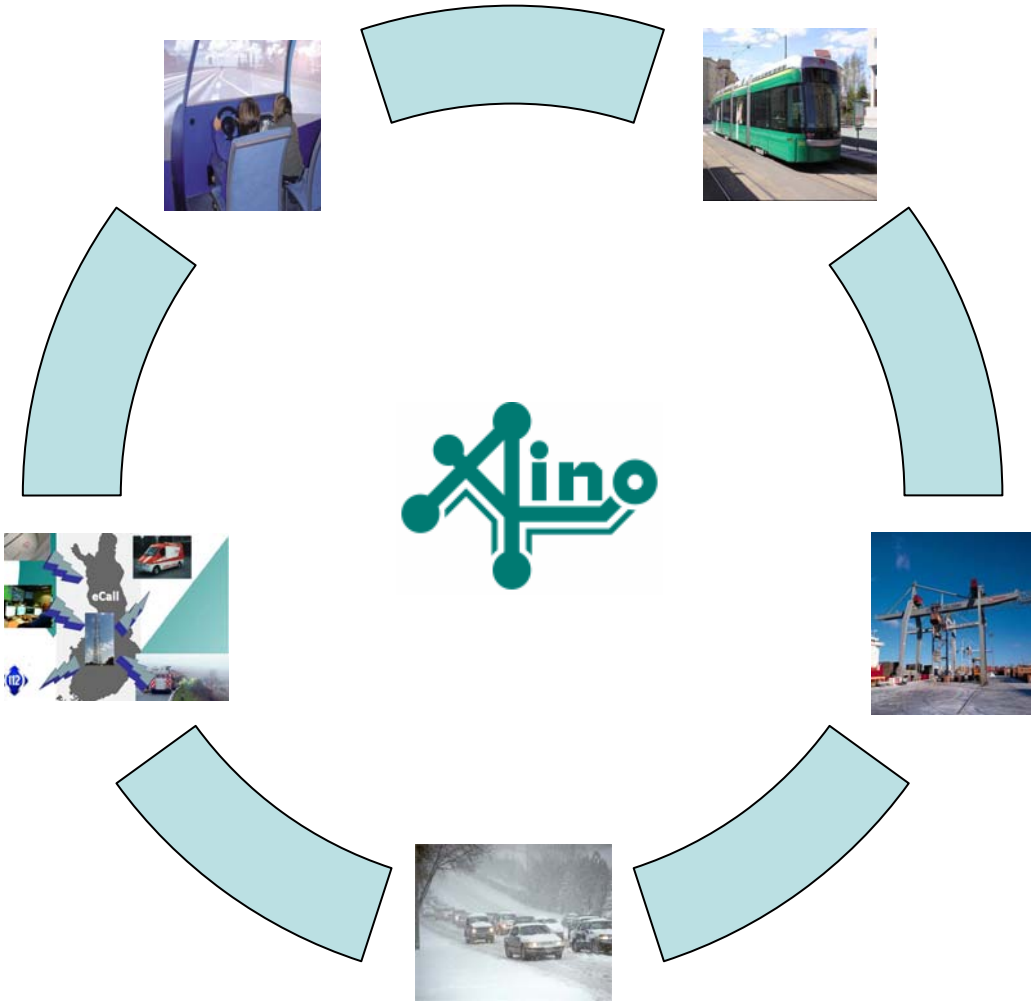
PUBLICATIONS OF
THE MINISTRY OF TRANSPORT AND COMMUNICATIONS 45/2007



Evaluation of the Finnish AINO Programme 2004-2007

MINISTRY OF TRANSPORT
AND COMMUNICATIONS FINLAND

Helsinki, 2007

MINISTRY OF TRANSPORT AND COMMUNICATIONS FINLAND

DESCRIPTION

Date of publication
31 August 2007

Authors	Type of publication
John Miles, Ankerbold International Ltd	Evaluation Report
Wim Broeders, Vialis Traffic BV	Assigned by Ministry of Transport and Communications
	Date when body appointed

Name of the publication

Evaluation of the Finnish AINO Programme 2004-2007

Abstract

The goal of the AINO programme was to develop collection, management and exploitation of real-time information and to create thereby prerequisites for ITS services improving the safety, efficiency and sustainability of the transport system. It is subdivided in five sub-programmes; Public Transport Information, Goods Transport Information, Transport Network Status Information, Driver Support and Service Framework.

This evaluation study aimed to assess how the AINO programme had reached its objectives, whether the focus had been correct in view of global developments, how the results should be exploited, and how the R&D programme activities should be continued. The evaluation was based on interviews, assessment forms, information collected through desk study, reports, websites, European Commission documents etc.

The programme achieved its project effectiveness, professional expertise and networking objectives. The financial incentive offered by AINO funding clearly provided impetus and delivered commitments in the organisations involved, public sector as well as private. More active conversation between projects within AINO as well as with the European R&D programmes could have been of added value regarding the exploitation of knowledge and findings of the projects. Progress was made specifically on the concepts and methods involved in multi-modal real-time services for passengers. Progress on real-time services for freight shippers and commercial deliveries was less apparent.

Recommendations are that future programmes on real-time multi-modal services should be organised in such a way that the stakeholders who will be responsible for development and implementation can easily build upon the results. Sufficient resources should be allocated to independent evaluation studies and fundamental innovative research. Results and findings from the projects that are not commercially sensitive should be published in detail and in a form accessible to the stakeholders. In addition there is a need for high-level summaries of results for decision-makers and the media. Lastly, in addition to research and development, further work is needed on the functional business models for multi-modal information services and on the implementation of AINO findings in separate transport investment programmes.

Keywords

transport system, public transport, goods transport, transport networks, programme evaluation

Miscellaneous

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Serial name and number	ISSN	ISBN
Publications of the Ministry of Transport and Communications 45/2007	1457-7488 (printed version) 1795-4045 (electronic version)	978-952-201-918-9 (printed version) 978-952-201-919-6 (electronic version)

Pages (printed version)	Language	Price	Confidence status
176	English		Public

Published and distributed by

Ministry of Transport and Communications

LIIKENNE- JA VIESTINTÄMINISTERIÖ

KUVAILULEHTI

Julkaisun päivämäärä
31.8.2007

Tekijät	Julkaisun laji
John Miles, Ankerbold International Ltd	Arviointiraportti
Wim Broeders, Vialis Traffic BV	Toimeksiantaja Liikenne- ja viestintäministeriö
	Toimielimen asettamispäivämäärä

Julkaisun nimi
AINO-ohjelman arviointi

Tiivistelmä

AINOn tavoitteena on ollut kehittää oikea-aikaisen liikennetiedon keräämistä, hallintaa ja hyödyntämistä sekä luoda siten edellytyksiä älykkäille liikennejärjestelmille niiden turvallisuuden, tehokkuuden ja kestävyyden parantamiseksi. Ohjelma oli jaettu viiteen alaohjelmaan: joukkoliikennetieto, kuljetustieto, liikenneverkon tilatieto, kuljettajan tuki ja palvelupuitteet.
Arvioinnissa on pyritty löytämään vastaus siihen, onko AINO-ohjelmassa saavutettu sen tavoitteet, oliko ohjelma suunnattu oikein ajatellen älykkäiden liikennejärjestelmien globaalia kehitystä, miten ohjelman tuloksia voisi parhaiten hyödyntää jatkossa ja miten älykkäiden liikennejärjestelmien tutkimus- ja kehitysohjelmia tulisi jatkaa. Ohjelman arviointi perustuu AINO-ohjelmassa mukana olleiden sekä tulosten hyödyntäjien haastatteluihin, projektivastaavien itsearviointilomakkeisiin sekä informaatioon, jota on koottu työpapereista, raporteista, verkkosivustoilta, Euroopan komissiosta jne.

AINO-ohjelma toteutettiin projektitehokkaasti, siinä hyödynnettiin ammatillista asiantuntemusta ja verkostoiduttiin tehokkaasti. AINO-rahoituksen taloudelliset kannustimet tarjosivat virikkeitä ja lisäsivät niin julkisen kuin yksityisenkin sektorin sitoutumista. Aktiivisempi yhteistyö AINOn sisäisten projektien ja eurooppalaisten t&k-ohjelmien välillä olisi ollut hyödyllistä projektien tietämyksen ja aikaansaannosten hyödyntämiseksi. Edistystä tapahtui erityisesti konsepteissa ja metodeissa, joita käytettiin monimuotoisissa oikea-aikaisissa matkustajapalveluissa. Sitä vastoin edistystä ei niinkään ollut oikea-aikaisissa palveluissa rahtauksessa ja kaupallisissa kuljetuksissa.
On suositeltavaa, että tulevat ohjelmat organisoitaisiin niin, että kehityksestä ja käyttöönotosta vastaavat voisivat helposti tukeutua tuloksiin. Riippumattomille arvioinneille ja innovatiiviselle perustutkimukselle tulisi kohdentaa riittävästi resursseja. Projektien tulokset, jotka eivät ole kaupallisesti arkaluonteisia, tulisi julkaista ja saattaa käyttökelpoiseen muotoon. Tutkimus- ja kehittämistyön lisäksi on tarpeen edelleenkehittää informaatiopalvelujen liiketoimintamalleja sekä ottaa AINO- ohjelman tuloksia käyttöön liikenne-investointiohjelmien yhteydessä.

Avainsanat (asiasanat)
liikennejärjestelmät, joukkoliikenne, kuljetus, liikenneverkot, ohjelma-arviointi

Muut tiedot
Yhteyshenkilö/LVM Martti Mäkelä

Sarjan nimi ja numero	ISSN	ISBN
Liikenne- ja viestintäministeriön julkaisuja 45/2007	1457-7488 (painotuote) 1795-4045 (verkkojulkaisu)	978-952-201-918-9 (painotuote) 978-952-201-919-6 (verkkojulkaisu)

Sivumäärä (painotuote)	Kieli	Hinta	Luottamuksellisuus
176	englanti		julkinen

Jakaja	Kustantaja
Liikenne- ja viestintäministeriö	Liikenne- ja viestintäministeriö

KOMMUNIKATIONSMINISTERIET

PRESENTATIONSBLAD

Utgivningsdatum
31.8.2007

Författare	Typ av publikation
John Miles, Ankerbold International Ltd	Utvärderingsrapport
Wim Broeders, Vialis Traffic BV	Uppdragsgivare Kommunikationsministeriet
	Datum för tillsättandet av organet

Publikation

Utvärdering av forsknings- och utvecklingsprogrammet AINO

Referat

AINO var ett FoU-program för att utveckla insamling, hantering och bearbetning av realtidsinformation om trafiken. Målet var att skapa förutsättningar för intelligenta trafiktjänster som förbättrar transportsystemets säkerhet, effektivitet och hållbarhet. Programmet var indelat i fem delområden: kollektivtrafikinformation, transportinformation, lägesinformation om trafiknätet, förarstöd och servicemiljö.

I rapporten utvärderas hur pass väl AINO-programmet har nått de uppställda målen, om programmet hade rätt fokus med tanke på den globala utvecklingen av intelligenta trafiksystem, hur resultaten av programmet bäst kan utnyttjas i fortsättningen och hur åtgärderna i FoU-programmet borde föras vidare. Utvärderingen av AINO grundar sig på intervjuer med deltagarna i programmet, utvärderingsformulär, självutvärdering av de projektansvariga och information inhämtad från arbetsdokument, rapporter, webbplatser, Europeiska kommissionen osv.

AINO genomfördes på ett effektivt sätt med utnyttjande av yrkeskunskap och nätverk. AINO-finansieringen var ett stimulerande ekonomiskt incitament som tydligt stärkte såväl den privata som den offentliga sektorns engagemang. Ett tätare samarbete mellan olika AINO-delprojekt och europeiska FoU-program hade eventuellt kunnat leda till ett bättre utnyttjande av den kunskap och de resultat som fanns tillgängliga i de olika projekten. De största framstegen gällde koncept och metoder i fråga om multimodala passagerartjänster i realtid. Däremot var framstegen inte lika påtagliga i fråga om godstransporter och kommersiella transporter i realtid.

Det rekommenderas att kommande program organiseras så att de som svarar för programutveckling och implementering lätt kan utnyttja resultaten av tidigare program. Tillräckliga resurser bör anvisas för oberoende utvärderingar och innovativ grundforskning. Alla projektresultat som inte är kommersiellt känsliga borde publiceras i ett lätthanterligt format. FoU-arbetet bör kompletteras med användbara affärsmodeller för multimodala informationstjänster och resultaten av AINO-programmet bör tillämpas i separata program som gäller trafikinvesteringar.

Nyckelord

trafiktjänster, kollektivtrafik, transport, trafiknät, programutvärdering

Övriga uppgifter

Kontaktperson vid ministeriet är Martti Mäkelä.

Seriens namn och nummer	ISSN	ISBN
Kommunikationsministeriets publikationer 45/2007	1457-7488 (trycksak) 1795-4045 (nätpublikation)	978-952-201-918-9 (trycksak) 978-952-201-919-6 (nätpublikation)

Sidoantal (trycksak)	Språk	Pris	Sekretessgrad
176	engelska		offentlig

Distribution	Förlag
Kommunikationsministeriet	Kommunikationsministeriet

FOREWORD

The AINO programme (2004-2007) is a research and development programme on real-time transport information. The goal of the programme is to develop the collection, management and exploitation of real-time information and to create thereby prerequisites for ITS services improving safety, efficiency and sustainability of the transport system while increasing the well-being of citizens and the competitiveness of Finnish companies. The AINO programme is divided in five sub-programmes; Public Transport Information, Goods Transport Information, Transport Network Status Information, Driver Support, and Service Framework.

Towards the end of 2006, as the AINO programme was coming to a conclusion, the Ministry of Transport and Communications commissioned an evaluation of the AINO R&D programme and appointed two international evaluators, John Miles of Ankerbold International Ltd., Great Britain and Wim Broeders of Vialis Traffic b.v., the Netherlands. The work started in November 2006 and concluded in May 2007 at the AINO concluding seminar.

The main questions that were put to the evaluators in their terms of reference were as follows:

- Has the AINO programme reached its objectives as described at the start of the programme?
- Was the orientation of the programme successful in view of the global developments in ITS?
- How should the results of the AINO programme be best further exploited?
- How should the ITS R&D programme activities be continued bearing in mind the national continuum TETRA-FITS-AINO and the global development scenarios including European co-operation?

The evaluation was based on: interviews with persons involved in the AINO programme, assessment forms filled in by the project leaders, and information collected through desk studies, reports, websites, European Commission etc.

This evaluation was conducted by independent experts. The results of the evaluation are by no means comments of the support group or the Ministry of Transport and Communications.

On behalf of the Ministry of Transport and Communications I wish to thank everyone who has contributed to the evaluation work.

Helsinki, August 2007

Martti Mäkelä
Senior Adviser

Evaluation of the Finnish AINO Programme
Final report

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Executive Summary

Summary

The AINO programme is a research and development programme on real-time transport information. This programme, which started in the year 2004, is subdivided in five sub-programmes; Public Transport Information, Goods Transport Information, Transport Network Status Information, Driver Support and Service Framework. The goal of the AINO programme is to develop the collection, management and exploitation of real-time information and to create thereby prerequisites for ITS services improving the safety, efficiency and sustainability of the transport system while increasing the well-being of citizens and the competitiveness of Finnish companies. In the period 2004-2007 many projects, researches and pilots have been incorporated into the AINO programme. In this evaluation study there is tried to find an answer on the question whether the AINO programme has reached its objectives or not.

The evaluation is based on:

- Interviews with about 20 persons involved in the AINO programme (sub-programme leaders & Project managers, ITS Finland);
- 46 assessment forms (some projects were combined in one assessment form, we get a reaction from 50 projects), filled in by the project leaders covering 70% of all the projects;
- Site visit to Heureka exhibition;
- Information collected through desk study, reports, websites, European Commission etc.

Main conclusions

AINO has been a major step forward in bringing ITS to Finland. The programme has achieved project effectiveness, professional expertise and networking objectives. ITS is now on the agenda of many of the leading players in Finland. Knowledge of ITS is now up to a high level, thereby making Finland a serious “ITS-partner“ at European level.

The financial incentive offered by AINO funding clearly provided impetus and delivered commitments in the organisations involved, public sector as well as private. ITS is now “on the agenda” and a strong ITS community has been formed. AINO has facilitated a network for ITS interested persons to meet and share knowledge and interests. It also catalysed work among different sectors in Finland (incl. Aviation).

Although this networking function of the programme was positive, close interaction between projects and sub-programmes was actually quite limited. Many projects performed in relative isolation. More active concertation between projects within AINO as well as with the European R&D programmes could have been of added value regarding the exploitation of knowledge and findings of the projects. There is a case for strengthening the international exchange of knowledge and experience on multi-modal real-time services in future. The eSafety project(s) of the AINO programme, show how this kind of international cooperation could be incorporated.

The services and service prerequisites developed during the programme were, on the whole, successful and in parts significant on the international scale. Considerable progress was made specifically on the concepts and methods involved in multi-modal real-time services for passengers, where the lead is primarily with the metropolitan and city authorities. Progress on real-time services for freight shippers and commercial deliveries was less apparent.

AINO was directed towards the practical demonstration of on-line services with a lesser emphasis on fundamental research. Basically AINO covered projects involving research, implementation and education. The true research content was limited and focused mainly on testing and evaluating technologies to enable the further development of services. Research on new technologies was more limited: ColdSpots, Railway warning system.

Although the re-organisation of responsibilities within the Ministry and between Departments was kept “away” from the projects it had a clear impact on them. The roles and responsibilities of the different organisations involved were in flux, and as time progressed the direction of the programme became less clear. Projects felt less secure and some became detached from the overall programme.

Recommendations are that future programmes on real-time multi-modal services should be organised in such a way that the stakeholders who will be responsible for development and implementation can make their own independent evaluations. Results and findings from the projects that are not commercially sensitive should be published in detail and in a form accessible to the stakeholders. In addition there is a need for high-level summaries of results for decision-makers and the media. Lastly, in addition to research and development, further work is needed on the functional business models for multi-modal information services and on the implementation of AINO findings in separate transport investment programmes.

1. Background

1.1. Overview of AINO

The AINO programme is a research and development programme on real-time transport information. This programme, which started in the year 2004, is subdivided in five sub-programmes; Public Transport Information, Goods Transport Information, Transport Network Status Information, Driver Support and Service Framework. The goal of the AINO programme is to develop the collection, management and exploitation of real-time information and to create thereby prerequisites for ITS services improving the safety, efficiency and sustainability of the transport system while increasing the well-being of citizens and the competitiveness of Finnish companies.

The following diagram shows the organisational structure of the programme.

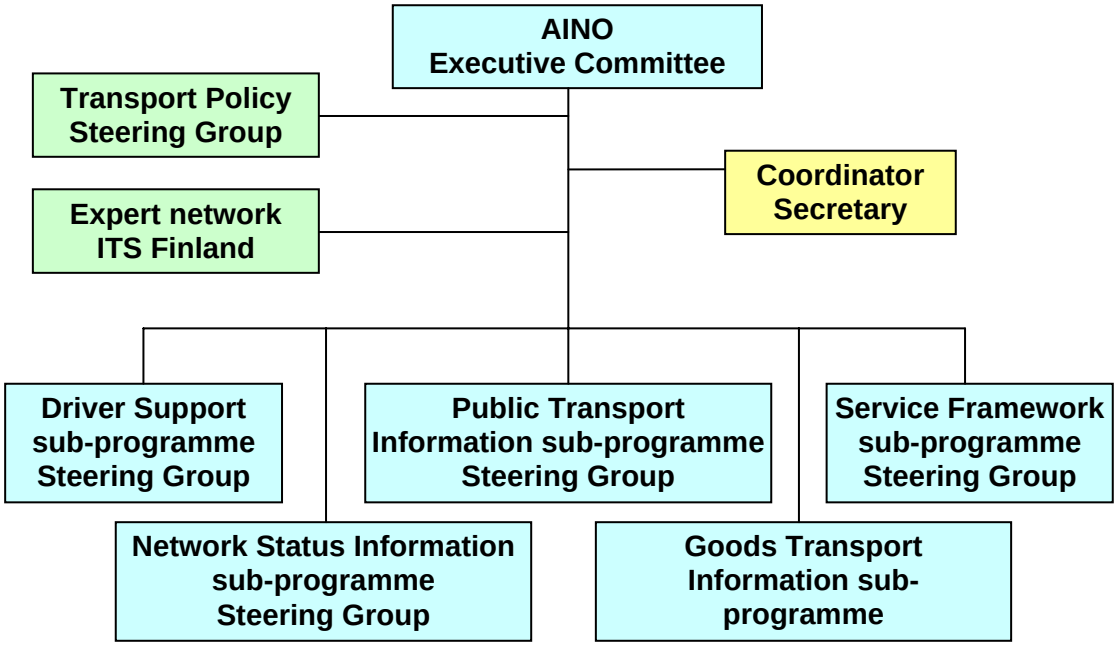

Figure 1

The following is an extract from Risto Kulmala's paper to 13th ITS World Congress London 2006 which described the AINO programme and its sub-programmes[1].

"The research and development programme activities on ITS (Intelligent Transport Systems) of the Ministry of Transport and Communications Finland have systematically been carried to strengthen the weakest parts of ITS building blocks in Finland, especially concentrating in the areas where the public sector has a crucial role. "

[1] Kulmala, Risto et al (2006) *Real-time transport information and operation*. Proceedings of the 13th World Congress on Intelligent Transport Systems. London 2006

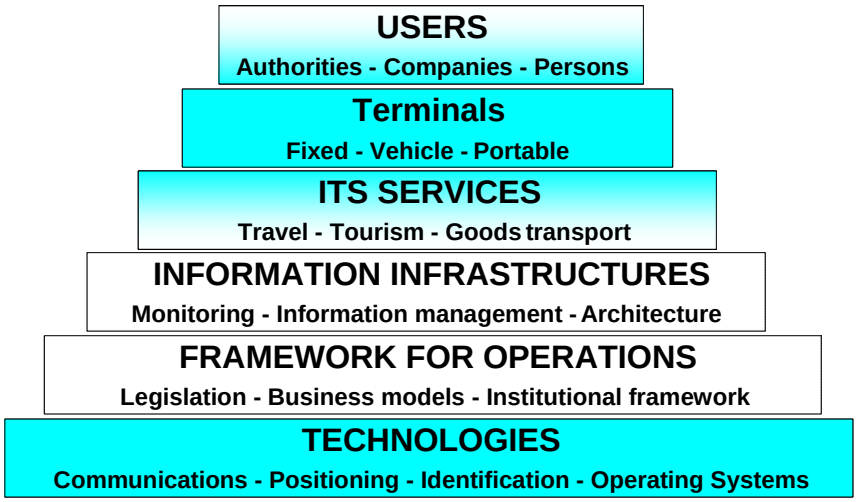

Figure 2

"The R&D programmes commenced in 1998 in the form of the TETRA programme (1998-2001) developing information infrastructures as well as the framework for operations. The next programme FITS (2001-2004) added ITS services in the focus of the programme. Both programmes encompassed more or less all areas of ITS services. The R&D programme activities continue in 2004-2007 in the form of the R&D programme on real time transport information called AINO. The next step is the development of ITS in the general context of the information society or the ubiquitous society. "

"The AINO programme consists of five sub-programmes:

- public transport information,
- goods transport information,
- transport network status information,
- driver support, and
- service framework. "

"Each sub-programme has a dedicated steering group involving the actors participating in the funding of the projects as well as other actors crucial to the success of the programme, excluding the project partners receiving funding from the programme. The programme management is assisted by the programme co-ordinator and management secretary. The sub-programme steering group leaders and the co-ordinator form the programme working committee, which also acts as the steering group of the service framework sub-programme dealing with generic issues common to several sub-programmes. The programme working committee allocates the programme funds to the sub-programmes and makes also other decisions concerning the whole programme. The Finnish Funding Agency for Technology and Innovation Tekes and the Academy of Finland are also involved in the working committee. "

"ITS Finland acts as the AINO expert network, making initiatives concerning the orientation and content of the calls for project proposals as well as promoting the exploitation of the programme results in service development and provision."

1.2. Participation

In AINO a diversity of different types of organisations were involved, public as well as private: Ministries, infrastructure administrations and governmental institutions (17), municipal administrations (14), scientific and educational organisations (3), interest groups and associations (8) and private companies (86). The Ministry of Transport and Communication was the main investor in the programme.

1.3. Programme costs

The financial summaries in this report are based on information from the fact sheets received from the projects and information received from the Ministry of Transport and Communications. There can be minor differences (round-off differences) in the financial status mentioned in this document, but in general the figures are representative.

Note: AINO funding represents exact values, while the others are estimated based on contracts and on information introduced by enterprises. Note; only costs by direct AINO monitored projects are given.

Overall costs and contributions

The total costs of the whole AINO programme are calculated around €8.1 million[2]. This amount is spread over a time period of four years and is mainly concern contributions from Administrations, Municipalities and Enterprises (58% of the total contribution). The other part (42%) is funded directly by AINO and the Ministry of Transport and Communications.

The Ministry of Transport and Communication contribution to AINO is a money amount of €3.4 million[3].

In order to participate in the programme proposals had to be submitted in response to one of the 4 open calls which were subjected to a full-scale evaluation against AINO programme and sub-programme criteria.

Totals for each of the four calls are detailed in the table below[4].

Open call	No of Proposals	Budget (k€)	Approved	Budget[1] (k€)
1 – May 2004	57	7,350	25	3,084.8
2 – Dec. 2005	54	4,745	11	1,111.8
3 – Dec. 2005	51	3,798	23	2,129.8
4 – May 2006	10	573	4	202.4
Follow-ups[2]	-	-	14	1,654.4
Total	**172**	**16,466**	**77**	**8,183.3**

Figure 3

1) Estimate based on numbers provided by participating parties (including self-financing)
2) Includes pilots not funded using actual programme funds. Does not include enterprises' own product development projects partially influenced and generated by AINO projects

[2] This money amount is excl. coordination and dissemination costs 2004-2007

[3] this is not exactly to calculate because for some projects it is hard to determine whether the AINO contribution is directly paid or paid for example via the MinTC or a Road Administration

[4] This is an extract from the report; *R&D Programme on Real-Time Transport Information 2004-2007 Final Report*

2. Evaluation procedure

In the period 2004-2007 many projects, researches and pilots were incorporated into the AINO programme. Towards the end of 2006, as the AINO programme was coming to a conclusion, the Ministry of Transport and Communications commissioned an evaluation of the AINO R&D programme and international evaluators were appointed (John Miles of Ankerbold International Ltd., Great Britain and Wim Broeders of Vialis Traffic b.v., the Netherlands). The work started in November 2006 and concludes in May 2007 at the AINO concluding seminar.

The main questions that were put to the evaluators in their terms of reference were as follows:

- Has the AINO programme reached its objectives as described at the start of the programme, in terms of promotion and prerequisite building for services utilising real-time transport information?
- Was the orientation of the programme successful in view of the global developments in ITS?
- How should the results of the AINO programme be best further exploited?
- How should the ITS R&D programme activities be continued bearing in mind the national continuum TETRA-FITS-AINO and the global development scenarios including European co-operation?

The evaluators began work in December 2006 and completed the work towards the end of April 2007. The evaluation was structured according to the following five steps:

1. Familiarisation with the AINO programme

The initial step was for the evaluators to become familiar with the AINO programme. This was done by means of a desk study (including web-sites) and discussions with Martti Makela, Director of Ministry of Transport and Communications Research Unit, the overall programme co-ordinator Risto Kulmala (VTT), and the programme secretary, Juhani Vehviläinen (Jussa Consultancy). In addition, half way through the evaluation process there was a dialogue with AINO Executive Committee to ensure the evaluators were properly informed about the programme.

2. Assessment by sub-programme

Interviews and discussions were held by the evaluators with AINO sub-programme leaders in order to get a clear picture of the status of work within the sub-programmes.

- Public Transport Information sub-programme: Kari Korpela
- Goods Transport Information sub-programme: Lassi Hilska
- Transport Network Status sub-programme: Kari Korpela
- Driver Support sub-programme: Matti Roine
- Service Framework sub-programme: Seppo Öörni

The sub-programme status was compared with the original objectives and the outcome of selected projects of the sub-programme.

3. Evaluation of key-projects

Summaries were available for all the projects. In addition, projects were requested to fill-out a self-assessment form containing details on approach, results, progress, financial status, impact assessment and exploitation schemes. (See Appendix F)

Using the project summaries a selection of projects for interviewing was made in discussion with the AINO programme coordinators and the sub-programme leaders. In total around 20 persons were interviewed. This delivered high value information to the evaluators on the progress being made on project level.

4. Exploitation of results

Special attention was given to assessing the impact of the projects and the exploitation of results. In this section the main items for evaluation were:

- Project contribution to the development of the information supply chain;
- Different types of end user groups (their needs & requirement);
- Business models and routes to market;

Project self-assessment forms and discussions with the projects gave the reviewers an idea of the exploitation schemes as foreseen by the projects as well as other possible schemes.

5. Reporting

Finally all the information has been reported in one document with three annexes concerning the personnel bibliographical details from the evaluators, the fact sheets from the projects and a summary of response per sub-programme.

Summary

The evaluation is based on:

- Interviews with about 20 persons involved in the AINO programme (sub-programme leaders & Project managers, ITS Finland);
- 46 assessment forms (some projects were combined in one assessment form, we get a reaction from 50 projects), filled in by the project leaders covering 70% of all the projects;
- Site visit to Heureka exhibition;
- Information collected through desk study, reports, websites, European Commission etc.

3. Public transport information sub-programme

3.1. Sub-programme objective

The public transport information sub-programme objective is to increase the attractiveness of public transport by providing real-time information, route guidance and a variety of value-added services in vehicles and at terminals. The services are designed to help provide an optimal travelling experience by giving travellers the sense that they are in control of their trip and that the trip is going smoothly. The real-time systems also support public transport operators' fleet management, making public transport services more efficient, less expensive and reliable.

3.2. Selected projects

1. Development and expansion of the tram traffic incident management pilot in the Helsinki metropolitan area

This project has met its objectives by creating the basis for an information service which gives passengers real-time information about traffic exceptions. Customer satisfaction surveys and other feedback has been positive. There is the possibility of extending the incident information service to include commuter train, subway and bus traffic, as well as the ferries to and from Suomenlinna. The main challenge has been to get the different technical systems reading each other and there are still problems to be solved with the Helmi real-time system.

Exploitation of results will be by the city authority as part of a wider strategy to grow public transport patronage and shift people form using private cars. The positive results from these trials will help in justifying the budget for wider exploitation.

2. Further development of the ELMI passenger information system

The ELMI development project is a good example of how an established legacy system can be upgraded to take advantage of recent technological developments and deliver service improvements, in the process extending the service lifetime life of the original investment by 2 or 3 years. The upgrades were to enable extended system functionality, provide underground GPS signal repeater at the Kamppi terminal, improved onboard systems maintenance and diagnostics, an open real-time data interface and server and development of an HTML display application of existing stop displays, with 200 new virtual stop displays. These improvements were successful, leading to the technical reliability, utilisation rate and reliability of data transfer being increased, and to displays now getting updated more rapidly.

3. Virtual monitor

This is a proof of concept project which can pave the way for further developments. The project occupies an important position in the final stages of the traveller information delivery chain. There is potential to significantly influence journey choices through provision of user-friendly low-cost real-time travel information tailored to the location (for display on signs and screens) or personalised to the individual (for them to access on a mobile phone). Services of this type are springing up in various locations, for example Kizoom in London on behalf of Transport for London and the regional train operating companies. It is recommended the developers take note of international examples and keep track of emerging good practice, particularly in the way the user navigates the screens on-line or over a handset and in the way key information, like next bus timings is presented.

4. Mobile flexible working to promote the competitiveness of public transport

This is a highly innovative project looking at how work patterns might be adapted to take full advantage of the possibilities for mobile tele-working, using broadband mobile communications. Quite correctly, the project has addressed the social, contractual and organisational aspects which are as important as the mobile communications and technology. All have to be demonstrated as fit for purpose. Reliable, high capacity mobile telecommunications are one part, but institutional factors, particularly the terms of employee contract in relation to flexible mobile work, will be decisive in how widely and how rapidly mobile flexible working will take off.

5. Rail traffic tracking and incident reporting and information

Development and operation of the exceptions reporting system is with the rail operating company, VR, which runs the trains. There is already an internet-based information service for national long-distance trains. An exceptions reporting system for local trains is of significance mainly for the Helsinki Region. This is what was tested in the project. AINO money provided the catalyst for developing new systems to augment the existing manual exceptions reporting. Development work post-AINO will be supported financially by the Finnish Rail Administration (RHK), the agency responsible for maintaining and developing the rail network for Finland. This development is an important part of the jig-saw of multi-modal information for the Helsinki region.

3.3. Sub-programme assessment

The overall emphasis of the public transport sub-programme is on how to make an enhancement to public transport operations, with comprehensive real-time information services for bus, tram and rail passengers as a major outcome. A key issue, particularly in the metropolitan areas, is how to grow public transport patronage and shift people from private cars. Real-time information services are seen as having a significant part to play in modernising the image of public transport, along with new vehicles and the latest payment and ticketing systems.

Tram-based real-time systems are developing well and bus systems are following on. An interesting trial has taken place with the Science Route which is 21 kilometres in total connecting the various campus areas of Helsinki University. A route-specific real-time information system pilot was implemented to promote the special profile of the route. The driving time is approximately 55 minutes but varies between 35 and 70 minutes. Users appreciate real-time information services, though overall benefits appeared to be in balance with the costs. However, passenger volumes of the Science Route have increased by 20 percent during one year of operation and the comfort of travelling has increased according to 70 % of the route's passengers. These are real achievements.

Real-time information on local rail services is less well developed. Each mode has its own distinctive, self-contained institutional arrangements. A strategic objective is to establish service exception reporting across all the modes – bus, rail and tram. The objective is to inform about delays of 15 minutes or more, both of sudden disruptions and exceptions known in advance. This will be helped by open data exchange to link the various independently-operated systems.

We note that much of the public transport sub-programme is focussed on the Helsinki region but other projects (not reviewed) are centred on Tapiola, Turku, Tampere and the city of Jyväskylä. Several passenger information systems are now in production. Planning and purchasing new information systems is going ahead, including web and mobile services and new TFT-LCD displays both on bus stops and inside buses. All systems are planned to work in real time. On the basis of project self-assessments, it has been beneficial to compare the quality and the overall cost of these systems one with another to determine which systems are really cost-effective.

We should also draw attention to the Helsinki Metropolitan Area Council's (YTV) route planner for pedestrians and bicyclists. The development of an information centre for all modes has value for residents and visitors alike.

Some of the work in this sub-programme would benefit from stronger international links, particularly over the development of personalised internet-based and mobile-phone information services. International benchmarking and some harmonisation in the way travel information is presented, using graphics, text and voice messages etc, will be invaluable, especially to users who move between cities and who utilise more than one transport mode. Special attention is needed to cater for those travellers with a disability, especially partially sighted people, and others with hearing loss.

3.4. Public Transport costs and contributions

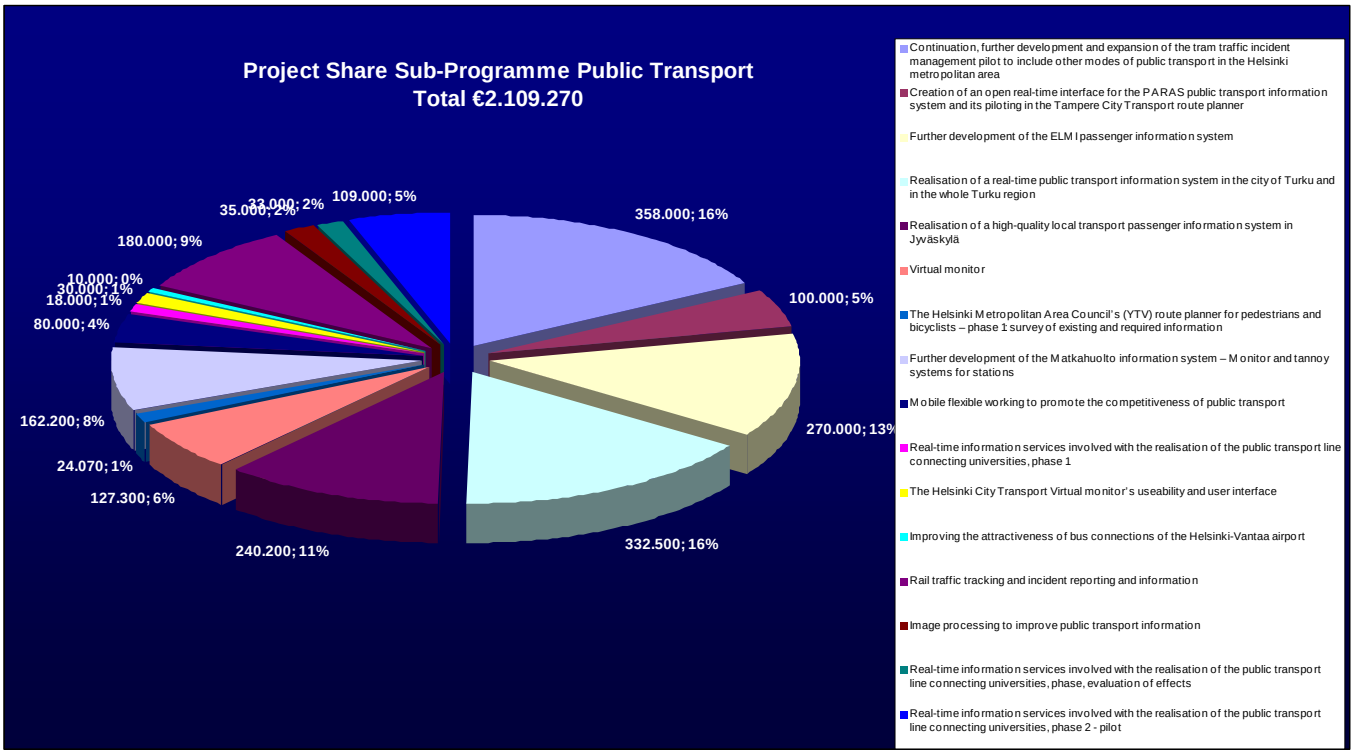

Figure 4

Total costs Public Transport sub-programme

The diagram above shows that the total costs of the sub-programme Public Transport are about €2,1 million. There are 16 projects in this sub-programme[5]. The first impression of the sub-programme is that the share of each project is balancly divided over the total costs of the sub-programme. Nevertheless, there are two projects which alight above the other projects. The first project is *'Continuation, further development and expansion of the tram traffic incident management pilot to include other modes of public transport in the Helsinki metropolitan area'* with a total cost of €358.000 and the second is '*Realisation of a real-time public transport information system in the city of Turku and in the whole Turku region'* with a total cost of €332.500. For both of the projects this is about 16% of the total costs in the sub-programme Public Transport.

[5] The project *The Helsinki Metropolitan Region Traffic Information Centre* is assigned to the Transport Network status sub-programme

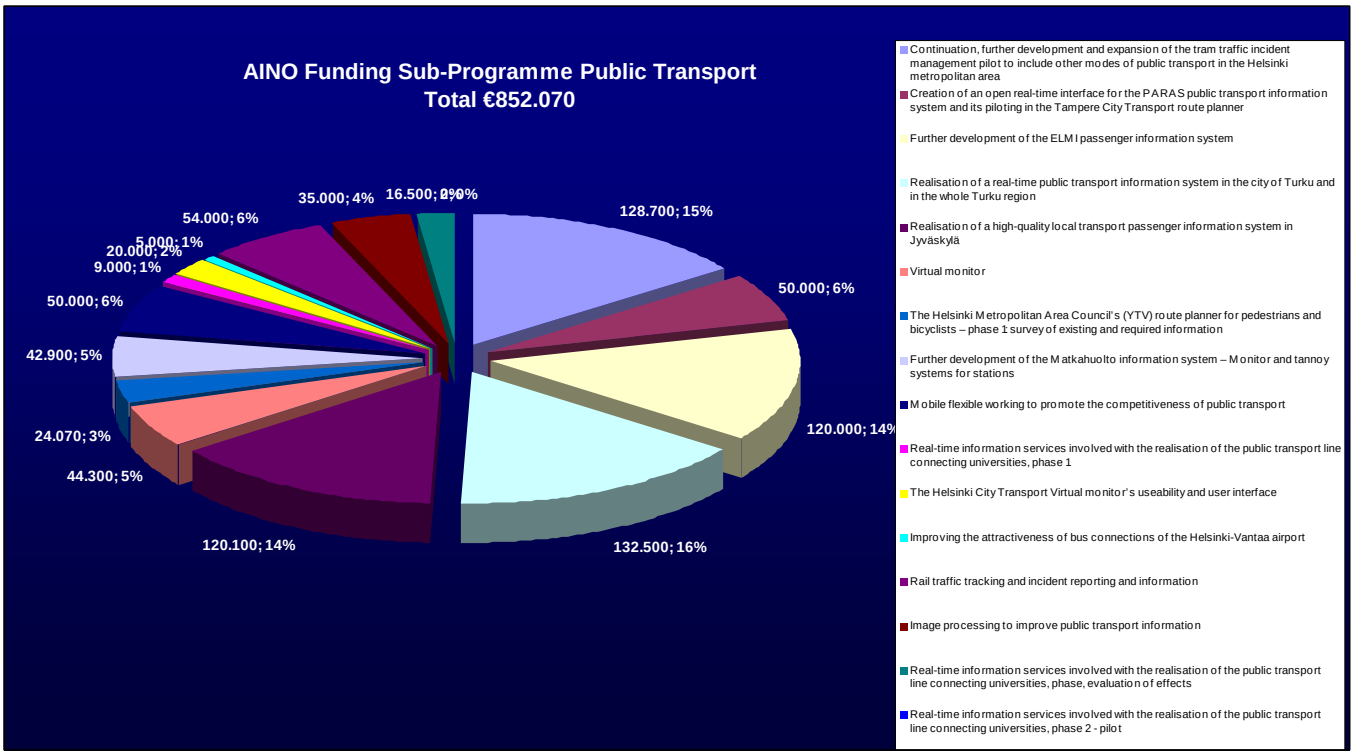

Figure 5

AINO Funding Public Transport sub-programme

In the diagram shown above, the investments from the AINO fund in the Public Transport sub-programme are drawn. The diagram looks rather similar like the diagram for the project share. This means that the AINO funding is relatively good divided over the individual projects, in relation to the project costs. For example; the two projects with the highest project costs *'Continuation, further development and expansion of the tram traffic incident management pilot to include other modes of public transport in the Helsinki metropolitan area'* and '*Realisation of a real-time public transport information system in the city of Turku and in the whole Turku region'* also received the highest AINO funding in comparison to the other projects (e.g. €128.700, 15% and €132.500, 16%).

