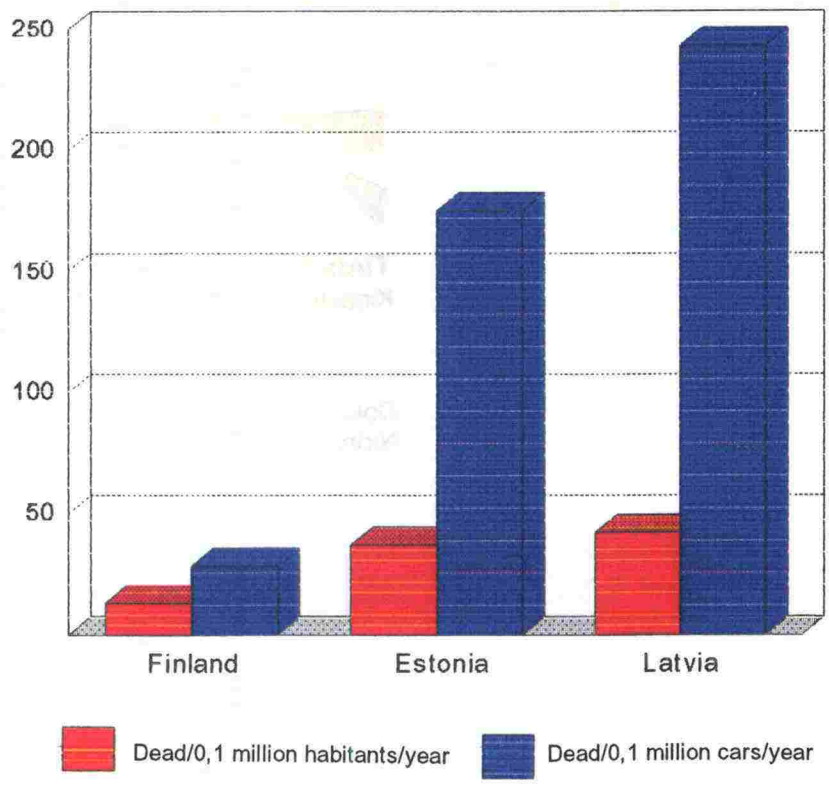
FinnRA

Traffic safety plan for the Bauska region



Jyväskylä 1994

CONTENTS

TRAFFIC SAFETY PLAN FOR THE BAUSKA REGION

1 INTRODUCTION

The road district of Bauska is situated in southern Latvia, along Via Baltica. The district is bounded on the north by the district of Riga and on the south by the Lithuanian border.

The area of the road district of Bauska is of average size among the Latvian road districts, comprising circa 730 km of road network. One central main road cuts through the area, namely Via Baltica, and there are a few small urban areas. The other parts of the road network are typical of rural areas.

The improvement of traffic safety is imperative, because of the present unsatisfactory situation and the anticipated development. The road district of Bauska is suitable for an exemplar target, where the traffic safety plan can be used for comparing Finnish practices with Latvian ones, and as a basis for finding improvement targets.

The traffic safety plan has been constructed by means of an allowance granted by the Finnish Ministry of Communications for cooperation with the neighboring areas. The plan is also connected with the development of the Via Baltica route. This plan has been made in the Road District of Central Finland and its authors are:

Seppo Kosonen, Planning Chief
Taisto Halttunen, Traffic Safety Engineer
Hannu Keralampi, General Planning Engineer

The work was commissioned by the Export Service Unit of the National Road Department, specifically Jukka Torniainen, M. Sc.

The contact person in the Latvia Road Department has been Vilnis Millers.

2 OBJECTIVES

The plan has several objectives:

- The plan is used to chart the problem areas of traffic sfety in the road district of Bauska.

- On the basis of the traffic accident data, the effectiveness of the collection and specificat on of information are evaluated and compared with the corresponding Finnish practices.

- The purpose of the plan is also to influence the appreciation of traffic safety work and the availability of resources allocated to traffic safety, by pointing out the economic effects of traffic safety. The priorities among traffic safety measures and their methods are also included in the plan.

- By means of the plan concrete and effective improvement measures for individual traffic safety problems are sought.

- On the basis of the plan, improvement proposals will be made, concerning both the collection of traffic accident data and the development of cooperation between different authorities.

- The general parts of the plan are constructed in such a way that the proposed measures are practicable for the whole of Latvia, while the Bauska district functions as a sort of pilot area in the introduction of new practices.

- The plan can be used for initiating training programs related to traffic safety, both in Bauska and in other road districts.

- The plan also provides development material for the composition of the road register and for the construction of road improvement programs.

3 LAND USE, COMMUNITY STRUCTURE AND TRAFFIC

3.1 General Points in the Planning of Land Use

One of the most efficient prospects of long-term traffic safety improvement involves the harmonious development of community structure and the traffic system. Traffic safety can be significantly enhanced by means of well-directed cooperation, appropriate land use decisions and synchronization of land use and the traffic system. The most favorable development, from the point of view of traffic safety, is the kind where the need for physical traffic is minimized and the mobility needs of different population groups have been satisfied, by taking into account the considerations of traffic safety.

The dissolution of community structure and the growth of urban areas, as well as motorization, increase the need of private cars in daily traffic. The number of accidents tends to grow especially in urban areas penetrated by a main oute, with land use activities scattered on both sides of the route. High driving speeds, neglected separation of pedestrian and bicycle traffic and permitted parking on the main roads increase accidents. Specially problematic in residential areas are junctions and routes used by through traffic. These problems are often connected with the conflict between through traffic and community structure. Planners should avoid placing land use along main routes or on the opposite side of the rest of the urban structure.

3.2 Different Forms of District Planning in Finland

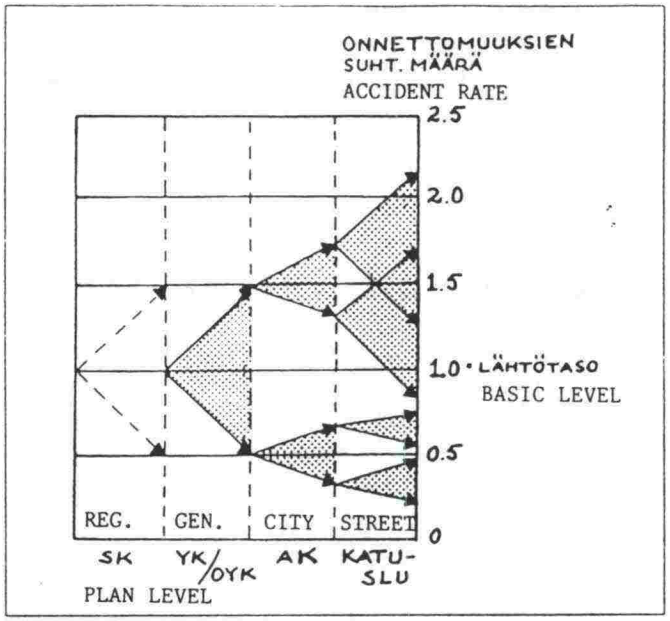
In Finland the different levels of district plans (regional plan, general plan, as well as town plan and local area development plan) form a hierarchical planning system, where the higher level directs the lower one. Thus the most universal plans, such as regional and general plans, which create the basis for community structure and for traffic needs and traffic safety, have the most far-reaching effects. It is difficult to make changes in the more detailed plans to influence the general policy decisions generated in the higher level plans. It is therefore important to encourage traffic safety considerations strongly, when the general plans are being constructed.

Regional planning has an impact on the formation of the traffic system, especially through the area reservations of national and regional projects. These include, for example, main roads, railroads and airfields. The area reservations of regional plans largely determine the direction of national and regional traffic flows. Regional land area reservations and growth directions, in turn , influence the main traffic flows and main route reservations and they are the decisive starting point in planning at the municipal level. It is thus already on the regional level, where people's mobility needs and transportation means are defined.

The general plan usually applies to one municipality or part of it. It contains the leading principles of using the areas for different purposes. The area reservations of the general plan decide the direction and volume of the traffic flows and create the possibilities for the realization of a traffic network serving them. In the general planning phase the mobility needs and transportation means are also significantly influenced. The main principles of the separation of traffic forms and organization of traffic routes are often determined already in the general plan.

Detailed town and local area development planning defines expressly the space reservations for land use and traffic routes. In detailed planning it is no longer possible to influence greatly the decisions made in higher level planning or to correct the potential problems they cause for traffic safety. However, by detailed positioning of activities, hierarchical organization of the traffic routes, separation of different forms of traffic and by access road arrangements and pedestrian and bicycle traffic solutions it is still possible to improve substantially the traffic safety of the area. It is in this planning phase that the final premises of route decisions are created and space reservations and technical details are defined.

--



The picture presenting the district planner's means and possibilities of influencing traffic safety

3.3 Planning of Land Use and Traffic Safety

The foundation is created for the traffic safety of different areas, and the volume and quality of traffic are determined in the planning phase of land use. The earlier the stage and the more general the level where traffic safety considerations are taken into account, the greater are the chances of influencing these matters.

The break-up of urban structure leads to increased need of using private cars and undermines the efficiency of public transport. Traffic safety continues to deteriorate, as traffic increases, unless deliberate efforts are made to change the situation.

Urban structure that is beneficial to traffic safety is usually most advantageous also as regards the prevention of traffic-generated environmental damages. A decrease in traffic volume reduces noise and exhaust gas emissions. Preservation of residential areas from through traffic increases people's satisfaction and improves their safety.

The most important questions affecting traffic safety that are solved in the planning process include people's mobility need, means of transport, structure of traffic networks, feasibility of traffic routes and solutions of problem places.

3.4 Importance of Cooperation in the Planning of Community Structure

Decisions made concerning land use and the road network have a fundamental impact on traffic safety. Mistakes are difficult to mend later on. Improvement measures are expensive, they change the living environment and can only partially remedy the situation.

As far as traffic needs and traffic safety issues are concerned, cooperation between the organization maintaining the traffic channels and the authorities responsible for the planning of land use is of crucial importance. The road keeper must actively direct the planners' attention to traffic safety issues, in order to maintain a good level of traffic safety in the living environment.

Inadequately designed land use decisions often cause problems which could have been avoided by cooperation and careful traffic planning. When the new system of community structure is created, it will provide an excellent opportunity for solutions that enhance the safety of all road user groups.

In Connection with the planning work, the Road Department should participate in the planning of the road net work and roads, to secure the inclusion of traffic safety viewpoits in planning work.

Defects in the road network may result in the weaving of short- and long-distance traffic and pedestrian and bicycle traffic, which deteriorates traffic safety. It is possible to improve traffic safety by hierarchical organization of the road network and by separation of the different traffic forms.

Land use must be in harmony with the road network. The division of the road- and street network into functionally different categories is obligatory, because of the quality of traffic flow, safety, land use and environmental concerns. The most important task is to divide the routes clearly into roads serving either traffic or land use. This division is manifested, above all, in the technical properties of the routes.

Public transport is another important issue to be considered in the planning of the road- and street network. The network should be designed so that conditions are created for the formation of an economical and efficient public transportation system.

The starting points for the planning of the pedestrian and bicycle traffic are the location of activities and the properties of this kind of traffic. The network should be constructed so that it fulfills, above all, the daily needs of bicycling and walking, including trips to school, work, errands and business. The network should form a continuous entity, in order to make travelling safe and smooth.

Pictures of exemplary targets (planning of land use and traffic network) on pages 10 - 13.

