



Patchwork policy making – linking innovation and transport policy in Austria

Austrian transport case study for the OECD NIS
MONIT Network

Katy Whitelegg – ARC systems research GmbH

June 2004

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Abstract:

This is the final report from a study on the links between transport and innovation policy in Austria undertaken as part of the OECD NIS MONIT (Monitoring horizontal innovation policy) project. The aim of the MONIT project is to better understand the meaning of horizontal innovation policy through analysing policy processes and mechanisms in selected countries. This includes understanding how traditional innovation policy (science, technology and industrial policies) works, but also how innovation is understood and used in sectoral policies. The MONIT approach focuses on analysing governance initiatives and mechanisms that facilitate a coherent approach to innovation policy and that are able to co-ordinate policies across different thematic fields.

The report looks at the way in which transport and innovation policy interact in Austria and what kind of mechanisms exist to facilitate the communication between the two policy areas. Two case studies are assessed in an attempt to understand in more detail the way in which innovation policy and transport policy interact with each other. The first case study concentrates on the RTD programmes in the area of transport technologies and the second case study focuses on the transport telematics framework programme. Although the two case studies are very different from one another, it is possible to gain a considerable overview of the barriers and problems that exist on the interface between the two policy areas.

Keywords: governance of innovation policy, horizontal innovation policy, policy coherence – transport and innovation policy, RTD programmes in transport technologies

1 Synthesis and conclusions

Co-ordinated and coherent policy making is growing in importance as policy makers become aware of the limitations of single goal policy making. As a result, the number and variety of co-ordination mechanisms has grown considerably over the last decade. Coordination and coherence within innovation policy has been the focus of many of these initiatives. This is due to the fact that innovation policy is a horizontal policy area with a large number of interfaces with different policy areas. The OECD decided to organise a working group to look at the way in which different countries deal with co-ordination in innovation policy making and to analyse the successes and failures in moving towards greater coherence.

The OECD NIS MONIT Project

In December 2002 the OECD NIS MONIT (Monitoring horizontal innovation policy) working group was established to further the OECDs understanding of systemic approaches to innovation policy. The project has two main work packages. The first work package aims to understand how innovation policy is conceptualised in the countries involved and uses a range of performance indicators to build up comparable pictures of the different countries. The second work package looks at the way innovation policy co-operates with other policy fields. The approach is based on the idea that innovation policy is not limited to traditional innovation policy mechanisms such as public RTD spending, but is a horizontal topic present in many other policy areas. The second work package considers the relationship between innovation policy and four different policy areas (regional development, ICT, transport and sustainable development).

The Austrian transport case study

This report is the final report from the case study on the links between transport and innovation policy in Austria. The case study looks at the way in which the two policy areas interact in Austria and what kind of mechanisms exist to facilitate communication between the two policy areas. Following an overview of the main documents within the field of transport policy and an assessment of their approach to innovation aspects in the field of transport, two case studies are looked at in more detail. The study based on an assessment of key documents in the two policy areas and a series of interviews with policy makers and experts in the two policy areas.

Two case studies are assessed as part of the attempt to understand in more detail the way in which innovation policy and transport policy interact with each other. The first case study concentrates on the RTD programmes in the area of transport technologies and the second case study focuses on the transport telematics framework programme. Although the two case studies are very different from one another it was possible to gain a considerable overview of the barriers and problems that exist on the interface between the two policy areas.

Case study 1: RTD Transport Technology Programmes

The Transport Technology RTD Programmes are one of the longest running RTD programmes in Austria and focus on increasing the innovation capabilities in the transport sector besides addressing transport and environmental goals. The programmes are designed and implemented by the innovation division in the Ministry for Transport, Innovation and Technology (BMVIT). Although the programmes have a strong transport focus, the involvement of the transport divisions in designing and implementing the programmes is limited. The reasons for the low level of co-operation are manifold and include:

- Lack of stable core competencies which leads to insecurities when dealing with others on related topics
- Threat of loss of responsibilities between the divisions
- Scepticism, often based on misunderstanding, of what the other one does
- Different time-scales, disciplines and approaches to change

The integration of different areas of policy making in the design of the programmes is difficult, but has been slowly making progress on the level of the individual programme lines. This can be seen by the way in which the RTD programmes are being included into other strategic processes such as the transport telematics framework programme. However, one element of the programmes that makes the interaction more difficult is the low level of more long term strategic planning.

Case study 2: Transport telematics framework programme

The transport telematics framework programme is a relatively new co-ordination mechanism that was established in 2002 in order to develop a strategic and overarching plan for the development and implementation of transport telematics in Austria. The programme is interesting as it represents a form of learning on the side of the ministry and an admittance of the problems facing co-ordinated policy making in transport policy and between transport and innovation policy. Factors contributing to this new form of co-ordination include:

- The programme is co-ordinated externally, outside the ministry
- It therefore poses less of a threat to other divisions who are also involved in the process
- The different policy fields involved do not see the process as being dominated by one individual policy field
- The programme has gained high level commitment within the ministry and stakeholder commitment external to the ministry

The programme has the potential to become one of the first strategic transport documents to be developed for two decades, albeit in one specialised area of transport policy. However, the process is still underway and the proof of the pudding will be in the implementation and seeing whether the various actors adhere to what is written in the programme.

Co-ordinated policy making

From the analysis of the two case studies on the interface between innovation and transport policy a number of observations can be made concerning the cooperation mechanisms and the barriers between the two.

The general policy making process:

- Policy making in Austria is built up of highly segregated policy niches that formulate their own policy
- Policy niches are often not clearly defined and there are overlaps between responsibilities
- Strategic, top-down policy documents that attempt to co-ordinate whole policy areas have little impact on these policy niches
- Policy making takes place in a bottom-up way through these policy niches. This can sometimes work very well. Other times it can allow one stakeholder or a group of stakeholders to dominate a policy area with few checks and balances
- Informing each other about policies, strategies and initiatives mainly only takes place on an informal level
- Informal co-ordination does not always suffice and there is a growing number of more formal mechanisms entering the policy making system
- Problems occur if responsibilities and ministries change as informal links are more difficult to build up than formal ones. They also rely on stable responsibilities and structures

Transport – innovation interface:

- There is not really an integrated transport policy in Austria and the last strategic policy document is two decades old
- The relationship between transport and innovation policy is not formalised anywhere either, but takes place on an ad-hoc basis between individuals
- Few formal co-ordination mechanisms exist between the two policy areas
- Informal co-ordination between policy areas is high especially where there are strong personal relationships between individuals

- Interaction between the policy areas is difficult partly due to difference in thinking between the policy areas (experimental versus stability)

Synthesis

The need for greater co-ordination and coherence in policy making is often talked about as a remedy for the fragmentation and departmentalisation of policy fields. In this context, one obvious solution is to integrate policy fields into **common organisational structures**. This was attempted in the Ministry for Transport, Innovation and Technology (BMVIT) through integrating all modes of transport and the innovation division into one ministry. However, this has not had the desired result of making co-ordination easier and the barriers to cooperation have remained. Organisational proximity alone is not the answer. Equally, common strategic documents for policy areas are also a co-ordination mechanism that is difficult to implement in the Austrian context given the strong bottom-up nature of policy making.

Strategic policy documents have several useful functions and properly implemented they can help to co-ordinate different policy fields and define the interfaces between policy fields. However, such policy documents can only play this role if they have the authority to do so and are taken seriously by the different policy areas. As has been the case with several high level strategic policy documents both within and external to the transport policy field such documents tend to have little influence in Austria. Therefore the question also here is whether suggesting a common strategic policy document for transport policy that combines a section on the interface with innovation policy would have any more value than the paper it was written on. On the other hand, if there is no common framework within which actors can move, then each is dependent on defining its own interface with other policy areas. Although this can and does work in many cases, it is more an ad-hoc approach to policy co-ordination than a thought through one. It also allows individual policy areas to dominate the debate with few checks and balances. More importantly, these individual policy areas only follow their own logic and have less incentive to input into more common strategic aims. Without a common strategic plan, however, it is difficult to evaluate individual policy initiatives.

The main question in the transport policy context and especially concerning the relationship with innovation policy is how can coherence be improved? The transport telematics framework programme is one example of such a mechanism that allows a strategic process to take place across policy areas with the involvement of different stakeholders. However, it is not yet possible to tell whether the implementation will take place. Although the external programme management has brought confidence into the process it is questionable whether it is advisable to have a multitude of such processes that all take place outside the ministry. This could reduce the ministries ability to understand the detail of the process.

Policy co-ordination is a time consuming and complex process. Policy makers often feel frustrated and have the impression that such processes do not get them anywhere. Unless there are clear goals and objectives to the co-ordination process and clear

areas of responsibility in the individual policy areas then cooperation is made even more complicated.

Policy recommendations

There is no right amount of integration and coherence in a system. It is a case of finding out what doesn't work and where the system fails and finding appropriate mechanisms to fix it. Looking further into what policy coherence and co-ordination mean in the Austrian context would be an interesting study that would benefit both from a deeper understanding of the patchwork style of policy making and of looking at the ways in which other countries deal with the transport/ innovation interface.

The study has also flagged a number of difficulties and barriers on the interface between transport and innovation policy. It has pointed to the need, among others, to increase the level of cooperation between the two policy areas especially over the direction and content of the transport technology RTD programmes.

The first step to be taken would be an analysis of the options for future cooperation between the innovation division and the transport division both generally and concerning the programme level. The programme level would appear to be the more concrete level to start on. The interviews with all divisions revealed that there is considerable willingness to talk, but too little structure to do so. It is possible that there are lessons to be learnt from the transport telematics framework programme for setting up a dialogue on the RTD programmes.

2 Introduction

Over the last decade policy makers in many European countries have reached the conclusion that the current segregated approach to policy making is no longer adequate to address the complexity of the issues they are faced with. Segregated policy areas, with relatively little contact to one another, cause a number of problems for policy making. Not only does segregation cause policies from neighbouring policy areas to overlap with one another, but can even lead uncoordinated policies to pursue contradictory aims. Another feature caused by segregated policy making occurs when cross-cutting areas, not traditionally belonging to a single policy area, are not adequately addressed by any ministry and no responsibility is taken for the issues.

The trend towards increasing coherence and coordination in the policy making process has been most pronounced in those areas of policy making that are inherently of a cross-cutting nature. In areas of policy making such as sustainable development or science and technology policy the pressure to develop more appropriate coordination measures has been higher. A number of recent studies and workshops have supported the search for better coherence in the area of innovation policy (*Edler et al.*, 2003, *Boekholt et al.*, 2002, *Arnold et al.*, 2003, *Smits et al.*, 2002). Although there is no such thing as a model of optimal policy coherence, the authors agree that there are ways of

conceptualising policy making for innovation policy that can increase the overall functioning of the system.

The problems inherent in politico-administrative systems in general and innovation in particular in most OECD countries is characterised by *Edler et al.* as:

- A high degree of departmentalisation, sectoralisation of the political administration, and low inter-departmental exchange and co-operation
- Heterogeneous, un-linked arenas: often corporatist negotiation deadlocks
- Failing attempts at restructuring responsibilities in government because of institutional inertia
- Dominance of "linear model" of innovation policy approaches (and of related economists as consultants)
- "Innovation policy" run in a very specific, narrow field focusing on introduction of new technologies in SMEs, IPR or VC issues etc.
- emerging multi-level governance in the context of the European integration makes the launching of "bridging/systemic" policy approaches even more difficult

The high level of segregation not only entails closed policy arenas in terms of ministries and departments. The closed way of thinking is often transported to the institutions such as universities, non-universities and other consultants that work closely for and with the departments. Policy fields create their own individual arenas where there is little space for input from sources other than those which are close to the central logic. Integration is therefore made more difficult by the narrowness of the policy areas themselves. This phenomenon has also been observed in innovation policies, especially if they are designed and implemented by different ministries and/or agencies. Innovation policies should be more focused around knowledge and less around the narrowly focused priorities of individual ministries.

Based on this assessment of the problems, there have been attempts to design better processes or better governance. The basis is a model founded on a systemic perspective of innovation attempts to increase the coherence of the system through developing horizontal, vertical and temporal coherence. Although vertical and temporal coherence are perceived as being important, more attention is paid to horizontal coherence as the more urgent.

There are three ways of looking at it horizontal co-ordination (*Arnold et al.*, 2003):

- The co-ordination and attuning of different societal and economic goals of research and innovation.
- The integration of knowledge creation (mostly basic research) and the use of knowledge for innovation. In policy terms this means the integration of science, research and innovation policy.