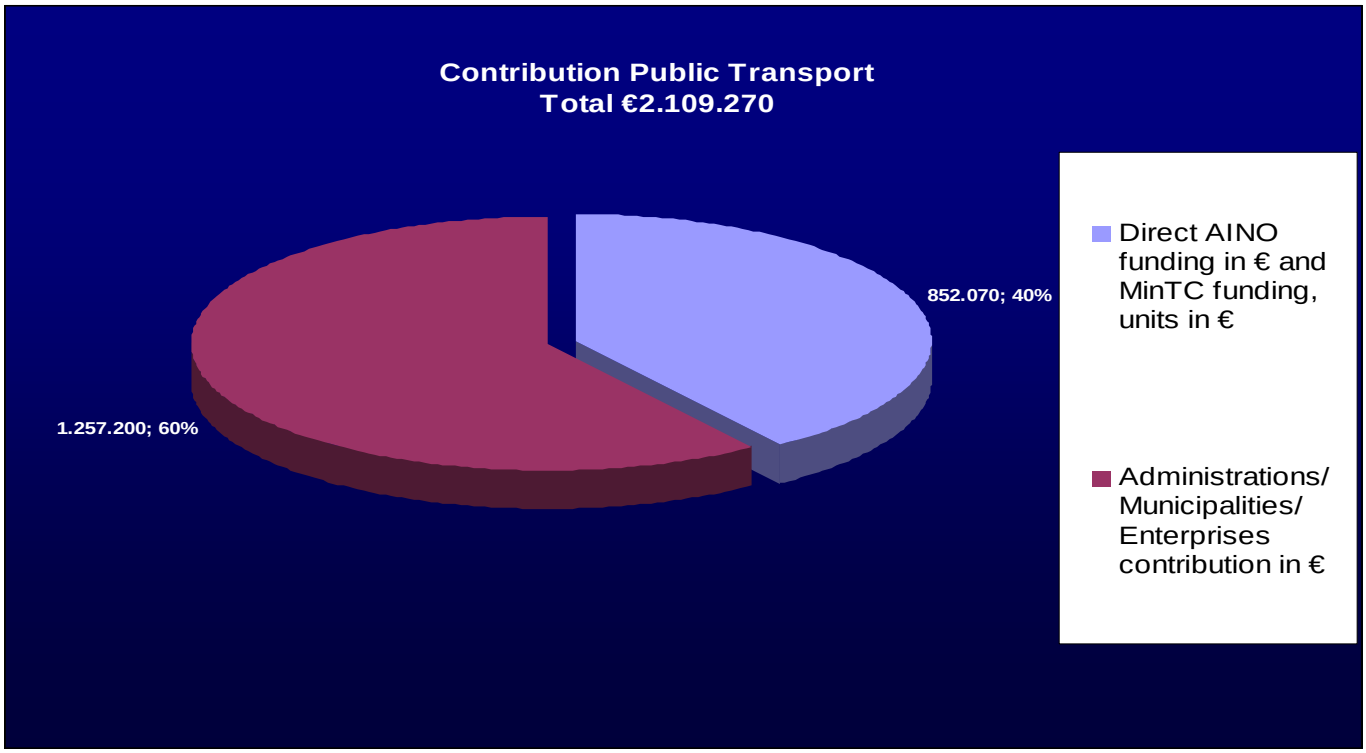

Figure 6

Contribution Public Transport sub-programme

The total costs of the AINO sub-programme Public Transport are €2.109.270. Administrations, Municipalities and Enterprises actors invested about 60% (€1.257.200) of the total sub-programme costs. That leaves about 40% of investments which were directly funded by the AINO programme and the Ministry of Transport and Communications.

4. Goods transport information sub-programme

4.1. Sub-programme objective

The objective of the goods transport information sub-programme is defined as follows:

“to improve the management of deliveries and deviations in them and to promote the use of paperless logistics chains independent of the transport mode or operator. This will help businesses rely on transports as on their own processes and allow logistics to switch to more efficient, paperless operations models. Hopefully the sub-programme will give rise to real-time services that aim to optimise the movement of transports through the supply chain and to modular intelligent electronic systems.”

Any services developed in this sub-programme should - if possible - be accessible independent of the terminal being used, through standardised data transfer methods and interfaces, with compatible information contents, easily and according to the freight transport telematics architecture. The services should be of sufficiently high quality (reliable, accessible, up-to-date etc.), nationally and internationally compatible, and - if necessary - light enough to realise. The services should also have competitive prices and cover a large geographical area and number of transport modes and connections. The sub-programme was headed by Lassi Hilska of the Ministry of Transport and Communications.

In November 2005 the sub-programme was merged into the EGLO programme. The goal of the EGLO programme is to support the global competitiveness of Finnish-based companies by promoting logistics research and development activities. EGLO focuses on the structure and operation models of the networks as well as on the development of the controlling systems.

4.2. Selected projects

1. KULTIS – Digitising of goods transport information – electronic bill of lading

The project has delivered its work according to the original plan. The results were also further utilized as an input in subsequent project: KULTIS- testing service for electronic waybill, in EGLO- programme financed by MinTC. It mainly concerned data definition and system specification. The research component mainly focussed on the investigation on needs and requirements. This is done by means of interviews.
The outcome is taken up in the EGLO programme and resulted in a first demonstration.
The business model as foreseen by the project focuses on public funding in the data acquisition level. This is mainly because the service will contain data of commercial value (from competition point of view).

2. PORTNET 2 – functional and technical feasibility study

PortNet has been successful within the AINO programme. It is a project of strategic value, it is related to the Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 on the establishment of a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC [Official Journal L 208 of 05.08.2002].. Both feasibility studies concern a further upgrading of the existing system. Work therefore mostly focuses on system design and development and not so much on research. PortNet is being handled as a public service focussing on improvement of the transport system. Although the main service could be looked upon as a public service, especially the transmission and the final user interface could be shared areas. The basic interface should be public but some more dedicated solutions might be introduced giving space to the private sector. It is however a service that should become available and be made accessible for all users.

4.3. Sub-programme assessment

The sub-programme Goods Transport covers strategically important topics like the organisation of logistic chain, cross-border and port clearance procedures. The work performed in this sub-programme is however rather limited. Competition between actors in the logistic chain was the main barrier to set up more added value projects. Only about 5% of the AINO budget is finally allocated to it. The impact of the AINO programme in this domain is therefore rather poor. However the added value of the projects on the improvement of port efficiency and also on safety in ports should nut be underestimated. Safety in ports has been recognised as a very important, political issue by the European Parliament.

It was a good decision to merge the AINO activities in this domain with the EGLO programme and to keep control over 2 major projects Kultis en PortNet. The co-ordination and strategic co-operation with the EGLO programme could and should have been stronger. The quality of the work performed in this sub-programme is difficult to judge since it is mainly managed outside the AINO programme. The information submitted by the projects shows a positive contribution to the programme. Especially the PortNet project demonstrated a pragmatic successful approach resulting in a tender procedure to build the system.
The main work performed in this sub-programme has a focus on system and service improvements and development, with a limited amount of technical research.
The work performed is in balance with the financial contribution from AINO. However reviewers felt that AINO didn't have direct control over the sub-programme. Forces outside the AINO programme appeared to be much stronger so the impact and contribution of AINO to the domain of Goods Transport is rather limited, although strategic projects like PortNet performed well.

Remark:
PortNet2 and TAPANI can be seen as main projects in the sub-programme. However TAPANI is fully managed by the EGLO programme (co-funded by AINO), the evaluators didn't receive any detailed information on this project except the project summary. TAPANI aim is to produce an intelligent data transfer and processing system for the logistics service network to enable and increase the efficiency of information exchange between members of the logistics network. The network's drivers and other members will be provided with default schedule information, external and internal guidance information for terminals, information on shipping and port operators, transport information, information on road weather and road surface conditions, information on hazardous conditions and disturbances, information on roadside services, and real-time information on any deviations from the above information.
It is worth mentioning that the TAPANI project has consumed over 40% of the budget of the Goods Sub-Programme but is totally out of control of AINO. It is fully managed by the EGLO programme and no direct information is presented on performance and status of work. Nevertheless it is a project of strategic value and also from a financial perspective it would have been of interest to monitor is more secure.

4.4. Goods Transport costs and contributions

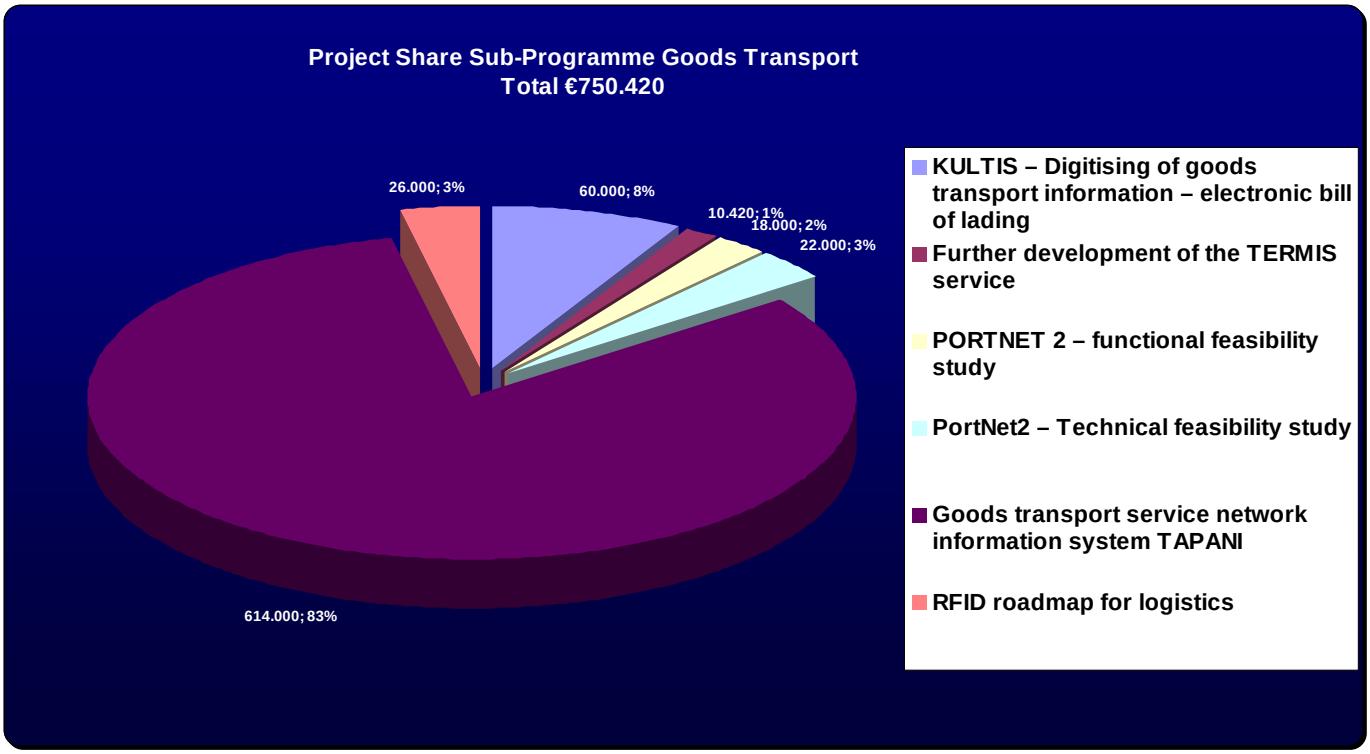

Figure 7

Total costs Goods Transport sub-programme

The diagram above shows that the total costs of the sub-programme Goods Transport are about €750.000. There are six projects in this sub-programme and the project '*Goods transport service network information system TAPANI'* has the biggest share (83% of the goods transport total costs). The sum of the other five projects is 17% of the total costs. So, it is clear that the financial status of this sub-programme is mainly depending on just one project.

Note: TAPANI is one of the projects that is "handed-over" to the EGLO programme. This means that there was no direct control over the project from AINO.

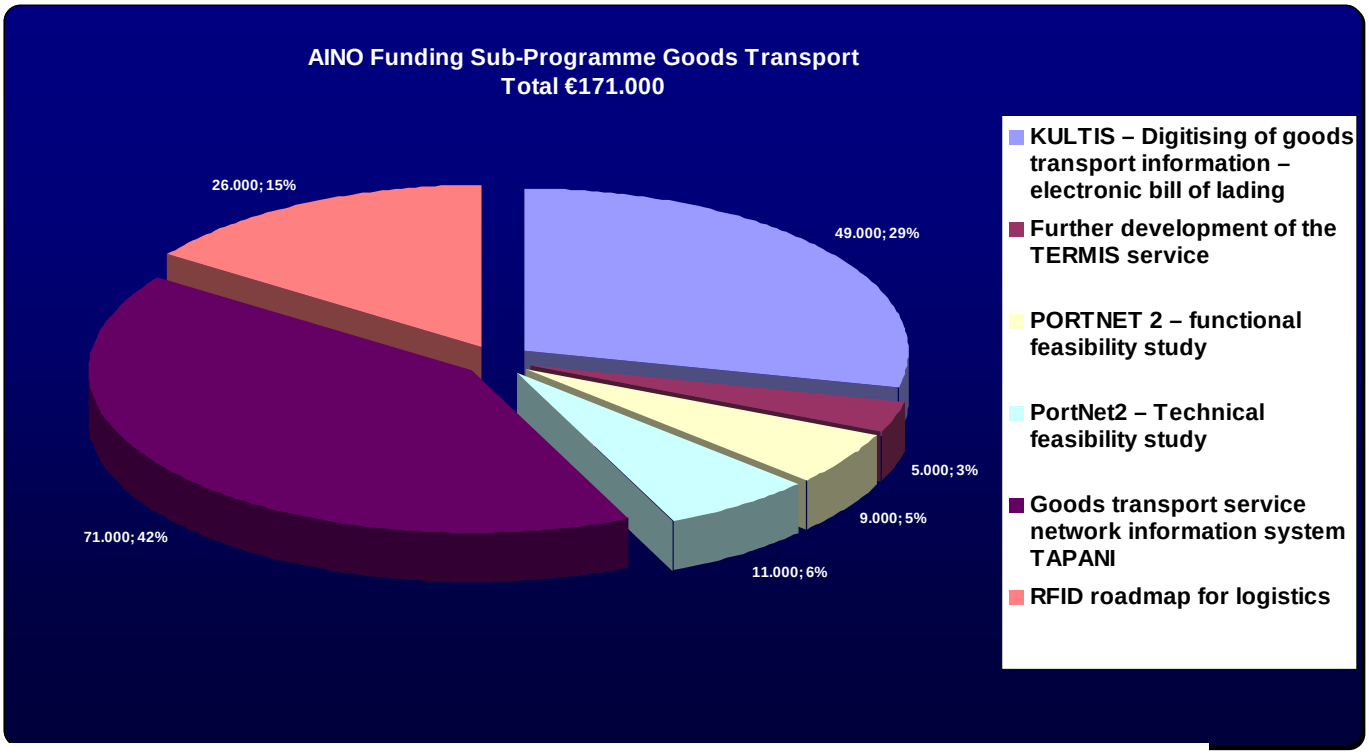

Figure 8

AINO Funding Goods Transport sub-programme

The diagram *'AINO funding in the sub-programme Goods Transport'* shows (relative) three 'major' projects. One of them is '*Goods transport service network information system TAPANI'.* In relation to the total AINO funding in this sub-programme, the TAPANI project is the largest. This project is however mainly funded by Administrations, Municipalities and Enterprises rather than direct AINO funding. So the TAPANI project, which is a rather big project, seem to have a large impact on the total costs of this sub-programme, but has a relative small impact on the AINO funding because the project is mainly funded by others. This is on the contrary with the other two 'major' projects; '*KULTIS – Digitising of goods transport information – electronic bill of lading'* and '*RFID roadmap for logistics'.* These projects are rather small in the cost share (this because of the high costs of TAPANI), but have a relatively large AINO funding.

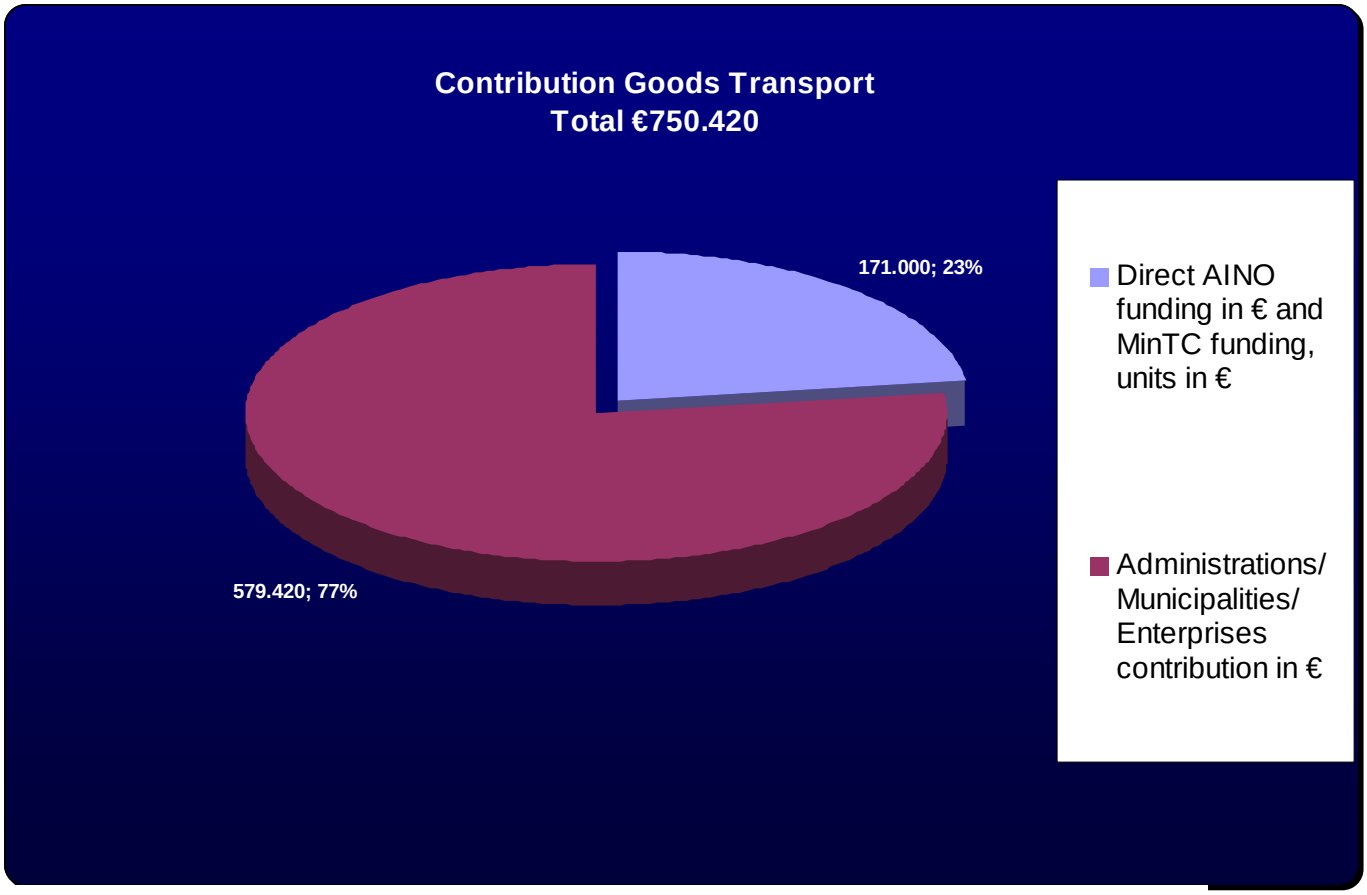

Figure 9

Contribution Goods Transport sub-programme

The Goods Transport sub-programme is, in comparison to the other sub-programmes, one of the smallest programmes in the number of projects, costs and fundings. The diagram for the contribution also demonstrates that Goods Transport is mainly funded outside AINO. But again this picture is not fully representative because of the TAPANI project. So, it is clear that the financial costs of this sub-programme are mainly depending on just one project. Therefore it is hard to draw a conclusion for this sub-programme.

5. Transport network status information sub-programme

5.1. Sub-programme objective

The objective of the transport network status sub-programme is defined as follows:

“develop the cost-effective real-time monitoring of transport network status information (incidents, congestion, weather, road surface conditions, travel times, the environment) as well as real-time information-based services for solving problems in the transport networks and urban areas and for improving the travelling and transport safety, reliability and comfort of citizens and businesses.”

The idea is that work in this sub-programme should change the focus of road management to move more rapidly towards network-wide operation and transport network efficiency, while drivers will no longer have to encounter the type of unpleasant surprises they do now due to traffic incidents. The sub-programme covers the entire transport network - including all links, nodes and transport modes.

All parts of the service chain being developed in the sub-programme should be cost-effective, and all of the services should have the potential to become permanent. The services being developed should reach customers and customers should use the services. These services could be made available in a variety of different versions (expensive/cheap; individual/common; updated at different pace etc.).
To be effective services must be of sufficiently high quality (reliable, accessible, up-to-date etc.) and cover a large geographical area and number of transport modes and connections. The information produced by the service should be provided to customers in an understandable form and in a way that produces the desired reaction.

The sub-programme was headed by Director Raimo Tapio of the Finnish Road Administration.

5.2. Selected projects

1. Traffic control around large metropolitan road works, phase 1, feasibility study

The work performed is according to the original plan. It meanly focussed on co-ordination and organisational aspects, “how organisations should work together and how to inform the road-users about the road-works”. The level of innovation and research involved in this project is rather limited and mainly focussed on organisational aspects.
The exploitation scheme envisaged by the project itself is based on a strong Public involvement. It is expected that road authorities will include a task on information services in the procurement procedure. So the road constructor must include it in his work and will be responsible for it.

2. ONNIMANNI – Real-time modelling and performance monitoring of the urban transport network & ONNIMANNI 2, Real-time modelling and performance monitoring of the urban transport network

The project team has demonstrated high level of knowledge in the field of on-line traffic modelling. Work in this domain is especially of interest for local road-authorities. The approach chosen has a somewhat scientific focus. Actors involved are not so much interested in the exploitation, their main interest is to perform research. More use could have been made from, operational experiences elsewhere in Europe. Although investigation seems to be performed on on-going activities in Europe no actions are taken. Especially the University of Helsinki should have made use of its international network more effectively. Data fusion, combining data from different sources would have been an interesting “new” element. In the

current phase no serious work has been performed in that field but it might be taken up in the Post-AINO phase. The project has some delay due to technical difficulties in connecting the Traffic Signalling systems.

3. ColdSpots: Development project for accurate road section-specific road surface condition forecasts, Phase 1: preparation of the database behind the road surface condition models & ColdSpots: Development project for accurate road section-specific road surface condition forecasts, Phase 2: development and verification of road surface condition models

This service is strongly related to road safety. Therefore it is required that public authorities are strongly involved in the data acquisition phase in such manner that quality is guaranteed and stable. Also the methodology for making predictions should be public "controlled" in order to prevent conflicting messages to be transmitted to the end-user. This might also have impact on the packaging of the information. The product being developed in this project is of high value with high potential on longer term. It is expected to become an "export" product towards countries facing bad weather regularly.

4. Heavy vehicle driver warning and route planning service - phase 1, study

VARO is a very good example of a project that succeeded in using AINO as a start-off for the definition and implementation of a successful business model. Main research in this project is not on technical issues but on impact assessment, user-needs and requirements. An evaluation methodology was defined to get feedback on quality level of the service implemented and the concrete requirements of the users. The approach is of high value and should have been investigated or even adopted by other projects in AINO.

5. Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 1 & Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 2

The project has shown possibilities for FCD service form a technical perspective as well as business models. Setting up a demonstration locally has supported mind setting of organisations (public as well as private) on feasibility and expectations of this technology. The actors involved have shown competence in this domain. The business model requires active involvement on national wide level and preferably international level. Project has been successful, mean risk is in the follow-up of it. Services like this could be fully privately operated. A feedback methodology could be defined by which users of the FCD system get on-line traffic information. No infrastructural work needs to be performed so road authorities can restrict themselves by specifying the data required (including quality level) and contract the private sector to deliver this data.

6. Green Box – The vehicle base for safe and sustainable traffic

The project will finish in autumn 2007. This means that at the moment of the review not all the work was finished yet. The results at the moment of the review:

- the services to be piloted are planned;
- pilot system implemented and tested;
- initial version of the final report written.

The raising discussion on road charging has put a lot of pressure on the project resulting in additional other, work and cost. Development of exploitation schemes are not foreseen.

It is expected that the project will achieve all the planned results.

5.3. Sub-programme assessment

The Transport Network Status sub-programme has reached its main goals. Projects involved all demonstrated a high level of experience and knowledge. The projects also demonstrated different exploitation models and some projects even moved towards the exploitation phase. Major, interesting research activities performed in this domain:

- Impact assessment
- User requirements and needs
- Service-definition

Work is mostly performed in isolation without direct contact and exchange of knowledge and experience within and outside the sub-programme. Work performed in especially the VARO and ColdSpots project is of high value and could be of interest for other projects too.

The types of projects vary from scientific up to practical focussed projects. In both more use could have been made of existing experience in Europe. Knowing that it has positive impact on the understanding and acceptance of specific systems and solutions, it doesn't need to be totally invented all over again. Here a better balance should have been sought.

The exploitation schemes envisaged by the projects all demonstrate a very conventional approach with still strong involvement of the public sector and risk sharing between public and private sector. Enlargement of the scope might be a solution to overcome this limited view. This means that actors involved should be willing to look over the edge of their own domain (out-of-the-box) and have a more European focus.

5.4. Transport network status costs and contributions

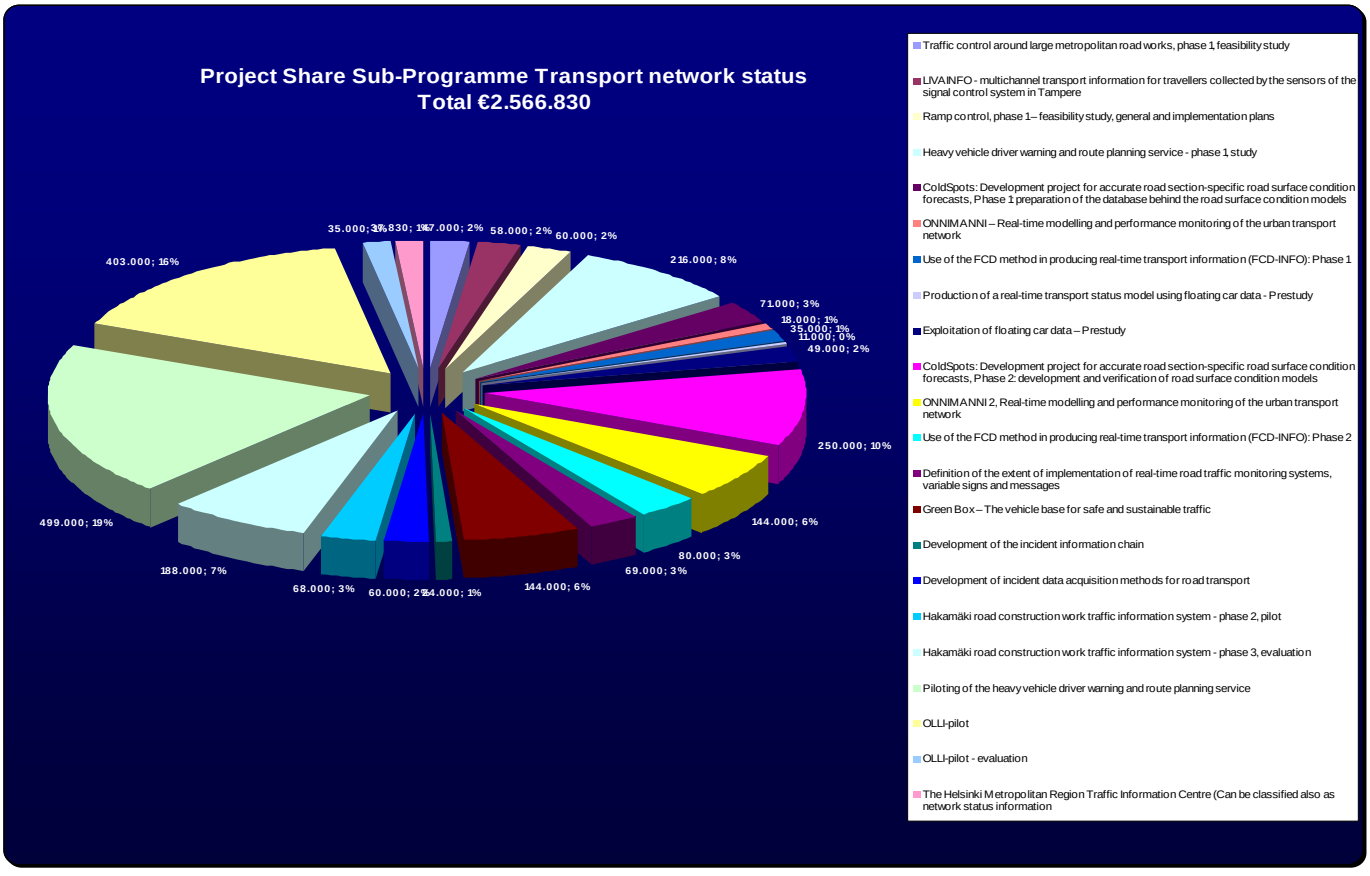

Figure 10

Total costs Transport Network Status sub-programme

Figure 10 shows that the total costs of the sub-programme Transport Network Status are about €2,6 million. There are 22 projects in this sub-programme. The first impression of the sub-programme is, similar with the sub-programme Public Transport, that the share of each project is balanced over the total costs of the sub-programme. Two projects alight in the diagram; '*Piloting of the heavy vehicle driver warning and route planning service'* with project costs of €499.000 (19%) and '*OLLI-pilot'* with project costs of €403.000 (16%).

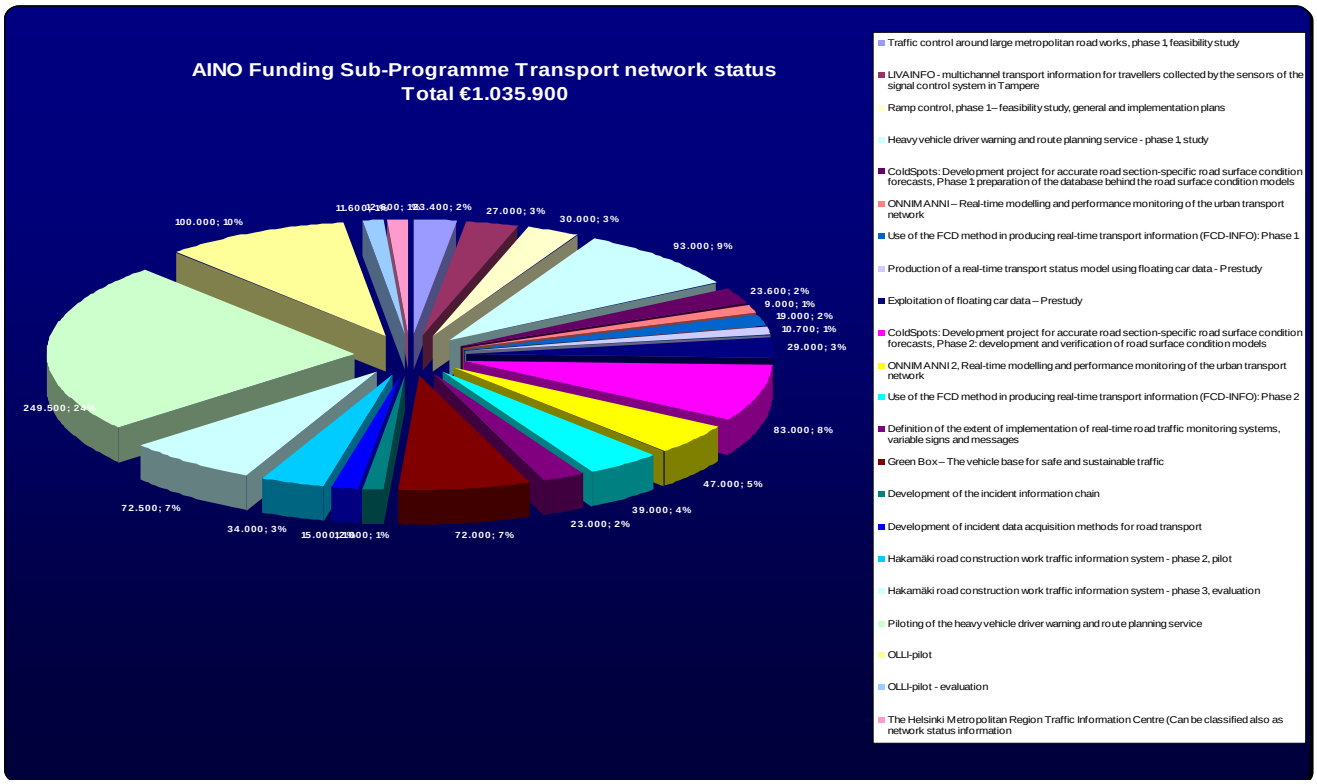

Figure 11

AINO Funding Transport Network Status sub-programme

The total funding from AINO in the sub-programme Transport Network Status is around the €1 million. In comparison to the project costs there is a good partitioning in the funding from AINO. The two projects with the highest costs also get the highest funding ('*Piloting of the heavy vehicle driver warning and route planning service'*[6] and the '*OLLI-pilot'*).

[6] It is not for 100% sure whether this project is funded directly by AINO or that the €249.500 is paid by the Finnish National Road Administration. In this research this amount has been considered as AINO funding.

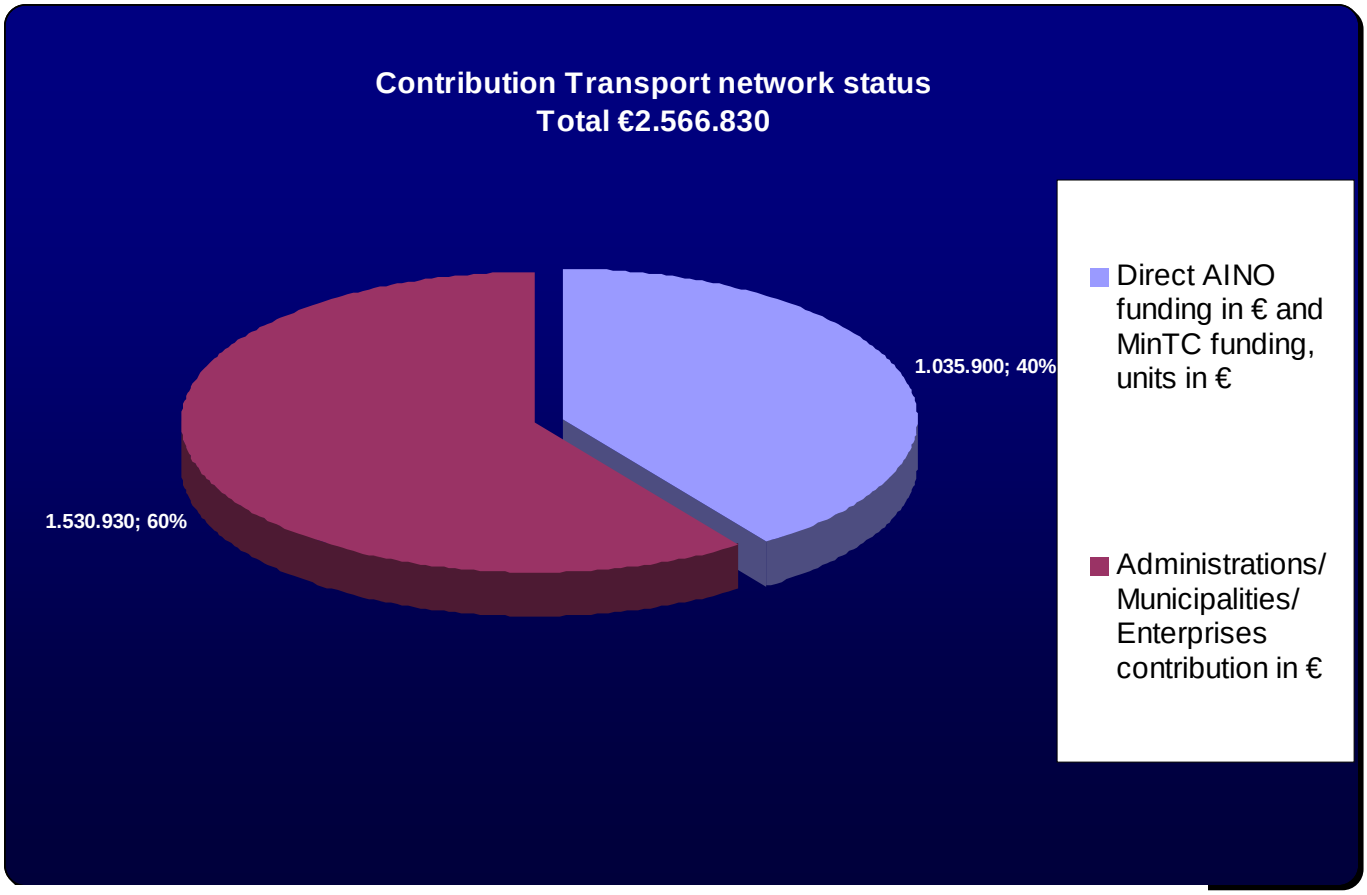

Figure 12

Contribution Transport Network status sub-programme

The AINO and the Ministry of Transport and Communications contribution in the Transport Network Status sub-programme is 40% of the total costs of all the 22 projects (e.g. €1.035.900). The other 60% is contributed by Administrations, Municipalities and Enterprises (€1.530.930).

6. Driver support sub-programme

6.1. Sub-programme objectives

The objective is to improve the safety of road, rail and maritime transport by developing and deploying systems and services that monitor hazardous conditions and the status and behaviour of drivers or vehicles, give feedback to drivers, and carry out control actions.

6.2. Selected projects

1. In-vehicle warnings about approaching trains at level crossings

Finland has some 3,800 unmanned level crossings and around 10 fatalities occur each year. This project aims to develop technology solutions for in-vehicle devices that warn drivers of approaching trains at level crossings. The devices should suit Finnish conditions, namely the high number of unguarded level crossings on private roads and the demands set by Finnish winters. A system trial was decided upon based on the findings of the feasibility study. The goal was to ensure the technical functionality of the proposed system, study its suitability for the task and produce recommendations for further actions.

Initially a prototype of the system was designed and built. The prototype was then tested at the operation tests on the railway line between Hanko and Karjaa on 16.6.2006. Before a full-scale implementation can take place, the safety effects of the system should be studied. This requires a large-scale pilot study with real end-users. The next step could be a large-scale pilot with real end-users and a pilot system implemented like a production-phase system.

It is important to make a distinction between on the one hand publicly planned and supported services that are promoted for reasons of public safety, and on the other hand more commercial projects, which are likely to be profit orientated and consumer-driven. In this case, the warning system is a safety enhancement that is being promoted in response to public policy concerns. The real-time train location information from the system could also be utilised for other purposes, such as safety improvement systems for people working on railway lines, rail operator rolling stock management and passenger information based on real-time data.

2. The safety and other benefits of the eCall system

This is an important piece of work, to quantify the impact and benefits of an in-vehicle emergency call system in theory and in practice. The results have received close scrutiny both within Finland and internationally. The range quoted for the benefit-cost ratio (between 0.5 and 2.3) suggests that there is still a degree of uncertainty concerning just how far eCall will deliver the benefits that are promised. There is a suggestion that more work is needed, in particular to quantify the indirect benefits. We think this would be worthwhile, given the high profile which eCall will have. At the same time it will be important to look in depth at the impact which eCall would have on Emergency Response Centre procedures, to establish whether there will be and additional work-load, and the efficiency gains to be had from a full-scale implementation.

3. Measuring the driving style of a driver and the possible safety impacts (Ajotapa)

Driving behaviour is one of the main aspects of traffic safety. In the Ajotapa project, the speed and accelerations of four taxi vehicles were measured in normal traffic during seven months in Helsinki area. A number of relevant, easily measurable safety-related parameters, such as speeding and sudden braking, (called jerk - often related to near accident situations) were used in defining and comparing driving styles. In addition, the suitability of the system for use as basis for feedback to drivers was investigated.

The project has developed a novel way of measuring and comparing driving styles. In particular sudden braking is used as a proxy for a near accident event. It would be good

practice to have this measurement technique validated in some way, to determine just how good a predictor it is of accident risk. We can see that the measurement method shows promise, but recommend a larger-scale trial before embarking on a programme of driver re-training

A change in driving styles by drivers collectively is a long-term task, but could in principle yield overall improvement in service level and performance benefits for the transport system.

We agree that future work for describing the actual traffic situations related to the jerks has the potential to open new possibilities in the field of traffic behaviour.

6.3. Sub-programme assessment

The work in this sub-programme is well focussed and is producing interesting results in an area which has great potential to improve traffic safety and improve the productivity of individuals.

Our main observation is a need to further strengthen international partnerships for research in this area, particularly between researchers who are familiar with the national situation in Finland and others who work in close contact with the vehicle manufacturers and telecommunications sectors. The latter operate throughout Europe, and in some cases worldwide. Together they will provide the technology platform(s) for new driver support services which Finland is developing. The eCall project demonstrates the point, where Finland has taken a high profile on the roll-out of in-vehicle emergency call services in Europe and is in the vanguard of early adopters.

Although not listed as a project for review here, it is worth noting that the Varo Alert, service developed by the Finnish Meteorological Institute with Finnish Road Enterprise, (part of the Network Status sub-programme) provides a good example of the way forward. The Varo service delivers real-time route-specific information on weather conditions and location-specific driver alerts over the internet and with voice alerts. It was developed out of public concern following a bus/truck accident with multiple fatalities. Varo is now being marketed as a package of services under “Varo Alert” branding. The particular development route in this case moved rapidly from field trial to full-scale operational service, taking full advantage of the latest developments in Smart phones. AINO was able to fund research which covered the technical evaluation, user evaluation and the commercial (business plan) evaluation.

It is interesting to note that none of the projects has recommended a public-private partnership for its exploitations plans. Given the safety-related nature of services such as eCall, and Ajotapa, and other projects concerned with influencing driver behaviour, it could be advantageous to explore partnership arrangements to bring on these projects.

6.4. Driver Support costs and contributions

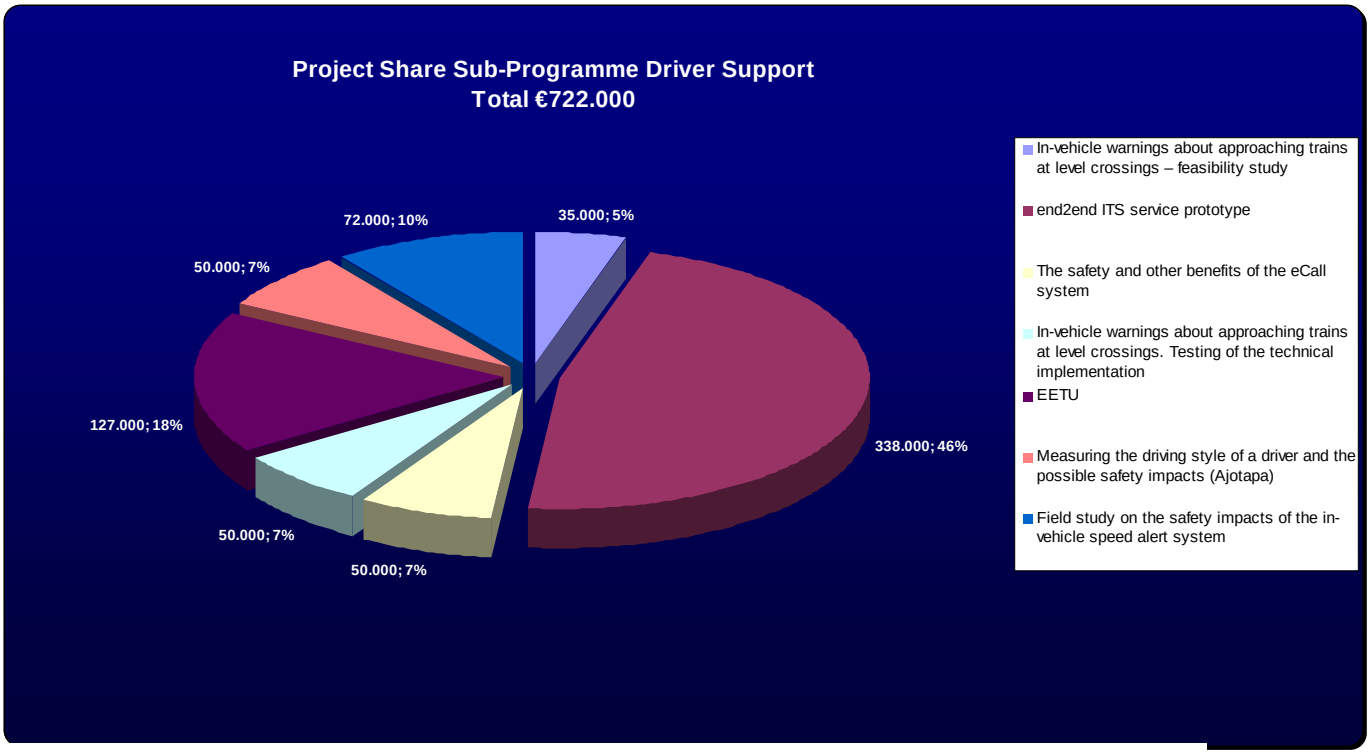

Figure 13

Total costs Driver Support sub-programme

In the sub-programme Driver Support, seven projects contributed to total costs of €722.000. One of these projects, '*End2end ITS service prototype'*, alights above the others. The costs of this project are almost 50% (€338.000) of the sub-programme total costs. The other six projects are rather similar in project costs, expect the EETU project which is 18% (€127.000) of the sub-programme total costs.