3.5 Safe Traffic Environment as a Goal

The cooperation between district planning and traffic planning should aim at preventing traffic accidents from taking place in advance. Accordingly, at least the following points should be taken into consideration:

- the environment must be adjusted according to the abilities and activities of the weakest individuals moving there (children, elderly people)

- people should be able to perceive the environment correctly and function according to its clues (nature of the road)

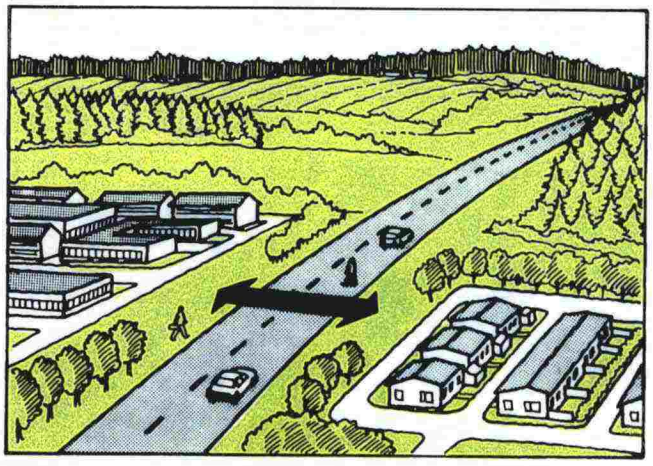
EXAMPLES OF RIGHT AND WRONG LAND USE SOLUTIONS FROM THE VIEWPOINT OF TRAFFIC SAFETY:

CONSTRUCTION ALONG THE MAIN ROAD

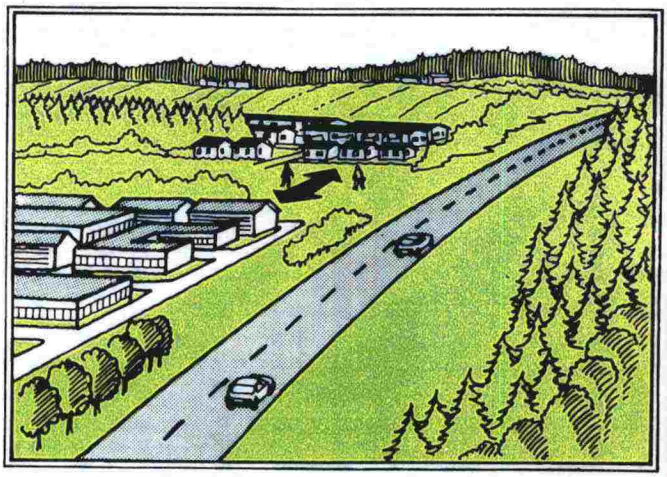
Traffic accidents are caused, when activities generating a great amount of across-the-road traffic are located on both sides of a busy road. The construction of a bridge or pedestrian underpass is often expensive and does not remove all problems.

Accordingly, traffic and intercommunication needs should be clarified, when land use and the road network are being planned. Land use should be situated in a way that helps to avoid unnecessary traffic across the main road.

WRONG



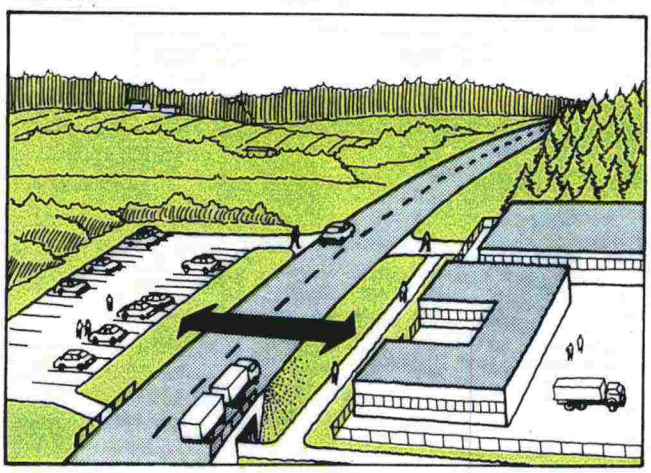
RIGHT



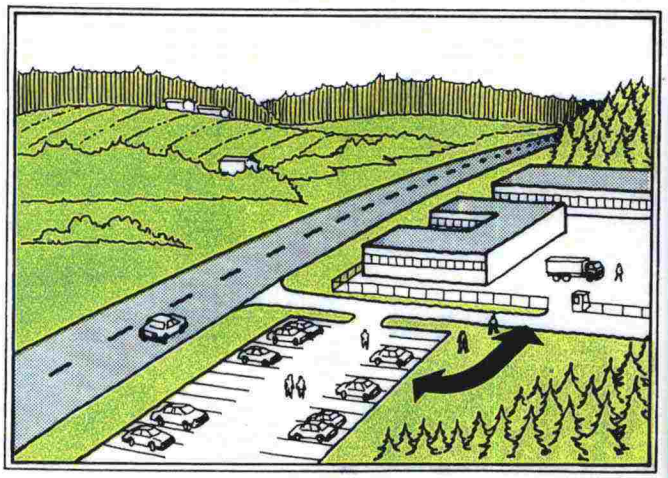
Case 1.
The residential area, work places and the school are located on different sides of the main road. Workers and school children must cross the main road.

The residential area, work places and school are located on the same side of the main road. Crossing the main road is not necessary.

WRONG



RIGHT



Case 2.
The industrial area and its parking lots are situated on different sides of the by-pass road of the center. Regardless of the pedestrian underpass, road crossings occur.

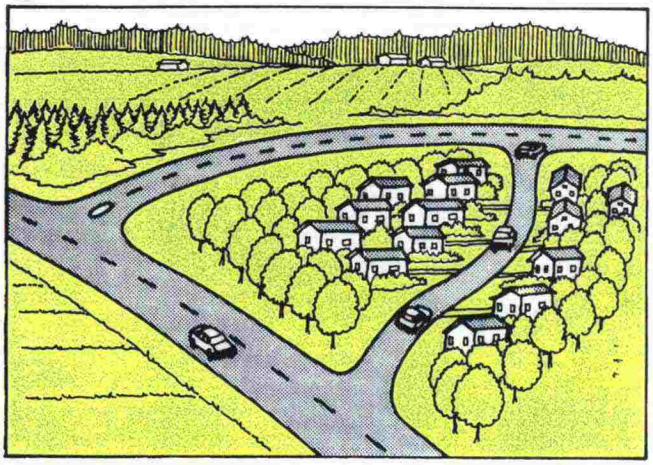
The parking place is on the same side of the by-pass as the industrial plant. There is no traffic across the by-pass. Pedestrian underpass is not necessary.

SOLUTIONS REGARDING THE ROAD NETWORK

Defects of the road network can lead to the weaving of short and long distance traffic, as well as pedestrian and bicycle traffic, which endangers traffic safety.

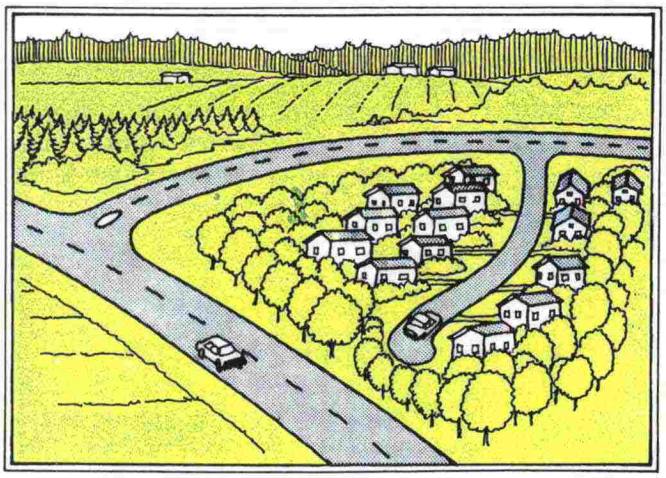
Land use and the road network must be in harmony with each other. Long distance traffic should be directed into the main routes and short distance traffic into roads and streets of lower categories. Road network solutions should avoid breaking up the structure of the urban area.

WRONG



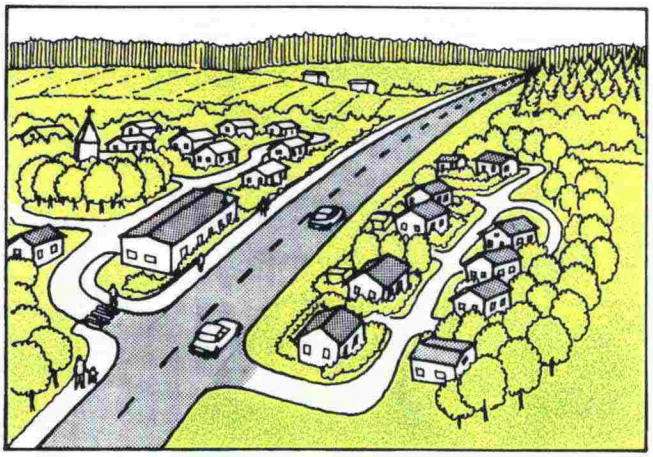
Case 3.
The road network allows the use of a by-pass cutting through the residential area. Part of the by-passing traffic is not directed into the main route. Instead, it burdens the lower category road and disturbs the inhabitants.

RIGHT



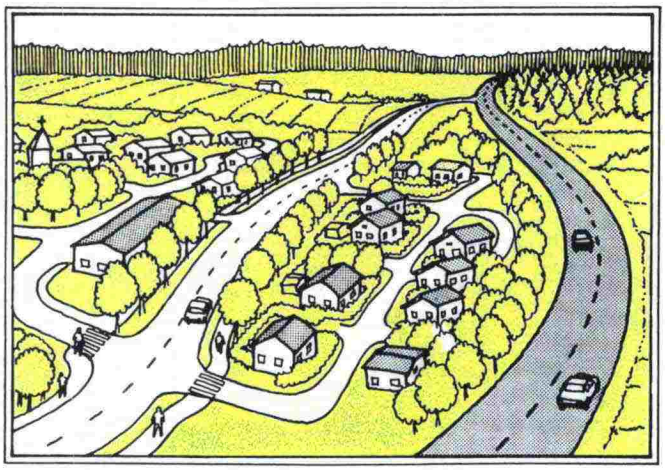
There is no through traffic connection in the residential area. The road leading to the residential area is used only by local traffic. The accident risk is usually small and environmental damage minimal.

WRONG



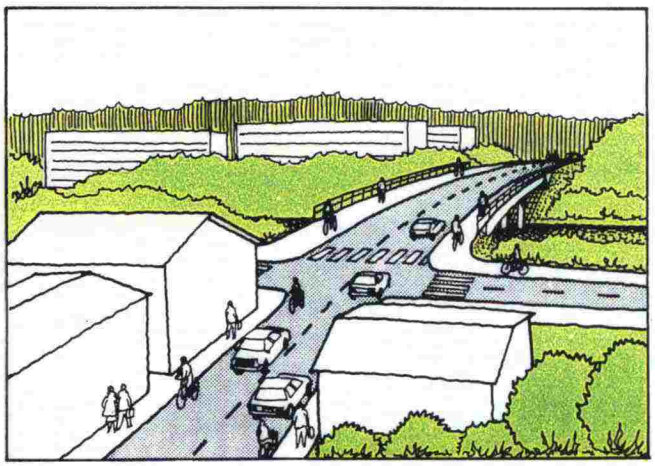
Case 4.
The urban area is cut through by a busy main road. The great volume of by-pass traffic and high speeds endanger especially the safety of pedestrian and bicycle traffic.

RIGHT



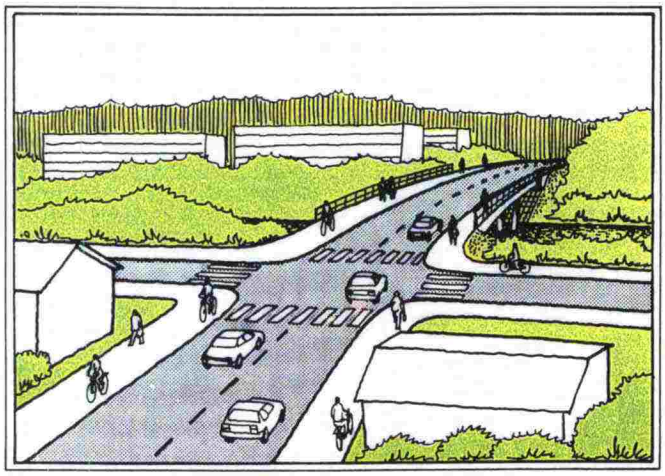
A relief road has been constructed for long distance traffic passing the urban area. The urban area road has been designed to meet the needs of local traffic.

WRONG



Case 5.
There is not enough room for the pedestrian and bicycle traffic, whose way is too narrow next to the house. Part of the bicyclists use the driveway of the main road.

RIGHT

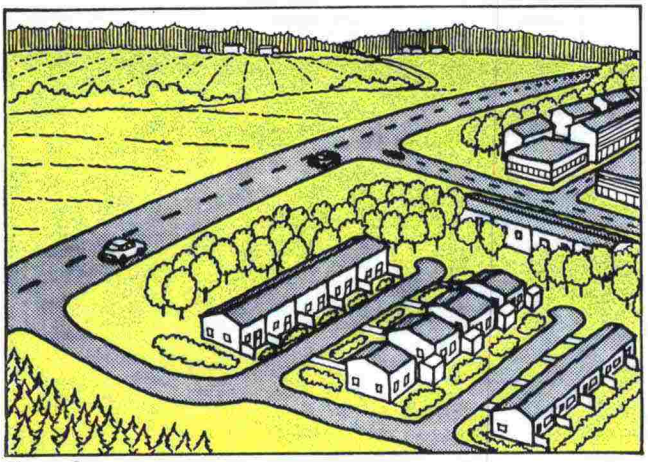


The needs of pedestrian and bicycle traffic have been anticipated in town planning. The pedestrian and bicycle ways are continuous and separated from automobile traffic.

