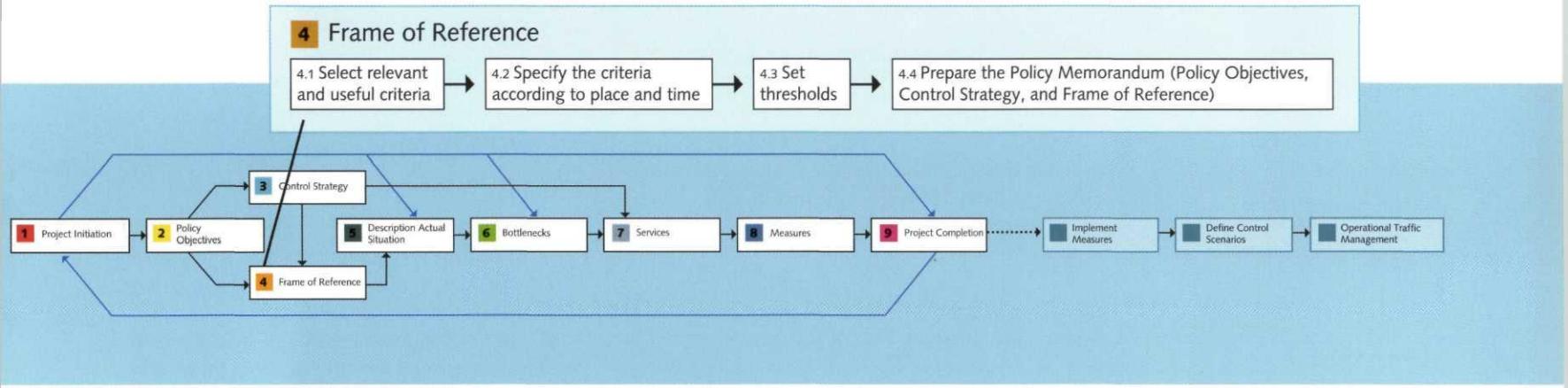
Next, you will indicate, on the map, where you intend to apply the criteria (at which location or network part). You will focus on the (more) important parts of the network. If your Sustainable Traffic Management project covers a number of different time periods – peak, off-peak, recreational – you will also indicate at which time or times you intend to use the criteria.

You will then look at each of the localised criteria to make them concrete for each situation, by selecting appropriate threshold values. For example, if you selected the travel time as a criterion, you could now stipulate "desirable: less than 10 minutes, undesirable: more than 20 minutes".

Finally, you will combine the results of step 2 (Policy Objectives), step 3 (Control Strategy), and the present step (Frame of Reference) into a single memorandum, the Policy Memorandum, which you will submit to the Steering Group for approval.

step 4

Set the Frame of Reference



step 4

Set the Frame of Reference

Frame of Reference: *Quantitative specification of the target situation expressed in terms of criteria (units) and thresholds (quantities) for each distinct relation and network part.*

Make sure you choose criteria suitable for defining the current situation.

4.1 The Expert Group selects relevant and useful criteria for the Frame of Reference.

You can use the list of criteria shown in table 4.1 for this purpose.

The nature of your policy objectives determines to what extent a criterion will be relevant in your specific situation.

For example, if the quality of the living environment is not an issue in your project, there is no need to include it in the Frame of Reference.

Concentrate on the criteria that are relevant for finding the bottlenecks and for determining the amount of leeway in your road network.

Since the Frame of Reference quantifies the policy targets, you will also be able to use it later, even outside the project, for before-and-after (policy) evaluations to see whether the original targets have been achieved.

In this step, you will not be looking yet at matters pertaining to the actual (on-line) control of traffic or the supervision of the traffic management measures. These aspects are left till step 8.

It goes without saying that a criterion will be useful only if you know for certain that you will later be able to compare it with the actual data. Such data can be measurements, or data you derive from measurements. You should therefore start by checking whether the relevant data are, or will become, available.

For example, if no equipment for measuring noise levels is available within the study area (nor will it become available soon), you should check whether noise levels can be derived from accurate traffic volumes and distribution data.