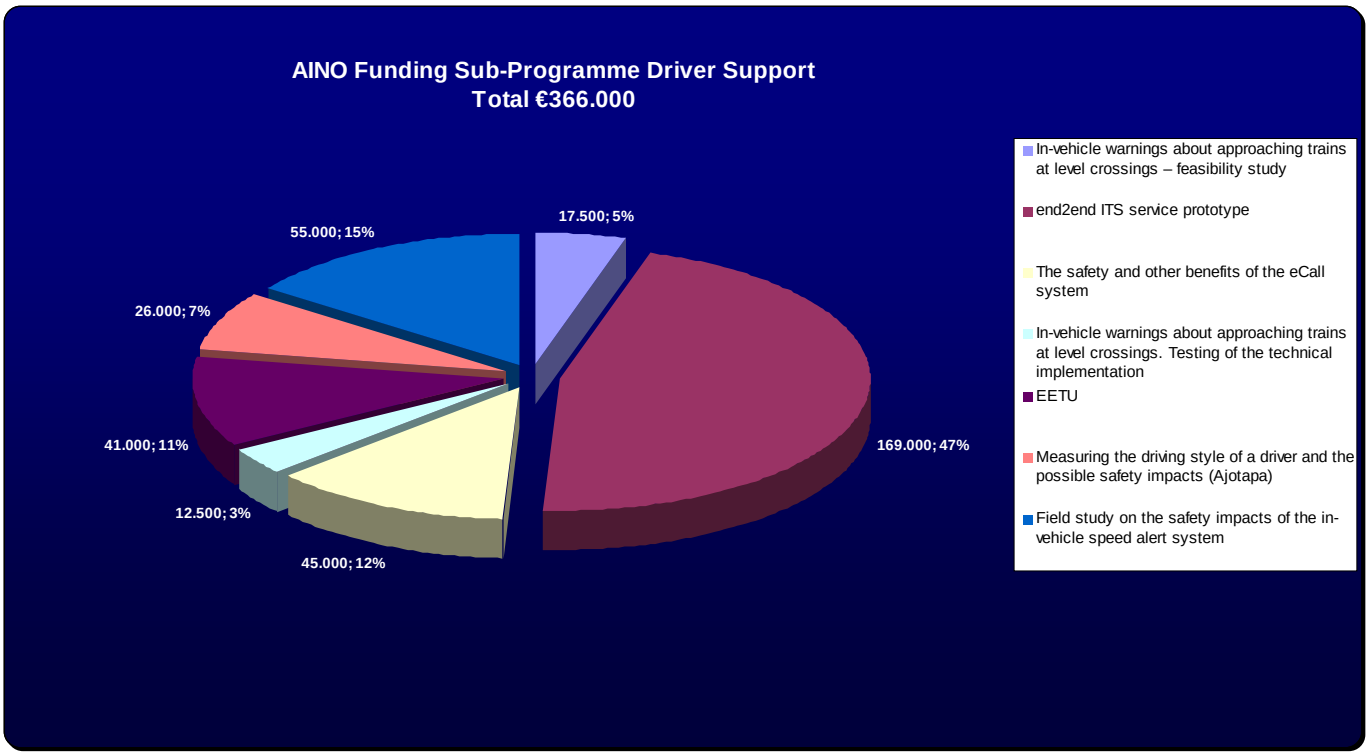

Figure 14

AINO Funding Driver Support sub-programme

AINO funded around the € 370.000 for the Driver Support sub-Programme and the half of it was spend on the '*End2end ITS service prototype'* project. Due to the costs from this project, the relatively high AINO funding is not unexpected. The fundings from AINO to the other projects are a good reflection compared to the project costs.

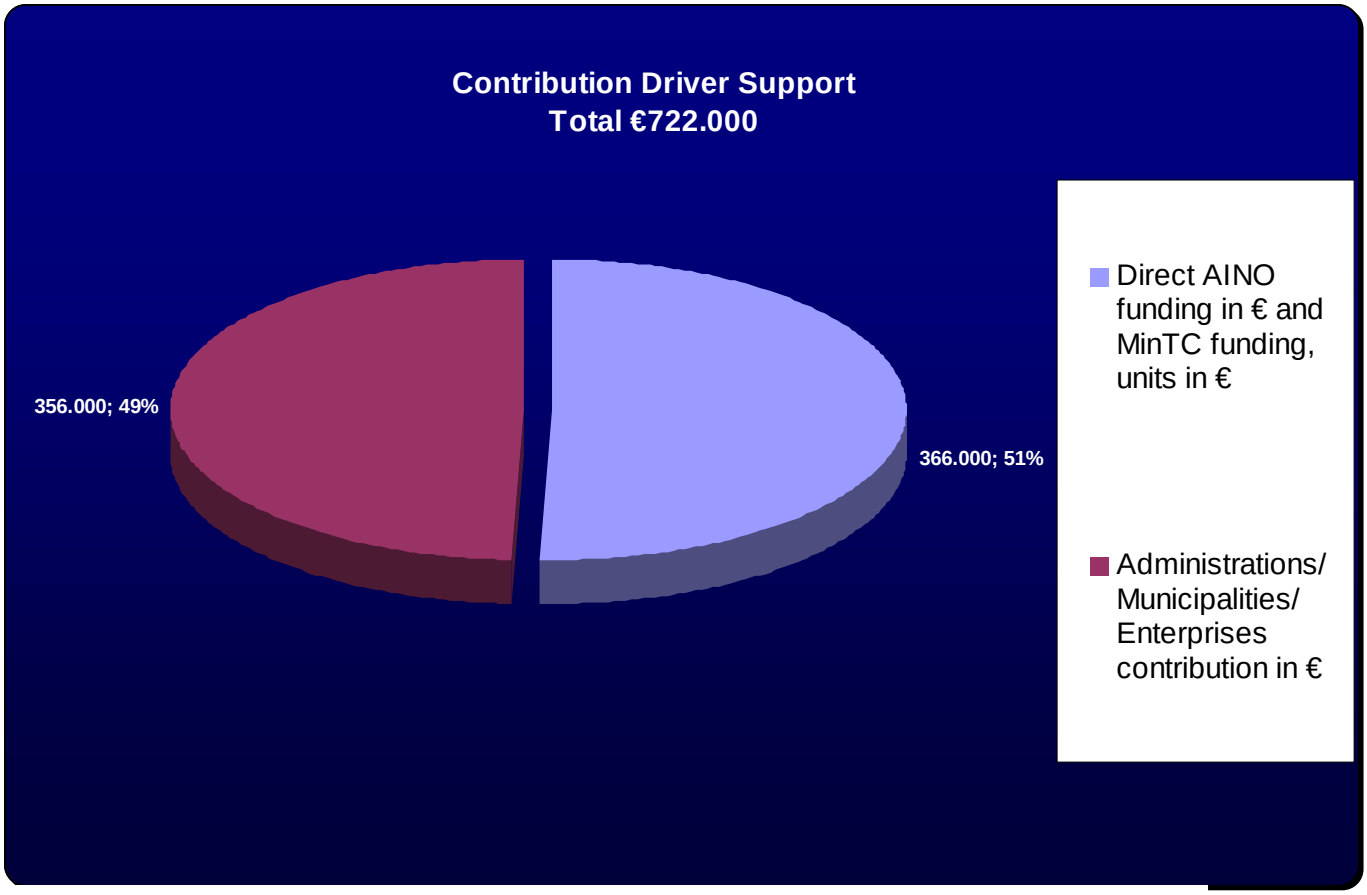

Figure 15

Contribution Driver Support sub-programme

The sub-programme Driver Support is for 51% funded by AINO and the Ministry of Transport and Communications and for 49% by other actors. Together with the Service Framework sub-programme this is the only sub-programme which has a higher AINO contribution than the contribution by other actors.

7. Service Framework sub-programme

7.1. Sub-programme objective

The Service Framework sub-programme objective is to solve legal, organisational and other problems that are common to the whole AINO programme, to develop the general prerequisites for services by giving different actors the opportunity to provide services without hindrance, and to ensure that the impacts and applicability of ITS are generally known.

7.2. Selected projects

1. Defining alternatives for the public sector's objectives in ITS service production

This project involves the definition of alternatives for the public sector's objectives in ITS service production. The project targets "Prerequisites for business" by defining alternative procurement packages for securing the public service requirement in multimodal traffic and travel information services. One of the specific goals of the Service framework sub-programme was to develop an "Optimum model for public sector participation in service business" and the project provided a proposal for such a model.

The results of this project initiated discussions within the public sector actors in Finland. This culminated in the reformulation of Finnra's service strategy in the autumn of 2006, which clearly stated the role and borders of public sector activities in ITS services. This has now been acknowledged by the private sector actors and the positive effects on new services have already started too emerge.

2. The AINO Programme's service evaluation framework

The objective of this project was to create a clear and simple evaluation practice that would provide essential information on the descriptions, accessibility, user impacts and benefits of transport information services considered for inclusion in the AINO Programme. The project evaluation tool in the form of an Excel workbook has been available at the AINO website from the beginning of 2005 and already has been widely used.

The availability of an evaluation tool has had great significant for the AINO programme by requiring assessments to be made of project proposals against an objective list of impact mechanisms and targets. All AINO service development projects must utilise this evaluation tool in order to apply for funding and in future it is likely that all such projects to be funded by the Ministry of Transport and Communications and its sector's administrations will use it. Translation of the evaluation tool into English, and its dissemination to the European Evaluation Expert Group and IBEC (the ad hoc group on ITS Benefits, Evaluation and Costs) were a means to ensure peer group review. We note that the evaluation tool has been taken up in Denmark and elsewhere, which is a very positive result.

3. ASK€L – A concrete and economical step towards multimodal transport services in a city

Tempere has been chosen to reflect the interests of a community of authorities. The project aims to find cost-effective methods to provide multi-modal information services suitable for a small city, and propose how this can be linked to the city's transport policies and traffic control strategies. The long-term objective is to develop real-time information services for all modes. City authorities want to use traffic and travel information to stem the decline in public transport, improve road safety, make better use of road capacity, and make a real impact on traffic.

Based on the results of the project the business model exists. The help of commercial partners could also enable new service elements. From marketing point of view personalised services are remarkable opportunity for valuable segmentation marketing. The development of multi-modal information services will need private investment. Investments will be financed

partly by public authorities (the part of their services) and partly by private companies. The service provider should be private in order to enable the new business model possibilities. The plan is to launch the new service in year 2007.

The project demonstrates the importance for small cities of Ministry funding of research on the service framework and business models for multi-modal information services, and the development of open, standardised interfaces.

4. Planning and realisation of the eCall test environment

In-vehicle emergency calls (eCall) have the potential to greatly reduce the number of fatalities, severity of injuries and stress in post-crash situations, by speeding up the response of the emergency services. eCall can be initiated manually or automatically after a crash. It passes relevant information of the accident, including its accurate location, to the emergency services (the Public Service Answering Point).

Results the Finnish eCall projects have played an important role in the discussions at European-level on how to take forward the eCall initiative. Ensuring the functionality of communications is an essential prerequisite for the large-scale implementation of the eCall system. The projects therefore address an important strategic function.

eCall also raises methodological issues about how to assess the true benefit of information services and what impact eCall will have on the Emergency Response Centres. Commercial exploitation of eCall is also a factor. The eCall projects listed here have been 100% funded from the AINO programme, with a total of €297,000 spent over the period 2004-07. Given the range of primary and secondary benefits that are claimed, and the expectation that the eCall communications testing service can be developed into a commercial business, it is somewhat surprising that this project was not carried out in partnership with the private sector with part-funding from a future eCall operator.

5. Impact evaluation method of the road surface condition warning service (VARO method)

The VARO information service was prompted by a serious coach accident which involved a number of fatalities. It is designed to give advice in real time to drivers on accident risk locations during the course of a journey. Development of the business case was based on a case-by-case analysis of 4 years of fatal accident reports to determine the proportion which would have benefited from an eCall service that would improve the emergency response, and thus save lives.

There has been a 1-year delay in implement the VARO service, and so no fieldwork has been done so far. In the meantime, interviews with truck and coach drivers suggest that the value of this kind of service may have been over-estimated. The service may be nice to have but is there a business case? What is the commercial impact on the company profits and revenue streams? The methodology, which is being tried for the first time, may be useful in the evaluating the economic benefits of an information service, to justify funding from public sources.

6. Transport information services in the Oulu region – Pilot feasibility study

The purpose of this study is to draw up a more detailed description of transport information services in the Oulu region in accordance with the public-private partnership (PPP) model. This study describes the existing infrastructure, outlines a desired future state for transport information services and seeks viable services and modes of operation that can then be piloted. Immediately after the feasibility study is completed, preparations will be started for a separate service pilot phase in the Oulu region in 2006. The decision on whether or not to proceed with the pilot will be made on the basis of the results of the feasibility study.

The final vision for and desired future state of the project is a regional transport management hub, which will offer both the existing and new services, depending on user needs and

demand. Information e.g. on travel conditions and traffic incidents will be easily and reliably available from one place through a variety of information channels. New technology etc. can also be exploited as quickly and flexibly as possible. The information requirements of a variety of users (the authorities, companies, private persons etc.) will all be fulfilled through the centre. If the model is successful, applications can also be introduced at other Finnish urban centres.

7. Intelligent transport at Heureka – a visit to the information world of transport

This is a very imaginative and effective form of outreach for the AINO programme, to explain the importance of multimodal information services to the general public. The interactive exhibits work well with a variety of age groups and provide a profile for systems, such as traffic signal control or air traffic monitoring, which would otherwise be taken for granted and be largely invisible, until they go wrong!

The Finnish Science Centre Heureka in co-operation with the ITS-Finland organisation has built up an interactive exhibition on transport telematics and information services in Finland. The exhibition was opened in the autumn of 2006 and will stay open until 2011. There are 16 interactive exhibits covering road traffic, railway traffic, air traffic, sea traffic, public transportation, emergency response system, passage control and road weather. The area of the exhibition is about 120 square metres. By the end of the year 2006 already over 57,000 people had visited the exhibition

The exhibition will be open at the Heureka for at least 3 years (until autumn 2009). After that it will need updating/upgrading and then it can remain open until 2011. The partners have already benefited by being able to demonstrate their inventions, products and services to their interest groups as well as the public. Partners can (and already have) duplicate single exhibits to be used outside Heureka, like fairs, conferences etc.

7.3. Sub-programme assessment

Defining the service framework is a necessary part of the deployment of multi-modal traffic and travel information services. The framework can evolve incrementally, but within AINO there has been the foresight to devote resources to finding effective business models and appropriate means of assessment.

There is a great diversity of projects within this sub-programme, perhaps inevitably given the range of objectives that are covered. Projects accepted into the sub-programme were intended to:

- develop the prerequisites for services and service provision as efficiently as possible
- to remove hindrances to service provision
- promote the clear division of responsibilities and roles between different types of actors
- promote the certification of services, and services that are interoperable to the relevant extent
- produce working solutions concerning the ownership of traffic and transport data, data security and earnings logic
- increase people's awareness of the impacts and viability of real-time services, as well as the needs of users and their assessment

There has been good progress in developing an understanding of the prerequisites for services and service provision, and in investigating the division of responsibilities and roles between different types of actors. Finnra, the Finnish Roads Administration, has taken a policy decision to focus on the public service requirement in information. However, it is clear there is still uncertainty about the division between the public sector role and private sector role is still uncertain.

Closely linked is the objective of producing working solutions concerning the ownership of traffic and transport data, data security and earnings logic. Projects like “Defining alternatives for the public sector’s objectives in ITS services” depend on adapting international to the national conditions of Finland. The needs of the authorities must be clearly defined. For example, it is positive that Finnra has been able to reformulate its service strategy based on recommendations from this study.

The ASK€L project raises some important issues for service delivery. The project leader reports:

“A bigger question is how ITS, and multi-modal traffic and travel information services in particular, can relate to the overall transport policy for the city. City authorities need to promote ecological and sustainable solutions for travel and traffic in their area. ITS has a lot of potential, but it is not yet clear what the city role should be.”

Some of the answers will only be resolved by public debate. The ITS displays at Heureka have certainly increased people's awareness of the impacts and viability of real-time services. We were initially surprised to see this being financed from the research budget but we accept that the exhibition complements the research programme very well. One small criticism is that there is no obvious branding of the AINO programme at the Heureka exhibits, nor is it obvious that there is financial support from MinTC.

Finally, we were pleased to see the issue of flexible mobile working included in the sub-programme. Although very much a small-scale pilot, the project seeks to achieve recognition for the new working methods which individuals have developed for themselves over the past 10 years. Information and communication technologies have great potential to increase productivity and remove some of the disadvantages of travel. More work is needed on the institutional, legal and administrative barriers to the wider adoption of flexible working, alongside the roll-out of the basic info-structure.

7.4. Service Framework costs and contributions

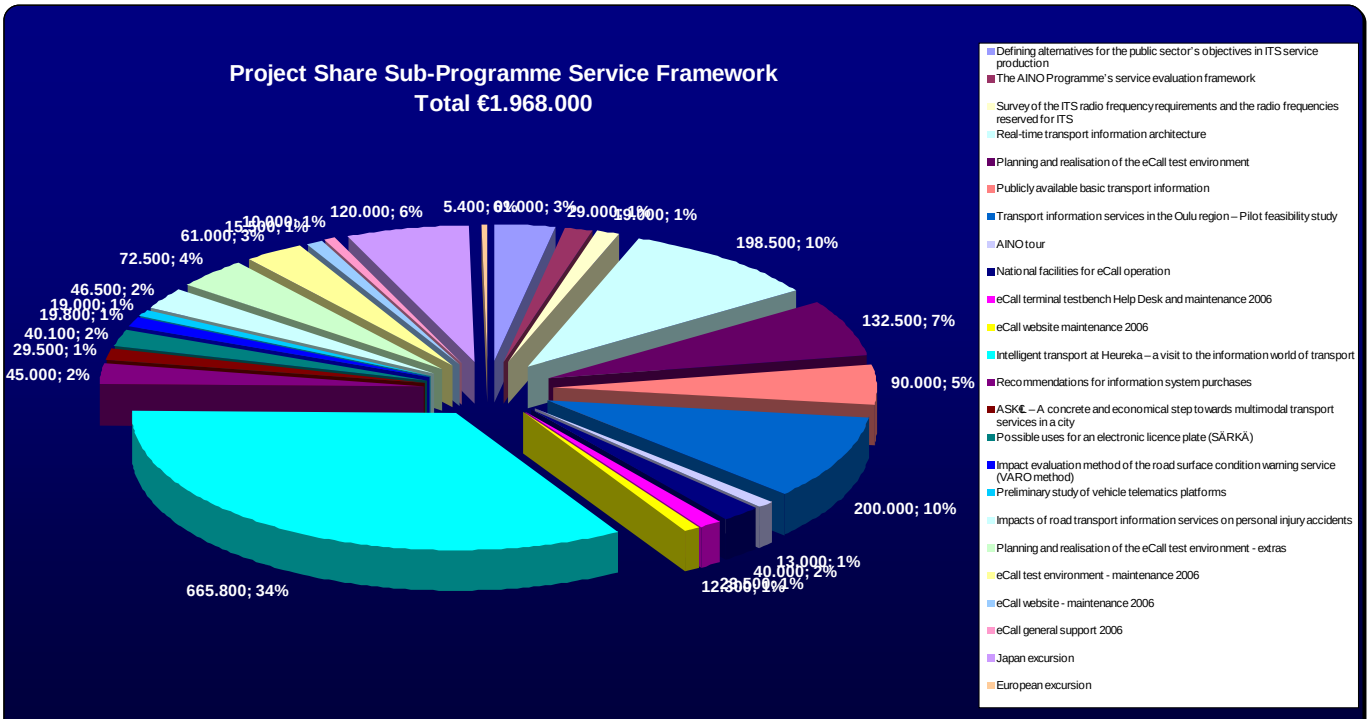

Figure 16

Total costs Service Framework sub-programme

The project costs from the Service Framework sub-programme, which are around the €2 million, are for 34% (€665.800) stipulated by the project *'Intelligent transport at Heureka – a visit to the information world of transport'*. The other 66% (€1.302.200) is formed by the costs of 23 different projects.

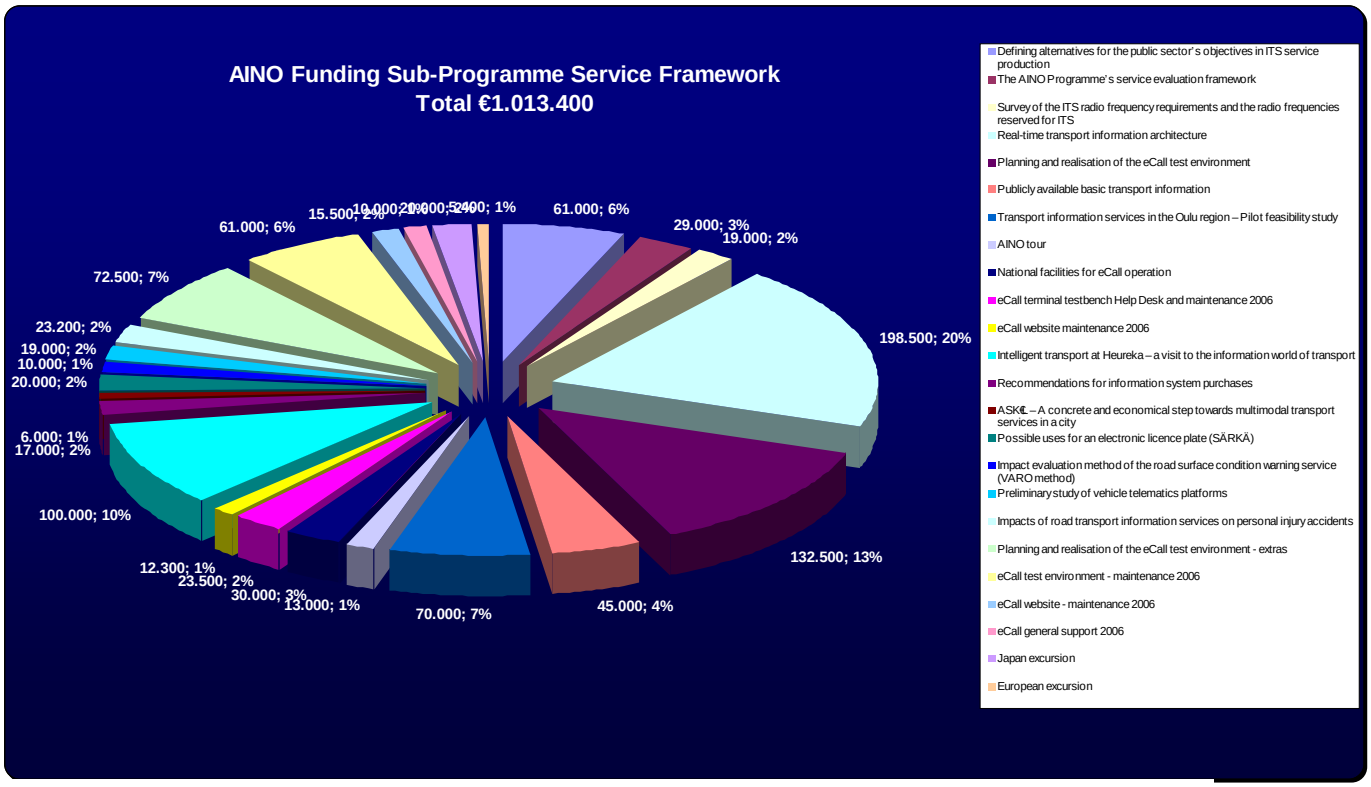

Figure 17

AINO Funding Service Framework sub-programme

The diagram above shows the direct AINO funding per project in relation to the total costs in this sub-programme. In most of the cases in the AINO programme, high project costs have a relative high AINO funding amount. This does not apply for the project *'Intelligent transport at Heureka – a visit to the information world of transport'*. This project is funded with 10% of the total funding in this sub-programme whereas the costs from this project were 34% of the total project costs. So that means that the highest part of this project is financed outside the AINO programme. A comparison between the project costs and the AINO funding shows a high number of projects which are funded 100% by AINO. (E.g. the '*Real-time transport information architecture'* project with costs of €198.500 and a AINO contribution of the same amount).

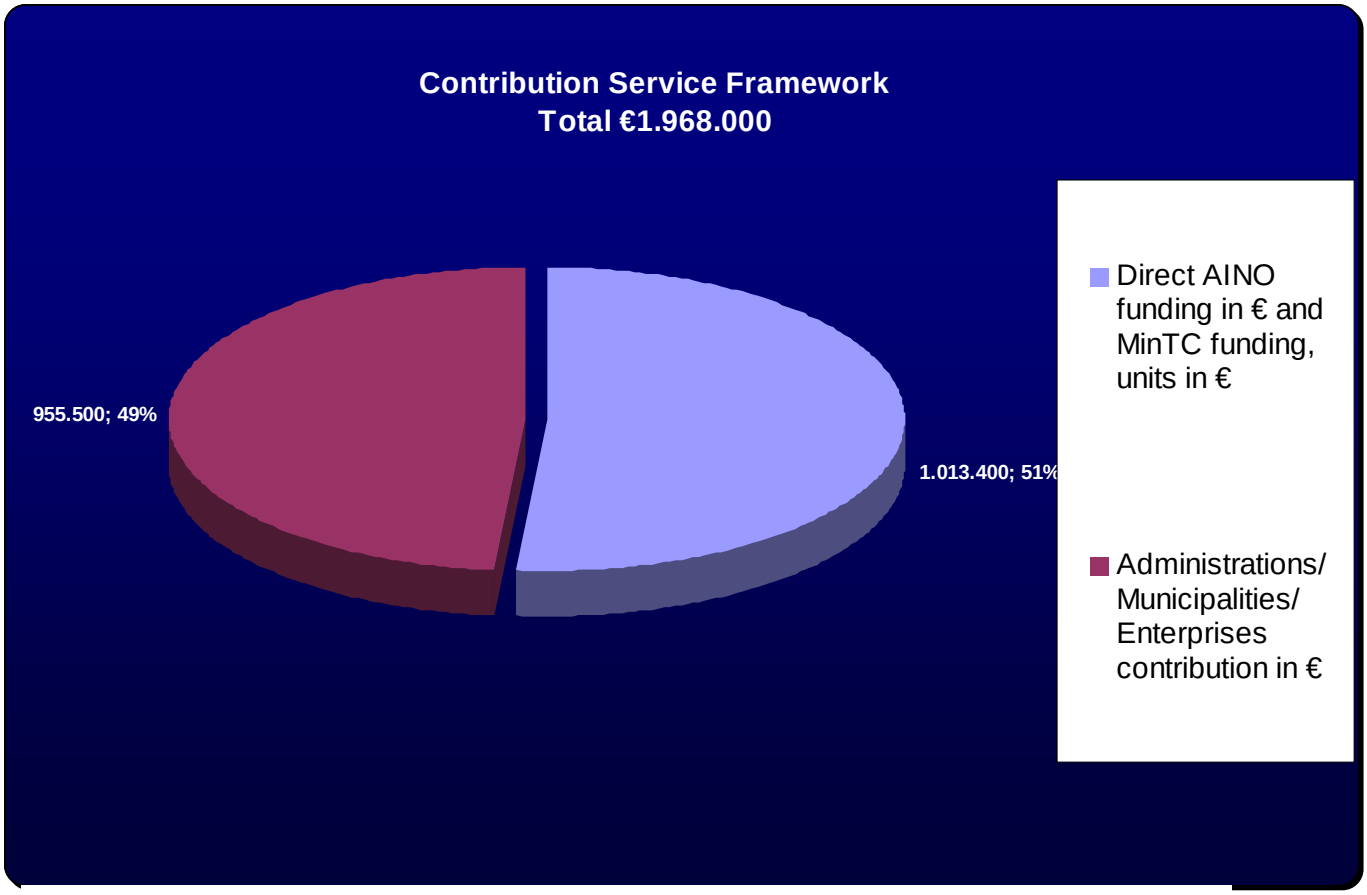

Figure 18

Contribution Service Framework sub-programme

The sub-programme Service Framework is for 51% funded by AINO and the Ministry of Transport and Communications and for 49% by other actors. Together with the Driver Support sub-programme this is the only sub-programme which has a higher AINO contribution than the contribution by other actors. This sub-programme includes the most projects which are fully (100%) financed by AINO, but that is not unexpected because the Service Framework is originally objected to solve legal, organisational and other problems that are common to the other four AINO sub-programmes.

8. Overall AINO programme assessment

The main questions that were put to the evaluators were as follows:

- Has the AINO programme reached its objectives as described at the start of the programme, in terms of promotion and prerequisite building for services utilising real-time transport information?
- Was the orientation of the programme successful in view of the global developments in ITS?
- How should the results of the AINO programme be best further exploited?
- How should the ITS R&D programme activities be continued bearing in mind the national continuum TETRA-FITS-AINO and the global development scenarios including European co-operation?

This chapter considers the first two items on this list. Chapter 9, the concluding chapter, is a consideration of items 3 and 4: i.e. how should the results of the AINO programme be best further exploited and what might follow on from AINO.

Note the original goal of AINO:

"The goal is to develop the collection, management and exploitation of real-time information and to create thereby prerequisites for ITS services improving the safety, efficiency and sustainability of the transport system while increasing the well-being of citizens and the competitiveness of Finnish companies."

8.1. General comments

AINO has fostered a network for persons interested in ITS to meet and share knowledge and interests in real-time multi-modal travel information. A strong ITS community has been formed with committed organisations. The programme also catalysed work among different sectors in Finland (including aviation). This networking function is significant, although from day-to-day the direct interaction between projects and sub-programmes appears to be rather limited. The international exchange of knowledge and experience is also somewhat mixed. Many of the projects have been performed in relative isolation. On the other hand, the eSafety projects of the AINO programme are very good examples of how international prominence can be achieved.

Although AINO clearly helped a number of companies to strengthen their position in ITS there is no direct proof that it has lead to an overall improvement of the competitiveness of Finnish companies. Some organizations succeeded in specializing in specific domains. This gives companies a potential improved position on the European market which can be exploited.

From several projects the reviewers received questions about the criteria on overall programme objectives. Apparently there was some uncertainty about the quality of their submitted proposal(s) related to the programme targets.

Re-organisation of the Ministry's programme was kept "away" from the projects. Nevertheless it had a clear impact on them. Roles and positions of the different organisations involved were not clear and even the objectives of the programme became less strong and clear. Projects felt insecure and not linked to any overall programme. However, these changes do not appear to have had an adverse effect on the delivery of results.

8.2. Promotion and prerequisites for services: main achievements

The message that comes forward consistently from the evaluation work is that AINO succeeded in bringing ITS forward in Finland. The availability of a source of funds earmarked for multi-modal real-time travel information gave a financial impetus to make things happen. AINO funds were instrumental in securing internal commitments in the organisations involved, public bodies as well as private. The result is that ITS is now on the agenda for a number of stakeholders who can lead full-scale deployment of multi-modal travel information services.

Services and service prerequisites developed during the programme were successfully demonstrated and (in parts) significant on international scale. Most activities have a focus on safety and a more efficient use of the network. Although the concrete impact is difficult to measure, AINO has clearly created the required commitment of organizations and started to define the basic required services.

Public Transport sub-programme

The results of the AINO-funded projects in public transport show positively in terms of user satisfaction surveys. The cost-benefit ratio for web-based mobile services are estimated to be very high. The information services themselves are becoming increasingly visible, for example real-time information at tram stops, and this raises public expectations for more route coverage.

Important progress has been made on

- Mobile payment (by GSM), first trials started using GSM
- Data exchange – like tram information at stations
- Movement towards real-time services

One of the key initiatives in this sub-programme is the development of the Helsinki metropolitan information centre that has a multi-modal approach. The approach chosen is strong and based on a publicly funded exploitation scheme. This is a direct consequence of how Public Transport is organised in Finland.

Goods sub-programme

This sub-programme covers topics of strategic importance:

- Organisation of the logistics chain for freight and commercial vehicles: this is however a very competitive domain making it difficult to fund research without encroaching on commercial sensitivities;
- Cross-border and port clearance procedures, which involve delays and administrative procedures involving serious costs for shippers.

Most of the projects are transferred to the EGLO programme, strongly reducing the influence and added value of AINO in this domain to pioneer developments in multi-modal information for freight. The impacts of sub-programme activities are therefore somewhat limited. It appears to be difficult to establish open-consortia demonstration projects and trials by way of an open call for proposals because of commercial sensitivities between the involved actors.

Network Status information sub-programme

In this sub-programme several exploitation schemes are tested and demonstrated. Projects in this sub-programme have not only demonstrated high level of knowledge but also succeeded in bringing research outcome towards deployment and exploitation. A more active dialogue and exchange of knowledge with other European players would have been of added value (for example through the Conference of European Roads Directors). More contact with other projects within the AINO programme dealing with exception reporting, network monitoring and data capture would have been mutually beneficial.

The project on Floating Car Data in Tampere has demonstrated feasibility of using new technologies for collecting traffic data. The concept should be further developed throughout Finland, enabling a more privately driven business model for the information delivery chain.

Driver Support sub-programme

Within this sub-programme strong, fundamental research has been performed. A very interesting cost-benefit analysis has been performed within the eCall project. Since most of the work covers research involved the actors involved are not so much focussed on the development of a business model. For bringing the work to a point where it is ready for full-scale exploitation further strong international involvement is required for strategic ITS technologies, in-car platform, standards, etc.

Service framework sub-programme

This sub-programme has a strong theoretical base, but is still in the process of being taken to practical conclusions. This is mainly because roles and responsibilities of partners are still in flux, making the role of different players unclear. Uncertainty over the most suitable business models for exploitation is also a factor. The sub-programme influence could have been enhanced by a more effective exchange of knowledge and experience across the different sub-programmes. VARO is one of the success stories with input from the Network Status and Driver support sub-programmes and is worth following to see if there are any general lessons. Partners in VARO succeeded in moving directly from a demonstrator into the exploitation phase.

In terms of a business model for exploitation, in the short-term publicly funded services are seen as the only real alternative by most projects, with some components out-sourced. Other, more privately driven exploitation schemes might be feasible but are not yet fully analysed.

8.3. AINO in the context of global developments

Programme Strengths

The level of knowledge throughout the whole AINO programme is high. Partners involved are aware of the technical details and fully capable to perform the projects. This is probably also why most of the projects succeeded in finalizing the work according to the plan. AINO has put ITS on the agenda of partners in Finland and has brought knowledge up to a high level making Finland a serious “ITS-partner“ on European level.

Programme Weaknesses

In the interviews with the selected projects we formed the impression that AINO has not reached its full potential as an integrated programme. Most of the work has been performed by self-contained consortia working in relative isolation. Exchange of knowledge and experience at the national level was limited to concertation meetings and the yearly AINO conference. There was relatively little contact with international projects. Direct links with international projects or partners were not established, apart from one or two good examples like the eCall project. We think interaction at EU level could have had positive impact on quality and spending by benchmarking Finnish R&D activities against reference projects elsewhere. These comments apply especially to innovative technologies like on-line traffic modelling and Floating Car Data as well as organisational aspects like the definition of business models and exploitation plans.

Opportunities

AINO has created a good base for further deployment of the information services. Knowledge is available, organisations are committed and the first investigations on user needs and requirements have been launched. Some specific knowledge has been developed of interest for countries facing low temperatures and bad weather situations. The developed monitoring technology combined with weather modelling can be an interesting export product. Broadening the scope towards a European market will create opportunities and enable the development business models of high commercial interest.

Threats

The lack of strategic partners and business plans for the further deployment and exploitation is a serious threat for the next step. This is less of an issue in metropolitan Helsinki, and more generally in the public transport arena, where the authorities have used AINO projects as stepping-stones to more ambitious deployment of passenger information services. But in all

sectors, including public transport, private companies need to be stimulated to invest in these new services and Public – Private partnerships need to be installed in those domains where risks or investments are too high for the private sector. This applies in particular to services which are not consumer led or market driven, such as emergency call procedures, and driver support for reasons of public safety; also for administrative services for the goods sub-programme (cross-border and at ports).

This also means that roles and positions of the involved actors need to be made clear. Public authorities should act conform a clear, predefined protocol, not entering into the market of the private sector.

Evaluation and Assessment

Project evaluation remains an important but difficult research area. Development of the AINO evaluation and assessment framework is a major step forward. The VARO Assessment project is of great interest here, because it is studying the effects of information services to develop a methodology for evaluating information services in general. The proposed methodology for post-hoc assessment will involve benchmarking the experiences of a sample of users against those for a control group, with a view to making assessments that are quantitative and data-based. Evaluation of VARO and the development of post-hoc assessment methodology have been held up because of delays in launching the service.

We agree with the VARO project officer that there is a world-wide lack of know-how for assessing the impacts on driver behaviour of these information services. The key issue is how to get messages to the correct target group of travellers, in particular vehicle drivers, at the correct point in their journey? It requires a successful combination of the right message, appropriate timing and a reliable means of delivery. Consumer research will yield useful qualitative information but the real challenge is to get convincing data on the economic benefits of information, and consumers' willingness to pay for personalised, added-value services.

8.4. Financial assessment

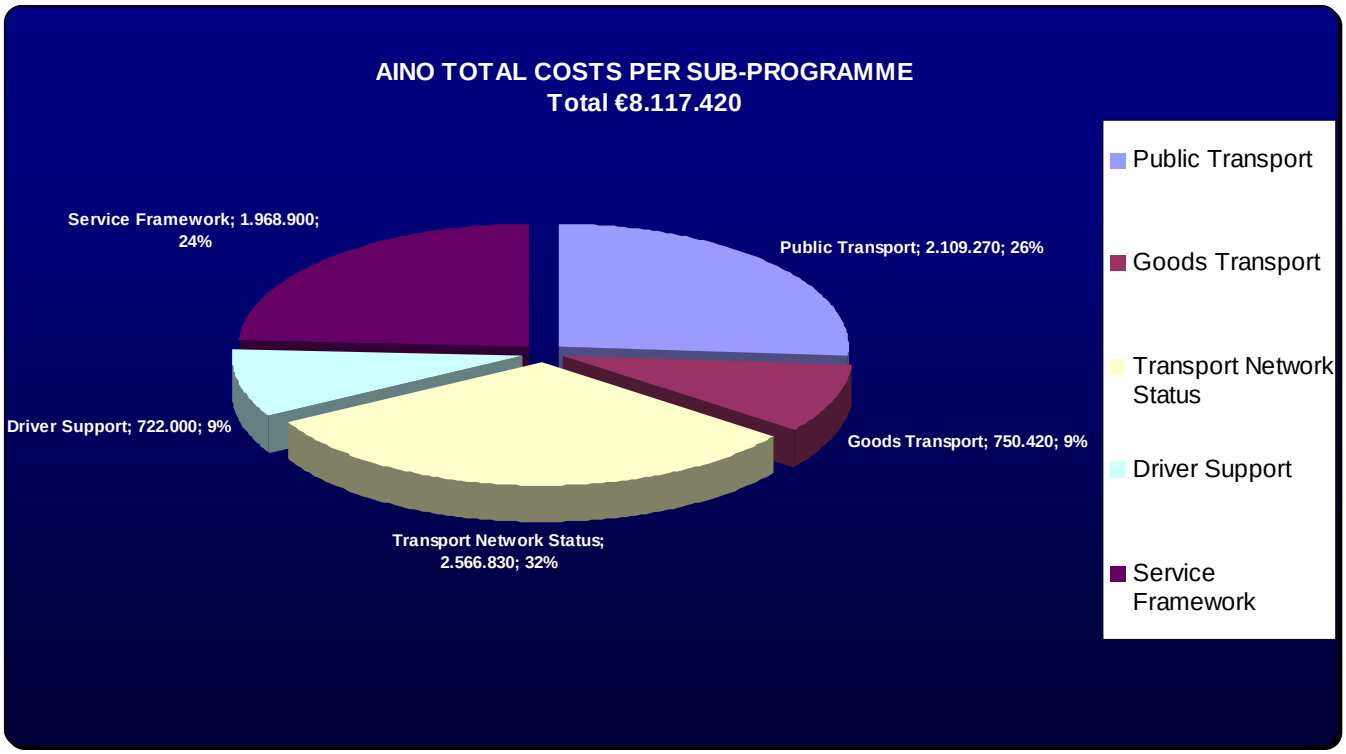

Figure 19

Total costs per sub-programme

In the diagram 'AINO total costs per sub-programme' the partitioning of each sub-programme related to the total costs of AINO is shown[7]. There are three 'major' and two 'minor' sub-programmes in the sense of the project costs. This, of course, is mainly caused by the number of projects within a sub-programme. Within the Goods Transport and Driver Support programme only a few projects (6 and 7 projects respectively) contributed to the total costs, as compared with the Public Transport, Transport Network Status and Service Framework sub-programme (16, 22 and 24 projects). Transport Network status absorbs 32% of the budget (€2.566.830) and is the sub-programme with the highest project costs, followed by Public Transport 26% (€2.109.270) and Service Framework 24% (€1.968.900). The Goods Transport and Driver Support sub-programme project costs are both much lower, at 9% of the total AINO costs (e.g. €750.420 and €722.000).

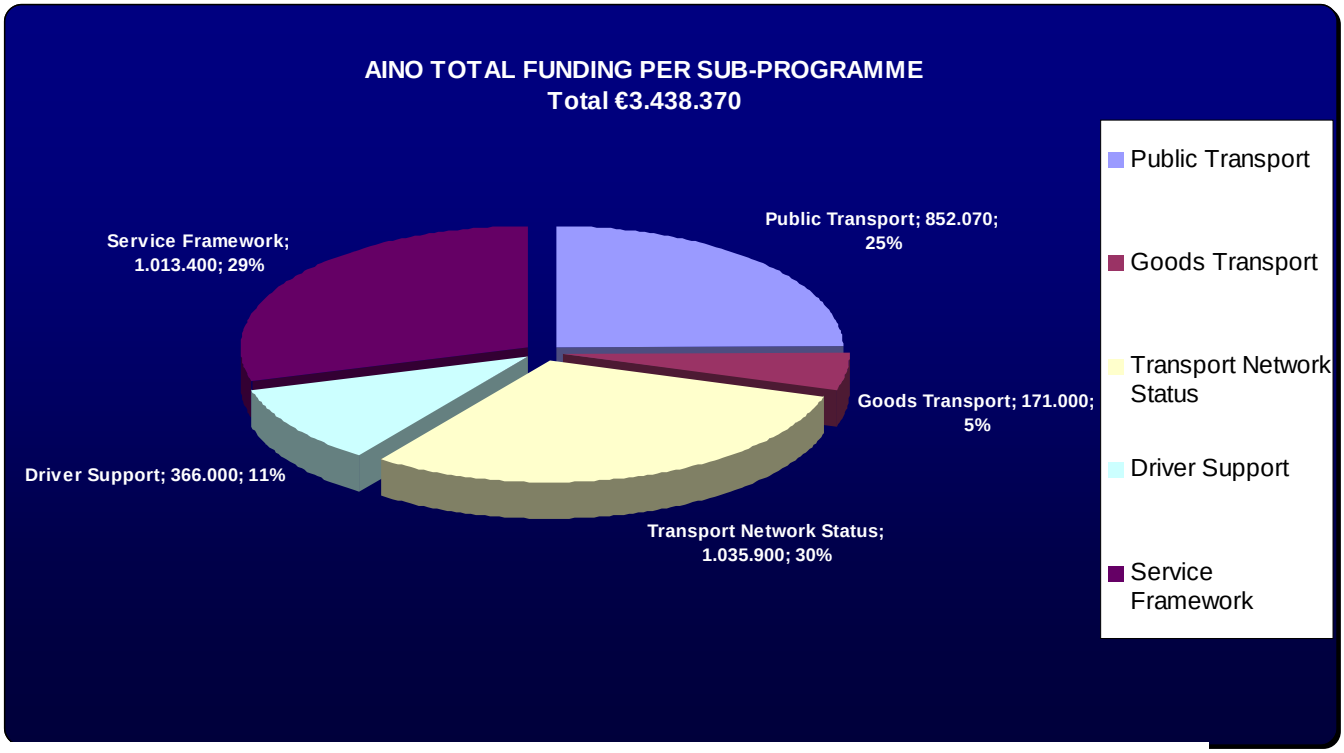

Figure 20

AINO Funding by sub-programme

Each project within a sub-programme is financed with investments from enterprises, municipalities and administrations or funded with direct subsidies from AINO. All these funding sources together determine the total AINO funding for the sub-programme. This is reflected in the diagram above. The total AINO funding (including al fundings from the Ministry of Transport and Communications) in the past four years is calculated around the €3.4 million[8]. The diagram above and the project costs diagram show that the share of AINO contribution over the different sub-programmes is in line with the total costs in the different sub-programmes. For example the Public Transport sub-programme; the total project costs are a fourth part of the total AINO costs and the same part is funded by AINO (in relation to the AINO total funding). There are two sub-programmes which have a slightly higher AINO funding, in relation to the project costs, than the other sub-programmes. This applies for Driver Support and Service Framework.