Too short spacings between junctions on the main road increase the accident risk. The junctions are especially dangerous in places with poor visibility.

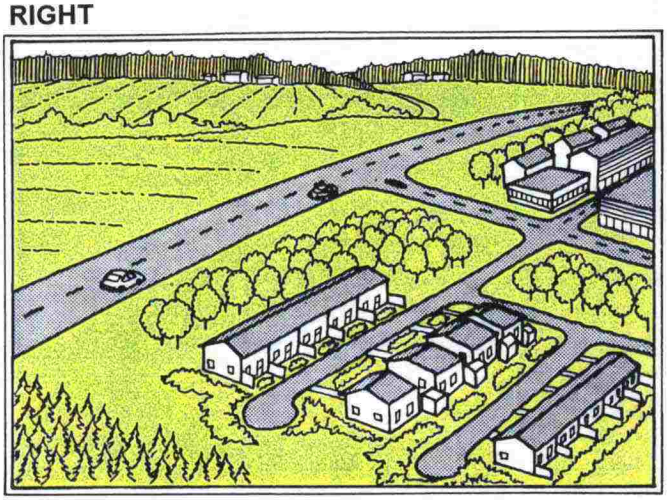
By avoiding unnecessary junctions and by constructing the junctions in safe locations, the number of accidents can be decreased.

WRONG



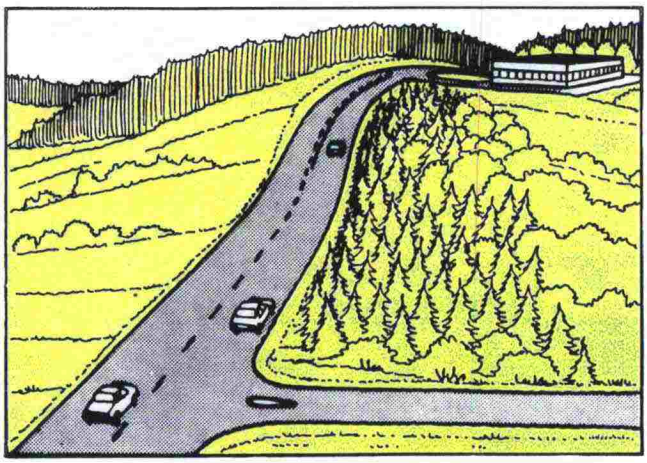
Case 6.
A junction into the main road has been constructed from a new residential area built in the vicinity of the urban area. The spacing between the junctions is short and the short distance traffic is mixed with the main road traffic, which endangers traffic safety.

RIGHT



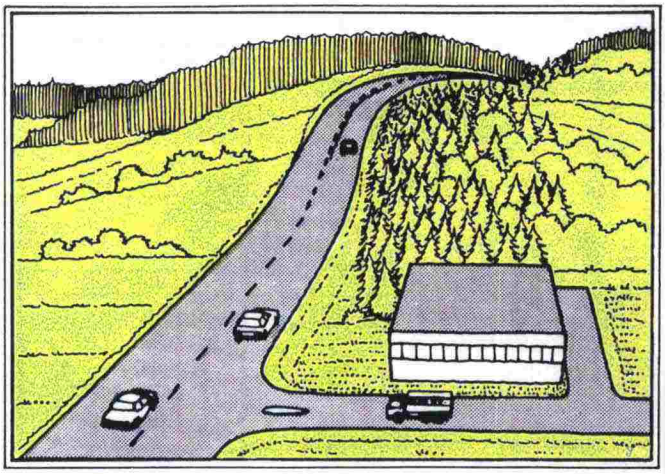
The road network of the new residential area is logically connected to the road network of the urban area and to the road serving long distance traffic.

WRONG



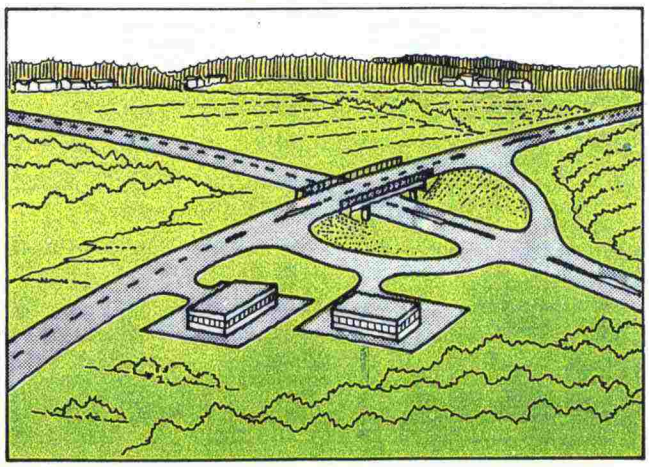
Case 7.
A building requiring its own junction to the main road, has been constructed on top of the hill. It is not usually possible to arrangea safe junction in such a place.

RIGHT



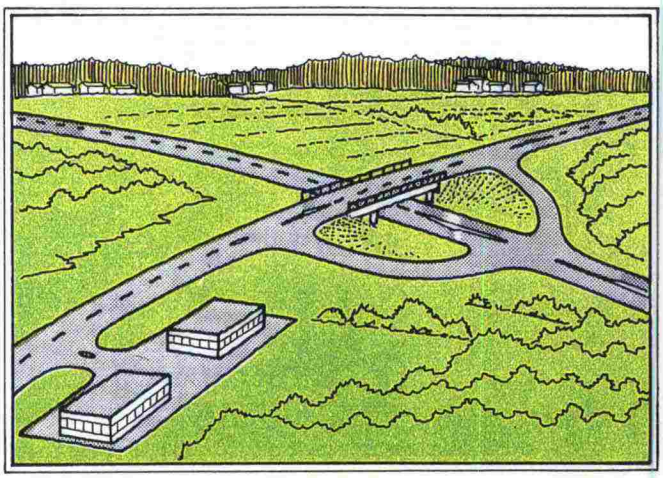
The new building has been situated in connection with an existing junction in a place where the road's visibility conditions are good.

WRONG



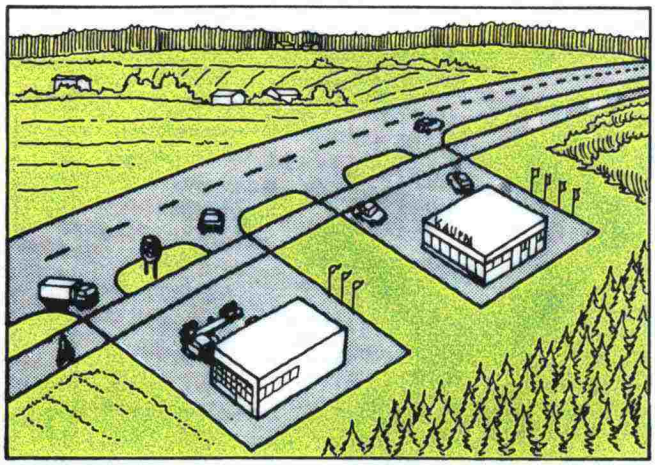
Case 8.
A shop and service station have been designed in the vicinity of the interchange ramps. Their junctions disturb and endanger the access traffic of the main roads.

RIGHT



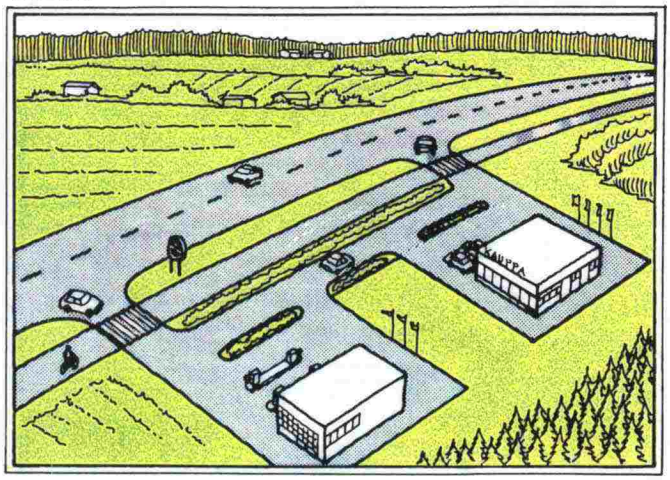
The junctions are organized in a spot where they do not disturb the access traffic of the main roads. It is not advisable to place traffic-generating activities close to the intersection of two busy roads.

WRONG



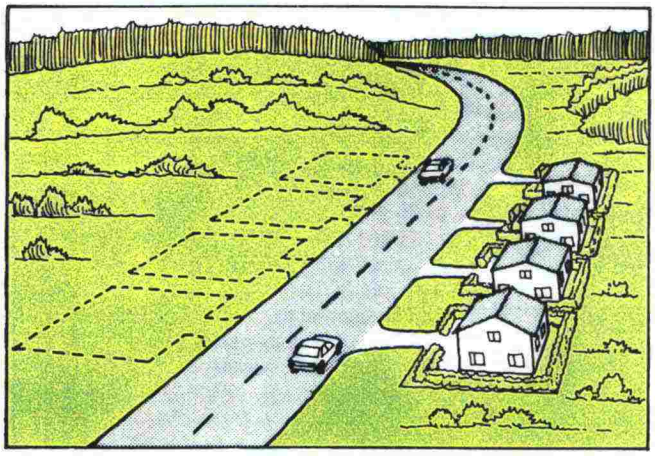
Case 9.
The shop and service station are located next to each other. Both have two junctions with two-way traffic. Furthermore, the junctions cross the pedestrian and bicycle way.

RIGHT



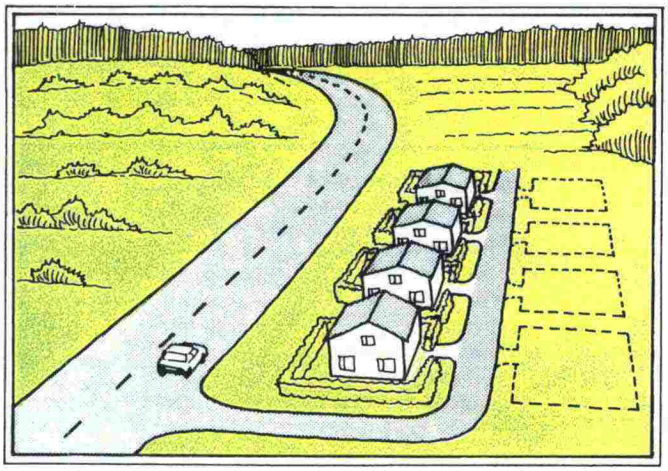
Only one junction for driving in and another for driving out are organized. This way minimal disturbance is caused to the traffic on the main road and to pedestrian and bicycle traffic.

WRONG



Case 10.
An individual access road has been constructed to each site in the small-house area. Future construction has been planned in a similar way on the opposite side of the road.

RIGHT



Future construction is planned on the same side of the road as the earlier buildings. The junctions are organized on a new lower category road.

TVH 741845

TAHTI-OFFSET KY ESPOO 1987

- as people move from one environment to another, they should be able to perceive clearly the changing of its nature.

- especially in urban areas it is important to organize the road network clearly into different types of sections (e.g., throughways, incoming traffic sections, business street sections of centers lined by commercial and public services). The change points of these different types of sections should be highlighted by diverse means, so that the motorist could observe the kind of traffic environment the is currently moving in and his attention level would be at the level required by the traffic environment.

While fast traffic is the goal, it is also important to secure safety. For this reason, the organization of the traffic network is imperative (long distance and local traffic should be separated) and the different traffic forms should be distinguished (automobile traffic and pedestrian and bicycle traffic should be separated).

Great traffic flows are collected into their own special routes, whose technical solutions are designed to correspond to the speed demands. Pedestrian and bicycle traffic and motor vehicles are separated either temporally (traffic lights) or physically (grade separation).

The majority of accidents tend to concentrate in junction areas. High speeds and neglected separation of pedestrian and bicycle traffic increase the number of accidents. Another common problem is permitted parking on the main routes. Through traffic should not be steered within residential areas.