Theme	Criterion
Accessibility (on relations)	- Travel time
	- Time lost per kilometre
	- Reliability (e.g. travel time variation)
Processing (on network parts)	- *Road section* ▣ *speed or journey speed*
	- Tailback length, queue length, obstructions, tailback severity
	- Vehicle hours (lost)
	- Continuity (e.g. no. of stops at traffic lights)
	- Availability (e.g. "no traffic jams outside peak hours on 80% of all workdays")
	- Volume (no. of vehicles per hour)
	- Vehicle kilometres
Safety (on network parts)	- Accidents, deaths, injuries
	- Road use (volume, speed, relations) relative to the road function (flow, access, private)
Quality of the living environment (on network parts)	- Noise (emission)
	- Air pollution (emission)
	- Crossability, barrier action
	- Road use (volume, speed, relations) relative to the road function (flow, access, private)

table 4.1: Frame of Reference Criteria.

Road section:
Network part between two intersections, junctions, or discontinuities.

A Versatile Instrument

The Frame of Reference on which you will be working in this step is a truly versatile instrument. In a direct way, it serves to determine where the bottlenecks are, and how severe they are in quantitative terms (step 6). It also shows which parts of the road network are free from bottlenecks, so they may offer capacity for taking up extra traffic.
Indirectly, this makes the Frame of Reference an essential means of determining the correct services and measures (steps 7 and 8). In addition, you will be using the Frame of Reference as an evaluation tool (before or afterwards) to see wheter everything works as intended in practice, and whether the target has been achieved. Last but not least, with the Frame of Reference you will be laying the foundations for subsequent on-line traffic control.

4.2 The Expert Group specifies the criteria of the Frame of Reference according to place and time period.

In other words, you will indicate where you intend to set the selected criteria, and when (for which situations – peak, off-peak, recreational).

The Frame of Reference focuses on the (more) important parts of the road network.

You should concentrate on the primary function of the Frame of Reference, which is to define the bottlenecks and the amount of leeway in your road network.

You should also restrict yourself to the (more) important parts of the road network. The details will be filled in later, when you will be looking at the development of control scenarios and on-line traffic control.

The times for which you are to set criteria will depend on the time periods (peak, off-peak, recreational) you have selected to be included in the Sustainable Traffic Management project.

In the previous action you have looked at the suitability per se of the criteria (are the relevant data available within your region?). You will now consider the same question for each separate location: will the measurement data be (or become) available for the locations at which you intend to use the relevant criteria? If not, can the information be derived from other available data?
Please explain your choices where necessary.

Intermediate Product: Criteria by Place and Time

➔ Suggested Method:

The details of each of the following items should be filled in separately for each time period (peak, off-peak, recreational).

- Fill in the accessibility-related criteria.
  At the very least, look at the highest-priority relations (see Prioritisation of Areas and Relations [3.1]).

By indicating such criteria as the maximum travel time for each of these relations, you will later be able to see how the traffic handling bottlenecks on the preferred route of that relation relate to a problem for that relation as a whole. For example, a traffic handling bottleneck may exist on a small section of the preferred route while the total travel time remains below the acceptable maximum. Strictly speaking, this means that no accessibility bottleneck exists for that relation.

Allow for special target groups such as public transport vehicles.

- Fill in the processing-related criteria.

You can often derive these directly from the location-focused policy objectives. See the list of Harmonised Policy Objectives[2.3].

The processing criteria can relate to network parts of different geographical levels of scale.

For example, you might set a maximum number of lost hours per vehicle for a part of the network (e.g. "the ring of motorways around a town"), or a minimum (segment) speed for routes between two intersections, or a maximum queue length for specific road sections at an intersection.

Look out for the high-priority network parts, and in particular the preferred routes and alternative routes (see Control Strategy[3.4]).

High-priority network parts often form part of one or more preferred routes of (high-priority) relations. You will certainly want to include traffic processing bottlenecks on those parts of your network, since they will affect accessibility. For the alternative routes on the other hand, you want to know how much leeway you have. Therefore, on these routes you want to be able to see such details as the maximum acceptable volumes.

You should pay particular attention to locations where network parts with different priorities meet.

For example, it may still be necessary to set a queue length limit for a low-priority network part if an excessively long queue threatens to block access to other network parts with higher priorities.

Allow for special target groups.

Allow for special combinations of quantity and quality ("few but fast", or "many but slower").

For example, you might be aiming for

Threshold:
Quantitative value (i.e. a number) relating to a certain criterion. It defines the point at which the situation on the relevant network part or relation changes from desirable to undesirable (and vice versa).

maximum volumes on a motorway during the rush hours, accepting a lower speed, whereas during off-peak hours you could be going for speed rather than the maximum amount of traffic handled.