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[7] The AINO total budget is calculated at €8.117.420. This amount is excl. two projects who are not yet classified; *AIS - detecting and analysis incidents in the Baltic sea* €60.000 and *Pro Park - feasibility study* €7.000. When we sum up these projects to the total, the AINO total volume is €8.184.420 (without coordination and dissemination costs).

[8] this is not exactly to calculate because for some projects it is hard to determine whether the AINO contribution is directly paid or paid for example via the MinTC or a Road Administration

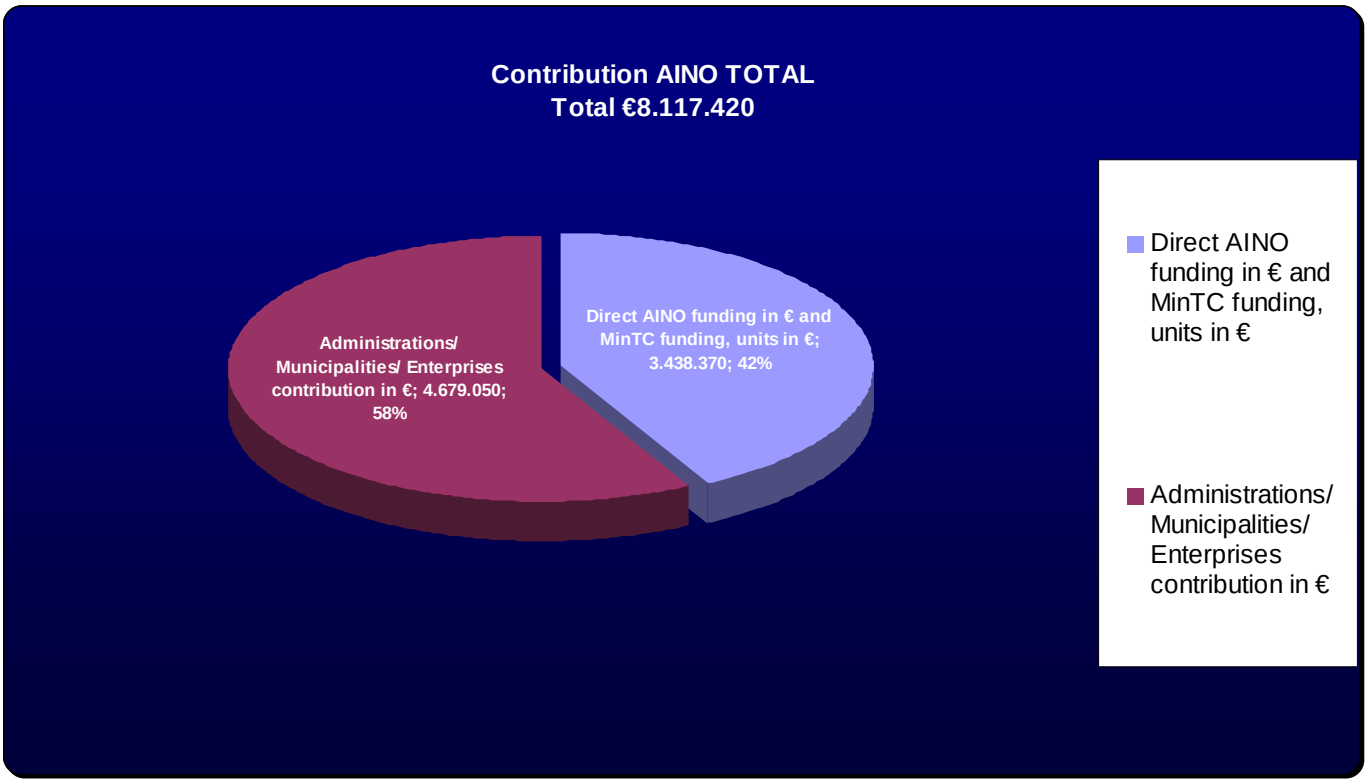


Figure 21

Reviewer comments

The programme's final total volume was ca. 9.0 million euros, 91.1 % of which was allocated to projects, 6.6 % to co-ordinating costs and 2.3 % to other running costs associated with the programme. The following is a statement of the coordination and dissemination costs.

Coordination and dissemination costs

AINO projects - Total volume		8.117,40
AINO coordination costs 2004 - 2007		593,7
Dissemination		204,7
AINO Total volume (1 000 €)		8.915,80
Not yet classified projects	*67,00* [9]	
AINO Total volume (1000 €)	*8.982.8*	

[9] Not yet classified projects are; *AIS - detecting and analysis incidents in the Baltic sea* €60.000 and *Pro Park - feasibility study* €7.000

9. Recommendations and considerations

This chapter considers how the results of the AINO programme can best be further exploited, and sets out to answer the question**:**

"*How should the ITS R&D programme activities [for Finland] be continued bearing in mind the national continuum TETRA-FITS-AINO and the global development scenarios including European co-operation?"*

It includes some thoughts prompted by the evaluation work concerning the continuation of ITS R&D programme activities in Finland.

9.1. Exploitation of results from the AINO programme

Considerable progress has been made in AINO on the concepts and methods involved in multi-modal real-time services, but the division of responsibilities of the public and private sectors is still unclear. There is interest in forming public-private partnerships, because of the potential for personalised added-value information services. At the same time, the public authorities see a need for information service in support of road network operations and urban mobility management.

Service frameworks

For the delivery of a service the complete service provision chain needs to be covered. Projects should therefore focus on trials and demonstration testing the effectiveness of this chain:

- Data acquisition
- Data fusion and processing (including Modelling)
- Information packaging
- Service delivery – communications and user interface

AINO has created the environment and facilities to create real-time information services. Some good and strong examples that already resulted in concrete exploitation can be mentioned:

- FCD project in Tampere;
- VARO;
- Helsinki metropolitan traffic centre,
- Transport information platform;

The needs and requirements of urban areas are complex. Initiatives such as those being considered for Tampere and the Oulu regions need further evaluation. The city of Tampere, for example, is being used as a model for other small and medium Finnish cities. It is particularly important for small cities that the Ministry funds the research on service framework and business models, and helps to define open interfaces which are useful to the whole community of authorities.

The positions and roles of the different actors should be defined and made transparent. It especially concerns positions of publicly-funded authorities like:

- Local authorities, municipalities;
- Finnish Road Enterprise (Destia);
- RHK Finnish Rail administration;
- Finnish Rail Agency;
- VR-National Railway operator;
- Helsinki City Transport, etc

Overall, several exploitation models are being tested in the AINO sub-programs. The public funded models are the most successful ones in Finland so far. Scopes should be broadened in order to make private funded models feasible. The general "rule" could be that public authorities will not deliver of services that could be delivered by the private market. We endorse the ASK€L project promoter's comments, as follows:

"Transport on-line services have not yet been utilised as a marketplace of other services and products. E.g. public transport fleet is widely used as a marketplace of the commercial sector. Commercial advertisements could bring some extra resource to be used as an extra resource to cover operational and development costs of services. Help of commercial partners could also enable new service elements. New innovative elements for business model are needed. New kind of information services can be offered for the citizens in order to avoid unpleasant surprises due to e.g. traffic incidents."

ITS Finland has an important role to play by providing a forum for key players to come together to share knowledge on the business and technical requirements. ITS Finland can also work with the Ministry to develop and refine the road-map for developing real-time information service in Finland.

9.2. Continuation of ITS R&D programme activities in Finland

The following recommendations can be made;

Promote a set of strategic projects

In the next programme a core set of targeted projects should be defined. A request for proposals should then be published based on functional specifications, covering the targeted project. This more focussed approach makes it easier for partners to make a proposal. For the delivery of a service the complete service provision chain needs to be covered. Projects should therefore focus on trials and demonstration testing the effectiveness of this chain: chain

- Data acquisition
- Data fusion and processing (including Modelling)
- Information packaging
- Service delivery – communications and user interface

There is a continuing need for pilot projects in the four biggest cities in Finland, so that users can appreciate the value and possibilities of real-time, personalised information services. There is also a continuing need to determine roles and responsibilities to develop and consolidate the information supply chain. Commercial players will not invest unless there is a clear understanding of the risks and a viable business model.

Public Transport sub-programme

For information services to be integrated across all the public transport modes there needs to be a strong focus for co-ordination. Development of a Helsinki Metropolitan Traffic Information Centre for the four cities of Helsinki, Espoo, Kauniainen and Vantaa provides the opportunity to create just that. A feasibility study for this project estimated start-up costs of €200,000 with annual operating and development costs of between €100,000 and €200,000. It would seem logical that further research and development of multimodal travel information services in the capital region should come under that umbrella, with the Helsinki City Authority (HKL), and the Metropolitan Area Council (VTY) involved in commissioning and monitoring the outcomes of further research on public transport information systems.

The following projects are proposed by the reviewers:

- Further development of the specification for multi-modal public transport information
    - Helsinki Met. Region Traffic / Travel Information Centre

- Roll-out to other urban areas & nation-wide

Goods Transport sub-programme

This sub-programme covers topics of strategically importance. The reviewers recommend to continue in line with the strategy chosen in AINO by moving all further activities regarding Goods Transport towards other programmes like EGLO. The AINO follow-up should put effort in an effective co-ordination with the Goods Transport programme and should monitor and stimulate the further developments on:

- Electronic clearance at ports and land frontiers
- Baltic ports logistics highway
- Organisation of logistic chain: this is however a very competitive domain making it difficult to steer and influence without disturbing the competition;
- Cross-border and port clearance procedures

Network Status information sub-programme

Especially in this sub-programme the issue of data capture and data-fusion should be further developed answering the question of how to combine data from the different sources (induction loops, radar, Floating Car Data etc.). Business models for Floating Car Data should be further developed by enlargement of the sites and European partnering.
Further research is required on road weather modelling. Apart from a follow-up action on ColdSpots, research on the use of friction measurements by car sensors can be of value.

Other items for further research and development in this sub-programme could be;

- Highway network operations
- Urban traffic management and control including scenario management based on on-line traffic modelling.

The experience and knowledge developed in the VARO project could to the opinion of the reviewers, be used by other projects more effectively.

Driver Support sub-programme

The acquired knowledge and experience in the Driver Support sub-programme is an excellent step for further development on ITS in Finland. The Driver Support sub-programme has a great potential to improve traffic safety and improve the productivity of individuals, though the reviewers think that international co-operation is inevitable here. Especially for the further development of eCall in Finland international cooperation is required. The main question to be answered here is how Finland will adopt and adapt core technologies required for this like:

- ITS Policy framework and architecture
- In vehicle sensors and service platforms
- Mobile handsets & nomadic devices (internet platforms)
- Digital mapping & positioning technologies (Galileo)
- Mobile wireless data transmission

Besides eCall further research and development is required in the domains of Environmental Applications, Urban traffic management and control and eSafety topics (CHVS/CVISN).

Service framework sub-programme

As already stated earlier the exchange of knowledge, experience and methodologies is of high added value. Not only from an efficiency point of view but also from the perspective of strengthening the ITS community feeling and to make outcomes and results comparable.

Main focus should be on development of common evaluation methodologies to support decisions on deployment (see also Recommendations for ÄLLI, the follow-on programme to AINO). User requirements and acceptance should be well treated.

9.3. Recommendations for *ÄLLI,* the follow-on programme to AINO

Fund Research as well as trials and demonstrations

Basically AINO has covered projects involving research, implementation and education. Research is mainly focussing on testing technologies enabling the further development of services. Research on new technologies is rather limited: ColdSpots, Railway warning system.

In the reviewers' opinion, 15 - 25% of budget should be allocated to real research oriented projects. Call(s) for proposals will be quite open, only indicating the domain in which research proposals can be submitted. This way unforeseen opportunities are covered and new, innovative research is covered.

Organise the evaluation of trials and demonstrations strategically

A substantial amount of budget should be reserve for evaluation to support decisions on deployment (5 - 10% of the budget). This budget could be allocated to the following domains:

- Development of business case for (multi-modal) information services;
  - Organisational capabilities;
  - How to engage strategic partners, already in the first, research phase.;
- Impact on political objectives and requirements for public investments;
  - Evaluation of the programme with respect to transport and industry policy goals and targets;
  - Impact assessment, quantitative estimates in changes in travel behaviour, travel times, based on statistical analyses;
  - User acceptance;
- Commercial service development ;
  - Market research to be performed by private sector;

Tendering procedures

The AINO programme had 4 open calls for tender in total. Proposals had to be submitted and were assessed against pre-defined criteria. This approach is quite strong in case fundamental research is required. As long as the main objectives are formulated clearly and the criteria are defined, new ideas and proposals can be submitted.
In case more structure is required and more concrete solutions, for further deployment are requested the approach of open – calls is more difficult. In the later case functional specifications need to be drafted in order to guarantee to receive proposals that give answer to the specific needs.

Coordination and Concertation

Interfacing and coordination is required with other programmes in order to prevent double work, diversion of solutions or blank areas of strategic value, not covered by any programme. Suggestions:

- Tekes programme
- Goods and Freight logistics
- Information Society / Knowledge economy

It is proposed to organise concertation not only on technical level but also on the programme goals and objectives. For example:

- How to manage the transition from research to full-scale deployment
- Benchmarking the position of Finland in European ITS
- How will Finland adopt and adapt core ITS technologies?

- Organisational capability for deployment
- Business model development
- Evaluation to support decisions on deployment

In order to enable development of exploitation schemes and commercial business models roles and responsibilities of public and semi-public organisations should be clearly formulated and communicated to the ITS partners. It mainly involves the role and position of:

- Local authorities
- Finnish Road Enterprise changed on 14th of February into Destia
- RHK Finnish Rail administration (public) and “Finnish Rail Agency” = rail safety organisation..
- VR-National Railway operator, Helsinki City Transport, etc

European cooperation

For several domains international coordination is required concerning European standards. It mainly concerns the following technologies:

- In vehicle sensors and service platforms
- Mobile handsets & nomadic devices (internet platforms)
- Digital mapping & positioning technologies (Galileo)
- Mobile wireless data transmission
- Electronic payment /micro payment
- Floating Vehicle Data

On other domains exchanging knowledge and experience with other countries, will give serious added value. European coordination is however also time-consuming and expensive. The following suggestions might be of use to find the right balance between the added value and the costs related to this international coordination:

- Organise national workshops with invited external participants;
- Organise “Scanning tours” for participants focussing on specific topics;
- Define a monitoring function for whole programme (EU-scanning manager?);
- Selective participation in international ITS events.

Projects might also be integrated or connected to the European Research programme (FP7). However partners should be aware that participation in these EU-projects causes some overhead.

Added-Value for Finland

It is suggested to define National test-site(s) in order to harmonize and co-ordinate work. It also gives a stronger value from a PR point of view. Instead of several small demonstrations throughout the country, 1 or 2 large demonstration sites will have more impact.

The following suggestions can be made to keep the programme on track:

- Selection of projects to be supported in independent objective manner
- Annual progress reports from projects
- Technical, financial, organisational
- Mid-term review of the programme
- Communication with projects on changes in strategy and priorities

10. Acknowledgements

The evaluators enjoyed working on the AINO programme. We were impressed by the level of knowledge demonstrated though the projects and pilots.

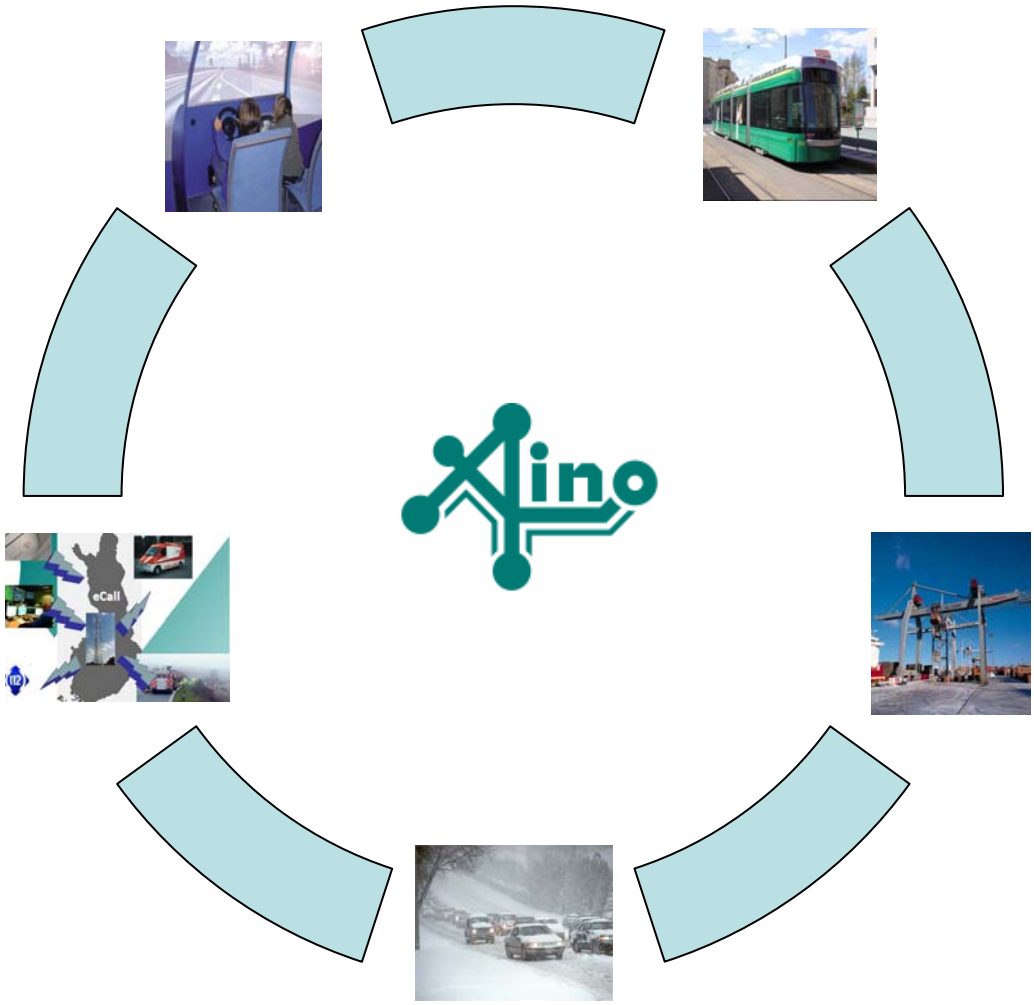
Especially the positive and enthusiastic attitude of the involved AINO actors kept us warm, even during the serious winter temperatures. They helped us a lot in getting a good inside view of the programme. We would like to thank all the partners for sharing their knowledge with us.

We would like to give special thanks to Risto Kulmala, Juhani Vehviläinen and Martti Makela for their support, organising the meetings and answering our sometimes difficult information requests.

Wim Broeders John Miles

Evaluation of the Finnish AINO Programme 2004-2007

Appendix



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Appendix A: Public transport information sub-programme

I. Interviewed persons

Ms Tarja Jääskeläinen, HKL, Helsink City Transport
Mr Marko Forsblom, Pöyry Consultants
Mr Kimmo Sinisalo, YTV, Helinki Metroplitan Area Council
Mr Manno Haapala, VR-Group Ltd
Mr Kimmo Turunen, RHK, Finnish Rail Administration (on behalf of sub-programme leader Kari Korela)

II. Sub-programme target impacts

Impact Target	**Projects reporting a strong (XXX) or serious impact (XX)**
Service level and performance of the transport system	• ELMI bus passenger information system (Helsinki) • Image recognition of bus line number • Mobile flexible working to promote P.T. • Information at stops and on-line in Jyvaskyla • Real-time information for the line connecting universities • Real-time information in Turku region • Tram traffic incident pilot
Costs of the transport system	
Prerequisites for business	• Information at stops and on-line in Jyvaskyla • Real-time information for the line connecting universities
Traffic safety	-
Others	-

Figure 1

III. Comment on sub-programme targets

The target of improving the service level and performance of the transport system is well covered by projects dealing with data capture, real-time incident monitoring, comprehensive traveller information services, and innovation in the delivery of information to users.

There are no reported projects which claim to target the costs of the transport system or traffic safety. This appears to be an omission from the public transport sub-programme that could be made good in a future research programme.

As regards prerequisites for business, the projects have been developed on the basis that they are an extension and adjunct to existing public transport operations, providing real-time information about the timings of services, incidents and delays.

IV. Projects for review

The following projects were drawn to our attention:

1. Continuation, further development and expansion of the tram traffic incident management pilot to include other modes of public transport in the Helsinki metropolitan area
2. Further development of the ELMI passenger information system
3. Virtual monitor
4. Mobile flexible working to promote the competitiveness of public transport
5. Rail traffic tracking and incident reporting and information

1. Continuation, further development and expansion of the tram traffic incident management pilot to include other modes of public transport in the Helsinki metropolitan area

Project summary

The Helsinki public transport incident information service aims to improve passenger information services in exceptional traffic situations. The incident information service best serves passengers if it covers all modes of transport in the metropolitan area.

The incident information service was first piloted in tram traffic. The initial pilot phase was six months (May-October 2004) which was then extended to get findings from a period that was likely to include more traffic problems due to bad road surface and weather conditions (November 2004-April 2005). Incident notifications are issued concerning disturbances that last 15 minutes or more.

During the pilot phase a registration service was introduced, allowing travellers to order automatic incident information bulletins to be sent to their mobile phone and/or e-mail. When registering, people choose if they want information on one line or more. During the pilot, the service was available free of charge.

Primary Impacts

- Improved public transport incident management or route choice
- More efficient public transport operation
- More efficient transport network incident management
- Development and piloting of innovative solutions

Secondary Impacts

- Change in transport infrastructure or vehicle fleet investments
- More efficient use of transport infrastructure
- Improved driver and vehicle support
- Promotion of non-motorised transports
- Promotion of standardised and generic solutions

Project exploitation plans

Helsinki city (HKL) and the regional authority (YTV) have investigated how the bus traffic exception reporting could be implemented. There are also plans to establish an information centre which provides information mostly about buses and trams but also about other transport modes in the Helsinki Metropolitan Area. Exception information would be one part of the service supply of the centre. The service centre would be organised by public authority in the first instance.

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	Public	Public	Public	Public	Public
Alternatives (See comments)	Shared	Shared	Out-source	Out-source	Out-source

Figure 2

Reviewers' comments

The exception information service has been carried out and developed mostly at the City of Helsinki's expense. Also The Finnish Rail Administration has contributed to costs (implementing and maintenance of disruption service in commuter train traffic).

The project has met its objectives by creating the basis for an information service which gives passengers real-time information about traffic exceptions. Customer satisfaction surveys and other feedback has been positive. There is the possibility of extending the incident information service to include commuter train, subway and bus traffic, as well as the ferries to and from Suomenlinna. The main challenge has been to get the different technical systems reading each other and there are still problems to be solved with the Helmi real-time system.

Exploitation of results will be by the city authority as part of a wider strategy to grow public transport patronage and shift people form using private cars. The positive results from these trials will help in justifying the budget for wider exploitation.

2. Further development of the ELMI passenger information system

Summary
ELMI is the real-time bus passenger information system for Southern Espoo. The original ELMI system, implemented mostly in 1998, was the first large-scale real-time bus information system in Finland. This multimodal service integrates real-time data from 3 different operational systems with planned timetable data. The service is a strategically important customer service channel for public transport service providers (authorities). The project consisted of software and hardware upgrades to the existing real-time information system to extend and improve functionality of the service, and expand the use and delivery of the real-time data to reach a larger number of passengers. This was done by implementing an open XML query interface on a dedicated server, creating 200 new virtual stops with predicted arrival times, and displaying the data on a www application.

The relevance to the AINO programme was mainly in the service improvements delivered, which represents a large part of working real-time bus information services in Finland. The implementation of a truly functioning interface between two existing systems by different providers was also something of a landmark in Public Transport telematics.

Primary Impacts
- Improved public transport incident management or route choice
- Improved passenger on-trip support

Secondary Impacts
- More efficient public transport operation
- More efficient use of transport infrastructure

Exploitation plans

The ELMI central system and onboard devices will be used until replacement by a new onboard information system, currently planned for implementation in 2009. Results from the AINO project are being used to plan upgrades and improvement to the system. The real-time display service for internet and mobile use "Omat lähdöt" will be promoted both for personal use (on desktop and mobile devices) and for institutional use (on video screens and other displays). The cost-benefit ratio for expanding the data delivery to reach more passengers via www and mobile services was estimated to be very high.

The data delivery interface on a dedicated server also allows for other (possibly commercial) applications, which could be developed to exploit the publicly available Real-Time data.

The repeated GPS signal in the Kamppi underground terminal will also be used to support other location-based systems, mainly the upgraded electronic ticketing system.

	Data Acquisition	Data Processing	Information Packaging	Service transmission	End-User Interface
1st choice (Project viewpoint)	Public	Public	Public	Out-source	Public
Alternatives (See comments)	Data pool	Data pool	Shared	Outsource	Shared

Figure 3

Reviewers' comments

The ELMI development project is a good example of how an established legacy system can be upgraded to take advantage of recent technological developments and deliver service improvements, in the process extending the service lifetime life of the original investment by 2 or 3 years. The upgrades were to enable extended system functionality, provide underground GPS signal repeater at the Kamppi terminal, improved onboard systems maintenance and diagnostics, an open real-time data interface and server and development of an HTML display application of existing stop displays, with 200 new virtual stop displays. These improvements were successful, leading to the technical reliability, utilisation rate and reliability of data transfer being increased, and to displays now getting updated more rapidly.

The strategic significance of the project is that it paves the way for a common strategy for the role-out of real-time multi-modal travel information across the Helsinki metropolitan region.

3. Virtual monitor

Summary
The aim of the project is to realise a user-friendly and inexpensive real-time public transport passenger information service that will provide easier access to real-time data no matter what the time or place. The objective is to create a public, multichannel personalised content service.

Based on a user's input profile, the online version of the Virtual monitor can produce e.g. timetables that can be put up in the lobbies of public buildings or posted on corporate intranets, detailing the timetable information for all public transport lines with stops in the vicinity.

The downloadable software for mobile phones is based on J2ME technology, which is supported by a large portion of mobile phones. The technology has finally allowed the provision of services based on downloadable mobile phone applications to the masses. Independent mobile phone applications have several benefits compared to SMS- or browser-based solutions, which require users to either remember complicated search phrases or to be connected to an online server at all times.

Primary Impacts

- Improved passenger on-trip support

Secondary Impacts

- More efficient use of transport infrastructure

Exploitation plans

No information on plans for this project was available to the reviewers.

Reviewers' comments

This is a proof of concept project which can pave the way for further developments. The project occupies an important position in the final stages of the traveller information delivery chain. There is potential to significantly influence journey choices through provision of user-friendly low-cost real-time travel information tailored to the location (for display on signs and screens) or personalised to the individual (for them to access on a mobile phone). Services of this type are springing up in various locations, for example Kizoom in London on behalf of Transport for London and the regional train operating companies. It is recommended the developers take note of international examples and keep track of emerging good practice, particularly in the way the user navigates the screens on-line or over a handset and in the way key information, like next bus timings is presented.

4. Mobile flexible working to promote the competitiveness of public transport

Summary
Flexible mobile work is defined as such work done during a daily, long distance commute that is considered as a part of person's official working time. This is a social innovation that can help to exploit the time used in daily commute. It has become possible in part because of new technologies. At the same time public transport gets added value and a competitive edge that passenger car cannot offer. The project was carried out as combined research study and pilot project. Altogether 21 people participated in the pilot for six months.

The main goal of this project was to increase the competitive edge of public transport compared to passenger car. The project received positive publicity for example in Finnish national TV news, radio news and newspapers (incl. Helsingin Sanomat). All together there have been about 20 different articles in newspapers and magazines.

To evaluate the possibilities and the need for further development there was a study conducted before and after the pilot. The study was sent via internet and it was aimed at both pilot persons and their employers.

The benefits of the pilot were reportedly unquestionable for the participating employees. They felt that the pilot arrangement had offered a significant improvement for their working time flexibility, total length of a work day and further for their everyday lives. Flexible mobile work had increased free time and improved private lives and social relationships. Furthermore, the employees felt that also their welfare, motivation and efficiency at work had improved. Also the employers experienced the pilot arrangement positive. The arrangement was described as viable and flexible. The employers felt that workers' welfare, motivation and efficiency at work had improved.

Primary Impacts

- More efficient use of transport infrastructure
- Development and piloting of innovative solutions

Secondary Impacts

- More efficient public transport operation
- Change in transport infrastructure or vehicle fleet investments

Exploitation plans

It is proposed that exploitation could be taken forward in the context of the Finnish "National Knowledge Society Strategy 2007–2015". Full-scale exploitation will depend on:

- Availability of reliable continuous broadband mobile internet connections on commuter trains
- Adaptation of rolling stock to allow commuters to use their lap-tops
- Agreement of the employers to flexible working practices
- Attention to privacy, data confidentiality and security risks for mobile workers

Reviewers' comments

This is a highly innovative project looking at how work patterns might be adapted to take full advantage of the possibilities for mobile tele-working, using broadband mobile communications. Quite correctly, the project has addressed the social, contractual and organisational aspects which are as important as the mobile communications and technology. All have to be demonstrated as fit for purpose. Reliable, high capacity mobile telecommunications are one part, but institutional factors, particularly the terms of employee contract in relation to flexible mobile work, will be decisive in how widely and how rapidly mobile flexible working will take off.

It makes sense for train operators to promote mobile flexible working. It offer the prospect of a real competitive advantage for rail travel over the private car, in terms of the utility of time spent on long-distance commuting and business travel. It also has potential for spreading peak-time travel, so that more journeys are made in the shoulder and off-peak periods. The advantages to regular commuters, in terms of time savings, are obvious. The benefits to the employer, however, are less clear. Results from this project will inform employers, rail operating companies and individuals contemplating starting mobile flexible working.

We note that VR has plans to introduce wireless LAN in their trains, but long-distance trains are likely to be equipped before the commuter trains.

5. Rail traffic tracking and incident reporting and information

Summary
In rail traffic, incident information is currently distributed only via the station displays and loudspeakers. The information dissemination through these channels is handled by the traffic control systems. The information reaches the customers only at the point of arrival to the station area. Pre-trip incident information has been found essential in several areas for raising the level of service of public transport.

The project is divided into two separate parts:

- monitoring the running of trains according to timetable, based on the JUSE train monitoring system of the Finnish Rail Administration
- incident detection, monitoring and processing for informing the end user through different channels

The second part of the project consists of incident management and information. In the VR head office, the national traffic control system registers incident data into a system created for this purpose. The VR Passenger Services communications centre processes the data into public information in at least three languages. The incident information covers all passenger traffic.

Primary Impacts

- Improved passenger on-trip support

Secondary Impacts

- More efficient public transport operation

Exploitation plans

Further development will include service production through different mobile channels either as a subscribed service or as single queries. Commuter rail service exceptions will be input to the multimodal travel information service for Helsinki, through a future metropolitan region travel centre.

Reviewers' comments

Development and operation of the exceptions reporting system is with the rail operating company, VR, which runs the trains. There is already an internet-based information service for national long-distance trains. An exceptions reporting system for local trains is of significance mainly for the Helsinki Region. This is what was tested in the project. AINO money provided the catalyst for developing new systems to augment the existing manual exceptions reporting. Development work post-AINO will be supported financially by the Finnish Rail Administration (RHK), the agency responsible for maintaining and developing the rail network for Finland. This development is an important part of the jig-saw of multi-modal information for the Helsinki region.

V. Project fact sheets

In this chapter all the received fact sheets for the Public Transport sub-programme are attached.

Continuation, further development and expansion of the tram traffic incident management pilot to include other modes of public transport in the Helsinki metropolitan area

Objectives of the project	
Originally formulated	**Comments**
To give passengers information about disruptions in the tram traffic through various channels and to expand the service also to the other public transport modes later. The planned information channels were sms, real-time timetable displays, internet and synthetic announcements in trams.	The service has been expanded to all other traffic modes than buses (trams, metro, commuter trains and Suomenlinna ferry). Buses are more difficult to implement but we are working on it. To get information to real-time displays and announcements is under construction.
Description of the work	
Exception information in tram traffic (pilot and follow-up pilot): coordinating of project, reporting; preliminary report on how to implement disruption information; technical definition and implementing the pilot project; maintenance of the service; new services (e.g. Internet and sms registration); report on how to expand the service to other traffic modes. (1.1.2003–30.4.2005) Maintenance of the exception information in tram traffic and expanding of the service: maintenance of the tram information; implementing metro traffic, commuter train traffic and the Suomenlinna ferry traffic; maintenance of all traffic modes included in the service; follow-up study and reporting. (1.5.–30.12.2005) From the beginning of 2006 the service has been carried out and developed without AINO-support.	
Results / Status	
Planned results	**Achieved results / comments**
Information service which gives passengers real-time information about traffic exceptions in public transport through various channels. The objective is to inform about delays of 15 minutes or more, both of sudden disruptions and exceptions known in advance.	The information chain does have some defects because it's not automated. Passengers don't get information about all exceptions which should be included in the service.
Context and Relevance to AINO programme	
The service collects, manages and utilises real time information in public transport and thereby improves efficiency and attractiveness of the public transport system. This raise for its part the share of public transport which increase sustainability of the transport systems and thereby improve well-being of citizens.	
Exploitation plan (after the project)	
The exception information service has been carried out and developed most at HKL's own expense. Also The Finnish Rail Administration has taken part in costs (implementing and maintenance of disruption service in commuter train traffic). HKL and YTV have investigated how the bus traffic could be implemented. There are also plans to found an information centre which provides information mostly about public transport but also about other transport modes in the Helsinki Metropolitan Area. Exception information would be one part of the service supply of the centre. At least at first the service centre would be organised by public author.	

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
103 + 154.5 = 257.5 + vat ≈ 314 K€	166.1 + 123.3 = 289,4 + vat ≈ 358 K€	≈ 128.7 K€	Costs increased because of new useful services.

Figure 4

Further development of the ELMI passenger information system

Objectives of the project	
Originally formulated	**Comments**
Enabling the system to stay functional at least until 2008	Yes, until 2009-10
Expanding the delivery of real-time data to integrated services and applications	Yes
Extending the service to larger share of passengers	Yes

Description of the work
The project consisted of software and hardware upgrades to an existing real-time information system ELMI (300 buses) to extend and improve functionality of the service, and of expanding the use and delivery of the real-time data to reach a larger number of passengers. This was done by implementing an open XML query interface on a dedicated server, creating 200 new virtual stops with predicted arrival times, and displaying the data on a www application. The system hardware and OS upgrades and the implementation of the data delivery interface and server were done by the original system provider Insta Visual Solutions, as well as installing a GPS signal repeater to the Kamppi underground bus terminal.. The integration of ELMI real-time data to the HKL www / mobile display application was done by the application provider Seasam. The project planning, procurement, testing, reporting and quality control was supported by Ramboll.Finland .

Results / Status	
Planned results	**Achieved results / comments**
Upgrades to enable extended system functionality	Yes, until 2009-10
Underground functionality in Kamppi terminal	Yes
Improving onboard HW maintenance w. diagnostic SW	Partially in use
Implementing open real-time data interface and server	Yes
HTML display application of existing stop displays	Yes, via HKL application ”Omat lähdöt” (www and mobile)
200 new virtual stop displays	Yes

Context and Relevance to AINO programme
ELMI system, implemented mostly in 1998, was the first large-scale real-time bus information system in Finland. However, the service delivery was limited to displays on just a few busiest stops. The cost-benefit ratio for expanding the data delivery to reach more passengers via www and mobile services was estimated to be very high. This also supported our plan to extend the technical lifecycle of the system. The relevance to AINO programme was mainly in the service delivered, which still represents a large part of working real-time bus information services in Finland. The implementation of a truly functioning interface between two existing systems by different providers was also something of a landmark in PT telematics.

Exploitation plan (after the project)
The real-time display service for internet and mobile use “Omat lähdöt” will be promoted both for personal use (on desktop and mobile devices) and for institutional use (on video screens and other displays). Currently this multimodal service integrates real-time data from 3 different operational systems with planned timetable data. This service is a strategically important customer service channel for the public transport service providers (authorities). The data delivery interface on a dedicated server also allows for other (possibly commercial) applications, which could be developed to exploit the publicly available RT data. The repeated GPS signal in the Kamppi underground terminal will also be used to support other location-based systems, mainly the upgraded electronic ticketing system. The ELMI central system and onboard devices will be used until replacement by a new onboard information system, currently planned for implementation in 2009.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
240 K Euro	270 K Euro	120 K Euro = 45 %	extra cost for service integration

Figure 5

Realisation of a high-quality local transport passenger information system in Jyväskylä

Objectives of the project	
Originally formulated	**Comments**
To offer high quality information on public transport in the Jyväskylä region.	Several passenger information systems are now in production. When comparing the quality and the overall cost of these systems to some other information systems that has been implemented (in other Finnish cities) before it is safe to say that this project has been really cost-effective.
Description of the work	
Planning and purchasing new information systems, including web and mobile services and new TFT-LCD displays both on bus stops and inside busses. All systems are planned to work in real time.	
Results / Status	
Planned results	**Achieved results / comments**
Purchasing new systems and displays in order to get better information for the passengers of public transport	Web and mobile services and a new display were purchased after the tender round from WM-data. The real time system with onboard computer and the indoor displays of the busses were purchased from Pusatec Ltd.
Context and Relevance to AINO programme	
AINO's main focus was in the real time systems and as an outcome of this project new innovations and real time systems were actually designed and build. Therefore, it is safe to say that this project represented the true spirit of AINO programme.	
Exploitation plan (after the project)	
The information systems are now in production and there are several new ideas to enhance these systems. The interfaces are open for third parties and the planned systems can be duplicated to other cities as well. From now on Jyväskylän liikenne (Jyväskylä transport) will update the required source material (information about routes, bus stops and schedules) to MINFO systems. All changes in MINFO are automatically delivered to the web services and to the bus stop displays.	

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
260 000 €	240 250	50 %	

Figure 6

Realisation of a real-time public transport information system in the city of Turku and in the whole Turku region

Objectives of the project	
Originally formulated	**Comments**
Develop a real time public transport information system using PT payment system as means to monitor buses.	

Description of the work
- To develop a new database for public transport routes and databases - to further develop the database to be able to manage real time tracking data from the payment system - to develop new passenger information systems utilising the data

Results / Status	
Planned results	**Achieved results / comments**
- new database - extended database using real time data - www-timetables - route planner - data transfer to national database - virtual monitor for mobile phones	ok ok ok ok ok ok The main problem in the project has been the delays in implementation of the PT payment system. This has caused major delays in the project. There was no contingency budget. Many relatively small needs for improvement have been identified during the project. It has been very difficult and sometimes impossible to implement them because we have not been able to increase the budget.

Context and Relevance to AINO programme
The project succeeded in demonstrating that real time passenger information systems can be developed with implementation costs that were much lower than in previous projects. The services have been taken into use and they improve the quality of Public transport and thereby promote the shift from private car to public transport.

Exploitation plan (after the project)
The services have been taken into use in Turke. The system makes it possible to extend the area of operation to cover the whole region (currently it covers the area of the city of Turku. New information services (e.g. real time bus stop signs) can easily be added utilising the same database.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
140 k€	approx. 200 k€	35 % (instead of the planned 50 %)	Delays (for reasons outside the project) increased the costs. Some cost items were not budgeted (e.g. implementing new signs on each bus stop to indicate the number of the bus stop.

Figure 7

Mobile flexible working to promote the competitiveness of public transport

Objectives of the project	
Originally formulated	**Comments**
The main objective of the project is to improve public transports competitiveness comparing to private cars in daily commutation. The other objectives were to develop a model for flexible mobile work in public transport in long distance commuting and to test it in practise. And in the case that test results are good, to promote this new social innovation for public.	The objectives were fully reached. The pilot was successful and the promotion got a good start.

Description of the work
Flexible mobile work is defined as such work done during daily, long distance commute that is considered as a part of person's official working time. This is a social innovation that helps to exploit the time used in daily commute. This has become possible because of e.g. new technologies. At the same time public transport gets such added value and competitive edge that passenger car cannot offer. The main goal of this project was to increase competitive edge of public transport compared to passenger car by means of flexible mobile work. The project was carried out as combined research study and pilot project. Altogether 21 people participated in the pilot for six months. The project was executed in two phases. In the first phase, the focus was in researching the possibilities and the potential of mobile telework in public transport. The themes of the research were long distance commuter traffic, teleworking and public transport vehicle as a working environment. The research phase also included an overview about legislation and technology concerning mobile teleworking in public transport. The result of the first phase was a general view of the demands and possibilities of mobile teleworking in public transport for a commuter and his employer. The second phase was a practice oriented pilot where 21 people were teleworking during their daily commuting by public transport for six months. There was an agreement made with both commuters and their employers that during the pilot it was possible to use public transport vehicle as an official working place. The commuters kept a diary, and the working hours they made during the commute were as good as the hours made in the office. To evaluate the possibilities and the needs for further development there was a study conducted before and after the pilot. The study was sent via internet and it was aimed at both pilot persons and their employers.

Results / Status	
Outcome of the project	**Achieved results / comments**
During the pilot, teleworking in public transport was experienced undisturbed and efficient. The benefits of the pilot study were unquestionable for the participating employees. They felt that the pilot arrangement had offered a significant improvement for their working time flexibility, total length of a work day and further for their everyday lives. Flexible mobile work had increased free time and improved private lives and social relationships. Furthermore, the employees felt that also their welfare, motivation and efficiency at work had improved. Also the employers experienced the pilot arrangement positive. The arrangement was described as viable and flexible. The employers felt that workers' welfare, motivation and efficiency at work had improved. The final outcome of the project was a general view of the possibilities of teleworking in public transport and the instructions for those who are interested about this new way of organizing the	During the pilot period some development needs were discovered. Development should be targeted at working conditions and telecommunications in public transport, and also particularly at information about teleworking while commuting, which influences heavily on prejudices against the matter. These matters need to be carefully noted in the future so that flexible mobile work can spread wider and some day reach a steady position as part of everyday working life.

work. One major result was that mobile teleworking became one of the proposals for measures in “The National Knowledge Society Strategy 2007–2015“ Mobile Teleworking in public transport has also been offered for employees as a new working method in some companies and public organizations for example in the City of Riihimäki, the Regional Council Häme and Ministry of Agriculture and Forestry.	