3.6 Undivided Community Structure as a Goal

In order to minimize people's mobility needs, activity centers comprising the foremost daily travel targets should be created at a walking distance from the dwelling place In practice, it is nevertheless often necessary to separate work places from dwelling places. By creating a community structure where work and dwelling places alternate, it is however possible to create the conditions for a minimal traffic need. The daily mobility need can be minimized by overlapping activities and by creating unbroken operative units at short distances.

- Combining the places of residence and work at a walking distance from each other.

- Alternating residential and working areas along public traffic routes.

- Distributing work places and service activities in the main center and in regional and local centers.

- Activities creating a great deal of automobile traffic should be situated along the main routes, between the residential areas and the main routes.

- Basic everyday services (shop, school, day-care center, post office, administrative services, etc.) should be joined to the residential areas by means of different kinds of pedestrian and bicycle connections.

- Enterprises creating motor vehicle traffic (business centers, airports, harbors, stations, etc.) should be built in the vicinity of the main routes. Access traffic should be directed through collector roads. Traffic should not pass through residential areas.

- Pedestrian and bicycle traffic is created by schools, day-care centers, play fields, parks and sport fields, etc. These should be located along the pedestrian and bicycle traffic route, instead of the main roads. The connections should not criss-cross with the motor vehicle routes. The needs of so-called escort traffic and parking lots should also be taken into consideration.

Urban areas are divided into distinct environmental units, regional entities. These incorporate the daily services (nearby shop, school, day-care center, park, etc.) and people mainly move there on foot or bicycle. Children can also move about freely and safely in such areas. The areas have natural interfaces with main traffic channels, waterways, railways, or other natural frontiers. There is no through traffic in the area. By creating distinct operative cells, by improving pedestrian and bicycle traffic connections and by categorizing the traffic network, it is possible to reduce accidents considerably.

3.7 Public Transport and Pedestrian and Bicycle Traffic should be favored

Public transport is the safest way of moving from place to place. Realization of a functional public transport system requires a community structure continuously lining the traffic routes or being in their near vicinity.

Pedestrian and bicycle traffic can be increased by planning the daily trips so that they do not exceed 2 kilometers (walking) and 3-10 kilometers (biking). This requires safe and continuous pedestrian and bicycle ways which do not cross with automobile traffic. The pedestrian and bicycle traffic network should also be linked to the public transport stops.

4 LEADING PRINCIPLES OF TRAFFIC SAFETY WORK IN FINLAND

4.1 Objectives

The current traffic safety work in Finland is mainly based on the objective issued by the Council of State in June 1993: the number of people who died in traffic during 1989 must be halved by the year 2000. The Council of State's decision includes objectives for different target groups, such as driver's training, changes in legislation, improvement of motor vehicle quality, increase of the use of safety equipment, uninterrupted traffic safety education from childhood to adult age, improvement of first aid, research and development, road keeping, etc. The whole decision is presented in Appendix 1.

The set of objectives of the National Road Department include specific improvement objectives for the whole Road Department and for the various road districts, whose monitoring and reporting take place thrice a year. The objectives of the Road Department aim at keeping fatal accidents or personal injuries below a certain number. Another objective is the number of personal injury accidents to be eliminated by road maintenance measures.

According to a general conception, it is not possible to decrease personal injury accidents by means of road keeping measures more than 20 - 30%.

4.2 Organizations and Cooperation

Many different authorities and organizations work in the field of traffic safety. The following list presents some of the different parties:

- The Ministry of Communications
  - Motor Vehicles Registration Center
  - The National Road Department
- The Ministry of Internal Affairs
  - municipalities
  - highway police
  - local police
- Traffic Safety Organization
- Traffic Insurance Center
- State Technological Research Center

The above-mentioned parties carry out different types of cooperation, which varies at regional and personal levels, etc. This cooperation is only loosely regulated and its forms are rather free. Often it is voluntary and based on mutual agreements between the parties.

4.2.1 Motor Vehicle Inspection Center

The inspection stations under the control of the Motor Vehicle Inspection Center take care of the inspection of motor vehicles and granting of driver's licenses. Motor vehicle inspectors also assist the police in the inspection of heavy motor vehicles on the road.

4.2.2 Municipalities

Definitely the most important work carried out by municipalities in the promotion of traffic safety, is the planning and supervision of land use. Municipalities construct and maintain their street networks. Naturally, these include route signing and traffic sign matters. The repair of the problem places in the street network belongs to the municipalities.

4.2.3 The Police

The police participates in traffic safety work by monitoring traffic, presenting traffic-related improvement proposals, by giving traffic education in schools, etc.

The basic task of the highway police is to control traffic. In addition, they assist the local police in various tasks, upon mutual agreement.

The investigation of traffic accidents belongs to the local police, who do not have much time for traffic control because of their numerous other tasks.

4.2.4 Traffic Safety Organization

The Traffic Safety Organization is responsible for the overall condition of traffic safety. It informs and trains people and organizes different safety campaigns.

4.2.5 Traffic Insurance Center

Under the guidance of the Traffic Insurance Center all motor vehicle traffic accidents leading to death are investigated. An investigation board carries out this work in each municipality. It includes a police member, an expert on traffic technique, an expert on motor vehicle technique and a member who is a doctor.

The investigation board explores the course of the accident, the event that lead to the accident, the background factors, the cause of death, the prevention possibilities of the accident and the chances of reducing handicaps. The aim of the investigation board is not to establish who is the guilty party, but to improve traffic safety. Over 300 data are stored of every accident, in order to process, compare and combine them in the desired way.

In 1989 the investigation boards examined 394 accidents; in 1993 264 accidents were investigated. As a result of the work carried out by the investigation boards, traffic rules have been improved, motor vehicle equipments have been added, etc. In many cases this work has also supported other ideas presented for the improvement of traffic safety. Such innovations include safety belts, motorcycle and moped driver's helmets, compulsory driving lights and general speed limits.

During a number of years different personal injury accidents have been investigated in the form of projects by the investigation boards. The targets have included taxi-, ambulance-, bus-accidents, etc.

4.2.6 State Technological Research Center

The most extensive and highly estimated research work is carried out by the State Technological Research Center. It investigates issues that are found important and are commissioned by some outsider. The most important commissioner of traffic safety research projects has been the National Road Department.

4.3 Registration of Accidents

The Central Statistical Office keeps a general register of all personal injury accidents occurring in traffic in Finland. The information is sent there by the police.

The police informs the road department (road district) about all accidents that take place on the roads maintained by the road district. The following information is then stored in the accident register (on the computer) by the road district:

- site of accident
- time of accident
- type of accident
- speed limit
- road surfacing
- road surface condition
- air temperature
- weather
- amount of light
- equipment of the crossing
- traffic lights
- railway level crossing
- number of participants
- number of the dead and injured
- number of damaged motor vehicles
- other damage to property

- anti-skid treatment and the time passed after it has been done
- type of intersection
- accident category
- type of participant
- age and sex of participant
- use of alcohol
- driver-specific 80 km/h limit
- travelling direction of participant
- the dead and injured in the participant motor vehicle

Summaries based on different criteria can be drawn up from this accident register, which is a part of the general road register. Improvements on traffic safety have been considered in targets where many accidents have occurred during several years. These targets can be located by a computer program that searches out the black spots.

5 TRAFFIC ACCIDENTS

The traffic accident concentrations in the Road District of Bauska are found on the Via Baltica, in urban areas, and in the most frequented four-way intersections.

5.1 Via Baltica

Via Baltica is the most frequented road of the road district of Bauska, as regards its traffic volume. Its share of accidents in the road district is also great, in other words, 41% of the personal-injury accidents during 1989-1993. The calculated accident frequency is c. 0,6 accidents/km/motor vehicle.

Accidents have taken place especially often in urban areas, but there are also a great number of accidents on the whole length of the road.

Collision is the most typical accident. This is often caused by alcohol, over-speeding and passing in a wrong traffic situation.

5.2 Urban Area Roads

In urban areas accidents involving pedestrians, bicycles and intersection accidents usually take place. It is noteworthy that in most pedestrian accidents it has been the pedestrian's fault.

In urban areas the worst situation, as regards accidents, is in Iecava where 24 personal injury accidents have taken place during 1991-93 on the Via Baltica section. In eleven cases either a pedestrian or a bicyclist has been a participant in the accident. Accident frequency on this road section, whose length is 2,5 km, is 3,2 accidents/km/motor vehicle. On the same road section the accident degree is 302 accidents/10^8 motor vehicle km/motor vehicle. These figures refer to personal injury accidents.

5.3 Rural Area Roads

On the quiet roads of the rural areas some accidents have occurred in various places, without any clear concentration.

The most typical accident is driving off the road. According to the police, the causes are alcohol, too high situational speed, passing of slower motor vehicles and, in some case, defects in road condition.

6 THE SITUATION OF TRAFFIC SAFETY

6.1 Organization of Traffic Safety Work

The unit responsible for traffic safety is the Traffic Safety Department, under the Ministry of Communications, which functions as a parallel central administrative agency with the Road Department.

In regional administration there are also parallel regional units, road districts of the Road Department and the regional unit of the Traffic Safety Department.

The Traffic Safety Department is responsible for the following tasks: registration and inspection of motor vehicles, drivers' driving licence examinations, compilation of statistics on traffic accident data, licenses and inspections related to the road network (e.g., speed limits, licenses for junctions, permits and inspections concerning construction work in the road reserve, etc.). Information dissemination and educational work related to traffic and traffic safety are also part of this unit's tasks.

The police carries out the special investigations at the accident site and fills out a basic information card on each accident (personal injury accidents), which forms the basis for the data of both the Traffic Safety Ministry and the Ministry of Internal Affairs.

Local cooperation takes place mainly between the police and the traffic safety unit, while the role of the road district is not very active in this cooperation.

6.2 Traffic Safety in Latvia

The most accurate way of comparing traffic safety in Latvia comprehensively with the situation in other countries is to calculate the number of people who have died in traffic per 100 000 inhabitants.

		Population (million)	Dead/100 000 inhabitants
Latvia		2,7	34
Lithuania		3,7	27
Estonia		1,6	31
Finland	(1991)	5,0	13
Sweden	(1991)	8,6	9
Norway	(1991)	4,2	8
Denmark	(1991)	5,2	12
W-Germany	(1991)	79	12

A more comprehensive comparison between the indicators of traffic safety is included in the monograph "Road Safety in the Baltic Sea Region", in the reference material.

6.3 Traffic Safety in the Road District of Bauska

We can take the towns of Jämsä and Jämsänkoski and the municipality of Kuhmoinen in Central Finland as an area that is comparable with the road district of Bauska. This covers approximately the maintenance area of Jämsä. In the following list first some background information is given, and then some accident data. These data concern the year 1992; the accident data, however, are from the period of 1989-93. In the accident data of Bauska the years 1990 and 1993 contain the information of nine months.

	Bauska	District of Jämsä
Inhabitants	53000	25000
Roads total (km)	723	621
Main roads (km)	53	79
Surfacing-%	27	41
Accidents in 1989-93:		
- personal injury accidents	338	184
- dead	87	c. 30
- injured	387	c. 250
Accident frequency (accident/km/motor vehicle)	0,09	0,06

Along the Via Baltica there are accident concentrations especially in urban areas, but abundantly also along the whole road length. In the urban areas the share of pedestrian and bicycle accidents is great, while in other places the distribution of accident causes is difficult to say exactly.

The Via Baltica route cuts through the city of Bauska, the length of street is 2,7 km. Along this road section there is no comprehensive artery of pedestrian and bicycle ways. There are several direct site accesses to the road. In the center there is a steep hill whose longitudinal slope fall is about 5 %. The bridge over the River Memele is rather narrow and in bad shape. The speed limit on the bridge is 30 km/h.

In the center of Iecava there are also traffic safety problems. In this urban area the length of the Via Baltica through-traffic section is about two kilometers. There are not enough pedestrian and bicycle ways. There is poor visibility in the intersections and a narrow bridge. The cross-section of the road is broad.

There is no concentration in the dispersion and location of accidents in the rural areas. According to the police, the majority of accidents on the lower road network are caused by alcohol, overspeeding, passing of slower motor vehicles and defects in road condition. The combination of new cars/young drivers is also the cause of many accidents. Usually there are several reasons, and wrong situational speed is usually always one of them.

6.4 Comparison with the Situation in Finland

The most suitable indicator figure for a comparison between the states is the number of fatalities in traffic, as compared to the number of inhabitants. If this figure is used for estimation, the citizens' risk of dying in a traffic accident in Latvia is more than 2,5-fold as compared with Finland.