- Specify the criteria relating to safety and the quality of the living environment.

  Be consistent with what you defined in the policy objectives about safety and the quality of the living environment. Find out to which network parts these items relate, and if possible (and relevant) set criteria accordingly.

  This time, be sure to include low-priority and unprioritised roads!

  This may be necessary to counteract potential rat-running traffic.

4.3 The Expert Group sets thresholds for the selected criteria according to place and time.

Assume a single threshold , a "toggle point".

For example, say a travel time of no more than 20 minutes from town A to town B is considered acceptable. If at a certain time the travel time exceeds this value, you have a bottleneck. The relevant general objective requirement can no longer be met, so action will be required.
Another example: Say the maximum volume on a road section forming part of an alternative route has been set at 1500 vehicles during the peak rush hour. As long as the actual vehicle volumes remain below this value the route offers additional capacity for processing traffic and can therefore still function as an alternative route.

The application of multiple thresholds falls outside the scope of this project. Additional detailing will not be necessary until you start preparing control scenarios and on-line traffic control systems.

Base your action on your Intermediate Product Criteria by Place and Time[4.2], and for each place and time period, determine the threshold value.

→ Bear in mind the following:

- Use comparable thresholds for comparable situations.
- If you intend to set speed thresholds on a certain road section or route, start with the current speed limits, and use these to derive uniform threshold values.
- Low-priority roads are not by definition also low-quality roads.

  A traffic jam on a lower-priority network part is as much a bottleneck as a traffic jam on a higher-priority network part. However, if resources are limited, the traffic jam on the lower-priority link becomes less urgent.

- For the safety criteria, use the standard Sustainable Safety threshold values (a combination of volumes and speed).
- For living environment criteria, use standard values and standard methods for such aspects as crossability, noise, and pollution.

The criteria according to place and time together with the thresholds form the Frame of Reference.

The Working Group evaluates the selected criteria, their application, and the applied thresholds, amending them as necessary.

4.4 The Expert Group prepares the Policy Memorandum.

Preparing the Policy Memorandum, also referred to as the Policy Objectives, Control Strategy, and Frame of Reference Memorandum, is the action by which the contents produced during steps 2, 3, and 4 are combined. These steps were all aimed at describing the target situation. You will use the (intermediate) product contents from these steps to prepare the memorandum.
In the introduction of the document, you should go to some lengths to point out its purpose, which is to provide a description of the network vision, the policy framework within which you will be implementing traffic management to achieve a predefined target.

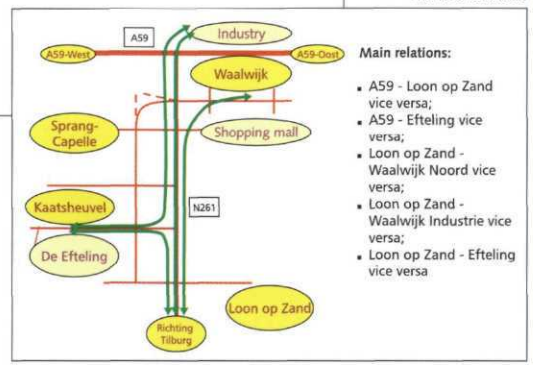
For example, the contents of the Policy Memorandum affect the way in which bottlenecks will be detected in the next steps. The memorandum also affects the choice of possible solutions, since the preferred routes and alternative routes have been indexed and prioritised.

PRACTICAL EXAMPLE

Frame of Reference

- **Maintain average travel time on five defined relationships at current level;**
- **Average journey speed of coach traffic must become 65 km/h;**
- **Volumes on the secondary roads must not increase;**
- **Queue at N261 junction must not block other intersections.**

The five relations



Main relations:

- A59 - Loon op Zand vice versa;
- A59 - Efteling vice versa;
- Loon op Zand - Waalwijk Noord vice versa;
- Loon op Zand - Waalwijk Industrie vice versa;
- Loon op Zand - Efteling vice versa

It has been agreed that within the area around the N261, near Kaatsheuvel, the current travel time on five major relations is to be safeguarded. Thus the current travel time becomes the threshold value for the Frame of Reference. Special attention is to be given to coaches in the area. In addition, prerequisites are defined to prevent measures on the main road network from adversely affecting the traffic situation on the underlying road network.