Context and Relevance to AINO programme

Our project is not a typical AINO –project and therefore its context and especially its relevance to AINO programme is difficult to define.

AINO programmes goal is to develop the collection, management and exploitation of real-time information and to create thereby prerequisites for ITS services improving the safety, efficiency and sustainability of the transport system while increasing the well-being of citizens and the competitiveness of Finnish companies.

In our project, the real-time information is considered to be any kind of information a passenger may need for working during a commute. So we are not dealing with transport information, but have thought the concept of information more widely than it was probably meant when defining the goal for AINO. But our final goal is altogether same; to improve efficiency and sustainability of the transport system while increasing the well-being of citizens and the competitiveness of Finnish companies.

Exploitation plan (after the project)

Our project has got quite a lot positive publicity for example in Finnish national TV news, radio news and newspapers (incl. Helsingin Sanomat). All together there have been about 20 different articles in newspapers and magazines.

There have also been some good examples in practise in introducing Mobile Teleworking in public transport in long distance commuting as mentioned before.

We are also looking forward to see how “The National Knowledge Society Strategy 2007–2015“ will be exploited in the near future.

Financial status

Planned costs	Final (expected) costs	% AINO Contribution	Remarks
80.000 €	80.000 €	62,5 %	

Figure 8

Real-time information services involved with the realisation of the public transport line connecting universities, phases 1, 2 and 3

Objectives of the project	
Originally formulated	**Comments**
Stage 1 : to find a quick and cheap way to implement a modern real-time bus information system to support the unique service profile and the partners involved in the Science Route project	Successful, led to implementation
Stage 3 : to evaluate the information system pilot,	Yes
to assess the feasibility of information display concept based on commercial infotainment and advertising,	Yes, partially
to compare different types of onboard displays, layouts and information content	Yes

Description of the work
1: pre-study of a project to implement a real-time bus information system that would allow participation and content creation by Science Route partner universities; visual design of the Science Line brand; bringing together parties interested in the pilot implementation 2 : functional and technical planning of the system integrating two technical providers; creating a new contract model for a short-term service / leasing pilot project; producing the information content and upload application for PT and the universities; applying the visual design; installing, configuring and testing the onboard devices, network and system software 3: evaluation of the technical and commercial success of the pilot by partner interviews, passenger surveys and cost/benefit analysis; assessment of passengers' opinions and preferences on real-time information delivery, onboard displays and commercial infotainment; evaluation of the public transport service offered by the Science Route

Results / Status	
Planned results	**Achieved results / comments**
- Finding a feasible non-traditional project model for a quick pilot implementation - info system: supporting the Science Route service brand and involving the universities - field testing a service / lease procurement model and a commercial infotainment concept - assessing passenger needs and attitudes	-pre-study: necessary for the project -implementation: successful, in time and at relatively low cost; good contributions from technical partners, just marginal from unis -evaluation: has provided needed insight to passenger preferences, technical solutions and business-model alternatives

Context and Relevance to AINO programme
Project brought a completely new approach to implementing information system in Finland; piloted features include the model for shared content creation, the business / contract model, the visual design and graphical display layouts, and some technical innovations. The stage 3 evaluation study has produced a lot of information about passenger preferences that have previously been researched only by hypothetical surveys. This will be very useful for future development of passenger information systems by the Helsinki region PT authorities, potential commercial service partners and operating companies.

Exploitation plan (after the project)
The pilot service will likely be extended to last until August 2008, when the Science Route bus operators' contract ends. At that point the information system may be either discontinued, transferred to new buses or replaced by another system implemented on a larger scale. The technical partners in the project (Indagon) are involved in a further pilot, which could lead to a new network architecture for the bus information and ticketing system in Helsinki region. The evaluation will be a basis for developing guidelines for onboard information systems, infotainment and advertising in the YTV area, as well as for applying flexible service contract models and PPP ideas to procurement of information and telematics systems. The study results will be disseminated in Finland and on European level through MoCuBa project, which has provided additional funding to stage 3.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
140 K Euro	160 K Euro	26 K Euro = 16 %	Extended pilot period

Figure 9

Improving the attractiveness of bus connections of the Helsinki-Vantaa airport

Objectives of the project	
Originally formulated	**Comments**
Promoting public transport by real-time passenger information at Helsinki-Vantaa airport. Also quite a few secondary objectives.	

Description of the work
The system functionality was designed, but project was discontinued because no feasible technical solution was available to implement the system. This is because practically all bus operators operate at the airport and it is not possible to place necessary equipment to all busses of all operators. Electronic tag identification is not enough for the needs of the system, communication between driver and the system was necessary.

Results / Status	
Planned results	**Achieved results / comments**
see above	see above

Context and Relevance to AINO programme

Exploitation plan (after the project)
Results are being used in the planning of the airport ground transport system so that the physical design of the area does not forbid planned functionality and later implementation of the system.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
14	10	50 %	

Figure 10

Image processing to improve public transport information

Objectives of the project	
Originally formulated	**Comments**
During the general planning of the Tapiola bus terminal it turned out that the planned passenger information system could be enhanced with pattern recognition technology. The main goal of this study was to find out whether existing licence plate recognition software could be used for the recognition of bus number plates.	The tested software (2) did not recognize any number plates not even when the parameters of the software were manually adjusted.

Description of the work
Work started as a preliminary study and the first objective was to learn more about pattern recognition techniques and existing software. The second phase was to conduct a pilot study in Tapiola bus terminal. The pilot system in Tapiola consisted of a camera, a passive infrared detector and a central unit, in which the licence plate recognition software was installed. The passive infrared detector was used as a trigger for the camera: when a high vehicle entered the bus lane it was detected by the passive infrared detector and the photo of the oncoming bus was saved into system's hard drive.

Results / Status	
Planned results	**Achieved results / comments**
To find existing recognition software that would recognize more than 95 % of the busses approaching the Tapiola Terminal.	Although all possible modification was made for the software, the recognition rate was 0 % during the whole study period. After the pilot study the recorded pictures were transferred to another licence plate recognition software but the recognition rate remained still as 0 %.

Context and Relevance to AINO programme
The idea of finding and using new technology in passenger information systems fully supports the main principles of AINO program. Although the final result of the pilot study was poor there is now a better possibility to develop new recognition software since during the study thousands of pictures of the number plates were taken and saved.

Exploitation plan (after the project)
The development of a new recognition software for bus number plates would cost somewhere between 25 000 to 100 000 euros but there are no guarantees of the reliability of the software. In addition, none of the possible software suppliers committed for developing the software. Because of these factors of uncertainty on the tender process of the new passenger information system of Tapiola bus terminal it is not possible to ask for a system that is solely based on the pattern recognition process. It is recommendable, however, to ask as an option for an additional feature that would add the pattern recognition process into the information system. Technically it would be possible to extend the pattern recognition based information system for other terminals, signal priorities and for real time monitoring in the line sections but financially these extensions are not recommendable. The costs will increase almost linearly when adding new monitoring points for the pattern recognition based information system.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
35 000 €	35 000 €	50 %	Pilot (equipment, work) 10 000 €, Study 25 000 €

Figure 11

Appendix B Goods transport information sub-programme

I. Interviewed persons

Antti Arkima, Finnish Maritime Administration
Lassi Hilska, Ministry of Transport and Communications

II. Sub-programme target impacts

Impact Target	Projects reporting a strong or serious impact
Service level and performance of the transport system	• KULTIS – Digitising of goods transport information – electronic bill of loading • Further development of the TERMIS service • PORTNET 2 – functional feasibility study • PortNet2 – Technical feasibility study • RFID roadmap for logistics
Costs of the transport system	• KULTIS – Digitising of goods transport information – electronic bill of loading • Further development of the TERMIS service • PORTNET 2 – functional feasibility study • PortNet2 – Technical feasibility study • RFID roadmap for logistics
Prerequisites for business	• Further development of the TERMIS service • RFID roadmap for logistics
Traffic safety	-
Others	• Further development of the TERMIS service

Figure 12

III. Comment on sub-programme targets

The projects in the Goods Transport sub-programme mainly focussed on the service level of performance of the transport systems and the costs of the transport system. In the view of the reviewers PortNet also has (indirect) impact on Traffic Safety. The prevention of accidents was one of the reasons for the European Parliament to develop a Directive on the establishment of a Community vessel traffic monitoring and information system (2002/59/EC). PortNet contributes strongly to this European objective.

IV. Projects for review

Although this sub-programme is of strategic value, especially the organisation of the logistic chain, there appeared to be only basis for a view projects. Competition between actors in the logistic chain made it difficult to have more projects in this sub-programme.
PortNet2 and TAPANI can be seen as main projects in the sub-programme. However TAPANI is fully managed by the EGLO programme (co-funded by AINO), the evaluators didn't receive any detailed information on this project except the project summary.

The following projects were drawn to our attention:

1. KULTIS – Digitising of goods transport information – electronic bill of lading
2. PORTNET 2 – functional feasibility study
3. PORTNET 2 – Technical feasibility study

1. KULTIS- Digitising of goods transport information- electronic bill of loading

Project summary

The objective of this project was to identify and prioritise the digitising needs and development stages (e.g. what has already been digitised and which actions are currently being carried out, such as the electronic transport order) of goods transport information. The case study examined what the bottlenecks associated with the introduction of the electronic bill of loading were, what technical solution is applicable and how the introduction process may go.

The final, overall objective is to create an electronic bill of loading approved by all parties that will standardise the information content and presentation of information on these documents. The work was started by user interviews of 14 organisations from different sectors utilising waybill: Transport/logistic operators, industry, wholesale, software developers, Customs etc

Next phase was the creation of comparison and mapping table of existing waybill documents (standard document/electronic equivalences/messages) and class diagram of waybill information contents. The final result of the project was data definition for electronic waybill based on UBL v.1.0 specification.

Primary Impacts

- More efficient use of transport infrastructure
- Improved logistic chains and deliveries
- Promotion of standardised and generic solutions

Secondary Impacts

- More efficient transport network incident management
- Improved driver and vehicle support

Electronic waybill is one link in the chain of electronic documents for transport. In developing the operation to electronic mode the matter is not only changing the paper documents into their electronic equivalents, but at the same time developing processes and procedures within the logistic chain.

Exploitation plans

The results was published as a project report in electronic and paper form as well as distributed all interested parties through www-pages. These results were also further utilized as an input in subsequent project: KULTIS- testing service for electronic waybill, in EGLO-programme financed by MinTC. This project is also finalized and testing service is up and running in TIEKEs www-pages. Several articles of the outcome and project itself was published in company periodicals as well as presented in domestic and international seminars and workshop forums e.g. UN/CEFACT Forum.

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	-	-	Shared	-	-
Alternatives (See comments)	Public	Public	Shared	Shared	Shared

Figure 13

Reviewers' comments

The project has delivered its work according to the original plan. It mainly concerned data definition and system specification. The research component mainly focussed on the investigation on needs and requirements. This is done by means of interviews.
The outcome is taken up in the EGLO programme and resulted in a first demonstration.
The business model as foreseen by the project focuses on public funding in the data acquisition level. This is mainly because the service will contain data of commercial value (from competition point of view).

2. PORTNET2

Project summary
PortNet is an integrated system unit used by the authorities, ports and private actors, which aims to increase automation in the management and exchange of information between parties in shipping and maritime transport. The current PortNet system generation was introduced in early 2000, and has been developed further since. The amount of PortNet users has increased significantly since then, and the system currently has more than 1,000 users e.g. at Finnish Customs, the Finnish Maritime Administration, ports, the coast guard and forwarding agencies.

PortNet is of special importance related to the Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 on the establishment of a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC [Official Journal L 208 of 05.08.2002]. This directive concerns the setting up of a Community vessel traffic monitoring and information system that helps to prevent accidents and pollution at sea and to minimise their impact on the marine and coastal environment, and on the economy and health of local communities.

Within the AINO programme two PORTNET 2 studies where funded:

- Functional feasibility study
- Technical feasibility study

Functional feasibility study
The functional feasibility study defined the functional requirements of the PortNet 2 system. The feasibility study has been funded by the AINO Programme and the Finnish Maritime Administration and realised by EDI Management Ltd consultants Irmeli Rinta-Keturi and Pekka Rautiainen. The assignment was completed in early 2005.

Technical feasibility study
The aim of the technical feasibility study was to roughly define the PortNet 2 system's goal architecture, which defined the subsystems, the interfaces between the subsystems, the interfaces with external systems and the recommended standards and technologies. The objective was to define a solution that utilises open standards, not tied to the competence of one provider, but that has taken compatibility and uniformity with other choices of the Finnish Maritime Administration into consideration.

Primary Impacts
- Improved logistic chains and deliveries

Secondary Impacts
- More efficient use of transport infrastructure
- More efficient transport network incident management

It is already known that the service will be taken into use and its impacts on the port environment are well known from a previous study based upon the present PortNet system.

The system has been largely presented on international fora and the unanimous opinion seems to be that Finland is a pioneer in this field compared to other countries.

Exploitation plans

The outcome was used in the call for tenders on the PortNet 2 building project, which constituted two parts, design and building. A contract was awarded and the design process has been completed on the basis of the pre-study. Because of financial reasons the building phase was deferred to the beginning of 2007.

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	Fully Public	Fully Public	Fully Public	Fully Public	Fully Public
Alternatives (See comments)	Fully Public	Fully Public	Public	Shared	Shared

Figure 14

Reviewers' comments

PortNet has been successful within the AINO programme. Both feasibility studies concern a further upgrading of the existing system. Work therefore mostly focuses on system design and development and not so much on research. PortNet is being handled as a public service focussing on improvement of the transport system. Although the main service could be looked upon as a public service, especially the transmission and the final user interface could be shared areas. The basic interface should be public but some more dedicated solutions might be introduced giving space to the private sector. It is however a service that should become available and be made accessible for all users (see also remark in project summary on Directive 2002/59/EC on the establishment of a Community vessel traffic monitoring and information system).

V. Project fact sheets

In this chapter all the received fact sheets for the Goods Transport sub-programme are attached.

KULTIS – Digitising of goods transport information – electronic bill of loading

Objectives of the project	
Originally formulated	**Comments**
The focus of KULTIS –project was to study needs, priorities and possibilities for electronic transport documents and their implementation, using electronic waybill as use case. The ultimate goal is commonly agreed definition for data contents of electronic waybill.	

Description of the work
Electronic waybill is one link in the chain of electronic documents for transport. In developing the operations towards electronic mode the issue is not only changing the paper documents into their electronic equivalents, but at the same time developing processes and procedures within the logistic chain. The work was started by user interviews of 14 organisations from different sectors utilising waybill: Transport/logistic operators, industry, wholesale, software developers, Customs etc Next phase was the creation of comparison and mapping table of existing waybill documents (standard document/electronic equivalences/messages) and class diagram of waybill information contents. The final result of the project was data definition for electronic waybill based on UBL v.1.0 specification.

Results / Status	
Planned results	**Achieved results / comments**
	The outcome of the project was according to the planned results

Context and Relevance to AINO programme
Electronic waybill is one link in the chain of electronic documents for transport. In developing the operation to electronic mode the matter is not only changing the paper documents into their electronic equivalents, but at the same time developing processes and procedures within the logistic chain. Transport order provides a solid base for creation of data content for electronic waybill. The effective use of transport order (and order confirmation) could be one step towards streamlined processes and the publication of waybill could be transferred from consignor to logistic operator or even abandoned. The information content of electronic waybill defined in this project includes in addition to traditional waybill some new data elements helping the physical delivery of goods like enhanced information on parties and their contacts as well as information on locations and status of the delivery. Technical development, e.g. RFID-tags, ensure the possibility to have updated tracking and tracing information on delivered goods in the future. E-Invoicing is also coming more and more popular in companies of all sizes. Electronic waybill is one step further towards fully electronic operations.

Exploitation plan (after the project)
The results was published as a project report in electronic and paper form as well as distributed all interested parties through www-pages. These results were also further utilized as an input in subsequent project: KULTIS- testing service for electronic waybill, in EGLO- programme financed by MinTC. This project is also finalized and testing service is up and running in TIEKEs www-pages. Several articles of the outcome and project itself was published in company periodicals as well as presented in domestic and international seminars and workshop forums e.g. UN/CEFACT Forum.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
60	60	83	

Figure 15

Further development of the TERMIS service

Objectives of the project	
Originally formulated	**Comments**
To improve the usability of Termis service by additional features like adding ports as users to Termis. (Termis is the procedure transmitting electronically the terminal advices from the shippers and their representatives to the port operators, ports and customs. Of export containers entering the port, Ports port operators and customs use the terminal advice for the operational and administrative purposes. Termis is based on the harmonised terminal advice, which has been created in the cooperation between port operators, customs and ports partly financed by FITS.)	Termis as a service exists as a result of a project partly financed by FITS.

Description of the work

Additional features:

1. Making of ports a new user role to Termis service
2. Making a style sheet to show the XML messages in the web browser
3. The acknowledgement of the XML messages
4. To realise the sending of XML messages to the ports

Results / Status	
Planned results	**Achieved results / comments**
One of the planned results, though implicitly stated, was to get the use of Termis started as a tool for transmitting the terminal advices to the relevant parties, port operators, customs and ports as an alternative to a fax. The starting was planned to be initiated with the cooperation of the members of the project group (main port operators, main ports).	The new features were implemented, tested and found to work though the style sheet The style sheet was realised later on. Termis as a service exists in the PortNet environment. The terminal advice can be made with the help of Termis and printed out in the paper format accepted by the customs. Once the interested parties with the real motivation are found, the full implementation of Termis, which also includes the electronic sending and exploitation of the data, can be started as an alternative of the faxed terminal advices (number of faxed terminal advices 150000 per annum in Finland).

Context and Relevance to AINO programme

Termis is connected to PortNet system, to which it shares similarities. Termis also uses the registers provided by PortNet.

Also in PortNet first a standardised form was developed to inform the relevant parties of ship arrivals and ship departures, and then it was brought to an electronic form. Customs helped in the promoting of PortNet by standardising the rules of transmitting the information. The regulatory PortNet information included also pre arrival and pre departure notifications to improve the overall logistics.

Termis also uses the registers provided by PortNet.

Termis was also recommended to include in to the PortNet 2 phase (See PortNet-2 preliminary technical study, an Aino project as well).

Exploitation plan (after the project)
There is a fear that Termis remains as a tool with no real use. Although many parties see the potentials of Termis, it has not even reached the pilot phase. Customs could act as an administrator for Termis in the pilot phase if interest is found for piloting it. In the long run the administrator however has to be found from other parties to whom Termis is of vital interest, terminal operators and port or their representatives. Termis service is also in the shippers' and forwarders' interest and the administrator can principally come from their side as well. It can be added that Termis can be used to inform the relevant parties of the trailers as well, not only the containers. Customs is building its own electronic export system Elex. Customs needs for exit control information of the containers export clearance before they reach the port terminal. This information can be given to the port operator by using Termis as one possible solution. The operator in turn sends this information to the customs for exit control and possible exit checks in the port. The development of the exit control system however has not been started yet.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
10.44	10.44	50 %	

Figure 16

PORTNET 2 – functional feasibility study

Objectives of the project	
Originally formulated	**Comments**
To produce a preliminary study on the functional requirements of PortNet 2. The study is supposed to constitute the first phase of the maritime traffic database building project called PortNet 2 and to be included as a tender requirement. PortNet 2 is succeeding the present PortNet system and is a single window application for collecting all the authority notices at the arrival and departure of ship into/in ports.	Objectives were reached.

Description of the work
The study was supposed to be the basis of the design phase of the PortNet 2 building project. In the telematic architecture project MeriArkki the creation of PortNet 2 was anticipated and one of the requirements was that MeriArkki should be accounted for in the preliminary study. Also the latest developments in the field of Custom's were supposed to be accounted for. A part of the study was to interview end users and to include their views in the study. The study was limited to the functional requirements. Another AINO prestudy concentrated on the technical requirements.

Results / Status	
Planned results	**Achieved results / comments**
The planned result was that the outcome that would constitute a useful basis for the design phase of the PortNet 2 project, containing the latest requirements and developments in this field.	The result was achieved and the result was used as described. The design phase was conducted on the basis of the study.

Context and Relevance to AINO programme
The project is a good example of a project that is a part of an important single window public service project. It is already known that the service will be taken into use and its impacts on the port environment are well known from a previous study based upon the present PortNet system. The system has been largely presented on international fora and the unanimous opinion seems to be that Finland is years ahead in this field compared to other countries.

Exploitation plan (after the project)
As described above, the outcome was used in the call for tenders on the PortNet 2 building project, which constituted two parts, design and building. A contract was awarded and the design process has been completed on the basis of the prestudy. Because of financial reasons the building phase was deferred to the beginning of 2007.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
19 k€	19 k€	50 %	

Figure 17

PortNet2 – Technical feasibility study

Objectives of the project	
Originally formulated	**Comments**
To produce a preliminary study on the technical requirements of PortNet 2. The study is supposed to constitute the first phase of the maritime traffic database building project called PortNet 2 and to be included as a tender requirement. PortNet 2 is succeeding the present PortNet system and is a single window application for collecting all the authority notices at the arrival and departure of ship into/in ports.	Objectives were reached.

Description of the work
The study was supposed to be the basis of the design phase of the PortNet 2 building project. In the telematic architecture project MeriArkki the creation of PortNet 2 was anticipated and one of the requirements was that MeriArkki should be accounted for in the preliminary study. Also the latest developments in the field of Custom's were supposed to be accounted for. A part of the study was to interview end users and to include their views in the study. The study was limited to the functional requirements. Another AINO prestudy concentrated on the functional requirements.

Results / Status	
Planned results	**Achieved results / comments**
The planned result was that the outcome that would constitute a useful basis for the design phase of the PortNet 2 project, containing the latest requirements and developments in this field.	The result was achieved and the result was used as described. The design phase was conducted on the basis of the study.

Context and Relevance to AINO programme
The project is a good example of a project that is a part of an important single window public service project. It is already known that the service will be taken into use and its impacts on the port environment are well known from a previous study based upon the present PortNet system. The system has been largely presented on international fora and the unanimous opinion seems to be that Finland is years ahead in this field compared to other countries.

Exploitation plan (after the project)
As described above, the outcome was used in the call for tenders on the PortNet 2 building project, which constituted two parts, design and building. A contract was awarded and the design process has been completed on the basis of the prestudy. Because of financial reasons the building phase was deferred to the beginning of 2007.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
21 k€	21 k€	50 %	

Figure 18

RFID roadmap for logistics

Objectives of the project	
Originally formulated	**Comments**
Describe the possible RFID development paths in logistics applications with Roadmap method. The study method consists of the following phases: The state-of-the-art, a vision for the period of next 5 to 10 years, description of the RFID world such as business, drivers, trends, breakthroughs and actions of the market leaders. All these lead to actions needed for the next years	

Description of the work
A four step model (developed by dr. Ventä at VTT) was used to build up the vision. The needs and requirements of Finnish enterprises have been studied by internet enquiry and a workshop. In May 2006 a survey was sent to 120 domestic actors who have participated in different logistics RFID projects, research programmes and pilots. The target of this survey was thereby selected group of experts who had earlier experience about RFID. Altogether 49 replies were received. Of the respondents 30 were end users, 12 RFID service suppliers and 4 others. 3 respondents did not give their background information. The organised workshop identified and evaluated logistics applications of RFID systems. The workshop dealt with the vision, state-of-the-art and further steps towards the vision. There were 11 RFID experts in the workshop. The state of the art report based on earlier studies done by VTT a lot of new literature was used to update it.

Results / Status	
Planned results	**Achieved results / comments**
RFID Vision 2015	Done and accepted by the project steering group
Description of the steps to the vision	Done; Three steps were formulated (2007-2009, 2010, 2013) with some additional remarks
Description of benefits of RFID implementation	Done by the enquiry and workshop
Description of bottlenecks and risks	Done, based on several earlier pilots and case studies
Proposals for actions	Done by the workshop

Context and Relevance to AINO programme
The objective of AINO sub programme “Freight transport “ is to improve the management of deliveries and deviations in them, and to promote the use of paperless logistics chains independent of the transport mode or operator. The implementation of RFID technology is a key topic globally in freight transport. Big players as Wal-Mart, Metro Group, Marks & Spencer and Tesco, as well as the US Department of Defence, have required their largest suppliers to provide logistic units (pallets), sent to specific distribution centres, with RFID tags. RFID will be big business in freight transport; already now new Finnish service companies have entered the national and global RFID market

Exploitation plan (after the project)
- Feedback to all who answered to internet enquiry - Paper and presentation at ITS World Congress 2006 (already done and published) - Presentation at the Finnish GS1 (done) - Presentation at the forest industry seminar in February 2007 - Article in the Finnish food magazine (Kehittyvä elintarvike) 5/06 The results give the potential users and service providers a good basis to evaluate the business potential and services needed. Public sector (especially Ministry of Transport and Communications) should we active in order to standardise and harmonise the technology and business processes. This would prevent the born of different, non interoperable systems.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
26000€	26000€	100%	

Figure 19

Appendix C Transport network status information sub-programme

I. Interviewed persons

Tomi Laine, Strafica
Kari Sane, Helsinki City Planning Departement
Juha Laakso, Infotripla
Raimo Tapio, Finnish Road Administration
Jussi Kiuru, Finnish Road Enterprise
Leila Maiche, Meteorological Institute

II. Sub-programme target impacts

Impact Target	**Projects reporting a strong or serious impact**
Service level and performance of the transport system	• Ramp control, phase 1 – feasibility study, general and implementation plans • ONNIMANNI – Real-time modelling and performance monitoring of the urban transport network • ONNIMANNI 2, Real-time modelling and performance monitoring of the urban transport network • Definition of the extent of implementation of real-time road traffic monitoring systems, variable signs and messages • Green Box – The vehicle base for safe and sustainable traffic • Development of the incident information chain • Development of incident data acquisition methods for road transport • Piloting of the heavy vehicle driver warning and route planning service • The Helsinki Metropolitan Region Traffic Information Centre (Can be classified also as network status information
Costs of the transport system	• LIVAINFO - multichannel transport information for travellers collected by the sensors of the signal control system in Tampere • Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 1 • Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 2 • Development of the incident information chain
Prerequisites for business	• LIVAINFO - multichannel transport information for travellers collected by the sensors of the signal control system in Tampere • Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 1 • Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 2 • Green Box – The vehicle base for safe and sustainable traffic • Piloting of the heavy vehicle driver warning and route planning service

Traffic safety	• LIVAINFO - multichannel transport information for travellers collected by the sensors of the signal control system in Tampere • ColdSpots: Development project for accurate road section-specific road surface condition forecasts, Phase 1: preparation of the database behind the road surface condition models • ColdSpots: Development project for accurate road section-specific road surface condition forecasts, Phase 2: development and verification of road surface condition models • Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 1 • Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 2 • Definition of the extent of implementation of real-time road traffic monitoring systems, variable signs and messages • Green Box – The vehicle base for safe and sustainable traffic • Development of the incident information chain • Development of incident data acquisition methods for road transport • Piloting of the heavy vehicle driver warning and route planning service
Others	-

Figure 20

III. Comment on sub-programme targets

The Transport Network Status sub-programme is mainly focussed on the service level of performance of the transport systems and the traffic safety. Projects with impact on traffic safety mainly focussed on weather conditions. Bad weather has serious impact on road safety, especially in Nordic countries.

IV. Projects for review

The following projects were drawn to our attention:

1. Traffic control around large metropolitan road works, phase 1, feasibility study
2. ONNIMANNI – Real-time modelling and performance monitoring of the urban transport network & ONNIMANNI 2, Real-time modelling and performance monitoring of the urban transport network
3. ColdSpots: Development project for accurate road section-specific road surface condition forecasts, Phase 1: preparation of the database behind the road surface condition models & ColdSpots: Development project for accurate road section-specific road surface condition forecasts, Phase 2: development and verification of road surface condition models
4. Heavy vehicle driver warning and route planning service - phase 1, study
5. Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 1 & Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 2
6. Green Box – The vehicle base for safe and sustainable traffic

1. Traffic control around large metropolitan road works, phase 1, feasibility study

Project summary
The project involved the development of an interactive traffic control operations model for large metropolitan road works, which is based on inter-actor co-operation and high-quality transport monitoring. The project produced several traffic control procedures and information services that are in operational use. Other outcome produced: Templates for tendering/purchasing for traffic control and guidelines for network-wide traffic control during comparable infrastructure improvement projects.

Primary Impacts / Secondary Impacts
- Change in transport infrastructure or vehicle fleet investments
- Improved public transport incident management or route choice
- More efficient use of transport infrastructure
- More efficient transport network incident management
- Improved driver and vehicle support
- Promotion of non-motorised transports
- Improved logistic chains and deliveries
- Promotion of standardised and generic solutions
- Development and piloting of innovative solutions

The project leader didn't indicate in the fact sheet submitted, any direct priority to the impacts expected. To the view of the evaluators however it project has direct impact on the efficient use of the infrastructure. It prevents motorist being stuck on a road works, it facilitates traffic to get around the works in a efficient and overall effective way.

Exploitation plans

The real-time information of the traffic situation in the construction zone will be applied on the large construction project on the Ring Road I starting 2007. The idea has been created in the AINO - project. In this Ring Road I project, and the future ones, the information services will be included in the same contract with the actual construction. This requirement has been learned in the project. The project will help the Ring Road I project in the procurement of the info services. The final report will also include these service requirements for future reference. The private operator of the basic information service is free to sell personalised info for car drivers and businesses.

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	Public	Fully Public	Fully Public	Private	Private
Alternatives (See comments)	Shared	Shared	Private	Private	Private

Figure 21

Reviewers' comments

The work performed is according to the original plan. It meanly focussed on co-ordination and organisational aspects, "how organisations should work together and how to inform the road-users about the road-works". The level of innovation and research involved in this project is rather limited.
The exploitation scheme envisaged by the project itself is based on a strong Public involvement. It is expected that road authorities will include a task on information services in the procurement procedure. So the road constructor must include it in his work and will be responsible for it.
A full commercial service operated by the private market is unlikely. The road-user is not willing to pay for the complete service, information on the status of the network is looked-upon as a public service.

2. ONNIMANNI Real-time modelling and performance monitoring of the urban transport network & ONNIMANNI 2, Real-time modelling and performance monitoring of the urban transport network

Project summary
The project is based on the real-time modelling of the urban transport network using commercial simulation software. The model is feeded with data/information of traffic signals as well as information provided by sensors connected to traffic signals. This allows the real-time estimation and measuring of the performance of the transport network (e.g. traffic flow), which can especially assist transport management officials in controlling traffic.

Primary Impacts
- More efficient use of transport infrastructure
- More efficient transport network incident management
- Improved driver and vehicle support

Secondary Impacts
- Change in transport infrastructure or vehicle fleet investments
- Promotion of standardised and generic solutions
- Development and piloting of innovative solutions

Exploitation plans
ONNIMANNI project will continue after AINO at least on two levels:

1) ONNIMANNI real time data of the current traffic flow and travel times on the *Ruoholahti* Area will be delivered also for public either on internet or via private companies (business model)

2) ONNIMANNI will be enlarged to several other sub-areas of the centre of Helsinki. The final target is that ONNIMANNI is used in the whole UTC area of Helsinki. This will take at least 5 years.

Besides the project has discussed also of the possibility to use ONNIMANNI real time traffic data for developing the short term (5-10 minutes) traffic forecasts.

Public Authorities will finance the new equipment needed for the enlargement of new ONNIMANNI areas as their own development projects for modernization traffic signal control systems. Note that the new equipment needed for ONNIMANNI is not very remarkable in future. Public Authorities will not finance directly the projects needed for delivering the ONNIMANNI real time traffic data for public.

The development of the ONNIMANNI real time traffic data combined with real time FCD data will be on responsible of private companies. It is expected when ONNIMANNI area is larger; the real time traffic data will give more opportunities for business model, too.

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	Public	Shared	-	-	-
Alternatives (See comments)	Shared	Shared	Shared	Shared	Shared

Figure 22

Reviewers' comments

The project team has demonstrated high level of knowledge in the field of on-line traffic modelling. Work in this domain is especially of interest for local road-authorities. The approach chosen has a somewhat scientific focus. More use could have been made from, operational experiences elsewhere in Europe. Although investigation seems to be performed on on-going activities in Europe no actions are taken. Especially the University of Helsinki should have made use of its international network more effectively. Data fusion, combining data from different sources would have been an interesting "new" element. In the current phase no serious work has been performed in that field but it might be taken up in the Post-AINO phase. The project has some delay due to technical difficulties in connecting the Traffic Signalling systems.
Actors involved are not so much interested in the exploitation. Their main interest is the research part and especially to perform the research themselves. The business model foreseen is a combined one with strong involvement of the Public sector in de Data acquisition phase. However there are already other models being implemented in Europe. A lot of examples exist where the data-acquisition phase is performed by and under full responsibility of private actors. They provide a complete service, including the data-collection, to road-authorities as well as to service-providers providing traffic information.

3. ColdSpots

Development project for accurate road section-specific road surface condition forecasts. The project had 2 phases. Phase 1: preparation of the database behind the road surface condition models & ColdSpots: Development project for accurate road section-specific road surface condition forecasts, Phase 2: development and verification of road surface condition models

Project summary

ColdSpots project has defined and developed a system to estimate the current weather and road surface condition. The overall aim was get a forecast of sufficient quality, of the road surface condition on specific road sections. As starting point the focus was on the spots of the road network with repeated road surface condition problems and accidents. The first phase of the ColdSpots project studied the current state of road surface condition prediction and developed and implemented a database of information essential for road surface condition forecasts from road network problem spot in the current data sources. This information has never been available for the developers of road surface condition models.

The defined road section-specific road surface condition forecasts, was developed further based on the results of the first phase of the project. The system was validated by means of actual road surface condition observations at limited areas, especially on the E18 road.

Primary Impacts

- More efficient public transport operation
- More efficient use of transport infrastructure
- More efficient transport network incident management
- Improved driver and vehicle support
- Improved logistic chains and deliveries
- Development and piloting of innovative solutions

Secondary Impacts

- Improved public transport incident management or route choice
- Promotion of standardised and generic solutions

Exploitation plans
The ColdSpots database will be publicly available for all interested parties.
Improved weather and road condition models will be used by public and private service providers in Finland and in neighbouring countries.
Both public and private parties sell road weather services during winter months.
Later on model development continues (it never stops) and results from this projects form a base for new developments.

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	Public	Public	Private	Private	Private
Alternatives (See comments)	Public	Public	Shared	Private	Private

Figure 23

Reviewers' comments

This service is strongly related to road safety. Therefore it is required that public authorities are strongly involved in the data acquisition phase in such manner that quality is guaranteed and stable. Also the methodology for making predictions should be public "controlled" in order to prevent conflicting messages to be transmitted to the end-user. This might also have impact on the packaging of the information.

This view is in line with the thoughts of the project leader and project team: "The ColdSpots database will be publicly available for all interested parties. Improved weather and road condition models will be used by public and private service providers in Finland and in neighbouring countries. Both public and private parties sell road weather services during winter months. Later on model development continues (it never stops) and results from this projects form a base for new developments."
The current actors are: public state institute, private weather company and state-owned road maintenance enterprise. Roles are quite well defined and most probably will not change much in the near future. The business done inside the institute should be separated to a company, though, for better transparency and to better apply European competition rules.
The product being developed in this project is of high value with high potential on longer term. It is expected to become an "export" product towards countries facing bad weather regularly.

The results of Phase 1 have been achieved. A representative sample of problem points of the Finnish road network has been selected for pilot studies. In Phase 2, the base analysis for the development work has been done with some interesting results. Mobile optical instruments have been installed and pilot studies will start during 2007.

4. Heavy vehicle driver warning and route planning service

Project summary
The heavy vehicle driver warning service (VARO) consists of two complementary services: a heavy transport route planning service and a real-time warning service. Both services were tested through a real life project by drivers, traffic co-ordinators and traffic foremen from participating transport companies as well as by other – separately agreed-upon – users. An extensive user-acceptance was organised by interviews. Following the pilot the service was put into operational use.

Primary Impacts
- More efficient use of transport infrastructure
- Improved driver and vehicle support
- Improved logistic chains and deliveries
- Promotion of standardised and generic solutions
- Development and piloting of innovative solutions

Secondary Impacts
- More efficient transport network incident management
- Improved service provision prerequisites and tendering

The main target of impact is on road safety. The project contributes in road safety by reducing the risk on accidents (with specifically truck) due to bad weather conditions. The use of SMS on mobile phones as medium to communicate to the drivers might not be the most effective method from a safety point of view. Even though the driver can programme his route at home, before departure, reading messages on a mobile while driving should be prevented.

Exploitation plans

The development project continues in future. Replacement of applied new mobile technologies (cellular positioning) with other options because of problems in usability, functionality and costs.
New forms of service have been brought to markets. E.g. Private driver's service (VaroWap-service) and new distribution channels was created and planned during the year 2006 and 2007.

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	Shared	Shared	Shared	Private	Private
Alternatives (See comments)	Shared	Private	Private	Private	Private

Figure 24

Reviewers' comments

VARO is a very good example of a project that succeeded in using AINO as a start-off for the definition and implementation of a successful business model. Main research in this project is not on technical issues but on impact assessment, user-needs and requirements. An evaluation methodology was defined to get feedback on quality level of the service implemented and the concrete requirements of the users. The approach is of high value and should have been investigated or even adopted by other projects in AINO.

For the technical solution a pragmatic approach was chosen: make use of existing and proven technologies. The project demonstrates knowledge and experience on technical, organisational and operational level. It was clearly driven by partners that interested in the exploitation model. In the model envisaged by the project the public sector will be responsible for the data that forms the basis for the service. Main reason for this is that it concerns a safety service and the role and position of the Meteorological Institute. However the reviewers foresee a stronger role of the private sector, also at the beginning of the chain.

As evidence of the successfulness of the approach chosen, the project has moved towards an operational service. They make use of a different, more applicable technology and have the ambition to reach not only truck drivers but also private car users.

VARO can be seen as one of the most successful project in the AINO programme from the perspective of deployment. The use of a user-friendly and safe user-interface is still an important issue to be solved.

5. Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 1 & Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 2

Project summary

FCD (Floating Car Data) means data collected from moving cars that can be used e.g. in traffic control and information services. A vehicle equipped with sensors detecting the required data (e.g. speed, location) and wireless data transfer can be used as the real-time data collection vehicle.
The first phase of the FCD-INFO project in the AINO programme was completed in October 2005. The first phase included designing the data system enabling the implementation and testing of the whole system from data collection to the pilot service in the taxi service at the Tampere area. The business possibilities of the consortium of actors were also evaluated and a general level business model was represented.
In the second phase of the project the data collection functionality and performance using the FCD method in taxis was tested in Tampere i.e.

- implement and test the designed data systems and operation models;
- test the required data transmission interfaces;
- implement the end user information services as new features of the Traffic in Tampere service;
- perform a user study and impact evaluation.

Primary Impacts
- Change in transport infrastructure or vehicle fleet investments
- More efficient public transport operation
- More efficient transport network incident management
- Promotion of standardised and generic solutions

Secondary Impacts
- Improved public transport incident management or route choice
- More efficient use of transport infrastructure
- Improved driver and vehicle support
- Improved service provision prerequisites and tendering
- Development and piloting of innovative solutions

FCD will add value to the existing set of traffic data. First studies demonstrated that 10% of the fleet should be equipped in order to get a reliable picture of the traffic situation. However during periods with low traffic volumes, at night, the data provided by FCD is not reliable. Another difficulty is that for traffic management purposes there is a need to have information on traffic volumes on specific spots and sections. This all means that FCD should be used in combination with other traffic data. When data from different sources is used and integrated (data fusion) the benefits on traffic management and efficiency will become very high.

The link with public transport is rather limited. There is a link in case buses are also equipped and when a tracking and tracing system is connected to it.

Exploitation plans

The preliminary business model has been created during the project. It describes the roles, motivations and business opportunities of the commercial actors. A more precise business plan is being made by Infotripla and Mobisoft. It will be utilised on the next marketing and implementation cases in Finland and abroad.

The next implementation will take place in Finland in the spring 2007. Also a few possible cases abroad are under negotiations. The most promising markets are the areas which have not invested in fixed monitoring equipment yet.

Mobisoft will be working as dispatching system provider that helps a content provider (taxi company) to collect FCD. Infotripla will do data processing and information packaging. Public authorities have a possibility to utilise the data and information. Authorities may also take part of the financing new implementations. Rest of the financing will come from service providers basing on their business activities.

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	Shared	Shared	Private	Private	Private
Alternatives (See comments)	Private	Private	Private	Private	Private

Figure 25

Reviewers' comments

The project has shown possibilities for FCD service form a technical perspective as well as business models. Level of research is limited since the work performed is already performed abroad several times. However setting up a demonstration locally supports mind setting of organisations (public as well as private) on feasibility and expectations of this technology. The actors involved have shown competence in this domain. However the business model requires active involvement on national wide level and preferably international level.

The currently preferred exploitation scheme is based on risk sharing between public and private sector. More Private involvement could be envisaged by broadening the focus:

- National wide or even European wide services
- Not only focus on Public sector but also on private services like traveller information to end-users and feeding of navigation systems.

The project has been successful, mean risk is in the follow-up of it. Services like this could be fully privately operated. A feedback methodology could be defined by which users of the FCD system get on-line traffic information. No infrastructural work needs to be performed so road authorities can restrict themselves by specifying the data required (including quality level) and contract the private sector to deliver this data.

6. Green Box – The vehicle base for safe and sustainable traffic

Project summary
The Green Box project has demonstrated, in practise, that with the available technology of today, it is possible to efficiently and securely collect traffic information and raise traffic fees. The Green Box projects planned to study and demonstrate the following services:

- collection of traffic status information using vehicles with measuring equipment (Floating Car Data);
- measuring and monitoring the speed of vehicles in selected links/routes;
- collection of traffic usage fees in an intelligent way.

The work includes planning of services to be demonstrated in a 1000 vehicle pilot, running the pilot to collect the data, analyzing the data and evaluating the results.

Primary Impacts
- More efficient use of transport infrastructure
- More efficient transport network incident management
- Improved driver and vehicle support
- Improved logistic chains and deliveries
- Improved service provision prerequisites and tendering
- Promotion of standardized and generic solutions
- Development and piloting of innovative solutions

Secondary Impacts
- More efficient public transport operation
- Change in transport infrastructure or vehicle fleet investments

The solutions for collecting traffic fees are currently a hot topic discussed a lot in public in Finland and in the EU. The relevance of the project to AINO programme is big. It also has serious impact regarding acceptance when discussing the issue of road charging. Collecting traffic fees was a taboo subject, when the project started, but its importance has grown seriously during the project.

Exploitation plans

The exploitation of the Green Box project results has neither been planned yet nor is there a business model, but it will be available when the project finishes in autumn 2007. The results could be utilized almost instantly, though, since the demonstrated services are based on existing technology and there is demand for technical solutions especially for collecting traffic fees. The demonstrated services will correspond well with other initiatives within the Ministry of Transport and Communications.
Since it concerns data and service containing privacy related information the public authorities should keep control, especially regarding infrastructure services. How data and information is transmitted to the users and the user-interface is mainly the responsibility of the private sector.

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	Shared	Shared	Shared	Shared	Shared
Alternatives (See comments)	Public	Outsourcing	Outsourcing	Private	Private

Figure 26

Reviewers' comments

The project will finish in autumn 2007. This means that at the moment of the review not all the work was finished yet. The results at the moment of the review:

- the services to be piloted are planned;
- pilot system implemented and tested;
- initial version of the final report written.

The raising discussion on road charging has put a lot of pressure on the project resulting in additional other, work and cost.

It is expected that the project will achieve all the planned results.

V. Project fact sheets

In this chapter all the received fact sheets for the Transport Network Status sub-programme are attached.

Traffic control around large metropolitan road works, phase 1, feasibility study

Objectives of the project	
Originally formulated	**Comments**
Develop a co-operation model for large road construction projects on urban areas. Develop, test and evaluate information services regarding to road construction projects. Give recommendations on the organisation of traffic information services on future construction projects.	The project will finish in august 2007. The objectives should be reached as planned.