The above presented figures from the road district of Bauska and the Jämsä district indicate that in Bauska there are 0,26 dead and 1,14 injured per personal injury accident; in Jämsä the corresponding figures are 0,11 and 1,45.

The seriousness of the accidents, as estimated by the number of fatalities, probably depends on many things. Accidents that take place under the influence of alcohol are usually more serious than other accidents. They involve over-speeding and other kinds of disregard of traffic rules. Often there are passengers in the car, and especially the young drivers must show off their skills. Another factor contributing to this trend in the indicator figures is the neglect of personal safety equipment (safety belts in cars, motorcyclist's helmet, pedestrian's reflector, etc.)

It is apparent that in the district of Bauska (in Latvia) people have a somewhat different criterion of injuries than in the Jämsä district (Finland). This difference is increased also by the fact that probably not all less serious accidents, where people have been injured, come to the knowledge of the police in Bauska.

7 ASSESSMENT OF THE FUTURE DEVELOPMENT

It is difficult to forecast the development of the traffic conditions in Bauska, but in the following paragraphs some assessments are made of the effects of various change factors, from the point of view of traffic safety:

- The development of the vehicle stock will follow European development trends, along with the economic development. Although the average economic growth may not be very fast, the uneven development of the economy means that the vehicle stock increases and is renewed because of the well-to-do. The traffic performance may not grow very rapidly, but the differences in people's incomes, privatization, changes in the way of living and in the share of public transport, as well as other factors, all contribute to the increase of private cars.

- As regards the condition of the vehicles, the situation will be poor. There is a great number of the old vehicle stock in the traffic, the economic situation causes postponement of repairs, deterioration of the condition of tires, and thus helps to increase the accident risks.

- As the privatization of agriculture progresses, new small-production units are created in the countryside. The traffic caused by them is slow, it uses old equipment and is increasingly entering the highways via junctions. The composition of traffic and the speed distribution will change in a more accident-prone direction.

- The impact of international traffic, especially on the main roads,brings additional risks to the traffic, and the demands for speed and undisturbed traffic flow increase.

- Inside the urban areas, the improvement of safety depends on the chosen emphasis, whether it favors automobile traffic or pedestrian and bicycle traffic. In the name of development, it may be difficult to restrict or slow down the conditions of cars.

- In the atmosphere of change and general emancipation from restrictions, traffic rules and their observance may undergo an inflation, resulting in a wilder traffic culture and increased accident development.

8 A PROPOSAL FOR THE DEVELOPMENT OF TRAFFIC SAFETY METHODS IN LATVIA

8.1 Organization of Traffic Safety Work

Cooperation between the different partners and the need of common plans are very important in traffic safety work. Especially at the local level it is imperative that the work of both municipal authorities (local plans, teaching, street technique,..) and the state road department, traffic safety unit and the police is cooperative and synchronized.

For the favorable development of the role and professional skill of the different partners, it might be worth while in Latvia to study the alternative where the work is divided so that road-technical skill and responsibility are concentrated in the road department, while matters concerning motor vehicles and drivers are concentrated in the traffic safety units.

8.2 Traffic Safety Objectives

At the political level (the government) a concrete goal and schedule for decreasing accidents will be created and approved, in order to form a common set of objectives for the different partners in traffic safety work.

For the implementation of this decision-in-principle, a safety-improvement plan concerning and obliging the different partners will be constructed, and resources for the implementation of this plan will be provided to the units.

The general goal will be further divided into a concrete task for each unit, and the priorities of the resources and the outcome of the task have been defined in advance, in relation to the other tasks of the unit.

In this set of objectives it is also necessary to define the division of responsibility and the implementation schedule for such traffic safety measures that are part of general legislation, such as:

- technical directives for motor vehicles
- regulation on tires
- rules on the use of driving lights
- rules on the use of personal safety equipments (safety belts, helmets, reflectors,...)
- per mil limits, alcohol education and control

To facilitate the prioritization of the objectives and measures, there are some applied studies being developed in Latvia on the economic effects of accidents and on the efficiency of different measures. For the achievement of the results, it is important to combine the experiences from this study and corresponding Nordic experiences with the practical work of all the partners.

8.3 Registration of Accidents

The report "Road Safety in the Baltic Sea Region" introduces the Finnish classification of accident types. It forms a good basis for examinations of safety improvement. It has been developed for the needs of automatic information processing.

In the next few years the Latvian Road Department will transfer to the so-called computer-time. It will happen by means of efficient micro computers. Then it will be easier to maintain different statistics, from which many kinds of summaries can be drawn. The accident register will be one of the most important systems to be created. It must be connected to the road register, to form a part of it, or at least so that they have a close connection with each other. Thus it will be easy to locate the black spots and to investigate the mutual connection between accidents and road conditions.

The Finnish Road Department is currently developing a computer-based road register for the Road Department of Estonia. It also includes the creation of an accident register. It might be useful to examine the suitability of the same project for Latvia.

8.4 Planning of Land Use and Cooperation with District Planning

As conditions of land use and land ownership change, it is to be expected that there will arise increasing needs for the use of the near environment of roads for constructing houses and different enterprises that survive on road traffic. As a result, there will emerge an increased need for access roads and road-side advertisements and other such factors that influence traffic safety.

It would be advantageous to concentrate the related permit and statement matters to the Road Department. The Road Department should, in cooperation with the district planners, actively strive at regulation of road-side building and other land use, so that traffic safety will not be endangered.

The building permits of houses to be built in the vicinity of roads should be submitted to the Road Department for a statement. In this connection the Road Department can decide how the travelling connections to the building site should be organized (access roads and possible private road arrangements). Also when district plans are drafted, the Road Department should have a prominent role, in order to ensure attention to traffic safety issues.

When district plan proposals are prepared, the representative of the Road Department must participate in the work as an expert on the traffic network and, if necessary, he must be given a chance to draw a traffic plan or road network plan. All district plans should be submitted to the Road Department for a statement. In its statements the Road Department should pay special attention to traffic safety matters and to preparation for potential new road arrangements.

8.5 Cooperation with Other Authorities

Cooperation between groups working with traffic safety is useful, even though all have their own special fields. Cooperation helps to enlarge people's views of the problems and urgent matters can be handled flexibly and rapidly.

As regards this cooperation, it is important to initiate the systematic investigation of fatal accidents. This work should be participated by representatives from the police, The Road Department and traffic safety office. The doctor who examines the cause of death, gives this work an extra dimension by explaining the functioning and durability of the human body.

When an accident has taken place, the course of events in the traffic environment should be investigated, and also the activities of the participants, the qualities of the motor vehicle, visibility, etc. This way it is possible to discover the events that led to the accident, and to make improvement proposals (traffic environment, legislation, motor vehicles, personal safety equipment, etc.).

Another form of cooperation that has been proposed for experimentation and development, is the holding of regular meetings for discussing the accident situation. The group would include representatives of the Road Department, the police, the traffic safety office and the municipality. This kind of group can consider rapid improvements and it can discuss long-term problems and ponder common issues in a more informal way.

8.6 Information and Traffic Education

Traffic safety work should also aim at reaching the general public by organized information activity, in order to create a positive attitude towards traffic safety and towards the organizations carrying out this work.

Reporting about changing road and weather conditions demands most up-to-date information dissemination, and the radio is the most suitable media for this purpose. The general public must also be informed about changed conditions and current maintenance works by means of the weather observation carried out for the needs of road maintenance. In its most developed form this monitoring can be based on special road weather observations, road weather stations and centers following the changes in road weather conditions. This sort of work can, however, be started by easier means like agreements with radio stations about regular news reports on road conditions, for example in the morning and in the afternoon, during return traffic from work.

Long term traffic safety education will guarantee that the public is conscious of factors affecting traffic safety and can also take into consideration the risks in traffic. Such diverse topics which are most conveniently reported to the public by the press include, among others:

- anticipated interference in traffic (rush hours, starting of school terms, animal accident risks, etc.)
- hindrances caused to traffic by roadwork
- changes connected with introduction of new routes
- accident-prone targets on the road network
- risks connected with driving habits

Information dissemination is often most effective, when it is directed to certain regions or certain target groups. This can be carried out by various regional events, open-doors days, school visits, local exhibitions, etc. This type of activity also helps to promote the image of enterprises participating in it.

9 PROPOSAL FOR TRAFFIC SAFETY IMPROVEMENT TARGETS ON THE ROAD NETWORK

9.1 Junctions of Primary Roads

On the Via Baltica section the alignment of the main road is mostly of a very high standard. Also the junctions of public roads usually have a good visibility and their width is even too great. In many junctions there are furthermore several branches joining in different directions, which increases the number of collision points.

As a proposal for an improvement policy of the junctions of public roads, the following measures are presented:

- the visibility of the junction is improved in the direction of the main road by correcting directional signing, so that an intersection is always preceded by a visible preceding sign and at the crossing there is route signing that is clearly visible in the driving direction, by means of an overhead sign support, if necessary

- when approaching the intersection, the standard of the road is changed in the direction of the yielding road, so that the driver perceives that he is coming to a crossing of a more important road. Intersection to the main road is usually made at a right angle and always through one driving channel, which is so narrow that it is impossible to drive to the main road simultaneously in many queues

- the channelization or broadening of the intersection in the direction of the main road accentuates the importance of the main road, and by differing from the rest of the road section, it draws attention to the exceptional driving conditions of the intersection area

- lighting the intersection increases its visibility, especially during dark, but even at other times it underscores teh nature of the unusual poit in the road

- junctions and road signing that follow a unified standard on Via Baltiaca help people to perceive the change points of the road, especially in case of drivers that are unfamiliar with the circumstances.

In the Appendix 2 there is a standard picture of a channeled junction of a main road and a public road.

9.2 Junctions of Private Roads

On the Via Baltica section, north of Bauska, there are a total of 140 junctions on the length of 32 kilometers. Private farms next to each other are occasionally joined to the main road, and the main road has become a local road serving the land use of the farms.

The proposal for the improvement of traffic safety states that, parallel to the main road, such connecting roads should be organized of the private roads that would help to converge the junctions, joining them either to lower class public roads or, in a very few places, to the main road.

The aim should be that there are no more junctions to a high-class main road than at the distance of one kilometer. If there is reason to anticipate that in later improvement of the main road separate passing lanes will become necessary, the distance between the junctions should rather be two kilometers. Thus it would be possible to construct an additional passing lane between the junctions for the driver's needs, alternating in both directions of the road.

In the Appendix 3 there is a basic proposal for the location of the junctions along the main road. Detailed planning and placement of the junctions must be individually designed in a more precise way.

9.3 Throughways of Urban Areas and Pedestrian and Bicycle Traffic

The plan proposes certain arrangements for the centers of both Bauska and Iecava, which help to increase especially the safety of pedestrian and bicycle traffic. In urban areas the traffic environment must have an outlook that signals to the motorist that he is travelling on a road with a lot of pedestrian and bicycle traffic and many junctions crossing the road and going in its direction.

In the nuclear centers of the urban areas it is proposed that the speed limit is reduced to 40 km/h and pedestrian crossings are improved by constructing pedestrian islands on the roadway for safe crossing. The driveway can be narrowed, which helps to restrict speeding. At the same time, there is a good opportunity to improve and construct continuous routes for pedestrian and bicycle traffic.

It is also proposed that in Iecava a pedestrian underpass is built in a place where the road is frequently crossed. In this spot safety can be improved simply by building a pedestrian island in the middle of the road. Appendix 4.

In Bauska we propose that the traffic in the street network is turned into one-way traffic, which reduces spots with a left turn and makes it possible to construct proper preselection lanes. Appendix 5.

Proposals for improvement measures can be found in the supplement maps.

9.4 Maintenance of the Road Network, Winter Maintenance and the Condition of Surfacing

The maintenance level of the road network influences traffic safety in many ways. Wintertime maintenance is specially underscored in Latvian conditions, where the condition of motor vehicles and tires varies greatly.

The safety effect of winter maintenance is based on correctly timed snow removal and anti-skid treatment, which eliminate unexpected changes in driving conditions. Effective winter maintenance thus requires weather observation and communication contacts between different units, as well as coordination of activities, so that conditions for road users are similar on the whole road section. In its sophisticated form such activity is based on road weather stations and centralized on-duty stations, road-condition centers, which survey both the weather as well as the road condition on a large area.

The condition of road surface is a factor influencing traffic safety also in summer conditions. The Latvian accident data contain indications of accidents caused by defects in road surface, particularly on the lower road network. Holes in road surfacing, looseness of surface and potholes on gravel roads,and the softness or steepness of road edges are unanticipated factors in a normal driving situation. The regularity and consistency of the road condition are basic factors in safe travelling.