Finally, the Frame of Reference in particular can act as a checklist on which (policy) evaluations can be based later on.

Table 4.4 gives an indication of the various (intermediate) products you will be combining in the Policy Memorandum.

The Working Group assesses the Policy Memorandum, proposing amendments as necessary.

In a plenary meeting, the Steering Group discusses the Policy Memorandum and ratifies it.

Action	(Intermediate) Product	Policy Memorandum
		Introduction:
1.6	Initial Memorandum	Rationale, memorandum framework, assignment, starting points (including situations under review)
		Policy Objectives:
2.3	Harmonised General Objectives	Uniform and Harmonised Policy Objectives
2.4	Policy Objectives Outline	General list of Policy Objectives
		Control Strategy:
3.1	Prioritisation of Areas and Relations	List of relevant areas and relations, indicating their relative priorities
3.2	Available network	List of available network parts (and parts to be excluded)
3.3	Preferred routes	List of preferred routes, prioritised
3.4	Prioritisation of Network Parts (map with explanatory notes)	Prioritisation of network parts (graceful degradation)
		Frame of Reference:
4.3	Frame of Reference	List showing which criteria are to be applied when and where, with the applicable thresholds

Table 4.4: An indication of the content of the Policy Memorandum and the Intermediate Products you require for it.

CASE STUDY
Improved access to South Lakedale
step 4

4.2 Frame of Reference

► Accessibility

Relation

- Aim for an average speed of 70 km/h on relations between the three main towns. This speed is to be achieved in at least 80% of all cases.
- Average of 70 km/h on the relation between Norton and the south
- Average speed for commercial traffic in transit at least 60 km/h
- Average public transport speed at least 60 km/h

Location

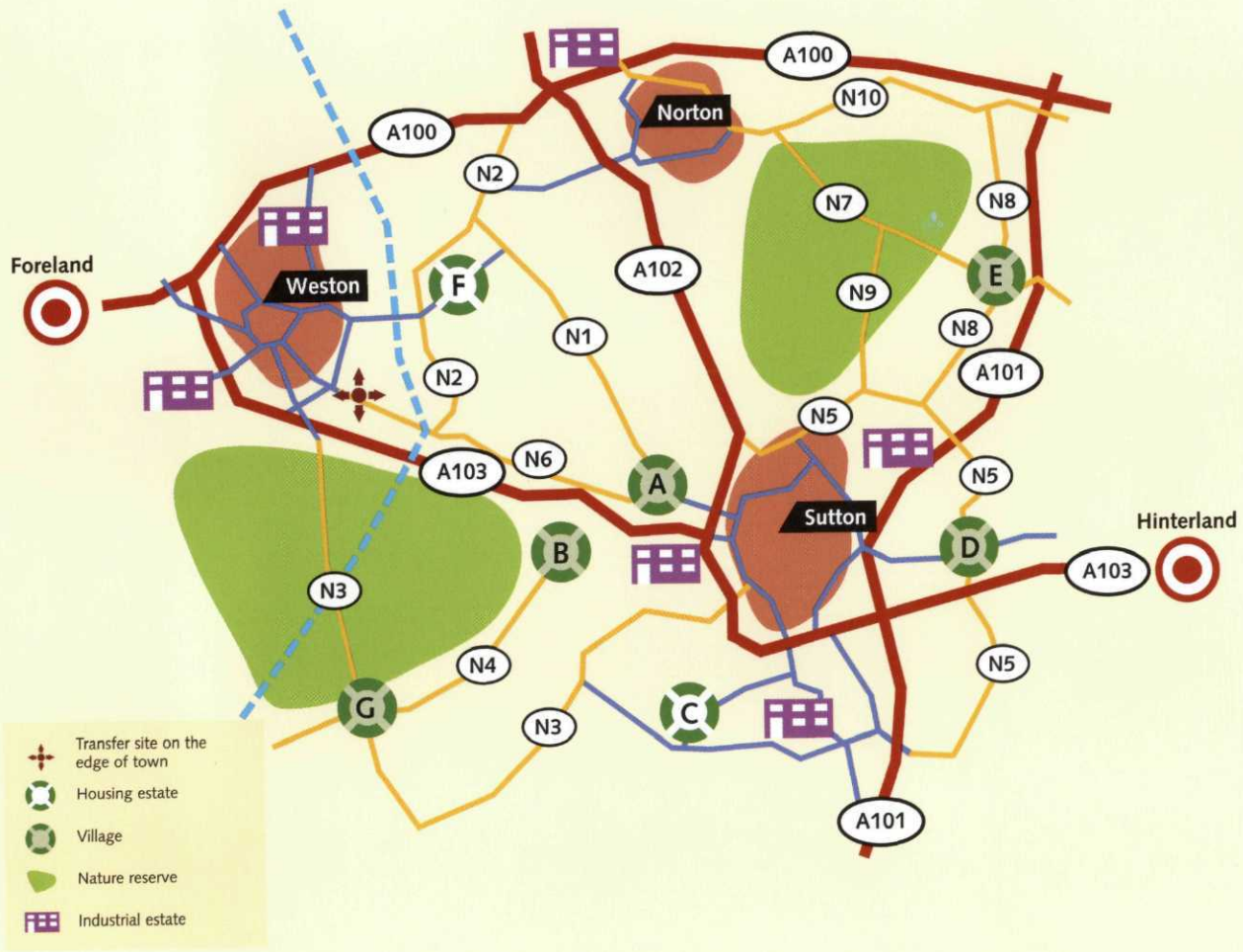
- Housing estates F and C: not more than one stop and a maximum of 2 cycles for vehicles at traffic lights
- No congestion on roads leading to the transfer site
- Open bridges may not cause intersections to become blocked
- Persistent bottlenecks must not become worse
- Traffic from industrial estates must reach the main road network in no more than 15 minutes