- The combination of knowledge from different science disciplines to tackle interdisciplinary research needs (e. g. bio-technology) and overarching societal problems that need such an interdisciplinary approach (e.g. climate change)

Coherence and co-ordination are not goals in themselves, but should be seen as tools. Depending on the policy field and actor constellation there are then different mechanisms that can be implemented to increase the ability of the system to think in terms of the whole. These are based on the increased need to manage interfaces, to embed innovation policies in broader socio-economic context and for increasing learning and experimenting. The role of the state changes to that of moderator and enabler allowing different parts of the system to communicate more effectively with each other. This in turn supports collective decision making and implementation of policies and encourages learning within the system (*Smits, 2002*).

To alleviate overlaps and gaps between policy areas, an increasing number of governance mechanisms have emerged to fill the co-ordination gap (*Glynn et al., 2002*). Many of these new mechanisms take the form of councils, commissions or platforms which bring together individual policy makers from different ministries together with non-policy specialists to discuss issues and formulate common policies and procedures. These bodies provide a useful basis for discussion and also improve the chances that initiatives in one policy area do not conflict with the goals in another area and that policies are co-ordinated. They do, however, not replace the policy process policy decisions still remain within the ministries. The extent to which the decisions taken in such forums have to be implemented or taken into account by the individual ministries differs from country to country and according to the subject matter. Recent examples of such mechanisms include the S&T Council in Austria, the Dutch Innovation Platform and the Finnish National Commission on Sustainable Development. These governance mechanisms are external processes that take place outside the ministries and have been designed to provide co-ordination and advice. Although these bodies are increasingly being seen as one of the best mechanisms for integrating policy fields this greatly depends on the way in which they are set up and the powers that are given. Not all such councils support policy integration attempts and some further contribute to the fragmentation of policy making structures (*Edler et al., 2003*).

Specifically designed external mechanisms in horizontal areas of policy making are only one small part of the complex network of interactions that exists on a bilateral basis between individual policy areas. Recently, attention has turned to the way individual policy areas interact with each other. Special focus has been given to innovation policy, not just as a horizontal policy area in itself, but as an individual policy area that has specific and individual relationships with other policy areas. As is the case within innovation policy as a horizontal policy area, there is no one best-practise model defining what co-ordination and coherence between policy areas should look like. Countries and policy areas differ and require co-ordination mechanisms tailored to suit their own specific needs.

Hertin – Berkhout (2002) suggest four different approaches to integration in their paper on environmental policy integration: integrated departments, communication mechanisms, central strategy and sectoral integration strategies. These four approaches vary from centralised top-down methods to decentralised integration strategies with a focus on a specific sector rather on administrative co-ordination.

Although the emphasis is often placed on formal co-ordination mechanisms, informal means of co-ordination are equally important "enabling parts" of a system's coherence. However, such mechanisms are usually more difficult to analyse and the success factors harder to depict.

2.1 MONIT Project aims

The OECD has a considerable track record in analysing and benchmarking innovation policies. The OECD project on National Innovation Systems has produced policy implications that have had an impact on national innovation policy in some OECD member states. It was also influential in establishing a systemic approach to innovation policy. Although this approach is no longer questioned, putting it into practise has proved to be more of a challenge. For this reason the OECD Monitoring and Implementing Horizontal Innovation Policy (MONIT) project was established. The idea is to "to provide a better understanding of national capabilities in innovation governance and policy coordination" (*OECD, 2002*). Although the multi-goal nature of innovation is no longer disputed and innovation policy is not any more confined to the role of enhancing competitiveness and economic growth, little is known about what a multi-goal innovation policy looks like and how policy areas interact and how policy areas are co-ordinated into a coherent horizontal innovation policy.

The aim of the MONIT project is to better understand what horizontal innovation policy means through analysing policy processes and mechanisms in selected countries. This includes understanding how traditional innovation policy (science, technology and industrial policies) can be opened up to include other frameworks, but also how innovation is understood and used in sectoral policies. It focuses on analysing tools that aim to facilitate a coherent approach to innovation policy and that are able to co-ordinate policies across institutional boundaries.

Each national innovation system is organised differently and the aim of the project is not to pick out best practise examples as these would most probably not be transferable but, to understand how the various national systems organise their interfaces between innovation policy and other policy agendas and how they overcome barriers to policy integration.

The MONIT project is divided into three parts. The first part provides a policy profile of the individual countries. Using a set of dimensions to build a picture of the national innovation system and building on previous OECD and EU literature it gives an overview of the main national priorities and strategies, the key reforms and decisions that have formed the current policy options. The second step, of which this report is

part, provides an insight into the relationship between innovation policy and sectoral policies in each country. Each country covers one mandatory case study, the relationship between innovation policy and information and communication technologies and another case study from either sustainability policy, regional policy or transport policy, but that is not predetermined. This report focuses on transport policy. The third step aims to produce a synthetic analysis of new models and practises for collaboration and co-operation in policy formulation. It will analyse the countries attempts to develop coherent policies and focus on how institutional arrangements influence the ability to develop such policies.

The second MONIT work package focuses on the interaction between innovation policy and other sectoral policies. This particular report focuses on the links between innovation policy and transport policy in Austria. The focus is on governance structures and mechanisms. It is easy to get lost in the details of individual transport technologies and this is not the focus of the MONIT project. Therefore this study focuses on governance aspects and not on the technological aspects.

This report is interested in three main questions:

- What are the underlying agendas that shape the direction of innovation in area of transport?
- What actors and stakeholders are (formally and informally) involved in the policy making process that determine the direction of innovation in the area of transport?
- Which mechanisms exist to facilitate the development of coherent policy making between these two areas?

Conceptual framework

The conceptual framework of the MONIT project is based on analysing the policy process. The aim is to assess whether policy formulation, implementation and learning fit together to form a coherent policy process. The concept of coherence plays a key role. Coherence can be understood in three ways (*Remoe, 2002*):

- Horizontal coherence ensures that individual policies build on each other to the extent possible, and minimises inconsistencies in the case of conflicting policy goals
- Vertical coherence ensures that public outputs are consistent with the original intentions of policy makers. In other words, vertical coherence is much about the relationship between policy objectives and the delivery of outputs through implementation instruments
- Temporal coherence ensures that today's policies are consistent with perceptions of future changes.

The MONIT study is also looking for what it calls national capabilities in terms of the means and the resources governments use to achieve coherence on these three levels. The MONIT conceptual framework has identified three key capabilities for achieving coherence: governance, horizontalisation and transition management. In very general terms, governance refers to the "rules, processes and behaviour that affect the way in which powers are exercised..... particularly as regards openness, participation, accountability, effectiveness and coherence" (*Boekholt et al., 2002*). For MONIT purposes this definition was broken down into the individual phases of the policy process, in particular co-ordination, learning and managing. *Co-ordination* refers to specific mechanisms that the policy process introduces to increase the coherence between different objectives and instruments. *Learning* refers to the way in which policy systems generate knowledge and how they go about understanding the preconditions and effects of their actions. Managing the policy cycle refers to the individual steps involved in creating and implementing policies (agenda setting, implementation, policy analysis and evaluation) and the key focus here is on processes.

Horizontalisation refers to the degree to which the distributed nature of innovation policies are bound together in a strategic approach. The MONIT framework is based on the policy co-ordination scale (Box 1) and believes that the higher up the scale policy issues are co-ordinated the more horizontalised an innovation policy will be.

Box 1. The policy co-ordination scale¹⁾

9. Government strategy
8. Establishing central priorities
7. Setting limits on ministerial action
6. Arbitration of policy differences
5. Search for agreement among ministries
4. Avoiding divergence among ministries
3. Consultation with other ministries (feedback)
2. Communication to other ministries
1. Independent decision-making by ministries

The final concept that forms the basis of the MONIT conceptual framework is that of transition management and refers to the ability to redirect the course of policy making.

¹⁾ Taken from the "MONIT: Joint conceptual paper" and based on Metcalfe.

2.2 Approach to the transport case study in Austria

The approach taken in this case study is based on the NIS MONIT conceptual papers and aims to assess the way in which innovation policy and transport policy interact in Austria. Using the MONIT concept paper as a base, a project outline was developed that first mapped the policy areas and then analysed the mechanisms used to increase co-ordination. As the mechanisms used in different countries are quite different, the first step in Austria was to gain an overview of the policy areas and the mechanisms that exist. The first step included looked for the following examples:

- Agenda setting, programme, criteria definition, action plans, impact evaluation, etc.
- Effective role and influence of different actors
- Mechanisms and structures for the mutual consideration of innovation and transport aspects
- Mechanisms for conflict resolution in policy-making
- Involvement of stakeholders
- Mechanisms for coherence with long-term strategies
- In-built learning processes (meta-level)

Following the initial overview, two individual case studies on the interface between innovation and transport policy were chosen to look at in more detail. These were described and analysed. The aim was to assess the level of co-ordination and coherence in the development and the implementation in individual policy initiatives.

The approach taken to the project used a combination of desk research and semi-structured interviews to obtain the information needed. The desk research uses policy documents from both innovation and transport policy fields, research policy strategies, RTD programme documents and evaluations of research activities in the transport field, recommendations from the Council for Science and Technology and other relevant material that helps to understand the organisation, strategies and aims of either policy field.

The desk research and document analysis is supplemented by a series of structured interviews with stakeholders from both the transport and innovation policy making areas, independent experts and agencies and consultancies involved in activities on the interface between innovation and transport policy.

The analysis of the information is based on reconstructing the case studies. It involves an assessment of the different stages of the policy cycle: agenda setting, implementation, policy learning and evaluation

2.3 Report structure

The report follows the following structure. The first part looks at the necessity for increasing policy coherence. The second part of the report aims to set the scene for analysing the interaction between innovation policy and transport policy. It describes both the current political discussions in transport policy and transport policy as it is formalised in transport policy documents. It then maps the main actors responsible for policy formulation in the two areas and in addition other non-policy actors who play a role. The third part of this report looks in more detail at two case studies that are situated on the interface between innovation and transport policy. It examines in each case how the policy areas interact with each other and what the barriers to interaction are. Although the conclusions that can be drawn from the case studies remain limited, it is possible to go into some depth as to how the two policy fields interact and to come to some general assumptions as to the barriers and challenges. The final part analyses the conclusions and attempts some preliminary conclusions as to ways of improving co-operation and co-ordination between the two policy areas.

The report does not aim to seek the objective truth as there are many truths. Not only do different actors have different viewpoints but, they are also willing or less willing to tell stories. Whereas some interviewees stick to the official line, other talk about the chaos behind the scenes and the processes through which policy making takes place. This report aims to make sense of the official lines, the story telling and the chaos and in doing so to synthesise some of the key aspects crucial to co-ordination and co-operation in policy making between these two areas.

3 Policy coherence between transport and innovation

From single goal policy to policy integration

Transport is by its nature a policy area which requires a high level of interaction with other policy areas. A wide range of issues influence the direction and the implementation of transport policy including infrastructure, spatial planning and environmental policy. Transport is a policy area where many different logics and policy levels come together. Although incremental change is the rule for the policy area, it is often confronted by very different logics from other policy areas. This is increasingly the case as transport moves central stage in the transition towards sustainable development. Many countries have now started to implement strategies for sustainable mobility and to create initiatives to link the direction taken in transport policy to also fulfilling other policy goals such as regional development and environmental policy. The benefits of joined-up government are perceived to outweigh the barriers.

Within the joined-up approach, the hopes on new technologies to provide solutions to transport problems are high. As one high level policy maker interviewed for this report remarked: there is no such thing as transport policy without taking the development of new technologies into account and the more involvement between innovation and

transport policy there is, the easier it is to benefit from development in the other policy area. However, technologies should not be seen as the sole solution and although playing a significant role, politicians should not be able to hide behind technological fixes when they don't want to tackle other larger behavioural problems in transport policy. The development of technologies in transport should be linked in to pursuing overall societal goals.

This report is about the interaction between innovation and transport policy. This focus to a certain extent artificially narrows the scope of policy aims addressed by transport policy which normally include other policy areas such as industrial policy and environmental policy. However, the integration between two policy areas can shed light on the way in which interaction takes place in general and can also touch on the direction policy making takes and which other policy areas play a role.