9.5 Lighting

The risk of traffic accident is greater in dark than in daylight. Especially pedestrian accidents, collisions with obstacles on the road, with parked cars or animals increase in the dark.

Accidents can be decreased by good lighting by 20-30 % and the consequences of more serious accidents can be alleviated. When the principles of lighting are created, the lighting can even be used as a signal to the driver about the coming traffic arrangements, such as the outline of the crossing.

The importance of the lighting becomes emphasized in urban areas with a lot of pedestrian and bicycle traffic. Lighting is also an important comfort to he pedestrians.

Intersections and junctions of public roads are important lighting targets. They should be designed as similar as possible. Then, for example, tourists driving along Via Baltica during dark would easily perceive that they are approaching a problem spot in traffic.

It would be useful to construct a general plan for lighting. The plan would include a clarification of the necessity of lighting certain sections of the road and the construction principles of the lighting, including the power of lighting, light types, colors of lighting in different spots and the column types to be used.

9.6 Speed Regulation

Regulation of speed is one of the basic questions in traffic safety. Speed limits can help to make traffic as smooth as possible, and thus passing decreases and accidents are minimized.

In urban areas speed limits must be set according to land use. The lowest speed limit of an urban area depends on the nature of the road and its cross-section, composition of the traffic, size of the urban area, arrangement of land use, etc. Speed limits in urban areas are graded from the center to the fringes of the urban area on the same grounds.

Regulation of speed in urban areas includes supporting the limitation with other traffic arrangements. The leading principle is: the lower the limitation, the narrower the lane must seem.

9.7 Removal of Obstacles from the Road Reserve and Roadside

The safety of the road area is dependent on the possibility, in case of accident, of slowing down the speed of the motor vehicle so much that the damage is minimized. Usually this concerns the curtailing of the effects of driving off the road accidents.

It is important that, when the accident takes place, the collision does not lead to a sudden stop, but the decrease of speed takes place gradually. Therefore, there should not be trees or other aggressive structures in the road area between the side ditches. Lighting columns should be such that they break down or yield from the impact of the collision. Rail ends should be made slanting.

It is important that the motor vehicle stays upright. This is promoted by slope inclinations. On the main roads the inside slopes should be 1:3 or less steep. The gradient of the external slope should also be 1:2, so that one would not crash on it and that there would be some kind of chance for the motor vehicle to stay upright.

9.8 New Relief Roads

There exist some earlier plans for constructing relief roads for both Bauska and Iecava. Particularly in the Iecava district the earlier plan would require the construction of a considerably long new road section. These plans are from the 1970s, and the situation has changed from that time, for example, as regards land-ownership conditions. The development of traffic and the impact of environment conditions have also changed since the plans were made.

The traffic safety impact of relief roads is most efficient on the section where long distance through traffic has caused accidents within an urban area. The impact is smaller, as regards the urban area's own internal traffic. Because Iecava is such a small urban area, the share of through traffic of the total traffic volume is greater than in Bauska, where the main part of the center's traffic (80%) consists of the internal traffic of the urban area.

In case of both urban areas this plan has limited itself to proposing internal traffic safety measures, because the implementation of relief roads is such an extensive investment that it demands much more precise investigations about the distribution of traffic and traffic safety impacts, as well as costs.

The internal traffic safety measures of urban areas are nonetheless necessary, even in case of the relief roads, in order to improve the safety of the traffic remaining within the urban area and the safety of pedestrian and bicycle traffic. Accordingly, the now proposed traffic safety improvements of the urban areas are part of a potential later project and their costs form only a fraction of extensive by-pass road arrangements.

Because of the changed conditions, the planning of relief roads would probably require a totally new general planning stage, including an estimate of the environmental effects. Such planning also calls for an adaptation of the urban general plan construction to the present land-ownership conditions and to the development prospects of the urban areas.

10 THE IMPACT OF TRAFFIC SAFETY MEASURES

10.1 Estimate of Accident Decrease

In the Finnish Road Department accidents are registered statistically in an accident register which provides information about the site of the accident, the conditions, participants, consequences and other matters mentioned in Chapter 4.3.

The accident situation and its development on a certain road sections can be estimated and forecasted by utilizing registered data (accident history) and information about the general accident situation of a similar type of road. By comparing these, we can get a picture of the road's accident situation.

Based on statistics and investigations, the impacts of different types of road maintenance measures on the development of accident density have been analyzed. By using this information and the data on the number of accidents, it is possible to estimate how traffic safety could be influenced by road maintenance measures in each situation.

In Finland the different road maintenance measures have been found to influence traffic safety in the following way (also foreign research material is included):

The impact of safety measures on personal injury accidents

MEASURE	IMPACT COEFFICIENT (c)
PEDESTRIAN AND BICYCLE TRAFFIC ARRANGEMENTS	
pedestrian and bicycle way	0,85
grade separated pedestrian and bicycle way	0,85
traffic island on the pedestrian crossing	0,90
signal control of pedestrian crossing	0,90
TRAFFIC CONTROL	
change of speed limit	
50 → 60 km/h	1,10
50 → 70 km/h	1,19
60 → 50 km/h	0,91
60 → 70 km/h	1,09
60 → 80 km/h	1,18
70 → 50 km/h	0,84
70 → 60 km/h	0,92
70 → 80 km/h	1,08
70 → 100 km/h	1,54
80 → 50 km/h	0,78
80 → 60 km/h	0,85
80 → 70 km/h	0,93
80 → 100 km/h	1,43
100 → 70 km/h	0,65
100 → 80 km/h	0,70
traffic lights	
-new signal control	
- 4-branch junction	0,60
- 3-branch junction	0,80
- traffic data control	0,80
setting up a point-down triangle	0,95
setting up a STOP sign	0,75

MEASURE	IMPACT COEFFICIENT (c)
IMPROVEMENT OF JUNCTIONS	
channelization of junction (when the problem is not crossing accidents)	
- 4-branch junction	0,75
- 3-branch junction	0,95
- signal control junction	0,85
staggered junction	0,75
construction of roundabout	0,80
construction of grade separated junction	0,60
construction of passing place	0,85
ROAD IMPROVEMENT	
semi-motorway → freeway	0,90
road lighting	0,95
realignment	0,90
widening of narrow road outside urban area	0,80
inner lane	0,95
private road arrangements	0,90
TRAFFIC ARRANGEMENTS OF URBAN AREAS	
traffic renovation, including lowering of speed limit	0,70
RAILWAY LEVEL CROSSING	
setting up a STOP sign	0,50
half booms	0,30
WINTER MAINTENANCE	
more effective anti-skid treatment	0,85

10.2 Estimate of Accident Costs

In traffic safety plans attention must be paid to the costs of different accident types, when accident cost savings are estimated (property damage, injury, death).

In Finland the accident cost data are based on statistics issued by traffic insurance companies compiled of the damage reports made by insurance takers, on police investigation memos and paid compensations. The traffic safety committee of insurance companies (VALT) publishes annually statistics on traffic damages and costs caused by them.

In 1993 the average traffic accident costs in Finland were as follows:

* property damage accident	44 000 mk
* personal injury accident	955 000 mk
* fatal accident	8 900 000 mk
* average road traffic accident	320 000 mk

When the impacts of road planning projects are estimated, accident costs are calculated on the basis of accident numbers. Accident numbers can be estimated by means of accident degrees and traffic volumes, by combining the information about the occurred accidents with the average accident numbers of similar road conditions. The impact of safety improvement measures is estimated by means of average impact coefficients designated for different measures.

The accident costs have been theoretically calculated in two parts: the real economic losses caused by the accident and so-called losses of well-being. Economic costs include the costs accrued from resources used for repairing the damages created by the accident, production losses and other corresponding financial costs. In addition to economic losses, however, the accident cost figures also contain a cost representing loss of well-being, which has been defined for each damage type separately, on the basis of so called social payment readiness.

In the calculation of accident costs the coverage of statistics has been taken into consideration by means of a representativeness coefficient. In Finland road authorities are informed about all fatal accidents in road traffic, about 65 % of accidents leading to handicaps and circa 30 % of property damage accidents.

10.3 Impacts of the Proposed Measures

10.3.1 Iecava

The impact of the measures proposed for Iecava are presented as an example of the Finnish calculation method. (Later references to accidents mean personal injury accidents.) The accidents have occurred in 1989-93. Their number and accident type are authentic, but they have been placed in relation to the measures, so that the calculation method would emerge as clearly as possible. Therefore, the following assumptions are made about the 24 accidents that have taken place:

- six of the nine collisions have taken place in the present traffic light intersection and three in the intersection where there is a pedestrian underpass and where the X-crossing turns into two T-crossings

- two turnings from the side-street to the main road have occurred in the place where a pedestrian and bicycle way comes; the speed limit does not change

- two of the eight pedestrian accidents have taken place in the present traffic light intersection, when crossing the main road; five accidents have occurred at the crossing of the future underpass, when crossing the main road, and in one case the pedestrian has been going in the direction of the main road

- three bicyclist accidents have taken place where the new pedestrian and bicycle way should be constructed

- 2 accidents have occurred in a spot where the speed limit changes from 60 to 50 km/h.

The different measures influence the different accidents in the following ways and by the following accident decrease coefficients:

- the underpass affects 5 pedestrian accidents, coefficient 0,40
- the pedestrian and bicycle way affects one pedestrian and three bicycle accidents, coefficient: 0,35
- changing the X-crossing into two T-crossings affects three collisions, coefficient: 0,25
- the channeling of the present traffic light intersection with island platforms affects six collisions, coefficient: 0,15; and two pedestrian accidents, coefficient: 0,30

- decrease of the speed limit (60 > 50) affects two accidents, coefficient: 0,10
- the measures have no effect on two accidents.

The total decrease of accidents on annual level is:

-	pedestrian underpass:	5*0,40/5	= 0,40
-	pedestrian and bicycle way:	4*0,35/5	= 0,28
-	X-crossing into two T-crossings	3*0,25/5	= 0,15
-	channeling of crossing with traffic islands:	6*0,15/5	= 0,18
		2*0,30/5	= 0,12
-	decreasing the speed limit:	2*0,10/5	= 0,04
Total accident decrease			1,17

10.3.2 Private Road Arrangements on Via Baltica

On those sections of Via Baltica, where private road arrangements are proposed, twenty personal injury accidents have taken place annually. The arrangements will affect approximately ten accidents. The private road arrangements decrease about 15% of the accidents. Thus the private road arrangements help to decrease a total of 1,5 accidents a year.

11 PROPOSAL FOR FURTHER MEASURES

11.1 Training

In the field of traffic safet it is very important to follow and utilize international studies. It is also necessary to organize in-service training within the Road Department, in order to introduce new methods and principles into practical work.

We therefore propose that the representatives of the Latvian Road Department are reserved an opportunity to participate in Nordic training events in the field, and that economic support is given to their traffic safety experts for cooperation with the Nordic countries.

We propose that, for example, the Road Department and State Technological Research Center will arrange separate courses in Finland, focusing on traffic safety, for persons in charge of these matters in the Latvian road districts.

11.2 Follow-up Work

The implementation of the proposals of this plan presumes separate development projects with specially appointed personnel and financing. The implementation of the plan may also require consultation given by the authors of the plan.

We propose that roughly after a year a follow-up seminar of the plan will be organized for evaluating the progress of the measures, the need for consultation and the usefulness of the plan from the viewpoint of the Bauska Road District.

11.3 Applications to Other Road Districts

The goal of the plan is that it might prove serviceable also for other road districts, as regards the principles of traffic safety work and its examples.

We propose that the plan is translated into Latvian and its usability also for the needs of other road districts is tested. Concurrently, the suitability is tested of the proposed measures for a uniform policy to be applied in the whole Latvian Road Department.

11.4 Development of the Methods

In the development of traffic safety a central role belongs to information acquired by analyzing accidents that have taken place. The collection, registration and utilization of accident data demand a vast information system and connections with a road data system.

We propose that the road register is developed so that the registration of accident data makes possible the many-sided use and analysis of the information. The Finnish Road Department is constructing such a register in cooperation with the Estonian Road Department, and it could be possible to carry out this development work in cooperation with the corresponding development work of Estonia.

11.5 Initiation of Joint Planning between General Town Planning and the Road Network in the Urban Sections of Bauska and Iecava

Old relief road plans exist for the urban areas of both Bauska and Iecava. However, the present situation has changed so much, as regards the development prospects of the urban areas, land ownership conditions and environmental values that totally new joint planning between the road network and community structure is required for the renovation of the plans.