► Quality of the living environment

Location

- Volumes on roads through nature reserves must not increase
- Volumes on north ring road at Sutton must drop by 25%
- Queues on the road networks within the towns must not block other intersections
- Noise level limit of 50 dB(A), with the exception of the link between Norton and Sutton: 60 dB(A) max.

4.3 Set thresholds



The Frame of Reference shown here was created for the Improved Access to South Lakedale project (see page on left). To make the framework more accessible, the map of the study area has been placed alongside the framework text. Since this project is restricted to rush hour traffic, the threshold values automatically apply to that period. If you were considering a number of different time periods (peak, off-peak, recreational), you would also indicate the period to which the threshold value applies.

▶▶ Continued on page 99

step 5

Describe the Actual Situation

In the previous steps you have focused on the target situation as seen from a policy point of view. In the most recent of these steps you set the Frame of Reference, indicating exactly where and when you intend to apply which criteria regarding accessibility, safety, and the quality of the living environment. In addition, you have set thresholds for each of these criteria to indicate what is acceptable, and what is not.

The logical next step is to objectively determine the actual values for each of the road parts and relations for which criteria have been set. Subsequent comparison (in step 6) of these actual value with your thresholds will then show you where the problems are that need resolving.

Step 5, Summary

In step 4 you set the Frame of Reference, linking criteria such as travel time, queue length, and noise to specific relations and network parts. You also defined threshold values for each of these criteria to indicate what is acceptable, and what is not.

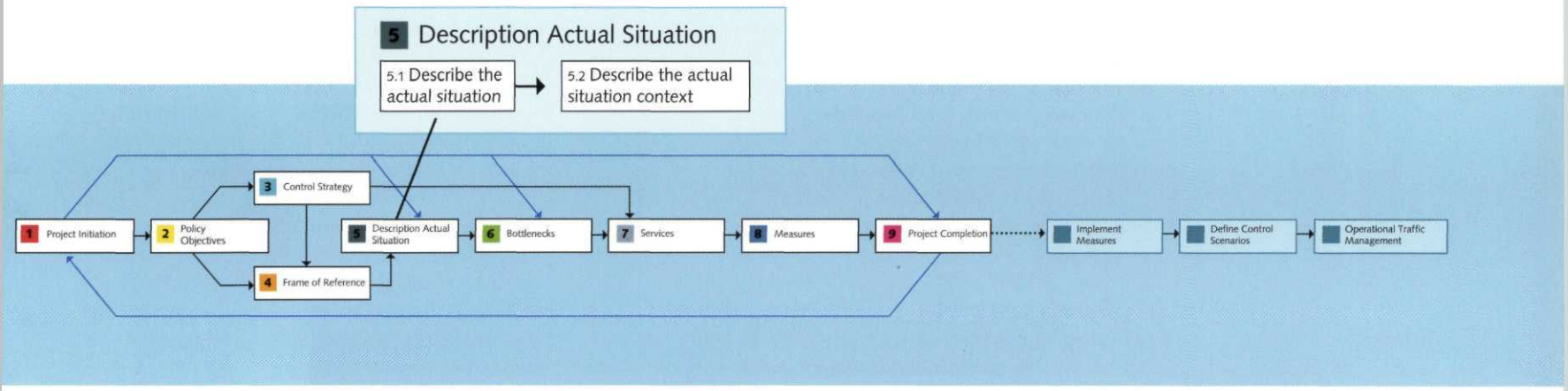
To find out where the problems are – in other words, where the traffic situation may become unacceptable – the threshold values from the Frame of Reference must be compared with the actual values. Equally important, you must find out where things will keep running more or less smoothly, and where you will have leeway to accommodate extra traffic, for example. With these targets you will be describing the actual situation.