4 Austrian transport policy – the main issues

Austrian transport policy is heavily influenced by the country's geographical and topographical situation. Transit and transport in sensitive regions are the main issues on the transport agenda given the steady increase in traffic taking place and expected to increase due to the end of the eco-point agreement and European enlargement. A recent expert working group on "Cross-alpine and inner-alpine transit traffic" estimate that the increase in traffic over the Brenner pass will increase by 45 percent by the year 2015 and over the Schober pass by 130 percent.

4.1 Transit and Eco-point agreement

The regulation of transit traffic is high on the Austrian political agenda and a contentious issue between Austria and the European Union. The Eco-point agreement that regulates the number of heavy goods vehicles allowed to travel through Austria terminated at the end of 2003 and opinions differ as to what should take its place. Whereas some players involved, including the European parliament, would like to see the end of the Eco-point agreement, the Austrian government and especially the federal state governments in the alpine region argued hard for a continuation of the agreement and further limits to the number of journeys permitted.

Regulating and implementing the Eco-points has not been plain sailing and disputes between Austria and the Commission have arisen on several occasions. The number of journeys made is monitored by each party as the number of future points is dependent on the number of journeys made in the previous year. In the past the statistics produced have varied between the two and led to heated discussions as to how many points are available for the following year; each party claiming superiority for their data and not accepting the other's count. This has led the Commission to distribute more points than the Austrians consider available and has resulted in Austria taking the Commission to the European Court.

The extension protagonists propose a temporary solution involving the continuation of Eco-points that would bridge the gap until the European Infrastructure Charging Guidelines come into force that are currently being developed (*Commission Proposal COM(2003) 448 final*). They claim that the increase in transit traffic caused by the free movement of vehicles would not be in line with the original agreement to reduce NOx levels.

Current state of play is that the Austrian government have rejected an EU extension compromise proposal. Transit traffic does not need Eco points at the moment.

Tensions between Austria the European Commission have continued to grow throughout 2003 due to an initiative brought by the state government in Tirol. As a result of air pollution levels the state government decided to introduce a night time ban on HGVs over 7.5 tonnes on sections of the A12 Inntal motorway for vehicles carrying any of the following materials: refuse, grain, round timber and cork, stone and earth, excavation material, motor vehicles and trailers and constructional steel. The ban is to be observed between 22:00 and 05:00. The justification for the ban is based on the Air Pollution Control Law whereby HGV traffic can be restricted if emissions obtain a certain level. The European Commission, however, views the ban as a breach of the freedom of services and the free movement of goods in the European Union and has filed an action with the European Court to have the ban lifted. The outcome of the final decision is at currently pending.

The publication of the draft guidelines for the charging of heavy goods vehicles for the use of certain infrastructure on 23.07.03 (*Commission Proposal COM(2003) 448 final*) has not eased the situation. The guidelines will replace the Eurovignette's time-dependent system currently in use with a distance-related infrastructure charging method. They will provide a framework for road price charging across the whole of Europe. Critique concentrates mainly on the fact that income from road pricing mechanisms is mainly to be used for road maintenance and construction and not used for rail projects. 20% can be used for rail. Another, that the external costs that are to be integrated only concern the accidents and not environmental, health or congestion.

Eco-points – how they work

The Eco-point transit agreement between Austria and the European Union was first established in 1992 and subsequently amended in Austria's accessions negotiations in 1994 when Austria. The system has been in operation since Austria joined the EU in 1996. It aims to limit transit traffic through the Alps and so to reduce nitrogen oxide emissions by 60%. The agreement applies to the whole of Austria.

The agreement specifies that every HGV over 7.5 tonnes needs to obtain Eco-points to transit Austria. The number of points required depends on the level of emissions produced per vehicle. Environmentally friendly HGVs need fewer points and can make more journeys. The number of overall points is reduced each year which is designed to decrease the emissions level.

Each country receives a certain number of Eco-points that they divide between the national freight companies. The HGVs have an electronic eco tag that can be read and written on by

infrastructure at the side of the road. Each time an HGV enters or leaves Austria this data is transferred to a central computer. The driver has to state whether the journey comes under the Eco-point agreement and the correct number of points will be deducted from the country's Eco-point account. This electronic system is automatic and requires no waiting time.

The agreement states the total number of Eco-points that are available until the agreement terminates at the end of 2003. The number of points available per year is linked to a level set in 1991. The level is only allowed to increase by 8% above this level. If the number of transit journeys in one year exceeds this level then the total number of points is reduced. The reduction takes place the following year.

4.2 Innovation/transport policy issues

The main aim of this study is to look at the interface between innovation and transport policy and to pick two policy initiatives to use as case studies. These two have been chosen because of their current relevance to both policy fields. There are however, many different ways in which the policy areas interact. The two issues below, although not further part of this study, are important areas where the two policy areas interact and which are worth mentioning in order to set the scene for the further analysis.

Innovation and road pricing

A much discussed issue over the past few years and very much on the transport/innovation interface has been the decision to introduce microwave technology for road pricing instead of GPS. The opinions vary considerably as to whether this is an old and obsolete technology or whether the GPS system is not yet sufficiently developed to be successful. The decision to implement microwave has therefore also to a certain extent widened the gap between the policy areas and their perceptions of each other. Transport policy is seen as being anti-technology and only interested in incremental change and innovation policy is seen as preferring new technologies no matter how stable, affordable and implementable.

Many interviewees from the innovation policy side feel that Austria has bought itself into an old technology by opting for the microwave technology that will be obsolete in a few years time, especially with the development of the European Union's Galileo system. On the other side of the fence the transport policy people disagree and see the benefits of introducing a technology that is reliable and which will bring quick returns. Several of their arguments back up this decision.

The Austrian road system is in considerable debt and the introduction of the microwave system is the quickest and easiest way of reducing the debt. In comparison, the German system is not in as much debt and therefore has the freedom to play around with the introduction of new technologies. The Austrian decision was not therefore not an anti-technological one, but a pragmatic one. In addition, the pro-microwave lobby argue that the microwave system will have fully paid for itself by 2008 and it will then be possible to switch to Galileo when that system has become more stable. They believe

that the GPS system is still too unstable and dependent on America to be implementable.

It was decided not, however, to take this decision as a case study further during this project even though it would have made an interesting subject to study. The two case studies taken instead are policy initiatives, not just decisions and were therefore deemed more fitting for this study.

Public procurement and transport technologies

It was not the aim of this study to go into such instruments of policy making as public procurement although this is one of the main ways in which the state can influence the direction and uptake of certain technologies. However, it is worth mentioning here that a considerable number of interview partners mentioned the influence of public procurement in influencing Austria transport policy. Several interviewees considered the influence to be far greater than that of the transport technology programmes.

The relationship between construction in the transport sector and technology policy is one area of public procurement that would need further research to fully understand the influence. One assumption is that less innovative solutions for transport policy are sought due to the dominance of tunnel-building as a solution for transport problems. Here the relationship between the construction industry, political parties and the banks plays a significant role in defining what solutions should be sought from the beginning.

5 National profile: Austrian transport policy

Strategic planning documents form an important starting point for the assessment of any policy area. Although they should not be taken as sole evidence of the existence of strategic policy making in an area, the existence, or the lack, of policy documents gives an indication of the way in which policy is formed. In Austria there are several documents that provide the framework for transport policy: the General Transport Plan (1991) and the Austrian Federal Transport Infrastructure Plan (2002). These two documents provide an interesting overview of transport policy in Austria. Neither of them could be called an integrated transport policy. The first, the General Transport Plan is already 13 years old and was written long before Austria joined the European Union. The second document, the Federal Transport Infrastructure Plan, focuses on one area of transport policy, namely on infrastructure.

5.1 Austrian Federal Transport Infrastructure Plan

The Austrian Federal Transport Infrastructure Plan aims to develop a strategy to plan how the road and railway network should evolve by the year 2015. Its main focus is on the structure of the network. As well as planning the road infrastructure, the Plan also includes a strategy for the development of other modes of transport including rail and waterway transport on the Danube.

The *Austrian General Transport Plan*²⁾ (BMVIT, 2002) is the first successful attempt at creating an Austrian federal transport infrastructure plan. The design process that began in March 2002 and lasted nine months was based on a new, discursive approach to decision making and consensus building. It concentrated on building a consensus between the main actors involved in planning and providing transport infrastructure on which infrastructure projects to finance. Non-infrastructure aspects of transport planning were not included in the plan. Safety, soft policies, legal aspects and financial support are mentioned, but not detailed as they are dealt with through other activities.

The process involved the main actors: the BMVIT, the Austrian Federal States, representatives of the main transport carriers and other individual stakeholders. The academic community, the media and other stakeholders were informed about the process through a "general transport plan platform".

5.1.1 Key strategic aims

According to *Rosinak – Snizek* (2003) the key strategic aims of the Austrian General Transport Plan are:

- To strengthen Austria as a business location: transport networks make or break the quality of a location.
- To ensure an efficient and appropriate extension of the existing network. A step-by-step modernisation.
- To increase safety (in the light of several tunnel accidents)
- To ensure the financing of projects, that is to co-ordinate short-term investments with long-term financial planning.
- To simplify implementation. To create a dynamic project management between the conceptual and the project level.

The process was organised in a series of stages. The stakeholders (see above) each defined their individual priorities. The BMVIT then organised the suggestions according to federal priorities and the states replied with comments. In parallel, the financial requirements were calculated according to the time horizon.

The federal priorities are based on infrastructure networks of national and international importance. They aim to link important Austrian nodes with each other and with other European nodes of importance for Austria. The Austrian nodes and the corridors were ranked according to their importance on a number of criteria including:

²⁾ For more information see: http://www.bmvit.gv.at/sixcms_upload/media/131/gvk.pdf.

- Criteria for nodes: relevance for freight, for passenger transport and evidence of bottlenecks
- Criteria for corridors: spatial integration of nodes, capacity, potential contribution to network, efficiency (investment compared to use)

The process consolidated 270 projects costing 45000 million into a series of infrastructure investment packages to be implemented in the near future worth 17100 million.

5.2 General Transport Plan

The General transport plan was finalised in 1991 and sets out the basic features of transport policy in Austria. It aims to provide an infrastructure that meet the countries transport needs and that makes it possible to switch to more environmentally friendly modes of transport. It drew up the following guidelines for Austrian transport policy:

To reduce transport: this should take place through balanced spatial development and increasing the quality of life in cities to reduce urban sprawl, through more efficient use of transport and reduction in empty journeys by employing new technologies and through use of producer pays principle in pricing

Support for environmentally friendly modes of transport: through establishing fair competition between the modes of transport, through support for rail projects and other public transport initiatives including local accessibility through integrating pedestrian and cycle networks with rail networks, through integration of public transport accessibility in planning regulations. In addition, through also increasing waterway transport on the Danube.

The earliest possible implementation of new technologies: through the introduction of legislation to support innovation in areas such as noise and pollution prevention, through support for the introduction of electric vehicles, through the implementation of technologies to increase road safety and traffic monitoring.

Involvement of stakeholders in transport policy: The inclusion of a wide range of stakeholders in the formulation and implementation of transport initiatives will allow the authorities access to different opinions and to weigh up the pros and cons of proposed initiatives. Through including a wide range of views the transparency and the acceptance of such processes can be increased.

True costs in transport: the internalisation of external costs and the introduction of the producer pays principle. Increasing fair costs in transport includes: measuring the external costs of accidents, environmental degradation etc., taking external costs into account in taxes, charging and pricing and employing the polluter pays principle, whereby regional and social differences should be taken into account.

Increased co-operation between modes of transport: Increasing co-operation between modes of transport concerns both freight and passenger transport. IN freight it

means increasing the logistics of freight transport and intensifying the use of information and communication systems for optimisation. It also entails creating freight centres for transferring from one mode to another, further developing technical systems for combined freight transport and increasing the provision of combined facilities to Eastern Europe. In passenger transport it means connecting different modes of transport to build up an integrated network including cycle networks, park and ride systems and taxi-busses.

Development of new transport legislation: This entails including the latest developments on road safety and on monitoring road safety, better protection for non-motorised road users and putting public transport first. It also includes introducing new technological standards to reduce the negative effects of transport.

Reducing the impact of transit traffic: this should include a review of the relevance of transport activity on the international level and the implementation of the polluter pays principle. Increasing international rail and waterway networks and a long term transit agreement with the EU based on environmental protection and the acceptance of the local population.