Description of the work
In the first phase a pre-study was conducted. The study included the analysis of the traffic flows and expected problems, interviews of all important stakeholders in the construction area, creating ideas for the information services necessary for different stakeholders and the planning of the organisation model for cooperation. In the next phase the information services were constructed and piloted in the Hakamäentie construction project. The evaluation plan was prepared. In the last phase the pilot will be evaluated and the services and cooperation model will be developed accordingly. Recommendation and guidelines will be prepared for future project of different size and features.

Results / Status	
Planned results	**Achieved results / comments**
- understanding of the needed information services for different stakeholders, i.e. Car drivers, light transport, freight companies, businesses, public transport, media, constructor, etc. - Cooperation model and guidelines how to organise the services in the future.	The results are partly achieved already and will be completely achieved in the end of the project, when the interviews are done.

Context and Relevance to AINO programme
In the project the procurement of traffic information from private contractor within a road construction project was tested for the first time. Also this was a test for the applicability of easily movable radar monitoring technology. In the project we have created new understanding of evaluation process for information services.

Exploitation plan (after the project)
The real-time information of the traffic situation in the construction zone, which is presented on the web site, will be applied on the large construction project on the Ring Road I starting 2007. The idea has been created in the AINO - project. In this Ring Road I project, and the future ones, the information services will be included in the same contract with the actual construction. This requirement has been learned in our project. The project will help the Ring Road I project in the procurement of the info services. The final report will also include these service requirements for future reference. The private operator of the basic information service is free to sell personalised info for car drivers and businesses.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**

Figure 27

LIVAINFO - multichannel transport information for travellers collected by the sensors of the signal control system in Tampere

Objectives of the project	
Originally formulated	**Comments**
The main objectives of LIVAINFO project were to create a cost-effective method to utilise existing traffic light devices to collect traffic and incident data and to share customised traffic information to the travellers in Tampere. A half-year project focused on developing and piloting profiled multi-channel traffic information service in order to have the service in large-scale public use in summer 2005.	Objectives were reached as originally formulated. The service (Traffic in Tampere) was launched to public in August 2005.

Description of the work

The main work was done by Infotripla Ltd. The project was financed by AINO, City of Tampere and Infotripla Ltd.

The first phase of the project included planning and specifying the service based on the preliminary ideas before project start. Needed modifications to the existing traffic signal system, deployment of the interfaces and planning of functionalities and technical solutions of service were also made. The service was developed based on the existing, well-experienced multi-channel information platform called *infoT*. The *InfoT* platform was already been used successfully in public transport information services. Implementation and testing was made during the summer 2005.

During the testing phase in summer 2006 a set of test users were using the pilot service and they were asked about their opinions as a user survey.

The project was finished and the results reported in autumn 2005. The method implemented is still part of the *Traffic in Tampere* service, which has later been equiped with other data sources (e.g. FCD).

Results / Status	
Planned results	**Achieved results / comments**
As a result, to • create a cost-effective method to utilise existing traffic light devices to collect traffic data on main intersections in the city, • produce traffic flow information of city traffic • share customised traffic and incident information to the travellers based on flexible platform, • support public users (e.g. traffic planning) in their daily duties by using on-line services.	Planned results were achieved. Traffic information based on the traffic signal system was suitable for traffic information. Customised information was delivered to the travellers by the help of *infoT* paltform.

Context and Relevance to AINO programme

Wider objectives of the project were to

- develop the traffic management in the city area by real-time traffic information in order to manage the growth of traffic volumes,
- utilise the existing devices of street network in developing city operations and new services,
- get support for decision making concerning the alternative methods for traffic data collection,
- create basis for the development of traffic information, interaction between travellers as well as the city transport planning.

From AINO objectives point of view new innovative elements for data collection are needed. One focus area has been in finding appropriate cost effective methods for the traffic data collection as an alternative to the costly investments on fixed roadside devices. Based on the better cost structure of data collection methods new and more comprehensive information services can be offered for the city area.

On the other hand, AINO seeks for new service concepts for travellers. The result of the project – Traffic in Tampere service – offers customised traffic information to daily city travellers - first time in

Finland.

Objectives of collecting traffic data by a new cost-effective method and providing personally customised, easy-to-use and multi-channel traffic information was proven to be right.

Exploitation plan (after the project)

As a result, *Traffic in Tampere* service was launched in August 2005. (www.liikennetampereella.fi/eng)

The preliminary business model was created during the project. It describes the roles, motivations and business opportunities of the commercial actors.

The LIVAINFO project was the first step on the developing path of extensive traffic information system in Tampere. After LIVAINFO project results were taken into use as a service, Tampere was selected as a Finnish pilot site to implement floating car data (FCD) method for traffic data collection (please look at the FCD-INFO project). FCD method was integrated into *Traffic in Tampere* service.

In addition to planned service concept Tampere has decided to facilitate the service with language version (English). Moreover, Tampere has ordered an extra tool for traffic statistics collected by the service and based on the same *infoT* platform of Infotripla.

Financial status

Planned costs	Final (expected) costs	% AINO Contribution	Remarks
53,900	58,197	46,3 %	Planned AINO contribution was 50 %. Extra costs were covered by Infotripla Ltd.

Figure 28

Ramp control, phase 1 – feasibility study, general and implementation plans

Objectives of the project	
Originally formulated	**Comments**
The four main objects were: 1) To evaluate if ramp metering would be feasible to use in Finland. If yes, then continue with the project. 2) Define criteria, when ramp metering could be used efficiently. Identify possible locations where ramp metering could be used. 3) Plan the ramp metering and produce the technical requirements (to be used in procurement). 4) Implement ramp metering at one location and study the effects.	The project was defined in three phases: 1) Feasibility study 2) "general planning" 3) "detailed planning"

Description of the work
The first part of the work was done mainly by literature studies, and was originally a part of a Master's Thesis. In second phase the defined most suitable locations were simulated, and studied more carefully (for example characteristic of the intersection). The third phase consisted of detailed planning of the ramp metering, and defining the systems and its costs. Phase 4 was never realised.

Results / Status	
Planned results	**Achieved results / comments**
Se originally formulated.	1) The study came up with criteria, where ramp metering would be feasible and with the result that ramp metering would be useful in Finland in Helsinki metropolitan area. 2) The criteria for choosing suitable locations for ramp metering were defined. The possible locations were defined. 3) The plans were also finalised as planned. 4) Implementation of ramp metering ran into problems due to the fact that the municipals of city of Espoo were opposed for implementing ramp metering at the most suitable location. Finnish Road Administration did not want to implement the system against municipals wishes.

Context and Relevance to AINO programme
Ramp metering, if implemented, would have been an actual new system in use in Finland. Also, it would have been benefiting the fluency of traffic and also traffic safety.

Exploitation plan (after the project)
If implemented, the results would have been studied to be able to equip possible new intersections with ramp metering.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
60	60	50%	There may be something missing in the costs, the details were not found.

Figure 29

ColdSpots: Development project for accurate road section-specific road surface condition forecasts, Phase 1: preparation of the database behind the road surface condition models and Phase 2: development and verification of road surface condition models

Objectives of the project	
Originally formulated	**Comments**
Objective of ColdSpots Phase 1 was to improve the present weather and road condition forecast models by establishing a novelty database containing detailed local information on problematic road sections in Finland. In Phase 2, objective is to develop these improved weather and road condition models, which will be verified with pilot studies during the next two winter periods by applying state-of-the-art verification methodologies.	The two ColdSpots Projects form a combined three-year development project. Phase 1 is concluded and the novelty database formed. Phase 2 is in its mid-term, the final pilot and test year ahead. The only risk is climate change, as this has been the warmest winter ever observed so far.

Description of the work
The new ColdSpots database was compiled in Phase 1. It contains detailed local information on problematic road sections in Finland, such as registers of road structure and traffic accidents, map information, road maintenance feedback and quality control data. This is the first time when these data are available to the developers of weather forecast models.A test set of some fifty most problematic locations have been selected based on the information of the accidents occurred due to freezing and on the knowledge of the local road maintenance experts. In Phase 2, the present weather and road condition models will be fine-tuned using these data. The new system will be verified with pilot studies, where one of key challenges is to get accurate local observations for verification studies. One method is to perform mobile measurements of friction and road surface temperature with optical instruments attached to a car. Pilot studies will start in January-February 2007 along three road stretches: one on road 8 along south-western coast, one in road 1 near Suomusjärvi and one in south-eastern corner on roads 6 and 7 near Utti. End of 2007 will be used in analysing the data. Project ColdSpots is co-funded by the Ministry of Transport and Communications Finland, Finnish Road Administration, and the consortium of three public and private partners: Foreca Ltd, Finnish Road Enterprise and Finnish Meteorological Institute.

Results / Status	
Planned results	**Achieved results / comments**
In Phase 1, to find a set of problematic Cold Spots and form a database with auxiliary data. In Phase 2, to develop improved weather and road condition models and verification methods. In pilot studies, to compare the old and new models and verify that more skillful forecasts can be made.	The results of Phase 1 have been achieved. A representative sample of problem points of the Finnish road network has been selected for pilot studies. In Phase 2, the base analysis for the development work has been done with some interesting results. Mobile optical instruments have been installed and pilot studies will start in a few weeks.

Context and Relevance to AINO programme
ColdSpots project will contribute to the safety and efficiency of Finnish road transport by providing more accurate weather services. Road maintenance will be less costly and easier to plan.

Exploitation plan (after the project)
The ColdSpots database will be publicly available for all interested parties. Improved weather and road condition models will be used by public and private service providers in Finland and in neighbouring countries. Both public and private parties sell road weather services during winter months. Later on model development continues (it never stops) and results from this projects form a base for new developments. The current actors are: public state institute, private weather company and state-owned road maintenance enterprise. Roles are quite well defined and most probably will not change much in the near future. The business done inside the institute should be separated to a company, though, for better transparency and to better apply European competition rules. Investments are financed mostly by profits. Larger development projects may be financed using various R&D funding resources (EU, Finnish Funding Agency for Technology and Innovation etc.)

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
317 k€	320 k€	67,4	FinnRA will fund 100% the optical instruments

Figure 30

ONNIMANNI 1&2 – Real-time modelling and performance monitoring of the urban transport network

Objectives of the project	
Originally formulated	**Comments**
ONNIMANNI project is inspired by the need of getting real-time information of the urban traffic performance. The basic object of the ONNIMANNI project is to find out the possibilities to use the Urban Traffic Control (UTC) equipment for on-line monitoring of traffic flow. The usage of real-time traffic signal control systems as UTOPIA/SPOT has not proved to be very effective in Nordic countries – this needs a lot of work and also the concept – minimising total delays and stops seems to be something else that the Finnish drivers are used - rigid green waves in main streets derived from the tradition from Germany is still very popular in Finland. This concept is completed in Helsinki with public transport priority more than thirty years, however So ONNIMANNI might be a different approach for developing effective area-wide signal control and monitoring. ONNIMANNI can be seen as flexible equipment to follow-up various traffic flow indicators and a sophisticated on-line calculator to give versatile performance information of the current traffic situation and even the historical data for long and short term chance comparisons. ONNIMANNI can give answers to the common questions made by traffic engineers: “Is the signal control concept A better than the concept B in these special traffic conditions”, or “What is the net effect of public transport priority for all traffic” or “Shall we maintain the signal coordination also in low traffic periods”. Because ONNIMANNI concept is based on real time traffic simulation, it may give more reliable background data for short time traffic forecasts than the FCD (floating car data), which only shows the current trend of the traffic volumes. Possibilities to use ONNIMANNI data for short term traffic control are discussed, too.	Although the project is not yet finished, there is no reason to say that the main object can not be fulfilled. The relevant question is how accurate and reliable is the information given by ONNIMANNI. This question has two sides: the problem of traffic measuring and the problem of traffic modelling: First the traffic measuring: ONNIMANNI is based on the basic vehicle detection equipment of traffic signals – no extra detectors are included in the system for ONNIMANNI. If the measuring accuracy is not enough, it is possible to increase number of detection points, but then the system is more a measuring equipment instead of the basic traffic control system. The traffic modelling is also a great challenge – it depends on the other hand on the performance of the computing but more on the versatile of the simulation model. It is more important, however, that the model distinguishes the relative changes and the trends of the traffic flow than the absolute values. After few months we will have preliminary answers to these two important questions - the cornerstones of the whole ONNIMANNI concept.
Description of the work	
ONNIMANNI 1 was a feasibility study of the of ONNIMANNI concept. This study proved that the online simulation system could be implemented using UTC system *Omnivue* controlling and a simulation software package *Paramics..* Omnivue includes a specific outstation unit (MDSL) in each junction connected to the signal controller. The software of this unit was able to be modified to deliver traffic flow and signal status data several times per second to ONNIMANNI server. The Paramics simulation software can also modified to use the real time data from Omnivue and make it a realistic traffic model with animation. ONNIMANNI 2 is an implementation project of the ONNIMANNI concept to Ruoholahti test area. The software of the MDSL-units in Omnivue has been prepared and it seems to work and – which was very important – it does no have any influence to control functions of Omnivue system. The network system including servers and connections seems to work, too. The measuring equipment in signalized junctions gives reliable information on signal status and vehicles on detectors. In general the system hardware problems are solved.	

The modelling of traffic is under development – the ideas discussed in project meetings seem to be reliable. The updating speed – several times per second is satisfied for the model. When the model is finished, it will be calibrated with the real traffic using video recording from two traffic cameras. The reporting modes are also under preparing..

The last thing is to prepare the interface which can be used for delivering the real time traffic data. This will be done in ONNIMANNI very briefly, because a special project should be launched for this task later.

Results / Status

Planned results	Achieved results / comments
ONNIMANNI 1 RESULTS 1. Online simulation system could be implemented by using *Omnivue* traffic signal control system and Paramics simulation software. 2. The system is able to collect all the detector and signal status data several times per second without any disturbance to the normal traffic control. 3. Data can be sent into the real-time simulation model, which computes the traffic indicators and the animation. 4. Some changes can be made to the traffic control system Omnivue so that ONNIMANNI and the back up system, HELPSI, can be operated simultaneously. Final result of ONNIMANNI 1: - implementation of ONNIMANNI is feasible ONNIMANNI 2 RESULTS 1. On-line traffic and signal status data collection works 2. Data transmission was a very difficult work. The original plan must be updated using an extra server connected to ONNIMANNI server. The problem is fire wall policy between the public and city networks, not any technical problems. 3. Simulation software package is flexible enough for modelling the sinks and sources needed in on-line simulation of vehicles. 4. The interface for delivering the real time data must be developed separately.	The ONNIMANNI project will be finished April 2007. In this moment (31.12.2007) there is no reason to think that the project will not fulfil its objectives.

More information can be found about ONNIMANNI

In English
On Helsinki University of Technology, Laboratory of Transportation Engineering,
- ONNIMANNI site: http://www.tkk.fi/Units/Transportation/ITS/ENG/onni.html
- DIGITRAFFIC site http://www.tkk.fi/Units/Transportation/ITS/ENG/dgtraf.html

In Finnish
On City of Helsinki, Traffic and transportation planning division,
- ONNIMANNI project site: http://www.hel2.fi/liikenteenohjaus/onnimanni/index.asp

Context and Relevance to AINO programme

One of the main objects of the AINO programme is to develop the cost-effective real-time monitoring of transport network status information. That is also the main goal of ONNIMANNI, which is focused only in urban areas..

The idea of ONNIMANNI is to use the urban traffic signal network equipment for the monitoring system. It is clearly an alternative approach compared to the FCD technology and it is supposed that these two methods might be complementary of each other.

ONNIMANNI real time traffic data can be used as a raw material for several services delivered by private services – however first when the onnimanni area will cover larger areas of the centre of HELSINKI. ONNIMANNI real time traffic data is used also for traffic control made by public authorities. Both sectors need the data but they will use it in different purposes.

ONNIMANNI is based on the traffic signal control equipment OMNIVUE / ETC developed by Swarco. This concept is widely used in Finland and also in Nordic countries. That is why ONNIMANNI is also easily extendable not only in Helsinki but also in other cities.

Exploitation plan (after the project)

ONNIMANNI project will continue after ONNIMANNI 2 at least on two levels:

1) ONNIMANNI real time data of the current traffic flow and travel times on the *Ruoholahti* Area will be delivered also for public either on internet or via private companies (business model)

2) ONNIMANNI will be enlarged to several other sub-areas of the centre of Helsinki. The final target is that ONNIMANNI is used in the whole UTC area of Helsinki. This will take at least 5 years.

   Besides the project has discussed also of the possibility to use ONNIMANNI real time traffic data for developing the short term (5-10 minutes) traffic forecasts.

Public Authorities will finance the new equipment needed for the enlargement of new ONNIMANNI areas as their own development projects for modernization traffic signal control systems. Note that the new equipment needed for ONNIMANNI is not very remarkable in future. Public Authorities will not finance directly the projects needed for delivering the ONNIMANNI real time traffic data for public.

The development of the ONNIMANNI real time traffic data combined with real time FCD data will be on responsible of private companies. It is expected when ONNIMANNI area is larger; the real time traffic data will give more opportunities for business model, too.

Financial status

Planned costs	Final (expected) costs	% AINO Contribution	Remarks
ONNIMANNI 1 18 k€	ONNIMANNI 1 18 k€	ONNIMANNI 1 50%	
ONNIMANNI 2 144 k€	ONNIMANNI 2 144 k€	ONNIMANNI 2 32.6%	

Figure 31

Use of the FCD method in producing real-time transport information (FCD-INFO): Phase 1& Phase 2

<table>
<tr><th colspan="2">Objectives of the project</th></tr>
<tr><th>Originally formulated</th><th>Comments</th></tr>
<tr><td>The companies were seeking for new business opportunities and markets. Public sector was looking for e.g. new cost effective methods and tools for data collection for traffic management. The objectives of the project were to:
design, create and test methods to collect traffic data from taxies,
combine the data with various other data sources and utilise it in creating reliable traffic information for end users, taxi drivers and authorities,
test the technology and the methods as part of an existing traffic information service,
create added value for the companies collecting and refining the data and providing information services.</td><td>The objectives were reached</td></tr>
<tr><th colspan="2">Description of the work</th></tr>
<tr><td colspan="2">The companies involved were Infotripla Ltd, Mobisoft Ltd and Tampere Regional Taxi Company Ltd. The project was financed by AINO, City of Tampere, Finnish Road Administration and the companies.

The first phase of the project was completed in autumn 2005. It included planning and specifying the modifications needed to the existing technology, designing the interfaces as well as planning of the business model. The implementation phase started by the end of 2005.
During the testing phase in autumn 2006 the taxi company collected data from 450 taxies operating in Tampere area. The data is filtered and delivered further by the TaxiBook dispatching system of Mobisoft. The data including the speed and positioning data as well as the data from other sources are received by the infoT service platform of Infotripla. infoT utilises the data in providing information services to end users (Traffic in Tampere service), taxi drivers and transport officials. Open interfaces have been implemented to deliver raw FCD from TaxiBook to content providers as well as to deliver traffic situation and incident data from infoT to transport officials and to other content and service providers.

The project was finished and the results reported in autumn 2006. The FCD methods and technologies are now utilised as new features of Traffic in Tampere service.</td></tr>
<tr><th colspan="2">Results / Status</th></tr>
<tr><th>Planned results</th><th>Achieved results / comments</th></tr>
<tr><td>new business opportunities and products for companies,
new cost effective methods and tools for traffic data collection,
more and better information for the end users</td><td>Three new FCD products: new features of TaxiBook dispatching system; Traffic data by Taxi as XML; infoT Traffic multichannel information services.
More information and data for traffic management.
Positive results from the user survey (end users and taxi drivers).
Positive feedback and comments from the media.</td></tr>
<tr><th colspan="2">Context and Relevance to AINO programme</th></tr>
</table>

It is possible to get more cost efficient traffic information for traffic management and planning purposes. Sometimes investments on fixed –and quite expensive- data monitoring technologies can be completed, postponed or even replaced by more flexible and inexpensive FCD.
New kind of information services can be offered for the citizens in order to avoid unpleasant surprises due to e.g. traffic incidents.

Exploitation plan (after the project)

The preliminary business model has been created during the project. It describes the roles, motivations and business opportunities of the commercial actors. A more precise business plan is being made by Infotripla and Mobisoft. It will be utilised on the next marketing and implementation cases in Finland and abroad.

The next implementation will take place in Finland in the spring 2007. Also a few possible cases abroad are under negotiations. The most promising markets are the areas which have not invested in fixed monitoring equipment yet.

Mobisoft will be working as dispatching system provider that helps a content provider (taxi company) to collect FCD. Infotripla will do data processing and information packaging. Public authorities have a possibility to utilise the data and information. Authorities may also take part of the financing new implementations. Rest of the financing will come from service providers basing on their business activities.

Financial status

Planned costs	Final (expected) costs	% AINO Contribution	Remarks
115 000	118 400	49 %	Changes on cost are due to some unexpected issues during implementation. Extra costs were covered by the companies involved.

Figure 32

Exploitation of floating car data – Prestudy

Objectives of the project	
Originally formulated	**Comments**
The aim of this study was to investigate the utilisation possibilities of probe vehicle data in Finland in real time applications as well as by analysing collected data afterwards (i.e. history data).	The aim was reached.

Description of the work
The present state of probe vehicle data collection and its standards was studied. In addition, it was studied how probe vehicle data has been used in other countries and how that knowledge could be applied in Finland. Finally, an expert workshop created a vision of how probe vehicles could be applied in Finland in the year 2015 and a guideline of the steps needed for accomplishing this vision.

Results / Status	
Planned results	**Achieved results / comments**
A report that includes: • commercial FCD applications and FCD applications made for research purposes and their suitability to Finland • different user groups and applications of different kind of FCD in Finland (both real time data and historic data) • production of real time traffic + weather and road condition data with probe vehicles in Finnish conditions • extra possibilities that XFCD enables • guidelines for how to proceed in the implementation of probe vehicles in Finland • vision of the future of probe vehicles in Finland Slides of the main results	Results were achieved.

Context and Relevance to AINO programme
The project gave a good overview of the state of art of FCD. It was also a good introduction to the subject for many people. The project supported other two AINO-projects that dealt with FCD.

Exploitation plan (after the project)
A guideline of the steps needed for accomplishing this vision of how probe vehicles could be applied in Finland in the year 2015 was made during the project. No exploitation plan has been made after the project.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
52 570 €	58 202 €	55%	VTT paid the overspend

Figure 33

Definition of the extent of implementation of real-time road traffic monitoring systems, variable signs and messages

Objectives of the project	
Originally formulated	**Comments**
To define the quantity and quality of telematics needed in Helsinki Metropolitan area. To prioritize the actions needed in Helsinki area main road traffic management. To estimate the costs of a comprehensive traffic management system.	The objectives of the study were reached. From now on, the realization of traffic management and monitoring system depends on decision makers.

Description of the work
Working group gathered data of existing and planned traffic management systems and refined it to a limited number of various strategy suggestions. Work was guided by a steering group. Alternative strategies were then introduced in a workshop to a group of experts representing all major operators in Helsinki area traffic management: state officials, municipal authorities, police, rescue organizations etc. The workshop chose the best policy. After the workshop, working group developed further this chosen strategy, finally introducing a suggestion of the path which should be followed in order to construct a sufficient traffic management system. The suggestion contains estimated time-tables, costs and effects of this system. The final report includes also estimations of improved traffic safety and fluency achieved by modern traffic management technology.

Results / Status	
Planned results	**Achieved results / comments**
A general plan of the needed traffic management system: time-table, cost-benefit analysis, construction costs, general lay-out of the system.	The final report meets the aim of the project.

Context and Relevance to AINO programme
One of the basic aims of AINO has been promoting new ideas and policies in the field of traffic management. In that sense, PÄÄTE project has been very useful and it relates very well to the context of AINO programme. It has also brought together all major players in Helsinki Metropolitan Area traffic management. Introducing new methods can be seen as a relevant part of AINO programme.

Exploitation plan (after the project)
The PÄÄTE final report describes the most suitable path for Helsinki Metropolitan Area traffic management deployment. Mostly, basic data collection and some other investments are carried out by public funds. However, in purchasing and exploiting traffic management systems there are possibilities for the private sector as well. The report shows some possible ways how to proceed, but after all it is a matter of selling the results of the project to politicians. High level decision making is needed in order to get new applications successfully on their way.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
100 000 €	100 000 €	33	

Figure 34

Green Box – The vehicle base for safe and sustainable traffic

Objectives of the project	
Originally formulated	**Comments**
The objectives of the Green Box project is to show, that with existing technology and information transfer mechanisms it is possible to efficiently collect traffic and vehicle status data, and to utilize the data in effective traffic telematic services in urban areas.	The project estimates that the objectives will be reached.

Description of the work
The Green Box projects studies and demonstrates the following services: ▪ collecting traffic status information using vehicles with measuring equipment (Floating Car Data) ▪ following the speed of vehicles in selected links/routes ▪ collecting traffic usage fees in an intelligent way. The work includes planning of services to be demonstrated in a 1000 vehicle pilot, running the pilot to collect the data, analyzing the data and evaluating the results.

Results / Status	
Planned results	**Achieved results / comments**
The Green Box project planned results: ▪ description of the project and the demonstrated system as a web document ▪ description of the pilot as a web document ▪ description of interfaces for adding traffic telematic services to the system both in a vehicle and the service centre ▪ final report including data analysis and evaluation of the pilot results.	The project will finish in autumn 2007, so all the results are not available yet. The results this far: ▪ the services to be piloted planned ▪ pilot system implemented and tested ▪ initial version of the final report written. The project estimates that all the planned results will be achieved.

Context and Relevance to AINO programme
The Green Box project will demonstrate in practise that with the technology available today it is possible to efficiently and securely collect traffic information and traffic fees. Especially the solutions for collecting traffic fees are currently a hot topic discussed a lot in public in Finland and in the EU. So the relevance of the project to AINO programme is big and actual. NB. Collecting traffic fees was a taboo subject, when the project started, but its importance has grown dramatically during the project. This has also resulted in additional work and cost, see below.

Exploitation plan (after the project)
The exploitation of the Green Box project results has neither been planned yet nor is there a business model, but it will be available when the project finishes in autumn 2007. The results could be utilized almost instantly, though, since the demonstrated services are based on existing technology and there is demand for technical solutions especially for collecting traffic fees. The demonstrated services will correspond well with other initiatives within the Ministry of Transport and Communications.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
124 k€	150 k€	48%	More emphasis and work in showing how to collect traffic fees

Figure 35

Development of the incident information chain

Objectives of the project	
Originally formulated	**Comments**
The main aims of this study is to study 1) how effective is the incident information chain (delays in process of getting the information from the field to the road users, information content) and 2) how the incident information process could be improved.	In this work the sudden incidents having larger effects (severity, network of great number of road users), mainly caused by road accidents are emphasized.

Description of the work
In this study the effectiveness of incident information chain is studied by collecting information about 1) occurred accidents (based on 112 media service), 2) traffic incident announcements (provided by Finnish national Road Administration) and by 3) recording two radio channels in order to verify the time and content of the information when it received by road users. The data collection phase was three months, ending on December 2007. Approximately 40 case incidents are selected and studied more carefully. The delays in different phases on incident information chain are analysed, but also the information content (understandable, correct information) is studied. In addition the possible effects of pre-information (from 112 services to Road Authority's TMC) about road accidents are studied. Also the characteristics of different type of incident information (authority, road users) are studied. The work started in November 2006 and will be finished by the end March 2007.

Results / Status	
Planned results	**Achieved results / comments**
Based on results, the possibilities to improve the traffic incident information process are concluded. Both the speed, but also the information content is considered in this study. Also the road users' perspective of being informed with different type of incident information (official incident announcements, individual road users calling the radio) is studied.	

Context and Relevance to AINO programme
The information about traffic incidents is one of the key elements of good traffic incident management. The possibilities to improve the process (both speed, but also quality) is essential in order to provide better information to road users, but also to guarantee the safe and efficient traffic.

Exploitation plan (after the project)
The results from the work will be taken into consideration both by the authorities (Finnish National Road Administration's Traffic Management Centre) and by parties responsible for giving the information to end users (radios etc.)

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
24 *k€'s*		50%	

Figure 36

Development of incident data acquisition methods for road transport

Objectives of the project	
Originally formulated	**Comments**
The project is going to support the development of mobile services that would be information-ergonomically suitable user–interface -- meaning a. Flexible during un-expected disturbance-situations b. Suitable while driving (physical inter-face and software solution) c. Mediated-peer-to-peer –type information structure and its possibilities to utilise: d. mobile community as a motivation factor to produce info and to improve its trustfulness	The aim was to utilize EETU project's data. Since that project had to extended, also Häikermen's user-data has been partly delayed. For this reason the data collection is still partly on-going.

Description of the work
The whole name of the project is "The development of methods of information of road disturbance". The focus is on the service's use-situation in the car, and on the developers' views on usability. User data: VARO-alert service, road users' in-calls to radio stations, and developers' interviews. The project is on-going at the moment. Radio data has been collected and mostly analysed. VARO service data has been also collected. However, it is smaller and out of the road-users' free-speech data, unlike it was expected.

Results / Status	
Planned results	**Achieved results / comments**
The model of improving the methods of disturbance-data (done by road-users) collection	At the moment the most interesting results are the comparisons of radio station in-calls and VARO alert service's user-reports.(The project is on-going at the moment)

Context and Relevance to AINO programme
There is widely shared atmosphere among the road and mobile service sectors in Finland that is waiting for the mobile services that would live on their own in the open market. Thus, one of the AINO program's main aims was to create ready-made services that would work in the open market, instead of, say, early-phase prototypes, or even more refined data-collection methods. Häikermen supports this aim by improving the understandings of the information ergonomics from car drivers' perspective.

Exploitation plan (after the project)
The consortium will continue its collaborative efforts among other mobile services. The improved understanding of how car drivers understand the disturbance situations in general, (what is a traffic congestion, how they describe the specific location of disturbance) and especially, what kind of occurrences they tend to report, and what kind of discursive structures they use when reporting orally.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
60	60	30	

Figure 37

Piloting of the heavy vehicle driver warning and route planning service

Objectives of the project	
Originally formulated	**Comments**
The main objective of the Varo Alert service-project was to improve road safety and traffic-flow by creating an enroute real-time forecasting and warning system. The second object was to create a commercial service produced by joint venture and financed by external revenues.	The objectives were reached well and as a result a workable service was succeeded to create even though warm weather during autumn 2005 delayed the test period and slowed down the pilot project.

Description of the work
The first phase of the project was carried out in the year 2004 when the tentative plan was done. The structure of the service was specified to consist of two services completing each others. First was the route planning service giving an advance warning to the organizers and managers of transport services as well as the drivers themselves of the en-route weather and road conditions, not to mention disruptions, such as accidents and road works. On the other hand the service works as a real time alert service which alerts driver of quickly changing weather and road conditions as well as any disruptions along the intended route. During the year 2005 the main development work was completed and at the end of the year the service was piloted and tested. At the beginning of the year 2006 the service was a fully working service concept.

Results / Status	
Planned results	**Achieved results / comments**
A concrete service was created, tested and implemented with in the project schedule as a result of the project.	Results were achieved as planned.

Context and Relevance to AINO programme
Varo Alert service is world wide unique service. It was created in order to improve road safety and traffic flow. The project has got a lot of national attention and been internationally interesting as well. Also a range of whole new technology was tested and implemented in the frame work of this project. Varo Alert service remains a concrete result of these kinds of programmes.

Exploitation plan (after the project)
The development project continues in future. Replacement of applied new mobile technologies (cellular positioning) with other options because of problems in usability, functionality and costs. New forms of service have been brought to markets. E.g. Private driver's service (VaroWap-service) and new distribution channels was created and planned during the year 2006 and 2007.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
715000	226 +	35% from planned costs	

Figure 38

The Helsinki Metropolitan Region Traffic Information Centre

Objectives of the project	
Originally formulated	**Comments**
Pre-study and evaluation of alternatives will lead to commitment and decisions on the operational model. Second stage, planning for implementation, can start in first half of 2007. (transport information centre)	To be seen, report to be published in February
Portal content and layout draft can be used to start procurement and implementation early in 2007. (transport information www portal)	Looks good to go

Description of the work
Pre-study to analyse services and functions suggested for the multimodal transport information center, assessment of needed resources and cost, comparative evaluation of different operational and organizational models for implementing the service (at start and 10-yr span). Analysis of available transport information content for the www portal, rough draft of layout and functionalities, to be used as basis of decision and as specifications for the implementation.

Results / Status	
Planned results	**Achieved results / comments**
Clear idea of possible functions for the centre at start and at later stage	Yes
Rough estimates of costs and resources	Yes
Preferred operational model identified	Yes
Recommendations for proceeding	Yes
Portal specs ready for implementation	Yes

Context and Relevance to AINO programme
The two multimodal services examined in these studies are among the lead projects presented in the strategic plan for traffic and mobility management in the Helsinki region 2015. The ability to manage incidents and to deliver real-time information on exceptions has also been identified in quality surveys as the part of public transport service most in need of improvement. Implementing these multimodal information services in the Helsinki region would be the most important achievement yet for creating true benefits by real-time transport information in Finland.

Exploitation plan (after the project)
The study reports will be published shortly and disseminated with supporting material. The directors' group of transport organisations in the Helsinki region will decide on the next step, but the plan needs to be supported by all main actors in the regional transport system, both by supply and delivery of information and on financial / organizational level. The studies have produced the necessary information for these decisions, so hopefully the internet portal can be published in 2007 and the information centre project can proceed to planning of implementation. The findings in the studies should also guide the partners in the development of their own data acquisition, processing and delivery to fit the integrated services; e.g. the need for better reporting and managing of exceptions in bus operations has been taken into consideration in the new service contracts and procurement procedures, as well as in the plan to equip all buses with GPS units and on-line communications.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
50 K Euro	38 K Euro	13 K Euro = 33 %	

Figure 39

Appendix D Driver support sub-programme

I. Interviewed persons

Matti Roine, MinTC (sub-programme leader)
Risto Öörni, VTT
Anna Schirokoff, VTT
Ms Leila Maiche, Finnish Meteorological Institute

II. Sub-programme target impacts

Impact Target	Projects reporting a strong (XXX) or serious impact (XX)
Service level and performance of the transport system	• Measuring the driving style of a driver
Costs of the transport system	-
Prerequisites for business	• EETU Road Weather and Condition Service • In-vehicle warnings about approaching trains at level crossings • Measuring the driving style of a driver
Traffic safety	• The safety and other benefits of the eCall system • EETU Road Weather and Condition Service • In-vehicle warnings about approaching trains at level crossings • Measuring the driving style of a driver
Others	-

Figure 40

III. Comment on sub-programme targets

This sub-programme includes most of the fundament research within AINO. It has as its two main themes the targets of traffic safety and the prerequisites for business. Both aspects are important to the success of the three potential new services included in this review: eCall, EETU and in-vehicle warnings of trains as they approach level crossings.

IV. Projects for review

The following projects were drawn to our attention;

1. In-vehicle warnings about approaching trains at level crossings – Feasibility study
2. In-vehicle warnings about approaching trains at level crossings - Testing of the technical implementation
3. The safety and other benefits of the eCall system
4. Measuring the driving style of a driver and the possible safety impacts (Ajotapa)

1. In-vehicle warnings about approaching trains at level crossings – (1) feasibility study and (2) testing of the technical implementation

Project summary

The initial feasibility study was a joint project between VTT Building and Transport and the Finnish Rail Administration. The objective was to examine and develop technology solutions for in-vehicle devices that warn drivers of approaching trains at level crossings. The devices should suit Finnish conditions, namely the high number of unguarded level crossings on private roads and the demands set by Finnish winters.

The feasibility study made an inventory of similar systems elsewhere in the world, outlined alternatives for the implementation of the system in Finnish conditions and suggested the realisation of a separate system pilot. Alternative implementation styles were mainly based on the satellite location and mobile phone data transmission alternative. Results were published in the AINO programme publication 17/2005.

A system trial was decided upon based on the findings of the feasibility study. The goal was to ensure the technical functionality of the proposed system, study its suitability for the task and produce recommendations for further actions.

Initially a prototype of the system was designed and built. The prototype was then tested at the operation tests on the railway line between Hanko and Karjaa on 16.6.2006. The principal goal of the operation test was to test whether the pilot system as implemented would fulfil the set functionality. The functionality of the system communications was studied using an Ethereal protocol analyser.

Primary Impacts

- Development and piloting of innovative solutions

Secondary Impacts

- Improved public transport incident management or route choice
- More efficient transport network incident management
- Improved logistic chains and deliveries

Exploitation plans

Before a full-scale implementation can take place, the safety effects of the system should be studied. This requires a large-scale pilot study with real end-users. The next step could be a large-scale pilot with real end-users and a pilot system implemented like a production-phase system.

The real-time train location information from the system could also be utilised for other purposes, such as safety improvement systems for people working on railway lines, rail operator rolling stock management and passenger information based on real-time data.

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	Out-source	Out-source	Out-source	Out-source	Out-source
Alternatives (See comments)	Data pool / Fully private	Data pool / Fully private	Seed-funding	Seed-funding	Seed-funding

Figure 41

Reviewers' comments

It is important to make a distinction between on the one hand publicly planned and supported services that are promoted for reasons of public safety, and on the other hand more commercial projects, which are likely to be profit orientated and consumer-driven. In this case, the warning system is a safety enhancement that is being promoted in response to public policy concerns. Finland has some 3,800 unmanned level crossings and around 10 fatalities occur each year. For this reason, out-sourcing is probably the best way forward, with some public seed-funding of the warning system when it is ready for integration with other commercial services.

We endorse the project manager's comment that full-scale implementation of an in-vehicle warning system for railway level crossings will need a further trial on a larger scale before decisions can be taken. The project needs full backing and co-operation from the Finnish rail authority and the development of a relevant business model.

3. The safety and other benefits of the eCall system

Project summary

The nationwide implementation of the in-vehicle emergency call system (eCall) has been planned in Finland since the spring of 2004. The aim is for the public sector to promote the purchasing of in-vehicle eCall terminal devices in 2006. The benefits of the eCall system are primarily based on the faster relaying of essential initial accident information, such as the type of accident and the precise location where the accident took place.

The aim of the study was to estimate the impacts of an automatic emergency call system (eCall) on accident consequences in Finland. More specifically, the study estimated: the annual number of fatalities that could be avoided using the eCall system; the effects of eCall on emergency response times; and the effects of real-time information about the vehicle location and accident type on the consequences of the accident. The project is carried out by VTT Building and Transport, and also includes two doctors, the Traffic Safety Committee of Insurance Companies (VALT) and the Ministry of the Interior.

In its evaluation of current practices, the study discusses the critical importance of timing and speedy action in treating trauma injuries. It also defines the procedures currently undertaken

by the authorities in traffic accidents and the presumable impact of eCall on those actions. A general description of the functionality of the automatic emergency call system is included.

The results showed that, in most accidents involving motor-vehicle occupants (82%), the emergency call had been made within five minutes of the accident. However, in 14% of the cases the emergency call had been made 5–30 minutes after the accident and in approximately 4% of the cases more than 30 minutes after the accident. In the accidents involving fatal unprotected road user, the delays were slightly shorter.

The eCall system could very probably have prevented 4.7% of the fatalities in accidents involving motor-vehicle occupants. In the accidents involving fatal unprotected road user, however, the system could probably have prevented no fatality. In all, eCall system was estimated to be able to reduce 4–8% of road fatalities in Finland.

The benefit-cost ratio of the eCall system examined in this study was 0.5–2.3. The benefit-cost ratio would have been higher if the indirect benefits of the eCall system could have been taken into consideration.

The project increased awareness of the impacts of the system. It also increased the knowledge of the system requirements in Emergency Response Centres. A master's thesis has been written, outlining the safety and other benefits and the costs of the eCall system.

Primary Impacts

- Improved driver and vehicle support

Secondary Impacts

- Change in transport infrastructure or vehicle fleet investments
- More efficient transport network incident management
- Development and piloting of innovative solutions

Exploitation plans

Based on the main findings of this study, the eCall system is recommended for immediate and widespread implementation in Finland. The study also indicated a need for developing statistics on severely injured accident casualties.

Reviewers' comments

This is an important piece of work, to quantify the impact and benefits of an in-vehicle emergency call system in theory and in practice. The results have received close scrutiny both within Finland and internationally. The range quoted for the benefit-cost ratio (between 0.5 and 2.3) suggests that there is still a degree of uncertainty concerning just how far eCall will deliver the benefits that are promised. There is a suggestion that more work is needed, in particular to quantify the indirect benefits. We think this would be worthwhile, given the high profile which eCall will have. At the same time it will be important to look in depth at the impact which eCall would have on Emergency Response Centre procedures, to establish whether there will be and additional work-load, and the efficiency gains to be had from a full-scale implementation.

4. Measuring the driving style of a driver and the possible safety impacts (Ajotapa)

Project summary
Driving behaviour is one of the main aspects of traffic safety. In the Ajotapa project, the speed and accelerations of four taxi vehicles were measured in normal traffic during seven months in Helsinki area. A number of relevant, easily measurable safety-related parameters, such as speeding and sudden braking, (called jerk - often related to near accident situations) were used in defining and comparing driving styles. In addition, the suitability of the system for use as basis for feedback to drivers was investigated.

The objectives of the project was to study

1) the possibility to measure driver-specific driving style in normal traffic in order to define driver-specific driving style with safety related measures and

2) the possible effects of random speed recording and information and group feedback (non-personal).

The data was collected in three phases. In first phase, there was no specific information about the study given to the driver. In the second phase all the company's drivers participated an information session, where drivers were reminded of the possibility of driving style measurements and explained in detail the possibilities to illustrate the results. In third phase the drivers that have serious speed violations were called for special group feedback session.

The results of the project were also used to evaluate:

- whether the speed and acceleration measurements of single vehicles in normal traffic can be used in detecting of possible traffic safety risks
- how the public sector can utilize a the gathered driving behaviour data on the traffic network level e.g. for traffic flow and safety monitoring and a base for decision making
- the suitability of driving behaviour measurements for a driver feedback system (as a part of young driver driving habit or transport company quality control) and its impacts

The recording system had GPS for location information and a (non-visible) on-board unit, which includes speed measuring and a modem for sending the collected data to the server. In addition to speed and location measurements, the possibility to measure and record information about acceleration and deceleration was also piloted in the study.

Results from Ajotapa suggest that there are clear differences in driving style between the company's drivers and these differences are measurable with speed and acceleration data. Near accident related jerks was found very interesting measurements. The jerks occurred in normal traffic even more often than expected and they can give valuable additional information both to individual drivers, but also to traffic research and planning. Therefore the future work for describing the actual traffic situations related to the jerks is very important and can open new possibilities in the field of traffic behaviour.

Primary Impacts
- Improved driver and vehicle support
- Improved logistic chains and deliveries
- Development and piloting of innovative solutions

Secondary Impacts
- Change in transport infrastructure or vehicle fleet investments
- More efficient public transport operation
- More efficient use of transport infrastructure

- Promotion of non-motorised transports
- Improved service provision prerequisites and tendering
- Promotion of standardised and generic solutions

Exploitation plans

The work will continue in project, funded by TEKES, private Finnish companies and VTT, aiming to use driving style measurements in heavy vehicle drivers' mandatory training (European Parliament directive 2003/59/EY, CAP).

The driving style measuring system has many possible application areas. In future the recording system could also be a part of the quality control system for companies. The quality system could be used especially in cases of transport of hazardous goods or with public transport contracts (school transport etc.). The system could also be used when monitoring special group of drivers for example speed limit offenders or young drivers (as a procedure in driver training). In larger scale, the collected data could be used as background information in traffic planning and research or when gathering information about exposure..