We propose that especially for Bauska, but if necessary, also for Iecava, an investigation is carried out by means of general planning and road network planning, in order to confirm the policy decisions of relief roads and the space reservations with related impacts and costs.

11.6 Initiation of the Organization Plan of Private Roads on the Via Baltica Section

One of the greatest traffic safety risks on the Via Baltica section is the great number of private access roads and the resulting slow traffic. It is even possible that the situation is rapidly deteriorating, with the privatization of agriculture and its division into smaller units.

We propose that along Via Baltica systematic planning is initiated aiming at a roadside private road system, with only very few sites of access to the main road. This planning will also concern the travelling connections between new farms that will be established along the road and the formation of the farms, so that crossings over the main road are avoided. The location of roadside services and their connections should also be defined in such a plan.

11.7 The Traffic Safety Plan and its Financing

In order to secure the finances for traffic safety, it is necessary that the different organizations have a common program for the improvement of traffic safety. In addition, the measures proposed in the program must be presented in a way that their impacts and costs are comparable, so that the most efficient measures can be financed.

We propose that a traffic safety plan concerning all partners of road traffic will be constructed, whose impacts and costs can be commensurately justified. By means of this plan it will be possible on the highest political level to make the decision about the promotion of traffic safety and the necessary financing of the different partners.

11.8 Turning the Operation of the Road Department into Products and Production Agreements Concerning Traffic Safety Measures

It is possible to use the traffic safety impacts of different measures as one instrument in the direction of the internal activity of the road department. By measuring the impacts we can choose the most effective measures and direct the finances to the realization of the objectives.

We propose that the Road District of Bauska will experiment the turning of its activities into products and the use of traffic safety impacts as a part of production agreements, for example, by applying the procedures of the Finnish Road Department.

11.9 Translation of the Finnish/Nordic Traffic Safety Directives into Latvian

In all Nordic countries there is a great amount of both research data and directives concerning traffic safety. Because of similar conditions, these are also suitable for the basis of development work in the Baltic countries. The main part of the directives are written in the language of each country, but some material translated into English for the needs of different conferences and international organizations can also be found.

We propose that mutually selected directives and research reports on the field of traffic safety will be systematically translated into Latvian. This translation work would be suitable, for example, as scholarly thesis projects, supporting technological education, and as a theme in the international exchange of trainees.

11.10 The Use of the Roadside Areas and Permit Procedures

Especially along the main roads there has emerged pressure towards further construction, advertisement, new access roads and other such activities that influence traffic safety.

We propose that a permit policy is created for the use of the roadside, by means of which the Road Department can secure the smoothness and safety of the traffic flow and which can also be used for the development of the communities' land use.

12 SUMMARY

The traffic safety plan for the Road District of Bauska contains a description and comparison of the different sectors of traffic safety work in Finland and Latvia.

The major part of the plan concentrates on such proposals, regarding both policies and improvement targets, where Finnish experience and methods can be directly utilized.

The most important policy proposals include the development of local and regional cooperation forms between the Road Department, police and municipal authorities in traffic safety matters, and the creation of an information system serving the analysis of accident data (accident register).

Concrete traffic safety policy proposals are made for Via Baltica and the urban areas along it. Among the rapid and effective primary development measures for Via Baltica are the improvement of public access roads and the reduction of private access roads by means of private road arrangements.

For the improvement of urban traffic safety we propose measures enhancing the situation of pedestrian and bicycle traffic and bringing the speed levels of motor vehicle traffic to a level corresponding to urban conditions. Separate pedestrian and bicycle routes, pedestrian crossings enhanced by pedestrian islands, narrowing of traffic lanes, supply of turning lanes and betterment of the surrounding milieu are some examples of measures for influencing traffic safety inside urban areas.

In addition, the plan contains calculation models for estimating the impacts of the proposed measures and several proposals for more detailed further plans.

FINNISH TECHNICAL INSTRUCTIONS FOR THE TRAFFIC SAFETY TARGETS

When the working group visited the Department of Information Dissemination and Foreign Relations of the Latvian Road Department, director Andris Veiss was handed a number of documents on traffic safety. These are listed below. The first one is in English, others are written in Finnish.

- Road Safety in the Baltic Sea Region
- Handbook on Traffic Safety
  A very extensive and thorough work on traffic safety, edited and translated from Norwegian by M. Salusjärvi.
- Existing traffic safety plans
  - The Road District of Central Finland
  - The Municipality of Piikiö
- Regional Improvement of Traffic Safety in Cooperation between Municipalities and the Road Department (2nd volume)
- Clarification of Methods Reducing Speed in Urban Areas
- Small Improvement Measures in Urban Areas
  A basic guide of small jobs for improving the safety and agreeability of urban centers.
- Small Improvement Targets of Urban Roads in the Town of Jämsänkoski
  An application example of the former report
- Roundabouts
  A new instruction of the use, dimensioning and signing of roundabouts.
- Development of Central Area Roads in Urban Areas
- The Effect of Road Maintenance Measures on Traffic Safety, Summary Report
  The report is a summary of a comprehensive literature survey that examined the effects of different measures on different kinds of accidents.

APPENDICES

- Council of state's decision in principle on the improvement of traffic safety. Appendix 1.
- A prototype drawing of a channeled junction of the main road. Appendix 2.
- The precept of private road arrangements on Via Baltica. Appendix 3
- Iecava, a proposal for improvement measures. Appendix 4.
- Bauska, a proposal for improvement measures. Appendix 5.

COUNCIL OF STATE'S DECISION IN PRINCIPLE ON THE IMPROVEMENT OF TRAFFIC SAFETY

In the early 1980s the annual number of deaths in traffic remained relatively constant in Finland. At the end of the decade the number rose rather steeply. The peak was reached in 1989, when 734 people died in road traffic. The figures for 1990, 1991 and 1992 were 649, 632 and 600. Of those who died in traffic accidents in 1991, 229 were pedestrians, bicyclists or mopedists.

In Nordic comparison, Finland's level of traffic safety is clearly worse than Norway's or Sweden's, and it is approximately on the same level as in Denmark, if the basis used for comparison is the number of fatalities in traffic per number of inhabitants.

The second parliamentary traffic committee proposed the definite traffic safety objective of halving the number of traffic fatalities of 1989 by the end of the 1990s. At the same time, the risk of injuries and accidents should be lowered. In the target situation Finland would be approximately on the same traffic safety level as the other Nordic countries, in case these achieve their own objectives.

The Council of State has, after preliminary discussion of the issue in the financial committee, made the decision in principle that the following measures will be prepared and implemented during 1993-1996, in order to reach the traffic safety objective:

Decreasing the growth of traffic

1. To promote public transportation, the price level of public passenger traffic is made compatible with the use of private cars, value-added taxation is implemented in public passenger traffic according to lowered tax rate and the feeder transfer stop system is improved. The speed, service interval and passenger comfort of express trains are increased.

2. To finance the traffic investments, the development of special financing arrangements are investigated, by means of which public transportation can be favored and traffic safety promoted.

3. In the direction of land use, special attention is paid to the traffic need generated by the projects and to the choice of traffic forms. The main focus of the direction exerted by state authorities will be on nationally and regionally important targets. While the decision-making power of municipalities is increased in district planning decisions, their knowledge of traffic safety issues is also enhanced.

4. A clarification is carried out, regarding the impact of taxation and support systems favoring the use of private cars and the effect of the tax reduction right of travel to and from work on the diffusion of community structure and traffic need.

5. In order to decrease the growth of traffic, the utilization of information transfer technology and logistic are promoted.

Improvement of pedestrian and bicycle traffic safety

6. To improve the knowledge basis concerning pedestrian and bicycle traffic, a systematic collection of data on the volume of pedestrian and bicycle traffic is started, and the representativeness of accident statistics is improved by means of hospital statistics.

7. Measures are taken to increase the voluntary use of bicyclist's helmet and pedestrian's reflector.

8. Construction of pedestrian and bicycle traffic routes is continued, to make them into continuous and safe networks.

Driver's training and driving test

9. In order to decrease the accident risk of new drivers, the feasibility of long-term driver's training period is examined, the methods and content of the training and the driver's test are developed and the control of new drivers' motoring offenses is implemented.

10. Additional training for all motor vehicle drivers is increased and the control system of risk-prone drivers is implemented.

11. The professional training of the drivers of heavy traffic is developed and brought to the level of the current demand for drivers, and selection methods based on driver aptitude are adopted.

12. The basic training of traffic teachers is developed and the need for further training of those in the field is clarified.

Motor vehicle safety

13. In order to improve the safety level of motor vehicles, at least the requirements of safety equipments corresponding to the EU directives are implemented. Steps are taken to influence the organs of EU in legislation improving traffic safety, and the roadside control of motor vehicles carried out by motor vehicle inspection authorities is increased.

14. Information and control concerning the use of safety belts and children's car seats are increased, the regulations on the use of safety belts are extended to concern also special cars, trucks and buses, and increased use of air pillows by means of tax benefits is clarified.

15. In order to improve the safety of motorcycling, changes in the rules and regulations increasing the safety of motorcycle's structures and equipment and visibility are implemented, and the use of appropriate driving equipment is promoted.

16. To improve the safety of motor sledges, directive proposals are prepared, registration of motor sledges is adopted and their control is enhanced.

17. To improve the safety of moped driving, the changes in the rules and regulations concerning the structures and equipment of mopeds and their visibility are implemented, registration of mopeds is started and the necessity of driving license is investigated.

Traffic safety education

18. In order to establish an unbroken traffic education system, traffic education is carried out in comprehensive schools and secondary level institutions. The traffic education of day-care and health-care personnel, secondary level teachers and youth workers and persons working with the elderly is initiated. Traffic safety is included as part of occupational safety work and the traffic safety work of voluntary organizations is supported.

Decreasing accidents caused by alcohol

19. The risk of being caught of drunken driving offenses, is increased mainly by means of police control. The effectiveness of this control is enhanced by linking drunken driving control with appropriate information.

20. The readiness of health care personnel and the police to detect the use of medication or drugs affecting the driver's driving ability is improved. Information and education concerning traffic risks caused by medicines and drugs are intensified.

21. Intoxicant abusers guilty of drunk driving offenses are more effectively directed to appropriate care, which is renovated by connecting imprisonment to social work with intoxicant abusers. Possibilities are examined of complementing the follow-up system of drunk driving offenses by measures replacing imprisonment and by making recontrol a condition for returning the driver's driving license.

Traffic control and consequences of offenses

22. The risk that those guilty of traffic offenses are caught is intensified by increasing the work hours used for controlling traffic and by installing automatic traffic control. The effectiveness of the control is enhanced by efficient information dissemination. The position and operating conditions of the highway police are secured.

23. The threshold of intervention in speed control is lowered, with uniform Nordic usage as a goal. The follow-up system of traffic offenses is reformed.

24. In order to decrease traffic offenses endangering people's safety, measures are enhanced to prevent the unlicensed use of motor vehicles.

Speed regulation

25. By means of information, speed limits and control, traffic speeds are brought to the economically optimal level that takes all costs into account.

26. The vehicle-specific speed limit of vans with a dead load exceeding 1200 kg, whose use has started before 1.1.1993, is lowered to 80/h.

27. The use of graded speed limitations is increased in urban areas and the formation of areas with 30 and 40 km/h limits are promoted in nuclear centers of urban areas and in residential areas. Structural measures are used to support the observance of speed restrictions.

Regional traffic safety work

28. Provincial traffic safety plans are constructed and their implementation is coordinated in connection with provincial governments and committees.

29. The aim of municipal traffic safety work is to realize in every municipality an up-to-date municipal traffic safety plan, which is consistent with the national safety objective. This work will increasingly rely on projects based on the active participation of inhabitants in municipalities.

Special problems of public roads

30. The traffic safety objective is given an increasingly high priority in the goals of the National Road Department. The traffic safety measures proposed by the Road Department aspire at reducing at least one quarter of the total decrease objective of traffic deaths on public roads. The share of the objective not reached by structural measures, will be realized by means of speed regulations.