Environmentally and socially acceptable organisation of transport in conurbations: Using planning tools to decrease traffic in urban areas and creating incentives to use public transport including traffic calming and restrictive parking initiatives, road pricing and prioritising trams and busses over private transport.

Opening up the borders to the eastern neighbours: Opening the borders increases traffic and requires a co-ordinated transport policy with eastern neighbours that includes increasing the rail and waterway networks and decreasing the impact of transport on people and on the environment.

Although the ten guidelines outlined above are relatively broad and can be said to form the basis for an integrated transport policy, they were never translated into practise. The GVK-Ö has remained largely a document that sets out impressive aims, that many refer to, but that was not implemented in a clear and structured manner.

The two documents mentioned above are the only official documents that outline transport policy in Austria. As one of them is devoted to infrastructure planning and the other one is already considerably old, it would suggest that transport policy is not something that is written down in Austria. Rather policy making take place in smaller policy arenas and on a more informal basis. Overall this approach to policy making has worked very well and there have been no further attempts to try and develop an integrated transport policy. However, although actors inside the policy area are able to relate to each other and know who is responsible for which subject, it is often seen as a closed shop by actors from different policy areas. A lack of a strategic transport policy is more of a problem from the outside than from within. This is also one of the main problems for innovation policy when trying to define the interface with transport policy.

There are few explicit links to innovation policy in the two documents discussed above. The *Austrian General Transport Plan* mentions the need to develop and implement new technologies at several points (logistics, transfer of freight from road to rail, public transport etc.) but goes into no more detail than an overall wish list. The Austrian Federal Transport Infrastructure Plan explicitly states that there are other documents that deal with transport policy and that it does not go into any more detail on issues other than infrastructure planning.

6 Institutional mapping of actors, institutions and flows

The interaction between innovation and transport policy in Austria can be more easily understood if the institutional setting has been looked at. As the barriers to coherent and co-ordinated policy making are often already inherent in the structures and not in the individual policies, a mapping of the main actors and their interactions forms the basis for looking later at individual policies. The Austrian institutional set-up in innovation and transport policy goes a long way in explaining the problems occurred. This section describes the main actors involved in innovation and in transport policy and refers to some of the barriers faced within innovation policy to developing coherent policy.

6.1 Innovation policy

An institutional mapping of Austrian innovation policy actors is a complex undertaking. Innovation policy is comprised of a large number of actors both on the strategic and the implementation level whose responsibilities are not clearly defined and often overlapping. Evaluations have frequently referred to fragmentation as one of the barriers to the design and implementation of a coherent innovation policy in Austria.. A recent evaluation (*Arnold et al., 2004*) of the two main research funds in Austria, the Austrian Industrial Research Fund (FFF) and the Austria Science Fund (FWF) concluded that:

- Overly fragmented policy delivery limits the opportunities for building scale and for learning – both about policy delivery and about policies themselves
- It makes the funding system hard to understand – which is a problem both for those who have to live in it and in terms of connecting it to developments in European R&D funding and performance
- With many small agencies, it is hard to build critical mass and especially hard to afford the needed investment in capabilities for analysis and strategy development ('strategic intelligence')
- There is a wide diversity of governance practice and therefore unclear interfaces between the ministries (as principals) and the agencies (their agencies). In some

cases, a ministry even simultaneously maintains different governance styles in its relationship with a single agency about different activities. This incoherence helps prevent ministries and agencies alike from building the right amount of strategic intelligence to maintain a coherent division of labour.

- Differences in governance styles limit the possibilities for individual agencies to serve multiple ministries.

Furthermore, to increase the confusion, the responsibilities and the organisation of actors within the policy field also changes frequently, often within one legislative period. The current Minister, Hubert Gorbach, is the fifth minister within the BMVIT to take office during the current coalition between the Austrian Freedom Party and the Austrian Peoples Party which began early 2000.

A mapping of actors and responsibilities that are directly involved in the design and implementation of innovation policy can be divided into ministries, research funds and programme management organisations. Four separate ministries are involved in innovation policy issues the Ministry for Economic Affairs and Employment (BMWA), the Ministry for Transport Innovation and Technology (BMVIT), the Ministry for Education, Research and Culture (BMBWK) and the Ministry of Finance (BMF).

The main research funding agencies in Austria are, as mentioned above, the FFF and the FWF with the FFF concentrating on the private sector and the FWF on basic research. The funds concentrate on supporting "bottom-up" or unprogrammed research activities. Although channelling funding through strategic thematic programmes in Austria has been growing in recent years, there are still few thematic programmes and the "bottom-up" approach is the preferred method. Having said this, some of the recent programmes that have been established have been less of a strategic nature and more a bundling together of the individual research projects contracted by a ministry in a particular field. These often do not have the same quality criteria that the funds require (*Arnold et al.*, 2004).

Other agencies include the Austrian Wirtschaft Service, the Technologie Impulse Gesellschaft (TIG), the Christian Doppler Gesellschaft, the Austrian Space Agency, the Ludwig Boltzmann Gesellschaft and the Anniversary Fund of the Austrian National Bank. Each of these has a budget of its own to pursue its own goals whether these are the *Kplus* centres (TIG) or an individual area or type of research such as space (ASA).

In addition to the agencies with their own budgets there are a further series of organisations that manage and administrate the thematic programmes on behalf of the ministries. Some of these organisations have specialised in programme management and have fewer competencies on the content side whilst other organisations have been included due to their expertise in a particular field. The management consultant Trust Consult is an example of the first type of organisation and they have provided the BMVIT with the programme management for previous and current transport technology programmes. An example of the second type of programme management is provided by Rosinak & Partner ZT GmbH who are well known transport consultants and are

programme managers for the rail technologies programme line within the current transport technology programmes. The contracts for the programme management are given for the duration of the programme and are put out to tender again if the programme is continued. There is little continuity between the management of the individual programmes and a large number of different actors involved in one programme period. This practise mirrors the general fragmentation in innovation policy discussed above. The only exception to this rule at the moment would appear to be the via donau, an agency owned by the BMVIT.

The via donau was established in 1999 by the BMVIT with the aim of increasing the competitiveness of inland navigation on the Danube through specific initiatives. It should support transport and environmental policy goals through the transfer of freight from road to waterways. Although initially, focused on waterway transport, the organisation's competencies were extended in 2003 to include traffic and transport telematics. The via donau supports the ITS Austria (the transport telematics plan) in implementing telematic systems throughout the entire national transport network.

6.1.1 Innovation policy co-ordination

The most important new addition to the innovation policy scene has been the Council for Science and Technology Development. The Council was established in August 2000 to advise the government, ministries and federal states on all matters concerning Austrian technology policy. The Council consists of eight members, four chosen by the BMVIT and four by the BMBWK. As well as advising on ad hoc issues, the Council has been charged with the task of developing long term strategic plans for Austrian technology policy. Most recently the Council was responsible for reviewing the special funds worth a total of 508 million euros. The special funds were not part of the normal science and technology funding and individual initiatives were applied for by different ministries. The Council reviewed and ratified each individual application according to a set of criteria that focused mainly on the leverage effect for private sector involvement. In addition, the Council also tried to build up a picture of the total initiatives handed in and to look for overlaps and cases where clearer definition would be useful.

The involvement of the Council in the distributing the special funds should not be underestimated. Previously, the ministries had been left to distribute such funding on their own without any external checks and balances. The Council brought a higher degree of transparency and standards to the formulation of individual programmes and initiatives and not merely through increasing the need to include evaluation. The Council had a considerable influence on the transport technology programmes that will be dealt with in more detail later.

6.2 Transport policy

Transport policy is the responsibility of the BMVIT in Austria. The ministry remit covers all modes of transport and also the overall coherence of transport policy. Within the

ministry two separate departments deal the transport agenda; the department for infrastructure and the department for co-ordination. The department for infrastructure covers the individual modes of transport and has four groups which cover the individual modes roads, railways and air and waterways and the transport inspectorate. Each group is further divided into individual units that focus on legal, technical or sectoral issues. The co-ordination department has the responsibility of co-ordinating and integration transport policy across the different modes and has three divisions; Co-ordination of Infrastructure policy, International Networks and the General transport Plan and Combined Transport. This current structure of transport policy in Austria is a relatively new one. Up until the formation of the coalition between the Peoples Party and the Freedom Party in 2000, transport policy was spread across different ministries. The agendas for road and rail were under brought under the same roof following the reorganisation. Transport policy is also influenced by the agendas of other ministries especially those covering land use and environmental policies and by the regional level.

6.3 Institutional linkages

On an institutional level there are potentially strong links between innovation and transport policy in Austria. Both policy areas are under the responsibility of one ministry, the BMVIT. Figure 1 shows details the relevant departments and units within the BMVIT.

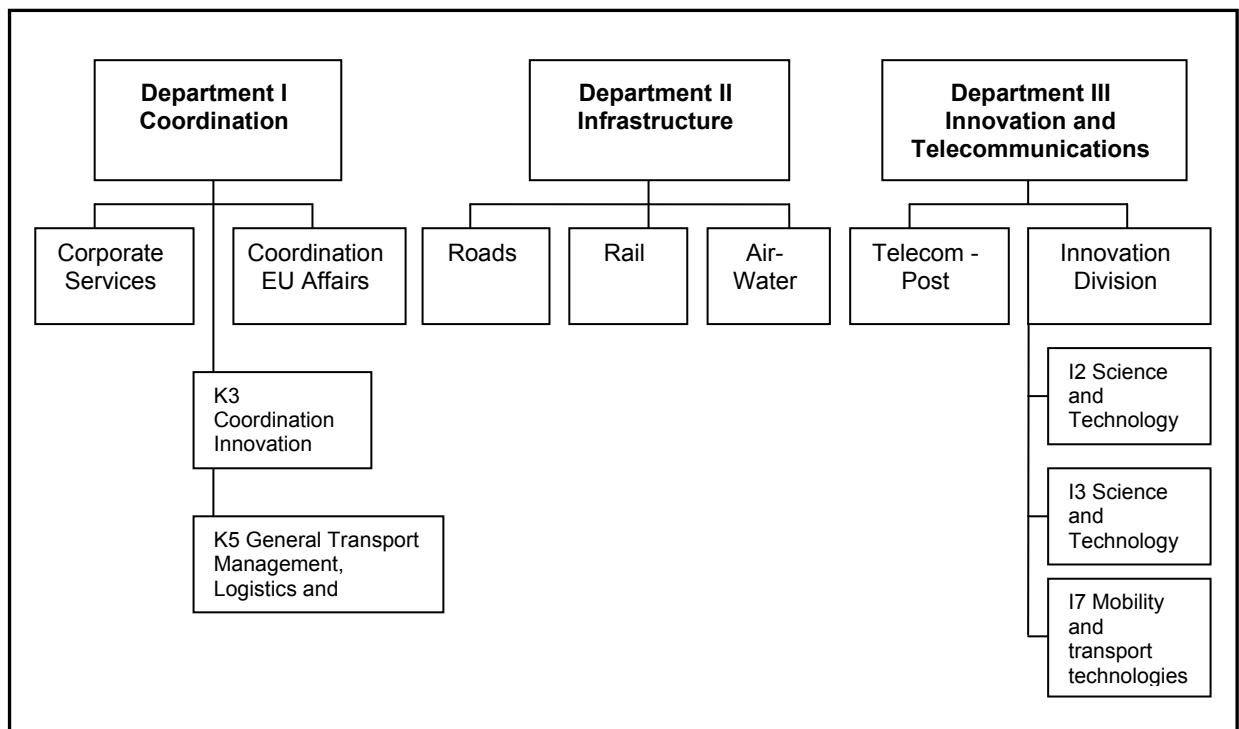
However, according to most sources interviewed for this study, this is where the links stop. Despite the fact that both policy areas are covered by the same ministry, co-operation between the two has not increased considerably and the physical proximity has not significantly contributed to integrated policy making. A variety of reasons were given for the difficulties perceived in co-ordinating the two policy areas that included:

- Confusion over which unit is responsible for which policies
- Difficult to understand the division of labour between the transport divisions and the co-ordination division.
- Need to defend own area of responsibility in the light of changing organisational structures
- Differences in thinking and in disciplinary backgrounds that influence the approach to change and to the concept of innovation within the departments
- Misperceptions about the way in which the other department approaches change and innovation. Perceptions are often stronger than reality
- Lack of a strategic guidelines to follow
- Lack of clear responsibilities as a basis for co-operation

- Lack of trust and fear of responsibilities being taken away if co-operation takes place and other units build up competencies in the area

The awareness is high that greater co-ordination is needed. And some experience but little knowledge about how this should take place. Sometimes the internal logic is not conducive to co-ordination. However, it is not known what it means and whether it will entail more a loss of competency than a gain in co-operation. Reality is a complex network of ad-hoc and personal co-ordination and co-operation activities.