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	Out-source	Out-source	Fully private	Fully private	Fully private
Alternatives	Public seed-funding	Public seed-funding	Out-source	Out-source	Out-source

Figure 42

Reviewers' comments

The project has developed a novel way of measuring and comparing driving styles. In particular the team have been monitoring sudden braking, which is used as a proxy for a near accident event. It would be good practice to have this measurement technique validated in some way, to determine just how good a predictor it is of accident risk. We can see that the measurement method shows promise, but recommend a larger-scale trial before embarking on a programme of driver re-training

A change in driving styles by drivers collectively is a long-term task, but could in principle yield overall improvement in service level and performance benefits for the transport system.

We agree that future work for describing the actual traffic situations related to the jerks has the potential to open new possibilities in the field of traffic behaviour.

V. Project fact sheets

In this chapter all the received fact sheets for the Driver Support sub-programme are attached.

The safety and other benefits of the eCall system

Objectives of the project	
Originally formulated	**Comments**
The aim of the study was to estimate the impacts of an automatic emergency call system (eCall) on accident consequences in Finland. More specifically, the study estimated: the annual number of fatalities that could be avoided using the eCall system; the effects of eCall on emergency response times; and the effects of real-time information about the vehicle location and accident type on the consequences of the accident.	The aims were not changed during the project.

Description of the work
In its evaluation of current practices, the study discusses the critical importance of timing and speedy action in treating trauma injuries. It also defines the procedures currently undertaken by the authorities in traffic accidents and the presumable impact of eCall on those actions. A general description of the functionality of the automatic emergency call system is included. The estimated number of fatalities that could be avoided using the eCall system is based on the case reports of Road Accident Investigation Teams covering the period 2001–2003. The time interval between the accident and notification of the emergency response centre was evaluated using three methods: based on the case reports of the Road Accident Investigation Teams, based on a questionnaire from the operators of emergency response centres, and by comparing the time of the accident estimated by the Road Accident Investigation Teams with the phone log of emergency response centres.

Results / Status	
Planned results	**Achieved results / comments**
The result was expected to be more reliable and accurate than the existed knowledge about impacts of the eCall.	The results showed that, in most accidents involving motor-vehicle occupants (82%), the emergency call had been made within five minutes of the accident. However, in 14% of the cases the emergency call had been made 5–30 minutes after the accident and in approximately 4% of the cases more than 30 minutes after the accident. In the accidents involving fatal unprotected road user, the delays were slightly shorter. The eCall system could very probably have prevented 4.7% of the fatalities in accidents involving motor-vehicle occupants. In the accidents involving fatal unprotected road user, however, the system could probably have prevented no fatality. In all, eCall system was estimated to be able to reduce 4–8% of road fatalities in Finland. The benefit-cost ratio of the eCall system examined in this study was 0.5–2.3. The benefit-cost ratio would have been higher if the indirect benefits of the eCall system could have been taken into consideration.

Context and Relevance to AINO programme
The project increased awareness of the impacts of the system. It also increased the knowledge of the system requirements in Emergency Reponse Centers. Based on the project Master's Thesis was published. All of these fulfilled the aims set for AINO programme.

Exploitation plan (after the project)
Based on the main findings of this study, the eCall system is recommended for immediate and widespread implementation in Finland. The study also indicated a need for developing statistics on severely injured accident casualties.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
49 780 €	exceeded the planned	90 % of the planned costs	Reason for the exceeding was the finishing of the Master's Thesis based on the work done in AINO.

Figure 43

In-vehicle warnings about approaching trains at level crossings. Testing of the technical implementation

Objectives of the project	
Originally formulated	**Comments**
The purpose of the study was to pilot a system warning driver inside the vehicle about approaching trains at level crossings. The goal was to ensure the technical functionality of the system suggested in the feasibility study, to study preliminarily its suitability for the task and produce recommendations for further actions based on the results.	Originally set objectives were achieved.

Description of the work
At first, a prototype of the system was designed and built. The prototype was then tested at the operation tests on the railway line between Hanko and Karjaa on 16.6.2006. The principal goal of the operation test was to test whether the pilot system implemented during the study would fulfil the set functionality. The functionality of the system communications was studied using an Ethereal protocol analyser.

Results / Status	
Planned results	**Achieved results / comments**
The aim of the project was to test, whether the system outlined in the preliminary study (AINO 17/2005) offers the needed functionality and give recommendations for future action. The prototype system was to be documented.	

Context and Relevance to AINO programme
The project was part of the Driver Support subprogramme. An in-vehicle warning system for railway level crossings is a real-time application which improves safety in railway level crossings.

Exploitation plan (after the project)
Large-scale implementation of an in-vehicle warning system for railway level crossings implies both co-operation of public authorities and existence of a relevant business model. The client side of the warning system would probably be implemented on same hardware and software platform with other ITS applications. Before a full-scale implementation takes place, the safety effects of the system should be studied. This requires a large-scale pilot study with real end-users. The next step could be a large-scale pilot with real end-users and a pilot system implemented like a production-phase system.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
50 k€	50 k€	25	

Figure 44

Measuring the driving style of a driver and the possible safety impacts (Ajotapa)

Objectives of the project	
Originally formulated	**Comments**
The main aims of this study was to study 1) the possibility to measure driver-specific driving style in normal traffic in order to define driver-specific driving style with safety related measures and 2) the possible effects of random speed recording and information and group (non-personal) feedback.	The first objective was emphasized because of the novelty of the acceleration measures and the relevancy in further work, both research and development of new services.

Description of the work

In this study the recording ISA system had the GPS for location information and an (non-visible) on-board unit, which includes speed measuring and modem for sending the collected data to server. In addition to speed and location measurements, also the possibility to measure and record information about acceleration and deceleration was piloted in the study. This was done by installing a sensor for acceleration measurements and memory for data logging to the system.

In the project, the speed and accelerations of four taxi vehicles was measured in normal traffic during seven months in Helsinki area. In the project some relevant, easily measurable safety measures, such as speeding and sudden braking called jerk (often related to near accident situations) were used when the defining and comparing the driving style. In addition, the suitability of the system to use as basis for feedback about speeding was studied.

The data was collected in three phases. In first phase, there is no specific information about the study given to the driver. In the second phase all the company's drivers participated an information session, where drivers were reminded of the possibility of driving style measurements and explained in detail the possibilities to illustrate the results. In third phase the drivers that have serious speed violations were called for special group feedback session.

Results / Status	
Planned results	**Achieved results / comments**
Speeding is a major safety problem that can be technically solved. However there is still strong resistance to these measures. Traffic safety can be substantially improved also by developing driving style measurements and use the collected data to affects driving styles. In this project, the traffic safety driving style measures are studied and defined. Based on those measures, company's drivers driving style is profiled and this measured driving style profile is compared to employer's driver evaluations (subjective). In addition, some possible exploitation possibilities are piloted. One of these was use of recording ISA for traffic safety information and training purposes.	The results suggest that there are clear differences in driving style between the company's drivers. Drivers speeding more often also had near accident related jerks, but also strong braking, more often than average driver in the same company and vehicle. These drivers drove often during evening and night-time. In general, the percentage of near accident related jerks was clearly higher during the night-time than during daytime. The results also suggest that employer is quite well aware of the drivers with non-risky driving style, but has difficulties defining the average and risky driving style drivers from each other. Therefore the driving style measuring and recording could serve a strong base for company's driver feedback, training and rewarding (bonus system) and the development of driving style measuring is important also in future. In addition measuring driving style (location based speeding and jerks) would offer valuable information both to public traffic planning and monitoring.

Context and Relevance to AINO programme

The results suggest that there are clear differences in driving style between the company's drivers and these differences are measurable with speed and accelerations.
Near accident related jerks was found very interesting measurements. The jerks occurred in normal traffic even more often than expected and they can give valuable additional information both to individual drivers, but also to traffic research and planning. Therefore the future work for describing the actual traffic situations related to the jerks is very important and can open new possibilities in the field of traffic behaviour.

Exploitation plan (after the project)

The work will continue in project, funded by TEKES, private Finnish companies and VTT, aiming to use driving style measurements in heavy vehicle drivers' mandatory training (European Parlament directive 2003/59/EY, CAP).

The driving style measuring system has many possible application areas. In future the recording system could also be a part of the quality control system for companies. The quality system could be used especially in cases of transport of hazardous goods or with public transport contracts (school transport etc.). The system could also be used when monitoring special group of drivers for example speed limit offenders or young drivers (as a procedure in driver training). In larger scale, the collected data could be used as background information in traffic planning and research or when gathering information about exposure.

Financial status

Planned costs	Final (expected) costs	% AINO Contribution	Remarks
50 *K €'s*	63 *K €'s*	41% (52% planned)	An additional 9 *K €'s* VTT funding

Figure 45

Field study on the safety impacts of the in-vehicle speed alert system

Objectives of the project	
Originally formulated	**Comments**
To develop a speed limit warning system to the symbian smart phone environment and test the feature with a 30-50 person test group. The aim is to focus on usability and experienced impacts on safety.	

Description of the work
The speed limit warning feature will be developed to an existing smart phone information service Varo+. The speed limit data will be taken from Digiroad system, so the project is also a test for the quality of Digiroad data. The test group will be gathered from our organisations' workers and also from private Varo+ users. The evaluation will be based on analyses of before-after speed data and questionnaire and phone interviews.

Results / Status	
Planned results	**Achieved results / comments**
Above.	The test period has not begun yet.

Context and Relevance to AINO programme
Tests a feature that will be part of the Varo+ service, which is an important product of Aino-programme. Tests the quality of Didiroad data.

Exploitation plan (after the project)
On the basis of the evaluation it is possible to decide, should the ministry start to put efforts on the wider use of in-vehicle speed limit warning systems, or on the traditional roadside speed warning systems. The project has raised a question should the winter-time speed limits be added to the Didiroad database, because the lack of this information greatly lowers the usability of the data on such services.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
54 655		Evaluation 100 % Development 50 %	

Figure 46

EETU

Objectives of the project	
Originally formulated	**Comments**
The goal of the EETU project was to a) produce a road weather and condition service that would be provided by The Finnish Road Enterprise. The service would combine the official and road-user-produced information as bi-directional, mostly automated communication. Road-user gets location-based traffic information and the national road administration gets local and "silent" info about roads. This all needs the b) preliminary idea of the business model and furthermore, c) a preliminary model for the collaboration between the transportation authority and private producers of added-value services, especially dealing with product development.	Different business models of project participants were more challenging than supposed. Service provider's readiness to start the service was hard to integrate with the project schedule. For this reason the project had to be extended more than the financial resources actually allowed. WM-data and WSP used much more their own resources for the project than was planned. Since the bi-directional feature (info from user to user) could not be full-filled as planned, the user-study could not be done as planned. The original experiences of the user had to be replaced by the road users/radio listeners' in-calls to two radio-stations.
Description of the work	
EETU concept for The Finnish Road Enterprise is prepared by WSP LT Consultants (currently WSP Finland) as a user researcher and consultant, and WM-data (currently LogicaCMG) as software producer and service integrator. The crucial enablers of this mobile service have been revealed. They are 1) the road administration's willingness to provide road information, 2) easiness of loading the software and of usage, 3) meaningfulness of the info delivered to service and road users, and 4) (as a motion factor) the delivering the road-user-produced info to other road-users. Along the project, a user research was done. Its data includes a) road-users' reports of traffic disturbances done (by the predefined smart phone buttons) and b) phone calls from car drivers to two radio stations. The first result is the model of how callers define the location of disturbance. Second result is that congestioned traffic is the biggest type of road-users' report.	
Results / Status	
Planned results	**Achieved results / comments**
-Preetu service: the preliminary version of the mobile road weather and disturbance information service -Preliminary business model -User-study, especially of community experiences among users -Suggestion for the Finnish Road Administration how to support financially development the added-value services	Preetu service: the preliminary version of the mobile road weather and disturbance information service/ The bi-directionality in communication works technically well. However, because the collected information is delivered also to other services, informal road-user-produced info and test reports by developers may be dysfunctional for those other services.
Context and Relevance to AINO programme	

There is widely shared atmosphere among the road and mobile service sectors in Finland that is waiting for the mobile services that would live on their own in the open market.

Thus, one of the AINO program's main aims was to create ready-made services that would work in the open market, instead of, say, early-phase prototypes, or even more refined data-collection methods. EETU fulfilled precisely the AINO's main goal, it created a mobile service for road-users. Furthermore, the model for public-private-partnership is crucial when dealing with services that are a) partly based on publically produced raw-data and partly financed by public authorities, at least in the beginning of the service's life cycle.

However, from the research point of view, it has been very frustrating that the public authorities (the orderers of the project) has explicitly required that the project report must be "positive". This means that critical remarks dealing with the project group itself or even the negative user-study results had to be pushed down and enticing ones emphasised.

Exploitation plan (after the project)

The consortium will continue its collaborative efforts among other mobile services. The Preetu server (run by WM-data) will be utilised in other services. Also the EETU-concept (community perspective will be utilised in other projects)

Financial status

Planned costs	Final (expected) costs	% AINO Contribution	Remarks
120	127	61	WSP has spent an extra 7000€ to extend the project, especially to finalize the project report.

Figure 47

Appendix E Service Framework sub-programme

I. Interviewed persons

Seppo Öörni, MinTC, sub-programme leader
Risto Kulmala, VTT
Matti Roine, MinTC
Risto Öörni, VTT
Anna Schirokoff, VTT
Leila Maich Finnish Meteorological Institute
Reijo Väliharju, City of Tampere
Antti Rainio, ITS Finland

II. Sub-programme target impacts

Impact Target	**Projects reporting a strong (XXX) or serious impact (XX)**
Service level and performance of the transport system	• Recommendations for information system purchases • ASK€L –multimodal transport services in a city • Electronic license plate (SÄRKÄ) • Preliminary study of vehicle telematics platforms
Costs of the transport system	• Recommendations for information system purchases • ASK€L –multimodal transport services in a city • Preliminary study of vehicle telematics platforms
Prerequisites for business	• Survey of the ITS radio frequencies • Publicly available basic transport information • eCall Help Desk test bench 2006 • Recommendations for information system purchases • ASK€L –multimodal transport services in a city • Preliminary study of vehicle telematics platforms
Traffic safety	• National facilities for eCall operation • eCall Help Desk test bench 2006 • ASK€L –multimodal transport services in a city • Preliminary study of vehicle telematics platforms • Impacts of road transport Information on pi accidents
Others (Evaluation, Promotion & demonstration of ITS)	• The AINO service evaluation framework • AINO tour • Intelligent transport at Heureka • Safety impact assessment (VARO)

Figure 48

III. Comment on sub-programme targets:

The projects listed provide good coverage of all the AINO target areas, with considerable emphasis on the prerequisites for business and traffic safety. In the ASK€L project attention was given to the potential for multimodal transport information services in a small city

Projects to study the operational feasibility and impact of the European eCall initiative were associated with the Finnish Presidency of the EU in the latter half of 2006.

Other projects were used to develop a service evaluation framework for the AINO programme, and to support outreach to the general public through Heureka, the Finnish science centre and exhibition. The Heureka project was supported to increase people's awareness of the impacts and viability of real-time services, as well as the needs of users and their assessment.

IV. Projects for review

The following projects were drawn to our attention;

1. Defining alternatives for the public sector's objectives in ITS service production
2. The AINO Programme's service evaluation framework
3. ASK€L –multimodal transport services in a city
4. Planning and realisation of the eCall test environment
5. Impact evaluation method of the road surface condition warning service (VARO)
6. Transport information services in the Oulu region – Pilot feasibility study
7. Intelligent transport at Heureka – a visit to the information world of transport

1. Defining alternatives for the public sector's objectives in ITS service production

Project summary

The project involves the definition of alternatives for the public sector's objectives in ITS service production. These alternatives should correspond to principles that are commonly observed in Finland, cover the essential ITS services, and take into consideration the EU's views on and international experiences of the creation of service businesses. A comprehensive workshop was organised, which included presentations by Finnish and foreign experts, followed by the development of alternatives for the public sector's objectives. Most of the material produced by the foreign experts is included in the publication's appendices. Six alternatives for the public sector's operational objectives were initially produced:

- Focus on transport network operations, information only provided on significant traffic incidents
- Payment for reaching socio-political objectives
- Outsourced basic service package
- Information services only used to improve safety
- Outsourcing in stages
- Free and partly outsourced basic services

The steering group then selected the first three alternatives listed above for further analysis. The alternatives were first examined from the angle of different actor roles. The strengths, weaknesses, potential and risks of each alternative were assessed. Then the alternatives were examined from the viewpoint of economic theory, international competitiveness and authority services. A proposal for utilising the project's findings was also introduced.

Primary Impacts

- Improved service provision prerequisites and tendering

Secondary Impacts

- Development and piloting of innovative solutions
- Promotion of standardised and generic solutions

Exploitation plans

The results of this project initiated discussions within the public sector actors in Finland. This culminated in the reformulation of Finnra's service strategy in the autumn of 2006, which clearly stated the role and borders of public sector activities in ITS services. The role was a mix of alternatives 1 and 4 of above. This has now been acknowledged by the private sector actors and the positive effects on new services have already started too emerge.

Reviewers' comments

The project targets "Prerequisites for business" by defining alternative procurement packages for securing the public service requirement in multimodal traffic and travel information services. One of the specific goals of the Service framework sub-programme was to develop an "Optimum model for public sector participation in service business" and the project provided a proposal for such a model. The value of the project is evidenced by the reformulation of Finnra's service strategy in response to the project recommendations.

2. The AINO Programme's service evaluation framework

Project summary

The objective of this project was to create a clear and simple evaluation practice that would provide essential information on the descriptions, accessibility, user impacts and benefits of transport information services up for inclusion in the AINO Programme. Socio-economic and private- and public-sector cost-effectiveness of the services would especially be assessed.

An evaluating tool was created in the form of an Excel workbook. This evaluation workbook was intended to aid service developers, evaluators and investors. The workbook was, on the one hand, to act as a tool for evaluating the AINO Programme's proposed service development projects and, on the other hand, to act as a general ITS service evaluating tool. It is based on the Ministry of Transport and Communications' general transport project evaluation guidelines and especially on the Ministry's ITS project evaluation guidelines from 2002. The aforementioned evaluation guidelines contain more detailed information on evaluations and their bases.

Primary Impacts

- Improved service provision prerequisites and tendering

Secondary Impacts

- International standards in ITS project evaluation

Exploitation plans

The project evaluation tool has been available at the AINO website from the beginning of 2005 and has been widely used already. All AINO service development projects must utilise this evaluation tool in order to apply for funding and in future probably all such projects to be funded by the Ministry and its sector's administrations will use it. The tool has been translated into English and disseminated in the European Evaluation Expert Group and IBEC, and further exploited in countries like Denmark. Elements of this tool have been used as part of the evaluation of the AINO programme.

Reviewers' comments

The availability of an evaluation tool has had great significant for the AINO programme by requiring assessments to be made of project proposals against an objective list of impact mechanisms and targets. Translation of the evaluation tool into English, and its dissemination to the European Evaluation Expert Group and IBEC were a means to ensure peer group review. We note that the evaluation tool has been taken up in Denmark and elsewhere, which is a very positive result.

3. ASK€L – A concrete and economical step towards multimodal transport services in a city

Project summary
Electronic transport information services are currently scattered and the user has to search for them from several different locations. The problem is that different services can only be found from different access points. It seems also that willingness to pay for traffic information services is also rather low.

The ASK€L project has investigated how to bring the information services for all modes together into one combined service. The project looked at the implementation of a multimodal service collection entity in an urban area, in this case Tampere, and the surrounding region. The objective was to create a service business in which information on the multimodal network of public transport services is available in one combined service. The possibilities for new and innovative commercial information services were also explored.

Possibilities of transport-related internet services were studied from the transport sector actors'' profitability point of view. It included the description of the third party operations as a part of electronic transport services and made concrete recommendations for further action. Tampere was used as a reference case for national objectives.

The main activities were:

- To sort out up to date possibilities to integrate services and data related to traffic information to develop a multimodal traffic service
- To make survey (a set of interviews) for local commercial advertisers to solve their interest for multimodal service concept as an advertising media. Also to solve their need for segmented marketing.
- To plan and specifying the multimodal service concept based on the traffic information services and data available. Also enable the commercial functionalities for the new business model.
- To carry out preliminary negotiations concerning data and service to be used in forthcoming service concept
- To report findings as an AINO report.

The project has produced:

- A plan and specification of multimodal information service for Tampere area, made according to the TelemArk guidelines (National ITS Architecture).
- Recommendations and comments for business model with commercial parties.

Primary Impacts

- Promotion of standardised and generic solutions
- Development and piloting of innovative solutions
- Improved public transport incident management or route choice
- More efficient transport network incident management
- Improved driver and vehicle support

Secondary Impacts

- Change in transport infrastructure or vehicle fleet investments
- More efficient public transport operation
- More efficient use of transport infrastructure
- Promotion of non-motorised transports
- Improved logistic chains and deliveries
- Improved service provision prerequisites and tendering

Exploitation plans

Several on-line transport information services used in Tampere will most likely be integrated as a pilot service based on public-private-partnership. Some new features will also be developed to provide a more complete set of services. Main ITS services of Tampere will then be reached from a single on-line service point. Services to be included will cover public

transport (e.g. journey planner, personalised services), individual traffic (e.g. personalised services, dynamic parking guidance) and pedestrian and bicycle traffic (e.g. routes, parking).

Based on the results of the project the business model exists. The help of commercial partners could also enable new service elements. From marketing point of view personalised services are remarkable opportunity for valuable segmentation marketing.

The development of such a service will need private investments. Investments will be financed partly by public authorities (the part of their services) and partly by private companies. The service provider should be private in order to enable the new business model possibilities. The plan is to launch the new service in year 2007.

	Data Acquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
1st choice (Project viewpoint)	Out-source	Out-source	Out-source	Public	Public
Alternatives	Data pool	Fully private	Fully private	Fully private	Fully private

Figure 49

Reviewers' comments

Tempere has been chosen to reflect the interests of a community of authorities. The project aims to find cost-effective methods to provide multi-modal information services suitable for a small city, and how this can be linked to the city's transport policies and traffic control strategies. The long-term objective is to develop real-time information services for all modes. City authorities want to use traffic and travel information to stem the decline in public transport, improve road safety, make better use of road capacity, and make a real impact on traffic.

We endorse the ASK€L project promoter's comments, as follows:

"Transport on-line services have not yet been utilised as a marketplace of other services and products. E.g. public transport fleet is widely used as a marketplace of the commercial sector. Commercial advertisements could bring some extra resource to be used as an extra resource to cover operational and development costs of services. Help of commercial partners could also enable new service elements. New innovative elements for business model are needed. New kind of information services can be offered for the citizens in order to avoid unpleasant surprises due to e.g. traffic incidents."

The project demonstrates the important for small cities of Ministry funding of research on the service framework and business models for ITS, and the development of open, standardised interfaces.

4. Planning and realisation of the eCall test environment

Project summary
In-vehicle emergency calls (eCall) have the potential to greatly reduce the number of fatalities, severity of injuries and stress in post-crash situations, by speeding up the response of the emergency services. eCall can be initiated manually or automatically after a crash. It passes relevant information of the accident, including its accurate location, to the emergency services (the Public Service Answering Point).
The eCall projects related to this assessment are:

1. Planning and implementation of the eCall test bench for testing eCall unit communications 2004-05
2. Implementation of the Finnish eCall website 2004-05
3. Maintenance & Help Desk of the eCall communications testing service 2005
4. Maintenance of the Finnish eCall website 2005
5. Maintenance & Help Desk of the eCall communications testing service 2006
6. Maintenance of the Finnish eCall website 2006
7. Updating the eCall test bench and Maintenance & Help Desk of the eCall communications testing service 2007
8. Maintenance of the Finnish eCall website 2007

The objective of the first of these – the eCall test bench project - was to plan and implement the eCall test bench for eCall unit communications. The communications involve both data and voice-frequency telephone connections using in-vehicle terminals that are part of eCall. This helps equipment suppliers to test and ensure the performance of their data transfer terminals. Using tests, the authorities can ensure that the terminals will transfer data also in emergency situations, but will not endanger the functioning of systems at the Emergency Response Centre even if they malfunction or fail.

The remaining projects were designed to maintain and update the testing service for eCall unit communications (mentioned above) and implement and maintain the Finnish eCall website and operator register.

Primary Impacts

- More efficient transport network incident management
- Improved driver and vehicle support
- Improved service provision prerequisites and tendering
- Promotion of standardised and generic solutions
- Development and piloting of innovative solutions

Secondary Impacts

- Change in transport infrastructure or vehicle fleet investments
- Improved public transport incident management or route choice
- More efficient use of transport infrastructure
- Improved logistic chains and deliveries

Exploitation plans

The eCall communications testing service can be developed into a commercial business after the essential parts of eCall messages (as size and contents MDS) and eCall communications have been standardized or at least defined and accepted at de facto level. The testing activity can then be continued as a chargeable EU level certified service by a testing facility. The testing environment can be extended to include also other terminal features such as interoperability with other vehicle systems, mount ability, usability and the physical characteristics of the equipment (temperature, vibration, humidity etc.)

The implementation of eCall should also promote the emergence of other official and commercial value-added real time telematic services based on positioning.

Reviewers' comments

This trial is designed to pave the way for large-scale national and international implementation of the telematics-based in-vehicle emergency call service, known as eCall. Results the Finnish eCall projects have played an important role in the discussions at European-level on how to take forward the eCall initiative. Ensuring the functionality of communications is an essential prerequisite for the large-scale implementation of the eCall system. The projects therefore address an important strategic function.

eCall also raises methodological issues about how to assess the true benefit of information services and what impact eCall will have on the Emergency Response Centres.

Commercial exploitation of eCall is also a factor. The eCall projects listed here have been 100% funded from the AINO programme, with a total of €297,000 spent over the period 2004-07. Given the range of primary and secondary benefits that are claimed, and the expectation that the eCall communications testing service can be developed into a commercial business, it is somewhat surprising that this project was not carried out in partnership with the private sector with part-funding from a future eCall operator.

5. Impact evaluation method of the road surface condition warning service (VARO method)

Project summary

The purpose of this project is to investigate the ways to study the impacts of real-time road surface condition warnings on the driving speeds of drivers at the problem or incident sites. This work complements the impact evaluations of the second phase of the Varo project and the Varo theory project. All these studies together create a general view on the impacts of the Varo service. The project also studies which parts of the method can be generalised for other precision information services and which parts are service specific.

Only 3 project meetings have been held so far. No actual work has been carried out. The study has been postponed because of a delay in the Varo service launch and the small number of the service users in spring 2006. The service was changed during the summer of 2006 and started again in November 2006. It was therefore agreed that the evaluation will be developed when the service has received its final form and when the number of users is large enough.

The project is expected to increase greatly the knowledge of conducting impact analysis on real-time information services. It will produce unique data about evaluating the impacts of road surface condition warnings. The results can be utilised in evaluating the impacts of real-time the road surface condition warning system on drivers driving behaviour. The results can also be partly utilised in the evaluation of other kinds of real-time precision informationservices.

Primary Impacts

- Evaluation, Promotion & demonstration of ITS

Secondary Impacts

- Improved service provision prerequisites and tendering

Exploitation plans

Road surface condition warnings aim to increase the safety of road users. It is expected that the detailed advance information about road surface conditions and weather along the route would be especially important for the drivers of heavy vehicles and buses committed to certain timetables and routes. The heavy vehicle driver warning service (Varo) developed in the AINO programme consists of two complementary services - a heavy transport route planning service and a real-time automatic warning service.

The results can be utilised in evaluating the impacts of real-time the road surface condition warning system on drivers driving behaviour. The results can also be partly utilised in the evaluation of other kinds of real-time precision information services.

Reviewers' comments

The VARO information service was prompted by a serious coach accident which involved a number of fatalities. It is designed to advice in real time to drivers on accident risk points during the course of the journey. Development of the business case prior to implementation was based on a case-by-case analysis of 4 years of fatal accident reports to determine the proportion which would have benefited from an eCall service that would improve the emergency response, and thus save lives.

There has been a 1-year delay in implement the VARO service, and so no fieldwork has been done so far. In the meantime, interviews with truck and coach drivers suggest that the value of this kind of service may have been over-estimated. The service may be nice to have but what is the commercial impact on the company profits and revenue streams. However, the methodology, which is being tried for the first time, may be useful in the evaluating the economic benefits of an information service, to justify funding from public sources.

6. Transport information services in the Oulu region – Pilot feasibility study

Project summary
(Note: no assessment information was received by the reviewers on this project)

The purpose of this study is to draw up a more detailed description of transport information services in the Oulu region in accordance with the public-private partnership (PPP) model. This continues the work begun during the Service Production Models project, which was part of the Pro Telio project. The Pro Telio project established among other things that there is much need, know-how, data and co-operative spirit for the production of ITS and the regional development of transport systems by utilising Information Communication Technologies know-how, but the development of services is hindered e.g. by the lack of an integrator and operations models.

This study describes the existing infrastructure, outlines a desired future state for transport information services and seeks viable services and modes of operation that can then be piloted. Immediately after the feasibility study is completed, preparations will be started for a separate service pilot phase in the Oulu region in 2006. The decision on whether or not to proceed with the pilot will be made on the basis of the results of the feasibility study.

Primary Impacts

- Improved service provision prerequisites and tendering
- Development and piloting of innovative solutions

Secondary Impacts

- Improved logistic chains and deliveries
- More efficient use of transport infrastructure
- More efficient transport network incident management
- Improved driver and vehicle support

Exploitation plans

The final vision for and desired future state of the project is a regional transport management centre, which will offer both the existing and new services, depending on user needs and demand. Information e.g. on travel conditions and traffic incidents will be easily and reliably available from one place through a variety of information channels. New technology etc. can also be exploited as quickly and flexibly as possible. The information requirements of a variety of users (the authorities, companies, private persons etc.) will all be fulfilled through the centre. If the model is successful, applications can also be introduced at other Finnish urban centres.

Reviewers' comments

Development of a regional transport management centre for the Oulu region will require a clear statement of service requirements and transparency over expected service delivery standards that are acceptable to all parties to the partnership.

7. Intelligent transport at Heureka – a visit to the information world of transport

Project summary
The Finnish Science Centre Heureka in co-operation with the ITS-Finland organisation has built up an interactive exhibition on transport telematics and information services in Finland. The exhibition was opened in the autumn of 2006 and will stay open until 2011. There are 16 interactive exhibits covering road traffic, railway traffic, air traffic, sea traffic, public transportation, emergency response system, passage control and road weather. The area of the exhibition is about 120 square metres. By the end of the year 2006 already over 57,000 people had visited the exhibition.

The purpose of the exhibition is to get the visitors of Heureka to look at transport and its information systems in a new way and also in a broader sense make them think about the meaning of transport in our everyday life. The estimated number of visitors is 1.3-1.5 million during the five years. There will also be other programme activity supporting the exhibition theme in Heureka during the exhibition. Ideas and suggestions for events are gladly accepted.

Primary Impacts
- Evaluation, Promotion & demonstration of ITS

Secondary Impacts
- Development and piloting of innovative solutions

Exploitation plans

The exhibition will be open at the Heureka for at least 3 years (until autumn 2009). After that it will need updating/upgrading and then it can remain open until 2011. The partners have already benefited by being able to demonstrate their inventions, products and services to their interest groups as well as the public. Partners can (and already have) duplicate single exhibits to be used outside Heureka, like fairs, conferences etc.

Reviewers' comments

This is a very imaginative and effective form of outreach for the AINO programme, to explain the importance of multimodal information services to the general public. The interactive exhibits work well with a variety of age groups and provide a profile for systems, such as traffic signal control or air traffic monitoring, which would otherwise be taken for granted and be largely invisible, until they go wrong!

V. Project fact sheets

In this chapter all the received fact sheets for the Service Framework sub-programme are attached.

Defining alternatives for the public sector's objectives in ITS service production

Objectives of the project	
Originally formulated	**Comments**
To define three alternatives for the public sector's objectives in ITS service production. These alternatives should correspond to principles that are commonly observed in Finland, cover the essential ITS services, and take into consideration the EU's views on and international experiences of the creation of service businesses.	The objectives were slightly widened by first studying six alternatives but then narrowing to three. The objectives were fully reached.

Description of the work
A comprehensive workshop was organised, which included presentations by Finnish and foreign experts, followed by the development of alternatives for the public sector's objectives. Six alternatives for the public sector's operational objectives were initially produced: - Focus on transport network operations, information only provided on major incidents - Payment for reaching socio-political objectives - Outsourced basic service package - Information services only used to improve safety - Outsourcing in stages - Free and partly outsourced basic services The steering group then selected the first three alternatives listed above for further analysis. The alternatives were first examined from the angle of different actor roles. The strengths, weaknesses, potential and risks of each alternative were assessed. Then the alternatives were examined from the viewpoint of economic theory, international competitiveness and authority services. A proposal for utilising the project's findings was also introduced

Results / Status	
Planned results	**Achieved results / comments**
Three alternatives for further decision making. These should then be utilised to make as quickly as possible a decision on the role of the public sector so that private actors could operate without the risk of public sector disturbance in the domain outside the scope of the public sector.	The planned results were achieved

Context and Relevance to AINO programme
Highly relevant. One of the specific goals of the Service framework subprogramme was to develop an "Optimum model for public sector participation in service business" and the project provided a proposal for such a model.

Exploitation plan (after the project)
The results of the project initiated discussions within the public sector actors in Finland, which culminated in the reformulation of Finnra's service strategy in the autumn of 2006, which clearly stated the role and borders of public sector activities in ITS services. The role was a mix of alternatives 1 and 4 of above. This has now been acknowledged by the private sector actors and the positive effects on new services have already started too emerge.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
56 000	61 000	100%	Increased work due to widened objectives

Figure 50

The AINO Programme's service evaluation framework

Objectives of the project	
Originally formulated	**Comments**
The objective of the project was to create a clear and simple evaluation practice that would provide essential information on the descriptions, accessibility, user impacts and benefits of transport information services up for inclusion in the AINO Programme. The socio-economic and private- and public-sector cost-effectiveness of the services would especially be assessed.	The objectives were fully met.

Description of the work
The project was divided into three phases: 1. The formulation of a service evaluation framework on the basis of the Ministry of Transport and Communications' general framework 2. The development of an evaluation practice and the associated presentation techniques 3. The evaluation of example projects and the consequent adjustments to the framework and evaluation practice An evaluating tool was created in the form of an Excel workbook. This evaluation workbook was intended to aid service developers, evaluators and investors.

Results / Status	
Planned results	**Achieved results / comments**
An evaluation tool for evaluating the AINO Programme's proposed service development projects and, on the other hand, to act as a general ITS service evaluating tool. It should be based on the Ministry of Transport and Communications' general transport project evaluation guidelines and especially on the Ministry's ITS project evaluation guidelines from 2002. The aforementioned evaluation guidelines contain more detailed information on evaluations and their bases.	The planned results were achieved. The evaluation tool was produced as an Excel workbook.

Context and Relevance to AINO programme
Highly relevant. One of the specific goals of the Service framework subprogramme was to ensure that "The benefits and applicability of ITS are well and widely known" and the project provided a tool for studies providing such information.

Exploitation plan (after the project)
The toolbox has been available at the AINO website from the beginning of 2005 and has been widely used already. All AINO service development projects and probably all such projects to be funded in the future by the Ministry and its sector's administrations must utilise this evaluation tool in order to apply for funding. The tool has also been translated into English and disseminated in the European Evaluation Expert Group and IBEC, and further exploited in countries like Denmark. Also the evaluators of AINO utilise elements of this tool.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
29 000	29 000	100%	-

Figure 51

Survey of the ITS radio frequency requirements and the radio frequencies reserved for ITS

Objectives of the project	
Originally formulated	**Comments**
The aim of the work was to gather information on radio frequencies available to ITS systems, analyse the radio frequency needs of different ITS applications and prepare recommendations related to radio frequencies and ITS systems.	Originally set objectives were achieved.

Description of the work
Internet searches and a literature study were the most important ways to find relevant information. In January 2005, a workshop was organised to obtain the latest information on the radio frequency needs of different ITS applications. In addition, some expert interviews were held to find answers to specific questions.

Results / Status	
Planned results	**Achieved results / comments**
The aim of the project was to gather information on the radio frequency needs of different ITS applications and radio frequencies available to ITS applications and prepare recommendations for future action.	

Context and Relevance to AINO programme
The project was part of the service framework subprogramme. A study on the radio frequency needs and frequencies available to ITS applications supports the implementation and decision-making related to different ITS applications.

Exploitation plan (after the project)
The most cost-efficient way for Finland to organise the monitoring of the use of radio spectrum and radio frequency needs of different ITS applications is probably to commission it to some established organisation working with ITS.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
19 k€	19 k€	100	

Figure 52

Publicly available basic transport information

Objectives of the project	
Originally formulated	**Comments**
Objective of the study was to define the public basic transportation data of Finnish Road, Rail and Maritime Administrations. The public basic transportation data means static and dynamic data on the whole traffic system from the authorities that is publicly available for every user.	

Description of the work
The first part of the study is a summary on the current situation and plans. Second part defines the vision and objectives for the public basic transportation data. Based on the results from the previous parts an objective state of the public data was defined. The last part of the study is a proposal of a development program of the public transportation data. The work was done in co-operation between the ministry, Finnish Road, Rail and Maritime Administrations. Each Administration created their own parts and the common understanding, vision, objective state and future plans were made in common workshops.

Results / Status	
Results	**Comments**
<u>Vision</u> The vision on the public basic transportation data is following: Year 2009 all user organizations can access the quality data on traffic network, its features, conditions and traffic on it defined and provided by the authorities easily and fairly. The public basic data on transportation is a part of the information society infrastructure that enables the efficient, economic and safety transportation system.	The defined vision was considered needed, clear and useful by all stakeholders
<u>Current and objective state</u> The administrations have currently extensive and valuable data on the networks and traffic. The objective state defines two issues: the public basic data service products of the administrations and how these products are available and defined. The products of Road and Maritime Administrations are not very different from the current data material. At the Road Administration the most important new material is enhanced real time traffic flow and forecast data. At the Maritime Administration new issues are traffic incident data and centralized delivery of the traffic follow-up data. The Rail Administration has the most significant development needs for new data services. At the Rail Administration the most essential new data services at the objective state are data on the rail network, train timetables and traffic incidents. The most important issue of the objective state is that the public basic data is easily available. Currently the ways of providing the data are case-specific and often difficult for the users. At the objective state it is easy for the users to find out the products available from a national traffic data dictionary. The users can access the data services from standardized service interfaces and through centralized customer services of each administration.	The project did well in investigating and documenting all the present traffic data materials. The objective state phase reached its objects in listing the future traffic data products, their development needs, defining the operating models how the data should be available and defining the way the data products should be documented. The project was not able to define all the objective future traffic data products in detail.
<u>Proposed future actions</u> It is proposed that the realization of the public basic data objective state will happen at a development program. The development program will realize the common tasks like building the traffic data dictionary and the program will follow the projects of the administrations that are developing the data services. It is also proposed that the other types of public basic data, like on public transportation, should be studied.	The proposal was considered needed by all stakeholders. The project was not able to organize the future actions.

Context and Relevance to AINO programme

The aim of the ministry and Administrations is to promote the traffic safety and efficiency by providing specific basic data on traffic easily available to the other parties. It has to be clear what data products are provided by the public sector, in order that the privet sector can understand their own role and opportunities. There has been studies and debate on this issue on general level, but the problem can be solved only by defining the ”data products” that the administrations provide.
Exploitation plan (after the project)
The project proposed future actions as described at the results phase. None of the actions have been realized after the study. There has not need a formal forum to decide or organize the proposed actions.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
90 000 €	90 000 €	50 %	

Figure 53

AINO tour

Objectives of the project	
Originally formulated	**Comments**
To increase decision makers knowledge of the benefits of ITS. To increase knowledge of the ITS technologies already in use in Finnish traffic management centers, i.e. road, maritime, railroad sectors as well as meteorological institute and private sector.	all achieved

Description of the work
We arranged 20 tours to 6-8 different centers a time. Participants were from different branches, many of them leading positions. Also media was well represented. Each tour had 4-8 guests and one tour leader (Ilpo Mattila). Program was carefully designed so that you could make a good picture of telematics used in everyday traffic management. Each tour lasted half a day. A preliminary tour was organized for ministries and AINO-program leaders.

Results / Status	
Planned results	**Achieved results / comments**
To increase the knowledge. To build network etc.	Good results were achieved, people told that they got new insights and much better information of traffic management than before (just sitting at seminars). Many radio- and tv-inserts were made, also many stories in magazines and some in newspapers were published that were inspired by the tours.

Context and Relevance to AINO programme
Relevance was important. More tours should have been made to get still more acquaintance to the programme. PR work is very important part of ITS, because nothing will happen without policymakers understanding and will.

Exploitation plan (after the project)

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
13000 €	13000 €	100	

Figure 54

Intelligent transport at Heureka – a visit to the information world of transport

Objectives of the project	
Originally formulated	**Comments**
To produce an interactive science centre exhibition about traffic telematics and intelligent traffic services. Exhibition will be opened at Heureka The Finnish Science Centre during autumn 2006 and it will be open until 2011.	Exhibition opened at Heureka 29th of September 2006.

Description of the work
Heureka has planned the content of the exhibition together with the co-operation partners. Heureka has designed and produced the exhibition and Heureka will maintain it. Marketing has been made in co-operation with partners. Partners include ITS-Finland, Ministry of Transport and Communications, Finnish Road Administration, Finnish Road Enterprise The Finnish Maritime Administration, Emergency Response Centre Administration, Finnish Rail Administration, VR-Group Ltd, Finnish Meteorological Institute, Finavia, National Land Survey of Finland, Central Organization for Traffic Safety in Finland, Helsinki City Transport, Hewlett-Packard Ltd, Finnish Federation of the Visually Impaired, Helsinki University of Technology, Laboratory of Transportation Engineering and Industrial Information Technology Laboratory, UPM Raflatac Ltd

Results / Status	
Planned results	**Achieved results / comments**
Exhibition will consist of 10-15 different interactive exhibits covering different traffic sectors. The area of the exhibition will be about 100 sqm.	16 interactive exhibits covering road traffic, railway traffic, air traffic, sea traffic, public transportation, emergency response system, passage control and road weather. The area of the exhibition is about 120 sqm. By the end of the year 2006 already over 57 000 people have visited the exhibition.

Context and Relevance to AINO programme
To launch traffic telematics and traffic related IT-services to wide audience. To increase public understanding of traffic IT-services – including also those projects related to AINO programme.

Exploitation plan (after the project)
Exhibition will be open at the Heureka at least 3 years (until autumn 2009). After that it will need updating/upgrading and then it can still be open in Heureka until 2011. Co-operation partners can (and already has) benefit the exhibition to demonstrate their inventions, products and services to their interest groups as well as the public. Co-operation partners can (and already have) duplicate single exhibits to be used outside Heureka (like fairs, conferences etc).

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
646 K€	650 K€	15	

Figure 55

National facilities for eCall operation

Objectives of the project	
Originally formulated	**Comments**
The objective of the project was to create the national eCall-framework for Finnish authorities in which the operative eCall authorities can commit and which will be the base of the national eCall co-operation in future.	Original objective was achieved.

Description of the work

The phases of the project were:

1. Working out the needs and the challenges of the relevant eCall authorities by literature study, internet search and interviews
2. Drafting the preliminary eCall framework
3. Complementation and validation the results related to the eCall framework (workshop with relevant authorities, other eCall operative actors and eCall experts)
4. Documentation of the results and final report.

Results / Status	
Planned results	**Achieved results / comments**
1. National eCall-framework for Finnish authorities - demands and needs of the authorities related to eCall system - relevant needs for change of the functioning of the authorities 2. Estimate of updating need of the national eCall architecture.	

Context and Relevance to AINO programme

The project was part of the Service Framework subprogramme.

Ensuring the commitment of the relevant authorities a prerequisite for the large-scale implementation of the whole eCall system. The implementation of eCall should also promote the emergence of other official and commercial value-added real time telematic services based on positioning.

Exploitation plan (after the project)

The co-operation and communication between the different actors will continue and expand on the grounds of the eCall framework developed in this project, in order to promote the national implementation and awareness of eCall.