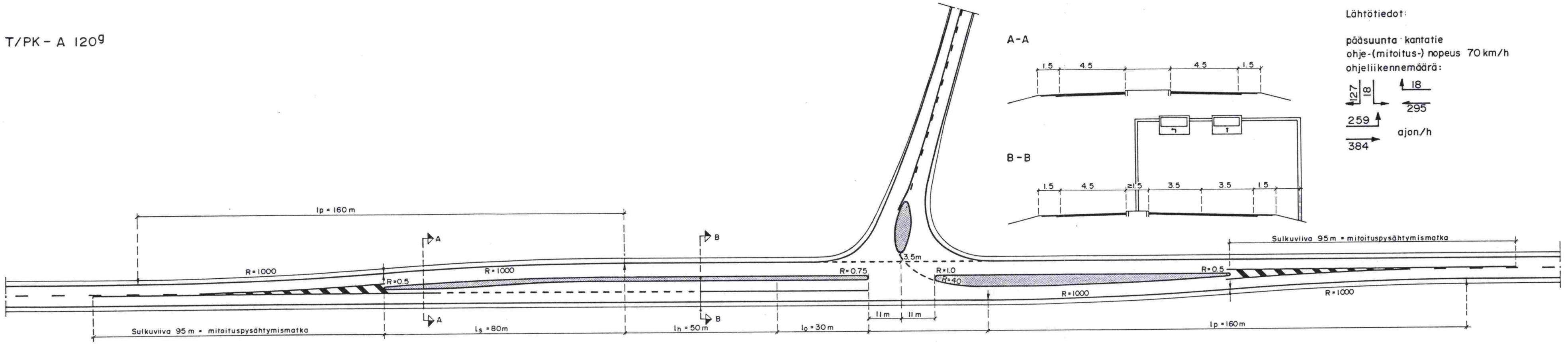
31. In order to achieve the safety objective of public roads, the share of resources for individual safety measures is significantly increased.

Implementation and monitoring of traffic safety measures

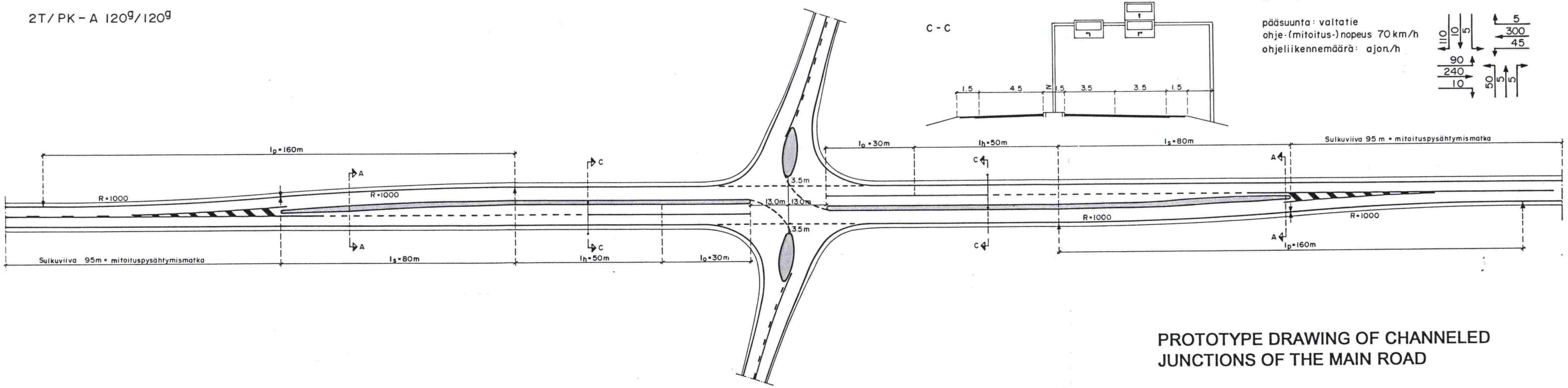
32. The traffic safety plan for 1993 - 1996 prepared by the Committee on Traffic Safety (in the Appendix) gives the more detailed definitions of the necessary measures during this period and their costs and impacts. The Council of State considers it important that organizations implement the plan as comprehensively as possible, nevertheless continuously following the future development of traffic performance and traffic safety, and that they organize the monitoring of the implementation. During 1993 and 1994 the work is carried out within the fixed budgets and frameworks, by allocating the resources, as far as possible, according to the recommendations of the above mentioned traffic safety plan.

33. The implementation of the traffic safety plan is coordinated by the Committee on Traffic Safety, operating under the auspices of the Ministry of Communications. The Ministry of Communications prepares reports on the progress of the plan and on the realization of the traffic safety objective to the Council of State, when necessary.

T/PK - A 120^{g}



2T/ PK - A 120^{g}/120^{g}

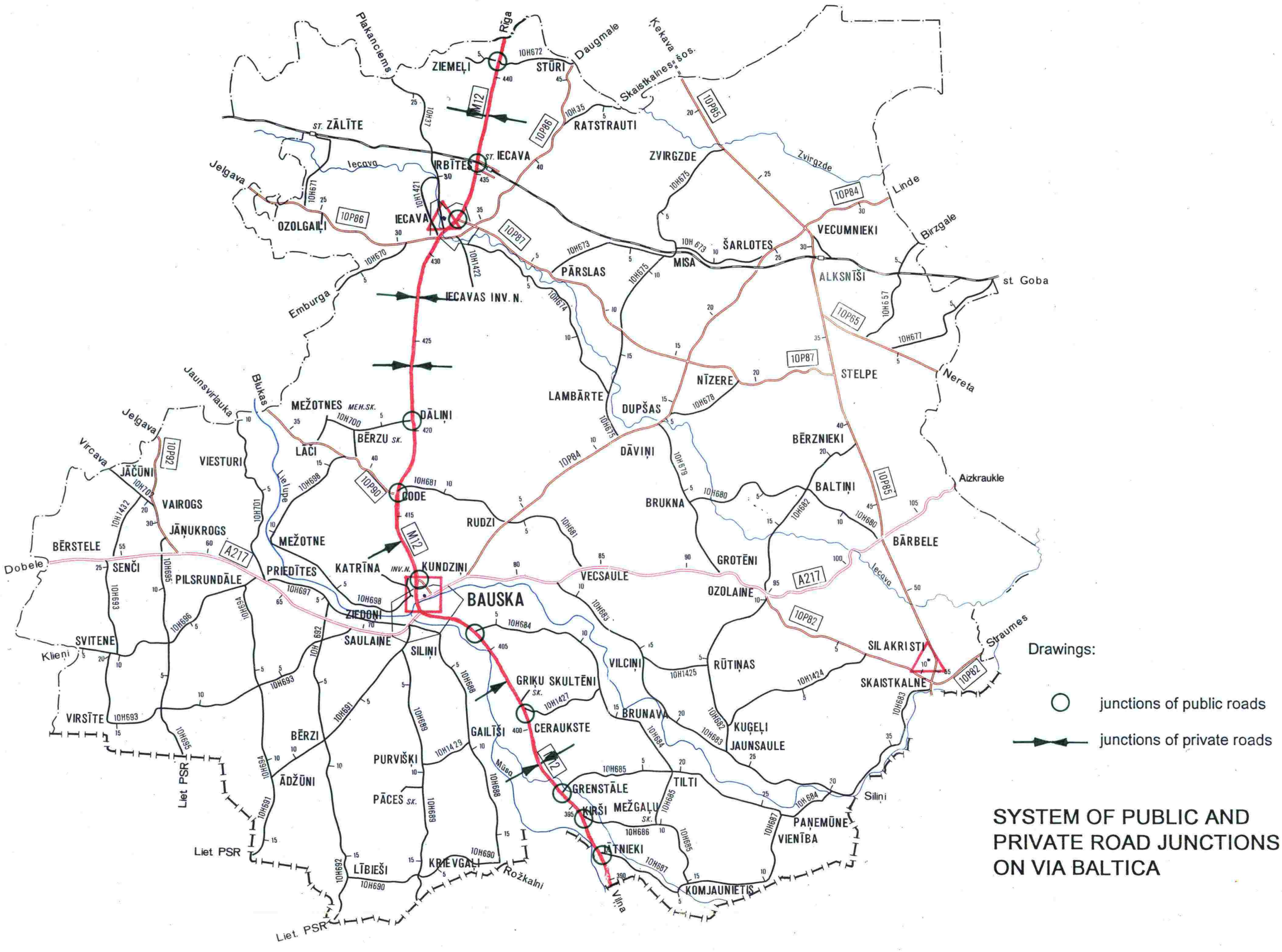


PROTOTYPE DRAWING OF CHANNELED JUNCTIONS OF THE MAIN ROAD

Sclale 1:100

APPENDIX 3

BAUSKAS RAJONS

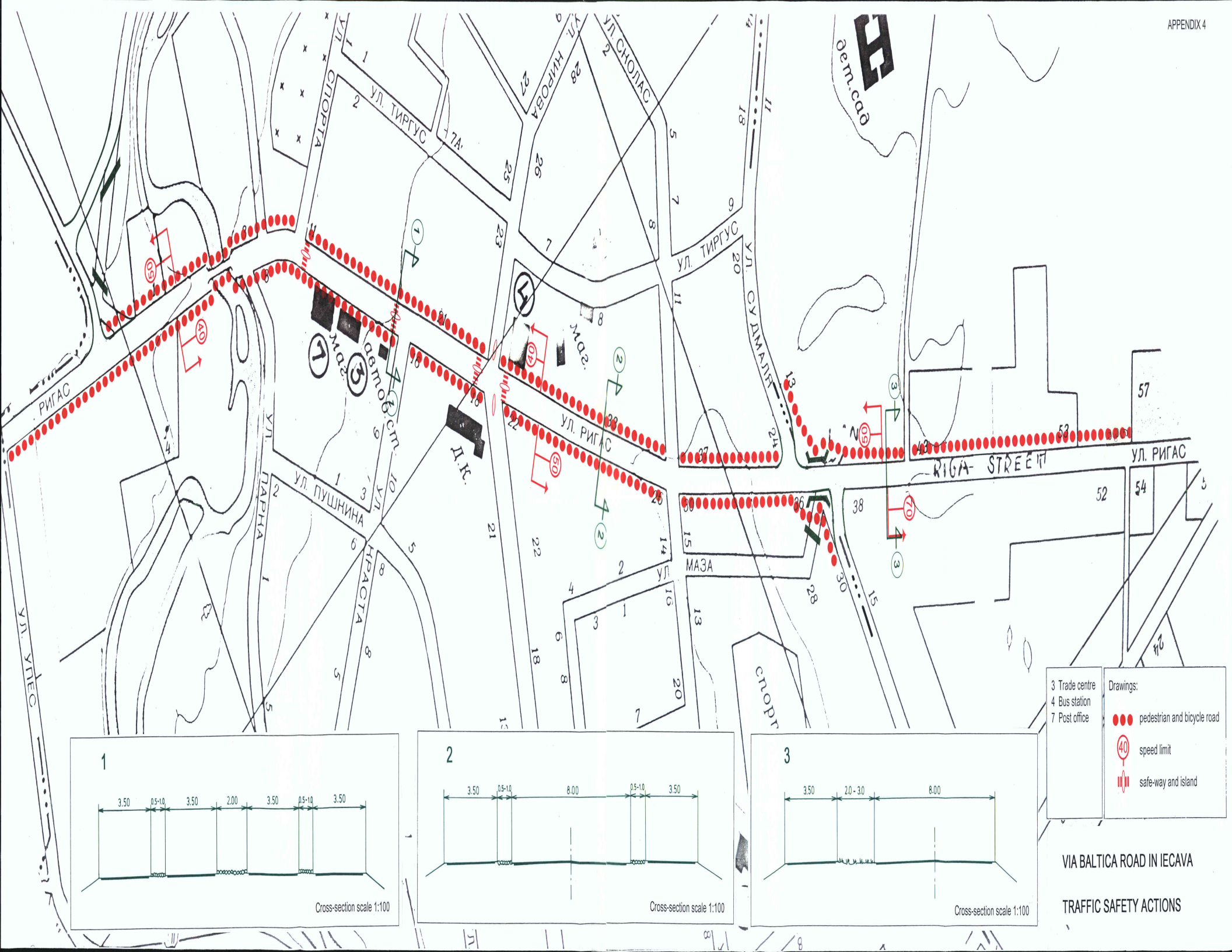


Drawings:

○ junctions of public roads

junctions of private roads

SYSTEM OF PUBLIC AND PRIVATE ROAD JUNCTIONS ON VIA BALTICA



VIA BALTICA ROAD IN IECAVA

TRAFFIC SAFETY ACTIONS

APPENDIX 5

1 Schools
3 Trade centres
4 Bus station
5 Hospital
6 Police station
7 Post office

Drawings:

- one-way-road
- pedestrian and bicycle road
- speed limit
- safe-way and island

VIA BALTICA ROAD IN BAUSKA CITY

TRAFFIC SAFETY ACTIONS