Figure 1: Detailed section of the departments within the BMVIT who have direct responsibility for innovation and transport policy



Source: Simplified version of the BMVIT organisational structure

7 Coordination arrangements typical for the policy area

Policy areas interact with each other. Whether they do this as part of a co-ordinated process or on a more ad-hoc basis depends on the structures and also on the degree of necessity for interaction. The integration between transport policy and innovation policy in Austria provides an example of close physical proximity but, little co-ordination on the formal level. Higher levels of interaction can be found on the informal level where personal connections play an important role. There are few typical arrangements

that characterise interaction for the policy area, but a rearrangement of actor constellations around each new issue with a greater or lesser degree of integration. The extent of the informal interaction that takes place between the different actors is difficult to depict and beyond the scope of this study. However, some of the general barriers and challenges to co-operation and collaboration can be observed when looking at specific activities that require interaction between the two areas.

7.1 Selected sub-cases

In this section two activities are looked at where the concrete interaction between transport policy and innovation policy can be observed. These activities have been selected for two different reasons. Firstly, they represent arguable the most important interfaces between these two policy areas and secondly they are both activities where there is a concrete need for interaction. The first, RTD activities in the area of transport technologies, is an area where there is a long, but not entirely friction-free, tradition of interaction between the two policy areas. The second activity, the Telematics Framework Programme, is a more recent initiative which was initiated to overcome some of the shortcomings in the interaction between different policy areas.

The Transport Technology RTD programmes were developed by the BMVIT. Examining the design and development of these research programmes offers the opportunity to observe at first hand an attempt to integrate innovation policy goals with transport policy goals. In this case, transport issues are addressed in the form of research programmes. Although the programmes are developed by the unit responsible for innovation, they require close contact to actors in the field of transport in order to be able to define the aims of the programmes. The contact between the two policy areas regarding the development of the programmes has not always been easy. The unclear demarcation between the responsibilities of the transport division to commission research and the innovation division to design transport programmes causes a certain amount of friction.

The second sub-case study, the Transport Telematics Framework Programme, is an initiative that requires the close involvement of innovation and transport agendas. It was established to ensure that the implementation of transport telematics in Austria is a coherent one and is in line with European standards in terms of the definition of interfaces, user demands and the implementation of new technologies. The process of designing the programme is organised by an agency external to the ministry, but with close contact to the different divisions who needs to be involved.

7.2 R&D Activities in the area of Transport

An important interface between innovation and sectoral policies in any country are research and development programmes that specifically focus on issues within the responsibility of the sectoral policy. Although expertise on funding mechanisms and options is often held within the innovation and research ministry, they rely on contact to

other forms of expertise in order to define the specific content of such programmes. Often the input comes from actors involved in the area of research, however, during the design and development of sectorally focused programmes ministries and agencies with responsibility for innovation and research issues often communicate with other sectoral ministries about their needs vis-à-vis the focus and outcomes of RTD programmes. Looking at the way in which RTD programmes are developed can provide an insight into the way in which policy areas communicate with each other.

In Austria transport focused RTD activities are the responsibility of the BMVIT. Research activities are commissioned and designed by both the Divisions under the Directorate for Infrastructure (Road and Rail) and the Innovation Division. The focus of the Divisions is different. The Infrastructure Divisions commission research relevant to the development of their mode of transport. The Railway Division has its own publications series and the road safety authority also commission research activities. The Innovation Division has a different focus and designated unit that focuses on transport technologies and designs and develops transport technology programmes. The focus within this division is on innovative (both technological and organisational) solutions to transport problems.

Trying to gain an overview of the other transport-related RTD funding activities is more difficult. Transport focused research and development initiatives are also funded by other ministries and agencies, but on a smaller scale and often on an individual project level. In many cases, the focus on transport is often a secondary consideration either to the type of funding mechanism or the focal issue of the individual ministry. Examples of other funding mechanisms that also encompass transport issues include the Austrian Science Fund (FWF) that funds basic research projects on an individual basis based on their academic merit. These projects can also cover transport issues as the Fund does not have any targeted thematic focus to its funding activities. Another is the Ministry of Economic Affairs and Employment that supports networking activities between academia and business in the form of competence centres. One of their centres concentrates on vehicle acoustics.

An interesting demarcation of competencies in the funding and development of transport research activities concerns research that focuses on the links between transport and the environment. The sustainable mobility agenda has been increasingly covered by the Unit for Transport, Mobility, Settlements and Noise in the Ministry for Agriculture, Forestry, Environment and Water (BMLFUW). This unit concentrates on the environment agenda and linking environment, transport and health issues. This should not suggest, however, that the transport programmes and initiatives of the other ministries have no reference to the environment, but that the sustainable mobility focus of the BMLFUW gives the environment a higher status in its research focus.

The above list of transport research examples is by no means exclusive and other BMVIT and also Ministry of Education, Research and Culture (BMBWK) research

initiatives³⁾ also address transport related issues. The main purpose of listing the above research funding initiatives of the different ministries and mechanisms is to show the fragmented nature of the policy area and the way in which the ministries support their own research agendas. Having said this, recent attempts have been made to co-ordinate and integrate different funding priorities and activities. These include attempts to integrate the Transport Division in the design of research programmes and the Council for Science and Technology's requests for a co-ordinated transport research programme. These issues are discussed further below under the development of the programmes.

7.3 The Transport Technology Programmes

The targeted funding of research and development activities in the area of transport can be traced back to the early nineties and the establishment of the *Transport Technologies Programme* (1992-1997). Prior to this programme individual projects existed in the area of transport, but there was no focused RTD programme. The subsequent development of the transport technology programmes can be divided into two periods: the Transport Technologies Programme Move – Mobility and Transport Technologies (1999-2003) and IV2S – Intelligent transport systems and services (2003-2006).

This section describes analyses the programmes as a typical mechanism on the interface between innovation policy and transport policy. It firstly provides an overview of the content of the programmes and subsequently looks at how the programmes were developed, which actors were involved in the design and which policy aims are addressed by the programmes.

7.3.1 Early transport technology programmes

The first transport technologies focused programme was also one of the first ever thematically orientated research programmes to be developed in Austria. It represents a considerably different approach to R&D funding in Austria and a break with the previous response mode organisation of funding projects. The Transport Technology Programme focused on the organisation of large scale projects and umbrella projects. The programme therefore did not only have to focus on developing the thematic content, but also on organising appropriate programme management structures.

The original idea and the motivation behind the development of the programme was to increase internal co-operation in R&D in the Austrian Industries (AI) AG. The first thematic focus of the programme, the Low Noise Rail Umbrella, was therefore based on a theme common to a large number of firms within the AI holding company. Three other umbrella programmes or projects followed later: Low noise road project, Logistics

³⁾ The BMVIT also supports Competence Centres that have a transport focus: the Austrian Centre of Competence for Tribology and the Competence Centre the Virtual Vehicle.

Austria umbrella (Logistics control systems and City logistics) and LOFT (feasibility study for a logistics research terminal).

The overall goals of the programme aimed to:

- Raise the technological capabilities of the Austrian transport equipment industry
- Attain supplier consortia of integrated systems
- Attain centres of competence on a national level
- Reduce the environmental impact of transport
- Accordance with the general transport policy

The programme was established and run by the Innovation and Technology Fund. However, as the ITF is a "virtual" organisation and the day-to-day management took place through funding instruments of the operative funds which subsidise company R&D in Austria, the FFF and the ERP.

MOVE

The MOVE Programme – Impulse Programme for Mobility and Transport Technologies (1999-2003) <http://www.movenet.at/> was established by the BMVIT (previously BMWV) to address "the strategic goals of Austrian transport policy on the one hand and the innovation potential of the Austrian economy on the other hand" (*Grassegger et al.*, 1998). The main motivation for the programme was to support innovation in the transport sector which would lead to a more efficient, environmentally-friendly and intermodal transport system. Following an analysis of the challenges and barriers in the Austrian transport system the decision was taken to focus on two main areas; increasing the attractiveness of public transport and optimising intermodal public and freight transport. The programme aimed to act as a moderator that would stimulate interaction between the individual modes of transport and to provide strategic impulses to decrease barriers to system innovations.

The programme consists of three programme lines that addressed the individual thematic lines of the programme's aims: Take ÖV, Logistics Austria Plus and Innovative Mobility Services.

TAKE ÖV

TAKE ÖV supports Austrian companies, research institutes and the transport industry in the conception and the implementation of telematics projects in the area of public transport. The key thematic areas are:

- ASSIST – Austrian Information Services for Travellers
- BSI – Operation systems and intelligent infrastructure
- TRANSACT – Transaction systems

- ÖV-IV – Interface between public and private transport

Logistik Austria Plus

Logistic Austria Plus builds on the ITF programme "Logistik Austria". Logistik Austria Plus initiates innovative concepts and solutions in transport and logistics and supports firms and research institutes in their application. The programme focuses on the following thematic areas:

- Green Logistics
- E-Business in Logistics
- Supply Chain Management
- Logistics Infrastructure

Innovative Mobility

Services

The aim of the competition is to develop innovative and feasible implementation projects for environmentally friendly mobility services in urban passenger transport. The aim is to create new perspectives for intermodal, customer-orientated solutions for the Austrian economy.

Other programmes

Two other programmes are financed that aim to support the development of the Danube Waterways. Pilot programme for the development of intermodal transport and to support projects in the area of integrated transport on the Donau water way. The aim of the programme is to increase the use of the inland waterways in the Danube corridor and in doing so to contribute to finding environmentally and socially acceptable means of coping with the increase in traffic especially in road traffic. It should also contribute to the economic development and integration of the Donau region. This entails the integration of the Donau shipping in the intermodal house to house transport chain.

Programme for the support of combined freight transport road-rail-ship. This programme concentrates on investments in installations and systems and mobile equipment that are specifically for transferring freight in combined transport road-rail-ship. The programme funds the following thematic areas:

- Installations for combined transport
- Transport equipment for combined transport
- Innovative technologies and systems in support of increased supply for combined transport

- Feasibility studies
- Educational costs

7.3.2 Thematic overview of current programmes

The Intelligent Transport Systems and Services Programme (IV2S) is a more recent programme that has been financed through the research special funds for research activities. It concentrates on three key areas: automotive suppliers, Rail technologies and transport telematics.

Austrian Advanced Automotive Technology – A3

The *Austrian Advanced Automotive Technology* programme A3 focuses on the automobile supply industry. The Automobile sector is a key branch for the Austrian supply industry. Increasing pressure is being put on the suppliers to change existing practises in the light of new trends and challenges that can be described as "cleaner, lighter, quieter, more intelligent and more flexible". In order to ensure the continuing success and the competitiveness of the supply industry in Austria it is necessary to take future dramatic technological leaps in automotive research into consideration. The programme covers six key areas: New propulsion systems, Energy efficient auxiliary vehicle systems, Alternative lubricants and fuels, Low-noise road vehicles, New vehicle concepts and Intelligent vehicles. Projects are funded that have at least three partners from industry, universities and the non-university research sector and that have a high development risk.

Innovative Rail System (ISB)

The aim of the ISB programme is to support the economic realisation of the latest technologies in passenger and freight transport. The programme concentrates on long term solutions in the area of interoperability of the European rail system, the relocation of freight transport to rail, increased customer acceptance in passenger transport and the optimisation of the vehicle/track.

On the basis of other European initiatives (A Joint Strategy for European Rail Research 2020 – Towards a Single European Railway System), the programme aims to develop long term solutions to technological challenges. It supports pre-competitive research and technological development, but also studies and demonstration projects in strategically important fields of technology such as:

- Track construction and maintenance technologies
- Information and communication technologies for operating systems, train control systems and traffic management systems
- Innovative vehicle and propulsion systems, mechatronics, energy efficient auxiliary vehicle systems

- Innovative rail transport systems, intermodality etc.

Intelligent Infrastructure (I2)

Intelligent Infrastructure is a research and development programme that focuses on the support of integrated systems approaches to telematics applications in the transport sector. This includes support for increased use of telematics in the transport sector. The programme was designed in order to increase innovative capacity in the transport telematics field, to support the requirement for high levels of co-operation and co-ordination between suppliers, customers and different modes of transport and to increase the user transparency in telematics.