In order to obtain the full picture, you will then place these values in a logical setting by describing the actual situation context.

This will result in a solid foundation for step 6, which will involve the identification and explanation of the bottlenecks, and determining the amount of leeway you have. At the same time, you will be getting sufficient background information for developing the services and measures in steps 7 and 8.

step 5

Describe the Actual Situation



step 5

Describe the Actual Situation

5.1 The Expert Group describes the actual situation.

In the Frame of Reference you indicated exactly where and when you intend to apply which criteria. In addition, you set the threshold values. The description of the actual situation focuses on the same relations, locations, time periods (peak, off-peak, recreational) and themes, with the simple question, what is the actual value for each criterion measured at the relevant location/relation?

For example, in the Frame of Reference you stipulated that on the relation from A to B (where) in the rush hours (when) you are looking for a travel time (criterion) of no more than 15 minutes (threshold). You will now describe what the actual travel time is during the rush hours on the relation from A to B.

In the Initial Memorandum[1.6], you set your time scale. In each description, you should include the actual situation as it is at present, as well as the (anticipated) actual situation or situations in the future.

For example, in the Initial Memorandum you set a time scale for the project of five years from the present. Therefore, in this action you should at least describe the situation as it is now and as it will probably be in five years' time.

You should derive the actual values of the current situation from recent surveys etc. provided by the relevant road management authorities.

You could derive the (probable) values in the future from e.g. traffic flow models, provided such models are available and supported by the parties involved. In many cases however, you will have to make do with an estimate of how the situation will develop.

For example, you could state that the travel time from A to B, which is now 20 minutes, is expected to increase considerably in the future, to over 30 minutes.

You will be looking at the reasons for your estimates of the developments in the next action.

Intermediate Product: Description of the Actual Situation

➔ Suggested Method:

- Deal with each item of your Frame of Reference[4.3] in turn.

  Find out what the actual value is for the relevant criterion (on the specific network part, in the specific time period, and within the indicated time scale).
  Use any available data for this purpose, such as survey results and model data.

- Where necessary, augment the data, e.g. through additional research or rough estimates.

  The extent to which you add to the available data depends on the level of detail of the Frame of Reference.

  You can use a (dynamic) traffic flow model for this purpose.

  Whether you will be using a traffic flow model or not will have been stipulated in the Initial Memorandum[1.6]. The memorandum will also contain the joint view of all the parties on the level of detail to be used.

- Where necessary, provide explanatory details about the status and reliability of the measurement data you use.

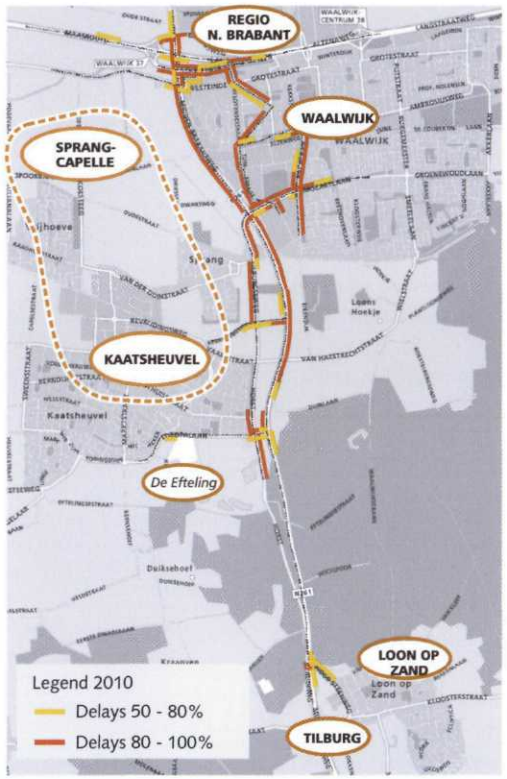
  In some cases you may be forced to use data obtained over a limited number of measuring days (i.e. with limited reliability), or estimates based on measurements on adjoining road sections, etc. To make sure the data will be correctly interpreted – e.g. when pinpointing the bottlenecks in step 6 – careful annotation of the data is essential.