Financial status

Planned costs	Final (expected) costs	% AINO Contribution	Remarks
40 k€	40 k€	75 %	

Figure 56

eCall terminal test bench Help Desk and maintenance 2006

Objectives of the project	
Originally formulated	**Comments**
The objectives of the projects were: - to plan and implement the eCall test bench for eCall unit communications - to maintain and update the testing service for eCall unit communications (mentioned above) - to implement and maintain the Finnish eCall website and operator register.	Original objectives are and will be reached (2007). This assessment covers all the "eCall test bench & service" and "eCall website" projects made in AINO programme during 2004-07. See "Description of the work".

Description of the work
The eCall projects related to this assessment are: 1. Planning and implementation of the eCall test bench for testing eCall unit communications 2004-05 2. Implementation of the Finnish eCall website 2004-05 3. Maintenance & Help Desk of the eCall communications testing service 2005 4. Maintenance of the Finnish eCall website 2005 5. Maintenance & Help Desk of the eCall communications testing service 2006 6. Maintenance of the Finnish eCall website 2006 7. Updating the eCall test bench and Maintenance & Help Desk of the eCall communications testing service 2007 8. Maintenance of the Finnish eCall website 2007

Results / Status	
Planned results	**Achieved results / comments**
- The eCall test bench for eCall unit communications 2005 and updated version 2007 (March 2007) - eCall communications testing service 2005-07 http://www.ecall.fi/testbenchl.htm , registered users from 20 countries (December 2006) - eCall website & operator register 2005-07 http://www.ecall.fi/indexe.html	

Context and Relevance to AINO programme
The project was part of the Service Framework subprogramme. Ensuring the functionality of communications is a prerequisite for the large-scale implementation of the whole eCall system. The implementation of eCall should also promote the emergence of other official and commercial value-added real time telematic services based on positioning. Real time eCall information is given by Finnish eCall website to the domestic and foreign eCall operators.

Exploitation plan (after the project)
The eCall communications testing service can be developed into a commercial business after the essential parts of eCall messages (as size and contents MDS) and eCall communications have been standardized or at least defined and accepted at de facto level. The testing activity can then be continued as a chargeable EU level certified service by a testing facility. The testing environment can be extended to include also other terminal features such as interoperability with other vehicle systems, mount ability, usability and the physical characteristics of the equipment (temperature, vibration, humidity etc.).

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
297 k€ (2004-07)	297 k€ (2004-07)	100%	

Figure 57

Recommendations for information system purchases

Objectives of the project	
Originally formulated	**Comments**
The purpose of this project was to define essential entities, problems and make recommendations for the procurement of passenger information systems made by the public sector.	The objectives were reached in a form of a high quality "guide book" (=report).for the contracting authorities.

Description of the work
The final report is an outcome of many workshops and interviews that were conducted during the project. In between the workshops consultants continuously updated the report.

Results / Status	
Planned results	**Achieved results / comments**
A high quality guide book for the contracting authorities	A high quality guide book for the contracting authorities

Context and Relevance to AINO programme
The guide book will definitely be helpful in forthcoming procurements. In our opinion, the relevance to AINO-project comes from the fact that with the results and experiences gathered in this project the future real time passenger information systems can be purchased more cost-effectively. In addition, in our report we have pointed out some guidelines to follow in order to secure the best quality of the future information systems.

Exploitation plan (after the project)
In the final report that here are some ideas and recommendations for how the future systems should be purchased (what kind of business model should be used, what to take in to consideration when preparing the invitation to tender etc.) These recommendations won't create new projects or procurements as it's own but they will help and support the authorities in future projects.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
45 000	45 000	50 %	

Figure 58

ASK€L – A concrete and economical step towards multimodal transport services in a city

Objectives of the project	
Originally formulated	**Comments**
The main objectives of the ASK€L project was to plan and specify the multimodal information service for Tampere. The core of the planned multimodal service will be based on a set of existing services. In addition to that the economical objective was to solve whether the commercial parties could be joined to service to support the business model with additional resources.	Objectives were reached as originally formulated.

Description of the work

The main work was done by Infotripla Ltd. The project was financed by AINO, City of Tampere, Finnish Road Administration and Infotripla Ltd.

The main activities were:

- To sort out up to date possibilities to integrate services and data related to traffic information to develop a multimodal traffic service
- To make survey (a set of interviews) for local commercial advertisers to solve their interest for multimodal service concept as an advertising media. Also to solve their need for segmented marketing.
- To plan and specifying the multimodal service concept based on the traffic information services and data available. Also enable the commercial functionalities for the new business model.
- To carry out preliminary negotiations concerning data and service to be used in forthcoming service concept
- To report findings as a AINO report.

All these were made having Tampere as a reference case for national objectives.

Results / Status	
Planned results	**Achieved results / comments**
As a result, to plan and specify the multimodal information service for Tampere based on a set of existing services. In addition to that to solve whether the commercial parties could be joined to service to support the business model with additional resources.	A plan and specification of multimodal information service for Tampere area. A plan and specification were made according to the TelemArk guidelines (National ITS Architecture). Recommendations and comments for business model with commercial parties.

Context and Relevance to AINO programme

Cities have several transport on-line services (from basic time tables on web to personalised mobile services), which are actively used. The problem is that different services could only be found from different access points. It seems also that willingness to pay for traffic information services is also rather low.

On the other hand, transport on-line services have not yet been utilised as a marketplace of other services and products. E.g. public transport fleet is widely used as a marketplace of the commercial sector. Commercial advertisements could bring some extra resource to be used as an extra resource to cover operational and development costs of services. Help of commercial partners could also enable new service elements. New innovative elements for business model are needed. New kind of information services can be offered for the citizens in order to avoid unpleasant surprises due to e.g. traffic incidents.

Exploitation plan (after the project)

As a result, several transport on-line services used in Tampere will most likely be integrated as a pilot service based on public-private-partnership. Some new features will also be developed to provide a more complete set of services. Main ITS services of Tampere will then be reached from one on-line service point. Services to be included in forthcoming multimodal service will cover public transport (e.g. journey planner, personalised services), individual traffic (e.g. personalised services, dynamic parking guidance) and pedestrian and bicycle traffic (e.g. routes, parking).

Based on the results of the project the business model exists. The help of commercial partners could also enable new service elements. From marketing point of view, e.g. personalised services are remarkable opportunity for valuable segmentation marketing.

The development of such a service will need private investments. Investments will be financed partly by public authorities (the part of their services) and partly by private companies. Service provider should be private in order to enable the new business model possibilities. The plan is to launch the new service in year 2007.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
24,725	29,495	21,0 %	Planned AINO contribution was 25 %. Extra costs were covered by Infotripla Ltd.

Figure 59

Possible uses for an electronic license plate (SÄRKÄ)

Objectives of the project	
Originally formulated	**Comments**
Automatic identification of vehicles allows many applications, both in the private and the public sector. An electronic licence plate can be implemented through RFID or other wireless technologies. The main objective of the project is to assess the possible applications (both private and public) and implementation scenarios for an electronic licence plate in Finland. The different aspects related to the implementation, especially data security and privacy aspects are studied.	All objectives were reached

Description of the work

The study consisted of the following tasks:

- state of the art on previous and ongoing research and activities on electronic vehicle identification
- workshop and interviews of Finnish stakeholders to identify their requirements and possible applications
- literature study of implementation technologies, products and experiences, possible architectures and implementation scenarios, costs, data content, privacy related issues
- assessment of possible implementation scenarios in Finland
- proposal for pilots

Results / Status	
Planned results	**Achieved results / comments**
The expected result was a study on the possibility of the electronic vehicle license plate in Finland and a proposal for a pilot.	The results were reported (see exploitation plan)

Context and Relevance to AINO programme

Electronic Vehicle Identification allows an improved identification of vehicles. The technology, in which the project was mostly interested, is passive RFID technology, which is very cheap (0,5-4 Euro): a cheap tag could allow building innovative services for both the public and the private sector. The public sector is interested in improved traffic control and monitoring, the private sector could use the identifier for e.g. access control, frequent customer schemes, and other innovative services. One of the purposes hence was to assess if an obligatory cheap vehicle identifier can be implemented and be used for both public and private services.

Exploitation plan (after the project)

Both public and private sector are interested in the possibilities of passive RFID technology for vehicle identification. A project proposal for a TEKES project for piloting the technology is being prepared. Some small scale pilots, e.g. for parking applications, will be realised in beginning 2007.
The use of the identifier for public services would require that the technology becomes obligatory. The Ministry of Transport and Communications is however reluctant to start the needed process, since the identifier is not in line with European Commission activities. The implementation should hence start from commercial services. A national architecture would be advisable, so that the same identifier can be applied for different services.

Financial status

Planned costs	Final (expected) costs	% AINO Contribution	Remarks
40,14 k€	40,14 k€	50%	

Figure 60

Impact evaluation method of the road surface condition warning service (VARO method)

Objectives of the project	
Originally formulated	**Comments**
The purpose of the project is to investigate the ways to study the impacts of real-time road surface condition warnings on the driving speeds of drivers at the problem or incident sites. The study produces nationally and also internationally unique knowledge about evaluating the impacts of road surface condition warnings. This work complements the impact evaluations of the second phase of the Varo project and the Varo theory project. All these studies together create a general view on the impacts of the Varo service. The project also studies which parts of the method can be generalised for other real-time information services and which parts is service specific.	It had been agreed on that the aim will be changed. The method will not only cover heavy vehicle drivers but also cars. The method will be extended to cover also incident warnings.

Description of the work
Only 3 project meetings have been held. No actual work has been carried.

Results / Status	
Planned results	**Achieved results / comments**
The results can be utilised in evaluating the impacts of real-time the road surface condition warning system on drivers driving behaviour. The results can also be partly utilised in the evaluation of other kinds of real-time precision information services.	The study has been postponed because of the delay of the Varo service publication and the few number of the service users in spring 2006. As the service was changed during the summer brake in 2006 and started again first in November 2006 it was agreed that the method will be developed first when the service has received its final form and when the amount of users is big enough. The next project meeting will be held at the end of January.

Context and Relevance to AINO programme
The project will increased highly the knowledge of conducting impact analysis of real-time information services.

Exploitation plan (after the project)
The method has been planned to be used in the project Varo assessment which has been accepted to AINO programme.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
19 813 €	The project has been decided to be expanded from the original	50 % of the planned costs	The final budget of the project is still open

Figure 61

Preliminary study of vehicle telematics platforms

Objectives of the project	
Originally formulated	**Comments**
The aim of the work was to find out, what kind of hardware and software platforms are available for in-vehicle use. The platform to be used to implement in-vehicle ITS applications should have an interface allowing software development and a wireless data connection. The focus was on devices which can be used by several ITS applications and actors on the field.	Originally set objectives were achieved.

Description of the work
A literature study and expert interviews were the methods of the study. Experts from five private companies and a representative of the Vehicle Registration Authority participated in the expert interviews. Different platforms with different kind of software and hardware were described with pictures. Requirements related to different ITS applications were described at general level.

Results / Status	
Planned results	**Achieved results / comments**
The aim of the work was to find out, what kind of hardware and software platforms are available for in-vehicle use.	

Context and Relevance to AINO programme
The project was part of the service framework subprogramme. Implementation of many ITS applications aren't possible without a suitable in-vehicle hardware and software platform. A study on the platforms available supports the decision-making of public authorities and provides information to private actors.

Exploitation plan (after the project)
Pilot studies, following the development in technology and active co-operation are proposed as future actions. The next step will be the formulations of a technology road map for in-vehicle ITS platforms.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
19 k€	19 k€	100	

Figure 62

Impacts of road transport information services on personal injury accidents

Objectives of the project	
Originally formulated	**Comments**
The main objective of road transport information services is to improve traffic fluency and transport safety, and more specifically to reduce the number of personal injury accidents. The impacts of information services should be examined e.g. by assessing indirect changes in driver behaviour or other associated factors. Several real-time information services are currently under development in Finland, but do not have many users yet. It is therefore important to examine the impacts information services have had on personal injury accidents in other, larger countries.	The services to be studied were redefined to contain: road weather problem warning service, incident warning service, navigation

Description of the work
First, a literature survey will be carried out. VTT's extensive network of international contacts should aid this, as it also wills the assessment of the impacts of different types of information services on the risk and the exposure to risk of personal injury accidents. The analysis will be carried out using the Delphi method.

Results / Status	
Planned results	**Achieved results / comments**
Information about the effectiveness of the selected services on injury accidents	Literature survey produced some but not many quantitative estimates on the effectiveness of the services. More than 100 responses to the first round of Delphi.

Context and Relevance to AINO programme
Highly relevant. One of the specific goals of the Service framework subprogramme was to ensure that "The benefits and applicability of ITS are well and widely known" and the project provide just such information.

Exploitation plan (after the project)
The findings can be utilised when deciding on the role the public sector should play in the introduction of road transport information services in Finland. The other impacts of ITS services e.g. on traffic fluency, emissions, choice of transport mode etc. can also be examined to a limited degree. It is essential to identify which impacts are direct and which are indirect.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
48 000	48 000	50% (50% Finnra)	-

Figure 63

Safety impact assessment of the Driver Alert service (VARO assessment)

Objectives of the project	
Originally formulated	**Comments**
The aim of the project is to assess the impacts of the VARO Driver Alert service or other comparable services on driver behaviour and consequently on transport safety. The impacts of weather, road surface condition, traffic situation and incident messages will all be assessed. The project will utilise the method developed during the VARO method project.	The project has not been started.

Description of the work
The project has been postponed until the Varo method project is completed.

Results / Status	
Planned results	**Achieved results / comments**
A research report will be drawn up outlining the service being assessed, the research method and materials used, the results obtained and the conclusions drawn concerning the significance of the findings.	The study has been postponed because of the delay of the Varo service publication and the few number of the service users in spring 2006 which has lead to the post-pone of the Varo method project.

Context and Relevance to AINO programme
The project will increased highly the knowledge of conducting impact analysis of real-time information services. The main objective of road transport information services is to improve traffic fluency and transport safety, and more specifically to reduce the number of personal injury accidents. However, the number of personal injury accidents that occur is relatively low in small countries such as Finland, which makes it difficult to prove the safety impacts of information services. The impacts should therefore be studied by assessing indirect behavioural changes or other associated factors. These kinds of studies have not been conducted in Finland before. There is neither any international evidence of such studies.

Exploitation plan (after the project)
The results can be exploited when modifying the assessed service. The results can be also used when planning new services or making the financial decisions.

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
75 000 €	75 000 €	7 % (5 000 €)	

Figure 64

Appendix F Project self-evaluation form

AINO Evaluation Programme

Project self - assessment

Project name: ……..
Project leader / contact person: …….
Date: …….

Objectives

The Ministry of Transport and Communications has contracted two evaluators, John Miles and Wim Broeders, to evaluate the AINO programme. Main questions to be answered through this evaluation are:

- Has the programme reached its objectives?
- Is the programme successful in view of the global developments?
- How will the results be further exploited?
- How should the follow-up of AINO look like?

The approach defined by the evaluators is partly based on a self-assessment process to be performed by the projects itself. This approach has also been explained at the AINO conference 28th of November 2006. **Enclosed you will find a brief document containing three forms to be filled out by the project leaders as part of the self-assessment. Since most of the information requested is probably already available we expect it will take not longer than 30 minutes to complete it. Please note that forms should be filled for every project; some leaders have 2 or even more projects.**

After having received all the forms from the projects meetings will be organised between project leaders of some main projects and the evaluation team. These meetings are planned for the second week of January 2007. The outcome of the evaluation will be presented at the AINO Closing Conference scheduled for the 10th of May 2007.

The quality of the evaluation strongly relies on your contribution so we trust on a good cooperation between the projects and the evaluation team. In order to meet the planning the form should be returned to the Ministry January 8th 2007 the latest by email: anne.miettinen@mintc.fi .

If you have any question regarding the evaluation procedure or in case you need more instructions for filling out the forms please do not hesitate to contact me or the evaluation team.

I would like to thank you on beforehand for your cooperation, also on behalf of the evaluation team:

Evaluation team

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Kind regards, *Martti Mäkelä*

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Fact Sheet

Instruction form

Objectives of the project	
Originally formulated	**Comments**
Give an brief overview of the main objectives formulated at the start of the project	*Indicate whether the objectives are/will be reached. Include motivation/argumentation why objectives are not reached as expected.*

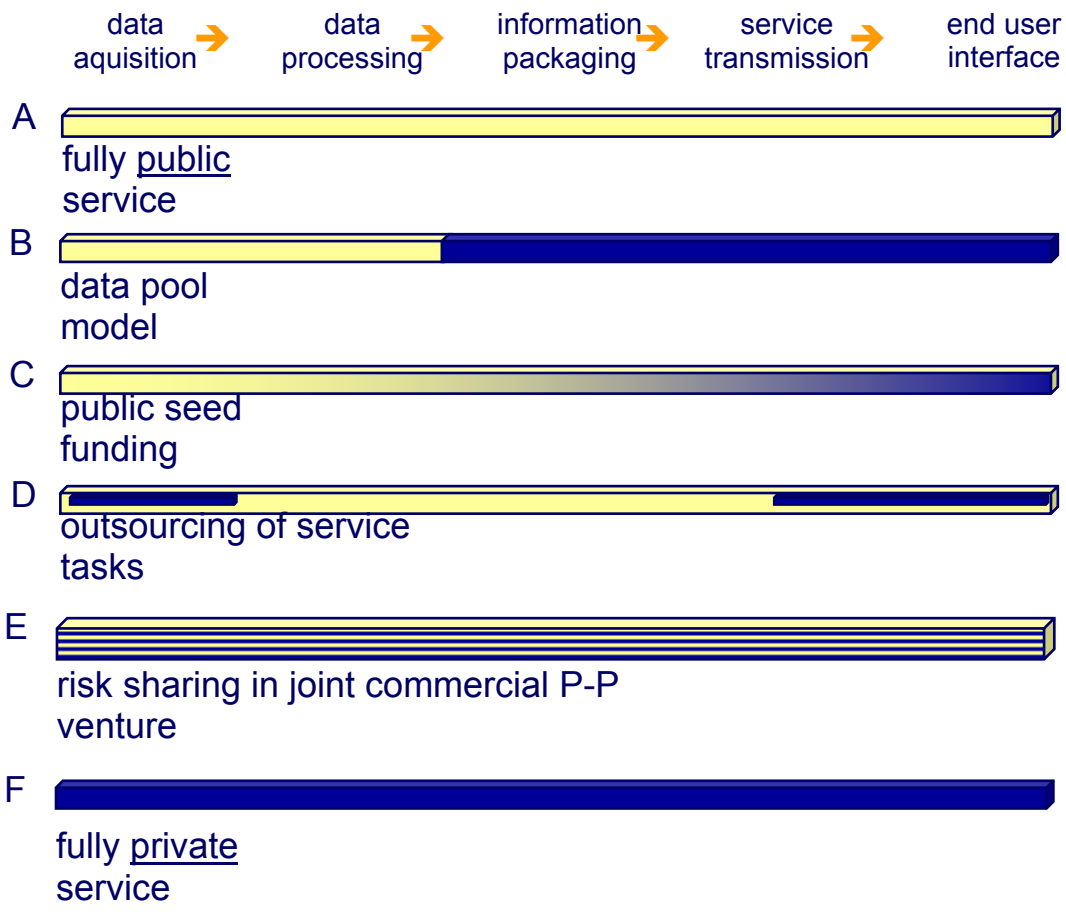
Description of the work
Give a brief overview of the work done including main activities

Results / Status	
Planned results	**Achieved results / comments**
Give an overview of the planned results/outcome of the project.	*Give the status of the planned results including motivation/argumentation in case results are not reached as expected.*

Context and Relevance to AINO programme
Give a description of the main contribution of the project to the AINO programme. What is the relevance of this specific project for the domain concerned.

Exploitation plan (after the project)
Give a clear description of the exploitation plan for the project results. *Is there a business model* *How will the results be further exploited including aspects like?* *What will be the role of the current actors (including Public Authorities)?* *How will investments be financed/*

Financial status			
Planned costs	**Final (expected) costs**	**% AINO Contribution**	**Remarks**
Total planned costs at start in K€'s	*Final total costs in K€'s*	*Final percentage of contribution from AINO programme*	*Motivation/argumentation for changes in costs*



The scheme above shows possible exploitation models for ITS – projects. From left to right it can be indicated in what phase of the ITS chain the project is positioned. Of course projects can be active in more than one phase.
From top to bottom 6 models are given for the different roles between Public Authorities and the private sector.
Please indicate in the table below the position of your project.

	Data Aquisition	**Data Processing**	**Information Packaging**	**Service transmission**	**End-User Interface**
A					
B					
C					
D					
E					
F					

IMPACT MECHANISMS AND TARGETS	Target of impacts				
	Service level and performance of transport system	Costs of transport system	Prerequisitives for businesses	Traffic safety	Other, specify?
Change in transport infrastructure or vehicle fleet investments					
Improved public transport incident management or route choice					
More efficient public transport operation					
More efficient use of transport infrastructure					
More efficient transport network incident management					
Improved dirver and vehicle support					
Promotion of non-motorised transports					
Improved logistic chains and deliveries					
Improved service provision prerequisites and tendering					
Promotion of standardised and generic solutions					
Development and piloting of innovative solutions					
Other, specify?					

Please fill out the table above indicating the (expected) impact of the project/service by using the following indicators:

Very negative impact =	--
Negative impact =	-
No impact =	0
Impact =	X
Serious impact =	XX
Strong impact=	XXX

Appendix G Personnel

External evaluator: Wim Broeders

EUROPEAN CURRICULUM VITAE FORMAT

PERSONAL INFORMATION

Name	BROEDERS, WIM
Address	VIALIS OUDEWEG 115, P.O. BOX 665, 2003 RR HAARLEM, THE NETHERLANDS
Telephone	+31 23 5189242
Fax	+31 23 5189104
E-mail	Wim.broeders@vialis.nl
Nationality	Dutch
Date of birth	13 February 1963

WORK EXPERIENCE

• Dates (from – to)	2006 – ..
• Name and address of employer	Vialis Traffic
• Type of business or sector	Consultancy on Traffic and Transport
• Occupation or position held	Business Unit Manger Consultancy
• Main activities and responsibilities	BU management, Research and development (ITS), Project management, evaluations, audits, assessments.
• Dates (from – to)	2004 – 2006
• Name and address of employer	AGV
• Type of business or sector	Traffic and Transport
• Occupation or position held	Group manager Traffic and Infrastructure
• Main activities and responsibilities	Project management of complex infrastructure related projects, evaluations, audits, assessments.
• Dates (from – to)	2000 – 2002
• Name and address of employer	DHV Environment and Infrastructure (address as above)
• Type of business or sector	Transport Consultancy
• Occupation or position held	Senior Project Manager
• Main activities and responsibilities	Senior Project Manager Traffic Management and Telematics within de Transportation Planning

	Department
• Dates (from – to)	1998 – 2000
• Name and address of employer	European Commission DG-TREN (Transport and Energy)
• Type of business or sector	Transport and Intelligent Transport services
• Occupation or position held	Projectmanager ITS
• Main activities and responsibilities	As detached national expert (Dutch Ministry of Transport) responsible for co-ordination of ITS-projects (Intelligent Transport Systems) on the Trans-European Road Network (TEN) and policy guidelines/EC-recommendations.
• Dates (from – to)	1994 – 1998
• Name and address of employer	Ministry of Transport, Public Works and Water Management (P.O. Box 1031, 3000 BA Rotterdam, the Netherlands)
• Type of business or sector	Transport Consultancy
• Occupation or position held	Senior Consultant
• Main activities and responsibilities	Senior Consultant Traffic Information
• Dates (from – to)	1993 – 1994
• Name and address of employer	Ministry of Transport, Public Works and Water Management (P.O. Box 1031, 3000 BA Rotterdam, the Netherlands)
• Type of business or sector	Transport Consultancy
• Occupation or position held	Consultant
• Main activities and responsibilities	Consultant traffic information and traffic management
• Dates (from – to)	1991 – 1993
• Name and address of employer	Ministry of Transport, Public Works and Water Management (P.O. Box 1031, 3000 BA Rotterdam, the Netherlands) Rijkswaterstaat Dienst Verkeerskunde
• Type of business or sector	Transport Consultancy
• Occupation or position held	Projectleader
• Main activities and responsibilities	Projectleader Fundamental Traffic Dynamics
• Dates (from – to)	1990 – 1991
• Name and address of employer	Philips Nederland N.V.
• Type of business or sector	Transport Consultancy
• Occupation or position held	Projectmember
• Main activities and responsibilities	Analysis of system configurations for vehicle navigation system CARIN
• Dates (from – to)	1989
• Name and address of employer	AMB Products
• Type of business or sector	Transport Consultancy
• Occupation or position held	Systemdeveloper
• Main activities and responsibilities	Development of time registration system for car races on the circuit of Zandvoort

EDUCATION AND TRAINING

• Dates (from – to)	2005
• Name and type of organisation providing education and training	HR/Movares
• Principal subjects/occupational skills covered	Coaching of professionals
• Title of qualification awarded	
• Level in national classification (if appropriate)	
• Dates (from – to)	2003
• Name and type of organisation providing education and training	Several training on project management
• Principal subjects/occupational	Project management

skills covered	
• Title of qualification awarded	
• Level in national classification (if appropriate)	
• Dates (from – to)	2000
• Name and type of organisation providing education and training	Communications, interaction and discussion technologies, Van Harte & Lingsma, The Netherlands
• Principal subjects/occupational skills covered	
• Title of qualification awarded	
• Level in national classification (if appropriate)	
• Dates (from – to)	1996
• Name and type of organisation providing education and training	Projectmanagement, Ministry of Transport, The Netherlands
• Principal subjects/occupational skills covered	
• Title of qualification awarded	
• Level in national classification (if appropriate)	
• Dates (from – to)	1995
• Name and type of organisation providing education and training	Traffic management, Technical University Delft – PAO, The Netherlands
• Principal subjects/occupational skills covered	
• Title of qualification awarded	
• Level in national classification (if appropriate)	
• Dates (from – to)	1993
• Name and type of organisation providing education and training	Internal Training Telematics Ministry of Transport, The Netherlands. Telematics in Transport
• Principal subjects/occupational skills covered	
• Title of qualification awarded	
• Level in national classification (if appropriate)	
• Dates (from – to)	1990
• Name and type of organisation providing education and training	M.Sc. degree Mathematics and Information Technologies, Technical University of Delft, The Netherlands. System design
• Principal subjects/occupational skills covered	In-Vehicle route navigation systems
• Title of qualification awarded	M.Sc.
• Level in national classification (if appropriate)	

PERSONAL SKILLS AND COMPETENCES

Acquired in the course of life and career but not necessarily covered by formal certificates and diplomas.

MOTHER TONGUE: DUTCH

OTHER LANGUAGES

	DUTCH	ENGLISH	GERMAN
• Reading skills	MOTHER TONGUE	EXCELLENT	GOOD
• Writing skills		EXCELLENT	MODERATE
• Verbal skills		EXCELLENT	GOOD

SOCIAL SKILLS AND COMPETENCES

Living and working with other people, in multicultural environments, in positions where communication is important and situations where teamwork is essential (for example culture and sports), etc.

SOCIAL WITH CAPABILITY TO HANDLE CONFLICT SITUATIONS.
RELIABLE AND STRONG TEAM WORKER.

ORGANISATIONAL SKILLS AND COMPETENCES

Coordination and administration of people, projects and budgets; at work, in voluntary work (for example culture and sports) and at home, etc.

LONG EXPERIENCE IN EUROPEAN PROJECT MANAGEMENT REQUIRES STRONG ORGANISATIONAL SKILL TERMS OF BRINGING THE REQUIRED EXPERTISE, KNOWLEDGE AND KEY ACTORS TOGETHER.

TECHNICAL SKILLS AND COMPETENCES

With computers, specific kinds of equipment, machinery, etc.

FORMING THE BRIDGE BETWEEN TECHNICAL SOLUTIONS AND POLICY.
Differentiation between technical issues and major, strategic issues.
Knowledge of the newest technologies and how to use it.

ANNEXES

ANNEX 1: REFERENCES

2005-2006	Monitoring technologies for Traveller information Study on the available technologies for data collection for Traffic and traveller information services. Main focus was on the preparation of travel times and comparing the different technologies. Work was contracted by the Dutch Ministry of Transport.
2005 - 2006	RDS-TMC office for Netherlands Definition and implementation of the Dutch RDS-TMC organization. Work was contracted by the National ITS organization (ITS Netherlands). Main issue was to define the different roles and positions of RDS-TMC actors in the Netherlands and to reach commitment among them for further cooperation. Outcome was a National TMC-office.
2000 – to date	Evaluation of Framework program – European Commission (DG-TREN, DG-INFSO) Involved in evaluation of new proposals for the framework programs as well as assessment of on-going and finished projects. Examples; Project assessments: E-Merge, GST, EURAMP, PISTA, Sirtaki, SafeTunnel, FAMS, …. Evaluation of new proposals FP5, FP6
2005	Action plan for parking information system Preparation of an action plan for a parking information system for the city of Eindhoven. Work was performed in close cooperation between the municipality and service providers.
2004 -2005	ITS action plan Iran Evaluation of the traffic situation in Iran and preparation of a action plan for improvement of traffic safety in Iran
2004	Status of Navigation and information services in the Netherlands Study on the status of navigation and information services in the Netherlands compared to other European Countries. Work was contracted by the Dutch Ministry of Transport.
2003	Evaluation Traffic management plan for M3 in Copenhagen The Road Directorate in Denmark plans to reconstruct the Motorway M3. This will take about 4 years (2005-2008) and will cause a lot of disturbance of the traffic. DHV was asked to perform an independent evaluation of the proposed traffic management program aiming at reducing the negative impact and increasing the road safety during the road construction period.
2003 – 2005	Information in the Car (the Netherlands) Support in tendering procedure "Information in the Car". The Ministry of Transport wants to investigate the consequences, effects, risks and opportunities for an in-car system which provides traffic management related services to the driver. The market will be asked to make proposals for a pilot on the public road network. Main responsibilities: define pilot, define functional specifications, prepare tender documents, support in the evaluation of proposals.
2003 – 2004	Audit of FCD-Project (the Netherlands) The Minsitry of Transport contracted a consortium ALLEGRO (Siemens, LogicaCMG) for the implementation and deployment of mobile datacollection services (Floating Car Data). The consortium is using 2 different technologies for this service: In-car Navigation (Siemens), Mobile Phones (LogicaCMG). Apart from the audit of the work performed by the consortium the followed procedure of the Ministry of Transport in entering the market will be evaluated. Main responsibilities: set up an evaluation framework , perform a quarterly audit (content of work as well as financial).
2002 – 2003	Support in tender procedure (the Netherlands) Dutch Ministry of Transport launched a call for tender for the development and implementation of a "mobile traffic data collection service". This service should be implemented on regional and local roads in order to provide dynamic traffic data to road authorities and TTIS-service providers (Traffic and Traveller information services). The objective was to have a commercial operating service available following the contract

period. Main responsibilities: prepare functional specifications, prepare tender documents, specify evaluation procedure of proposals, evaluation of proposals, secretariat of tender team.

2002 – 2003 Tempo (Belgium)
The European Commission has launched the TEMPO programme - for Trans-European intelligent transport systeMs PrOjects - specifically devoted to ITS in the road sector, among the five groups of "projects of common interest" which are being funded. TEMPO is part of a wider programme, the Multi-annual Indicative Programme (MIP) which is a funding programme covering the period from 2001 to 2006, designed to stimulate the trans-European transport network.
The key objective of TEMPO is to stimulate a harmonised and synchronised deployment of ITS systems and services on the trans-European road network (TERN) and to contribute to convergence between national/regional planning and the overall implementation of the Information Society in the field of road transport in Europe. DHV and TRL are contracted to support the EC in managing the programme. Main responsibilities are: Development of ITS deployment plan, coordination of different ITS projects, ex- post and ex- ante evaluation of ITS projects.

2002 – 2003 RDS/TMC (the Netherlands)
Support the Ministry of Transport (Traffic Informatio Centre) in tendering the National Public RDS-TMC service (Radio Data System - Traffic Message Channel). Main responsibilities were: prepare functional specifications of service, prepare tender documents, define evaluation procedure for proposals, evaluation of proposals, secretariat of tenderteam.

2002 – 2003 DYVERS (The Netherlands)
User survey. The Dutch Ministry of Transport installed a system on a motroway link (A1) to harmonise traffic flows (DYVERS) using vms indicating the maximum speed which is based upon the actual traffic situation (speed, density etc.). DHV was contracted to collect the experiences and views of the road-users. Main responsibilities: develop an evaluation framework, preparation of a questionnaire, organise the user survey, analyse the results of the survey.

2002 – 2003 Haaglanden (the Netherlands)
Development of business models for a regional mobility-information centre for the region of Haaglanden.

2002 – 32003 Haaglanden (the Netherlands)
Development of businessmodels for a dynamic, individual routguidance service for business cars and heavy goods vehicles in the region of Haaglanden. DHV was contracted for the project by the Chamber of Commerce.

2001 – 2002 Performance Indicators (Belgium) The "INDICATORS" study has been commissioned by the European Commission's Directorate General for Transport (DG TREN) with the aim to undertake a study within the framework of the European Union's activities concerning the Trans-European Transport Network (TEN-T).
The actions to be developed within the study aim at supporting the monitoring of the implementation and the revision of the Guidelines for the development of the trans-European network for transport (TEN-T). The purpose is to study the technical, institutional, legal and contractual aspects related to the establishment of a monitoring mechanism to evaluate the trans-European infrastructure and traffic. The goal is to specify the evaluation framework and the corresponding indicators. A set of common indicators will be proposed to measure the performance of the TEN-T network.
The consortium for this project consists of TRL (UK), ISIS (F), Dorsch (D) and DHV (NL).

2000 – 2002 Multi-Monitoring Concept: MMC (the Netherlands)
On-line traffic data of local roads is not yet widely available in The Netherlands. This in contracts to the availability of traffic data on Motorways. New technologies and co-operation between different organisations form new opportunities to make this information available. The growing Telecom business facilitates the change of accent

from road based systems towards in-car technologies. This way data-collection becomes more flexible an more efficient. This all means new type of business and new structures for co-operation (PPS). In April 2000 a letter of intent was signed (Multi-Monitoring Concept) by 24 organisations.

2000 – 2002 **Pilot Lane Departure Warning**

The Dutch Ministry of Transport is preparing a pilot with a new, advanced system that assists the drivers of Trucks and Busses to keep their lane. The system, Lane Departure Warning Assistant, notifies the driver in case of an "unexpected" change of lane (without the use of the blinker, direction indicator). The pilot, January - October 2002 is one of the outcomes of a survey of the Ministry of Transport on ADA-systems (Advanced Driver Assistant).

2000 – to date **Evaluation of Framework program – European Commission (DG-TREN, DG-INFSO)**

Involved in evaluation of new proposals for the framework programs as well as assessment of finished projects.

1998 – 2000 **Co-ordination of European projects in the domain of Transport Telematics – ITS (Belgium)**

It mainly concerned studies and implementation projects on the TERN (Trans-European Road Network) involving several Member States (EURO-Regional). The European Commission - DG-TREN (Transport and Energy) gives financial support to these projects (10-50%) using the so-called TEN-budget line. The remaining part of the financing is normally taken care of by the Member States themselves. Apart from the technical co-ordination between these projects (incl. cross-fertilisation), evaluation of the projects was part of the task: relation of the (interim) results with original work plan, the quality of the work, value for money.

A new special assessment procedure was developed for this that needed to be started as soon as a proposal was received. This way also the quality and value of new proposals were assessed related to the European Transport Policy.

Responsible for management of Euro-Regional Projects: Viking, Centrico, Serti.

1998 – 2000 **Contributions to the development of European guidelines for the deployment of ITS on the TERN (Trans-European Road Network) to remove traffic bottlenecks (Belgium)** Identification of key actions for the European deployment plan for ITS (road sector).

Contributions to the development of several EC-Recommendations like "Infrastructure Charging", "Electronic Fee Collection".

Identifying priorities for TEN-T funding in the field of ITS and assessment of applications for TEN-T funding.

1998 – 2000 **Project co-ordinator for the European Commission DG-TREN for projects in the domain of Electronic Fee Collection (Belgium)**

Most important project was CESARE (Common EFC System for an ASECAP Road Tolling European System). The project was part of the ITS TEN-T program and managed by ASECAP (ASsociation Européenne des Concessionnaires d'Autoroutes et d'ouvrages a Péage). Main objectives of project: definition of pan-European EFC service, definition of an pan-European Memorandum of Understanding between EFC-operators.

1997 – 1998 **Projectmanager of PROMISE (the Netherlands)**

Project hase developed a traveller information service using GSM. It concerned a co-operation between AND-Software en -Mapping, KPN Telecom, Teleatlas, Ars Informationis, TNO and the Dutch Ministry of Transport. The project was embedded in an international framework involving other countries (Finland, Sweden)supported by the EC.

1995 – 1998 **Senior Projectmanager for the National wide Implementation of RDS/TMC (Radio Data System - Traffic Message Channel) (the Netherlands)**

With this system traffic information is coded and transmitted through the normal FM-frequencies. Special decoders (integrated in a car-radio and/or navigation system) are able present the information with a minimum of delay. The definition of an organisational framework as well as the co-ordination with the European industry for the development of a commercial product were important elements of this project.

1994 –1998 Projectmanager definition, implementation and maintenance of road-network database including the development of the a software tools for maintenance (the Netherlands) This database was used within the area of traffic management and traffic information. At the moment the Dutch National Traffic Information Centre is using this database and system.Apart from the database itself an organisation was defined for controlling and maintaining the database.

1994 – 1998 International co-ordinator (Country Co-0rdinator) for the Netherlands in several ITS projects

FORCE and ECORTIS are the 2 biggest projects which I've set-up together with the German Ministry of Transport. Around 11 Member States participated in these project with a total of about 40 partners. Subject of these project was the European wide implementation and Co-ordination of RDS-TMC. Evaluation of the effects of this service on traffic in general was also part of the projects.

1993 – 1997 Active role in several standardisation working groups of CEN-TC278 in the domain of road transport telematics mainly focusing on traffic information and electronic fee collection.

1993 – 1995 Projectmanager of pilot project for testing a new system for the distribution of Traffic Information, RDS/TMC (Radio Data System - Traffic Message Channel)
About 400 drivers (cars and trucks) participated in the pilot with a special developed in-vehicle receiver. The project was performed in close co-operation with the Dutch Touring Club (ANWB), Transportation Organisations (TLN), Public Broadcasters (NOB/NOS), Philips Car Systems and the Dutch National Police

1991 – 1994 Projectmanager of several sub-projects within the Rekening Rijden project (Technical sector).
Main subjects concerned were the functional system specifications, communication technologies and SmartCard developments. Co-ordination and integration with other traffic management tools was the main priority

1993 – 1994 Development of a common vision between the Ministry of Transport, the Dutch Touring Club (ANWB) and the National Police (KLPD), concerning terminology to be used in the field of traffic information.

External evaluator: John Miles

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Summary of Experience

Dr John Miles has particular expertise in transport planning, transport research and public policy development, including experience in the development of government policies and of directing a large operational team. He brings over 35 years' experience in research, policy development and innovative projects in integrated transport.

As a civil servant, John held senior positions with a number of public bodies including the UK Departments of Environment and Transport and the European Commission. He served as DoT Director (Network Management) Greater London Region 1991-1994.

After more than 25 years in public service, in 1996 John established Ankerbold International as a successful transport research and management consultancy, advising on the strategic themes surrounding the deployment of Intelligent Transport Systems (ITS) in UK and Europe. He has been working with senior officials, politicians and stakeholders to deliver effective policies for ITS in the road transport sector. He specialises in the organisational and institutional aspects of ITS, including public-private partnerships.

From 2001–2003 he was instrumental in establishing and coordinating a network of ITS professionals from Europe, the USA and Canada, in the EC project ATLANTIC.

In 2004, John was appointed chair of the World Road Association (PIARC) Technical Committee on Management of Network Operations. He is co-editor of the PIARC ITS Handbook, jointly with Kan Chen of University of Michigan.

Web links	Academic Achievements	
www.itshandbook.com	B.Sc. Hons. Civil Engineering.	1966
www.ankerbold.co.uk	M.Sc. Transportation Engineering	1969
www.transportvisions.org	Ph.D. Traffic & Environment	1975

Relevant Project Experience

London Traffic Systems Vision project

Collaborated in the development of a strategic framework for the development programme for traffic control and street-space management systems in Greater London over the next 10-15 years.

Transport Direct Market Research

Senior member of the Social Research Associates team, researched the decision-making processes that individuals apply to journey planning.

Office of Science and Technology t

Co-authored a paper on the potential application of artificial intelligence in transport for the Foresight project on Intelligent Infrastructure Systems.

World Road Association (PIARC)

Co-editor with Professor Kan Chen (Michigan University) of the PIARC ITS Handbook 2nd Edition (2004). Appointed Chair, World Road Association (PIARC) Technical Committee 1.4 on Network Operations for the term 2004 – 2007.

Highways Agency Video Information Highway Project

Since 2001, principal advisor to the Highways Agency on the policy implications of the Video Information Highway (VIH) project with lead responsibility for developing the licensing framework for distribution of CCTV images from traffic cameras to TV stations and other 3rd parties.

International Benefits, Evaluation and Costs (IBEC) Group
From 2001 to 2003, provided the technical coordination for the EC-funded Thematic Research Network ATLANTIC (A Thematic Long-term Approach to Networking for the Telematics and ITS Community). ATLANTIC operated as a network of professionals, researchers and decision-makers from Europe, the USA and Canada working together on key issues in ITS and to communicate results to stakeholders via events such as the series of Benefits, Evaluation and Costs (BEC) Workshops at the annual ITS World Congresses.

Finland: ITS development programme
Advisor on the development of ITS Information Infrastructures in Finland, on behalf of the Ministry of Transport and Communications, 2005.

Department for Transport ITS Strategy
Collaborated on an exercise for the Department for Transport to scope the development of a Strategic Policy Framework in support of Intelligent Transport Systems in the UK.

Highways Agency Vision 2030 study
Led the expert team on behalf of WSP Systems for the "Vision 2030" project for the Highways Agency looking at the potential roles of strategic highways in meeting long-term mobility needs of people and goods.

National Traffic Control Centre
Ground breaking work on the operational specifications for the National Traffic Control Centre for England, as part of the IBI team.

Relevant Publications
Co-editor: *Intelligent Transport Systems (ITS) Handbook*, Recommendations from the World Road Association (PIARC), Route 2 Market, London (2nd Edition 2004)
Co-author: *Science Review: The potential application of artificial intelligence in transport.* IEE Proceedings – Intelligent Transport Systems (2006 forthcoming)

Co-author: *Vision 2030: Transport Visions for Strategic Highways*. Proceedings of the Institution of Civil Engineers Volume 157, Issue TR4 Transport, November 2004, pp 203-210.
Co-editor: *ITS Handbook 2000*, Artech House, London and Boston USA, (September 1999)
Co-author: *Inter-Urban Traffic Management Systems*. Supplement to the Journal of the Institution of Highways and Transportation, (December 1999).
Co-author: *Access control in city centres: objectives, methods and examples*. Traffic Engineering and Control vol 39 (12), December 1998.
Co-author: *ITS in Europe*. Chapter in Walker, J. (editor) Advances in Mobile Information Systems, Artech House, Boston and London, 1998.
Co-author: *Intelligent Transport Systems in Japan*. Report of the ITS Focus OSTEMS Mission to Japan. ITS Focus, Crowthorne, Berkshire, 1996.
Author: *Recent developments in European transport infrastructure policy*. Proceedings of the Institution of Civil Engineers Volume 111 Issue TR3 Transport August 1995 pp 169-177.

Relevant Committees
Chairman of World Road Association (PIARC) Technical Committee on Network Operations.
Member of Advisory Committee for the NICHES project on innovative urban transport and mobility, coordinated by the POLIS group of European cities.