The main requirement for research and technology policy intervention is to support trend-setting research and demonstration projects for intermodal, system integrated telematics solutions, network building and activities that stimulate demand and acceptance from the customer side.

7.3.3 Programme actors and their responsibilities

The main actors involved in the design and the implementation of the transport technology programmes are the BMVIT and the organisations acting as programme managers.

Programme design and development

The BMVIT has the overall responsibility for the development and implementation of the transport technology programmes. The Unit directly responsible for the programmes is the Unit for Mobility and Transport Technologies which is part of the Innovation Division in the Directorate for Innovation and Telecommunication.

The Innovation Division has the responsibility for science and technology funding and science and technology infrastructure. It includes units that oversee research initiatives in the areas of air and space, information and communication technologies and nano technology, transport technologies and energy and environmental technologies.

The Mobility and Transport Technology Unit is responsible for the strategic development of transport technologies.

Programme management

The day-to-day administrative management of the programmes is not performed in-house by the ministry, but is carried out by an external programme management agency. In the case of the transport technology programmes, each programme line is managed by a different programme management organisation. These are selected through a competitive tendering process based on criteria such as previous programme management expertise and knowledge of actors in the RTD scene. In the case of some programme lines the project management is chosen partly due to its thematic competencies in the field of transport technologies whereas in other cases the programme management is carried out by an organisation which specialises in the management of programmes.

The administrative activities performed by the programme management include organising the project tendering process, reviewing the submitted projects and organising an international peer review process. Over and above these duties the programme management also fulfils a networking and publicity role both between the projects and the ministry on an informal basis, between the different projects in the form of workshops and presentations and with the general public through internet web pages.

The recent programmes have involved another actor as the administrative management has been separated from the financial management. The financial controlling is carried out by the Austrian Industrial Research Promotion Fund (FFF).

7.3.4 The design process

The development of the transport technology programmes provides an in depth look at the way in which themes are reached and the content of programmes decided. The focus in this section is on the interaction between transport and innovation policy. This, to some extent, narrows the focus of aims and objectives that are addressed in the programmes. An equally important role in the development of the programmes is played by environmental and by industrial development goals. However, to focus on the interaction of all policy areas would be too complex.

The extent of the interaction between policy areas can be best established in two ways through looking firstly at the input and then at the output of the programmes. Firstly, the input can be examined and the number of different actors that were involved in developing the process can be looked at. However, this does not necessarily guarantee integration of output and secondly, the output can be considered in the form of the policy goals that are addressed by the programmes.

Bottom-up programme development

Within the general framework in which the transport technology programmes are developed there are two independent sets of actors that influence their design and

composition. Firstly, actors from industry and the research sector play an important part in the bottom-up definition of the content of the specific programme lines. Secondly, actors within the research funding framework play an increasingly important role in influencing the direction of the programmes. However, although the research policy framework has changed significantly over the course of the three programmes, the basic mechanisms for designing programmes have not changed. The design process for the programmes is characterised by policy level definition of a need followed by the translation into concrete programmes through a participation process on the bottom-level. It is sometimes unclear as to whether this process is underpinned by a strategic planning process.

The design model described above is one that can be observed throughout the development of all the three transport technology programmes. It was first established during the development of the Transport technologies programme. The TT programme was initially conceived to develop the state-owned industrial sector. It aimed to enhance internal R&D co-operation in the Austrian Industries AG (AI). Once this need had been defined on the policy level, the definition of individual programme lines and topics took place through a bottom-up process involving sector relevant participants. This happened first within AI, then with AI and the ÖBB and then with private sector companies, mostly from the construction sector. The outcome of the process was a focus on noise reduction as an area with a high degree of synergy across the partners involved in the process (Ohler *et al.*, 1998B). The 1998 Evaluation of the ITF Transport Technologies Programme (1992-1997) (Ohler *et al.*, 1998A) further details the development of the individual umbrellas within the programme. The umbrellas were also developed through a bottom-up process involving industrial companies handed in project proposals. The authors came to the conclusion that strategic priorities were not given first priority in the programme but that the "Early involvement of potential participants in the envisaged programme worked to some extent as a substitute for a more systematic and broader analysis of problems and needs. Programme goals had not been defined in beforehand in order to use them as a guideline for approaching the most appropriate stakeholders but evolved during the first brainstorming session" (Ohler *et al.*, 1998A). The evaluation further concluded in its analysis of the low-noise rail programme that "these considerations suggest that there was in fact a much larger problem of innovation deficit in the Austrian railways cluster than could be addressed by focusing on noise reduction. In the ideal case, this would have been revealed by analysis" (Ohler *et al.*, 1998A).

The development of the two subsequent programmes, MOVE and IV2S proceeded along similar lines. The policy need was defined on the top level and the individual programme lines were developed with the help of stakeholders from industry and the research field on the bottom level. These were then developed into strategy concepts that summarise the content of the programmes (Geyer, 2001).

Programme learning

The new programme lines have significantly increased the transparency, the costs and the quality of projects through the call for tenders method. The funding of research projects in the ITF programme was not based on

IV2S – Council's co-ordination attempts

The IVS2 programme underwent a slightly different ratification process to the previous programme lines in the Move and the ITF Transport Technologies programme which were significant in relation to the interaction with transport policy. Since the previous programmes the research funding structure in Austria had changed and a new player introduced. A Council for Research and Technology Development had been established to co-ordinate and develop research activities. In 2001 this entailed all research and technology development programmes submitted for funding under the special funds for research had to be submitted to the council for approval. The Council assessed each submission and delivered a recommendation as to the funding of the programmes developed by the individual ministries. Only after a positive recommendation from the Council would the Finance Ministry release the resources.

One of the main reasons for establishing the Council was to increase co-ordination in research activities and to try to reduce fragmentation within the Austrian R&D sector. The Council took its role seriously and when it considered the transport programmes it initially refused to give a positive recommendation. The reasons for this decision were detailed in the Council's Recommendation from 27 June 2001 (*Rat für Forschung und Technologieentwicklung, 2001A*) which read:

- The Council initially postpones a recommendation on the programme Intelligent Transport Systems. Regarding the announced comprehensive transport plan in which this programme will be integrated an alternative financing concept should be developed. This concept should be financed from sources other than the Research and Development Special Funds for the parts of the programme that are not directly research related or very applied (e.g. infrastructure installations, demonstration activities etc.) due to their high relevance for transport policy. Other sources could be resources from the transport divisions."

The Council was also unsure about the areas of competencies between transport policy and innovation policy within the BMVIT. It did not want to fund activities that were not research related. In the Council's Recommendation from 20 November 2001 (*Rat für Forschung und Technologieentwicklung, 2001B*), however, the Council agreed to fund the proposed programme. It came to two conclusions. Firstly, that the comprehensive transport plan would not be completed for some time and that the decision on the programmes could not wait. Secondly, it agreed that the co-ordination of transport policy and transport technologies could not be achieved in such a short space of time and that either the programme was financed out of the Special Funds or

would not happen at all. The only provision the Council made was to request a mid-term report on the development of the programme before releasing the second half of the funding. This has already taken place without any problems.

The Council was well aware of the co-ordination problems between transport policy and innovation policy. However, it was unable to foster better co-ordination between the two policy areas.

Involvement of research, industrial and policy actors

The involvement of actors from research, industry and policy in the development of the programme can, if used appropriately, ensure the relevancy of the programme vis-à-vis policy needs, research state-of-the-art and industry. The involvement of a wide range of stakeholders can also ensure that the goals of the programme are not just tailored towards a small group of players but include a variety of goals.

The involvement of actors from industry and the research sector was high during the development of all the programmes as the individual programme lines were developed with their help. Most of the individual programme lines were developed with the help of key stakeholders from the individual sectors. In addition, the programmes held brainstorming and ratifying workshops in order to gauge the reactions from the research and industrial sectors.

The involvement of policy makers from other policy areas has been more complicated. During the development of the recent IV2S programme attempts were made to include the transport divisions of the BMVIT in the design process. However, the integration was not entirely successful. This has several reasons which are based on both structural inconsistencies and on perceptions the divisions have of each other.

The Transport Divisions tend towards the view that the Innovation Division is responsible for innovation in the transport sector and that this does not concern broader transport policy issues. They see the boundaries between transport policy and transport technologies as clearly demarcated and separated from each other. The Innovation Division does not limit its own remit merely to the development of transport technologies and interprets its agenda as also encompassing organisational aspects related to the implementation of new technologies. This causes two potential conflicts with the Transport Divisions.

One potential conflict between innovation and transport policy areas is based on the fact that there are no clear areas of competencies related to who is responsible for R&D in transport (as a whole). The more the Innovation Division concern itself with issues to do with transport policy and not just transport technologies, the more know-how they build up about transport policy issues and the more of a threat they become to transport policy. The demarcation, however, is not a satisfactory one and the Innovation Division is well aware of the fact that there are many interfaces between transport technologies and transport policy that need to be addressed. This was one of

the main reasons for attempting to include the Transport Divisions in the programme development process.

Furthermore, each of the transport divisions has small research budgets of their own to commission studies related to their own policy area. It is not in their interest to co-operate with the Innovation Division if this means that all R&D activities are co-ordinated by the Innovation Division.

Another potential conflict area is more subtle but of no less impact are the perceptions the policy areas have of each other and how this affects their willingness to co-operate and learn from each other. The two policy areas have fundamentally different attitudes to what innovation means and what benefits it holds. The transport divisions, such as rail, that deal with large and complex systems are more sceptical of the benefits. They are suspicious of the Innovation Division's motives for pursuing new technologies and caricature the Division as jumping onto every new bandwagon with no thought for the impact they can have on large systems. The perceptions the other way round are no different and the Transport Divisions are depicted as being anti-innovation, traditional and set in their ways. Although there is some truth in the perceptions in reality neither policy area is quite as bad as portrayed by the other. It does, however, have an effect on the willingness to co-operate as trust is one of the main foundations for interaction.

Addressing different policy goals

R&D programmes can address a variety of goals or be focused on a single objective. In the area of transport, many European programmes try to address more than one policy objective in their programme design.

An assessment of the three programmes reveals that the programme documents all state that although their main focus is on innovation, they also aim to pursue transport and environmental policy goals at the same time. However, a closer look at the programmes reveals that their first and foremost aim is to support Austrian industry through R&D collaborations. Following closely behind this goal are other transport and environmental policy aims such as increasing intermodality in order to reduce environmental impact.

The transport technology programmes are perceived as the belonging to the innovation division within the ministry and not the transport division. This has several implications for the direction and the focus of the programmes. Although the aim of the programmes are broad and address environmental issues as well as the increase in multi-modal transport, the main focus on the programmes is on the promotion, the use and the barriers to innovation to reach these aims.

The programmes also all make reference to the transport policy documents available. However, given the fact that the General Transport Plan dates from 1991 and was never implemented and the Austrian Federal Transport Infrastructure Plan (2002) is purely an infrastructure plan, there is no transport policy level document that outlines the role transport technologies should play within an integrated transport strategy. It is

left up to the Unit and to the programmes to define their own legitimacy and position and more importantly their links to transport policy.

Austrian Transport Technology Programmes

Programme	Programme lines	Thematic focus	Time scale	Strategic management	Administrative management	Content advice	Financial management
IVS2- Intelligent Transport Systems and Services (new programme lines)	A3	Automotive suppliers	2003-2006	BMVIT	Roland Gareis Consulting	Austrian suppliers forum (AOEM)	FFF
	ISB	Rail technologies	2003-2006	BMVIT Technologiepolitik und -programme, Abt. V/A/7	Herry/Rosinak		FFF
	I2	Transport telematics	2003-2006	BMVIT	Trust Consult		FFF
MOVE – current programmes	TAKE-ÖV	Telematics – public transport	1999-2003	BMVIT	Trust Consult	Energieverwertungs-agentur E.V.A.	ERP
	Logistik Austria Plus	Logistics	1999-2003	BMVIT	FAA Holding (from Dec. 2002)		ERP
	Innovative mobility services	Urban passenger transport		BMVIT	EVA		ERP
	Pilotprogramm Donau		2001-2005	BMVIT	ERP-Fonds	Via Donau	ERP
	Combined Freight transport	Combined road, rail and ship freight transport	1999-2002	BMVIT	ERP-Fonds		ERP
	ITF	Transport technology programme	1992-1997	BMVIT			

7.4 Transport telematics framework programme

When looking at the interaction between innovation policy and transport policy the issues quickly become very concrete and complex. It is very difficult to stay on an abstract systems innovation level and talk about making sure the various policy levels are co-ordinated without defining the levels, the actors the issues and going into considerable detail on a single issue. One example that illustrates this point is the Austrian Telematics Framework Programme. Telematics is a horizontal policy issue that affects, amongst other policy areas, both transport and innovation. The development and trial of new technologies is the responsibility of the innovation policy agenda whereas their interaction with real world situations and implementation belongs to the transport agenda. This is however, not a linear process and the costs and benefits of technological developments need to be communicated with the expectations from the transport side.