5.2 The Expert Group describes the actual situation context.

In the previous action you focused on the bare (objective) facts concerning the relations and locations to which a criterion is linked in the Frame of Reference[4.3]. You will now increase your scope to include the context of these facts. What explanations can you find for the observed actual situation or for the probable developments?

PRACTICAL EXAMPLE

Quantitative description of the initial situation, N261



Description of the actual situation:
The actual situation can be visualised in a number of different ways.
In the survey, "Dynamic Traffic Management Architecture, N261 secondary road", the (probable) delays have been quantified using a traffic flow model.

Planning developments will directly affect the traffic volumes on the connecting road network, and consequently, the flow of traffic. The same applies to major changes in the road network (e.g. the construction of a new road, or traffic flow reduction measures as part of a Sustainable Safety scheme).
Again, you can link developments in accessibility with developments in the traffic flow. For instance, increasing travel times (accessibility) are closely connected with speed reductions on network parts (traffic flow), which in turn are the result of increasing volumes.

A proper understanding of this context will serve as a basis for the explanatory notes to the relevant bottlenecks (step 6) and will also provide some insight into the level of reality of the services and measures you will be introducing in steps 7 and 8.

Intermediate Product: Description of the Actual Situation Context

→ Suggested Method:

Start with the Description of the Actual Situation. In preparing the context description, focus on finding connections and explanations for the values you encounter.

You may already have collected the necessary data on the actual situation when you prepared the Overview of Policy Problems[1.3]. If so, you can fill in the details in this action.

- Describe the relevant target areas and relations.

You have already defined the relevant target areas and relations, and provided a rough description of each, when you prioritised the areas and relations[3.1].

The target area properties include such items as type of location (origin/destination, residential/office/commercial etc.), size etc. Relation properties include such items as direction, composition (commuter, recreational, commercial traffic, etc.) and size.
If the project considers a number of different situations (periods: peak, off-peak, recreational traffic), you would do well to include the behaviour during each period to see what the peak times are.

Map out the planning developments.

For example, the layout of a new industrial estate, which is bound to attract more traffic.

- Describe the road network and its layout.

You have listed the relevance of the roads in and around the study area in the Intermediate Product, Available Network[3.2].

Map out the infrastructural developments, and include (the development of) any current and proposed traffic management measures.

For example, will traffic light systems be replaced with roundabouts, or will access control systems be installed on rat-run routes in the near future?

- Describe the use of the road network.

Insofar as the available figures allow you to do so, describe the size of the traffic flows and the composition of the traffic (commercial vehicles, private cars, target groups).
Do so for each of the time periods you are considering (peak, off-peak, recreational).

Map out the developments in road network use.

For example, any growth trends throughout the years.

- Describe the traffic flows and accessibility.

Indicate where congestion occurs, how severe it is (e.g. expressed in terms of waiting times and queue lengths), and if possible, point out the cause.

Collect any available figures on travel times and reliability concerning the relations listed previously. Attempt to correlate the values you find for the relations with the traffic flow information.

For example, you could state that, on relations from X to Y via route Z, considerable delays are caused by congestion at locations A and B.

Do so for each of the time periods under review (peak, off-peak, recreational).

- Describe the safety conditions and the quality of the living environment.

Collect any available figures on traffic safety and the quality of the living environment. Which specific measures have already been taken?

The Working Group assesses the Description of the Actual Situation [5.1] and the Actual Situation Context (this action), amending it as necessary.

It is essential that the description and the actual situation context meet with general approval. In other words, do the Working Group members recognise the descriptions? Does everything look plausible to them?