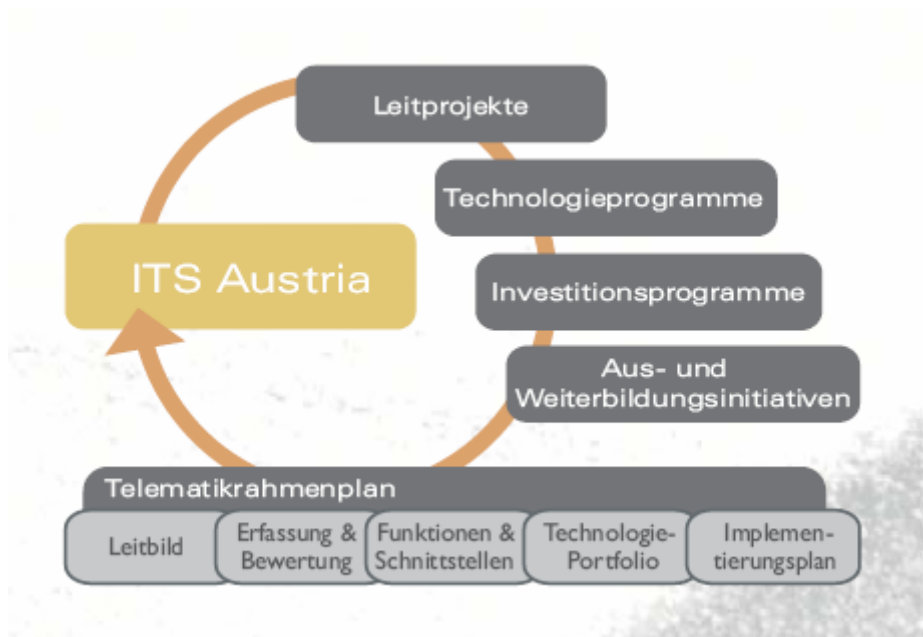
The Telematics Framework Plan provides such a platform for a variety of actors to jointly define what the future and framework conditions for the development and implementation of telematics applications should look like. The telematics Plan provides a common framework where actors from specialised areas of policy making are able to express their requirements, interests and questions from their own point of view without having to understand the entire concept. The process is managed and synthesised by an external.

7.5 Telematics Framework Programme – Structure

Problems in transport have led to the need to find ways of optimise existing structures, linking modes of transport and using transport system more efficiently. Transport telematics have the potential to bring considerable benefits. However, need for a common approach. For this reason the Transport telematics initiative *ITS Austria* (Intelligent Transport Systems) was initiated. It will ensure that the implementation of transport telematics in Austria is a coherent one and that it is in line with European standards in terms of the definition of interfaces, user demands and the implementation of new technologies. A coherent strategy will provide stability for companies who want to invest in the area.

The basis of the ITS Austria is the Telematics Framework Programme TTS-A (Transport Telematics Systems Austria). The framework programme's aim is to provide comprehensive guidelines for the implementation of telematics in transport in Austria. Four other parts (lead projects, technology programmes, investment programmes and further education and training programmes) contribute to the overall aims.

Figure 2 Telematics Framework Programme Structure



The Five parts of the process

The Telematics Framework Programme is a highly structured process that aims to include many of the different actors involved in the formulation and the implementation of transport telematics. In order to structure their involvement the process has been divided into five clear stages (see Figure 2): Guiding framework, assessment and evaluation, functions and interfaces, technology portfolio and general telematics plan.

- **Guiding framework**
This part focuses on the definition of a guiding framework in which the development of the framework programme should take place. It is based on the assessment of user requirements. The guiding framework is based on four overarching themes: efficiency, safety, quality and usability.
- **Assessment and evaluation**
This part involves an assessment of the current and expected use of telematic applications in Austria. The data will be assessed according to the overarching themes and user requirements. The data collection included analysing different systems and areas of application.
- **Functions and interfaces**
To develop a ITS system architecture for Austria. The aim is the interoperability and the inclusion of user requirements for existing and future telematic implementations. There are three parts: functional architecture, physical architecture and communication architecture.

- **Technology portfolio**
This part establishes recommendations for the implementation of telematics technologies in all areas of transport and traffic in Austria with a time frame up to 2015. It develops a categorisation method for existing technologies according to technical and economic factors and on the basis of the overarching themes. It aims to develop a priority list for the implementation of telematics technologies on the basis of the technology assessment.
- **Implementation plan**
This part aims to develop a unified and country-wide basis for planning in the area of telematic implementation in order to ensure an overall common approach across all modes of transport and areas of implementation in Austria. It deals with broader organisational and legal framework conditions.

7.6 Design process

The transport telematics framework programme is an attempt to design a comprehensive strategy across all modes of transport and areas of implementation. The process should not just produce a strategy on paper, but should include the commitment of all stakeholders from both the public and private sectors who will then be responsible for putting the strategy into practise. For this reason the process involves a wide range of actors from senior policy makers through to field specialists.

Co-ordination through stakeholder involvement

High-level commitment for the process is attained TTS-A Advisory Board has 16 members including the heads of the transport and innovation divisions in the Ministry and representatives from the transport operators (Asfinag, SCHIG, ÖBB). The advisory board ensures that there is high-level commitment for the work that goes on in defining the framework programme. Without the commitment of this level the plan would remain a theoretical exercise.

Working groups involving representatives from the departments involved and from the operators. The working groups concentrated on different modes of transport and the implementation of telematics in the individual areas.

The process also benefits from the involvement of external expertise through the inclusion of European experts and civil servants from countries who have expertise in the area of designing and implementing telematics framework programmes.

Process management by agency

The responsibility of organising and co-ordinating the process of designing the framework programme lies with the via donau. This is an agency that belongs to the BMVIT and that manages several of the RTD programmes.

Assessment

It should be stressed though that the development of this plan is no simple process and that it has required the commitment of a considerable range of actors including high level policy makers, the heads of the transport operators and highly motivated individuals who have stuck to the process. The results so far look positive and it would seem as if the process is working. However, the plan can only be called successful if it is also implemented.

8 Assessment

This section looks at the extent to which horizontal policy integration can be considered reality between innovation and transport policy in Austria. This assessment is based on an analysis of the two case studies according to the following stages in the policy cycle.

- Setting directions (agenda setting/prioritisation, stakeholder involvement, using strategic intelligence)
- Horizontal co-ordination in policy formulation (interdepartmental collaboration, policy co-ordination at strategic level)
- Horizontal co-ordination in policy implementation (multi-principle approach, cross-agency initiatives)
- Policy learning (accountability)

Setting directions

There are no strategic policy documents in the area of transport policy. The infrastructure plan cannot be considered an overall strategic policy document. It only deals with one small, if albeit significant, area of transport policy. This is often put down to the fact that there are strong and very localised policy areas with their own agendas. Given this setting more top-down strategic planning documents are difficult to establish and even more to implement. This doesn't however mean that there is no coordination between the different, individual areas of transport policy making. It mainly works on an informal and un-codified basis based on the relationships between individual policy makers who have a certain profile within the policy area. The lack of a strategic transport planning document means that each individual policy area within transport policy is free to pursue its own goals.

Direction setting at the highest level is not often done in collaboration with different policy areas. The initial impetus for a strategy or an instrument usually comes from inside one policy field. This was the case for both case studies in the transport field. This is also a result of the fact that the process through which initiatives are initiated is ad-hoc and not very structured. They are often dependent on a certain opening for a specific issue and not on strategic need for a certain policy instrument.

Horizontal co-ordination in policy formulation

The transport technology RTD programmes reveal limited success in co-ordinated policy formulation. The cooperation between the transport and innovation divisions proves to be difficult due to a number of factors including differences in approaches and time scales, the threat of take over bids from other divisions and the lack of clear process ownership

The transport telematics framework programme is a good example of co-ordination at the policy formulation stage. A wide range of actors are involved in the process both from the ministries and from the private sector. As can be seen with this process, the external management of complex political and technical processes is becoming increasingly common⁴). It firstly, moves the process out of one individual policy area and secondly also allows a broader perspective to be included. Individual policy areas often do not see beyond the next budget or the next large technology programme. Often external actors are not tied to such time horizons and are able to take a longer term perspective.

Horizontal co-ordination in policy implementation

The implementation of the transport technology RTD programmes takes place between the innovation division and the programme management. The transport division does not get involved in this stage of the RTD programmes. However, not all co-ordination mechanisms need the collaboration of all mechanisms at every level and the implementation of the programmes is perhaps best left to the division with the most experience in programme management.

In the telematics framework programme it is probably too early to say how the implementation of the co-ordination mechanism will take place.

Policy learning

The very fact that the telematics framework programme was established is a signal that learning is taking place within the policy system. This framework programme has addressed several of the main problems and barriers that exist between transport and innovation policy in Austria. Firstly, it addressed the issue of process ownership and moved the process out of the ministry. Through doing this it decreased the threat of losing responsibilities to another division which is perceived as being one of the main obstacles to policy co-ordination. Secondly, it has been able to develop long term strategic aims for a policy area that has the potential to work in practise and not just to remain on paper. However, it is still too early to be able to assess the outcomes of the programme as the process is still in the conception phase. The effectiveness of the

⁴) The General Transport Infrastructure Plan was also developed with the help of an external moderator.

process can first be tested when the programme is completed and it can be seen whether individual actors use the programme as a basis for their decision making.

On another level, a new actor within the innovation system is trying to supporting overall coherence. The Council for Science and Technological Development is forcing parts of the innovation policy system to take a step back and to consider the gaps and overlaps within the system. It is able to take a wider perspective and to pinpoint such failures in the system. This is was able to do when it ratified all of the RTD programmes submitted for funding by the special funds. Many of the programmes were rejected first time round due to their lack of co-ordination with other similar programmes in the same area. However, although the Council was able to pinpoint the system failures, the time given for the individual actors to remedy the situation was short and it is not clear whether the co-ordination has a long term effect on the system.

Having looked at the level of coherence and co-ordination between the two policy areas in the different phases of the policy making process, the following section summarises the main barriers to policy integration that exist in Austria. This summary shows that although the cases vary considerably according to the success they have in attempting co-ordination between the policy areas, the barriers that lay behind both the case studies are remarkably similar.

Barriers to policy integration

The barriers to the co-ordination of policy areas are manifold. As has been mentioned above, there are both structural, organisational and psychological barriers to co-operation between innovation and transport policy in the development of transport technology programmes. The following are the summarised main barriers

- The **lack of clear structures and** competencies increases mistrust and encourages each part of the system to try and strengthen their own corner. It hinders an openness and interest as to what others are doing.
- **Unstable structures, changing competencies and resources** lead to an atmosphere of mistrust. Co-operation needs to be based on a degree of stability.
- **A lack of strategic planning documents.** The fact that there are no policy documents outlining the role of transport technologies in an integrated transport strategy also inhibits an integration of policy areas.
- Transport goals are only formulated implicitly and not explicitly
- Lack of understanding as to the **differences in thinking** between the two policy areas. Each policy area does not make allowances for the differences in thinking and instead believes the other one should change.
- **Lack of time** to increase cooperation which is a time consuming

- **Lack of formal processes.** Although informal processes function well then cannot always substitute formal ones

Success factors

- The external management of the Telematics Framework Programme by an organisation separate from the ministry that has a mediation function can be seen as learning within the system and therefore as a success factor.
- Policy niches are highly informed about their specific area and connected to the actors within that area
- There is a high level of informal networking and information flows that keep one part of the system informed about the other
- Policy makers are in touch with what is going on in their area and able to make informed decisions

9 Conclusions

This report has touched briefly on a wide range of issues both concerning overall policy making in Austria, on both the organisation of transport and innovation policy and on the interaction between the two policy areas. It has thrown up a number of questions which it has not been able to answer, but which would warrant further investigation.

The question on the pros and cons of long term strategic policy documents that provide a framework in which individual policy areas and sub units can work is a problematic one. It is not clear whether one strategic transport policy document which contained a clear link to innovation and the role innovation should play in supporting overall transport goals would actually help. Firstly, it is not clear whether it would be possible to develop such a document in the beginning in such a way that all actors were involved and felt that they owned the process. Secondly, it is not at all clear that even if such a document were produced that it would be lived. There have been several attempts in ICT policy to create such documents that have failed to have the intended impact.

In addition to the belief in strategic policy documents, there is a tendency to think that coherence in policy making means integration and that combining ministries or agencies is a way of ensuring they work more efficiently and effectively. The experiences of the past four years in the BMVIT in which transport and innovation have been under the same roof have shown that mere organisational proximity is not the only barrier to be overcome. There is no right amount of integration and coherence in a system. It is a case of finding out what doesn't work and where the system fails and finding appropriate mechanisms to fix it. Looking further into what policy coherence and co-ordination mean in the Austrian context would be an interesting study that would benefit both from a deeper understanding of the patchwork style of policy making and

of looking at the ways in which other countries deal with the transport/ innovation interface. Unfortunately no other countries looked at innovation and transport within the MONIT project.

Based on the two case studies looked at in this report there are a number of specific questions that would be interesting to follow.

Further research and implementation questions

- Concrete ways of improving interaction between policy areas within the BMVIT
- Finding ways of institutionalising coordination so that knowledge is not entirely lost if individuals leave their posts.
- Justifying the technology transfer programmes the Council for Science and Technology Development
- Increasing the RTD programmes links to transport policy
- The links between national policy and European policy including the transport technology platforms
- The role of public procurement in influencing the uptake and implementation of innovative solutions in the transport sector

Conclusions for the MONIT process

In addition to analysing the case studies within the Austrian policy context, the aim of the project was also to continue the development of the NIS MONIT conceptual approach to analysing horizontal policy making. At several MONIT working groups meetings, the participating members were encouraged to think about the implications of their own individual work in the member states in regards to synthesising and aggregating the results. The following four questions were conceived to channel the results of the national case studies:

- What are the key lessons from the policy case studies for developing horizontal innovation policy?
- Dimensions for developing an institutionally/evolutionary based innovation theory for policy systems?
- Typology of policy and governance systems across participating countries.
- Focal points for developing policy implications from the material?

What are the key lessons from the policy case studies for developing horizontal innovation policy?

One of the main results of the Austrian case studies in transport was the need to rethink what coherence means and whether strategic policy documents for a specific policy area are useful. Evidence from the area of transport policy and from other policy areas⁵⁾ suggests that such documents remain very noncommittal. They should only be seen as one method of co-ordination.

There is a move to overcome problems associated with departmentalisation through externalising co-ordination processes and managing them through outside the ministries.

Dimensions for developing an institutionally/evolutionary based innovation theory for policy systems

Any theory that aims to help understand policy systems should be based on understanding the basis on which the system works as a first step to understanding why individual actors within the system behave in the way they do. It should aim to understand what co-ordination means in a particular context. The question then arises: Are there a set of criteria against which the coherence of a system can be measured?

As this probably also means the absence of policy failures, or the ability of a system to learn from previous mistakes and the ability not to make the same mistakes twice, the level of learning would be a starting point.

Typology of policy and governance systems across participating countries

Thinking about a typology for Austrian policy initiatives and the overall policy system, the following ideas would provide a useful basis:

- Focus and aim of policy: is the policy issue a broad one covering the whole policy area or is it a specific topic with a policy area?
- Focus and aim of mechanism: is the mechanism a broad one that's main purpose co-ordination is (e.g. a council or platform) or is the co-ordination effort the means to an end such as the development of an RTD programme?
- Process ownership: Internal to the ministry or external
- Implementation of the coordination mechanism: who is involved

⁵⁾ The Austrian NIS MONIT case study in the ICT policy field also came to a similar conclusion about the noncommittal nature of strategic policy documents. Another policy document that has been criticised for its noncommittal nature is the National research and innovation plan (NaFIP) developed by the Council for research and technology development. This document exists parallel to individual strategies from the ministries and the Council has few ways of enforcing the ministries to take it into account.

- No. of actors involved (co-ordination between ministry stakeholders or broader range of stakeholders included in development process)
- Phase of process: Development of policy, implementation of policy
- Level of evaluation and cyclical policy making: how often do evaluations take place and at which level?

From the Austria situation there are a number of concrete mechanisms and policy initiatives that would help to formulate a more general typology

- Strategic policy documents that attempt to build "master-plans" for a certain policy area
- External processes that take place outside the ministry
- Thematic coordination processes that take place in a specific and localised policy area
- RTD Programmes that address more than one policy area

This typology of mechanisms and initiatives could also lead to a broader categorisation of systems based on issues such as:

- Joined-up policy making approach to policy making versus patchwork approach to policy making
- Top-down or bottom-up approach to policy definition
- Integration of ministries into "super ministries" or larger number of independent ministries
- Use of platforms or external bodies as go-betweens

Focal points for developing policy implications from the material

Focal points for developing policy from the Austrian case study should concentrate on the Austrian patchwork system and the necessity to take this into account when thinking about what coherence means. It would mean addressing the fact that the system works and efficiently without having one coherent strategy organising it.

A further focal point, linked to the last one, would be the high level of competency and engagement of individual actors within the policy niches and the need to keep this level whilst opening up the system towards increased co-ordination.

10 Literature

- Arnold, E., Boekholt, P., *Research and innovation governance in eight countries, A meta-analysis of work funded by EZ (Netherlands) and RCN (Norway)*, Brighton: Technopolis, 2003.
- Arnold et al., *Evaluation of the Austrian Industrial Research Promotion Fund (FFF) and the Austrian Science Fund (FWF) Synthesis Report*, Technopolis, Brighton, 2004.
- Boekholt, P. et al., *The Governance of Research and Innovation An international comparative study Country reports*, Technopolis, Amsterdam, 2002.
- Commission Proposal COM(2003) 448 final. *Directive of the European Parliament and of the Council amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures*.
- BMVIT, *Generalverkehrsplan Österreich 2002 – Verkehrspolitische Grundsätze und Infrastrukturprogramm*. Wien: BMVIT, 2002.
- Elder, J., Kuhlmann, St., Smits, R., *New Governance for Innovation, The need for Horizontal and Systemic Policy Co-ordination*, Fraunhofer ISI Discussion Papers *Innovation System and policy Analysis*, No 2/2003, Karlsruhe: Institute Systems and Innovation Research, 2002.
- Geyer, A., *Strategiekonzept "Intelligente Verkehrssysteme und Services" Endbericht*, ARCS, Seibersdorf, 2001.
- Glynn, St. et al., *Typifying Scientific Advisory Structures and Scientific Advice Production Methodologies (TSAS)*, PREST, Manchester, 2002.
- Grassegger, E., Frötscher, A., Pichler, R., Glöckel, T., Seitz, M., Jörg, L., *Das Impulsprogramm Mobilität & Verkehrstechnologien MOVE 1999 – 2003*, Seibersdorf Research Report OEFZS--A-4546, Seibersdorf, 1998.
- Hertin, J., Berkhout, F., *Practical experiences on policy integration and recommendations for future initiatives on EU and national level. Pa per for the 3rd Blueprint workshop: Instruments for integrating environmental and innovation policy*, 26-27 September, Brussels, 2002.
- OECD, *Monitoring and implementing horizontal innovation policy: proposal for a new tip activity (monit)*. DSTI/STP/TIP(2002)9/REV1, Paris: OECD, 2002.
- Ohler, F., Arnold, E., Jörg, L., Corsten, D. (1998A), *Evaluation of the ITF-Transport Technology Programme*. Seibersdorf: ARCS, 1998.
- Ohler, F., Jörg, L. (1998B), *Public Procurement as Collective Action: The Case of the Austrian Low-Noise Rail Programme*. Seibersdorf: ARCS, 1998.
- Rat für Forschung und Technologieentwicklung (2001A), *Empfehlung vom 27 Juni 2001, Verteilung von F&E Sondermittel*, http://www.rat-fte.at/files/empf_010627_sondermittel3.pdf
- Rat für Forschung und Technologieentwicklung (2001B), *Empfehlung vom 20 November 2001* http://www.rat-fte.at/files/empf_011120_sondermittel4.pdf
- Remoe, S., *MONIT: Joint conceptual paper*, MONIT working paper, 2002.
- Rosinak W., Snizek, S., *Der General Verkehrsplan Österreich 2002 Verfahren und Methoden. Internationales Verkehrswesen* (55) 3/2003 76-81, 2003.
- Smits, R., Kuhlmann, St., *Strengthening interfaces in innovation systems: rationale, concepts and (new) instruments. Report for the EC STRATA Workshop "New challenges and new responses for S&T policies in Europe"* Brussels, 22-23 April 2002.

Appendix A List of interview partners

Mag. Dr. Andreas Dorda	A3 Programme Responsibility, Unit I7, BMVIT
Mag. Ute Nagl-Estermann	Transport Policy, Vereinigung der Österr. Industrie
Dr. Gerald Estermann	Overall transport management, logistics and telematics, BMVIT
Dr. Erhard Fürst	Bereichsleiter, Industriepolitik & Ökonomie, Vereinigung der Österr. Industrie
Mag. Evelinde Grassegger	Head of Unit, I7 Mobility and Transport Technologies, BMVIT
Mag. Leonhard Jörg	Technopolis Austria
DI Anton Geyer	Futures Project, IPTS
DI Dr. techn.Herman Knoflacher	Head of the Institute, Institute for Transport Planning and Traffic Engineering, Vienna University of Technology
DI Ernst Lung	Overall transport policy, BMVIT
DI Fritz Ohler	Technopolis Austria
Dr. Reinhard Pfliegl	Via Donau, Telematics plan
DI Wolfgang Rauh	Wissenschaftlicher Leiter, VCÖ
DI Dr. Werner Rosinak	Rosinak & Partner, Ziviltechniker GmbH, Planungs- und Beratungsbüro
Mag. Ingolf Schädler	Head of Innovation Division, BMVIT
DI Brigitte Tiefenthaler	Member of Council's Secretariat, Council for Science and Technology Development
Mag. Markus Radl	Abteilung K6, EU-Koordination, Bundesministerium für Verkehr, Innovation und Technologie, Wien

Appendix B Interview Guidelines

Introduction

The transport case study within the OECD NIS MONIT project aims to examine the links and interactions between the development and the implementation of transport policy and innovation policy objectives. It aims to assess the mechanisms through which the two policy areas communicate and to also address the areas where communication is lacking.

The following guidelines for the case study define the areas to be addressed in the interviews. They focus on three issues: an analysis of the perceptions of the ways in which the two policy areas interact, an analysis of the competencies and the responsibilities for defining and implementing policy and a detailed analysis of the mechanisms and concepts used for increasing policy coherence.

Perceptions of the issues – Interaction between transport and innovation policy in Austria

How are transport policy goals and innovation policy goals linked in Austria?

What role does innovation play in reaching overall transport policy goals?

Is there a designated role for innovation in transport policy?

What role does transport play in setting innovation policy goals?

Stakeholders – competencies, responsibilities and agenda-setting abilities

Who are the main actors involved in defining and implementing policy goals in each field?

Policy actors: Which ministries and/or agencies are responsible for the policy areas?

What role do the agencies play?

Industry actors: What role does industry play in influencing goal setting in the policy field?

Other actors: Which other organisations are also involved in agenda setting including industry organisation, NGOs and lobby organisations.

Horizontal policy making – concrete examples and mechanisms

What mechanisms exist to ensure that policy objectives are integrated?

Are there examples of specific RTD programmes, agencies or other bodies established to co-ordinate the interaction between transport and innovation policies?

If so, how are they developed and who is involved?

When are new measures introduced?

Are there examples whereby a failure to communicate across policy fields has led either to competition between fields or to ill-informed decisions being taken?

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Medieninhaber (Verleger), Herausgeber und Hersteller: Österreichisches Institut für Wirtschaftsforschung,
Wien 3, Arsenal, Objekt 20 • Postanschrift: A-1103 Wien, Postfach 91 • Tel. (+43 1) 798 26 01-0 •
Fax (+43 1) 798 93 86 • <http://www.wifo.ac.at/> • Verlags- und Herstellungsort: Wien

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